SPN codes description

SPN Code	SPN Name	SPN Description
16	Engine Fuel Filter Differential Pressure (see also SPN 1382)	Differential pressure measured across the fuel filter located between the fuel tank and the supply pump. See SPN 1382 and Figures SPN16_A & SPN16_B.
18	Engine Fuel Pressure (Extended Range)	
19	Engine Oil Pressure (Extended Range)	
20	Engine Coolant Pressure 1 (Extended Range)	Gage pressure of liquid found in engine cooling system. See also SPN 109 for alternate range and resolution.
21	Engine ECU Temperature (use SPN 1136)	Temperature of the engine electronic control unit. (SPN 21 & SPN 1207 are not to be used – obsolete)
22	Engine Extended Crankcase Blow-by Pressure	Differential crankcase blow-by pressure as measured through a tube with a venturi. (SPN 1264 is not to be used – obsolete)
23	Generator Oil Pressure	Not referenced in J1939-71
24	Generator Coolant Temperature	Not referenced in J1939-71

27	Engine Exhaust Gas Recirculation 1 Valve Position	The position of the exhaust gas recirculation valve expressed as a percentage of full travel. Zero percent means the valve is closed and no exhaust gas is flowing into the intake air stream. One hundred percent means the valve is fully opened.
28	Accelerator Pedal 3 Position	The ratio of actual position of the third analog engine speed/torque request input device (such as an accelerator pedal or throttle lever) to the maximum position of the input device. This parameter is intended for the third accelerator control in an application. If an application has only one accelerator control, use SPN 91. . In marine applications, this will typically be the operator's third throttle lever.If a low idle validation switch is used in conjunction with accelerator pedal 3 position, use Accelerator Pedal 3 Low Idle Switch, SPN 2971. NOTE—See SPNs 91 and 974 for additional accelerator position parameters. SPN 28 is an additional SPN for accelerator position.
29	Accelerator Pedal 2 Position	The ratio of actual position of the second analog engine speed/torque request input device (such as an accelerator pedal or throttle lever) to the maximum position of the input device. This parameter is intended for secondary accelerator control in an application. If an application has only one accelerator control, use SPN 91.In marine applications, this will typically be the operator's second throttle lever. If a low idle validation switch is used in conjunction with accelerator pedal 2 position, use Accelerator Pedal 2 Low Idle Switch, SPN 2970. NOTE—See SPNs 91 and 974 for additional accelerator position parameters.
30	Engine Crankcase Blowby Pressure	
31	Transmission Range Position	Not referenced in J1939-71
32	Transmission Splitter Position	The current position of the splitter cylinder.
33	Clutch Cylinder Position	Not referenced in J1939-71
36	Clutch Plates	Not referenced in J1939-71

37	Transmission Air Tank Pressure	The pressure of the air in the tank supplying the automatically shifting transmission.
38	Fuel Level 2	Ratio of volume of fuel to the total volume of fuel in the second or right-side storage container. When Fuel Level 2 is not used, Fuel Level 1 (SPN 96) represents the total fuel in all fuel storage containers.
39	Tire Pressure Check Interval	The interval at which the system will check the tire pressures (e.g., 5, 10, 15 min.). NOTE – A value of 0 indicates continuous (real time) pressure readings.
46	Pneumatic Supply Pressure	The pneumatic pressure in the main reservoir, sometimes referred to as the wet tank.
48	Barometric Pressure (Extended Range)	
51	Engine Throttle Valve 1 Position 1	The position of the valve used to regulate the supply of a fluid, usually air or fuel/air mixture, to an engine. 0% represents no supply and 100% is full supply.
52	Engine Intercooler Temperature	Temperature of liquid found in the intercooler located after the turbocharger.
53	Transmission Synchronizer Clutch Value	The current modulated value for the air supply to the synchronizer clutch.
54	Transmission Synchronizer Brake Value	The current modulated value for the air supply to the synchronizer brake.
59	Transmission Shift Finger Gear Position	The current position of the shift finger in the gear direction.
60	Transmission Shift Finger Rail Position	The current position of the shift finger in the rail direction.
64	Transmission #2 Oil Temperature	Temperature of transmission #2 lubricant.

69	Two Speed Axle Switch	Switch signal which indicates the current axle range. 00b = Low speed range 01b = High speed range 10b = Error 11b = Not available
70	Parking Brake Switch	Switch signal which indicates when the parking brake is set. In general the switch actuated by the operator's park brake control, whether a pedal, lever or other control mechanism (see also SPN 619 and 5275).00b = Parking brake not set 01b = Parking brake set 10b = Error 11b = Not available
72	Engine Blower Bypass Valve Position	Relative position of the blower bypass valve.
73	Auxiliary Pump Pressure	Gage pressure of auxiliary water pump driven as a PTO device.
74	Maximum Vehicle Speed Limit	Maximum vehicle velocity allowed. See SPN 6808 for an alternate resolution.
75	Steering Axle Temperature	Temperature of lubricant in steering axle.
76	Axle Lift Air Pressure	
77	Forward Rear Drive Axle Temperature	
78	Rear Rear Drive Axle Temperature	
79	Road Surface Temperature	Indicated temperature of road surface over which vehicle is operating.
80	Washer Fluid Level	Ratio of volume of liquid to total container volume of fluid reservoir in windshield wash system.
81	Aftertreatment 1 Diesel Particulate Filter Intake Pressure (use SPN 3609)	Exhaust pressure as a result of particle accumulation on filter media placed in the exhaust stream. It is recommended that SPN 3609 be used as it has better resolution.

82	Engine Air Start Pressure	Gage pressure of air in an engine starting system that utilizes compressed air to provide the force required to rotate the crankshaft.
84	Wheel-Based Vehicle Speed	Speed of the vehicle as calculated from wheel or tailshaft speed.
86	Cruise Control Set Speed	Value of set (chosen) velocity of velocity control system. See SPN 6809 for an alternate resolution. If an algorithm that can modify the cruise control set point exists in the system, such as Predictive Cruise Control or Adaptive Cruise Control, then Cruise Control Set Speed (SPN 86) will not include the speed adjustment made by that algorithm. For the parameter that includes the adjustment, see Cruise Control Speed (SPN 7319) for the final speed used by the cruise control algorithm.
87	Cruise Control High Set Limit Speed	Maximum vehicle velocity at which cruise can be set. If Cruise Control Adjusted Maximum Speed (SPN 7495) is supported, then SPN 7495 has priority over SPN 87. See the definition for SPN 7495 for more details.
88	Cruise Control Low Set Limit Speed	Minimum vehicle velocity at which cruise can be set or minimum vehicle velocity for cruise operation before it will exit cruise control operation.
90	Power Takeoff Oil Temperature	Temperature of lubricant in device used to transmit engine power to auxiliary equipment.
91	Accelerator Pedal Position 1	This parameter is intended for the primary accelerator control in an application. SPN 91 is the calculated ratio of actual position of the operator's [engine] speed request or [engine] torque request input device (most commonly an accelerator pedal or throttle lever) to the maximum position of the input device. Where redundant means are used to sense the position of the control, SPN 91 shall display the outcome of the manufacturer-defined (i.e. calculated) method to determine the ratio from the redundant inputs.For on-highway vehicles SPN 91 is the operator's accelerator pedal, in the normal driving position. In addition to signaling the operator's powertrain demand, SPN 91 also provides anticipatory information to transmission and ASR algorithms about driver intentions. In marine applications, this will typically be the operator's throttle lever. NOTE— If an application has only one accelerator control,

		use SPN 91. See SPNs 28, 29 and 974 for additional accelerator pedal position parameters. SPN 9510 is an additional diagnostic SPN for accelerator pedal position. SPN91 represents the combined, actual position, of the 1st accelerator pedal, based on the information from all available, redundant, position sensors for that pedal. If a low idle validation switch is used in conjunction with accelerator pedal position 1, use Accelerator Pedal Low Idle Switch 1, SPN 558. See SAE J1843 for standardized accelerator pedal position interface descriptions. SPNs 9763, 2972, and 2973 may be used as diagnostic SPNs for pedal sensors that support multiple outputs.
92	Engine Percent Load At Current Speed	The ratio of actual engine percent torque (indicated) to maximum indicated torque available at the current engine speed, clipped to zero torque during engine braking.
93	Engine Net Brake Torque	
94	Engine Fuel Delivery Pressure	Gage pressure of fuel in system as delivered from supply pump to the injection pump. See SPN 7469 for alternate resolution.See also SPN 5578 for Fuel Delivery Absolute Pressure.
95	Engine Fuel Filter Differential Pressure	Change in fuel delivery pressure, measured across the filter, due to accumulation of solid or semisolid matter on the filter element.
96	Fuel Level 1	Ratio of volume of fuel to the total volume of fuel storage container. When Fuel Level 2 (SPN 38) is not used, Fuel Level 1 represents the total fuel in all fuel storage containers. When Fuel Level 2 is used, Fuel Level 1 represents the fuel level in the primary or left-side fuel storage container.
97	Water In Fuel Indicator 1	Signal which indicates the presence of water in the fuel. 00b = No 01b = Yes 10b = Error 11b = Not available
98	Engine Oil Level	Ratio of current volume of engine sump oil to maximum required volume.

99	Engine Oil Filter Differential Pressure	Change in engine oil pressure, measured across the filter, due to the filter and any accumulation of solid or semisolid material on or in the filter. See SPN 7471 for alternate resolution.
100	Engine Oil Pressure 1	Gage pressure of oil in engine lubrication system as provided by oil pump. See SPN 7468 for alternate resolution.
101	Engine Crankcase Pressure 1	First instance of the gage pressure inside engine crankcase.
102	Engine Intake Manifold #1 Pressure	The gage pressure measurement of the air intake manifold. If there are multiple air pressure sensors in the intake stream, this is the last one in flow direction before entering the combustion chamber. This should be the pressure used to drive gauges and displays. See also SPNs 1127-1130 and SPN 3562 for alternate range and resolution. If there is only one pressure measurement of the air intake manifold to report and this range and resolution is adequate, this parameter should be used.
103	Engine Turbocharger 1 Speed	Rotational velocity of rotor in the turbocharger.
104	Engine Turbocharger Lube Oil Pressure 1	Gage pressure of oil in turbocharger lubrication system.
105	Engine Intake Manifold 1 Temperature	Temperature of pre-combustion air found in intake manifold of engine air supply system.
106	Engine Intake Air Pressure	Absolute air pressure at input port to intake manifold or air box.
107	Engine Air Filter 1 Differential Pressure	Change in engine air system pressure, measured across the filter, due to the filter and any accumulation of solid foreign matter on or in the filter.This is the measurement of the first filter in a multiple air filter system. In a single air filter application, this is the only SPN used. Filter numbering follows the guidelines noted in section, Naming Convention For Engine Parameters.
108	Barometric Pressure	Absolute air pressure of the atmosphere.

109	Engine Coolant Pressure 1	Gage pressure of liquid found in engine cooling system. See SPN 20 for alternate range and resolution.
110	Engine Coolant Temperature	Temperature of liquid found in engine cooling system.
111	Engine Coolant Level 1	Ratio of volume of liquid found in engine cooling system to total cooling system volume. Typical monitoring location is in the coolant expansion tank.
112	Engine Coolant Filter Differential Pressure	Change in coolant pressure, measured across the filter, due to the filter and any accumulation of solid or semisolid matter on or in the filter.
113	Engine Governor Droop	
114	SLI Battery 1 Net Current	Net flow of electrical current into/out of the first battery or first set of batteries used for starting the engine, for lighting, and for ignition (SLI). If more than one battery is included in the first set of batteries and the net current for each battery is desired, then SPNs 7900, 7908, 7916, & 7924 shall be used.See SPN 2579 for alternate range and resolution.
115	Alternator Current	Measure of electrical current flow from the alternator. Alternator Current (High Range/Resolution) parameter SPN 1795 has a higher range and resolution of the same parameter.
116	Brake Application Pressure	Gage pressure of compressed air or fluid in vehicle braking system measured at the brake chamber when brake shoe (or pad) is placed against brake drum (or disc).
117	Brake Primary Pressure	Gage pressure of air in the primary, or supply side, of the air brake system.
118	Brake Secondary Pressure	Gage pressure of air in the secondary, or service side, of the air brake system.
119	Hydraulic Retarder Pressure	Gage pressure of oil in hydraulic retarder system.

120	Hydraulic Retarder Oil Temperature	Temperature of oil found in a hydraulic retarder.
122	Engine Retarder Percent	
123	Transmission Clutch 1 Pressure	Gage pressure of oil within a wet clutch.
124	Transmission Oil Level 1	First instance of a transmission oil level indicator. Conveys the ratio of volume of transmission sump oil to recommended volume.
126	Transmission Filter Differential Pressure	Change in transmission fluid pressure, measured after the filter, due to accumulation of solid or semisolid material on or in the filter.
127	Transmission 1 Oil Pressure	Gage pressure of lubrication fluid in transmission 1, measured after pump.
129	Engine Fuel 1 Injector Metering Rail 2 Pressure (duplicate, use SPN 1349)	The gage pressure of fuel in the metering rail #2 as delivered from the supply pump to the injector metering intake. See Figure SPN16_A for fuel system related parameters. Although the figure does not show rail #2 it does show the relationship of rail pressure to other signals.(Obsolete – use SPN 1349)
130	Engine Power Specific Fuel Economy	
131	Engine Exhaust Pressure (duplicate, use SPN 1209)	
132	Engine Intake Air Mass Flow Rate	Mass flow rate of fresh air entering the engine air intake, before any EGR mixer, if used. Flow rate of fresh air conducted to the engine cylinders to support combustion.
133	Engine Average Fuel Rate	
135	Engine Fuel Delivery Pressure (Absolute)	

136	Auxiliary Vacuum Pressure Reading	Identifies the current vacuum pressure (relative to atmosphere) that is configured uniquely per application. Not to be used in place of defined parameters.
137	Auxiliary Gage Pressure Reading 1	Identifies the current gage pressure (relative to atmosphere) that is configured uniquely per application. Not to be used in place of defined parameters.
138	Auxiliary Absolute Pressure Reading	Identifies the current absolute pressure (relative to 0 pressure) that is configured uniquely per application. Not to be used in place of defined parameters.
141	Trailer, Tag Or Push Channel Tire Pressure Target	The tire pressure control system's target gage pressure for the trailer, tag, or push group of tires.
142	Drive Channel Tire Pressure Target	The tire pressure control system's target gage pressure for the drive group of tires.
143	Steer Channel Tire Pressure Target	The tire pressure control system's target gage pressure for the steer group of tires.
144	Trailer, Tag Or Push Channel Tire Pressure	The latest gage pressure reading of the trailer, tag, or push group of tires, as opposed to the pressure in each tire.
145	Drive Channel Tire Pressure	The latest gage pressure reading of the drive group of tires, as opposed to the pressure in each tire.
146	Steer Channel Tire Pressure	The latest gage pressure reading of the steer group of tires, as opposed to the pressure in each tire.
147	Engine Average Fuel Economy (Gaseous)	
148	Engine Instantaneous Fuel Economy (Gaseous)	

149	Engine Mass Flow Rate (Gaseous) – (Obsolete – Use SPN 1241)	This SPN is obsolete. Use SPN 1241.
152	Number Of ECU Resets	
153	Engine Crankcase Pressure (High Resolution)	
156	Engine Fuel 1 Injector Timing Rail 1 Pressure	The gage pressure of fuel in the timing rail delivered from the supply pump to the injector timing intake.
157	Engine Fuel 1 Injector Metering Rail 1 Pressure	The gage pressure of fuel in the primary, or first, metering rail as delivered from the supply pump to the injector metering intake.
158	Key Switch Battery Potential	Battery potential measured at the input of the electronic control unit supplied through a key switch or similar switching device.
159	Engine Gaseous Fuel Supply Pressure 1	Gage pressure of gaseous fuel supply to fuel metering device.
160	Transmission Intermediate Shaft Speed	Rotational velocity of the first intermediate shaft of the transmission.
161	Transmission 1 Input Shaft Speed	Rotational velocity of the primary shaft transferring power into the first transmission. When a torque converter is present, it is the output of the torque converter.Note: Single input shaft transmissions should use SPN 161 (Transmission Input Shaft Speed). Multiple input shaft transmissions should use SPN 5960 and 5961 (DCT Input Shaft 1 and 2 Speeds). For maximum compatibility, a multiple input shaft speed transmission may also broadcast SPN 161 as a virtual or current inputshaft speed with the following logic: Transmission Input Shaft Speed = DCT Input Shaft 1 Speed when shaft 1 is engaged. Transmission Input Shaft Speed = DCT Input Shaft 2 Speed when shaft 2 is engaged. Transmission Input Shaft Speed = Transitional interpolated value when shifting between shaft 1 and 2.

162	Transmission Requested Range	Range selected by the operator. Characters may include P, Rx, Rx-1…R2, R1, R, Nx, Nx-1…N2, N1, N, D, D1, D2…, Dx, L, L1, L2…, Lx-1, 1, 2, 3,… If only one displayed character is required, the second character shall be used and the first character shall be a space (ASCII 32) or a control character (ASCII 0 to 31). If the first character is a control character, refer to the manufacturer's application document for definition.
163	Transmission Current Range	Range currently being commanded by the transmission control system. Characters may include P, Rx, Rx-1…R2, R1, R, Nx, Nx-1…N2, N1, N, D, D1, D2…, Dx, L, L1, L2…, Lx-1, 1, 2, 3,… If only one displayed character is required, the second character shall be used and the first character shall be a space (ASCII 32) or a control character (ASCII 0 to 31). If the first character is a control character, refer to the manufacturer's application document for definition.
164	Engine Fuel Injection Control Pressure	The gage pressure of the engine oil in the hydraulic accumulator that powers an intensifier used for fuel injection.
165	Compass Bearing	Present compass bearing of vehicle.
166	Engine Rated Power	Net brake power that the engine will deliver continuously, specified for a given application at a rated speed.
167	Charging System Potential (Voltage)	Electrical potential measured at the charging system output. The charging system may be any device charging the batteries. This includes alternators, generators, solid state charger and other charging devices.
168	Battery Potential / Power Input 1	This parameter measures the first source of battery potential as measured at the input of the ECU/actuator etc. coming from one or more batteries, irrespective of the distance between the component and the battery. This SPN is also used when ECUs are interconnected in a series configuration, where the source of power is coming directly or indirectly from the same battery/batteries.If more than one battery is included in the first set of batteries and the potential for each battery is desired, then SPNs 7902, 7910, 7918, & 7926 shall be used.

169	Cargo Ambient Temperature	Temperature of air inside vehicle container used to accommodate cargo.
170	Cab Interior Temperature	Temperature of air inside the part of the vehicle that encloses the driver and vehicle operating controls. Note: See also SPN 1691. SPN 1662 is an additional diagnostic SPN associated with cab temperature.
171	Ambient Air Temperature	Temperature of air surrounding vehicle.
172	Engine Intake 1 Air Temperature	Temperature of air entering vehicle air induction system.
173	Engine Exhaust Temperature	Temperature of combustion byproducts leaving the engine. See SPNs 2433, 2434, 5969 and 5970 for engines with more than one exhaust temperature measurement.
174	Engine Fuel 1 Temperature 1	Temperature of fuel (or gas) of the first fuel type. See SPN 3468 for a second temperature measurement of the first fuel type.
175	Engine Oil Temperature 1	Temperature of the engine lubricant. Note: If there is only one engine oil temperature measurement, this SPN should be used. This is the SPN that is typically displayed on an on-highway truck instrument cluster. See also SPNs 1135 and 5925 for additional engine oil temperature measurements.
176	Engine Turbocharger 1 Oil Temperature	Temperature of the turbocharger lubricant.
177	Transmission Oil Temperature 1	First instance of transmission lubricant temperature.
178	Front Axle Weight	
179	Rear Axle Weight	
180	Trailer Weight	Total mass of freight-carrying vehicle designed to be pulled by truck, including the weight of the contents.

181	Cargo Weight	The mass of freight carried.
182	Engine Trip Fuel	Fuel consumed during all or part of a journey. See SPN 5053 for alternate resolution.
183	Engine Fuel Rate	Amount of fuel consumed by engine per unit of time. NOTE – See SPN 1600 for alternate resolution.
184	Engine Instantaneous Fuel Economy	Current fuel economy at current vehicle velocity. FB00h = Infinite (for example, during engine motoring)
185	Engine Average Fuel Economy	Average of instantaneous fuel economy for that segment of vehicle operation of interest.
186	Power Takeoff Speed	Rotational velocity of device used to transmit engine power to auxiliary equipment.
187	Power Takeoff Set Speed	Rotational velocity selected by operator for device used to transmit engine power to auxiliary equipment.
188	Engine Speed At Idle, Point 1	Stationary low idle speed of engine which includes influences due to engine temperature (after power up) and other stationary changes (calibration offsets, sensor failures, etc). This parameter is point 1 of the engine configuration map (see PGN 65251).
189	Engine Rated Speed	The maximum governed rotational velocity of the engine crankshaft under full load conditions. Note that the engine speed at point 2 (SPN 528) is equal to rated engine speed only in the case when the engine has not been derated. Please also reference PGN 65251.
190	Engine Speed	Actual engine speed which is calculated over a minimum crankshaft angle of 720 degrees divided by the number of cylinders.
191	Transmission 1 Output Shaft Speed	Calculated speed of the transmission 1 output shaft.

228	Speed Sensor Calibration	
229	Total Fuel Used (Gaseous) (duplicate, use SPN 1040)	
230	Total Idle Fuel Used (Gaseous) (duplicate, use SPN 1010)	
231	Trip Fuel (Gaseous) (duplicate, use SPN 1039)	
232	DGPS Differential Correction	
233	Unit Number (Power Unit)	Owner assigned unit number for the power unit of the vehicle. NOTE: The ASCII character « * » is reserved as a delimiter.
234	Software Identification	Software identification of an electronic module. As an example, this parameter may be represented with ASCII characters MMDDYYaa where MM is the month, DD is the day, YY is the year, and aa is the revision number.NOTE The ASCII character "*" is reserved as a delimiter.
235	Engine Total Idle Hours	Accumulated time of operation of the engine while under idle conditions.
236	Engine Total Idle Fuel Used	Accumulated amount of fuel used during vehicle operation while under idle conditions.
237	Vehicle Identification Number	Vehicle Identification Number (VIN) as assigned by the vehicle manufacturer. NOTE The ASCII character "*" is reserved as a delimiter.
238	Velocity Vector	
241	Tire Pressure	Pressure at which air is contained in cavity formed by tire and rim.

242	Tire Temperature	Temperature at the surface of the tire sidewall.
244	Trip Distance	Distance traveled during all or part of a journey. NOTE See SPN 918 for alternate resolution.
245	Total Vehicle Distance	Accumulated distance traveled by vehicle during its operation. NOTE See SPN 917 for alternate resolution.
246	Total Vehicle Hours	Accumulated time of operation of vehicle.
247	Engine Total Hours of Operation	Accumulated time of operation of engine.
248	Total Power Takeoff Hours	Accumulated time of operation of power takeoff device.
249	Engine Total Revolutions	Accumulated number of revolutions of engine crankshaft during its operation.
250	Engine Total Fuel Used	Accumulated amount of fuel used during vehicle operation. See SPN 5054 for alternate resolution.
251	Time	
252	Date	
257	Cold Restart Of Specific Component	
258	Warm Restart Of Specific Component	
259	Acknowledgement Of Warm Or Cold Restart	
354	Relative Humidity	Measures humidity of combustion air prior to entry into turbocharger

355	Engine Oil Life Remaining	Signal which indicates the actual oil life remaining in percent. 100% means the engine oil is brand new, and 0% means the engine oil is at the end of its life.
378	Fare Collection Unit Status	
380	Articulation Angle	
383	Vehicle Acceleration	
407	Axle Group Full Weight Calibration	The full weight calibration measurement of an axle group
408	Axle Group Empty Weight Calibration	The empty weight calibration measurement of an axle group
409	Axle Group Weight	Total mass imposed on the road surface by all the tires in the axle group
411	Engine Exhaust Gas Recirculation 1 Differential Pressure	Differential pressure across the Exhaust Gas Recirculation (EGR) system
412	Engine Exhaust Gas Recirculation 1 Temperature	Temperature of Recirculated Exhaust Gas. This should not be used for Exhaust Gas Recirculation Mixer Intake Temperature. See SPN 5020.
413	Net Vehicle Weight Change	Identifies the net vehicle weight change from the time of last vehicle net weight zeroing.
417	Gross Combination Weight	Total weight of the truck and all the trailers with on-board scales.
430	Engine Starter Solenoid Voltage	This is the voltage at the battery terminal of the starter solenoid.
441	Auxiliary Temperature 1	Temperature measured by auxiliary temperature sensor #1. Not to be used in place of existing SPNs.

442	Auxiliary Temperature 2	Temperature measured by auxiliary temperature sensor #2. Not to be used in place of existing SPNs.
443	Auxiliary Gage Pressure Reading 2	
444	Battery Potential / Power Input 2	This parameter measures the second source of battery potential as measured at the input of the ECU/actuator etc. coming from one or more batteries, irrespective of the distance between the component and the battery. This SPN is also used when ECUs are interconnected in a series configuration, where the source of power is coming directly or indirectly from the same battery/batteries.
445	Engine Bank 2 Cylinder Head Temperature	
446	Engine Bank 1 Cylinder Head Temperature	
447	Passenger Counter	
501	Signage Message	
502	Fare Collection Unit – Point Of Sale	
503	Fare Collection Unit – Service Detail	
504	Annunciator Voice Message	
505	Vehicle Control Head Keyboard Message	
506	Vehicle Control Head Display Message	

507	Driver Identification	
508	Transit Route Identification	
509	Milepost Identification	Used to identify the milepost as detected by a milepost sensor. The length of the ASCII text for this parameter must be reported using SPN 3070 (Number of bytes in the Milepost Identification).
512	Driver's Demand Engine – Percent Torque	The requested torque output of the engine by the driver. It is based on input from the following requestors external to the powertrain: operator (via the accelerator pedal), cruise control and/or road speed limit governor. Dynamic commands from internal powertrain functions such as smoke control, low- and high-speed engine governing; ASR and shift control are excluded from this calculation. The data is transmitted in indicated torque as a percent of the reference engine torque. See PGN 65251 for the engine configuration message. Several status bits are defined separately to indicate the request which is currently being honored. This parameter may be used for shift scheduling.
513	Actual Engine – Percent Torque	The calculated output torque of the engine. The data is transmitted in indicated torque as a percent of reference engine torque (see the engine configuration message, PGN 65251). The engine percent torque value will not be less than zero and it includes the torque developed in the cylinders required to overcome friction.
514	Nominal Friction – Percent Torque	The calculated torque that indicates the amount of torque required by the basic engine itself added by the loss torque of accessories. It contains the frictional and thermodynamic loss of the engine itself, pumping torque loss (SPN 5398), and the losses of fuel, oil and cooling pumps. The data is transmitted as a percent of reference engine torque (see the engine configuration message, PGN 65251).The realization can be done by a map dependent on engine speed and engine temperature and an offset value for additional loss torques. See SPN 2978 for an indicator that describes the possible inclusion of engine parasitic losses such as cooling fan, etc. in this parameter value. Note: Refer to section 5.2.1 in SAE J1939-71. Note: Beginning in 2016, HD-OBD requires reporting of engine torque to Portable Emissions

		Measurement System (PEMS) equipment that is representative of torque as measured by the engine dynamometer during the emissions certification process. Therefore, for applications that are subject to HD-OBD regulations in 2016 or later, estimated parasitic losses shall no longer be included in SPN 514 Nominal Friction – Percent Torque and must be included in SPN 2978 Estimated Engine Parasitic Losses – Percent Torque.
515	Engine's Desired Operating Speed	An indication by the engine of the optimal operating speed of the engine for the current existing conditions. These conditions may include the torque generated to accommodate powertrain demands from the operator (via the accelerator pedal), cruise control, road speed limit governors, or ASR. Dynamic commands from functions such as smoke control or shift control are excluded from this calculation.
516	Ground-Based Vehicle Speed	Actual ground speed of the vehicle, measured by a device such as RADAR. (1.609344 km/h = 1 mph)
517	Navigation-Based Vehicle Speed	Speed of the vehicle as calculated from a device such as a Global Positioning System (GPS).
518	Engine Requested Torque/Torque Limit	Parameter provided to the engine or retarder in the torque/speed control message for controlling or limiting the output torque.Requested torque to the engine is measured in indicated torque as a percentage of reference engine torque (see the engine configuration message, PGN 65251). This is the engine torque at which the engine is expected to operate if the torque control mode is active or the engine torque which the engine is not expected to exceed if the torque limit mode is active. Zero torque can be requested which implies zero fuel and, according to Figures SPN512_A and SPN512_B, the engine will not be allowed to stall. The actual engine percent torque (SPN 513) should be zero and the engine should decelerate until the low idle governor kicks in, at which time the actual engine percent torque will be calculated as shown in Figures SPN512_A and SPN512_B and the engine torque mode bits (SPN 899) should be equal to 0000b – Low Idle Governor. Requested torque to the retarder is measured in indicated torque as a percentage of reference retarder torque (see the retarder configuration message, PGN 65249). The logic used in enabling or disabling

		the retarder is based on the override control mode priority bits (SPN 897). A zero torque request to the retarder is a disable request, and is used by a J1939 node to prevent the retarder from being activated by other combinations of inputs outside of J1939 commands. The Torque Limit Mode is commonly used for this purpose.
519	Engine's Desired Operating Speed Asymmetry Adjustment	This byte is utilized in transmission gear selection routines and indicates the engine's preference of lower versus higher engine speeds should its desired speed not be achievable. This is a scaled ratio such that 125 represents an equal preference for a speed lower or higher that the engine's indicated desired speed. The higher the asymmetry adjustment value is above 125, the more the engine prefers to be operated at or above its indicated desired speed. Conversely, the lower the asymmetry adjustment value is below 125, the more the engine prefers to operate at or below its indicated desired speed. Typically, the engine's asymmetry adjustment will be predicated on fuel consumption considerations, and under these conditions, the method for computing the asymmetry adjustment is indicated in Figure SPN519_A. The engine may include other factors into its asymmetry adjustment calculation such as temperatures, pressures, and other operating parameters.
520	Actual Retarder – Percent Torque	Actual braking torque of the retarder as a percent of retarder configuration reference torque SPN 556. Note: Refer to section 5.2.1 in SAE J1939-71.
521	Brake Pedal Position	Ratio of brake pedal position to maximum pedal position. Used for electric brake applications. 0% means no braking. Also when there are two brake pedals on the machine (Left Brake Pedal Position SPN 3033 and Right Brake Pedal Position SPN 3032) the maximum of the two should be transmitted for Brake Pedal Position.
522	Percent Clutch Slip	Parameter which represents the ratio of input shaft speed to current engine speed (in percent). Percent Clutch Slip = ((Engine rpm – Input shaft rpm)/(Engine rpm)) x 100
523	Transmission Current Gear	The gear currently engaged in the transmission or the last gear engaged while the transmission is in the process of shifting to the new or selected gear. Transitions toward a destination gear will not be indicated. Once the selected gear has been engaged then Transmission Current Gear (SPN 523) will reflect that gear.

524	Transmission Selected Gear	The gear that the transmission will attempt to achieve during the current shift if a shift is in progress, or the next shift if one is pending (i.e., waiting for torque reduction to initiate the shift).
525	Transmission Requested Gear	Gear requested by the operator, ABS, or engine. Negative values are reverse gears, positive values are forward gears, zero is neutral, parameter specific indicators are listed below. Parameter specific values for this parameter are as follows: FDh = Hold current gear FCh = Forward Drive Position FBh = 'Park' position FAh = Forward 'Low' position F9h = Upshift 1 gear from current position F8h = Upshift 2 gears from current position F7h = Downshift 1 gear from current position F6h = Downshift 2 gears from current position F5h = D-1: 1st forward selector position referenced from 'Drive' F4h = D-2: 2nd forward selector position referenced from 'Drive' F3h = D-3: 3rd forward selector position referenced from 'Drive' F2h = D-4: 4th forward selector position referenced from 'Drive' F1h = D-5: 5th forward selector position referenced from 'Drive' F0h = D-6: 6th forward selector position referenced from 'Drive' EFh = D-7: 7th forward selector position referenced from 'Drive' EEh = Between two shift selector positions (if detail is unknown) EDh = Between two reverse shift selector positions ECh = Between two forward shift selector positions EBh = Between D-7 and D-6 shift selector positions EAh = Between D-6 and D-5 shift selector positions E9h = Between D-5 and D-4 shift selector positions E8h = Between D-4 and D-3 shift selector positions E7h = Between D-3 and D-2 shift selector positions E6h = Between D-2 and D-1 shift selector positions E5h = Between D-1 and 'Drive' shift selector positions E4h = Between 'Drive' and 'Neutral' shift selector positions E3h = Between 'Neutral' and 'Reverse' shift selector positions E2h = Between 'Reverse' and 'Park' shift selector positions E1h = Press of momentary button to reselect current position E0h = Position unknown and/or no buttons pressed DFh = Reverse Selector Position DEh to BEh = Reserved 3Ch to 00h = Reserved Forward selector position from drive (F5h to EFh) – Indicates shift selector position in reference to the 'Drive' position on the selector. It is possible that the shift selector software may not know the number of forward ranges. The shift selector may identify the position selected by the operator while the transmission ECU determines what range or gear that represents. If there is a digital display, the transmission ECU would communicate what is to be displayed via another message such as ETC#2 or ETC#7.

		For example: Consider a vehicle with a 5-speed automatic transmission with the shift lever on the column. Suppose that shift selector has a limited number of positions, such that having positions for D-4-3-2-1 is not an option. For this example, assume there are only have enough lever positions for D-3-2-1. Pulling the lever into « D » will put the transmission in 5th (highest gear). It is desired that pulling the lever to the physical « 3 » position will limit the transmission to a maximum range of 3rd gear. When the selector is pulled down into « 3 », the shifter selector itself has no way of correlating this physical lever position to the desired gear; it would have to be calibrated with software to tell it this information. If not calibrated, the shift selector cannot directly command the transmission to go to 3rd gear; it only knows it's one notch below drive. However, if « D-1 » (lever position, as opposed to desired gear) is broadcast by the selector, the transmission ECU can receive this and then make the determination of what range is desired. The benefit is that no specific calibration of the shift selector is required. Between selector positions (EEh to E2h) – Indicates the shift selector is not in an appropriate position. If a lever-type shift selector with a mechanical display is stuck between detents, it may appear to the operator that it is in the desired position when in fact it is not. The shift selector may be capable of reporting only that it is between positions or that it is between forward or reverse positions. If known, the transmission ECU may respond differently depending on which positions are involved. Reselect current position (E1h) – If the TC1 message continues to send the position last selected, then a capability to reselect the same position is required. For example: If a 'Neutral to Drive' shift is selected and that shift is inhibited (say for high engine speed), it may be necessary for the operator to reselect 'Drive' after the inhibit conditions pass in order for the transmission ECU to honor the request. Position unknown and/or no buttons pressed (E0h) – A push-button style shift selector with momentary contact buttons may send this indicator after initialization before any buttons are pressed, or before the transmission ECU determines and communicates the initial selection. This indicator could also be sent between button presses as an alternative to sending the last button press.
526	Transmission Actual Gear Ratio	Actual ratio of input shaft speed to output shaft speed.

527	Cruise Control States	This parameter is used to indicate the current state, or mode, of operation by the cruise control device. This is a status parameter.000b = Off/Disabled 001b = Hold 010b = Accelerate 011b = Decelerate 100b = Resume 101b = Set 110b = Accelerator Override 111b = Not available
528	Engine Speed At Point 2	Engine speed of point 2 of the engine torque map (see PGN 65251 and supporting document). In engine configuration mode 1 and 3, point 2 is defined as the kick-in point from which torque is reduced to zero. In mode 2 (see Table PGN65251_A), there are no special requirements for the definition of this point.
529	Engine Speed At Point 3	Engine speed of point 3, 4, and 5 of the engine torque map (see PGN 65251 and supporting document). It is recommended that one of these points indicate the peak torque point for the current engine torque map. Points 3, 4, and 5 are optional and lie between idle and point 2.
530	Engine Speed At Point 4	Engine speed of point 3, 4, and 5 of the engine torque map (see PGN 65251 and supporting document). It is recommended that one of these points indicate the peak torque point for the current engine torque map. Points 3, 4, and 5 are optional and lie between idle and point 2.
531	Engine Speed At Point 5	Engine speed of point 3, 4, and 5 of the engine torque map (see PGN 65251 and supporting document). It is recommended that one of these points indicate the peak torque point for the current engine torque map. Points 3, 4, and 5 are optional and lie between idle and point 2.
532	Engine Speed At High Idle, Point 6	Engine speed of high idle (point 6) of the engine torque map (see PGN 65251 and supporting document). In engine configuration mode 3 (see Figure PGN65251_C), point 6 is not defined by the engine torque map but by the governor characteristic and the zero torque line.
533	Engine Maximum Momentary Override Speed, Point 7	The maximum engine speed above high idle allowed by the engine control during a momentary high idle override. This duration of the override is limited by the maximum momentary override time limit, SPN 534.

534	Engine Maximum Momentary Override Time Limit	The maximum time limit allowed to override the engine's high idle speed.
535	Engine Requested Speed Control Range Lower Limit	The minimum engine speed that the engine will allow when operating in a speed control/limit mode.
536	Engine Requested Speed Control Range Upper Limit	The maximum engine speed regardless of load that the engine will allow when operating in a speed control/limit mode, excluding any maximum momentary engine override speed, if supported.
537	Engine Requested Torque Control Range Lower Limit	The minimum engine torque that the engine will allow when operating in a torque control/limit mode.
538	Engine Requested Torque Control Range Upper Limit	The maximum engine torque that the engine will allow when operating in a torque control/limit mode.
539	Engine Percent Torque At Idle, Point 1	The torque limit that indicates the available engine torque which can be provided by the engine at idle speed. This parameter may be influenced by engine temperature (after power up) and other stationary changes (calibration offsets, sensor failures, etc.) See also SPN 188. The data is transmitted in indicated torque as a percent of the reference engine torque.
540	Engine Percent Torque At Point 2	The torque limit that indicates the available engine torque which can be provided by the engine at point 2 of the engine map (see PGN 65251 and supporting documents). In engine configuration mode 1 and 3 (see Table PGN65251_A see PGN 65251), point 2 is defined as the kick-in point from which torque is reduced to zero. In mode 2, there are no special requirements for the definition of this point. The data is transmitted in indicated torque as a percent of the reference engine torque.
541	Engine Percent Torque At Point 3	The torque limit that indicates the available engine torque which can be provided by the engine at point 3, 4, and 5 of the engine map (see PGN 65251 and supporting documents).. It is required that one of these points indicate the peak torque point for

		the current engine torque map. Points 3, 4, and 5 lie between idle and point 2. The data is transmitted in indicated torque as a percent of the reference engine torque.
542	Engine Percent Torque At Point 4	The torque limit that indicates the available engine torque which can be provided by the engine at point 3, 4, and 5 of the engine map (see PGN 65251 and supporting documents). It is required that one of these points indicate the peak torque point for the current engine torque map. Points 3, 4, and 5 lie between idle and point 2. The data is transmitted in indicated torque as a percent of the reference engine torque.
543	Engine Percent Torque At Point 5	The torque limit that indicates the available engine torque which can be provided by the engine at point 3, 4, and 5 of the engine map (see PGN 65251 and supporting documents). It is required that one of these points indicate the peak torque point for the current engine torque map. Points 3, 4, and 5 lie between idle and point 2. The data is transmitted in indicated torque as a percent of the reference engine torque.
544	Engine Reference Torque	This parameter is the 100% reference value for all defined indicated engine torque parameters. It is only defined once and doesn't change if a different engine torque map becomes valid.
545	Engine Gain (Kp) Of The Endspeed Governor	The endspeed governor is defined as a linear line with the following equations (Capital letters mean physical values, small letters mean normalized values). Refer to Figures PGN65251_A and PGN65251_B.The gain KP/kp is defined as a positive value. The factor 4096 is necessary for realizing flat curves with sufficient resolution as well as very steep curves. KP = delta Torque / delta Speed kp (normalized) = KP * 250/100% * 8031 rpm/64255 * 4096 = KP * 1280 rpm/%
546	Retarder Speed At Idle, Point 1	Please reference PGN 65249
547	Retarder Speed At Peak Torque, Point 5	Please reference PGN 65249
548	Maximum Retarder Speed, Point 2	Maximum speed of retarder (Please reference PGN 65249).

549	Retarder Speed At Point 3	Retarder speed of point 3 of the engine retarder torque map. Please reference PGN 65249.
550	Retarder Speed At Point 4	Retarder speed of point 4 of the engine retarder torque map. Please reference PGN 65249.
551	Retarder Percent Torque At Idle, Point 1	The torque limit that indicates the available retarder torque which can be provided by the retarder at idle speed. The data is transmitted in indicated torque as a percent of the reference retarder torque.
552	Retarder Percent Torque At Maximum Speed, Point 2	The torque limit that indicates the available retarder torque which can be provided by the retarder at its maximum speed. Please reference PGN 65249. The data is transmitted in indicated torque as a percent of the reference retarder torque.
553	Retarder Percent Torque At Point 3	The torque limit that indicates the available retarder torque which can be provided by the retarder at points 3 and 4 of the retarder torque map. Please reference PGN 65249. The data is transmitted in indicated torque as a percent of the reference retarder torque.
554	Retarder Percent Torque At Point 4	The torque limit that indicates the available retarder torque which can be provided by the retarder at points 3 and 4 of the retarder torque map. Please reference PGN 65249. The data is transmitted in indicated torque as a percent of the reference retarder torque.
555	Retarder Percent Torque At Peak Torque, Point 5	The torque limit that indicates the available retarder torque which can be provided by the retarder at point 5 of the retarder torque map. Please reference PGN 65249. The data is transmitted in indicated torque as a percent of the reference retarder torque.
556	Retarder Reference Torque	This parameter is the 100% reference value for all defined indicated retarder torque parameters. It is only defined once and doesn’t change if a different retarder torque map becomes valid.
557	Retarder Control Method	This parameter identifies the number of steps used by the retarder.

558	Accelerator Pedal 1 Low Idle Switch	Switch signal which indicates the state of the accelerator pedal 1 low idle switch. The low idle switch is defined in SAE Recommended Practice J1843. 00b = Accelerator pedal 1 not in low idle condition 01b = Accelerator pedal 1 in low idle condition 10b = Error 11b = Not available
559	Accelerator Pedal Kickdown Switch	Switch signal which indicates whether the accelerator pedal kickdown switch is opened or closed. The kickdown switch is defined in SAE J1843.00b = Kickdown passive 01b = Kickdown active 10b = Error 11b = Not available
560	Transmission Driveline Engaged	Driveline engaged indicates the transmission controlled portion of the driveline is engaged sufficiently to allow a transfer of torque through the transmission. Driveline engaged is ACTIVE whenever the transmission is in gear and the clutch (if controlled by the transmission controller) is less than 100% clutch slip (clutch able to transfer torque). This parameter should be used in conjunction with the parameter « Shift in Process » (SPN 574). While a shift is in process, the receiver should not assume that the driveline is either fully engaged or disengaged (i.e., cruise control).00b = Driveline disengaged 01b = Driveline engaged 10b = Error 11b = Not available
561	ASR Engine Control Active	State signal which indicates that ASR engine control has been commanded to be active. Active means that ASR actually tries to control the engine. This state signal is independent of other control commands to the engine (e.g., from the transmission) which may have higher priority.00b = ASR engine control passive but installed 01b = ASR engine control active 10b = Reserved 11b = Not available
562	ASR Brake Control Active	State signal which indicates that ASR brake control is active. Active means that ASR actually controls wheel brake pressure at one or more wheels of the driven axle(s).00b = ASR brake control passive but installed 01b = ASR brake control active 10b = Reserved 11b = Not available
563	Anti-Lock Braking (ABS) Active	State signal which indicates that the ABS is active. The signal is set active when wheel brake pressure actually starts to be modulated by ABS and is reset to passive when all wheels are in a stable condition for a certain time. The signal can also be set active when driven wheels are in high slip (e.g., caused by retarder). Whenever the

		ABS system is not fully operational (due to a defect or during off-road ABS operation) , this signal is only valid for that part of the system that is still working. When ABS is switched off completely, the flag is set to passive regardless of the current wheel slip conditions.00b = ABS passive but installed 01b = ABS active 10b = Reserved 11b = Not available
564	Differential Lock State – Central	State used which indicates the condition of the central differential lock. The differential locks are located as defined in attached figure SPN564_A.00b = Differential lock disengaged 01b = Differential lock engaged 10b = Error 11b = Not available
565	Differential Lock State – Central Front	State used which indicates the condition of the central front differential lock. The differential locks are located as defined in figure SPN564_A.00b = Differential lock disengaged 01b = Differential lock engaged 10b = Error 11b = Not available
566	Differential Lock State – Central Rear	State used which indicates the condition of the central rear differential lock. The differential locks are located as defined in figure SPN564_A.00b = Differential lock disengaged 01b = Differential lock engaged 10b = Error 11b = Not available
567	Differential Lock State – Front Axle 1	State used which indicates the condition of the front axle 1 differential lock. The differential locks are located as defined in figure SPN564_A.00b = Differential lock disengaged 01b = Differential lock engaged 10b = Error 11b = Not available
568	Differential Lock State – Front Axle 2	State used which indicates the condition of the front axle 2 differential lock. The differential locks are located as defined in figure SPN 564_A.00b = Differential lock disengaged 01b = Differential lock engaged 10b = Error 11b = Not available
569	Differential Lock State – Rear Axle 1	State used which indicates the condition of the rear axle 1 differential lock. The differential locks are located as defined in figure SPN 564_A.00b = Differential lock disengaged 01b = Differential lock engaged 10b = Error 11b = Not available

570	Differential Lock State – Rear Axle 2	State used which indicates the condition of the rear axle 2 differential lock. The differential locks are located as defined in figure SPN 564_A.00b = Differential lock disengaged 01b = Differential lock engaged 10b = Error 11b = Not available
571	Retarder Enable – Brake Assist Switch	Switch signal which indicates whether the operator wishes the retarder to be enabled for vehicle braking assist. The retarder does not check this switch, nor does the enabling of this switch engage the retarder. When this switch is « enabled, » the devices constructing TSC1 – destination retarder messages may command retarder torque for braking. For example, the cruise control should not request retarder torque if this switch is not « enabled. » The switch exists to prevent the engine retarder from being asked to be engaged via TSC1 in a noise sensitive area. See also SPN 57200b = Retarder – brake assist disabled 01b = Retarder – brake assist enabled 10b = Error 11b = Not available
572	Retarder Enable – Shift Assist Switch	Switch signal which indicates whether the operator wishes the retarder to be enabled for transmission shift assist. The retarder does not check this switch, nor does the enabling of this switch engage the retarder. When this switch is « enabled, » the transmission may activate the retarder (via the TSC1 message) to increase the rate of engine deceleration to assist in shift control. The switch exists to prevent the engine retarder from being asked to be engaged via TSC1 in a noise sensitive area. See SPN 571.00b = Retarder – shift assist disabled 01b = Retarder – shift assist enabled 10b = Error 11b = Not available
573	Transmission Torque Converter Lockup Engaged	State signal which indicates whether the torque converter lockup is engaged. 00b = Torque converter lockup disengaged 01b = Torque converter lockup engaged 10b = Error 11b = Not available
574	Transmission Shift In Process	Indicates that the transmission is in process of shifting from the current gear to the selected gear. This state is generally ACTIVE during the entire time that the transmission controls the vehicle during a shift. This includes any transmission clutch control, all engine control sequences, pulling to transmission neutral, and engaging the destination gear (e.g., until it is no longer sending commands and/or limits to the engine). See also SPN 560. (See Figure SPN574_A)This state is INACTIVE during

		other engine control such as torque limiting outside of a shift. 00b = Shift is not in process 01b = Shift in process 10b = Error 11b = Not available
575	ABS Off-road Switch	Switch signal which indicates the position of the ABS off-road switch. 00b = ABS off-road switch passive 01b = ABS off-road switch active 10b = Error 11b = Not available
576	ASR Off-road Switch	Switch signal which indicates the position of the ASR off-road switch. 00b = ASR off-road switch passive 01b = ASR off-road switch active 10b = Error 11b = Not available
577	ASR « Hill Holder » Switch	Switch signal which indicates the position of the ASR « hill holder » switch. 00b = ASR « hill holder » switch passive 01b = ASR « hill holder » switch active 10b = Error 11b = Not available
578	Drive Axle Temperature	Temperature of axle lubricant in drive axle.
579	Drive Axle Lift Air Pressure	Gage pressure of air in system that utilizes compressed air to provide force between axle and frame.
580	Altitude	Altitude of the vehicle referenced to sea level at standard atmospheric pressure and temperature.
581	Transmission Gear Ratio	The transmission configuration describes the number of forward gears, the number of reverse gears, and the ratio of each gear with the following resolution.
582	Axle Weight	Total mass imposed by the tires on the road surface at the specified axle.
583	Pitch	Pitch (rotation about the y-axis) of the vehicle as calculated by the navigation device(s). The pitch angle for an angle of ascent is reported with a positive value. This parameter is defined according to a Z-Down axis system and the sign of the value is in accordance to the right-hand rule, as specified in SAE J670. As specified

		in SAE J670, a Z-Down Axis System has positive X directed forward, positive Y to the right, and positive Z directed down.
584	Latitude	Latitude position of the vehicle.
585	Longitude	Longitude position of the vehicle.
586	Make	Make of the component corresponding to the codes defined in the American Trucking Association Vehicle Maintenance Reporting Standard (ATA/VMRS).Note: This parameter is to be transmitted as a 5 character ASCII string; as a zero length string, if not available. For example, International is transmitted as INTXX.
587	Model	Model of the component. NOTE – The ASCII character « * » is reserved as a delimiter.
588	Serial Number	Serial number of the component. NOTE – The ASCII character « * » is reserved as a delimiter.
589	Alternator Speed	Actual rotation speed of the alternator.
590	Engine Idle Shutdown Timer State	Status signal which indicates the current mode of operation of the idle shutdown timer system. See Figure SPN590_A.00b = Inactive 01b = Active 10b = Error 11b = Not available
591	Engine Idle Shutdown Timer Function	Parameter which indicates the configuration of the idle shutdown timer system. 00b = Disabled in calibration 01b = Enabled in calibration 10b = Error 11b = Not available
592	Engine Idle Shutdown Timer Override	Status signal which indicates the status of the override feature of the idle shutdown timer system. See Figure SPN590_A.00b = Inactive 01b = Active 10b = Error 11b = Not available

593	Engine Idle Shutdown has Shutdown Engine	Status signal which identifies whether or not the engine has been shutdown by the idle shutdown timer system. See Figure SPN590_A.00b = No 01b = Yes 10b = Error 11b = Not available
594	Engine Idle Shutdown Driver Alert Mode	Status signal which indicates the status of the driver alert mode of the idle shutdown timer system. While the driver alert mode is active, the idle shutdown timer may be overridden. See Figure SPN590_A.00b = Inactive 01b = Active 10b = Error 11b = Not available
595	Cruise Control Active	Cruise control is switched on. It is not ensured that the engine is controlled by cruise control, as in the case of a large driver's demand the engine is controlled by the driver while cruise control is active (maximum selection of cruise control and driver's demand). The cruise control is set to 0 if a switch off condition occurs.00b = Cruise control switched off 01b = Cruise control switched on 10b = Error 11b = Not available
596	Cruise Control Enable Switch	Switch signal which indicates that it is possible to manage the cruise control function. 00b = Cruise control disabled 01b = Cruise control enabled 10b = Error 11b = Not available
597	Brake Switch	Switch signal which indicates that the driver operated brake foot pedal is being pressed. This brake foot pedal is controlling the vehicles' service brake (total vehicle braking application, not park brakes). It is necessary for safe drivetrain behavior that the switch activates before the physical braking components are activated (i.e. Disengage the cruise control function prior to the activation of friction brakes).00b = Brake pedal released 01b = Brake pedal depressed 10b = Error 11b = Not Available
598	Clutch Switch	Switch signal which indicates that the clutch pedal is being pressed. It is necessary for a safe drivetrain behavior that the clutch switch is set before the clutch is opened (cruise control function).00b = Clutch pedal released 01b = Clutch pedal depressed 10b = Error 11b = Not available

599	Cruise Control Set Switch	Switch signal of the cruise control activator which indicates that the activator is in the position « set. » 00b = Cruise control activator not in the position « set » 01b = Cruise control activator in position « set » 10b = Error 11b = Not available
600	Cruise Control Coast (Decelerate) Switch	Switch signal of the cruise control activator which indicates that the activator is in the position « coast (decelerate). »00b = Cruise control activator not in the position « coast » 01b = Cruise control activator in position « coast » 10b = Error 11b = Not available
601	Cruise Control Resume Switch	Switch signal of the cruise control activator which indicates that the activator is in the position « resume. »00b = Cruise control activator not in the position « resume » 01b = Cruise control activator in position « resume » 10b = Error 11b = Not available
602	Cruise Control Accelerate Switch	Switch signal of the cruise control activator which indicates that the activator is in the position « accelerate. »00b = Cruise control activator not in the position « accelerate » 01b = Cruise control activator in position « accelerate » 10b = Error 11b = Not available
603	Brake Pedal Switch 2	Second switch signal instance which indicates that the driver operated brake foot pedal is being pressed. This parameter is functionally equivalent to SPN 597, but derived from a second, independent sensor and may be used where redundancy is required. For applications with only one sensing method, SPN 597 should be used.00b = Brake pedal released 01b = Brake pedal depressed 10b = Error 11b = Not Available
604	Transmission Neutral Switch	Identifies the status of the switch that indicates neutral. 00b = Off 01b = On 10b = Error 11b = Not available
605	Refrigerant High Pressure Switch	Switch signal which indicates the position of the high pressure switch in the coolant circuit of an air conditioning system. When the switch is enabled, the pressure inside the circuit is too high and the compressor clutch may be disengaged.00b = Pressure normal 01b = Pressure too high, compressor clutch may be disengaged 10b = Error 11b = Not available

606	Engine Momentary Overspeed Enable	Command signal used to indicate that the engine speed may be boosted up to the maximum engine overspeed value to accommodate transmission downshifts. The maximum time for overspeed is limited by the time defined in the engine configuration message (see PGN 65,251). The transmission module must command a « override disabled » state at least once before the engine will accept a subsequent request for overspeed.00b = Momentary engine overspeed is disabled 01b = Momentary engine overspeed is enabled 10b = Reserved 11b = Take no action
607	Progressive Shift Disable	Command signal used to indicate that progressive shifting by the engine should be disallowed. 00b = Progressive shift is not disabled 01b = Progressive shift is disabled 10b = Reserved 11b = Take no action
608	J1587	See document J1939-73 for SPN details.
609	Controller #2	
610	Power Connect Device	
611	System Diagnostic Code #1	
612	System Diagnostic Code #2	
613	System Diagnostic Code #3	
614	System Diagnostic Code #4	
615	System Diagnostic Code #5	
616	Auxiliary Analog Input #1	
617	Parking Brake On Actuator	

618	Parking Brake Off Actuator	
619	Parking Brake Actuator	Signal which indicates the current state of the actuator(s) that control the parking brake (see also SPN 70 and 5275).00b = Parking brake actuator inactive 01b = Parking brake actuator active 10b = Error 11b = Not available
620	5 Volts DC Supply (Obsolete)	This SPN is obsolete. SPNs 3509-3514 should be used instead.
621	Antenna Electronics	
622	J1922	See document J1939-73 for SPN details.
623	Red Stop Lamp	See document J1939-73 for SPN details.
623	Red Stop Lamp	See document J1939-73 for SPN details.
623	Red Stop Lamp	See document J1939-73 for SPN details.
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623	Red Stop Lamp	See document J1939-73 for SPN details.
623	Red Stop Lamp	See document J1939-73 for SPN details.
624	Amber Warning Lamp	See document J1939-73 for SPN details.
624	Amber Warning Lamp	See document J1939-73 for SPN details.
624	Amber Warning Lamp	See document J1939-73 for SPN details.
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624	Amber Warning Lamp	See document J1939-73 for SPN details.
624	Amber Warning Lamp	See document J1939-73 for SPN details.
625	Proprietary Network #1	See document J1939-73 for SPN details.
626	Engine Start Enable Device 1	Devices that assist an Engine in starting, e.g. intake heaters and ether. Primary starting aid. Parameter indicating whether the start enable device 1 is ON or OFF00b = start enable OFF 01b = start enable ON 10b = reserved 11b = not available
627	Power Supply (Obsolete)	This SPN is obsolete. SPNs 3597 should be used instead.
628	Program Memory	
629	Controller #1	
630	Calibration Memory	
631	Calibration Module	
632	Engine Fuel Shutoff 1 Control	Control setting for fuel shutoff 1. The second instance is SPN 2807. For a single fuel shutoff system, this represents its commanded position. For a dual fuel shutoff system, this SPN is representative of the upstream fuel shutoff commanded position. When fuel (gas) is desired at the engine, the fuel shutoff is opened. Otherwise, it is closed.00b = Open (fuel supplied to engine) 01b = Closed (no fuel supplied to engine) 10b = Reserved 11b = Don’t care / take no action In addition to communicating desired action of fuel shutoff 1 and its driver status, this new SPN can be used to communicate whether fuel shutoff 1 feedback position (if available) matches the commanded position, through the use of FMIs.
633	Engine Fuel Actuator 1 Control Command	The control command to fuel actuator 1, normalized to percent, where 0% represents fully closed and 100% represents fully open. In applications where the fuel actuator

		controls to differential pressure, 0% represents minimum differential pressure and 100% represents maximum differential pressure. Typically, this fuel actuator is used to regulate low pressure natural gas flow rate, mixing into the air flow, which together then come into the engine. Using the standard convention for determining the position. If only 2 actuators are present, then left/front is #1 (SPN 633) and right/rear is #2 (SPN 1244). If more than two actuators are present, then left/front is #1 (SPN 633), left/rear is #2 (SPN 1244), right/front is #3 (SPN 7593) and right/rear is #4 (SPN 7594).The values of FB00h – FB64h are sent to initiate the self calibration of the fuel actuator. The LSB specifies the % to calibrate to with a resolution of 1%/bit (eg, FB32h is sent to calibrate the actuator to 50%). In the case of a differential pressure control, this calibration is in terms of differential pressure. The value of FBFFh is sent to command the fully closed position for differential pressure control applications. Note: Existing applications of this SPN may not support the calibration or forced closure features.
634	Engine Throttle Bypass Valve	
635	Engine Timing Actuator 1	The detected position of actuator 1 on the Engine Timing System, where the system has different timing positions depending on current operating status of the engine. Timing positions may be used to determine intake and outlet valve timings.000b = Unknown Position 001b = Diesel Mode Position 010b = Diesel Part Load Position 011b = Gas Mode Position 100b = Diesel Part Load / Gas Mode Position 101b to 110b = Reserved 111b = Not Available
636	Engine Position Sensor	
637	Engine Timing Sensor	
638	Engine Fuel Rack 1 Actuator	Actuator that positions the fuel rack 1 to control fuel supply to the injectors.
639	J1939 Network #1, Primary Vehicle Network	See document J1939-73 for SPN details.

640	Engine External Protection Input	
641	Engine Variable Geometry Turbocharger Actuator #1	Actuator that controls the variable geometry turbocharger geometry.The control command to the actuator, normalized to percent, where 0% nominally represents fully closed (smallest turbocharger geometry) and 100% represents fully open (largest geometry turbocharger).
642	Engine Turbocharger Variable Geometry Actuator #2	
643	Engine External Fuel Command Input	
644	Engine External Speed Command Input	
645	Engine Tachometer Signal Output	
646	Engine Turbocharger 1 Wastegate Drive	Do not use – Use SPN 1188 for Turbocharger 1 Wastegate Drive data.
647	Engine Fan Clutch 1 Output Driver	This parameter indicates the status of the Engine Fan Clutch 1 Output Device
648	Engine Exhaust Pressure Sensor (duplicate, use SPN 1209)	
649	Engine Exhaust Bank 1 Pressure Regulator Control Command	The control command to the Engine Exhaust Pressure Regulator in bank 1, normalized to percent. 100 percent means the regulator is fully closed, providing the maximum restriction to exhaust gas flow from the engine. Zero percent means the regulator is fully open, providing the minimum available restriction.
650	Electronic Drive Unit Power Relay	

651	Engine Fuel 1 Injector Cylinder 1	
652	Engine Fuel 1 Injector Cylinder 2	
653	Engine Fuel 1 Injector Cylinder 3	
654	Engine Fuel 1 Injector Cylinder 4	
655	Engine Fuel 1 Injector Cylinder 5	
656	Engine Fuel 1 Injector Cylinder 6	
657	Engine Fuel 1 Injector Cylinder 7	
658	Engine Fuel 1 Injector Cylinder 8	
659	Engine Fuel 1 Injector Cylinder 9	
660	Engine Fuel 1 Injector Cylinder 10	
661	Engine Fuel 1 Injector Cylinder 11	
662	Engine Fuel 1 Injector Cylinder 12	
663	Engine Fuel 1 Injector Cylinder 13	
664	Engine Fuel 1 Injector Cylinder 14	
665	Engine Fuel 1 Injector Cylinder 15	
666	Engine Fuel 1 Injector Cylinder 16	

667	Engine Fuel 1 Injector Cylinder 17	
668	Engine Fuel 1 Injector Cylinder 18	
669	Engine Fuel 1 Injector Cylinder 19	
670	Engine Fuel 1 Injector Cylinder 20	
671	Engine Fuel 1 Injector Cylinder 21	
672	Engine Fuel 1 Injector Cylinder 22	
673	Engine Fuel 1 Injector Cylinder 23	
674	Engine Fuel 1 Injector Cylinder 24	
675	Engine Glow Plug Lamp	
676	Engine Glow Plug Relay	
677	Engine Starter Motor Relay	Activates the starter
678	ECU 8 Volts DC Supply	
679	Engine Fuel Injection Control Pressure Regulator	
680	Engine Valve Variable Swirl System	
681	Transmission Gear Shift Inhibit Request	Command signal to inhibit gear shifts. 00b = Gear shifts are allowed (disable function) 01b = Gear shifts are inhibited (enable function) 10b = Reserved 11b = Take no action (leave function as is)

682	Transmission Torque Converter Lockup Request	Command signal to override normal transmission control of the torque converter lockup clutch. This command may be used to control lockup as needed for different operating modes or environmental conditions. For example, the torque converter lockup clutch may need to be disabled or prevented during ABS / ASR operation, or it may need to be enabled or maintained when the vehicle application requires a fixed gear ratio or direct connection to the engine. State 00b effectively allows the transmission to control the torque converter lockup as needed for operating conditions.Note: Requests for torque converter lockup (10b) may or may not be honored depending on transmission operation conditions or other restrictions. 00b = Allow torque converter lockup 01b = Disable torque converter lockup 10b = Request torque converter lockup 11b = Take no action
683	Disengage Driveline Request	Command signal used to simply disengage the driveline, e.g., to prevent engine drag torque from causing high wheel slip on slippery surfaces.00b = Allow driveline engagement 01b = Disengage driveline 10b = Reserved 11b = Take no action Note: If this signal is used to disengage the driveline for fuel economy purposes, the sender should consider SPN 7430 PCC Driveline Disengage Inhibit Request.
684	Requested Percent Clutch Slip	Parameter which represents the percent clutch slip requested by a device.
685	Disengage Differential Lock Request – Front Axle 1	Command signal used to disengage the various differential locks, e.g., to allow an undistributed individual wheel control by ABS. The differential locks are located as defined in Figure SPN564_A.00b = Engage differential lock 01b = Disengage differential lock 10b = Reserved 11b = Take no action
686	Disengage Differential Lock Request – Front Axle 2	Command signal used to disengage the various differential locks, e.g., to allow an undistributed individual wheel control by ABS. The differential locks are located as defined in Figure SPN564_A.00b = Engage differential lock 01b = Disengage differential lock 10b = Reserved 11b = Take no action
687	Disengage Differential Lock Request – Rear Axle 1	Command signal used to disengage the various differential locks, e.g., to allow an undistributed individual wheel control by ABS. The differential locks are located as

		defined in Figure SPN564_A.00b = Engage differential lock 01b = Disengage differential lock 10b = Reserved 11b = Take no action
688	Disengage Differential Lock Request – Rear Axle 2	Command signal used to disengage the various differential locks, e.g., to allow an undistributed individual wheel control by ABS. The differential locks are located as defined in Figure SPN564_A.00b = Engage differential lock 01b = Disengage differential lock 10b = Reserved 11b = Take no action
689	Disengage Differential Lock Request – Central	Command signal used to disengage the various differential locks, e.g., to allow an undistributed individual wheel control by ABS. The differential locks are located as defined in Figure SPN564_A.00b = Engage differential lock 01b = Disengage differential lock 10b = Reserved 11b = Take no action
690	Disengage Differential Lock Request – Central Front	Command signal used to disengage the various differential locks, e.g., to allow an undistributed individual wheel control by ABS. The differential locks are located as defined in Figure SPN564_A.00b = Engage differential lock 01b = Disengage differential lock 10b = Reserved 11b = Take no action
691	Disengage Differential Lock Request – Central Rear	Command signal used to disengage the various differential locks, e.g., to allow an undistributed individual wheel control by ABS. The differential locks are located as defined in Figure SPN564_A.00b = Engage differential lock 01b = Disengage differential lock 10b = Reserved 11b = Take no action
692	ABS Offroad Switch Request	Command signal used by the driver via a dashboard switch to choose the ABS offroad function. 00b = Switch off ABS offroad function 01b = Switch on ABS offroad function 10b = Reserved 11b = Take no action
693	ASR Offroad Switch Request	Command signal used by the driver via a dashboard switch to choose the ASR offroad function. 00b = Switch off ASR offroad function 01b = Switch on ASR offroad function 10b = Reserved 11b = Take no action

694	ASR « Hill Holder » Switch Request	Command signal used by the driver via a dashboard switch to choose a special ASR function. 00b = Switch off ASR special function 01b = Switch on ASR special function 10b = Reserved 11b = Take no action
695	Engine Override Control Mode	The override control mode defines which sort of command is used: 00b = Override disabled – Disable any existing control commanded by the source of this command. 01b = Speed control – Govern speed to the included « desired speed » value. 10b = Torque control – Control torque to the included « desired torque » value. 11b = Speed/torque limit control – Limit speed and/or torque based on the included limit values. The speed limit governor is a droop governor where the speed limit value defines the speed at the maximum torque available during this operation. If a device wants to know whether it has access to the engine, there are several possibilities: a. Comparing its command with the actual engine broadcasts. b. Looking at command modes from other devices. c. Looking to the engine and retarder torque mode. Remarks: a. The realization of a torque limit (minimum selection) is possible by setting Engine Override Control Mode = 11b (speed/torque limit control) and the speed limit to a high value (FAFFh). b. The realization of a speed limit (minimum selection) is possible by setting Engine Override Control Mode = 11b (speed/torque limit control) and the torque limit to a high value (FAh). c. Limiting the retarder torque means to limit the magnitude of the torque request. As the brake torque is represented by negative torque values, the limitation must be done by a maximum selection of the requested torque and the retarder internal torque signals. d. For torque increasing functions, time limits for the torque or speed value (command) and the direct modes are desirable. e. The selection of which device has control of the engine’s speed or torque depends on the override mode priority (see SPN 897) with the highest priority device gaining control. In the case of two devices with identical priority, the engine responds to speed/torque control commands over speed/torque limit commands and will act on the speed or torque commands on a first come, first served basis. The torque limit will be a « lowest wins » selection (e.g., if one device commands 60% limit and another 80% limit, then the engine will limit torque to 60%). Figure SPN695_A provides a flowchart of the torque/speed control priority selection logic. f. The SPN 695 pre-arbitration filter block was added in February 2017 to reduce undesired arbitration interactions. Regardless of why they are sent,

		« Override Disabled » commands are not a request for active control and therefore they do not need to be arbitrated. However, depending on message priorities, their inclusion in the arbitration process can interfere with other TSC1 commands that are requesting active control. Support of this filter will be more important as it appears more devices are using periodic TSC1 heartbeats to meet Functional Safety obligations.
696	Engine Requested Speed Control Conditions	This mode tells the engine control system the governor characteristics that are desired during speed control. The four characteristics defined are:00b = Transient Optimized for driveline disengaged and non-lockup conditions 01b = Stability Optimized for driveline disengaged and non-lockup conditions 10b = Stability Optimized for driveline engaged and/or in lockup condition 1 (e.g., vehicle driveline) 11b = Stability Optimized for driveline engaged and/or in lockup condition 2 (e.g., PTO driveline) 00b – This speed governor gain selection is adjusted to provide rapid transition between speed setpoints. RPM overshoot and undershoot may be greater than what is seen when the « speed control characteristic » is set to be stability optimized. 01b – This control condition has been optimized to minimize rpm overshoot and undershoot given an expected plant consisting of the engine and its accessory loads. This gain adjustment is not intended to compensate for driveline characteristics. This characteristic is most appropriate when no driveline is connected. 10b – This control condition has been optimized to minimize rpm overshoot and undershoot given a more complex plant. For instance, the more complex plant would contain the engine, its accessory loads and the driveline characteristics. As an example, the driveline characteristics might include the effective spring mass relationship of pumps, tires, clutches, axles, driveshafts, and multiple gear ratios. This characteristic is most appropriate when a driveline is engaged. 11b – This speed control characteristic is available for applications requiring compensation for more than one driveline characteristic. It has been optimized to minimize rpm overshoot and undershoot given a more complex plant of the second variety. This more complex plant would again contain the engine, its accessory loads and a second driveline characteristic unique from the one described in speed control characteristic 10b.
697	Auxiliary PWM Driver #1	

698	Auxiliary PWM Driver #2	
699	Auxiliary PWM Driver #3	
700	Auxiliary PWM Driver #4	
701	Auxiliary I/O #01	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error 11b = Not available
702	Auxiliary I/O #02	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error 11b = Not available
703	Auxiliary I/O #03	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error 11b = Not available
704	Auxiliary I/O #04	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error 11b = Not available
705	Auxiliary I/O #05	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error 11b = Not available
706	Auxiliary I/O #06	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error 11b = Not available
707	Auxiliary I/O #07	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error 11b = Not available

708	Auxiliary I/O #08	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error 11b = Not available
709	Auxiliary I/O #09	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error 11b = Not available
710	Auxiliary I/O #10	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error 11b = Not available
711	Auxiliary I/O #11	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error 11b = Not available
712	Auxiliary I/O #12	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error 11b = Not available
713	Auxiliary I/O #13	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error 11b = Not available
714	Auxiliary I/O #14	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error 11b = Not available
715	Auxiliary I/O #15	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error 11b = Not available

716	Auxiliary I/O #16	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error 11b = Not available
717	Autoshift High Gear Actuator	
718	Autoshift Low Gear Actuator	
719	Autoshift Neutral Actuator	
720	Autoshift Common Low Side (Return)	
721	Prestroke Sensor	
722	Prestroke Actuator	
723	Engine Speed 2	The engine speed as measured by speed sensor 2 Note: This is for the engine speed from the 2nd engine speed sensor. This may be different than SPN 190 when used in multiple engine speed sensor configurations. In an application with multiple engine speed sensors, SPN 190 data can be derived from any of the speed sensors.
724	O2 Sensor	
725	Engine Ignition Control Mode Signal	
726	Engine Ignition Control Timing Signal	
727	Engine Turbocharger Secondary Intake Pressure	

728	Engine Oil Cooler Coolant Outlet Temperature	Temperature of liquid after it exits the engine oil cooler.
729	Engine Intake Air Heater Driver #1	
730	Engine Intake Air Heater Driver #2	
731	Engine Knock 1	Value of 1st sensor used to detect engine knock.
732	Engine Gas Metering Valve	
733	Engine Rack Position Sensor	Obsolete – Use SPN 1210
734	Transmission Range Clutch C1 Solenoid	
735	Transmission Range Clutch C2 Solenoid	
736	Transmission Range Clutch C3 Solenoid	
737	Transmission Range Clutch C4 Solenoid	
738	Transmission Range Clutch C5 Solenoid	
739	Transmission Range Clutch C6 Solenoid	

740	Transmission Torque Converter Lockup Clutch Actuator	Identifies the status of the actuator that controls the torque converter lockup clutch. 00b = Off 01b = On 10b = Error 11b = Not available
741	Transmission 1 Forward Solenoid Valve	
742	Transmission Low Signal Solenoid Valve	
743	Retarder Enable Solenoid Valve	
744	Retarder Modulation Solenoid Valve	
745	Retarder Response Solenoid Valve	
746	Differential Lock Solenoid Valve #1	Operates the first differential lock.
747	Engine/Transmission Match	
748	Transmission Output Retarder	Identifies the status of the transmission output retarder. 00b = Off 01b = On 10b = Error 11b = Not available
749	Transmission Neutral Start Output	
750	Transmission Turbine Speed Sensor	
751	Transmission Primary Shift Selector	
752	Transmission Secondary Shift Selector	

753	Transmission Special Function Inputs	
754	Transmission Range C1 Clutch Pressure Indicator	
755	Transmission Range C2 Clutch Pressure Indicator	
756	Transmission Range C3 Clutch Pressure Indicator	
757	Transmission Range C4 Clutch Pressure Indicator	
758	Transmission Range C5 Clutch Pressure Indicator	
759	Transmission Range C6 Clutch Pressure Indicator	
760	Transmission Lockup Clutch Pressure Indicator (Obsolete – Use SPN 3184)	
761	Transmission Forward Range Pressure Indicator	
762	Transmission Neutral Range Pressure Indicator	

763	Transmission Reverse Range Pressure Indicator	
764	Retarder Response System Pressure Indicator	
765	Differential Lock Clutch Pressure Indicator	
766	Transmission Multiple Pressure Indicators	
767	Transmission Reverse Direction Switch	Identifies the status of the switch that indicates reverse direction. 00b = Off 01b = On 10b = Error 11b = Not available
768	Transmission Range High Actuator	Identifies the status of the range high actuator in the auxiliary unit. 00b = Off 01b = On 10b = Error 11b = Not available
769	Transmission Range Low Actuator	Identifies the status of the range low actuator in the auxiliary unit. 00b = Off 01b = On 10b = Error 11b = Not available
770	Transmission Splitter Direct Actuator	Identifies the status of the splitter direct actuator in the auxiliary unit. 00b = Off 01b = On 10b = Error 11b = Not available
771	Transmission Splitter Indirect Actuator	Identifies the status of the splitter indirect actuator in the auxiliary unit. 00b = Off 01b = On 10b = Error 11b = Not available
772	Transmission Shift Finger Rail Actuator 1	Identifies the status of the actuator that moves the shift finger identified as rail actuator #1. 00b = Off 01b = On 10b = Error 11b = Not available
773	Transmission Shift Finger Gear Actuator 1	Identifies the status of the actuator that moves the shift finger identified as gear actuator #1. 00b = Off 01b = On 10b = Error 11b = Not available

774	Transmission Upshift Request Switch	
775	Transmission Downshift Request Switch	
776	Torque Converter Interrupt Actuator	
777	Torque Converter Lockup Actuator (Obsolete – Use 740)	
778	Transmission High Range Sense Switch	Identifies the status of the switch that represents high range. 00b = Off 01b = On 10b = Error 11b = Not available
779	Transmission Low Range Sense Switch	Identifies the status of the switch that represents low range. 00b = Off 01b = On 10b = Error 11b = Not available
780	Transmission Shift Finger Neutral Indicator	Indicates the status of the shift finger in the neutral position. 00b = Off 01b = On 10b = Error 11b = Not available
781	Transmission Shift Finger Engagement Indicator	Identifies the status of the shift finger in the engagement position. 00b = Off 01b = On 10b = Error 11b = Not available
782	Transmission Shift Finger Center Rail Indicator	Identifies the status of the shift finger in the center rail position. 00b = Off 01b = On 10b = Error 11b = Not available
783	Transmission Shift Finger Rail Actuator 2	Identifies the status of the actuator that moves the shift finger identified as rail actuator #2. 00b = Off 01b = On 10b = Error 11b = Not available
784	Transmission Shift Finger Gear Actuator 2	Identifies the status of the actuator that moves the shift finger identified as gear actuator #2. 00b = Off 01b = On 10b = Error 11b = Not available

785	Transmission Hydraulic System	
786	Transmission Defuel Actuator	Identifies the status of the actuator that controls the engine defuel mechanism. 00b = Off 01b = On 10b = Error 11b = Not available
787	Transmission Inertia Brake Actuator	Identifies the status of the actuator that controls the inertia brake. 00b = Off 01b = On 10b = Error 11b = Not available
788	Transmission Clutch Actuator	Identifies the status of the actuator that controls the clutch. 00b = Off 01b = On 10b = Error 11b = Not available
789	Wheel Sensor ABS Axle 1 Left	
790	Wheel Sensor ABS Axle 1 Right	
791	Wheel Sensor ABS Axle 2 Left	
792	Wheel Sensor ABS Axle 2 Right	
793	Wheel Sensor ABS Axle 3 Left	
794	Wheel Sensor ABS Axle 3 Right	
795	Pressure Modulation Valve ABS Axle 1 Left	
796	Pressure Modulation Valve ABS Axle 1 Right	
797	Pressure Modulation Valve ABS Axle 2 Left	

798	Pressure Modulation Valve ABS Axle 2 Right	
799	Pressure Modulation Valve ABS Axle 3 Left	
800	Pressure Modulation Valve ABS Axle 3 Right	
801	Retarder Control Relay	
802	Relay Diagonal 1	
803	Relay Diagonal 2	
804	Mode Switch ABS	
805	Mode Switch ASR	
806	Dif 1 – ASR Valve	
807	Dif 2 – ASR Valve	
808	Pneumatic Engine Control	
809	Electronic Engine Control (Servomotor)	
810	Speed Signal Input	
811	Warning Light Bulb	

812	ASR Light Bulb	
813	Wheel Sensor ABS Axle 1 Average	
814	Wheel Sensor ABS Axle 2 Average	
815	Wheel Sensor ABS Axle 3 Average	
816	Pressure Modulator, Drive Axle Relay Valve	
817	Pressure Transducer, Drive Axle Relay Valve	
818	Master Control Relay	
819	Trailer Brake Slack Out Of Adjustment Forward Axle Left	
820	Trailer Brake Slack Out Of Adjustment Forward Axle Right	
821	Trailer Brake Slack Out Of Adjustment Rear Axle Left	
822	Trailer Brake Slack Out Of Adjustment Rear Axle Right	
823	Tractor Brake Slack Out Of Adjustment Axle 1 Left	

824	Tractor Brake Slack Out Of Adjustment Axle 1 Right	
825	Tractor Brake Slack Out Of Adjustment Axle 2 Left	
826	Tractor Brake Slack Out Of Adjustment Axle 2 Right	
827	Tractor Brake Slack Out Of Adjustment Axle 3 Left	
828	Tractor Brake Slack Out Of Adjustment Axle 3 Right	
829	Left Fuel Level Sensor	
830	Right Fuel Level Sensor	
831	Engine Fuel Feed Rate Sensor	
832	Engine Fuel Return Rate Sensor	
833	Fuel Rack Position Sensor	Obsolete – Use SPN 1210
834	Fuel Rack Actuator	Obsolete – Use SPN 638
835	Oil Level Indicator Output	
836	Tachometer Drive Output	
837	Speedometer Drive Output	

838	PWM Input (ABS/ASR)	
839	Dead Reckoning Unit	
840	Loran Receiver	
841	Global Positioning System (GPS)	
842	Integrated Navigation Unit	
843	Operator Control Panel (OCP) 1	Operator interface with one or more operator controls, gages, or displays.
844	Pneumatic Control Unit (PCU)	
845	PCU Steer Solenoid	
846	PCU Drive Solenoid	
847	PCU Trailer, Tag, Or Push Solenoid	
848	PCU Supply Solenoid	
849	PCU Control Solenoid	
850	PCU Deflate Solenoid	
851	Pneumatic – Steer Channel	
852	Pneumatic – Drive Channel	
853	Pneumatic – Trailer, Tag Or Push Channel	

854	Heater Circuit #01	
855	Heater Circuit #02	
856	Heater Circuit #03	
857	Heater Circuit #04	
858	Heater Circuit #05	
859	Heater Circuit #06	
860	Heater Circuit #07	
861	Heater Circuit #08	
862	Heater Circuit #09	
863	Heater Circuit #10	
864	Heater Circuit #11	
865	Heater Circuit #12	
866	Heater Circuit #13	
867	Heater Circuit #14	
868	Heater Circuit #15	
869	Heater Circuit #16	

870	Heater Regeneration System	
871	Refrigerant Charge	
872	Refrigerant Moisture Level	
873	Non-Condensable Gas In Refrigerant	
874	Refrigerant Flow Control Solenoid	
875	Refrigerant Low Pressure Switch	Switch signal which indicates the position of the low pressure switch in the coolant circuit of an air conditioning system. When the switch is enabled, the pressure inside the circuit is too low and the compressor clutch may be disengaged.00b = Pressure normal 01b = Pressure too low, compressor clutch may be disengaged 10b = Error 11b = Not available
876	Compressor Clutch Circuit	
877	Evaporator Thermostat Circuit	
878	Clearance, Side Marker, Identification Lamp Circuit (Black)	
879	Left Turn Lamp Circuit (Yellow)	
880	Stop Lamp Circuit (Red)	
881	Right Turn Lamp Circuit (Green)	
882	Tail Lamp/License Plate Lamp Circuit (Brown)	

883	Auxiliary Lamp Circuit (Blue)	
884	Tractor Mounted Rear Axle Slider Control Unit	
885	Trailer Mounted Rear Axle Slider Control Unit	
886	Headway Controller Forward Antenna	
887	Headway Controller Brake Input Monitor	
888	Headway Controller Speaker Monitor	
889	Headway Controller Steering Sensor Monitor	
890	Headway Controller Speedometer Monitor	
891	Headway Controller Right Turn Signal Monitor	
892	Headway Controller Left Turn Signal Monitor	
893	Headway Controller Control Display Unit	

894	Headway Controller Right Side Sensor	
895	Headway Controller Left Side Sensor	
896	Headway Controller Rear Sensor	
897	Override Control Mode Priority	This field is used as an input to the engine or retarder to determine the priority of the Override Control Mode received in the Torque/Speed Control message (see PGN 0). The default is 11b (Low priority). It is not required to use the same priority during the entire override function. For example, the transmission can use priority 01b (High priority) during a shift, but can set the priority to 11b (Low priority) at the end of the shift to allow traction control to also interact with the torque limit of the engine.The four priority levels defined are: 00b = Highest priority 01b = High priority 10b = Medium priority 11b = Low priority 00b – Highest Priority = Used for situations that require immediate action by the receiving device in order to provide safe vehicle operation (i.e., braking systems). This level of priority should only be used in safety critical conditions. 01b – High Priority = Used for control situations that require prompt action in order to provide safe vehicle operation. An example is when the transmission is performing a shift and requires control of the engine in order to control driveline reengagement. 10b – Medium Priority = Used for powertrain control operations which are related to assuring that the vehicle is in a stable operating condition. An example is when the traction control system is commanding the engine in order to achieve traction stability. 11b – Low Priority = Used to indicate that the associated command desires powertrain control but is needed for function which improves the driver comfort which may be overridden by other devices. An example is cruise control or the non-critical part of a transmission shift to a new gear.
898	Engine Requested Speed/Speed Limit	Parameter provided to the engine from external sources in the torque/speed control message. This is the engine speed which the engine is expected to operate at if the speed control mode is active or the engine speed which the engine is not expected to exceed if the speed limit mode is active.

899	Engine Torque Mode	State signal which indicates which engine torque mode is currently generating, limiting, or controlling the torque. Note that the modes are not in prioritized order. Not all modes may be relevant for a given device. Some devices may not implement all functions. For typical priorities refer to Figures SPN512_A and SPN512_B for engine control. The data type of this parameter is measured.Mode 0000b means “No request”: engine torque may range from 0 to full load only due to low idle governor output. Modes 0001b to 1110b indicate that there is either a torque request or the identified function is currently controlling the engine: engine torque may range from 0 (no fueling) to the upper limit.
900	Retarder Torque Mode	State signal which indicates which retarder torque mode is currently generating, limiting, or controlling the torque. Note that the modes are not in prioritized order. Not all modes may be relevant for a given device. Some devices may not implement all functions. For typical priorities refer to Tables SPN518_A to SPN518_B for retarder control. The data type of this parameter is measured.Mode 0000b means “No request”: retarder torque = 0 (no braking). Modes 0001b to 1110b indicate that there is either a torque request or the identified function is currently controlling the retarder: retarder torque may range from 0 (no braking) to the upper limit.
901	Retarder Type	A vehicle retarder is a supplementary device to the wheel brakes for the driver to better control the vehicle. The wheel brakes used in the vehicle are not designed for continuous retarding operation. In a prolonged period of braking, the brakes can be thermally over-stressed, causing the braking effect to be reduced or even lead to complete braking system failure. The vehicle retarder is designed for continuous operation for braking during downhill operation and is also used for braking the vehicle to comply with speed limits and traffic conditions.This parameter provides some indication of the retarder dynamics. It is used in the retarder configuration message. The data type of this parameter is measured. 0000b = Electric/Magnetic 0001b = Hydraulic 0010b = Cooled Friction 0011b = Compression Release (Engine retarder) or Combined Compression Release with Exhaust 0100b = Exhaust 0101b to 1101b = Not defined 1110b = Other 1111b = Not available

902	Retarder Location	This parameter defines whether the « torque/speed curve » defined by the retarder configuration message (PGN 65249) is dependent on engine rpm, output shaft rpm, or other parameter. The data type of this parameter is measured.0000b = (Primary) Engine Compression Release Brake or Engine Compression Release Brake Combined with Engine Exhaust Brake (Engine rpm) 0001b = (Primary) Engine Exhaust Brake (Exhaust pressure) 0010b = (Primary) Transmission Input (Engine rpm) 0011b = (Secondary) Transmission Output (Output Shaft rpm) 0100b = (Secondary) Driveline (Output Shaft rpm) 0101b = Trailer (Vehicle speed) 0110b to 1101b = Not defined 1110b = Other 1111b = Not available
903	Transmission Forward Direction Switch	Identifies the status of the switch that indicates forward direction. 00b = Off 01b = On 10b = Error 11b = Not available
904	Front Axle Speed	The average speed of the two front wheels.
905	Relative Speed; Front Axle, Left Wheel	The speed of the front axle, left wheel relative to the front axle speed, SPN 904.
906	Relative Speed; Front Axle, Right Wheel	The speed of the front axle, right wheel relative to the front axle speed, SPN 904.
907	Relative Speed; Rear Axle #1, Left Wheel	The speed of the rear axle #1, left wheel relative to the front axle speed, SPN 904.
908	Relative Speed; Rear Axle #1, Right Wheel	The speed of the rear axle #1, right wheel relative to the front axle speed, SPN 904.
909	Relative Speed; Rear Axle #2, Left Wheel	The speed of the rear axle #2, left wheel relative to the front axle speed, SPN 904.
910	Relative Speed; Rear Axle #2, Right Wheel	The speed of the rear axle #2, right wheel relative to the front axle speed, SPN 904.

911	Service Component Identification	Identification of component needing service. See Table SPN911_A.
912	Service Component Identification	Identification of component needing service. See Table SPN911_A.
913	Service Component Identification	Identification of component needing service. See Table SPN911_A.
914	Service Distance	The distance which can be traveled by the vehicle before the next service inspection is required. A negative distance is transmitted if the service inspection has been passed. The component that requires service is identified by the service component identification (see SPN 911-913, 1379, and 1584).
915	Service Delay/Calendar Time Based	The time in weeks until the next vehicle service inspection is required. A negative value is transmitted if the service inspection has been passed. The component that requires service is identified by the service component identification (see SPN 911-913, 1379, and 1584).
916	Service Delay/Operational Time Based	The time in vehicle operational time until the next vehicle service inspection is required. A negative value is transmitted if the service inspection has been passed. The component that requires service is identified by the service component identification (see SPN 911-913, 1379, and 1584).
917	Total Vehicle Distance (High Resolution)	Accumulated distance traveled by the vehicle during its operation. NOTE – See SPN 245 for alternate resolution.
918	Trip Distance (High Resolution)	Distance traveled during all or part of a journey. NOTE – See SPN 244 for alternate resolution.
919	Ambient Light Sensor	
920	Audible Alarm	
921	Green Lamp	

922	Ride Height Relay	
923	PWM Output	
924	Auxiliary Output #1	
925	Auxiliary Output #2	
926	Auxiliary Output #3	
927	Location	To identify to which of several similar devices (such as tires or fuel tanks) the information applies. The low order 4 bits represent a position number, counting left to right when facing in the direction of normal vehicle travel (forward). The high order 4 bits represent a position number, counting front to back on the vehicle. The value FFh indicates not available. It is recommended that output devices add 1 to the position number (range 1 to 15, not 0 to 14) for use by drivers and service technicians. Examples: Tire pressure for location 00h would be left front tire. Tire pressure for location 23h would be right outside rear rear on a 3-axle tractor with dual axle per side (3rd axle, 4th tire).
928	Axle Location	To identify to which of several similar devices (such as tires or fuel tanks) the information applies. The low order 4 bits represent a position number, counting left to right when facing in the direction of normal vehicle travel (forward). The high order 4 bits represent a position number, counting front to back on the vehicle. The value FFh indicates not available. It is recommended that output devices add 1 to the position number (range 1 to 15, not 0 to 14) for use by drivers and service technicians. Examples: Tire pressure for location 00h would be left front tire. Tire pressure for location 23h would be right outside rear rear on a 3-axle tractor with dual axle per side (3rd axle, 4th tire).
929	Tire Location	Identifies which tire is associated with the parametric data in this PGN. The low order 4 bits represent a position number, counting left to right when facing in the direction of normal vehicle travel (forward). The high order 4 bits represent a position number,

		counting front to back on the vehicle. The value FFh indicates not available. It is recommended that output devices add 1 to the position number (range 1 to 15, not 0 to 14) for use by drivers and service technicians. Examples: Tire pressure for location 00h would be left front tire. Tire pressure for location 23h would be right outside rear rear on a 3-axle tractor with dual axle per side (3rd axle, 4th tire).
930	Drive Axle Location	To identify to which of several similar devices (such as tires or fuel tanks) the information applies. The low order 4 bits represent a position number, counting left to right when facing in the direction of normal vehicle travel (forward). The high order 4 bits represent a position number, counting front to back on the vehicle. The value FFh indicates not available. It is recommended that output devices add 1 to the position number (range 1 to 15, not 0 to 14) for use by drivers and service technicians. Examples: Tire pressure for location 00h would be left front tire. Tire pressure for location 23h would be right outside rear rear on a 3-axle tractor with dual axle per side (3rd axle, 4th tire).
931	Engine Fuel Supply Pump Actuator	
932	Brake System Hold Modulator Valve Solenoid Axle 1 Left	
933	Brake System Hold Modulator Valve Solenoid Axle 1 Right	
934	Brake System Hold Modulator Valve Solenoid Axle 2 Left	
935	Brake System Hold Modulator Valve Solenoid Axle 2 Right	
936	Brake System Hold Modulator Valve Solenoid Axle 3 Left	

937	Brake System Hold Modulator Valve Solenoid Axle 3 Right	
938	Brake System Dump Modulator Valve Solenoid Axle 1 Left	
939	Brake System Dump Modulator Valve Solenoid Axle 1 Right	
940	Brake System Dump Modulator Valve Solenoid Axle 2 Left	
941	Brake System Dump Modulator Valve Solenoid Axle 2 Right	
942	Brake System Dump Modulator Valve Solenoid Axle 3 Left	
943	Brake System Dump Modulator Valve Solenoid Axle 3 Right	
944	Driver Air Bag Ignitor Loop	
945	Passenger Air Bag Ignitor Loop	
946	Left Belt Tensioner Ignitor Loop	
947	Right Belt Tensioner Ignitor Loop	
948	Safety Restraint System Lamp	

949	Automotive Seat Occupancy Sensor – passenger side	
950	Side Collision Detector – Left	
951	Side Bag Ignitor Loop 1 – Left	
952	Side Bag Ignitor Loop 2 – Left	
953	Side Collision Detector – Right	
954	Side Bag Ignitor Loop 1 – Right	
955	Side Bag Ignitor Loop 2 – Right	
956	Rollover Sensor	
957	Number of Forward Gear Ratios	Number of forward gear ratios in the transmission, provided as part of the configuration.
958	Number of Reverse Gear Ratios	Number of reverse gear ratios in the transmission, provided as part of the transmission configuration.
959	Seconds	The seconds component of the current time of day. This should be reported as the seconds component of the current time at UTC (Universal Time Coordinate), a.k.a. GMT; however, it may be reported as the seconds component of the current time at a local time zone. The Local Hour Offset parameter (SPN 1602) is used to indicate if the time of day (SPNs 959, 960, and 961) is the current UTC time or a local time zone time. Refer to SPN 1602 for details.
960	Minutes	The minutes component of the current time of day. This should be reported as the minutes component of the current time at UTC (Universal Time Coordinate), a.k.a.

		GMT; however, it may be reported as the minutes component of the current time at a local time zone. The Local Hour Offset parameter (SPN 1602) is used to indicate if the time of day (SPNs 959, 960, and 961) is the current UTC time or a local time zone time. Refer to SPN 1602 for details.
961	Hours	The hour component of the current time of day. This should be reported as the hour component of the current time at UTC (Universal Time Coordinate), a.k.a. GMT; however, it may be reported as the hour component of the current time at a local time zone. The Local Hour Offset parameter (SPN 1602) is used to indicate if time of day (SPNs 959, 960, and 961) is the current UTC time or a local time zone time. Refer to SPN 1602 for details.
962	Day	The day component of the current calendar date. This should be reported as the day component of the current date at UTC (Universal Time Coordinate), a.k.a. GMT; however, it may be reported as the day component of the current date at a local time zone. The Local Hour Offset parameter (SPN 1602) is used to indicate if the calendar date (SPNs 962, 963, and 964) is the current UTC date or a local time zone date. Refer to SPN 1602 for details.NOTE – A value of 0 for the date is null. The values 1, 2, 3, and 4 are used to identify the first day of the month; 5, 6, 7, and 8 identify the second day of the month; etc. Multiples of 4 are a common encoding use.
963	Month	The month component of the current calendar date. This should be reported as the month component of the current date at UTC (Universal Time Coordinate), a.k.a. GMT; however, it may be reported as the month component of the current date at a local time zone. The Local Hour Offset parameter (SPN 1602) is used to indicate if the calendar date (SPNs 962, 963, and 964) is the current UTC date or a local time zone date. Refer to SPN 1602 for details.NOTE – A value of 0 for the month is null. The value 1 identifies January; 2 identifies February; etc.
964	Year	The year component of the current calendar date. This should be reported as the year component of the current date at UTC (Universal Time Coordinate), a.k.a. GMT; however, it may be reported as the year component of the current date at a local time zone. The Local Hour Offset parameter (SPN 1602) is used to indicate if the calendar

		date (SPNs 962, 963, and 964) is the current UTC date or a local time zone date. Refer to SPN 1602 for details.NOTE – A value of 0 for the year identifies the year 1985; a value of 1 identifies 1986; etc.
965	Number of Software Identification Fields	Number of software identification designators represented in the software identification parameter group.
966	Engine Diagnostic Test Mode Switch	Switch signal which indicates the position of the engine diagnostic test mode switch. 00b = Off 01b = On 10b = Error 11b = Not available
967	Engine Idle Decrement Switch	Switch signal which indicates the position of the idle decrement switch. 00b = Off 01b = On 10b = Error 11b = Not available
968	Engine Idle Increment Switch	Switch signal which indicates the position of the idle increment switch. 00b = Off 01b = On 10b = Error 11b = Not available
969	Remote Accelerator Enable Switch	Switch signal which indicates that the remote accelerator has been enabled and controls the engine. 00b = Off 01b = On 10b = Error 11b = Not available NOTE—The accelerator interlock switch (see SPN 972) must be disabled in order for the remote accelerator to perform engine control.
970	Engine Auxiliary Shutdown Switch	Switch signal which requests that all engine fueling stop. 00b = Off 01b = On 10b = Error 11b = Not available
971	Engine Derate Switch	Switch signal used to activate the torque limiting feature of the engine. The specific nature of torque limiting should be verified with the manufacturer.00b = Off 01b = On 10b = Error 11b = Not available
972	Accelerator Interlock Switch	Switch signal used to disable the accelerator and remote accelerator inputs, causing the engine to return to idle.00b = Off 01b = On 10b = Error 11b = Not available
973	Engine Retarder Selection	The position of the operator controlled selector, expressed as a percentage and determined by the ratio of the current position of the selector to its maximum possible

		position. Zero percent means no braking torque is requested by the operator from the engine while 100% means maximum braking.
974	Remote Accelerator Pedal Position	The ratio of actual position of the remote analog engine speed/torque request input device (such as an accelerator pedal or throttle lever) to the maximum position of the input device.For example, in on-highway vehicles this could be an accelerator control device that is external to the drivers cab or an accelerator that is controlled by a hand lever from the operators seat. The Remote Accelerator Enable Switch is SPN 969. This parameter enables the remote accelerator operation. NOTE—See SPNs 29 and 91 for additional accelerator position parameters. If only one accelerator position exists on a vehicle, SPN 91 shall be used. SPN 28 is an additional diagnostic SPN for accelerator position.
975	Engine Fan 1 Estimated Percent Speed	Estimated fan speed as a ratio of the fan drive (current speed) to the fully engaged fan drive (maximum fan speed). A two state fan (off/on) will use 0% and 100% respectively. A three state fan (off/intermediate/on) will use 0%, 50% and 100% respectively. A variable speed fan will use 0% to 100%. Multiple fan systems will use 0 to 100% to indicate the percent cooling capacity being provided.Note that the intermediate fan speed of a three state fan will vary with different fan drives, therefore 50% is being used to indicate that the intermediate speed is required from the fan drive.
976	PTO Governor State	This parameter is used to indicate the current state or mode of operation by the power takeoff (PTO) governor. In lieu of support for PTO Drive Engagement parameters, this parameter may represent the status of a PTO drive. The broadcasting device must ensure that each achieved state is conveyed in at least one message broadcast before a transition to another state is allowed. 00000b = Off/Disabled 00001b = Hold 00010b = Remote Hold 00011b = Standby 00100b = Remote Standby 00101b = Set 00110b = Decelerate/Coast 00111b = Resume 01000b = Accelerate 01001b = Accelerator Override 01010b = Preprogrammed set speed 1 01011b = Preprogrammed set speed 2 01100b = Preprogrammed set speed 3 01101b = Preprogrammed set speed 4 01110b = Preprogrammed set speed 5 01111b = Preprogrammed set speed 6 10000b = Preprogrammed set speed 7 10001b = Preprogrammed set speed 8 10010b = PTO set

		speed memory 1 10011b = PTO set speed memory 2 10100b = PTO set speed memory 3 10101b to 11110b = Not defined 11111b = Not availableOff/Disabled 00000b — Used to indicate that the PTO governor enable switch is in the off position. Hold 00001b — Used to indicate that the PTO governor is active and currently maintaining a captured operating speed. Remote Hold 00010b — Used to indicate that the remote PTO governor is active and the PTO governor is currently maintaining a captured operating speed. Standby 00011b — Used to indicate that the PTO governor device enable switch is in the ON position and it is possible to manage the PTO governor. Remote Standby 00100b — Used to indicate that the remote PTO governor device enable switch is in the ON position and it is possible to manage the PTO governor. Set 00101b — Used to indicate that the PTO governor is establishing current speed as the operating speed (captured value). Decelerate/Coast 00110b — Used to indicate that the PTO governor is in the process of ramping down, or coasting, from the current operating speed. Resume 00111b — Used to indicate that the PTO governor is in the process of resuming the operating speed to a previously captured value. Accelerate 01000b — Used to indicate that the PTO governor is in the process of ramping up the operating speed. Accelerator Override 01001b—Used to indicate that the PTO governor is active but for the present time the engine is controlled by a large driver's demand. Preprogrammed PTO Governor Set Speed 1 01010b—Used to indicate that the PTO device is establishing a first preprogrammed PTO governor set speed (user programmable) as the current operating speed. Preprogrammed PTO Governor Set Speed 2 01011b—Used to indicate that the PTO device is establishing a second preprogrammed PTO governor set speed (user programmable) as the current operating speed. Preprogrammed PTO Governor Set Speed 3 01100b —Used to indicate that the remote PTO device is establishing a third preprogrammed PTO governor set speed (user programmable) as the current operating speed. Preprogrammed PTO Governor Set Speed 4 01101b —Used to indicate that the remote PTO device is establishing a fourth preprogrammed PTO governor set speed (user programmable) as the current operating speed. Preprogrammed PTO Governor Set Speed 5 01110b —Used to indicate that the remote PTO device is establishing a fifth preprogrammed PTO governor set speed (user programmable) as the current operating speed. Preprogrammed PTO Governor Set Speed 6 01111b—Used to indicate that the remote PTO device is establishing a

		sixth preprogrammed PTO governor set speed (user programmable) as the current operating speed. Preprogrammed PTO Governor Set Speed 7 10000b —Used to indicate that the remote PTO device is establishing a seventh preprogrammed PTO governor set speed (user programmable) as the current operating speed. Preprogrammed PTO Governor Set Speed 8 10001b —Used to indicate that the remote PTO device is establishing a eighth preprogrammed PTO governor set speed (user programmable) as the current operating speed. PTO set speed memory 1 10010b —Used to indicate that PTO set speed memory one set state is active. PTO set speed memory 2 10011b — Used to indicate that PTO set speed memory two set state is active.
977	Fan Drive State	This parameter is used to indicate the current state or mode of operation by the fan drive. 0000b = Fan off 0001b = Engine system–General 0010b = Excessive engine air temperature 0011b = Excessive engine oil temperature 0100b = Excessive engine coolant temperature 0101b = Excessive transmission oil temperature 0110b = Excessive hydraulic oil temperature 0111b = Default Operation 1000b = Reverse Operation 1001b = Manual control 1010b = Transmission retarder 1011b = A/C system 1100b = Timer 1101b = Engine brake 1110b = Other 1111b = Not available Fan off 0000b —Used to indicate that the fan clutch is disengaged and the fan is inactive Engine system–General 0001b —Used to indicate that the fan is active due to an engine system not otherwise defined. Excessive engine air temperature 0010b — Used to indicate that the fan is active due to high air temperature. Excessive engine oil temperature 0011b —Used to indicate that the fan is active due to high oil temperature. Excessive engine coolant temperature 0100b —Used to indicate that the fan is active due to high coolant temperature. Reverse Operation 1000b — Used to indicate that the fan is in reverse direction of operation compared to the normal direction of operation Manual control 1001b —Used to indicate that the fan is active as requested by the operator. Transmission retarder 1010b —Used to indicate that the fan is active as required by the transmission retarder. A/C system 1011b —Used to indicate that the fan is active as required by the air conditioning system. Timer 1100b —Used to indicate that the fan is active as required by a timing function. Engine brake 1101b —Used to indicate that the fan is active as required to assist engine braking. Excessive transmission oil temperature – 0101b – Used to indicate fan is

		active due to excessive transmission oil temperature. Excessive hydraulic oil temperature – 0110b – Used to indicate fan is active due to excessive hydraulic oil temperature. Default Operation – 0111b – Used to indicate fan is active due to a error condition resulting in default operation
978	Engine Remote PTO Governor Variable Speed Control Switch	Switch signal which indicates that the remote PTO governor toggle switch is in the enabled (ON) position. If the toggle switch is enabled and other conditions are satisfied then the remote PTO governor feature is activated and the PTO governor will control at a variable speed.00b = Off 01b = On 10b = Error 11b = Not available
979	Engine Remote PTO Governor Preprogrammed Speed Control Switch	Switch signal which indicates that the remote PTO governor toggle switch is in the enabled (ON) position. If the toggle switch is enabled and other conditions are satisfied then the remote PTO governor feature is activated and the PTO governor will control at the preprogrammed speed.00b = Off 01b = On 10b = Error 11b = Not available
980	Engine PTO Governor Enable Switch	Switch signal which indicates that the PTO governor toggle switch is in the enabled (ON) position and therefore it is possible to manage the PTO control function.00b = Off 01b = On 10b = Error 11b = Not available
981	Engine PTO Governor Accelerate Switch	Switch signal of the PTO control activator which indicates that the activator is in the position to « accelerate » the PTO governor set speed.00b = Off 01b = On 10b = Error 11b = Not available
982	Engine PTO Governor Resume Switch	Switch signal of the PTO control activator which indicates that the activator is in the position to « resume » a previously established PTO governor set speed.00b = Off 01b = On 10b = Error 11b = Not available
983	Engine PTO Governor Coast/Decelerate Switch	Switch signal of the PTO control activator which indicates that the activator is in the position to « coast/decelerate » the PTO governor set speed.00b = Off 01b = On 10b = Error 11b = Not available

984	Engine PTO Governor Set Switch	Switch signal of the PTO control activator which indicates that the activator is in the position to « set » the engine PTO governor set speed.00b = Off 01b = On 10b = Error 11b = Not available
985	A/C High Pressure Fan Switch	Switch signal which indicates that the pressure in the coolant circuit of an air conditioning system is high and the fan may be engaged.00b = Pressure normal 01b = Pressure high, fan may be engaged 10b = Error 11b = Not available
986	Engine Fan 1 Requested Percent Speed	Fan speed of the first or only fan in the system as a ratio of the actual fan drive (current speed) to the fully engaged fan drive (maximum fan speed). A two state fan (off/on) will use 0% and 100% respectively. A three state fan (off/intermediate/on) will use 0%, 50% and 100% respectively. A variable speed fan will use 0% to 100%. Multiple fan systems will use 0 to 100% to indicate the percent cooling capacity being provided. Feedback to this request is provided using the estimated fan speed (see SPN 975).Note that the intermediate fan speed of a three state fan will vary with different fan drives, therefore 50% is being used to indicate that the intermediate speed is required from the fan drive. Typically, the first fan in a system will be the fan closest to the radiator. The second fan will be located farthest from the radiator. See SPN 6730 for systems that have two fans.
987	Protect Lamp	See document J1939-73 for SPN details.
987	Protect Lamp	See document J1939-73 for SPN details.
987	Protect Lamp	See document J1939-73 for SPN details.
987	Protect Lamp	See document J1939-73 for SPN details.
987	Protect Lamp	See document J1939-73 for SPN details.
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987	Protect Lamp	See document J1939-73 for SPN details.
987	Protect Lamp	See document J1939-73 for SPN details.
987	Protect Lamp	See document J1939-73 for SPN details.
988	Trip Group 1	Command signal used to reset the PGNs and parameters as defined in Table SPN988_A. 00b = Take no action 01b = Reset 10b = Reserved 11b = Not applicable

989	Trip Group 2 – Proprietary	Command signal used to reset proprietary parameters associated with a trip but not defined within this document.00b = Take no action 01b = Reset 10b = Reserved 11b = Not applicable
990	Total Compression Brake Distance	Total distance over which the compression brakes have been active for the life of the engine.
991	Trip Compression Brake Distance	Total distance over which the compression brakes have been active since the last trip reset.
992	Trip Service Brake Distance	Total distance over which the service brakes have been active since the last trip reset.
993	Trip Service Brake Applications	Total number of times the service brakes have been activated since the last trip reset. Brake applications of less than 0.5 s are not counted and lengthy brake applications (longer than 0.5 s) are counted as a single event.NOTE – Definition and resolution shall stay the same if brakes are applied by only the tractor, only the trailer or both.
994	Trip Fan On Time	Total time the fan has been on (due to an automatic trigger or manual trigger) since the last trip reset. The fan could be requested to be on by the engine system, a manual switch, and/or the A/C system. Whichever system requests the fan activation first shall have the time accumulated against it. The sum total of these three values shall equal the trip fan on time.NOTE—If the fan has been requested to be on by a component that is not one of the defined categories, this time shall be accumulated in the Engine System category by default.
995	Trip Fan On Time Due to the Engine System	Total time the fan has been on due to engine triggers (i.e., excluding time on due to an operator manual switch or A/C system) since the last trip reset. For the time to be accumulated against the engine system, it is necessary that it be the first to request the fan activation or it be the only system requesting fan activation.
996	Trip Fan On Time Due to a Manual Switch	Total time the fan has been on due to manual activation by the operator (i.e., excluding time on due to automatic triggers) since the last trip reset. For the time to

		be accumulated against the manual switch, it is necessary that it be the first to request the fan activation or it be the only system requesting fan activation.
997	Trip Fan On Time Due to the A/C System	Total time the fan has been on due to the A/C system since the last trip reset. For the time to be accumulated against the A/C system, it is necessary that it be the first to request the fan activation or it be the only system requesting fan activation.
998	Trip Distance on VSL	Total distance accumulated while the engine torque mode is road speed governing since the last trip reset.
999	Trip Gear Down Distance	Total distance accumulated while the vehicle has operated in the gear which is one gear down from top gear and exceeds a calibrated minimum time (typically the time to shift the transmission) since the last trip reset.
1000	Trip Distance in Top Gear	Total distance accumulated while the vehicle has operated in top gear for a calibrated minimum time since the last trip reset.
1001	Trip Drive Fuel Used	Total fuel consumed while the engine speed is greater than zero, vehicle speed is greater than or equal to 2 km/h, and neither the PTO or the remote PTO is controlling the engine power output, since the last trip reset.NOTE—This parameter is intended for liquid fueled engines. See SPN 1007 for alternate resolution.
1002	Trip PTO Governor Moving Fuel Used	Total fuel consumed while either the PTO or remote PTO governors are in the hold state, the engine speed is greater than zero, and vehicle speed is greater than or equal to 2 km/h, since the last trip reset.NOTE—This parameter is intended for liquid fueled engines. See SPN 1008 for alternate resolution.
1003	Trip PTO Governor Non-moving Fuel Used	Total fuel consumed while either the PTO or remote PTO governors are in the hold state, the engine speed is greater than zero, and vehicle speed is less than 2 km/h, since the last trip reset.NOTE—This parameter is intended for liquid fueled engines. See SPN 1009 for alternate resolution.

1004	Trip Vehicle Idle Fuel Used	Total fuel consumed while neither the PTO or remote PTO governor is in the hold state, the engine speed is greater than zero, and vehicle speed is less than 2 km/h, since the last trip reset.In marine applications, this parameter is defined as the total fuel consumed while the engine speed is greater than zero, and less than or equal to 50 RPM greater than low idle, since the last trip reset. NOTE—This parameter is intended for liquid fueled engines. See SPN 1010 for alternate resolution.
1005	Trip Cruise Fuel Used	Total fuel consumed while the engine is in the cruise hold state since the last trip reset. If both cruise control and VSL (vehicle speed limiter) are commanding the same amount of fuel, the cruise control is deemed the active torque mode and fuel will be accumulated in « trip cruise fuel used » parameter. If fuel commanded due to the accelerator pedal position is larger than fuel commanded by cruise control (e.g., accelerator override torque mode), the cruise control is not deemed the active torque mode and fuel will not be accumulated in the « trip cruise fuel used » parameter.NOTE—This parameter is intended for liquid fueled engines. See SPN 1011 for alternate resolution.
1006	Trip Drive Fuel Economy	Trip drive fuel economy is equal to the distance traveled by vehicle in the drive state (engine speed greater than zero, vehicle speed greater than or equal to 2 km/h, and neither the PTO or remote PTO governors are controlling engine power output) divided by trip drive fuel used (SPN 1001), since the last trip reset.NOTE—This parameter is intended for liquid fueled engines. See SPN 1012 for alternate resolution.
1007	Trip Drive Fuel Used (Gaseous)	Total fuel consumed while the engine speed is greater than zero, vehicle speed is greater than or equal to 2 km/h, and neither the PTO or the remote PTO governors are controlling the engine power output, since the last trip reset.NOTE—This parameter is intended for gaseous fueled engines. See SPN 1001 for alternate resolution.
1008	Trip PTO Governor Moving Fuel Used (Gaseous)	Total fuel consumed while the PTO or remote PTO governors are in the hold state, the engine speed is greater than zero, and vehicle speed is greater than or equal to 2 km/h, since the last trip reset.NOTE—This parameter is intended for gaseous fueled engines. See SPN 1002 for alternate resolution.

1009	Trip PTO Governor Non-moving Fuel Used (Gaseous)	Total fuel consumed while the PTO or remote PTO governors are in the hold state, the engine speed is greater than zero, and vehicle speed is less than to 2 km/h, since the last trip reset.NOTE—This parameter is intended for gaseous fueled engines. See SPN 1003 for alternate resolution.
1010	Trip Vehicle Idle Fuel Used (Gaseous)	Total fuel consumed while neither the PTO or remote PTO governors are active, the engine speed is greater than zero, and vehicle speed is less than to 2 km/h, since the last trip reset.NOTE—This parameter is intended for gaseous fueled engines. See SPN 1004 for alternate resolution. Trip vehicle idle fuel while in fast idle (vehicle speed less than 2 km/h with engine speed greater than 700 rpm) shall be accumulated in the trip vehicle idle fuel category. All other fuel usage scenarios that do not fall directly in the categories defined shall be accumulated in trip drive fuel used.
1011	Trip Cruise Fuel Used (Gaseous)	Total fuel consumed while the engine is in the cruise hold state since the last trip reset. If both cruise control and VSL (vehicle speed limiter) are commanding the same amount of fuel, the cruise control is deemed the active torque mode and fuel will be accumulated in « trip cruise fuel used » parameter. If fuel commanded due to the accelerator pedal position is larger than fuel commanded by cruise control (e.g., accelerator override torque mode), the cruise control is not deemed the active torque mode and fuel will not be accumulated in the « trip cruise fuel used » parameter.NOTE—This parameter is intended for gaseous fueled engines. See SPN 1005 for alternate resolution.
1012	Trip Drive Fuel Economy (Gaseous)	Trip drive fuel economy is equal to the distance traveled by vehicle in the drive state (engine speed greater than zero, vehicle speed greater than or equal to 2 km/h, and neither the PTO or remote PTO governors are controlling engine power output) divided by trip drive fuel used (SPN 1007), since the last trip reset.NOTE—This parameter is intended for gaseous fueled engines. See SPN 1006 for alternate resolution.
1013	Trip Maximum Engine Speed	Maximum engine speed achieved since the last trip reset.

1014	Trip Average Engine Speed	Average speed of the engine since the last trip reset. NOTE — Excludes ignition-on time without the engine speed above zero. Includes idle, engine PTO governor (moving and non-moving), and drive operation.
1015	Trip Drive Average Load Factor	Average engine load factor while engine speed is greater than zero, vehicle speed is greater than or equal to 2 km/h, and both the PTO (moving/non-moving) and remote PTO governors are not in the hold state, since the last trip reset. Engine operation during cruise control operation is included.In marine applications, this parameter is defined as the average engine load factor while engine speed is greater than zero, since last trip reset.
1016	Total Drive Average Load Factor	Average engine load factor while engine speed is greater than zero, vehicle speed is greater than or equal to 2 km/h, and both the PTO (moving/non-moving) and remote PTO governors are not in the hold state, over the life of the engine. Engine operation during cruise control operation is included.In marine applications, this parameter is defined as the average engine load factor while engine speed is greater than zero.
1017	Total Engine Cruise Time	Total time that the engine has operated in the cruise hold state, excluding time in accelerator override, over the life of the engine.
1018	Trip Maximum Vehicle Speed	Maximum vehicle speed achieved while the engine speed is greater than zero and the accelerator pedal position (APS) is at a value greater than 0%, since the last trip reset.
1019	Trip Cruise Distance	Total distance that the engine has operated in the cruise hold state, excluding time in accelerator override, since the last trip reset.
1020	Trip Number of Hot Shutdowns	Total number of hot shutdowns since the last trip reset. A hot shutdown is based on operation at high load or high engine speed or for long operating periods without allowing the engine to cool sufficiently.
1021	Trip Number of Idle Shutdowns	Total number of times the engine has been shutdown due to idling too long (at normal idle or fast idle) since the last trip reset.

1022	Trip Number of Idle Shutdown Overrides	Total number of times an operator disables idle shutdown to prevent an engine shutdown, since the last trip reset.
1023	Trip Sudden Decelerations	Total number of decelerations whenever the vehicle deceleration is more than XYZ km/h/sec (where XYZ is a calibratible threshold), since the last trip reset. A lengthy deceleration shall be counted as one sudden deceleration.
1024	Trip Time in VSL	Total time accumulated when the engine has operated on the vehicle speed limiter (VSL) while not in the cruise hold state, since the last trip reset. The engine torque mode is equal to road speed governor during this operation.
1025	Trip Time in Top Gear	Total time accumulated when the vehicle has operated in top gear for a calibrated minimum time, since the last trip reset.
1026	Trip Time in Gear Down	Total time accumulated when the vehicle has operated in one gear down from the top gear for a calibrated minimum time, since the last trip reset.
1027	Trip Time in Derate by Engine	Total time accumulated when the engine final fueling has been derated due to an engine protection algorithm, since the last reset.
1028	Total Engine PTO Governor Fuel Used	Total fuel used while the PTO or remote PTO governors are in the hold state and engine speed is above zero, over the life of the engine.NOTE—This parameter is intended for liquid fueled engines. See SPN 1030 for alternate resolution.
1029	Trip Average Fuel Rate	Average fuel rate, equal to trip fuel divided by trip time while the engine speed is above zero, since the last trip reset. This includes idle, engine PTO governor (both moving and non-moving) and drive operation but excludes ignition-on time while the engine speed is at zero rpm.NOTE—This parameter is intended for liquid fueled engines. See SPN 1031 for alternate resolution.
1030	Total Engine PTO Governor Fuel Used (Gaseous)	Total fuel used while the PTO or remote PTO governors are in the hold state and engine speed is above zero, over the life of the engine.NOTE—This parameter is intended for gaseous fueled engines. See SPN 1028 for alternate resolution.

1031	Trip Average Fuel Rate (Gaseous)	Average fuel rate, equal to trip fuel divided by trip time while the engine speed is above zero, since the last trip reset. This includes idle, engine PTO governor (both moving and non-moving) and drive operation but excludes ignition-on time while the engine speed is at zero rpm.NOTE—This parameter is intended for gaseous fueled engines. See SPN 1029 for alternate resolution.
1032	Total ECU Distance	Total distance accumulated over the life of the ECU. When the ECU is replaced this value shall be reset.
1033	Total ECU Run Time	Total time accumulated over the life of the ECU, from ignition switch ON to ignition switch OFF. When the ECU is replaced this value shall be reset.
1034	Trip Cruise Time	Total time accumulated while the engine is in the cruise hold state, excluding time in accelerator override, since the last trip reset.
1035	Trip PTO Governor Time	Total time accumulated while the engine is in the PTO or remote PTO governor hold state since the last trip reset.
1036	Trip Engine Running Time	Total time accumulated while the engine speed is greater than zero since the last trip reset. Note that time with the ignition switch on but engine speed at zero is not included.
1037	Trip Idle Time	Total time accumulated while the engine speed is greater than zero, both the PTO and remote PTO governors are inactive, and the vehicle speed is less than 2 km/h, since the last trip reset.In marine applications, this parameter is defined as the total time accumulated while the engine speed is greater than zero, and less than or equal to 50 RPM greater than low idle, since the last trip reset.
1038	Trip Air Compressor On Time	Total time that the air compressor is on and compressing air since the last trip reset.
1039	Trip Fuel (Gaseous)	Total fuel consumed (trip drive fuel + trip PTO governor moving fuel + trip PTO governor non-moving fuel + trip idle fuel) since the last trip reset.

1040	Total Fuel Used (Gaseous)	Total fuel consumed (trip drive fuel + trip PTO governor moving fuel + trip PTO governor non-moving fuel + trip idle fuel) over the life of the engine.
1041	Start Signal Indicator	
1042	Electronic Tractor/Trailer Interface (ISO 11992)	
1043	Internal Sensor Voltage Supply	
1044	Hydraulic Pump Motor	
1045	Brake Light Switch 1	
1046	Brake Light Switch 2	
1047	Electronic Pressure Control Axle 1	
1048	Pneumatic Back-up Pressure Control Axle 1	
1049	Brake Pressure Sensing Axle 1	
1050	Electronic Pressure Control Axle 2	
1051	Pneumatic Back-up Pressure Control Axle 2	
1052	Brake Pressure Sensing Axle 2	
1053	Electronic Pressure Control Axle 3	

1054	Pneumatic Back-up Pressure Control Axle 3	
1055	Brake Pressure Sensing Axle 3	
1056	Electronic Pressure Control, Trailer Control	
1057	Pneumatic Back-up Pressure Control, Trailer Control	
1058	Brake Pressure Sensing, Trailer Control	
1059	Axle Load Sensor	
1060	Lining Wear Sensor Axle 1 Left	
1061	Lining Wear Sensor Axle 1 Right	
1062	Lining Wear Sensor Axle 2 Left	
1063	Lining Wear Sensor Axle 2 Right	
1064	Lining Wear Sensor Axle 3 Left	
1065	Lining Wear Sensor Axle 3 Right	
1066	Brake Signal Transmitter	
1067	Brake Signal Sensor 1	

1068	Brake Signal Sensor 2	
1069	Tire Dimension Supervision	
1070	Vehicle Deceleration Control	
1071	Engine Cooling Fan Drive Output	
1072	Engine Compression Brake Output #1	Engine Compression Brake driver circuit (includes the ECM driver and solenoid coil).
1073	Engine Compression Brake Output #2	Engine Compression Brake driver circuit (includes the ECM driver and solenoid coil).
1074	Engine Exhaust Brake Output	
1075	Engine Electric Lift Pump	This is the engine electric lift pump for the engine fuel supply.
1076	Engine Fuel Injection Pump 1 Fuel Control Valve	Fuel control valve in fuel pump 1.
1077	Engine Fuel Injection Pump Controller	
1078	Engine Fuel Injection Pump 1 Speed/Position Sensor	
1079	Sensor Supply Voltage 1 (+5V DC) (Obsolete)	This SPN is obsolete. SPNs 3509-3514 should be used instead.
1080	Sensor Supply Voltage 2 (+5V DC) (Obsolete)	This SPN is obsolete, SPNs 3509-3514 should be used instead.

1081	Engine Wait to Start Lamp	Lamp signal which indicates that the engine is too cold to start and the operator should wait until the signal becomes inactive (turns off). See SPN 5416 for the lamp operating condition.00b = Off 01b = On 10b = Error 11b = Not available
1082	Engine Coolant Load Increase	Status of an event, external to the engine, that may increase the nominal temperature of the engine coolant liquid.00b = No coolant load increase 01b = Coolant load increase possible 10b = Error 11b = Not available
1083	Auxiliary I/O Channel #1	Auxiliary channel of data (16 bit) read by the ECU. This data is in A/D counts and is manufacturer specific. It may be configured uniquely per application.
1084	Auxiliary I/O Channel #2	Auxiliary channel of data (16 bit) read by the ECU. This data is in A/D counts and is manufacturer specific. It may be configured uniquely per application.
1085	Intended Retarder Percent Torque	Braking torque of retarder that the retarder is currently trying to achieve. This value takes into account all static limitations, but not the limitations due to the dynamic behavior of the retarder. This value, if unchanged over a certain time, can and will be reached by the actual retarder – percent torque (See SPN 520).
1086	Parking and/or Trailer Air Pressure	The pneumatic pressure in the circuit or reservoir for the parking brake and/or the trailer supply.
1087	Service Brake Circuit 1 Air Pressure	The pneumatic pressure in the primary service brake circuit or reservoir, supplying the rear axle.
1088	Service Brake Circuit 2 Air Pressure	The pneumatic pressure in the secondary service brake circuit or reservoir, supplying the front axle.
1089	Auxiliary Equipment Supply Pressure	The pneumatic pressure in the auxiliary circuit.
1090	Air Suspension Supply Pressure	The pneumatic pressure in the circuit for the electronically controlled air suspension system.

1091	Brake Application Pressure High Range, Front Axle, Left Wheel	The brake application pressure for the left wheel on the front axle.
1092	Brake Application Pressure High Range, Front Axle, Right Wheel	The brake application pressure for the right wheel on the front axle.
1093	Brake Application Pressure High Range, Rear Axle #1, Left Wheel	The brake application pressure for the left wheel on the rear axle #1.
1094	Brake Application Pressure High Range, Rear Axle #1, Right Wheel	The brake application pressure for the right wheel on the rear axle #1.
1095	Brake Application Pressure High Range, Rear Axle #2, Left Wheel	The brake application pressure for the left wheel on the rear axle #2.
1096	Brake Application Pressure High Range, Rear Axle #2, Right Wheel	The brake application pressure for the right wheel on the rear axle #2.
1097	Brake Application Pressure High Range, Rear Axle #3, Left Wheel	The brake application pressure for the left wheel on the rear axle #3.
1098	Brake Application Pressure High Range, Rear Axle #3, Right Wheel	The brake application pressure for the right wheel on the rear axle #3.
1099	Brake Lining Remaining, Front Axle, Left Wheel	The percentage of brake lining which can still be measured for the left wheel on the front axle. 100% represents new brake linings, 0% represents totally worn brake linings.
1100	Brake Lining Remaining, Front Axle, Right Wheel	The percentage of brake lining which can still be measured for the right wheel on the front axle. 100% represents new brake linings, 0% represents totally worn brake linings.

1101	Brake Lining Remaining, Rear Axle #1, Left Wheel	The percentage of brake lining which can still be measured for the left wheel on the rear axle #1. 100% represents new brake linings, 0% represents totally worn brake linings.
1102	Brake Lining Remaining, Rear Axle #1, Right Wheel	The percentage of brake lining which can still be measured for the right wheel on the rear axle #1. 100% represents new brake linings, 0% represents totally worn brake linings.
1103	Brake Lining Remaining, Rear Axle #2, Left Wheel	The percentage of brake lining which can still be measured for the left wheel on the rear axle #2. 100% represents new brake linings, 0% represents totally worn brake linings.
1104	Brake Lining Remaining, Rear Axle #2, Right Wheel	The percentage of brake lining which can still be measured for the right wheel on the rear axle #2. 100% represents new brake linings, 0% represents totally worn brake linings.
1105	Brake Lining Remaining, Rear Axle #3, Left Wheel	The percentage of brake lining which can still be measured for the left wheel on the rear axle #3. 100% represents new brake linings, 0% represents totally worn brake linings.
1106	Brake Lining Remaining, Rear Axle #3, Right Wheel	The percentage of brake lining which can still be measured for the right wheel on the rear axle #3. 100% represents new brake linings, 0% represents totally worn brake linings.
1107	Engine Protection System Timer State	Status signal which indicates the current mode of the engine protection system timer system. See Figure SPN1107_A.00b = Inactive 01b = Active 10b = Error 11b = Not available
1108	Engine Protection System Timer Override	Status signal which indicates the status of the override feature of the engine protection system timer. See Figure SPN1107_A.00b = Inactive 01b = Active 10b = Error 11b = Not available

1109	Engine Protection System Approaching Shutdown	Status signal which indicates that engine shutdown is imminent. This engine protection signal can be a result of different systems failing, i.e., engine overheating. See Figure SPN1107_A.00b = Not approaching 01b = Approaching 10b = Error 11b = Not available
1110	Engine Protection System has Shutdown Engine	Status signal which indicates whether or not the engine protection system has shutdown the engine. See Figure SPN1107_A.00b = No 01b = Yes 10b = Error 11b = Not available
1111	Engine Protection System Configuration	Parameter which indicates the configuration of the engine shutdown system. 00b = Disabled in calibration 01b = Enabled in calibration 10b = Error 11b = Not available
1112	Engine Compression Brake Output #3	Engine Compression Brake driver circuit (includes the ECM driver and solenoid coil).
1113	Recommended Gear	The transmission calculates this gear continuously. In dangerous situations this gear may be selected to gain back vehicle control.
1114	Lowest Possible Gear	The transmission calculates this gear continuously. Together with the highest possible gear (see SPN 1115), it enables a management computer to know the exact range of available gears.
1115	Highest Possible Gear	The transmission calculates this gear continuously. Together with the lowest possible gear (see SPN 1114), it enables a management computer to know the exact range of available gears.
1116	Gaseous Fuel Correction Factor	A correction to a predefined gaseous fuel energy (expressed in energy per unit volume) represented as a percentage. The actual fuel energy used to control the engine is the product of the gaseous fuel correction factor and the energy of the gas.
1117	Engine Desired Rated Exhaust Oxygen	The desired amount of oxygen in the exhaust at rated conditions represented as a percentage by volume with respect to the total volume of exhaust gases leaving the engine.

1118	Engine Desired Exhaust Oxygen	The desired amount of oxygen in the exhaust represented as a percentage by volume with respect to the total volume of exhaust gases leaving the engine.
1119	Engine Actual Exhaust 1 Oxygen	The actual amount of oxygen in the exhaust represented as a percentage by volume with respect to the total volume of exhaust gases leaving the engine.
1120	Articulation Angle	Angle of deflection of an articulated transit vehicle (rotation angle about the vehicles z-axis). A right turn (clockwise) is indicated with a positive angle and a left turn is indicated with a negative angle. This parameter is defined according to a Z-Down axis system and the sign of the value is in accordance to the right-hand rule, as specified in SAE J670. As specified in SAE J670, a Z-Down Axis System has positive X directed forward, positive Y to the right, and positive Z directed down.
1121	EBS Brake Switch	Switch signal which indicates that the brake pedal is being pressed. The EBS brake switch is independent of the brake light switch and has no provisions for external connections.00b = Brake pedal is not being pressed 01b = Brake pedal is being pressed 10b = Error 11b = Not available
1122	Engine Alternator Bearing 1 Temperature	Temperature of the bearing inside the alternator. Bearing 1 is the left or rear bearing.
1123	Engine Alternator Bearing 2 Temperature	Temperature of the bearing inside the alternator. Bearing 2 is the right or front bearing.
1124	Engine Alternator Winding 1 Temperature	Temperature of the windings inside the alternator.
1125	Engine Alternator Winding 2 Temperature	Temperature of the windings inside the alternator.
1126	Engine Alternator Winding 3 Temperature	Temperature of the windings inside the alternator.

1127	Engine Turbocharger 1 Boost Pressure	Gage pressure of air measured downstream of the compressor discharge side of the turbocharger. See also SPN 102 for alternate range and resolution. If there is only one boost pressure to report and the range and resolution in SPN 102 is adequate, then it should be used.
1128	Engine Turbocharger 2 Boost Pressure	Gage pressure of air measured downstream of the compressor discharge side of the turbocharger. See also SPN 102 for alternate range and resolution. If there is only one boost pressure to report and the range and resolution in SPN 102 is adequate, then it should be used.
1129	Engine Turbocharger 3 Boost Pressure	Gage pressure of air measured downstream of the compressor discharge side of the turbocharger. See also SPN 102 for alternate range and resolution. If there is only one boost pressure to report and the range and resolution in SPN 102 is adequate, then it should be used.
1130	Engine Turbocharger 4 Boost Pressure	Gage pressure of air measured downstream of the compressor discharge side of the turbocharger. See also SPN 102 for alternate range and resolution. If there is only one boost pressure to report and the range and resolution in SPN 102 is adequate, then it should be used.
1131	Engine Intake Manifold 2 Temperature	Temperature of pre-combustion air found in intake manifold of engine air supply system.
1132	Engine Intake Manifold 3 Temperature	Temperature of pre-combustion air found in intake manifold of engine air supply system.
1133	Engine Intake Manifold 4 Temperature	Temperature of pre-combustion air found in intake manifold of engine air supply system.
1134	Engine Charge Air Cooler Thermostat Opening	The current position of the thermostat used to regulate the temperature of the engine charge air cooler. A value of 0% represents the thermostat being completely closed and 100% represents the thermostat being completely open.

1135	Engine Oil Temperature 2	Temperature of the engine lubricant. Note: If there is only one engine oil temperature measurement, SPN 175 should be used. See also SPNs 175 and 5925 for additional engine oil temperature measurements.
1136	Engine ECU Temperature	Temperature of the engine electronic control unit.
1137	Engine Exhaust Gas Port 1 Temperature	Temperature at the cylinder exhaust port of the engine.
1138	Engine Exhaust Gas Port 2 Temperature	Temperature at the cylinder exhaust port of the engine.
1139	Engine Exhaust Gas Port 3 Temperature	Temperature at the cylinder exhaust port of the engine.
1140	Engine Exhaust Gas Port 4 Temperature	Temperature at the cylinder exhaust port of the engine.
1141	Engine Exhaust Gas Port 5 Temperature	Temperature at the cylinder exhaust port of the engine.
1142	Engine Exhaust Gas Port 6 Temperature	Temperature at the cylinder exhaust port of the engine.
1143	Engine Exhaust Gas Port 7 Temperature	Temperature at the cylinder exhaust port of the engine.
1144	Engine Exhaust Gas Port 8 Temperature	Temperature at the cylinder exhaust port of the engine.
1145	Engine Exhaust Gas Port 9 Temperature	Temperature at the cylinder exhaust port of the engine.

1146	Engine Exhaust Gas Port 10 Temperature	Temperature at the cylinder exhaust port of the engine.
1147	Engine Exhaust Gas Port 11 Temperature	Temperature at the cylinder exhaust port of the engine.
1148	Engine Exhaust Gas Port 12 Temperature	Temperature at the cylinder exhaust port of the engine.
1149	Engine Exhaust Gas Port 13 Temperature	Temperature at the cylinder exhaust port of the engine.
1150	Engine Exhaust Gas Port 14 Temperature	Temperature at the cylinder exhaust port of the engine.
1151	Engine Exhaust Gas Port 15 Temperature	Temperature at the cylinder exhaust port of the engine.
1152	Engine Exhaust Gas Port 16 Temperature	Temperature at the cylinder exhaust port of the engine.
1153	Engine Exhaust Gas Port 17 Temperature	Temperature at the cylinder exhaust port of the engine.
1154	Engine Exhaust Gas Port 18 Temperature	Temperature at the cylinder exhaust port of the engine.
1155	Engine Exhaust Gas Port 19 Temperature	Temperature at the cylinder exhaust port of the engine.
1156	Engine Exhaust Gas Port 20 Temperature	Temperature at the cylinder exhaust port of the engine.

1157	Engine Main Bearing 1 Temperature	Temperature of the main bearing which supports the crankshaft of the engine.
1158	Engine Main Bearing 2 Temperature	Temperature of the main bearing which supports the crankshaft of the engine.
1159	Engine Main Bearing 3 Temperature	Temperature of the main bearing which supports the crankshaft of the engine.
1160	Engine Main Bearing 4 Temperature	Temperature of the main bearing which supports the crankshaft of the engine.
1161	Engine Main Bearing 5 Temperature	Temperature of the main bearing which supports the crankshaft of the engine.
1162	Engine Main Bearing 6 Temperature	Temperature of the main bearing which supports the crankshaft of the engine.
1163	Engine Main Bearing 7 Temperature	Temperature of the main bearing which supports the crankshaft of the engine.
1164	Engine Main Bearing 8 Temperature	Temperature of the main bearing which supports the crankshaft of the engine.
1165	Engine Main Bearing 9 Temperature	Temperature of the main bearing which supports the crankshaft of the engine.
1166	Engine Main Bearing 10 Temperature	Temperature of the main bearing which supports the crankshaft of the engine.
1167	Engine Main Bearing 11 Temperature	Temperature of the main bearing which supports the crankshaft of the engine.
1168	Engine Turbocharger Lube Oil Pressure 2	Gage pressure of oil in turbocharger lubrication system.
1169	Engine Turbocharger 2 Speed	Rotational velocity of rotor in the turbocharger.
1170	Engine Turbocharger 3 Speed	Rotational velocity of rotor in the turbocharger.
1171	Engine Turbocharger 4 Speed	Rotational velocity of rotor in the turbocharger.

1172	Engine Turbocharger 1 Compressor Intake Temperature	Temperature of the air entering the compressor side of the turbocharger.
1173	Engine Turbocharger 2 Compressor Intake Temperature	Temperature of the air entering the compressor side of the turbocharger.
1174	Engine Turbocharger 3 Compressor Intake Temperature	Temperature of the air entering the compressor side of the turbocharger.
1175	Engine Turbocharger 4 Compressor Intake Temperature	Temperature of the air entering the compressor side of the turbocharger.
1176	Engine Turbocharger 1 Compressor Intake Pressure	Gage pressure of the air entering the compressor side of the turbocharger.
1177	Engine Turbocharger 2 Compressor Intake Pressure	Gage pressure of the air entering the compressor side of the turbocharger.
1178	Engine Turbocharger 3 Compressor Intake Pressure	Gage pressure of the air entering the compressor side of the turbocharger.
1179	Engine Turbocharger 4 Compressor Intake Pressure	Gage pressure of the air entering the compressor side of the turbocharger.
1180	Engine Turbocharger 1 Turbine Intake Temperature	Temperature of the combustion by-products entering the turbine side of the turbocharger.
1181	Engine Turbocharger 2 Turbine Intake Temperature	Temperature of the combustion by-products entering the turbine side of the turbocharger.
1182	Engine Turbocharger 3 Turbine Intake Temperature	Temperature of the combustion by-products entering the turbine side of the turbocharger.

1183	Engine Turbocharger 4 Turbine Intake Temperature	Temperature of the combustion by-products entering the turbine side of the turbocharger.
1184	Engine Turbocharger 1 Turbine Outlet Temperature	Temperature of the combustion by-products exiting the turbine side of the turbocharger.
1185	Engine Turbocharger 2 Turbine Outlet Temperature	Temperature of the combustion by-products exiting the turbine side of the turbocharger.
1186	Engine Turbocharger 3 Turbine Outlet Temperature	Temperature of the combustion by-products exiting the turbine side of the turbocharger.
1187	Engine Turbocharger 4 Turbine Outlet Temperature	Temperature of the combustion by-products exiting the turbine side of the turbocharger.
1188	Engine Turbocharger Wastegate Actuator 1 Position	Position of the wastegate drive. A value of 0% represents fully closed and a value of 100% represents fully open.
1189	Engine Turbocharger Wastegate Actuator 2 Position	Position of the wastegate drive. A value of 0% represents fully closed and a value of 100% represents fully open.
1190	Engine Turbocharger Wastegate Actuator 3 Position	Position of the wastegate drive. A value of 0% represents fully closed and a value of 100% represents fully open.
1191	Engine Turbocharger Wastegate Actuator 4 Position	Position of the wastegate drive. A value of 0% represents fully closed and a value of 100% represents fully open.
1192	Engine Turbocharger Wastegate Actuator Control Air Pressure	Gage pressure of the air used to control the actuator which opens and closes the wastegate valve.
1193	Engine Operation Time Since Rebuild	The time in engine operation since the last engine rebuild.

1194	Anti-theft Encryption Seed Present Indicator	Indicates the presence of the encryption seed random number. 00b = Random number is not present 01b = Random number is present 10b = Error 11b = Not available
1195	Anti-theft Password Valid Indicator	Indicates the presence of a validated password. 00b = Password is not a validated password 01b = Password is a validated password 10b = Error 11b = Not available
1196	Anti-theft Component Status States	Indicates whether or not the component can be started. 00b = Unlocked 01b = Locked 10b = Blocked 11b = Not defined 00b – Unlocked = This state indicates that the component can be started without the end user being required to enter a password. 01b – Locked = This state indicates that the component can NOT be started (i.e., Unlocked) without the end user being required to enter a password. 10b – Blocked = This state indicates that a Lock or Unlock command cannot be executed because some other algorithm or command of higher priority is commanding differently.
1197	Anti-theft Modify Password States	This parameter is used to indicate whether a password request was successfully performed, or if the request could not be perform due to system constraints or if the request was not a valid request.00b = Ok 01b = Full_of_Passwords 10b = Empty_of_Passwords 11b = Not_valid 00b – Ok = This state indicates that the request was successfully performed. 01b – Full_Of_Passwords = This state indicates that the component can NOT store any additional passwords in its memory. 10b – Empty_Of_Passwords = This state indicates that the component would be empty of passwords (an unacceptable condition) if the password under which the end user is logged in, is deleted. Thus the delete password command is not successfully executed. Note that if the Delete_Password command is sent to a component that does not currently have a password the Empty_Of_Passwords state indicator shall be used. 11b – Not_Valid = This state indicates that the request is not a valid one.
1198	Anti-theft Random Number	A seven byte random numeric code provided by the component in response to an anti-theft request. This parameter is sent as a numeric value utilizing the full range of 0 to FFFFFFFFFFFFFFh. The most significant byte is sent first, not following the rules of Table 1 found in J1939-71.

1199	Anti-theft Encryption Indicator States	This parameter is used to indicate if a random number seed is being requested, or if an encrypted password is being provided to the component.00b = Encryption_Seed_Request 01b = Encrypted_Code_Present 10b = Not defined 11b = Not_Available 00b – Encryption_Seed_Request = This state represents a request to the component to provide a random number seed. 01b – Encrypted_Code_Present = This state is used to indicate that an encrypted password is being provided to the component. 11b – Not_Available = This state is used to indicate that a random number is NOT being requested nor is an encrypted password being provided to the component.
1200	Anti-theft Desired Exit Mode States	This parameter is used to specify the desired triggers that are to be used by the component in deciding when to transition to the Locked state.00b = Lock_Upon_Operator_Request 01b = Lock_When_Key_Off 10b = Not defined 11b = Not_Available 00b – Lock_Upon_Operator_Request—This state is used to indicate that the end user would have to manually enter a password to Lock the engine. 01b – Lock_When_Keyoff—This state is used to indicate that the component would automatically transition to the Locked state when the end user turns off the engine (i.e. without the end user being required to manually enter the password). 11b – Not_Available—This state is indicates that the option is not selectable or changeable by the operator via using current tool.
1201	Anti-theft Command States	This parameter is used to identify the specific requests being sent to the component. 000b = Add_Password 001b = Delete_Password 010b = Change_Password 011b = Lock_or_Unlock 100b = Check_Status 101b = Login 110b to 111b = Not defined 000b – Add_Password—This state represents a request to the component to add a password to the list of passwords that the component has stored as valid codes. This command will not be performed if the component has already stored, the maximum number of passwords that it is capable of storing. The Login command must precede this command. 001b – Delete_Password—This state represents a request to the component to delete the password (the same one used when the end-user logged in). See SPN 1197 for limitations. 010b – Change_Password—This state represents a request to the component to change the password (the same one that the end-user logged in with) to a different password, which is to be specified by the end user. The

		Login command must precede this command. 011b – Lock_Or_Unlock—This state represents a request to the component to change from the Locked state to the Unlocked state or from the Unlocked state to the Locked state. 100b – Check_Status—This state represents a request to check to see if the component is in the Locked or Unlocked state. 101b – Login—This state represents a request to validate the end user, before performing commands such as Add_Password and Change_Password.
1202	Anti-theft Password Representation	This parameter is the seven byte numeric code (i.e., 'encrypted password' or 'key') that is generated based on the encryption algorithm, the password supplied by the end user, and the random number seed given by the component. This parameter is sent as a numeric value utilizing the full range of 0 to FFFFFFFFFFFFFFh. The most significant byte is sent first, not following the rules of Table 1 found in J1939-71.
1203	Engine Auxiliary Coolant Pressure	Gage pressure of coolant found in the intercooler which is located after the turbocharger.
1204	Electrical Load	Electrical power delivered by the engine to the electrical system connected to the generator.
1205	Safety Wire Status	Status signal which indicates that the safety wire has been activated. When the safety wire is activated, the engine will not operate. This is used for maintenance purposes.00b = Safety wire has not been activated 01b = Safety wire has been activated 10b = Error 11b = Not available
1206	Engine Turning Gear Engaged	Status signal which indicates that the turning gear is engaged. The turning gear is used to turn the flywheel/crankshaft, for maintenance purposes, while the engine is not running.00b = Not engaged 01b = Engaged 10b = Error 11b = Not available
1207	Engine ECU Temperature (Obsolete – Use SPN 1136)	Temperature of the engine electronic control unit. (21, 1207 are not to be used – obsolete)

1208	Engine Oil Filter Intake Pressure	Gage pressure of the engine oil before the oil reaches the oil filter. See SPN 7470 for alternate resolution.
1209	Engine Exhaust Pressure 1	Gage pressure of the exhaust gases as measured at the turbine intake of the turbocharger. This SPN to be used for inline engines or exhaust bank 1 of multiple bank engines. See SPN 5749 for exhaust bank 2 and See SPN 6384 for alternate range and resolution.
1210	Engine Fuel Rack Position	Measured position of the engine fuel rack. A value of 0% rack represents no fueling and a value of 100% rack represents maximum fueling.
1211	Engine Build Hours Reset	Command signal used to reset the engine rebuild hours. 00b = Do not reset 01b = Reset 10b = Reserved 11b = Take no action
1212	Engine Auxiliary Coolant Temperature	Temperature of coolant found in the intercooler which is located after the turbocharger.
1213	Malfunction Indicator Lamp	See document J1939-73 for SPN details.
1213	Malfunction Indicator Lamp	See document J1939-73 for SPN details.
1213	Malfunction Indicator Lamp	See document J1939-73 for SPN details.
1213	Malfunction Indicator Lamp	See document J1939-73 for SPN details.
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1213	Malfunction Indicator Lamp	See document J1939-73 for SPN details.
1213	Malfunction Indicator Lamp	See document J1939-73 for SPN details.
1214	Suspect Parameter Number	See document J1939-73 for SPN details.
1214	Suspect Parameter Number	See document J1939-73 for SPN details.

1214	Suspect Parameter Number	See document J1939-73 for SPN details.
1214	Suspect Parameter Number	See document J1939-73 for SPN details.
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1214	Suspect Parameter Number	See document J1939-73 for SPN details.
1214	Suspect Parameter Number	See document J1939-73 for SPN details.
1215	Failure Mode Identifier	See document J1939-73 for SPN details.
1215	Failure Mode Identifier	See document J1939-73 for SPN details.
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1215	Failure Mode Identifier	See document J1939-73 for SPN details.
1215	Failure Mode Identifier	See document J1939-73 for SPN details.
1216	Occurrence Count	See document J1939-73 for SPN details.
1216	Occurrence Count	See document J1939-73 for SPN details.
1216	Occurrence Count	See document J1939-73 for SPN details.
1216	Occurrence Count	See document J1939-73 for SPN details.
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1216	Occurrence Count	See document J1939-73 for SPN details.
1216	Occurrence Count	See document J1939-73 for SPN details.
1217	Freeze Frame Length	See document J1939-73 for SPN details.

1218	Active Diagnostic Trouble Code Count	See document J1939-73 for SPN details.
1219	Previously Active Trouble Codes	See document J1939-73 for SPN details.
1220	OBD Compliance	See document J1939-73 for SPN details.
1221	Continuously Monitored Systems Support/Status	See document J1939-73 for SPN details.
1222	Non-continuously Monitored Systems Support	See document J1939-73 for SPN details.
1223	Non-continuously Monitored Systems Status	See document J1939-73 for SPN details.
1224	Test Identifier	See document J1939-73 for SPN details.
1224	Test Identifier	See document J1939-73 for SPN details.
1224	Test Identifier	See document J1939-73 for SPN details.
1224	Test Identifier	See document J1939-73 for SPN details.
1225	Test Type/Component Identifier	See document J1939-73 for SPN details.
1226	Test Value	See document J1939-73 for SPN details.
1227	Test Limit Maximum	See document J1939-73 for SPN details.
1228	Test Limit Minimum	See document J1939-73 for SPN details.

1229	Test Identifiers Supported	See document J1939-73 for SPN details.
1230	Current Data Link	See document J1939-73 for SPN details.
1231	J1939 Network #2	See document J1939-73 for SPN details.
1232	ISO 9141	See document J1939-73 for SPN details.
1233	J1850	See document J1939-73 for SPN details.
1234	Other, Manufacturer Specified Port	See document J1939-73 for SPN details.
1235	J1939 Network #3	See document J1939-73 for SPN details.
1236	Hold Signal	See document J1939-73 for SPN details.
1237	Engine Shutdown Override Switch	Switch signal which indicates the position of the engine shutdown override switch. This switch function allows the operator to override an impending engine shutdown.00b = Off 01b = On 10b = Error 11b = Not available
1238	Traction Control Override Switch	Switch signal which indicates the position of the traction control override switch. The traction control override signal disables the automatic traction control function allowing the wheels to spin.00b = Off 01b = On 10b = Error 11b = Not available or not installed
1239	Engine Fuel Leakage 1	Status signal which indicates fuel leakage in the fuel rail of the engine. Location can be either before or after the fuel pump.00b = no leakage detected 01b = leakage detected 10b = Error 11b = Not available
1240	Engine Fuel Leakage 2	Status signal which indicates fuel leakage in the fuel rail of the engine. Location can be either before or after the fuel pump.00b = no leakage detected 01b = leakage detected 10b = Error 11b = Not available

1241	Engine Fuel System 1 Gas Mass Flow Rate	Gas mass flow rate delivered to an engine through its first fuel control system. See SPN 3467 for the second fuel control system.
1242	Instantaneous Estimated Brake Power	Estimate of the power developed by the engine.
1243	ABS Fully Operational	Signal which indicates whether an ABS system is fully operational or whether its functionality is reduced by a defect or by an intended action (e.g., by activation of an ABS-off-road switch or during special diagnostic procedures). There are cases where the signal is necessary to fulfill legal regulations for special applications (e.g., switching off integrated retarders).00b = Not Fully Operational 01b = Fully Operational 10b = Reserved 11b = Not available
1244	Engine Fuel Actuator 2 Control Command	The control command to fuel actuator 2, normalized to percent, where 0% represents fully closed and 100% represents fully open. Typically, this fuel actuator is used to regulate low pressure natural gas flow rate, mixing into the air flow, which together then come into the engine. Using the standard convention for determining the position. If only 2 actuators are present, then left/front is #1 (SPN 633) and right/rear is #2 (SPN 1244). If more than two actuators are present, then left/front is #1 (SPN 633), left/rear is #2 (SPN 1244), right/front is #3 (SPN 7593) and right/rear is #4 (SPN 7594).
1245	Engine Timing Actuator 2	The detected position of actuator 2 on the Engine Timing System, where the system has different timing positions depending on current operating status of the engine. Timing positions may be used to determine intake and outlet valve timings.000b = Unknown Position 001b = Diesel Mode Position 010b = Diesel Part Load Position 011b = Gas Mode Position 100b = Diesel Part Load / Gas Mode Position 101b to 110b = Reserved 111b = Not Available
1246	Number of Engine Torque History Records	Number of torque history records contained in the engine torque history PGN. A value of 0 is broadcast if no torque history records are stored in the ECU.

1247	Engine Power	Advertised engine power capability. Advertised power is what a customer will find on a sales sheet for an engine with a certain calibration.
1248	Engine Peak Torque 1	Maximum torque output of the current ECU calibration when the engine operates on torque curve 1. For calibrations that support two torque curves, this parameter shall be assigned the value of the lower curve. For calibrations that support only one curve, this parameter should be used.
1249	Engine Peak Torque 2	Maximum torque output of the current ECU calibration when the engine operates on torque curve 2. For calibrations that support two torque curves, this parameter shall be assigned the value of the higher curve. For calibrations that support only one curve, this parameter should to set to “not available”.
1250	Calibration Record Start Month	Calendar month timestamp when an ECU record was established. NOTE – A value of 0 for the month is null. The value 1 identifies January; 2 identifies February; etc.
1251	Calibration Record Start Day	Calendar day timestamp when an ECU record was established. NOTE – A value of 0 for the date is null. The values 1, 2, 3, and 4 are used to identify the first day of the month; 5, 6, 7, and 8 identify the second day of the month; etc.
1252	Calibration Record Start Year	Calendar year timestamp when an ECU record was established. NOTE – A value of 0 for the year identifies the year 1985; a value of 1 identifies 1986; etc.
1253	Calibration Record Duration Time	Duration in hours for which the engine operated in the conditions captured in the current record.
1254	Torque Limiting Feature Status	Status of an ECU feature which limits the torque output of the engine. 00b = Disabled 01b = Enabled 10b = Error 11b = Not available
1255	Transmission Gear Ratio 1	Gear ratio value stored in the ECU that is used to define a range of transmission gears for which a limit is applied to the engine output torque. Transmission gear ratio 1 should be the numerically highest transmission gear ratio breakpoint that defines ratio ranges for torque limits.

1256	Engine Torque Limit 1, Transmission	Limit applied to the engine output torque during vehicle operation in transmission gear ratios numerically greater than transmission gear ratio 1 (see SPN 1255).
1257	Transmission Gear Ratio 2	Gear ratio value stored in the ECU that is used to define a range of transmission gears for which a limit is applied to the engine output torque. Transmission gear ratio 2 should be the numerically highest transmission gear ratio breakpoint less than transmission gear ratio 1 (see SPN 1255) that defines ratio ranges for torque limits.
1258	Engine Torque Limit 2, Transmission	Limit applied to the engine output torque during vehicle operation in transmission gear ratios numerically less than or equal to transmission gear ratio 1 (see SPN 1255) and numerically greater than transmission gear ratio 2 (see.SPN 1257). For example, with transmission gear ratio 1 equal to 12.0:1 and transmission gear ratio 2 equal to 5.0:1, vehicle operation in a transmission gear with a ratio of 6.0:1 will result in the application of engine torque limit 2, transmission.
1259	Transmission Gear Ratio 3	Gear ratio value stored in the ECU that is used to define a range of transmission gears for which a limit is applied to the engine output torque. Transmission gear ratio 3 should be the numerically highest transmission gear ratio breakpoint less than transmission gear ratio 2 (see SPN 1257) that defines ratio ranges for torque limits.
1260	Engine Torque Limit 3, Transmission	Limit applied to the engine output torque during vehicle operation in transmission gear ratios numerically less than or equal to transmission gear ratio 2 (see SPN 1257) and numerically greater than transmission gear ratio 3 (see.SPN 1259). For example, with transmission gear ratio 2 equal to 5.0:1 and transmission gear ratio 3 equal to 2.0:1, vehicle operation in a transmission gear with a ratio of 3.0:1 will result in the application of engine torque limit 3, transmission.
1261	Engine Torque Limit 4, Transmission	Limit applied to the engine output torque during vehicle operation in transmission gear ratios numerically less than or equal to transmission gear ratio 3 (see SPN 1259).
1262	Engine Torque Limit 5, Switch	Limit applied to the engine output torque based on activation of an ECU switch input.

1263	Engine Torque Limit 6, Axle Input	Limit applied to the engine output torque based on the maximum allowable axle input torque. Axle input torque is calculated as the current engine torque output multiplied by the transmission gear ratio.
1264	Engine Extended Crankcase Blow-by Pressure – duplicate (see SPN 22)	Differential crankcase blow-by pressure as measured through a tube with a venturi. (SPN 1264 is not to be used – obsolete)
1265	Engine Oil Burn Valve	Valve to control the folow of oil to be burned off in the engine.
1266	Engine Oil Replacement Valve	Valve to control the replacement oil to the engine.
1267	Idle Shutdown Vehicle Accessories Relay Driver Circuit	When Idle Shutdown System is activated, the relay will shutdown off accessories.
1268	Engine Ignition Coil #1	Coil for high voltage spark plug in gas engines.
1269	Engine Ignition Coil #2	Coil for high voltage spark plug in gas engines.
1270	Engine Ignition Coil #3	Coil for high voltage spark plug in gas engines.
1271	Engine Ignition Coil #4	Coil for high voltage spark plug in gas engines.
1272	Engine Ignition Coil #5	Coil for high voltage spark plug in gas engines.
1273	Engine Ignition Coil #6	Coil for high voltage spark plug in gas engines.
1274	Engine Ignition Coil #7	Coil for high voltage spark plug in gas engines.
1275	Engine Ignition Coil #8	Coil for high voltage spark plug in gas engines.
1276	Engine Ignition Coil #9	Coil for high voltage spark plug in gas engines.

1277	Engine Ignition Coil #10	Coil for high voltage spark plug in gas engines.
1278	Engine Ignition Coil #11	Coil for high voltage spark plug in gas engines.
1279	Engine Ignition Coil #12	Coil for high voltage spark plug in gas engines.
1280	Engine Ignition Coil #13	Coil for high voltage spark plug in gas engines.
1281	Engine Ignition Coil #14	Coil for high voltage spark plug in gas engines.
1282	Engine Ignition Coil #15	Coil for high voltage spark plug in gas engines.
1283	Engine Ignition Coil #16	Coil for high voltage spark plug in gas engines.
1284	Engine Ignition Coil #17	Coil for high voltage spark plug in gas engines.
1285	Engine Ignition Coil #18	Coil for high voltage spark plug in gas engines.
1286	Engine Ignition Coil #19	Coil for high voltage spark plug in gas engines.
1287	Engine Ignition Coil #20	Coil for high voltage spark plug in gas engines.
1288	Engine Ignition Coil #21	Coil for high voltage spark plug in gas engines.
1289	Engine Ignition Coil #22	Coil for high voltage spark plug in gas engines.
1290	Engine Ignition Coil #23	Coil for high voltage spark plug in gas engines.
1291	Engine Ignition Coil #24	Coil for high voltage spark plug in gas engines.
1292	Engine Ignition Control Module #1	Electronic control unit for an ignition system.

1293	Engine Ignition Control Module #2	Electronic control unit for an ignition system.
1294	Engine Spark Plug 1	The measured voltage of the spark event on Cylinder #1
1295	Engine Spark Plug 2	The measured voltage of the spark event on Cylinder #2
1296	Engine Spark Plug 3	The measured voltage of the spark event on Cylinder #3
1297	Engine Spark Plug 4	The measured voltage of the spark event on Cylinder #4
1298	Engine Spark Plug 5	The measured voltage of the spark event on Cylinder #5
1299	Engine Spark Plug 6	The measured voltage of the spark event on Cylinder #6
1300	Engine Spark Plug 7	The measured voltage of the spark event on Cylinder #7
1301	Engine Spark Plug 8	The measured voltage of the spark event on Cylinder #8
1302	Engine Spark Plug 9	The measured voltage of the spark event on Cylinder #9
1303	Engine Spark Plug 10	The measured voltage of the spark event on Cylinder #10
1304	Engine Spark Plug 11	The measured voltage of the spark event on Cylinder #11
1305	Engine Spark Plug 12	The measured voltage of the spark event on Cylinder #12
1306	Engine Spark Plug 13	The measured voltage of the spark event on Cylinder #13
1307	Engine Spark Plug 14	The measured voltage of the spark event on Cylinder #14
1308	Engine Spark Plug 15	The measured voltage of the spark event on Cylinder #15

1309	Engine Spark Plug 16	The measured voltage of the spark event on Cylinder #16
1310	Engine Spark Plug 17	The measured voltage of the spark event on Cylinder #17
1311	Engine Spark Plug 18	The measured voltage of the spark event on Cylinder #18
1312	Engine Spark Plug 19	The measured voltage of the spark event on Cylinder #19
1313	Engine Spark Plug 20	The measured voltage of the spark event on Cylinder #20
1314	Engine Spark Plug 21	The measured voltage of the spark event on Cylinder #21
1315	Engine Spark Plug 22	The measured voltage of the spark event on Cylinder #22
1316	Engine Spark Plug 23	The measured voltage of the spark event on Cylinder #23
1317	Engine Spark Plug 24	The measured voltage of the spark event on Cylinder #24
1318	Engine Exhaust Temperature Bank Imbalance	The imbalance between two banks of of exhaust port temperatures.
1319	Engine Intake Manifold Pressure Bank Imbalance	Imbalance between two banks of intake pressure manifolds
1320	Engine External Shutdown Air Supply Pressure	Pressure of the air used to shut off the fuel supply to the engine.
1321	Engine Starter Solenoid Lockout Relay Driver Circuit	This relay is in series with the engine starter motor relay and controlled by engine ECM to prevent starter engagement
1322	Engine Misfire for Multiple Cylinders	When a misfire occurs in any one of the cylinders

1323	Engine Cylinder 1 Misfire Rate	The misfire rate of engine cylinder 1 over the number of engine cycles in SPN6394 represented as a percentage.
1324	Engine Cylinder 2 Misfire Rate	The misfire rate of engine Cylinder 2 over the number of engine cycles in SPN6394 represented as a percentage.
1325	Engine Cylinder 3 Misfire Rate	The misfire rate of engine Cylinder 3 over the number of engine cycles in SPN6394 represented as a percentage.
1326	Engine Cylinder 4 Misfire Rate	The misfire rate of engine Cylinder 4 over the number of engine cycles in SPN6394 represented as a percentage.
1327	Engine Cylinder 5 Misfire Rate	The misfire rate of engine Cylinder 5 over the number of engine cycles in SPN6394 represented as a percentage.
1328	Engine Cylinder 6 Misfire Rate	The misfire rate of engine Cylinder 6 over the number of engine cycles in SPN6394 represented as a percentage.
1329	Engine Cylinder 7 Misfire Rate	The misfire rate of engine Cylinder 7 over the number of engine cycles in SPN6394 represented as a percentage.
1330	Engine Cylinder 8 Misfire Rate	The misfire rate of engine Cylinder 8 over the number of engine cycles in SPN6394 represented as a percentage.
1331	Engine Cylinder 9 Misfire Rate	The misfire rate of engine Cylinder 9 over the number of engine cycles in SPN6394 represented as a percentage.
1332	Engine Cylinder 10 Misfire Rate	The misfire rate of engine Cylinder 10 over the number of engine cycles in SPN6394 represented as a percentage.
1333	Engine Cylinder 11 Misfire Rate	The misfire rate of engine Cylinder 11 over the number of engine cycles in SPN6394 represented as a percentage.

1334	Engine Cylinder 12 Misfire Rate	The misfire rate of engine Cylinder 12 over the number of engine cycles in SPN6394 represented as a percentage.
1335	Engine Cylinder 13 Misfire Rate	The misfire rate of engine Cylinder 13 over the number of engine cycles in SPN6394 represented as a percentage.
1336	Engine Cylinder 14 Misfire Rate	The misfire rate of engine Cylinder 14 over the number of engine cycles in SPN6394 represented as a percentage.
1337	Engine Cylinder 15 Misfire Rate	The misfire rate of engine Cylinder 15 over the number of engine cycles in SPN6394 represented as a percentage.
1338	Engine Cylinder 16 Misfire Rate	The misfire rate of engine Cylinder 16 over the number of engine cycles in SPN6394 represented as a percentage.
1339	Engine Cylinder 17 Misfire Rate	The misfire rate of engine Cylinder 17 over the number of engine cycles in SPN6394 represented as a percentage.
1340	Engine Cylinder 18 Misfire Rate	The misfire rate of engine Cylinder 18 over the number of engine cycles in SPN6394 represented as a percentage.
1341	Engine Cylinder 19 Misfire Rate	The misfire rate of engine Cylinder 19 over the number of engine cycles in SPN6394 represented as a percentage.
1342	Engine Cylinder 20 Misfire Rate	The misfire rate of engine Cylinder 20 over the number of engine cycles in SPN6394 represented as a percentage.
1343	Engine Misfire Cylinder #21	Engine misfire detected in cylinder 21
1344	Engine Misfire Cylinder #22	Engine misfire detected in cylinder 22
1345	Engine Misfire Cylinder #23	Engine misfire detected in cylinder 23

1346	Engine Misfire Cylinder #24	Engine misfire detected in cylinder 24
1347	Engine Fuel Pump Pressurizing Assembly #1	The pumping assembly of the fuel system
1348	Engine Fuel Pump Pressurizing Assembly #2	The pumping assembly of the fuel system
1349	Engine Fuel 1 Injector Metering Rail 2 Pressure	The gage pressure of fuel in the metering rail #2 as delivered from the supply pump to the injector metering intake. See Figure SPN16_A for fuel system related parameters. Although the figure does not show rail #2 it does show the relationship of rail pressure to other signals.
1350	Time Since Last Service	The vehicle operation time since the last service was performed. The type of service information is identified by the service component identification number.
1351	Air Compressor Status	Indicates whether the air compressor is actively compressing air. 00b = Compressor not active 01b = Compressor active 10b = Error indicator 11b = Not available
1352	Engine Cylinder 1 Knock Level	Used to indicate the level of knock for engine cylinder 1. The level of knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more knock until 100% indicates the most severe level of knock allowed or measurable for the engine.Use SPN 6398 if knock level information is time critical or needs to be combustion synchronous.
1353	Engine Cylinder 2 Knock Level	Used to indicate the level of knock for engine cylinder 2. The level of knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more knock until 100% indicates the most severe level of knock allowed or measurable for the engine.Use SPN 6402 if knock level information is time critical or needs to be combustion synchronous.
1354	Engine Cylinder 3 Knock Level	Used to indicate the level of knock for engine cylinder 3. The level of knock is reported using a relative scale where 0% is least level of knock, and increasing levels

		indicate more knock until 100% indicates the most severe level of knock allowed or measurable for the engine.Use SPN 6406 if knock level information is time critical or needs to be combustion synchronous.
1355	Engine Cylinder 4 Knock Level	Used to indicate the level of knock for engine cylinder 4. The level of knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more knock until 100% indicates the most severe level of knock allowed or measurable for the engine.Use SPN 6410 if knock level information is time critical or needs to be combustion synchronous.
1356	Engine Cylinder 5 Knock Level	Used to indicate the level of knock for engine cylinder 5. The level of knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more knock until 100% indicates the most severe level of knock allowed or measurable for the engine.Use SPN 6414 if knock level information is time critical or needs to be combustion synchronous.
1357	Engine Cylinder 6 Knock Level	Used to indicate the level of knock for engine cylinder 6. The level of knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more knock until 100% indicates the most severe level of knock allowed or measurable for the engine.Use SPN 6418 if knock level information is time critical or needs to be combustion synchronous.
1358	Engine Cylinder 7 Knock Level	Used to indicate the level of knock for engine cylinder 7. The level of knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more knock until 100% indicates the most severe level of knock allowed or measurable for the engine.Use SPN 6422 if knock level information is time critical or needs to be combustion synchronous.
1359	Engine Cylinder 8 Knock Level	Used to indicate the level of knock for engine cylinder 8. The level of knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more knock until 100% indicates the most severe level of knock allowed or measurable for the engine.Use SPN 6426 if knock level information is time critical or needs to be combustion synchronous.

1360	Engine Cylinder 9 Knock Level	Used to indicate the level of knock for engine cylinder 9. The level of knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more knock until 100% indicates the most severe level of knock allowed or measurable for the engine.Use SPN 6430 if knock level information is time critical or needs to be combustion synchronous.
1361	Engine Cylinder 10 Knock Level	Used to indicate the level of knock for engine cylinder 10. The level of knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more knock until 100% indicates the most severe level of knock allowed or measurable for the engine.Use SPN 6434 if knock level information is time critical or needs to be combustion synchronous.
1362	Engine Cylinder 11 Knock Level	Used to indicate the level of knock for engine cylinder 11. The level of knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more knock until 100% indicates the most severe level of knock allowed or measurable for the engine.Use SPN 6438 if knock level information is time critical or needs to be combustion synchronous.
1363	Engine Cylinder 12 Knock Level	Used to indicate the level of knock for engine cylinder 12. The level of knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more knock until 100% indicates the most severe level of knock allowed or measurable for the engine.Use SPN 6442 if knock level information is time critical or needs to be combustion synchronous.
1364	Engine Cylinder 13 Knock Level	Used to indicate the level of knock for engine cylinder 13. The level of knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more knock until 100% indicates the most severe level of knock allowed or measurable for the engine.Use SPN 6446 if knock level information is time critical or needs to be combustion synchronous.
1365	Engine Cylinder 14 Knock Level	Used to indicate the level of knock for engine cylinder 14. The level of knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more knock until 100% indicates the most severe level of knock allowed or

		measurable for the engine.Use SPN 6450 if knock level information is time critical or needs to be combustion synchronous.
1366	Engine Cylinder 15 Knock Level	Used to indicate the level of knock for engine cylinder 15. The level of knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more knock until 100% indicates the most severe level of knock allowed or measurable for the engine.Use SPN 6454 if knock level information is time critical or needs to be combustion synchronous.
1367	Engine Cylinder 16 Knock Level	Used to indicate the level of knock for engine cylinder 16. The level of knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more knock until 100% indicates the most severe level of knock allowed or measurable for the engine.Use SPN 6458 if knock level information is time critical or needs to be combustion synchronous.
1368	Engine Cylinder 17 Knock Level	Used to indicate the level of knock for engine cylinder 17. The level of knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more knock until 100% indicates the most severe level of knock allowed or measurable for the engine.Use SPN 6462 if knock level information is time critical or needs to be combustion synchronous.
1369	Engine Cylinder 18 Knock Level	Used to indicate the level of knock for engine cylinder 18. The level of knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more knock until 100% indicates the most severe level of knock allowed or measurable for the engine.Use SPN 6466 if knock level information is time critical or needs to be combustion synchronous.
1370	Engine Cylinder 19 Knock Level	Used to indicate the level of knock for engine cylinder 19. The level of knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more knock until 100% indicates the most severe level of knock allowed or measurable for the engine.Use SPN 6470 if knock level information is time critical or needs to be combustion synchronous.

1371	Engine Cylinder 20 Knock Level	Used to indicate the level of knock for engine cylinder 20. The level of knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more knock until 100% indicates the most severe level of knock allowed or measurable for the engine.Use SPN 6474 if knock level information is time critical or needs to be combustion synchronous.
1372	Engine Cylinder 21 Knock Level	Used to indicate the level of knock for engine cylinder 21. The level of knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more knock until 100% indicates the most severe level of knock allowed or measurable for the engine.
1373	Engine Cylinder 22 Knock Level	Used to indicate the level of knock for engine cylinder 22. The level of knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more knock until 100% indicates the most severe level of knock allowed or measurable for the engine.
1374	Engine Cylinder 23 Knock Level	Used to indicate the level of knock for engine cylinder 23. The level of knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more knock until 100% indicates the most severe level of knock allowed or measurable for the engine.
1375	Engine Cylinder 24 Knock Level	Used to indicate the level of knock for engine cylinder 24. The level of knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more knock until 100% indicates the most severe level of knock allowed or measurable for the engine.
1376	Battery 2 Potential (Voltage) (duplicate – see also SPN 444)	The voltage for isolated battery #2. Duplicate SPN, recommend use of SPN 444.
1377	Engine Synchronization Switch	This is the On/Off operation of the Multiple Unit Synchronization functionality. When it is enabled (i.e. On) the master engine will synchronize one or more slave engines to operate at the same speed. This switch position indicates whether this

		feature is disabled (off) or enabled (on).00b = Functionality is disabled (off) 01b = Functionality is enabled (on) 10b = Error 11b = Not available or Unused
1378	Engine Oil Change Interval	The engine oil change interval time has expired
1379	Service Component Identification	Identification of component needing service. See Table SPN911_A.
1380	Engine Oil Level Remote Reservoir	Ratio of current volume of engine oil in a remote reservoir to the maximum required volume. If a single switch (on/off) is used, 20% and 100% respectively will be used where 100% means no oil needs to be added and 20% means oil needs to be added. If two switches are used, 20%, 50%, and 100% will be used where 20% indicates the oil is critically low, 50% indicates the oil level is low, and 100% means no oil needs to be added. For continuous sensors, the actual measured percent will be used.
1381	Engine Fuel Supply Pump Intake Absolute Pressure	Absolute pressure of fuel at the fuel supply pump intake. See Figures SPN16_A & SPN16_B. See SPN 7472 for alternate resolution.
1382	Engine Fuel Filter (suction side) Differential Pressure	Differential pressure measured across the fuel filter located between the fuel tank and the supply pump. See Figures SPN16_A and SPN16_B.
1383	Engine was Shut Down Hot	Abrupt engine shutdown when hot
1384	Engine has Been Shut Down from Data Link Information	Engine commanded to shutdown via the datalink
1385	Auxiliary Temperature #1 (duplicate see also SPN 441)	Temperature measured by auxiliary temperature sensor #1 or #2. Not to be used in place of existing SPNs.
1386	Auxiliary Temperature #2 (duplicate see also SPN 442)	Temperature measured by auxiliary temperature sensor #1 or #2. Not to be used in place of existing SPNs.

1387	Auxiliary Pressure #1	Pressure measured by auxiliary pressure sensor #1. Not to be used in place of existing SPNs.
1388	Auxiliary Pressure #2	Pressure measured by auxiliary pressure sensor #2. Not to be used in place of existing SPNs.
1389	Engine Fuel Specific Gravity	This parameter conveys the specific gravity of the gaseous fuel being used by the engine. The specific gravity of the fuel can then be used to compute the density of the fuel.
1390	Engine Fuel Valve 1 Intake Absolute Pressure	The absolute pressure of gas on the intake side of the first system control valve. See SPN 3466 for Engine Fuel Valve 2, 7505 for Engine Fuel Valve 3 & 7506 for Engine Fuel Valve 4.
1391	Engine Fuel Valve 1 Differential Pressure	The differential pressure between the intake and the outlet of the first or only gaseous fuel valve. See SPN 8494 for alternate range and resolution.
1392	Engine Air to Fuel Differential Pressure	The differential pressure between the gaseous fuel and the air intake manifold.
1393	Engine Cylinder 1 Ignition Transformer Secondary Output	This parameter indicates the relative intensity of the secondary output voltage of the ignition transformer.
1394	Engine Cylinder 2 Ignition Transformer Secondary Output	This parameter indicates the relative intensity of the secondary output voltage of the ignition transformer.
1395	Engine Cylinder 3 Ignition Transformer Secondary Output	This parameter indicates the relative intensity of the secondary output voltage of the ignition transformer.
1396	Engine Cylinder 4 Ignition Transformer Secondary Output	This parameter indicates the relative intensity of the secondary output voltage of the ignition transformer.

1397	Engine Cylinder 5 Ignition Transformer Secondary Output	This parameter indicates the relative intensity of the secondary output voltage of the ignition transformer.
1398	Engine Cylinder 6 Ignition Transformer Secondary Output	This parameter indicates the relative intensity of the secondary output voltage of the ignition transformer.
1399	Engine Cylinder 7 Ignition Transformer Secondary Output	This parameter indicates the relative intensity of the secondary output voltage of the ignition transformer.
1400	Engine Cylinder 8 Ignition Transformer Secondary Output	This parameter indicates the relative intensity of the secondary output voltage of the ignition transformer.
1401	Engine Cylinder 9 Ignition Transformer Secondary Output	This parameter indicates the relative intensity of the secondary output voltage of the ignition transformer.
1402	Engine Cylinder 10 Ignition Transformer Secondary Output	This parameter indicates the relative intensity of the secondary output voltage of the ignition transformer.
1403	Engine Cylinder 11 Ignition Transformer Secondary Output	This parameter indicates the relative intensity of the secondary output voltage of the ignition transformer.
1404	Engine Cylinder 12 Ignition Transformer Secondary Output	This parameter indicates the relative intensity of the secondary output voltage of the ignition transformer.
1405	Engine Cylinder 13 Ignition Transformer Secondary Output	This parameter indicates the relative intensity of the secondary output voltage of the ignition transformer.
1406	Engine Cylinder 14 Ignition Transformer Secondary Output	This parameter indicates the relative intensity of the secondary output voltage of the ignition transformer.
1407	Engine Cylinder 15 Ignition Transformer Secondary Output	This parameter indicates the relative intensity of the secondary output voltage of the ignition transformer.

1408	Engine Cylinder 16 Ignition Transformer Secondary Output	This parameter indicates the relative intensity of the secondary output voltage of the ignition transformer.
1409	Engine Cylinder 17 Ignition Transformer Secondary Output	This parameter indicates the relative intensity of the secondary output voltage of the ignition transformer.
1410	Engine Cylinder 18 Ignition Transformer Secondary Output	This parameter indicates the relative intensity of the secondary output voltage of the ignition transformer.
1411	Engine Cylinder 19 Ignition Transformer Secondary Output	This parameter indicates the relative intensity of the secondary output voltage of the ignition transformer.
1412	Engine Cylinder 20 Ignition Transformer Secondary Output	This parameter indicates the relative intensity of the secondary output voltage of the ignition transformer.
1413	Engine Cylinder 1 Ignition Timing	The ignition timing (SI engines) or main fuel injection timing (CI engines) of the cylinder. Positive values indicate an increasingly advanced timing from TDC.
1414	Engine Cylinder 2 Ignition Timing	The ignition timing (SI engines) or main fuel injection timing (CI engines) of the cylinder. Positive values indicate an increasingly advanced timing from TDC.
1415	Engine Cylinder 3 Ignition Timing	The ignition timing (SI engines) or main fuel injection timing (CI engines) of the cylinder. Positive values indicate an increasingly advanced timing from TDC.
1416	Engine Cylinder 4 Ignition Timing	The ignition timing (SI engines) or main fuel injection timing (CI engines) of the cylinder. Positive values indicate an increasingly advanced timing from TDC.
1417	Engine Cylinder 5 Ignition Timing	The ignition timing (SI engines) or main fuel injection timing (CI engines) of the cylinder. Positive values indicate an increasingly advanced timing from TDC.
1418	Engine Cylinder 6 Ignition Timing	The ignition timing (SI engines) or main fuel injection timing (CI engines) of the cylinder. Positive values indicate an increasingly advanced timing from TDC.

1419	Engine Cylinder 7 Ignition Timing	The ignition timing (SI engines) or main fuel injection timing (CI engines) of the cylinder. Positive values indicate an increasingly advanced timing from TDC.
1420	Engine Cylinder 8 Ignition Timing	The ignition timing (SI engines) or main fuel injection timing (CI engines) of the cylinder. Positive values indicate an increasingly advanced timing from TDC.
1421	Engine Cylinder 9 Ignition Timing	The ignition timing (SI engines) or main fuel injection timing (CI engines) of the cylinder. Positive values indicate an increasingly advanced timing from TDC.
1422	Engine Cylinder 10 Ignition Timing	The ignition timing (SI engines) or main fuel injection timing (CI engines) of the cylinder. Positive values indicate an increasingly advanced timing from TDC.
1423	Engine Cylinder 11 Ignition Timing	The ignition timing (SI engines) or main fuel injection timing (CI engines) of the cylinder. Positive values indicate an increasingly advanced timing from TDC.
1424	Engine Cylinder 12 Ignition Timing	The ignition timing (SI engines) or main fuel injection timing (CI engines) of the cylinder. Positive values indicate an increasingly advanced timing from TDC.
1425	Engine Cylinder 13 Ignition Timing	The ignition timing (SI engines) or main fuel injection timing (CI engines) of the cylinder. Positive values indicate an increasingly advanced timing from TDC.
1426	Engine Cylinder 14 Ignition Timing	The ignition timing (SI engines) or main fuel injection timing (CI engines) of the cylinder. Positive values indicate an increasingly advanced timing from TDC.
1427	Engine Cylinder 15 Ignition Timing	The ignition timing (SI engines) or main fuel injection timing (CI engines) of the cylinder. Positive values indicate an increasingly advanced timing from TDC.
1428	Engine Cylinder 16 Ignition Timing	The ignition timing (SI engines) or main fuel injection timing (CI engines) of the cylinder. Positive values indicate an increasingly advanced timing from TDC.
1429	Engine Cylinder 17 Ignition Timing	The ignition timing (SI engines) or main fuel injection timing (CI engines) of the cylinder. Positive values indicate an increasingly advanced timing from TDC.

1430	Engine Cylinder 18 Ignition Timing	The ignition timing (SI engines) or main fuel injection timing (CI engines) of the cylinder. Positive values indicate an increasingly advanced timing from TDC.
1431	Engine Cylinder 19 Ignition Timing	The ignition timing (SI engines) or main fuel injection timing (CI engines) of the cylinder. Positive values indicate an increasingly advanced timing from TDC.
1432	Engine Cylinder 20 Ignition Timing	The ignition timing (SI engines) or main fuel injection timing (CI engines) of the cylinder. Positive values indicate an increasingly advanced timing from TDC.
1433	Engine Desired Ignition Timing 1	A programmable timing value specific to the engine's application. Factors affecting this value include both fuel type and the nature of the load being driven. Positive values indicate an increasingly advanced timing from TDC.
1434	Engine Desired Ignition Timing 2	A programmable timing value specific to the engine's application. Factors affecting this value include both fuel type and the nature of the load being driven. Positive values indicate an increasingly advanced timing from TDC.
1435	Engine Desired Ignition Timing 3	A programmable timing value specific to the engine's application. Factors affecting this value include both fuel type and the nature of the load being driven. Positive values indicate an increasingly advanced timing from TDC.
1436	Engine Actual Ignition Timing	The actual ignition timing at the current engine conditions. This parameter may or may not be equal to one of the desired timing parameters (see SPNs 1433-1435), depending on the status of the engine. Positive values indicate an increasingly advanced timing from TDC. See SPN 7355 for commanded ignition timing.
1437	Road Speed Limit Status	Status (active or not active) of the system used to limit maximum vehicle velocity. 00b = Active 01b = Not Active 10b = Error 11b = Not available NOTE – While somewhat inconsistent with other J1939 status parameters, the states defining 00b = active and 01b = inactive for Road Speed Limit Status are NOT typographical errors, and should be implemented as stated.

1438	ABS/EBS Amber Warning Signal (Powered Vehicle)	This parameter commands the ABS/EBS amber/yellow optical warning signal 00b = Off 01b = On 10b = Reserved 11b = Take no action
1439	EBS Red Warning Signal	This parameter commands the EBS red optical warning signal 00b = Off 01b = On 10b = Reserved 11b = Take no action
1440	Engine Fuel Flow Rate 1	The rate at which the fuel is flowing through a fuel valve.
1441	Engine Fuel Flow Rate 2	The rate at which the fuel is flowing through a fuel valve.
1442	Engine Fuel Valve 1 Position	The position of a gaseous fuel valve that is metering the fuel flow to the engine. 0% indicates no fuel flow through valve and 100% means maximum fuel flow through valve.
1443	Engine Fuel Valve 2 Position	The position of a gaseous fuel valve that is metering the fuel flow to the engine. 0% indicates no fuel flow through valve and 100% means maximum fuel flow through valve.
1444	Engine Cylinder #1 Combustion Time	The amount of time from when the ignition of the fuel is initiated to when the fuel is completely ignited (i.e., the flame front has propagated across the cylinder).
1445	Engine Cylinder #2 Combustion Time	The amount of time from when the ignition of the fuel is initiated to when the fuel is completely ignited (i.e., the flame front has propagated across the cylinder).
1446	Engine Cylinder #3 Combustion Time	The amount of time from when the ignition of the fuel is initiated to when the fuel is completely ignited (i.e., the flame front has propagated across the cylinder).
1447	Engine Cylinder #4 Combustion Time	The amount of time from when the ignition of the fuel is initiated to when the fuel is completely ignited (i.e., the flame front has propagated across the cylinder).
1448	Engine Cylinder #5 Combustion Time	The amount of time from when the ignition of the fuel is initiated to when the fuel is completely ignited (i.e., the flame front has propagated across the cylinder).

1449	Engine Cylinder #6 Combustion Time	The amount of time from when the ignition of the fuel is initiated to when the fuel is completely ignited (i.e., the flame front has propagated across the cylinder).
1450	Engine Cylinder #7 Combustion Time	The amount of time from when the ignition of the fuel is initiated to when the fuel is completely ignited (i.e., the flame front has propagated across the cylinder).
1451	Engine Cylinder #8 Combustion Time	The amount of time from when the ignition of the fuel is initiated to when the fuel is completely ignited (i.e., the flame front has propagated across the cylinder).
1452	Engine Cylinder #9 Combustion Time	The amount of time from when the ignition of the fuel is initiated to when the fuel is completely ignited (i.e., the flame front has propagated across the cylinder).
1453	Engine Cylinder #10 Combustion Time	The amount of time from when the ignition of the fuel is initiated to when the fuel is completely ignited (i.e., the flame front has propagated across the cylinder).
1454	Engine Cylinder #11 Combustion Time	The amount of time from when the ignition of the fuel is initiated to when the fuel is completely ignited (i.e., the flame front has propagated across the cylinder).
1455	Engine Cylinder #12 Combustion Time	The amount of time from when the ignition of the fuel is initiated to when the fuel is completely ignited (i.e., the flame front has propagated across the cylinder).
1456	Engine Cylinder #13 Combustion Time	The amount of time from when the ignition of the fuel is initiated to when the fuel is completely ignited (i.e., the flame front has propagated across the cylinder).
1457	Engine Cylinder #14 Combustion Time	The amount of time from when the ignition of the fuel is initiated to when the fuel is completely ignited (i.e., the flame front has propagated across the cylinder).
1458	Engine Cylinder #15 Combustion Time	The amount of time from when the ignition of the fuel is initiated to when the fuel is completely ignited (i.e., the flame front has propagated across the cylinder).
1459	Engine Cylinder #16 Combustion Time	The amount of time from when the ignition of the fuel is initiated to when the fuel is completely ignited (i.e., the flame front has propagated across the cylinder).

1460	Engine Cylinder #17 Combustion Time	The amount of time from when the ignition of the fuel is initiated to when the fuel is completely ignited (i.e., the flame front has propagated across the cylinder).
1461	Engine Cylinder #18 Combustion Time	The amount of time from when the ignition of the fuel is initiated to when the fuel is completely ignited (i.e., the flame front has propagated across the cylinder).
1462	Engine Cylinder #19 Combustion Time	The amount of time from when the ignition of the fuel is initiated to when the fuel is completely ignited (i.e., the flame front has propagated across the cylinder).
1463	Engine Cylinder #20 Combustion Time	The amount of time from when the ignition of the fuel is initiated to when the fuel is completely ignited (i.e., the flame front has propagated across the cylinder).
1464	Engine Desired Combustion Time	The desired combustion time based upon engine load and speed lookup maps.
1465	Engine Average Combustion Time	The average combustion time of all cylinders of an engine.
1466	Steer Channel Mode	Indicates the functional mode of steer channel of the tire pressure control system. 0000b = Maintain 0001b = Inflate 0010b = Deflate 0011b = Confirm 0100b = Inflate Wait – System will inflate when conditions allow 0101b = Deflate Wait – System will deflate when conditions allow 0110b = Pressure Check 0111b to 1101b = Reserved 1110b = Error Condition 1111b = Not available
1467	Trailer/tag Channel Mode	Indicates the functional mode of trailer/tag channel of the tire pressure control system. 0000b = Maintain 0001b = Inflate 0010b = Deflate 0011b = Confirm 0100b = Inflate Wait – System will inflate when conditions allow 0101b = Deflate Wait – System will deflate when conditions allow 0110b = Pressure Check 0111b to 1101b = Reserved 1110b = Error Condition 1111b = Not available
1468	Drive Channel Mode	Indicates the functional mode of trailer/tag channel of the tire pressure control system. 0000b = Maintain 0001b = Inflate 0010b = Deflate 0011b = Confirm 0100b = Inflate Wait – System will inflate when conditions allow 0101b = Deflate Wait – System will deflate when conditions allow 0110b = Pressure Check 0111b to 1101b = Reserved 1110b = Error Condition 1111b = Not available

1469	PCU Drive Solenoid Status	Current state of the drive solenoid used to implement a tire pressure control system in its pneumatic control unit (PCU).00b = Off 01b = On 10b = Error 11b = Not available
1470	PCU Steer Solenoid Status	Current state of the steer solenoid used to implement a tire pressure control system in its pneumatic control unit (PCU).00b = Off 01b = On 10b = Error 11b = Not available
1471	Tire Pressure Supply Switch Status	Current state of an open/closed type switch used to determine if adequate pressure exists for system implementation.00b = Off 01b = On 10b = Error 11b = Not available
1472	PCU Deflate Solenoid Status	Current state of the deflate solenoid used to implement a tire pressure control system in its pneumatic control unit (PCU).00b = Off 01b = On 10b = Error 11b = Not available
1473	PCU Control Solenoid Status	Current state of the control solenoid used to implement a tire pressure control system in its pneumatic control unit (PCU).00b = Off 01b = On 10b = Error 11b = Not available
1474	PCU Supply Solenoid Status	Current state of the supply solenoid used to implement a tire pressure control system in its pneumatic control unit (PCU).00b = Off 01b = On 10b = Error 11b = Not available
1475	PCU Trailer, Tag or Push Solenoid Status	Current state of the trailer, tag, or push solenoid used to implement a tire pressure control system in its pneumatic control unit (PCU).00b = Off 01b = On 10b = Error 11b = Not available
1476	Engine Oil Specific Resistance	Engine oil specific resistance used to describe the engine oil quality.
1477	Engine Oil Kinematic Viscosity	Engine oil kinematic viscosity used to describe the engine oil quality.
1478	Engine Oil Relative Dielectricity	Engine oil relative dielectricity used to describe the engine oil quality.

1479	Security Entity Type	See document J1939-73 for SPN details.
1480	Source Address of Controlling Device for Retarder Control	The source address of the SAE J1939 device currently controlling the retarder. It is used to expand the torque mode parameter (see SPN 899) in cases where control is in response to an ECU that is not listed in Table SPN899_A. Its value may be the source address of the ECU transmitting the message (which means that no external SAE J1939 message is providing the active command) or the source address of the SAE J1939 ECU that is currently providing the active command in a TSC1 (see PGN 0) or similar message. Note that if this parameter value is the same as the source address of the device transmitting it, the control may be due to a message on a non-SAE J1939 data link such as SAE J1922 or a proprietary link.
1481	Source Address of Controlling Device for Brake Control	The source address of the SAE J1939 device currently controlling the brake system. Its value may be the source address of the ECU transmitting the message (which means that no external SAE J1939 message is providing the active command) or the source address of the SAE J1939 ECU that is currently providing the active command in a TSC1 (see PGN 0) or similar message. Note that if this parameter value is the same as the source address of the device transmitting it, the control may be due to a message on a non-SAE J1939 data link such as SAE J1922 or a proprietary link.
1482	Source Address of Controlling Device for Transmission Control	The source address of the SAE J1939 device currently controlling the transmission. Its value may be the source address of the ECU transmitting the message (which means that no external SAE J1939 message is providing the active command) or the source address of the SAE J1939 ECU that is currently providing the active command in a TSC1 (see PGN 0) or similar message. Note that if this parameter value is the same as the source address of the device transmitting it, the control may be due to a message on a non-SAE J1939 data link such as SAE J1922 or a proprietary link.
1483	Source Address of Controlling Device for Engine Control	The source address of the SAE J1939 device currently controlling the engine. It is used to expand the torque mode parameter (see SPN 899) in cases where control is in response to an ECU that is not listed in Table SPN899_A. Its value may be the source address of the ECU transmitting the message (which means that no external SAE J1939 message is providing the active command) or the source address of the SAE

		J1939 ECU that is currently providing the active command in a TSC1 (see PGN 0) or similar message. Note that if this parameter value is the same as the source address of the device transmitting it, the control may be due to a message on a non-J1939 data link such as SAE J1922 or a proprietary link.
1484	Other ECUs Have Reported Diagnostic Trouble Codes Affecting Operation	Indication of fault codes for other devices
1485	ECM Main Relay	
1486	Concave Position	Combine Concave Clearance Measurement
1487	Illumination Brightness Percent	Commanded backlight brightness level for all cab displays. Note: If a separate device is used to independently control the switch backlight brightness level, see SPN 5532.
1488	Thresher Speed	See document J1939-74 for SPN details.
1489	Cleaning Fan Speed	See document J1939-74 for SPN details.
1490	Header Backshaft Speed	See document J1939-74 for SPN details.
1491	Instrument Panel #1 Backlighting Driver	First Tailings Sensor circuit
1492	Instrument Panel #2 Backlighting Driver	Second Tailings Sensor circuit
1493	Tailings System	Tailings Elevator Paddles (e.g., missing)
1494	Tailings Sensor #1	Drive circuit which engages the unloading auger system

1495	Tailings Sensor #2	Drive circuit which engages the unloading header system
1496	Tailings Elevator Paddles	Drive circuit which engages the unloading separator system
1497	Unloading Auger Drive	See document J1939-74 for SPN details.
1498	Header Drive	See document J1939-74 for SPN details.
1499	Separator Drive	See document J1939-74 for SPN details.
1500	Tachometer Module Switch Matrix	Switch input matrix that controls monitoring functions of the tachometer module
1501	Grain Loss Module Switch Matrix	Switch input matrix that controls monitoring functions of the grain loss module
1502	Automatic Header Control Switch Matrix	Switch input matrix that controls monitoring functions of the automatic header module
1503	Armrest 1 Switch 1	Status of the first switch located in armrest 1. 00b = Off 01b = On 10b = Reserved 11b = Don’t care/take no action
1504	Operator Seat Switch	This switch senses the presence of the operator in the seat. 00b = Operator Not In Seat 01b = Operator In Seat 10b = Error 11b = Not Available
1505	Automatic Header Sensitivity Adjustment	See document J1939-74 for SPN details.
1506	Automatic Header Rate Adjustment Input	See document J1939-74 for SPN details.
1507	Discharge Beater Speed Disable Adjustment	Input to adjust the discharge beater speed

1508	Hydraulic Reservoir Temperature	See document J1939-74 for SPN details.
1509	Thresher Separator Hydraulic Drive 1 Temperature	See document J1939-74 for SPN details.
1510	Chopper Vane Angle Adjustment	See document J1939-74 for SPN details.
1511	Right side Cleaning Shoe Relative Grain Loss	See document J1939-74 for SPN details.
1512	Left side Cleaning Shoe Relative Grain Loss	See document J1939-74 for SPN details.
1513	Right side Separator Relative Grain Loss	See document J1939-74 for SPN details.
1514	Left side Separator Relative Grain Loss	See document J1939-74 for SPN details.
1515	Header Height System	General fault in the system that controls the header
1516	Header	Mechanical problem with the header system
1517	Header Lift Cylinder Pressure	See document J1939-74 for SPN details.
1518	Header Sensor Identification	See document J1939-74 for SPN details.
1519	Header Raise Valve Drive	See document J1939-74 for SPN details.
1520	Header Lower Valve Drive	See document J1939-74 for SPN details.
1521	Header Tilt Left Valve Drive	See document J1939-74 for SPN details.

1522	Header Tilt Right Valve Drive	See document J1939-74 for SPN details.
1523	Header Lift Cylinder Pressure Diverted Valve Drive	See document J1939-74 for SPN details.
1524	Reel Position Forward Actuator	See document J1939-74 for SPN details.
1525	Reel Position Aft Actuator	See document J1939-74 for SPN details.
1526	Reel Position Raise Actuator	See document J1939-74 for SPN details.
1527	Reel Position Lower Actuator	See document J1939-74 for SPN details.
1528	Header Drop Rate Control Valve Drive	See document J1939-74 for SPN details.
1529	Header Lift Cylinder Accumulator Shutoff Valve Drive	See document J1939-74 for SPN details.
1530	Unloading auger flow bypass valve drive	See document J1939-74 for SPN details.
1531	Reel Drive Motor Speed Increase Valve Drive	See document J1939-74 for SPN details.
1532	Reel Drive Motor Speed Decrease Valve Drive	See document J1939-74 for SPN details.
1533	Feederhouse Angle	Circuit and sensor for measuring the feederhouse angle parameter
1534	Header Leftmost Height	See document J1939-74 for SPN details.

1535	Header Rightmost Height	See document J1939-74 for SPN details.
1536	Header Center Height	See document J1939-74 for SPN details.
1537	Reel Fore-Aft Position	See document J1939-74 for SPN details.
1538	Reel Up-Down Position	See document J1939-74 for SPN details.
1539	Header Lateral Tilt Angle	See document J1939-74 for SPN details.
1540	Reel Speed Actuator Position	See document J1939-74 for SPN details.
1541	Reel Speed	See document J1939-74 for SPN details.
1542	ECU Power Supply Voltage #2 (Obsolete)	This SPN is obsolete. SPNs 3598 should be used instead.
1543	ECU Power Supply Voltage #3 (Obsolete)	This SPN is obsolete. SPNs 3599 should be used instead.
1544	Hydro Handle Matrix Switch	Multi-function handle circuit
1545	SPN Data	See document J1939-73 for SPN details.
1546	HVAC Coolant Valve Position Sensor	Circuit and sensor associated with providing the HVAC coolant valve position parameter
1547	A/C Evaporator Temperature	Circuit and sensor associated with providing the HVAC coolant valve position parameter
1548	HVAC Duct Temperature	Circuit and sensor associated with providing the HVAC duct temperature parameter

1549	HVAC Water Valve Drive	Output circuit that drives this valve
1550	Estimated Percent Fan 2 Speed	Estimated fan speed as a ratio of the fan drive (current speed) to the fully engaged fan drive (maximum fan speed). A two state fan (off/on) will use 0% and 100% respectively. A three state fan (off/intermediate/on) will use 0%, 50% and 100% respectively. A variable speed fan will use 0% to 100%. Multiple fan systems will use 0 to 100% to indicate the percent cooling capacity being provided.Note that the intermediate fan speed of a three state fan will vary with different fan drives, therefore 50% is being used to indicate that the intermediate speed is required from the fan drive.
1551	A/C Pressurizer Drive Circuit	Output circuit that drives this valve
1552	Operator Input device for Cab Climate Control	Circuit and sensor for measuring the HVAC temperature setpoint parameter
1553	HVAC Blower Motor Speed Adjustment	Circuit and sensor for measuring the HVAC blower motor speed adjustment parameter
1554	Clean Grain Elevator Speed	See document J1939-74 for SPN details.
1555	Moisture Sensor Cell Frequency	Critical parameter of moisture sensor
1556	Datalog Memory Card	Removable memory pack
1557	Fan 2 Drive State	This parameter is used to indicate the current state or mode of operation by the second fan drive. 0000b = Fan off 0001b = Engine system–General 0010b = Excessive engine air temperature 0011b = Excessive engine oil temperature 0100b = Excessive engine coolant temperature 0101b = Excessive transmission oil temperature 0110b = Excessive hydraulic oil temperature 0111b = Default Operation 1000b = Reverse Operation 1001b = Manual control 1010b = Transmission retarder 1011b = A/C system 1100b = Timer 1101b = Engine brake 1110b = Other 1111b = Not available Fan off 0000b —Used to indicate that the fan clutch is disengaged and

		the fan is inactive Engine system–General 0001b —Used to indicate that the fan is active due to an engine system not otherwise defined. Excessive engine air temperature 0010b —Used to indicate that the fan is active due to high air temperature. Excessive engine oil temperature 0011b —Used to indicate that the fan is active due to high oil temperature. Excessive engine coolant temperature 0100b —Used to indicate that the fan is active due to high coolant temperature. Reverse Operation 1000b — Used to indicate that the fan is in reverse direction of operation compared to the normal direction of operation Manual control 1001b —Used to indicate that the fan is active as requested by the operator. Transmission retarder 1010b —Used to indicate that the fan is active as required by the transmission retarder. A/C system 1011b —Used to indicate that the fan is active as required by the air conditioning system. Timer 1100b —Used to indicate that the fan is active as required by a timing function. Engine brake 1101b —Used to indicate that the fan is active as required to assist engine braking. Excessive transmission oil temperature – 0101b – Used to indicate fan is active due to excessive transmission oil temperature. Excessive hydraulic oil temperature – 0110b – Used to indicate fan is active due to excessive hydraulic oil temperature. Default Operation – 0111b – Used to indicate fan is active due to a error condition resulting in default operation
1558	Programming Error, Device Refused to Enter Programming Mode	Device to be programmed is reporting that it cannot be programmed
1559	Programming Error, Device Timed Out While Entering the Programming Mode	Tool timed out waiting for device to enter program mode
1560	Programming Error, Device Timed Out While Erasing	Tool timed out waiting for device to erase
1561	Programming Error, Device Timed Out While Programming	Tool timed out waiting for device to program

1562	Programming Error, Device did not Accept Program Line	Device to be programmed reporting that it cannot accept program block
1563	Incompatible Monitor/Controller	An incompatible device has been detected on the network
1564	CCD Data Link	
1565	Armrest Status	Parameter associated with the armrest module status
1566	Armrest Rotary Inputs	Parameter associated with the armrest module rotary inputs
1567	Header Height Control Mode Selector Switches	Parameter associated with the header height control mode selector switches
1568	Engine Torque Curve Selection	This parameter will report the selected torque curve, as indicated by SPN 6796. 0 = Indicates that the engine is using a torque that is not presently selected by SPN 6796 1 = Indicates that Torque Curve 1 is selected 2 = Indicates that Torque Curve 2 is selected 3 to 13 = Indicates that Torque Curve 3 through 13 is selected 14 = Error 15 = Not supported
1569	Engine Protection Torque Derate	Torque has been derated for protection of the engine
1570	Implement Disconnected	A previously connected implement is no longer connected
1571	Display Conflict	Multiple controllers contending for a display resource (region)
1572	Display Overload	Display not able to keep up with display commands
1573	LED Display Data #1	Informs display devices how to display the current vertical position. Values which are less than 128 decimal are bit-mapped values and any combination of these values is considered a valid value. For example communicating the « High Fine LED on » value to the display would result in the High Fine LED being turned on.

		Communicating a value with the « High Fine LED on » bit set to « 1 » and the « On-Grade LED on » bit set to « 1 » should result in the display turning on the High Fine LED AND the On-Grade LED. Values 128 decimal and above are discrete states. Any bit-mapped combination of these states are invalid unless the results correspond to one of the states defined. For example, the result of adding the « Low Coarse » and « Low Medium » states results in the « Low Medium » state, which is valid. However, adding the « Low Medium » and the « Low Fine » states results in an value which does not have a defined state and is invalid. 00000010b = High Coarse LED on 00000100b = High Fine LED on 00001000b = On-grade LED on 00010000b = Low Fine LED on 00100000b = Low Coarse LED on 10000000b = Low Coarse 10000001b = Low Medium/Coarse 10000010b = Low Medium 10000011b = Low Medium/Fine 10000100b = Low Fine 10010000b = On Grade 10010001b = High Fine 10010010b = High Medium/Fine 10010011b = High Medium 10010100b = High Medium/Coarse 10010101b = High Coarse 10011111b = No data (i.e. no laser strikes) 11111110b = Error 11111111b = Not Available Undefined values between 10100000b and 11111101b are reserved for future use.
1574	Laser Strike Vertical Deviation	The calculated distance from the laser strike position to the current land leveling system reference point.
1575	Modify Leveling System Set Point	Used to control and coordinate the set point for the leveling system. Operating Range: -3200 to +3200 mm, negative values are below current position, positive values are above current position, zero is no change. Parameter specific parameter: FE01h = indicates Stop modifying the set point FE03h = indicates Raise the current set point by 5 mm FE11h = indicates Lower the current set point by 5 mm FE13h = indicates Search for laser or target FE15h = indicates go to the Park position FE17h = indicates go to the Bench position
1576	Mast Position	Used to monitor the position of the sensor attached to the land leveling mast.
1577	Blade Duration and Direction	Used to indicate the duration and direction that the land leveling system blade moves.

1578	Blade Control Mode	Allows the user to select the type of blade control for the land leveling system. 00000000b = Manual mode 00000001b = Automatic mode 00000010b = Inactive automatic mode All other values Reserved
1579	Laser Tracer Target Deviation	The calculated distance for the laser target to the current laser tracer reference point. Parameter specific parameter: FE03h indicates that the sensor can not sense the laser
1580	Laser Tracer Vertical Distance	The elevation of the laser tracer sensor in a laser leveling system.
1581	Laser Tracer Horizontal Deviation	The calculated percent deviation between the target distance and the center of the laser tracer.
1582	LED Display Data #2	Informs display devices how to display the current position of the laser tracer. Values which are less than 128 decimal are bit-mapped values and any combination of these values is considered a valid value. For example communicating the « Up LED on » value to the display would result in the Up LED being turned on. Communicating a value with the « Up LED on » bit set to « 1 » and thet « On-Grade 'A' LED on » bit set to « 1 » should result in the display turning on the Up LED AND the On-Grade « A » LED. Values 128 decimal and above are discrete states. Any bit-mapped combination of these states are invalid unless the results correspond to one of the states defined. For example, the result of adding the « Low Coarse » and « Low Medium » states results in the « Low Medium » state, which is valid. However, adding the « Low Medium » and the « Low Fine » states results in an value which does not have a defined state and is invalid. 00000001b = On-grade « A » LED on 00000010b = On-grade « B » LED on 00000100b = On-grade « C » LED on 00001000b = Up LED on 00010000b = Down LED on 00100000b = Left LED on 01000000b = Right LED on 10000000b = Low Coarse 10000001b = Low Medium/Coarse 10000010b = Low Medium 10000011b = Low Medium/Fine 10000100b = Low Fine 10010000b = On Grade 10010001b = High Fine 10010010b = High Medium/Fine 10010011b = High Medium 10010100b = High Medium/Coarse 10010101b = High Coarse 10011111b = No data (i.e. no laser strikes) 11111110b = Error 11111111b = Not Available Undefined values between 10100000b and 11111101b are reserved for future use.

1583	Laser Tracer Information	Provides the status of the laser tracer to the operator. 00000001b = Laser power is on 00000010b = Laser is ready 00000100b = Valid target (1 = yes) 00001000b = Previous pass (1 = yes) 00010000b = Stringline (1 = yes) 00100000b = Curb (1 = yes) All other values Reserved
1584	Service Component Identification	Identification of component needing service. See Table SPN911_A.
1585	Powered Vehicle Weight	Total mass imposed by the tires of the powered vehicle on the road surface. Does not include the trailer.
1586	Speed of forward vehicle	Absolute velocity of the preceding vehicle situated within 250 m in the same lane and moving in the same direction.
1587	Distance to forward vehicle	Distance to the preceding vehicle situated within 250 m in the same lane and moving in the same direction.
1588	Adaptive Cruise Control Set Speed	Value of the desired (chosen) velocity of the adaptive cruise control system.
1589	Adaptive cruise control set distance mode	Selected distance mode for adaptive cruise control. 000b = ACC Distance mode #1 (largest distance) 001b = ACC Distance mode #2 010b = ACC Distance mode #3 011b = ACC Distance mode #4 100b = ACC Distance mode #5 (shortest distance) 101b = Conventional cruise control mode 110b = Error condition 111b = Not available/not valid
1590	Adaptive Cruise Control Mode	This parameter is used to indicate the current state, or mode, of operation by the Adaptive Cruise Control (ACC) device. The states characterize independent system states (e.g., it is not possible to express distance control active and overtake mode simultaneously). ACC must not switch itself off while active because the driver expects it to work. So if an error occurs, the ACC must signal that to the driver so that the driver knows that he has to switch off the ACC.000b = Off (Standby, enabled, ready for activation) 001b = Speed control active 010b = Distance control active 011b = Overtake mode 100b = Hold mode 101b = Finish mode 110b = Disabled or error condition 111b = Not available/not valid 000b – Off—Used to indicate the ACC is

		enabled in calibration or configuration and there are no faults that would prevent the system from operating. 001b – Speed Control Active—Used to indicate that ACC is on but not currently sending control messages. In other words, there is no target ahead and regular vehicle cruise control is controlling the vehicle speed to the driver's set speed. 010b – Distance Control Active—Used to indicate that ACC is on and actively sending control messages to maintain the appropriate following interval. 011b – Overtake Mode—Used to indicate that ACC is on but temporarily disabled because the driver is manually overriding cruise control by using either the accelerator pedal or the cruise control « accel » switch. 100b – Hold Mode—Used to indicate that the ACC has lost the previous target vehicle and is in HOLD mode. In this mode, the ACC shall limit the speed to the speed held when the target was lost. For example, if the driver activates the typical cruise buttons (Resume/Inc/Dec) the HOLD mode shall be exited and normal cruise functionality resumed. If a new target is detected, the Distance Control Active mode (010b) is again entered, unless existing conditions prohibit this. 101b – Finish Mode—Used to indicate that ACC is on with no target ahead, and ACC is currently sending control messages to return to the driver's set speed. This occurs when the target the ACC system was tracking moves out of the way so ACC returns the vehicle to the driver's set speed. 110b – Disabled or Error Condition—Used to indicate that ACC is in an error state and can not operate.
1591	Road curvature	Estimated value of the current road curvature for use by the adaptive cruise control system. Positive values are used for left curves. Curvature is the inverse of the radius and is zero for straight roads.
1592	Front Axle, Left Wheel Speed	High resolution measurement of the speed of the left wheel on the front axle.
1593	Front axle, right wheel speed	High resolution measurement of the speed of the right wheel on the front axle.
1594	Rear axle, left wheel speed	High resolution measurement of the speed of the left wheel on the rear axle.
1595	Rear axle, right wheel speed	High resolution measurement of the speed of the right wheel on the rear axle.

1596	Security Entity Length	See document J1939-73 for SPN details.
1597	Data Security Parameter	See document J1939-73 for SPN details.
1598	Fan 2 Speed	The speed of the second fan associated with engine coolant system.
1599	Seed	See document J1939-73 for SPN details.
1600	Engine Fuel Rate (High Resolution)	Amount of fuel consumed by engine per unit of time. NOTE – See SPN 183 for alternate resolution.
1601	Local minute offset	The minute component of the offset between the UTC time and date and a local time zone time and date. This is the number of minutes to add to UTC (Universal Time Coordinate) time and date to convert to the time and date in the local time zone . The Local Offset is a positive value for time zones East of the Prime Meridian to the International Date Line. The Local Offset is a negative value for time zones West of the Prime Meridian to the International Date Line. The Local Minute Offset is only applicable when the Time and Date parameters are reported as UTC time and date. Refer to SPN 1602 for details.
1602	Local hour offset	The hour component of the offset between the UTC (Universal Time Coordinate) time and date and a local time zone time and date. This is the number of hours to add to UTC, a.k.a. GMT, time and date to convert to the time and date in the local time zone. This parameter indicates the time reference of the data reported in the Time and Date SPNs 959, 960. 961, 962, 963, and 964. The Local Offset is a positive value for time zones East of the Prime Meridian to the International Date Line. The Local Offset is a negative value for time zones West of the Prime Meridian to the International Date Line. The Local Hour Offset is only applicable when the Time and Date parameters are reported as UTC time and date.Recommended Settings: Applications should not use the FFh ‘Not Available’ if using the Time and Date parameters due to some ambiguity of the time standard for the reported time and date values. The recommended settings for the Local Hour Offset settings are: If reporting the Time and Date as Local time, then Local Hour Offset must be reported as FAh. If

		reporting the Time and Date as UTC time and Local Hour Offset is not supported or not known, then Local Hour Offset must be reported as F9h. If reporting the Time and Date as UTC time and Local Hour Offset is known, then Local Hour Offset must be reported as a value between 66h and 94h.
1603	Adjust seconds	The seconds component for setting the current time of day. This should be reported as the seconds component of the current time according to the time of day standard indicated with the Local Hour Offset parameter (SPN 1602). The time of day should be reported as the current time at UTC (Universal Time Coordinate), a.k.a. GMT; however, it may be reported as the current time at a local time zone. The Local Hour Offset parameter (SPN 1602) is used to indicate if the time of day (SPNs 959, 960, and 961) is the current UTC time or a local time zone time. Refer to SPN 1602 for details.
1604	Adjust minutes	The minutes component for setting the current time of day. This should be reported as the minutes component of the current time according to the time of day standard indicated with the Local Hour Offset parameter (SPN 1602). The time of day should be reported as the current time at UTC (Universal Time Coordinate), a.k.a. GMT; however, it may be reported as the current time at a local time zone. The Local Hour Offset parameter (SPN 1602) is used to indicate if the time of day (SPNs 959, 960, and 961) is the current UTC time or a local time zone time. Refer to SPN 1602 for details.
1605	Adjust hours	The hours component for setting the current time of day. This should be reported as the hours component of the current time according to the time of day standard indicated with the Local Hour Offset parameter (SPN 1602). The time of day should be reported as the current time at UTC (Universal Time Coordinate), a.k.a. GMT; however, it may be reported as the current time at a local time zone. The Local Hour Offset parameter (SPN 1602) is used to indicate if the time of day (SPNs 959, 960, and 961) is the current UTC time or a local time zone time. Refer to SPN 1602 for details.

1606	Adjust month	The month component for setting the current calendar date. This should be reported as the month component of the current date according to the calendar date standard indicated with the Local Hour Offset parameter (SPN 1602). The calendar date should be reported as the current date at UTC (Universal Time Coordinate), a.k.a. GMT; however, it may be reported as the current date at a local time zone. The Local Hour Offset parameter (SPN 1602) is used to indicate if the calendar date (SPNs 962, 963, and 964) is the current UTC date or a local time zone date. Refer to SPN 1602 for details.NOTE – A value of 0 for the month is null. The value 1 identifies January; 2 identifies February; etc.
1607	Adjust day	The day component for setting the current calendar date. This should be reported as the day component of the current date according to the calendar date standard indicated with the Local Hour Offset parameter (SPN 1602). The calendar date should be reported as the current date at UTC (Universal Time Coordinate), a.k.a. GMT; however, it may be reported as the current date at a local time zone. The Local Hour Offset parameter (SPN 1602) is used to indicate if the calendar date (SPNs 962, 963, and 964) is the current UTC date or a local time zone date. Refer to SPN 1602 for details.NOTE – A value of 0 for the date is null. The values 1, 2, 3, and 4 are used to identify the first day of the month; 5, 6, 7, and 8 identify the second day of the month; etc.
1608	Adjust year	The year component for setting the current calendar date. This should be reported as the year component of the current date according to the calendar date standard indicated with the Local Hour Offset parameter (SPN 1602). The calendar date should be reported as the current date at UTC (Universal Time Coordinate), a.k.a. GMT; however, it may be reported as the current date at a local time zone. The Local Hour Offset parameter (SPN 1602) is used to indicate if the calendar date (SPNs 962, 963, and 964) is the current UTC date or a local time zone date. Refer to SPN 1602 for details.NOTE – A value of 0 for the year identifies the year 1985; a value of 1 identifies 1986; etc.
1609	Adjust local minute offset	The minute component for setting the offset between the UTC (Universal Time Coordinate) time and date and a the local time zone time and date. This is the number

		of minutes to add to UTC, a.k.a. GMT, time and date to convert to the time and date in the Local Time Zone. The Local Offset is a positive value for time zones East of the Prime Meridian to the International Date Line. The Local Offset is a negative value for time zones West of the Prime Meridian to the International Date Line.The Local Minute Offset is only applicable when the Time and Date parameters are reported as UTC time and date. Refer to SPN 1602 for details.
1610	Adjust local hour offset	The hour component for setting the offset between the UTC (Universal Time Coordinate) time and date and a the local time zone time and date. This is the number of minutes to add to UTC, a.k.a. GMT, time and date to convert to the time and date in the Local Time Zone. The Local Offset is a positive value for time zones East of the Prime Meridian to the International Date Line. The Local Offset is a negative value for time zones West of the Prime Meridian to the International Date Line.The Local Hour Offset is only applicable when the Time and Date parameters are reported as UTC time and date. Refer to SPN 1602 for details.
1611	Vehicle motion	Indicates whether motion of the vehicle is detected or not. 00b = Vehicle motion not detected 01b = Vehicle motion detected 10b = Error 11b = Not available
1612	Driver 1 working state	State of work of the driver. 000b = Rest – sleeping 001b = Driver available – short break 010b = Work – loading, unloading, working in an office 011b = Drive – behind wheel 100b to 101b = Reserved 110b = Error 111b = Not available
1613	Driver 2 working state	State of work of the driver. 000b = Rest – sleeping 001b = Driver available – short break 010b = Work – loading, unloading, working in an office 011b = Drive – behind wheel 100b to 101b = Reserved 110b = Error 111b = Not available
1614	Vehicle Overspeed	Indicates whether the vehicle is exceeding the legal speed limit set in the tachograph. 00b = No overspeed 01b = Overspeed 10b = Error 11b = Not available
1615	Driver card, driver 1	Indicates the presence of a driver card 00b = Driver card not present 01b = Driver card present 10b = Error 11b = Not available

1616	Driver card, driver 2	Indicates the presence of a driver card 00b = Driver card not present 01b = Driver card present 10b = Error 11b = Not available
1617	Driver 1 Time Related States	Indicates if the driver approaches or exceeds working time limits (or other limits). 0000b = Normal/No limits reached 0001b = Limit #1 – 15 min before 4 ½ h 0010b = Limit #2 – 4 ½ h reached 0011b = Limit #3 – 15 min before 9 h 0100b = Limit #4 – 9 h reached 0101b = Limit #5 – 15 min before 16 h (not having 8h rest during the last 24h) 0110b = Limit #6 – 16 h reached 0111b to 1100b = Reserved 1101b = Other 1110b = Error 1111b = Not available
1618	Driver 2 Time Related States	Indicates if the driver approaches or exceeds working time limits (or other limits). 0000b = Normal/No limits reached 0001b = Limit #1 – 15 min before 4 ½ h 0010b = Limit #2 – 4 ½ h reached 0011b = Limit #3 – 15 min before 9 h 0100b = Limit #4 – 9 h reached 0101b = Limit #5 – 15 min before 16 h (not having 8h rest during the last 24h) 0110b = Limit #6 – 16 h reached 0111b to 1100b = Reserved 1101b = Other 1110b = Error 1111b = Not available
1619	Direction indicator	Indicates the direction of the vehicle. 00b = Forward 01b = Reverse 10b = Error 11b = Not available
1620	Tachograph performance	Indicates the tachograph performance; including electronic or mechanical analysis, instrument analysis, speed sensor analysis, mass storage analysis, and printer analysis.00b = Normal performance 01b = Performance analysis 10b = Error 11b = Not available
1621	Handling information	Indicates that handling information is present. Information could include « no printer paper », « no driver card », etc.00b = No handling information 01b = Handling information 10b = Error 11b = Not available
1622	System event	Indicates that a tachograph event has occurred. This may include power supply interruption, interruption of the speed sensor, incorrect data on the driver card, driving without a driver card, illegal removal of a driver card, insertion of a driver

		card during driving, and time adjustment.00b = No tachograph event 01b = Tachograph event 10b = Error 11b = Not available
1623	Tachograph output shaft speed	Calculated speed of the transmission output shaft.
1624	Tachograph vehicle speed	Speed of the vehicle registered by the tachograph.
1625	Driver 1 identification	Used to obtain the driver identity.
1626	Driver 2 identification	Used to obtain the driver identity.
1627	Reserved for Certification agency ID	See document J1939-73 for SPN details.
1628	Reserved for Certification seed/key length	See document J1939-73 for SPN details.
1629	Reserved for Certification signature	See document J1939-73 for SPN details.
1630	Reserved for Certification public key	See document J1939-73 for SPN details.
1631	Reserved for Certification vehicle identification number	See document J1939-73 for SPN details.
1632	Engine Torque Limit Feature	Torque limit rating described in the current record. 000b = Reserved 001b = Highest torque rating 010b = First torque rating 011b = Previous torque rating (rating prior to the current rating) 100b = Current torque rating 101b to 110b = Reserved 111b = Not available
1633	Cruise Control Pause Switch	Switch signal which indicates the position of the Cruise Control Pause Switch used on Remote Cruise Control applications. The Cruise Control Pause Switch signal temporarily disables the Cruise Control function.00b = Off 01b = On 10b = Error Indicator 11b = Take No Action

1634	Calibration Verification Number	See document J1939-73 for SPN details.
1635	Calibration Identification	See document J1939-73 for SPN details.
1636	Engine Intake Manifold 1 Temperature (High Resolution)	Temperature of pre-combustion air found in intake manifold of engine air supply system. The higher resolution is required for control purposes.
1637	Engine Coolant Temperature (High Resolution)	Temperature of liquid found in engine cooling system. The higher resolution is required for control purposes.
1638	Hydraulic Temperature	Temperature of hydraulic fluid.
1639	Fan Speed	The speed of the fan associated with engine coolant system.
1640	Length/Number Requested	See document J1939-73 for SPN details.
1641	Pointer Type	See document J1939-73 for SPN details.
1642	Command	See document J1939-73 for SPN details.
1643	Pointer Extension	See document J1939-73 for SPN details.
1644	Pointer	See document J1939-73 for SPN details.
1645	Key/User_Level	See document J1939-73 for SPN details.
1646	Status (for DM 15)	See document J1939-73 for SPN details.
1647	EDCP Extension	See document J1939-73 for SPN details.
1648	Error Indicator/EDC Parameter	See document J1939-73 for SPN details.

1649	Length/Number Allowed	See document J1939-73 for SPN details.
1650	Number of Occurrences of Raw Binary Data	See document J1939-73 for SPN details.
1651	Raw Binary Data	See document J1939-73 for SPN details.
1651	Raw Binary Data	See document J1939-73 for SPN details.
1652	Boot Load Data	See document J1939-73 for SPN details.
1653	Vehicle Limiting Speed Governor Enable Switch	Switch signal which enables the Vehicle Limiting Speed Governor (VLSG) such that the vehicle speed may be either increased or decreased when the engine is off idle.00b = Switch disabled 01b = Switched enabled 10b = Error 11b = Not available
1654	Vehicle Limiting Speed Governor Increment Switch	Switch signal which increases the Vehicle Limiting Speed Governor (VLSG). 00b = Switch in the off state 01b = Switch in the on state – increase 10b = Error 11b = Not available
1655	Vehicle Limiting Speed Governor Decrement Switch	Switch signal which decreases the Vehicle Limiting Speed Governor (VLSG). 00b = Switch in the off state 01b = Switch in the on state – decrease 10b = Error 11b = Not available
1656	Engine Automatic Start Enable Switch	Switch signal which enables the idle management system to be enabled. When this system is enabled with the engine in an idle mode and safe operating conditions existing, then the engine may be started or stopped automatically.00b = Switch in the off state 01b = Switch in the on state 10b = Error 11b = Not available
1657	Engine Fuel 1 Injector Needle Lift Sensor 1	The injector needle lift sensor used to detect the initial movement of the injector component which correlates the start of fuel injection #1

1658	Engine Fuel 1 Injector Needle Lift Sensor 2	The injector needle lift sensor used to detect the initial movement of the injector component which correlates the start of fuel injection #2
1659	Engine Coolant System Thermostat 1	Electronic thermostat that will divert the coolant to the radiator at the preset temperature. See SPN 7423 for a second thermostat
1660	Engine Automatic Start Alarm	An audio alarm which is activated just before the Engine Automatic Start Feature is engaged
1661	Engine Automatic Start Lamp	A visible indication to the driver/operator that the Engine Automatic Start Feature is engaged
1662	Cab Interior Temperature Thermostat	Thermostat for driver/operator to set the desired cab temperature. Note: See SPN 1691 and SPN 170.
1663	Engine Automatic Start Safety Interlock Circuit	Multiple inputs, e.g. hood and parking brake positions and neutral transmission switch, which determins whether Engine Automatic feature may be activated or not
1664	Engine Automatic Start Failed (Engine)	Conditions that prevent the engine from starting.e.g. Engine Automatic Start Safety Interlock Circuit
1665	Engine Turbocharger Oil Level Switch	Switch signal which indicates the presence of oil at the turbocharger 00b = No oil present at turbocharger 01b = Oil present at turbocharger 10b = Error 11b = Not available
1666	Automatic Gear Shifting Enable Switch	Indicates that automated gear shifting is enabled via a switch 00b = Automated Gear Shifting is disabled 01b = Automated Gear Shifting is enabled 10b = Error 11b = Not available
1667	Retarder Requesting Brake Light	Indicates that whether the retarder is requesting that the brake lights are illuminated. 00b = Retarder is not requesting that the brake lights are illuminated 01b = Retarder is requesting that the brake lights are illuminated 10b = Reserved 11b = Not available/Take no action

1668	J1939 Network #4	See document J1939-73 for SPN details.
1669	J1939 Network #5	
1670	J1939 Network #6	
1671	J1939 Network #7	
1672	J1939 Network #8	
1673	J1939 Network #9	
1674	J1939 Network #10	
1675	Engine Starter Mode	There are several phases in a starting action and different reasons why a start cannot take place. 0000b = start not requested 0001b = starter active but not engaged 0010b = starter active and engaged 0011b = start finished; starter not active after having been actively engaged (after 50ms mode goes to 0000b) 0100b = starter inhibited due to engine already running 0101b = starter inhibited due to engine not ready for start (preheating) 0110b = starter inhibited due to driveline engaged or other transmission inhibit 0111b = starter inhibited due to active immobilizer 1000b = starter inhibited due to starter over-temp 1001b = starter inhibited due to intake air shutoff valve being active 1010b = starter inhibited due to active emissions control system condition 1011b = starter inhibited due to ignition key cycle required 1100b = starter inhibited – reason unknown 1101b = error (legacy implementation only, use 1110b) 1110b = error 1111b = not available
1676	Auxiliary Heater Water Pump Status	Parameter indicating whether the auxiliary heater water pump is running 00b = Water Pump is not running 01b = Water Pump is running 10b = Reserved 11b = Not available
1677	Auxiliary Heater Mode	State of the auxiliary heater 0000b = Heater not active 0001b = Off due to ADR per European Regulations for Transport of hazardous materials 0010b = Economy mode

		0011b = Normal mode 0100b = Heater pump up-keep (running the equipment in order to keep it in good condition) 0101b = Heater Starting – Indicates the start-phase of the heater which can be used to control the fan and circulation air flaps. 0110b = Heater Stopping – Indicates the burn-out phase of the heater which can be used to control the fan and circulation air flaps. 0111b = Diagnose Active – Indicates any active/running diagnostic service/routine/IO-control without the normal heater burn taking place. 1000b = Heater Locked – Indicates a sticky error state after running a number of failed heater start attempts. Heater will need to be unlocked at a workshop. 1001b to 1101b = Not defined 1110b = Error 1111b = Not available
1678	Cab Ventilation	Indicates whether the cab is being ventilated or not. 00b = Cab not ventilated 01b = Cab is ventilated 10b = Reserved 11b = Not available
1679	Engine Heating Zone	Parameter indicating whether the engine zone is being heated. 00b = Engine heating zone off 01b = Engine heating zone on 10b = Reserved 11b = Not available
1680	Cab Heating Zone	Parameter indicating whether the cab zone is being heated. 00b = Cab heating zone off 01b = Cab heating zone on 10b = Reserved 11b = Not available
1681	Battery Main Switch Hold State	Parameter indicating whether the battery main switch is held due to an external request or not. The state battery main switch held indicates that the battery main switch is about to switch off.00b = Battery main switch not held 01b = Battery main switch held 10b = Reserved 11b = Don’t care/take no action
1682	Battery Main Switch Hold Request	Request to hold the battery main switch. 00b = Release Battery Main Switch 01b = Hold Battery Main Switch 10b = undefined 11b = Don’t care/take no action
1683	Auxiliary Heater Mode Request	Request to activate the auxiliary heater. 0000b = De-activate auxiliary heater 0001b = Off due to ADR per European Regulations for Transport of hazardous materials 0010b = Economy mode 0011b = Normal mode 0100b = Heater pump up-keep 0101b to 1000b = Reserved 1001b to 1101b = Not defined 1110b = Reserved 1111b = Don’t care/take no action

1684	Auxiliary Heater Coolant Pump Request	Indicates whether to activate the auxiliary heater coolant water pump. 00b = Deactivate water pump 01b = Activate water pump 10b = Reserved 11b = Don’t care/take no action
1685	Request Engine Zone Heating	Request to activate engine zone heating. 00b = Do not heat engine zone 01b = Heat engine zone 10b = Reserved 11b = Don’t care/take no action
1686	Request Cab Zone Heating	Request to activate cab zone heating. 00b = Do not heat cab engine zone 01b = Heat cab zone 10b = Reserved 11b = Don’t care/take no action
1687	Auxiliary Heater Output Coolant Temperature	Temperature of the auxiliary heater output coolant (I.e. water in a water heater system.)
1688	Auxiliary Heater Input Air Temperature	Temperature of the input air in an auxiliary heater system.
1689	Auxiliary Heater Output Power Percent	Current auxiliary heater output power, relative to the auxiliary heater maximum output power.
1690	Auxiliary Heater Maximum Output Power	The maximum output power of the auxiliary heater.
1691	Cab Interior Temperature Command	Parameter used to command a certain cab interior temperature. Note: See also SPN 170. SPN 1662 is an additional diagnostic SPN associated with cab temperature.
1692	Engine Intake Manifold Desired Absolute Pressure	The desired absolute intake manifold pressure (turbo boost limit) of the engine.
1693	Engine Turbocharger Wastegate Valve Position	The position of the turbocharger wastegate valve (not the electronic wastegate control valve).

1694	Engine Fuel System Gas Mass Flow Rate Sensor Fueling Correction	The amount of fuel the Gas Mass Flow Rate Sensor is sensing should be added or subtracted compared to the maximum amount of fuel the control system allows the sensor to add or subtract.
1695	Engine Exhaust O2 Sensor Fueling Correction	The amount of fueling change required by the system based on the measured exhaust oxygen value compared to the maximum fueling change permitted by the system, expressed as percentages.
1696	Engine Exhaust O2 Sensor Closed Loop Operation	Indicates whether the engine is using the exhaust oxygen sensor to control the air/fuel ratio. 00b = Engine not using the exhaust oxygen sensor (open loop) 01b = Engine using the exhaust oxygen sensor for a closed loop operation 10b = Reserved 11b = Don't Care/take no action See also SPN 4240 for an implementation with more states.
1697	Tire Sensor Electrical Fault	Indicates the status of electrical fault on the tire sensor. 00b = Ok (No Fault) 01b = Not Defined (Fault) 10b = Error 11b = Not Supported
1698	Tire Status	Indicates the status of the tire. 00b = Ok (no fault) 01b = Tire leak detected 10b = Error 11b = Not Supported
1699	Tire Sensor Enable Status	Indicates whether the tire sensor is being monitored by the controller or is Enabled/Disabled. 00b = Off / Isolated / Disabled 01b = On (tire is polled) / Enabled 10b = Not Defined 11b = Not Supported
1700	Lane Departure Imminent, Left Side	Indicates departure imminent on left side of lane. 00b = Not imminent 01b = Imminent 10b = Reserved 11b = Not used
1701	Lane Departure Imminent, Right Side	Indicates departure imminent on right side of lane. 00b = Not imminent 01b = Imminent 10b = Reserved 11b = Not Used
1702	Lane Departure Indication Enable Status	Indicates whether lane departure indication is active. 00b = Lane Departure indication disabled 01b = Lane Departure Indication enabled 10b = Reserved 11b = Not Used
1703	Lane Tracking Speaker – Right Side	Lane tracking right side output diagnostic object

1704	Lane Tracking Speaker – Left Side	Lane tracking left side output diagnostic object
1705	Forward View Imager System	Forward Imager system condition.
1706	SPN Conversion Method	See document J1939-73 for SPN details.
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1707	Hydraulic Fan 2 Motor Pressure	The hydraulic pressure used to drive the second fan system, sensed before the hydraulic fan motor.
1708	Fan 2 Drive Bypass Command Status	Status of the Fan Drive Bypass Command for the second fan as being commanded by the ECU. The fan drive bypass diverts pump pressure away from the hydraulic motor to maintain the fan drive pressure. 0% is defined as no bypass (i.e. diverting no fan drive pressure) and 100% is defined as full bypass (i.e. diverting the maximum fan drive pressure) from the fan motor.

1709	Transmission Controller Power Relay	
1710	Lane Tracking Status Left Side	Indicates whether the left side is tracking lane. 00b = Not Tracking Left side 01b = Tracking Left side 10b = Reserved 11b = Don't care/Take no action
1711	Lane Tracking Status Right Side	Indicates whether right side is tracking lane. 00b = Not Tracking Right side 01b = Tracking Right side 10b = Reserved 11b = Don't Care/take no action
1712	Engine Requested Speed Control Range Upper Limit (Extended Range)	The maximum engine speed regardless of load that the engine will allow when operating in a speed control/limit mode, excluding any maximum momentary engine override speed, if supported.When the limit is higher than 2500 RPM the 'Requested Speed Control Range Upper Limit (Engine Configuration)' parameter (see SPN 536) will be transmitted with a value of 2500 RPM.
1713	Hydraulic Oil Filter Restriction Switch	This switch indicates whether hydraulic oil filter is clogged. This is not the transmission oil filter restriction switch, which is SPN 3359.00b = No restriction 01b = Restriction exists on oil filter 10b = Error 11b = Not Available
1714	Operator Seat Direction Switch	Senses whether the operator seat is in the forward driving position 00b = Operator seat not facing forward 01b = Operator seat is facing forward 10b = Error 11b = Not Available
1715	Drivers Demand Retarder – Percent Torque	The Drivers demand retarder – percent torque is the maximum torque selected by the driver when one or more modes are selected by the driver, such as hand lever, switch, constant torque, constant velocity, etc.
1716	Retarder Selection, non-engine	The "Retarder Selection, non-engine" is the position of the driver's selector for retarders that are not part of the engine system, expressed as percent and determined by the ratio of current position to the maximum possible position. The physical device may be a lever, rotary dial, combination of switches, or other device that the driver can use to select the type or amount of retardation needed.

1717	Actual Maximum Available Retarder – Percent Torque	This is the maximum amount of torque that the retarder can immediately deliver. It is the same as the maximum torque shown in the Retarder's Configuration message, but allows for a much faster rate of change than could be communicated by reissuing the configuration message. Application Note: The purpose for this parameter is to allow a "Master" retarder controller to more accurately allocate the vehicle's retarder requirements among multiple retarders. Its value should be the same as the value in the Configuration message at the time that message is assembled for broadcast, but may vary between those broadcasts.
1718	Damper Stiffness Request Front Axle	Demand value for the shock absorber control at the front axle.
1719	Damper Stiffness Request Rear Axle	Demand value for the shock absorber control at the rear axle.
1720	Damper Stiffness Request Lift / Tag Axle	Demand value for the shock absorber control at the lift or tag axle
1721	Relative Level Front Axle Left	Information of the height at the left side of the front axle referred to normal level 1. For explanations of normal level 1 see SPN 1734 – Nominal Level Front Axle.
1722	Relative Level Front Axle Right	Information of the height at the right side of the front axle referred to normal level 1. For explanations of normal level 1 see SPN 1734 – Nominal Level Front Axle.
1723	Relative Level Rear Axle Right	Information of the height at the left side of the rear axle referred to normal level 1. For explanations of normal level 1 see parameter SPN 1734 – Nominal Level Front Axle.
1724	Relative Level Rear Axle Left	Information of the height at the left side of the rear axle referred to normal level 1. For explanations of normal level 1 see parameter SPN 1734 – Nominal Level Front Axle.
1725	Bellow Pressure Front Axle Left	Information of the pressure of the air suspension bellow at the left side of the front axle

1726	Bellow Pressure Front Axle Right	Information of the pressure of the air suspension bellow at the right side of the front axle
1727	Bellow Pressure Rear Axle Left	Information of the pressure of the air suspension bellow at the left side of the rear axle
1728	Bellow Pressure Rear Axle Right	Information of the pressure of the air suspension bellow at the right side of the rear axle
1729	Damper Stiffness Front Axle	Damper stiffness information of the shock absorber control at the front axle
1730	Damper Stiffness Rear Axle	Damper stiffness information of the shock absorber control at the rear axle
1731	Damper Stiffness Lift / Tag Axle	Damper stiffness information of the shock absorber control at the lift of tag axle
1732	Level Preset Front Axle Left	Set value for nominal level ‘preset level’ at the left side of the front axle. This value is referred to ‘Normal level 1’. For explanations of normal level 1 see parameter SPN 1734 – Nominal Level Front Axle.
1733	Nominal Level Rear Axle	Signal which indicates the nominal (desired) height of the rear axle to be controlled by the suspension system.For further explanations see SPN 1734 – Nominal Level Front Axle. 0000b = Level not specified,(i.e. the nominal level is none of the specified levels, no error condition) 0001b = « Normal Level 1,(i.e. the level prescribed for normal driving, given by design) 0010b = « Normal Level 2,(i.e. a level permitted for driving, for example to lower the vehicle in case of high speed) 0011b = « Normal Level 3,(i.e. a level permitted for driving, for example to lift the vehicle in case of offroad) 0100b = « Preset Level,(i.e. a level to be defined externally via CAN) 0101b = « Customer Level,(i.e. a level to be defined by customer via parameter setting) 0110b = « Upper Level,(i.e. the highest level to be controlled) 0111b = « Lower Level,(i.e. the lowest level to be controlled) 1000b = Level change stopped 1001b = Raising 1010b = Lowering 1011b to 1101b = Reserved 1110b = Error 1111b = Not available

1734	Nominal Level Front Axle	Signal which indicates the nominal (desired) height of the front axle to be controlled by the suspension system.These heights are discrete levels. They are the upper level, lower level, normal level 1, normal level 2, normal level 3, customer level, and preset level. Refer to Figure SPN1734_A. · Upper Level is the highest mechanically available height of the vehicle. · Lower Level is the lowest mechanically available height of the vehicle. Normal Levels 1, 2 and 3 are heights normally used during driving. · Normal Level 1 is most often used and is given by design. · Normal Level 2 may be chosen, for example, to be lower than Normal Level 1 for the purpose of reducing fuel consumption while driving on highways. · Normal Level 3 may be chosen above Normal Level 1 for driving off road. The preset level has to be set by means of ASC 6 (PGN: 53504). States 'Raising' and 'Lowering' are only active when corresponding states are requested in SPN 1751. This provides the possibility to adjust vehicle to a level other than the predefined levels. 0000b = Level not specified,(i.e. the nominal level is none of the specified levels, no error condition) 0001b = « Normal Level 1,(i.e. the level prescribed for normal driving, given by design) 0010b = « Normal Level 2,(i.e. a level permitted for driving, for example to lower the vehicle in case of high speed) 0011b = « Normal Level 3,(i.e. a level permitted for driving, for example to lift the vehicle in case of offroad) 0100b = « Preset Level,(i.e. a level to be defined externally via CAN) 0101b = « Customer Level,(i.e. a level to be defined by customer via parameter setting) 0110b = « Upper Level,(i.e. the highest level to be controlled) 0111b = « Lower Level,(i.e. the lowest level to be controlled) 1000b = Level change stopped 1001b = Raising 1010b = Lowering 1011b to 1101b = Reserved 1110b = Error 1111b = Not available
1735	Level Preset Rear Axle Right	Set value for nominal level 'preset level' at the right side of the rear axle. This value is referred to 'Normal level 1'. For explanations of normal level 1 see SPN 1734 – Nominal Level Front Axle.
1736	Above Nominal Level Rear Axle	Signal which indicates whether the actual height of the rear axle is above the nominal (desired) level of the rear axle. For explanations of nominal level see parameter SPN 1734 – Nominal Level Front Axle.00b = Not above 01b = Above 10b = Error 11b = Not available

1737	Above Nominal Level Front Axle	Signal which indicates whether the actual height of the front axle is above the nominal (desired) level of the front axle. For explanations of nominal level see SPN 1734 – Nominal Level Front Axle.00b = Not above 01b = Above 10b = Error 11b = Not available
1738	Below Nominal Level Front Axle	Signal which indicates whether the actual height of the front axle is below the nominal (desired) level for the front axle. For explanations of nominal level see parameter SPN 1734 – Nominal Level Front Axle.00b = Not below 01b = Below 10b = Error 11b = Not available
1739	Lifting Control Mode Front Axle	Signal which indicates the actual lifting level change at the front axle 00b = Lifting not active 01b = Lifting active 10b = Error 11b = Not available
1740	Lowering Control Mode Front Axle	Signal which indicates the actual lowering level change at the front axle 00b = Lowering not active 01b = Lowering active 10b = Error 11b = Not available
1741	Level Control Mode	Signal which indicates the actual control mode of the air suspension system 0000b = Normal operation; i.e. the system performs a « pure » control of the vehicle height 0001b = Traction help (load transfer); i.e. the driven axle is loaded to a maximum value given by legislation or design 0010b = Load fixing; i.e. the driven axlen is loaded to a value defined by the driver 0011b = Pressure ratio 1; i.e. the ratio between the pressures at the driven axle and at the third axle is controlled, so that the ratio equals a fixed value 1 0100b = Pressure ratio 2; i.e. the ratio between the pressures at the driven axle and at the third axle is controlled, so that the ratio equals a fixed value 2 0101b = Optimum traction 1; i.e. the pressure at the driven axle is controlled at a fixed value 1 0110b = Optimum traction 2; i.e. the pressure at the driven axle is controlled at a fixed value 2 0111b = Traction help – load reduce; (i.e. the driven axle load is reduced to normal load condition) 1000b = Exhausting bellow function; i.e. the bellows are exhausted totally 1001b = Air suspension control prohibited (i.e. hold current pressures in all suspension devices.) 1010b = Automatic air suspension control prohibited 1011b = Force to bumper level request is in effect 1100b to 1101b = Not defined 1110b = Error 1111b = Not available

1742	Kneeling Information	Signal which indicates the actual level change in case of kneeling function 0000b = Not active,(i.e. the kneeling function is not active ») 0001b = Lowering active,(i.e. the vehicle is lowered due to a kneeling request) 0010b = Kneeling level reached,(i.e. the vehicle is at the fixed kneeling level) 0011b = Lifting active,(i.e. the vehicle is lifted due to a recover request) 0100b = Kneeling aborted,(i.e. in case of manual actuation the request was dropped before the kneeling level was reached) 0101b to 1101b = Not defined 1110b = Error 1111b = Not available
1743	Lift Axle 1 Position	Signal which indicates the position / load condition of lift axle / tag axle 1. Numbering of lift/tag axles starts at front axle. See SPN 6843 for more detail.00b = Lift axle position down / tag axle laden 01b = Lift axle position up / tag axle unladen 10b = Error 11b = Not available
1744	Door Release	Signal which indicates that the doors may be opened. [Please note: doors instead of door!] In case a kneeling request is active the ASC indicates during lowering the vehicle « doors shall not be opened » as a security information until the kneeling level is reached. Then « doors may be opened » is sent.00b = Doors may not be opened 01b = Doors may be opened 10b = Error 11b = Not available
1745	Vehicle Motion Inhibit	Signal which indicates whether vehicle motion is inhibited. 00b = Vehicle may be moved 01b = Vehicle motion is inhibited 10b = Error 11b = Not available
1746	Security Device	The signal which indicates the status of the security device. An example of a security device is a curbstone feeler installed beneath the doors of a bus. If the security device becomes active during kneeling the kneeling process (lowering) is stopped and the vehicle lifts back to the starting level.00b = Not active 01b = Active 10b = Error 11b = Not available
1747	Kneeling Control Mode Request	Command signal to select the kneeling functionality 00b = Automatically actuated 01b = Manually actuated 10b = Reserved 11b = Don’t care/take no action

1748	Kneeling Request Right Side	Command signal to activate the kneeling functionality on the right side of the vehicle 00b = No kneeling request 01b = Kneeling request 10b = Reserved 11b = Don't care/take no action
1749	Kneeling Request Left Side	Command signal to activate the kneeling functionality on the left side of the vehicle 00b = No kneeling request 01b = Kneeling request 10b = Reserved 11b = Don't care/take no action
1750	Nominal Level Request Rear Axle	Command signal to activate a level of the rear axle programmed and/or memorized in the ECU. For explanations of nominal level see SPN 1734 – Nominal Level Front Axle.0000b = No level request 0001b = Normal Level 1,(i.e. the level prescribed for normal driving, given by design) 0010b = Normal Level 2,(i.e. a level permitted for driving, for example to lower the vehicle in case of high speed) 0011b = Normal Level 3,(i.e. a level permitted for driving, for example to lift the vehicle in case of offroad) 0100b = Preset Level,(i.e. a level to be defined externally via CAN) 0101b = Customer Level,(i.e. a level to be defined by customer via parameter setting) 0110b = Upper Level,(i.e. the highest level to be controlled) 0111b = Lower Level,(i.e. the lowest level to be controlled) 1000b = Stop level change,(i.e. the level change in process shall be stopped immediately) 1001b = Raise Request (Continuously raising front axle, as long as active). 1010b = Lower Request (Continuously lowering front axle, as long as active). 1011b to 1101b = Not defined 1110b = Reserved 1111b = Don't care/take no action
1751	Nominal Level Request Front Axle	Command signal to activate a level of the front axle programmed and/or memorized in the ECU For explanations of nominal level see SPN 1734 – Nominal Level Front Axle.0000b = No level request 0001b = Normal Level 1,(i.e. the level prescribed for normal driving, given by design) 0010b = Normal Level 2,(i.e. a level permitted for driving, for example to lower the vehicle in case of high speed) 0011b = Normal Level 3,(i.e. a level permitted for driving, for example to lift the vehicle in case of offroad) 0100b = Preset Level,(i.e. a level to be defined externally via CAN) 0101b = Customer Level,(i.e. a level to be defined by customer via parameter setting) 0110b = Upper Level,(i.e. the highest level to be controlled) 0111b = Lower Level,(i.e. the lowest level to be controlled) 1000b = Stop level change,(i.e. the level change in

		process shall be stopped immediately) 1001b = Raise Request (Continuously raising front axle, as long as active). 1010b = Lower Request (Continuously lowering front axle, as long as active). 1011b to 1101b = Not defined 1110b = Reserved 1111b = Don’t care/take no action
1752	Lift Axle 1 Position Command	Signal to command the position/load condition of lift/tag axle #1. Numbering of lift/tag axles starts at front axle.00b = Lift axle position down / tag axle laden 01b = Lift axle position up / tag axle unladen 10b = Reserved 11b = Don’t care/take no action
1753	Level Control Mode Request	Command signal to activate a level control mode 0000b = Normal operation; i.e. the system performs a « pure » control of the vehicle height 0001b = Traction help (load transfer); i.e. the driven axle is loaded to a maximum value given by legislation or design 0010b = Load fixing; i.e. the driven axle is loaded to a value defined by the driver 0011b = Pressure ratio 1; i.e. the ratio between the pressures at the driven axle and at the third axle is controlled, so that the ratio equals a fixed value 1 0100b = Pressure ratio 2; i.e. the ratio between the pressures at the driven axle and at the third axle is controlled, so that the ratio equals a fixed value 2 0101b = Optimum traction 1; i.e. the pressure at the driven axle is controlled at a fixed value 1 0110b = Optimum traction 2; i.e. the pressure at the driven axle is controlled at a fixed value 2 0111b = Traction help – load reduce; (i.e. reduce axle load of driven axle to normal load condition) 1000b = Exhaust bellows 1001b = Force to bumper level 1010b = Reverse traction help (reverse load transfer); i.e. the second driven axle is loaded to a maximum value given by legislation or design 1011b = Not defined 1100b = Not defined 1101b = Not defined 1110b = Reserved 1111b = Don’t care/take no action Mode 1001b would be used to override other level change requests and force an immediate return to bumper level, e.g. in a situation where the vehicle is in danger of tilting.
1754	Below Nominal Level Rear Axle	Signal which indicates whether the actual height of the rear axle is below the nominal (desired) level for the rear axle. For explanations of nominal level see SPN 1734 – Nominal Level Front Axle.00b = Not below 01b = Below 10b = Error 11b = Not available

1755	Lowering Control Mode Rear Axle	Signal which indicates the actual lowering level change at the rear axle 00b = Lowering not active 01b = Lowering active 10b = Error 11b = Not available
1756	Lifting Control Mode Rear Axle	Signal which indicates the actual lifting level change at the rear axle 00b = Lifting not active 01b = Lifting active 10b = Error 11b = Not available
1757	Level Preset Front Axle Right	Set value for nominal level ‘preset level’ at the right side of the front axle. This value is referred to ‘Normal level 1’. For explanations of normal level 1 see SPN 1734 – Nominal Level Front Axle.
1758	Level Preset Rear Axle Left	Set value for nominal level ‘preset level’ at the left side of the rear axle. This value is referred to ‘Normal level 1’. For explanations of normal level 1 see SPN 1734 – Nominal Level Front Axle.
1759	Blade Height Set Point (High Resolution)	High resolution for the laser guided blade set point. The high resolution required for more accurate control and ‘accurate’ unit conversions.Negative values are below grade, positive values are above grade, zero is on grade.
1760	Gross Combination Vehicle Weight	The total weight of the truck and all attached trailers.
1761	Aftertreatment 1 Diesel Exhaust Fluid Tank Volume	Ratio of volume of diesel exhaust fluid to the total volume of diesel exhaust fluid storage container for aftertreatment system 1 (exhaust bank 1). 0% is empty and 100% is full. See SPN 3517 and SPN 7530 for alternate measurements.Parameter Specific Indicator: A value of FBh indicates conditions are not acceptable for a valid measurement.
1762	Hydraulic Pressure	Hydraulic pressure measured at the output of the hydraulic pump.
1763	Engine Hydraulic Pressure Governor Mode Indicator	Mode for governor operation is hydraulic pressure control. 00b = Disabled 01b = Enabled 10b = Error Indicator 11b = Not Available
1764	Engine Hydraulic Pressure Governor Switch	Switch that sets the mode of hydraulic governor 00b = Pressure Mode Inactive 01b = Pressure Mode Active 10b = Error Indicator 11b = Not Available

1765	Engine Fuel Valve 1 Commanded Position	The commanded position of the first fuel valve that is metering the fuel flow to the engine.
1766	Engine Fuel Valve 2 Commanded Position	The commanded position of the second fuel valve that is metering the fuel flow to the engine.
1767	Specific Heat Ratio	The specific heat ratio of the fuel.
1768	Engine Low Limit Threshold for Maximum RPM from Engine	Minimum allowable value for maximum continuous RPM from engine
1769	Engine High Limit Threshold for Minimum Continuous Engine RPM	Maximum allowable value for minimum continuous RPM from engine
1770	Engine Low Limit Threshold for Maximum Torque from Engine	Minimum allowable value for maximum continuous torque from engine
1771	Engine High Limit Threshold for Minimum Continuous Torque from Engine	Maximum allowable value for minimum continuous torque from engine
1772	Engine Maximum Continuous RPM	Applied limit for maximum continuous engine RPM
1773	Engine Minimum Continuous RPM	Applied limit for minimum continuous engine RPM
1774	Engine Maximum Continuous Torque	Applied limit for maximum continuous engine torque.
1775	Engine Minimum Continuous Torque	Applied limit for minimum continuous engine torque

1776	Low Limit Threshold for Maximum RPM from Retarder	Minimum allowable value for maximum continuous retarder speed
1777	High Limit Threshold for Minimum Continuous RPM from Retarder	Maximum allowable value for minimum continuous retarder speed
1778	Low Limit Threshold for Maximum Torque from Retarder	Minimum allowable value for maximum continuous retarder torque.
1779	High Limit Threshold for Minimum Continuous Torque from Retarder	Maximum allowable value for minimum continuous retarder torque.
1780	Maximum Continuous Retarder Speed	Applied limit for maximum continuous retarder RPM
1781	Minimum Continuous Retarder Speed	Applied limit for minimum continuous retarder RPM
1782	Maximum Continuous Retarder Torque	Applied limit for maximum continuous retarder torque.
1783	Minimum Continuous Retarder Torque	Applied limit for minimum continuous retarder torque
1784	Engine Speed Limit Request – Minimum Continuous	Requested minimum continuous engine speed
1785	Engine Speed Limit Request – Maximum Continuous	Requested maximum continuous engine speed
1786	Engine Torque Limit Request – Minimum Continuous	Requested minimum continuous engine torque (operating range: 0 to 125%)

1787	Engine Torque Limit Request – Maximum Continuous	Requested maximum continuous engine torque (operating range: 0 to 125%)
1788	Minimum Continuous Retarder Speed Limit Request	Requested minimum continuous retarder speed
1789	Maximum Continuous Retarder Speed Limit Request	Requested maximum continuous retarder speed
1790	Minimum Continuous Retarder Torque Limit Request	Requested minimum continuous retarder torque (operating range: -125 to 0%)
1791	Maximum Continuous Retarder Torque Limit Request	Requested maximum continuous retarder torque (operating range: -125 to 0%)
1792	Tractor-Mounted Trailer ABS Warning Signal	This parameter commands the tractor-mounted trailer ABS optical warning signal. 00b = Off 01b = On 10b = Reserved 11b = Take no action
1793	ATC/ASR Information Signal	This parameter commands the ATC/ASR driver information signal, for example a dash lamp. 00b = Off 01b = On 10b = Reserved 11b = Take no action
1794	Engine Moment of Inertia	Moment of inertia for the engine, including items driven full-time by the engine such as fuel, oil and cooling pumps. The inertia from the following items are not included: flywheel, alternator, compressor, fan, and other engine-driven accessories.
1795	Alternator Current (High Range/Resolution)	This parameter indicates the amount of electrical current output from the alternator of the main vehicle. Alternator Current (SPN 115) has a lower range and resolution.
1796	ACC Distance Alert Signal	Signal to indicate to the operator that the ACC system is not able to maintain the distance to the target. Example: Target stopping rapidly. This signal may be used to activate warning sounds or indicators.00b = ACC DAS Not Active 01b = ACC DAS Active 10b = Reserved 11b = Take no action

1797	ACC System Shutoff Warning	Signal to warn the driver of system deactivation due to non-driver actions. Example: Attempting to control vehicle speed below or above limits of ACC. This signal may be used to activate warning sounds or indicators.00b = ACC SSOW Not Active 01b = ACC SSOW Active 10b = Reserved 11b = Take no action
1798	ACC Target Detected	Signal to indicate to the driver that the ACC system has detected a target. 00b = No targets detected 01b = Target detected 10b = Reserved 11b = Take no action
1799	Requested ACC Distance Mode	The Requested Distance Control Mode to the ACC system from the operators interface. The ACC Set Distance Mode (SPN 1589) indicates the selected Distance Control Mode for the ACC system. This parameter is the driver requested setting for this. 000b = Requested ACC Distance Mode #1 (largest distance) 001b = Requested ACC Distance Mode #2 010b = Requested ACC Distance Mode #3 011b = Requested ACC Distance Mode #4 100b = Requested ACC Distance Mode #5 (shortest distance) 101b = not defined 110b = error condition 111b = not available
1800	SLI Battery 1 Temperature	Temperature of the battery 1 used for starting the engine, for lighting, and for ignition (SLI). The relation to physical location is determined by the equipment manufacturer.
1801	SLI Battery 2 Temperature	Temperature of the second battery or second set of batteries used for starting the engine, for lighting, and for ignition (SLI).The relation to physical location is determined by the equipment manufacturer.
1802	Engine Intake Manifold 5 Temperature	Temperature of pre-combustion air found in intake manifold number 5 of engine air supply system.
1803	Engine Intake Manifold 6 Temperature	Temperature of pre-combustion air found in intake manifold number 6 of engine air supply system.
1804	Engine Start Enable Device 2	Devices that assist an engine in starting, e.g. intake heaters, ether, or an alternate/secondary starting aid. May be of the same type or different than Start Enable Device 1 (SPN 626). Parameter indicating whether the start enable device 2 is

		ON or OFF.00b = start enable OFF 01b = start enable ON 10b = reserved 11b = not available
1805	LED Display Mode Control	This parameter informs the system what the selected Display mode will be. 0000b = Center On-Grade Display Mode 1 (5 CHANNEL) 0001b = Offset On-Grade Display Mode 0010b = Center On-Grade Display Mode 2 (7 CHANNEL) 0011b to 1110b = Reserved 1111b = Not Available or Not Applicable
1806	LED Display Deadband Control	This parameter informs the system what the selected Display deadband will be. 0000b = +/- 4.5 mm (0.015 feet, 0.18 inches) 0001b = +/- 12 mm (0.040 feet, 0.45 inches) 0010b = +/- 24 mm (0.080 feet, 0.96 inches) 0011b = +/- 5 mm (0.017 feet, 0.2 inches) 0100b = +/- 1 mm (0.003 feet, 0.04 inches) 0101b to 1110b = Reserved 1111b = Not Available or Not applicable
1807	Steering Wheel Angle	The main operator`s steering wheel angle (on the steering column, not the actual wheel angle). The vehicle being steered to the left (counterclockwise) results in a positive steering wheel angle. This is the yaw angle of the steering wheel with the z-axis along the centerline of the steering column. This parameter is defined according to a Z-Up axis system and the sign of the value is in accordance to the right-hand rule, as specified in SAE J670. As specified in SAE J670, a Z-Up Axis System has positive X directed forward, positive Y to the left, and positive Z directed up.
1808	Yaw Rate	Indicates the rate of rotation about the vertical axis (i.e. the z-axis). A positive yaw rate signal results when the vehicle turns counter-clockwise. This parameter is defined according to a Z-Up axis system and the sign of the value is in accordance to the right-hand rule, as specified in SAE J670. As specified in SAE J670, a Z-Up Axis System has positive X directed forward, positive Y to the left, and positive Z directed up. See SPN 4985 for an alternate range and resolution using a Z-Down Axis System.
1809	Lateral Acceleration	Indicates a lateral acceleration of the vehicle (the component of vehicle acceleration vector along the Y-axis). A positive lateral acceleration signal results when the vehicle is accelerated to the left. This parameter is defined according to a Z-Up axis system and the sign of the value is in accordance to the right-hand rule, as specified in

		SAE J670. As specified in SAE J670, a Z-Up Axis System has positive X directed forward, positive Y to the left, and positive Z directed up. See SPN 5347 for an alternate range and resolution.
1810	Longitudinal Acceleration	Indicates the longitudinal acceleration of the vehicle. A positive longitudinal acceleration signal results when the vehicle speed increases, regardless of driving the vehicle forward or backward. This parameter is applicable to vehicle speed measurement systems, such as passive wheel speed sensors, that are not capable of determining the direction of the vehicle motion. See SPN 5348 for an alternate longitudinal acceleration.
1811	Steering Wheel Turn Counter	Indicates number of steering wheel turns, absolute position or relative position at ignition on. Positive values indicate left turns.
1812	Steering Wheel Angle Sensor Type	Indicates whether the steering wheel angle sensor is capable of absolute measuring of the number of steering wheel turns or not (relative measuring to position at ignition on).00b = Relative measuring principle 01b = Absolute measuring principle 10b = Reserved 11b = Not Available
1813	VDC Information Signal	This parameter commands the VDC information signal, for example a dash lamp. 00b = Off 01b = On 10b = Reserved 11b = Don’t care/Take no action
1814	VDC Fully Operational	Signal that indicates whether VDC is fully operational or whether its functionality is reduced by a permanent or temporary (e.g. low voltage) defect, by intended action (e.g. disabled by a switch or during special diagnostic procedures), not configured or not yet fully initialized (e.g. missing initialization or configuration message). VDC contains ROP and YC.00b = Not fully operational 01b = Fully operational 10b = Reserved 11b = Don’t care/Take no action
1815	VDC brake light request	Indicates whether VDC requests to turn the vehicle brake lights on 00b = Turn brake light not on 01b = Turn brake light on 10b = Reserved 11b = Don’t care/Take no action

1816	ROP Engine Control active	State Signal which indicates that the Roll Over Prevention (ROP) has commanded engine control to be active. Within the physical limits, ROP attempts to prevent rolling over of the vehicle. Active means that ROP actually tries to control the engine. This state signal is independent of other control commands to the engine which may have higher priority.00b = ROP engine control passive but installed 01b = ROP engine control active 10b = Reserved 11b = Don’t care/Take no action
1817	YC Engine Control active	State Signal which indicates that the Yaw Control (YC) has commanded engine control to be active. Within the physical limits, YC attempts to prevent yawing of the vehicle. Active means that YC actually tries to control the engine. This state signal is independent of other control commands to the engine which may have higher priority.00b = YC engine control passive but installed 01b = YC engine control active 10b = Reserved 11b = Don’t care/Take no action
1818	ROP Brake Control active	State signal which indicates that Roll over Prevention (ROP) has activated brake control. Active means that ROP actually controls wheel brake pressure at one or more wheels of the vehicle or vehicle combination. Within the physical limits, ROP attempts to prevent rolling over of the vehicle.00b = ROP brake control passive but installed 01b = ROP brake control active 10b = Reserved 11b = Don’t care/Take no action
1819	YC Brake Control active	State signal which indicates that Yaw Control (YC) has activated brake control. Active means that YC actually controls wheel brake pressure at one or more wheels of the vehicle or vehicle combination. Within the physical limits, YC attempts to prevent yawing of the vehicle.00b = YC brake control passive but installed 01b = YC brake control active 10b = Reserved 11b = Don’t care/Take no action
1820	Ramp / Wheel Chair Lift Position	Signal which indicates the actual position of the ramp / wheel chair lift. 00b = Inside bus 01b = Outside bus 10b = Error 11b = Not available
1821	Position of doors	Signal which indicates the actual position of the doors. 0000b = At least 1 door is open 0001b = Closing last door 0010b = All doors closed 0011b to 1101b = Not defined 1110b = Error 1111b = Not available

1822	Lift Axle 2 Position	Signal which indicates the position / load condition of lift axle / tag axle #2. Numbering of lift/tag axles starts at front axle. See SPN 6844 for more detail.00b = Lift axle position down / tag axle laden 01b = Lift axle position up / tag axle unladen 10b = Error 11b = Not available
1823	Rear Axle in Bumper Range	Signal which indicates that the vehicle height at the rear axle (SPNs 1723 and 1724) is within the bumper range.00b = Actual level out of bumper range 01b = Actual level within bumper range 10b = Error 11b = Not available
1824	Front Axle in Bumper Range	Signal which indicates that the vehicle height at the front axle (SPNs 1721 and 1722) is within the bumper range.00b = Actual level out of bumper range 01b = Actual level within bumper range 10b = Error 11b = Not available
1825	Suspension Remote control 2	Signal which indicates that the suspension system is controlled by remote control #2. Remote control is an external unit to operate the suspension system.00b = Not active 01b = Active 10b = Error 11b = Not available
1826	Suspension Remote Control 1	Signal which indicates that the suspension system is controlled by remote control #1. Remote control is an external unit to operate the suspension system.00b = Not active 01b = Active 10b = Error 11b = Not available
1827	Suspension Control Refusal Information	Signal which indicates that the air suspension control cannot perform a request due to the operating conditions. It also provides a reason for the refusal.0000b = Actual request not refused 0001b = Axle load limit reached (load transfer) 0010b = Would exceed axle load limit (tag axle) 0011b = Bogie differential not locked 0100b = Above speed limit 0101b = Below speed limit 0110b = General reject; I.e. no specified reason applies 0111b = Requested level not available 1000b to 1101b = Not defined 1110b = Error 1111b = Not available
1828	Lift Axle 2 Position Command	Signal to command the position / load condition of lift / tag axle #2. Numbering of lift/tag axles starts at front axle.00b = Lift axle position down / tag axle laden 01b = Lift axle position up / tag axle unladen 10b = Reserved 11b = Don’t care/take no action

1829	Kneeling Command – Rear Axle	Command signal to activate the kneeling functionality at the rear axle of the vehicle. 00b = Deactivate kneeling 01b = Activate kneeling 10b = Reserved 11b = Don't care/take no action
1830	Kneeling Command – Front Axle	Command signal to activate the kneeling functionality at the front axle of the vehicle 00b = Deactivate kneeling 01b = Activate kneeling 10b = Reserved 11b = Don't care/take no action
1831	Electronic Shock Absorber Control Mode – Lift/Tag Axle	Signal which indicates the current mode of operation of the electronic shock absorber control at the lift/tag axle.00b = Normal operation dampers passive 01b = Normal operation dampers active 10b = Error 11b = Not available
1832	Electronic Shock Absorber Control Mode – Rear Axle	Signal which indicates the current mode of operation of the electronic shock absorber control at the rear axle.00b = Normal operation dampers passive 01b = Normal operation dampers active 10b = Error 11b = Not available
1833	Electronic Shock Absorber Control Mode – Front Axle	Signal which indicates the current mode of operation of the electronic shock absorber control at the front axle.00b = Normal operation dampers passive 01b = Normal operation dampers active 10b = Error 11b = Not available
1834	Engine Total Average Fuel Rate	Average fuel rate, equal to total fuel used divided by total engine hours, over the life of the engine
1835	Engine Total Average Fuel Economy	Average fuel economy, equal to total vehicle distance divided by total fuel used, over the life of the engine
1836	Trailer ABS Status	State signal which indicates that ABS in the trailer is actively controlling the brakes. A message is sent to the tractor from the trailer (i.e. by PLC). The receiving device in the tractor transfers this information to the J1939 network. At the beginning of power on the message is sent by the trailer to indicate if this status information is supported. Timeout of the trailer ABS active can be done by monitoring of the Trailer warning light information.00b = Trailer ABS Status Information Available But Not Active

		01b = Trailer ABS Active 10b = Reserved 11b = Trailer ABS Status Information Not Available or Parameter Not Supported
1837	Convoy Driving Lamp Select	Black Out Convoy Driving Lamp Selection 00b = Off 01b = On 10b = Reserved 11b = Not Supported
1838	Convoy Lamp Select	Black Out Convoy Lamp Selection 00b = Off 01b = On 10b = Reserved 11b = Not Supported
1839	Front Black Out Marker Lamp Select	Front Black Out Marker Lamp Selection 00b = Off 01b = On 10b = Reserved 11b = Not Supported
1840	Rear Black Out Marker Select	Rear Black Out Marker Selection 00b = Off 01b = On 10b = Reserved 11b = Not Supported
1841	Black Out Brake/Stop Lamp Select	Black Out Brake/Stop Lamp Selection 00b = Off 01b = On 10b = Reserved 11b = Not Supported
1842	Black Out Work Lamp Select	Black Out Work Lamp Selection 00b = Off 01b = On 10b = Reserved 11b = Not Supported
1843	Night Vision Illuminator Select	Night Vision Illuminator Selection 00b = Off 01b = On 10b = Reserved 11b = Not Supported
1844	Operators Black Out Intensity Selection	Operators Selection of lamp intensity in black out mode. This parameter provides the operators selected illumination intensity as a percentage of available full scale. This parameter would be typically used as a dash or instrument cluster intensity adjustment.
1845	Transmission Torque Limit	Parameter provided to the engine from the transmission as a torque limit to be invoked by the engine in the event that J1939 communication with the transmission is lost.The intention is to protect transmissions that use a continuous torque limit during torque converter mode or operation in specific lower gears, where stall or drivetrain

		torque may reach levels higher than the gearbox capacity. If communication is lost during torque limited operation, unrestricted engine torque output could harm the transmission. It is recommended that engines use reception of the ETC#1 message as a transmission « heartbeat ». In the event that the ETC#1 message is not received in a time period of 5 times its' broadcast rate (5 x 10 ms = 50 ms), the engine should invoke a torque limit holding the engine to less than or equal to the value of the Transmission Torque Limit parameter. The engine may release the limit when transmission-to-engine communication is re-established. A value of FF00h to FFFFh indicates that no transmission torque limit is desired. It is expected that the engine will record this torque value in non-volatile memory and will include this in the engine configuration PGN as parameter Engine Default Torque Limit (SPN 1846) If the engine observes change in this parameter value on power-up, the engine should record the new value. SPN 7827 provides an idle torque limit for the transmission in case of communications failure.
1846	Engine Default Torque Limit	Companion parameter to Transmission Torque Limit (SPN 1845). This « echo » parameter provides confirmation to the transmission that the engine has received and will invoke the requested Transmission Torque Limit in the event that J1939 communication is lost between the two devices.If the engine supports this protection logic, the Engine Default Torque Limit parameter should be set equal to the Transmission Torque Limit parameter as received in the Transmission Configuration 2 message (PGN 65099). Otherwise, an Engine Default Torque Limit value of FF00h to FFFFh indicates that no engine default torque limit has been received or set. The intention is to protect transmissions that use a continuous torque limit during torque converter mode or operation in specific lower gears, where stall or drivetrain torque may reach levels higher than the gearbox capacity. If communication is lost during torque limited operation, unrestricted engine torque output could harm the transmission. It is recommended that engines use reception of the ETC#1 message as a transmission « heartbeat ». In the event that the ETC#1 message is not received in a time period of 5 times its' broadcast rate (5 x 10 ms = 50 ms), the engine should invoke a torque limit holding the engine to less than or equal to the value of the Transmission Torque Limit parameter. The engine may release the limit when engine-to-transmission communication is re-established.

1847	Hill Holder Lamp Command	Command signal directly controlling Hill Holder Lamp. 00b = Lamp Off 01b = Lamp On 10b = Lamp Flash (1 Hz) 11b = Not available
1848	Hill Holder Lamp Data	This message will be transmitted by the controller that is illuminating the lamps. 00b = Lamp deactivated (Off) 01b = Lamp activated (On) 10b = Error 11b = Not Available
1849	Transmission Requested Range Display Flash State	State signal indicating a transmission request for the display of the Transmission Requested Range parameter (SPN 162) to flash or not to flash. The 'Transmission Requested Range Display Flash State' indicator can be utilized by (but not limited to) the shift console, instrument cluster, or cab display. Definition of the cause of this state is at the discretion of the transmission manufacturer. The flash period shall be 700 ms @ 50% duty cycle.Transmission manufacturers may want to flash the Transmission Requested Range display depending on certain events. It could be because a gear could not be attained, or because fluid is low, etc. Indicator should be on for 350 ms and off for 350 ms. Transmissions supporting both this parameter and the Transmission Requested Range Display Blank State should treat the active states of these parameters as mutually exclusive; both parameters should not indicate « active » at the same time. 00b = Inactive; Transmission Requested Range display should not be flashing 01b = Active; Transmission Requested Range display should be flashing 10b = Reserved 11b = Take no action
1850	Transmission Requested Range Display Blank State	State signal indicating a transmission request for the display of the Transmission Requested Range parameter (SPN162) to be blanked or not blanked. The 'Transmission Requested Range Display Blank State' indicator can be utilized by (but not limited to) the shift console, instrument cluster, or cab display. Definition of the cause of this state is at the discretion of the transmission manufacturerTransmission manufacturers may want to blank the Transmission Requested Range display depending on certain events. Typically it is an indication of a shift selector problem. Transmissions supporting both this parameter and the Transmission Requested Range Display Flash State should treat the active states of these parameters as mutually exclusive; both parameters should not indicate « active » at the same time. 00b = Inactive; Transmission Requested Range display

		should not be blanked 01b = Active; Transmission Requested Range display should be blanked 10b = Reserved 11b = Take no action
1851	Transmission Shift Inhibit Indicator	State signal indicating a transmission request for the Shift Inhibit Indicator to be active or inactive. The shift inhibit indicator can be of lamp or text form, located on (but not limited to) the shift console, instrument cluster, or cab display. Definition of the cause of the ‘range inhibit’ state is at the discretion of the transmission manufacturer.Transmission manufacturers may want to indicate that they currently cannot make a requested shift. This could be due to inappropriate vehicle speed or other restrictions. Distinctions in meaning between the continuous and flashing are left to the transmission manufacturer. 00b = Inactive; shift is not inhibited 01b = Active (on continuously); shift is inhibited 10b = Active (flashing) 11b = Take no action
1852	Transmission Mode 1	Indicates whether transmission mode 1 is enabled. Modes are manufacturer specific and are not necessarily mutually exclusive. See also SPN 2536.00b = Disable 01b = Enable 10b = Reserved 11b = Take no action
1853	Transmission Mode 2	Indicates whether transmission mode 2 is enabled. Modes are manufacturer specific and are not necessarily mutually exclusive. See also SPN 2537.00b = Disable 01b = Enable 10b = Reserved 11b = Take no action
1854	Transmission Mode 3	Indicates whether transmission mode 3 is enabled. Modes are manufacturer specific and are not necessarily mutually exclusive. See also SPN 2538.00b = Disable 01b = Enable 10b = Reserved 11b = Take no action
1855	Transmission Mode 4	Indicates whether transmission mode 4 is enabled. Modes are manufacturer specific and are not necessarily mutually exclusive. See also SPN 2539.00b = Disable 01b = Enable 10b = Reserved 11b = Take no action
1856	Seat Belt Switch	State of switch used to determine if Seat Belt is buckled 00b = NOT Buckled 01b = OK – Seat Belt is buckled 10b = Error – Switch state cannot be determined 11b = Not Available

1857	Winch Oil Pressure Switch	State of switch used to determine if Winch Oil Pressure is above desired minimum 00b = NOT OK- Oil pressure is too low 01b = OK – Oil pressure is above minimum 10b = Error – Switch state cannot be determined 11b = Not Available
1858	Intermittent Wiper Control	Output driver for an intermittent windshield wiper motor
1859	Ground Based Implement Speed	See document ISO 11783-7 for SPN details.
1860	Ground Based Implement Distance	See document ISO 11783-7 for SPN details.
1861	Ground Based Direction	See document ISO 11783-7 for SPN details.
1862	Wheel Based Speed	See document ISO 11783-7 for SPN details.
1863	Wheel Based Distance	See document ISO 11783-7 for SPN details.
1864	Wheel Based Direction	See document ISO 11783-7 for SPN details.
1865	Key Switch NOT OFF	See document ISO 11783-7 for SPN details.
1866	Maximum Time of Tractor Power	See document ISO 11783-7 for SPN details.
1867	Maintain ECU Power	See document ISO 11783-7 for SPN details.
1868	Maintain Acuator Power	See document ISO 11783-7 for SPN details.
1869	Implement Transport State	See document ISO 11783-7 for SPN details.
1870	Implement Park State	See document ISO 11783-7 for SPN details.
1871	Implement Ready-to-Work State	See document ISO 11783-7 for SPN details.

1872	Front Hitch Position	See document ISO 11783-7 for SPN details.
1873	Rear Hitch Position	See document ISO 11783-7 for SPN details.
1874	Front Hitch Position Command	See document ISO 11783-7 for SPN details.
1875	Rear Hitch Position Command	See document ISO 11783-7 for SPN details.
1876	Front Hitch In-work Indication	See document ISO 11783-7 for SPN details.
1877	Rear Hitch In-work Indication	See document ISO 11783-7 for SPN details.
1878	Front Draft	See document ISO 11783-7 for SPN details.
1879	Rear Draft	See document ISO 11783-7 for SPN details.
1880	Front Nominal Lower Link Force	See document ISO 11783-7 for SPN details.
1881	Rear Nominal Lower Link Force	See document ISO 11783-7 for SPN details.
1882	Front PTO output shaft speed	See document ISO 11783-7 for SPN details.
1883	Rear PTO output shaft speed	See document ISO 11783-7 for SPN details.
1884	Front PTO Output Shaft Speed Set Point	See document ISO 11783-7 for SPN details.
1885	Rear PTO Output Shaft Speed Set Point	See document ISO 11783-7 for SPN details.
1886	Front PTO Output Shaft Speed Set Point Command	See document ISO 11783-7 for SPN details.

1887	Rear PTO Output Shaft Speed Set Point Command	See document ISO 11783-7 for SPN details.
1888	Front Power Take Off Engagement	See document ISO 11783-7 for SPN details.
1889	Front Power Take Off Mode	See document ISO 11783-7 for SPN details.
1890	Rear Power Take Off Mode	See document ISO 11783-7 for SPN details.
1891	Front Power Take Off Economy Mode	See document ISO 11783-7 for SPN details.
1892	Rear Power Take Off Economy Mode	See document ISO 11783-7 for SPN details.
1893	Front Power Take Off Engagement Command	See document ISO 11783-7 for SPN details.
1894	Rear Power Take Off Engagement Command	See document ISO 11783-7 for SPN details.
1895	Front Power Take Off Mode Command	See document ISO 11783-7 for SPN details.
1896	Rear Power Take Off Mode Command	See document ISO 11783-7 for SPN details.
1897	Front Power Take Off Economy Mode Command	See document ISO 11783-7 for SPN details.
1898	Rear Power Take Off Economy Mode Command	See document ISO 11783-7 for SPN details.

1899	Aux Valve 0 Extend Port Measured Flow	See document ISO 11783-7 for SPN details.
1900	Aux Valve 0 Retract Port Measured Flow	See document ISO 11783-7 for SPN details.
1901	Aux Valve 0 Extend Port Estimated Flow	See document ISO 11783-7 for SPN details.
1902	Aux Valve 0 Retract Port Estimated Flow	See document ISO 11783-7 for SPN details.
1903	Aux Valve 0 State	See document ISO 11783-7 for SPN details.
1904	Aux Valve 0 Extend Port Pressure	See document ISO 11783-7 for SPN details.
1905	Aux Valve 0 Retract Port Pressure	See document ISO 11783-7 for SPN details.
1906	Aux Valve 0 Return Port Pressure	See document ISO 11783-7 for SPN details.
1907	Aux Valve 0 Port Flow Command	See document ISO 11783-7 for SPN details.
1908	Aux Valve 0 State Command	See document ISO 11783-7 for SPN details.
1909	Aux Valve 0 Fail Safe Mode Command	See document ISO 11783-7 for SPN details.
1910	Aux Valve 0 Fail Safe Mode	See document ISO 11783-7 for SPN details.
1911	Aux Valve 1 Extend Port Measured Flow	See document ISO 11783-7 for SPN details.

1912	Aux Valve 1 Retract Port Measured Flow	See document ISO 11783-7 for SPN details.
1913	Aux Valve 1 Extend Port Estimated Flow	See document ISO 11783-7 for SPN details.
1914	Aux Valve 1 Retract Port Estimated Flow	See document ISO 11783-7 for SPN details.
1915	Aux Valve 1 State	See document ISO 11783-7 for SPN details.
1916	Aux Valve 1 Extend Port Pressure	See document ISO 11783-7 for SPN details.
1917	Aux Valve 1 Retract Port Pressure	See document ISO 11783-7 for SPN details.
1918	Aux Valve 1 Return Port Pressure	See document ISO 11783-7 for SPN details.
1919	Aux Valve 1 Port Flow Command	See document ISO 11783-7 for SPN details.
1920	Aux Valve 1 State Command	See document ISO 11783-7 for SPN details.
1921	Aux Valve 1 Fail Safe Mode Command	See document ISO 11783-7 for SPN details.
1922	Aux Valve 1 Fail Safe Mode	See document ISO 11783-7 for SPN details.
1923	Aux Valve 2 Extend Port Measured Flow	See document ISO 11783-7 for SPN details.
1924	Aux Valve 2 Retract Port Measured Flow	See document ISO 11783-7 for SPN details.

1925	Aux Valve 2 Extend Port Estimated Flow	See document ISO 11783-7 for SPN details.
1926	Aux Valve 2 Retract Port Estimated Flow	See document ISO 11783-7 for SPN details.
1927	Aux Valve 2 State	See document ISO 11783-7 for SPN details.
1928	Aux Valve 2 Extend Port Pressure	See document ISO 11783-7 for SPN details.
1929	Aux Valve 2 Retract Port Pressure	See document ISO 11783-7 for SPN details.
1930	Aux Valve 2 Return Port Pressure	See document ISO 11783-7 for SPN details.
1931	Aux Valve 2 Port Flow Command	See document ISO 11783-7 for SPN details.
1932	Aux Valve 2 State Command	See document ISO 11783-7 for SPN details.
1933	Aux Valve 2 Fail Safe Mode Command	See document ISO 11783-7 for SPN details.
1934	Aux Valve 2 Fail Safe Mode	See document ISO 11783-7 for SPN details.
1935	Aux Valve 3 Extend Port Measured Flow	See document ISO 11783-7 for SPN details.
1936	Aux Valve 3 Retract Port Measured Flow	See document ISO 11783-7 for SPN details.
1937	Aux Valve 3 Extend Port Estimated Flow	See document ISO 11783-7 for SPN details.

1938	Aux Valve 3 Retract Port Estimated Flow	See document ISO 11783-7 for SPN details.
1939	Aux Valve 3 State	See document ISO 11783-7 for SPN details.
1940	Aux Valve 3 Extend Port Pressure	See document ISO 11783-7 for SPN details.
1941	Aux Valve 3 Retract Port Pressure	See document ISO 11783-7 for SPN details.
1942	Aux Valve 3 Return Port Pressure	See document ISO 11783-7 for SPN details.
1943	Aux Valve 3 Port Flow Command	See document ISO 11783-7 for SPN details.
1944	Aux Valve 3 State Command	See document ISO 11783-7 for SPN details.
1945	Aux Valve 3 Fail Safe Mode Command	See document ISO 11783-7 for SPN details.
1946	Aux Valve 3 Fail Safe Mode	See document ISO 11783-7 for SPN details.
1947	Aux Valve 4 Extend Port Measured Flow	See document ISO 11783-7 for SPN details.
1948	Aux Valve 4 Retract Port Measured Flow	See document ISO 11783-7 for SPN details.
1949	Aux Valve 4 Extend Port Estimated Flow	See document ISO 11783-7 for SPN details.
1950	Aux Valve 4 Retract Port Estimated Flow	See document ISO 11783-7 for SPN details.

1951	Aux Valve 4 State	See document ISO 11783-7 for SPN details.
1952	Aux Valve 4 Extend Port Pressure	See document ISO 11783-7 for SPN details.
1953	Aux Valve 4 Retract Port Pressure	See document ISO 11783-7 for SPN details.
1954	Aux Valve 4 Return Port Pressure	See document ISO 11783-7 for SPN details.
1955	Aux Valve 4 Port Flow Command	See document ISO 11783-7 for SPN details.
1956	Aux Valve 4 State Command	See document ISO 11783-7 for SPN details.
1957	Aux Valve 4 Fail Safe Mode Command	See document ISO 11783-7 for SPN details.
1958	Aux Valve 4 Fail Safe Mode	See document ISO 11783-7 for SPN details.
1959	Aux Valve 5 Extend Port Measured Flow	See document ISO 11783-7 for SPN details.
1960	Aux Valve 5 Retract Port Measured Flow	See document ISO 11783-7 for SPN details.
1961	Aux Valve 5 Extend Port Estimated Flow	See document ISO 11783-7 for SPN details.
1962	Aux Valve 5 Retract Port Estimated Flow	See document ISO 11783-7 for SPN details.
1963	Aux Valve 5 State	See document ISO 11783-7 for SPN details.
1964	Aux Valve 5 Extend Port Pressure	See document ISO 11783-7 for SPN details.

1965	Aux Valve 5 Retract Port Pressure	See document ISO 11783-7 for SPN details.
1966	Aux Valve 5 Return Port Pressure	See document ISO 11783-7 for SPN details.
1967	Aux Valve 5 Port Flow Command	See document ISO 11783-7 for SPN details.
1968	Aux Valve 5 State Command	See document ISO 11783-7 for SPN details.
1969	Aux Valve 5 Fail Safe Mode Command	See document ISO 11783-7 for SPN details.
1970	Aux Valve 5 Fail Safe Mode	See document ISO 11783-7 for SPN details.
1971	Aux Valve 6 Extend Port Measured Flow	See document ISO 11783-7 for SPN details.
1972	Aux Valve 6 Retract Port Measured Flow	See document ISO 11783-7 for SPN details.
1973	Aux Valve 6 Extend Port Estimated Flow	See document ISO 11783-7 for SPN details.
1974	Aux Valve 6 Retract Port Estimated Flow	See document ISO 11783-7 for SPN details.
1975	Aux Valve 6 State	See document ISO 11783-7 for SPN details.
1976	Aux Valve 6 Extend Port Pressure	See document ISO 11783-7 for SPN details.
1977	Aux Valve 6 Retract Port Pressure	See document ISO 11783-7 for SPN details.
1978	Aux Valve 6 Return Port Pressure	See document ISO 11783-7 for SPN details.

1979	Aux Valve 6 Port Flow Command	See document ISO 11783-7 for SPN details.
1980	Aux Valve 6 State Command	See document ISO 11783-7 for SPN details.
1981	Aux Valve 6 Fail Safe Mode Command	See document ISO 11783-7 for SPN details.
1982	Aux Valve 6 Fail Safe Mode	See document ISO 11783-7 for SPN details.
1983	Aux Valve 7 Extend Port Measured Flow	See document ISO 11783-7 for SPN details.
1984	Aux Valve 7 Retract Port Measured Flow	See document ISO 11783-7 for SPN details.
1985	Aux Valve 7 Extend Port Estimated Flow	See document ISO 11783-7 for SPN details.
1986	Aux Valve 7 Retract Port Estimated Flow	See document ISO 11783-7 for SPN details.
1987	Aux Valve 7 State	See document ISO 11783-7 for SPN details.
1988	Aux Valve 7 Extend Port Pressure	See document ISO 11783-7 for SPN details.
1989	Aux Valve 7 Retract Port Pressure	See document ISO 11783-7 for SPN details.
1990	Aux Valve 7 Return Port Pressure	See document ISO 11783-7 for SPN details.
1991	Aux Valve 7 Port Flow Command	See document ISO 11783-7 for SPN details.
1992	Aux Valve 7 State command	See document ISO 11783-7 for SPN details.

1993	Aux Valve 7 Fail Safe Mode Command	See document ISO 11783-7 for SPN details.
1994	Aux Valve 7 Fail Safe Mode	See document ISO 11783-7 for SPN details.
1995	Aux Valve 8 Extend Port Measured Flow	See document ISO 11783-7 for SPN details.
1996	Aux Valve 8 Retract Port Measured Flow	See document ISO 11783-7 for SPN details.
1997	Aux Valve 8 Extend Port Estimated Flow	See document ISO 11783-7 for SPN details.
1998	Aux Valve 8 Retract Port Estimated Flow	See document ISO 11783-7 for SPN details.
1999	Aux Valve 8 State	See document ISO 11783-7 for SPN details.
2000	Source Address 0	See document J1939-21 for SPN details.
2001	Source Address 1	See document J1939-21 for SPN details.
2002	Source Address 2	See document J1939-21 for SPN details.
2003	Source Address 3	See document J1939-21 for SPN details.
2004	Source Address 4	See document J1939-21 for SPN details.
2005	Source Address 5	See document J1939-21 for SPN details.
2006	Source Address 6	See document J1939-21 for SPN details.

2007	Source Address 7	See document J1939-21 for SPN details.
2008	Source Address 8	See document J1939-21 for SPN details.
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2249	Source Address 249	See document J1939-21 for SPN details.
2250	Source Address 250	See document J1939-21 for SPN details.
2251	Source Address 251	See document J1939-21 for SPN details.
2252	Source Address 252	See document J1939-21 for SPN details.
2253	Source Address 253	See document J1939-21 for SPN details.
2254	Source Address 254	See document J1939-21 for SPN details.
2255	Source Address 255	See document J1939-21 for SPN details.
2256	Aux Valve 8 Extend Port Pressure	See document ISO 11783-7 for SPN details.
2257	Aux Valve 8 Retract Port Pressure	See document ISO 11783-7 for SPN details.
2258	Aux Valve 8 Return Port Pressure	See document ISO 11783-7 for SPN details.
2259	Aux Valve 8 Port Flow Command	See document ISO 11783-7 for SPN details.
2260	Aux Valve 8 State Command	See document ISO 11783-7 for SPN details.
2261	Aux Valve 8 Fail Safe Mode Command	See document ISO 11783-7 for SPN details.
2262	Aux Valve 8 Fail Safe Mode	See document ISO 11783-7 for SPN details.

2263	Aux Valve 9 Extend Port Measured Flow	See document ISO 11783-7 for SPN details.
2264	Aux Valve 9 Retract Port Measured Flow	See document ISO 11783-7 for SPN details.
2265	Aux Valve 9 Extend Port Estimated Flow	See document ISO 11783-7 for SPN details.
2266	Aux Valve 9 Retract Port Estimated Flow	See document ISO 11783-7 for SPN details.
2267	Aux Valve 9 State	See document ISO 11783-7 for SPN details.
2268	Aux Valve 9 Extend Port Pressure	See document ISO 11783-7 for SPN details.
2269	Aux Valve 9 Retract Port Pressure	See document ISO 11783-7 for SPN details.
2270	Aux Valve 9 Return Port Pressure	See document ISO 11783-7 for SPN details.
2271	Aux Valve 9 Port Flow Command	See document ISO 11783-7 for SPN details.
2272	Aux Valve 9 State Command	See document ISO 11783-7 for SPN details.
2273	Aux Valve 9 Fail Safe Mode Command	See document ISO 11783-7 for SPN details.
2274	Aux Valve 9 Fail Safe Mode	See document ISO 11783-7 for SPN details.
2275	Aux Valve 10 Extend Port Measured Flow	See document ISO 11783-7 for SPN details.

2276	Aux Valve 10 Retract Port Measured Flow	See document ISO 11783-7 for SPN details.
2277	Aux Valve 10 Extend Port Estimated Flow	See document ISO 11783-7 for SPN details.
2278	Aux Valve 10 Retract Port Estimated Flow	See document ISO 11783-7 for SPN details.
2279	Aux Valve 10 State	See document ISO 11783-7 for SPN details.
2280	Aux Valve 10 Extend Port Pressure	See document ISO 11783-7 for SPN details.
2281	Aux Valve 10 Retract Port Pressure	See document ISO 11783-7 for SPN details.
2282	Aux Valve 10 Return Port Pressure	See document ISO 11783-7 for SPN details.
2283	Aux Valve 10 Port Flow Command	See document ISO 11783-7 for SPN details.
2284	Aux Valve 10 State Command	See document ISO 11783-7 for SPN details.
2285	Aux Valve 10 Fail Safe Mode Command	See document ISO 11783-7 for SPN details.
2286	Aux Valve 10 Fail Safe Mode	See document ISO 11783-7 for SPN details.
2287	Aux Valve 11 Extend Port Measured Flow	See document ISO 11783-7 for SPN details.
2288	Aux Valve 11 Retract Port Measured Flow	See document ISO 11783-7 for SPN details.

2289	Aux Valve 11 Extend Port Estimated Flow	See document ISO 11783-7 for SPN details.
2290	Aux Valve 11 Retract Port Estimated Flow	See document ISO 11783-7 for SPN details.
2291	Aux Valve 11 State	See document ISO 11783-7 for SPN details.
2292	Aux Valve 11 Extend Port Pressure	See document ISO 11783-7 for SPN details.
2293	Aux Valve 11 Retract Port Pressure	See document ISO 11783-7 for SPN details.
2294	Aux Valve 11 Return Port Pressure	See document ISO 11783-7 for SPN details.
2295	Aux Valve 11 Port Flow Command	See document ISO 11783-7 for SPN details.
2296	Aux Valve 11 State Command	See document ISO 11783-7 for SPN details.
2297	Aux Valve 11 Fail Safe Mode Command	See document ISO 11783-7 for SPN details.
2298	Aux Valve 11 Fail Safe Mode	See document ISO 11783-7 for SPN details.
2299	Aux Valve 12 Extend Port Measured Flow	See document ISO 11783-7 for SPN details.
2300	Aux Valve 12 Retract Port Measured Flow	See document ISO 11783-7 for SPN details.
2301	Aux Valve 12 Extend Port Estimated Flow	See document ISO 11783-7 for SPN details.

2302	Aux Valve 12 Retract Port Estimated Flow	See document ISO 11783-7 for SPN details.
2303	Aux Valve 12 State	See document ISO 11783-7 for SPN details.
2304	Aux Valve 12 Extend Port Pressure	See document ISO 11783-7 for SPN details.
2305	Aux Valve 12 Retract Port Pressure	See document ISO 11783-7 for SPN details.
2306	Aux Valve 12 Return Port Pressure	See document ISO 11783-7 for SPN details.
2307	Aux Valve 12 Port Flow Command	See document ISO 11783-7 for SPN details.
2308	Aux Valve 12 State Command	See document ISO 11783-7 for SPN details.
2309	Aux Valve 12 Fail Safe Mode Command	See document ISO 11783-7 for SPN details.
2310	Aux Valve 12 Fail Safe Mode	See document ISO 11783-7 for SPN details.
2311	Aux Valve 13 Extend Port Measured Flow	See document ISO 11783-7 for SPN details.
2312	Aux Valve 13 Retract Port Measured Flow	See document ISO 11783-7 for SPN details.
2313	Aux Valve 13 Extend Port Estimated Flow	See document ISO 11783-7 for SPN details.
2314	Aux Valve 13 Retract Port Estimated Flow	See document ISO 11783-7 for SPN details.

2315	Aux Valve 13 State	See document ISO 11783-7 for SPN details.
2316	Aux Valve 13 Extend Port Pressure	See document ISO 11783-7 for SPN details.
2317	Aux Valve 13 Retract Port Pressure	See document ISO 11783-7 for SPN details.
2318	Aux Valve 13 Return Port Pressure	See document ISO 11783-7 for SPN details.
2319	Aux Valve 13 Port Flow Command	See document ISO 11783-7 for SPN details.
2320	Aux Valve 13 State Command	See document ISO 11783-7 for SPN details.
2321	Aux Valve 13 Fail Safe Mode Command	See document ISO 11783-7 for SPN details.
2322	Aux Valve 13 Fail Safe Mode	See document ISO 11783-7 for SPN details.
2323	Aux Valve 14 Extend Port Measured Flow	See document ISO 11783-7 for SPN details.
2324	Aux Valve 14 Retract Port Measured Flow	See document ISO 11783-7 for SPN details.
2325	Aux Valve 14 Extend Port Estimated Flow	See document ISO 11783-7 for SPN details.
2326	Aux Valve 14 Retract Port Estimated Flow	See document ISO 11783-7 for SPN details.
2327	Aux Valve 14 State	See document ISO 11783-7 for SPN details.
2328	Aux Valve 14 Extend Port Pressure	See document ISO 11783-7 for SPN details.

2329	Aux Valve 14 Retract Port Pressure	See document ISO 11783-7 for SPN details.
2330	Aux Valve 14 Return Port Pressure	See document ISO 11783-7 for SPN details.
2331	Aux Valve 14 Port Flow Command	See document ISO 11783-7 for SPN details.
2332	Aux Valve 14 State Command	See document ISO 11783-7 for SPN details.
2333	Aux Valve 14 Fail Safe Mode Command	See document ISO 11783-7 for SPN details.
2334	Aux Valve 14 Fail Safe Mode	See document ISO 11783-7 for SPN details.
2335	Aux Valve 15 Extend Port Measured Flow	See document ISO 11783-7 for SPN details.
2336	Aux Valve 15 Retract Port Measured Flow	See document ISO 11783-7 for SPN details.
2337	Aux Valve 15 Extend Port Estimated Flow	See document ISO 11783-7 for SPN details.
2338	Aux Valve 15 Retract Port Estimated Flow	See document ISO 11783-7 for SPN details.
2339	Aux Valve 15 State	See document ISO 11783-7 for SPN details.
2340	Aux Valve 15 Extend Port Pressure	See document ISO 11783-7 for SPN details.
2341	Aux Valve 15 Retract Port Pressure	See document ISO 11783-7 for SPN details.
2342	Aux Valve 15 Return Port Pressure	See document ISO 11783-7 for SPN details.

2343	Aux Valve 15 Port Flow Command	See document ISO 11783-7 for SPN details.
2344	Aux Valve 15 State Command	See document ISO 11783-7 for SPN details.
2345	Aux Valve 15 Fail Safe Mode Command	See document ISO 11783-7 for SPN details.
2346	Aux Valve 15 Fail Safe Mode	See document ISO 11783-7 for SPN details.
2347	High Beam Head Light Command	Command to activate or de-activate the tractor high beam head light lamps. 00b = De-activate 01b = Activate 10b = Reserved 11b = Don’t Care
2348	High Beam Head Light Data	This parameter provides measured data from the tractor high beam head light lamps. 00b = De-activated 01b = Activated 10b = Fault Detected 11b = Not Available
2349	Low Beam Head Light Command	Command to activate or de-activate the tractor low beam head light lamps. 00b = De-activate 01b = Activate 10b = Reserved 11b = Don’t Care
2350	Low Beam Head Light Data	This parameter provides measured data from the tractor low beam head light lamps. 00b = De-activated 01b = Activated 10b = Fault Detected 11b = Not Available
2351	Alternate Beam Head Light Command	Command to activate or de-activate the tractor alternate head lights (only low beam is available on alternate head lights). The alternate position lights are intended for use with loader and snow plows that tend to block the primary head lights.00b = De-activate 01b = Activate 10b = Reserved 11b = Don’t Care
2352	Alternate Beam Head Light Data	This parameter provides measured data from the tractor alternate beam head light lamps. 00b = De-activated 01b = Activated 10b = Fault Detected 11b = Not Available
2353	Tractor Front Low Mounted Work Lights Command	Command to activate or de-activate the tractor front low mounted work lights. 00b = De-activate 01b = Activate 10b = Reserved 11b = Don’t Care

2354	Tractor Front Low Mounted Work Lights	This parameter provides measured data from the tractor front low mounted work lights. 00b = De-activated 01b = Activated 10b = Fault Detected 11b = Not Available
2355	Tractor Front High Mounted Work Lights Command	Command to activate or de-activate the tractor front high mounted work lights. 00b = De-activate 01b = Activate 10b = Reserved 11b = Don't Care
2356	Tractor Front High Mounted Work Lights	This parameter provides measured data from the tractor front high mounted work lights. 00b = De-activated 01b = Activated 10b = Fault Detected 11b = Not Available
2357	Tractor Underside Mounted Work Lights Command	Command to activate or de-activate the tractor underside mounted work lights. 00b = De-activate 01b = Activate 10b = Reserved 11b = Don't Care
2358	Tractor Underside Mounted Work Lights	This parameter provides measured data from the tractor underside mounted work lights. 00b = De-activated 01b = Activated 10b = Fault Detected 11b = Not Available
2359	Tractor Rear Low Mounted Work Lights Command	Command to activate or de-activate the tractor rear low mounted work lights. 00b = De-activate 01b = Activate 10b = Reserved 11b = Don't Care
2360	Tractor Rear Low Mounted Work Lights	This parameter provides measured data from the tractor rear low mounted work lights. 00b = De-activated 01b = Activated 10b = Fault Detected 11b = Not Available
2361	Tractor Rear High Mounted Work Lights Command	Command to activate or de-activate the tractor rear high mounted work lights. 00b = De-activate 01b = Activate 10b = Reserved 11b = Don't Care
2362	Tractor Rear High Mounted Work Lights	This parameter provides measured data from the tractor rear high mounted work lights. 00b = De-activated 01b = Activated 10b = Fault Detected 11b = Not Available
2363	Tractor Side Low Mounted Work Lights Command	Command to activate or de-activate the tractor side low mounted work lights. 00b = De-activate 01b = Activate 10b = Reserved 11b = Don't Care
2364	Tractor Side Low Mounted Work Lights	This parameter provides measured data from the tractor side low mounted work lights. 00b = De-activated 01b = Activated 10b = Fault Detected 11b = Not Available

2365	Tractor Side High Mounted Work Lights Command	Command to activate or de-activate the tractor side high mounted work lights. 00b = De-activate 01b = Activate 10b = Reserved 11b = Don't Care
2366	Tractor Side High Mounted Work Lights	This parameter provides measured data from the tractor side high mounted work lights. 00b = De-activated 01b = Activated 10b = Fault Detected 11b = Not Available
2367	Left Turn Signal Lights Command	Command to activate or de-activate left turn signal lights on the tractor and all connected implements 00b = De-activate 01b = Activate 10b = Reserved 11b = Don't Care
2368	Left Turn Signal Lights	This parameter provides measured data from the tractor and attached implement left turn signal lights. 00b = De-activated 01b = Activated 10b = Fault Detected 11b = Not Available
2369	Right Turn Signal Lights Command	Command to activate or de-activate right turn signal lights on the tractor and all connected implements 00b = De-activate 01b = Activate 10b = Reserved 11b = Don't Care
2370	Right Turn Signal Lights	This parameter provides measured data from the tractor and attached implement right turn signal lights. 00b = De-activated 01b = Activated 10b = Fault Detected 11b = Not Available
2371	Left Stop Light Command	Command to activate or de-activate the tractor and implement left stop lights 00b = De-activate 01b = Activate 10b = Reserved 11b = Don't Care
2372	Left Stop Light	This parameter provides measured data from the tractor and attached implement left stop lights. 00b = De-activated 01b = Activated 10b = Fault Detected 11b = Not Available
2373	Right Stop Light Command	Command to activate or de-activate the tractor and implement right stop light 00b = De-activate 01b = Activate 10b = Reserved 11b = Don't Care

2374	Right Stop Light	This parameter provides measured data from the tractor and attached implement right stop lights. 00b = De-activated 01b = Activated 10b = Fault Detected 11b = Not Available
2375	Center Stop Light Command	Command to activate or de-activate the tractor and implement center stop light 00b = De-activate 01b = Activate 10b = Reserved 11b = Don't Care
2376	Center Stop Light	This parameter provides measured data from the tractor and attached implement center stop lights. 00b = De-activated 01b = Activated 10b = Fault Detected 11b = Not Available
2377	Tractor Marker Light Command	Command to activate or de-activate tractor and implement front position lights, rear red tail lights, side amber running lights, license plate lights and instrument and switch back lights.00b = De-activate 01b = Activate 10b = Reserved 11b = Don't Care
2378	Tractor Marker Light	This parameter provides measured data from the tractor and attached implement marker lights, including front position lights, rear tail lights, side running lights, license plate lights and instruments and switch back lights.00b = De-activated 01b = Activated 10b = Fault Detected 11b = Not Available
2379	Implement Marker Light Command	Command to activate or de-activate implement front position lights, rear red tail lights, side amber running lights, license plate lights and instrument and switch back lights.00b = De-activate 01b = Activate 10b = Reserved 11b = Don't Care
2380	Implement Marker Light	This parameter provides measured data from an attached implement marker lights, including front position lights, rear tail lights, side running lights, license plate lights and instruments and switch back lights.00b = De-activated 01b = Activated 10b = Fault Detected 11b = Not Available
2381	Tractor Clearance Light Command	Command to activate or de-activate the tractor high mounted clearance and center ID lights 00b = De-activate 01b = Activate 10b = Reserved 11b = Don't Care

2382	Tractor Clearance Light	This parameter provides measured data from the tractor high mounted clearance and center ID lights. 00b = De-activated 01b = Activated 10b = Fault Detected 11b = Not Available
2383	Implement Clearance Light Command	Command to activate or de-activate the implement high mounted clearance and lights. 00b = De-activate 01b = Activate 10b = Reserved 11b = Don't Care
2384	Implement Clearance Light	This parameter provides measured data from an attached implement high mounted clearance lights. 00b = De-activated 01b = Activated 10b = Fault Detected 11b = Not Available
2385	Rotating Beacon Light Command	Command to activate or de-activate slow moving vehicle indicator lights on tractor and/or implements. Activation of the slow moving vehicle lights implies that the controller should manipulate the lighting as appropriate to provide the slow moving vehicle lighting function.00b = De-activate 01b = Activate 10b = Reserved 11b = Don't Care
2386	Rotating Beacon Light	This parameter provides measured data from the beacon light on tractor or attached implements. 00b = De-activated 01b = Activated 10b = Fault Detected 11b = Not Available
2387	Tractor Front Fog Lights Command	Command to activate or de-activate tractor front fog lights. 00b = De-activate 01b = Activate 10b = Reserved 11b = Don't Care
2388	Tractor Front Fog Lights	This parameter provides measured data from the tractor front fog lights. 00b = De-activated 01b = Activated 10b = Fault Detected 11b = Not Available
2389	Rear Fog Light Command	Command to activate or de-activate tractor or implement rear fog lights. 00b = De-activate 01b = Activate 10b = Reserved 11b = Don't Care
2390	Rear Fog Lights	This parameter provides measured data from the tractor and/or implement rear fog lights. 00b = De-activated 01b = Activated 10b = Fault Detected 11b = Not Available

2391	Back Up Light and Alarm Horn Command	Command to activate or de-activate the back up lights and/ or associated alarm if required 00b = De-activate 01b = Activate 10b = Reserved 11b = Don’t Care
2392	Back Up Light and Alarm Horn	This parameter provides measured data from the back up lights and/ or associated alarm. 00b = De-activated 01b = Activated 10b = Fault Detected 11b = Not Available
2393	Lighting Data Request Command	Command to provide a response of the light state 00b = De-activate 01b = Activate 10b = Reserved 11b = Don’t Care
2394	Implement Rear Work Light	This parameter provides measured data from the implement rear work lamps. 00b = De-activated 01b = Activated 10b = Fault Detected 11b = Not Available
2395	Implement OEM Option 1 Light Command	Command to activate or de-activate an implement OEM option 1 light. This is provided to meet special needs on implements, such as tank inspection or filling lights.00b = De-activate 01b = Activate 10b = Reserved 11b = Don’t Care
2396	Implement OEM Option 1 Light	This parameter provides measured data from the implement OEM option 1 light. 00b = De-activated 01b = Activated 10b = Fault Detected 11b = Not Available
2397	Implement OEM Option 2 Light Command	Command to activate or de-activate an implement OEM option 2 light. This is provided to meet special needs on implements, such as tank inspection or filling lights.00b = De-activate 01b = Activate 10b = Reserved 11b = Don’t Care
2398	Implement OEM Option 2 Light	This parameter provides measured data from the implement OEM option 2 light. 00b = De-activated 01b = Activated 10b = Fault Detected 11b = Not Available
2399	Implement Left Facing Work Light Command	Command to activate or de-activate the left facing work lights toward the left end of the implement. 00b = De-activate 01b = Activate 10b = Reserved 11b = Don’t Care
2400	Implement Left Facing Work Light	This parameter provides measured data from the left facing work lights toward the left end of the implement. 00b = De-activated 01b = Activated 10b = Fault Detected 11b = Not Available

2401	Implement Right Forward Work Light Command	Command to activate or de-activate the forward facing work lights toward the right end of the implement. 00b = De-activate 01b = Activate 10b = Reserved 11b = Don't Care
2402	Implement Right Forward Work Light	This parameter provides measured data from the forward facing work lights toward the right end of the implement.00b = De-activated 01b = Activated 10b = Fault Detected 11b = Not Available
2403	Running Light Command	Command to activate or de-activate the tractor or powered vehicle running lights. Usually only used for on road vehicles.00b = De-activate 01b = Activate 10b = Reserved 11b = Don't Care
2404	Running Light	This parameter provides measured data from the vehicle's running lights. 00b = De-activated 01b = Activated 10b = Fault Detected 11b = Not Available
2405	Implement Rear Work Light Command	Command to activate or de-activate implement rear work lights. (This is also the same as Reversing Lights for truck applications.)00b = De-activate 01b = Activate 10b = Reserved 11b = Don't Care
2406	Implement Right Facing Work Light Command	Command to activate or de-activate work lights mounted on an implement to illuminate beyond right end of the implement.00b = De-activate 01b = Activate 10b = Reserved 11b = Don't Care
2407	Implement Right Facing Work Light	This parameter provides measured data from the work lights mounted on an implement to illuminate beyond right end of the implement.00b = De-activated 01b = Activated 10b = Fault Detected 11b = Not Available
2408	Rear Power Take Off Engagement	See document ISO 11783-7 for SPN details.
2409	Number of Members in Working Set	See document ISO 11783 for SPN details.
2409	Number of Members in Working Set	See document ISO 11783 for SPN details.

2410	Language Code Command	See document ISO 11783-7 for SPN details.
2411	Decimal Symbol Command	See document ISO 11783-7 for SPN details.
2412	Date Command	See document ISO 11783-7 for SPN details.
2413	Time Command	See document ISO 11783-7 for SPN details.
2414	Distance Unit Command	See document ISO 11783-7 for SPN details.
2415	Area Unit Command	See document ISO 11783-7 for SPN details.
2416	Volume Unit Command	See document ISO 11783-7 for SPN details.
2417	Mass Unit Command	See document ISO 11783-7 for SPN details.
2418	Repetition Rate Parameter	See document ISO 11783-7 for SPN details.
2418	Repetition Rate Parameter	See document ISO 11783-7 for SPN details.
2419	Data Format/Error Condition (Obsolete)	See document ISO 11783-7 for SPN details.
2420	Process Data Type (Obsolete)	See document ISO 11783-7 for SPN details.
2421	Process Data Modifier (Obsolete)	See document ISO 11783-7 for SPN details.
2422	Count Number (Obsolete)	See document ISO 11783-7 for SPN details.
2423	Group Number (Obsolete)	See document ISO 11783-7 for SPN details.
2424	Element Number (Obsolete)	See document ISO 11783-7 for SPN details.

2425	Implement Type (Obsolete)	See document ISO 11783-7 for SPN details.
2426	Implement Position (Obsolete)	See document ISO 11783-7 for SPN details.
2427	Data Dictionary Row (Obsolete)	See document ISO 11783-7 for SPN details.
2428	Data Dictionary Column (Obsolete)	See document ISO 11783-7 for SPN details.
2429	Process Variable Value (Obsolete)	See document ISO 11783-7 for SPN details.
2430	Engine Coolant Level – Main Radiator	Indicator of coolant level in main radiator or engine. Coolant Level (SPN 111) should be used if coolant expansion tank is being monitored.
2431	Engine Oil Rail High Pressure Leakage	Indicates oil leakage in the high pressure oil rail of the engine.
2432	Engine Demand – Percent Torque	The requested torque output of the engine by all dynamic internal inputs, including smoke control, noise control and low and high speed governing.
2433	Engine Exhaust Manifold Bank 2 Temperature 1	Temperature of combustion byproducts measured in engine bank 2 (right bank) exhaust manifold. Single manifold engines should use exhaust temperature (SPN 173).
2434	Engine Exhaust Manifold Bank 1 Temperature 1	Temperature of combustion byproducts measured in engine bank 1 (left bank) exhaust manifold. Single manifold engines should use exhaust temperature (SPN 173).
2435	Sea Water Pump Outlet Pressure	Gauge pressure of liquid found at outlet of sea water pump in sea water cooling system.
2436	Generator Average AC Frequency	Average AC frequency measured at the generator output.

2437	Generator Phase A AC Frequency	AC frequency measured at the generator phase A output.
2438	Generator Phase B AC Frequency	AC frequency measured at the generator phase B output.
2439	Generator Phase C AC Frequency	AC frequency measured at the generator phase C output.
2440	Generator Average Line-Line AC RMS Voltage	Average Line to Line RMS voltage measured at the generator output.
2441	Generator Phase AB Line-Line AC RMS Voltage	Line to Line RMS voltage measured at the generator phase AB output.
2442	Generator Phase BC Line-Line AC RMS Voltage	Line to Line RMS voltage measured at the generator phase BC output.
2443	Generator Phase CA Line-Line AC RMS Voltage	Line to Line RMS voltage measured at the generator phase CA output.
2444	Generator Average Line-Neutral AC RMS Voltage	The average Line to Neutral AC RMS voltage measured at the Generator output.
2445	Generator Phase A Line-Neutral AC RMS Voltage	Line to Neutral RMS voltage measured at the generator phase A output.
2446	Generator Phase B Line-Neutral AC RMS Voltage	Line to Neutral RMS voltage measured at the generator phase B output.
2447	Generator Phase C Line-Neutral AC RMS Voltage	Line to Neutral RMS voltage measured at the generator phase C output.
2448	Generator Average AC RMS Current	Average RMS current measured at the generator output.

2449	Generator Phase A AC RMS Current	RMS current measured at the generator phase A output.
2450	Generator Phase B AC RMS Current	RMS current measured at the generator phase B output.
2451	Generator Phase C AC RMS Current	RMS current measured at the generator phase C output.
2452	Generator Total Real Power	Total real power delivered by the generator.
2453	Generator Phase A Real Power	The real power delivered by phase A of the generator.
2454	Generator Phase B Real Power	The real power delivered by phase B of the generator.
2455	Generator Phase C Real Power	The real power delivered by phase C of the generator.
2456	Generator Total Reactive Power	The total reactive power delivered by the generator
2457	Generator Phase A Reactive Power	The reactive power delivered by phase A of the generator
2458	Generator Phase B Reactive Power	The reactive power delivered by phase B of the generator
2459	Generator Phase C Reactive Power	The reactive power delivered by phase C of the generator
2460	Generator Total Apparent Power	The total apparent power delivered by the generator.
2461	Generator Phase A Apparent Power	The apparent power delivered by phase A of the generator.
2462	Generator Phase B Apparent Power	The apparent power delivered by phase B of the generator.
2463	Generator Phase C Apparent Power	The apparent power delivered by phase C of the generator.
2464	Generator Overall Power Factor	The average power factor of the generator.

2465	Generator Phase A Power Factor	The power factor of phase A of the generator.
2466	Generator Phase B Power Factor	The power factor of phases B of the generator.
2467	Generator Phase C Power Factor	The power factor of phases C of the generator.
2468	Generator Total kW Hours Export	The total kilowatt-hours that have been exported by the generator.
2469	Generator Total kW Hours Import	The total kilowatt-hours that have been imported by the generator.
2470	Utility Average AC Frequency	Average AC frequency measured at the utility incomer.
2471	Utility Phase A AC Frequency	AC frequency measured at the utility incomer phase A.
2472	Utility Phase B AC Frequency	AC frequency measured at the utility incomer phase B.
2473	Utility Phase C AC Frequency	AC frequency measured at the utility incomer phase C.
2474	Utility Average Line-Line AC RMS Voltage	Average Line to Line RMS voltage measured at the utility incomer .
2475	Utility Phase AB Line-Line AC RMS Voltage	Line to Line RMS voltage measured at the utility incomer phase AB.
2476	Utility Phase BC Line-Line AC RMS Voltage	Line to Line RMS voltage measured at the utility incomer phase BC.
2477	Utility Phase CA Line-Line AC RMS Voltage	Line to Line RMS voltage measured at the utility incomer phase CA.
2478	Utility Average Line-Neutral AC RMS Voltage	The average Line to Neutral AC RMS voltage measured at the utility incomer .

2479	Utility Phase A Line-Neutral AC RMS Voltage	Line to Neutral RMS voltage measured at the utility incomer phase A.
2480	Utility Phase B Line-Neutral AC RMS Voltage	Line to Neutral RMS voltage measured at the utility incomer phase B.
2481	Utility Phase C Line-Neutral AC RMS Voltage	Line to Neutral RMS voltage measured at the utility incomer phase C.
2482	Utility Average AC RMS Current	Average RMS current measured at the utility incomer.
2483	Utility Phase A AC RMS Current	RMS current measured at the utility incomer phase A.
2484	Utility Phase B AC RMS Current	RMS current measured at the utility incomer phase B.
2485	Utility Phase C AC RMS Current	RMS current measured at the utility incomer phase C.
2486	Utility Total Real Power	Total real power delivered by the utility incomer.
2487	Utility Phase A Real Power	The real power delivered by phase A of the utility incomer.
2488	Utility Phase B Real Power	The real power delivered by phase B of the utility incomer.
2489	Utility Phase C Real Power	The real power delivered by phase C of the utility incomer.
2490	Utility Total Reactive Power	The total reactive power delivered by the utility incomer
2491	Utility Phase A Reactive Power	The reactive power delivered by phase A of the utility incomer
2492	Utility Phase B Reactive Power	The reactive power delivered by phase B of the utility incomer
2493	Utility Phase C Reactive Power	The reactive power delivered by phase C of the utility incomer

2494	Utility Total Apparent Power	The total apparent power delivered by the utility incomer.
2495	Utility Phase A Apparent Power	The apparent power delivered by phase A of the utility incomer.
2496	Utility Phase B Apparent Power	The apparent power delivered by phase B of the utility incomer.
2497	Utility Phase C Apparent Power	The apparent power delivered by phase C of the utility incomer.
2498	Utility Overall Power Factor	The average power factor of the utility incomer.
2499	Utility Phase A Power Factor	The power factor of phase A of the utility incomer.
2500	Utility Phase B Power Factor	The power factor of phases B of the utility incomer.
2501	Utility Phase C Power Factor	The power factor of phases C of the utility incomer.
2502	Utility Total kW Hours Export	The total kilowatt-hours that have been exported by the utility incomer.
2503	Utility Total kW Hours Import	The total kilowatt-hours that have been imported by the utility incomer.
2504	Bus #1 Average AC Frequency	Average AC frequency measured at bus #1.
2505	Bus #1 Phase A AC Frequency	AC frequency measured at bus #1 phase A.
2506	Bus #1 Phase B AC Frequency	AC frequency measured at bus #1 phase B.
2507	Bus #1 Phase C AC Frequency	AC frequency measured at bus #1 phase C.
2508	Bus #1 Average Line-Line AC RMS Voltage	Average Line to Line RMS voltage measured at bus #1 .

2509	Bus #1 Phase AB Line-Line AC RMS Voltage	Line to Line RMS voltage measured at bus #1 phase AB.
2510	Bus #1 Phase BC Line-Line AC RMS Voltage	Line to Line RMS voltage measured at bus #1 phase BC.
2511	Bus #1 Phase CA Line-Line AC RMS Voltage	Line to Line RMS voltage measured at bus #1 phase CA.
2512	Bus #1 Average Line-Neutral AC RMS Voltage	The average Line to Neutral AC RMS voltage measured at bus #1 .
2513	Bus #1 Phase A Line-Neutral AC RMS Voltage	Line to Neutral RMS voltage measured at bus #1 phase A.
2514	Bus #1 Phase B Line-Neutral AC RMS Voltage	Line to Neutral RMS voltage measured at bus #1 phase B.
2515	Bus #1 Phase C Line-Neutral AC RMS Voltage	Line to Neutral RMS voltage measured at bus #1 phase C.
2516	Bus #1/Generator AC Phase Difference	The phase difference between the Bus #1 voltage and Generator voltage.
2517	Bus #1/Utility AC Phase Difference	The phase difference between the Bus #1 voltage and Utility voltage.
2518	Generator Overall Power Factor Lagging	Lead/lag status for generator average power factor. 00b = Leading 01b = Lagging 10b = Error 11b = Not Available or Not Installed
2519	Generator Phase A Power Factor Lagging	Lead/lag status for generator phase A power factor. 00b = Leading 01b = Lagging 10b = Error 11b = Not Available or Not Installed

2520	Generator Phase B Power Factor Lagging	Lead/lag status for generator phase B power factor. 00b = Leading 01b = Lagging 10b = Error 11b = Not Available or Not Installed
2521	Generator Phase C Power Factor Lagging	Lead/lag status for generator phase C power factor. 00b = Leading 01b = Lagging 10b = Error 11b = Not Available or Not Installed
2522	Utility Overall Power Factor Lagging	Lead/lag status for utility incomer average power factor. 00b = Leading 01b = Lagging 10b = Error 11b = Not Available or Not Installed
2523	Utility Phase A Power Factor Lagging	Lead/lag status for utility incomer phase A power factor. 00b = Leading 01b = Lagging 10b = Error 11b = Not Available or Not Installed
2524	Utility Phase B Power Factor Lagging	Lead/lag status for utility incomer phase B power factor. 00b = Leading 01b = Lagging 10b = Error 11b = Not Available or Not Installed
2525	Utility Phase C Power Factor Lagging	Lead/lag status for utility incomer phase C power factor. 00b = Leading 01b = Lagging 10b = Error 11b = Not Available or Not Installed
2526	Bus #1/Generator Phase Match	Indicator of whether phase difference between Bus #1 and Generator is adequate for paralleling. This indicator will be based on the measured AC phase difference qualified using parameters such as Phase Tolerance and Dwell Time.00b = Phases do not match 01b = Phases match 10b = Error 11b = Not Available or Not Installed
2527	Bus #1/Generator Voltage Match	Indicator of whether voltage difference between Bus #1 and Generator is adequate for paralleling. This indicator will be based on the measured AC voltages qualified using parameters such as Voltage Tolerance.00b = Voltages do not match 01b = Voltages match 10b = Error 11b = Not Available or Not Installed
2528	Bus #1/Generator Frequency Match	Indicator of whether frequency difference between Bus #1 and Generator is adequate for paralleling. This indicator will be based on the measured AC frequencies qualified using parameters such as Frequency Tolerance, Phase Tolerance, and Dwell Time.00b = Frequencies do not match 01b = Frequencies match 10b = Error 11b = Not Available or Not Installed

2529	Bus #1/Generator In Sync	Indicator of whether Bus #1 and Generator are properly synchronized for paralleling. This indicator will be based on parameters such as Voltage Match, Frequency Match, and Phase Match.00b = Not synchronized 01b = Synchronized 10b = Error 11b = Not Available or Not Installed
2530	Bus #1/Generator Dead Bus	Indicator of whether Bus #1 is considered dead for closing to the generator. This indicator will be based on parameters such as Bus #1 Voltage and dead bus threshold values.00b = Bus is not dead 01b = Bus is dead 10b = Error 11b = Not Available or Not Installed
2531	Bus #1/Utility Phase Match	Indicator of whether phase difference between Bus #1 and Utility is adequate for paralleling. This indicator will be based on the measured AC phase difference qualified using parameters such as Phase Tolerance and Dwell Time.00b = Phases do not match 01b = Phases match 10b = Error 11b = Not Available or Not Installed
2532	Bus #1/Utility Voltage Match	Indicator of whether voltage difference between Bus #1 and Utility is adequate for paralleling. This indicator will be based on the measured AC voltages qualified using parameters such as Voltage Tolerance.00b = Voltages do not match 01b = Voltages match 10b = Error 11b = Not Available or Not Installed
2533	Bus #1/Utility Frequency Match	Indicator of whether frequency difference between Bus #1 and Utility is adequate for paralleling. This indicator will be based on the measured AC frequencies qualified using parameters such as Frequency Tolerance, Phase Tolerance, and Dwell Time.00b = Frequencies do not match 01b = Frequencies match 10b = Error 11b = Not Available or Not Installed
2534	Bus #1/Utility In Sync	Indicator of whether Bus #1 and Utility are properly synchronized for paralleling. This indicator will be based on parameters such as Voltage Match, Frequency Match, and Phase Match.00b = Not synchronized 01b = Synchronized 10b = Error 11b = Not Available or Not Installed
2535	Bus #1/Utility Dead Bus	Indicator of whether Bus #1 is considered dead for closing to the utility. This indicator will be based on parameters such as Bus #1 Voltage and dead bus threshold

		values.00b = Bus is not dead 01b = Bus is dead 10b = Error 11b = Not Available or Not Installed
2536	Transmission Mode 1 Indicator	This state signal is the transmission's indication that it is operating under transmission mode 1 (SPN 1852) as commanded via the TC1 message (PGN 256). The definition of the transmission mode is left to the discretion of the transmission manufacturer. 00b = Transmission Mode 1 not active 01b = Transmission Mode 1 Active 10b = Error 11b = Not available
2537	Transmission Mode 2 Indicator	This state signal is the transmission's indication that it is operating under transmission mode 2 (SPN 1853) as commanded via the TC1 message (PGN 256). The definition of the transmission mode is left to the discretion of the transmission manufacturer.00b = Transmission Mode 2 not active 01b = Transmission Mode 2 Active 10b = Error 11b = Not available
2538	Transmission Mode 3 Indicator	This state signal is the transmission's indication that it is operating under transmission mode 3 (SPN 1854) as commanded via the TC1 message (PGN 256). The definition of the transmission mode is left to the discretion of the transmission manufacturer.00b = Transmission Mode 3 not active 01b = Transmission Mode 3 Active 10b = Error 11b = Not available
2539	Transmission Mode 4 Indicator	This state signal is the transmission's indication that it is operating under transmission mode 4 (SPN 1855) as commanded via the TC1 message (PGN 256). The definition of the transmission mode is left to the discretion of the transmission manufacturer.00b = Transmission Mode 4 not active 01b = Transmission Mode 4 Active 10b = Error 11b = Not available
2540	Parameter Group Number (RQST)	See document J1939-21 for SPN details.
2541	Control Byte (ACKM)	See document J1939-21 for SPN details.
2542	Group Function Value (ACK)	See document J1939-21 for SPN details.

2543	Parameter Group Number (ACK)	See document J1939-21 for SPN details.
2544	Group Function Value (NACK)	See document J1939-21 for SPN details.
2545	Parameter Group Number (NACK)	See document J1939-21 for SPN details.
2546	Group Function Value (NACK_AD)	See document J1939-21 for SPN details.
2547	Parameter Group Number (NACK_AD)	See document J1939-21 for SPN details.
2548	Group Function Value (NACK_Busy)	See document J1939-21 for SPN details.
2549	Parameter Group Number (NACK_Busy)	See document J1939-21 for SPN details.
2550	Manufacturer Specific Information (PropA_PDU1)	See document J1939-21 for SPN details.
2551	Manufacturer Defined Usage (PropB_PDU2)	See document J1939-21 for SPN details.
2551	Manufacturer Defined Usage (PropB_PDU2)	See document J1939-21 for SPN details.
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2551	Manufacturer Defined Usage (PropB_PDU2)	See document J1939-21 for SPN details.
2552	Parameter Group Number of Requested Information (XFER)	See document J1939-21 for SPN details.
2553	Length of data for the reported PGN (XFER)	See document J1939-21 for SPN details.
2554	Controller Application Identity (CAI)	See document J1939-81 for SPN details.
2555	Transfer Data	See document J1939-21 for SPN details.
2556	Control Byte (TP.CM)	See document J1939-21 for SPN details.
2557	Total Message Size (TP.CM_RTS)	See document J1939-21 for SPN details.
2558	Total Number of Packets (TP.CM_RTS)	See document J1939-21 for SPN details.
2559	Maximum Number of Packets (TP.CM_RTS)	See document J1939-21 for SPN details.
2560	Parameter Group Number of the packeted message (TP.CM_RTS)	See document J1939-21 for SPN details.
2561	Number of Packets that can be sent (TP.CM_CTS)	See document J1939-21 for SPN details.

2562	Next Packet Number to be sent (TP.CM_CTS)	See document J1939-21 for SPN details.
2563	Parameter Group Number of the packeted message (TP.CM_CTS)	See document J1939-21 for SPN details.
2564	Total Message Size (TP.CM_EndofMsgACK)	See document J1939-21 for SPN details.
2565	Total Number of Packets (TP.CM_EndofMsgACK)	See document J1939-21 for SPN details.
2566	Parameter Group Number of the packeted message (TP.CM_EndofMsgACK)	See document J1939-21 for SPN details.
2567	Total Message Size (TP.CM_BAM)	See document J1939-21 for SPN details.
2568	Total Number of Packets (TP.CM_BAM)	See document J1939-21 for SPN details.
2569	Parameter Group Number of the packeted message (TP.CM_BAM)	See document J1939-21 for SPN details.
2570	Connection Abort Reason	See document J1939-21 for SPN details.
2571	Parameter Group Number of packeted message (TP.CM_Conn_Abort)	See document J1939-21 for SPN details.
2572	Sequence Number (TP.DT)	See document J1939-21 for SPN details.

2573	Packetized Data (TP.DT)	See document J1939-21 for SPN details.
2574	Parameter Group Number (RQST2)	See document J1939-21 for SPN details.
2575	Use Transfer Mode	See document J1939-21 for SPN details.
2576	Laser Receiver Type	Identifies which type of Laser Receiver transmitted the message. 0 = Reserved 1 = Linear Laser Receiver 2 = 1 Meter Survey Receiver 3 = 2 Meter Survey Receiver 4 = 2.5 Meter Survey Receiver 5 to 250 = Reserved
2577	Display Deadbands	Sets Display Deadbands mode. 0000b = Narrow = +/- 4.5mm 0001b = Standard = +/- 12mm 0010b = Wide = +/- 24mm 0011b to 1110b = Reserved 1111b = Not Available
2578	LED Pattern Control	Sets LED Pattern control mode on laser leveling systems. 0000b = 5 Channel 0001b = Offset 0010b = 7 Channel 0011b to 1110b = Reserved 1111b = Not Available
2579	SLI Battery 1 Net Current (High Range/Resolution)	Net flow of electrical current into/out of the first battery or first set of batteries used for starting the engine, for lighting, and for ignition (SLI). If more than one battery is included in the first set of batteries and the net current for each battery is desired, then SPNs 7900, 7908, 7916, & 7924 shall be used.See SPN 114 for alternate range and resolution.
2580	Hydraulic Brake Pressure Circuit 1	Gage hydraulic pressure in circuit 1 of the hydraulic brake system
2581	Hydraulic Brake Pressure Circuit 2	Gage hydraulic pressure in circuit 2 of the hydraulic brake system
2582	Hydraulic Brake Pressure Supply State Circuit 1	Signal which indicates whether the hydraulic brake pressure supply of circuit 1 is reliable; that is, able to support continued braking.00b = Supply is not reliable 01b = Supply is reliable 10b = Error indicator 11b = Not available

2583	Hydraulic Brake Pressure Supply State Circuit 2	Signal which indicates whether the hydraulic brake pressure supply of circuit 2 is reliable; that is, able to support continued braking.00b = Supply is not reliable 01b = Supply is reliable 10b = Error indicator 11b = Not available
2584	Hydraulic Brake Pressure Warning State Circuit 1	Signal which indicates whether the hydraulic brake pressure of circuit 1 is below the warning level 00b = Pressure level sufficient 01b = Pressure level below warning level 10b = Error indicator 11b = Not available
2585	Hydraulic Brake Pressure Warning State Circuit 2	Signal which indicates whether the hydraulic brake pressure of circuit 2 is below the warning level 00b = Pressure level sufficient 01b = Pressure level below warning level 10b = Error indicator 11b = Not available
2586	Tire Air Leakage Rate	The pressure loss rate of a tire.
2587	Tire Pressure Threshold Detection	Signal indicating the pressure level of the tire. The levels defined represent different pressure conditions of the tire:000b = Extreme over pressure – The tire pressure is at a level where the safety of the vehicle may be jeopardised. 001b = Over pressure – The tire pressure is higher than the pressure defined by the vehicle or tire manufacturer. 010b = No warning pressure – The tire pressure is within the thresholds defined by the vehicle or tire manufacturer. 011b = Under pressure – The tire pressure is lower than the pressure defined by the vehicle or tire manufacturer. 100b = Extreme under pressure – The tire pressure is at a level where the safety of the vehicle may be jeopardised. 101b = Not defined 110b = Error indicator 111b = Not available
2588	Maximum Vehicle Speed Limit 1	The lowest Maximum Vehicle Speed Limit. This value is the similar to SPN 74. However, SPN 74 was not specifically defined to convey the applied vehicle speed limit or what was possible to be applied. This new SPN is the lowest vehicle speed limit that is possible. Additionally, the lowest vehicle speed limit shall be applied when the J1939 network is no longer providing input regarding the Selected Maximum Vehicle Speed Limit. Exceptions to this exist when the device performing the maximum vehicle speed limiting function has methods of selecting the thresholds separately from the Selected Maximum Vehicle Speed Limit parameter.

2589	Maximum Vehicle Speed Limit 2	The highest of the two lowest vehicle speed limits
2590	Maximum Vehicle Speed Limit 3	The highest of the three lowest vehicle speed limits
2591	Maximum Vehicle Speed Limit 4	The highest of the four lowest vehicle speed limits
2592	Maximum Vehicle Speed Limit 5	The highest of the five lowest vehicle speed limits
2593	Maximum Vehicle Speed Limit 6	The highest of the six lowest vehicle speed limits
2594	Maximum Vehicle Speed Limit 7	The highest of the seven lowest vehicle speed limits
2595	Applied Vehicle Speed Limit	The vehicle speed limit in effect. 251 (FBh) is used to indicate that a maximum vehicle speed limit is not selected. See SPN 7420 for alternate resolution.
2596	Selected Maximum Vehicle Speed Limit	User selected maximum vehicle speed. If one is selected, then this SPN must equal one of the maximum vehicle speeds #1-#7 from PGN 64997 – Maximum Vehicle Speed Limit Status . If different maximum vehicle speed requests are present from different devices, the lowest requested value should be used.0 is used to indicate that a maximum vehicle speed is not selected. 1 through 7 are valid selectable speed limits. 8 through 250 are not allowed.
2597	Implement Left Forward Work Light Command	Command to activate or de-activate work lights mounted on an implement to illuminate beyond left end of the implement.00b = De-activate 01b = Activate 10b = Reserved 11b = Don’t Care
2598	Implement Left Forward Work Light	This parameter provides measured data from the work lights mounted on an implement to illuminate the forward left end of the implement.00b = De-activate 01b = Activate 10b = Fault Detected 11b = Not Available

2599	Fire Apparatus Pump Engagement	The measured status of the pump used to provide water in fire fighting apparatus for distribution of water through water cannons or fire hoses.00b = Pump not engaged 01b = Pump engaged 10b = Error 11b = Not available or not installed
2600	Payload Percentage	The current payload of the equipment, reported as a percentage of the equipment's rated payload limit.
2601	Travel Velocity Control Position	The position of the travel velocity control component reported as a percentage of the control's full displacement in each direction respectively. Positive position values indicate forward travel direction; negative position values indicate reverse, or backward, travel direction; and zero (0) percent position indicates the control device is in the neutral position. Higher percent for a particular travel direction indicates a higher desired travel speed in that direction.
2602	Hydraulic Oil Level	This parameter indicates the level of the hydraulic fluid in tank as a ratio of current volume to total tank volume. This parameter is intended for reporting the hydraulic fluid level in the system tank or reservoir. This hydraulic fluid is for the entire hydraulics system of a piece of equipment.
2603	Pneumatic Supply Pressure Request	Command signal to influence the pneumatic pressure in the main reservoir. This parameter is the setpoint for the parameter SPN 46.
2604	Parking and/or Trailer Air Pressure Request	Command signal to influence the pneumatic pressure in the circuit or reservoir for the parking brake and/or the trailer supply. This parameter is the setpoint for the parameter SPN 1086.
2605	Service Brake Air Pressure Request, Circuit #1	Command signal to influence the pneumatic pressure in the service brake circuit or reservoir #1. This parameter is the setpoint for the parameter SPN 1087.
2606	Service Brake Air Pressure Request, Circuit #2	Command signal to influence the pneumatic pressure in the service brake circuit or reservoir #2. This parameter is the setpoint for the parameter SPN 1088.

2607	Auxiliary Equipment Supply Pressure Request	Command signal to influence the pneumatic pressure in the auxiliary circuit. This parameter is the setpoint for the parameter SPN 1089.
2608	Air Suspension Supply Pressure Request	Command signal to influence the pneumatic pressure in the circuit for the electronically controlled air suspension system. This parameter is the setpoint for the parameter SPN 1090.
2609	Cab A/C Refrigerant Compressor Outlet Pressure	This is the gage pressure at the compressor outlet in the cab air conditioning system.
2610	Solar Intensity Percent	This is the solar radiation (power density) falling on the vehicle in percent of the maximum sensor value (SPN 2611). Currently this is in the infra-red spectrum.
2611	Solar Sensor Maximum	This is the maximum value which can be reported by the sensor for the solar intensity. (This is a configuration parameter)
2612	Front Wheel Drive Actuator Status	Feedback on the front wheel drive actuator. 00b = Front Wheel Drive Actuator not engaged 01b = Front Wheel Drive Actuator engaged 10b = Error 11b = Not Available
2613	Drive Axle Lube Pressure	The drive axle lubricant pressure with location determined by Drive Axle Location (SPN 930).
2614	Steering Axle Lube Pressure	The steering axle lubricant pressure.
2615	Engine Throttle Synchronization Mode Status	The status of the Throttle Synchronization Mode. Throttle Synchronization Mode is used to indicate which throttle, if any, is currently being used for the synchronized throttle.0000b = Not Synchronized 0001b = Synchronized Center 0010b = Synchronized Port 0011b = Synchronized Starboard 0100b = Synchronized Master 0101b to 1110b = Reserved 1111b = Take no action
2616	Trolling Mode Status	The status of the Trolling Mode. Trolling mode limits the top speed. Full range travel of the throttle level spans from low idle engine speed to maximum trolling speed.See Trolling Mode (Extended Range) – SPN 9657 for alternate range and resolution. 00b

		= Trolling mode is off 01b = Trolling mode is active 10b = Reserved 11b = Take no action
2617	Slow Vessel Mode Status	The status of the Slow Vessel Mode. Slow Vessel Mode puts the engine in a lower-than-normal low idle speed during docking or other slow vessel operations.00b = Slow vessel mode is OFF. 01b = Slow vessel mode is ACTIVE. 10b = Reserved 11b = Take no action
2618	Suspend Signal	See document J1939-73 for SPN details.
2619	Suspend Duration	See document J1939-73 for SPN details.
2620	Brake Lining Display	Driver/operator information device for brake lining wear
2621	Pneumatic Brake Pressure Limitation Valve Front Axle	Pneumatic valve limiting the maximum brake pressure at the front axle
2622	Hillholder system	System for short time substitute of parking brake by activation of service brake.
2623	Accelerator Pedal #1 Channel 2	Sensor output 2 for the accelerator pedal #1 position when using a redundant-style sensor. The ratio of actual accelerator pedal position to maximum pedal position. This is for the first occurrence of the accelerator pedal. Although it is used as an input to determine powertrain demand, it also provides anticipatory information to transmission and ASR algorithms about driver actions. This is the second sensor output when a multiple output (redundant) sensor is used for Accelerator Pedal #1 position. Sensor outputs 1 & 3 (for accelerator pedal #1 position) are SPNs 91 & 2624.
2624	Accelerator Pedal #1 Channel 3	Sensor output 3 for the accelerator pedal #1 position when using a redundant-style sensor. The ratio of actual accelerator pedal position to maximum pedal position. This is for the first occurrence of the accelerator pedal. Although it is used as an input to determine powertrain demand, it also provides anticipatory information to transmission and ASR algorithms about driver actions. This is the third sensor output

		when a multiple output (redundant) sensor is used for Accelerator Pedal #1 position. Sensor outputs 1 & 2 (for accelerator pedal #1 position) are SPNs 91 & 2623.
2625	Accelerator Pedal #2 Channel 2	Sensor output 2 for the accelerator pedal #2 position when using a redundant-style sensor. The ratio of actual accelerator pedal position to maximum pedal position. This is for the second occurrence of the accelerator pedal. Although it is used as an input to determine powertrain demand, it also provides anticipatory information to transmission and ASR algorithms about driver actions. This is the second sensor output when a multiple output (redundant) sensor is used for Accelerator Pedal # 2 position. Sensor outputs 1 & 3 (for accelerator pedal #2 position) are SPNs 29 & 2626.
2626	Accelerator Pedal #2 Channel 3	Sensor output 3 for the accelerator pedal #2 position when using a redundant-style sensor. The ratio of actual accelerator pedal position to maximum pedal position. This is for the second occurrence of the accelerator pedal. Although it is used as an input to determine powertrain demand, it also provides anticipatory information to transmission and ASR algorithms about driver actions. This is the third sensor output when a multiple output (redundant) sensor is used for Accelerator Pedal # 2 position. Sensor outputs 1 & 2 (for accelerator pedal #2 position) are SPNs 29 & 2625.
2627	Gaseous Fuel Tank 1 High Pressure Shutoff Valve	The gaseous fuel shutoff valve located at the tank. This valve blocks the flow of fuel away from tank 1.
2628	Gaseous Fuel Tank 1 Low Pressure Shutoff Valve	The gaseous fuel shutoff valve located after the pressure regulator. This valve blocks the flow of the pressure regulated fuel.
2629	Engine Turbocharger 1 Compressor Outlet Temperature	Temperature of the air or air/fuel mixture exiting the turbocharger 1 compressor outlet
2630	Engine Charge Air Cooler 1 Outlet Temperature	Temperature of combustion air after it exits from the Charge Air Cooler 1 but before any mixing of recirculated exhaust gas.

2631	Engine Charge Air Cooler Outlet Pressure	Measures pressure of air at outlet from charge air cooler
2632	Engine Charge Air Cooler 1 Bypass	Controls whether combustion air passes through the charge air cooler
2633	Engine Variable Geometry Turbocharger (VGT) 1 Nozzle Position	Measures the position of the nozzles or vanes in variable geometry turbocharger #1 (Note: Preferred SPN is 2795)
2634	Power Relay	Used to control power to other devices on the vehicle
2635	Neutral Only » Power Relay	Provides power to accessories ONLY when transmission is in neutral
2636	Windshield Wiper Motor ON/OFF	Activates the windshield wipers
2637	Windshield Wiper Motor Speed	Selects the windshield wiper speed
2638	Differential Lock Control Valve #2	Operates the second Differential Lock
2639	Cab Door « Lock » Control	Commands the door mechanism to Lock
2640	Cab Door « Unlock » Control	Commands the door mechanism to Unlock
2641	Horn	Activates the vehicle horn
2642	Mirror 1 Heater	Mirror 1 Heater defrosts the first rear view mirror, alternatively all rear view mirrors.
2643	Battery Monitor Load #1	Activates the #1 electrical load to monitor battery condition
2644	Battery Monitor Load #2	Activates the #2 electrical load to monitor battery condition
2645	ECU « Wake Up » Control	Sends a signal to cause other ECUs to begin operation

2646	Auxiliary Output #4	Dynamically configurable, no permanent name
2647	Auxiliary Output #5	Dynamically configurable, no permanent name
2648	Maintenance Lamp	Indicates that vehicle maintenance is due
2649	Low Air Pressure	Activates the Low Air Pressure warning
2650	Fan Override Indicator	Indicates that the driver has requested manual fan operation
2651	Interior Lamps	Activates the cab interior lights
2652	Switch Diagnostic Enable	Provides power to diagnose dashboard switch problems
2653	Headlamp Low Beam Left #1	Activates the left headlamp low beam filament (driver #1)
2654	Headlamp Low Beam Left #2	Activates the left headlamp low beam filament (driver #2)
2655	Headlamp Low Beam Right #1	Activates the right headlamp low beam filament (driver #1)
2656	Headlamp Low Beam Right #2	Activates the right headlamp low beam filament (driver #2)
2657	Engine Auxiliary Cooling System	Activates a secondary engine cooling system
2658	Engine Intake Air Precleaner	Activates a pre-cleaning system for the engine intake air
2659	Engine Exhaust Gas Recirculation 1 Mass Flow Rate	Flow rate of gas through the EGR system. Flow rate of the exhaust gas being recirculated into the combustion air.
2660	Joystick 1 X-Axis Position	The position of the joystick in the relative motion of travel from the neutral position. Position value of 0 is Neutral and position value 1000 (100%) is the end of linear zone. Value of 1022 indicates an error has occurred.

2661	Joystick 1 Y-Axis Position	The position of the joystick in the relative motion of travel from the neutral position. Position value of 0 is Neutral and position value 1000 (100%) is the end of linear zone. Value of 1022 indicates an error has occurred.
2662	Joystick 1 Grip X-Axis Position	The position of the joystick grip in the relative motion of travel from the neutral position. Position value of 0 is Neutral and position value 1000 (100%) is the end of linear zone. Value of 1022 indicates an error has occurred.
2663	Joystick 1 Grip Y-Axis Position	The position of the joystick grip in the relative motion of travel from the neutral position. Position value of 0 is Neutral and position value 1000 (100%) is the end of linear zone. Value of 1022 indicates an error has occurred.
2664	Joystick 1 Theta-Axis Position	The position of the joystick in the relative motion of travel from the neutral position. Position value of 0 is Neutral and position value 1000 (100%) is the end of linear zone. Value of 1022 indicates an error has occurred.
2665	Joystick 1 X-Axis Lever Right Positive Position Status	Reports when the current joystick position is on the positive travel side (forward, right, clockwise, up) relative to the neutral position for that axis of travel.00b = Not on Positive side of Neutral 01b = On positive side of Neutral 10b = Error Indicator 11b = Not Available
2666	Joystick 1 Y-Axis Lever Forward Positive Position Status	Reports when the current joystick position is on the positive travel side (forward, right, clockwise, up) relative to the neutral position for that axis of travel.00b = Not on Positive side of Neutral 01b = On positive side of Neutral 10b = Error Indicator 11b = Not Available
2667	Joystick 1 Grip X-Axis Lever Right Positive Position Status	Reports when the current joystick grip position is on the positive travel side (forward, right, clockwise, up) relative to the neutral position for that axis of travel.00b = Not on Positive side of Neutral 01b = On positive side of Neutral 10b = Error Indicator 11b = Not Available
2668	Joystick 1 Grip Y-Axis Lever Forward Positive Position Status	Reports when the current joystick grip position is on the positive travel side (forward, right, clockwise, up) relative to the neutral position for that axis of travel.00b = Not

		on Positive side of Neutral 01b = On positive side of Neutral 10b = Error Indicator 11b = Not Available
2669	Joystick 1 Theta-Axis Clockwise Positive Position Status	Reports when the current joystick position is on the positive travel side (forward, right, clockwise, up) relative to the neutral position for that axis of travel.00b = Not on Positive side of Neutral 01b = On positive side of Neutral 10b = Error Indicator 11b = Not Available
2670	Joystick 1 X-Axis Lever Left Negative Position Status	Reports when the current joystick position is on the negative travel side (back, left, counterclockwise, down) relative to the neutral position for that axis of travel.00b = Not on negative side of Neutral 01b = On negative side of Neutral 10b = Error Indicator 11b = Not Available
2671	Joystick 1 Y-Axis Lever Back Negative Position Status	Reports when the current joystick position is on the negative travel side (back, left, counterclockwise, down) relative to the neutral position for that axis of travel.00b = Not on negative side of Neutral 01b = On negative side of Neutral 10b = Error Indicator 11b = Not Available
2672	Joystick 1 Grip X-Axis Lever Left Negative Position Status	Reports when the current joystick grip position is on the negative travel side (back, left, counterclockwise, down) relative to the neutral position for that axis of travel.00b = Not on negative side of Neutral 01b = On negative side of Neutral 10b = Error Indicator 11b = Not Available
2673	Joystick 1 Grip Y-Axis Lever Back Negative Position Status	Reports when the current joystick grip position is on the negative travel side (back, left, counterclockwise, down) relative to the neutral position for that axis of travel.00b = Not on negative side of Neutral 01b = On negative side of Neutral 10b = Error Indicator 11b = Not Available
2674	Joystick 1 Theta-Axis Counter Clockwise Negative Position Status	Reports when the current joystick position is on the negative travel side (back, left, counterclockwise, down) relative to the neutral position for that axis of travel.00b = Not on negative side of Neutral 01b = On negative side of Neutral 10b = Error Indicator 11b = Not Available

2675	Joystick 1 X-Axis Neutral Position Status	Reports when the current joystick position is in the neutral position for that axis of travel. The neutral position measurement must be determined from some mechanism other than the axis position measurement device.00b = Not in Neutral Position 01b = In Neutral Position 10b = Error Indicator 11b = Not Available
2676	Joystick 1 Y-Axis Neutral Position Status	Reports when the current joystick position is in the neutral position for that axis of travel. The neutral position measurement must be determined from some mechanism other than the axis position measurement device.00b = Not in Neutral Position 01b = In Neutral Position 10b = Error Indicator 11b = Not Available
2677	Joystick 1 Grip X-Axis Neutral Position Status	Reports when the current joystick grip position is in the neutral position for that axis of travel. The neutral position measurement must be determined from some mechanism other than the axis position measurement device.00b = Not in Neutral Position 01b = In Neutral Position 10b = Error Indicator 11b = Not Available
2678	Joystick 1 Grip Y-Axis Neutral Position Status	Reports when the current joystick grip position is in the neutral position for that axis of travel. The neutral position measurement must be determined from some mechanism other than the axis position measurement device.00b = Not in Neutral Position 01b = In Neutral Position 10b = Error Indicator 11b = Not Available
2679	Joystick 1 Theta-Axis Neutral Position Status	Reports when the current joystick position is in the neutral position for that axis of travel. The neutral position measurement must be determined from some mechanism other than the axis position measurement device.00b = Not in Neutral Position 01b = In Neutral Position 10b = Error Indicator 11b = Not Available
2680	Joystick 1 X-Axis Detent Position Status	Reports when the current joystick position is in the detent position for that axis of travel. 00b = Not in the Detent Position 01b = In the Detent Position 10b = Error Indicator 11b = Not Available
2681	Joystick 1 Y-Axis Detent Position Status	Reports when the current joystick position is in the detent position for that axis of travel. 00b = Not in the Detent Position 01b = In the Detent Position 10b = Error Indicator 11b = Not Available

2682	Joystick 1 Grip X-Axis Detent Position Status	Reports when the current joystick grip position is in the detent position for that axis of travel. 00b = Not in the Detent Position 01b = In the Detent Position 10b = Error Indicator 11b = Not Available
2683	Joystick 1 Grip Y-Axis Detent Position Status	Reports when the current joystick grip position is in the detent position for that axis of travel. 00b = Not in the Detent Position 01b = In the Detent Position 10b = Error Indicator 11b = Not Available
2684	Joystick 1 Theta-Axis Detent Position Status	Reports when the current joystick position is in the detent position for that axis of travel. 00b = Not in the Detent Position 01b = In the Detent Position 10b = Error Indicator 11b = Not Available
2685	Joystick 1 Button 1 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
2686	Joystick 1 Button 2 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
2687	Joystick 1 Button 3 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
2688	Joystick 1 Button 4 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
2689	Joystick 1 Button 5 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
2690	Joystick 1 Button 6 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
2691	Joystick 1 Button 7 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available

2692	Joystick 1 Button 8 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
2693	Joystick 1 Button 9 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
2694	Joystick 1 Button 10 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
2695	Joystick 1 Button 11 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
2696	Joystick 1 Button 12 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
2697	Joystick 2 X-Axis Position	The position of the joystick in the relative motion of travel from the neutral position. Position value of 0 is Neutral and position value 1000 (100%) is the end of linear zone. Value of 1022 indicates an error has occurred.
2698	Joystick 2 Y-Axis Position	The position of the joystick in the relative motion of travel from the neutral position. Position value of 0 is Neutral and position value 1000 (100%) is the end of linear zone. Value of 1022 indicates an error has occurred.
2699	Joystick 2 Grip X-Axis Position	The position of the joystick grip in the relative motion of travel from the neutral position. Position value of 0 is Neutral and position value 1000 (100%) is the end of linear zone. Value of 1022 indicates an error has occurred.
2700	Joystick 2 Grip Y-Axis Position	The position of the joystick grip in the relative motion of travel from the neutral position. Position value of 0 is Neutral and position value 1000 (100%) is the end of linear zone. Value of 1022 indicates an error has occurred.

2701	Joystick 2 Theta-Axis Position	The position of the joystick in the relative motion of travel from the neutral position. Position value of 0 is Neutral and position value 1000 (100%) is the end of linear zone. Value of 1022 indicates an error has occurred.
2702	Joystick 2 X-Axis Lever Right Positive Position Status	Reports when the current joystick position is on the positive travel side (forward, right, clockwise, up) relative to the neutral position for that axis of travel.00b = Not on Positive side of Neutral 01b = On positive side of Neutral 10b = Error Indicator 11b = Not Available
2703	Joystick 2 Y-Axis Lever Forward Positive Position Status	Reports when the current joystick position is on the positive travel side (forward, right, clockwise, up) relative to the neutral position for that axis of travel.00b = Not on Positive side of Neutral 01b = On positive side of Neutral 10b = Error Indicator 11b = Not Available
2704	Joystick 2 Grip X-Axis Lever Right Positive Position Status	Reports when the current joystick grip position is on the positive travel side (forward, right, clockwise, up) relative to the neutral position for that axis of travel.00b = Not on Positive side of Neutral 01b = On positive side of Neutral 10b = Error Indicator 11b = Not Available
2705	Joystick 2 Grip Y-Axis Lever Forward Positive Position Status	Reports when the current joystick grip position is on the positive travel side (forward, right, clockwise, up) relative to the neutral position for that axis of travel.00b = Not on Positive side of Neutral 01b = On positive side of Neutral 10b = Error Indicator 11b = Not Available
2706	Joystick 2 Theta-Axis Clockwise Positive Position Status	Reports when the current joystick position is on the positive travel side (forward, right, clockwise, up) relative to the neutral position for that axis of travel.00b = Not on Positive side of Neutral 01b = On positive side of Neutral 10b = Error Indicator 11b = Not Available
2707	Joystick 2 X-Axis Lever Left Negative Position Status	Reports when the current joystick position is on the negative travel side (back, left, counterclockwise, down) relative to the neutral position for that axis of travel.00b = Not on negative side of Neutral 01b = On negative side of Neutral 10b = Error Indicator 11b = Not Available

2708	Joystick 2 Y-Axis Lever Back Negative Position Status	Reports when the current joystick position is on the negative travel side (back, left, counterclockwise, down) relative to the neutral position for that axis of travel.00b = Not on negative side of Neutral 01b = On negative side of Neutral 10b = Error Indicator 11b = Not Available
2709	Joystick 2 Grip X-Axis Lever Left Negative Position Status	Reports when the current joystick grip position is on the negative travel side (back, left, counterclockwise, down) relative to the neutral position for that axis of travel.00b = Not on negative side of Neutral 01b = On negative side of Neutral 10b = Error Indicator 11b = Not Available
2710	Joystick 2 Grip Y-Axis Lever Back Negative Position Status	Reports when the current joystick grip position is on the negative travel side (back, left, counterclockwise, down) relative to the neutral position for that axis of travel.00b = Not on negative side of Neutral 01b = On negative side of Neutral 10b = Error Indicator 11b = Not Available
2711	Joystick 2 Theta-Axis Counter Clockwise Negative Position Status	Reports when the current joystick position is on the negative travel side (back, left, counterclockwise, down) relative to the neutral position for that axis of travel.00b = Not on negative side of Neutral 01b = On negative side of Neutral 10b = Error Indicator 11b = Not Available
2712	Joystick 2 X-Axis Neutral Position Status	Reports when the current joystick position is in the neutral position for that axis of travel. The neutral position measurement must be determined from some mechanism other than the axis position measurement device.00b = Not in Neutral Position 01b = In Neutral Position 10b = Error Indicator 11b = Not Available
2713	Joystick 2 Y-Axis Neutral Position Status	Reports when the current joystick position is in the neutral position for that axis of travel. The neutral position measurement must be determined from some mechanism other than the axis position measurement device.00b = Not in Neutral Position 01b = In Neutral Position 10b = Error Indicator 11b = Not Available
2714	Joystick 2 Grip X-Axis Neutral Position Status	Reports when the current joystick grip position is in the neutral position for that axis of travel. The neutral position measurement must be determined from some mechanism other than the axis position measurement device. 00b = Not on negative

		side of Neutral 01b = On negative side of Neutral 10b = Error Indicator 11b = Not Available
2715	Joystick 2 Grip Y-Axis Neutral Position Status	Reports when the current joystick grip position is in the neutral position for that axis of travel. The neutral position measurement must be determined from some mechanism other than the axis position measurement device.00b = Not in Neutral Position 01b = In Neutral Position 10b = Error Indicator 11b = Not Available
2716	Joystick 2 Theta-Axis Neutral Position Status	Reports when the current joystick position is in the neutral position for that axis of travel. The neutral position measurement must be determined from some mechanism other than the axis position measurement device.00b = Not in Neutral Position 01b = In Neutral Position 10b = Error Indicator 11b = Not Available
2717	Joystick 2 X-Axis Detent Position Status	Reports when the current joystick position is in the detent position for that axis of travel. 00b = Not in the Detent Position 01b = In the Detent Position 10b = Error Indicator 11b = Not Available
2718	Joystick 2 Y-Axis Detent Position Status	Reports when the current joystick position is in the detent position for that axis of travel. 00b = Not in the Detent Position 01b = In the Detent Position 10b = Error Indicator 11b = Not Available
2719	Joystick 2 Grip X-Axis Detent Position Status	Reports when the current joystick grip position is in the detent position for that axis of travel. 00b = Not in the Detent Position 01b = In the Detent Position 10b = Error Indicator 11b = Not Available
2720	Joystick 2 Grip Y-Axis Detent Position Status	Reports when the current joystick grip position is in the detent position for that axis of travel. 00b = Not in the Detent Position 01b = In the Detent Position 10b = Error Indicator 11b = Not Available
2721	Joystick 2 Theta-Axis Detent Position Status	Reports when the current joystick position is in the detent position for that axis of travel. 00b = Not in the Detent Position 01b = In the Detent Position 10b = Error Indicator 11b = Not Available

2722	Joystick 2 Button 1 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
2723	Joystick 2 Button 2 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
2724	Joystick 2 Button 3 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
2725	Joystick 2 Button 4 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
2726	Joystick 2 Button 5 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
2727	Joystick 2 Button 6 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
2728	Joystick 2 Button 7 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
2729	Joystick 2 Button 8 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
2730	Joystick 2 Button 9 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
2731	Joystick 2 Button 10 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
2732	Joystick 2 Button 11 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available

2733	Joystick 2 Button 12 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
2734	Joystick 3 X-Axis Position	The position of the joystick in the relative motion of travel from the neutral position. Position value of 0 is Neutral and position value 1000 (100%) is the end of linear zone. Value of 1022 indicates an error has occurred.
2735	Joystick 3 Y-Axis Position	The position of the joystick in the relative motion of travel from the neutral position. Position value of 0 is Neutral and position value 1000 (100%) is the end of linear zone. Value of 1022 indicates an error has occurred.
2736	Joystick 3 Grip X-Axis Position	The position of the joystick grip in the relative motion of travel from the neutral position. Position value of 0 is Neutral and position value 1000 (100%) is the end of linear zone. Value of 1022 indicates an error has occurred.
2737	Joystick 3 Grip Y-Axis Position	The position of the joystick grip in the relative motion of travel from the neutral position. Position value of 0 is Neutral and position value 1000 (100%) is the end of linear zone. Value of 1022 indicates an error has occurred.
2738	Joystick 3 Theta-Axis Position	The position of the joystick in the relative motion of travel from the neutral position. Position value of 0 is Neutral and position value 1000 (100%) is the end of linear zone. Value of 1022 indicates an error has occurred.
2739	Joystick 3 X-Axis Lever Right Positive Position Status	Reports when the current joystick position is on the positive travel side (forward, right, clockwise, up) relative to the neutral position for that axis of travel.00b = Not on Positive side of Neutral 01b = On positive side of Neutral 10b = Error Indicator 11b = Not Available
2740	Joystick 3 Y-Axis Lever Forward Positive Position Status	Reports when the current joystick position is on the positive travel side (forward, right, clockwise, up) relative to the neutral position for that axis of travel.00b = Not on Positive side of Neutral 01b = On positive side of Neutral 10b = Error Indicator 11b = Not Available

2741	Joystick 3 Grip X-Axis Lever Right Positive Position Status	Reports when the current joystick grip position is on the positive travel side (forward, right, clockwise, up) relative to the neutral position for that axis of travel.00b = Not on Positive side of Neutral 01b = On positive side of Neutral 10b = Error Indicator 11b = Not Available
2742	Joystick 3 Grip Y-Axis Lever Forward Positive Position Status	Reports when the current joystick grip position is on the positive travel side (forward, right, clockwise, up) relative to the neutral position for that axis of travel.00b = Not on Positive side of Neutral 01b = On positive side of Neutral 10b = Error Indicator 11b = Not Available
2743	Joystick 3 Theta-Axis Clockwise Positive Position Status	Reports when the current joystick position is on the positive travel side (forward, right, clockwise, up) relative to the neutral position for that axis of travel.00b = Not on Positive side of Neutral 01b = On positive side of Neutral 10b = Error Indicator 11b = Not Available
2744	Joystick 3 X-Axis Lever Left Negative Position Status	Reports when the current joystick position is on the negative travel side (back, left, counterclockwise, down) relative to the neutral position for that axis of travel.00b = Not on negative side of Neutral 01b = On negative side of Neutral 10b = Error Indicator 11b = Not Available
2745	Joystick 3 Y-Axis Lever Back Negative Position Status	Reports when the current joystick position is on the negative travel side (back, left, counterclockwise, down) relative to the neutral position for that axis of travel.00b = Not on negative side of Neutral 01b = On negative side of Neutral 10b = Error Indicator 11b = Not Available
2746	Joystick 3 Grip X-Axis Lever Left Negative Position Status	Reports when the current joystick grip position is on the negative travel side (back, left, counterclockwise, down) relative to the neutral position for that axis of travel.00b = Not on negative side of Neutral 01b = On negative side of Neutral 10b = Error Indicator 11b = Not Available
2747	Joystick 3 Grip Y-Axis Lever Back Negative Position Status	Reports when the current joystick grip position is on the negative travel side (back, left, counterclockwise, down) relative to the neutral position for that axis of

		travel.00b = Not on negative side of Neutral 01b = On negative side of Neutral 10b = Error Indicator 11b = Not Available
2748	Joystick 3 Theta-Axis Counter Clockwise Negative Position Status	Reports when the current joystick position is on the negative travel side (back, left, counterclockwise, down) relative to the neutral position for that axis of travel.00b = Not on negative side of Neutral 01b = On negative side of Neutral 10b = Error Indicator 11b = Not Available
2749	Joystick 3 X-Axis Neutral Position Status	Reports when the current joystick position is in the neutral position for that axis of travel. The neutral position measurement must be determined from some mechanism other than the axis position measurement device.00b = Not in Neutral Position 01b = In Neutral Position 10b = Error Indicator 11b = Not Available
2750	Joystick 3 Y-Axis Neutral Position Status	Reports when the current joystick position is in the neutral position for that axis of travel. The neutral position measurement must be determined from some mechanism other than the axis position measurement device.00b = Not in Neutral Position 01b = In Neutral Position 10b = Error Indicator 11b = Not Available
2751	Joystick 3 Grip X-Axis Neutral Position Status	Reports when the current joystick grip position is in the neutral position for that axis of travel. The neutral position measurement must be determined from some mechanism other than the axis position measurement device.00b = Not on negative side of Neutral 01b = On negative side of Neutral 10b = Error Indicator 11b = Not Available
2752	Joystick 3 Grip Y-Axis Neutral Position Status	Reports when the current joystick grip position is in the neutral position for that axis of travel. The neutral position measurement must be determined from some mechanism other than the axis position measurement device.00b = Not in Neutral Position 01b = In Neutral Position 10b = Error Indicator 11b = Not Available
2753	Joystick 3 Theta-Axis Neutral Position Status	Reports when the current joystick position is in the neutral position for that axis of travel. The neutral position measurement must be determined from some mechanism other than the axis position measurement device.00b = Not in Neutral Position 01b = In Neutral Position 10b = Error Indicator 11b = Not Available

2754	Joystick 3 X-Axis Detent Position Status	Reports when the current joystick position is in the detent position for that axis of travel. 00b = Not in the Detent Position 01b = In the Detent Position 10b = Error Indicator 11b = Not Available
2755	Joystick 3 Y-Axis Detent Position Status	Reports when the current joystick position is in the detent position for that axis of travel. 00b = Not in the Detent Position 01b = In the Detent Position 10b = Error Indicator 11b = Not Available
2756	Joystick 3 Grip X-Axis Detent Position Status	Reports when the current joystick grip position is in the detent position for that axis of travel. 00b = Not in the Detent Position 01b = In the Detent Position 10b = Error Indicator 11b = Not Available
2757	Joystick 3 Grip Y-Axis Detent Position Status	Reports when the current joystick grip position is in the detent position for that axis of travel. 00b = Not in the Detent Position 01b = In the Detent Position 10b = Error Indicator 11b = Not Available
2758	Joystick 3 Theta-Axis Detent Position Status	Reports when the current joystick position is in the detent position for that axis of travel. 00b = Not in the Detent Position 01b = In the Detent Position 10b = Error Indicator 11b = Not Available
2759	Joystick 3 Button 1 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
2760	Joystick 3 Button 2 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
2761	Joystick 3 Button 3 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
2762	Joystick 3 Button 4 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available

2763	Joystick 3 Button 5 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
2764	Joystick 3 Button 6 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
2765	Joystick 3 Button 7 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
2766	Joystick 3 Button 8 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
2767	Joystick 3 Button 9 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
2768	Joystick 3 Button 10 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
2769	Joystick 3 Button 11 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
2770	Joystick 3 Button 12 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
2771	Engine Turbocharger Compressor Bypass Actuator 1 Control	The control module used to control the compressor bypass of the turbocharger.
2772	Engine Turbocharger Compressor Blowoff Actuator 1 Control	The control module used to control the compressor blowoff actuator of the turbocharger.
2773	Engine Fuel Supply Flow Rate	The rate of fuel flowing through a fuel supply line carrying fuel from the fuel tank to the engine.

2774	Engine Fuel Return Flow Rate	The rate of fuel flowing through a fuel return line carrying fuel from the engine back to fuel tank.
2775	Engine Fuel Supply Temperature	The temperature of the fuel flowing through a fuel supply line from the fuel tank to the engine.
2776	Engine Fuel Return Temperature	The temperature of the fuel flowing through a fuel return line from the engine back to the fuel tank.
2777	Number of Fuel Consumption Monitoring Transducers	The number of fuel consumption monitoring transducers installed in the fuel consumption monitoring system.
2778	Engine Idle Fuel Flow Rate Threshold	A configuration value that indicates the maximum flow rate for engine idle operation.
2779	SLI Battery 3 Temperature	Temperature of the third battery or third set of batteries used for starting the engine, for lighting, and for ignition (SLI).The relation to physical location is determined by the equipment manufacturer.
2780	SLI Battery 4 Temperature	Temperature of the fourth battery or fourth set of batteries used for starting the engine, for lighting, and for ignition (SLI).The relation to physical location is determined by the equipment manufacturer.
2781	Engine Secondary Coolant Circuit Coolant Pressure 2	The second instance of pressure in the low temp (secondary circuit) coolant loop. This is in addition to the hight temp tank (primary engine block circuit).See SPN 2981 for the first instance of pressure in the low temp coolant loop.
2782	Engine Secondary Coolant Circuit Coolant Temperature 2	The second instance of temperature of the low temp (secondary circuit) coolant loop. This is in addition to the high temp tank (primary engine block circuit).See SPN 2982 for the first instance of temperature in the low temp coolant loop.

2783	Aftertreatment 1 Gas Oxidation Catalyst Missing	Indicates that the gas oxidation catalyst is missing in exhaust bank 1. SPN will be used with FMI 31 (Condition Exists) to indicate that this device is missing in exhaust bank 1.
2784	Aftertreatment 2 Gas Oxidation Catalyst Missing	Indicates that the gas oxidation catalyst is missing in exhaust bank 2. SPN will be used with FMI 31 (Condition Exists) to indicate that this device is missing in exhaust bank 2.
2785	Aftertreatment 1 Three Way Catalyst Missing	Indicates that the three way catalyst is missing in exhaust bank 1. SPN will be used with FMI 31 (Condition Exists) to indicate that this device is missing in exhaust bank 1.
2786	Aftertreatment 2 Three Way Catalyst Missing	Indicates that the three way catalyst is missing in exhaust bank 2. SPN will be used with FMI 31 (Condition Exists) to indicate that this device is missing in exhaust bank 2.
2789	Engine Turbocharger 1 Calculated Turbine Intake Temperature	Calculated value of turbine intake temperature based on engine operating conditions, such as intake manifold temperature, charge fuel ratio, injection timing, and engine speed. Use SPN 1180 for actual measured intake temperature.
2790	Engine Turbocharger 1 Calculated Turbine Outlet Temperature	Calculated value of turbocharger compressor outlet air temperature. Temperature of air exiting the turbocharger compressor and before entering charge air cooler. The estimate is based on turbo speed and measured turbocharger compressor intake temperature. Use SPN 1184 for actual measured outlet temperature.
2791	Engine Exhaust Gas Recirculation 1 Valve 1 Control 1	Desired percentage of maximum Exhaust Gas Recirculation (EGR) valve 1 opening. 0% means valve is closed. 100% means maximum valve opening (full gas flow).
2792	Engine Variable Geometry Turbocharger (VGT) Air Control Shutoff Valve	Isolates vehicle brake air from the Variable Geometry Turbocharger (VGT) system when engine is not running. This valve prevents vehicle air from bleeding off through the VGT Control Valve when engine is not in use. Primary vehicle air system from air tanks feed the VGT Air Control Shutoff Valve, which in turn provides air to the VGT Control Valve when the key switch is ‘ON’. The VGT Control Valve delivers

		air to the VGT actuator to adjust turbocharger geometry.00b = VGT Air Control Shutoff Valve is Off 01b = VGT Air Control Shutoff Valve is On 10b = Reserved 11b = Not available
2793	Laser Strike Data Latency	Time from laser strike to CAN message transmission. This parameter will be reported by survey receiver type devices only. Byte 3 (SPN 2576) of PGN 65141 identifies the type of Laser Receiver.
2794	Absolute Laser Strike Position	Laser Strike location on the survey type laser receiver.
2795	Engine Variable Geometry Turbocharger (VGT) 1 Actuator Position	Sensor that measures the position of the variable geometry turbocharger actuator. A position of 0% indicates the actuator is in the position creating the smallest geometry turbocharger. A position of 100% represents the largest geometry turbocharger.
2796	Transfer Case Selector Switch	Operator switch to select the condition of the transfer case. States 000b and 001b should be used if the transfer case only functions to switch between 2-wheel and 4-wheel drive. If the transfer case includes a High / Low Range function, states 011b and 100b should be supported as well. For reporting the status of the transfer case, see SPN 3645.000b = 2 wheel high (Normal or 'On Highway' Range) 001b = 4 wheel high (Normal or 'On Highway' Range) 010b = Neutral 011b = 2 wheel low (or 'Off Highway' Range) 100b = 4 wheel low (or 'Off Highway' Range) 101b = Reserved for SAE assignment 110b = Error indicator 111b = Not available
2797	Engine Fuel 1 Injector Group 1	A first collection of fuel injector circuits that are grouped together. Some failure modes in this group can not be isolated to an individual injector.
2798	Engine Fuel 1 Injector Group 2	A second collection of fuel injector circuits that are grouped together. Some failure modes in this group can not be isolated to an individual injector.
2799	Engine Turbocharger 2 Compressor Outlet Temperature	Temperature of the air or air/fuel mixture exiting the turbocharger 2 compressor outlet.

2800	Engine Turbocharger 3 Compressor Outlet Temperature	Temperature of the air or air/fuel mixture exiting the turbocharger 3 compressor outlet.
2801	Engine Turbocharger 4 Compressor Outlet Temperature	Temperature of the air or air/fuel mixture exiting the turbocharger 4 compressor outlet.
2802	Data Memory Usage	The used storage capacity of the data buffer memory internal to an ECU, such as a data logger.
2803	Keep-Alive Battery Consumption	The capacity consumed from the direct battery connection since the key was last turned off. This value is maintained and does not accumulate while the key switch is on. The value is reset to 0 when the key switch is turned to the off position.
2804	FMS-standard Diagnostics Supported	Status signal which indicates if the FMS Vehicle Interface (FMS Gateway) supports the handling of diagnostic messages from the vehicle network onto the FMS network.The FMS gateway does NOT support the re-broadcast of diagnostics messages present on the vehicle network. If this 'FMS-standard Diagnostics Supported' feature is supported by the FMS Gateway, the FMS Gateway will support the requests for diagnostics information (from the FMS device) onto the vehicle network and pass the responses onto the FMS network. Note: This feature of the FMS Gateway is independent of the 'FMS-standard Requests Supported'. The FMS Gateway may support diagnostics without supporting the 'FMS-standard Requests Supported' function, or visa-versa. 00b = Diagnostics Is Not Supported 01b = Diagnostics Is Supported 10b = Reserved 11b = Don't care
2805	FMS-standard Requests Supported	Status signal which indicates if the FMS Vehicle Interface (FMS Gateway) will respond to requests from the FMS device for the PGNs listed in the FMS Interface Specification.This mode is to support FMS gateway devices that only operate in a 'Request' mode. The FMS PGNs may also be broadcast periodically in this mode. The FMS Gateway will NOT support the requests for information not included in the FMS Interface Specification onto the vehicle network. » 00b = On request mode is not supported 01b = On request mode is supported 10b = Reserved 11b = Don't care

2806	FMS-standard SW-version supported.	Information that identifies which issue level of the FMS-standard document the software included in the FMS gateway supports. Four bytes, representing xx.yy type revision level identification.Information to be ASCII equivalent of the numeric revision level of the FMS document, 00.01 to 99.99. The first released version will be 01.00. Note: Byte 2 and byte 3 represents the SW version supported for trucks. Version number in the format ab.cd where Byte 2 represents « a » ASCII and Byte 3 represents « b » ASCII. Byte 4 and byte 5 represents the SW version supported for bus and coaches; version number in the format ab.cd where Byte 4 represents « c » ASCII and Byte 5 represents « d » ASCII.
2807	Engine Fuel Shutoff 2 Control	Control setting for fuel shutoff 2. First instance is SPN 632. For a dual fuel shutoff system, this SPN is representative of the downstream fuel shutoff commanded position. When fuel (gas) is desired at the engine, the fuel shutoff is opened. Otherwise, it is closed.00b = Open (fuel supplied to engine) 01b = Closed (no fuel supplied to engine) 10b = Reserved 11b = Don't care / take no action In addition to communicating desired action of fuel shutoff 2 and its driver status, this new SPN can be used to communicate whether fuel shutoff 2 feedback position (if available) matches the commanded position, through the use of FMIs.
2808	Keypad 1	Keypad associated with controller application.
2809	Engine Air Filter 2 Differential Pressure	Change in engine air system pressure, measured across the second air filter, due to the filter and any accumulation of solid foreign matter on or in the filter.This is for monitoring the air filter on the intake to the second turbocharger. Filter numbering follows the guidelines noted in section Naming Convention For Engine Parameters.
2810	Engine Air Filter 3 Differential Pressure	Change in engine air system pressure, measured across the third air filter, due to the filter and any accumulation of solid foreign matter on or in the filter.This is for monitoring the air filter on the intake to the third turbocharger. Filter numbering follows the guidelines noted in section Naming Convention For Engine Parameters.
2811	Engine Air Filter 4 Differential Pressure	Change in engine air system pressure, measured across the fourth air filter, due to the filter and any accumulation of solid foreign matter on or in the filter.This is for

		monitoring the air filter on the intake to the fourth turbocharger. Filter numbering follows the guidelines noted in section Naming Convention For Engine Parameters.
2812	Engine Overspeed Test	The engine overspeed test signal as measured by the reporting ECM. Engine Overspeed Test is a mechanism to simulate engine overspeed situations, while operating the engine within the engine's safe operating range.State signal which indicates when the overspeed test input to the ECM is being driven. 00b = Engine Overspeed Test Not Active 01b = Engine Overspeed Test Active 10b = Reserved 11b = Not Available
2813	Engine Air Shutoff Command Status	State signal which indicates when the Air Shutoff driver output is being driven. Disabled means controller wants air flowing to the engine. Status of the airflow shutoff as being commanded by the ECU.00b = Air Shutoff Disabled, not attempting to shutoff engine air supply 01b = Air Shutoff Enabled, attempting to shutoff engine air supply 10b = Reserved 11b = Not Available
2814	Engine Alarm Output Command Status	State signal which indicates when the Alarm driver output is being driven. Not active means the Controller has no alarm level conditions.00b = Engine Alarm Output Command Not Active 01b = Engine Alarm Output Command Active 10b = Reserved 11b = Not Available
2815	Engine Alarm Acknowledge	The Engine Alarm Acknowledge Input signal as measured by the reporting ECU. The Engine Alarm Acknowledge is a mechanism for external acknowledgement of the SPN 2814, Engine Alarm Output Command.00b = Engine Alarm Acknowledge Not Active 01b = Engine Alarm Acknowledge Active 10b = Error 11b = Not Available
2816	Simultaneous Upshift and Downshift	Simultaneous upshift and downshift request being indicated. Both gear upshift and downshift are being indicated concurrently.
2817	Operator Using Clutch Pedal During Non-Recoverable Clutch Fault	The operator is still trying to use the clutch pedal even though a fault with the clutch system was already reported.

2818	Operators Rear PTO Switch On with Operator Not Present	The operators Rear PTO ON/OFF switch is on with the operator presence detection indicating the operator is NOT present.
2819	Park Interlock Error	A park interlock is not as expected by a controlling system.
2820	Operator Not Present During Reverser Command	The operators reverser control has changed with the operator presence detection indicating the operator is NOT present.
2821	Reverser Lever Neutral and Power Signals Conflict	There is a conflict between the Neutral and Neutral Power Interlock switches within the reverser lever. The reverser lever is an operator direction control lever that is mounted separately from the shift lever/controls but still operable from the normal operators station.
2822	Reverser Lever Neither Forward or Reverse	Neither Forward or Reverse Switch indicated by Reverser Lever. The reverser lever is an operator direction control lever that is mounted separately from the shift lever/controls but still operable from the normal operators station.
2823	Reverser Lever Simultaneous Forward and Reverse	Forward and Reverse Switches are indicated concurrently by the reverser lever. The reverser lever is an operator direction control lever that is mounted separately from the shift lever/controls but still operable from the normal operators station.
2824	Reverser Lever Motion Interlock Conflict	Two Interlocking switches within the reverser lever are conflicting while the lever is moving.
2825	Reverser Lever	Reverser Lever is an operator direction control lever that is mounted separately from the shift lever/controls but still operable from the normal operators station. This may contain park and/or neutral as well as direction.
2826	Reverser Lever Multiple Switch Conflicts	Multiple switches within the reverser lever are conflicting. The reverser lever is an operator direction control lever that is mounted separately from the shift lever/controls but still operable from the normal operators station.
2827	Power Up Without Neutral	Controller has powered-up to find shift lever/control not in either park or neutral.

2828	Reverser Lever In Power Zero/Direction Transition Too Long	The transition time between the Neutral Power Interlock and the Direction switches on a Reverser Lever was too long. The reverser lever is an operator direction control lever that is mounted separately from the shift lever/controls but still operable from the normal operators station.
2829	Reverser Lever in Neutral/Park Transition Too Long	The transition time between Neutral and Park on a Reverser Lever was too long. The reverser lever is an operator direction control lever that is mounted separately from the shift lever/controls but still operable from the normal operators station.
2830	Reversing Ratio Rationality Fault	The ratio between the operator entered speed set point values for forward and reverse is incorrect/not possible.
2831	No Carrier Speed at Start-up	The speed of the first identified carrier within a transmission was not detected following engine start.
2832	Operator Not in Operating Station	The Operator Presence Detection System indicates the operator is not in the correct operating station.
2833	Motion with Park Brake Engaged	Unexpected motion with Park Brake engaged.
2834	No Hydrostatic Unit Speed at Start-up	Rotation of the hydrostatic unit was not detected following engine start.
2835	Neutral to Gear Command Conflict	During neutral to Gear movement of the shift controls,improper switch transitions were detected.
2836	Battery 1 Potential 2 (Voltage), Switched (Obsolete)	Electrical potential of the second circuit powered by the primary battery (battery 1) as measured at the input of the electronic control unit supplied through a switching device.This SPN is obsolete. Use SPN 158, 168 or 444. SPN 158 is only used if you know that this is controlled by the key switch.
2837	Identity Number	See document J1939-81 for SPN details.

2838	Manufacturer Code	See document J1939-81 for SPN details.
2839	Function Instance	See document J1939-81 for SPN details.
2840	ECU Instance	See document J1939-81 for SPN details.
2841	Function	See document J1939-81 for SPN details.
2842	Vehicle System	See document J1939-81 for SPN details.
2843	Vehicle System Instance	See document J1939-81 for SPN details.
2844	Arbitrary Address Capable	See document J1939-81 for SPN details.
2845	NAME of Working Set Member	See document ISO 11783 for SPN details.
2846	Industry Group	See document J1939-81 for SPN details.
2847	Address Assignment (new source address)	See document J1939-81 for SPN details.
2848	NAME of Controller Application (for address claimed)	See document J1939-81 for SPN details.
2849	NAME of Commanded Address Target	See document J1939-81 for SPN details.
2850	Communications Antenna	A failure in the antenna system of a communications unit.
2851	Communications Service Personal Identification Number	The Personal Identification Number (PIN) is incorrect or has been blocked.

2852	Communications Service Subscriber Identification Module	The hardware key, know as a Subscriber Identification Module (SIM), is either missing or incorrect.
2853	Communications Connection	A communications unit has established connection but no data exchanged has occurred (no other knowledge of why).
2854	Communications Carrier	The communications unit has suffered carrier loss.
2855	Communications Bit Error Rate	The data failure rate is too high for communications to keep working at the specified error rate within the specific communications unit in use.
2856	Communications Data Upload	A failure has occurred while sending data using a communications unit from the mobile machine to the fixed base.
2857	Communications Data Download	A failure has occurred while sending data using a communications unit from the fixed base to the mobile machine.
2858	Machine Data Configuration 1	There is a problem involving the parameter list (along with the parameter locating information) for the data structure for configuring operations within the Controller Application being communicated with.
2859	Machine Data Configuration 2	There is a problem involving one (or more) of the PGN(s) within the parameter list for the data structure for configuring operations within the Controller Application being communicated with.
2860	Machine Data Configuration 3	There is a problem involving the first output control list for the data structure for configuring operations within the Controller Application being communicated with.
2861	Machine Data Configuration 4	There is a problem involving the second output control list for the data structure for configuring operations within the Controller Application being communicated with.

2862	Machine Data Configuration 5	There is a problem involving the third output control list for the data structure for configuring operations within the Controller Application being communicated with.
2863	Front Operator Wiper Switch	State of operation selected by operator switch for the Wiper in front of the operator position. This parameter, 'Front Operator Wiper Switch' should be used for the control information if either of the other wiper switch parameters is 'Not Available' and the associated wiper still needs to be controlled.0000b = Off 0001b = Low 0010b = Medium 0011b = High 0100b = Delayed 1 (used for the first delay choice when the wiper switch position controls the delay) 0101b = Delayed 2 (used for the second delay choice when the wiper switch position controls the delay) 0110b = Mist (position where external sensor controls wiper rate) 0111b to 1110b = Reserved 1111b = Not available (do not change)
2864	Front Non-operator Wiper Switch	State of operation selected by operator switch for the front wiper not in front of the operator position. The parameter, 'Front Operator Washer Switch' should be used for the control information if this parameter is 'Not Available' and the associated washer still needs to be controlled.0000b = Off 0001b = Low 0010b = Medium 0011b = High 0100b = Delayed 1 (used for the first delay choice when the wiper switch position controls the delay) 0101b = Delayed 2 (used for the second delay choice when the wiper switch position controls the delay) 0110b = Mist (position where external sensor controls wiper rate) 0111b to 1110b = Reserved 1111b = Not available (do not change)
2865	Rear Wiper Switch	State of operation selected by operator switch for the rear wiper. The parameter, 'Front Operator Washer Switch' should be used for the control information if this parameter is 'Not Available' and the associated washer still needs to be controlled.0000b = Off 0001b = Low 0010b = Medium 0011b = High 0100b = Delayed 1 (used for the first delay choice when the wiper switch position controls the delay) 0101b = Delayed 2 (used for the second delay choice when the wiper switch position controls the delay) 0110b = Mist (position where external sensor controls wiper rate) 0111b to 1110b = Reserved 1111b = Not available (do not change)

2866	Front Operator Washer Switch	State of operation selected by operator switch for the washer in front of the operator position. This parameter, ‘Front Operator Washer Switch’ should be used for the control information if either of the other washer switch parameters is ‘Not Available’ and the associated washer still needs to be controlled.000b = Off 001b = Low 010b = Medium 011b = High 100b to 110b = Reserved 111b = Not available (do not change)
2867	Front Non-operator Washer Switch	State of operation selected by operator switch for the front washer not in front of the operator position. The parameter, ‘Front Operator Washer Switch’ should be used for the control information if this parameter is ‘Not Available’ and the associated washer still needs to be controlled.000b = Off 001b = Low 010b = Medium 011b = High 100b to 110b = Reserved 111b = Not available (do not change)
2868	Rear Washer Function	State of operation selected by operator switch for the rear washer. The parameter, ‘Front Operator Washer Switch’ should be used for the control information if this parameter is ‘Not Available’ and the associated washer still needs to be controlled.000b = Off 001b = Low 010b = Medium 011b = High 100b to 110b = Reserved 111b = Not available (do not change)
2869	Front Operator Wiper Delay Control	Time between cycles of the front operator side wiper (i.e. from end of cycle ‘n’ to start of cycle ‘n+1’) as selected by the operator control (switch, etc.) in percentage of position with maximum position corresponding to maximum delay selectable. This parameter, ‘Front Operator Wiper Delay Control’ should be used for the delay information if either of the other delay parameters is ‘Not Available’ and the function needs to be provided.
2870	Front Non-operator Wiper Delay Control	Time between cycles of the front non-operator side wiper (i.e. from end of cycle ‘n’ to start of cycle ‘n+1’) as selected by the operator control (switch, etc.) in percentage of position with maximum position corresponding to maximum delay selectable. The parameter, ‘Front Operator Wiper Delay Control’ should be used for the delay information if this parameter is ‘Not Available’ and the function needs to be provided.

2871	Rear Wiper Delay Control	Time between cycles of the rear wiper (i.e. from end of cycle ‘n’ to start of cycle ‘n+1’) as selected by the operator control (switch, etc.) in percentage of position with maximum position corresponding to maximum delay selectable. The parameter, ‘Front Operator Wiper Delay Control’ should be used for the delay information if this parameter is ‘Not Available’ and the function needs to be provided.
2872	Main Light Switch	A 4 bit parameter to indicate the selected position of the operator’s main light switch. 0000b = Off – The position by which the operator selects that none of the lamps are to be on. 0001b = Park On – The position by which the operator selects that the park lamps are to be on. 0010b = Headlight On – The position by which the operator selects that the headlamps are to be on. 0011b = Headlight and Park On – The position by which the operator selects that Both the Headlamps and the Park lamps are to be on. 0100b = Automatic Lights – The position by which the operator selects that the Headlamps and Park Lamps turn on and off due to outside ambient light conditions 0101b = Reserved 0110b = Reserved 0111b = Reserved 1000b = Delayed Off – The position by which the operator selects that a certain set of lamps are to come On and then are to be turned Off following a delay time (Operators Desired – Delayed Lamp Off Time). 1001b = Reserved 1010b = Reserved 1011b = Reserved 1100b = Reserved 1101b = Reserved 1110b = Error 1111b = Not available (do not change)
2873	Work Light Switch	A 4 bit parameter to indicate the selected position of the operator’s work light switch. In Ag applications the work lights are often refereed to as field lights. In on-highway applications the work lights are often referred to as clearance lights and may or may not be operated by a switch separate from the main light switch. 0000b = Off – The position by which the operator selects that none of the work lamps are to be on. 0001b = Work Light Combination #1 On – The position by which the operator selects that the lamps in the combination defined as Work Light Combination #1 are to be on. 0010b = Work Light Combination #2 On – The position by which the operator selects that the lamps in the combination defined as Work Light Combination #2 are to be on. 0011b = Work Light Combination #3 On – The position by which the operator selects that the lamps in the combination defined as Work Light Combination #3 are to be on. 0100b = Work Light Combination #4 On – The position

		by which the operator selects that the lamps in the combination defined as Work Light Combination #4 are to be on. 0101b to 1101b = Reserved 1110b = Error 1111b = Not available (do not change)
2874	High-Low Beam Switch	A 2 bit parameter to indicate the selected position of the operator's high/low beam select switch. 00b = Low Beam Selected 01b = High Beam Selected 10b = Error 11b = Not available (do not change)
2875	Hazard Light Switch	A 2 bit parameter to indicate the selected position of the operator's hazard light switch. 00b = Hazard Lamps to be Off 01b = Hazard Lamps to be Flashing 10b = Error 11b = Not available (do not change)
2876	Turn Signal Switch	A 4 bit parameter to indicate the selected position of the operator's turn signal switch. 0000b = No Turn being signaled 0001b = Left Turn to be Flashing 0010b = Right turn to be Flashing 0011b to 1101b = Reserved 1110b = Error (to include both left and right selected simultaneously) 1111b = Not available (do not change)
2877	Operators Desired – Delayed Lamp Off Time	A 16 bit parameter to be associated with Delayed Off position (1000b) of the Main Light Switch. This parameter indicates the time the operator wishes to have elapse following the Main Light switch being placed in Delayed Off position before the defined lights turn back off. The Operator's definition as to which lamps are to turn On (and then Off of course) when the Main Light Switch is in the Delayed Off position. The specific lamps are not identified within this message, but are to be stored by whatever device (ecu) is planning to send the lamp command message for said lamps. Said device must also provide the means for the operator to enter and/or adjust said definition.
2878	Operators Desired Back-light	A 8 bit parameter to indicate the level of back lighting the operator has selected for displays. This is to be differentiated from the Illumination Brightness Percent (SPN:1487 PGN:53248 Cab Illumination Message) which is sent to the displays to tell them what level to be at. This is the operator desired level (as sensed by operator controls) for those system where the operator controls are monitored by an ecu separate from the ecu sending the command to the displays. Note each display (if

		appropriate) will need to have its own balance function to compensate its nominal brightness to the same level of that of all other displays. This is especially important for systems with back-lights which may change noticeable with aging. In other words it will be necessary within a vehicle to scale all of the displays down to the same level as the dimmest display (since, obviously you can not make the dimmest brighter).
2879	Engine Droop Accelerator 2 Select	In some off-highway applications it may be desirable to have multiple droop settings available across the range of engine operation. For example, in an agricultural tractor application, this functionality allows a higher engine speed during low load so as to maximize vehicle speed driven between fields on the road. Another use of the droop settings would be to provide functionality for maintaining an engine speed independent of the applied load on demand. There is a normal droop setting, and up to 13 additional preprogrammed droop settings which are user selectable by switching. The selections apply to Accelerator 2.0000b = Normal Droop Setting is selected 0001b to 1101b = One of Droop Setting 1 through 13 (in sequential order) is selected 1110b = Error condition 1111b = Not available
2880	Engine Operator Primary Intermediate Speed Select	Allows the operator to select one of 13 preprogrammed Intermediate Speed Control settings. If no speed setting is requested, the engine operates normally. The Intermediate Speed Control is widely used in the Industrial application to control the engine to an intermediate speed setting which can either replace the accelerator position control altogether, or limit the accelerator position control to a selectable speed point minimum or maximum.0000b = indicates that the ISC functionality is not requested, engine operates normally 0001b to 1101b = indicates that the ISC Setting 1 thru 13 (in sequential order) is selected 1110b = error condition 1111b = not available
2881	Engine Droop Accelerator 1 Select	In some off-highway applications it may be desirable to have multiple droop settings available across the range of engine operation. For example, in an agricultural tractor application, this functionality allows a higher engine speed during low load so as to maximize vehicle speed driven between fields on the road. Another use of the droop settings would be to provide functionality for maintaining an engine speed independent of the applied load on demand. There is a normal droop setting, and up to 13 additional preprogrammed droop settings which are user selectable by

		switching. The selections apply to Accelerator 1.0000b = Normal Droop Setting is selected 0001b to 1101b = One of Droop Setting 1 through 13 (in sequential order) is selected 1110b = Error condition 1111b = Not available
2882	Engine Alternate Rating Select	In some off-highway applications it may be desirable to have multiple engine ratings available for selection by the operator. There is the default engine rating, which provides the maximum available power across the range of operation. There are additional engine ratings which the user can select that allow for alternate fueling across the operational range. Engine rating selection number 0 is the maximum rating. Selection number 1 is the next highest, selection 2 next highest, etc. The selection impacts the operating points in the Engine Configuration.0 = indicates that Maximum Power Fueling is selected 1 = indicates that the Alternate Power Fueling 1 is selected 2 = indicates that the Alternate Power Fueling 2 is selected 3 = indicates that the Alternate Power Fueling 3 is selected 4 to 253 = indicates that the Alternate Power Fueling 4 thru 253 (in sequential order) is selected. 254 = Error condition. 255 = Not available
2883	Engine Alternate Low Idle Switch	Operator switch which selects between two low idle speeds, default and alternate. The normal programmed low idle is the default low idle, and when the Alternate Low Idle switch is activated, a alternate preprogrammed low idle speed is selected. The accelerator position control operates as normal but is now bounded to a different low idle speed. This selection impacts Point 1 on the Engine Configuration. 00b = Default low idle point is selected 01b = Alternate low idle point is selected 10b = Error 11b = Not available or Unused
2884	Engine Auxiliary Governor Switch	This is the On/Off operation of the Auxiliary Governor feature switch. This feature is used to allow engine speed to be controlled by an auxiliary input such as pressure or tailshaft speed. This switch position indicates whether this feature is requested or not.00b = Auxiliary Governor is disabled 01b = Auxiliary Governor is enabled 10b = Error condition 11b = Not available
2885	Engine Droop Auxiliary Input Select	In some off-highway applications it may be desirable to have multiple droop settings available across the range of engine operation. For example, in an agricultural tractor

		application, this functionality allows a higher engine speed during low load so as to maximize vehicle speed driven between fields on the road. Another use of the alternate droop settings would be to provide functionality for maintaining an engine speed independent of the applied load on demand. There is a normal droop setting, and up to 13 additional preprogrammed droop settings which are user selectable by switching. The selections apply to the engine droop auxiliary input.0000b = Normal Droop Setting is selected 0001b to 1101b = One of Droop Setting 1 through 13 (in sequential order) is selected 1110b = Error condition 1111b = Not available
2886	Engine Droop Remote Accelerator Select	In some off-highway applications it may be desirable to have multiple droop settings available across the range of engine operation. For example, in an agricultural tractor application, this functionality allows a higher engine speed during low load so as to maximize vehicle speed driven between fields on the road. Another use of the alternate droop settings would be to provide functionality for maintaining an engine speed independent of the applied load on demand. There is a normal droop setting, and up to 13 additional preprogrammed droop settings which are user selectable by switching. The selections apply to the remote accelerator.0000b = Normal Droop Setting is selected 0001b to 1101b = One of Droop Setting 1 through 13 (in sequential order) is selected 1110b = Error condition 1111b = Not available
2887	Total Count of Configuration Changes Made	Total number of times changes have been made to any of the configurable parameters.
2888	Engine Alternate Rating Select State	This parameter reflects the control state that has been achieved based on the input from the SPN 2882. In some off-highway applications it may be desirable to have multiple engine ratings available for selection by the operator. There is the default engine rating, which provides the maximum available power across the range of operation. There are additional engine ratings which the engine controller may use that allow for alternate fueling across the operational range. Engine rating number 1 is the maximum rating. Rating number 2 is the next highest, rating 3 next highest, etc.00h = Control state is Maximum Power Fueling 01h = Control state is Alternate Power Fueling 1 02h = Control state is Alternate Power Fueling 2 03h = Control state

		is Alternate Power Fueling 3 04h to FDh = Control state is Alternate Power Fueling 4 thru 253 (in sequential order) FEh = SAE reserved FFh = Not available
2889	Engine Droop Accelerator 1 Select State	In some off-highway applications it may be desirable to have multiple droop settings available across the range of engine operation. For example, in an agricultural tractor application, this functionality allows a higher engine speed during low load so as to maximize vehicle speed driven between fields on the road. Another use of the alternate droop settings would be to provide functionality for maintaining an engine speed independent of the applied load on demand. There is a normal droop setting, and up to 13 additional preprogrammed droop settings which are user selectable by switching. The selections may apply to Accelerator 1. This parameter indicates which state has been selected by the controlling ECM.0000b = Control state is Normal Droop Setting 0001b to 1101b = Control state is one of Droop Setting 1 through 13 (in sequential order) 1110b = SAE reserved 1111b = Not available
2890	Engine Multi-Unit Sync State	This feature is widely used in Industry to operate multiple engines from a single command source. A master engine will « synchronize » one or more slave engines to operate at the same speed. This feature is requested by an operator switch, this parameter indictes the state of the feature as determined by the controlling ECM.00b = Control State is Functionality disabled (off) 01b = Control State is Functionality enabled (on) 10b = SAE reserved 11b = Not available
2891	Engine Alternate Low Idle Select State	In many applications, it is desirable that an alternate low idle speed setting be made available via switch input. The normal programmed low idle is the default low idle, and when the Alternate Low Idle feature is activated, an alternate preprogrammed low idle speed is selected. The accelerator position control operates as normal but is now bounded to a different low idle speed. This selection impacts Point 1 on the Engine Configuration.00b = Normal idle state 01b = Alternate idle state 10b = SAE reserved 11b = not available
2892	Engine Operator Primary Intermediate Speed Select State	13 preprogrammed intermediate speed control settings are available for the controlling ECM to select. If no speed setting is requested, the engine operates normally. The Intermediate Speed Control is widely used in the Industrial application

		to control the engine to an intermediate speed setting which can either replace the accelerator position control altogether, or limit the accelerator position control to a selectable speed point minimum or maximum. This parameter indicates which state has been selected by the controlling ECM.0000b = Control state is ISC functionality is not requested, engine operates normally 0001b to 1101b = Control state is ISC Setting 1 thru 13 (in sequential order) 1110b = SAE reserved 1111b = not available
2893	Engine Alternate Droop Accelerator 2 Select State	In some off-highway applications it may be desirable to have multiple droop settings available across the range of engine operation. For example, in an agricultural tractor application, this functionality allows a higher engine speed during low load so as to maximize vehicle speed driven between fields on the road. Another use of the alternate droop settings would be to provide functionality for maintaining an engine speed independent of the applied load on demand. There is a normal droop setting, and up to 13 additional preprogrammed droop settings which are user selectable by switching. The selections apply to Accelerator 2.0000b = Control's state is Normal Droop Setting 0001b to 1101b = Control's state is One of Alternate Droop Setting 1 through 13 (in sequential order) 1110b = SAE reserved 1111b = Not available
2894	Engine Droop Remote Accelerator Select State	In some off-highway applications it may be desirable to have multiple droop settings available across the range of engine operation. For example, in an agricultural tractor application, this functionality allows a higher engine speed during low load so as to maximize vehicle speed driven between fields on the road. Another use of the alternate droop settings would be to provide functionality for maintaining an engine speed independent of the applied load on demand. There is a normal droop setting, and up to 13 additional preprogrammed droop settings which are user selectable by switching. The selections apply to Remote Accelerator.0000b = Control state is Normal Droop Setting 0001b to 1101b = Control state is One of Droop Setting 1 through 13 (in sequential order) 1110b = SAE reserved 1111b = Not available
2895	Engine Droop Auxiliary Input Select State	In some off-highway applications it may be desirable to have multiple droop settings available across the range of engine operation. For example, in an agricultural tractor application, this functionality allows a higher engine speed during low load so as to maximize vehicle speed driven between fields on the road. Another use of the

		alternate droop settings would be to provide functionality for maintaining an engine speed independent of the applied load on demand. There is a normal droop setting, and up to 13 additional preprogrammed droop settings which are user selectable by switching. The selections apply to Auxiliary Input.0000b = Control state is Normal Droop Setting 0001b to 1101b = Control state is One of Droop Setting 1 through 13 (in sequential order) 1110b = SAE reserved 1111b = Not available
2896	Engine Auxiliary Governor State	This is the Engine Auxiliary Governor feature. This feature is used to allow engine speed to be controlled by an auxiliary input such as pressure or tailshaft speed. This feature is requested by an operator switch, this parameter indicates the state of the feature as determined by the controlling ECM.00b = Control State is Auxiliary Governor disabled 01b = Control State is Auxiliary Governor enabled 10b = SAE reserved 11b = Not available
2897	Operator Engine PTO Governor Memory Select Switch	Measured state of the operator's engine PTO governor memory select switch. This switch selects which of the two available memory locations is to be used to store the dynamically assigned value. This speed will be set using the PTO governor set switch and modified using the PTO governor accelerate and coast/decelerate switches.00b = PTO set speed memory 1 selected 01b = PTO set speed memory 2 selected 10b = error 11b = not available
2898	Engine Start Enable Device 2 Configuration	The start enable device installed for start enable device 2. 0000b = no start enable device 2 installed 0001b = glow plugs installed 0010b = fuelled start installed 0011b = ether injection installed 0100b = electric intake air heater installed 0101b to 1110b = reserved 1111b = not available
2899	Engine Start Enable Device 1 Configuration	The start enable device installed for start enable device 1. 0000b = no start enable device 1 installed 0001b = glow plugs installed 0010b = fuelled start installed 0011b = ether injection installed 0100b = electric intake air heater installed 0101b to 1110b = reserved 1111b = not available
2900	Transmission Engine Crank Enable	State signal from the transmission indicating if the transmission's status is such that engine cranking is allowed (i.e. at a minimum, transmission is in neutral and the

		driveline is disengaged). As sender of this information, the transmission is responsible for correct indication immediately upon first broadcast of this parameter.As with hard-wired neutral start implementations, those utilizing this parameter should consider the impact of the transmission or other controllers 'resetting' due to voltage drops during the engine start sequence. The vehicle system design should also consider the impact of timing latency in the engine starting sequence. For example, the turn of an ignition key from 'off' to 'start' may happen more quickly than the transmission controller can boot up, determine its' current state of being, and begin broadcasting information over the J1939 datalink. 00b = Cranking disabled; engine cranking is prohibited by the transmission 01b = Cranking enabled; engine cranking is allowed by the transmission 10b = Error 11b = Not available
2901	ECU Part Number	The part number of the physical ECU.
2902	ECU Serial Number	The serial number of the physical ECU.
2903	ECU Location	The location of the ECU within a network.
2904	ECU Type	The type of ECU. One example of a use of the ECU type could be for classifying ECU capabilities, such as I/O.
2905	Transmission Range Clutch C7 Solenoid	Transmission range clutch #C7 solenoid
2906	Transmission Range Clutch C8 Solenoid	Transmission range clutch #C8 solenoid
2907	Transmission Axle Disconnect Clutch Valve Actuator	The axle disconnect clutch disconnects the front axle from the transmission. It is located within the transmission housing.
2908	Transmission Boost Pressure Valve Actuator	The solenoid which controls source/main pressure for the clutch control valves, relieving excess flow.

2909	Torque Converter Modulating Clutch Valve Actuator	The torque converter modulating clutch limits torque to converter circuit and transmission. It is located between the engine and transmission.
2910	Transmission PTO Clutch Valve Actuator	Transmission PTO clutch valve actuator controls the on/off condition of PTO Clutch Valve.
2911	Halt brake switch	Switch signal which indicates the position of the halt brake switch. 00b = Halt brake switch passive 01b = Halt brake switch active 10b = Error 11b = Not available
2912	Hill holder mode	Signal which indicates the current mode of the hill holder function. 000b = Inactive 001b = Active 010b = Active, but will change to inactive in a short time. (This mode may be used to warn the driver) 011b = Active, but may activate parking brake if needed. 100b = Reserved 101b = Reserved 110b = Hill holder not functional 111b = Not available
2913	Halt brake mode	Signal which indicates the current mode of the halt brake function. 000b = Inactive 001b = Active 010b = Active, but not functioning properly. (This mode may be used to warn the driver) 011b to 101b = Not defined 110b = Halt brake not functional 111b = Not available
2914	XBR EBI Mode	The XBR EBI (Endurance Brake Integration) Mode is used as an input for the brake system to prescribe the use of endurance brakes like retarders or engine brakes.00b = No Endurance Brake Integration allowed The demanded acceleration must be realized by the brake system by using only the foundation brakes. During an active XBR request, the brake system must not actively demand brake torque from other braking devices like retarders or engine brakes. 01b = Only Endurance Brakes allowed The demanded acceleration must be realized by the brake system by demanding brake torque from other brake devices like retarders or engine brakes. The foundation brake itself must not be used (e.g. to reduce brake lining wear). 10b = Endurance Brake Integration allowed The demanded acceleration may be realized by the brake system by using the foundation brakes and/or by demanding brake torque from other brake devices like retarders or engine brakes. 11b = Not defined

2915	XBR Priority	The XBR Priority is used as an input to the brake system to manage the priority of overlapping external and internal requests.00b = Highest priority – used for emergency situations, e.g. for future Collision Avoidance System. This mode overrides any brake protection measures of the brake system. 01b = High priority – not defined 10b = Medium priority – used for ACC-Systems. This mode does not override brake protection measures of the brake system. 11b = Low priority – used in « override disabled » XBR Control Mode
2916	XBR Control Mode	The XBR Control Mode is used as an input to the brake system and defines how the external acceleration demand has to be realized.00b = Override disabled – Disable any existing control commanded by the source of this command. 01b = Acceleration control with addition mode – Add the XBR acceleration demand to the driver's acceleration demand. 10b = Acceleration control with maximum mode – Execute the XBR acceleration demand if it is higher than the driver's acceleration demand. 11b = Not defined
2917	XBR System State	This parameter indicates which external brake control is allowed. 00b = Any external brake demand will be accepted (brake system fully operational) 01b = Only external brake demand of highest XBR Priority (00b) will be accepted (e.g. because the temperature limit of the brake system is exceeded) 10b = No external brake demand will be accepted (e.g. because of fault in brake system) 11b = not available
2918	XBR Active Control Mode	This parameter indicates which XBR Control Mode is executed by the brake system. 0000b = No brake demand being executed (default mode) 0001b = Driver's brake demand being executed, no external brake demand 0010b = Addition mode of XBR acceleration control being executed 0011b = Maximum mode of XBR acceleration control being executed 0100b to 1110b = Reserved for SAE assignment 1111b = Not available
2919	Foundation Brake Use	This parameter indicates if the brake system presently uses the foundation brakes. 00b = Foundation brakes not in use 01b = Foundation brakes in use 10b = Reserved 11b = Not available

2920	External Acceleration Demand	Parameter provided to the brake system from external sources. This is the acceleration which the brake system is expected to realize. It is specified as an absolute acceleration in reference to the road. Positive values lead to increasing vehicle speed, negative values lead to decreasing vehicle speed. Note: Normally only the negative data range is used, but e.g. in case of downhill driving also positive values are possible.
2921	XBR Acceleration Limit	The brake system may temporarily or generally limit the maximum brake performance available for external systems. A temporary limit may be nessary due to high brake temperature; a general limit may be defined by the vehicle manufacturer, e.g. a value of -2.5 m/s^2 due to liability reasons. The actual limit is communicated to the external systems that request braking. The limit is only effective in the XBR Priorities 01b to 11b. It is specified as an absolute acceleration in reference to the road.
2922	Steerable Lift Axle Lowering Inhibit	A signal which indicates if lowering of lifted axle is allowed or inhibited. 00b = Lowering allowed 01b = Lowering inhibited 10b = Reserved 11b = Not available
2923	Status of Steering Axle	A signal which indicates different states of the steering axle 0000b = Axle steering not active (adhesion steering) 0001b = Axle steering active 0010b = Axle centered 0011b = Axle centered, because of an error 0100b = Axle not active because of an error (adhesion steering) 0101b = Axle steering in special mode (diagnosis, calibration mode) 0110b to 1110b = Reserved for SAE Assignment 1111b = Not available
2924	Steering Type	Indicates the different types of steering systems (ref. ECE Regulation 79 paragraph 2.5) 0000b = Main steering system 0001b = Auxiliary steering equipment 0010b to 1110b = Reserved for Assignment by SAE 1111b = Not Available 0000b Main steering system – The steering equipment of a vehicle which is mainly responsible for determining the direction of travel. 0001b Auxiliary steering equipment – A system in which the wheels on axle(s) of vehicles of categories M and N are steered in addition to the wheels of the main steering equipment in the same or opposite direction to

		those of the main steering equipment and/or the steering angle of the front and/or the rear wheels may be adjusted relative to vehicle behaviour.
2925	Type of Steering Forces	Type of Steering Forces (Ref. ECE Regulation 79 paragraph 2.5) 0000b = Manual steering equipment 0001b = Power assisted steering equipment 0010b = Full power steering equipment 0011b = Self tracking steering equipment 0100b to 1110b = Reserved for SAE assignment 1111b = Not Available 0000b Manual steering equipment – The steering forces result solely from the muscular effort of the driver. 0001b Power assisted steering equipment – The steering forces result from both the muscular effort of the driver and the energy supply or supplies. 0010b Full power steering equipment – The steering forces are provided solely by one or more energy supplies. 0011b Self tracking steering equipment – A system designed to create a change of steering angle on one or more wheels only when acted upon by forces and/or moments applied through the tire to road contact.
2926	Type of Steering Transmission	Type of Steering Transmission (Ref. ECE Regulation 79 paragraph 2.6) 0000b = Purely mechanical steering transmission 0001b = Purely hydraulic steering transmission 0010b = Purely electric steering transmission 0011b = Hybrid steering transmission 0100b to 1110b = Reserved for SAE assignment 1111b = Not available 0000b Purely mechanical steering transmission – A steering transmission in which the steering forces are transmitted entirely by mechanical means. 0001b Purely hydraulic steering transmission – A steering transmission in which the steering forces, somewhere in the transmission, are transmitted only by hydraulic means. 0010b Purely electric steering transmission – A steering transmission in which the steering forces, somewhere in the transmission, are transmitted only through electric means. 0011b Hybrid steering transmission – A steering transmission in which part of the steering forces is transmitted through one and the other part through another of the above mentioned means. However, in the case where any mechanical part of the transmission is designed only to give position feedback and is too weak to transmit the total sum of the steering forces, this system shall be considered to be purely hydraulic or purely electric steering transmission.

2927	Actual Inner wheel steering angle	Signal which indicates the actual inner wheel steering angle. The steering angle is the angle of wheel turn relative to the vehicle x-axis (yaw angle of inner wheel). See Figure SPN2927_A for explanation of positive and negative angles. This parameter is defined according to a Z-Down axis system and the sign of the value is in accordance to the right-hand rule, as specified in SAE J670. As specified in SAE J670, a Z-Down Axis System has positive X directed forward, positive Y to the right, and positive Z directed down.
2928	Axle Location	To identify to which of several similar devices (such as tires or fuel tanks) the information applies. The low order 4 bits represent a position number, counting left to right when facing in the direction of normal vehicle travel (forward). The high order 4 bits represent a position number, counting front to back on the vehicle. The value FFh indicates not available. It is recommended that output devices add 1 to the position number (range 1 to 15, not 0 to 14) for use by drivers and service technicians. Examples: Tire pressure for location 00h would be left front tire. Tire pressure for location 23h would be right outside rear rear on a 3-axle tractor with dual axle per side (3rd axle, 4th tire).
2930	Hydraulic Brake System Audible Warning Command	Signal which commands an audible warning by the hydraulic braking system. 00b = Audible warning off 01b = Audible warning on 10b = Reserved 11b = Don’t care
2931	Hydraulic Brake Fluid Level Switch	Signal which indicates whether the hydraulic fluid level in the reservoir(s) is sufficient. 00b = Fluid level is not sufficient 01b = Fluid level is sufficient 10b = Error indicator 11b = Not available
2932	Valve State	See document ISO 11783-7 for SPN details.
2933	Valve State Command	See document ISO 11783-7 for SPN details.
2934	Valve Fail Safe Mode	See document ISO 11783-7 for SPN details.
2935	Valve Fail Safe Mode Command	See document ISO 11783-7 for SPN details.

2936	General Purpose Valve Number	See document ISO 11783-7 for SPN details.
2937	Extend Port Measured Flow	See document ISO 11783-7 for SPN details.
2938	Retract Port Measured Flow	See document ISO 11783-7 for SPN details.
2939	Extend Port Estimated Flow	See document ISO 11783-7 for SPN details.
2940	Retract Port Estimated Flow	See document ISO 11783-7 for SPN details.
2941	Extend Port Pressure	See document ISO 11783-7 for SPN details.
2942	Retract Port Pressure	See document ISO 11783-7 for SPN details.
2943	Return Port Pressure	See document ISO 11783-7 for SPN details.
2944	Port Flow Command	See document ISO 11783-7 for SPN details.
2945	Active Shift Console Indicator	Signal from transmission control unit indicating which shift console (primary or secondary) it currently considers as the active shift selector input.00b = Primary shift console is active 01b = Secondary shift console is active 10b = Reserved 11b = Not available Note: In some applications such as refuse trucks, the transmission can be operated from two positions in the vehicle. The transmission control unit will accept changes in transmission requested gear (SPN 525) from the operator only from the active shift console. The transmission control unit determines which shift console is active based on a switch input controlled by the operator and transmission system state criteria.
2946	Engine Mixer Intake Relative Humidity	This is the measurement of the relative humidity of air before the mixer.
2947	Engine Fuel Rack Position #2	This is the position of the fuel rack #2. The method of measurement is not defined.

2948	Engine Intake Valve Actuation System Oil Pressure	The gage pressure of the oil in the hydraulic system that powers the engine intake valve actuation system
2949	Engine Intake Valve Actuation System Oil Pressure Control Valve	The valve that controls the pressure of the oil being supplied to the engine intake valve actuation system.
2950	Engine Intake Valve Actuator #1	The first instance of an actuator that controls or alters the control of the engine intake valve(s).
2951	Engine Intake Valve Actuator #2	The second instance of an actuator that controls or alters the control of the engine intake valve(s).
2952	Engine Intake Valve Actuator #3	The third instance of an actuator that controls or alters the control of the engine intake valve(s).
2953	Engine Intake Valve Actuator #4	The fourth instance of an actuator that controls or alters the control of the engine intake valve(s).
2954	Engine Intake Valve Actuator #5	The fifth instance of an actuator that controls or alters the control of the engine intake valve(s).
2955	Engine Intake Valve Actuator #6	The sixth instance of an actuator that controls or alters the control of the engine intake valve(s).
2956	Engine Intake Valve Actuator #7	The seventh instance of an actuator that controls or alters the control of the engine intake valve(s).
2957	Engine Intake Valve Actuator #8	The eighth instance of an actuator that controls or alters the control of the engine intake valve(s).
2958	Engine Intake Valve Actuator #9	The ninth instance of an actuator that controls or alters the control of the engine intake valve(s).

2959	Engine Intake Valve Actuator #10	The tenth instance of an actuator that controls or alters the control of the engine intake valve(s).
2960	Engine Intake Valve Actuator #11	The eleventh instance of an actuator that controls or alters the control of the engine intake valve(s).
2961	Engine Intake Valve Actuator #12	The twelveth instance of an actuator that controls or alters the control of the engine intake valve(s).
2962	Engine Intake Valve Actuator #13	The thirteenth instance of an actuator that controls or alters the control of the engine intake valve(s).
2963	Engine Intake Valve Actuator #14	The fourteenth instance of an actuator that controls or alters the control of the engine intake valve(s).
2964	Engine Intake Valve Actuator #15	The fifteenth instance of an actuator that controls or alters the control of the engine intake valve(s).
2965	Engine Intake Valve Actuator #16	The sixteenth instance of an actuator that controls or alters the control of the engine intake valve(s).
2966	Engine Intake Valve Actuator #17	The seventeenth instance of an actuator that controls or alters the control of the engine intake valve(s).
2967	Engine Intake Valve Actuator #18	The eighteenth instance of an actuator that controls or alters the control of the engine intake valve(s).
2968	Engine Intake Valve Actuator #19	The nineteenth instance of an actuator that controls or alters the control of the engine intake valve(s).
2969	Engine Intake Valve Actuator #20	The twentieth instance of an actuator that controls or alters the control of the engine intake valve(s).

2970	Accelerator Pedal 2 Low Idle Switch	Switch signal which indicates the state of the accelerator pedal 2 low idle switch. The low idle switch is defined in SAE J1843.00b = Accelerator pedal 2 not in low idle condition 01b = Accelerator pedal 2 in low idle condition 10b = Error 11b = Not available Note: Also refer to SPN 558 Accelerator Pedal 1 Low Idle Switch and SPN 2971 Accelerator Pedal 3 Low Idle Switch.
2971	Accelerator Pedal 3 Low Idle Switch	Switch signal which indicates the state of the accelerator pedal 3 low idle switch. The low idle switch is defined in SAE J1843.00b = Accelerator pedal 3 not in low idle condition 01b = Accelerator pedal 3 in low idle condition 10b = Error 11b = Not available Note: Also refer to SPN 558 Accelerator Pedal 1 Low Idle Switch and SPN 2970 Accelerator Pedal 2 Low Idle Switch.
2972	Accelerator Pedal 1 Position Output 2	Second output for accelerator pedal 1 position.
2973	Accelerator Pedal 1 Position Output 3	Third output for accelerator pedal 1 position.
2974	Accelerator Pedal 2 Position Output 2	Second output for accelerator pedal 2 position.
2975	Accelerator Pedal 2 Position Output 3	Third output for accelerator pedal 2 position.
2976	Accelerator Pedal 3 Position Output 2	Second output for accelerator pedal 3 position.
2977	Accelerator Pedal 3 Position Output 3	Third output for accelerator pedal 3 position.
2978	Estimated Engine Parasitic Losses – Percent Torque	The calculated torque that indicates the estimated amount of torque loss due to engine parasitics, such as cooling fan, air compressor, air conditioning, etc. It is expressed as a percent of Engine Reference Torque.If there are multiple devices on a network that

		provide this parameter, then users of this data shall add each of these values to determine the total torque loss due to engine parasitics. Devices that provide this parameter shall use the value of Engine Reference Torque transmitted by the engine during the current key cycle to determine the percent torque loss as seen by the engine. When the data value of this parameter is equal to FBh it means that all parasitic losses calculated by the engine are included in the Engine's Nominal Friction Percent Torque (SPN 514). Note: Refer to section 5.2.1 in SAE J1939-71. Note: Beginning in 2016, HD-OBD requires reporting of engine torque to Portable Emissions Measurement System (PEMS) equipment that is representative of torque as measured by the engine dynamometer during the emissions certification process. Therefore, for applications that are subject to HD-OBD regulations in 2016 or later, estimated parasitic losses shall no longer be included in SPN 514 Nominal Friction – Percent Torque and must be included in SPN 2978 Estimated Engine Parasitic Losses – Percent Torque. See SPN 7837 for alternate resolution. If both SPN 2978 and SPN 7837 are supported by a single source address, consumers of the parasitic data should only use one of these values.
2979	Vehicle Acceleration Rate Limit Status	Status (active or not active) of the system used to limit maximum forward vehicle acceleration. 00b = Limit not active 01b = Limit active 10b = Reserved 11b = Not available NOTE: The effects of emission control limits, such as engine exhaust smoke control, are specifically excluded; they are not considered to be part of a function to limit vehicle acceleration.
2980	Engine Fuel Valve 1 Outlet Absolute Pressure	Absolute Pressure of gas on outlet side of the first or only fuel system control valve. See SPN 3469 for the second fuel control valve.
2981	Engine Secondary Coolant Circuit Coolant Pressure 1	The pressure of the low temp (secondary circuit) coolant loop. This is in addition to the high temp tank (primary engine block circuit).See SPN 109 for the engine coolant pressure of loop 1. See SPN 2781 for the second instance of pressure in the low temp coolant loop.
2982	Engine Secondary Coolant Circuit Coolant Temperature 1	The temperature of the low temp (secondary circuit) coolant loop. This is in addition to the high temp tank (primary engine block circuit).See SPN 110 for Engine Coolant

		Temperature for engine coolant loop 1. See SPN 29782 for the first instance of temperature in the low temp coolant loop.
2983	Clutch Life Remaining	Signal which indicates the actual clutch life remaining in percent. One hundred percent means the clutch is brand new and zero percent means the clutch is at the end of its life.
2984	Automatic traction help (load transfer)	This signal enables the traction help (load transfer) in case of an active ASR function 00b = Disable automatic traction help 01b = Enable automatic traction help 10b = Reserved 11b = Don’t care
2985	Transmission Shift Selector Display Mode Switch	Status of the operator’s switch used to ‘toggle’ through multiple display modes of a shift selector display. When a shift selector display is capable of displaying more than just range information, this switch is toggled by the operator to move through the different display modes. If the selector has only two display modes, this switch may behave as a typical SPST switch. If the selector has more than two display modes, the switch may be momentary, where each activation indicates that the selector has scrolled through to the next subsequent display mode. 00b = Off 01b = On 10b = Error 11b = Not available
2986	Engine Intake Valve Actuation System Oil Temperature	The temperature of the oil in the hydraulic system that powers the intake valve actuation system.
2987	Engine will not start, pre-lube system issue	The engine is not allowed to start due to pre-lube system issues.
2988	Engine Coolant Diverter Valve	A valve other than the engine coolant thermostat that changes the flow of coolant in an engine.
2989	Combine separator speed	See document J1939-74 for SPN details.
2991	Tailings volume	See document J1939-74 for SPN details.

2992	Move reel forward	See document J1939-74 for SPN details.
2993	Move reel aft	See document J1939-74 for SPN details.
2994	Reel raise	See document J1939-74 for SPN details.
2995	Reel lower	See document J1939-74 for SPN details.
2996	Header raise slow	See document J1939-74 for SPN details.
2997	Header lower slow	See document J1939-74 for SPN details.
2998	Header raise fast	See document J1939-74 for SPN details.
2999	Header lower fast	See document J1939-74 for SPN details.
3000	Tilt header left	See document J1939-74 for SPN details.
3001	Tilt header right	See document J1939-74 for SPN details.
3002	Header fold	See document J1939-74 for SPN details.
3003	Header unfold	See document J1939-74 for SPN details.
3004	Draper speed increment	See document J1939-74 for SPN details.
3005	Draper speed decrement	See document J1939-74 for SPN details.
3006	Reel speed increment	See document J1939-74 for SPN details.
3007	Reel speed decrement	See document J1939-74 for SPN details.

3008	Threshing clearance increment	See document J1939-74 for SPN details.
3009	Threshing clearance decrement	See document J1939-74 for SPN details.
3010	Threshing speed increment	See document J1939-74 for SPN details.
3011	Threshing speed decrement	See document J1939-74 for SPN details.
3012	Product fan speed increment	See document J1939-74 for SPN details.
3013	Product fan speed decrement	See document J1939-74 for SPN details.
3015	Implement fold down	See document J1939-74 for SPN details.
3016	Implement fold up	See document J1939-74 for SPN details.
3017	RH header raise	See document J1939-74 for SPN details.
3018	LH header raise	See document J1939-74 for SPN details.
3019	Product fan engage mode	See document J1939-74 for SPN details.
3020	Augers engage mode	See document J1939-74 for SPN details.
3021	Product basket fill state	See document J1939-74 for SPN details.
3022	Augers enable mode	See document J1939-74 for SPN details.
3023	Header height control mode	See document J1939-74 for SPN details.
3024	Header remote tether control mode	See document J1939-74 for SPN details.

3025	Lubrication control mode	See document J1939-74 for SPN details.
3026	Transmission Oil Level 1 Measurement Status	Measurement status for the first instance of a transmission oil level indicator. Indicates if conditions are acceptable to obtain a valid transmission oil level measurement as conveyed in SPN 124 Transmission Oil Level or SPN 3027 Transmission Oil Level 1 High / Low. If conditions are not acceptable, this parameter conveys to the operator what prevents conditions from being acceptable. Only one condition can be conveyed in this parameter at any given point in time. If multiple conditions exist, it is not important which condition is actually broadcast, as the driver must 'correct' each and every condition as it is presented before a valid oil level reading can be made. If multiple conditions exist that prevent a valid reading, the sender should broadcast one of those conditions until it is corrected; then the next condition can be conveyed to the operator, and so on.0000b = Conditions valid for transmission oil level measurement 0001b = Conditions not valid – Settling timer still counting down 0010b = Conditions not valid – Transmission in gear 0011b = Conditions not valid – Transmission fluid temperature too low 0100b = Conditions not valid – Transmission fluid temperature too high 0101b = Conditions not valid – Vehicle moving; output shaft speed too high 0110b = Conditions not valid – Vehicle not level 0111b = Conditions not valid – Engine speed too low 1000b = Conditions not valid – Engine speed too high 1001b = Conditions not valid – No request for reading 1010b = Not defined 1011b = Not defined 1100b = Not defined 1101b = Conditions not valid – Other 1110b = Error 1111b = Not available
3027	Transmission Oil Level 1 High / Low	First instance of a transmission oil level indicator. Conveys the amount of current volume of transmission sump oil compared to recommended volume. Positive values indicate overfill. Zero means the transmission fluild is filled to the recommended level.Parameter Specific Indicator: A value of FBh indicates conditions are not acceptable for a valid fluid level measurement.
3028	Transmission Oil Level 1 Countdown Timer	Countdown timer for the first instance of a transmission oil level indicator. Once all vehicle conditions (such as vehicle stopped, etc) are met, some transmissions may require a 'settling time' to allow the fluid level to normalize. This parameter indicates how much of the required settling time remains. When time reaches 0, a valid oil

		level measurement value will be broadcast in SPN 3027 Transmission Oil Level 1 High / Low.0000b = less than 1 minute 0001b = One minute 0010b = Two minutes 0011b = Three minutes 0100b = Four minutes 0101b = Five minutes 0110b = Six minutes 0111b = Seven minutes 1000b = Eight minutes 1001b = Nine minutes 1010b = Ten minutes 1011b = Eleven minutes 1100b = Twelve minutes 1101b = Thirteen minutes 1110b = Error 1111b = Not Available
3029	Engine Start Inhibited, Pre-lube System Issue	The engine oil pre-lube system will not allow the engine to start.
3030	Transmission Torque Converter Ratio	Ratio of the transmissions torque converter output torque to torque converter input torque at current speed. The ratio of 1.000 (03E8h) indicates torque converter lockup. If the ratio is less than 1 and the ratio can not be properly determined it shall be set to a value of FB00h. Ratios above 1 indicate torque converter multiplication.
3031	Aftertreatment 1 Diesel Exhaust Fluid Tank Temperature 1	Temperature of the diesel exhaust fluid in the storage tank.
3032	Right Brake Pedal Position	See document J1939-74 for SPN details.
3033	Left Brake Pedal Position	See document J1939-74 for SPN details.
3034	DM22 Control Byte – Individual DTC Clear/Reset Control Byte	See document J1939-73 for SPN details.
3035	DM22 – Control Byte Specific Indicator For Individual DTC Clear	See document J1939-73 for SPN details.
3036	DM22 – SPN	See document J1939-73 for SPN details.
3037	DM22 – FMI	See document J1939-73 for SPN details.

3038	Flash Malfunction Indicator Lamp	See document J1939-73 for SPN details.
3038	Flash Malfunction Indicator Lamp	See document J1939-73 for SPN details.
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3038	Flash Malfunction Indicator Lamp	See document J1939-73 for SPN details.
3038	Flash Malfunction Indicator Lamp	See document J1939-73 for SPN details.
3038	Flash Malfunction Indicator Lamp	See document J1939-73 for SPN details.
3039	Flash Red Stop Lamp (RSL)	See document J1939-73 for SPN details.
3039	Flash Red Stop Lamp (RSL)	See document J1939-73 for SPN details.
3039	Flash Red Stop Lamp (RSL)	See document J1939-73 for SPN details.
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3039	Flash Red Stop Lamp (RSL)	See document J1939-73 for SPN details.
3039	Flash Red Stop Lamp (RSL)	See document J1939-73 for SPN details.
3039	Flash Red Stop Lamp (RSL)	See document J1939-73 for SPN details.
3040	Flash Amber Warning Lamp (AWL)	See document J1939-73 for SPN details.
3040	Flash Amber Warning Lamp (AWL)	See document J1939-73 for SPN details.
3040	Flash Amber Warning Lamp (AWL)	See document J1939-73 for SPN details.
3040	Flash Amber Warning Lamp (AWL)	See document J1939-73 for SPN details.

3040	Flash Amber Warning Lamp (AWL)	See document J1939-73 for SPN details.
3040	Flash Amber Warning Lamp (AWL)	See document J1939-73 for SPN details.
3040	Flash Amber Warning Lamp (AWL)	See document J1939-73 for SPN details.
3040	Flash Amber Warning Lamp (AWL)	See document J1939-73 for SPN details.
3040	Flash Amber Warning Lamp (AWL)	See document J1939-73 for SPN details.
3040	Flash Amber Warning Lamp (AWL)	See document J1939-73 for SPN details.
3040	Flash Amber Warning Lamp (AWL)	See document J1939-73 for SPN details.
3040	Flash Amber Warning Lamp (AWL)	See document J1939-73 for SPN details.
3040	Flash Amber Warning Lamp (AWL)	See document J1939-73 for SPN details.
3040	Flash Amber Warning Lamp (AWL)	See document J1939-73 for SPN details.
3040	Flash Amber Warning Lamp (AWL)	See document J1939-73 for SPN details.
3040	Flash Amber Warning Lamp (AWL)	See document J1939-73 for SPN details.
3040	Flash Amber Warning Lamp (AWL)	See document J1939-73 for SPN details.
3040	Flash Amber Warning Lamp (AWL)	See document J1939-73 for SPN details.
3040	Flash Amber Warning Lamp (AWL)	See document J1939-73 for SPN details.

3040	Flash Amber Warning Lamp (AWL)	See document J1939-73 for SPN details.
3040	Flash Amber Warning Lamp (AWL)	See document J1939-73 for SPN details.
3041	Flash Protect Lamp	See document J1939-73 for SPN details.
3041	Flash Protect Lamp	See document J1939-73 for SPN details.
3041	Flash Protect Lamp	See document J1939-73 for SPN details.
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3041	Flash Protect Lamp	See document J1939-73 for SPN details.
3041	Flash Protect Lamp	See document J1939-73 for SPN details.
3042	Requested Wheel Speed	See document J1939-74 for SPN details.
3043	Type of Passenger Count	Used to notify transit link devices of the type of passenger counting system used in the vehicle. Some passenger counting systems indicate real-time boarding and exiting data for other devices to accumulate. Other types of passenger counters report a current on-board total relative to a transit door status, a fare collection status, or other signal which can define the end of the boarding/exiting period and a stable underway totalized passenger count.0 = absolute passenger count 1 = boarding passenger 2 = exiting passenger 3 = boarding passenger (second passenger stream) 4 = exiting passenger (second passenger stream) 5 to 250 = reserved for future assignment 251 to 253 = reserved 254 = error indicator 255 = not available
3044	Silent Alarm Status	Used to report silent alarm push button status. 00b = Off 01b = On 10b = Error condition 11b = Not available

3045	Vehicle Use Status	Used to indicate the proper or unauthorized use of the vehicle. The administrative control device or any device issuing the vehicle use status PID should be sensitive to the run switch status (SPN 3046) and any other locally defined criteria for authorized use (i.e., driver log-ons) before the vehicle use status PID is used to generate an unauthorized use alarm.00b = Normal use 01b = Unauthorized use 10b = Error condition 11b = Not available
3046	Transit Run Status	Status of the run switch for the vehicle. 00b = Off 01b = On 10b = Error condition 11b = Not available
3047	Patron Count	Count of the number of passengers on a transit vehicle. If the type of passenger count (SPN 3043) is 0, the patron count indicates the number of patrons currently on vehicle after the door has closed. If the type of passenger count is 1 to 4, the patron count indicates an incremental count of passengers since the last data transmittal.
3048	Engine Ignition Cycle Counter	See document J1939-73 for SPN details.
3049	OBD Monitoring Conditions Encountered Counts	See document J1939-73 for SPN details.
3050	Catalyst Bank 1 System Monitor	See document J1939-73 for SPN details.
3051	Catalyst 2 System Monitor	See document J1939-73 for SPN details.
3052	Engine Misfire System Monitor	See document J1939-73 for SPN details.
3053	Engine Evaporative System Monitor	See document J1939-73 for SPN details.
3054	Secondary Air System Monitor	See document J1939-73 for SPN details.
3055	Engine Fuel System Monitor	See document J1939-73 for SPN details.

3056	Oxygen (or Exhaust Gas) Sensor Bank 1 Monitor	See document J1939-73 for SPN details.
3057	Oxygen (or Exhaust Gas) Sensor Bank 2 Monitor	See document J1939-73 for SPN details.
3058	Engine Exhaust Gas Recirculation System Monitor	See document J1939-73 for SPN details.
3059	Engine Positive Crankcase Ventilation System Monitor	See document J1939-73 for SPN details.
3060	Engine Cooling System Monitor	See document J1939-73 for SPN details.
3061	Engine Cold Start Emission Reduction Strategy System Monitor	See document J1939-73 for SPN details.
3062	Air Conditioning System Component Monitor	See document J1939-73 for SPN details.
3063	Direct Ozone Reduction Monitor	See document J1939-73 for SPN details.
3064	Aftertreatment Diesel Particulate Filter System Monitor	See document J1939-73 for SPN details.
3065	Comprehensive Component Monitor	See document J1939-73 for SPN details.
3066	SPN of Applicable System Monitor	See document J1939-73 for SPN details.
3067	Applicable System Monitor Numerator	See document J1939-73 for SPN details.

3068	Applicable System Monitor Denominator	See document J1939-73 for SPN details.
3069	Distance Travelled While MIL is Activated	See document J1939-73 for SPN details.
3070	Number of bytes in the Milepost Identification	Number of bytes in the Milepost Identification. This parameter identifies the length, in bytes, of the data in SPN 509 (Milepost Identification).
3071	Number of bytes in the Transit Assigned Route Identity	Number of bytes in the Transit Assigned Route Identity. This parameter identifies the length, in bytes, of the data in SPN 3074 (Transit Assigned Route Identity).
3072	Number of bytes in the Transit Assigned Run Identity	Number of bytes in the Transit Assigned Run Identity. This parameter identifies the length, in bytes, of the data in SPN 3075 (Transit Assigned Run Identity).
3073	Number of bytes in the Transit Assigned Block Identity	Number of bytes in the Transit Assigned Block Identity. This parameter identifies the length, in bytes, of the data in SPN 3076 (Transit Assigned Block Identity).
3074	Transit Assigned Route Identity	Identifies the transit route assigned to a specific vehicle. The length of the ASCII text for this parameter must be reported using SPN 3071 (Number of bytes in the Transit Assigned Route Identity).
3075	Transit Assigned Run Identity	Identifies the transit run assigned to a specific vehicle. The length of the ASCII text for this parameter must be reported using SPN 3073 (Number of bytes in the Transit Assigned Run Identity).
3076	Transit Assigned Block Identity	Identifies the transit block assigned to a specific vehicle. The length of the ASCII text for this parameter must be reported using SPN 3073 (Number of bytes in the Transit Assigned Block Identity).
3078	Agency	The identity of the agency involved in this transaction

3079	Intersection Preemption Request/Response	Status of the intersection signal preemption 00b = Message is a request directed to the emitter 01b = Message is a response from the emitter 10b = Error condition 11b = Not available
3080	Transit Route ID Usage	Transit route ID usage 00b = Transit route ID not used for interleaved data 01b = Transit route ID used for interleaved data (if range code not enabled) 10b = Error condition 11b = Not available
3081	Range Code Enable	Range code enable 00b = Range code not used for interleaved data 01b = Range code used for interleaved data 10b = Error condition 11b = Not available
3082	Strobe Activation Control Status	Strobe activation control status 00b = Deactivate strobe 01b = Activate strobe 10b = Error condition 11b = Not available Note: Strobe will flash if not overridden by transit door status, strobe is working, and emitter is in the normal mode.
3083	Transit Door Enable	Transit door enable 00b = Ignore transit door status 01b = Transit door status will override strobe activation 10b = Error condition 11b = Not available
3084	Priority of Response Sent by Emitter	Priority of response sent by emitter 0000b = Reserved 0001b = Low priority 0010b = Probe priority 0011b = High priority 0100b to 1000b = Reserved 1001b = Priority set by hardware to low priority 1010b = Priority set by hardware to probe priority 1011b = Priority set by hardware to high priority 1100b to 1101b = Reserved 1110b = Error condition 1111b = Not available
3085	Vehicle ID	Numerical designation of the vehicle. 65535 is used to represent the vehicle ID is not available.
3086	Transmission Ready for Brake Release	This parameter indicates that enough torque / motive force is available at the transmission output shaft to release all the brakes without a risk of unintentional movement in the opposite direction.00b = Transmission Not Ready for Brake Release 01b = Transmission Ready for Brake Release 10b = Error 11b = Not available
3087	Auxiliary Level	Level measured by a sensor.

3088	Header height vertical rate control	See document J1939-74 for SPN details.
3089	Header height sensitivity control	See document J1939-74 for SPN details.
3090	Header height setpoint change	See document J1939-74 for SPN details.
3091	Header height setpoint change sequence number	See document J1939-74 for SPN details.
3092	Header platform height	See document J1939-74 for SPN details.
3093	Header platform height maximum	See document J1939-74 for SPN details.
3096	Header float pressure	See document J1939-74 for SPN details.
3097	Header float pressure maximum	See document J1939-74 for SPN details.
3098	Header position percent	See document J1939-74 for SPN details.
3099	Header position percent maximum	See document J1939-74 for SPN details.
3102	Unloading Auger swing out	See document J1939-74 for SPN details.
3103	Unloading auger swing in	See document J1939-74 for SPN details.
3104	Unloading auger swing out-auto	See document J1939-74 for SPN details.
3105	Unloading auger swing in-auto	See document J1939-74 for SPN details.
3106	Side hill left tilt	See document J1939-74 for SPN details.
3107	Side hill right tilt	See document J1939-74 for SPN details.

3108	Spreader speed increment	See document J1939-74 for SPN details.
3109	Spreader speed decrement	See document J1939-74 for SPN details.
3110	Precleaner open	See document J1939-74 for SPN details.
3111	Precleaner close	See document J1939-74 for SPN details.
3112	Open chaffer	See document J1939-74 for SPN details.
3113	Close chaffer	See document J1939-74 for SPN details.
3114	Open sieve	See document J1939-74 for SPN details.
3115	Close sieve	See document J1939-74 for SPN details.
3116	Move chopper vane left	See document J1939-74 for SPN details.
3117	Move chopper vane right	See document J1939-74 for SPN details.
3118	Quick stop switch	See document J1939-74 for SPN details.
3119	Unloading auger engage/disengage	See document J1939-74 for SPN details.
3120	Unloading auger fold	See document J1939-74 for SPN details.
3121	Unloading auger unfold	See document J1939-74 for SPN details.
3122	Max allowable cleaning shoe travel	See document J1939-74 for SPN details.
3123	Right hand header height setpoint	See document J1939-74 for SPN details.

3124	Left hand header height setpoint	See document J1939-74 for SPN details.
3125	Left hand header height	See document J1939-74 for SPN details.
3126	Right hand header height	See document J1939-74 for SPN details.
3127	Header control response rate setpoint	See document J1939-74 for SPN details.
3128	Header control response rate maximum setpoint	See document J1939-74 for SPN details.
3129	Header control response rate minimum setpoint	See document J1939-74 for SPN details.
3130	Product system tank water level	See document J1939-74 for SPN details.
3131	Product fan speed	See document J1939-74 for SPN details.
3132	Product system manifold pressure	See document J1939-74 for SPN details.
3133	Product system pump discharge pressure	See document J1939-74 for SPN details.
3134	Product fan hours	See document J1939-74 for SPN details.
3135	Right hand header height max setpoint	See document J1939-74 for SPN details.
3136	Right hand header height min setpoint	See document J1939-74 for SPN details.
3137	Left hand header height min setpoint	See document J1939-74 for SPN details.

3138	Left hand header height max setpoint	See document J1939-74 for SPN details.
3139	Right hand header unit speed	See document J1939-74 for SPN details.
3140	Left hand header unit speed	See document J1939-74 for SPN details.
3141	GPS differential corrections license	See document NMEA 2000 for SPN details.
3142	Method, GNSS	See document NMEA 2000 for SPN details.
3143	Differential source	See document NMEA 2000 for SPN details.
3144	Differential source, Secondary	See document NMEA 2000 for SPN details.
3145	DGNSS fix	See document NMEA 2000 for SPN details.
3146	PGN of message being configured	See document J1939-74 for SPN details.
3147	Parameter being included	See document J1939-74 for SPN details.
3148	Position of configured parameter	See document J1939-74 for SPN details.
3149	Message will be used proprietarily	See document J1939-74 for SPN details.
3150	Message will use transport protocol	See document J1939-74 for SPN details.
3151	First parameter only being identified	See document J1939-74 for SPN details.
3152	Number of parameters included	See document J1939-74 for SPN details.
3153	Starting bit for this parameter	See document J1939-74 for SPN details.

3154	Parameter to be located	See document J1939-74 for SPN details.
3155	Parameter locate command	See document J1939-74 for SPN details.
3156	Blade Control Mode Switch	Indicates the blade control mode switch state the user has set for the land leveling system. The switch value directly correlates to the current switch state, regardless of the switch being used. This parameter is intended for use in systems using only one parameter to control the blade movement (i.e. elevation). Systems using two independent parameters to control blade position, i.e. one blade edge maintains a constant elevation and the other blade edge maintains a constant blade angle, should use parameters specific to that usage. Only one of the following states will be active at a time. Below are the data values defined for each switch type that may be used in this application. The purpose of the following switch information is to define what data should be reported based on what type of switch is used.1. A toggle button with two states can be used, in which the button is either in the manual or the auto position at all times. Toggle button usage is as follows: Manual Position = 0010b Manual button pressed Auto Position = 0011b Automatic button pressed 2. The momentary rocker switch may be used, where the default is the no button pressed position. The user can press the rocker into the manual position, and when pressure is released, it will return to the no button pressed position. The user may also press the rocker into the auto position, and when pressure is released, it will return to the no button pressed position. Momentary rocker button usage is as follows: No Button Pressed = 0000b No button pressed Manual Button Pressed = 0010b Manual button pressed Auto Button Pressed = 0011b Automatic button pressed 3. The momentary contact button pair may be used, where the default is no buttons being pressed. The user can press the manual button, and when pressure is released, it will return to the no button pressed position. The user may press the auto button, and when pressure is released, it will return to the no button pressed position. Momentary contact buttons (button pair) usage is as follows: No Button Pressed = 0000b No button pressed Manual Button Pressed = 0010b Manual button pressed Auto Button Pressed = 0011b Automatic button pressed 4. The momentary contact single button may be used, where the default is no button being pressed. The user can press the button, which is the button pressed position, and when pressure is released, it will return to the no button pressed

		position. The controller receiving this command will keep track of what mode the blade is in, auto or manual. When the button is pressed, the « mode button pressed » state is reported and the receiving controller then changes the current mode to its opposite value (i.e. manual to automatic or vise-versa). Momentary contact button (single button) usage is as follows: No Button Pressed = 0000b No button pressed Button Pressed = 0001b Mode button pressed Data Values and Descriptions: 0000b = No button pressed 0001b = Mode button pressed 0010b = Manual button pressed 0011b = Automatic button pressed 1110b = Error Indicator 1111b = Not Installed All other values are reserved Notes: 1. The switch state can be read in two ways. One method uses the direct analog switch input to determine the switch state, while the second method relies on a secondary control to read the analog input, then relay the information on the data link. The parameter is designed to provide the actual switch state to other controls that need the information. 2. Other systems with automated blade controls should be able to use this parameter, since it is a measured switch value.
3157	Desired Grade Offset Switch	Indicates the grade offset switch state the user has set for the land leveling system. The desired grade offset value is the vertical offset measured from a given elevation reference point to the bottom edge of the blade. This parameter is intended for use in systems using only elevation offset to control the blade movement (i.e. elevation). Systems using two independent parameters to control blade position, i.e. one edge maintains a constant elevation and the other blade edge maintains a constant angle, should use parameters specific to that usage. Only one of the following states will be active at a time. Below are the data values defined for each switch type that may be used in this application. The purpose of the following switch information is to define what data should be reported based on what type of switch is used.1. The momentary rocker switch may be used, where the default is the no button pressed position. The user can press the rocker into the increment button pressed position, and when pressure is released, it will return to the no button pressed position. The user may also press the rocker into the decrement button pressed position, and when pressure is released, it will return to the no button pressed position. Momentary rocker button usage is as follows: No Button Pressed = 0000b No button pressed Increment Button Pressed = 0001b Increment button pressed Decrement Button Pressed = 0010b

		Decrement button pressed 2. The momentary contact button pair may be used, where the default is the no buttons pressed position. The user can press the increment button, and when pressure is released, it will return to the no buttons pressed position. The user may press the decrement button, and when pressure is released, it will return to the no buttons pressed position. Momentary contact button (button pair) usage is as follows: No Button Pressed = 0000b No button pressed Increment Button Pressed = 0001b Increment button pressed Decrement Button Pressed = 0010b Decrement button pressed Data Values and Descriptions: 0000b = No button pressed 0001b = Increment button pressed 0010b = Decrement button pressed 1110b = Error Indicator 1111b = Not installed All other values are reserved Notes: 1. The switch state can be read in two ways. One method uses the direct analog switch input to determine the switch state, while the second method relies on a secondary control to read the analog input, then relay the information on the data link. The parameter is designed to provide the actual switch state to other controls that need the information. 2. Other systems with automated blade controls should be able to use this parameter, since it is a measured switch value.
3158	Blade Auto Mode Command	Allows other controllers to command to the primary control system what they think is the appropriate auto control mode to be engaged in, based on the information they have available to them. When in automatic mode, the blade automatically adjusts its position to the center of the blade to maintain a desired grade offset. Only one of the following states will be active at a time. Below is extended information describing each command. The purpose of this information is to define what command state should be reported based on what auto control mode command is deemed appropriate by the operational specifications of the system.0000b Auto Allowed – Auto mode permitted as appropriate (auto button was pushed or directly returned from Suspend Auto condition) 0001b Activity Allows Auto – Auto mode permitted only if the primary control system detects operator activity. The control issuing this command does not have sufficient information/reason to absolutely allow Auto mode (state 0000b) or not allow Auto mode (state 0100b). The control issuing this command is permitting the primary control system to operate in auto mode only if the primary control system detects operator activity, such as direct input to the primary control system. If the primary control system does not detect operator activity, then the

		control issuing this command is not allowing auto mode. For example, the control issuing this command has detected no operator activity yet it acknowledges that there may be other sources of operator activity that might make auto mode permissible. 0010b Suspend Auto – Auto mode is temporarily not allowed and the control issuing this command wants the primary control system to automatically return to the previous state (Auto or Manual) when the suspend auto condition is removed. 0011b Service Mode – Auto mode is permitted only for special services such as calibrations. 0100b Auto Not Allowed – Auto mode is not allowed under any condition Data Values and Descriptions: 0000b = Auto Allowed 0001b = Activity Allows Auto – must detect operator before auto allowed 0010b = Suspend Auto – temporarily suspend auto mode 0011b = Service Mode – auto allowed only during service modes 0100b = Auto Not Allowed 1110b = Error Indicator 1111b = Not Supported All other values are reserved Note: The control issuing this command is aware that it does not have access to all information that the primary controller of the Land Leveling System attachment has access to. Therefore, it commands the Land Leveling system to activate a auto blade mode based on the input it has access to. In some cases, like in the « Activity Allows Auto » situation, the control knows the Land Leveling system has access to an additional display (which has switches and several buttons) which may help determine if an operator is present. On the other hand, the control may also have information the primary controller of the Land Leveling System does not have access to, like the parking brake status.
3159	Trip Number	The identity number assigned to this trip.
3160	Assigned Route	The identity number assigned to this route. Note: This is the numerical value for the route as opposed to the « Transit Assigned Route Identity » (SPN 3074) which is variable length ASCII or the « Route number » (SPN 3169) which is 12 bit numeric.
3161	Pattern Number	The agency defined pattern number for this trip
3162	Assigned Run	The agency defined run number for this trip
3163	Assigned Block	The agency defined block number for this trip

3164	Driver’s farebox security code	Security code for the farebox, numerical only. Note: 0 = Farebox is in reporting status 1 to 65535 = security code
3165	Fare Validity	Agency defined value indicating validity of this fare
3166	Pass Category	Agency defined value indicating the category of the passenger associated with this fare
3167	Initial Fare Agency	Identifies where the initial fare is paid Note: The definition of the agency numbering plan shall be agreed by the operating agency and the farebox manufacturer. The value of 0 is reserved, the usable range is 1 to 31.
3168	Transfer Sold	Indicates that a transfer was sold or issued on this transaction including its type and/or restrictions. The final definitions of the transfer issued information shall be agreed by the operating agency and the farebox manufacturer.Note: A non-zero value indicates that a transfer was sold or issued. The value of zero is reserved to indicate that no transfer has been sold or issued.
3169	Route Number	The route number issuing the transfer.
3170	Transaction Type	Enumerated value representing the type of transaction completed 0000b = Cash 0001b = Token 0010b = Ticket 0011b = Pass 0100b = Card 0101b = Permit 0110b = Transfer 0111b = Free 1000b to 1011b = Reserved for assignment 1100b to 1111b = Agency defined
3171	Passenger Type	Enumerated value representing the type/class of passenger, as defined by the agency.
3172	Type of Service	The type of service provided 000b = Local service 001b = Express service 010b to 111b = Agency defined
3173	Transfer Type	The kind of transfer used 00000b = North 00001b = South 00010b = East 00011b = West 00100b = In 00101b = Out 00110b to 11111b = Agency defined

3174	Trip Direction	The general direction of travel for this trip. 0000b = North 0001b = South 0010b = East 0011b = West 0100b = In 0101b = Out 0110b to 1111b = Agency defined
3175	Fare Presets	Fare Presets 00000000b to 00001111b = Agency defined 00010000b to 11111111b = Reserved for assignment
3176	Type of Fare	Type of Fare 0000b = Cash/No detail 0001b = Token A 0010b = Token B 0011b = Ticket A 0100b = Ticket B 0101b = Pass A 0110b = Pass B 0111b to 1010b = Reserved for assignment 1011b to 1111b = Agency defined
3177	Payment Details	Payment details. 0000b = Not an upgrade 0001b = Cash 0010b = Token 0011b = Ticket 0100b = Pass 0101b = Card 0110b to 1010b = Reserved for assignment 1011b to 1111b = Agency defined
3178	Farebox Service Status	Indicates if the farebox is in or out of service. 00b = Farebox out of service 01b = Farebox in service 10b = Error Condition 11b = Not available
3179	Farebox Emergency Status	Indicates if a farebox emergency condition exists. 00b = Non-emergency condition 01b = Emergency condition 10b = Error Condition 11b = Not available
3180	Trip Status	Trip Status 000b = Undefined 001b = Trip start 010b = Trip end 011b = Undefined 100b = Undefined 101b = Layover start 110b = Layover end 111b = Undefined
3181	Farebox Alarm Identifier	Indicates the nature of the farebox alarm condition. 0000000b = Voltage dropout 0000001b = Voltage restored 0000010b = Probe started 0000011b = Probe completed 0000100b = Cashbox removed 0000101b = Cashbox restored 0000110b = Cashbox door timeout 0000111b = Cashbox opened in service, considered an alarm condition 0001000b = Insufficient fare accepted 0001001b = Coinbox 75% full 0001010b = Coinbox full 0001011b = Currency box 75% full 0001100b = Currency box less than 75% full 0001101b = Currency box full 0001110b = Card/pass box 75% full 0001111b = Card/pass box less than 75% full 0010000b = Card/pass box full 0010001b = Coin de-jam operated 0010010b = Farebox set in manual bypass 0010011b = Farebox reset to automatic mode 0010100b = Pass/transfer jam

		0010101b = Pass/transfer jam cleared 0010110b = Paper currency jam 0010111b = Paper currency jam cleared 0011000b = Maintenance access in service, considered an alarm condition 0011001b = Maintenance access out of service 0011010b to 1100000b = Reserved – to be assigned 1100001b to 1111111b = Agency defined
3182	Transmission Retarder Enable Solenoid Valve	Valve that makes hydraulic fluid available for retarder use.
3183	Transmission Retarder Modulation Solenoid Valve	Valve used to control hydraulic retarder application.
3184	Transmission Torque Converter Lockup Clutch Pressure Indicator	Pressure being applied to the torque converter lockup clutch.
3185	Transmission Differential Lock Solenoid Valve	Valve used to apply pressure to differential lock.
3186	Transmission Differential Lock Clutch Pressure Indicator	Indicates pressure applied to differential lock clutch.
3187	Transmission Shift Console Data Link	Communication link between transmission and shift selector.
3188	XBR Message Checksum	The XBR message checksum is used to verify the signal path from the demanding device to the brake controller on electronic brake systems. The support of this parameter is mandatory if PGN 1024 is supported as there is no means to indicate « not available ».The 4 bit XBR message checksum is calculated using the first 7 data bytes, the 4 bit message counter and the bytes of the message identifier. It is calculated as follows: Checksum = (Byte1 + Byte2 + Byte3 + Byte4 + Byte5 + Byte6 + Byte7 + (message counter & 0Fh) + message ID low byte + message ID mid low byte + message ID mid high byte + message ID high byte) XBR Message Checksum = ((Checksum >> 4) + Checksum) & 0Fh Note: A failure in the communication sets

		the XBR system state: – to ’01b’ for failed XBR ‘priority 01b, 10b or 11b’ messages – to ’10b’ for failed XBR ‘priority 00b’ messages.
3189	XBR Message Counter	The XBR message counter is to verify the signal path from the demanding device to the brake controller on electronic brake systems.. The support of this parameter is mandatory.Note: The initial value of the 4 bit message counter for the first message during a driving cycle is arbitrary. In every following message the counter is incremented by 1 (0 follows 15).
3190	Tire Location	Identifies which tire is associated with the parametric data in this PGN. The low order 4 bits represent a position number, counting left to right when facing in the direction of normal vehicle travel (forward). The high order 4 bits represent a position number, counting front to back on the vehicle. The value FFh indicates not available. It is recommended that output devices add 1 to the position number (range 1 to 15, not 0 to 14) for use by drivers and service technicians. Examples: Tire pressure for location 00h would be left front tire. Tire pressure for location 23h would be right outside rear rear on a 3-axle tractor with dual axle per side (3rd axle, 4th tire).
3191	Reference Tire Pressure	Reference value of the tire pressure as basis for the tire pressure monitoring
3192	Tire Location	Identifies which tire is associated with the parametric data in this PGN. The low order 4 bits represent a position number, counting left to right when facing in the direction of normal vehicle travel (forward). The high order 4 bits represent a position number, counting front to back on the vehicle. The value FFh indicates not available. It is recommended that output devices add 1 to the position number (range 1 to 15, not 0 to 14) for use by drivers and service technicians. Examples: Tire pressure for location 00h would be left front tire. Tire pressure for location 23h would be right outside rear rear on a 3-axle tractor with dual axle per side (3rd axle, 4th tire).
3193	Reference Tire Pressure Setting	Reference value of the tire pressure setting as basis for the tire pressure monitoring
3194	Control Byte	See document J1939-31 for SPN details.

3195	Number of Ports	See document J1939-31 for SPN details.
3196	Uptime since last power-on reset	See document J1939-31 for SPN details.
3197	Average Messages Filtered per Second	See document J1939-31 for SPN details.
3198	Average Messages Forwarded per Second	See document J1939-31 for SPN details.
3199	Average Messages Received per Second	See document J1939-31 for SPN details.
3200	Number of Messages with Excessive Transit Delay Time	See document J1939-31 for SPN details.
3201	Number of Messages lost due to Buffer Overflow	See document J1939-31 for SPN details.
3202	Average Transit Delay Time	See document J1939-31 for SPN details.
3203	Maximum Transit Delay Time	See document J1939-31 for SPN details.
3204	Maximum Messages Filtered per Second	See document J1939-31 for SPN details.
3205	Maximum Messages Forwarded per Second	See document J1939-31 for SPN details.
3206	Maximum Messages Received per Second	See document J1939-31 for SPN details.

3207	Number of Filter Database Entries	See document J1939-31 for SPN details.
3208	Maximum Filter Database Size	See document J1939-31 for SPN details.
3209	Buffer Size	See document J1939-31 for SPN details.
3210	Parameter Number	See document J1939-31 for SPN details.
3211	SA_List	See document J1939-31 for SPN details.
3212	PGN_List	See document J1939-31 for SPN details.
3213	Filter_Mode	See document J1939-31 for SPN details.
3214	Port_Pair	See document J1939-31 for SPN details.
3215	Prohibit air suspension control	This parameter is an external request to the air suspension control system to prohibit all air suspension control. If the request is accepted, response intended to be sent in ASC1 (additional status requested in ASC1), there will be no control either for height changes or axle load distribution changes, i.e. hold current pressures in all suspension devices.00b = No request 01b = Request prohibit air suspension control 10b = Error indicator 11b = Not available
3216	Engine Exhaust 1 NOx 1	The amount of combined NO and NO2 in the exhaust, represented in NOx molecule parts per million non-NOx molecules, in exhaust bank 1. This sensor is located at the intake of the SCR system if an SCR system exists.SPN 3216 shall display the raw, uncorrected NOx sensor signal. 2016 MY and later engines with NOx sensors may be required to output a ‘corrected’ NOx sensor signal (see SPN 7353) in addition to the raw NOx sensor signal output using SPN 3216. A value of FB00h shall be provided when ambient or engine operating conditions do not permit the sensor to operate in data collection mode.

3217	Engine Exhaust 1 Percent Oxygen 1	The actual oxidation factor (Percent Oxygen) of the gas within the exhaust stream. For positive values, the parameter represents the percent oxygen in excess of the amount required for stoichiometric combustion. For negative values, the parameter is proportional to the amount of oxygen being pumped by the sensor. This value is measured by a sensor at the aftertreatment intake in exhaust bank 1.A value of -12% (0000h) indicates rich, a value of 21% (FAFFh) indicates lean. These data points could optionally be used with switching O2 sensors to indicate those states as alternatives to broadcasting the threshold %O2 values. Diagnostic Tools could change display to use the text « Rich » or « Lean » in place of the implied %O2 values which would also be acceptable for display.
3218	Engine Exhaust 1 Gas Sensor 1 Power In Range	Indicates that the power supplied to the aftertreatment intake gas sensor, either NOx or O2, is within the manufacturer's specification in exhaust bank 1. This parameter reports the status as reported by the sensor.00b = Not in range 01b = In range 10b = Error 11b = Not available
3219	Aftertreatment 1 Intake Gas Sensor 1 at Temperature	Indicates that the heater element of the aftertreatment intake gas sensor, either NOx or O2, is within the manufacturer's specified range for accurate measurements in exhaust bank 1.00b = Not in range 01b = In range 10b = Error 11b = Not available
3220	Engine Exhaust 1 NOx 1 Reading Stable	Indicates that the NOx reading of the first NOx sensor is stable as determined by the manufacturer's control software in exhaust bank 1. This sensor is located at the intake of the SCR system if an SCR system exists.00b = Not stable 01b = Stable 10b = Error 11b = Not available
3221	Aftertreatment 1 Intake Wide-Range Percent Oxygen 1 Reading Stable	Indicates that the percent oxygen reading of the aftertreatment intake gas sensor, either NOx or O2, is stable as determined by the manufacturer's control software in exhaust bank 1.00b = Not stable 01b = Stable 10b = Error 11b = Not available
3222	Aftertreatment 1 Intake Gas Sensor 1 Heater Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the heater of the intake exhaust gas sensor, either NOx or O2, by the manufacturer's sensor control software in exhaust bank 1. In the case of multiple failures the most severe is communicated.A

		value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
3223	Aftertreatment 1 Intake Gas Sensor 1 Heater Control	Indicates the heater status in the warm-up process. Upon receiving a power-up command, the gas sensor ramps up according to a manufacturer defined profile. The Preheat 1, Preheat 2, and Automatic messages are regions within this profile in exhaust bank 1.00b = Automatic 01b = Preheat 2 10b = Preheat 1 11b = Heater off
3224	Engine Exhaust 1 NOx Sensor 1 Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the first NOx sensor by the manufacturer's sensor control software in exhaust bank 1. This sensor is located at the intake of the SCR system if an SCR system exists. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
3225	Aftertreatment 1 Intake Oxygen Sensor 1 Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the aftertreatment intake oxygen sensor by the manufacturer's sensor control software in exhaust bank 1. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
3226	Aftertreatment 1 Outlet NOx 1	The amount of combined NO and NO2 in the exhaust exiting the aftertreatment system measured by a NOx sensor at the aftertreatment outlet, represented in NOx molecule parts per million non-NOx molecules in exhaust bank 1.SPN 3226 shall display the raw, uncorrected NOx sensor signal. 2016 MY and later engines with NOx sensors may be required to output a 'corrected' NOx sensor signal (see SPN 7351) in addition to the raw NOx sensor signal output using SPN 3226. A value of FB00h shall be provided when ambient or engine operating conditions do not permit the sensor to operate in data collection mode.
3227	Aftertreatment 1 Outlet Percent Oxygen 1	The actual oxidation factor (percent oxygen) of the gas within the exhaust stream. For positive values, the parameter represents the percent oxygen in excess of the amount required for stoichiometric combustion. For negative values, the parameter is proportional to the amount of oxygen being pumped by the sensor. This value is measured by a sensor at the aftertreatment outlet in exhaust bank 1.A value of -12%

		(0000h) indicates rich, a value of 21% (FAFFh) indicates lean. These data points could optionally be used with switching O2 sensors to indicate those states as alternatives to broadcasting the threshold %O2 values. Diagnostic Tools could change display to use the text « Rich » or « Lean » in place of the implied %O2 values which would also be acceptable for display.
3228	Aftertreatment 1 Outlet Gas Sensor 1 Power In Range	Indicates that the power supplied to the aftertreatment outlet gas sensor, either NOx or O2, is within the manufacturer's specification in exhaust bank 1. This parameter reports the status as reported by the sensor.00b = Not in range 01b = In range 10b = Error 11b = Not available
3229	Aftertreatment 1 Outlet Gas Sensor 1 at Temperature	Indicates that the heater element of the aftertreatment outlet gas sensor, either NOx or O2, is within the manufacturer's specified range for accurate measurements in exhaust bank 1.00b = Not in range 01b = In range 10b = Error 11b = Not available
3230	Aftertreatment 1 Outlet NOx 1 Reading Stable	Indicates that the NOx reading of the aftertreatment outlet NOx sensor is stable as determined by the manufacturer's control software in exhaust bank 1.00b = Not stable 01b = Stable 10b = Error 11b = Not available
3231	Aftertreatment 1 Outlet Wide-Range Percent Oxygen 1 Reading Stable	Indicates that the percent oxygen reading of the aftertreatment outlet gas sensor, either NOx or O2, is stable as determined by the manufacturer's control software in exhaust bank 1.00b = Not stable 01b = Stable 10b = Error 11b = Not available
3232	Aftertreatment 1 Outlet Gas Sensor 1 Heater Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the heater of the outlet exhaust gas sensor, either NOx or O2, by the manufacturer's sensor control software in exhaust bank 1. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
3233	Aftertreatment 1 Outlet Gas Sensor 1 Heater Control	Indicates the heater status in the warm-up process. Upon receiving a power-up command, the gas sensor ramps up according to a manufacturer defined profile. The Preheat 1, Preheat 2, and Automatic messages are regions within this profile in exhaust bank 1.00b = Automatic 01b = Preheat 2 10b = Preheat 1 11b = Heater off

3234	Aftertreatment 1 Outlet NOx Sensor 1 Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the aftertreatment outlet NOx sensor by the manufacturer's sensor control software in exhaust bank 1. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
3235	Aftertreatment 1 Outlet Oxygen Sensor 1 Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the aftertreatment outlet oxygen sensor by the manufacturer's sensor control software in exhaust bank 1. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
3236	Aftertreatment 1 Exhaust Gas Mass Flow Rate	Measured/calculated exhaust gas mass upstream of the aftertreatment system in exhaust bank 1 and 2.
3237	Aftertreatment 1 Intake Dew Point	Indicates that the temperature on the intake side of the aftertreatment system has exceeded the dew point, as estimated by the ECU in exhaust bank 1.00b = Not exceeded the dew point 01b = Exceeded the dew point 10b = Error 11b = Not available
3238	Aftertreatment 1 Exhaust Dew Point	Indicates that the temperature on the exhaust side of the aftertreatment has exceeded the dew point, as estimated by the ECU in exhaust bank 1.00b = Not exceeded the dew point 01b = Exceeded the dew point 10b = Error 11b = Not available
3239	Aftertreatment 2 Intake Dew Point	Indicates that the temperature on the intake side of the aftertreatment system has exceeded the dew point, as estimated by the ECU in exhaust bank 2.00b = Not exceeded the dew point 01b = Exceeded the dew point 10b = Error 11b = Not available
3240	Aftertreatment 2 Exhaust Dew Point	Indicates that the temperature on the exhaust side of the aftertreatment has exceeded the dew point, as estimated by the ECU in exhaust bank 2.00b = Not exceeded the dew point 01b = Exceeded the dew point 10b = Error 11b = Not available
3241	Aftertreatment 1 Exhaust Temperature 1	The reading from the exhaust temperature sensor located farthest upstream in the aftertreatment system in exhaust bank 1.

3242	Aftertreatment 1 Diesel Particulate Filter Intake Temperature	Temperature of engine combustion byproducts entering the diesel particulate filter in exhaust bank 1.
3243	Aftertreatment 1 Exhaust Temperature 1 Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the exhaust temperature 1 sensor by the manufacturer's sensor control software in exhaust bank 1. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
3244	Aftertreatment 1 Diesel Particulate Filter Intake Temperature Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the diesel particulate filter intake temperature sensor by the manufacturer's sensor control software in exhaust bank 1. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
3245	Aftertreatment 1 Exhaust Temperature 3	The reading from the exhaust temperature sensor located farthest downstream in the aftertreatment system in exhaust bank 1.
3246	Aftertreatment 1 Diesel Particulate Filter Outlet Temperature	Temperature of engine combustion byproducts leaving the diesel particulate filter exhaust in exhaust bank 1.
3247	Aftertreatment 1 Exhaust Temperature 3 Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the exhaust temperature 3 sensor by the manufacturer's sensor control software in exhaust bank 1. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
3248	Aftertreatment 1 Diesel Particulate Filter Outlet Exhaust Temperature Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the diesel particulate filter outlet temperature sensor by the manufacturer's sensor control software in exhaust bank 1. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
3249	Aftertreatment 1 Exhaust Temperature 2	The reading from the exhaust temperature sensor located midstream of the other two temperature sensors in the aftertreatment system in exhaust bank 1.

3250	Aftertreatment 1 Diesel Particulate Filter Intermediate Temperature	Temperature of engine combustion byproducts at a mid-point in the diesel particulate filter in exhaust bank 1.
3251	Aftertreatment 1 Diesel Particulate Filter Differential Pressure	Exhaust differential pressure measured between the intake and exhaust of a diesel particulate filter in exhaust bank 1.
3252	Aftertreatment 1 Exhaust Temperature 2 Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the exhaust temperature 2 sensor by the manufacturer's sensor control software in exhaust bank 1. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
3253	Aftertreatment 1 Diesel Particulate Filter Differential Pressure Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the diesel particulate filter differential pressure sensor by the manufacturer's sensor control software in exhaust bank 1. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
3254	Aftertreatment 1 Diesel Particulate Filter Intermediate Temperature Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the diesel particulate filter intermediate temperature sensor by the manufacturer's sensor control software in exhaust bank 1. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
3255	Engine Exhaust 2 NOx 1	The amount of combined NO and NO2 in the exhaust, represented in NOx molecule parts per million non-NOx molecules, in exhaust bank 2. This sensor is located at the intake of the SCR system if an SCR system exists.For a single exhaust bank system, refer to parameters in PGNs 61454, 61455, 64946, 64947, 64948, and 65247. SPN 3255 shall display the raw, uncorrected NOx sensor signal. 2016 MY and later engines with NOx sensors may be required to output a 'corrected' NOx sensor signal (see SPN 7354) in addition to the raw NOx sensor signal output using SPN 3255. A value of FB00h shall be provided when ambient or engine operating conditions do not permit the sensor to operate in data collection mode.

3256	Engine Exhaust 2 Percent Oxygen 1	The actual oxidation factor (percent oxygen) of the gas within the exhaust stream. For positive values, the parameter represents the percent oxygen in excess of the amount required for stoichiometric combustion. For negative values, the parameter is proportional to the amount of oxygen being pumped by the sensor. This value is measured by a sensor at the aftertreatment intake in exhaust bank 2.For a single exhaust bank system, refer to parameters in PGNs 61454, 61455, 64946, 64947, 64948, and 65247. A value of -12% (0000h) indicates rich, a value of 21% (FAFFh) indicates lean. These data points could optionally be used with switching O2 sensors to indicate those states as alternatives to broadcasting the threshold %O2 values. Diagnostic Tools could change display to use the text « Rich » or « Lean » in place of the implied %O2 values which would also be acceptable for display.
3257	Engine Exhaust 2 Gas Sensor 1 Power In Range	Indicates that the power supplied to the intake gas sensor, either NOx or O2, is within the manufacturer's specification in exhaust bank 2. This parameter reports the status as reported by the sensor. This sensor is located at the intake of the SCR system if an SCR system exists.For a single exhaust bank system, refer to parameters in PGNs 61454, 61455, 64946, 64947, 64948, and 65247.
3258	Aftertreatment 2 Intake Gas Sensor 1 at Temperature	Indicates that the heater element of the aftertreatment intake gas sensor, either NOx or O2, is within the manufacturer's specified range for accurate measurements in exhaust bank 2.For a single exhaust bank system, refer to parameters in PGNs 61454, 61455, 64946, 64947, 64948, and 65247. 00b = Not in range 01b = In range 10b = Error 11b = Not available
3259	Engine Exhaust 2 NOx 1 Reading Stable	Indicates that the NOx reading of the first NOx sensor is stable as determined by the manufacturer's control software in exhaust bank 2. This sensor is located at the intake of the SCR system if an SCR system exists.For a single exhaust bank system, refer to parameters in PGNs 61454, 61455, 64946, 64947, 64948, and 65247. 00b = Not stable 01b = Stable 10b = Error 11b = Not available
3260	Aftertreatment 2 Intake Wide-Range Percent Oxygen 1 Reading Stable	Indicates that the percent oxygen reading of the aftertreatment intake gas sensor, either NOx or O2, is stable as determined by the manufacturer's control software in exhaust bank 2.For a single exhaust bank system, refer to parameters in PGNs 61454,

		61455, 64946, 64947, 64948, and 65247. 00b = Not stable 01b = Stable 10b = Error 11b = Not available
3261	Aftertreatment 2 Intake Gas Sensor 1 Heater Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the heater of the intake exhaust gas sensor, either NOx or O2, by the manufacturer's sensor control software in exhaust bank 2. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported. For a single exhaust bank system, refer to parameters in PGNs 61454, 61455, 64946, 64947, 64948, and 65247.
3262	Aftertreatment 2 Intake Gas Sensor 1 Heater Control	Indicates the heater status in the warm-up process. Upon receiving a power-up command, the gas sensor ramps up according to a manufacturer defined profile. The Preheat 1, Preheat 2, and Automatic messages are regions within this profile in exhaust bank 2.For a single exhaust bank system, refer to parameters in PGNs 61454, 61455, 64946, 64947, 64948, and 65247. 00b = Automatic 01b = Preheat 2 10b = Preheat 1 11b = Heater off
3263	Engine Exhaust 2 NOx Sensor 1 Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the NOx sensor by the manufacturer's sensor control software in exhaust bank 2. This sensor is located at the intake of the SCR system if an SCR system exists. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported. For a single exhaust bank system, refer to parameters in PGNs 61454, 61455, 64946, 64947, 64948, and 65247.
3264	Aftertreatment 2 Intake Oxygen Sensor 1 Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the aftertreatment intake oxygen sensor by the manufacturer's sensor control software in exhaust bank 2. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported. For a single exhaust bank system, refer to parameters in PGNs 61454, 61455, 64946, 64947, 64948, and 65247.
3265	Aftertreatment 2 Outlet NOx 1	The amount of combined NO and NO2 in the exhaust entering the aftertreatment system measured by a NOx sensor at the aftertreatment outlet, represented in NOx

		molecule parts per million non-NOx molecules in exhaust bank 2.For a single exhaust bank system, refer to parameters in PGNs 61454, 61455, 64946, 64947, 64948, and 65247. SPN 3265 shall display the raw, uncorrected NOx sensor signal. 2016 MY and later engines with NOx sensors may be required to output a 'corrected' NOx sensor signal (see SPN 7352) in addition to the raw NOx sensor signal output using SPN 3265. A value of FB00h shall be provided when ambient or engine operating conditions do not permit the sensor to operate in data collection mode.
3266	Aftertreatment 2 Outlet Percent Oxygen 1	The actual oxidation factor (percent oxygen) of the gas within the exhaust stream. For positive values, the parameter represents the percent oxygen in excess of the amount required for stoichiometric combustion. For negative values, the parameter is proportional to the amount of oxygen being pumped by the sensor. This value is measured by a sensor at the aftertreatment outlet in exhaust bank 2.For a single exhaust bank system, refer to parameters in PGNs 61454, 61455, 64946, 64947, 64948, and 65247. A value of -12% (0000h) indicates rich, a value of 21% (FAFFh) indicates lean. These data points could optionally be used with switching O2 sensors to indicate those states as alternatives to broadcasting the threshold %O2 values. Diagnostic Tools could change display to use the text « Rich » or « Lean » in place of the implied %O2 values which would also be acceptable for display.
3267	Aftertreatment 2 Outlet Gas Sensor 1 Power In Range	Indicates that the power supplied to the aftertreatment outlet gas sensor, either NOx or O2, is within the manufacturer's specification in exhaust bank 2.For a single exhaust bank system, refer to parameters in PGNs 61454, 61455, 64946, 64947, 64948, and 65247. This parameter reports the status as reported by the sensor. 00b = Not in range 01b = In range 10b = Error 11b = Not available
3268	Aftertreatment 2 Outlet Gas Sensor 1 at Temperature	Indicates that the heater element of the aftertreatment outlet gas sensor, either NOx or O2, is within the manufacturer's specified range for accurate measurements in exhaust bank 2.For a single exhaust bank system, refer to parameters in PGNs 61454, 61455, 64946, 64947, 64948, and 65247. 00b = Not in range 01b = In range 10b = Error 11b = Not available

3269	Aftertreatment 2 Outlet NOx 1 Reading Stable	Indicates that the NOx reading of the aftertreatment outlet NOx sensor is stable as determined by the manufacturer's control software in exhaust bank 2.For a single exhaust bank system, refer to parameters in PGNs 61454, 61455, 64946, 64947, 64948, and 65247. 00b = Not stable 01b = Stable 10b = Error 11b = Not available
3270	Aftertreatment 2 Outlet Wide-Range Percent Oxygen 1 Reading Stable	Indicates that the percent oxygen reading of the aftertreatment outlet gas sensor, either NOx or O2, is stable as determined by the manufacturer's control software in exhaust bank 2.For a single exhaust bank system, refer to parameters in PGNs 61454, 61455, 64946, 64947, 64948, and 65247. 00b = Not stable 01b = Stable 10b = Error 11b = Not available
3271	Aftertreatment 2 Outlet Gas Sensor 1 Heater Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the heater of the outlet exhaust gas sensor, either NOx or O2, by the manufacturer's sensor control software in exhaust bank 2. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported. For a single exhaust bank system, refer to parameters in PGNs 61454, 61455, 64946, 64947, 64948, and 65247.
3272	Aftertreatment 2 Outlet Gas Sensor 1 Heater Control	Indicates the heater status in the warm-up process. Upon receiving a power-up command, the gas sensor ramps up according to a manufacturer defined profile. The Preheat 1, Preheat 2, and Automatic messages are regions within this profile in exhaust bank 2.For a single exhaust bank system, refer to parameters in PGNs 61454, 61455, 64946, 64947, 64948, and 65247. 00b = Automatic 01b = Preheat 2 10b = Preheat 1 11b = Heater off
3273	Aftertreatment 2 Outlet NOx Sensor 1 Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the aftertreatment outlet NOx sensor by the manufacturer's sensor control software in exhaust bank 2. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported. For a single exhaust bank system, refer to parameters in PGNs 61454, 61455, 64946, 64947, 64948, and 65247.

3274	Aftertreatment 2 Outlet Oxygen Sensor 1 Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the aftertreatment outlet oxygen sensor by the manufacturer's sensor control software in exhaust bank 2. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported. For a single exhaust bank system, refer to parameters in PGNs 61454, 61455, 64946, 64947, 64948, and 65247.
3275	Aftertreatment 2 Exhaust Temperature 1	The reading from the exhaust temperature sensor located farthest upstream in the aftertreatment system in exhaust bank 2. (For a single exhaust bank system, refer to parameters in PGNs 61454, 61455, 64946, 64947, 64948, and 65247)
3276	Aftertreatment 2 Diesel Particulate Filter Intake Temperature	Temperature of engine combustion byproducts entering the diesel particulate filter in exhaust bank 2. (For a single exhaust bank system, refer to parameters in PGNs 61454, 61455, 64946, 64947, 64948, and 65247)
3277	Aftertreatment 2 Exhaust Temperature 1 Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the exhaust temperature 1 sensor by the manufacturer's sensor control software in exhaust bank 2. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported. For a single exhaust bank system, refer to parameters in PGNs 61454, 61455, 64946, 64947, 64948, and 65247.
3278	Aftertreatment 2 Diesel Particulate Filter Intake Temperature Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the diesel particulate filter intake temperature sensor by the manufacturer's sensor control software in exhaust bank 2. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported. For a single exhaust bank system, refer to parameters in PGNs 61454, 61455, 64946, 64947, 64948, and 65247.
3279	Aftertreatment 2 Exhaust Temperature 3	The reading from the exhaust temperature sensor located farthest downstream in the aftertreatment system in exhaust bank 2. (For a single exhaust bank system, refer to parameters in PGNs 61454, 61455, 64946, 64947, 64948, and 65247)

3280	Aftertreatment 2 Diesel Particulate Filter Outlet Temperature	Temperature of engine combustion byproducts leaving the diesel particulate filter exhaust in exhaust bank 2. (For a single exhaust bank system, refer to parameters in PGNs 61454, 61455, 64946, 64947, 64948, and 65247)
3281	Aftertreatment 2 Exhaust Temperature 3 Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the exhaust temperature 3 sensor by the manufacturer's sensor control software in exhaust bank 2. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported. For a single exhaust bank system, refer to parameters in PGNs 61454, 61455, 64946, 64947, 64948, and 65247.
3282	Aftertreatment 2 Diesel Particulate Filter Exhaust Temperature Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the diesel particulate filter outlet temperature sensor by the manufacturer's sensor control software in exhaust bank 2. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported. For a single exhaust bank system, refer to parameters in PGNs 61454, 61455, 64946, 64947, 64948, and 65247.
3283	Aftertreatment 2 Exhaust Temperature 2	The reading from the exhaust temperature sensor located midstream of the other two temperature sensors in the aftertreatment system in exhaust bank 2. (For a single exhaust bank system, refer to parameters in PGNs 61454, 61455, 64946, 64947, 64948, and 65247)
3284	Aftertreatment 2 Diesel Particulate Filter Intermediate Temperature	Temperature of engine combustion byproducts at a mid-point in the diesel particulate filter in exhaust bank 2. (For a single exhaust bank system, refer to parameters in PGNs 61454, 61455, 64946, 64947, 64948, and 65247)
3285	Aftertreatment 2 Diesel Particulate Filter Differential Pressure	Exhaust differential pressure measured between the intake and exhaust of a diesel particulate filter in exhaust bank 2. (For a single exhaust bank system, refer to parameters in PGNs 61454, 61455, 64946, 64947, 64948, and 65247)
3286	Aftertreatment 2 Exhaust Temperature 2 Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the exhaust temperature 2 sensor by the manufacturer's sensor control software in exhaust bank 2. In the case of

		multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported. For a single exhaust bank system, refer to parameters in PGNs 61454, 61455, 64946, 64947, 64948, and 65247.
3287	Aftertreatment 2 Diesel Particulate Filter Differential Pressure Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the diesel particulate filter differential pressure sensor by the manufacturer's sensor control software in exhaust bank 2. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported. For a single exhaust bank system, refer to parameters in PGNs 61454, 61455, 64946, 64947, 64948, and 65247.
3288	Aftertreatment 2 Diesel Particulate Filter Intermediate Temperature Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the diesel particulate filter intermediate temperature sensor by the manufacturer's sensor control software in exhaust bank 2. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported. For a single exhaust bank system, refer to parameters in PGNs 61454, 61455, 64946, 64947, 64948, and 65247.
3289	Transmission Requested Gear Feedback	Feedback of the SPN 525 Transmission Requested Gear input as received from the shift selector, ABS or engine via PGN 256, Transmission Control 1 (TC1) or other transmission selector input. Scaling, values and parameter specific indicators are identical to those listed for SPN 525 Requested Gear.This feedback from the transmission allows shift selectors and other TC1 input devices to verify that their Transmission Requested Gear command has been properly received by the transmission. (This parameter is not intended for driver display purposes). In systems with mechanical or electrical shift selectors which do not support J1939 communication, this parameter allows the transmission ECU to convey the requested gear as interpreted by the transmission from its mechanical or electrical input.
3290	Address Acknowledged	See document J1939-21 for SPN details.

3291	Address Negative Acknowledgement	See document J1939-21 for SPN details.
3292	Address Access Denied	See document J1939-21 for SPN details.
3293	Address Busy	See document J1939-21 for SPN details.
3294	Distance Since Diagnostic Trouble Codes Cleared	See document J1939-73 for SPN details.
3295	Minutes Run by Engine While MIL is Activated	See document J1939-73 for SPN details.
3296	Time Since Diagnostic Trouble Codes Cleared	See document J1939-73 for SPN details.
3297	SPN Supported	See document J1939-73 for SPN details.
3298	SPN Support Type	See document J1939-73 for SPN details.
3299	SPN Data Length	See document J1939-73 for SPN details.
3300	Expanded Freeze Frame Length	See document J1939-73 for SPN details.
3301	Time Since Engine Start	See document J1939-73 for SPN details.
3302	Number of Warm-Ups Since Diagnostic Trouble Codes Cleared	See document J1939-73 for SPN details.
3303	Continuously Monitored Systems Enabled/Completed Status	See document J1939-73 for SPN details.

3304	Non-Continuously Monitored Systems Enabled Status	See document J1939-73 for SPN details.
3305	Non-Continuously Monitored Systems Completed Status	See document J1939-73 for SPN details.
3306	Variable Valve Timing and/or Control	See document J1939-73 for SPN details.
3307	Fifth Wheel Error Status	Fifth wheel error state which conveys information when coupling status is incomplete or bad. 0000b = Improper Couple 0001b = Locks Closed / No Kingpin at Startup 0010b = Kingpin / Locks Open at Startup 0011b = Not Used 0100b = Not Used 0101b = Coupling Sequence Error 0110b = Coupling Sequence Error / Kingpin 0111b = Coupling Timing Error 1000b = Kingpin Missing More Than 5 Seconds 1001b = Kingpin / Lock Open (Handle Pulled) 1010b = Not Used 1011b = Not Used 1100b = Not Used 1101b = Not Used 1110b = Not Used 1111b = Not available
3308	Fifth Wheel Vertical Force	The amount of load being applied to the fifth wheel by the trailer. Zero load is indicated without a trailer.
3309	Fifth Wheel Drawbar Force	Fifth wheel drawbar force, with the trailer held stationary a positive force is generated by the vehicle pulling forward.
3310	Fifth Wheel Roll Moment	Fifth wheel roll moment force – If the moment is positive, the trailer is rolling clockwise relative to the normal vehicle forward motion.
3311	Fifth Wheel Slider Position	Slider position measurement. Zero equals fully back position, that is, the farthest to the rear of the vehicle.
3312	Fifth Wheel Lock Ready to Couple Indicator	Indicates to the vehicle operator that the fifth wheel lock is open and ready to couple. 00b = Lock not open, not ready to couple 01b = Lock open, ready to couple 10b = Error 11b = Not Available

3313	Fifth Wheel Lock Couple Status Indicator	Indicates results of coupling operation to the vehicle operator. For incomplete couples further information can be obtained from the fifth wheel error status SPN.00b = Incomplete or bad couple, truck should not be moved 01b = Successful couple detected 10b = Error 11b = Not Available
3314	Fifth Wheel Release Control	Operator input used to release the fifth wheel. Fifth Wheel Release Control Security Lockout and other conditions must be properly enabled before this will function.00b = Coupler Locked 01b = Coupler Unlocked, trailer can be unhitched or hitched 10b = Error 11b = Not Available
3315	Fifth Wheel Release Control Security Lockout	Operator's fifth wheel release control interlock. This operator input must be enabled prior to activating the fifth wheel release control (SPN 3314).00b = Fifth wheel release Disabled 01b = Fifth wheel release Enabled 10b = Error 11b = Not Available
3316	Fifth Wheel Slider Lock Indicator	Indicates to vehicle operator that the fifth wheel slider is in position and locked. 00b = Not Locked 01b = Locked 10b = Error 11b = Not Available
3317	Fifth Wheel Roll Warning Indicator	Indicates to the vehicle operator that the roll moment has exceeded a preset limit. 00b = Limit not exceeded 01b = Limit exceeded 10b = error 11b = Not Available
3318	Pitch Angle	The angle between the vehicle x-axis and the ground plane (i.e. rotation about the vehicle Y-axis). The pitch angle for an angle of ascent is reported with a positive value. This parameter is defined according to a Z-Down axis system and the sign of the value is in accordance to the right-hand rule, as specified in SAE J670. As specified in SAE J670, a Z-Down Axis System has positive X directed forward, positive Y to the right, and positive Z directed down. See SPN 4976 for an alternate range and resolution.
3319	Roll Angle	The angle between the vehicle y-axis and the ground plane (i.e. rotation about the X-axis). The roll angle for a roll to the right is reported with a positive value. Roll angle is the same for both Z-Down and Z-Up axis systems, since both systems have positive X axis directed forward. The sign of the value is in accordance to the right-hand rule, as specified in SAE J670. See SPN 4977 for an alternate range and resolution.

3322	Pitch Rate	Pitch rate is the rate-of-change of the pitch angle over time, where the pitch angle vector is in the direction of travel of the vehicle. The pitch rate for increasing ascent over time is reported with a positive value. This parameter is defined according to a Z-Down axis system and the sign of the value is in accordance to the right-hand rule, as specified in SAE J670. As specified in SAE J670, a Z-Down Axis System has positive X directed forward, positive Y to the right, and positive Z directed down. See SPN 4983 for an alternate range and resolution.
3323	Pitch Angle Figure of Merit	Figure of merit for pitch angle measurement. 00b = Pitch angle fully functional. Data is within sensor specification. 01b = Pitch angle degraded. Data is suspect due to environmental conditions. 10b = Error 11b = Not available
3324	Roll Angle Figure of Merit	Figure of merit for roll angle measurement. 00b = Roll angle fully functional. Data is within sensor specification. 01b = Roll angle degraded. Data is suspect due to environmental conditions. 10b = Error 11b = Not available
3325	Pitch Rate Figure of Merit	Figure of merit for the pitch rate measurement. 00b = Pitch rate fully functional. Data is within sensor specification. 01b = Pitch rate degraded. Data is suspect due to environmental conditions. 10b = Error 11b = Not available
3326	Pitch and Roll Compensated	Compensated mode for the pitch and roll measurements. Compensation is the use of multiple sensors together to enhance the output of pitch and roll measurements.00b = Compensation Off 01b = Compensation On 10b = Error 11b = Not Available
3327	Roll and Pitch Measurement Latency	The estimated measurement latency of the measurement. NOTE: This is only the sensor latency and does not include any additional latencies that might exist because of the CAN Bus or overall system implementation. Latency is the time from sensor readings to the queuing of the message data for CAN transmission.
3328	Manufacturer Specific Information (PropA2_PDU1)	See document J1939-21 for SPN details.
3329	Message Selection Control	See document J1939-74 for SPN details.

3330	PGN of Configurable Message Desired	See document J1939-74 for SPN details.
3331	Blade Rotation Angle	The blade rotation angle measurement around the yaw (z-axis). The Blade Rotation Angle is defined to be the angle from the null position on the machine. The null position is orthogonal from the z-axis along the x-axis. A positive blade angle results when the blade is rotated clockwise from the null position. This parameter is defined according to a Z-Down axis system and the sign of the value is in accordance to the right-hand rule, as specified in SAE J670. As specified in SAE J670, a Z-Down Axis System has positive X directed forward, positive Y to the right, and positive Z directed down.
3332	Blade Rotation Angle Figure of Merit	Figure of merit for blade rotation measurement. Bits 00b = Blade Rotation Angle fully functional. Data is within sensor specification. 01b = Blade Rotation Angle degraded. Data is suspect due to environmental conditions. 10b = Blade Rotation Angle failed. Roll sensor failed to operate correctly. 11b = Blade Rotation Angle not available
3333	Feederhouse Height	See document J1939-74 for SPN details.
3334	Left Blade Control Mode Operator Control	This parameter indicates the left blade control mode operator control state the user has set for the land leveling system. The operator control value directly relates to the current operator control state correlating to the left edge of the blade. The purpose of this parameter is to set the control mode (auto/manual) for the left side of the blade. For this system, the left and right side of the blade can be adjusted independently of each other to either change the elevation from a given reference point or the blade angle (also known as blade tilt)/cross slope depending on the function requested by the operator.This parameter is intended for use in systems using two parameters (right/left) to control the blade as described above. Systems using only one parameter to control blade position, i.e. elevation, should use the Blade Control Mode Switch parameter. Only one of the following states will be active at a time. In the example below, data values are defined for each switch type that may be used in an application. The purpose of the following switch information is to define what data

		should be reported based on what type of switch is used. 1. A toggle button with two states can be used, in which the button is either in the manual or the auto position at all times. Toggle button usage is as follows: Manual Button Pressed = 0010b Manual Operator Control Request Automatic Button Pressed = 0011b Automatic Operator Control Request Invalid Switch Input(ex. auto and manual read/pressed simultaneously) = 1110b Error Indicator 2. The momentary rocker switch may be used, where the default is the no button pressed position. The user can press the rocker into the manual position, and when pressure is released, it will return to the no button pressed position. The user may also press the rocker into the auto position, and when pressure is released, it will return to the no button pressed position. Momentary rocker button usage is as follows: No button pressed = 0000b No change Manual Button Pressed = 0010b Manual Operator Control Request Automatic Button Pressed = 0011b Automatic Operator Control Request Invalid Switch Input(ex. auto and manual read/pressed simultaneously) = 1110b Error Indicator 3. The momentary contact button pair may be used, where the default is no buttons being pressed. The user can press the manual button, and when pressure is released, it will return to the no button pressed position. The user may press the auto button, and when pressure is released, it will return to the no button pressed position. Momentary contact buttons (button pair) usage is as follows: No button pressed = 0000b No change Manual Button Pressed = 0010b Manual Operator Control Request Automatic Button Pressed = 0011b Automatic Operator Control Request Invalid Switch Input(ex. auto and manual read/pressed simultaneously) = 1110b Error Indicator 4. The momentary contact single button may be used, where the default is no button being pressed. The user can press the button, which is the button pressed position, and when pressure is released, it will return to the no button pressed position. The controller receiving this command will keep track of what mode the blade is in, auto or manual. If the blade is in manual mode to begin with, one press of the button will change to mode to auto. If the button is pressed again, the blade will be put into manual mode. Momentary contact button (single button) usage is as follows: No button pressed = 0000b No change Mode Button Pressed = 0001b Momentary Operator Control Request Data Values and Descriptions: 0000b = No Change 0001b = Momentary Operator Control Request 0010b = Manual Operator Control Request 0011b = Automatic Operator Control Request 1100b to 1101b = Reserved 1110b = Error Indicator 1111b = Not

		Installed Notes: 1. The operator control state can be read in two ways. One method uses the direct operator control input to determine the operator control state, while the second method relies on a secondary control to read the operator control input, then relay the information on the data link. The parameter is designed to provide the actual operator control state to other controls that need the information. 2. Other systems with automated blade controls should be able to use this parameter, since it is an actual operator control value.
3335	Right Blade Control Mode Operator Control	This parameter indicates the right blade control mode operator control state the user has set for the land leveling system. The operator control value directly relates to the current operator control state correlating to the left edge of the blade. The purpose of this parameter is to set the control mode (auto/manual) for the left side of the blade. For this system, the left and right side of the blade can be adjusted independently of each other to either change the elevation from a given reference point or the blade angle (also known as blade tilt)/cross slope depending on the function requested by the operator.This parameter is intended for use in systems using two parameters(right/left) to control the blade as described above. Systems using only one parameter to control blade position, i.e. elevation, should use the Blade Control Mode Switch parameter. Only one of the following states will be active at a time. In the example below, data values are defined for each switch type that may be used in an application. The purpose of the following switch information is to define what data should be reported based on what type of switch is used. 1. A toggle button with two states can be used, in which the button is either in the manual or the auto position at all times. Toggle button usage is as follows: Manual Button Pressed = 0010b Manual Operator Control Request Automatic Button Pressed = 0011b Automatic Operator Control Request Invalid Switch Input(ex. auto and manual read/pressed simultaneously) = 1110b Error Indicator 2. The momentary rocker switch may be used, where the default is the no button pressed position. The user can press the rocker into the manual position, and when pressure is released, it will return to the no button pressed position. The user may also press the rocker into the auto position, and when pressure is released, it will return to the no button pressed position. Momentary rocker button usage is as follows: No button pressed = 0000b No change Manual Button Pressed = 0010b Manual Operator Control Request Automatic Button Pressed

		= 0011b Automatic Operator Control Request Invalid Switch Input(ex. auto and manual read/pressed simultaneously) = 1110b Error Indicator 3. The momentary contact button pair may be used, where the default is no buttons being pressed. The user can press the manual button, and when pressure is released, it will return to the no button pressed position. The user may press the auto button, and when pressure is released, it will return to the no button pressed position. Momentary contact buttons (button pair) usage is as follows: No button pressed = 0000b No change Manual Button Pressed = 0010b Manual Operator Control Request Automatic Button Pressed = 0011b Automatic Operator Control Request Invalid Switch Input(ex. auto and manual read/pressed simultaneously) = 1110b Error Indicator 4. The momentary contact single button may be used, where the default is no button being pressed. The user can press the button, which is the button pressed position, and when pressure is released, it will return to the no button pressed position. The controller receiving this command will keep track of what mode the blade is in, auto or manual. If the blade is in manual mode to begin with, one press of the button will change to mode to auto. If the button is pressed again, the blade will be put into manual mode. Momentary contact button (single button) usage is as follows: No button pressed = 0000b No change Mode Button Pressed = 0001b Momentary Operator Control Request Data Values and Descriptions: 0000b = No Change 0001b = Momentary Operator Control Request 0010b = Manual Operator Control Request 0011b = Automatic Operator Control Request 1110b = Error Indicator 1111b = Not Installed All other values reserved
3336	Left Desired Blade Offset Operator Control	This parameter indicates the left blade offset operator control state the user has set for the land leveling system. The left desired blade offset value is the offset measured from a given reference point to the bottom left edge of the blade. This parameter will only be used when the control mode for land leveling system has been set to auto. The purpose of this parameter is to adjust the elevation from a given reference point or the blade angle(also known as blade tilt)/cross slope depending on the function being requested by the operator for the left side of the blade.This parameter is intended for use in systems using two parameters(left/right) to control the blade as described above. Systems using only one parameter to control blade position, i.e. elevation, should use the Desired Blade Offset Switch parameter. Only one of the

		following states will be active at a time. In the example below, data values are defined for each switch type that may be used in an application. The purpose of the following switch information is to define what data should be reported based on what type of switch is used. 1. The momentary rocker switch may be used, where the default is the neutral position with no buttons pressed. The user can press the rocker into the increment button pressed position, and when pressure is released, it will return to the neutral position. The user may also press the rocker into the decrement button pressed position, and when pressure is released, it will return to the neutral position. Momentary rocker button usage is as follows: Neutral position = 0000b No Operator Control Request Increment Button Pressed = 0001b Increment Operator Control Request Decrement Button Pressed = 0010b Decrement Operator Control Request Invalid Switch Input(ex. inc./dec. values read simultaneously) = 1110b Error Indicator 2. The momentary contact button pair may be used, where the default is the neutral position with no buttons pressed. The user can press the increment button, and when pressure is released, it will return to the neutral position. The user may press the decrement button, and when pressure is released, it will return to the neutral position. Momentary contact button (button pair) usage is as follows: No Button Pressed = 0000b No Operator Control Request Increment Button Pressed = 0001b Increment Operator Control Request Decrement Button Pressed = 0010b Decrement Operator Control Request Invalid Switch Input(ex. inc./dec. values read simultaneously) = 1110b Error Indicator Data Values and Descriptions: 0000b = No Operator Control Request 0001b = Increment Operator Control Request 0010b = Decrement Operator Control Request 0011b to 1101b = Reserved 1110b = Error Indicator 1111b = Not installed Notes: 1. The operator control state can be read in two ways. One method uses the direct operator control input to determine the operator control state, while the second method relies on a secondary control to read the operator control input, then relay the information on the data link. The parameter is designed to provide the actual operator control state to other controls that need the information. 2. Other systems with automated blade controls should be able to use this parameter, since it is an actual operator control value.
3337	Right Desired Blade Offset Operator Control	This parameter indicates the right blade offset operator control state the user has set for the land leveling system. The right desired blade offset value is the offset

		measured from a given reference point to the bottom right edge of the blade. This parameter will only be used when the control mode for land leveling system has been set to auto. The purpose of this parameter is to adjust the elevation from a given reference point or the blade angle(also known as blade tilt)/cross slope depending on the function being requested by the operator for the left side of the blade.This parameter is intended for use in systems using two parameters(left/right) to control the blade as described above. Systems using only one parameter to control blade position, i.e. elevation, should use the Desired Blade Offset Switch parameter. Only one of the following states will be active at a time. In the example below, data values are defined for each switch type that may be used in an application. The purpose of the following switch information is to define what data should be reported based on what type of switch is used. 1. The momentary rocker switch may be used, where the default is the neutral position with no buttons pressed. The user can press the rocker into the increment button pressed position, and when pressure is released, it will return to the neutral position. The user may also press the rocker into the decrement button pressed position, and when pressure is released, it will return to the neutral position. Momentary rocker button usage is as follows: Neutral position = 0000b No Operator Control Request Increment Button Pressed = 0001b Increment Operator Control Request Decrement Button Pressed = 0010b Decrement Operator Control Request Invalid Switch Input(ex. inc./dec. values read simultaneously) = 1110b Error Indicator 2. The momentary contact button pair may be used, where the default is the neutral position with no buttons pressed. The user can press the increment button, and when pressure is released, it will return to the neutral position. The user may press the decrement button, and when pressure is released, it will return to the neutral position. Momentary contact button (button pair) usage is as follows: No Button Pressed = 0000b No Operator Control Request Increment Button Pressed = 0001b Increment Operator Control Request Decrement Button Pressed = 0010b Decrement Operator Control Request Invalid Switch Input(ex. inc./dec. values read simultaneously) = 1110b Error Indicator Data Values and Descriptions: 0000b = No Operator Control Request 0001b = Increment Operator Control Request 0010b = Decrement Operator Control Request 0011b to 1101b = Reserved 1110b = Error Indicator 1111b = Not installed Notes: 1. The operator control state can be read in two ways. One method uses the direct operator control input to determine the operator control state, while the

		second method relies on a secondary control to read the operator control input, then relay the information on the data link. The parameter is designed to provide the actual operator control state to other controls that need the information. 2. Other systems with automated blade controls should be able to use this parameter, since it is an actual operator control value.
3338	Side-shift Blade Control Mode Operator Control	This parameter indicates the side-shift offset operator control state the user has set for the land leveling system. When an implement moves in a side-shift direction, it moves from side to side, usually along its longitudinal axis. The desired side-shift offset value is the offset measured from a given vertical reference point to the center of the blade.Only one of the following states will be active at a time. In the example below, the data values are defined for each switch type that may be used in an application. The purpose of the following switch information is to define what data should be reported based on what type of switch is used. 1. The momentary rocker switch may be used, where the default is the neutral position with no buttons pressed. The user can press the rocker into the increment button pressed position, and when pressure is released, it will return to the neutral position. The user may also press the rocker into the decrement button pressed position, and when pressure is released, it will return to the neutral position. Momentary rocker button usage is as follows: – Neutral position = 0000b No Operator Control Request – Increment Button Pressed = 0001b Increment Operator Control Request – Decrement Button Pressed = 0010b Decrement Operator Control Request 2. The momentary contact button pair may be used, where the default is the neutral position with no buttons pressed. The user can press the increment button, and when pressure is released, it will return to the neutral position. The user may press the decrement button, and when pressure is released, it will return to the neutral position. Momentary contact button (button pair) usage is as follows: – No Button Pressed = 0000b No Operator Control Request – Increment Button Pressed = 0001b Increment Operator Control Request – Decrement Button Pressed = 0010b Decrement Operator Control Request Data Values and Descriptions: 0000b = No Operator Control Request 0001b = Increment Operator Control Request 0010b = Decrement Operator Control Request 0011b to 1101b = Reserved 1110b = Error Indicator 1111b = Not installed

3339	Side-shift Desired Blade Offset Operator Control	This parameter indicates the side-shift blade control mode operator control state the user has set for the land leveling system. When an implement moves in a side-shift direction, it moves from side to side, usually along its longitudinal axis.The operator control value directly correlates to the current operator control state. Only one of the following states will be active at a time. In the example below, the data values are defined for each switch type that may be used in an application. The purpose of the following switch information is to define what data should be reported based on what type of switch is used. 1. A toggle button with two states can be used, in which the button is either in the manual or the auto position at all times. Toggle button usage is as follows: Manual Position = 0010b Manual Operator Control Request Auto Position = 0011b Automatic Operator Control Request 2. The momentary rocker switch may be used, where the default is the no button pressed position. The user can press the rocker into the manual position, and when pressure is released, it will return to the no button pressed position. The user may also press the rocker into the auto position, and when pressure is released, it will return to the no button pressed position. Momentary rocker button usage is as follows: No Button Pressed = 0000b No Operator Control Request Manual Button Pressed = 0010b Manual Operator Control Request Auto Button Pressed = 0011b Automatic Operator Control Request 3. The momentary contact button pair may be used, where the default is no buttons being pressed. The user can press the manual button, and when pressure is released, it will return to the no button pressed position. The user may press the auto button, and when pressure is released, it will return to the no button pressed position. Momentary contact buttons (button pair) usage is as follows: No Button Pressed = 0000b No Operator Control Request Manual Button Pressed = 0010b Manual Operator Control Request Auto Button Pressed = 0011b Automatic Operator Control Request 4. The momentary contact single button may be used, where the default is no button being pressed. The user can press the button, which is the button pressed position, and when pressure is released, it will return to the no button pressed position. The controller receiving this command will keep track of what mode the blade is in, auto or manual. If the blade is in manual mode to begin with, one press of the button will change to mode to auto. If the button is pressed again, the blade will be put into manual mode. Momentary contact button (single button) usage is as follows: No Button Pressed = 0000b No Operator Control Request Button Pressed = 0001b Momentary Operator Control

		Request Data Values and Descriptions: 0000b = No Operator Control Request 0001b = Momentary Operator Control Request 0010b = Manual Operator Control Request 0011b = Automatic Operator Control Request 0100b to 1101b = Reserved 1110b = Error Indicator 1111b = Not Installed
3340	Engine Charge Air Cooler 1 Intake Pressure	Pressure of air at intake to 1st or only charge air cooler, from multiple first stage turbochargers being cooled and feeding multiple second stage turbochargers.
3341	Engine Charge Air Cooler 2 Intake Pressure	Pressure of air at intake to 2nd charge air cooler, from multiple first stage turbochargers being cooled and feeding multiple second stage turbochargers.
3342	Engine Coolant Pump Differential Pressure	The differential pressure measured across the input and output of the engine coolant pump.
3343	Engine Centrifugal Oil Filter speed	The speed of a rotating (centrifugal) engine oil filter.
3344	Support Variable Rate TSC1 Message	This parameter indicates which TSC1 transmission rates are supported by the engine ECU in addition to the required 10ms transmission rate for temporary powertrain control purposes.Bit Position Transmission Rate 1 1000 ms transmission rate 2 750 ms transmission rate 3 500 ms transmission rate 4 250 ms transmission rate 5 100 ms transmission rate 6 50 ms transmission rate 7 20 ms transmission rate 8 Reserved for SAE assignment (set to one) Where 0 = Transmission Rate Supported by Engine and 1 = Transmission Rate Not supported by Engine Note: FFh for this byte implies that the engine only supports standard temporary powertrain control (e.g. 10 ms)
3345	Support TSC1 Control Purpose Group 1	This parameter indicates which TSC1 control purposes are supported in group 1 of 4. One bit is used to convey the support of each Control Purpose. A value of 0 equals supported and a value of 1 equals not supported. This bit logic is used to allow the default to FFh to be backward compatible.This group of 4 parameters (SPNs 3345, 3346, 3347, and 3348) indicates which TSC1 Control Purposes are supported by the engine ECU in addition to the Temporary Powertrain Control Purpose (which is denoted as control purpose P32). All ones in the Group 1 through 4 parameters indicates the engine only supports Temporary Powertrain Control. Group 1 of 4 Bit

		Position Control Purpose Value Control Purpose Description 1 P1 Accelerator Pedal/Operator Selection 2 P2 Cruise Control 3 P3 PTO Governor 4 P4 Road Speed Governor 5 P5 Engine protection 6 P6 Transient-Optimized Torque Limit 7 P7 Automated Driving System Input 8 P8 Reserved for assignment by SAE Where 0 = Control Purpose is supported and 1 = Control Purpose is not supported
3346	Support TSC1 Control Purpose Group 2	This parameter indicates which TSC1 control purposes are supported in group 2 of 4. One bit is used to convey the support of each Control Purpose. A value of 0 equals supported and a value of 1 equals not supported. This bit logic is used to allow the default to FFh to be backward compatible.This group of 4 parameters (SPNs 3345, 3346, 3347, and 3348) indicates which TSC1 Control Purposes are supported by the engine ECU in addition to the Temporary Powertrain Control Purpose (which is denoted as control purpose P32). All ones in the Group 1 through 4 parameters indicates the engine only supports Temporary Powertrain Control. Group 2 of 4 Bit Position Control Purpose Value Control Purpose Description 1 P9 Reserved for assignment by SAE 2 P10 Reserved for assignment by SAE 3 P11 Reserved for assignment by SAE 4 P12 Reserved for assignment by SAE 5 P13 Reserved for assignment by SAE 6 P14 Reserved for assignment by SAE 7 P15 Reserved for assignment by SAE 8 P16 Reserved for assignment by SAE Where 0 = Control Purpose is supported and 1 = Control Purpose is not supported
3347	Support TSC1 Control Purpose Group 3	This parameter indicates which TSC1 control purposes are supported in group 3 of 4. One bit is used to convey the support of each Control Purpose. A value of 0 equals supported and a value of 1 equals not supported. This bit logic is used to allow the default to FFh to be backward compatible.This group of 4 parameters (SPNs 3345, 3346, 3347, and 3348) indicates which TSC1 Control Purposes are supported by the engine ECU in addition to the Temporary Powertrain Control Purpose (which is denoted as control purpose P32). All ones in the Group 1 through 4 parameters indicates the engine only supports Temporary Powertrain Control. Group 3 of 4 Bit Position Control Purpose Value Control Purpose Description 1 P17 Reserved for assignment by SAE 2 P18 Reserved for assignment by SAE 3 P19 Reserved for assignment by SAE 4 P20 Reserved for assignment by SAE 5 P21 Reserved for assignment by SAE 6 P22 Reserved for assignment by SAE 7 P23 Reserved for

		assignment by SAE 8 P24 Reserved for assignment by SAE Where 0 = Control Purpose is supported and 1 = Control Purpose is not supported
3348	Support TSC1 Control Purpose Group 4	This parameter indicates which TSC1 control purposes are supported in group 4 of 4. One bit is used to convey the support of each Control Purpose. A value of 0 equals supported and a value of 1 equals not supported. This bit logic is used to allow the default to FFh to be backward compatible.This group of 4 parameters (SPNs 3345, 3346, 3347, and 3348) indicates which TSC1 Control Purposes are supported by the engine ECU in addition to the Temporary Powertrain Control Purpose (which is denoted as control purpose P32). All ones in the Group 1 through 4 parameters indicates the engine only supports Temporary Powertrain Control. Group 4 of 4 Bit Position Control Purpose Value Control Purpose Description 1 P25 Reserved for assignment by SAE 2 P26 Reserved for assignment by SAE 3 P27 Reserved for assignment by SAE 4 P28 Reserved for assignment by SAE 5 P29 Reserved for assignment by SAE 6 P30 Reserved for assignment by SAE 7 P31 Reserved for assignment by SAE 8 See Note Not assignable, must always be set to 1. Where 0 = Control Purpose is supported and 1 = Control Purpose is not supported NOTE: P32 is always supported and is Temporary Powertrain Control (the original use of the TSC1 Command). The engine configuration will not indicate separate support of Temporary Powertrain Control mode.
3349	TSC1 Transmission Rate	This parameter indicates the transmission rate at which the sending device will transmit the TSC1 message. The engine shall adjust its timeout for TSC1 messages accordingly. Variable TSC1 transmission rates shall only apply to messages sent to the engine.A value of all ones is to be used in TSC1 messages directed to retarders because the TSC1 Transmission Rate parameter is not applicable for retarders. All TSC1 messages sent to the retarder shall use the standard 50 ms rate. Devices sending TSC1 messages to the engine should only invoke alternative transmission rates which the engine has indicated it supports in SPN 3344 – Support Variable Rate TSC1 Message. 000b = 1000 ms transmission rate 001b = 750 ms transmission rate 010b = 500 ms transmission rate 011b = 250 ms transmission rate 100b = 100 ms transmission rate 101b = 50 ms transmission rate 110b = 20 ms transmission rate 111b = Use standard TSC1 transmission rates of 10 ms to engine Note: Sending

		devices shall not send variable rate TSC1 messages to the engine for unsupported control purposes.
3350	TSC1 Control Purpose	State signal which indicates which control mode the sending device is using to generate the TSC1 command. Note that the modes are not in prioritized order. Not all modes may be relevant for a given device. Some devices may not implement all functions. For typical priorities refer to Figures SPN512_A, SPN512_B for engine control and Figure SPN695_A. The TSC1 control purpose shall only apply to messages sent to the engine.A value of all ones is to be used in TSC1 messages directed to retarders because the TSC1 Control Purpose parameter is not applicable for retarders. Control Purpose P6 (Transient-Optimized Torque Limit) is for use with engines capable of supporting a more rapid engine torque limit response than seen with traditional (P32) TSC1 torque limit commands. In applications where an engine has multiple ways (fuel, air, and/or spark control) of realizing torque reduction, this parameter can help the engine determine which method to use. One such example would be a spark-ignited engine. Transient-Optimized Torque Limits are not intended for long term usage, and supporting engines will likely place time limits on the duration of their response. In addition, supporting engines may also restrict the level of torque change allowed under this command. Control Purpose P7 (Automated Driving System Input) is for use with powertrain systems capable of supporting Automated Driving Systems. Using Control Purpose P7 will allow the powertrain system to process the requested torque along with other driver inputs such as the accelerator pedal, yet indicate the final commanded torque was not directly commanded by the driver. Devices described in SAE J3016 may use Control Purpose P7 (Automated Driving System Input). 00000b = P1 = Accelerator Pedal/Operator Selection 00001b = P2 = Cruise Control 00010b = P3 = PTO Governor 00011b = P4 = Road Speed Governor 00100b = P5 = Engine Protection 00101b = P6 = Transient-Optimized Torque Limit 00110b = P7 = Automated Driving System Input 00111b to 11110b = P8-P31 = Reserved for SAE Assignment 11111b = P32 = Temporary Powertrain Control (Original use of TSC1 Command) Note: Sending devices shall not send variable rate TSC1 messages to the engine for unsupported control purposes.

3351	Engine Exhaust Pressure Regulator Vent Valve Control	Exhaust Pressure Regulator Vent Valve Control is the output that is used to control the valve position .
3352	Engine Exhaust Pressure Regulator Vent Valve Position	Provides feedback to the Regulator Vent Valve Exhaust Pressure Position.
3353	Alternator 1 Status	Alternator 1 operating status. 00b = Alternator 1 not charging 01b = Alternator 1 charging 10b = error 11b = not available
3354	Alternator 2 Status	Alternator 2 operating status. 00b = Alternator 2 not charging 01b = Alternator 2 charging 10b = error 11b = not available
3355	Alternator 3 Status	Alternator 3 operating status. 00b = Alternator 3 not charging 01b = Alternator 3 charging 10b = error 11b = not available
3356	Alternator 4 Status	Alternator 4 operating status. 00b = Alternator 4 not charging 01b = Alternator 4 charging 10b = error 11b = not available
3357	Actual Maximum Available Engine – Percent Torque	This is the maximum amount of torque that the engine can immediately deliver as a percentage of the reference engine torque (SPN 544). The Actual Maximum Available Engine – Percent Torque shall take into consideration all engine torque derates (e.g. air fuel ratio control (AFC), noise control, etc.) that could potentially be active in the system. This parameter differentiates itself from the engine percent torque points 1 through 5 of the engine configuration map because it takes into account all dynamic internal inputs such as AFC and that it is updated on a 50ms basis.
3358	Engine Exhaust Gas Recirculation 1 Intake Pressure	EGR intake gage pressure is measured after the EGR cooler and before the EGR valve.
3359	Transmission Oil Filter Restriction Switch	This switch indicates whether the transmission oil filter is clogged. 00b = No restriction 01b = Restriction exists on oil filter 10b = Error 11b = Not available

3360	Aftertreatment 1 Diesel Exhaust Fluid Controller 1	The diesel exhaust fluid controller has the ability to read attributes of the SCR system, including but not limited to, diesel exhaust fluid level, diesel exhaust fluid temperature, diesel exhaust fluid quality, and diesel exhaust fluid dosing rate.
3361	Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit 1	The diesel exhaust fluid dosing unit is a device that mixes the diesel exhaust fluid and air, and delivers a metered quantity of this mixture to the exhaust stream. This can also refer to a device that delivers diesel exhaust fluid to an aftertreatment diesel exhaust fluid dosing valve without air assistance.This parameter refers to the dosing unit in bank 1, or the first of multiple dosing units if there is more than one dosing unit in bank 1.
3362	Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit 1 Input Lines	The diesel exhaust fluid dosing unit is a device that mixes the diesel exhaust fluid and air, such that it contains an input line from the air tank and an input line from the diesel exhaust fluid tank.This parameter refers to the input lines of the dosing unit in bank 1, or the input lines of the first of multiple dosing units if there is more than one dosing unit in bank 1.
3363	Aftertreatment 1 Diesel Exhaust Fluid Tank Heater	Percentage of heating applied to the aftertreatment 1 diesel exhaust fluid tank heater. A value of 0% means no heating applied, a value of 100% means full heating applied. The diesel exhaust fluid tank heater warms the diesel exhaust fluid in the diesel exhaust fluid tank. See SPN 5137 for the command for this tank heater.
3364	Aftertreatment 1 Diesel Exhaust Fluid Tank Quality	Measures the quality of the diesel exhaust fluid in the diesel exhaust fluid tank
3365	Relative Blade Height	The measured vertical distance from a fixed location on the machine blade to a ground-based reference (i.e. relative height). Examples of a ground based reference include a curb, a stringline or the ground itself. The measurement may be positive or negative based on the initial reference used.
3366	Relative Blade Height and Blade Rotation Angle Measurement Latency	The estimated measurement latency of the measurement. NOTE: This is only the sensor latency and does not include any additional latencies that might exist because of the CAN Bus or overall system implementation. For example, if the technique used

		is a sonic pulse/echo system, the round trip time divided by two will be a reasonably accurate estimate of the measurement latency if the processing time is small with respect to the propagation time.
3367	Relative Blade Height Figure of Merit	Figure of merit for blade height measurement. Bits 00b = Relative Blade Height fully functional. Data is within sensor specification. 01b = Relative Blade Height degraded. Data is suspect due to environmental conditions. 10b = Relative Blade Height failed. 11b = Relative Blade Height not available
3368	Network Transceiver Status 1	Indicates the status of the transceiver for the wireless communications network type 0 = Off 1 = On 2 = Not Authorized to Operate on Network 3 to 250 = Reserved for Future Assignment 251 to 253 = Reserved 254 = Error 255 = Not Available
3369	Network Service Status 1	Indicates the status of the Service for the wireless communications network type 0 = Local Service 1 = Roaming Service 2 = Service not available 3 = Not Authorized to Operate on Service 4 to 250 = Reserved for Future Assignment 251 to 253 = Reserved 254 = Error 255 = Not Available
3370	Network Antenna Status 1	Indicates the status of the antenna for the wireless communications network type 0 = Off 1 = On 2 to 250 = Reserved for Future Assignment 251 to 253 = Reserved 254 = Error 255 = Not Available
3371	Network Signal Strength 1	Indicates the signal strength for the wireless communications network type.
3372	Wireless Communication Network Type 1	Type of Wireless Communication Network 0 = Cellular network #1 1 = Cellular network #2 2 = Wireless LAN #1 3 = Wireless LAN #2 4 = Satellite network 5 to 250 = Reserved for Future Assignment 251 to 253 = Reserved 254 = Error 255 = Not Available
3374	Generator Excitation Ripple Current	Reports excessive generator exitation ripple current
3375	Voltage Regulator Load Compensation Mode	State signal indicating the voltage regulator load compensation mode. Load compensation is when the voltage is adjusted based on the magnitude of load

		current000b = load compensation disabled 001b = Voltage droop compensation enabled 010b = IR line drop compensation enabled 011b = Reserved 100b = Reserved 101b = Reserved 110b = Reserved 111b = Not available Notes: Voltage droop compensation is used to minimize the amount of reactive current that flows between generators when they are parallelled together. Excessive reactive current will result in the eventual failure of the generator exciter. IR line compensation increases the generator output voltage as the load increases so the voltage measured at the load will remain constant. Without IR compensation, the voltage measured at the load drops due the IR losses in the power line.
3376	Voltage Regulator VAr/Power Factor operating mode	State signal indicating the operating mode for the Voltage regulator VAr/Power Factor 000b = VAr/Power Factor regulation disabled 001b = Power factor regulation enabled 010b = VAr regulation enabled 011b = Reserved 100b = Reserved 101b = Reserved 110b = Reserved 111b = Not available Note: This parameter sets the mode of regulation for the voltage regulator. The voltage regulator can regulate the generator AC output voltage by using the generator AC output voltage, the generator power factor, or the generator reactive power (VAr). The generator AC output voltage, the generator power factor, and the generator reactive power (VAr) are defined in SAE J1939 – 75
3377	Voltage Regulator Underfrequency Compensation enabled	State signal indicating the operating mode for underfrequency compensation. 00b = Underfrequency compensation disabled 01b = Underfrequency compensation enabled 10b = Reserved 11b = Not available Note: Underfrequency compensation is when the generator voltage is adjusted based on the generator frequency. Typically generator voltage decreases as frequency decreases. A frequency decrease occurs when load is increased on the genset. Underfrequency compensation decreases the load by reducing the voltage as frequency decreases until a point is reached where the engine can accept more load. Load is applied to the engine when the voltage increases with frequency.
3378	Voltage Regulator Soft Start State	State signal indicating the mode of the Voltage regulator soft start function. Soft start controls the generator voltage overshoot by controlling the rate of rise of the

		generator output voltage at generator start up.00b = Soft start is inactive 01b = Soft start is active 10b = Reserved 11b = Not available
3379	Voltage Regulator Enabled	State signal indicating the Voltage Regulator is enabled. This parameter indicates whether the regulator is regulating or not regulating generator output voltage.00b = Not regulating voltage – unit disabled 01b = Regulating voltage 10b = Reserved 11b = Not available
3380	Generator Excitation Field Voltage	Measured signal that represents the generator excitation field voltage. Generator excitation field voltage is indicative of the amount of excitation current being supplied by the voltage regulator to the generator field.
3381	Generator Excitation Field Current	Measured signal that represents the generator excitation field current.
3382	Generator Output Voltage Bias Percentage	Measured signal that represents the voltage bias percentage of the generator ouptput voltage being requested by external to the voltage regulator.Generator output voltage bias percentage is the amount of voltage in percent the generator output voltage will vary from the generator nominal setpoint.
3383	Requested Generator Total AC Reactive Power	The total reactive power requested to be delivered by the generator
3384	Requested Generator Overall Power Factor	The requested average power factor of the generator.
3385	Requested Generator Overall Power Factor Lagging	The requested lead/lag status for the generator average AC power factor 00b = Leading 01b = Lagging 10b = Reserved 11b = Not available or Not installed
3386	Requested Generator Average Line-Line AC RMS Voltage	The requested average AC RMS voltage to be delivered by the generator.
3387	Engine Cylinder 1 Combustion Status	This parameter is used to indicate state of combustion in engine cylinder #1 00b = No combustion 01b = Combustion exists 10b = Error 11b = Not available

3388	Engine Cylinder 2 Combustion Status	This parameter is used to indicate state of combustion in engine cylinder #2 00b = No combustion 01b = Combustion exists 10b = Error 11b = Not available
3389	Engine Cylinder 3 Combustion Status	This parameter is used to indicate state of combustion in engine cylinder #3 00b = No combustion 01b = Combustion exists 10b = Error 11b = Not available
3390	Engine Cylinder 4 Combustion Status	This parameter is used to indicate state of combustion in engine cylinder #4 00b = No combustion 01b = Combustion exists 10b = Error 11b = Not available
3391	Engine Cylinder 5 Combustion Status	This parameter is used to indicate state of combustion in engine cylinder #5 00b = No combustion 01b = Combustion exists 10b = Error 11b = Not available
3392	Engine Cylinder 6 Combustion Status	This parameter is used to indicate state of combustion in engine cylinder #6 00b = No combustion 01b = Combustion exists 10b = Error 11b = Not available
3393	Engine Cylinder 7 Combustion Status	This parameter is used to indicate state of combustion in engine cylinder #7 00b = No combustion 01b = Combustion exists 10b = Error 11b = Not available
3394	Engine Cylinder 8 Combustion Status	This parameter is used to indicate state of combustion in engine cylinder #8 00b = No combustion 01b = Combustion exists 10b = Error 11b = Not available
3395	Engine Cylinder 9 Combustion Status	This parameter is used to indicate state of combustion in engine cylinder #9 00b = No combustion 01b = Combustion exists 10b = Error 11b = Not available
3396	Engine Cylinder 10 Combustion Status	This parameter is used to indicate state of combustion in engine cylinder #10 00b = No combustion 01b = Combustion exists 10b = Error 11b = Not available
3397	Engine Cylinder 11 Combustion Status	This parameter is used to indicate state of combustion in engine cylinder #11 00b = No combustion 01b = Combustion exists 10b = Error 11b = Not available
3398	Engine Cylinder 12 Combustion Status	This parameter is used to indicate state of combustion in engine cylinder #12 00b = No combustion 01b = Combustion exists 10b = Error 11b = Not available

3399	Engine Cylinder 13 Combustion Status	This parameter is used to indicate state of combustion in engine cylinder #13 00b = No combustion 01b = Combustion exists 10b = Error 11b = Not available
3400	Engine Cylinder 14 Combustion Status	This parameter is used to indicate state of combustion in engine cylinder #14 00b = No combustion 01b = Combustion exists 10b = Error 11b = Not available
3401	Engine Cylinder 15 Combustion Status	This parameter is used to indicate state of combustion in engine cylinder #15 00b = No combustion 01b = Combustion exists 10b = Error 11b = Not available
3402	Engine Cylinder 16 Combustion Status	This parameter is used to indicate state of combustion in engine cylinder #16 00b = No combustion 01b = Combustion exists 10b = Error 11b = Not available
3403	Engine Cylinder 17 Combustion Status	This parameter is used to indicate state of combustion in engine cylinder #17 00b = No combustion 01b = Combustion exists 10b = Error 11b = Not available
3404	Engine Cylinder 18 Combustion Status	This parameter is used to indicate state of combustion in engine cylinder #18 00b = No combustion 01b = Combustion exists 10b = Error 11b = Not available
3405	Engine Cylinder 19 Combustion Status	This parameter is used to indicate state of combustion in engine cylinder #19 00b = No combustion 01b = Combustion exists 10b = Error 11b = Not available
3406	Engine Cylinder 20 Combustion Status	This parameter is used to indicate state of combustion in engine cylinder #20 00b = No combustion 01b = Combustion exists 10b = Error 11b = Not available
3407	Engine Cylinder 21 Combustion Status	This parameter is used to indicate state of combustion in engine cylinder #21 00b = No combustion 01b = Combustion exists 10b = Error 11b = Not available
3408	Engine Cylinder 22 Combustion Status	This parameter is used to indicate state of combustion in engine cylinder #22 00b = No combustion 01b = Combustion exists 10b = Error 11b = Not available
3409	Engine Cylinder 23 Combustion Status	This parameter is used to indicate state of combustion in engine cylinder #23 00b = No combustion 01b = Combustion exists 10b = Error 11b = Not available

3410	Engine Cylinder 24 Combustion Status	This parameter is used to indicate state of combustion in engine cylinder #24 00b = No combustion 01b = Combustion exists 10b = Error 11b = Not available
3411	Status 2 of doors	Composite indication of all bus door statuses. Enabled means the bus doors are able to be automatically opened or closed.00b = all bus doors are disabled 01b = at least 1 bus door enabled 10b = error 11b = not available
3412	Lock Status of Door 1	Lock status of bus door 1 00b = unlocked 01b = locked 10b = error 11b = not available
3413	Open Status of Door 1	Open status of bus door 1 00b = door closed 01b = door opened 10b = error 11b = not available
3414	Enable Status of Door 1	Enable status of bus door 1. Enabled means the bus doors are able to be automatically opened or closed. 00b = door disabled 01b = door enabled 10b = error 11b = not available
3415	Lock Status of Door 2	Lock status of bus door 2 00b = unlocked 01b = locked 10b = error 11b = not available
3416	Open Status of Door 2	Open status of bus door 2 00b = door closed 01b = door opened 10b = error 11b = not available
3417	Enable Status of Door 2	Enable status of bus door 2. Enabled means the bus doors are able to be automatically opened or closed. 00b = door disabled 01b = door enabled 10b = error 11b = not available
3418	Lock Status of Door 3	Lock status of bus door 3 00b = unlocked 01b = locked 10b = error 11b = not available
3419	Open Status of Door 3	Open status of bus door 3 00b = door closed 01b = door opened 10b = error 11b = not available

3420	Enable Status of Door 3	Enable status of bus door 3. Enabled means the bus doors are able to be automatically opened or closed. 00b = door disabled 01b = door enabled 10b = error 11b = not available
3421	Lock Status of Door 4	Lock status of bus door 4 00b = unlocked 01b = locked 10b = error 11b = not available
3422	Open Status of Door 4	Open status of bus door 4 00b = door closed 01b = door opened 10b = error 11b = not available
3423	Enable Status of Door 4	Enable status of bus door 4. Enabled means the bus doors are able to be automatically opened or closed. 00b = door disabled 01b = door enabled 10b = error 11b = not available
3424	Lock Status of Door 5	Lock status of bus door 5 00b = unlocked 01b = locked 10b = error 11b = not available
3425	Open Status of Door 5	Open status of bus door 5 00b = door closed 01b = door opened 10b = error 11b = not available
3426	Enable Status of Door 5	Enable status of bus door 5. Enabled means the bus doors are able to be automatically opened or closed. 00b = door disabled 01b = door enabled 10b = error 11b = not available
3427	Lock Status of Door 6	Lock status of bus door 6 00b = unlocked 01b = locked 10b = error 11b = not available
3428	Open Status of Door 6	Open status of bus door 6 00b = door closed 01b = door opened 10b = error 11b = not available
3429	Enable Status of Door 6	Enable status of bus door 6. Enabled means the bus doors are able to be automatically opened or closed. 00b = door disabled 01b = door enabled 10b = error 11b = not available

3430	Lock Status of Door 7	Lock status of bus door 7 00b = unlocked 01b = locked 10b = error 11b = not available
3431	Open Status of Door 7	Open status of bus door 7 00b = door closed 01b = door opened 10b = error 11b = not available
3432	Enable Status of Door 7	Enable status of bus door 7. Enabled means the bus doors are able to be automatically opened or closed. 00b = door disabled 01b = door enabled 10b = error 11b = not available
3433	Lock Status of Door 8	Lock status of bus door 8 00b = unlocked 01b = locked 10b = error 11b = not available
3434	Open Status of Door 8	Open status of bus door 8 00b = door closed 01b = door opened 10b = error 11b = not available
3435	Enable Status of Door 8	Enable status of bus door 8. Enabled means the bus doors are able to be automatically opened or closed. 00b = door disabled 01b = door enabled 10b = error 11b = not available
3436	Lock Status of Door 9	Lock status of bus door 9 00b = unlocked 01b = locked 10b = error 11b = not available
3437	Open Status of Door 9	Open status of bus door 9 00b = door closed 01b = door opened 10b = error 11b = not available
3438	Enable Status of Door 9	Enable status of bus door 9. Enabled means the bus doors are able to be automatically opened or closed. 00b = door disabled 01b = door enabled 10b = error 11b = not available
3439	Lock Status of Door 10	Lock status of bus door 10 00b = unlocked 01b = locked 10b = error 11b = not available

3440	Open Status of Door 10	Open status of bus door 10 00b = door closed 01b = door opened 10b = error 11b = not available
3441	Enable Status of Door 10	Enable status of bus door 10. Enabled means the bus doors are able to be automatically opened or closed. 00b = door disabled 01b = door enabled 10b = error 11b = not available
3442	Network Transceiver Status 2	Indicates the status of the transceiver for the wireless communications network type 0 = Off 1 = On 2 = Not Authorized to Operate on Network 3 to 250 = Reserved for Future Assignment 251 to 253 = Reserved 254 = Error 255 = Not Available
3443	Network Service Status 2	Indicates the status of the Service for the wireless communications network type 0 = Local Service 1 = Roaming Service 2 = Service not available 3 = Not Authorized to Operate on Service 4 to 250 = Reserved for Future Assignment 251 to 253 = Reserved 254 = Error 255 = Not Available
3444	Network Antenna Status 2	Indicates the status of the antenna for the wireless communications network type 0 = Off 1 = On 2 to 250 = Reserved for Future Assignment 251 to 253 = Reserved 254 = Error 255 = Not Available
3445	Network Signal Strength 2	Indicates the signal strength for the wireless communications network type.
3446	Wireless Communication Network Type 2	Type of Wireless Communication Network 0 = Cellular network #1 1 = Cellular network #2 2 = Wireless LAN #1 3 = Wireless LAN #2 4 = Satellite network 5 to 250 = Reserved for Future Assignment 251 to 253 = Reserved 254 = Error 255 = Not Available
3447	Remote PTO Governor Preprogrammed Speed Control Switch #2	Switch signal which indicates that the remote PTO governor toggle switch #2 is in the enabled (ON) position. If the toggle switch is enabled and other conditions are satisfied then the remote PTO governor control feature is activated and the PTO governor will control at the preprogrammed speed #2.00b = Off 01b = On 10b = Error 11b = Not Available Note: This switch is different than the 1-8 Preprogrammed

		Set Speeds because this is a physical switch input, not a user programmable set speed (although the associated PTO set speed for this toggle switch is user defined).
3448	Auxiliary Input Ignore Switch	Switch signal which overrides other switch input's ability to disable an engine's operating condition. 00b = Off 01b = On 10b = Error 11b = Not Available This switch input can be used to prevent the PTO from disengaging if another switch input's state changes. For example, if the PTO is normally disengaged when the clutch is depressed, then this switch would allow the user to use PTO while depressing the clutch. Interlock switches which are specifically intended to inhibit PTO operation have priority over this parameter.
3451	Engine Multiple Cylinder Spark Voltage	The spark voltage of a spark event measured on multiple cylinders. This parameter is intended for use on engines where the spark plug, spark plug wire, and coils are used to measure the voltage of a spark event on multiple cylinders.
3452	Enable Switch – Transmission input shaft PTO 1	Status of the operator's switch or other input which indicates the desire for engaging the first PTO drive mounted on the transmission case. There may be more than one PTO drive mounted on the transmission case.00b = Enable switch off – PTO operation not desired 01b = Enable switch on – PTO operation desired 10b = Error 11b = Not available
3453	Enable Switch – Transmission input shaft PTO 2	Status of the operator's switch or other input which indicates the desire for engaging the second PTO drive mounted on the transmission case. If there is only one PTO drive on the transmission case, use SPN 3452 Enable Switch – Transmission input shaft PTO 1.00b = Enable switch off – PTO operation not desired 01b = Enable switch on – PTO operation desired 10b = Error 11b = Not available
3454	Enable Switch – Transmission output shaft PTO	Status of the operator's switch or other input which indicates the desire for engaging the PTO drive mounted on the transmission output shaft.00b = Enable switch off – PTO operation not desired 01b = Enable switch on – PTO operation desired 10b = Error 11b = Not available

3455	Enable Switch – Transfer case output shaft PTO	Status of the operator's switch or other input which indicates the desire for engaging the PTO drive mounted on the output shaft of the transfer case.00b = Enable switch off – PTO operation not desired 01b = Enable switch on – PTO operation desired 10b = Error 11b = Not available
3456	Engagement Consent – Transmission input shaft PTO 1	Status of the transmission controller's consent to engage the first or sole PTO drive mounted on the transmission case. The controller in charge of the PTO drive should monitor this parameter and only engage the drive when consent is given. If consent is removed, while the PTO drive is engaged, the drive controller should disengage the drive as soon as possible. Engaging the drive or continuing drive engagement when consent is removed may result in damage to the transmission and / or the PTO drive mechanism.00b = Consent not given – PTO drive should not be engaged 01b = Consent given – PTO drive may be engaged 10b = Error 11b = Not available
3457	Engagement Consent – Transmission input shaft PTO 2	Status of the transmission controller's consent to engage the second PTO drive mounted on the transmission case. The controller in charge of the PTO drive should monitor this parameter and only engage the drive when consent is given. If consent is removed while the PTO drive is engaged, the drive controller should disengage the drive as soon as possible. Engaging the drive or continuing drive engagement when consent is removed may result in damage to the transmission and / or the PTO drive mechanism. If there is only one PTO drive on the transmission case, use SPN 3456 Engagement Consent – Transmission input shaft PTO 1.00b = Consent not given – PTO drive should not be engaged 01b = Consent given – PTO drive may be engaged 10b = Error 11b = Not available
3458	Engagement Consent – Transmission output shaft PTO	Status of the transmission controller's consent to engage the PTO drive connected to the transmission output shaft. The controller in charge of the PTO drive should monitor this parameter and only engage the drive when consent is given. If consent is removed, while the PTO drive is engaged, the drive controller should disengage the drive as soon as possible. Engaging the drive or continuing drive engagement when consent is removed may result in damage to the transmission and / or the PTO drive mechanism.00b = Consent not given – PTO drive should not be engaged 01b = Consent given – PTO drive may be engaged 10b = Error 11b = Not available

3459	Engagement Consent – Transfer case output shaft PTO	Status of the transmission controller’s consent to engage the PTO drive connected to the transfer case output shaft. The controller in charge of the PTO drive should monitor this parameter and only engage the drive when consent is given. If consent is removed, while the PTO drive is engaged, the drive controller should disengage the drive as soon as possible. Engaging the drive or continuing drive engagement when consent is removed may result in damage to the transmission and / or the PTO drive mechanism.00b = Consent not given – PTO drive should not be engaged 01b = Consent given – PTO drive may be engaged 10b = Error 11b = Not available
3460	Engagement Status – Transmission input shaft PTO 1	Reports if this specific PTO drive is engaged. This parameter should be broadcast only by the controller(s) receiving feedback about the specific drive.For example, a pressure switch may be used to determine if a PTO-driven pump has been engaged. If the Body Controller (SA33) were monitoring this feedback signal, it should be the node broadcasting this parameter. 00b = Drive not engaged 01b = Drive is engaged 10b = Error 11b = Not available
3461	Engagement Status – Transmission input shaft PTO 2	Reports if this specific PTO drive is engaged. This parameter should be broadcast only by the controller(s) receiving feedback about the specific drive.For example, a pressure switch may be used to determine if a PTO-driven pump has been engaged. If the Body Controller (SA33) were monitoring this feedback signal, it should be the node broadcasting this parameter. If there is only one PTO drive on the transmission case, SPN 3460 Engagement Status – Transmission input shaft PTO 1 should be used. 00b = Drive not engaged 01b = Drive is engaged 10b = Error 11b = Not available
3462	Engagement Status – Transmission output shaft PTO	Reports if this specific PTO drive is engaged. This parameter should be broadcast only by the controller(s) receiving feedback about the specific drive.For example, a pressure switch may be used to determine if a PTO-driven pump has been engaged. If the Body Controller (SA33) were monitoring this feedback signal, it should be the node broadcasting this parameter. 00b = Drive not engaged 01b = Drive is engaged 10b = Error 11b = Not available
3463	Engagement Status – Transfer case output shaft PTO	Reports if this specific PTO drive is engaged. This parameter should be broadcast only by the controller(s) receiving feedback about the specific drive.For example, a

		pressure switch may be used to determine if a PTO-driven pump has been engaged. If the Body Controller (SA33) were monitoring this feedback signal, it should be the node broadcasting this parameter. 00b = Drive not engaged 01b = Drive is engaged 10b = Error 11b = Not available
3464	Engine Throttle Actuator 1 Control Command	The control command to throttle actuator 1, normalized to percent, where 0% represents fully closed and 100% represents fully open. Typically, this throttle actuator is used to regulate air or air / fuel mix to the engine. Using the standard convention for determining the position. Left/front is #1 and right/rear is #2 (SPN 3465).FB00h – FB64h is sent to calibrate to a specific position. The LSB specifies the position with a resolution of 1%/bit (eg, FB32h is sent to calibrate the actuator to 50%). FBFFh is sent to calibrate the actuator using its own algorithm. Calibration status from the actuator is received on SPN 5445.
3465	Engine Throttle Actuator 2 Control Command	The control command to throttle actuator 2, normalized to percent, where 0% represents fully closed and 100% represents fully open. Typically, this throttle actuator is used to regulate air or air / fuel mix to the engine. Using the standard convention for determining the position. Left/front is #1 (SPN 3464) and right/rear is #2.
3466	Engine Fuel Valve 2 Intake Absolute Pressure	Absolute pressure of gas on intake side of the second fuel system control valve, using standard convention for determining position.In a system with two fuel system control valves, left/front is #1 (SPN 1390) and right/rear is #2 (SPN 3466). In a system with more than 2 fuel system control valves, the front left is #1 (SPN 1390), the front right is #2 (SPN 3466), the rear left is #3 (SPN 7505), and the rear right is #4 (SPN 7506).
3467	Engine Fuel System 2 Gas Mass Flow Rate	Gas mass flow rate delivered to an engine through its second fuel control system, using standard convention for determining position.In a system with two fuel system control valves, left/front is #1 (SPN 1241) and right/rear is #2 (SPN 3467). In a system with more than 2 fuel systems, the front left is #1 (SPN 1241), the front right is #2 (SPN 3467), the rear left is #3 (SPN 7509), and the rear right is #4 (SPN 7510).

3468	Engine Fuel 1 Temperature 2	Second Temperature measurement of fuel (or gas) of the first fuel type. See SPN 174 for first fuel temperature measurement.
3469	Engine Fuel Valve 2 Outlet Absolute Pressure	Absolute pressure of gas on outlet side of the second fuel system control valve. See SPN 2980 for the first or only fuel system control valve.
3470	Engine Turbocharger Compressor Bypass Actuator 1 Command	The command to a compressor bypass actuator, normalized to percent, where 0% nominally represents fully closed and 100% represents fully open. Typically, the turbocharger compressor bypass actuator is used to keep the engine out of surge by metering compressed air (charge).
3471	Aftertreatment 1 Fuel Pressure Control Actuator	Diagnostic SPN for the actuator controlling aftertreatment 1 fuel pressure
3472	Aftertreatment 1 Air Pressure Control Actuator	Diagnostic SPN for the actuator controlling aftertreatment 1 air pressure
3473	Aftertreatment 1 Failed to Ignite	Indicates that aftertreatment 1 has failed to ignite enough times to warrant triggering a diagnostic event. Note: Intended to be used with FMI 31 – condition exists. This SPN would indicate that aftertreatment 1 has been trying to ignite using the ignition system but has been unable to for an unknown reason. The ignition system, air system, or fuel system could be at fault.
3474	Aftertreatment 1 Diesel Particulate Filter Loss of Combustion	Indicates that aftertreatment 1 has lost combustion enough times to warrant triggering a diagnostic. Note: Intended to be used with FMI 31 – condition exists. This SPN would indicate that aftertreatment 1 has lost combustion during a regeneration for an unknown reason.
3475	Aftertreatment 2 Fuel Pressure Control Actuator	Diagnostic SPN for the actuator controlling aftertreatment 2 fuel pressure
3476	Aftertreatment 2 Air Pressure Control Actuator	Diagnostic SPN for the actuator controlling aftertreatment 2 air pressure

3477	Aftertreatment 2 Failed to Ignite	Indicates that aftertreatment 2 has failed to ignite enough times to warrant triggering a diagnostic event. Note: Intended to be used with FMI 31 – condition exists. This SPN would indicate that aftertreatment 2 has been trying to ignite using the ignition system but has been unable to for an unknown reason. The ignition system, air system, or fuel system could be at fault.
3478	Aftertreatment 2 Diesel Particulate Filter Loss of Combustion	Indicates that aftertreatment 2 has lost combustion enough times to warrant triggering a diagnostic. Note: Intended to be used with FMI 31 – condition exists. This SPN would indicate that aftertreatment 2 has lost combustion during a regeneration for an unknown reason.
3479	Aftertreatment 1 Fuel Pressure 1 Control	Position that the controller is commanding the aftertreatment 1 fuel pressure control to maintain. 0% = fully closed, 100% = fully open.
3480	Aftertreatment 1 Fuel Pressure 1	First fuel pressure measurement for the aftertreatment 1 system
3481	Aftertreatment 1 Fuel Rate	Rate of fuel being delivered to aftertreatment 1 for regeneration
3482	Aftertreatment 1 Fuel Enable Actuator	Indicates whether aftertreatment 1 fuel enable actuator is on or off 00b = not active 01b = active 10b = reserved for SAE assignment 11b = not available
3483	Aftertreatment 1 Regeneration Status	Indicates whether regeneration is active or inactive in aftertreatment 1. 00b = not active 01b = active 10b = reserved for SAE assignment 11b = not available
3484	Aftertreatment 1 Ignition	Indicates whether aftertreatment 1 ignition circuit is energized by the ECU. 00b = not active 01b = active 10b = reserved for SAE assignment 11b = not available
3485	Aftertreatment 1 Supply Air Pressure	Pressure of the supply air for aftertreatment 1. Supply air is the air supplied from a pneumatic line for an air-assisted or pneumatic actuator. One example is an air assisted fuel injector (the supply air assists in the atomization of fuel).
3486	Aftertreatment 1 Purge Air Pressure	Pressure of the purge air supply for aftertreatment 1

3487	Aftertreatment 1 Air Pressure Control	Position that the controller is commanding the aftertreatment 1 air pressure control to maintain. 0% = fully closed, 100% = fully open
3488	Aftertreatment 1 Air Pressure Actuator Position	Position of the aftertreatment 1 air pressure actuator as measured by a position feedback sensor.
3489	Aftertreatment 1 Air Enable Actuator	Indicates whether aftertreatment 1 air enable actuator is on or off 00b = not active 01b = active 10b = reserved for SAE assignment 11b = not available
3490	Aftertreatment 1 Purge Air Actuator	Indicates whether aftertreatment 1 purge air actuator is on or off 00b = not active 01b = active 10b = reserved for SAE assignment 11b = not available
3491	Aftertreatment 1 Atomization Air Actuator	Indicates whether aftertreatment 1 atomization air actuator is on or off 00b = not active 01b = active 10b = reserved for SAE assignment 11b = not available
3492	Aftertreatment 1 Air System Relay	Indicates whether aftertreatment 1 air system relay is on or off 00b = not active 01b = active 10b = reserved for SAE assignment 11b = not available
3493	Aftertreatment 2 Fuel Pressure 1 Control	Position that the controller is commanding the aftertreatment 2 fuel pressure control to maintain. 0% = fully closed, 100% = fully open.
3494	Aftertreatment 2 Fuel Pressure 1	Pressure of the fuel for Aftertreatment 2.
3495	Aftertreatment 2 Fuel Rate	Rate of fuel being delivered to aftertreatment 2 for regeneration
3496	Aftertreatment 2 Fuel Enable Actuator	Indicates whether aftertreatment 2 fuel enable actuator is on or off 00b = not active 01b = active 10b = reserved for SAE assignment 11b = not available
3497	Aftertreatment 2 Regeneration Status	Indicates whether regeneration is active or inactive in aftertreatment 2. 00b = not active 01b = active 10b = reserved for SAE assignment 11b = not available

3498	Aftertreatment 2 Ignition	Indicates whether aftertreatment 2 ignition circuit is energized by the ECU. 00b = not active 01b = active 10b = reserved for SAE assignment 11b = not available
3499	Aftertreatment 2 Supply Air Pressure	Pressure of the supply air for aftertreatment 2. Supply air is the air supplied from a pneumatic line for an air-assisted or pneumatic actuator. One example is an air assisted fuel injector (the supply air assists in the atomization of fuel).
3500	Aftertreatment 2 Purge Air Pressure	Pressure of the purge air supply for aftertreatment 2
3501	Aftertreatment 2 Air Pressure Control	Position that the controller is commanding the aftertreatment 2 air pressure control to maintain. 0% = fully closed, 100% = fully open
3502	Aftertreatment 2 Air Pressure Actuator Position	Position of the aftertreatment 2 air pressure actuator as measured by a position feedback sensor.
3503	Aftertreatment 2 Air Enable Actuator	Indicates whether aftertreatment 2 air enable actuator is on or off 00b = not active 01b = active 10b = reserved for SAE assignment 11b = not available
3504	Aftertreatment 2 Purge Air Actuator	Indicates whether aftertreatment 2 purge air actuator is on or off 00b = not active 01b = active 10b = reserved for SAE assignment 11b = not available
3505	Aftertreatment 2 Atomization Air Actuator	Indicates whether aftertreatment 2 atomization air actuator is on or off 00b = not active 01b = active 10b = reserved for SAE assignment 11b = not available
3506	Aftertreatment 2 Air System Relay	Indicates whether aftertreatment 2 air system relay is on or off 00b = not active 01b = active 10b = reserved for SAE assignment 11b = not available
3507	TECU ECU_PWR relay	The high current ECU PWR relay for the ECU PWR distribution on the Implement bus as controlled by the Tractor ECU (TECU). This includes from the internal control portion of the ECU PWR relay to the output of the ECU PWR relay on the vehicle which directly controls the power for the Implement bus ecu type loads.

3508	TECU PWR Relay	The high current PWR relay for the PWR distribution on the Implement bus as controlled by the Tractor ECU (TECU). This includes from the internal control portion of the PWR relay to the output of the main PWR relay on the vehicle which directly controls the power for the Implement bus non-ecu type loads.
3509	Sensor supply voltage 1	Sensor ECU supply voltage 1
3510	Sensor supply voltage 2	Sensor ECU supply voltage 2
3511	Sensor supply voltage 3	Sensor ECU supply voltage 3
3512	Sensor supply voltage 4	Sensor ECU supply voltage 4
3513	Sensor supply voltage 5	Sensor ECU supply voltage 5
3514	Sensor supply voltage 6	Sensor ECU supply voltage 6
3515	Aftertreatment 1 Diesel Exhaust Fluid Temperature 2	Temperature of the diesel exhaust fluid at the device measuring diesel exhaust fluid quality
3516	Aftertreatment 1 Diesel Exhaust Fluid Concentration	A measure of the concentration of urea in water. Zero percent means that the tank contains no urea. A 32.5% value indicates that the diesel exhaust fluid is of the proper concentration. The 32.5% value indicates that the concentration is highest quality.Parameter Specific Indicator: A value of FBh indicates conditions are not acceptable for a valid measurement.
3517	Aftertreatment 1 Diesel Exhaust Fluid Tank Level	The diesel exhaust fluid level height in mm in the diesel exhaust fluid storage container for aftertreatment system 1 (exhaust bank 1). See SPN 1761 and SPN 7530 for alternate measurements.Parameter Specific Indicator: A value of FB00h indicates conditions are not acceptable for a valid measurement.

3518	Aftertreatment 1 Diesel Exhaust Fluid Conductivity	A measure of the conductivity of the diesel exhaust fluid at the sensor. The conductivity is an indication of the diesel exhaust fluid's chemical make up.
3519	Aftertreatment 1 Diesel Exhaust Fluid Temperature 2 Preliminary FMI	Used to identify the applicable J1939-73 FMI that applies to the most significant failure of the diesel exhaust fluid temperature sensor. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
3520	Aftertreatment 1 Diesel Exhaust Fluid Properties Preliminary FMI	Used to identify the applicable J1939-73 FMI that applies to the most significant failure of the diesel exhaust fluid properties sensor. This may be used for indicating failures of the diesel exhaust fluid concentration, diesel exhaust fluid conductivity or diesel exhaust fluid type. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
3521	Aftertreatment 1 Diesel Exhaust Fluid Property	This parameter indicates the property of the fluid compound in the tank. A value of 0011b indicates uncontaminated Diesel Exhaust Fluid.0000b = Urea concentration too high 0001b = Urea concentration too low 0010b = Fluid is diesel 0011b = Diesel exhaust fluid is proper mixture 0100b to 1011b = Reserved for SAE assignment 1100b = Diesel exhaust fluid, but concentration cannot be determined 1101b = Not able to determine fluid property (fluid type unknown) 1110b = Error with diesel exhaust fluid property detection 1111b = Not available
3522	Aftertreatment 1 Total Fuel Used	Total amount of fuel used by aftertreatment device 1 over the lifetime of the device.
3523	Aftertreatment 1 Total Regeneration Time	Total amount of time that aftertreatment device 1 has been regenerating over the lifetime of the device.
3524	Aftertreatment 1 Total Disabled Time	Total amount of time that aftertreatment 1 regeneration has been manually disabled.
3525	Aftertreatment 1 Total Number of Active Regenerations	Total number of active regenerations by aftertreatment device 1 over the lifetime of the device.

3526	Aftertreatment 2 Total Fuel Used	Total amount of fuel used by aftertreatment device 2 over the lifetime of the device.
3527	Aftertreatment 2 Total Regeneration Time	Total amount of time that aftertreatment device 2 has been regenerating over the lifetime of the device.
3528	Aftertreatment 2 Total Disabled Time	Total amount of time that aftertreatment 2 regeneration has been manually disabled.
3529	Aftertreatment 2 Total Number of Active Regenerations	Total number of active regenerations by aftertreatment device 2 over the lifetime of the device.
3530	Aftertreatment 1 Regeneration Manually Disabled	Indicates that aftertreatment device 1 has been manually disabled by a service technician. Note: This SPN is intended to be used with FMI 31 – Condition Exists.
3531	Aftertreatment 2 Regeneration Manually Disabled	Indicates that aftertreatment device 2 has been manually disabled by a service technician. Note: This SPN is intended to be used with FMI 31 – Condition Exists.
3532	Aftertreatment 1 Diesel Exhaust Fluid Tank Level/Volume Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the diesel exhaust fluid tank level sensor by the manufacturer's sensor control software. This FMI is applicable to either the diesel exhaust fluid tank level or diesel exhaust fluid tank volume parameters. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
3533	Transmission Oil Level Switch	This switch indicates whether transmission oil level is full or empty. 00b = Empty 01b = Full or not empty 10b = Error 11b = Not available
3534	Brake Torque Output Axle 1 Left	Brake torque output on wheel brake axle 1 left
3535	Brake Torque Output Axle 1 Right	Brake torque output on wheel brake axle 1 right
3536	Brake Torque Output Axle 2 Left	Brake torque output on wheel brake axle 2 left

3537	Brake Torque Output Axle 2 Right	Brake torque output on wheel brake axle 2 right
3538	Brake Torque Output Axle 3 Left	Brake torque output on wheel brake axle 3 left
3539	Brake Torque Output Axle 3 Right	Brake torque output on wheel brake axle 3 right
3540	Reference Ground Connection	The reference ground is an additional ground connection in order to supervise the main ground connection
3541	Brake Light Relay	Relay to control the brake lights.
3542	Requested Engine Control Mode	This parameter is used to request a change to the engine control mode. This is a status parameter. 0000b = Normal Engine Shutdown 0001b = Rapid Engine Shutdown 0010b = Emergency Engine Shutdown 0011b = Normal Engine Start 0100b = Rapid Engine Start 0101b to 1101b = available for SAE assignment 1110b = 1111b = Don't Care / Take No ActionNormal Engine Shutdown – Used to request that the engine control system shut down the engine, using the normal shutdown sequence for the engine. The shutdown sequence might include cool down or other intermediate states that delay stopping the engine. Rapid Engine Shutdown – Used to request that the engine control system shut down the engine, using an abbreviated shutdown sequence for the engine. The intent is that the rapid engine shutdown take less time than a normal engine shutdown, but the specific shutdown sequence will depend on the configuration of the engine control system. Emergency Engine Shutdown – Used to request that the engine control system shut down the engine, using the emergency shutdown sequence for the engine. The intent is to shut down the engine in the fastest possible manner, using all mechanisms available. All intermediate states that delay stopping the engine must be skipped for an emergency engine shutdown. In addition, any installed emergency stop aids (such as air shutoff, Jake Brakes, etc.) must be activated for an emergency shutdown. Normal Engine Start – Used to request that the engine control system start the engine, using the normal starting sequence for the engine. All starting aids and pre-start states will be employed as appropriate for the engine and the current operating conditions. Rapid Engine Start – Used to request that the engine control system start the engine, using an abbreviated starting sequence for

		the engine. The intent is that the rapid engine start take less time than a normal engine start, but the specific starting sequence will depend on the configuration of the engine control system.
3543	Engine Operating State	This parameter is used to indicate the current state, or mode, of operation by the engine. This is a status parameter.0000b = Engine Stopped 0001b = Pre-Start 0010b = Starting 0011b = Warm-Up 0100b = Running 0101b = Cool-down 0110b = Engine Stopping 0111b = Post-Run 1000b to 1101b = available for SAE assignment 1110b = 1111b = not available STOPPED – In the stopped state, the ECM is powered and the engine is not turning. The engine is ready to start. PRE-START – In the PRE-START state, the engine is not running. Actions are taken by various subsystem controls to prepare the engine for cranking and starting. This may include any priming, prelubrication, preheating sequences, interlocks or other start permissives. These subsystems have their own state based control and communicate their status to the engine state control logic. STARTING – During the STARTING state, actions are taken by various subsystem controls to attempt to start the engine. WARM-UP – During the WARM-UP state, the engine operates at reduced speed and / or load to allow the engine to come up to operating temperature. RUNNING – In the RUNNING state, the engine is turning and is prepared to output power. COOL-DOWN – During the COOLDOWN state, the engine operates at reduced speed and / or load to allow the engine to cool off before the engine is stopped. STOPPING – In the STOPPING state, actions are taken by various subsystem controls to attempt to stop the engine. POST-RUN – During the POST-RUN state, the engine is not turning. Actions are taken by various subsystem controls to prevent engine damage and extend component life. The engine is not ready to start.
3544	Time Remaining in Engine Operating State	This parameter is used to indicate the time remaining in the current engine operating state, based on the state defined in the SPN « Engine Operating State » (SPN 3543). For the states in which time remaining is not applicable, use 65535 (FFFFh).
3545	Generator Circuit Breaker Status	This parameter indicates the measured state of the generator circuit breaker. 000b = Open 001b = Closed 010b = Locked Out 011b = Transitioning to Open state 100b =

		Transitioning to Closed state 101b = Available for SAE assignment 110b = Error 111b = Not Available
3546	Utility Circuit Breaker Status	This parameter indicates the measured state of the utility circuit breaker. 000b = Open 001b = Closed 010b = Locked Out 011b = Transitioning to Open state 100b = Transitioning to Closed state 101b = Available for SAE assignment 110b = Error 111b = Not Available
3547	Automatic Transfer Switch Status	This parameter indicates the measured state of the automatic transfer switch. 000b = Normal position 001b = Emergency position 010b = Available for SAE assignment 011b = Transitioning to Normal position 100b = Transitioning to Emergency position 101b = Available for SAE assignment 110b = Error 111b = Not Available
3548	Engine Waste Oil Reservoir Level	Level of crankcase blowby emulsion collected by a container. Normalized to percent, 0% represents completely empty and 100% represents completely full.
3549	Engine Oil Filter Outlet Pressure	Oil pressure (gage) measured just downstream of oil filter.Used in conjunction with SPN1208 (pre-filter oil pressure) to determine oil filter health.
3550	Engine Oil Priming Pump Switch	Switch input for activating the engine oil priming pump. 00b = Off 01b = On 10b = Error 11b = Not available or not installed
3551	Engine Oil Priming State	Determination of whether or not the engine is (or has recently been) sufficiently lubricated for starting purposes.00b = Not sufficiently lubricated 01b = Sufficiently lubricated 10b = Unable to determine if sufficiently lubricated 11b = Not available or not installed
3552	Engine Oil Pre-Heated State	Indicates whether the engine oil pre-heated sufficiently for starting purposes. 00b = Not sufficiently pre-heated 01b = Sufficiently pre-heated 10b = Unable to determine if engine oil is pre-heated sufficiently 11b = Not available or not installed

3553	Engine Coolant Pre-heated State	Indicates whether the engine coolant is pre-heated sufficiently for starting purposes. 00b = Not sufficiently pre-heated 01b = Sufficiently pre-heated 10b = Unable to determine engine coolant pre-heated sufficiently 11b = Not available or not installed
3554	Engine Ventilation Status	Engine ventilation control states. 000b = Sufficiently vented (all combustible gases have been evacuated from intake and exhaust systems) 001b = Ventilation needed (combustible gases may be present in intake and exhaust systems) 010b = Ventilation delay (delay without cranking between ventilation and start engine states) 011b = Currently venting (engine cranks w/o gas or ignition to clear intake and exhaust systems with air) 100b = Reserved for SAE assignment 101b = Reserved for SAE assignment 110b = Not able to determine if sufficiently vented 111b = Not available or not installe
3555	Ambient Air Density	The density of the ambient air
3556	Aftertreatment 1 Hydrocarbon Doser 1	The doser used to inject fuel into the aftertreatment system
3557	Parking Brake Red Warning Signal	This parameter commands the Parking Brake red optical warning signal. 00b = off 01b = on 10b = Reserved 11b = Take no action
3558	AETC Data Collection Standard	Indicates the standardized method by which torque data was obtained for the Advertised Engine Torque Curve (AETC). For example, in North America, heavy duty diesel engine specifications are typically based on SAE J1995. Other applicable SAE, ISO, or DIN standards may be added as necessary in the future.0000b = SAE J1995 0001b to 1101b = Not Defined 1111b = Not Available
3559	Number of AETC data points	Indicates the number of speed / torque data points contained in the Advertised Engine Torque Curve broadcast (AETC). A minimum of 5 points is required, with a maximum of 15 points available as needed to accurately convey the curve.
3560	AETC Speed Value	Engine speed value of the data points in PGN 64912 – Advertised Engine Torque Curve (AETC).

3561	AETC Torque value	Engine torque value of the data points in PGN 64912 – Advertised Engine Torque Curve (AETC).
3562	Engine Intake Manifold #2 Pressure	The gage pressure measurement of the air intake manifold for bank #2 or the second air intake manifold. If there are multiple air pressure sensors in the second intake stream, this is the last one in flow direction before entering the combustion chamber. See also SPNs 1127-1130 and SPN 102 for alternate range and resolution.
3563	Engine Intake Manifold #1 Absolute Pressure	The absolute pressure measurement of the air intake manifold. If there are multiple air pressure sensors in the intake stream, this is the last one in flow direction before entering the combustion chamber.
3564	Lane Departure Warning Enable Command	Command to enable/disable Lane Departure Indication 00b = Disable Lane Departure Warning 01b = Enable Lane Departure Warning 10b = Reserved 11b = Don´t care
3565	Lane Departure Left	Indicates that the middle of vehicle departs the lane on the left side. The parameter indicates that the vehicle is changing the lane to the left.00b = Middle of the vehicle does not depart the lane to the left side 01b = Middle of the vehicle departs the lane to the left side 10b = Reserved 11b = Take no action
3566	Lane Departure Right	Indicates that the middle of vehicle departs the lane on the right side. The parameter indicates that the vehicle is changing the lane to the right.00b = Middle of the vehicle does not depart the lane to the right side 01b = Middle of the vehicle departs the lane to the right side 10b = Reserved 11b = Take no action
3567	Generator Control Not In Automatic Start State	This parameter indicates whether or not the generator set is in a condition to automatically start up and provide power. If not, this status parameter is in the ACTIVE state.00b = inactive (ready to start automatically) 01b = active (not ready to start automatically) 10b = error 11b = not available Note: Legislative requirements for generator sets require that this condition be visually indicated (alarmed) on the local generator set control and remotely indicated on ancillary monitoring devices. The state has been defined in this manner (‘Not in automatic start ») to allow the use

		of FMI 31 to indicate NOT ready to automatically start up and provide power, which is an undesired condition.
3568	Generator Not Ready to Automatically Parallel State	This parameter indicates whether or not all systems required to start the engine and close to the bus are prepared to operate automatically. If not, the generator is not ready to automatically parallel, and the status parameter is in the ACTIVE state.00b = inactive (ready to parallel) 01b = active (not ready to parallel) 10b = error 11b = not available Note: Legislative requirements for generator sets require that this condition be visually indicated (alarmed) on the local generator set control and remotely indicated on ancillary monitoring devices. The state has been defined in this manner (« Not ready ») to allow the use of FMI 31 to indicate NOT ready to automatically parallel, which is an undesired condition.
3569	Generator Neutral Earth Fault	Some means (usually a core balance current transformer into a matched measurement device) identifies that an imbalance between the current in the live phase(s) and neutral from the generator exceeds a threshold. When this condition occurs, this SPN is triggered to indicate that a fault to earth current is flowing within the generator. Typically used with FMI 31 to indicate that the condition exists.
3570	Generator Load Neutral Earth Leakage	Some means (usually a core balance current transformer into a matched measurement device) identifies that an imbalance between the current in the live phase(s) and neutral from the load has exceeded a threshold. When this condition occurs, this SPN is triggered to indicate that a fault to earth current is flowing in the load. Typically used with FMI 31 to indicate that the condition exists.
3571	Generator Circuit Breaker Opening Time	As determined by the genset control, it will attempt to close or open a circuit breaker depending on the operational mode and system status. This parameter indicates the time between the control commanding the breaker to open, and the breaker opening (as measured by the genset control). If the breaker fails to open within a specified amount of time, a diagnostic may be generated.This SPN may be used in a diagnostic DM1 message with FMI 15 or FMI 0 to trigger actions of increasing severity if the breaker doesn’t open within specified amounts of time after the command is issued.

3572	Generator Circuit Breaker Closing Time	As determined by the genset control, it will attempt to close or open a circuit breaker depending on the operational mode and system status. This parameter indicates the time between the control commanding the breaker to close, and the breaker closing (as measured by the genset control). If the breaker fails to close within a specified amount of time, a diagnostic may be generated.This SPN may be used in a diagnostic DM1 message with FMI 15 or FMI 0 to trigger actions of increasing severity if the breaker doesn't close within specified amounts of time after the command is issued.
3573	Utility Circuit Breaker Opening Time	As determined by the genset control, it will attempt to close or open a circuit breaker depending on the operational mode and system status. This parameter indicates the time between the control commanding the breaker to open, and the breaker opening (as measured by the genset control). If the breaker fails to open withinin a specified amount of time, a diagnostic may be generated.This SPN may be used in a diagnostic DM1 message with FMI 15 or FMI 0 to trigger actions of increasing severity if the breaker doesn't open within specified amounts of time after the command is issued.
3574	Utility Circuit Breaker Closing Time	As determined by the genset control, it will attempt to close or open a circuit breaker depending on the operational mode and system status. This parameter indicates the time between the control commanding the breaker to close, and the breaker closing (as measured by the genset control). If the breaker fails to close within a specified amount of time, a diagnostic may be generated.This SPN may be used in a diagnostic DM1 message with FMI 15 or FMI 0 to trigger actions of increasing severity if the breaker doesn't open within specified amounts of time after the command is issued.
3575	Utility to Generator Transfer Time	When the genset control commands the generator(s) to pick up load, it transfers the load from the utility to the generator(s). This parameter indicates the time between the genset control requesting the generator(s) to pick up the load, and the completion of the load transfer from the utility to the generator(s). If the transfer fails to complete within a specified amount of time, a diagnostic may be generated.This SPN may be used in a diagnostic DM1 message with FMI 15 and FMI 0 to trigger actions of increasing severity at specified times.

3576	Generator to Utility Transfer Time	When the genset control commands the generator(s) to drop load, it transfers the load to the utility, and then it disconnects. This parameter indicates the time between the genset control requesting the generator(s) to drop the load, and the completion of the load transfer from the generator(s) to the utility. If the transfer fails to complete within a specified amount of time, a diagnostic may be generated.This SPN may be used in a diagnostic DM1 message with FMI 15 and FMI 0 to trigger actions of increasing severity at specified times.
3577	Loss of Electric Utility Grid	Typically the determination that utility has failed or no longer available is made by monitoring the voltage supplied by the utility. When the voltage drops below a predetermined level for a specified amount of time, this condition becomes active. In emergency standby generator systems, this is also the signal for starting the generator set. The automatic transfer switch will then switch the load from utility to generator set.This SPN may be used in a diagnostic DM1 message with FMI 31 to indicate that a loss of electric utility grid has occurred.
3578	Generator to Bus Synchronization Time	This parameter indicates the time between the command to synchronize to the bus being issued and successful synchronization. If synchonization fails to complete within a specified amount of time, a diagnostic may be generated.This SPN may be used in a diagnostic DM1 message with FMI 31 to indicate that a loss of electric utility grid has occurred.
3579	Generator to Bus Phase Sequence Mismatch	This parameter indicates a phase sequence mismatch between the generator and the bus. Typically used with FMI 31 to indicate that the condition exists.
3580	Generator Soft Unload Time	This parameter indicates the time between the command to soft unload and the completion of the ramp down to an unloaded condition. If the generator fails to unload within a specified amount of time, a diagnostic may be generated.This SPN may be used in a diagnostic DM1 message with FMI 15 and FMI 0 to trigger actions of increasing severity at specified times.
3581	Modbus Data Link	Identifies the action to be performed on the Modbus communications port. Parameter mirrors SPN 608 (for J1587 diagnostic) and SPN 639 (for J1939 diagnostic).

3582	Utility Power Supply	110/120V (60Hz) or 220/240V (50Hz) alternating current power supply for engine AC auxiliary devices. This Utility power supply would typically come from local utility or ‘wall outlet’. It can be used to power a battery charger, DC power supply, or on engine auxiliaries like heaters, fans, pumps, etc. directly.
3583	Common AC Auxiliaries Breaker	This parameter covers designs where several independent AC auxiliary control devices each have their own breakers, but the controlling ECU only receives a single breaker tripped feedback indication if any one of these breakers is tripped.
3584	Fire Detected	A sensor has detected the presence of a fire at or near the engine.
3585	Engine Emergency Shutdown Switch	An emergency shutdown switch that is activated by the operator for immediate engine shutdown.
3587	Ether Hold Control	This control circuit is used to hold the ether valve in the open position, causing ether injection to continue.
3588	Ether Start Control	This control circuit is used to initially open the ether valve and begin ether flow.
3589	Engine Oil Priming Pump Control	This control is used to activate a pump that lubricates the engine, particularly prior to initial engine startup.00b = Off 01b = On 10b = Reserved 11b = unavailable
3590	Generator Total Percent kW	This parameter reports the generator total AC power, as a percentage of rated power.
3591	Generator Total Percent kVA	This parameter reports the generator total AC apparent power, as a percentage of rated power.
3592	Generator Total Percent kVAr	This parameter reports the generator total AC reactive power, as a percentage of rated power.
3593	Generator Total kVAr Hours Export	This parameter reports the cumulative total AC reactive energy exported from the generator.

3594	Generator Total kVAr Hours Import	This parameter reports the cumulative total AC reactive energy imported to the generator.
3595	Utility Total kVAr Hours Export	This parameter reports the cumulative total AC reactive energy exported from the utility.
3596	Utility Total kVAr Hours Import	This parameter reports the cumulative total AC reactive energy imported to the utility.
3597	ECU Power Output Supply Voltage #1	The first power output from an ECU.
3598	ECU Power Output Supply Voltage #2	The second power output from an ECU.
3599	ECU Power Output Supply Voltage #3	The third power output from an ECU.
3600	Steering Straight Ahead Position Reset	Used to reset the straight ahead position for a steering sensor in the steering column or a steering controller's straight ahead position on any steerable axle.00b = Take no action – Do not Reset 01b = Reset 10b = Reserved, take no action 11b = Not applicable
3601	Engine Fuel Shutoff Valve Leak Test Control	Control setting for fuel shutoff valve proving system test. Typically, this type of system can only be used with a dual fuel shutoff system. The test consists of a small pump to pressurize the chamber between the dual fuel shutoffs when they are closed. After pressurizing, the test is passed if the pressure is above a certain threshold, indicating the fuel shutoffs are sealed completely shut without leaks. Otherwise, a low pressure indicates a leak is present past one or both of the fuel shutoffs.00b = Off (reset / no test in process) 01b = On (test in process / test complete) 10b = Reserved 11b = Don't care / take no action In addition to communicating desired action of the fuel shutoff valve proving system test and its driver status, this new SPN can be used

		to communicate whether the fuel shutoff valve proving system test failed, through the use of FMIs.
3602	Engine Oil Pre-heater Control	Control setting for an electrically actuated oil pre-heating device. 00b = Off 01b = On 10b = Reserved 11b = Don’t care / take no action In addition to communicating desired action of the electrically actuated oil pre-heater and its driver status, this new SPN can be used to communicate if any attempts to adequately pre-heat the oil are unsuccessful, through the use of FMIs.
3603	Engine Electrical System Power Conservation Control	Control setting for cutting power to various devices when the engine is not in use. Useful if it is desired to keep the engine in standby, with main control ECU still powered on and communictaing with outside world, but actuators and certain other ECUs can be de-powered.00b = Off (No Power conservation; all systems with supply power available) 01b = On (power conservation active; certain systems have supply power witheld) 10b = Reserved 11b = Unavailable
3604	Engine Pre-Heater Control	Control setting for an electrically actuated engine block or coolant pre-heating device. 00b = Off 01b = On 10b = Reserved 11b = Unavailable
3605	Engine Coolant Pump Control	Control setting for an electrically actuated engine coolant circulating pump. 00b = Off 01b = On 10b = Reserved 11b = Don’t care / take no action .
3606	Engine Controlled Shutdown Request	A signal issued by the engine control system to a user or external system requesting for a controlled shutdown. This request is made when engine protection diagnostics determine a condition warrants a shutdown soon, but it is not severe enough to necessitate an immediate shutdown. This function gives notice such that the engine can be unloaded and cooled down before stopping.00b = Off (No Shutdown Requested) 01b = On (Shutdown Requested) 10b = Reserved 11b = Don’t care / take no action
3607	Engine Emergency (Immediate) Shutdown Indication	A signal issued by the engine control system to a user or external system indicating that it is immediately shutting the engine down. This indication is made when engine protection diagnostics determine a condition necessitates an immediate shutdown.

		This function gives notice that this has occurred.00b = Off (No Shutdown Requested) 01b = On (Shutdown Requested) 10b = Reserved 11b = Don’t care / take no action
3608	Engine Fuel Shutoff Vent Control	Control setting for a fuel shutoff vent. Typically, for a dual fuel shutoff system, the vent line is located between them and is plumbed to vent outside to atmosphere. The vent control typically always actuates opposite to that of the fuel shutoff(s) control. Thus, when the fuel shutoff(s) are closed, the vent is open, thereby ‘ventilating’ any leftover or leaking gas from the fuel shutoff. When the fuel shutoff(s) are open, the vent is closed, thereby all gas passes through to the engine.00b = Closed (vent closed) 01b = Open (vent open) 10b = Reserved 11b = Don’t care / take no action
3609	Aftertreatment 1 Diesel Particulate Filter Intake Pressure	This parameter indicates the diesel particulate filter intake gage pressure 1 (bank 1).
3610	Aftertreatment 1 Diesel Particulate Filter Outlet Pressure	This parameter indicates the diesel particulate filter outlet gage pressure 1 (bank 1).
3611	Aftertreatment 2 Diesel Particulate Filter Intake Pressure	This parameter indicates the diesel particulate filter intake gage pressure 2 (bank 2).
3612	Aftertreatment 2 Diesel Particulate Filter Outlet Pressure	This parameter indicates the diesel particulate filter outlet gage pressure 2 (bank 2).
3613	Text Display Instructions	This parameter describes the status for the display how to show the information. 0000b = Clear display – The displayed information should be deleted or not displayed any more. 0001b = Hold display – The presently displayed information should be retained 0010b = Append at end of display – The transmitted information should be displayed at the end of the presently displayed information 0011b = Overwrite display – The presently displayed information is to be overwritten with the transmitted information 0100b = Overwrite substring – A portion of the presently displayed information is to be overwritten with the transmitted information starting at display text index (SPN 3614) 0101b = Highlight substring 0110b = Blink substring 0111b to 1110b = Reserved 1111b = Not applicable

3614	Text Display Index	Used for overwriting consecutive bytes of a displayed string when byte 1 « Text Display Instructions » state is set for « overwrite substring » mode. When used, this byte declares where in the text string that the new text will start overwriting, this number is also known as the start byte. As usual for the transmitted text string, the Text Display Characters will be sent and then terminated by the null character, this will be the stop byte indicator to declare when to stop overwriting.EXAMPLE: To only modify 3 bytes (50, 51, 52) of an 87 byte character string. Text Display Instructions – set to 0100b (Overwrite substring) Text Display Index – set to 50d (starting byte of desired overwrite) Text Display Characters – 3 characters sent, then the null ending byte
3615	Text Display Character	From 1 up to 200 characters to be presented on a display. Up to 4 characters can be displayed without using Transport Protocol. The Display Text characters will follow the standard J1939-71 display method. Control characters can be used but not displayed. The characters are to be terminated with a 00h which is the « null » or « /0 » character.EXAMPLE: Since this parameter starts in byte position 4, the first displayed byte would be in byte 4 of the Data Frame, the fourth displayed byte would be in byte 7 of the Data Frame, byte 8 would be the null character.
3618	SAE J2012 DTC Presence	A J1939 controller has one or more SAE J2012 format DTCs. FMI 31 shall be used with this SPN.
3619	Number of J2012 DTCs	The number J2012 DTCs being conveyed in PGN 64906. If the value of this parameter is zero, the device broadcasting PGN 64906 has no active or previously active J2012 DTCs.
3620	J2012 DTC	Five character ASCII SAE J2012 DTC, sent most significant byte first.
3621	J2012 DTC Status	Indicates if the respective SAE J2012 DTC is active or previously active. 0b = DTC is previously active 1b = DTC is active

3622	J2012 DTC Occurrence Count	Number of occurrences of the respective SAE J2012 DTC being conveyed. If more than 126 occurrences happen the value shall be set to 126. If the occurrence count is not available to be sent then this value shall be set to 127.
3623	Vehicle Roll	This parameter indicates the roll in degrees from level. Facing the direction of travel a tip to the left would be indicated by a negative number and a tip to the right would be indicated by a positive number.
3624	Engine Intake Valve Actuation Oil Pressure for Cylinder #1	The gage pressure of the oil in the hydraulic accumulator that powers the engine intake valve for cylinder #1.This intake valve pressure is at the first cylinder in the engine, while SPN 2948 reflects the intake valve pressure of the entire engine system.
3625	Engine Intake Valve Actuation Oil Pressure for Cylinder #2	The gage pressure of the oil in the hydraulic accumulator that powers the engine intake valve for cylinder #2.
3626	Engine Intake Valve Actuation Oil Pressure for Cylinder #3	The gage pressure of the oil in the hydraulic accumulator that powers the engine intake valve for cylinder #3.
3627	Engine Intake Valve Actuation Oil Pressure for Cylinder #4	The gage pressure of the oil in the hydraulic accumulator that powers the engine intake valve for cylinder #4.
3628	Engine Intake Valve Actuation Oil Pressure for Cylinder #5	The gage pressure of the oil in the hydraulic accumulator that powers the engine intake valve for cylinder #5.
3629	Engine Intake Valve Actuation Oil Pressure for Cylinder #6	The gage pressure of the oil in the hydraulic accumulator that powers the engine intake valve for cylinder #6.
3630	Engine Intake Valve Actuation Oil Pressure for Cylinder #7	The gage pressure of the oil in the hydraulic accumulator that powers the engine intake valve for cylinder #7.
3631	Engine Intake Valve Actuation Oil Pressure for Cylinder #8	The gage pressure of the oil in the hydraulic accumulator that powers the engine intake valve for cylinder #8.

3632	Engine Intake Valve Actuation Oil Pressure for Cylinder #9	The gage pressure of the oil in the hydraulic accumulator that powers the engine intake valve for cylinder #9.
3633	Engine Intake Valve Actuation Oil Pressure for Cylinder #10	The gage pressure of the oil in the hydraulic accumulator that powers the engine intake valve for cylinder #10.
3634	Engine Intake Valve Actuation Oil Pressure for Cylinder #11	The gage pressure of the oil in the hydraulic accumulator that powers the engine intake valve for cylinder #11.
3635	Engine Intake Valve Actuation Oil Pressure for Cylinder #12	The gage pressure of the oil in the hydraulic accumulator that powers the engine intake valve for cylinder #12.
3636	Engine Intake Valve Actuation Oil Pressure for Cylinder #13	The gage pressure of the oil in the hydraulic accumulator that powers the engine intake valve for cylinder #13.
3637	Engine Intake Valve Actuation Oil Pressure for Cylinder #14	The gage pressure of the oil in the hydraulic accumulator that powers the engine intake valve for cylinder #14.
3638	Engine Intake Valve Actuation Oil Pressure for Cylinder #15	The gage pressure of the oil in the hydraulic accumulator that powers the engine intake valve for cylinder #15.
3639	Engine Intake Valve Actuation Oil Pressure for Cylinder #16	The gage pressure of the oil in the hydraulic accumulator that powers the engine intake valve for cylinder #16.
3640	Engine Intake Valve Actuation Oil Pressure for Cylinder #17	The gage pressure of the oil in the hydraulic accumulator that powers the engine intake valve for cylinder #17.
3641	Engine Intake Valve Actuation Oil Pressure for Cylinder #18	The gage pressure of the oil in the hydraulic accumulator that powers the engine intake valve for cylinder #18.
3642	Engine Intake Valve Actuation Oil Pressure for Cylinder #19	The gage pressure of the oil in the hydraulic accumulator that powers the engine intake valve for cylinder #19.

3643	Engine Intake Valve Actuation Oil Pressure for Cylinder #20	The gage pressure of the oil in the hydraulic accumulator that powers the engine intake valve for cylinder #20.
3644	Engine Derate Request	This parameter is a derate request made from the engine control system to an external system, where the engine is requesting an external device to reduce the load being applied. A zero value indicates that there is no derate being requested and 100% means full derate being requested. Any non-zero value represents a derate is being requested, at a percentage of full load. The engine control system identifies any problems and determines the amount of derate the situation calls for. This parameter can be useful to customer applications that prefer awareness and control of the engine derate.See also SPN 8436 for a Derate Request in kW.
3645	Transfer case status	This parameter describes the feedback from the transfer case controller . Used by instrument clusters, tachographs, PTOs , etc.000b = 2 wheel high (normal or ``On Highway' Range) 001b = 4 wheel high (normal or 'On Highway' Range 010b = neutral 011b = 2 wheel low (or ``Off Highway' Range) 100b = 4 wheel low (or ``Off Highway' Range) 101b = Transfer Case Shift in Progress or gear not confirmed 110b = error 111b = not available
3646	Transmission Park Selector	The Transmission Park Selector is a device (switch, button, lever position) that indicates the vehicle should be in or change to the Park transmission mode.
3647	Transmission Reverse Selector	The Transmission Reverse Selector is a device (switch, button, lever position) that indicates the vehicle/transmission should be in or change to the Reverse transmission mode.
3648	Transmission Neutral Selector	The Transmission Neutral Selector is a device (switch, button, lever position) that indicates the vehicle/transmission should be in or change to the Neutral transmission mode.
3649	Transmission Drive Selector	The Transmission Drive Selector is a device (switch, button, lever position) that indicates the vehicle/transmission should be in or change to the Drive transmission mode.

3650	Transmission Low Selector	The Transmission Low Selector is a device (switch, button, lever position) that indicates the vehicle/transmission should be in or change to the Low transmission mode.
3651	Transmission Primary Manual Selector	The Transmission Primary Manual Selector is a device (switch, button, lever position) that indicates the vehicle/transmission should be in or change to the Manual transmission mode.
3652	Transmission Primary Shift Up Selector	The Transmission Primary Shift Up Selector is a device (switch, button, lever position) that indicates the vehicle/transmission should be in or change to the Shift Up transmission mode.
3653	Transmission Primary Shift Down Selector	The Transmission Primary Shift Down Selector is a device (switch, button, lever position) that indicates the vehicle/transmission should be in or change to the Shift Down transmission mode.
3654	Transmission Secondary Manual Selector	The Transmission Secondary Manual Selector is a device (switch, button, lever position) that indicates the vehicle/transmission should be in or change to the Manual transmission mode.
3655	Transmission Secondary Shift Up Selector	The Transmission Secondary Shift Up Selector is a device (switch, button, lever position) that indicates the vehicle/transmission should be in or change to the Shift Up transmission mode.
3656	Transmission Secondary Shift Down Selector	The Transmission Secondary Shift Down Selector is a device (switch, button, lever position) that indicates the vehicle/transmission should be in or change to the Shift Down transmission mode.
3657	Steering Wheel Mounted Shift Controls Decoder	The Steering Wheel Mounted Shift Controls Decoder of the hardware circuitry that reads and monitors the Steering Wheel Mounted Shift Controls.
3658	Steering Wheel Mounted Shift Controls Input	The Steering Wheel Mounted Shift Controls Input is the input to the device that reads and monitors the Steering Wheel Mounted Shift Controls.

3659	Engine Fuel 1 Injector Cylinder 1 Actuator 2	This is the second valve actuator on Engine Fuel Injector Cylinder 1
3660	Engine Fuel 1 Injector Cylinder 2 Actuator 2	This is the second valve actuator on Engine Fuel Injector Cylinder 2
3661	Engine Fuel 1 Injector Cylinder 3 Actuator 2	This is the second valve actuator on Engine Fuel Injector Cylinder 3
3662	Engine Fuel 1 Injector Cylinder 4 Actuator 2	This is the second valve actuator on Engine Fuel Injector Cylinder 4
3663	Engine Fuel 1 Injector Cylinder 5 Actuator 2	This is the second valve actuator on Engine Fuel Injector Cylinder 5
3664	Engine Fuel 1 Injector Cylinder 6 Actuator 2	This is the second valve actuator on Engine Fuel Injector Cylinder 6
3665	Engine Fuel 1 Injector Cylinder 7 Actuator 2	This is the second valve actuator on Engine Fuel Injector Cylinder 7
3666	Engine Fuel 1 Injector Cylinder 8 Actuator 2	This is the second valve actuator on Engine Fuel Injector Cylinder 8
3667	Engine Air Shutoff Status	State signal which indicates the actual measured position of the Air Shutoff. 00b = Air flow allowed to engine 01b = Air flow restricted 10b = Error 11b = Not Available Note: This parameter, in conjunction with SPN 2813 – « Engine Air Shutoff Command Status », is provided to allow an external system to annunciate and/or alarm on either an accidental air shutoff (shutoff detected but not commanded), or a failed air shutoff (shutoff commanded but not detected).
3668	Engine Charge Air Cooler Coolant Level	Ratio of volume of liquid found in an engine charge air cooler cooling system to total engine charge air cooler cooling system volume.

3669	Engine Rotation Direction	Direction of engine rotation, as reported by the engine. Direction convention as viewed by an observer standing at the rear of the engine, viewing the flywheel.00b = CounterClockWise (CCW) 01b = ClockWise (CW) 10b = Unknown (Rotation Direction Unknown) 11b = Not Available When the rotation direction is yet to be detected, Unknown will be reported.
3670	Maximum Crank Attempts per Start Attempt	The number of cranking cycles that will be performed before ending the start attempt. This is intended to be used in conjunction with Crank Attempt Count on Present Start Attempt, in order to give a FMI 0 diagnostic on the latter.
3671	Crank Attempt Count on Present Start Attempt	Reports the number of cranking cycles undergone during the present start attempt. Note: This is intended to be used in conjunction with Maximum Crank Attempts per Start Attempt, in order to give a FMI 0 diagnostic on this parameter when the count exceeds the maximum. When the engine is not in a start attempt, this parameter can either hold the last value or return a Not Available (FFh).
3672	Engine Exhaust Gas Recirculation 1 Cooler Bypass Actuator Position	The parameter gives the % open of the exhaust gas recirculation cooler bypass actuator, where 0% = Fully Closed (no gas flowing through the bypass), and 100% = Fully Open.
3673	Engine Throttle Valve 2 Position	The sensed position feedback of the valve, coming from a second electrical actuator for a second throttle plate, used to regulate the supply of a fluid, usually air or fuel//air mixture. 0% represents no supply and 100% is full supply. SPN 51 is used for the first throttle position feedback.
3675	Engine Turbocharger Compressor Bypass Actuator 1 Position	Measures the position of the turbocharger compressor bypass actuator, where 0% represents bypass fully closed and 100% represents bypass fully open. Typically, the compressor bypass is used to lower the compressor outlet pressure and/or intake manifold pressure during situations where too much boost is being generated by the turbocharger. Typically, a compressor bypass will be plumbed from the compressor outlet or intake manifold back to the compressor intake, with the compressor bypass actuator and valve in place to regulate bypass flow.

3676	Engine Aftercooler Coolant Level	Ratio of aftercooler coolant system volume of liquid to total cooling system volume. The engine aftercooler coolant level is for the low temperature (LT) cooling circuit used for the compressor outlet air or charge aftercooling.SPN 111 « Coolant Level » is assumed to represent a high temperature (HT) cooling circuit used for cooling the engine and its various components.
3677	Generator Unavailable to Start / Run	Indicates that the generator is not available to start up and run. This may indicate that a shutdown condition is present, or simply that the system has been manually placed into a STOP state.
3678	EPS Unavailable to Accept Load	Indicates that the Emergency Power System (EPS) is not prepared to accept load. This implies that the EPS is not in a state that will allow for a quick synchronization and connection to the load bus.
3680	Transmission Master Valve	The transmission master valve is in series with a common supply for other transmission valves that control individual functions. They permit overriding the on state of any individual circuit as well as switching on multiple circuits simultaneously.
3681	Power Conversion Enable Signal	Microcontroller based systems used in vehicles commonly use managed power down modes. In the event that the operator switches the vehicle off, a system with managed power down may continue to run until that system’s requirements for full power down are met.If the system uses a power supply that operates at a different potential than that of the vehicle, a power conversion function is required. For example, use of a 24v controller in a 12v vehicle would require power conversion to double the nominally 12v power supply. With a managed power down mode, that power conversion function needs a power conversion enable signal from the microcontroller that it may power down the power conversion independent of the vehicle’s power down.
3682	Transmission Air Pressure Regulator Valve	The valve used to regulate the air supply pressure for the transmission.

3683	Steering Wheel Angle	The main operator`s steering wheel angle (on the steering column, not the actual wheel angle). The vehicle being steered to the left (counterclockwise) results in a positive steering wheel angle. This is the yaw angle of the steering wheel with the z-axis along the centerline of the steering column. This parameter is defined according to a Z-Up axis system and the sign of the value is in accordance to the right-hand rule, as specified in SAE J670. As specified in SAE J670, a Z-Up Axis System has positive X directed forward, positive Y to the left, and positive Z directed up.
3684	Steering Wheel Angle Range Counter	The signal indicates the number of steering wheel angle range overflows if the operating range of steering wheel is greater than the measuring range of sensor element. Positive values indicate left turns (counterclockwise). If the steering wheel angle range is +/-180 degrees this signal is equivalent to a steering wheel turn counter. This parameter is defined according to a Z-Up axis system and the sign of the value is in accordance to the right-hand rule, as specified in SAE J670. As specified in SAE J670, a Z-Up Axis System has positive X directed forward, positive Y to the left, and positive Z directed up.
3685	Steering Wheel Angle Range Counter Type	The signal indicates whether the steering wheel angle sensor is capable of absolute measuring of the number of steering wheel angle ranges or not. Absolute measuring means that the steering wheel angle range counter signal indicates the real position of steering wheel at ignition on. Relative measuring means that the steering wheel angle range counter signal is zero at ignition on independent of the real position of steering wheel.00b = relative number of counts 01b = absolute number of counts 10b = not defined 11b = signal not available
3686	Steering Wheel Angle Range	The signal indicates the range of the steering wheel angle the sensor element is capable to measure. The steering wheel angle signal ranges between the negative and the positive value of the steering wheel angle range.For example, a steering angle sensor transmits +13.6 rad to indicate a range of +/- 13.6 rad.
3687	Steering Angle Sensor Active Mode	This signal indicates the operational mode of the steering angle sensor. 00b = Programming mode active 01b = Normal mode active 10b = Reserved 11b = Not available

3688	Steering Angle Sensor Calibrated	This signal indicates the calibration status of the steering angle sensor. 00b = SAS not calibrated 01b = SAS calibrated 10b = Reserved 11b = Not available
3689	Message Counter	The message counter is to verify the signal path from the demanding device to the steering controller. The support of this parameter is mandatory.Note: The initial value of the 4 bit message counter for the first message during a driving cycle is arbitrary. In every following message the counter is incremented by 1 (0 follows 15).
3690	Message Checksum	The message checksum is used to verify the signal path from the demanding device to the steering controller. The support of this parameter is mandatory if PGN 61469 is supported as there is no means to indicate « not available ».The 4 bit checksum is the sum of the high nibble and the low nibble of the sum of the identifier, the first 7 data bytes and the 4 bit message counter. It is calculated as follows: Checksum = (Byte1 + Byte2 + Byte3 + Byte4 + Byte5 + Byte6 + Byte7 + (message counter & 0Fh) + message ID low byte + message ID mid low byte + message ID mid high byte + message ID high byte) Checksum = ((Checksum >> 4) + Checksum) & 0Fh
3691	Left Headlamp Dynamic Bending Light	This parameter indicates whether the dynamic bending light of the left headlamp is working properly. 000b = Dynamic bending light deactivated. There is no problem but for some reasons (e.g. daylight present) the bending light is deactivated. 001b = Dynamic bending light is working properly. Normal operation mode. Bending light is working properly. 010b = Dynamic bending light fail safe position. Bending light is damaged, current position does not affect oncoming traffic. 011b = Dynamic bending light failure. Bending light does not work, current position may affect oncoming traffic. 100b to 110b = Reserved 111b = Not available
3692	Right Headlamp Dynamic Bending Light	This parameter indicates whether the dynamic bending light of the left headlamp is working properly. 000b = Dynamic bending light deactivated. There is no problem but for some reasons (e.g. daylight present) the bending light is deactivated. 001b = Dynamic bending light is working properly. Normal operation mode. Bending light is working properly. 010b = Dynamic bending light fail safe position. Bending light is damaged, current position does not affect oncoming traffic. 011b = Dynamic bending

		light failure. Bending light does not work, current position may affect oncoming traffic. 100b to 110b = Reserved 111b = Not available
3693	Left Headlamp Light Distribution	This parameter indicates what kind of light distribution is set by the AFS system for the left headlamp. 0000b = Light distribution town – The basic light distribution for town light is generated with a symmetrical cut-off line (Class V) 0001b = Light distribution country – Country light is mostly similar to the actual SAE low beam pattern. (Class C) 0010b = Light distribution motorway – The task of motorway light is an improved overall viewing distance and an optimum of illumination of the second lane on roads with more than one lane and without oncoming traffic. (Class E) 0011b = Light distribution high beam – The high beam distribution of the module generates an illumination level that an additional high beam spot is not necessary. 0100b = Light distribution adverse weather – The adverse weather light improves the viewing situation for the driver on wet roads and reduces the amount of glare from reflections on wed reads for the oncoming traffic. (Class W) 0101b = Light distribution fail safe position – Module is damaged, current light distribution does not affect oncoming traffic. 0110b = Light distribution failure – Module is damaged, current position may affect oncoming traffic. 0111b = Different light distributions not available – No AFS distributions available. Head lamp has only one distribution. 1000b to 1110b = Reserved 1111b = Not available
3694	Right Headlamp Light Distribution	This parameter indicates what kind of light distribution is set by the AFS system for the right headlamp. 0000b = Light distribution town – The basic light distribution for town light is generated with a symmetrical cut-off line (Class V) 0001b = Light distribution country – Country light is mostly similar to the actual SAE low beam pattern. (Class C) 0010b = Light distribution motorway – The task of motorway light is an improved overall viewing distance and an optimum of illumination of the second lane on roads with more than one lane and without oncoming traffic. (Class E) 0011b = Light distribution high beam – The high beam distribution of the module generates an illumination level that an additional high beam spot is not necessary. 0100b = Light distribution adverse weather – The adverse weather light improves the viewing situation for the driver on wet roads and reduces the amount of glare from reflections on wed reads for the oncoming traffic. (Class W) 0101b = Light

		distribution fail safe position – Module is damaged, current light distribution does not affect oncoming traffic. 0110b = Light distribution failure – Module is damaged, current position may affect oncoming traffic. 0111b = Different light distributions not available – No AFS distributions available. Head lamp has only one distribution. 1000b to 1110b = Reserved 1111b = Not available
3695	Aftertreatment Regeneration Inhibit Switch	Indicates the state of a switch available to the operator that inhibits aftertreatment regeneration. 00b = not active 01b = active 10b = error 11b = not availableThis SPN would be « not active » when aftertreatment regeneration is allowed to occur normally (aftertreatment regeneration is not inhibited). The engine controller shall inhibit regeneration when SPN 3695 is in the ON state. Regeneration shall be activated by SPN 3696 when it is in the ON state and SPN 3695 is in the OFF state.
3696	Aftertreatment Regeneration Force Switch	Indicates the state of a switch available to the operator that forces aftertreatment regeneration. 00b = not active 01b = active 10b = error 11b = not availableThis SPN would be « not active » when aftertreatment regeneration is allowed to occur normally (aftertreatment regeneration is not being forced). The engine controller shall inhibit regeneration when SPN 3695 is in the ON state. Regeneration shall be activated by SPN 3696 when it is in the ON state and SPN 3695 is in the OFF state.
3697	Diesel Particulate Filter Lamp Command	Command to control the diesel particulate filter lamp. 000b = Off 001b = On – solid 010b = reserved for SAE assignment 011b = reserved for SAE assignment 100b = On – fast blink (1 HZ) 101b = reserved for SAE assignment 110b = reserved for SAE assignment 111b = not available This SPN would be « off » when diesel particulate filter lamp is unlit. The « on – solid » should indicate that diesel particulate filter active regeneration is needed at the lowest level of urgency and that operator intervention is required. The flashing state indicates a more severe condition requiring regeneration. This SPN shall not be used to convey information regarding operator switch feedback from SPNs 3695 and 3696. The ISO 2575 Symbol F21 is recommended for use with this message.
3698	Exhaust System High Temperature Lamp Command	Command to control the exhaust system high temperature lamp. This lamp indicates that the exhaust system temperature is high.000b = Off 001b = On – solid 010b =

		reserved for SAE assignment 011b = reserved for SAE assignment 100b = reserved for SAE assignment 101b = reserved for SAE assignment 110b = reserved for SAE assignment 111b = not available This SPN would be « off » when the lamp is unlit. The « on – solid » status indicates that the exhaust gas temperature is high. This SPN shall not be used to convey information regarding operator switch feedback from SPNs 3695 and 3696. The ISO 2575 Symbol « F.26 » is recommended for use with this message. This symbol is the ISO exhaust gas symbol with the temperature symbol added to it.
3699	Aftertreatment Diesel Particulate Filter Passive Regeneration Status	Indicates the state of diesel particulate filter passive regeneration. This is an aggregate of bank 1 and bank 2. It is a system status and not individual bank status.00b = not active 01b = active 10b = reserved for SAE assignment 11b = not available
3700	Aftertreatment Diesel Particulate Filter Active Regeneration Status	Indicates the state of diesel particulate filter active regeneration. This is an aggregate of bank 1 and bank 2. It is a system status and not individual bank status.00b = not active 01b = active 10b = regeneration needed – automatically initiated active regeneration imminent 11b = not available
3701	Aftertreatment Diesel Particulate Filter Status	Indicates the state of the diesel particulate filter regeneration need and urgency. This is an aggregate of bank 1 and bank 2. It is a system status and not individual bank status.000b = Regeneration not needed 001b = Regeneration needed – lowest level 010b = Regeneration needed – moderate level 011b = Regeneration needed – highest level 100b = reserved for SAE assignment 101b = reserved for SAE assignment 110b = reserved for SAE assignment 111b = not available
3702	Diesel Particulate Filter Active Regeneration Inhibited Status	Indicates the state of diesel particulate filter active regeneration inhibition. 00b = not inhibited 01b = inhibited 10b = reserved for SAE assignment 11b = not available This SPN indicates the reason for the diesel particulate filter regeneration not being initiated or being exited prior to completion. When this state becomes active, the system will not initiate an active regeneration or will exit an active regeneration. If the reason for inhibiting is not covered by SPNs 3703 thru 3717 or 5629, a request for a status parameter should be submitted to the SAE Truck and Bus J1939 Request Processing Group to have the reason added.

3703	Diesel Particulate Filter Active Regeneration Inhibited Due to Inhibit Switch	Indicates the state of diesel particulate filter active regeneration inhibition due to the Diesel Particulate Filter Regeneration Inhibit Switch.00b = not inhibited 01b = inhibited 10b = reserved for SAE assignment 11b = not available This SPN indicates the reason for the diesel particulate filter regeneration not being initiated or being exited prior to completion. When this state becomes active the system will not initiate an active regeneration or will exit an active regeneration. The state provides information that may be provided to the driver/service technician as to why the regeneration did not initiate or was exited.
3704	Diesel Particulate Filter Active Regeneration Inhibited Due to Clutch Disengaged	Indicates the state of diesel particulate filter active regeneration inhibition due to the clutch being disengaged.00b = not inhibited 01b = inhibited 10b = reserved for SAE assignment 11b = not available This SPN indicates the reason for the diesel particulate filter regeneration not being initiated or being exited prior to completion. When this state becomes active the system will not initiate an active regeneration or will exit an active regeneration. The state provides information that may be provided to the driver/service technician as to why the regeneration did not initiate or was exited.
3705	Diesel Particulate Filter Active Regeneration Inhibited Due to Service Brake Active	Indicates the state of diesel particulate filter active regeneration inhibition due to the service brake being active.00b = not inhibited 01b = inhibited 10b = reserved for SAE assignment 11b = not available This SPN indicates the reason for the diesel particulate filter regeneration not being initiated or being exited prior to completion. When this state becomes active the system will not initiate an active regeneration or will exit an active regeneration. The state provides information that may be provided to the driver/service technician as to why the regeneration did not initiate or was exited.
3706	Diesel Particulate Filter Active Regeneration Inhibited Due to PTO Active	Indicates the state of diesel particulate filter active regeneration inhibition due to the PTO being active. 00b = not inhibited 01b = inhibited 10b = reserved for SAE assignment 11b = not available This SPN indicates the reason for the diesel particulate filter regeneration not being initiated or being exited prior to completion. When this state becomes active the system will not initiate an active regeneration or will exit an active regeneration. The state provides information that may be provided

		to the driver/service technician as to why the regeneration did not initiate or was exited.
3707	Diesel Particulate Filter Active Regeneration Inhibited Due to Accelerator Pedal Off Idle	Indicates the state of diesel particulate filter active regeneration inhibition due to the accelerator pedal being off idle.00b = not inhibited 01b = inhibited 10b = reserved for SAE assignment 11b = not available This SPN indicates the reason for the diesel particulate filter regeneration not being initiated or being exited prior to completion. When this state becomes active the system will not initiate an active regeneration or will exit an active regeneration. The state provides information that may be provided to the driver/service technician as to why the regeneration did not initiate or was exited.
3708	Diesel Particulate Filter Active Regeneration Inhibited Due to Out of Neutral	Indicates the state of diesel particulate filter active regeneration inhibition due to the transmission being out of neutral.00b = not inhibited 01b = inhibited 10b = reserved for SAE assignment 11b = not available This SPN indicates the reason for the diesel particulate filter regeneration not being initiated or being exited prior to completion. When this state becomes active the system will not initiate an active regeneration or will exit an active regeneration. The state provides information that may be provided to the driver/service technician as to why the regeneration did not initiate or was exited.
3709	Diesel Particulate Filter Active Regeneration Inhibited Due to Vehicle Speed Above Allowed Speed	Indicates the state of diesel particulate filter active regeneration inhibition due to the vehicle speed being above an allowed limit.00b = not inhibited 01b = inhibited 10b = reserved for SAE assignment 11b = not available This SPN indicates the reason for the diesel particulate filter regeneration not being initiated or being exited prior to completion. When this state becomes active the system will not initiate an active regeneration or will exit an active regeneration. The state provides information that may be provided to the driver/service technician as to why the regeneration did not initiate or was exited.
3710	Diesel Particulate Filter Active Regeneration Inhibited Due to Parking Brake Not Set	Indicates the state of diesel particulate filter active regeneration inhibition due to the parking brake being not set.00b = not inhibited 01b = inhibited 10b = reserved for SAE assignment 11b = not available This SPN indicates the reason for the diesel

		particulate filter regeneration not being initiated or being exited prior to completion. When this state becomes active the system will not initiate an active regeneration or will exit an active regeneration. The state provides information that may be provided to the driver/service technician as to why the regeneration did not initiate or was exited.
3711	Diesel Particulate Filter Active Regeneration Inhibited Due to Low Exhaust Temperature	Indicates the state of diesel particulate filter active regeneration inhibition due to the exhaust temperature being too low. This implies that the diesel particulate filter and/or oxidation catalyst are likewise too cold for active regeneration.00b = not inhibited 01b = inhibited 10b = reserved for SAE assignment 11b = not available This SPN indicates the reason for the diesel particulate filter regeneration not being initiated or being exited prior to completion. When this state becomes active the system will not initiate an active regeneration or will exit an active regeneration. The state provides information that may be provided to the driver/service technician as to why the regeneration did not initiate or was exited.
3712	Diesel Particulate Filter Active Regeneration Inhibited Due to System Fault Active	Indicates the state of diesel particulate filter active regeneration inhibition due to a system fault being active.00b = not inhibited 01b = inhibited 10b = reserved for SAE assignment 11b = not available This SPN indicates the reason for the diesel particulate filter regeneration not being initiated or being exited prior to completion. When this state becomes active the system will not initiate an active regeneration or will exit an active regeneration. The state provides information that may be provided to the driver/service technician as to why the regeneration did not initiate or was exited.
3713	Diesel Particulate Filter Active Regeneration Inhibited Due to System Timeout	Indicates the state of diesel particulate filter active regeneration inhibition due to a system timeout. 00b = not inhibited 01b = inhibited 10b = reserved for SAE assignment 11b = not available This SPN indicates the reason for the diesel particulate filter regeneration not being initiated or being exited prior to completion. When this state becomes active the system will not initiate an active regeneration or will exit an active regeneration. The state provides information that may be provided to the driver/service technician as to why the regeneration did not initiate or was exited.

3714	Diesel Particulate Filter Active Regeneration Inhibited Due to Temporary System Lockout	Indicates the state of diesel particulate filter active regeneration inhibition due to a temporary system lockout.00b = not inhibited 01b = inhibited 10b = reserved for SAE assignment 11b = not available This SPN indicates the reason for the diesel particulate filter regeneration not being initiated or being exited prior to completion. When this state becomes active the system will not initiate an active regeneration or will exit an active regeneration. The state provides information that may be provided to the driver/service technician as to why the regeneration did not initiate or was exited.
3715	Diesel Particulate Filter Active Regeneration Inhibited Due to Permanent System Lockout	Indicates the state of diesel particulate filter active regeneration inhibition due to a permanent system lockout.00b = not inhibited 01b = inhibited 10b = reserved for SAE assignment 11b = not available This SPN indicates the reason for the diesel particulate filter regeneration not being initiated or being exited prior to completion. When this state becomes active the system will not initiate an active regeneration or will exit an active regeneration. The state provides information that may be provided to the driver/service technician as to why the regeneration did not initiate or was exited.
3716	Diesel Particulate Filter Active Regeneration Inhibited Due to Engine Not Warmed Up	Indicates the state of diesel particulate filter active regeneration inhibition due to the engine not being warmed up.00b = not inhibited 01b = inhibited 10b = reserved for SAE assignment 11b = not available This SPN indicates the reason for the diesel particulate filter regeneration not being initiated or being exited prior to completion. When this state becomes active the system will not initiate an active regeneration or will exit an active regeneration. The state provides information that may be provided to the driver/service technician as to why the regeneration did not initiate or was exited.
3717	Diesel Particulate Filter Active Regeneration Inhibited Due to Vehicle Speed Below Allowed Speed	Indicates the state of diesel particulate filter active regeneration inhibition due to vehicle speed being less than the allowed vehicle speed.00b = not inhibited 01b = inhibited 10b = reserved for SAE assignment 11b = not available This SPN indicates the reason for the diesel particulate filter regeneration not being initiated or being exited prior to completion. When this state becomes active the system will not initiate an active regeneration or will exit an active regeneration. The state provides

		information that may be provided to the driver/service technician as to why the regeneration did not initiate or was exited.
3718	Diesel Particulate Filter Automatic Active Regeneration Initiation Configuration	Indicates the configuration of diesel particulate filter active regeneration automatic initiation. 00b = not enabled 01b = enabled 10b = reserved for SAE assignment 11b = not available
3719	Aftertreatment 1 Diesel Particulate Filter Soot Load Percent	Indicates the soot load percent of diesel particulate filter 1. 100% is the level at which active diesel particulate filter regeneration should be triggered.100% level is the active regeneration trigger level (and if conditions are not favorable for regeneration, soot loading can continue beyond 100%). During normal operation and regeneration a value 0% will indicate a fully regenerated diesel particulate filter. Values of 25%, 50% and 75% will indicate the general level of soot prior to the 100% level where an active regeneration is needed.
3720	Aftertreatment 1 Diesel Particulate Filter Ash Load Percent	Indicates the ash load percent of diesel particulate filter 1. 100% is the level at which diesel particulate filter ash service should be performed.100% level is the target ash service interval (and if ash service is not immediately performed, ash loading can continue beyond 100%).
3721	Aftertreatment 1 Diesel Particulate Filter Time Since Last Active Regeneration	Indicates the time since the last active regeneration event of diesel particulate filter 1.
3722	Aftertreatment 2 Diesel Particulate Filter Soot Load Percent	Indicates the soot load percent of diesel particulate filter 2. 100% is the level at which active diesel particulate filter regeneration should be triggered.100% level is the active regeneration trigger level (and if conditions are not favorable for regeneration, soot loading can continue beyond 100%). During normal operation and regeneration a value 0% will indicate a fully regenerated diesel particulate filter. Values of 25%, 50% and 75% will indicate the general level of soot prior to the 100% level where an active regeneration is needed.

3723	Aftertreatment 2 Diesel Particulate Filter Ash Load Percent	Indicates the ash load percent of diesel particulate filter 2. 100% is the level at which diesel particulate filter ash service should be performed.100% level is the target ash service interval (and if ash service is not immediately performed, ash loading can continue beyond 100%).
3724	Aftertreatment 2 Diesel Particulate Filter Time Since Last Active Regeneration	Indicates the time since the last active regeneration event of diesel particulate filter 2.
3725	Aftertreatment 1 Diesel Particulate Filter Total Passive Regeneration Time	Total amount of time that aftertreatment 1 diesel particulate filter has been in passive regeneration over the lifetime of the device.
3726	Aftertreatment 1 Diesel Particulate Filter Total Number of Passive Regenerations	Total number of passive regenerations by aftertreatment device 1 over the lifetime of the device.
3727	Aftertreatment 1 Diesel Particulate Filter Total Number of Active Regeneration Inhibit Requests	Total number of aftertreatment device 1 active regeneration inhibit requests by the operator over the lifetime of the device.
3728	Aftertreatment 1 Diesel Particulate Filter Total Number of Active Regeneration Manual Requests	Total number of aftertreatment device 1 active regeneration manual requests by the operator over the lifetime of the device.
3729	Aftertreatment 2 Diesel Particulate Filter Total Passive Regeneration Time	Total amount of time that Aftertreatment device 2 has been in passive regeneration over the lifetime of the device.
3730	Aftertreatment 2 Diesel Particulate Filter Total Number of Passive Regenerations	Total number of passive regenerations by Aftertreatment device 2 over the lifetime of the device.

3731	Aftertreatment 2 Diesel Particulate Filter Total Number of Active Regeneration Inhibit Requests	Total number of Aftertreatment device 2 active regeneration inhibit requests by the operator over the lifetime of the device.
3732	Aftertreatment 2 Diesel Particulate Filter Total Number of Active Regeneration Manual Requests	Total number of Aftertreatment device 2 active regeneration manual requests by the operator over the lifetime of the device.
3733	Aftertreatment 1 Diesel Particulate Filter Trip Fuel Used	Total amount of fuel used by the aftertreatment 1 diesel particulate filter during the current trip period. NOTE: This SPN needs to be reset by the reset PGN 56832.
3734	Aftertreatment 1 Diesel Particulate Filter Trip Active Regeneration Time	Total amount of time that the aftertreatment 1 diesel particulate filter has been in active regeneration during the current trip period.NOTE: This SPN needs to be reset by the reset PGN 56832.
3735	Aftertreatment 1 Diesel Particulate Filter Trip Disabled Time	Total amount of time that aftertreatment 1 diesel particulate filter regeneration has been manually disabled during the current trip period.NOTE: This SPN needs to be reset by the reset PGN 56832.
3736	Aftertreatment 1 Diesel Particulate Filter Trip Number of Active Regenerations	Total number of active regenerations of the aftertreatment 1 diesel particulate filter during the current trip period.NOTE: This SPN needs to be reset by the reset PGN 56832.
3737	Aftertreatment 1 Diesel Particulate Filter Trip Passive Regeneration Time	Total amount of time that the aftertreatment 1 diesel particulate filter has been in passive regeneration during the current trip period.NOTE: This SPN needs to be reset by the reset PGN 56832.
3738	Aftertreatment 1 Diesel Particulate Filter Trip Number of Passive Regenerations	Total number of passive regenerations of the aftertreatment 1 diesel particulate filter during the current trip period.NOTE: This SPN needs to be reset by the reset PGN 56832.

3739	Aftertreatment 1 Diesel Particulate Filter Trip Number of Active Regeneration Inhibit Requests	Total number of aftertreatment 1 diesel particulate filter active regeneration inhibit requests by the operator during the current trip period.NOTE: This SPN needs to be reset by the reset PGN 56832.
3740	Aftertreatment 1 Diesel Particulate Filter Trip Number of Active Regeneration Manual Requests	Total number of aftertreatment 1 diesel particulate filter active regeneration manual requests by the operator during the current trip period.NOTE: This SPN needs to be reset by the reset PGN 56832.
3741	Aftertreatment 2 Diesel Particulate Filter Trip Fuel Used	Total amount of fuel used by the aftertreatment 2 diesel particulate filter during the current trip period. NOTE: This SPN needs to be reset by the reset PGN 56832.
3742	Aftertreatment 2 Diesel Particulate Filter Trip Active Regeneration Time	Total amount of time that the aftertreatment 2 diesel particulate filter has been in active regeneration during the current trip period.NOTE: This SPN needs to be reset by the reset PGN 56832.
3743	Aftertreatment 2 Diesel Particulate Filter Trip Disabled Time	Total amount of time that aftertreatment 2 diesel particulate filter regeneration has been manually disabled during the current trip period.NOTE: This SPN needs to be reset by the reset PGN 56832.
3744	Aftertreatment 2 Diesel Particulate Filter Trip Number of Active Regenerations	Total number of active regenerations of the aftertreatment 2 diesel particulate filter during the current trip period.NOTE: This SPN needs to be reset by the reset PGN 56832.
3745	Aftertreatment 2 Diesel Particulate Filter Trip Passive Regeneration Time	Total amount of time that the aftertreatment 2 diesel particulate filter has been in passive regeneration during the current trip period.NOTE: This SPN needs to be reset by the reset PGN 56832.
3746	Aftertreatment 2 Diesel Particulate Filter Trip Number of Passive Regenerations	Total number of passive regenerations of the aftertreatment 2 diesel particulate filter during the current trip period.NOTE: This SPN needs to be reset by the reset PGN 56832.

3747	Aftertreatment 2 Diesel Particulate Filter Trip Number of Active Regeneration Inhibit Requests	Total number of aftertreatment 2 diesel particulate filter active regeneration inhibit requests by the operator during the current trip period.NOTE: This SPN needs to be reset by the reset PGN 56832.
3748	Aftertreatment 2 Diesel Particulate Filter Trip Number of Active Regeneration Manual Requests	Total number of aftertreatment 2 diesel particulate filter active regeneration manual requests by the operator during the current trip period.NOTE: This SPN needs to be reset by the reset PGN 56832.
3749	Engine Overcooled	Indicates that the engine has been overcooled enough to warrant triggering a diagnostic event. Intended to be used with FMI 31 – condition exists This SPN would indicate that the engine is not capable of generating enough heat energy to get to a warmed up state due to unknown conditions.
3750	Aftertreatment 1 Diesel Particulate Filter Conditions Not Met for Active Regeneration	Indicates that diesel particulate filter 1 is not able to begin or continue an active regenerate event at the current engine operating conditions.00b = active DPF regeneration not inhibited 01b = active DPF regeneration inhibited 10b = reserved for SAE assignment 11b = not available This SPN would indicate that the diesel particulate filter (bank 1) is not able to begin or continue an active regeneration event due to current engine operating conditions. The conditions on these SPNs are exclusive to the conditions in the PGN 64892 Examples of these other conditions are: – Engine Speed/Load Conditions not met – Soot Load Percent not high enough – Engine is a working mode senario SPN 3702 should be set to inhibited when SPN 3750 goes to inhibited status.
3751	Aftertreatment 2 Diesel Particulate Filter Conditions Not Met for Active Regeneration	Indicates that diesel particulate filter 2 is not able to begin or continue an active regenerate event at the current engine operating conditions.Intended to be used with FMI 31 – condition exists This SPN would indicate that the diesel particulate filter (bank 2) is not able to begin or continue an active regeneration event due to current engine operating conditions.
3752	Wrapping Arm Fast Speed Rotation Actuator	The actuator for the wrapping arm fast speed rotation function. The wrapper is used to apply the wrapping material around the bale.

3753	Wrapping Arm Reverse Rotation Actuator	The actuator for the wrapping arm reverse rotation function. The wrapper is used to apply the wrapping material around the bale.
3754	Wrapping Arm Regular Speed Rotation Actuator	The actuator for the wrapping arm regular speed rotation. The wrapper is used to apply the wrapping material around the bale.
3755	Bale Rotational Speed	The measured rotational speed of the bale inside the chamber.
3756	Wrapper Knife Close Actuator	The close actuator for the knives used on the wrapper. The knives are used to cut the end of the wrapping material after it is on the bale.
3757	Wrapper Knife Open Actuator	The open actuator for the knives used on the wrapper. The knives are used to cut the end of the wrapping material after it is on the bale.
3758	Baler Gate Actuator	The actuator used to operate the gate on the back of the baler.
3759	Transfer Table Backward Actuator	The backward actuator for the baler transfer table control which delivers the bale to the wrapper. This backs up the table to move the bale away from the wrapper if needed.
3760	Transfer Table Forward Actuator	The forward actuator for the baler transfer table control which delivers the bale to the wrapper.
3761	Precutter Reverser Actuator	The actuator for the part of the baler precutter system that can reverse the flow of the crop to remove a plug.
3762	Precutter Knives Actuator	The crop precutting knives that process the crop before loading into the machine.
3763	Baler Pickup Actuator	The actuator for the pickup system mechanism that gathers the crop from the field.
3764	Baler Net Actuator Mode	The baler net actuator mechanism response to commands.

3765	Baler Net Actuator	The actuator mechanism that ties the net or wrapping material around the bale.
3783	Intake Manifold Charge Combustion	This parameter provides diagnostics on a charge combustion event within the engine intake manifold, which is commonly called spit-back or intake manifold backfire. This combustion event may be caused by factors such as burnt or sticking intake valves, by ignition timing errors in the case of spark ignition engines, and others. This combustion event may occur without warning at any time on a running engine. A pressure switch or transducer that is fitted directly into the intake manifold to detect the first rising pulse and cause lockout will provide protection against further engine damage.
3785	Tractor Brake Stroke Axle 1 Left	Brake stroke status for left brake actuator on tractor axle 1. 000b = OK (Normal operation) 001b = Non-functioning 010b = Overstroke 011b = Dragging brake 100b = Reserved 101b = Reserved 110b = Sensor error 111b = Not available
3786	Tractor Brake Stroke Axle 1 Right	Brake stroke status for right brake actuator on tractor axle 1. 000b = OK (Normal operation) 001b = Non-functioning 010b = Overstroke 011b = Dragging brake 100b = Reserved 101b = Reserved 110b = Sensor error 111b = Not available
3787	Tractor Brake Stroke Axle 2 Left	Brake stroke status for left brake actuator on tractor axle 2. 000b = OK (Normal operation) 001b = Non-functioning 010b = Overstroke 011b = Dragging brake 100b = Reserved 101b = Reserved 110b = Sensor error 111b = Not available
3788	Tractor Brake Stroke Axle 2 Right	Brake stroke status for right brake actuator on tractor axle 2. 000b = OK (Normal operation) 001b = Non-functioning 010b = Overstroke 011b = Dragging brake 100b = Reserved 101b = Reserved 110b = Sensor error 111b = Not available
3789	Tractor Brake Stroke Axle 3 Left	Brake stroke status for left brake actuator on tractor axle 3. 000b = OK (Normal operation) 001b = Non-functioning 010b = Overstroke 011b = Dragging brake 100b = Reserved 101b = Reserved 110b = Sensor error 111b = Not available

3790	Tractor Brake Stroke Axle 3 Right	Brake stroke status for right brake actuator on tractor axle 3. 000b = OK (Normal operation) 001b = Non-functioning 010b = Overstroke 011b = Dragging brake 100b = Reserved 101b = Reserved 110b = Sensor error 111b = Not available
3791	Tractor Brake Stroke Axle 4 Left	Brake stroke status for left brake actuator on tractor axle 4. 000b = OK (Normal operation) 001b = Non-functioning 010b = Overstroke 011b = Dragging brake 100b = Reserved 101b = Reserved 110b = Sensor error 111b = Not available
3792	Tractor Brake Stroke Axle 4 Right	Brake stroke status for right brake actuator on tractor axle 4. 000b = OK (Normal operation) 001b = Non-functioning 010b = Overstroke 011b = Dragging brake 100b = Reserved 101b = Reserved 110b = Sensor error 111b = Not available
3793	Tractor Brake Stroke Axle 5 Left	Brake stroke status for left brake actuator on tractor axle 5. 000b = OK (Normal operation) 001b = Non-functioning 010b = Overstroke 011b = Dragging brake 100b = Reserved 101b = Reserved 110b = Sensor error 111b = Not available
3794	Tractor Brake Stroke Axle 5 Right	Brake stroke status for right brake actuator on tractor axle 5. 000b = OK (Normal operation) 001b = Non-functioning 010b = Overstroke 011b = Dragging brake 100b = Reserved 101b = Reserved 110b = Sensor error 111b = Not available
3795	Trailer Brake Stroke Axle 1 Left	Brake stroke status for left brake actuator on trailerr axle 1. 000b = OK (Normal operation) 001b = Non-functioning 010b = Overstroke 011b = Dragging brake 100b = Reserved 101b = Reserved 110b = Sensor error 111b = Not available
3796	Trailer Brake Stroke Axle 1 Right	Brake stroke status for right brake actuator on trailer axle 1. 000b = OK (Normal operation) 001b = Non-functioning 010b = Overstroke 011b = Dragging brake 100b = Reserved 101b = Reserved 110b = Sensor error 111b = Not available
3797	Trailer Brake Stroke Axle 2 Left	Brake stroke status for left brake actuator on trailer axle 2. 000b = OK (Normal operation) 001b = Non-functioning 010b = Overstroke 011b = Dragging brake 100b = Reserved 101b = Reserved 110b = Sensor error 111b = Not available

3798	Trailer Brake Stroke Axle 2 Right	Brake stroke status for right brake actuator on trailer axle 2. 000b = OK (Normal operation) 001b = Non-functioning 010b = Overstroke 011b = Dragging brake 100b = Reserved 101b = Reserved 110b = Sensor error 111b = Not available
3799	Trailer Brake Stroke Axle 3 Left	Brake stroke status for left brake actuator on trailer axle 3. 000b = OK (Normal operation) 001b = Non-functioning 010b = Overstroke 011b = Dragging brake 100b = Reserved 101b = Reserved 110b = Sensor error 111b = Not available
3800	Trailer Brake Stroke Axle 3 Right	Brake stroke status for right brake actuator on trailer axle 3. 000b = OK (Normal operation) 001b = Non-functioning 010b = Overstroke 011b = Dragging brake 100b = Reserved 101b = Reserved 110b = Sensor error 111b = Not available
3801	Trailer Brake Stroke Axle 4 Left	Brake stroke status for left brake actuator on trailer axle 4. 000b = OK (Normal operation) 001b = Non-functioning 010b = Overstroke 011b = Dragging brake 100b = Reserved 101b = Reserved 110b = Sensor error 111b = Not available
3802	Trailer Brake Stroke Axle 4 Right	Brake stroke status for right brake actuator on trailer axle 4. 000b = OK (Normal operation) 001b = Non-functioning 010b = Overstroke 011b = Dragging brake 100b = Reserved 101b = Reserved 110b = Sensor error 111b = Not available
3803	Trailer Brake Stroke Axle 5 Left	Brake stroke status for left brake actuator on trailer axle 5. 000b = OK (Normal operation) 001b = Non-functioning 010b = Overstroke 011b = Dragging brake 100b = Reserved 101b = Reserved 110b = Sensor error 111b = Not available
3804	Trailer Brake Stroke Axle 5 Right	Brake stroke status for right brake actuator on trailer axle 5. 000b = OK (Normal operation) 001b = Non-functioning 010b = Overstroke 011b = Dragging brake 100b = Reserved 101b = Reserved 110b = Sensor error 111b = Not available
3805	Tractor Brake Stroke Alert Monitor	Tractor Brake Stroke Alert System Status
3806	Trailer Brake Stroke Alert Monitor	Trailer Brake Stroke Alert System Status

3807	Park Brake Release Inhibit Request	Park Brake Release Inhibit Request signals the desire that an applied park brake remain applied and limit the ability of the vehicle to be moved.00b = Park Brake Release Inhibit not requested 01b = Park Brake Release Inhibit requested 10b = SAE reserved 11b = Unavailable This parameter provides the capability to request the device controlling a parking brake to inhibit its release. This is intended for devices to request the park brake remain applied. Status 00b is provided when conditions recommending the application of the park brake no longer exist for the sender.
3808	Park Brake Release Inhibit Status	This parameter provides reports on the status of the Park Brake Release Inhibit function. 00b = Park Brake release is not inhibited 01b = Park Brake release is inhibited 10b = Error (for example: Park Brake release is not inhibited, but is requested to be inhibited) 11b = Unavailable The device controlling the Park Brake sends a status of the inhibit function. The allowed release of the park brake is provided as status 00b. 01b indicates that the release of the park brake is inhibited. The release may be inhibited by either an external request or by local information available to the controlling device.
3809	Transmission Oil Level Request	Conveys operator or vehicle system desire for a transmission oil level reading to be taken. 00b = No transmission oil level reading desired 01b = Transmission oil level reading desired 10b = Reserved 11b = Don’t care / take no action
3810	Retract Status of ramp 1	Retract status of ramp at doorway 1, counting from front to back on the vehicle. 00b = ramp retracted 01b = ramp extended 10b = error 11b = not available
3811	Enable status of ramp 1	Enable status of ramp at doorway 1, counting from front to back on the vehicle. 00b = ramp disabled 01b = ramp enabled 10b = error 11b = not available
3812	Movement status of ramp 1	Movement status of ramp at doorway 1, counting from front to back on the vehicle. 00b = ramp not being moved 01b = ramp being moved 10b = error 11b = not available
3813	Retract Status of ramp 2	Retract status of ramp at doorway 2, counting from front to back on the vehicle. 00b = ramp retracted 01b = ramp extended 10b = error 11b = not available

3814	Enable status of ramp 2	Enable status of ramp at doorway 2, counting from front to back on the vehicle. 00b = ramp disabled 01b = ramp enabled 10b = error 11b = not available
3815	Movement status of ramp 2	Movement status of ramp at doorway 2, counting from front to back on the vehicle. 00b = ramp not being moved 01b = ramp being moved 10b = error 11b = not available
3816	Retract Status of ramp 3	Retract status of ramp at doorway 3, counting from front to back on the vehicle. 00b = ramp retracted 01b = ramp extended 10b = error 11b = not available
3817	Enable status of ramp 3	Enable status of ramp at doorway 3, counting from front to back on the vehicle. 00b = ramp disabled 01b = ramp enabled 10b = error 11b = not available
3818	Movement status of ramp 3	Movement status of ramp at doorway 3, counting from front to back on the vehicle. 00b = ramp not being moved 01b = ramp being moved 10b = error 11b = not available
3819	Front axle group engagement status	Front axle group engagement status 00b = front axle group disengaged 01b = front axle group engaged 10b = error 11b = not available
3820	Rear axle group engagement status	Rear axle group engagement status 00b = rear axle group disengaged 01b = rear axle group engaged 10b = error 11b = not available
3821	Engine Exhaust Gas Recirculation 1 Valve 2 Control	Desired percentage of maximum Exhaust Gas Recirculation (EGR) valve opening for valve 2. 0% means valve is closed. 100% means maximum valve opening (full gas flow).
3822	Engine Exhaust Gas Recirculation 1 Valve 2 Position	The position of the second exhaust gas recirculation valve expressed as a percentage of full travel. Zero percent means the valve is closed and no exhaust gas is flowing into the intake air stream. One hundred percent means the valve is fully opened.
3823	Transmission Torque Converter Oil Outlet Temperature	Temperature of transmission torque converter outlet oil.

3824	Transmission Gear Latch Actuator	Actuator for transmission gear latch. This actuator controls an on/off valve that makes the system pressure available to the clutch solenoids when it is on. The actuator allows the transmission to hold a gear (i.e. gear latch) until the vehicle slows down when power is lost to the engine and/or transmission ECUs. With the transmission still in gear, the engine will keep rotating, thus keeping the power steering pumps and such running.
3825	Transmission Output Speed 2	Second sensor to measure transmission output speed.
3826	Aftertreatment 1 Diesel Exhaust Fluid Average Consumption	Measured use of diesel exhaust fluid by a Selective Catalytic Reduction system for exhaust emission control, averaged over the previous 15 hours of engine operation.Used to determine whether the SCR system is using an appropriate amount of diesel exhaust fluid, by comparing with the Aftertreatment 1 Commanded Diesel Exhaust Fluid Consumption parameter (SPN 3828).
3828	Aftertreatment 1 SCR Commanded Diesel Exhaust Fluid Consumption	This parameter transmits the amount of diesel exhaust fluid that the emissions control system has requested to be used, averaged over the past 15 hours of engine operation.Used to determine whether the SCR system is using an appropriate amount of diesel exhaust fluid, by comparing with the Aftertreatment 1 Average Diesel Exhaust Fluid Consumption parameter (SPN 3826).
3829	EPS Supplying Load	The generator set controller indicates that the Emergency Power System (generator set) can supply load when the genset is:1. actually supplying load 2. enabled to supply load, such as when the transfer switch has disconnected the utility and is connected to the generator set.
3830	Aftertreatment 1 Secondary Air Differential Pressure	Indicates the secondary air differential pressure for aftertreatment 1. Secondary air is air provided to the exhaust system (per SAE J2403).
3831	Aftertreatment 1 Secondary Air Temperature	Indicates the secondary air temperature for aftertreatment 1. Secondary air is air provided to the exhaust system (per SAE J2403).

3832	Aftertreatment 1 Secondary Air Mass Flow Rate	Indicates the secondary air mass flow for aftertreatment 1. Secondary air is the air provided to the exhaust system (per SAE J2403).
3833	Aftertreatment 2 Secondary Air Differential Pressure	Indicates the secondary air differential pressure for aftertreatment 2. Secondary air is air provided to the exhaust system (per SAE J2403).
3834	Aftertreatment 2 Secondary Air Temperature	Indicates the secondary air temperature for aftertreatment 2. Secondary air is air provided to the exhaust system (per SAE J2403).
3835	Aftertreatment 2 Secondary Air Mass Flow Rate	Indicates the secondary air mass flow for aftertreatment 2. Secondary air is the air provided to the exhaust system (per SAE J2403).
3837	Aftertreatment 1 Secondary Air Pressure	Pressure of the secondary air for aftertreatment 1. Secondary air is air provided to the exhaust system (per SAE J2403).For absolute pressure, see SPN 5589.
3838	Aftertreatment 2 Secondary Air Pressure	Pressure of the secondary air for aftertreatment 2. Secondary air is air provided to the exhaust system (per SAE J2403).For absolute pressure, see SPN 5590.
3839	Brake Temperature Warning	This parameter indicates if the temperature in the service brakes exceeds a certain value. It can be used for a warning information for the driver. The temperature warning value is vehicle manufacturer specific.00b = Not Active 01b = Active 10b = Reserved 11b = not available
3840	Auxiliary I/O #17	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3841	Auxiliary I/O #18	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application

3842	Auxiliary I/O #19	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3843	Auxiliary I/O #20	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3844	Auxiliary I/O #21	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3845	Auxiliary I/O #22	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3846	Auxiliary I/O #23	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3847	Auxiliary I/O #24	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3848	Auxiliary I/O #25	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b

		= Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3849	Auxiliary I/O #26	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3850	Auxiliary I/O #27	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3851	Auxiliary I/O #28	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3852	Auxiliary I/O #29	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3853	Auxiliary I/O #30	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3854	Auxiliary I/O #31	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application

3855	Auxiliary I/O #32	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3856	Auxiliary I/O #33	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3857	Auxiliary I/O #34	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3858	Auxiliary I/O #35	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3859	Auxiliary I/O #36	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3860	Auxiliary I/O #37	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3861	Auxiliary I/O #38	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b

		= Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3862	Auxiliary I/O #39	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3863	Auxiliary I/O #40	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3864	Auxiliary I/O #41	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3865	Auxiliary I/O #42	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3866	Auxiliary I/O #43	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3867	Auxiliary I/O #44	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application

3868	Auxiliary I/O #45	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3869	Auxiliary I/O #46	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3870	Auxiliary I/O #47	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3871	Auxiliary I/O #48	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3872	Auxiliary I/O #49	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3873	Auxiliary I/O #50	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3874	Auxiliary I/O #51	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b

		= Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3875	Auxiliary I/O #52	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3876	Auxiliary I/O #53	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3877	Auxiliary I/O #54	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3878	Auxiliary I/O #55	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3879	Auxiliary I/O #56	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3880	Auxiliary I/O #57	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application

3881	Auxiliary I/O #58	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3882	Auxiliary I/O #59	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3883	Auxiliary I/O #60	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3884	Auxiliary I/O #61	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3885	Auxiliary I/O #62	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3886	Auxiliary I/O #63	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3887	Auxiliary I/O #64	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b

		= Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3888	Auxiliary I/O #65	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3889	Auxiliary I/O #66	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3890	Auxiliary I/O #67	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3891	Auxiliary I/O #68	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3892	Auxiliary I/O #69	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3893	Auxiliary I/O #70	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application

3894	Auxiliary I/O #71	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3895	Auxiliary I/O #72	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3896	Auxiliary I/O #73	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3897	Auxiliary I/O #74	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3898	Auxiliary I/O #75	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3899	Auxiliary I/O #76	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3900	Auxiliary I/O #77	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b

		= Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3901	Auxiliary I/O #78	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3902	Auxiliary I/O #79	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3903	Auxiliary I/O #80	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3904	Auxiliary I/O #81	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3905	Auxiliary I/O #82	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3906	Auxiliary I/O #83	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application

3907	Auxiliary I/O #84	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3908	Auxiliary I/O #85	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3909	Auxiliary I/O #86	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3910	Auxiliary I/O #87	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3911	Auxiliary I/O #88	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3912	Auxiliary I/O #89	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3913	Auxiliary I/O #90	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b

		= Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3914	Auxiliary I/O #91	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3915	Auxiliary I/O #92	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3916	Auxiliary I/O #93	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3917	Auxiliary I/O #94	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3918	Auxiliary I/O #95	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3919	Auxiliary I/O #96	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application

3920	Auxiliary I/O #97	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3921	Auxiliary I/O #98	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3922	Auxiliary I/O #99	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3923	Auxiliary I/O #100	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3924	Auxiliary I/O #101	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3925	Auxiliary I/O #102	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3926	Auxiliary I/O #103	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b

		= Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3927	Auxiliary I/O #104	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3928	Auxiliary I/O #105	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3929	Auxiliary I/O #106	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3930	Auxiliary I/O #107	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3931	Auxiliary I/O #108	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3932	Auxiliary I/O #109	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application

3933	Auxiliary I/O #110	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3934	Auxiliary I/O #111	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3935	Auxiliary I/O #112	Identifies the current status of auxiliary input/output functions that are configured uniquely per application.00b = Auxiliary channel off 01b = Auxiliary channel on 10b = Error Indicator or Not Used , depending on application 11b = Not Available or Take No Action, depending on application
3936	Aftertreatment Diesel Particulate Filter System	Indicates non-specific failures of the aftertreatment diesel particulate filter system. This is a diagnostic for the aftertreatment diesel particulate filter, indicating the soot filter performance. This diagnostic does not indicate that the differential pressure sensor is functioning.
3938	Generator Governing Bias	Control signal used to govern the genset’s speed or load (depending on isochronous or utility parallel operation, respectively)NOTE: If this method of engine control is used, the PGN 0 (TSC1) is not expected to be received by the engine controller and it will not be processed.
3939	Enable Switch – PTO Engine Flywheel	Status of the PTO Engine Flywheel enable switch 00b = Enable switch off – PTO operation not desired 01b = Enable switch on – PTO operation desired 10b = Error 11b = Not available
3940	Engagement Consent – PTO Engine Flywheel	Engagement Consent status for the PTO Engine Flywheel 00b = Consent not given – PTO drive may not be engaged 01b = Consent given – PTO drive may be engaged 10b = Error 11b = Not available

3941	Engagement Status – PTO Engine Flywheel	Engagement status of the PTO Engine Flywheel 00b = Drive not engaged 01b = Drive engaged 10b = Error 11b = Not available
3942	Enable Switch – PTO Engine Accessory Drive 1	Status of the PTO engine accessory drive 1 enable switch 00b = Enable switch off – PTO operation not desired 01b = Enable switch on – PTO operation desired 10b = Error 11b = Not available
3943	Engagement Consent – PTO Engine Accessory Drive 1	Engagement consent status for the PTO engine accessory drive 1 00b = Consent not given – PTO drive may not be engaged 01b = Consent given – PTO drive may be engaged 10b = Error 11b = Not available
3944	Engagement Status – PTO Engine Accessory Drive 1	Engagement status of the PTO engine accessory drive 1 00b = Drive not engaged 01b = Drive engaged 10b = Error 11b = Not available
3945	Enable Switch – PTO Engine Accessory Drive 2	Status of the PTO engine accessory drive 2 enable switch 00b = Enable switch off – PTO operation not desired 01b = Enable switch on – PTO operation desired 10b = Error 11b = Not available
3946	Engagement Consent – PTO Engine Accessory Drive 2	Engagement Consent status for the PTO engine accessory drive 2 00b = Consent not given – PTO drive may not be engaged 01b = Consent given – PTO drive may be engaged 10b = Error 11b = Not available
3947	Engagement Status – PTO Engine Accessory Drive 2	Engagement status of the PTO engine accessory drive 2 00b = Drive not engaged 01b = Drive engaged 10b = Error 11b = Not available
3948	At least one PTO engaged	Indicates that at least one PTO is engaged 00b = No PTO drive is engaged 01b = At least one PTO drive is engaged 10b = Error 11b = Not available Note: This parameter should only be sent by the controller that has knowledge of all PTO drives on the vehicle (e.g, the FMS gateway). Individual PTO drive controllers should broadcast this parameter as « not available ».
3949	AC Power Voltage, 120V, 60 Hz	The electrical potential of an alternating current power supply at 120 Volts, 60 Hz.

3950	Air Horn	The air horn is the operator’s externally mounted, pneumatically operated, signal device.
3951	Air Horn Switch	The air horn switch conveys the operator’s demand to sound the air horn.
3952	Air Shield Light	The air shield light is the backlight for a lighted sign in the air fairing over the cab
3953	Auxiliary Gauge Package	The auxiliary gauge package incorporates non-standard gauges into a single physical package.
3954	Auxiliary Gauge Package Gauge 1	The first gauge of an auxiliary gauge package, numbered left to right, top to bottom.
3955	Auxiliary Gauge Package Gauge 2	The second gauge of an auxiliary gauge package, numbered left to right, top to bottom.
3956	Auxiliary Gauge Package Gauge 3	The third gauge of an auxiliary gauge package, numbered left to right, top to bottom.
3957	Auxiliary Transmission Constant Supply Actuator	The auxiliary transmission constant supply actuator energizes the supply port of an auxiliary transmission. This may demand a shift to neutral, when no other inputs are pressurized.
3958	Auxiliary Transmission High Range Actuator	The auxiliary transmission high range actuator energizes the high range port of an auxiliary transmission, demanding the high range of the auxiliary transmission.
3959	Auxiliary Transmission Neutral Actuator	The auxiliary transmission neutral actuator energizes the neutral port of an auxiliary transmission demanding a shift to neutral.
3960	Auxiliary Transmission Range Switch	The auxiliary transmission range switch indicates the desired range of an auxiliary transmission.

3961	Body Equipment Hydraulic Power Auxiliary Pump Inhibit Switch	The body equipment hydraulic power auxiliary pump Inhibit signal prevents the operation of an auxiliary pump that supplies hydraulic power when the vehicle's PTO driven pump is not operating.
3962	Bus Amber Signal Light 1	Bus amber signal light 1 illuminates the left front bus amber signal lamp. When mounted on a school bus, bus amber signal lights will comply with SAE J887, except that the lens will be amber.
3963	Bus Amber Signal Light 2	The bus amber signal light 2 illuminates the right front bus amber signal lamp.
3964	Bus Amber Signal Light 3	The bus amber signal light 3 illuminates the left rear bus amber signal lamp
3965	Bus Amber Signal Light 4	The bus amber signal light 4 illuminates the right rear bus amber signal lamp
3966	Bus Crossing Gate	The bus crossing gate extends a rod that encourages passengers to stay within the driver's forward view when crossing in front of a bus.
3967	Bus Passenger Door Close Relay	The bus passenger d/oor close relay energizes the closing actuator of a bus passenger entrance door.
3968	Bus Passenger Door Control Switch 1	The bus door control switch 1 requests that the passenger entrance door be opened or closed.
3969	Bus Passenger Door Control Switch 2	The bus door control switch 2 provides an alternate switch signal for requesting the passenger entrance door to open or close.
3970	Bus Passenger Door Open Relay	The bus passenger door open relay energizes the device that opens the passenger entrance door
3971	Bus Red Signal Light 1	The bus red signal light 1 is the left front bus red signal lamp. When mounted on a school bus, these lamps comply with SAE J887.

3972	Bus Red Signal Light 2	The bus red signal light 2 is the right front school bus red signal lamp.
3973	Bus Red Signal Light 3	The bus red signal light 3 is the left rear school bus red signal lamp.
3974	Bus Red Signal Light 4	The bus red signal light 4 is the right rear school bus red signal lamp.
3975	Bus Stop Arm	The bus stop arm signals oncoming traffic to stop to permit passengers to cross the road.
3976	Cab Dome Light 1	The cab dome light 1 is the forwardmost interior light mounted on the ceiling of the cab behind the driver's shoulders. Typically, the cab dome light 1 will illuminate when the driver's or passenger's door is open. Cabs with four doors may have more than one dome light
3977	Cab Dome Light 2	The cab dome light 2 is the second forwardmost interior light mounted on the ceiling of the cab behind the driver's shoulders. Typically, the cab dome light 2 will illuminate when a rear passenger door is open.
3978	Cab Dome Light 2 Switch	The cab dome light 2 switch controls the operation of the second dome light in the cab or sleeping berth.
3979	Cab Floor Light	The cab floor light illuminates the cab's floor
3980	Cab Floor Light Switch	The cab floor light switch initiates cab floor illumination.
3981	Cab HVAC Mode Control Actuator	The cab HVAC mode control actuator selects which ducts convey conditioned air into the cabin of the vehicle. The actuator directs the air through the ducts [e.g. floor, defrost, dash, or a combination], based on the position of the operator's control.
3982	Cab HVAC Rear Blower Speed Control Switch	The cab HVAC rear blower speed control switch controls the blower speed of the second (rear) or sleeper HVAC system in the cab.

3983	Cab HVAC Rear Temperature Control Switch	The cab HVAC rear temperature control switch controls the temperature of the second (rear) or sleeper HVAC system
3984	Cab HVAC Recirculation Door Control Actuator	The cab HVAC recirculation door control actuator positions the door in the HVAC module that controls the amount of outside air drawn into the HVAC system.
3985	Cab HVAC System Controller	The cab HVAC system controller provides the operator controls and logic for operating the cabin's heating ventilation and cooling (HVAC) system.
3986	CAB HVAC Temperature Control Actuator	The cab HVAC temperature control actuator controls the door in the HVAC system to bypass the heater core, producing a balance between heating and cooling.
3987	Compression Brake Enable Switch Indicator Lamp Command	Command signal directly controlling Compression Brake Enable Switch Indicator Lamp. The compression brake switch indicator signals the status of the compression brake enable switch to the operator. 00b = Lamp OFF 01b = Lamp ON 10b = Reserved 11b = Not available
3988	Door 1 Control Module	The status of the first door control module. Doors are numbered left to right, front to back.
3989	Door 1 Window Motor	The window motor in door 1. Doors are numbered left to right, front to back.
3990	Door 2 Control Module	The status of the second door control module. Doors are numbered left to right, front to back.
3991	Door 2 Window Motor	The window motor in door 2. Doors are numbered left to right, front to back.
3992	Door 3 Control Module	The status of the third door control module. Doors are numbered left to right, front to back.
3993	Door 3 Window Motor	The window motor in door 3. Doors are numbered left to right, front to back.

3994	Door 4 Control Module	The status of the fourth door control module. Doors are numbered left to right, front to back.
3995	Door 4 Window Motor	The window motor in door 4. Doors are numbered left to right, front to back.
3996	Electrical Accessory Power	Electrical accessory power identifies that the ignition key switch is in the accessory state.
3997	Electrical Accessory Power Relay	The electrical accessory power relay energizes the vehicle's accessory bus (or portion thereof)
3998	Electrical Load Shed OFF	The electrical load shed OFF deactivates the system that saves power by selectively disabling the power supplied to individual devices or circuits of the vehicle during low battery charge.
3999	Electrical Load Shed ON	Electrical load shed ON activates the system that saves power by selectively disabling the power supplied to individual devices or circuits of the vehicle during low battery charge
4000	Engine Exhaust Brake Enable Switch	The exhaust brake enable switch permits or inhibits the engine exhaust brake function.
4001	Engine Exhaust Brake Enable Switch Indicator	The engine exhaust brake enable switch indicator signals the status of the engine exhaust brake enable switch
4002	Engine Remote Start	Engine remote start initiates an engine start from an alternate operator's station or sleeping berth.
4003	Engine Remote Stop	Engine remote stop stops the engine from an alternate operator's location or sleeping berth

4004	Exterior Lamp Check Switch	The exterior lamp check switch requests activation or deactivation of the exterior lamp check function.
4005	Fifth Wheel Lock Actuator	The fifth wheel lock actuator operates the fifth wheel lock that secures the king pin in the fifth wheel.
4006	Fifth Wheel Slider Lock Actuator	The fifth wheel slide latch solenoid clock actuator operates the latch that permits the fifth wheel to slide forward or aft of its current location.
4007	Fifth Wheel Slider Lock Switch	Fifth wheel slider lock switch provides operator input to the fifth wheel slider lock actuator.
4008	Fog Light 2	Fog light 2 is second (or right) fog lamp mounted facing forward on the vehicle.
4009	Fuel Filter Fuel Heater Relay	The fuel filter fuel heater relay energizes the heating element in the fuel filter, which typically is self regulating when energized.
4010	Fuel Tank Transfer Pump	Operating state of the fuel tank transfer pump. The fuel tank transfer pump transfers fuel from the secondary fuel tank to the primary fuel tank.00b = Off 01b = On 10b = Error 11b = Not available
4011	Headlamp 1 High Beam	The headlamp 1 high beam provides the high beam function of the left headlamp.
4012	Headlamp 2 High Beam	The headlamp 2 high beam provides the high beam function of the right headlamp.
4013	Headlight Interrupt Switch	The headlight interrupt switch signals that the head lights are to be turned off for a limited interval of time. This switch allows drivers to extinguish DRL or other headlight features, such as when in line at a weigh station.
4014	High Current Auxiliary Load Switch 1	The high current auxiliary load switch 1 requests the operation of the first auxiliary high current load relay to power a high current auxiliary bus.

4015	High Current Auxiliary Load Switch 2	The high current auxiliary load switch 2 requests the operation of the second auxiliary high current load relay to power a high current auxiliary bus.
4016	High Current Auxiliary Power Relay 1	The high current auxiliary relay 1 switches power to the first high current auxiliary bus.
4017	High Current Auxiliary Power Relay 2	The high current auxiliary relay 2 switches power to the second high current auxiliary bus.
4018	Lift Axle Lower Actuator	The lift axle lower actuator unstows a lift axle and lowers it to the roadway.
4019	Lift Axle Lower Switch	The lift axle lower switch requests that a lift axle be unstowed and lowered to the roadway.
4020	Lift Axle Raise Actuator	The lift axle raise actuator raises and stows a lift axle from the roadway.
4021	Lift Axle Raise Switch	The lift axle raise switch requests that a lift axle be raised from the roadway and stowed.
4022	Lift Gate Power Control Enable	The lift gate power control enable permits operation of the lift gate through the lift gate power control switch.
4023	Lift Gate Power Control Switch	The lift gate power control switch requests that power is supplied to an electric lift gate motor attached to the vehicle’s body.
4024	Marker Light Interrupt Switch	The marker light interrupt switch requests that the marker lights be toggled (turned off if on or turned on if off)
4026	Mirror 2 Heater	Mirror 2 heater defrosts the second rear view mirror
4027	Power Inverter Enable Switch	Switch used to enable or disable the vehicle AC bus

4028	Service Brake Circuit 1 Air Tank Drain Valve	The service brake circuit 1 air tank drain valve purges condensed moisture from the primary air tank when opened.
4029	Service Brake Circuit 1 Air Tank Drain Valve Switch	The service brake circuit 1 air tank drain valve switch allows the primary air tank drain valve to cycle and purge condensed moisture from the secondary air tank.
4030	Service Brake Circuit 2 Air Tank Drain Valve	The service brake circuit 2 air tank drain valve switch allows the secondary air tank drain valve to cycle and purge condensed moisture from the secondary air tank.
4031	Service Brake Supply Air Tank Drain Valve	The service brake supply air tank drain valve actuator opens the valve that purges the supply air tank of collected condensation.
4032	Service Brake Supply Air Tank Drain Valve Switch	The service brake supply air tank drain valve switch operates the supply air tank drain valve to purge the air tank of collected condensation.
4033	Engine Remote Start/Stop Enable	Engine remote start/stop enable activates the engine's remote start/stop function from alternate equipment operating stations or sleeping berth of the vehicle.
4034	Snow Plow High Beam Light 1	The snow plow high beam light 1 activates or de-activates the left headlamp high beam light mounted above a snow plow
4035	Snow Plow High Beam Light 2	The snow plow high beam light 2 activates or de-activates the right headlamp high beam light mounted above a snow plow
4036	Snow Plow Low Beam Light 1	The snow plow low beam light 1 provides the left headlamp mounted above a snow plow blade.
4037	Snow Plow Low Beam Light 2	The snow plow low beam light 2 provides the right headlamp mounted above a snow plow blade.
4038	Snow Plow Forward Lighting Relay 2	The snow plow forward lighting relay 2 switches the forward lights from the normal headlamps to the lamps mounted above the snow plow blade. The snow plow forward

		lighting relay 2 controls the right headlamp if lighting control is divided left from right.
4039	Snow Plow Forward Lighting Relay 1	The snow plow forward lighting relay 1 switches the forward lights from the normal headlamps to the lamps mounted above the snow plow blade. The snow plow forward lighting relay 1 controls the left headlamp if lighting control is divided left from right.
4040	Snow Plow Lighting Mode Switch	The snow plow lighting mode switch directs that the forward illumination switch to snow plow mode from normal mode. This switch turns on lamps that are mounted above a snow plow blade to provide forward illumination that would otherwise be blocked by a snow plow blade mounted on a front frame extension.
4041	Software Loop Time Exceeded	Software loop time exceeded is reported should a device detect that the maximum loop execution time has been exceeded.
4042	Trailer Auxiliary Power Switch	The trailer auxiliary power switch controls the supply of power to the trailer's auxiliary power circuit.
4043	Transfer Case Front Driveline Actuator	The transfer case front driveline actuator engages the driveline output of a transfer case to provide power to the vehicle's front axle.
4044	Transfer Case High Range Actuator	The transfer case high range actuator engages the high range of the transfer case.
4045	Transfer Case Low Range Actuator	The transfer case low range actuator engages the low range of the transfer case.
4046	Transfer Case Neutral Actuator	The transfer case neutral actuator commands the transfer case to neutral.
4047	Transfer Case Output Shaft PTO Actuator	Actuator that engages the output shaft PTO drive of the transfer case.
4048	Transfer Case Range Switch	The transfer case range switch signals the operator's desire to operate in high range, low range or neutral (if available).

4049	Transfer Case Rear Driveline Actuator	Commands the driveline output of a transfer case to be engaged to provide power to the vehicle’s rear axle(s).
4050	Transmission Secondary Mode Switch	The transmission secondary mode switch signals the transmission to operate in a secondary mode (e.g, the most fuel efficient manner possible)
4051	Transmission Input Shaft PTO 1 Actuator	Actuator which engages the PTO of the first transmission input shaft PTO drive mounted on the transmission.
4052	Transmission Input Shaft PTO 1 Retention Actuator	Actuator which locks the PTO of the first transmission input shaft PTO drive retention device in place.
4053	Transmission Input Shaft PTO 2 Actuator	Actuator which engages the PTO of the second transmission input shaft PTO drive mounted on the transmission.
4054	Transmission Input Shaft PTO 2 Retention Actuator	Actuator which locks the PTO of the second transmission input shaft PTO drive retention device in place.
4055	Transmission Retarder Enable Switch	The transmission retarder enable switch indicates whether the operator allows the transmission to engage its integral retarder when indicated by vehicle operating conditions.
4056	Two Speed Axle Actuator	Identifies the status of the actuator for the two-speed axle
4057	Wiper Motor	Motor which operates the windshield wiper system
4058	Cab Dome Light 1 Switch	The cab dome light 1 switch controls the operation of the dome lights in the vehicle.
4059	Sole or Forward-most Steer Axle Group Weight Available	Indicates the availability of the sole or forward-most steer axle group for purposes of weight measurement 00b = Steer axle group not present 01b = Steer axle group present 10b = Reserved 11b = Not available / not applicable If there is only one steer axle, this SPN should be used. See also SPN 5933 for a second steer axle.

4060	Lift Axle Group Weight Available	Indicates the availability of the lift axle group for purposes of weight measurement 00b = Lift axle group not present 01b = Lift axle group present 10b = Reserved 11b = Not available / not applicable
4061	Sole or Forward-most Drive Axle Group Weight Available	Indicates the availability of the sole or forward-most drive axle group for purposes of weight measurement 00b = Drive axle group not present 01b = Drive axle group present 10b = Reserved 11b = Not available / not applicable If there is only one drive axle, this SPN should be used. See also SPN 5934 for a second drive axle.
4062	Tag Axle Group Weight Available	Indicates the availability of the tag axle group for purposes of weight measurement 00b = Tag axle group not present 01b = Tag axle group present 10b = Reserved 11b = Not available / not applicable
4063	Additional Tractor Axle Group Weight Available	Indicates the availability of the additional tractor axle group for purposes of weight measurement 00b = Additional tractor axle group not present 01b = Additional tractor axle group present 10b = Reserved 11b = Not available / not applicable
4064	Trailer A Axle Group Weight Available	Indicates the availability of the trailer A axle group for purposes of weight measurement 00b = Trailer A axle group not present 01b = Trailer A axle group present 10b = Reserved 11b = Not available / not applicable
4065	Trailer B Axle Group Weight Available	Indicates the availability of the trailer B axle group for purposes of weight measurement 00b = Trailer B axle group not present 01b = Trailer B axle group present 10b = Reserved 11b = Not available / not applicable
4066	Trailer C Axle Group Weight Available	Indicates the availability of the trailer C axle group for purposes of weight measurement 00b = Trailer C axle group not present 01b = Trailer C axle group present 10b = Reserved 11b = Not available / not applicable
4067	Trailer D Axle Group Weight Available	Indicates the availability of the trailer D axle group for purposes of weight measurement 00b = Trailer D axle group not present 01b = Trailer D axle group present 10b = Reserved 11b = Not available / not applicable

4068	Trailer E Axle Group Weight Available	Indicates the availability of the trailer E axle group for purposes of weight measurement 00b = Trailer E axle group not present 01b = Trailer E axle group present 10b = Reserved 11b = Not available / not applicable
4069	Trailer F Axle Group Weight Available	Indicates the availability of the trailer F axle group for purposes of weight measurement 00b = Trailer F axle group not present 01b = Trailer F axle group present 10b = Reserved 11b = Not available / not applicable
4070	Trailer G Axle Group Weight Available	Indicates the availability of the trailer G axle group for purposes of weight measurement 00b = Trailer G axle group not present 01b = Trailer G axle group present 10b = Reserved 11b = Not available / not applicable
4071	Trailer H Axle Group Weight Available	Indicates the availability of the trailer H axle group for purposes of weight measurement 00b = Trailer H axle group not present 01b = Trailer H axle group present 10b = Reserved 11b = Not available / not applicable
4072	Additional Trailer Axle Group Weight Available	Indicates the availability of the additional trailer axle group for purposes of weight measurement 00b = Additional trailer axle group not present 01b = Additional trailer axle group present 10b = Reserved 11b = Not available / not applicable
4073	Axle Group Location	Specific axle group used in conjunction with and when communicating the axle group weight, listed from the front of the vehicle to the rear.If the value of SPN 5935 is 1111b, then this SPN is used to indicate the axle group referred to by this PGN. Otherwise, this SPN should be broadcast as 1111b. 0000b = Reserved 0001b = Sole or Forward-most Steer axle group 0010b = Lift axle group 0011b = Sole or Forward-most Drive axle group 0100b = Tag axle group 0101b = Additional tractor axle group 0110b = Trailer A axle group 0111b = Trailer B axle group 1000b = Trailer C axle group 1001b = Trailer D axle group 1010b = Trailer E axle group 1011b = Trailer F axle group 1100b = Trailer G axle group 1101b = Trailer H axle group 1110b = Additional trailer axle group 1111b = Reserved
4074	Axle Group Location	Specific axle group used in conjunction with and when communicating the axle group calibration, listed from the front of the vehicle to the rear.If the value of SPN 5936 is

		1111b, then this SPN is used to indicate the axle group referred to by this PGN. Otherwise, this SPN should be broadcast as 1111b. 0000b = Reserved 0001b = Sole or Forward-most Steer axle group 0010b = Lift axle group 0011b = Sole or Forward-most Drive axle group 0100b = Tag axle group 0101b = Additional tractor axle group 0110b = Trailer A axle group 0111b = Trailer B axle group 1000b = Trailer C axle group 1001b = Trailer D axle group 1010b = Trailer E axle group 1011b = Trailer F axle group 1100b = Trailer G axle group 1101b = Trailer H axle group 1110b = Additional trailer axle group 1111b = Reserved
4075	Zero Net Vehicle Weight Change	Zero Net Vehicle Weight Change command. A controller receiving this command will record the current Gross Combination Weight as the new Zero, and future requests for Net Vehicle Weight Change will be answered with the difference between the (then) current Gross Combination Weight and the recorded value.00b = No change to Net Vehicle Weight Change 01b = Zero Net Vehicle Weight Change 10b = Reserved 11b = Not available / Not applicable
4076	Engine Coolant Temperature 2	Second temperature of liquid found in the engine cooling system. See also SPNs 110, 4193 and 6209.
4077	Aftertreatment 1 Fuel Pressure 2	Second fuel pressure measurement for the aftertreatment 1 system
4078	Generator Alternator Efficiency	Measured, calculated, and/or estimated operating efficiency of the generator alternator. Percentage reflects ratio of power output divided by power input, multiplied by 100.
4079	Generator Governing Speed Command	Command from user and/or generator control system for the genset (engine) to govern to low idle or rated base speed setpoints. If this method of engine control is used, then the PGN 0 (TSC1) is not expected to be received by the engine controller and it will not be processed.00b = Rated Speed 01b = Low Idle Speed 10b = Reserved 11b = Don’t care / take no action
4080	Generator Frequency Selection	Command from user and/or generator control system for the genset (engine) to target operations for 50 Hz, 60 Hz, or 400 Hz.0000b = 50 Hz 0001b = 60 Hz 0010b = 400

		Hz 0011b to 1101b = SAE Reserved 1110b = Unknown 1111b = Don’t care /take no action
4081	Engine Oil Recovery Pump	The engine oil recovery pump pumps filtered crankcase vapor condensate (oil) back into the engine oil resevoir.
4082	Fuel Pump Primer Control	Parameter used to activate or deactivate a priming system on the fuel transfer system. The fuel priming system is a system that purges air in the fuel lines and may assist fuel delivery to a second pump at lower speeds.00b = Deactivate 01b = Activate 10b = Reserved 11b = Unavailable
4083	Fuel Pump Primer Status	Parameter used to transmit the actual status of the fuel priming system. The fuel priming system is a system that purges air in the fuel lines and may assist fuel delivery to a second pump at lower speeds.00b = Off 01b = On 10b = Error 11b = Unavailable
4084	General Purpose Valve Spool	The internal hydraulic spool associated with a general purpose valve. Flow from a general purpose valve is determined by the movement of an internal spool.
4085	General Purpose Valve	A hydraulic valve, such as used on an implement control system, that offers flows of extend, retract, neutral, and float.
4086	Valve Load Sense Pressure	The maximum of the currently measured pressures of a valve’s work port A and work port B.
4087	Valve Pilot Pressure	Pressure of a valve’s pilot supply port.
4088	Valve Assembly Load sense Pressure	The maximum pressure of a valve assembly’s current collective load sense pressures where a valve assembly can consist of two or more valves.
4089	Valve Assembly Supply Pressure	Pressure of the hydraulic supply port to a valve assembly.

4090	NOx limits exceeded, root cause unknown	Indicates that On-Board Diagnostics has determined that the limits for NOx in the exhaust stream have been exceeded, but the root cause cannot be determined by the OBD system.
4091	NOx limits exceeded due to Deactivation of EGR	Indicates that On-Board Diagnostics has determined that the limits for NOx in the exhaust stream have been exceeded due to deactivation of EGR.
4092	NOx limits exceeded due to Incorrect EGR flow	Indicates that On-Board Diagnostics has determined that the limits for NOx in the exhaust stream have been exceeded due to incorrect EGR flow.
4093	NOx limits exceeded due to Low Diesel Exhaust Fluid Consumption	Indicates that On-Board Diagnostics has determined that the limits for NOx in the exhaust stream have been exceeded due to low diesel exhaust fluid consumption.
4094	NOx limits exceeded due to Insufficient Diesel Exhaust Fluid Quality	Indicates that On-Board Diagnostics has determined that the limits for NOx in the exhaust stream have been exceeded due to an insufficient diesel exhaust fluid quality.
4095	NOx limits exceeded due to Interrupted Diesel Exhaust Fluid Dosing	Indicates that On-Board Diagnostics has determined that the limits for NOx in the exhaust stream have been exceeded due to an interruption in diesel exhaust fluid dosing activity.
4096	NOx limits exceeded due to Empty Diesel Exhaust Fluid Tank	Indicates that On-Board Diagnostics has determined that the limits for NOx in the exhaust stream have been exceeded due to the diesel exhaust fluid tank being empty.
4097	Aftertreatment 1 Fuel Drain Actuator	Indicates whether aftertreatment 1 fuel drain actuator is on or off 00b = not active 01b = active 10b = reserved for SAE assignment 11b = not available
4098	Aftertreatment 2 Fuel Drain Actuator	Indicates whether aftertreatment 2 fuel drain actuator is on or off 00b = not active 01b = active 10b = reserved for SAE assignment 11b = not available
4099	XBR urgency	The idea of the urgency value is to adjust the endurance brake integration behavior in the EBS system according to the traffic situation.On low urgency values (0%, e.g. downhill cruise control or preceding vehicle far ahead) the brake system shall

		primarily use endurance brakes to reduce lining wear. On high urgency values (100%, e.g. vehicle close up or a vehicle cuts into the traffic line just before host vehicle) the brake system is expected to gain the demanded deceleration (acceleration) as fast as possible. Values: 0% – Situation not critical; low retarder dynamics are tolerated. Activation of the foundation brakes after a time if retarder performance is insufficient y % – Faster activation of foundation brakes to compensate retarder performance, linear interpolation between 0 and 100% 100% – Low retarder dynamics shall be fully compensated by the foundation brakes Notes: – This parameter has only an effect if XBR EBI switch is set to « 10b: endurance brake integration allowed » – XBR urgency makes sense only if the XBR request(s) is (are) processed in one device like the EBS controller which also sends TSC1 to the retarder(s). Such a data flow diagram is shown in figure PGN1024_A. When the Retarder is controlled directly by the XBR transmitter XBR urgency should be set to not available. In adaptive cruise control (ACC) operation there are situations where it is useful to have as less lining wear as possible like keeping the set speed on going downhill. It would not be useful to activate foundation brakes in such a situation except when the capabilities of the endurance brakes are not sufficient. In other situations like emergency braking or fast reaction on a car that cut in at a short distance in front of the own vehicle a reaction as fast as possible is needed. In such cases low retarder dynamics must be compensated by the foundation brakes. There are two different ways to integrate the endurance brakes into the adaptive cruise control. a) the request for deceleration could be processed by the EBS system completely. This means that the EBS receives the deceleration demand and activates the friction and/or the endurance brakes accordingly. EBS is sending the TSC1 to the retarder. (see figure PGN1024_A dataflow diagram for external brake request) b) the ACC sends XBR to the brake controller and TSC1 to the endurance brakes. In case « a) » the ACC system does not have direct control of the endurance brakes. To adjust the endurance brakes according to the traffic situation (high or low urgency values see above) this new SPN is needed. If the retarder performance is not sufficient (e.g. because of high retarder temperature) the foundation brakes will be added automatically. This case of not sufficient retarder performance cannot be covered by switching EBI mode from 01b (endurance brakes only) to EBI mode 10b (endurance brake integration allowed) because the actual deceleration caused by the retarder is less than the requested

		decelleration. A simple switching (01b to 10b) would cause an uncomfortable jerk. NOTE: This parameter is defined in European patent EP 1 386 774 B1 (see reference in section 2.1.3) and is included with permission from the patent holder. The patent holder is prepared to grant a free license to an unrestricted number of applicants on a worldwide, non-discriminatory basis to comply with this recommended practice.
4100	Supported in Expanded Freeze Frame (e.g., DM25)	See document J1939-73 for SPN details.
4101	Supported in Data Stream	See document J1939-73 for SPN details.
4102	Supported in Scaled Test Results (e.g., DM30)	See document J1939-73 for SPN details.
4103	SPN Data Length	See document J1939-73 for SPN details.
4104	Emission-Related Pending DTC Count	See document J1939-73 for SPN details.
4105	All Pending DTC Count	See document J1939-73 for SPN details.
4106	Emission-Related MIL-On DTC Count	See document J1939-73 for SPN details.
4107	Emission-Related Previously MIL-On Diagnostic Trouble Codes Count	See document J1939-73 for SPN details.
4108	Emission-Related Permanent DTC Count	See document J1939-73 for SPN details.
4109	SLOT Identifier	See document J1939-73 for SPN details.

4110	Test Value	See document J1939-73 for SPN details.
4111	Test Limit Maximum	See document J1939-73 for SPN details.
4112	Test Limit Minimum	See document J1939-73 for SPN details.
4113	DTCx Malfunction Indicator Lamp Support & Status	See document J1939-73 for SPN details.
4114	DTCx Red Stop Lamp Support & Status	See document J1939-73 for SPN details.
4115	DTCx Amber Warning Lamp Support & Status	See document J1939-73 for SPN details.
4116	DTCx Protect Lamp Support & Status	See document J1939-73 for SPN details.
4117	DTCx Flash Malfunction Indicator Lamp Support & Status	See document J1939-73 for SPN details.
4118	DTCx Flash Red Stop Lamp Support & Status	See document J1939-73 for SPN details.
4119	DTCx Flash Amber Warning Lamp Support & Status	See document J1939-73 for SPN details.
4120	DTCx Flash Protect Lamp Support & Status	See document J1939-73 for SPN details.
4121	DTCx Total Active Time	See document J1939-73 for SPN details.

4122	DTCx Total Previously Active Time	See document J1939-73 for SPN details.
4123	DTCx Time Until Derate	See document J1939-73 for SPN details.
4124	EI-AECD Number	See document J1939-73 for SPN details.
4125	EI-AECD Engine Hours Timer 1	See document J1939-73 for SPN details.
4126	EI-AECD Engine Hours Timer 2	See document J1939-73 for SPN details.
4127	NOx NTE Control Area Status	See document J1939-73 for SPN details.
4128	Manufacturer-specific NOx NTE Limited Testing Region Status	See document J1939-73 for SPN details.
4129	NOx NTE Deficiency Area Status	See document J1939-73 for SPN details.
4130	PM NTE Control Area Status	See document J1939-73 for SPN details.
4131	Manufacturer-specific PM NTE Limited Testing Region Status	See document J1939-73 for SPN details.
4132	PM NTE Deficiency Area Status	See document J1939-73 for SPN details.
4133	Vehicle Non-Roadworthy Component Count	See document J1939-73 for SPN details.
4134	Vehicle Continuous Malfunction Indicator	See document J1939-73 for SPN details.
4135	Vehicle Malfunction Indicator Display Strategy	See document J1939-73 for SPN details.

4136	Vehicle Malfunction Indicator Activation Mode	See document J1939-73 for SPN details.
4137	Vehicle Incomplete Monitor Count	See document J1939-73 for SPN details.
4138	Vehicle Current Malfunction Indicator Accumulated Time	See document J1939-73 for SPN details.
4139	System Non-Roadworthy Component Count	See document J1939-73 for SPN details.
4140	System Continuous Malfunction Indicator	See document J1939-73 for SPN details.
4141	System Malfunction Indicator Display Strategy	See document J1939-73 for SPN details.
4142	System Malfunction Indicator Activation Mode	See document J1939-73 for SPN details.
4143	System Incomplete Monitor Count	See document J1939-73 for SPN details.
4144	Global Technical Regulation Description	See document J1939-73 for SPN details.
4145	System Cumulative Continuous MI Time	See document J1939-73 for SPN details.
4146	System Greatest B1 Counter	See document J1939-73 for SPN details.
4147	Failure Specific B1 Counter	See document J1939-73 for SPN details.

4148	SPN Identifying Component / System	See document J1939-73 for SPN details.
4149	FMI Identifying Component / System Specific Test	See document J1939-73 for SPN details.
4151	Engine Exhaust Temperature Average	The calculated average temperature based upon all of the engine exhaust port temperatures. This is the average temperature based upon the exhaust port temperature measurements at each of the engine cylinders.Notes: Use SPN 173 – Engine Exhaust Temperature to report the actual measured temperature of the exhaust for the entire engine, after the turbocharger. See SPN 2433 – Engine Exhaust Manifold Bank 2 Temperature 1, and SPN 2434 – Engine Exhaust Manifold Bank 1 Temperature 1 to report the actual measured temperature of the manifold for engines requiring more than one exhaust temperature measurement.
4152	Engine Exhaust Bank 2 Temperature Average	The calculated average temperature based upon all of the Bank 2 (right bank) engine exhaust port temperatures. This is the average temperature based upon the exhaust port temperature measurements of each of the engine cylinders on the right bank before the turbocharger.Use SPN 2433 Engine Exhaust Manifold Bank 2 Temperature 1 to report the actual measured temperature of the manifold on the right side as seen from the flywheel end of the engine.
4153	Engine Exhaust Bank 1 Temperature Average	The calculated average temperature based upon all of the Bank 1 (left bank) engine exhaust port temperatures. This is the average temperature based upon the exhaust port temperature measurements of each of the engine cylinders on the left bank prior to the turbocharger.Use SPN 2434 Engine Exhaust Manifold Bank 1 Temperature 1 to report the actual measured temperature of the manifold on the left side as seen from the flywheel end of the engine.
4154	Actual Engine – Percent Torque (Fractional)	This parameter displays an additional torque in percent of the reference engine torque. When the MSB is set to 1, this parameter is not available. When the MSB is set to 0, bits 1 to 3 indicate the desired torque with resolution of 0.125%/bit . Range is from 0 to 0.875% of reference torque. The parameter is used in combination with

		SPN 513 Actual Engine Torque. The resulting actual engine torque will be calculated by adding these two parameters. Additional torque representations 0000b = +0.000% 0001b = +0.125% . . . 0111b = +0.875% 1000b to 1111b = not available For example, if SPN 513 = 150 (or 25%) and this parameter is 0100b, the torque would be 25.5%. If SPN 513 = 175 (or 50%) and this parameter is 0001b, the torque would be 50.125% If SPN 513 = 175 (or 50%) and this parameter is 1111b, the torque would remain 50% (no high resolution available)
4155	Auxiliary I/O Channel #6	Identifies the current value of auxiliary input/output channels that are configured uniquely per application.
4156	Auxiliary I/O Channel #5	Identifies the current value of auxiliary input/output channels that are configured uniquely per application.
4157	Auxiliary I/O Channel #4	Identifies the current value of auxiliary input/output channels that are configured uniquely per application.
4158	Auxiliary I/O Channel #3	Identifies the current value of auxiliary input/output channels that are configured uniquely per application.
4159	Auxiliary I/O Channel #10	Identifies the current value of auxiliary input/output channels that are configured uniquely per application.
4160	Auxiliary I/O Channel #9	Identifies the current value of auxiliary input/output channels that are configured uniquely per application.
4161	Auxiliary I/O Channel #8	Identifies the current value of auxiliary input/output channels that are configured uniquely per application.
4162	Auxiliary I/O Channel #7	Identifies the current value of auxiliary input/output channels that are configured uniquely per application.

4163	Auxiliary I/O Channel #14	Identifies the current value of auxiliary input/output channels that are configured uniquely per application.
4164	Auxiliary I/O Channel #13	Identifies the current value of auxiliary input/output channels that are configured uniquely per application.
4165	Auxiliary I/O Channel #12	Identifies the current value of auxiliary input/output channels that are configured uniquely per application.
4166	Auxiliary I/O Channel #11	Identifies the current value of auxiliary input/output channels that are configured uniquely per application.
4167	Auxiliary I/O Channel #18	Identifies the current value of auxiliary input/output channels that are configured uniquely per application.
4168	Auxiliary I/O Channel #17	Identifies the current value of auxiliary input/output channels that are configured uniquely per application.
4169	Auxiliary I/O Channel #16	Identifies the current value of auxiliary input/output channels that are configured uniquely per application.
4170	Auxiliary I/O Channel #15	Identifies the current value of auxiliary input/output channels that are configured uniquely per application.
4171	Auxiliary I/O Channel #22	Identifies the current value of auxiliary input/output channels that are configured uniquely per application.
4172	Auxiliary I/O Channel #21	Identifies the current value of auxiliary input/output channels that are configured uniquely per application.
4173	Auxiliary I/O Channel #20	Identifies the current value of auxiliary input/output channels that are configured uniquely per application.

4174	Auxiliary I/O Channel #19	Identifies the current value of auxiliary input/output channels that are configured uniquely per application.
4175	Diesel Particulate Filter Active Regeneration Forced Status	Indicates the forced execution status of diesel particulate filter regeneration. 000b = Not Active 001b = Active – Forced by Switch (See SPN 3696) 010b = Active – Forced by Service Tool 011b = Reserved for SAE Assignment 100b = Reserved for SAE Assignment 101b = Reserved for SAE Assignment 110b = Reserved for SAE Assignment 111b = not available This SPN indicates the forced execution status of diesel particulate filter regeneration. The SPN would be « Not Active » when the execution of diesel particulate filter regeneration has not been forced. Either of the states « Active – Forced by Switch » and « Active – Forced by Service Tool » will be active when execution of diesel particulate filter regeneration is forced, providing feedback as to which entity forced the execution of diesel particulate filter regeneration.
4176	Transmission Current Range Display Blank State	State signal indicating a transmission request for the display of the Transmission Current Range parameter (SPN 163) to be blanked or not blanked. The 'Transmission Current Range Display Blank State' indicator can be utilized by (but not limited to) the shift console, instrument cluster, or cab display. Definition of the cause of this state is at the discretion of the transmission manufacturer.00b = Not Blanked 01b = Blanked 10b = Error 11b = Not Supported Note: This is a companion of SPN 1850, that will allow the « current range » display to be blanked as needed while still retaining a valid current range broadcast in SPN 163.
4177	Transmission Oil Life Remaining	Signal which indicates the actual oil life remaining in percent. 100% means the transmission oil is brand new, and 0% means the transmission oil is at the end of its life.
4178	Transmission Service Indicator	Signal from transmission indicating that some aspect of the gearbox requires servicing, such as the oil, filter, clutch(es) or other component.00b = Transmission Service Indicator is off 01b = Transmission Service Indicator is on continuously 10b = Transmission Service Indicator is flashing 11b = Not available

4180	Data Dictionary Manufacturer Code	The J1939 Manufacturer Code (see J1939 Table B10) associated with the manufacturer who defined the proprietary communications method. 7FFh reserved for « Not Available
4181	Data Dictionary Method	A manufacturer defined code to define the proprietary communications method. The structure and interpretation of the code is manufacturer specific. This allows manufacturers to establish their own methods for reporting proprietary support for PropA, PropA2, and PropB messages.
4182	Generator Output Frequency Adjustment Circuit	The Generator Output Frequency Adjustment Circuit is a potentiometric circuit used to regulate the generator frequency. The potentiometer is located on the generator control panel. The diagnostic SPN will be used for out of range faults.
4183	Generator Droop Adjustment Circuit	The Generator Droop Adjustment Circuit is a potentiometric circuit used to regulate the generator droop. The potentiometer is located on the generator control panel. The diagnostic SPN will be used for out of range faults.
4184	Generator Gain Adjustment Circuit	The Generator Gain Adjustment Circuit is a potentiometric circuit used to regulate the generator gain. The potentiometer is located on the generator control panel. The diagnostic SPN will be used for out of range faults.
4185	Overspeed Shutdown Relay Driver	The Overspeed Shutdown relay driver drives the overspeed shutdown lamp to indicate the engine has reached overspeed. This SPN is to indicate faults with the overspeed shutdown relay driver circuit.
4186	Low Oil Pressure Shutdown Relay Driver	The Low Oil Pressure Shutdown relay driver indicates the engine has reached a low oil pressure condition. This SPN is to indicate faults with the Low Oil Pressure Shutdown relay driver circuit.
4187	High Engine Temperature Shutdown Relay Driver	The High Engine Temperature Shutdown relay driver indicates the engine has reached a high temperature condition. This SPN is to indicate faults with the High Engine Temperature shutdown relay driver circuit.

4188	Pre-Low Oil Pressure Indicator Relay Driver	The Pre-Low Oil Pressure indicator relay driver indicates that the engine has reached a moderately severe low oil pressure condition. This SPN is to indicate faults with the Pre-Low Oil Pressure indicator relay driver circuit.
4189	Pre-High Oil Pressure Indicator Relay Driver	The Pre-High Oil Pressure indicator relay driver indicates that the engine has reached a moderately severe high oil pressure condition. This SPN is to indicate faults with the Pre-High Oil Pressure indicator relay driver circuit.
4191	Engine Requested Torque (Fractional)	This parameter displays an additional torque in percent of the reference engine torque. When the MSB is set to 1, this parameter is not available. When the MSB is set to 0, bits 1 to 3 indicate the desired torque with resolution of 0.125%/bit . Range is from 0 to 0.875% of reference torque. The parameter is used in combination with SPN 518 Engine Requested Torque/Torque Limit. The resulting torque/torque limit will be calculated by adding these two parameters. Validity of Engine Requested Torque High Res has no effect on SPN 518. Additional torque representations 0000b = +0.000% 0001b = +0.125% . . . 0111b = +0.875% 1000b to 1111b = not available For example, if SPN 518 = 150 (or 25%) and this parameter is 0100b, the torque would be 25.5%. If SPN 518 = 175 (or 50%) and this parameter is 0001b, the torque would be 50.125% If SPN 518 = 175 (or 50%) and this parameter is 1111b, the torque would remain 50% (no high resolution available)
4192	Engine Fuel Filter Water Level sensor	Device which senses the water level in a fuel filter that has a water separator
4193	Engine Coolant Pump Outlet Temperature	The actual value of engine coolant temperature at the coolant pump outlet. See also SPNs 110, 4076 and 6209 for additional coolant temperature parameters.
4194	Engine Coolant Thermostat Opening	The current position of the Thermostat used to regulate the temperature of the engine coolant. 0% represents the thermostat allows flow to completely bypass the radiator and 100% represents the flow is fully through the radiator.

4195	Engine Coolant Thermostat Mode	Specifies if the engine coolant thermostat valve will operate in temperature control mode or position control mode.00b = temperature control mode 01b = position control mode (used for service only) 10b = reserved 11b = don't care/reserved
4196	Desired Engine Coolant Pump Outlet Temperature	Desired engine coolant temperature of the engine to an electronic thermostat. If the electronic thermostat valve is operating in position control mode (see SPN 4195) then transmit FFh.
4197	Desired Engine Coolant Thermostat Opening	Indicates the desired position of the engine coolant control valve. 0% represents the thermostat allows flow to completely bypass the radiator and 100% represents the flow is fully through the radiator. If the electronic thermostat is operating in temperature control mode (SPN 4195) then transmit FFh.
4198	Aftercooler Coolant Thermostat Mode	Specifies if the aftercooler coolant thermostat valve will operate in temperature control mode or position control mode.00b = temperature control mode 01b = position control mode (used for service only) 10b = reserved 11b = don't care/reserved
4199	Desired Aftercooler Coolant Intake Temperature	Indicates the desired temperature of the fluid in the low temperature aftercooler circuit to an electronic thermostat. If the aftercooler coolant thermostat valve is operating in position control mode (see SPN 4198) then this value should be FFh.
4200	Desired Aftercooler Coolant Thermostat Opening	Used to transmit the desired position of the low temperature aftercooler temperature control valve. 0% represents the thermostat allows flow to completely bypass the aftercooler and 100% represents the flow is fully through the aftercooler. If the aftercooler coolant thermostat is operating in temperature control mode (see SPN 4198) then this value should be FFh.
4201	Engine Speed 1	The engine speed as measured by speed sensor 1. Note: This is for the engine speed from the 1st engine speed sensor. This may be different than SPN 190 when used in multiple engine speed sensor configurations. In an application with only one speed sensor, SPN 190 will represent both the speed and the sensor for diagnostic purposes

		and SPN 4201 will not be used. However, in an application with multiple engine speed sensors, SPN 190 data can be derived from any of the speed sensors.
4202	Engine Speed 3	The engine speed as measured by speed sensor 3. Note: This is for the engine speed from the 3rd engine speed sensor. This may be different than SPN 190 when used in multiple engine speed sensor configurations. In an application with multiple engine speed sensors, SPN 190 data can be derived from any of the speed sensors.
4203	Engine Speed Sensor 1 Timing Pattern Status	This is the timing pattern status of the engine speed sensor signal for sensor 1. The sensor may be sending a speed signal but the pattern may not be valid. Since the speed is considered valid, the error indicator will not be used in the engine speed parameter (SPN 4201). The sensor does give a speed but the pattern is not matched. In this condition, the position of the crank has not been determined so injection is not enabled. The engine speed signal provides both engine speed and crankshaft location information to the engine control. A « Not OK » status may be caused by extra or missing teeth, gear runout, etc.00b = Not OK 01b = OK 10b = Error 11b = Not available Note: This is intended to be used on a service tool for troubleshooting a no start condition.
4204	Engine Speed Sensor 2 Timing Pattern Status	This is the timing pattern status of the engine speed sensor signal for sensor 2. The sensor may be sending a speed signal but the pattern may not be valid. Since the speed is considered valid, the error indicator will not be used in the engine speed parameter (SPN 723).00b = Not OK 01b = OK 10b = Error 11b = Not available Note: This is intended to be used on a service tool for troubleshooting a no start condition. The sensor does give a speed but the pattern is not matched. In this condition, the position of the crank has not been determined so injection is not enabled. The engine speed signal provides both engine speed and crankshaft location information to the engine control. A « Not OK » status may be caused by extra or missing teeth, gear runout, etc.
4205	Engine Speed Sensor 3 Timing Pattern Status	This is the timing pattern status of the engine speed sensor signal for sensor 3. The sensor may be sending a speed signal but the pattern may not be valid. Since the speed is considered valid, the error indicator will not be used in the engine speed

		parameter (SPN 4202). 00b = Not OK 01b = OK 10b = Error 11b = Not availableNote: This is intended to be used on a service tool for troubleshooting a no start condition. The sensor does give a speed but the pattern is not matched. In this condition, the position of the crank has not been determined so injection is not enabled. The engine speed signal provides both engine speed and crankshaft location information to the engine control. A « Not OK » status may be caused by extra or missing teeth, gear runout, etc.
4206	Message Counter	The message counter is used to detect situations where the transmitting ECU malfunction repeats the same frame all the time. The receiver of the information may use the counter parameter to detect this situation. The transmitting device will increase the message counter in every cycle. The message counter will count from 0 to 7 and then wrap.The values 8h thru Eh are SAE reserved and should be ignored by the receiver. Value Fh (all bits set to 1) will indicate that the message counter is not available. For compatibility purposes, TSC1 should also be honored if the message counter is not available from the transmitting device.
4207	Message Checksum	The message checksum is used to verify the signal path from the transmitting device to the receiving device. The message checksum is calculated using the first 7 data bytes, the message counter and the bytes of the message identifier. It is calculated as follows: Checksum = (Byte1 + Byte2 + Byte3 + Byte4 + Byte5 + Byte6 + Byte7 + (message counter & 0Fh) + message ID low byte + message ID mid low byte + message ID mid high byte + message ID high byte) Message Checksum = (((Checksum >> 6) & 03h) + (Checksum >>3) + Checksum) & 07h Value Fh (all bits set to 1) will indicate that the checksum is not available. For compatibility purposes, TSC1 should also be honored if the checksum is not available from the transmitting device.
4209	Engine Crank Without Prelube	Used to annunciate when the engine prelube has been disabled during a cranking event. This feature has user disable capabilities as well as a delay crank timer that can cause the engine to be cranked without the prelube being activated.

4210	Engine Prelube Drive	Prelube is provided with the use of the electronic prelube actuator that the ECU controls from an output driver.
4211	Hydraulic Fan Motor Pressure	The hydraulic pressure used to drive the fan system, sensed before the hydraulic fan motor.
4212	Fan Drive Bypass Command Status	Status of the Fan Drive Bypass Command as being commanded by the ECU. The fan drive bypass diverts pump pressure away from the hydraulic motor to maintain the fan drive pressure. 0% is defined as no bypass (i.e. diverting no fan drive pressure) and 100% is defined as full bypass (i.e. diverting the maximum fan drive pressure) from the fan motor.
4213	Engine Crank Without Fuel Injection	Indication of engine cranking without fuel injection.
4214	Engine Fan Reverse Actuator	Actuator for driving the engine fan in the reverse direction.
4215	Ground-Level Shutdown Activated	Status of equipment shutdown as a result of activation of a ground-level shutdown control, such as a switch.
4216	Transmission 1 Reverse Solenoid Valve	Engages transmission reverse output shaft direction
4217	Transmission 1 Shift Solenoid Valve	Provides proportional control of transmission synchronizer engagement. See also SPN 6795. Note: The modulation solenoid/valve unit provides a means for modulating hydraulic pressure applied in moving shift rails. This allows fine control of synchronization to be achieved.
4218	Transmission Shift Rail 1 Position	The current position of transmission shift rail identified as rail #1.
4219	Transmission Shift Rail 2 Position	The current position of transmission shift rail identified as rail #2.
4220	Transmission Shift Rail 3 Position	The current position of transmission shift rail identified as rail #3.

4221	Transmission Directional Shift at High Speed	Indicates that transmission has executed a direction shift whereby the transmission output shaft speed was above a pre-determined level at the initiation of the shift.Note: This SPN will facilitate unique identification of the occurance of this condition in troubleshooting scenarios. The presence of this SPN in a list of previously active DTCs could be used to deduce that a transmission has been operated in an abusive manner while in service.
4222	Generator Speed/Load Governing Bias Circuit	The Generator Speed/Load Governing Bias Circuit is a circuit used to regulate the generator frequency. The circuit has a user controllable potentiometer on the control panel. The diagnostic SPN will be used for out of range faults.
4223	Pre-High Engine Temperature Warning Relay Driver	The Pre-High Engine Temperature Warning Relay Driver drives the pre-high engine temperature warning lamp to indicate the engine has reached warning level engine temperature. This SPN is to indicate faults with the relay driver circuit.
4225	NOx limits exceeded due to error in the NOx control system	Indicates that On-Board Diagnostics has determined that the limits for NOx in the exhaust stream have been exceeded due to an error in the NOx control system.
4226	Engine Turbocharger Compressor Intake Differential Pressure	The pressure differential of air across a venturi measured at the turbocharger compressor intake
4227	Engine Crankcase Breather Oil Separator	Device which separates the engine oil vapor from crankcase breather gases. Note: This is not a centrifugal device.
4228	Engine Variable Geometry Turbocharger Actuator 1 Temperature	The temperature of the controller or actuator mechanism for a variable geometry turbocharger
4229	Retarder Electromagnetic Coil 1	Coil 1 for electromagnetic retarder
4230	Retarder Electromagnetic Coil 2	Coil 2 for electromagnetic retarder
4231	Retarder Electromagnetic Coil 3	Coil 3 for electromagnetic retarder

4232	Retarder Electromagnetic Coil 4	Coil 4 for electromagnetic retarder
4233	Retarder Road Speed Limit Switch	Retarder road speed limit switch states: 00b = Road speed limiting by retarder is disabled 01b = Road speed limiting by retarder is enabled. When the speed limit is not set by a network device, the road speed that the retarder will limit to may be determined when the switch transitions from 00b to 01b. 10b = Error Indicator 11b = Not Available
4234	Retarder Road Speed Exceeded Status	Retarder Road Speed Exceeded Status: 00b = Road speed is below threshold 01b = Road speed is above threshold and retarder is allowed to be activated 10b = Reserved 11b = Don’t care/Take no action
4236	Short-term Fuel Trim – Bank 1	This parameter is the short-term percent change in fueling based on the O2 sensor feedback for cylinder bank 1, based on the operating point in the nominal fuel map.Note: This is similar to SPN 1695, but with higher resolution.
4237	Long-term Fuel Trim – Bank 1	This parameter is the long-term percent change in fueling based on the O2 sensor feedback for cylinder bank 1, based on the operating point in the nominal fuel map.
4238	Short-term Fuel Trim – Bank 2	This parameter is the short-term percent change in fueling based on the O2 sensor feedback for cylinder bank 2, based on the operating point in the nominal fuel map.
4239	Long-term Fuel Trim – Bank 2	This parameter is the long-term percent change in fueling based on the O2 sensor feedback for cylinder bank 2, based on the operating point in the nominal fuel map.
4240	Engine Exhaust Bank 1 O2 Sensor Closed Loop Operation	This parameter indicates the status of the bank 1 O2 sensor feedback closed loop operation 0000b = Open loop – has not yet satisfied conditions to go closed loop 0001b = Closed loop – using oxygen sensor(s) as feedback for fuel control 0010b = Open loop due to driving conditions (e.g., power enrichment, deceleration enleanment) 0011b = Open loop – due to detected system fault 0100b = Closed loop, but fault with at least one oxygen sensor – may be using single oxygen sensor for fuel control 0101b to 1110b = reserved 1111b = not supported See also SPN 1696 as an prior implementation.

4241	Engine Exhaust Bank 2 O2 Sensor Closed Loop Operation	This parameter indicates the status of the bank 2 O2 sensor feedback closed loop operation 0000b = Open loop – has not yet satisfied conditions to go closed loop 0001b = Closed loop – using oxygen sensor(s) as feedback for fuel control 0010b = Open loop due to driving conditions (e.g., power enrichment, deceleration enleanment) 0011b = Open loop – due to detected system fault 0100b = Closed loop, but fault with at least one oxygen sensor – may be using single oxygen sensor for fuel control 0101b to 1110b = reserved 1111b = not supported
4242	Transmission Reverse Gear Shift Inhibit Request	Allows devices external to the normal transmission shift selector system to request the transmission to inhibit shifts into any Reverse gear and force the transmission into Neutral if it is currently in Reverse or attempting to shift to Reverse. These transmission responses occur regardless of shift selector (Forward, Neutral or Reverse) position at the time the request is received.This request would typically come from a component wishing to override the vehicle operator's ability to shift or keep the transmission in Reverse. For example, the control system of a rear-loading refuse packer may wish to prevent shifts to reverse when it detects the presence of someone behind the vehicle. Reverse gear shift inhibits include all 'Neutral-to-Reverse' shifts and 'Forward-to-Reverse' shifts; the ability of the transmission to complete 'Neutral-to-Forward' or 'Forward-to-Forward' gear shifts is not impacted. If the transmission is in Reverse or attempting to shift to Reverse and receives an active Reverse gear shift inhibit request (01b), the transmission will shift to Neutral. When the request subsequently goes inactive (00b), the transmission will remain in Neutral until it receives a selector input from the vehicle operator requesting it to shift into a Non-Neutral gear. The transmission should not automatically return to the previous gear when this signal goes inactive. Transmission response to this request can be monitored via SPN 4261 – Transmission Reverse Gear Shift Inhibit Status, SPN 523 Transmission Current Gear, and SPN 524 Transmission Selected Gear. 00b = Allow shifts into Reverse gear 01b = Inhibit shifts into Reverse gear, and shift transmission to Neutral if already in Reverse or attempting to shift to Reverse 10b = Reserved 11b = Take no action
4243	Engine Oil to Coolant Differential Temperature	This is a diagnostic SPN related to the temperature difference between the engine oil and engine coolant. Intended for use with FMI 0, 1, 15, 16, 17, or 18 to indicate a

		high or low temperature difference.This could be used, for example, to indicate that there is a problem with the engine oil cooler, because the coolant is too cold and/or the engine oil is too hot.
4244	Engine Run Relay	This is a diagnostic SPN related to the Engine Run Relay. The Engine Run Relay is a relay used to indicate to external controls (such as switchgear) that the engine is either running or is progressing through the initialization sequence. This is intended for use with diagnostic FMIs to indicate a problem with the relay, such as an open-circuit condition.
4245	Fuel energy content	Energy content (lower heating value) of the gaseous fuel. Note: For gaseous fuels, the fuel's energy content (lower heating value) is commonly defined in terms of energy / volume. The gas volume is defined for regular pressure and temperature conditions and is stated in terms of normal cubic meters. For the purpose of measuring energy content in gaseous fuels, the normal conditions are defined to be 101.31 kPa and 0 degC as defined in ISO 10780:1994 – Stationary source emissions, Measurement of velocity and volume flowrate of gas streams in ducts
4246	Transmission Mode 5	Indicates whether transmission mode 5 is enabled. Modes are manufacturer specific and are not necessarily mutually exclusive. See also SPN 4250.00b = Disable 01b = Enable 10b = Reserved 11b = Take no action
4247	Transmission Mode 6	Indicates whether transmission mode 6 is enabled. Modes are manufacturer specific and are not necessarily mutually exclusive. See also SPN 4251.00b = Disable 01b = Enable 10b = Reserved 11b = Take no action
4248	Transmission Mode 7	Indicates whether transmission mode 7 is enabled. Modes are manufacturer specific and are not necessarily mutually exclusive. See also SPN 4252.00b = Disable 01b = Enable 10b = Reserved 11b = Take no action
4249	Transmission Mode 8	Indicates whether transmission mode 8 is enabled. Modes are manufacturer specific and are not necessarily mutually exclusive. See also SPN 4253.00b = Disable 01b = Enable 10b = Reserved 11b = Take no action

4250	Transmission Mode 5 Indicator	This state signal is the transmission's indication that it is operating under transmission mode 5 (SPN 4246) as commanded via the TC1 message (PGN 256). The definition of the transmission mode is left to the discretion of the transmission manufacturer.00b = Transmission Mode 5 not active 01b = Transmission Mode 5 active 10b = Error 11b = Not available
4251	Transmission Mode 6 Indicator	This state signal is the transmission's indication that it is operating under transmission mode 6 (SPN 4247) as commanded via the TC1 message (PGN 256). The definition of the transmission mode is left to the discretion of the transmission manufacturer.00b = Transmission Mode 6 not active 01b = Transmission Mode 6 active 10b = Error 11b = Not available
4252	Transmission Mode 7 Indicator	This state signal is the transmission's indication that it is operating under transmission mode 7 (SPN 4248) as commanded via the TC1 message (PGN 256). The definition of the transmission mode is left to the discretion of the transmission manufacturer.00b = Transmission Mode 7 not active 01b = Transmission Mode 7 active 10b = Error 11b = Not available
4253	Transmission Mode 8 Indicator	This state signal is the transmission's indication that it is operating under transmission mode 8 (SPN 4249) as commanded via the TC1 message (PGN 256). The definition of the transmission mode is left to the discretion of the transmission manufacturer.00b = Transmission Mode 8 not active 01b = Transmission Mode 8 active 10b = Error 11b = Not available
4254	Transmission Mode Label	Conveys ASCII 'labels' for each of the manufacturer-specified TC1 Transmission Mode 'x' / ETC7 Transmission Mode Indicator 'x' pairs. Intended for use with on-board or service tool displays.NOTE – Non-printable or non-graphic ASCII characters are not allowed, and the ASCII character "*" is reserved as a delimiter
4255	Transmission Requested Launch Gear	Initial gear for the transmission to start out in when the vehicle is launched from a standing stop, as specified by the vehicle operator or vehicle system. Automatic transmissions typically default to starting out in 1st gear. However, in applications such as those with very low gearing, it is desirable to launch the vehicle in a range

		higher than 1st. For example, when the vehicle has little or no payload, the operator may wish to launch from 2nd or 3rd gear to avoid stacked, unnecessary shifts in the lower ranges.The intent of SPN 4255 is to request the initial starting range to be used when the vehicle gets underway from a stop; it does not request direction changes (forward / reverse). SPN 525 sets the direction requested by the operator. For example, if SPN 525 is requesting a Reverse range, any SPN 4255 value indicating a desired forward launch gear would be ignored by the transmission controller. The SPN 4255 value is only utilized by the transmission controller when its direction matches that of the current SPN 525 value. 0000b = No specific launch gear requested; use default launch gear 0001b = Launch the vehicle in 1st gear 0010b = Launch the vehicle in 2nd gear 0011b = Launch the vehicle in 3rd gear 0100b = Launch the vehicle in 4th gear 0101b = Launch the vehicle in 5th gear 0110b = Launch the vehicle in 6th gear 0111b = Launch the vehicle in 7th gear 1000b = Launch the vehicle in 8th gear 1001b = Launch the vehicle in Reverse 1 1010b = Launch the vehicle in Reverse 2 1011b = Launch the vehicle in Reverse 3 1100b = Launch the vehicle in Reverse 4 1101b = Allow transmission to select the optimum launch gear 1110b = Error 1111b = Not Available
4256	Cranking Voltage	Used for diagnostics related to cranking voltage (« load test » on the battery). This is different from the low battery voltage during steady-state operation.This is a sort of « load test » on the battery, and a low cranking voltage indicates the battery is weak and needs to be changed soon. Intended for use with FMI 17 or 18 to indicate a low warning condition.
4257	Engine Fuel 1 Injector Group 3	A third collection of fuel injector circuits that are grouped together. Some failure modes in this group can not be isolated to an individual injector.
4258	Engine Fuel 1 Injector Group 4	A fourth collection of fuel injector circuits that are grouped together. Some failure modes in this group can not be isolated to an individual injector.
4259	Engine Fuel 1 Injector Group 5	A fifth collection of fuel injector circuits that are grouped together. Some failure modes in this group can not be isolated to an individual injector.

4260	Engine Fuel 1 Injector Group 6	A sixth collection of fuel injector circuits that are grouped together. Some failure modes in this group can not be isolated to an individual injector.
4261	Transmission Reverse Gear Shift Inhibit Status	Reflects the status of transmission reverse inhibit activity in response to requests via SPN 4242 – Transmission Reverse Gear Shift Inhibit Request. Typically broadcast by the transmission controller.00b = Reverse gear shifts are currently allowed 01b = Reverse gear shifts are currently inhibited 10b = Error 11b = Not Available
4263	Manufacturer Specified Information	See document J1939-73 for SPN details.
4265	Aftertreatment 1 Ignition Transformer Secondary Output	This SPN should be used to broadcast Aftertreatment 1 Ignition Transformer Secondary Output faults. This diagnostic only SPN should be used with standard FMIs.
4266	Aftertreatment 2 Ignition Transformer Secondary Output	This SPN should be used to broadcast Aftertreatment 2 Ignition Transformer Secondary Output faults. This diagnostic only SPN should be used with standard FMIs.
4267	Engine Cylinder #01 Exhaust Valve Actuator	The exhaust valve actuator for engine cylinder #1.
4268	Engine Cylinder #02 Exhaust Valve Actuator	The exhaust valve actuator for engine cylinder #2.
4269	Engine Cylinder #03 Exhaust Valve Actuator	The exhaust valve actuator for engine cylinder #3.
4270	Engine Cylinder #04 Exhaust Valve Actuator	The exhaust valve actuator for engine cylinder #4.
4271	Engine Cylinder #05 Exhaust Valve Actuator	The exhaust valve actuator for engine cylinder #5.

4272	Engine Cylinder #06 Exhaust Valve Actuator	The exhaust valve actuator for engine cylinder #6.
4273	Engine Cylinder #07 Exhaust Valve Actuator	The exhaust valve actuator for engine cylinder #7.
4274	Engine Cylinder #08 Exhaust Valve Actuator	The exhaust valve actuator for engine cylinder #8.
4275	Engine Cylinder #09 Exhaust Valve Actuator	The exhaust valve actuator for engine cylinder #9.
4276	Engine Cylinder #10 Exhaust Valve Actuator	The exhaust valve actuator for engine cylinder #10.
4277	Engine Cylinder #11 Exhaust Valve Actuator	The exhaust valve actuator for engine cylinder #11.
4278	Engine Cylinder #12 Exhaust Valve Actuator	The exhaust valve actuator for engine cylinder #12.
4279	Engine Cylinder #13 Exhaust Valve Actuator	The exhaust valve actuator for engine cylinder #13.
4280	Engine Cylinder #14 Exhaust Valve Actuator	The exhaust valve actuator for engine cylinder #14.
4281	Engine Cylinder #15 Exhaust Valve Actuator	The exhaust valve actuator for engine cylinder #15.
4282	Engine Cylinder #16 Exhaust Valve Actuator	The exhaust valve actuator for engine cylinder #16.

4283	Engine Cylinder #17 Exhaust Valve Actuator	The exhaust valve actuator for engine cylinder #17.
4284	Engine Cylinder #18 Exhaust Valve Actuator	The exhaust valve actuator for engine cylinder #18.
4285	Engine Cylinder #19 Exhaust Valve Actuator	The exhaust valve actuator for engine cylinder #19.
4286	Engine Cylinder #20 Exhaust Valve Actuator	The exhaust valve actuator for engine cylinder #20.
4287	Engine Exhaust Valve Actuation System Oil Pressure	The absolute pressure of the oil in the hydraulic system that powers the engine exhaust valve actuation system
4288	Engine Exhaust Valve Actuation System Oil Temperature	The temperature of the oil in the hydraulic system that powers the engine exhaust valve actuation system
4289	Aftertreatment 1 Three Way Catalyst Intake Temperature	Temperature of engine combustion byproducts entering the Three Way Catalyst in exhaust bank 1.
4290	Aftertreatment 1 Three Way Catalyst Outlet Temperature	Temperature of engine combustion byproducts leaving the Three Way Catalyst in exhaust bank 1.
4291	Aftertreatment 1 Three Way Catalyst Differential Pressure	Exhaust differential pressure measured between the intake and exhaust of a Three Way Catalyst in exhaust bank 1.
4292	Aftertreatment 1 Three Way Catalyst Intake Temperature Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the Three Way Catalyst intake temperature sensor by the manufacturer’s sensor control software in exhaust bank 1. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.

4293	Aftertreatment 1 Three Way Catalyst Outlet Temperature Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the Three Way Catalyst outlet temperature sensor by the manufacturer's sensor control software in exhaust bank 1. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
4294	Aftertreatment 1 Three Way Catalytic Converter Differential Pressure Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the Three Way Catalytic Converter differential pressure sensor by the manufacturer's sensor control software in exhaust bank 1. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
4295	Aftertreatment 2 Three Way Catalyst Intake Temperature	Temperature of engine combustion byproducts entering the Three Way Catalyst in exhaust bank 2. (For a single exhaust bank system, refer to parameters in PGN 64838.)
4296	Aftertreatment 2 Three Way Catalyst Outlet Temperature	Temperature of engine combustion byproducts leaving the Three Way Catalyst in exhaust bank 2. (For a single exhaust bank system, refer to parameters in PGN 64838.)
4297	Aftertreatment 2 Three Way Catalyst Differential Pressure	Exhaust differential pressure measured between the intake and exhaust of a Three Way Catalyst in exhaust bank 2.(For a single exhaust bank system, refer to parameters in PGN 64838.)
4298	Aftertreatment 2 Three Way Catalyst Intake Temperature Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the Three Way Catalyst intake temperature sensor by the manufacturer's sensor control software in exhaust bank 2. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported. For a single exhaust bank system, refer to parameters in PGN 64838.
4299	Aftertreatment 2 Three Way Catalyst Outlet Temperature Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the Three Way Catalyst outlet temperature sensor by the manufacturer's sensor control software in exhaust bank 2. In the case of multiple failures the most severe is communicated.A value of

		31 is sent to indicate that no failure has been detected or this parameter is not supported. For a single exhaust bank system, refer to parameters in PGN 64838.
4300	Aftertreatment 2 Three Way Catalytic Converter Differential Pressure Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the Three Way Catalytic Converter differential pressure sensor by the manufacturer's sensor control software in exhaust bank 2. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported. For a single exhaust bank system, refer to parameters in PGN AT1TWCC.
4301	Aftertreatment 1 Fuel Injector 1 Heater Control	Heating level that the controller is commanding the aftertreatment 1 fuel injector 1 heater control to maintain. 0% = off, 100% = maximum.
4302	Aftertreatment 2 Fuel Injector 1 Heater Control	Heating level that the controller is commanding the aftertreatment 2 fuel injector 1 heater control to maintain. 0% = off, 100% = maximum.
4303	Aftertreatment 2 Fuel Pressure 2	Second fuel pressure measurement for the aftertreatment 2 system.
4304	ECU Manufacturer Name	The name of the manufacturer of the physical ECU. This name may be different than the manufacturer identified by the Manufacturer Code (SPN 2838) and listed in table B10 of J1939.
4305	Machine selected speed	See document ISO 11783-7 for SPN details.
4306	Machine selected distance	See document ISO 11783-7 for SPN details.
4307	Persistent limit status	See document ISO 11783-7 for SPN details.
4308	Machine selected speed source	See document ISO 11783-7 for SPN details.
4309	Machine selected direction	See document ISO 11783-7 for SPN details.

4310	Machine selected speed setpoint command	See document ISO 11783-7 for SPN details.
4311	Machine selected speed setpoint limit	See document ISO 11783-7 for SPN details.
4312	Machine selected direction command	See document ISO 11783-7 for SPN details.
4313	ISOBUS compliance certification year	See document ISO 11783-7 for SPN details.
4314	ISOBUS compliance certificate revision	See document ISO 11783-7 for SPN details.
4315	ISOBUS compliance certificate laboratory type	See document ISO 11783-7 for SPN details.
4316	ISOBUS Compliance certification laboratory ID	See document ISO 11783-7 for SPN details.
4317	ISOBUS Compliance certification type – Minimum ECU	See document ISO 11783-7 for SPN details.
4318	ISOBUS Compliance certification type – TECU Class 1	See document ISO 11783-7 for SPN details.
4319	ISOBUS Compliance certification type – TECU Class 2	See document ISO 11783-7 for SPN details.
4320	ISOBUS Compliance certification type – TECU Class 3	See document ISO 11783-7 for SPN details.

4321	ISOBUS Compliance certification type – Class 3 ECU	See document ISO 11783-7 for SPN details.
4322	ISOBUS Compliance certification type – Virtual terminal	See document ISO 11783-7 for SPN details.
4323	ISOBUS Compliance certification type – VT working set master	See document ISO 11783-7 for SPN details.
4324	ISOBUS Compliance certification type – VT working set member	See document ISO 11783-7 for SPN details.
4325	ISOBUS Compliance certification type – Task Controller	See document ISO 11783-7 for SPN details.
4326	ISOBUS Compliance certification type – TC working set master	See document ISO 11783-7 for SPN details.
4327	ISOBUS Compliance certification type – TC working set member	See document ISO 11783-7 for SPN details.
4328	ISOBUS Compliance certification type – File server	See document ISO 11783-7 for SPN details.
4329	ISOBUS Compliance certification type – GPS receiver	See document ISO 11783-7 for SPN details.
4330	ISOBUS Compliance certification reference number	See document ISO 11783-7 for SPN details.
4331	Aftertreatment 1 Diesel Exhaust Fluid Actual Dosing Quantity	Actual reducing agent quantity of SCR-system

4332	Aftertreatment 1 SCR System 1 State	Actual state of SCR system 0000b = Dormant (sleep mode) 0001b = Preparing dosing readiness (wake up; prepare to operate; wait for start) 0010b = Normal dosing operation 0011b = System error pending 0100b = Purging (SCR dosing system is removing residual DEF from system prior to shutdown) 0101b = Protect mode against heat (pressure buildup) 0110b = Protect mode against cold (defreeze) 0111b = Shutoff (wait for after-run) 1000b = Diagnosis (after-run) 1001b = Service test mode, dosing allowed 1010b = Service test mode, dosing not allowed 1011b = Ok to Power Down (SCR dosing system has complete housekeeping and power may safely be removed.) 1100b = Priming (Pressure Buildup) 1101b = Reserved for future assignment by SAE 1110b = Error 1111b = Not available
4333	Aftertreatment 1 Diesel Exhaust Fluid Actual Quantity of Integrator	The SCR requested diesel exhaust fluid integrator total quantity for aftertreatment system 1 (exhaust bank 1).
4334	Aftertreatment 1 Diesel Exhaust Fluid Doser 1 Absolute Pressure	The absolute pressure (measured closest to dosing valve) of the first or only DEF dosing unit for aftertreatment system 1 (exhaust bank 1).
4335	Aftertreatment 1 SCR Dosing Air Assist Absolute Pressure	The SCR dosing system air assist absolute pressure for aftertreatment system 1 (exhaust bank 1). The air assist system is used to improve the dosed reagent atomization.
4336	Aftertreatment 1 SCR Dosing Air Assist Valve	The position of the valve used to regulate the air supply of an air assist SCR dosing system for an engine. 0% represents no supply and 100% is full supply.
4337	Aftertreatment 1 Diesel Exhaust Fluid Doser 1 Temperature	The temperature (measured closest to dosing valve) of the first or only DEF dosing unit for aftertreatment system 1 (exhaust bank 1).
4338	Aftertreatment 1 SCR Doser Valve Exhaust Temperature Reduction Request	Protection request for the doser valve of the SCR system to prevent overheating 000b = no request 001b = reduction request stage 1 010b = reduction request stage 2 011b = reserved for future assignment by SAE 100b = reserved for future assignment by SAE 101b = reserved for future assignment by SAE 110b = error 111b = not available

4339	Aftertreatment 1 SCR Feedback Control Status	The SCR feedback control status (open/closed loop) for aftertreatment system 1 (exhaust bank 1). 000b = open loop control active 001b = closed loop control active 010b = reserved for future assignment by SAE 011b = reserved for future assignment by SAE 100b = reserved for future assignment by SAE 101b = reserved for future assignment by SAE 110b = error 111b = not available
4340	Aftertreatment 1 Diesel Exhaust Fluid Line Heater 1 State	The diesel exhaust fluid line heater 1 state for aftertreatment system 1 (exhaust bank 1). 00b = heater inactive 01b = heater active 10b = error 11b = not available
4341	Aftertreatment 1 Diesel Exhaust Fluid Line Heater 1 Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the diesel exhaust fluid line heater 1, by the manufacturer's control software in exhaust bank 1. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
4342	Aftertreatment 1 Diesel Exhaust Fluid Line Heater 2 State	The diesel exhaust fluid line heater 2 state for aftertreatment system 1 (exhaust bank 1). 00b = heater inactive 01b = heater active 10b = error 11b = not available
4343	Aftertreatment 1 Diesel Exhaust Fluid Line Heater 2 Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the diesel exhaust fluid line heater 2, by the manufacturer's control software in exhaust bank 1. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
4344	Aftertreatment 1 Diesel Exhaust Fluid Line Heater 3 State	The diesel exhaust fluid line heater 3 state for aftertreatment system 1 (exhaust bank 1). 00b = heater inactive 01b = heater active 10b = error 11b = not available
4345	Aftertreatment 1 Diesel Exhaust Fluid Line Heater 3 Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the diesel exhaust fluid line heater 3, by the manufacturer's control software in exhaust bank 1. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
4346	Aftertreatment 1 Diesel Exhaust Fluid Line Heater 4 State	The diesel exhaust fluid line heater 4 state for aftertreatment system 1 (exhaust bank 1). 00b = heater inactive 01b = heater active 10b = error 11b = not available

4347	Aftertreatment 1 Diesel Exhaust Fluid Line Heater 4 Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the diesel exhaust fluid line heater 4, by the manufacturer's control software in exhaust bank 1. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
4348	Aftertreatment 1 Diesel Exhaust Fluid Dosing Requested Quantity	Actual requested dosing quantity of diesel exhaust fluid.
4349	Aftertreatment 1 SCR System Requested State	Requested state of SCR system for aftertreatment system 1 (exhaust bank 1). 0000b = Dormant (sleep mode) 0001b = Preparing dosing readiness (wake up; prepare to operate; wait for start) 0010b = Normal dosing operation 0011b = System error pending 0100b = Reserved for future assignment by SAE 0101b = Protect mode against heat (pressure buildup) 0110b = Protect mode against cold (defreeze) 0111b = Shutoff (wait for after-run) 1000b = Diagnosis (after-run) 1001b = Service test mode, dosing allowed 1010b = Service test mode, dosing not allowed 1011b to 1101b = Reserved for future assignment by SAE 1110b = Error 1111b = Not available
4350	Aftertreatment 1 Diesel Exhaust Fluid Requested Quantity of Integrator	Represents the command for the diesel exhaust fluid quantity integrator in the dosing control unit. See SPN 7783 for alternate resolution.
4352	Aftertreatment 1 Diesel Exhaust Fluid Doser Fault Suppression Request	Used if external devices can warn of conditions that require suppression of potential faults in the doser due to environmental conditions.00b = Error suppression off 01b = Error suppression on 10b = Reserved 11b = Not available
4353	Aftertreatment 1 Diesel Exhaust Fluid Doser Heating Mode Request	Used if multiple heater modes are available in the Doser. 000b = Heater off 001b = Heater economy mode 010b = Heater automatic mode 011b = Heater on 100b to 110b = Reserved 111b = Not available
4354	Aftertreatment 1 Diesel Exhaust Fluid Line Heater 1	The diesel exhaust fluid line heater 1 request for aftertreatment system 1 (exhaust bank 1). 00b = request for heater to be inactive 01b = request for heater to be active 10b = reserved for future assignment by SAE 11b = not available

4355	Aftertreatment 1 Diesel Exhaust Fluid Line Heater 2	The diesel exhaust fluid line heater 2 request for aftertreatment system 1 (exhaust bank 1). 00b = request for heater to be inactive 01b = request for heater to be active 10b = reserved for future assignment by SAE 11b = not available
4356	Aftertreatment 1 Diesel Exhaust Fluid Line Heater 3	The diesel exhaust fluid line heater 3 request for aftertreatment system 1 (exhaust bank 1). 00b = request for heater to be inactive 01b = request for heater to be active 10b = reserved for future assignment by SAE 11b = not available
4357	Aftertreatment 1 Diesel Exhaust Fluid Line Heater 4	The diesel exhaust fluid line heater 4 request for aftertreatment system 1 (exhaust bank 1). 00b = request for heater to be inactive 01b = request for heater to be active 10b = reserved for future assignment by SAE 11b = not available
4358	Aftertreatment 1 SCR Differential Pressure	Differential pressure measured between the intake and outlet of an SCR component in exhaust bank 1.
4359	Aftertreatment 1 SCR Differential Pressure Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the SCR differential pressure sensor by the manufacturer’s sensor control software in exhaust bank 1. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
4360	Aftertreatment 1 SCR Intake Temperature	Temperature of engine combustion byproducts entering the SCR in exhaust bank 1.
4361	Aftertreatment 1 SCR Intake Temperature Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the SCR intake temperature sensor by the manufacturer’s sensor control software in exhaust bank 1. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
4362	Aftertreatment 1 SCR Outlet Temperature Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the SCR outlet temperature sensor by the manufacturer’s sensor control software in exhaust bank 1. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.

4363	Aftertreatment 1 SCR Outlet Temperature	Temperature of engine combustion byproducts leaving the SCR outlet in exhaust bank 1.
4364	Aftertreatment 1 SCR Conversion Efficiency	The SCR conversion efficiency percentage. Calculated as 100 times the catalyst intake NOx minus the catalyst outlet NOx divided by the catalyst intake NOx. The catalyst conversion efficiency number in itself does not imply emissions compliance or system function or system malfunction.
4365	Aftertreatment 1 Diesel Exhaust Fluid Tank 1 Temperature Preliminary FMI	Used to identify the applicable J1939-73 FMI detected for the diesel exhaust fluid tank temperature for aftertreatment system 1 (exhaust bank 1), as detected by the manufacturer's control software. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
4366	Aftertreatment 1 Diesel Exhaust Fluid Tank 1 Heater Preliminary FMI	Used to identify the applicable J1939-73 FMI detected for the heater of the diesel exhaust fluid tank for aftertreatment system 1 (exhaust bank 1), as detected by the manufacturer's control software. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
4367	Aftertreatment 1 Diesel Exhaust Fluid Quick Thaw Tank Volume	Ratio of volume of diesel exhaust fluid to the total volume of the diesel exhaust fluid quick thaw tank for aftertreatment system 1 (exhaust bank 1). 0% is empty and 100% is full. See SPN 4369 for an alternate measurement.Parameter Specific Indicator: A value of FBh indicates conditions are not acceptable for a valid measurement.
4368	Aftertreatment 1 Diesel Exhaust Fluid Quick Thaw Temperature	The diesel exhaust fluid quick thaw tank temperature for aftertreatment system 1 (exhaust bank 1).
4369	Aftertreatment 1 Diesel Exhaust Fluid Quick Thaw Tank Level	The diesel exhaust fluid level height in mm in the diesel exhaust fluid quick thaw tank for aftertreatment system 1 (exhaust bank 1). See SPN 4367 for alternate measurement.Parameter Specific Indicator: A value of FB00h indicates conditions are not acceptable for a valid measurement.

4370	Aftertreatment 1 Diesel Exhaust Fluid Quick Thaw Level/Volume Preliminary FMI	Used to identify the applicable J1939-73 FMI detected for the fluid level height of the diesel exhaust fluid quick thaw tank for aftertreatment system 1 (exhaust bank 1), as detected by the manufacturer's control software. This FMI is applicable to either the diesel exhaust fluid quick thaw tank level or diesel exhaust fluid quick thaw tank volume parameters. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
4371	Aftertreatment 1 Diesel Exhaust Fluid Quick Thaw Temperature Preliminary FMI	Used to identify the applicable J1939-73 FMI detected for the diesel exhaust fluid quick thaw tank temperature for aftertreatment system 1 (exhaust bank 1), as detected by the manufacturer's control software. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
4372	Aftertreatment 1 Diesel Exhaust Fluid Quick Thaw Heater	The diesel exhaust fluid quick thaw tank heater percentage for aftertreatment system 1 (exhaust bank 1). 0% is off. See SPN 5414 for the command for this tank heater.
4373	Aftertreatment 1 Diesel Exhaust Fluid Quick Thaw Heater Preliminary FMI	Used to identify the applicable J1939-73 FMI detected for the heater of the diesel exhaust fluid quick thaw tank for aftertreatment system 1 (exhaust bank 1), as detected by the manufacturer's control software. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
4374	Aftertreatment 1 Diesel Exhaust Fluid Pump 1 Motor Speed	Rotational speed of the motor driving the first or only pump for the diesel exhaust fluid used in aftertreatment system 1 (exhaust bank 1).
4375	Aftertreatment 1 Diesel Exhaust Fluid Pump Drive Percentage	The percent (command) sent to the motor to control the speed of the diesel exhaust fluid pump.
4376	Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit 1 Diverter Valve	Command to the valve which determines whether the diesel exhaust fluid on dosing unit 1 is delivered to the injector or is routed back to the diesel exhaust fluid tank. Zero directs all diesel exhaust fluid flow to the injector, 100% sends all diesel exhaust fluid back to the tank.

4377	Aftertreatment 1 Outlet NH3	The amount of NH3 in the exhaust exiting the aftertreatment system measured by a NH3 sensor at the aftertreatment outlet, represented in NH3 molecule parts per million non-NH3 molecules in exhaust bank 1.
4378	Aftertreatment 1 Outlet NH3 Sensor Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the aftertreatment outlet NH3 sensor by the manufacturer's sensor control software in exhaust bank 1. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
4379	Aftertreatment 1 Outlet NH3 Reading Stable	Indicates that the NH3 reading of the aftertreatment outlet NH3 sensor is stable as determined by the manufacturer's control software in exhaust bank 1.00b = Reading is not stable 01b = Reading is stable 10b = Error 11b = Not available
4380	Aftertreatment 1 Outlet NH3 Gas Sensor Power In Range	Indicates that the power supplied to the aftertreatment outlet NH3 gas sensor is within the manufacturer's specification in exhaust bank 1.00b = Power is not in range 01b = Power is in range 10b = Error 11b = Not available
4381	Aftertreatment 1 Outlet NH3 Gas Sensor at Temperature	Indicates that the heater element of the aftertreatment outlet NH3 gas sensor is within the manufacturer's specified range for accurate measurements in exhaust bank 1.00b = Heater element is not in range 01b = Heater element is in range 10b = Error 11b = Not available
4382	Aftertreatment 1 Outlet NH3 Gas Sensor Heater Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the heater of the outlet NH3 exhaust gas sensor by the manufacturer's sensor control software in exhaust bank 1. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
4383	Aftertreatment 1 Outlet NH3 Gas Sensor Heater Control	Indicates the heater status in the warm-up process. Upon receiving a power-up command, the NH3 gas sensor ramps up according to a manufacturer defined profile. The Preheat 1, Preheat 2, and Automatic messages are regions within this profile in exhaust bank 1. 00b = Automatic 01b = Preheat 2 10b = Preheat 1 11b = Heater off or not available

4384	Aftertreatment 2 Diesel Exhaust Fluid Actual Dosing Quantity	Actual reducing agent quantity of SCR system.
4385	Aftertreatment 2 SCR System 1 State	Actual state of SCR system 1. 0000b = Dormant (sleep mode) 0001b = Preparing dosing readiness (wake up; prepare to operate; wait for start) 0010b = Normal dosing operation 0011b = System error pending 0100b = Purging (SCR dosing system is removing residual DEF from system prior to shutdown) 0101b = Protect mode against heat (pressure buildup) 0110b = Protect mode against cold (defreeze) 0111b = Shutoff (wait for after-run) 1000b = Diagnosis (after-run) 1001b = Service test mode, dosing allowed 1010b = Service test mode, dosing not allowed 1011b = Ok to Power Down (SCR dosing system has complete housekeeping and power may safely be removed) 1100b = Priming (Pressure Buildup) 1101b = Reserved for future assignment by SAE 1110b = Error 1111b = Not available
4386	Aftertreatment 2 Diesel Exhaust Fluid Actual Quantity of Integrator	The SCR requested diesel exhaust fluid integrator total quantity for aftertreatment system 2 (exhaust bank 2).
4387	Aftertreatment 2 Diesel Exhaust Fluid Doser 1 Absolute Pressure	The absolute pressure (measured closest to dosing valve) of the first or only DEF doser for aftertreatment system 2 (exhaust bank 2).
4388	Aftertreatment 2 SCR Dosing Air Assist Absolute Pressure	The SCR dosing system air assist absolute pressure for aftertreatment system 2 (exhaust bank 2). The air assist system is used to improve the dosed reagent atomization.
4389	Aftertreatment 2 SCR Dosing Air Assist Valve	The position of the valve used to regulate the air supply of an air assist SCR dosing system for an engine. 0% represents no supply and 100% is full supply.
4390	Aftertreatment 2 Diesel Exhaust Fluid Doser 1 Temperature	The temperature (measured closest to dosing valve) of the first or only DEF doser for aftertreatment system 2 (exhaust bank 2).
4391	Aftertreatment 2 SCR Doser Valve Exhaust Temperature Reduction Request	Protection request for the doser valve of the SCR system to prevent overheating 000b = no request 001b = reduction request stage 1 010b = reduction request stage 2 011b = reserved for future assignment by SAE 100b = reserved for future assignment by

		SAE 101b = reserved for future assignment by SAE 110b = error 111b = not available
4392	Aftertreatment 2 SCR Feedback Control Status	The SCR feedback control status (open/closed loop) for aftertreatment system 2 (exhaust bank 2). 000b = open loop control active 001b = closed loop control active 010b = reserved for future assignment by SAE 011b = reserved for future assignment by SAE 100b = reserved for future assignment by SAE 101b = reserved for future assignment by SAE 110b = error 111b = not available
4393	Aftertreatment 2 Diesel Exhaust Fluid Line Heater 1 State	The diesel exhaust fluid line heater 1 state for aftertreatment system 2 (exhaust bank 2). 00b = heater inactive 01b = heater active 10b = error 11b = not available
4394	Aftertreatment 2 Diesel Exhaust Fluid Line Heater 1 Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the diesel exhaust fluid line heater 1, by the manufacturer's control software in exhaust bank 2. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
4395	Aftertreatment 2 Diesel Exhaust Fluid Line Heater 2 State	The diesel exhaust fluid line heater 2 state for aftertreatment system 2 (exhaust bank 2). 00b = heater inactive 01b = heater active 10b = error 11b = not available
4396	Aftertreatment 2 Diesel Exhaust Fluid Line Heater 2 Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the diesel exhaust fluid line heater 2, by the manufacturer's control software in exhaust bank 2. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
4397	Aftertreatment 2 Diesel Exhaust Fluid Line Heater 3 State	The diesel exhaust fluid line heater 3 state for aftertreatment system 2 (exhaust bank 2). 00b = heater inactive 01b = heater active 10b = error 11b = not available
4398	Aftertreatment 2 Diesel Exhaust Fluid Line Heater 3 Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the diesel exhaust fluid line heater 3, by the manufacturer's control software in exhaust bank 2. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.

4399	Aftertreatment 2 Diesel Exhaust Fluid Line Heater 4 State	The diesel exhaust fluid line heater 4 state for aftertreatment system 2 (exhaust bank 2). 00b = heater inactive 01b = heater active 10b = error 11b = not available
4400	Aftertreatment 2 Diesel Exhaust Fluid Line Heater 4 Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the diesel exhaust fluid line heater 4, by the manufacturer's control software in exhaust bank 2. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
4401	Aftertreatment 2 Diesel Exhaust Fluid Dosing Requested Quantity	Actual requested dosing quantity of diesel exhaust fluid.
4402	Aftertreatment 2 SCR System Requested State	Requested state of SCR system for aftertreatment system 2 (exhaust bank 2). 0000b = Dormant (sleep mode) 0001b = Preparing dosing readiness (wake up; prepare to operate; wait for start) 0010b = Normal dosing operation 0011b = System error pending 0100b = Reserved for future assignment by SAE 0101b = Protect mode against heat (pressure buildup) 0110b = Protect mode against cold (defreeze) 0111b = Shutoff (wait for after-run) 1000b = Diagnosis (after-run) 1001b = Service test mode, dosing allowed 1010b = Service test mode, dosing not allowed 1011b to 1101b = Reserved for future assignment by SAE 1110b = Error 1111b = Not available
4403	Aftertreatment 2 Diesel Exhaust Fluid Requested Quantity of Integrator	Represents the command for the diesel exhaust fluid quantity integrator in the dosing control unit. See SPN 7784 for alternate resolution.
4405	Aftertreatment 2 Diesel Exhaust Fluid Doser Fault Suppression Request	Used if external devices can warn of conditions that require suppression of potential faults in the doser due to environmental conditions.00b = Error suppression off 01b = Error suppression on 10b = Reserved 11b = Not available
4406	Aftertreatment 2 Diesel Exhaust Fluid Doser Heating Mode Request	Used if multiple heater modes are available in the Doser. 000b = Heater off 001b = Heater economy mode 010b = Heater automatic mode 011b = Heater on 100b to 110b = Reserved 111b = Not available

4407	Aftertreatment 2 Diesel Exhaust Fluid Line Heater 1	The diesel exhaust fluid line heater 1 request for aftertreatment system 2 (exhaust bank 2). 00b = request for heater to be inactive 01b = request for heater to be active 10b = reserved for future assignment by SAE 11b = not available
4408	Aftertreatment 2 Diesel Exhaust Fluid Line Heater 2	The diesel exhaust fluid line heater 2 request for aftertreatment system 2 (exhaust bank 2). 00b = request for heater to be inactive 01b = request for heater to be active 10b = reserved for future assignment by SAE 11b = not available
4409	Aftertreatment 2 Diesel Exhaust Fluid Line Heater 3	The diesel exhaust fluid line heater 3 request for aftertreatment system 2 (exhaust bank 2). 00b = request for heater to be inactive 01b = request for heater to be active 10b = reserved for future assignment by SAE 11b = not available
4410	Aftertreatment 2 Diesel Exhaust Fluid Line Heater 4	The diesel exhaust fluid line heater 4 request for aftertreatment system 2 (exhaust bank 2). 00b = request for heater to be inactive 01b = request for heater to be active 10b = reserved for future assignment by SAE 11b = not available
4411	Aftertreatment 2 SCR Differential Pressure	Differential pressure measured between the intake and exhaust of an SCR component in exhaust bank 2.
4412	Aftertreatment 2 SCR Differential Pressure Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the SCR differential pressure sensor by the manufacturer’s sensor control software in exhaust bank 2. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
4413	Aftertreatment 2 SCR Intake Temperature	Temperature of engine combustion byproducts entering the SCR in exhaust bank 2.
4414	Aftertreatment 2 SCR Intake Temperature Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the SCR intake temperature sensor by the manufacturer’s sensor control software in exhaust bank 2. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.

4415	Aftertreatment 2 SCR Outlet Temperature	Temperature of engine combustion byproducts leaving the SCR exhaust in exhaust bank 2.
4416	Aftertreatment 2 SCR Outlet Temperature Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the SCR outlet temperature sensor by the manufacturer's sensor control software in exhaust bank 2. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
4417	Aftertreatment 2 Diesel Exhaust Fluid Average Consumption	Measured use of diesel exhaust fluid by a Selective Catalytic Reduction system for exhaust emission control, averaged over the previous 15 hours of engine operation.Used to determine whether the SCR system is using an appropriate amount of diesel exhaust fluid, by comparing with the Aftertreatment 2 Commanded Diesel Exhaust Fluid Consumption parameter (SPN 4418).
4418	Aftertreatment 2 SCR Commanded Diesel Exhaust Fluid Consumption	This parameter transmits the amount of diesel exhaust fluid that the emissions control system has requested to be used, averaged over the past 15 hours of engine operation.Used to determine whether the SCR system is using an appropriate amount of diesel exhaust fluid, by comparing with the Aftertreatment 2 Average Diesel Exhaust Fluid Consumption parameter (SPN 4417).
4419	Aftertreatment 2 SCR Conversion Efficiency	The SCR conversion efficiency percentage. Calculated as 100 times the catalyst intake NOx minus the catalyst outlet NOx divided by the catalyst intake NOx. The catalyst conversion efficiency number in itself does not imply emissions compliance or system function or system malfunction.
4420	Aftertreatment 2 Diesel Exhaust Fluid Temperature 2	Temperature of the diesel exhaust fluid at the device measuring diesel exhaust fluid quality
4421	Aftertreatment 2 Diesel Exhaust Fluid Concentration	A measure of the concentration of urea in water. Zero percent means that the tank contains no urea. A 32.5% value indicates that the reagent is of the proper concentration. The 32.5% value indicates that the concentration is highest quality.Parameter Specific Indicator: A value of FBh indicates conditions are not acceptable for a valid measurement.

4422	Aftertreatment 2 Diesel Exhaust Fluid Conductivity	A measure of the conductivity of the diesel exhaust fluid at the sensor. The conductivity is an indication of the diesel exhaust fluid's chemical make up.
4423	Aftertreatment 2 Diesel Exhaust Fluid Temperature 2 Preliminary FMI	Used to identify the applicable J1939-73 FMI that applies to the most significant failure of the diesel exhaust fluid temperature sensor. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
4424	Aftertreatment 2 Diesel Exhaust Fluid Properties Preliminary FMI	Used to identify the applicable J1939-73 FMI that applies to the most significant failure of the diesel exhaust fluid properties sensor. This may be used for indicating failures of the diesel exhaust fluid concentration, diesel exhaust fluid conductivity or diesel exhaust fluid type. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
4425	Aftertreatment 2 Diesel Exhaust Fluid Type Property	This parameter indicates the property of the fluid compound in the tank. A value of 0011b indicates uncontaminated Diesel Exhaust Fluid.0000b = Urea concentration too high 0001b = Urea concentration too low 0010b = Fluid is diesel 0011b = Diesel exhaust fluid is proper mixture 0100b to 1011b = Reserved for SAE assignment 1100b = Diesel exhaust fluid, but concentration cannot be determined 1101b = Not able to determine fluid property (fluid type unknown) 1110b = Error with diesel exhaust fluid property detection 1111b = Not available
4426	Aftertreatment 2 Diesel Exhaust Fluid Tank Volume	Ratio of volume of diesel exhaust fluid to the total volume of the diesel exhaust fluid storage container for aftertreatment system 2 (exhaust bank 2). 0% is empty and 100% is full. See SPN 4428 and SPN 7531 for alternate measurements.Parameter Specific Indicator: A value of FBh indicates conditions are not acceptable for a valid measurement.
4427	Aftertreatment 2 Diesel Exhaust Fluid Tank Temperature 1	Temperature of the diesel exhaust fluid in the storage tank.

4428	Aftertreatment 2 Diesel Exhaust Fluid Tank Level	The diesel exhaust fluid level height in mm in the diesel exhaust fluid storage container for aftertreatment system 2 (exhaust bank 2). See SPN 4426 and SPN 7531 for alternate measurements.Parameter Specific Indicator: A value of FB00h indicates conditions are not acceptable for a valid measurement.
4429	Aftertreatment 2 Diesel Exhaust Fluid Tank Level/Volume Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the diesel exhaust fluid tank level sensor by the manufacturer's sensor control software. This FMI is applicable to either the diesel exhaust fluid tank level or diesel exhaust fluid tank volume parameters. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
4430	Aftertreatment 2 Diesel Exhaust Fluid Tank 1 Temperature Preliminary FMI	Used to identify the applicable J1939-73 FMI detected for the diesel exhaust fluid tank temperature for aftertreatment system 2 (exhaust bank 2), as detected by the manufacturer's control software. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
4431	Aftertreatment 2 Diesel Exhaust Fluid Tank Heater	Percentage of heating applied to the aftertreatment 2 diesel exhaust fluid tank heater. A value of 0% means no heating applied, a value of 100% means full heating applied. The diesel exhaust fluid tank heater warms the diesel exhaust fluid in the diesel exhaust fluid tank. See SPN 5138 for the command for this tank heater.
4432	Aftertreatment 2 Diesel Exhaust Fluid Tank 1 Heater Preliminary FMI	Used to identify the applicable J1939-73 FMI detected for the heater of the diesel exhaust fluid tank for aftertreatment system 2 (exhaust bank 2), as detected by the manufacturer's control software. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
4433	Aftertreatment 2 Diesel Exhaust Fluid Quick Thaw Tank Volume	Ratio of volume of diesel exhaust fluid to the total volume of diesel exhaust fluid storage container for aftertreatment system 2 (exhaust bank 2). 0% is empty and 100% is full. An alternative to this SPN is SPN 4435.Parameter Specific Indicator: A value of FBh indicates conditions are not acceptable for a valid measurement.

4434	Aftertreatment 2 Diesel Exhaust Fluid Quick Thaw Temperature	The diesel exhaust fluid quick thaw tank temperature for aftertreatment system 2 (exhaust bank 2).
4435	Aftertreatment 2 Diesel Exhaust Fluid Quick Thaw Tank Level	The diesel exhaust fluid level height in mm in the diesel exhaust fluid quick thaw tank for aftertreatment system 2 (exhaust bank 2). See SPN 4433 for alternate measurement.Parameter Specific Indicator: A value of FB00h indicates conditions are not acceptable for a valid measurement.
4436	Aftertreatment 2 Diesel Exhaust Fluid Quick Thaw Level Preliminary FMI	Used to identify the applicable J1939-73 FMI detected for the fluid level height of the diesel exhaust fluid quick thaw tank for aftertreatment system 2 (exhaust bank 2), as detected by the manufacturer's control software. This FMI is applicable to either the diesel exhaust fluid quick thaw tank level or diesel exhaust fluid quick thaw tank volume parameters. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
4437	Aftertreatment 2 Diesel Exhaust Fluid Quick Thaw Temperature Preliminary FMI	Used to identify the applicable J1939-73 FMI detected for the diesel exhaust fluid quick thaw tank temperature for aftertreatment system 2 (exhaust bank 2), as detected by the manufacturer's control software. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
4438	Aftertreatment 2 Diesel Exhaust Fluid Quick Thaw Heater	The diesel exhaust fluid quick thaw tank heater percentage for aftertreatment system 2 (exhaust bank 2). 0% is off. See SPN 5415 for the command for this tank heater.
4439	Aftertreatment 2 Diesel Exhaust Fluid Quick Thaw Heater Preliminary FMI	Used to identify the applicable J1939-73 FMI detected for the heater of the diesel exhaust fluid quick thaw tank for aftertreatment system 2 (exhaust bank 2), as detected by the manufacturer's control software. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
4440	Aftertreatment 2 Diesel Exhaust Fluid Pump 1 Motor Speed	Rotational speed of the motor driving the first or only pump for the diesel exhaust fluid used in aftertreatment system 2 (exhaust bank 2).

4441	Aftertreatment 2 Diesel Exhaust Fluid Pump Drive Percentage	The percent (command) sent to the motor to control the speed of the diesel exhaust fluid pump.
4442	Aftertreatment 2 Diesel Exhaust Fluid Dosing Unit 1 Diverter Valve	Command to the valve which determines whether the diesel exhaust fluid of dosing unit 1 is delivered to the injector or is routed back to the diesel exhaust fluid tank. Zero directs all diesel exhaust fluid flow to the injector, 100% sends all diesel exhaust fluid back to the tank.
4443	Aftertreatment 2 Outlet NH3	The amount of NH3 in the exhaust exiting the aftertreatment system measured by a NH3 sensor at the aftertreatment outlet, represented in NH3 molecule parts per million non-NH3 molecules in exhaust bank 2.
4444	Aftertreatment 2 Outlet NH3 Sensor Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the aftertreatment outlet NH3 sensor by the manufacturer's sensor control software in exhaust bank 2. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
4445	Aftertreatment 2 Outlet NH3 Reading Stable	Indicates that the NH3 reading of the aftertreatment outlet NH3 sensor is stable as determined by the manufacturer's control software in exhaust bank 2.00b = Reading is not stable 01b = Reading is stable 10b = Error 11b = Not available
4446	Aftertreatment 2 Outlet NH3 Gas Sensor Power In Range	Indicates that the power supplied to the aftertreatment outlet NH3 gas sensor is within the manufacturer's specification in exhaust bank 2.00b = Heater element is not in range 01b = Heater element is in range 10b = Error 11b = Not available
4447	Aftertreatment 2 Outlet NH3 Gas Sensor at Temperature	Indicates that the heater element of the aftertreatment outlet NH3 gas sensor is within the manufacturer's specified range for accurate measurements in exhaust bank 2.00b = Heater element is not in range 01b = Heater element is in range 10b = Error 11b = Not available
4448	Aftertreatment 2 Outlet NH3 Gas Sensor Heater Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the heater of the outlet NH3 exhaust gas sensor by the manufacturer's sensor control software in exhaust bank 2.

		In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
4449	Aftertreatment 2 Outlet NH3 Gas Sensor Heater Control	Indicates the heater status in the warm-up process. Upon receiving a power-up command, the NH3 gas sensor ramps up according to a manufacturer defined profile. The Preheat 1, Preheat 2, and Automatic messages are regions within this profile in exhaust bank 1. 00b = Automatic 01b = Preheat 2 10b = Preheat 1 11b = Heater off or Not available
4450	Aftertreatment 2 Diesel Exhaust Fluid Controller 1	The Diesel Exhaust Fluid Controller has the ability to read attributes of the SCR system, including but not limited to, diesel exhaust fluid level, diesel exhaust fluid temperature, diesel exhaust fluid quality, and diesel exhaust fluid dosing rate.
4451	Aftertreatment 2 Diesel Exhaust Fluid Dosing Unit 1	The diesel exhaust fluid dosing unit is a device that mixes the diesel exhaust fluid and air, and delivers a metered quantity of this mixture to the exhaust stream. This can also refer to a device that delivers diesel exhaust fluid to an aftertreatment diesel exhaust fluid dosing valve without air assistance.This parameter refers to the dosing unit in bank 2, or the first of multiple dosing units if there is more than one dosing unit in bank 2.
4452	Aftertreatment 2 Diesel Exhaust Fluid Dosing Unit 1 Input Lines	The diesel exhaust fluid dosing unit is a device that mixes the diesel exhaust fluid and air, such that it contains an input line from the air tank and an input line from the diesel exhaust fluid tank.This parameter refers to the input lines of the dosing unit in bank 2, or the input lines of the first of multiple dosing units if there is more than one dosing unit in bank 2.
4453	Aftertreatment 2 Diesel Exhaust Fluid Tank Quality	Measures the quality of the diesel exhaust fluid in the diesel exhaust fluid tank
4454	Retract Status of ramp 4	Retract status of ramp at doorway 4, counting from front to back on the vehicle. 00b = ramp retracted 01b = ramp extended 10b = error 11b = not available

4455	Enable status of ramp 4	Enable status of ramp at doorway 4, counting from front to back on the vehicle. 00b = ramp disabled 01b = ramp enabled 10b = error 11b = not available
4456	Movement status of ramp 4	Movement status of ramp at doorway 4, counting from front to back on the vehicle. 00b = ramp not being moved 01b = ramp being moved 10b = error 11b = not available
4457	Retract Status of ramp 5	Retract status of ramp at doorway 5, counting from front to back on the vehicle. 00b = ramp retracted 01b = ramp extended 10b = error 11b = not available
4458	Enable status of ramp 5	Enable status of ramp at doorway 5, counting from front to back on the vehicle. 00b = ramp disabled 01b = ramp enabled 10b = error 11b = not available
4459	Movement status of ramp 5	Movement status of ramp at doorway 5, counting from front to back on the vehicle. 00b = ramp not being moved 01b = ramp being moved 10b = error 11b = not available
4460	Joystick 1 Lamp 1 Command	Tells joystick 1 to switch on/off/blinking lamp 1. 00b = Off 01b = On 10b = Blinking 11b = Don’t care / Take no action
4461	Joystick 1 Lamp 2 Command	Tells joystick 1 to switch on/off/blinking lamp 2. 00b = Off 01b = On 10b = Blinking 11b = Don’t care / Take no action
4462	Joystick 1 Lamp 3 Command	Tells joystick 1 to switch on/off/blinking lamp 3. 00b = Off 01b = On 10b = Blinking 11b = Don’t care / Take no action
4463	Joystick 1 Lamp 4 Command	Tells joystick 1 to switch on/off/blinking lamp 4. 00b = Off 01b = On 10b = Blinking 11b = Don’t care / Take no action
4464	Joystick 1 Lamp 5 Command	Tells joystick 1 to switch on/off/blinking lamp 5. 00b = Off 01b = On 10b = Blinking 11b = Don’t care / Take no action

4465	Joystick 1 Lamp 6 Command	Tells joystick 1 to switch on/off/blinking lamp 6. 00b = Off 01b = On 10b = Blinking 11b = Don’t care / Take no action
4466	Joystick 1 Lamp 7 Command	Tells joystick 1 to switch on/off/blinking lamp 7. 00b = Off 01b = On 10b = Blinking 11b = Don’t care / Take no action
4467	Joystick 1 Lamp 8 Command	Tells joystick 1 to switch on/off/blinking lamp 8. 00b = Off 01b = On 10b = Blinking 11b = Don’t care / Take no action
4468	Joystick 1 Lamp 9 Command	Tells joystick 1 to switch on/off/blinking lamp 9. 00b = Off 01b = On 10b = Blinking 11b = Don’t care / Take no action
4469	Joystick 1 Lamp 10 Command	Tells joystick 1 to switch on/off/blinking lamp 10. 00b = Off 01b = On 10b = Blinking 11b = Don’t care / Take no action
4470	Joystick 2 Lamp 1 Command	Tells joystick 2 to switch on/off/blinking lamp 1. 00b = Off 01b = On 10b = Blinking 11b = Don’t care / Take no action
4471	Joystick 2 Lamp 2 Command	Tells joystick 2 to switch on/off/blinking lamp 2. 00b = Off 01b = On 10b = Blinking 11b = Don’t care / Take no action
4472	Joystick 2 Lamp 3 Command	Tells joystick 2 to switch on/off/blinking lamp 3. 00b = Off 01b = On 10b = Blinking 11b = Don’t care / Take no action
4473	Joystick 2 Lamp 4 Command	Tells joystick 2 to switch on/off/blinking lamp 4. 00b = Off 01b = On 10b = Blinking 11b = Don’t care / Take no action
4474	Joystick 2 Lamp 5 Command	Tells joystick 2 to switch on/off/blinking lamp 5. 00b = Off 01b = On 10b = Blinking 11b = Don’t care / Take no action
4475	Joystick 2 Lamp 6 Command	Tells joystick 2 to switch on/off/blinking lamp 6. 00b = Off 01b = On 10b = Blinking 11b = Don’t care / Take no action

4476	Joystick 2 Lamp 7 Command	Tells joystick 2 to switch on/off/blinking lamp 7. 00b = Off 01b = On 10b = Blinking 11b = Don’t care / Take no action
4477	Joystick 2 Lamp 8 Command	Tells joystick 2 to switch on/off/blinking lamp 8. 00b = Off 01b = On 10b = Blinking 11b = Don’t care / Take no action
4478	Joystick 2 Lamp 9 Command	Tells joystick 2 to switch on/off/blinking lamp 9. 00b = Off 01b = On 10b = Blinking 11b = Don’t care / Take no action
4479	Joystick 2 Lamp 10 Command	Tells joystick 2 to switch on/off/blinking lamp 10. 00b = Off 01b = On 10b = Blinking 11b = Don’t care / Take no action
4480	Joystick 3 Lamp 1 Command	Tells joystick 3 to switch on/off/blinking lamp 1. 00b = Off 01b = On 10b = Blinking 11b = Don’t care / Take no action
4481	Joystick 3 Lamp 2 Command	Tells joystick 3 to switch on/off/blinking lamp 2. 00b = Off 01b = On 10b = Blinking 11b = Don’t care / Take no action
4482	Joystick 3 Lamp 3 Command	Tells joystick 3 to switch on/off/blinking lamp 3. 00b = Off 01b = On 10b = Blinking 11b = Don’t care / Take no action
4483	Joystick 3 Lamp 4 Command	Tells joystick 3 to switch on/off/blinking lamp 4. 00b = Off 01b = On 10b = Blinking 11b = Don’t care / Take no action
4484	Joystick 3 Lamp 5 Command	Tells joystick 3 to switch on/off/blinking lamp 5. 00b = Off 01b = On 10b = Blinking 11b = Don’t care / Take no action
4485	Joystick 3 Lamp 6 Command	Tells joystick 3 to switch on/off/blinking lamp 6. 00b = Off 01b = On 10b = Blinking 11b = Don’t care / Take no action
4486	Joystick 3 Lamp 7 Command	Tells joystick 3 to switch on/off/blinking lamp 7. 00b = Off 01b = On 10b = Blinking 11b = Don’t care / Take no action

4487	Joystick 3 Lamp 8 Command	Tells joystick 3 to switch on/off/blinking lamp 8. 00b = Off 01b = On 10b = Blinking 11b = Don’t care / Take no action
4488	Joystick 3 Lamp 9 Command	Tells joystick 3 to switch on/off/blinking lamp 9. 00b = Off 01b = On 10b = Blinking 11b = Don’t care / Take no action
4489	Joystick 3 Lamp 10 Command	Tells joystick 3 to switch on/off/blinking lamp 10. 00b = Off 01b = On 10b = Blinking 11b = Don’t care / Take no action
4490	Specific Humidity	Specific humidity of the ambient intake air.
4491	Joystick 4 X-Axis Neutral Position Status	Reports when the current joystick position is in the neutral position for that axis of travel. The neutral position measurement must be determined from some mechanism other than the axis position measurement device.00b = Not in Neutral Position 01b = In Neutral Position 10b = Error Indicator 11b = Not Available
4492	Joystick 4 X-Axis Lever Left Negative Position Status	Reports when the current joystick position is on the negative travel side (back, left, counterclockwise, down) relative to the neutral position for that axis of travel.00b = Not on negative side of Neutral 01b = On negative side of Neutral 10b = Error Indicator 11b = Not Available
4493	Joystick 4 X-Axis Lever Right Positive Position Status	Reports when the current joystick position is on the positive travel side (forward, right, clockwise, up) relative to the neutral position for that axis of travel.00b = Not on Positive side of Neutral 01b = On positive side of Neutral 10b = Error Indicator 11b = Not Available
4494	Joystick 4 X-Axis Position	The position of the joystick in the relative motion of travel from the neutral position. Position value of 0 is Neutral and position value 1000 (100%) is the end of linear zone. Value of 1022 indicates an error has occurred.
4495	Joystick 4 Y-Axis Neutral Position Status	Reports when the current joystick position is in the neutral position for that axis of travel. The neutral position measurement must be determined from some mechanism

		other than the axis position measurement device.00b = Not in Neutral Position 01b = In Neutral Position 10b = Error Indicator 11b = Not Available
4496	Joystick 4 Y-Axis Lever Back Negative Position Status	Reports when the current joystick position is on the negative travel side (back, left, counterclockwise, down) relative to the neutral position for that axis of travel.00b = Not on negative side of Neutral 01b = On negative side of Neutral 10b = Error Indicator 11b = Not Available
4497	Joystick 4 Y-Axis Lever Forward Positive Position Status	Reports when the current joystick position is on the positive travel side (forward, right, clockwise, up) relative to the neutral position for that axis of travel.00b = Not on Positive side of Neutral 01b = On positive side of Neutral 10b = Error Indicator 11b = Not Available
4498	Joystick 4 Y-Axis Position	The position of the joystick in the relative motion of travel from the neutral position. Position value of 0 is Neutral and position value 1000 (100%) is the end of linear zone. Value of 1022 indicates an error has occurred.
4499	Joystick 4 Y-Axis Detent Position Status	Reports when the current joystick position is in the detent position for that axis of travel. 00b = Not in the Detent Position 01b = In the Detent Position 10b = Error Indicator 11b = Not Available
4500	Joystick 4 X-Axis Detent Position Status	Reports when the current joystick position is in the detent position for that axis of travel. 00b = Not in the Detent Position 01b = In the Detent Position 10b = Error Indicator 11b = Not Available
4501	Joystick 4 Button 4 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4502	Joystick 4 Button 3 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4503	Joystick 4 Button 2 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available

4504	Joystick 4 Button 1 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4505	Joystick 4 Button 8 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4506	Joystick 4 Button 7 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4507	Joystick 4 Button 6 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4508	Joystick 4 Button 5 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4509	Joystick 4 Button 12 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4510	Joystick 4 Button 11 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4511	Joystick 4 Button 10 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4512	Joystick 4 Button 9 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4513	Joystick 4 Grip X-Axis Neutral Position Status	Reports when the current joystick grip position is in the neutral position for that axis of travel. The neutral position measurement must be determined from some mechanism other than the axis position measurement device.00b = Not in Neutral Position 01b = In Neutral Position 10b = Error Indicator 11b = Not Available

4514	Joystick 4 Grip X-Axis Lever Left Negative Position Status	Reports when the current joystick grip position is on the negative travel side (back, left, counterclockwise, down) relative to the neutral position for that axis of travel.00b = Not on negative side of Neutral 01b = On negative side of Neutral 10b = Error Indicator 11b = Not Available
4515	Joystick 4 Grip X-Axis Lever Right Positive Position Status	Reports when the current joystick grip position is on the positive travel side (forward, right, clockwise, up) relative to the neutral position for that axis of travel.00b = Not on Positive side of Neutral 01b = On positive side of Neutral 10b = Error Indicator 11b = Not Available
4516	Joystick 4 Grip X-Axis Position	The position of the joystick grip in the relative motion of travel from the neutral position. Position value of 0 is Neutral and position value 1000 (100%) is the end of linear zone. Value of 1022 indicates an error has occurred.
4517	Joystick 4 Grip Y-Axis Neutral Position Status	Reports when the current joystick grip position is in the neutral position for that axis of travel. The neutral position measurement must be determined from some mechanism other than the axis position measurement device.00b = Not in Neutral Position 01b = In Neutral Position 10b = Error Indicator 11b = Not Available
4518	Joystick 4 Grip Y-Axis Lever Back Negative Position Status	Reports when the current joystick grip position is on the negative travel side (back, left, counterclockwise, down) relative to the neutral position for that axis of travel.00b = Not on negative side of Neutral 01b = On negative side of Neutral 10b = Error Indicator 11b = Not Available
4519	Joystick 4 Grip Y-Axis Lever Forward Positive Position Status	Reports when the current joystick grip position is on the positive travel side (forward, right, clockwise, up) relative to the neutral position for that axis of travel.00b = Not on Positive side of Neutral 01b = On positive side of Neutral 10b = Error Indicator 11b = Not Available
4520	Joystick 4 Grip Y-Axis Position	The position of the joystick grip in the relative motion of travel from the neutral position. Position value of 0 is Neutral and position value 1000 (100%) is the end of linear zone. Value of 1022 indicates an error has occurred.

4521	Joystick 4 Theta-Axis Neutral Position Status	Reports when the current joystick position is in the neutral position for that axis of travel. The neutral position measurement must be determined from some mechanism other than the axis position measurement device.00b = Not in Neutral Position 01b = In Neutral Position 10b = Error Indicator 11b = Not Available
4522	Joystick 4 Theta-Axis Counter Clockwise Negative Position Status	Reports when the current joystick position is on the negative travel side (back, left, counterclockwise, down) relative to the neutral position for that axis of travel.00b = Not on negative side of Neutral 01b = On negative side of Neutral 10b = Error Indicator 11b = Not Available
4523	Joystick 4 Theta-Axis Clockwise Positive Position Status	Reports when the current joystick position is on the positive travel side (forward, right, clockwise, up) relative to the neutral position for that axis of travel.00b = Not on Positive side of Neutral 01b = On positive side of Neutral 10b = Error Indicator 11b = Not Available
4524	Joystick 4 Theta-Axis Position	The position of the joystick in the relative motion of travel from the neutral position. Position value of 0 is Neutral and position value 1000 (100%) is the end of linear zone. Value of 1022 indicates an error has occurred.
4525	Joystick 4 Theta-Axis Detent Position Status	Reports when the current joystick position is in the detent position for that axis of travel. 00b = Not in the Detent Position 01b = In the Detent Position 10b = Error Indicator 11b = Not Available
4526	Joystick 4 Grip Y-Axis Detent Position Status	Reports when the current joystick grip position is in the detent position for that axis of travel. 00b = Not in the Detent Position 01b = In the Detent Position 10b = Error Indicator 11b = Not Available
4527	Joystick 4 Grip X-Axis Detent Position Status	Reports when the current joystick grip position is in the detent position for that axis of travel. 00b = Not in the Detent Position 01b = In the Detent Position 10b = Error Indicator 11b = Not Available
4528	Joystick 5 X-Axis Neutral Position Status	Reports when the current joystick position is in the neutral position for that axis of travel. The neutral position measurement must be determined from some mechanism

		other than the axis position measurement device.00b = Not in Neutral Position 01b = In Neutral Position 10b = Error Indicator 11b = Not Available
4529	Joystick 5 X-Axis Lever Left Negative Position Status	Reports when the current joystick position is on the negative travel side (back, left, counterclockwise, down) relative to the neutral position for that axis of travel.00b = Not on negative side of Neutral 01b = On negative side of Neutral 10b = Error Indicator 11b = Not Available
4530	Joystick 5 X-Axis Lever Right Positive Position Status	Reports when the current joystick position is on the positive travel side (forward, right, clockwise, up) relative to the neutral position for that axis of travel.00b = Not on Positive side of Neutral 01b = On positive side of Neutral 10b = Error Indicator 11b = Not Available
4531	Joystick 5 X-Axis Position	The position of the joystick in the relative motion of travel from the neutral position. Position value of 0 is Neutral and position value 1000 (100%) is the end of linear zone. Value of 1022 indicates an error has occurred.
4532	Joystick 5 Y-Axis Neutral Position Status	Reports when the current joystick position is in the neutral position for that axis of travel. The neutral position measurement must be determined from some mechanism other than the axis position measurement device.00b = Not in Neutral Position 01b = In Neutral Position 10b = Error Indicator 11b = Not Available
4533	Joystick 5 Y-Axis Lever Back Negative Position Status	Reports when the current joystick position is on the negative travel side (back, left, counterclockwise, down) relative to the neutral position for that axis of travel.00b = Not on negative side of Neutral 01b = On negative side of Neutral 10b = Error Indicator 11b = Not Available
4534	Joystick 5 Y-Axis Lever Forward Positive Position Status	Reports when the current joystick position is on the positive travel side (forward, right, clockwise, up) relative to the neutral position for that axis of travel.00b = Not on Positive side of Neutral 01b = On positive side of Neutral 10b = Error Indicator 11b = Not Available

4535	Joystick 5 Y-Axis Position	The position of the joystick in the relative motion of travel from the neutral position. Position value of 0 is Neutral and position value 1000 (100%) is the end of linear zone. Value of 1022 indicates an error has occurred.
4536	Joystick 5 Y-Axis Detent Position Status	Reports when the current joystick position is in the detent position for that axis of travel. 00b = Not in the Detent Position 01b = In the Detent Position 10b = Error Indicator 11b = Not Available
4537	Joystick 5 X-Axis Detent Position Status	Reports when the current joystick position is in the detent position for that axis of travel. 00b = Not in the Detent Position 01b = In the Detent Position 10b = Error Indicator 11b = Not Available
4538	Joystick 5 Button 4 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4539	Joystick 5 Button 3 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4540	Joystick 5 Button 2 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4541	Joystick 5 Button 1 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4542	Joystick 5 Button 8 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4543	Joystick 5 Button 7 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4544	Joystick 5 Button 6 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available

4545	Joystick 5 Button 5 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4546	Joystick 5 Button 12 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4547	Joystick 5 Button 11 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4548	Joystick 5 Button 10 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4549	Joystick 5 Button 9 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4550	Joystick 5 Grip X-Axis Neutral Position Status	Reports when the current joystick grip position is in the neutral position for that axis of travel. The neutral position measurement must be determined from some mechanism other than the axis position measurement device.00b = Not in Neutral Position 01b = In Neutral Position 10b = Error Indicator 11b = Not Available
4551	Joystick 5 Grip X-Axis Lever Left Negative Position Status	Reports when the current joystick grip position is on the negative travel side (back, left, counterclockwise, down) relative to the neutral position for that axis of travel.00b = Not on negative side of Neutral 01b = On negative side of Neutral 10b = Error Indicator 11b = Not Available
4552	Joystick 5 Grip X-Axis Lever Right Positive Position Status	Reports when the current joystick grip position is on the positive travel side (forward, right, clockwise, up) relative to the neutral position for that axis of travel.00b = Not on Positive side of Neutral 01b = On positive side of Neutral 10b = Error Indicator 11b = Not Available
4553	Joystick 5 Grip X-Axis Position	The position of the joystick grip in the relative motion of travel from the neutral position. Position value of 0 is Neutral and position value 1000 (100%) is the end of linear zone. Value of 1022 indicates an error has occurred.

4554	Joystick 5 Grip Y-Axis Neutral Position Status	Reports when the current joystick grip position is in the neutral position for that axis of travel. The neutral position measurement must be determined from some mechanism other than the axis position measurement device.00b = Not in Neutral Position 01b = In Neutral Position 10b = Error Indicator 11b = Not Available
4555	Joystick 5 Grip Y-Axis Lever Back Negative Position Status	Reports when the current joystick grip position is on the negative travel side (back, left, counterclockwise, down) relative to the neutral position for that axis of travel.00b = Not on negative side of Neutral 01b = On negative side of Neutral 10b = Error Indicator 11b = Not Available
4556	Joystick 5 Grip Y-Axis Lever Forward Positive Position Status	Reports when the current joystick grip position is on the positive travel side (forward, right, clockwise, up) relative to the neutral position for that axis of travel.00b = Not on Positive side of Neutral 01b = On positive side of Neutral 10b = Error Indicator 11b = Not Available
4557	Joystick 5 Grip Y-Axis Position	The position of the joystick grip in the relative motion of travel from the neutral position. Position value of 0 is Neutral and position value 1000 (100%) is the end of linear zone. Value of 1022 indicates an error has occurred.
4558	Joystick 5 Theta-Axis Neutral Position Status	Reports when the current joystick position is in the neutral position for that axis of travel. The neutral position measurement must be determined from some mechanism other than the axis position measurement device.00b = Not in Neutral Position 01b = In Neutral Position 10b = Error Indicator 11b = Not Available
4559	Joystick 5 Theta-Axis Counter Clockwise Negative Position Status	Reports when the current joystick position is on the negative travel side (back, left, counterclockwise, down) relative to the neutral position for that axis of travel.00b = Not on negative side of Neutral 01b = On negative side of Neutral 10b = Error Indicator 11b = Not Available
4560	Joystick 5 Theta-Axis Clockwise Positive Position Status	Reports when the current joystick position is on the positive travel side (forward, right, clockwise, up) relative to the neutral position for that axis of travel.00b = Not on Positive side of Neutral 01b = On positive side of Neutral 10b = Error Indicator 11b = Not Available

4561	Joystick 5 Theta-Axis Position	The position of the joystick in the relative motion of travel from the neutral position. Position value of 0 is Neutral and position value 1000 (100%) is the end of linear zone. Value of 1022 indicates an error has occurred.
4562	Joystick 5 Theta-Axis Detent Position Status	Reports when the current joystick position is in the detent position for that axis of travel. 00b = Not in the Detent Position 01b = In the Detent Position 10b = Error Indicator 11b = Not Available
4563	Joystick 5 Grip Y-Axis Detent Position Status	Reports when the current joystick grip position is in the detent position for that axis of travel. 00b = Not in the Detent Position 01b = In the Detent Position 10b = Error Indicator 11b = Not Available
4564	Joystick 5 Grip X-Axis Detent Position Status	Reports when the current joystick grip position is in the detent position for that axis of travel. 00b = Not in the Detent Position 01b = In the Detent Position 10b = Error Indicator 11b = Not Available
4565	Joystick 6 X-Axis Neutral Position Status	Reports when the current joystick position is in the neutral position for that axis of travel. The neutral position measurement must be determined from some mechanism other than the axis position measurement device.00b = Not in Neutral Position 01b = In Neutral Position 10b = Error Indicator 11b = Not Available
4566	Joystick 6 X-Axis Lever Left Negative Position Status	Reports when the current joystick position is on the negative travel side (back, left, counterclockwise, down) relative to the neutral position for that axis of travel.00b = Not on negative side of Neutral 01b = On negative side of Neutral 10b = Error Indicator 11b = Not Available
4567	Joystick 6 X-Axis Lever Right Positive Position Status	Reports when the current joystick position is on the positive travel side (forward, right, clockwise, up) relative to the neutral position for that axis of travel.00b = Not on Positive side of Neutral 01b = On positive side of Neutral 10b = Error Indicator 11b = Not Available

4568	Joystick 6 X-Axis Position	The position of the joystick in the relative motion of travel from the neutral position. Position value of 0 is Neutral and position value 1000 (100%) is the end of linear zone. Value of 1022 indicates an error has occurred.
4569	Joystick 6 Y-Axis Neutral Position Status	Reports when the current joystick position is in the neutral position for that axis of travel. The neutral position measurement must be determined from some mechanism other than the axis position measurement device.00b = Not in Neutral Position 01b = In Neutral Position 10b = Error Indicator 11b = Not Available
4570	Joystick 6 Y-Axis Lever Back Negative Position Status	Reports when the current joystick position is on the negative travel side (back, left, counterclockwise, down) relative to the neutral position for that axis of travel.00b = Not on negative side of Neutral 01b = On negative side of Neutral 10b = Error Indicator 11b = Not Available
4571	Joystick 6 Y-Axis Lever Forward Positive Position Status	Reports when the current joystick position is on the positive travel side (forward, right, clockwise, up) relative to the neutral position for that axis of travel.00b = Not on Positive side of Neutral 01b = On positive side of Neutral 10b = Error Indicator 11b = Not Available
4572	Joystick 6 Y-Axis Position	The position of the joystick in the relative motion of travel from the neutral position. Position value of 0 is Neutral and position value 1000 (100%) is the end of linear zone. Value of 1022 indicates an error has occurred.
4573	Joystick 6 Y-Axis Detent Position Status	Reports when the current joystick position is in the detent position for that axis of travel. 00b = Not in the Detent Position 01b = In the Detent Position 10b = Error Indicator 11b = Not Available
4574	Joystick 6 X-Axis Detent Position Status	Reports when the current joystick position is in the detent position for that axis of travel. 00b = Not in the Detent Position 01b = In the Detent Position 10b = Error Indicator 11b = Not Available
4575	Joystick 6 Button 4 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available

4576	Joystick 6 Button 3 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4577	Joystick 6 Button 2 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4578	Joystick 6 Button 1 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4579	Joystick 6 Button 8 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4580	Joystick 6 Button 7 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4581	Joystick 6 Button 6 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4582	Joystick 6 Button 5 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4583	Joystick 6 Button 12 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4584	Joystick 6 Button 11 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4585	Joystick 6 Button 10 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4586	Joystick 6 Button 9 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available

4587	Joystick 6 Grip X-Axis Neutral Position Status	Reports when the current joystick grip position is in the neutral position for that axis of travel. The neutral position measurement must be determined from some mechanism other than the axis position measurement device.00b = Not in Neutral Position 01b = In Neutral Position 10b = Error Indicator 11b = Not Available
4588	Joystick 6 Grip X-Axis Lever Left Negative Position Status	Reports when the current joystick grip position is on the negative travel side (back, left, counterclockwise, down) relative to the neutral position for that axis of travel.00b = Not on negative side of Neutral 01b = On negative side of Neutral 10b = Error Indicator 11b = Not Available
4589	Joystick 6 Grip X-Axis Lever Right Positive Position Status	Reports when the current joystick grip position is on the positive travel side (forward, right, clockwise, up) relative to the neutral position for that axis of travel.00b = Not on Positive side of Neutral 01b = On positive side of Neutral 10b = Error Indicator 11b = Not Available
4590	Joystick 6 Grip X-Axis Position	The position of the joystick grip in the relative motion of travel from the neutral position. Position value of 0 is Neutral and position value 1000 (100%) is the end of linear zone. Value of 1022 indicates an error has occurred.
4591	Joystick 6 Grip Y-Axis Neutral Position Status	Reports when the current joystick grip position is in the neutral position for that axis of travel. The neutral position measurement must be determined from some mechanism other than the axis position measurement device.00b = Not in Neutral Position 01b = In Neutral Position 10b = Error Indicator 11b = Not Available
4592	Joystick 6 Grip Y-Axis Lever Back Negative Position Status	Reports when the current joystick grip position is on the negative travel side (back, left, counterclockwise, down) relative to the neutral position for that axis of travel.00b = Not on negative side of Neutral 01b = On negative side of Neutral 10b = Error Indicator 11b = Not Available
4593	Joystick 6 Grip Y-Axis Lever Forward Positive Position Status	Reports when the current joystick grip position is on the positive travel side (forward, right, clockwise, up) relative to the neutral position for that axis of travel.00b = Not on Positive side of Neutral 01b = On positive side of Neutral 10b = Error Indicator 11b = Not Available

4594	Joystick 6 Grip Y-Axis Position	The position of the joystick grip in the relative motion of travel from the neutral position. Position value of 0 is Neutral and position value 1000 (100%) is the end of linear zone. Value of 1022 indicates an error has occurred.
4595	Joystick 6 Theta-Axis Neutral Position Status	Reports when the current joystick position is in the neutral position for that axis of travel. The neutral position measurement must be determined from some mechanism other than the axis position measurement device.00b = Not in Neutral Position 01b = In Neutral Position 10b = Error Indicator 11b = Not Available
4596	Joystick 6 Theta-Axis Counter Clockwise Negative Position Status	Reports when the current joystick position is on the negative travel side (back, left, counterclockwise, down) relative to the neutral position for that axis of travel.00b = Not on negative side of Neutral 01b = On negative side of Neutral 10b = Error Indicator 11b = Not Available
4597	Joystick 6 Theta-Axis Clockwise Positive Position Status	Reports when the current joystick position is on the positive travel side (forward, right, clockwise, up) relative to the neutral position for that axis of travel.00b = Not on Positive side of Neutral 01b = On positive side of Neutral 10b = Error Indicator 11b = Not Available
4598	Joystick 6 Theta-Axis Position	The position of the joystick in the relative motion of travel from the neutral position. Position value of 0 is Neutral and position value 1000 (100%) is the end of linear zone. Value of 1022 indicates an error has occurred.
4599	Joystick 6 Theta-Axis Detent Position Status	Reports when the current joystick position is in the detent position for that axis of travel. 00b = Not in the Detent Position 01b = In the Detent Position 10b = Error Indicator 11b = Not Available
4600	Joystick 6 Grip Y-Axis Detent Position Status	Reports when the current joystick grip position is in the detent position for that axis of travel. 00b = Not in the Detent Position 01b = In the Detent Position 10b = Error Indicator 11b = Not Available

4601	Joystick 6 Grip X-Axis Detent Position Status	Reports when the current joystick grip position is in the detent position for that axis of travel. 00b = Not in the Detent Position 01b = In the Detent Position 10b = Error Indicator 11b = Not Available
4602	Joystick 7 X-Axis Neutral Position Status	Reports when the current joystick position is in the neutral position for that axis of travel. The neutral position measurement must be determined from some mechanism other than the axis position measurement device.00b = Not in Neutral Position 01b = In Neutral Position 10b = Error Indicator 11b = Not Available
4603	Joystick 7 X-Axis Lever Left Negative Position Status	Reports when the current joystick position is on the negative travel side (back, left, counterclockwise, down) relative to the neutral position for that axis of travel.00b = Not on negative side of Neutral 01b = On negative side of Neutral 10b = Error Indicator 11b = Not Available
4604	Joystick 7 X-Axis Lever Right Positive Position Status	Reports when the current joystick position is on the positive travel side (forward, right, clockwise, up) relative to the neutral position for that axis of travel.00b = Not on Positive side of Neutral 01b = On positive side of Neutral 10b = Error Indicator 11b = Not Available
4605	Joystick 7 X-Axis Position	The position of the joystick in the relative motion of travel from the neutral position. Position value of 0 is Neutral and position value 1000 (100%) is the end of linear zone. Value of 1022 indicates an error has occurred.
4606	Joystick 7 Y-Axis Neutral Position Status	Reports when the current joystick position is in the neutral position for that axis of travel. The neutral position measurement must be determined from some mechanism other than the axis position measurement device.00b = Not in Neutral Position 01b = In Neutral Position 10b = Error Indicator 11b = Not Available
4607	Joystick 7 Y-Axis Lever Back Negative Position Status	Reports when the current joystick position is on the negative travel side (back, left, counterclockwise, down) relative to the neutral position for that axis of travel.00b = Not on negative side of Neutral 01b = On negative side of Neutral 10b = Error Indicator 11b = Not Available

4608	Joystick 7 Y-Axis Lever Forward Positive Position Status	Reports when the current joystick position is on the positive travel side (forward, right, clockwise, up) relative to the neutral position for that axis of travel.00b = Not on Positive side of Neutral 01b = On positive side of Neutral 10b = Error Indicator 11b = Not Available
4609	Joystick 7 Y-Axis Position	The position of the joystick in the relative motion of travel from the neutral position. Position value of 0 is Neutral and position value 1000 (100%) is the end of linear zone. Value of 1022 indicates an error has occurred.
4610	Joystick 7 Y-Axis Detent Position Status	Reports when the current joystick position is in the detent position for that axis of travel. 00b = Not in the Detent Position 01b = In the Detent Position 10b = Error Indicator 11b = Not Available
4611	Joystick 7 X-Axis Detent Position Status	Reports when the current joystick position is in the detent position for that axis of travel. 00b = Not in the Detent Position 01b = In the Detent Position 10b = Error Indicator 11b = Not Available
4612	Joystick 7 Button 4 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4613	Joystick 7 Button 3 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4614	Joystick 7 Button 2 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4615	Joystick 7 Button 1 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4616	Joystick 7 Button 8 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available

4617	Joystick 7 Button 7 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4618	Joystick 7 Button 6 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4619	Joystick 7 Button 5 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4620	Joystick 7 Button 12 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4621	Joystick 7 Button 11 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4622	Joystick 7 Button 10 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4623	Joystick 7 Button 9 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4624	Joystick 7 Grip X-Axis Neutral Position Status	Reports when the current joystick grip position is in the neutral position for that axis of travel. The neutral position measurement must be determined from some mechanism other than the axis position measurement device.00b = Not in Neutral Position 01b = In Neutral Position 10b = Error Indicator 11b = Not Available
4625	Joystick 7 Grip X-Axis Lever Left Negative Position Status	Reports when the current joystick grip position is on the negative travel side (back, left, counterclockwise, down) relative to the neutral position for that axis of travel.00b = Not on negative side of Neutral 01b = On negative side of Neutral 10b = Error Indicator 11b = Not Available
4626	Joystick 7 Grip X-Axis Lever Right Positive Position Status	Reports when the current joystick grip position is on the positive travel side (forward, right, clockwise, up) relative to the neutral position for that axis of travel.00b = Not

		on Positive side of Neutral 01b = On positive side of Neutral 10b = Error Indicator 11b = Not Available
4627	Joystick 7 Grip X-Axis Position	The position of the joystick grip in the relative motion of travel from the neutral position. Position value of 0 is Neutral and position value 1000 (100%) is the end of linear zone. Value of 1022 indicates an error has occurred.
4628	Joystick 7 Grip Y-Axis Neutral Position Status	Reports when the current joystick grip position is in the neutral position for that axis of travel. The neutral position measurement must be determined from some mechanism other than the axis position measurement device.00b = Not in Neutral Position 01b = In Neutral Position 10b = Error Indicator 11b = Not Available
4629	Joystick 7 Grip Y-Axis Lever Back Negative Position Status	Reports when the current joystick grip position is on the negative travel side (back, left, counterclockwise, down) relative to the neutral position for that axis of travel.00b = Not on negative side of Neutral 01b = On negative side of Neutral 10b = Error Indicator 11b = Not Available
4630	Joystick 7 Grip Y-Axis Lever Forward Positive Position Status	Reports when the current joystick grip position is on the positive travel side (forward, right, clockwise, up) relative to the neutral position for that axis of travel.00b = Not on Positive side of Neutral 01b = On positive side of Neutral 10b = Error Indicator 11b = Not Available
4631	Joystick 7 Grip Y-Axis Position	The position of the joystick grip in the relative motion of travel from the neutral position. Position value of 0 is Neutral and position value 1000 (100%) is the end of linear zone. Value of 1022 indicates an error has occurred.
4632	Joystick 7 Theta-Axis Neutral Position Status	Reports when the current joystick position is in the neutral position for that axis of travel. The neutral position measurement must be determined from some mechanism other than the axis position measurement device.00b = Not in Neutral Position 01b = In Neutral Position 10b = Error Indicator 11b = Not Available
4633	Joystick 7 Theta-Axis Counter Clockwise Negative Position Status	Reports when the current joystick position is on the negative travel side (back, left, counterclockwise, down) relative to the neutral position for that axis of travel.00b =

		Not on negative side of Neutral 01b = On negative side of Neutral 10b = Error Indicator 11b = Not Available
4634	Joystick 7 Theta-Axis Clockwise Positive Position Status	Reports when the current joystick position is on the positive travel side (forward, right, clockwise, up) relative to the neutral position for that axis of travel.00b = Not on Positive side of Neutral 01b = On positive side of Neutral 10b = Error Indicator 11b = Not Available
4635	Joystick 7 Theta-Axis Position	The position of the joystick in the relative motion of travel from the neutral position. Position value of 0 is Neutral and position value 1000 (100%) is the end of linear zone. Value of 1022 indicates an error has occurred.
4636	Joystick 7 Theta-Axis Detent Position Status	Reports when the current joystick position is in the detent position for that axis of travel. 00b = Not in the Detent Position 01b = In the Detent Position 10b = Error Indicator 11b = Not Available
4637	Joystick 7 Grip Y-Axis Detent Position Status	Reports when the current joystick grip position is in the detent position for that axis of travel. 00b = Not in the Detent Position 01b = In the Detent Position 10b = Error Indicator 11b = Not Available
4638	Joystick 7 Grip X-Axis Detent Position Status	Reports when the current joystick grip position is in the detent position for that axis of travel. 00b = Not in the Detent Position 01b = In the Detent Position 10b = Error Indicator 11b = Not Available
4639	Joystick 8 X-Axis Neutral Position Status	Reports when the current joystick position is in the neutral position for that axis of travel. The neutral position measurement must be determined from some mechanism other than the axis position measurement device.00b = Not in Neutral Position 01b = In Neutral Position 10b = Error Indicator 11b = Not Available
4640	Joystick 8 X-Axis Lever Left Negative Position Status	Reports when the current joystick position is on the negative travel side (back, left, counterclockwise, down) relative to the neutral position for that axis of travel.00b = Not on negative side of Neutral 01b = On negative side of Neutral 10b = Error Indicator 11b = Not Available

4641	Joystick 8 X-Axis Lever Right Positive Position Status	Reports when the current joystick position is on the positive travel side (forward, right, clockwise, up) relative to the neutral position for that axis of travel.00b = Not on Positive side of Neutral 01b = On positive side of Neutral 10b = Error Indicator 11b = Not Available
4642	Joystick 8 X-Axis Position	The position of the joystick in the relative motion of travel from the neutral position. Position value of 0 is Neutral and position value 1000 (100%) is the end of linear zone. Value of 1022 indicates an error has occurred.
4643	Joystick 8 Y-Axis Neutral Position Status	Reports when the current joystick position is in the neutral position for that axis of travel. The neutral position measurement must be determined from some mechanism other than the axis position measurement device.00b = Not in Neutral Position 01b = In Neutral Position 10b = Error Indicator 11b = Not Available
4644	Joystick 8 Y-Axis Lever Back Negative Position Status	Reports when the current joystick position is on the negative travel side (back, left, counterclockwise, down) relative to the neutral position for that axis of travel.00b = Not on negative side of Neutral 01b = On negative side of Neutral 10b = Error Indicator 11b = Not Available
4645	Joystick 8 Y-Axis Lever Forward Positive Position Status	Reports when the current joystick position is on the positive travel side (forward, right, clockwise, up) relative to the neutral position for that axis of travel.00b = Not on Positive side of Neutral 01b = On positive side of Neutral 10b = Error Indicator 11b = Not Available
4646	Joystick 8 Y-Axis Position	The position of the joystick in the relative motion of travel from the neutral position. Position value of 0 is Neutral and position value 1000 (100%) is the end of linear zone. Value of 1022 indicates an error has occurred.
4647	Joystick 8 Y-Axis Detent Position Status	Reports when the current joystick position is in the detent position for that axis of travel. 00b = Not in the Detent Position 01b = In the Detent Position 10b = Error Indicator 11b = Not Available

4648	Joystick 8 X-Axis Detent Position Status	Reports when the current joystick position is in the detent position for that axis of travel. 00b = Not in the Detent Position 01b = In the Detent Position 10b = Error Indicator 11b = Not Available
4649	Joystick 8 Button 4 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4650	Joystick 8 Button 3 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4651	Joystick 8 Button 2 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4652	Joystick 8 Button 1 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4653	Joystick 8 Button 8 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4654	Joystick 8 Button 7 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4655	Joystick 8 Button 6 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4656	Joystick 8 Button 5 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4657	Joystick 8 Button 12 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available

4658	Joystick 8 Button 11 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4659	Joystick 8 Button 10 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4660	Joystick 8 Button 9 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4661	Joystick 8 Grip X-Axis Neutral Position Status	Reports when the current joystick grip position is in the neutral position for that axis of travel. The neutral position measurement must be determined from some mechanism other than the axis position measurement device.00b = Not in Neutral Position 01b = In Neutral Position 10b = Error Indicator 11b = Not Available
4662	Joystick 8 Grip X-Axis Lever Left Negative Position Status	Reports when the current joystick grip position is on the negative travel side (back, left, counterclockwise, down) relative to the neutral position for that axis of travel.00b = Not on negative side of Neutral 01b = On negative side of Neutral 10b = Error Indicator 11b = Not Available
4663	Joystick 8 Grip X-Axis Lever Right Positive Position Status	Reports when the current joystick grip position is on the positive travel side (forward, right, clockwise, up) relative to the neutral position for that axis of travel.00b = Not on Positive side of Neutral 01b = On positive side of Neutral 10b = Error Indicator 11b = Not Available
4664	Joystick 8 Grip X-Axis Position	The position of the joystick grip in the relative motion of travel from the neutral position. Position value of 0 is Neutral and position value 1000 (100%) is the end of linear zone. Value of 1022 indicates an error has occurred.
4665	Joystick 8 Grip Y-Axis Neutral Position Status	Reports when the current joystick grip position is in the neutral position for that axis of travel. The neutral position measurement must be determined from some mechanism other than the axis position measurement device.00b = Not in Neutral Position 01b = In Neutral Position 10b = Error Indicator 11b = Not Available

4666	Joystick 8 Grip Y-Axis Lever Back Negative Position Status	Reports when the current joystick grip position is on the negative travel side (back, left, counterclockwise, down) relative to the neutral position for that axis of travel.00b = Not on negative side of Neutral 01b = On negative side of Neutral 10b = Error Indicator 11b = Not Available
4667	Joystick 8 Grip Y-Axis Lever Forward Positive Position Status	Reports when the current joystick grip position is on the positive travel side (forward, right, clockwise, up) relative to the neutral position for that axis of travel.00b = Not on Positive side of Neutral 01b = On positive side of Neutral 10b = Error Indicator 11b = Not Available
4668	Joystick 8 Grip Y-Axis Position	The position of the joystick grip in the relative motion of travel from the neutral position. Position value of 0 is Neutral and position value 1000 (100%) is the end of linear zone. Value of 1022 indicates an error has occurred.
4669	Joystick 8 Theta-Axis Neutral Position Status	Reports when the current joystick position is in the neutral position for that axis of travel. The neutral position measurement must be determined from some mechanism other than the axis position measurement device.00b = Not in Neutral Position 01b = In Neutral Position 10b = Error Indicator 11b = Not Available
4670	Joystick 8 Theta-Axis Counter Clockwise Negative Position Status	Reports when the current joystick position is on the negative travel side (back, left, counterclockwise, down) relative to the neutral position for that axis of travel.00b = Not on negative side of Neutral 01b = On negative side of Neutral 10b = Error Indicator 11b = Not Available
4671	Joystick 8 Theta-Axis Clockwise Positive Position Status	Reports when the current joystick position is on the positive travel side (forward, right, clockwise, up) relative to the neutral position for that axis of travel.00b = Not on Positive side of Neutral 01b = On positive side of Neutral 10b = Error Indicator 11b = Not Available
4672	Joystick 8 Theta-Axis Position	The position of the joystick in the relative motion of travel from the neutral position. Position value of 0 is Neutral and position value 1000 (100%) is the end of linear zone. Value of 1022 indicates an error has occurred.

4673	Joystick 8 Theta-Axis Detent Position Status	Reports when the current joystick position is in the detent position for that axis of travel. 00b = Not in the Detent Position 01b = In the Detent Position 10b = Error Indicator 11b = Not Available
4674	Joystick 8 Grip Y-Axis Detent Position Status	Reports when the current joystick grip position is in the detent position for that axis of travel. 00b = Not in the Detent Position 01b = In the Detent Position 10b = Error Indicator 11b = Not Available
4675	Joystick 8 Grip X-Axis Detent Position Status	Reports when the current joystick grip position is in the detent position for that axis of travel. 00b = Not in the Detent Position 01b = In the Detent Position 10b = Error Indicator 11b = Not Available
4676	Joystick 9 X-Axis Neutral Position Status	Reports when the current joystick position is in the neutral position for that axis of travel. The neutral position measurement must be determined from some mechanism other than the axis position measurement device.00b = Not in Neutral Position 01b = In Neutral Position 10b = Error Indicator 11b = Not Available
4677	Joystick 9 X-Axis Lever Left Negative Position Status	Reports when the current joystick position is on the negative travel side (back, left, counterclockwise, down) relative to the neutral position for that axis of travel.00b = Not on negative side of Neutral 01b = On negative side of Neutral 10b = Error Indicator 11b = Not Available
4678	Joystick 9 X-Axis Lever Right Positive Position Status	Reports when the current joystick position is on the positive travel side (forward, right, clockwise, up) relative to the neutral position for that axis of travel.00b = Not on Positive side of Neutral 01b = On positive side of Neutral 10b = Error Indicator 11b = Not Available
4679	Joystick 9 X-Axis Position	The position of the joystick in the relative motion of travel from the neutral position. Position value of 0 is Neutral and position value 1000 (100%) is the end of linear zone. Value of 1022 indicates an error has occurred.
4680	Joystick 9 Y-Axis Neutral Position Status	Reports when the current joystick position is in the neutral position for that axis of travel. The neutral position measurement must be determined from some mechanism

		other than the axis position measurement device.00b = Not in Neutral Position 01b = In Neutral Position 10b = Error Indicator 11b = Not Available
4681	Joystick 9 Y-Axis Lever Back Negative Position Status	Reports when the current joystick position is on the negative travel side (back, left, counterclockwise, down) relative to the neutral position for that axis of travel.00b = Not on negative side of Neutral 01b = On negative side of Neutral 10b = Error Indicator 11b = Not Available
4682	Joystick 9 Y-Axis Lever Forward Positive Position Status	Reports when the current joystick position is on the positive travel side (forward, right, clockwise, up) relative to the neutral position for that axis of travel.00b = Not on Positive side of Neutral 01b = On positive side of Neutral 10b = Error Indicator 11b = Not Available
4683	Joystick 9 Y-Axis Position	The position of the joystick in the relative motion of travel from the neutral position. Position value of 0 is Neutral and position value 1000 (100%) is the end of linear zone. Value of 1022 indicates an error has occurred.
4684	Joystick 9 Y-Axis Detent Position Status	Reports when the current joystick position is in the detent position for that axis of travel. 00b = Not in the Detent Position 01b = In the Detent Position 10b = Error Indicator 11b = Not Available
4685	Joystick 9 X-Axis Detent Position Status	Reports when the current joystick position is in the detent position for that axis of travel. 00b = Not in the Detent Position 01b = In the Detent Position 10b = Error Indicator 11b = Not Available
4686	Joystick 9 Button 4 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4687	Joystick 9 Button 3 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4688	Joystick 9 Button 2 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available

4689	Joystick 9 Button 1 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4690	Joystick 9 Button 8 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4691	Joystick 9 Button 7 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4692	Joystick 9 Button 6 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4693	Joystick 9 Button 5 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4694	Joystick 9 Button 12 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4695	Joystick 9 Button 11 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4696	Joystick 9 Button 10 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4697	Joystick 9 Button 9 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4698	Joystick 9 Grip X-Axis Neutral Position Status	Reports when the current joystick grip position is in the neutral position for that axis of travel. The neutral position measurement must be determined from some mechanism other than the axis position measurement device.00b = Not in Neutral Position 01b = In Neutral Position 10b = Error Indicator 11b = Not Available

4699	Joystick 9 Grip X-Axis Lever Left Negative Position Status	Reports when the current joystick grip position is on the negative travel side (back, left, counterclockwise, down) relative to the neutral position for that axis of travel.00b = Not on negative side of Neutral 01b = On negative side of Neutral 10b = Error Indicator 11b = Not Available
4700	Joystick 9 Grip X-Axis Lever Right Positive Position Status	Reports when the current joystick grip position is on the positive travel side (forward, right, clockwise, up) relative to the neutral position for that axis of travel.00b = Not on Positive side of Neutral 01b = On positive side of Neutral 10b = Error Indicator 11b = Not Available
4701	Joystick 9 Grip X-Axis Position	The position of the joystick grip in the relative motion of travel from the neutral position. Position value of 0 is Neutral and position value 1000 (100%) is the end of linear zone. Value of 1022 indicates an error has occurred.
4702	Joystick 9 Grip Y-Axis Neutral Position Status	Reports when the current joystick grip position is in the neutral position for that axis of travel. The neutral position measurement must be determined from some mechanism other than the axis position measurement device.00b = Not in Neutral Position 01b = In Neutral Position 10b = Error Indicator 11b = Not Available
4703	Joystick 9 Grip Y-Axis Lever Back Negative Position Status	Reports when the current joystick grip position is on the negative travel side (back, left, counterclockwise, down) relative to the neutral position for that axis of travel.00b = Not on negative side of Neutral 01b = On negative side of Neutral 10b = Error Indicator 11b = Not Available
4704	Joystick 9 Grip Y-Axis Lever Forward Positive Position Status	Reports when the current joystick grip position is on the positive travel side (forward, right, clockwise, up) relative to the neutral position for that axis of travel.00b = Not on Positive side of Neutral 01b = On positive side of Neutral 10b = Error Indicator 11b = Not Available
4705	Joystick 9 Grip Y-Axis Position	The position of the joystick grip in the relative motion of travel from the neutral position. Position value of 0 is Neutral and position value 1000 (100%) is the end of linear zone. Value of 1022 indicates an error has occurred.

4706	Joystick 9 Theta-Axis Neutral Position Status	Reports when the current joystick position is in the neutral position for that axis of travel. The neutral position measurement must be determined from some mechanism other than the axis position measurement device.00b = Not in Neutral Position 01b = In Neutral Position 10b = Error Indicator 11b = Not Available
4707	Joystick 9 Theta-Axis Counter Clockwise Negative Position Status	Reports when the current joystick position is on the negative travel side (back, left, counterclockwise, down) relative to the neutral position for that axis of travel.00b = Not on negative side of Neutral 01b = On negative side of Neutral 10b = Error Indicator 11b = Not Available
4708	Joystick 9 Theta-Axis Clockwise Positive Position Status	Reports when the current joystick position is on the positive travel side (forward, right, clockwise, up) relative to the neutral position for that axis of travel.00b = Not on Positive side of Neutral 01b = On positive side of Neutral 10b = Error Indicator 11b = Not Available
4709	Joystick 9 Theta-Axis Position	The position of the joystick in the relative motion of travel from the neutral position. Position value of 0 is Neutral and position value 1000 (100%) is the end of linear zone. Value of 1022 indicates an error has occurred.
4710	Joystick 9 Theta-Axis Detent Position Status	Reports when the current joystick position is in the detent position for that axis of travel. 00b = Not in the Detent Position 01b = In the Detent Position 10b = Error Indicator 11b = Not Available
4711	Joystick 9 Grip Y-Axis Detent Position Status	Reports when the current joystick grip position is in the detent position for that axis of travel. 00b = Not in the Detent Position 01b = In the Detent Position 10b = Error Indicator 11b = Not Available
4712	Joystick 9 Grip X-Axis Detent Position Status	Reports when the current joystick grip position is in the detent position for that axis of travel. 00b = Not in the Detent Position 01b = In the Detent Position 10b = Error Indicator 11b = Not Available
4713	Joystick 10 X-Axis Neutral Position Status	Reports when the current joystick position is in the neutral position for that axis of travel. The neutral position measurement must be determined from some mechanism

		other than the axis position measurement device.00b = Not in Neutral Position 01b = In Neutral Position 10b = Error Indicator 11b = Not Available
4714	Joystick 10 X-Axis Lever Left Negative Position Status	Reports when the current joystick position is on the negative travel side (back, left, counterclockwise, down) relative to the neutral position for that axis of travel.00b = Not on negative side of Neutral 01b = On negative side of Neutral 10b = Error Indicator 11b = Not Available
4715	Joystick 10 X-Axis Lever Right Positive Position Status	Reports when the current joystick position is on the positive travel side (forward, right, clockwise, up) relative to the neutral position for that axis of travel.00b = Not on Positive side of Neutral 01b = On positive side of Neutral 10b = Error Indicator 11b = Not Available
4716	Joystick 10 X-Axis Position	The position of the joystick in the relative motion of travel from the neutral position. Position value of 0 is Neutral and position value 1000 (100%) is the end of linear zone. Value of 1022 indicates an error has occurred.
4717	Joystick 10 Y-Axis Neutral Position Status	Reports when the current joystick position is in the neutral position for that axis of travel. The neutral position measurement must be determined from some mechanism other than the axis position measurement device.00b = Not in Neutral Position 01b = In Neutral Position 10b = Error Indicator 11b = Not Available
4718	Joystick 10 Y-Axis Lever Back Negative Position Status	Reports when the current joystick position is on the negative travel side (back, left, counterclockwise, down) relative to the neutral position for that axis of travel.00b = Not on negative side of Neutral 01b = On negative side of Neutral 10b = Error Indicator 11b = Not Available
4719	Joystick 10 Y-Axis Lever Forward Positive Position Status	Reports when the current joystick position is on the positive travel side (forward, right, clockwise, up) relative to the neutral position for that axis of travel.00b = Not on Positive side of Neutral 01b = On positive side of Neutral 10b = Error Indicator 11b = Not Available

4720	Joystick 10 Y-Axis Position	The position of the joystick in the relative motion of travel from the neutral position. Position value of 0 is Neutral and position value 1000 (100%) is the end of linear zone. Value of 1022 indicates an error has occurred.
4721	Joystick 10 Y-Axis Detent Position Status	Reports when the current joystick position is in the detent position for that axis of travel. 00b = Not in the Detent Position 01b = In the Detent Position 10b = Error Indicator 11b = Not Available
4722	Joystick 10 X-Axis Detent Position Status	Reports when the current joystick position is in the detent position for that axis of travel. 00b = Not in the Detent Position 01b = In the Detent Position 10b = Error Indicator 11b = Not Available
4723	Joystick 10 Button 4 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4724	Joystick 10 Button 3 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4725	Joystick 10 Button 2 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4726	Joystick 10 Button 1 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4727	Joystick 10 Button 8 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4728	Joystick 10 Button 7 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4729	Joystick 10 Button 6 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available

4730	Joystick 10 Button 5 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4731	Joystick 10 Button 12 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4732	Joystick 10 Button 11 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4733	Joystick 10 Button 10 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4734	Joystick 10 Button 9 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
4735	Joystick 10 Grip X-Axis Neutral Position Status	Reports when the current joystick grip position is in the neutral position for that axis of travel. The neutral position measurement must be determined from some mechanism other than the axis position measurement device.00b = Not in Neutral Position 01b = In Neutral Position 10b = Error Indicator 11b = Not Available
4736	Joystick 10 Grip X-Axis Lever Left Negative Position Status	Reports when the current joystick grip position is on the negative travel side (back, left, counterclockwise, down) relative to the neutral position for that axis of travel.00b = Not on negative side of Neutral 01b = On negative side of Neutral 10b = Error Indicator 11b = Not Available
4737	Joystick 10 Grip X-Axis Lever Right Positive Position Status	Reports when the current joystick grip position is on the positive travel side (forward, right, clockwise, up) relative to the neutral position for that axis of travel.00b = Not on Positive side of Neutral 01b = On positive side of Neutral 10b = Error Indicator 11b = Not Available
4738	Joystick 10 Grip X-Axis Position	The position of the joystick grip in the relative motion of travel from the neutral position. Position value of 0 is Neutral and position value 1000 (100%) is the end of linear zone. Value of 1022 indicates an error has occurred.

4739	Joystick 10 Grip Y-Axis Neutral Position Status	Reports when the current joystick grip position is in the neutral position for that axis of travel. The neutral position measurement must be determined from some mechanism other than the axis position measurement device.00b = Not in Neutral Position 01b = In Neutral Position 10b = Error Indicator 11b = Not Available
4740	Joystick 10 Grip Y-Axis Lever Back Negative Position Status	Reports when the current joystick grip position is on the negative travel side (back, left, counterclockwise, down) relative to the neutral position for that axis of travel.00b = Not on negative side of Neutral 01b = On negative side of Neutral 10b = Error Indicator 11b = Not Available
4741	Joystick 10 Grip Y-Axis Lever Forward Positive Position Status	Reports when the current joystick grip position is on the positive travel side (forward, right, clockwise, up) relative to the neutral position for that axis of travel.00b = Not on Positive side of Neutral 01b = On positive side of Neutral 10b = Error Indicator 11b = Not Available
4742	Joystick 10 Grip Y-Axis Position	The position of the joystick grip in the relative motion of travel from the neutral position. Position value of 0 is Neutral and position value 1000 (100%) is the end of linear zone. Value of 1022 indicates an error has occurred.
4743	Joystick 10 Theta-Axis Neutral Position Status	Reports when the current joystick position is in the neutral position for that axis of travel. The neutral position measurement must be determined from some mechanism other than the axis position measurement device.00b = Not in Neutral Position 01b = In Neutral Position 10b = Error Indicator 11b = Not Available
4744	Joystick 10 Theta-Axis Counter Clockwise Negative Position Status	Reports when the current joystick position is on the negative travel side (back, left, counterclockwise, down) relative to the neutral position for that axis of travel.00b = Not on negative side of Neutral 01b = On negative side of Neutral 10b = Error Indicator 11b = Not Available
4745	Joystick 10 Theta-Axis Clockwise Positive Position Status	Reports when the current joystick position is on the positive travel side (forward, right, clockwise, up) relative to the neutral position for that axis of travel.00b = Not on Positive side of Neutral 01b = On positive side of Neutral 10b = Error Indicator 11b = Not Available

4746	Joystick 10 Theta-Axis Position	The position of the joystick in the relative motion of travel from the neutral position. Position value of 0 is Neutral and position value 1000 (100%) is the end of linear zone. Value of 1022 indicates an error has occurred.
4747	Joystick 10 Theta-Axis Detent Position Status	Reports when the current joystick position is in the detent position for that axis of travel. 00b = Not in the Detent Position 01b = In the Detent Position 10b = Error Indicator 11b = Not Available
4748	Joystick 10 Grip Y-Axis Detent Position Status	Reports when the current joystick grip position is in the detent position for that axis of travel. 00b = Not in the Detent Position 01b = In the Detent Position 10b = Error Indicator 11b = Not Available
4749	Joystick 10 Grip X-Axis Detent Position Status	Reports when the current joystick grip position is in the detent position for that axis of travel. 00b = Not in the Detent Position 01b = In the Detent Position 10b = Error Indicator 11b = Not Available
4750	Engine Exhaust Gas Recirculation 1 Cooler Intake Temperature	Exhaust Gas Recirculation (EGR) Temperature measured at the EGR cooler intake. See SPN 412 for Engine EGR temperature which is typically measured at the EGR cooler outlet.
4751	Engine Exhaust Gas Recirculation 1 Cooler Intake Absolute Pressure	Exhaust gas recirculation absolute pressure is measured at the EGR cooler intake. See SPN 3358 for EGR pressure measured at the EGR cooler outlet before the valve.
4752	Engine Exhaust Gas Recirculation 1 Cooler Efficiency	Exhaust Gas Recirculation cooler efficiency is an indication of the cooler's ability to reduce the temperature of the exhaust gas that is being recirculated back to the intake. 0% = no reduction in temperature, 100% = maximum cooling. The EGR cooler efficiency is calculated as (EGR cooler intake temperature minus EGR gas temperature) divided by (EGR cooler intake temperature minus engine coolant temperature).
4753	Aftertreatment 1 Gas Oxidation Catalyst Intake Temperature	Temperature of engine combustion byproducts entering the gas oxidation catalyst in exhaust bank 1. This parameter should be used with engines fueled by gaseous fuel

		like natural gas or propane. A separate parameter has been defined for diesel fueled engines.
4754	Aftertreatment 1 Gas Oxidation Catalyst Outlet Temperature	Temperature of engine combustion byproducts leaving the gas oxidation catalyst in exhaust bank 1. This parameter should be used with engines fueled by gaseous fuel like natural gas or propane. A separate parameter has been defined for diesel fueled engines
4755	Aftertreatment 1 Gas Oxidation Catalyst Differential Pressure	Exhaust differential pressure measured between the intake and exhaust of the gas oxidation catalyst in exhaust bank 1. This parameter should be used with engines fueled by gaseous fuel like natural gas or propane. A separate parameter has been defined for diesel fueled engines.
4756	Aftertreatment 1 Gas Oxidation Catalyst Intake Temperature Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the gas oxidation catalyst intake temperature sensor by the manufacturer's sensor control software in exhaust bank 1. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported. This parameter should be used with engines fueled by gaseous fuel like natural gas or propane. A separate parameter has been defined for diesel fueled engines.
4757	Aftertreatment 1 Gas Oxidation Catalyst Outlet Temperature Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the gas oxidation catalyst outlet temperature sensor by the manufacturer's sensor control software in exhaust bank 1. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported. This parameter should be used with engines fueled by gaseous fuel like natural gas or propane. A separate parameter has been defined for diesel fueled engines.
4758	Aftertreatment 1 Gas Oxidation Catalyst Differential Pressure Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the gas oxidation catalyst differential pressure sensor by the manufacturer's sensor control software in exhaust bank 1. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not

		supported. This parameter should be used with engines fueled by gaseous fuel like natural gas or propane. A separate parameter has been defined for diesel fueled engines.
4759	Aftertreatment 2 Gas Oxidation Catalyst Intake Temperature	Temperature of engine combustion byproducts entering the gas oxidation catalyst in exhaust bank 2. This parameter should be used with engines fueled by gaseous fuel like natural gas or propane. A separate parameter has been defined for diesel fueled engines.
4760	Aftertreatment 2 Gas Oxidation Catalyst Outlet Temperature	Temperature of engine combustion byproducts leaving the gas oxidation catalyst in exhaust bank 2. This parameter should be used with engines fueled by gaseous fuel like natural gas or propane. A separate parameter has been defined for diesel fueled engines
4761	Aftertreatment 2 Gas Oxidation Catalyst Differential Pressure	Exhaust differential pressure measured between the intake and exhaust of the gas oxidation catalyst in exhaust bank 2. This parameter should be used with engines fueled by gaseous fuel like natural gas or propane. A separate parameter has been defined for diesel fueled engines.
4762	Aftertreatment 2 Gas Oxidation Catalyst Intake Temperature Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the gas oxidation catalyst intake gas temperature sensor by the manufacturer's sensor control software in exhaust bank 2. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported. This parameter should be used with engines fueled by gaseous fuel like natural gas or propane. A separate parameter has been defined for diesel fueled engines.
4763	Aftertreatment 2 Gas Oxidation Catalyst Outlet Temperature Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the gas oxidation catalyst outlet gas temperature sensor by the manufacturer's sensor control software in exhaust bank 2. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported. This parameter should be used with engines fueled by gaseous fuel like

		natural gas or propane. A separate parameter has been defined for diesel fueled engines.
4764	Aftertreatment 2 Gas Oxidation Catalyst Differential Pressure Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the gas oxidation catalyst differential pressure sensor by the manufacturer's sensor control software in exhaust bank 2. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported. This parameter should be used with engines fueled by gaseous fuel like natural gas or propane. A separate parameter has been defined for diesel fueled engines.
4765	Aftertreatment 1 Diesel Oxidation Catalyst Intake Temperature	Temperature of engine combustion byproducts entering the diesel oxidation catalyst in exhaust bank 1. This parameter should be used with engines fueled by diesel fuel (not gaseous fuel like natural gas or propane). A separate parameter has been defined for gas fueled engines.
4766	Aftertreatment 1 Diesel Oxidation Catalyst Outlet Temperature	Temperature of engine combustion byproducts leaving the diesel oxidation catalyst exhaust in exhaust bank 1. This parameter should be used with engines fueled by diesel fuel (not gaseous fuel like natural gas or propane). A separate parameter has been defined for gas fueled engines.
4767	Aftertreatment 1 Diesel Oxidation Catalyst Differential Pressure	Exhaust differential pressure measured between the intake and exhaust of a diesel oxidation catalyst in exhaust bank 1. This parameter should be used with engines fueled by diesel fuel (not gaseous fuel like natural gas or propane). A separate parameter has been defined for gas fueled engines.
4768	Aftertreatment 1 Diesel Oxidation Catalyst Intake Temperature Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the diesel oxidation catalyst intake temperature sensor by the manufacturer's sensor control software in exhaust bank 1. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported. This parameter should be used with engines fueled by diesel fuel (not gaseous fuel like natural gas or propane). A separate parameter has been defined for gas fueled engines.

4769	Aftertreatment 1 Diesel Oxidation Catalyst Outlet Temperature Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the diesel oxidation catalyst outlet gas temperature sensor by the manufacturer's sensor control software in exhaust bank 1. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported. This parameter should be used with engines fueled by gaseous fuel like natural gas or propane. A separate parameter has been defined for diesel fueled engines.
4770	Aftertreatment 1 Diesel Oxidation Catalyst Differential Pressure Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the diesel oxidation catalyst differential pressure sensor by the manufacturer's sensor control software in exhaust bank 1. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported. This parameter should be used with engines fueled by diesel fuel (not gaseous fuel like natural gas or propane). A separate parameter has been defined for gas fueled engines.
4771	Aftertreatment 2 Diesel Oxidation Catalyst Intake Temperature	Temperature of engine combustion byproducts entering the diesel oxidation catalyst in exhaust bank 2. This parameter should be used with engines fueled by diesel fuel (not gaseous fuel like natural gas or propane). A separate parameter has been defined for gas fueled engines.
4772	Aftertreatment 2 Diesel Oxidation Catalyst Outlet Temperature	Temperature of engine combustion byproducts leaving the diesel oxidation catalyst exhaust in exhaust bank 2. This parameter should be used with engines fueled by diesel fuel (not gaseous fuel like natural gas or propane). A separate parameter has been defined for gas fueled engines.
4773	Aftertreatment 2 Diesel Oxidation Catalyst Differential Pressure	Exhaust differential pressure measured between the intake and exhaust of a diesel oxidation catalyst in exhaust bank 2. This parameter should be used with engines fueled by diesel fuel (not gaseous fuel like natural gas or propane). A separate parameter has been defined for gas fueled engines.

4774	Aftertreatment 2 Diesel Oxidation Catalyst Intake Temperature Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the diesel oxidation catalyst intake temperature sensor by the manufacturer's sensor control software in exhaust bank 2. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported. This parameter should be used with engines fueled by diesel fuel (not gaseous fuel like natural gas or propane). A separate parameter has been defined for gas fueled engines.
4775	Aftertreatment 2 Diesel Oxidation Catalyst Outlet Temperature Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the diesel oxidation catalyst outlet gas temperature sensor by the manufacturer's sensor control software in exhaust bank 2. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported. This parameter should be used with engines fueled by gaseous fuel like natural gas or propane. A separate parameter has been defined for diesel fueled engines.
4776	Aftertreatment 2 Diesel Oxidation Catalyst Differential Pressure Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the diesel oxidation catalyst differential pressure sensor by the manufacturer's sensor control software in exhaust bank 2. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported. This parameter should be used with engines fueled by diesel fuel (not gaseous fuel like natural gas or propane). A separate parameter has been defined for gas fueled engines.
4777	Aftertreatment 1 Gas Oxidation Catalyst Differential Temperature	The differential engine combustion byproducts gas temperature measured between the intake and outlet of the gas oxidation catalyst for exhaust bank 1. This parameter should be used with engine fueled by gaseous fuel like natural gas or propane. Diesel engines should not use this parameter.
4778	Aftertreatment 2 Gas Oxidation Catalyst Differential Temperature	The differential engine combustion byproducts gas temperature measured between the intake and outlet of the gas oxidation catalyst for exhaust bank 2. This parameter should be used with engine fueled by gaseous fuel like natural gas or propane. Diesel engines should not use this parameter.

4779	Aftertreatment 1 Three Way Catalyst Differential Temperature	The differential engine combustion byproducts gas temperature measured between the intake and outlet of the three way catalyst for exhaust bank 1.
4780	Aftertreatment 2 Three Way Catalyst Differential Temperature	The differential engine combustion byproducts gas temperature measured between the intake and outlet of the three way catalyst for exhaust bank 2.
4781	Aftertreatment 1 Diesel Particulate Filter Soot Mass	Soot mass in diesel particulate filter 1.
4782	Aftertreatment 1 Diesel Particulate Filter Soot Density	Soot density in diesel particulate filter 1.
4783	Aftertreatment 1 Diesel Particulate Filter Mean Soot Signal	Mean output signal level from diesel particulate filter 1 soot sensor.
4784	Aftertreatment 1 Diesel Particulate Filter Median Soot Signal	Median output signal level from diesel particulate filter 1 soot sensor.
4785	Aftertreatment 1 Diesel Particulate Filter Soot Sensor Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the soot sensor signal by the manufacturer’s sensor control software in diesel particulate filter 1. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
4786	Aftertreatment 2 Diesel Particulate Filter Soot Mass	Soot mass in diesel particulate filter 2.
4787	Aftertreatment 2 Diesel Particulate Filter Soot Density	Soot density in diesel particulate filter 2.
4788	Aftertreatment 2 Diesel Particulate Filter Mean Soot Signal	Mean output signal level from diesel particulate filter 2 soot sensor.

4789	Aftertreatment 2 Diesel Particulate Filter Median Soot Signal	Median output signal level from diesel particulate filter 2 soot sensor.
4790	Aftertreatment 2 Diesel Particulate Filter Soot Sensor Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the soot sensor signal by the manufacturer's sensor control software in diesel particulate filter 2. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
4791	Aftertreatment 1 Warm Up Diesel Oxidation Catalyst	Indicates non-specific failures of the warm up oxidation catalytic converter in exhaust bank 1, such as poor conversion efficiency or high temperature across the device.
4792	Aftertreatment 1 Selective Catalytic Reduction System	Indicates non-specific failures of the SCR in exhaust bank 1, such as high temperature across the device.
4793	Aftertreatment 1 Warm Up Diesel Oxidation Catalyst Missing	Indicates that the warm-up oxidation catalyic converter is missing in exhaust bank 1. SPN will be used with FMI 31 (Condition Exists) to indicate that this device is missing in exhaust bank 1.
4794	Aftertreatment 1 SCR System Missing	SPN will be used with FMI 31 (Condition Exists) to indicate that this device is missing in exhaust bank 1.
4795	Aftertreatment 1 Diesel Particulate Filter Missing	SPN will be used with FMI 31 (Condition Exists) to indicate that this device is missing in exhaust bank 1.
4796	Aftertreatment 1 Diesel Oxidation Catalyst Missing	SPN will be used with FMI 31 (Condition Exists) to indicate that this device is missing in exhaust bank 1.
4797	Engine Fuel 1 Injector Cylinder 9 Actuator 2	This is the second valve actuator on Engine Fuel Injector Cylinder 9.
4798	Engine Fuel 1 Injector Cylinder 10 Actuator 2	This is the second valve actuator on Engine Fuel Injector Cylinder 10.

4799	Engine Fuel 1 Injector Cylinder 11 Actuator 2	This is the second valve actuator on Engine Fuel Injector Cylinder 11.
4800	Engine Fuel 1 Injector Cylinder 12 Actuator 2	This is the second valve actuator on Engine Fuel Injector Cylinder 12.
4801	Engine Fuel 1 Injector Cylinder 13 Actuator 2	This is the second valve actuator on Engine Fuel Injector Cylinder 13.
4802	Engine Fuel 1 Injector Cylinder 14 Actuator 2	This is the second valve actuator on Engine Fuel Injector Cylinder 14.
4803	Engine Fuel 1 Injector Cylinder 15 Actuator 2	This is the second valve actuator on Engine Fuel Injector Cylinder 15.
4804	Engine Fuel 1 Injector Cylinder 16 Actuator 2	This is the second valve actuator on Engine Fuel Injector Cylinder 16.
4805	Engine Fuel 1 Injector Cylinder 17 Actuator 2	This is the second valve actuator on Engine Fuel Injector Cylinder 17.
4806	Engine Fuel 1 Injector Cylinder 18 Actuator 2	This is the second valve actuator on Engine Fuel Injector Cylinder 18.
4807	Engine Fuel 1 Injector Cylinder 19 Actuator 2	This is the second valve actuator on Engine Fuel Injector Cylinder 19.
4808	Engine Fuel 1 Injector Cylinder 20 Actuator 2	This is the second valve actuator on Engine Fuel Injector Cylinder 20.

4809	Aftertreatment 1 Warm Up Diesel Oxidation Catalyst Intake Temperature	This is the temperature measured at the intake of the warm up oxidation catalytic converter in exhaust bank 1.
4810	Aftertreatment 1 Warm Up Diesel Oxidation Catalyst Outlet Temperature	This is the temperature measured at the outlet of the warm up oxidation catalytic converter in exhaust bank 1.
4811	Engine Piston Cooling Gallery Oil Pressure	Pressure of the engine lubricating oil in the gallery that feeds the piston cooling spray nozzles. The pressure in this gallery varies from the main engine oil fed to the bearings, and is usually lower.
4812	Engine Piston Cooling Oil Supply Valve Command	Command for the Piston Cooling Valve opening; zero is closed (no oil to cool the pistons) and 100% is open (all possible oil flowing to cool the pistons.)
4813	Engine Oil Thermostat Bypass Valve Opening	Command to the valve that directs engine oil around the oil thermostat. Zero means closed (all oil flows through the thermostat passage) and 100% means open (all possible oil bypasses the thermostat.)
4814	Engine Coolant Pump Command	Command for a coolant pump that can be driven at varying output level. A command of zero is pump OFF, 100% results in maximum coolant flow. The pump may allow adjustment of coolant flow by varying the pump speed. The ECU commands a percentage of maximum pump output.
4815	Engine Cooling Fan Thermal Switch	This is a feedback measurement of the position of a thermal switch that turns on an engine cooling fan. 0 = OFF (cooling flow not needed) 1 = ON (cooling flow demanded) 2 = ERROR 3 = Not Available Note that this is not a command to turn the fan on, nor a direct measurement of fan speed to assure that the fan is working. It is a measurement of the position of a switch that is activated by temperature, and provides feedback to the ECU of the state of that thermal switch.
4816	Transmission Torque Converter Lockup Transition in Process	State signal indicating whether or not the transmission torque converter lock up clutch is transitioning between being applied and being released. The broadcast value

		should be set to 01b as soon as an apply or release of the lockup clutch is initiated, and then set to 00b once the given transition is complete. This parameter is a companion to SPN 573 Transmission Torque Converter Lockup Engaged.00b = Transition is not in process 01b = Transition is in process 10b = Error 11b = Not available
4817	Engine Intake Manifold 1 Absolute Pressure (High Resolution)	The absolute pressure measurement of the air intake manifold. If there are multiple air pressure sensors in the intake stream, this is the last one in flow direction before entering the combustion chamber. This SPN is a high resolution measurement. See SPN 3563 if high resolution is not needed.
4818	Driver Airbag Ignitor Loop 1st Stage – Resistance	Resistance of Driver Airbag Ignitor Loop 1st Stage.
4819	Passenger Airbag Ignitor Loop 1st Stage – Resistance	Resistance of Passenger Airbag Ignitor Loop 1st Stage.
4820	Driver Airbag Ignitor Loop 2nd Stage – Resistance	Resistance of Driver Airbag Ignitor Loop 2nd Stage.
4821	Passenger Airbag Ignitor Loop 2nd Stage – Resistance	Resistance of Passenger Airbag Ignitor Loop 2nd Stage.
4822	Driver Belt Tensioner Ignitior Loop – Resistance	Resistance of Driver Belt Tensioner Ignitor Loop 1st Stage.
4823	Passenger Belt Tensioner Ignitor Loop – Resistance	Resistance of Passenger Belt Tensioner Ignitor Loop 1st Stage.
4824	Side Bag Ignitor Loop 1 – Left – Resistance	Resistance of Side Bag Ignitor Loop 1 – Left.

4825	Side Bag Ignitor Loop 2 – Left – Resistance	Resistance of Side Bag Ignitor Loop 2 – Left.
4826	Side Bag Ignitor Loop 1 – Right – Resistance	Resistance of Side Bag Ignitor Loop 1 – Right.
4827	Side Bag Ignitor Loop 2 – Right – Resistance	Resistance of Side Bag Ignitor Loop 2 – Right.
4828	Special Ignitor Loop 1 – Resistance	Resistance of Special Ignitor Loop 1. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4829	Special Ignitor Loop 2 – Resistance	Resistance of Special Ignitor Loop 2. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4830	Special Ignitor Loop 3 – Resistance	Resistance of Special Ignitor Loop 3. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4831	Special Ignitor Loop 4 – Resistance	Resistance of Special Ignitor Loop 4. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4832	Special Ignitor Loop 5 – Resistance	Resistance of Special Ignitor Loop 5. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4833	Special Ignitor Loop 6 – Resistance	Resistance of Special Ignitor Loop 6. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.

4834	Special Ignitor Loop 7 – Resistance	Resistance of Special Ignitor Loop 7. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4835	Special Ignitor Loop 8 – Resistance	Resistance of Special Ignitor Loop 8. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4836	Special Ignitor Loop 9 – Resistance	Resistance of Special Ignitor Loop 9. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4837	Special Ignitor Loop 10 – Resistance	Resistance of Special Ignitor Loop 10. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4838	Special Ignitor Loop 11 – Resistance	Resistance of Special Ignitor Loop 11. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4839	Special Ignitor Loop 12 – Resistance	Resistance of Special Ignitor Loop 12. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4840	Special Ignitor Loop 13 – Resistance	Resistance of Special Ignitor Loop 13. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4841	Special Ignitor Loop 14 – Resistance	Resistance of Special Ignitor Loop 14. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.

4842	Special Ignitor Loop 15 – Resistance	Resistance of Special Ignitor Loop 15. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4843	Special Ignitor Loop 16 – Resistance	Resistance of Special Ignitor Loop 16. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4844	Special Ignitor Loop 17 – Resistance	Resistance of Special Ignitor Loop 17. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4845	Special Ignitor Loop 18 – Resistance	Resistance of Special Ignitor Loop 18. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4846	Special Ignitor Loop 19 – Resistance	Resistance of Special Ignitor Loop 19. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4847	Special Ignitor Loop 20 – Resistance	Resistance of Special Ignitor Loop 20. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4848	Special Ignitor Loop 21 – Resistance	Resistance of Special Ignitor Loop 21. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4849	Special Ignitor Loop 22 – Resistance	Resistance of Special Ignitor Loop 22. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.

4850	Special Ignitor Loop 23 – Resistance	Resistance of Special Ignitor Loop 23. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4851	Special Ignitor Loop 24 – Resistance	Resistance of Special Ignitor Loop 24. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4852	Special Ignitor Loop 25 – Resistance	Resistance of Special Ignitor Loop 25. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4853	Special Ignitor Loop 26 – Resistance	Resistance of Special Ignitor Loop 26. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4854	Special Ignitor Loop 27 – Resistance	Resistance of Special Ignitor Loop 27. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4855	Special Ignitor Loop 28 – Resistance	Resistance of Special Ignitor Loop 28. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4856	Special Ignitor Loop 29 – Resistance	Resistance of Special Ignitor Loop 29. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4857	Special Ignitor Loop 30 – Resistance	Resistance of Special Ignitor Loop 30. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.

4858	Special Ignitor Loop 31 – Resistance	Resistance of Special Ignitor Loop 31. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4859	Special Ignitor Loop 32 – Resistance	Resistance of Special Ignitor Loop 32. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4860	Special Ignitor Loop 33 – Resistance	Resistance of Special Ignitor Loop 33. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4861	Special Ignitor Loop 34 – Resistance	Resistance of Special Ignitor Loop 34. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4862	Special Ignitor Loop 35 – Resistance	Resistance of Special Ignitor Loop 35. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4863	Special Ignitor Loop 36 – Resistance	Resistance of Special Ignitor Loop 36. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4864	Special Ignitor Loop 37 – Resistance	Resistance of Special Ignitor Loop 37. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4865	Special Ignitor Loop 38 – Resistance	Resistance of Special Ignitor Loop 38. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.

4866	Special Ignitor Loop 39 – Resistance	Resistance of Special Ignitor Loop 39. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4867	Special Ignitor Loop 40 – Resistance	Resistance of Special Ignitor Loop 40. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4868	Special Ignitor Loop 41 – Resistance	Resistance of Special Ignitor Loop 41. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4869	Special Ignitor Loop 42 – Resistance	Resistance of Special Ignitor Loop 42. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4870	Special Ignitor Loop 43 – Resistance	Resistance of Special Ignitor Loop 43. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4871	Special Ignitor Loop 44 – Resistance	Resistance of Special Ignitor Loop 44. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4872	Special Ignitor Loop 45 – Resistance	Resistance of Special Ignitor Loop 45. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4873	Special Ignitor Loop 46 – Resistance	Resistance of Special Ignitor Loop 46. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.

4874	Special Ignitor Loop 47 – Resistance	Resistance of Special Ignitor Loop 47. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4875	Special Ignitor Loop 48 – Resistance	Resistance of Special Ignitor Loop 48. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4876	Special Ignitor Loop 49 – Resistance	Resistance of Special Ignitor Loop 49. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4877	Special Ignitor Loop 50 – Resistance	Resistance of Special Ignitor Loop 50. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4878	Special Ignitor Loop 51 – Resistance	Resistance of Special Ignitor Loop 51. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4879	Special Ignitor Loop 52 – Resistance	Resistance of Special Ignitor Loop 52. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4880	Special Ignitor Loop 53 – Resistance	Resistance of Special Ignitor Loop 53. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4881	Special Ignitor Loop 54 – Resistance	Resistance of Special Ignitor Loop 54. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.

4882	Special Ignitor Loop 55 – Resistance	Resistance of Special Ignitor Loop 55. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4883	Special Ignitor Loop 56 – Resistance	Resistance of Special Ignitor Loop 56. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4884	Special Ignitor Loop 57 – Resistance	Resistance of Special Ignitor Loop 57. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4885	Special Ignitor Loop 58 – Resistance	Resistance of Special Ignitor Loop 58. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4886	Special Ignitor Loop 59 – Resistance	Resistance of Special Ignitor Loop 59. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4887	Special Ignitor Loop 60 – Resistance	Resistance of Special Ignitor Loop 60. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4888	Special Ignitor Loop 61 – Resistance	Resistance of Special Ignitor Loop 61. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4889	Special Ignitor Loop 62 – Resistance	Resistance of Special Ignitor Loop 62. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.

4890	Special Ignitor Loop 63 – Resistance	Resistance of Special Ignitor Loop 63. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4891	Special Ignitor Loop 64 – Resistance	Resistance of Special Ignitor Loop 64. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4892	Special Ignitor Loop 65 – Resistance	Resistance of Special Ignitor Loop 65. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4893	Special Ignitor Loop 66 – Resistance	Resistance of Special Ignitor Loop 66. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4894	Special Ignitor Loop 67 – Resistance	Resistance of Special Ignitor Loop 67. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4895	Special Ignitor Loop 68 – Resistance	Resistance of Special Ignitor Loop 68. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4896	Special Ignitor Loop 69 – Resistance	Resistance of Special Ignitor Loop 69. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4897	Special Ignitor Loop 70 – Resistance	Resistance of Special Ignitor Loop 70. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.

4898	Special Ignitor Loop 71 – Resistance	Resistance of Special Ignitor Loop 71. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4899	Special Ignitor Loop 72 – Resistance	Resistance of Special Ignitor Loop 72. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4900	Special Ignitor Loop 73 – Resistance	Resistance of Special Ignitor Loop 73. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4901	Special Ignitor Loop 74 – Resistance	Resistance of Special Ignitor Loop 74. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4902	Special Ignitor Loop 75 – Resistance	Resistance of Special Ignitor Loop 75. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4903	Special Ignitor Loop 76 – Resistance	Resistance of Special Ignitor Loop 76. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4904	Special Ignitor Loop 77 – Resistance	Resistance of Special Ignitor Loop 77. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4905	Special Ignitor Loop 78 – Resistance	Resistance of Special Ignitor Loop 78. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.

4906	Special Ignitor Loop 79 – Resistance	Resistance of Special Ignitor Loop 79. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4907	Special Ignitor Loop 80 – Resistance	Resistance of Special Ignitor Loop 80. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4908	Special Ignitor Loop 81 – Resistance	Resistance of Special Ignitor Loop 81. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4909	Special Ignitor Loop 82 – Resistance	Resistance of Special Ignitor Loop 82. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4910	Special Ignitor Loop 83 – Resistance	Resistance of Special Ignitor Loop 83. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4911	Special Ignitor Loop 84 – Resistance	Resistance of Special Ignitor Loop 84. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4912	Special Ignitor Loop 85 – Resistance	Resistance of Special Ignitor Loop 85. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4913	Special Ignitor Loop 86 – Resistance	Resistance of Special Ignitor Loop 86. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.

4914	Special Ignitor Loop 87 – Resistance	Resistance of Special Ignitor Loop 87. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4915	Special Ignitor Loop 88 – Resistance	Resistance of Special Ignitor Loop 88. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4916	Special Ignitor Loop 89 – Resistance	Resistance of Special Ignitor Loop 89. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4917	Special Ignitor Loop 90 – Resistance	Resistance of Special Ignitor Loop 90. Since there are many different vehicle types (e.g. truck, bus, firetruck or ambulance), the ignitor loop configuration has a wide variation.
4918	Frontal Collision Sensor 1 – Type	Type of Frontal Collision Sensor 1. 0000b = acceleration sensor 0001b = pressure sensor 0010b = rollrate sensor 0011b = sonic sensor 0100b = fiber-optic sensor 0101b = radar sensor 0110b = lidar sensor 0111b = optical sensor 1000b to 1101b = Reserved 1110b = Error – Type of sensor cannot be determined (unknown sensor) 1111b = not available
4919	Frontal Collision Sensor 2 – Type	Type of Frontal Collision Sensor 2. 0000b = acceleration sensor 0001b = pressure sensor 0010b = rollrate sensor 0011b = sonic sensor 0100b = fiber-optic sensor 0101b = radar sensor 0110b = lidar sensor 0111b = optical sensor 1000b to 1101b = Reserved 1110b = Error – Type of sensor cannot be determined (unknown sensor) 1111b = not available
4920	Frontal Collision Sensor 3 – Type	Type of Frontal Collision Sensor 3. 0000b = acceleration sensor 0001b = pressure sensor 0010b = rollrate sensor 0011b = sonic sensor 0100b = fiber-optic sensor 0101b = radar sensor 0110b = lidar sensor 0111b = optical sensor 1000b to 1101b = Reserved 1110b = Error – Type of sensor cannot be determined (unknown sensor) 1111b = not available

4921	Frontal Collision Sensor 4 – Type	Type of Frontal Collision Sensor 4. 0000b = acceleration sensor 0001b = pressure sensor 0010b = rollrate sensor 0011b = sonic sensor 0100b = fiber-optic sensor 0101b = radar sensor 0110b = lidar sensor 0111b = optical sensor 1000b to 1101b = Reserved 1110b = Error – Type of sensor cannot be determined (unknown sensor) 1111b = not available
4922	Side Collision Sensor Front Left – Type	Type of Side Collision Sensor Front – Left. 0000b = acceleration sensor 0001b = pressure sensor 0010b = rollrate sensor 0011b = sonic sensor 0100b = fiber-optic sensor 0101b = radar sensor 0110b = lidar sensor 0111b = optical sensor 1000b to 1101b = Reserved 1110b = Error – Type of sensor cannot be determined (unknown sensor) 1111b = not available
4923	Side Collision Sensor Mid Front Left – Type	Type of Side Collision Sensor Mid Front – Left. 0000b = acceleration sensor 0001b = pressure sensor 0010b = rollrate sensor 0011b = sonic sensor 0100b = fiber-optic sensor 0101b = radar sensor 0110b = lidar sensor 0111b = optical sensor 1000b to 1101b = Reserved 1110b = Error – Type of sensor cannot be determined (unknown sensor) 1111b = not available
4924	Side Collision Sensor Mid Rear Left – Type	Type of Side Collision Sensor Mid Rear – Left. 0000b = acceleration sensor 0001b = pressure sensor 0010b = rollrate sensor 0011b = sonic sensor 0100b = fiber-optic sensor 0101b = radar sensor 0110b = lidar sensor 0111b = optical sensor 1000b to 1101b = Reserved 1110b = Error – Type of sensor cannot be determined (unknown sensor) 1111b = not available
4925	Side Collision Sensor Rear Left – Type	Type of Side Collision Sensor Rear – Left. 0000b = acceleration sensor 0001b = pressure sensor 0010b = rollrate sensor 0011b = sonic sensor 0100b = fiber-optic sensor 0101b = radar sensor 0110b = lidar sensor 0111b = optical sensor 1000b to 1101b = Reserved 1110b = Error – Type of sensor cannot be determined (unknown sensor) 1111b = not available
4926	Side Collision Sensor Front Right – Type	Type of Side Collision Sensor Front – Right. 0000b = acceleration sensor 0001b = pressure sensor 0010b = rollrate sensor 0011b = sonic sensor 0100b = fiber-optic sensor 0101b = radar sensor 0110b = lidar sensor 0111b = optical sensor 1000b to

		1101b = Reserved 1110b = Error – Type of sensor cannot be determined (unknown sensor) 1111b = not available
4927	Side Collision Sensor Mid Front Right – Type	Type of Side Collision Sensor Mid Front – Right. 0000b = acceleration sensor 0001b = pressure sensor 0010b = rollrate sensor 0011b = sonic sensor 0100b = fiber-optic sensor 0101b = radar sensor 0110b = lidar sensor 0111b = optical sensor 1000b to 1101b = Reserved 1110b = Error – Type of sensor cannot be determined (unknown sensor) 1111b = not available
4928	Side Collision Sensor Mid Rear Right – Type	Type of Side Collision Sensor Mid Rear – Right. 0000b = acceleration sensor 0001b = pressure sensor 0010b = rollrate sensor 0011b = sonic sensor 0100b = fiber-optic sensor 0101b = radar sensor 0110b = lidar sensor 0111b = optical sensor 1000b to 1101b = Reserved 1110b = Error – Type of sensor cannot be determined (unknown sensor) 1111b = not available
4929	Side Collision Sensor Rear Right – Type	Type of Side Collision Sensor Rear – Right. 0000b = acceleration sensor 0001b = pressure sensor 0010b = rollrate sensor 0011b = sonic sensor 0100b = fiber-optic sensor 0101b = radar sensor 0110b = lidar sensor 0111b = optical sensor 1000b to 1101b = Reserved 1110b = Error – Type of sensor cannot be determined (unknown sensor) 1111b = not available
4930	Rear Collision Sensor 1 – Type	Type of Rear Collision Sensor 1. 0000b = acceleration sensor 0001b = pressure sensor 0010b = rollrate sensor 0011b = sonic sensor 0100b = fiber-optic sensor 0101b = radar sensor 0110b = lidar sensor 0111b = optical sensor 1000b to 1101b = Reserved 1110b = Error – Type of sensor cannot be determined (unknown sensor) 1111b = not available
4931	Rear Collision Sensor 2 – Type	Type of Rear Collision Sensor 2. 0000b = acceleration sensor 0001b = pressure sensor 0010b = rollrate sensor 0011b = sonic sensor 0100b = fiber-optic sensor 0101b = radar sensor 0110b = lidar sensor 0111b = optical sensor 1000b to 1101b = Reserved 1110b = Error – Type of sensor cannot be determined (unknown sensor) 1111b = not available

4932	Rear Collision Sensor 3 – Type	Type of Rear Collision Sensor 3. 0000b = acceleration sensor 0001b = pressure sensor 0010b = rollrate sensor 0011b = sonic sensor 0100b = fiber-optic sensor 0101b = radar sensor 0110b = lidar sensor 0111b = optical sensor 1000b to 1101b = Reserved 1110b = Error – Type of sensor cannot be determined (unknown sensor) 1111b = not available
4933	Rear Collision Sensor 4 – Type	Type of Rear Collision Sensor 4. 0000b = acceleration sensor 0001b = pressure sensor 0010b = rollrate sensor 0011b = sonic sensor 0100b = fiber-optic sensor 0101b = radar sensor 0110b = lidar sensor 0111b = optical sensor 1000b to 1101b = Reserved 1110b = Error – Type of sensor cannot be determined (unknown sensor) 1111b = not available
4934	Rollover Sensor – Type	Type of Rollover Sensor. 0000b = acceleration sensor 0001b = pressure sensor 0010b = rollrate sensor 0011b = sonic sensor 0100b = fiber-optic sensor 0101b = radar sensor 0110b = lidar sensor 0111b = optical sensor 1000b to 1101b = Reserved 1110b = Error – Type of sensor cannot be determined (unknown sensor) 1111b = not available
4935	Frontal Collision Sensor 1 – Serial Number	Serial Number of Frontal Collision Sensor 1.
4936	Frontal Collision Sensor 2 – Serial Number	Serial Number of Frontal Collision Sensor 2.
4937	Frontal Collision Sensor 3 – Serial Number	Serial Number of Frontal Collision Sensor 3.
4938	Frontal Collision Sensor 4 – Serial Number	Serial Number of Frontal Collision Sensor 4.
4939	Side Collision Sensor Front Left – Serial Number	Serial Number of Side Collision Sensor Front – Left.

4940	Side Collision Sensor Mid Front Left – Serial Number	Serial Number of Side Collision Sensor Mid Front – Left.
4941	Side Collision Sensor Mid Rear Left – Serial Number	Serial Number of Side Collision Sensor Mid Rear – Left.
4942	Side Collision Sensor Rear Left – Serial Number	Serial Number of Side Collision Sensor Rear – Left.
4943	Side Collision Sensor Front Right – Serial Number	Serial Number of Side Collision Sensor Front – Right.
4944	Side Collision Sensor Mid Front Right – Serial Number	Serial Number of Side Collision Sensor Mid Front – Right.
4945	Side Collision Sensor Mid Rear Right – Serial Number	Serial Number of Side Collision Sensor Mid Rear – Right.
4946	Side Collision Sensor Rear Right – Serial Number	Serial Number of Side Collision Sensor Rear – Right.
4947	Rear Collision Sensor 1 – Serial Number	Serial Number of Rear Collision Sensor 1.
4948	Rear Collision Sensor 2 – Serial Number	Serial Number of Rear Collision Sensor 2.
4949	Rear Collision Sensor 3 – Serial Number	Serial Number of Rear Collision Sensor 3.
4950	Rear Collision Sensor 4 – Serial Number	Serial Number of Rear Collision Sensor 4.

4951	Rollover Sensor – Serial Number	Serial Number of Rollover Sensor.
4952	Driver Beltlock Status	State of switch used to determine if Driver Beltlock is buckled. 00b = unlocked 01b = locked 10b = Error – Beltlock state cannot be determined 11b = not available
4953	Passenger Beltlock Status	State of switch used to determine if Passenger Beltlock is buckled. 00b = unlocked 01b = locked 10b = Error – Beltlock state cannot be determined 11b = not available
4954	Beltlock 3 Status	State of switch used to determine if Beltlock 3 is buckled. 00b = unlocked 01b = locked 10b = Error – Beltlock state cannot be determined 11b = not available
4955	Beltlock 4 Status	State of switch used to determine if Beltlock 4 is buckled. 00b = unlocked 01b = locked 10b = Error – Beltlock state cannot be determined 11b = not available
4956	Beltlock 5 Status	State of switch used to determine if Beltlock 5 is buckled. 00b = unlocked 01b = locked 10b = Error – Beltlock state cannot be determined 11b = not available
4957	Beltlock 6 Status	State of switch used to determine if Beltlock 6 is buckled. 00b = unlocked 01b = locked 10b = Error – Beltlock state cannot be determined 11b = not available
4958	Beltlock 7 Status	State of switch used to determine if Beltlock 7 is buckled. 00b = unlocked 01b = locked 10b = Error – Beltlock state cannot be determined 11b = not available
4959	Beltlock 8 Status	State of switch used to determine if Beltlock 8 is buckled. 00b = unlocked 01b = locked 10b = Error – Beltlock state cannot be determined 11b = not available
4960	Beltlock 9 Status	State of switch used to determine if Beltlock 9 is buckled. 00b = unlocked 01b = locked 10b = Error – Beltlock state cannot be determined 11b = not available
4961	Beltlock 10 Status	State of switch used to determine if Beltlock 10 is buckled. 00b = unlocked 01b = locked 10b = Error – Beltlock state cannot be determined 11b = not available

4962	Passenger Airbag Deactivation Switch Status	State of switch used to deactivate Passenger Airbag manually. 00b = passenger airbag activated 01b = passenger airbag deactivated 10b = Error – State of deactivation switch cannot be determined 11b = not available
4963	Driver Occupant Classification System Status	State of Occupant Classification System for driver. 000b = empty 001b = child 010b = small adult 011b = adult 100b = large adult 101b = reserved 110b = Error – Classification of occupant cannot be determined 111b = not available
4964	Passenger Occupant Classification System Status	State of Occupant Classification System for passenger. 000b = empty 001b = child 010b = small adult 011b = adult 100b = large adult 101b = Error – Classification of occupant cannot be determined 110b = reserved 111b = not available
4965	Occupant Classification System 3 Status	State of Occupant Classification System for seat position 3. 00b = empty 01b = occupied 10b = Error – Classification cannot be determined 11b = not available
4966	Occupant Classification System 4 Status	State of Occupant Classification System for seat position 4. 00b = empty 01b = occupied 10b = Error – Classification cannot be determined 11b = not available
4967	Occupant Classification System 5 Status	State of Occupant Classification System for seat position 5. 00b = empty 01b = occupied 10b = Error – Classification cannot be determined 11b = not available
4968	Occupant Classification System 6 Status	State of Occupant Classification System for seat position 6. 00b = empty 01b = occupied 10b = Error – Classification cannot be determined 11b = not available
4969	Occupant Classification System 7 Status	State of Occupant Classification System for seat position 7. 00b = empty 01b = occupied 10b = Error – Classification cannot be determined 11b = not available
4970	Occupant Classification System 8 Status	State of Occupant Classification System for seat position 8. 00b = empty 01b = occupied 10b = Error – Classification cannot be determined 11b = not available
4971	Occupant Classification System 9 Status	State of Occupant Classification System for seat position 9. 00b = empty 01b = occupied 10b = Error – Classification cannot be determined 11b = not available

4972	Occupant Classification System 10 Status	State of Occupant Classification System for seat position 10. 00b = empty 01b = occupied 10b = Error – Classification cannot be determined 11b = not available
4973	Crash Type	Type of crash event. 00001b = frontal crash 00010b = rear crash 00100b = side crash (left) 01000b = side crash (right) 10000b = rollover It is possible to combine different Crash Types. (e.g. frontal and side crash (left) = 00101b)
4974	Crash Counter	The Crash Counter prevents other ECUs from reacting to a faulty transmission of the Crash Notification PGN and serves as a safety mechanism. The Crash Counter becomes incremented by 1 for every sent message, starting with « 0 ». (0 follows 15)
4975	Crash Checksum	The Crash Checksum is used to verify the signal path from the airbag ECU to other devices in case of a crash.The 4 bit checksum is the sum of the high nibble and the low nibble of the sum of the identifier, the first 7 data bytes and the 4 bit message counter. It is calculated as follows: Checksum = (Byte1 + Byte2 + Byte3 + Byte4 + Byte5 + Byte6 + Byte7 + (message counter & 0Fh) + message ID low byte + message ID mid low byte + message ID mid high byte + message ID high byte) Checksum = ((Checksum >> 4) + Checksum) & 0Fh
4976	Pitch Angle (Extended Range)	The angle between the vehicle x-axis and the ground plane (i.e. rotation about the vehicle Y-axis). The pitch angle for an angle of ascent is reported with a positive value. This parameter is defined according to a Z-Down axis system and the sign of the value is in accordance to the right-hand rule, as specified in SAE J670. As specified in SAE J670, a Z-Down Axis System has positive X directed forward, positive Y to the right, and positive Z directed down. See SPN 3318 for an alternate range and resolution.
4977	Roll Angle (Extended Range)	The angle between the vehicle y-axis and the ground plane (i.e. rotation about the X-axis). The roll angle for a roll to the right is reported with a positive value. Roll angle is the same for both Z-Down and Z-Up axis systems, since both systems have positive X axis directed forward. The sign of the value is in accordance to the right-hand rule, as specified in SAE J670. See SPN 3319 for an alternate range and resolution.

4978	Pitch Angle Compensation (Extended Range)	Compensated mode for the pitch measurement. Compensation is the use of multiple sensors together to enhance the output of the pitch measurement.00b = On 01b = Off 10b = Error 11b = Not Available
4979	Pitch Angle Figure of Merit (Extended Range)	Figure of merit for pitch angle measurement. 00b = Pitch angle fully functional. Data is within sensor specification. 01b = Pitch angle degraded. Data is suspect due to environmental conditions. 10b = Error 11b = Not available
4980	Roll Angle Compensation (Extended Range)	Compensated mode for the roll angle measurement. Compensation is the use of multiple sensors together to enhance the output of the roll angle measurement.00b = On 01b = Off 10b = Error 11b = Not Available
4981	Roll Angle Figure of Merit (Extended Range)	Figure of merit for roll angle measurement. 00b = Roll angle fully functional. Data is within sensor specification. 01b = Roll angle degraded. Data is suspect due to environmental conditions. 10b = Error 11b = Not available
4982	Roll and Pitch Measurement Latency (Extended Range)	Time between start of sensor processing and CAN transmission
4983	Pitch Rate (Extended Range)	Pitch rate is the rate-of-change of the pitch angle over time, where the pitch angle vector is in the direction of travel of the vehicle. The pitch rate for increasing ascent over time is reported with a positive value. This parameter is defined according to a Z-Down axis system and the sign of the value is in accordance to the right-hand rule, as specified in SAE J670. As specified in SAE J670, a Z-Down Axis System has positive X directed forward, positive Y to the right, and positive Z directed down. See SPN 3322 for an alternate range and resolution.
4984	Roll Rate (Extended Range)	Roll rate is the rate-of-change of the roll angle over time. The roll rate for increasing roll to the right is reported with a positive value. Roll angle is the same for both Z-Down and Z-Up axis systems, since both systems have positive X axis directed forward. The sign of the value is in accordance to the right-hand rule, as specified in SAE J670.

4985	Yaw Rate (Extended Range)	Yaw rate is the rate-of-change of the yaw angle over time. A positive yaw rate signal results when the object turns clockwise. This parameter is defined according to a Z-Down axis system and the sign of the value is in accordance to the right-hand rule, as specified in SAE J670. As specified in SAE J670, a Z-Down Axis System has positive X directed forward, positive Y to the right, and positive Z directed down. See SPN 1808 for Yaw Rate with an alternate range and resolution using a Z-Up Axis System.
4986	Pitch Rate Figure of Merit (Extended Range)	Figure of merit for pitch rate measurement. 00b = Pitch rate fully functional. Data is within sensor specification. 01b = Pitch rate degraded. Data is suspect due to environmental conditions. 10b = Error 11b = Not available
4987	Roll Rate Figure of Merit (Extended Range)	Figure of merit for roll rate measurement. 00b = Roll rate fully functional. Data is within sensor specification. 01b = Roll rate degraded. Data is suspect due to environmental conditions. 10b = Error 11b = Not available
4988	Yaw Rate Figure of Merit (Extended Range)	Figure of merit for yaw angle measurement. 00b = Yaw rate fully functional. Data is within sensor specification. 01b = Yaw rate degraded. Data is suspect due to environmental conditions. 10b = Error 11b = Not available
4989	Angular Rate Measurement Latency	The estimated measurement latency of the measurement. NOTE: This is only the sensor latency and does not include any additional latencies that might exist because of the CAN Bus or overall system implementation. Latency is the time from sensor readings to the queuing of the message data for CAN transmission.
4990	Battery Charger 1 State	A state of the battery charger connected to the main battery. 0 = Idling. The power line or the battery is disconnected from the charger. 1 = Charging the battery. 2 = Stand-by or maintaining the battery charge. 3 to 12 = Reserved 13 = Battery failure. An error condition due to the battery state (high temperature, etc.) 14 = Charger failure. An error condition due to the charger state. 15 = Not available.
4991	Battery Charger 1 Power Line State	A state of the battery charger connection to the power line for the charger connected to the main battery. 0 = Disconnected. The power line is disconnected from the

		charger. 1 = Connected. The power line is connected to the charger. 2 = Error 3 = Not available
4992	Battery Charger 1 Output Voltage	Output voltage measured on the battery terminals of the battery charger connected to the main battery.
4993	Battery Charger 1 Output Current	Output current of the battery charger connected to the main battery. If positive, this parameter shows the charging current of the battery charger connected to the main battery. Otherwise, if the charger hardware permits, this parameter represents the current consumed by the battery charger ECU from the main battery.
4994	Battery Charger 2 State	A state of the offline battery charger connected to the auxiliary battery. 0 = Idling. The power line or the battery is disconnected from the charger. 1 = Charging the battery. 2 = Stand-by or maintaining the battery charge. 3 to 12 = Reserved 13 = Battery failure. An error condition due to the battery state (high temperature, etc.) 14 = Charger failure. An error condition due to the charger state. 15 = Not available.
4995	Battery Charger 2 Power Line State	A state of the battery charger connection to the power line for the charger connected to the auxiliary battery.0 = Disconnected. The power line is disconnected from the charger. 1 = Connected. The power line is connected to the charger. 2 = Error 3 = Not available
4996	Battery Charger 2 Output Voltage	Output voltage measured on the battery terminals of the offline battery charger connected to the auxiliary battery.
4997	Battery Charger 2 Output Current	Output current of the battery charger connected to the main battery. If positive, this parameter shows the charging current of the battery charger connected to the main battery. Otherwise, if the charger hardware permits, this parameter represents the current consumed by the battery charger ECU from the main battery.
4998	Magnet Boost Time	The duration of time after the activation of the magnet circuit that a relatively high current is sent to the magnet for material pick up operations. This time is called boost

		time. After the boost time expires, a lower operation current is sent to the magnet to hold the material.
4999	Magnet Rated Power	The rated power that the magnet can accept during material holding operations. Note that the magnet may experience more power over short intervals, such as during initial activation of the magnet circuit to pick up material.
5000	Generator Overheat Status	The Status of Generator being Overheated. 00b = Not Overheat 01b = Overheat 10b = Error 11b = Not Available
5001	Genset System Output Voltage Range Status	Status of generator voltage in or out of desired operating range. 00b = Out of Range 01b = In Range 10b = Error 11b = Not Available
5002	Reverse Current Range Setting	The operator setting for the Reverse Current. The setting defines the maximum reverse current. The actual current limits are specific to the application.00000b = 1 00001b = 2 00010b = 3 00011b = 4 00100b = 5 00101b = 6 00110b = 7 00111b = 8 01000b = 9 01001b = 10 01010b = 11 01011b = 12 01100b = 13 01101b = 14 01110b = 15 01111b = 16 10000b to 11101b = Not used 11110b = Error 11111b = Not Available
5003	Grapple/Magnet Selection Switch	This is a switch that can be used to select either the Grapple or Magnet function of the material handler machine.00b = Grapple Selected 01b = Magnet Selected 10b = Error 11b = Not Available
5004	Genset Softstart Active Status	The Genset Softstart Active Status refers to the status of the genset softstart relay. The moment the Genset System is started, this relay is activated. As a result, the hydraulic power is hold on for a short period of time, and this relay will be turned off once the genset hydraulic power become stable.00b = Off 01b = On 10b = Error 11b = Not Available
5005	Genset Enable Active Status	Status of the Genset Enable Relay that enables or disables the Genset. 00b = Not Enabled 01b = Enabled 10b = Error 11b = Not Avaialble

5006	Voltage Monitor Active Status	Status of Voltage Monitor Relay. When it is activated, the Generator Voltage Monitor is connected to the generator output line so that the generator output voltage range could be monitored.00b = Monitor is Off 01b = Monitor is On 10b = Error 11b = Not Available
5007	Generator Duty Cycle Exceeded Status	The status of the duty cycle of the generator usage, indicating if the generator has been on for too much time within a defined time window. The duty cycle is the ratio of the time the generator is on and the time the generator is off within a time window.00b = Duty Cycle Not Exceed 01b = Duty Cycle Exceed 10b = Error 11b = Not Avaiable
5008	Magnet Forward Current	The forward current being supplied by the generator to the electric magnet to create a magnet field to lift material.
5009	Magnet Reverse Current	A reverse current being supplied to the electric magnet to reduce the forward current generated magnet field as quick as possible so that the magnet can release material as fast as possible.
5010	Material Lift Switch	This is a switch that can be used to enable the lift functionality of the Material Handler machine. When it is activated, the magnet is energized to pick up material.00b = Don’t Lift 01b = Lift 10b = Error 11b = Not Available
5011	Material Drop Switch	This is a switch that can be used to enable the drop functionality of the Material Handler machine. 00b = Don’t Drop 01b = Drop 10b = Error 11b = Not Available
5012	Generator Current Boost Active Status	Status of generator current boost relay that can boost the generator output current for picking-up material operations. When this relay is « on », the generator is generating the maximum current for the material handler machine to pick-up material. When the relay is off, the genetator is generating normal current for the material handler machine to hold material.00b = Off 01b = On 10b = Error 11b = Not Available

5013	Material Lift Active Status	The status of Material Lift Relay. When it is on, the generator generates forward direction current so that the material handler machine can pick up material.00b = Off 01b = On 10b = Error 11b = Not Available
5014	Material Drop Active Status	The status of Material Drop Relay. When it is on, the generator generates reverse direction current so that the material handler machine can release material.00b = Off 01b = On 10b = Error 11b = Not Available
5015	Momentary Engine Maximum Power Enable	Momentarily Requesting highest torque map from the engine control 00b = not requesting maximum power available 01b = momentarily requesting maximum power available 10b = fault 11b = not available
5016	ECU Power Output Supply Voltage #4	The fourth power output from an ECU.
5017	ECU Power Output Supply Voltage #5	The fifth power output from an ECU.
5018	Aftertreatment 1 Diesel Oxidation Catalyst System	Indicates non-specific failures of the diesel oxidation catalyst system in exhaust bank 1, such as poor conversion efficiency or high temperature across the device.
5019	Engine Exhaust Gas Recirculation 1 Outlet Pressure	EGR outlet pressure is measured immediately after the EGR valve.
5020	Engine Exhaust Gas Recirculation 1 Mixer Intake Temperature	The temperature of the EGR gas entering the intake mixer, measured after the intake throttle when provided.
5021	Momentary Engine Maximum Power Enable Feedback	Momentarily requesting Engine Maximum Power Enable – feature support feedback 00b = disabled 01b = supported 10b = reserved 11b = don’t care
5022	Forward Collision Warning	This parameter indicates if a collision is imminent and strong driver reaction either by braking hard or by an avoidance maneuver are imperative to prevent a collision.00b = No warning 01b = Collision is imminent 10b = Error indicator 11b = not available

5023	ACC usage demand	This parameter indicates the drivers demand to activate or deactivate ACC keeping distance control. 00b = driver demand for not using ACC distance keeping control 01b = driver demand for using ACC distance keeping control 10b = reserved 11b = don’t care
5024	Engine Exhaust 1 NOx Sensor Heater Ratio	Heater ratio to determine temperature at sensor tip. This sensor is located at the intake of the aftertreatment system if an aftertreatment system exists.
5025	Engine Exhaust 1 NOx Sensor New part deviation NOx Gain	New part deviation NOx_Gain to correct (recalculate) sensor signal on the Engine ECU side. This sensor is located at the intake of the aftertreatment system if an aftertreatment system exists.
5026	Engine Exhaust 1 NOx Sensor New part deviation NOx Offset	New part deviation NOx_Offset to correct (recalculate) sensor signal on the Engine ECU side. This sensor is located at the intake of the aftertreatment system if an aftertreatment system exists.
5027	Engine Exhaust 1 NOx Sensor O2 Pressure Correction	Correction of pressure Lambda-signal to correct (recalculate) sensor signal on the Engine ECU side. This sensor is located at the intake of the aftertreatment system if an aftertreatment system exists.
5028	Engine Exhaust 1 NOx Sensor NOx Pressure Correction	Correction of pressure NOx-signal to correct (recalculate) sensor signal on the Engine ECU side. This sensor is located at the intake of the aftertreatment system if an aftertreatment system exists.
5029	Engine Exhaust 1 NOx Sensor NO2 Correction	Correction of NO2 at the NOx-signal to correct (recalculate) sensor signal on the Engine ECU side. This sensor is located at the intake of the aftertreatment system if an aftertreatment system exists.
5030	Engine Exhaust 1 NOx Sensor NH3 Correction	Correction of NH3 at the NOx-signal to correct (recalculate) sensor signal on the Engine ECU side. This sensor is located at the intake of the aftertreatment system if an aftertreatment system exists.

5031	Aftertreatment 1 Outlet NOx Sensor Heater Ratio	Heater ratio to determine temperature at sensor tip.
5032	Aftertreatment 1 Outlet NOx Sensor New part deviation NOx Gain	New part deviation NOx_Gain to correct (recalculate) sensor signal on the Engine ECU side.
5033	Aftertreatment 1 Outlet NOx Sensor New part deviation NOx Offset	New part deviation NOx_Offset to correct (recalculate) sensor signal on the Engine ECU side.
5034	Aftertreatment 1 Outlet NOx Sensor O2 Pressure Correction	Correction of pressure Lambda-signal to correct (recalculate) sensor signal on the Engine ECU side.
5035	Aftertreatment 1 Outlet NOx Sensor NOx Pressure Correction	Correction of pressure NOx-signal to correct (recalculate) sensor signal on the Engine ECU side.
5036	Aftertreatment 1 Outlet NOx Sensor NO2 Correction	Correction of NO2 at the NOx-signal to correct (recalculate) sensor signal on the Engine ECU side.
5037	Aftertreatment 1 Outlet NOx Sensor NH3 Correction	Correction of NH3 at the NOx-signal to correct (recalculate) sensor signal on the Engine ECU side.
5038	Engine Exhaust 2 Intake NOx Sensor Heater Ratio	Heater ratio to determine temperature at sensor tip. This sensor is located at the intake of the aftertreatment system if an aftertreatment system exists.
5039	Engine Exhaust 2 Intake NOx Sensor New part deviation NOx Gain	New part deviation NOx_Gain to correct (recalculate) sensor signal on the Engine ECU side. This sensor is located at the intake of the aftertreatment system if an aftertreatment system exists.
5040	Engine Exhaust 2 Intake NOx Sensor New part deviation NOx Offset	New part deviation NOx_Offset to correct (recalculate) sensor signal on the Engine ECU side. This sensor is located at the intake of the aftertreatment system if an aftertreatment system exists.

5041	Engine Exhaust 2 Intake NOx Sensor O2 Pressure Correction	Correction of pressure Lambda-signal to correct (recalculate) sensor signal on the Engine ECU side. This sensor is located at the intake of the aftertreatment system if an aftertreatment system exists..
5042	Engine Exhaust 2 Intake NOx Sensor NOx Pressure Correction	Correction of pressure NOx-signal to correct (recalculate) sensor signal on the Engine ECU side. This sensor is located at the intake of the aftertreatment system if an aftertreatment system exists.
5043	Engine Exhaust 2 Intake NOx Sensor NO2 Correction	Correction of NO2 at the NOx-signal to correct (recalculate) sensor signal on the Engine ECU side. This sensor is located at the intake of the aftertreatment system if an aftertreatment system exists.
5044	Engine Exhaust 2 Intake NOx Sensor NH3 Correction	Correction of NH3 at the NOx-signal to correct (recalculate) sensor signal on the Engine ECU side. This sensor is located at the intake of the aftertreatment system if an aftertreatment system exists.
5045	Aftertreatment 2 Outlet NOx Sensor Heater Ratio	Heater ratio to determine temperature at sensor tip.
5046	Aftertreatment 2 Outlet NOx Sensor New part deviation NOx Gain	New part deviation NOx_Gain to correct (recalculate) sensor signal on the Engine ECU side.
5047	Aftertreatment 2 Outlet NOx Sensor New part deviation NOx Offset	New part deviation NOx_Offset to correct (recalculate) sensor signal on the Engine ECU side.
5048	Aftertreatment 2 Outlet NOx Sensor O2 Pressure Correction	Correction of pressure Lambda-signal to correct (recalculate) sensor signal on the Engine ECU side.
5049	Aftertreatment 2 Outlet NOx Sensor NOx Pressure Correction	Correction of pressure NOx-signal to correct (recalculate) sensor signal on the Engine ECU side.
5050	Aftertreatment 2 Outlet NOx Sensor NO2 Correction	Correction of NO2 at the NOx-signal to correct (recalculate) sensor signal on the Engine ECU side.

5051	Aftertreatment 2 Outlet NOx Sensor NH3 Correction	Correction of NH3 at the NOx-signal to correct (recalculate) sensor signal on the Engine ECU side.
5052	Transmission Clutch/Converter Input Speed	Rotational velocity of the input to a transmission's master clutch or torque converter. In most cases the rotational velocity will be the same as engine flywheel speed unless there is an intermediate device, such as a power divider, between the engine and the clutch/converter.
5053	Engine Trip Fuel (High Resolution)	Fuel consumed during all or part of a journey. High resolution used for calculations and fleet management systems. See SPN 182 for alternate resolution.
5054	Engine Total Fuel Used (High Resolution)	Accumulated amount of fuel used during vehicle operation. High resolution used for calculations and fleet management systems. See SPN 250 for alternate resolution.
5055	Engine Oil Viscosity	Dynamic viscosity of the engine oil
5056	Engine Oil Density	Density of the engine oil
5057	Cab Noise Control Command	Command signal to change the state of the Cab Noise Control System to on-line or off-line 00b = Take Cab Noise Control System Off Line 01b = Bring Cab Noise Control System On Line 10b = Reserved 11b = Don't Care/Not Commanded
5058	Cab Noise Control Tuning Command	Command values for the Tuning State of the Cab Noise Control System. The Tuning State allows the Cab Noise Control System to adjust certain system characteristics (e.g. to account for microphone or speaker degradation over time).000b = Activate Manual Tuning, Wait for Save and Exit Commands 001b = Activate Automatic Tuning, Wait for Save and Exit Commands 010b = Activate Automatic Tuning State, Saving Parameters, Exit on Completion 011b = Remain In Tuning, Save Current Parameters 100b = Exit Tuning, Not Saving Parameters 101b = Exit Tuning, Saving Parameters 110b = Reserved 111b = Don't Care, NOT Commanded

5059	Cab Noise Control Status	This parameter returns the current status of the Cab Noise Control system. 00b = Cab Noise Control System ON-Line 01b = Cab Noise Control System OFF-Line 10b = Error Indicator 11b = Not Available/Not Requested
5060	Cab Noise Control Tuning Status	This parameter returns the current status of tuning function of the Cab Noise Control system. When the tuning state is active, the Cab Noise Control System adjusts certain system characteristics (e.g. to account for sensor and/or transducer degradation over time). This adjustment may be automatic or under manual control.0000b = Manual Tuning Mode 0001b = Manual Tuning Mode – Command Complete 0010b = Manual Tuning Mode – Saving Data 0011b = Reserved 0100b = Reserved 0101b = Reserved 0110b = Reserved 0111b = Manual Tuning Denied – Requires Security Verification 1000b = Automatic Tuning Mode 1001b = Automatic Tuning Mode – Command Complete 1010b = Automatic Tuning Mode – Saving Data 1011b = Reserved 1100b = Reserved 1101b = Reserved 1110b = Tuning Mode – Error 1111b = Not Available/Not Tuning/Not Requested
5061	Noise Controller	Used to show an error condition in the Noise Controller
5062	Noise Control Microphone 1	Noise Control microphone 1 failure
5063	Noise Control Microphone 2	Noise Control microphone 2 failure
5064	Noise Control Microphone 3	Noise Control microphone 3 failure
5065	Noise Control Microphone 4	Noise Control microphone 4 failure
5066	Noise Control Microphone 5	Noise Control microphone 5 failure
5067	Noise Control Microphone 6	Noise Control microphone 6 failure
5068	Noise Control Output 1	Noise Control output 1 failure

5069	Noise Control Output 2	Noise Control output 2 failure
5070	Noise Control Output 3	Noise Control output 3 failure
5071	Noise Control Output 4	Noise Control output 4 failure
5072	Noise Control Output 5	Noise Control output 5 failure
5073	Noise Control Output 6	Noise Control output 6 failure
5074	Noise Control Feed Forward Sensor 1	Noise Control feed forward sensor 1 failure
5075	Noise Control Feed Forward Sensor 2	Noise Control feed forward sensor 2 failure
5077	Engine Protect Lamp Command	Command signal directly controlling the Engine Protect Lamp 00b = Lamp Off 01b = Lamp On 10b = Reserved 11b = Not available Note: SPN 987 should be used for reporting diagnostics of the Engine Protect Lamp.
5078	Engine Amber Warning Lamp Command	Command signal directly controlling the Engine Amber Warning Lamp 00b = Lamp Off 01b = Lamp On 10b = Reserved 11b = Not available Note: SPN 624 should be used for reporting diagnostics of the Engine Amber Warning Lamp.
5079	Engine Red Stop Lamp Command	Command signal directly controlling the Engine Red Stop Lamp 00b = Lamp Off 01b = Lamp On 10b = Reserved 11b = Not available Note: SPN 623 should be used for reporting diagnostics of the Engine Red Stop Lamp.
5080	OBD Malfunction Indicator Lamp Command	Command signal directly controlling the OBD Malfunction Indicator Lamp 00b = Lamp Off 01b = Lamp On 10b = Reserved 11b = Not available Note: SPN 1213 should be used for reporting diagnostics of the OBD Malfunction Indicator Lamp.

5081	Engine Brake Active Lamp Command	Command signal directly controlling the Engine Brake Active Lamp. This is used for engine based retarders. 00b = Lamp Off 01b = Lamp On 10b = Reserved 11b = Not available
5082	Engine Oil Pressure Low Lamp Command	Command signal directly controlling the Engine Oil Pressure Low Lamp 00b = Lamp Off 01b = Lamp On 10b = Reserved 11b = Not available
5083	Engine Coolant Temperature High Lamp Command	Command signal directly controlling the Engine Coolant Temperature High Lamp 00b = Lamp Off 01b = Lamp On 10b = Reserved 11b = Not available
5084	Engine Coolant Level Low Lamp Command	Command signal directly controlling the Engine Coolant Level Low Lamp 00b = Lamp Off 01b = Lamp On 10b = Reserved 11b = Not available
5085	Engine Idle Management Active Lamp Command	Command signal directly controlling the Engine Idle Management Active Lamp 00b = Lamp Off 01b = Lamp On 10b = Reserved 11b = Not available Note: SPN 1661 should be used for reporting diagnostics of the Engine Idle Management Active Lamp.
5086	Engine Air Filter Restriction Lamp Command	Command signal directly controlling the Engine Air Filter Restriction Lamp. 00b = Lamp Off 01b = Lamp On 10b = Reserved 11b = Not available
5087	Vehicle Battery Voltage Low Lamp Command	Command signal directly controlling the Vehicle Battery Voltage Low Lamp. 00b = Lamp Off 01b = Lamp On 10b = Reserved 11b = Not available
5088	Vehicle Fuel Level Low Lamp Command	Command signal directly controlling the Vehicle Fuel Level Low Lamp. 00b = Lamp Off 01b = Lamp On 10b = Reserved 11b = Not available
5089	Vehicle Air Pressure Low Lamp Command	Command signal directly controlling the Vehicle Air Pressure Low Lamp. 00b = Lamp Off 01b = Lamp On 10b = Reserved 11b = Not available
5090	Vehicle HVAC Recirculation Lamp Command	Command signal directly controlling the Vehicle HVAC Recirculation Lamp. 00b = Lamp Off 01b = Lamp On 10b = Reserved 11b = Not available

5091	Vehicle Battery Charging Lamp Command	Command signal directly controlling the Vehicle Battery Charging Lamp. 00b = Lamp Off 01b = Lamp On 10b = Reserved 11b = Not available
5093	Engine Protect Lamp Data	This parameter provides measured data from the Engine Protect Lamp. 00b = Lamp deactivated (Off) 01b = Lamp activated (On) 10b = Error 11b = Not available
5094	Engine Amber Warning Lamp Data	This parameter provides measured data from the Engine Amber Warning Lamp. 00b = Lamp deactivated (Off) 01b = Lamp activated (On) 10b = Error 11b = Not available
5095	Engine Red Stop Lamp Data	This parameter provides measured data from the Engine Red Stop Lamp. 00b = Lamp deactivated (Off) 01b = Lamp activated (On) 10b = Error 11b = Not available
5096	OBD Malfunction Indicator Lamp Data	This parameter provides measured data from the OBD Malfunction Indicator Lamp. 00b = Lamp deactivated (Off) 01b = Lamp activated (On) 10b = Error 11b = Not available
5097	Engine Brake Active Lamp Data	This parameter provides measured data from the Engine Brake Active Lamp. 00b = Lamp deactivated (Off) 01b = Lamp activated (On) 10b = Error 11b = Not available
5098	Compression Brake Enable Switch Indicator Lamp Data	This parameter provides measured data from the Compression Brake Enable Switch Indicator Lamp. 00b = Lamp deactivated (Off) 01b = Lamp activated (On) 10b = Error 11b = Not available
5099	Engine Oil Pressure Low Lamp Data	This parameter provides measured data from the Engine Oil Pressure Low Lamp. 00b = Lamp deactivated (Off) 01b = Lamp activated (On) 10b = Error 11b = Not available
5100	Engine Coolant Temperature High Lamp Data	This parameter provides measured data from the Engine Coolant Temperature High Lamp. 00b = Lamp deactivated (Off) 01b = Lamp activated (On) 10b = Error 11b = Not available

5101	Engine Coolant Level Low Lamp Data	This parameter provides measured data from the Engine Coolant Level Low Lamp. 00b = Lamp deactivated (Off) 01b = Lamp activated (On) 10b = Error 11b = Not available
5102	Engine Idle Management Active Lamp Data	This parameter provides measured data from the Engine Idle Management Active Lamp. 00b = Lamp deactivated (Off) 01b = Lamp activated (On) 10b = Error 11b = Not available
5103	Engine Air Filter Restriction Lamp Data	This parameter provides measured data from the Engine Air Filter Restriction Lamp. 00b = Lamp deactivated (Off) 01b = Lamp activated (On) 10b = Error 11b = Not available
5104	Vehicle Battery Voltage Low Lamp Data	This parameter provides measured data from the Vehicle Battery Voltage Low Lamp. 00b = Lamp deactivated (Off) 01b = Lamp activated (On) 10b = Error 11b = Not available
5105	Vehicle Fuel Level Low Lamp Data	This parameter provides measured data from the Vehicle Fuel Level Low Lamp. 00b = Lamp deactivated (Off) 01b = Lamp activated (On) 10b = Error 11b = Not available
5106	Vehicle Air Pressure Low Lamp Data	This parameter provides measured data from the Vehicle Air Pressure Low Lamp. 00b = Lamp deactivated (Off) 01b = Lamp activated (On) 10b = Error 11b = Not available
5107	Vehicle HVAC Recirculation Lamp Data	This parameter provides measured data from the Vehicle HVAC Recirculation Lamp. 00b = Lamp deactivated (Off) 01b = Lamp activated (On) 10b = Error 11b = Not available
5108	Vehicle Battery Charging Lamp Data	This parameter provides measured data from the Vehicle Battery Charging Lamp. 00b = Lamp deactivated (Off) 01b = Lamp activated (On) 10b = Error 11b = Not available
5109	Controller #3	Controller #3

5110	Controller #4	Controller #4
5111	Controller #5	Controller #5
5112	Controller #6	Controller #6
5113	Controller #7	Controller #7
5114	Controller #8	Controller #8
5115	Controller #9	Controller #9
5116	Controller #10	Controller #10
5117	Controller #11	Controller #11
5118	Controller #12	Controller #12
5119	Controller #13	Controller #13
5120	Controller #14	Controller #14
5121	Controller #15	Controller #15
5122	Controller #16	Controller #16
5123	Controller #17	Controller #17
5124	Controller #18	Controller #18
5125	Sensor supply voltage 7	Sensor ECU supply voltage 7

5126	Sensor supply voltage 8	Sensor ECU supply voltage 8
5127	Sensor supply voltage 9	Sensor ECU supply voltage 9
5128	Sensor supply voltage 10	Sensor ECU supply voltage 10
5129	Sensor supply voltage 11	Sensor ECU supply voltage 11
5130	Sensor supply voltage 12	Sensor ECU supply voltage 12
5131	Sensor supply voltage 13	Sensor ECU supply voltage 13
5132	Sensor supply voltage 14	Sensor ECU supply voltage 14
5133	Sensor supply voltage 15	Sensor ECU supply voltage 15
5134	Sensor supply voltage 16	Sensor ECU supply voltage 16
5135	Sensor supply voltage 17	Sensor ECU supply voltage 17
5136	Sensor supply voltage 18	Sensor ECU supply voltage 18
5137	Aftertreatment 1 Diesel Exhaust Fluid Tank Heater Command	Command for the Aftertreatment 1 Diesel Exhaust Fluid Tank Heater. A value of 0% means no heating applied, a value of 100% means full heating applied. See SPN 3363 for the measured value of the Aftertreatment 1 Diesel Exhaust Fluid Tank Heater.
5138	Aftertreatment 2 Diesel Exhaust Fluid Tank Heater Command	Command for the Aftertreatment 2 Diesel Exhaust Fluid Tank Heater. A value of 0% means no heating applied, a value of 100% means full heating applied. See SPN 4431 for the measured value of the Aftertreatment 2 Diesel Exhaust Fluid Tank Heater.
5139	Implement operating state – command	See document ISO 11783-7 for SPN details.

5140	All Implement Stop Operations Switch State	See document ISO 11783-7 for SPN details.
5141	Low Voltage Disconnect Manual Disconnect State	State of the Manual Disconnect hardwired input to the LVD. Manual Disconnect is used to override the LVD's normal activlty and dicconnect all of the LVD outputs. Manual Disconnect is lower in priority than the Manual Connect hardwired input, but has priority over all LVD Set Operating Mode messages.00b = Input off 01b = Input on 10b = Error 11b = Not installed
5142	Low Voltage Disconnect Manual Connect State	State of the Manual Connect hardwired input to the LVD. Manual Connect is used to override the LVD's normal activlty and connect all of the LVD outputs. Manual Connect has priority over the Manual Dicsonnect hardwired input and all LVD Set Operating Mode messages.00b = Input off 01b = Input on 10b = Error 11b = Not installed
5143	Low Voltage Disconnect Current Operating Mode	Current operating mode of the LVD. The current mode is dependent on the state of the Manual Disconnect/Connect hardwired inputs and on the most-recent received LVD Set Desired Operating Mode message. The hardwired inputs have priority over the LVD Set Operating Mode message, and Connects have priority over Disconnects.0000b = Automatic 0001b to 0011b = Reserved 0100b = Manual Disconnect via J1939 request 0101b = Manual Connect via J1939 request 0110b to 0111b = Reserved 1000b = Manual Disconnect via hardwired input 1001b = Manual Connect via hardwired input 1010b to 1110b = Reserved 1111b = Not available
5144	Low Voltage Disconnect Output #3 State	State of the Output #3 from the LVD. Output #3 controls an external load or relay. This external load could be independent of the main output, and may apply to an application specific circuit or zone. If the LVD supports prioritization, this circuit will disconnect before Output #2 and reconnect after Output #2.0000b = Output off or disconnected 0001b = Output on or connected 0010b = Disconnect alarm expired, output off or disconnected 0011b = Disconnect pending, alarm active 0100b = Connect pending, alarm active 0101b to 1101b = Reserved 1110b = Output fault 1111b = Not available or not installed

5145	Low Voltage Disconnect Output #2 State	State of the Output #2 from the LVD. Output #2 controls an external load or relay. This external load could be independent of the main output, and may apply to an application specific circuit or zone. If the LVD supports prioritization, this circuit will disconnect before Output #1 and reconnect after Output #1.0000b = Output off or disconnected 0001b = Output on or connected 0010b = Disconnect alarm expired, output off or disconnected 0011b = Disconnect pending, alarm active 0100b = Connect pending, alarm active 0101b to 1101b = Reserved 1110b = Output fault 1111b = Not available or not installed
5146	Low Voltage Disconnect Output #1 State	State of the Output #1 from the LVD. Output #1 controls an external load or relay. This external load could be independent of the main output, and may apply to an application specific circuit or zone. If the LVD supports prioritization, this circuit will disconnect before the Vout output and reconnect after the Vout output.0000b = Output off or disconnected 0001b = Output on or connected 0010b = Disconnect alarm expired, output off or disconnected 0011b = Disconnect pending, alarm active 0100b = Connect pending, alarm active 0101b to 1101b = Reserved 1110b = Output fault 1111b = Not available or not installed
5147	Low Voltage Disconnect Vout Output State	State of the Vout Output from the LVD. Vout is the LVD's main internal, controllable, high-current output. If the LVD supports prioritization, this circuit will be the last to disconnect and the first to reconnect.0000b = Output off or disconnected 0001b = Output on or connected 0010b = Disconnect alarm expired, output off or disconnected 0011b = Disconnect pending, alarm active 0100b = Connect pending, alarm active 0101b to 1101b = Reserved 1110b = Output fault 1111b = Not available or not installed
5148	Low Voltage Disconnect Temperature	Internal temperature of the LVD.
5149	Low Voltage Disconnect Desired Operating Mode	Desired Operating Mode of the LVD. Used to issue a J1939 request to the LVD to change modes. 0000b = Automatic 0001b to 0011b = Reserved 0100b = Manual Disconnect 0101b = Manual Connect 0110b to 1110b = Reserved 1111b = No change

5150	Front Hitch Position Limit status	See document ISO 11783-7 for SPN details.
5151	Rear Hitch Position Limit status	See document ISO 11783-7 for SPN details.
5152	Front PTO engagement request status	See document ISO 11783-7 for SPN details.
5153	Front PTO mode request status	See document ISO 11783-7 for SPN details.
5154	Front PTO Economy mode request status	See document ISO 11783-7 for SPN details.
5155	Front PTO shaft speed limit status	See document ISO 11783-7 for SPN details.
5156	Rear PTO engagement request status	See document ISO 11783-7 for SPN details.
5157	Rear PTO mode request status	See document ISO 11783-7 for SPN details.
5158	Rear PTO Economy mode request status	See document ISO 11783-7 for SPN details.
5159	Rear PTO shaft speed limit status	See document ISO 11783-7 for SPN details.
5160	Auxiliary valve number 0 measured flow limit status	See document ISO 11783-7 for SPN details.
5161	Auxiliary valve number 0 estimated flow limit status	See document ISO 11783-7 for SPN details.
5162	Auxiliary valve number 1 measured flow limit status	See document ISO 11783-7 for SPN details.

5163	Auxiliary valve number 1 estimated flow limit status	See document ISO 11783-7 for SPN details.
5164	Auxiliary valve number 2 measured flow limit status	See document ISO 11783-7 for SPN details.
5165	Auxiliary valve number 2 estimated flow limit status	See document ISO 11783-7 for SPN details.
5166	Auxiliary valve number 3 measured flow limit status	See document ISO 11783-7 for SPN details.
5167	Auxiliary valve number 3 estimated flow limit status	See document ISO 11783-7 for SPN details.
5168	Auxiliary valve number 4 measured flow limit status	See document ISO 11783-7 for SPN details.
5169	Auxiliary valve number 4 estimated flow limit status	See document ISO 11783-7 for SPN details.
5170	Auxiliary valve number 5 measured flow limit status	See document ISO 11783-7 for SPN details.
5171	Auxiliary valve number 5 estimated flow limit status	See document ISO 11783-7 for SPN details.
5172	Auxiliary valve number 6 measured flow limit status	See document ISO 11783-7 for SPN details.
5173	Auxiliary valve number 6 estimated flow limit status	See document ISO 11783-7 for SPN details.

5174	Auxiliary valve number 7 measured flow limit status	See document ISO 11783-7 for SPN details.
5175	Auxiliary valve number 7 estimated flow limit status	See document ISO 11783-7 for SPN details.
5176	Auxiliary valve number 8 measured flow limit status	See document ISO 11783-7 for SPN details.
5177	Auxiliary valve number 8 estimated flow limit status	See document ISO 11783-7 for SPN details.
5178	Auxiliary valve number 9 measured flow limit status	See document ISO 11783-7 for SPN details.
5179	Auxiliary valve number 9 estimated flow limit status	See document ISO 11783-7 for SPN details.
5180	Auxiliary valve number 10 measured flow limit status	See document ISO 11783-7 for SPN details.
5181	Auxiliary valve number 10 estimated flow limit status	See document ISO 11783-7 for SPN details.
5182	Auxiliary valve number 11 measured flow limit status	See document ISO 11783-7 for SPN details.
5183	Auxiliary valve number 11 estimated flow limit status	See document ISO 11783-7 for SPN details.
5184	Auxiliary valve number 12 measured flow limit status	See document ISO 11783-7 for SPN details.

5185	Auxiliary valve number 12 estimated flow limit status	See document ISO 11783-7 for SPN details.
5186	Auxiliary valve number 13 measured flow limit status	See document ISO 11783-7 for SPN details.
5187	Auxiliary valve number 13 estimated flow limit status	See document ISO 11783-7 for SPN details.
5188	Auxiliary valve number 14 measured flow limit status	See document ISO 11783-7 for SPN details.
5189	Auxiliary valve number 14 estimated flow limit status	See document ISO 11783-7 for SPN details.
5190	Auxiliary valve number 15 measured flow limit status	See document ISO 11783-7 for SPN details.
5191	Auxiliary valve number 15 estimated flow limit status	See document ISO 11783-7 for SPN details.
5192	General purpose valve measured limit status	See document ISO 11783-7 for SPN details.
5193	General purpose valve estimated limit status	See document ISO 11783-7 for SPN details.
5194	Temperature units	See document ISO 11783-7 for SPN details.
5195	Pressure units	See document ISO 11783-7 for SPN details.
5196	Force units	See document ISO 11783-7 for SPN details.

5197	Units system	See document ISO 11783-7 for SPN details.
5198	Repetition rate	See document ISO 11783-7 for SPN details.
5199	Process data command	See document ISO 11783-10 for SPN details.
5200	Process data element number	See document ISO 11783-10 for SPN details.
5201	Process data data dictionary identifier	See document ISO 11783-10 for SPN details.
5202	Process data variable value	See document ISO 11783-10 for SPN details.
5203	Implement Start/Stop operations	See document ISO 11783-7 for SPN details.
5204	Tractor control mode commands	See document ISO 11783-7 for SPN details.
5205	Tractor control commanded vehicle speed	See document ISO 11783-7 for SPN details.
5206	Tractor control commanded PTO speed	See document ISO 11783-7 for SPN details.
5207	Tractor control commanded hitch position	See document ISO 11783-7 for SPN details.
5208	Tractor control commanded PTO torque	See document ISO 11783-7 for SPN details.
5209	Tractor control commanded auxiliary valve flow	See document ISO 11783-7 for SPN details.

5210	Tractor control commanded auxiliary valve state	See document ISO 11783-7 for SPN details.
5211	Tractor control commanded auxiliary valve number	See document ISO 11783-7 for SPN details.
5212	Tractor control commanded draft force	See document ISO 11783-7 for SPN details.
5213	Tractor control mode command response	See document ISO 11783-7 for SPN details.
5214	Tractor control vehicle speed set point value response	See document ISO 11783-7 for SPN details.
5215	Tractor control PTO speed set point value response	See document ISO 11783-7 for SPN details.
5216	Tractor control hitch position set point value response	See document ISO 11783-7 for SPN details.
5217	Tractor control PTO torque set point value response	See document ISO 11783-7 for SPN details.
5218	Tractor control maximum slip set point value response	See document ISO 11783-7 for SPN details.
5219	Tractor control auxiliary valve flow set point value response	See document ISO 11783-7 for SPN details.
5220	Tractor control auxiliary valve state response	See document ISO 11783-7 for SPN details.

5221	Tractor control auxiliary valve number response	See document ISO 11783-7 for SPN details.
5222	Tractor control draft force set point value response	See document ISO 11783-7 for SPN details.
5223	Tractor Control draft force limit set point	See document ISO 11783-7 for SPN details.
5224	Tractor Control PTO torque limit set point	See document ISO 11783-7 for SPN details.
5225	Tractor Control Absolute maximum PTO torque limit set point 540 rpm	See document ISO 11783-7 for SPN details.
5226	Tractor Control auxiliary valve flow limit set point	See document ISO 11783-7 for SPN details.
5227	Tractor Control limit status	See document ISO 11783-7 for SPN details.
5228	Tractor control draft force limit set point command	See document ISO 11783-7 for SPN details.
5229	Tractor control PTO torque limit set point command	See document ISO 11783-7 for SPN details.
5230	Tractor control absolute maximum PTO torque limit set point 540 rpm command	See document ISO 11783-7 for SPN details.
5231	Tractor control auxiliary valve flow limit set point command	See document ISO 11783-7 for SPN details.

5232	Tractor ECU class request	See document ISO 11783-7 for SPN details.
5233	Tractor facility request	See document ISO 11783-7 for SPN details.
5234	Tractor ECU class response	See document ISO 11783-7 for SPN details.
5235	Tractor facility response	See document ISO 11783-7 for SPN details.
5236	Tractor facility reserved bit indicator	See document ISO 11783-7 for SPN details.
5237	Guidance curvature command	See document ISO 11783-7 for SPN details.
5238	Guidance estimated curvature	See document ISO 11783-7 for SPN details.
5239	Guidance curvature command status	See document ISO 11783-7 for SPN details.
5240	Guidance request reset command status	See document ISO 11783-7 for SPN details.
5241	Guidance steering input position status	See document ISO 11783-7 for SPN details.
5242	Guidance steering system readiness	See document ISO 11783-7 for SPN details.
5243	Mechanical system lockout	See document ISO 11783-7 for SPN details.
5244	Operator direction reversed	See document ISO 11783-7 for SPN details.
5245	Aftertreatment Diesel Exhaust Fluid Tank Low Level Indicator	The desired illumination of the driver's warning indicator for diesel exhaust fluid (DEF) tank low level. 000b = Off – indicates adequate DEF level e.g., for Euro VI this is used to indicate the driver warning system is non-active for diesel exhaust fluid level 001b = On solid – indicates low DEF level e.g., for Euro VI this is used to

		indicate the driver warning system is initially activated for low diesel exhaust fluid level 010b = reserved for SAE assignment 011b = reserved for SAE assignment 100b = On fast blink (1 Hz) indicates the DEF level is lower than the level indicated by the solid illumination (state 001b) e.g., for Euro VI this is used to indicate the second driver warning system detection threshold for diesel exhaust fluid level, where the visual alarm of the driver warning system is required to « escalate in intensity ». 101b = reserved for SAE assignment 110b = reserved for SAE assignment 111b = not available Note: SPN 5245 is similar to SPN 5825. SPN 5245 is intended to be used in implementations where the warning indicator is used to convey diesel exhaust fluid tank low level information only, whereas SPN 5825 is intended to be used in implementations where the warning indicator is used to convey diesel exhaust fluid tank low level as well as specific emission control malfunction information. Thus, SPN 5245 is a subset of SPN 5825, and if both are utilized, will match only under certain conditions.
5246	Aftertreatment SCR Operator Inducement Severity	Severity status of the operator inducement system for anomalies with the SCR system, such as tampering, low DEF quality, and DEF tank level. Higher numerical levels indicate more severe levels of inducement. Level 1 is the least severe.000b = Driver Warning, Low-Level Inducement, and Severe Inducement Non-Active 001b = Inducement Level 1 … EPA defined SCR Inducement – DEF Warning ……. FMI 15 …Euro VI – Driver Warning System Active …….. FMI 15 …Off Highway (Tier4) – DEF Warning…… FMI 15 010b = Inducement Level 2 … DEF Warning, second level (optional) …….. FMI 15 … Euro VI – Low-Level Inducement Enabled …… FMI 15 …Off Highway (Tier4) – DEF Warning, second level…….. FMI 15 011b = Inducement Level 3 … EPA defined SCR Inducement – Engine Derate …… FMI 16 … Euro VI – Low-Level Inducement Active …… FMI 16 …Off Highway (Tier4) – Low-Level Inducement Active…….. FMI 16 100b = Inducement Level 4 … Severe Inducement Pre-Trigger (optional) ….…… FMI 16 … Euro VI – Severe Inducement Enabled …….. FMI 16 …Off Highway (Tier4) – Severe Inducement Enabled…… FMI 16 101b = Inducement

		Level 5 … EPA defined SCR Inducement – Severe Inducement …….. FMI 0 … Euro VI – Severe Inducement Active …….. FMI 0 …Off Highway (Tier4) – Final Inducement Enabled……. FMI 0 110b = Temporary Override of Inducement – The SCR inducement has been temporarily interrupted. 111b = Not Available / Not Supported When SPN 5246 is used in a DTC the recommended FMI usage is as shown. Reference EPA CISD-09-04-REVISED SCR Guidance document for more information regarding EPA implementations. Reference Euro VI implementing regulation Annex XIII, Appendix 5, section 3.1.(b), 3.1.(c), and 3.1.(d) for more information regarding Euro VI implementations. Reference EU directive 97/68/EC amendment (2012/46/EU), EPA webinar nrci-scr-web-conf.2011-07-25, and JMLIT « Technical Guidelines for Urea Selective Catalytic Reduction System » Kokujikan 132-3, Feb.16, 2012 for Off Highway (Tier4) implementations. JMLIT – Japan Ministry Of Land, Infrastructure, Transport and Tourism Note: SPN 5246 is similar to SPN 5826. SPN 5246 is intended to be used to indicate the severity status of the operator inducement system for anomalies with the SCR system only, whereas SPN 5826 is intended to be used to indicate the severity status of the operator inducement system for anomalies with the SCR and EGR systems. Thus, SPN 5246 is a subset of SPN 5826, and if both are utilized, will match only under certain conditions.
5247	Command – Process Data	See document ISO 11783-7 for SPN details.
5248	Sub-command – Process Data	See document ISO 11783-7 for SPN details.
5249	Command specific parameters – Process Data	See document ISO 11783-7 for SPN details.
5250	Element number	See document ISO 11783-7 for SPN details.
5251	Data Dictionary Identifier	See document ISO 11783-7 for SPN details.
5252	Engine Exhaust Gas Recirculation 2 Differential Pressure	Differential Pressure across the Exhaust Gas Recirculation 2 (EGR2) system.

5253	Engine Exhaust Gas Recirculation 2 Intake Pressure	EGR2 intake gauge pressure is measured after EGR2 cooler and before EGR2 valve
5254	Engine Exhaust Gas Recirculation 2 Outlet Absolute Pressure	Absolute Pressure immediately after the EGR2 valve
5255	Engine Exhaust Gas Recirculation 2 Temperature	Temperature of Recirculated Exhaust Gas of EGR2
5256	Engine Exhaust Gas Recirculation 2 Mixer Intake Temperature	The temperature of the EGR gas entering the intake of EGR2 system mixer.
5257	Engine Exhaust Gas Recirculation 2 Mass Flow Rate	Flow rate of gas through the second EGR system. Flow rate of the exhaust gas being recirculated from the 2nd EGR system into combustion air.
5258	Engine Exhaust Gas Recirculation 2 Cooler Intake Temperature	Exhaust Gas Recirculation 2 (EGR2) Temperature measured at EGR2 cooler intake. See SPN 5255 for Engine EGR2 temperature.
5259	Engine Exhaust Gas Recirculation 2 Cooler Intake Gas Absolute Pressure	Exhaust Gas Recirculation 2 gas absolute pressure is measured at EGR2 cooler intake. See SPN 5253 for EGR2 pressure measured at the EGR2 cooler outlet before the valve.
5260	Engine Exhaust Gas Recirculation 2 Cooler Efficiency	Exhaust Gas Recirculation 2 cooler efficiency is an indication of the cooler's ability to reduce the temperature of the exhaust gas that is being recirculated back to the intake. 0% = no reduction in temperature, 100% = maximum cooling. The EGR 2 cooler efficiency is calculated as (EGR 2 cooler intake temperature minus EGR 2 gas temperature) divided by (EGR 2 cooler intake temperature minus engine coolant temperature).
5261	Engine Exhaust Gas Recirculation 2 Cooler Bypass Actuator Position	EGR2 Cooler Bypass Actuator position, where 0% = Fully Closed (no gas flowing through the bypass), and 100% = Fully Open..

5262	Engine Exhaust Gas Recirculation 2 Valve Position	Position of EGR2 valve expressed as a percentage of full travel. 0% means the valve is closed and no exhaust gas is flowing into the air stream. 100% means the valve is fully opened.
5263	Engine Exhaust Gas Recirculation 2 Valve 2 Position	The position of the second exhaust gas recirculation valve of EGR 2 expressed as a percentage of full travel. 0% means the valve is closed and no exhaust gas is flowing into the air stream. 100% means the valve is fully opened.
5264	Engine Exhaust Gas Recirculation 2 Valve 1 Control	Desired percentage of maximum Exhaust Gas Recirculation 2 (EGR2) valve opening. 0% means the valve is closed. 100% means maximum opening (full gas flow).
5265	Engine Exhaust Gas Recirculation 2 Valve 2 Control	Desired percentage of maximum Exhaust Gas Recirculation 2 (EGR2) valve 2 opening. 0% means the valve is closed. 100% means maximum opening (full gas flow).
5266	Aftertreatment 1 Diesel Particulate Filter Soot Signal Standard Deviation	Standard deviation of the soot measurement from diesel particulate filter 1 soot sensor.
5267	Aftertreatment 1 Diesel Particulate Filter Soot Signal Maximum	Maximum output signal level of the current soot measurement from diesel particulate filter 1 soot sensor. This is a statistical value, not the maximum sensing capability of the sensor.
5268	Aftertreatment 1 Diesel Particulate Filter Soot Signal Minimum	Minimum output signal level of the current soot measurement from diesel particulate filter 1 soot sensor. This is a statistical value, not the minimum sensing capability of the sensor.
5269	Aftertreatment 2 Diesel Particulate Filter Soot Signal Standard Deviation	Standard deviation of the soot measurement from diesel particulate filter 2 soot sensor.

5270	Aftertreatment 2 Diesel Particulate Filter Soot Signal Maximum	Maximum output signal level of the current soot measurement from diesel particulate filter 2 soot sensor. This is a statistical value, not the maximum sensing capability of the sensor.
5271	Aftertreatment 2 Diesel Particulate Filter Soot Signal Minimum	Minimum output signal level of the current soot measurement from diesel particulate filter 2 soot sensor. This is a statistical value, not the minimum sensing capability of the sensor.
5272	Unexpected Engine Shutdown	To provide a warning to alert the operator that the engine has performed an unexpected shutdown
5273	Crank Terminate Relay	Crank Terminate Relay diagnostic
5274	Prohibit Automatic Air Suspension Control	This parameter is an internal request to the air suspension control system to prohibit automatic air suspension control. If the request is accepted, response intended to be sent in ASC1 (additional status requested in ASC1), there will be no automatic control either for height changes or axle load distribution changes, i.e. hold current pressures in all suspension devices.For example, to prohibit automatic air suspension control when a wheelchair lift is in use. 00b = No request 01b = Request prohibit automatic air suspension control 10b = Error indicator 11b = Not available
5275	Parking Brake Actuator Fully Activated	Signal which indicates when the parking brake actuator is fully activated. (see also SPN 70 and 619). 00b = Parking Brake Actuator not fully activated 01b = Parking Brake Actuator fully activated 10b = Error 11b = Not available
5276	Engine Exhaust Manifold Bank 1 Flow Balance Valve Actuator Control	Commanded percentage of maximum Engine Exhaust Manifold Bank 1 Balance valve opening. 0% means valve is closed. 100% means maximum valve opening (full gas flow).
5277	Engine Exhaust Manifold Bank 1 Flow Balance Valve Actuator Position	Actual percentage of maximum Engine Exhaust Manifold Bank 1 Balance valve opening. 0% means valve is closed. 100% means maximum valve opening (full gas flow).

5278	Engine Exhaust Manifold Bank 2 Flow Balance Valve Actuator Control	Commanded percentage of maximum Engine Ehaust Manifold Bank 2 Balance valve opening. 0% means valve is closed. 100% means maximum valve opening (full gas flow).
5279	Engine Exhaust Manifold Bank 2 Flow Balance Valve Actuator Position	Actual percentage of maximum Engine Manifold Bank 2 Balance valve opening. 0% means valve is closed. 100% means maximum valve opening (full gas flow).
5280	Engine Charge Air Cooler 1 Precooler Intake Temperature	Temperature of the combustion air measured at the charge air cooler 1 precooler intake.
5281	Engine Charge Air Cooler 1 Precooler Outlet Temperature	Temperature of the combustion air measured at the charge air cooler 1 precooler outlet.
5282	Engine Charge Air Cooler 1 Precooler Efficiency	Engine charge air cooler 1 (CAC1) precooler efficiency is an indication of the precooler's ability to reduce the temperature of the combustion air that is being routed through the precooler. 0% = no reduction in temperature, 100% = maximum cooling. The CAC1 precooler efficiency is calculated as (CAC1 precooler Intake temperature minus CAC1 precooler outlet temperature) divided by (CAC1 precooler Intake temperature minus engine coolant temperature). This calculation assumes that the precooler uses engine coolant as the cooling fluid.
5283	Engine Charge Air Cooler 1 Intake Temperature	Temperature of the combustion air measured at the CAC 1 Intake.
5284	Engine Charge Air Cooler 1 Ambient Air Temperature	Temperature of the air surrounding charge air cooler 1.
5285	Engine Charge Air Cooler 1 Efficiency	Engine charge air cooler 1(CAC1) efficiency is an indication of the CAC's ability to reduce the temperature of the combustion air that is being routed through the CAC1. 0% = no reduction in temperature, 100% = maximum cooling. The CAC1 efficiency is calculated as (CAC1 Intake temperature minus CAC1 outlet temperature) divided by (CAC1 Intake temperature minus CAC1 ambient air temperature). This calculation

		assumes that the CAC uses a measured or estimated ambient air temperature as the cooling fluid temperature.
5286	Engine Charge Air Cooler 2 Precooler Intake Temperature	Temperature of the combustion air measured at the charge air cooler 2 precooler Intake.
5287	Engine Charge Air Cooler 2 Precooler Outlet Temperature	Temperature of the combustion air measured at the charge air cooler 2 precooler outlet.
5288	Engine Charge Air Cooler 2 Precooler Efficiency	Engine charge air cooler 2 (CAC2) precooler efficiency is an indication of the precooler's ability to reduce the temperature of the gas that is being routed through the precooler. 0% = no reduction in temperature, 100% = maximum cooling. The CAC2 precooler efficiency is calculated as (CAC2 precooler Intake temperature minus CAC2 precooler outlet temperature) divided by (CAC2 precooler Intake temperature minus engine coolant temperature). This calculation assumes that the CAC2 precooler uses engine coolant as the cooling fluid.
5289	Engine Charge Air Cooler 2 Intake Temperature	Temperature of the combustion air measured at the charge air cooler 2 Intake.
5290	Engine Charge Air Cooler 2 Outlet Temperature	Temperature of combustion air after it exits from the Charge Air Cooler 2 but before any mixing of recirculated exhaust gas.
5291	Engine Charge Air Cooler 2 Ambient Air Temperature	Temperature of the air surrounding charge air cooler 2.
5292	Engine Charge Air Cooler 2 Efficiency	Engine charge air cooler 2 (CAC2) is an indication of the CAC's ability to reduce the temperature of the combustion air that is being routed through the CAC. 0% = no reduction in temperature, 100% = maximum cooling. The CAC2 efficiency is calculated as (CAC2 Intake temperature minus CAC2 outlet temperature) divided by (CAC2 Intake temperature minus CAC2 ambient air temperature). This calculation assumes that the CAC uses a measured or estimated ambient air temperature as the cooling fluid temperature.

5293	Allow Level Control During Braking Command	This parameter overides the inhibit of level control during braking. 00b = Disallow level control during braking (normal operation) 01b = Allow level control during braking 10b = Reserved 11b = Don’t’ care/take no action
5294	Allow Level Control During Braking Status	This parameter indicates if the function Allow Level Control During Braking is active. Functions is activated by SPN 5293.00b = Deactivated 01b = Activated 10b = Reserved 11b = Don’t care/take no action
5295	Speed Dependent Level Control Request	This parameter activates speed dependent level control in suspension system. 00b = Deactivate 01b = Activate 10b = Reserved 11b = Don’t care/take no action
5296	Speed Dependant Level Control Status	This parameter indicates if the function Speed Dependant Level Control is active. The function is activated by SPN 5295.00b = Inactive 01b = Active 10b = Reserved 11b = Don’t’ care/take no action
5297	Aftertreatment 2 Warm Up Diesel Oxidation Catalyst Conversion Efficiency	The aftertreatment 2 warm up catalyst conversion efficiency percentage. The catalyst conversion efficiency number in itself does not imply emissions compliance or system function or system malfunction.
5298	Aftertreatment 1 Diesel Oxidation Catalyst Conversion Efficiency	The aftertreatment 1 diesel oxidation catalyst conversion efficiency percentage. The catalyst conversion efficiency number in itself does not imply emissions compliance or system function or system malfunction.
5299	Aftertreatment 2 Diesel Oxidation Catalyst Conversion Efficiency	The aftertreatment 2 diesel oxidation catalyst conversion efficiency percentage. The catalyst conversion efficiency number in itself does not imply emissions compliance or system function or system malfunction.
5300	Aftertreatment 1 Diesel Oxidation Catalyst Insufficient NO2 Conversion	The aftertreatment 1 diesel oxidation catalyst insufficient NO2 conversion efficiency percentage.

5301	Aftertreatment 2 Diesel Oxidation Catalyst Insufficient NO2 Conversion	The aftertreatment 2 diesel oxidation catalyst insufficient NO2 conversion efficiency percentage.
5302	Aftertreatment 1 Post SCR NH3 Conversion Efficiency	The post SCR conversion efficiency percentage in exhaust bank 1. The catalyst conversion efficiency number in itself does not imply emissions compliance or system function or system malfunction.
5303	Aftertreatment 2 Post SCR NH3 Conversion Efficiency	The post SCR conversion efficiency percentage in exhaust bank 2. The catalyst conversion efficiency number in itself does not imply emissions compliance or system function or system malfunction.
5304	Aftertreatment 1 NOx Adsorber Catalyst Conversion Efficiency	The aftertreatment 1 NOx adsorber catalyst conversion efficiency percentage. The catalyst conversion efficiency number in itself does not imply emissions compliance or system function or system malfunction.
5305	Aftertreatment 2 NOx Adsorber Catalyst Conversion Efficiency	The aftertreatment 2 NOx adsorber catalyst conversion efficiency percentage. The catalyst conversion efficiency number in itself does not imply emissions compliance or system function or system malfunction.
5306	Aftertreatment 1 NOx Adsorber Catalyst Dosing System	Indicates non-specific failures of the NOx adsorber dosing system in exhaust bank 1, such as insufficient dosing efficiency.
5307	Aftertreatment 2 NOx Adsorber Catalyst Dosing System	Indicates non-specific failures of the NOx adsorber dosing system in exhaust bank 2, such as insufficient dosing efficiency.
5308	Aftertreatment 1 NOx Adsorber Catalyst System Monitor	Monitors Aftertreatment 1 NOx Adsorbing Catalyst System.. SPN 3064 may be used to represent readiness, in-use ratio, test results, data stream and DTC. Reported in-use ratio is the lowest numerical ratio of the in-use ratios that are tracked separately for each required monitor that detects malfunctions of NOx adsorber catalyst system.
5309	Aftertreatment 2 NOx Adsorber Catalyst System	Indicates non-specific failures of the NOx adsorber catalyst in exhaust bank 2, such as high temperature across the device.

5310	Aftertreatment 1 Diesel Particulate Filter NMHC Conversion Efficiency	The aftertreatment 1 hydrocarbon conversion efficiency of the diesel particulate filter. The catalyst conversion efficiency number in itself does not imply emissions compliance or system function or system malfunction.
5311	Aftertreatment 2 Diesel Particulate Filter NMHC Conversion Efficiency	The aftertreatment 2 hydrocarbon conversion efficiency of the diesel particulate filter. The catalyst conversion efficiency number in itself does not imply emissions compliance or system function or system malfunction.
5312	Engine Intake Manifold Commanded Pressure	Provides the commanded set point value for the engine intake manifold pressure.
5313	Commanded Engine Fuel Rail Pressure	Provides the commanded set point value for the engine fuel rail gage pressure
5314	Commanded Engine Fuel Injection Control Pressure	Provides the commanded set point value for the engine fuel injection control pressure.
5315	Aftertreatment 2 Warm Up Diesel Oxidation Catalyst Intake Temperature	Temperature of engine combustion byproducts entering the warm up Diesel Oxidation Catalyst in exhaust bank 2. This diesel parameter should be used with engines fueled by diesel fuel (not gaseous fuel like natural gas or propane). A separate parameter has been defined for gas fueled engines.
5316	Aftertreatment 2 Warm Up Diesel Oxidation Catalyst Outlet Temperature	Temperature of engine combustion byproducts leaving the warm up Diesel Oxidation Catalyst in exhaust bank 2. This diesel parameter should be used with engines fueled by diesel fuel (not gaseous fuel like natural gas or propane). A separate parameter has been defined for gas fueled engines.
5317	Aftertreatment 2 Diesel Oxidation Catalyst System	Indicates non-specific failures of the diesel oxidation catalyst system in exhaust bank 2.
5318	Aftertreatment Exhaust Gas Sensor System Monitor	See document J1939-73 for SPN details.

5319	Aftertreatment 1 Diesel Particulate Filter Incomplete Regeneration	Indicates that a regeneration event of the bank 1 diesel particulate filter was started but failed to complete.
5320	Aftertreatment 2 Diesel Particulate Filter Incomplete Regeneration	Indicates that a regeneration event of the bank 2 diesel particulate filter was started but failed to complete.
5321	Engine Intake Manifold Pressure System Monitor	See document J1939-73 for SPN details.
5322	Aftertreatment NMHC Converting Catalyst System Monitor	See document J1939-73 for SPN details.
5323	Engine Fuel Control Mode	Indicates whether the Engine Fuel Control System is in open loop or closed loop. 00b = Open loop 01b = Closed loop 10b = SAE reserved 11b = Not available
5324	Engine Glow Plug 1	Status of the engine glow plug 1. 00b = Inactive 01b = Active 10b = Error 11b = Not available
5325	Engine Glow Plug 2	Status of the engine glow plug 2. 00b = Inactive 01b = Active 10b = Error 11b = Not available
5326	Engine Glow Plug 3	Status of the engine glow plug 3. 00b = Inactive 01b = Active 10b = Error 11b = Not available
5327	Engine Glow Plug 4	Status of the engine glow plug 4. 00b = Inactive 01b = Active 10b = Error 11b = Not available
5328	Engine Glow Plug 5	Status of the engine glow plug 5. 00b = Inactive 01b = Active 10b = Error 11b = Not available
5329	Engine Glow Plug 6	Status of the engine glow plug 6. 00b = Inactive 01b = Active 10b = Error 11b = Not available

5330	Engine Glow Plug 7	Status of the engine glow plug 7. 00b = Inactive 01b = Active 10b = Error 11b = Not available
5331	Engine Glow Plug 8	Status of the engine glow plug 8. 00b = Inactive 01b = Active 10b = Error 11b = Not available
5332	Engine Glow Plug 9	Status of the engine glow plug 9. 00b = Inactive 01b = Active 10b = Error 11b = Not available
5333	Engine Glow Plug 10	Status of the engine glow plug 10. 00b = Inactive 01b = Active 10b = Error 11b = Not available
5334	Engine Glow Plug 11	Status of the engine glow plug 11. 00b = Inactive 01b = Active 10b = Error 11b = Not available
5335	Engine Glow Plug 12	Status of the engine glow plug 12. 00b = Inactive 01b = Active 10b = Error 11b = Not available
5336	Engine Glow Plug 13	Status of the engine glow plug 13. 00b = Inactive 01b = Active 10b = Error 11b = Not available
5337	Engine Glow Plug 14	Status of the engine glow plug 14. 00b = Inactive 01b = Active 10b = Error 11b = Not available
5338	Engine Glow Plug 15	Status of the engine glow plug 15. 00b = Inactive 01b = Active 10b = Error 11b = Not available
5339	Engine Glow Plug 16	Status of the engine glow plug 16. 00b = Inactive 01b = Active 10b = Error 11b = Not available
5340	Engine Glow Plug 17	Status of the engine glow plug 17. 00b = Inactive 01b = Active 10b = Error 11b = Not available

5341	Engine Glow Plug 18	Status of the engine glow plug 18. 00b = Inactive 01b = Active 10b = Error 11b = Not available
5342	Engine Glow Plug 19	Status of the engine glow plug 19. 00b = Inactive 01b = Active 10b = Error 11b = Not available
5343	Engine Glow Plug 20	Status of the engine glow plug 20. 00b = Inactive 01b = Active 10b = Error 11b = Not available
5344	Transmission Warning Indicator	Signal from transmission indicating that some aspect of its operation is not functioning correctly, and as a result, transmission operation may be altered or restricted. The indicator is typically a lamp. Distinctions in meaning between the continuous and flashing are left to the transmission manufacturer.00b = Transmission Warning Indicator is off 01b = Transmission Warning Indicator is on continuously 10b = Transmission Warning Indicator is flashing 11b = Not available
5345	Transmission Overheat Indicator	Signal from transmission indicating that its fluid temperature is above normal acceptable limits, and as a result, transmission operation may be altered or restricted. The indicator is typically a lamp. Distinctions in meaning between the continuous and flashing are left to the transmission manufacturer..00b = Transmission Overheat Indicator is off 01b = Transmission Overheat Indicator is on continuously 10b = Transmission Overheat Indicator is flashing 11b = Not available
5346	Driveline Retarder Overheat Indicator	Signal from the driveline retarder indicating that its fluid temperature is above normal acceptable limits, and as a result, retarder operation may be altered or restricted. The indicator is typically a lamp. Distinctions in meaning between the continuous and flashing are left to the transmission manufacturer.00b = Driveline Retarder Overheat Indicator is off 01b = Driveline Retarder Overheat Indicator is on continuously 10b = Driveline Retarder Overheat Indicator is flashing 11b = Not available
5347	Lateral Acceleration (Extended Range)	Indicates lateral acceleration of the vehicle (the component of vehicle acceleration vector along the Y-axis). A positive lateral acceleration signal results when the vehicle is accelerated to the left. This parameter is defined according to a Z-Up axis

		system and the sign of the value is in accordance to the right-hand rule, as specified in SAE J670. As specified in SAE J670, a Z-Up Axis System has positive X directed forward, positive Y to the left, and positive Z directed up. See SPN 1809 for an alternate range and resolution.
5348	Longitudinal Acceleration (Extended Range)	Indicates longitudinal acceleration of the vehicle (the component of vehicle acceleration vector along the X-axis). A positive longitudinal acceleration signal results when the vehicle speed increases in the forward direction. Longitudinal acceleration is the same for both Z-Down and Z-Up axis systems, since both systems have positive X axis directed forward. The sign of the value is in accordance to the right-hand rule, as specified in SAE J670. See SPN 1810 for an alternate longitudinal acceleration.
5349	Vertical Acceleration (Extended Range)	Indicates vertical acceleration of the vehicle and the effect of gravity (the component of vehicle acceleration vector along the Z-axis). A positive vertical acceleration signal of 1 gravity results when the vehicle is stationary on a horizontal surface. This parameter is defined according to a Z-Up axis system and the sign of the value is in accordance to the right-hand rule, as specified in SAE J670. As specified in SAE J670, a Z-Up Axis System has positive X directed forward, positive Y to the left, and positive Z directed up.
5350	Lateral Acceleration Figure of Merit (Extended Range)	Figure of merit for lateral acceleration measurement. 00b = lateral acceleration is fully functional. Data is within sensor specification 01b = lateral acceleration is degraded. Data is suspect due to enviromental conditions 10b = error 11b = not available
5351	Longitudinal Acceleration Figure of Merit (Extended Range)	Figure of merit for longitudinal acceleration measurement. 00b = longitudinal acceleration is fully functional. Data is within sensor specification 01b = longitudinal acceleration is degraded. Data is suspect due to enviromental conditions 10b = error 11b = not available
5352	Vertical Acceleration Figure of Merit (Extended Range)	Figure of merit for vertical acceleration measurement. 00b = vertical acceleration is fully functional. Data is within sensor specification 01b = verticalacceleration is

		degraded. Data is suspect due to enviromental conditions 10b = error 11b = not available
5353	Support Variable Transmission Repetition Rate for Acceleration Sensor	Indicates which acceleration transmission rate are supported by the ECU in addition to the required 10 ms transmission rate.00 = Reserve for SAE assignment 01 = Reserved for SAE assignment 10 to 20 = ms rate supported 11 = ECU only supports standard transmission rate of 10 ms
5354	Aftertreatment NMHC Converting Catalyst Monitor	See document J1939-73 for SPN details.
5355	Engine Intake Manifold #1 Pressure System Monitor	See document J1939-73 for SPN details.
5356	NOx Converting Catalyst and/or NOx Adsorber Monitor	See document J1939-73 for SPN details.
5357	Engine Fuel Injection Quantity Error for Multiple Cylinders	See document J1939-73 for SPN details.
5358	Engine Cylinder #1 Fuel Injection Quantity	See document J1939-73 for SPN details.
5359	Engine Cylinder #2 Fuel Injection Quantity	See document J1939-73 for SPN details.
5360	Engine Cylinder #3 Fuel Injection Quantity	See document J1939-73 for SPN details.
5361	Engine Cylinder #4 Fuel Injection Quantity	See document J1939-73 for SPN details.

5362	Engine Cylinder #5 Fuel Injection Quantity	See document J1939-73 for SPN details.
5363	Engine Cylinder #6 Fuel Injection Quantity	See document J1939-73 for SPN details.
5364	Engine Cylinder #7 Fuel Injection Quantity	See document J1939-73 for SPN details.
5365	Engine Cylinder #8 Fuel Injection Quantity	See document J1939-73 for SPN details.
5366	Engine Turbocharger Compressor Bypass Actuator 1 Desired Position	The requested position of the Engine Turbocharger Compressor Bypass actuator by the engine ECU, where 0% represents bypass fully closed and 100% represents bypass fully open.This is the position that the device is attempting to achieve.
5367	Engine Turbocharger Compressor Bypass Actuator 1 Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the Engine Turbocharger Compressor Bypass Actuator 1 by the manufacturers software. When there is multiple failures, the most severe is transmitted.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
5368	Engine Turbocharger Compressor Bypass Actuator 1 Temperature Status	Used to identify the status of the Engine Turbocharger Compresssor Bypass Actuator 1 drive circuitry temperature. Temperature excursions may affect the torque output.000b = High Most severe 001b = High Least severe 010b = In Range 011b = Low Least severe 100b = Low Most severe 101b = Not Defined 110b = Error 111b = Not available
5369	Engine Turbocharger Compressor Bypass Actuator 2 Command	The command to a compressor bypass actuator 2, normalized to percent, where 0% nominally represents fully closed and 100% represents fully open. Typically, the turbocharger compressor bypass actuator is used to keep the engine out of surge by metering compressed air (charge).

5370	Engine Turbocharger Wastegate Actuator 1 Desired Position	The Requested Valve position of the Turbocharger Wastegate Valve 1, commanded by the engine ECU. A value of 0% represents fully closed and a value of 100% represents fully open.This is the position that the device is attempting to achieve.
5371	Engine Turbocharger Wastegate Actuator 1 Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the Engine Turbocharger Wastegate Actuator 1 by the manufacturers software. When there is multiple failures, the most severe is transmittedA value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
5372	Engine Turbocharger Wastegate Actuator 1 Temperature Status	Used to identify the status of the Engine Turbocharger Wastegate Actuator 1 drive circuitry temperature. Temperature excursions may affect the torque output.000b = High Most severe 001b = High Least severe 010b = In Range 011b = Low Least severe 100b = Low Most severe 101b = Not Defined 110b = Error 111b = Not available
5373	Engine Turbocharger Wastegate Actuator 2 Desired Position	The Requested Valve position of the Turbocharger Wastegate Valve 2, commanded by the engine ECU. A value of 0% represents fully closed and a value of 100% represents fully open.This is the position that the device is attempting to achieve.
5374	Engine Desired Throttle Valve 1 Position	The desired position of the Throttle valve 1 (SPN 51) that is regulating the fluid, usually air/fuel mixture to the engine as commanded by the Engine Control unit. 0% represents no supply and 100% is full supply.This is the position that the device is attempting to achieve.
5375	Engine Throttle Valve 1 Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the engine throttle valve 1 (SPN 51) by the manufacturers software. When there is multiple failures, the most severe is transmitted.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
5376	Engine Throttle Valve 1 Temperature Status	Used to identify the status of the engine throttle valve 1 (SPN 51) drive circuitry temperature. Temperature excursions may affect the torque output.000b = High most severe 001b = High Least severe 010b = In Range 011b = Low Least severe 100b = Low Most severe 101b = Not Defined 110b = Error 111b = Not available

5377	Engine Desired Throttle Valve 2 Position	The desired position of the engine throttle valve 2 (SPN 3673) that is regulating the fluid, usually air/fuel mixture to the engine as commanded by the Engine Control Unit. 0% represents no supply and 100% is full supply.This is the position that the device is attempting to achieve.
5378	Engine Throttle Valve 2 Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the engine throttle valve 2 (SPN 3673) by the manufacturers software. When there is multiple failures, the most severe is transmitted.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
5379	Engine Throttle Valve 2 Temperature status	Used to identify the status of the Engine throttle valve 2 (SPN 3673) drive circuitry temperature. Temperature excursions may affect the torque output.000b = High Most severe 001b = High Least severe 010b = In Range 011b = Low Least severe 100b = Low Most severe 101b = Not Defined 110b = Error 111b = Not available
5380	Engine Fuel Valve 1 Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the Engine Fuel Valve 1 by the manufacturers software. When there is multiple failures, the most severe is transmitted.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
5381	Engine Fuel Valve 1 Temperature Status	Used to identify the status of the Engine Fuel valve 1 drive circuitry temperature. Temperature excursions may affect the torque output.000b = High Most severe 001b = High Least severe 010b = In Range 011b = Low Least severe 100b = Low Most severe 101b = Not Defined 110b = Error 111b = Not available
5382	Engine Fuel Valve 2 Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the Engine Fuel Valve 2 by the manufacturers software. When there is multiple failures, the most severe is transmitted.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
5383	Engine Fuel Valve 2 Temperature Status	Used to identify the status of the Engine Fuel valve 2 drive circuitry temperature. Temperature excursions may affect the torque output.000b = High most severe 001b

		= High Least severe 010b = In Range 011b = Low Least severe 100b = Low Most severe 101b = Not Defined 110b = Error 111b = Not available
5384	Engine Turbocharger Wastegate Actuator 2 Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the Engine Turbocharger Wastegate Actuator 2 by the manufacturers software. When there is multiple failures, the most severe is transmitted.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
5385	Engine Turbocharger Wastegate Actuator 2 Temperature Status	Used to identify the status of the Engine Turbocharger Wastegate Actuator 2 drive circuitry temperature. Temperature excursions may affect the torque output.000b = High most severe 001b = High Least severe 010b = In Range 011b = Low Least severe 100b = Low Most severe 101b = Not Defined 110b = Error 111b = Not available
5386	Engine Turbocharger Wastegate Actuator 1 Command	The command to a Turbocharger Wastegate actuator 1, normalized to percent, where 0% nominally represents fully closed (No Flow) and 100% represents fully open (Max Flow).FB00h – FB64h is sent to calibrate to a specific position. The LSB specifies the position with a resolution of 1%/bit (eg, FB32h is sent to calibrate the actuator to 50%). FBFFh is sent to calibrate the actuator using its own algorithm. Calibration status from the actuator is received on SPN 5451.
5387	Engine Turbocharger Wastegate Actuator 2 Command	The command to a Turbocharger Wastegate actuator 2, normalized to percent, where 0% nominally represents fully closed (No Flow) and 100% represents fully open (Max Flow).
5388	Engine Turbocharger Compressor Bypass Actuator 2 Position	Measures the position of the turbocharger compressor bypass actuator 2, where 0% represents bypass fully closed and 100% represents bypass fully open. Typically, the compressor bypass is used to lower the compressor outlet pressure and/or intake manifold pressure during situations where too much boost is being generated by the turbocharger. Typically, a compressor bypass will be plumbed from the compressor outlet or intake manifold back to the compressor inlet, with the compressor bypass actuator and valve in place to regulate bypass flow.

5389	Engine Turbocharger Compressor Bypass Actuator 2 Desired Position	The desired position of the Engine Turbocharger Compressor Bypass actuator 2 by the engine ECU, where 0% represents bypass fully closed and 100% represents bypass fully open.This is the position that the device is attempting to achieve.
5390	Engine Turbocharger compressor Bypass Actuator 2 Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the Engine Turbocharger Compressor Bypass Actuator 1 by the manufacturers software. When there is multiple failures, the most severe is transmitted.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
5391	Engine Turbocharger Compressor Bypass Actuator 2 Temperature Status	Used to identify the status of the Engine Turbocharger Compresssor Bypass Actuator 2 drive circuitry temperature. Temperature excursions may affect the torque output.000b = High most severe 001b = High Least severe 010b = In Range 011b = Low Least severe 100b = Low Most severe 101b = Not Defined 110b = Error 111b = Not available
5392	Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit 1 Loss of Prime	Indicates that the aftertreatment diesel exhaust fluid dosing unit 1 has lost prime. SPN will be used with FMI 31 (Condition Exists) to indicate that this device has lost prime.
5393	Engine Exhaust Gas Recirculation 1 Cooler Bypass Actuator	The actuator controlling the cooler bypass valve on the first or only Exhaust Gas Recirculation (EGR) device.
5394	Aftertreatment 1 Diesel Exhaust Fluid Doser Valve 1	Diagnostic SPN for the aftertreatment diesel exhaust fluid doser used to inject diesel exhaust fluid into the aftertreatment exhaust stream.
5395	Engine Idle Fuel Quantity	Indicates that the quantity of fuel required to maintain idle speed is not within the regulated boundries.
5396	Engine Crankcase Ventilation Hose Disconnected	Indicates that the crankcase ventilation hose has been disconnected or removed. SPN will be used with FMI 31 (Condition Exists) to indicate that this device is missing in the crankcase ventilation system.

5397	Aftertreatment 1 Diesel Particulate Filter Regeneration too Frequent	Indicates that a regeneration event of the diesel particulate filter system is occurring too frequently. SPN will be used with FMI 31 (Condition Exists) to indicate the diesel particulate filter regeneration occurring too frequently.
5398	Estimated Pumping – Percent Torque	The calculated torque that indicates the estimated amount of torque loss due to the engine air handling system. The value transmitted in this parameter is included in SPN 514 (Nominal Friction – Percent Torque). The data is transmitted as a percent of reference engine torque (see the engine configuration message, PGN 65251).
5399	DPF Thermal Management Active	Indicates that the exhaust temperatures have been elevated for regeneration of the diesel particulate filter aftertreatment system or in preparation of regeneration of the diesel particulate aftertreatment system.00b = DPF Thermal Management is not active 01b = DPF Thermal Management is active 10b = Reserved 11b = Don’t care
5400	SCR Thermal Management Active	Indicates that the exhaust temperatures have been elevated for regeneration of the SCR aftertreatment system or in preparation of regeneration of the SCR aftertreatment system.00b = SCR Thermal Management is not active 01b = SCR Thermal Management is active 10b = Reserved 11b = Don’t care
5401	Engine Turbocharger Turbine Bypass Actuator	Diagnostic SPN for the actuator controlling the engine turbocharger turbine bypass valve. In a single turbocharger configuration, « bypass » and « wastegate » refer to the same function and SPN 5421 should be used. In a configuration where there is more than one turbocharger, it is possible to bypass the first turbocharger without functioning as a wastegate, and SPN 5401 would refer to the bypass valve.
5402	Lift Relay Control	Command signal used to Engage and Disengage the Lift Relay controlling a Steady-State Magnet. 00b = Off, Disable Lift Relay Request 01b = On, Enable Lift Relay Request 10b = Reserved 11b = Take No Action
5403	Drop Relay Control	Command signal used to Engage and Disengage the Drop Relay controlling a Steady-State Magnet. 00b = Off, Disable Drop Relay Request 01b = On, Enable Drop Relay Request 10b = Reserved 11b = Take No Action

5404	PTO Shutdown has Shutdown Engine	Status signal which identifies whether or not the engine has been shutdown by the PTO shutdown system. 00b = No 01b = Yes 10b = Error 11b = Not available
5405	Set Elevation Sensor #1 Reference Elevation	Command from a display or other external device (i.e. remote switch) to the land leveling system controller instructing the controller to set the reference elvation based on data received from the corresponding land leveling sensor.00b = Do not Set Reference Elevation 01b = Set Reference Elevation 10b = Reserved 11b = Don’t Care / Take No Action
5406	Set Elevation Sensor #2 Reference Elevation	Command from a display or other external device (i.e. remote switch) to the land leveling system controller instructing the controller to set the reference elvation based on data received from the corresponding land leveling sensor.00b = Do not Set Reference Elevation 01b = Set Reference Elevation 10b = Reserved 11b = Don’t Care / Take No Action
5407	Blade Control Mode – Left	Indicate if the land leveling system’s automatic control is active or inactive for the elevation sensor on the left side of the blade. The « left » notation is applicable to grading machines such tractors and motor graders where « left » is the position of the elevation sensor as seen by the operator.If the left sensor is not installed, then the value communicated should be « 1111b ». For systems with a single elevation sensor, the system should be flexible enough to be configured in a manner which most accurately represents what is installed on the machine. Manual: Operator controls the position of the blade as normal Auto: The grade control system is controlling the position of the blade without operator input Inactive Auto: An operating condition exists which prevents the grade control system from allowing automatic controls to engage. This would include conditions such as laser signal is not detected, but not faulty components. Error: A fault exists in the system. 0000b = Manual 0001b = Auto 0010b = Inactive Auto 0011b to 1101b = Reserved 1110b = Error 1111b = Not Available
5408	Blade Control Mode – Right	Indicate if the land leveling system’s automatic control is active or inactive for the elevation sensor on the right side of the blade. The « left » notation is applicable to grading machines such tractors and motor graders where « right » is the position of

		the elevation sensor as seen by the operator.If the right sensor is not installed, then the value communicated should be « 1111b ». For systems with a single elevation sensor, the system should be flexible enough to be configured in a manner which most accurately represents what is installed on the machine. Manual: Operator controls the position of the blade as normal Auto: The grade control system is controlling the position of the blade without operator input Inactive Auto: An operating condition exists which prevents the grade control system from allowing automatic controls to engage. This would include conditions such as laser signal is not detected, but not faulty components. Error: A fault exists in the system. 0000b = Manual 0001b = Auto 0010b = Inactive Auto 0011b to 1101b = Reserved 1110b = Error 1111b = Not Available
5409	Land Leveling System Enable Status	Communicate the enable/disable status of the Land Leveling System. 00b = Disabled 01b = Enabled 10b = Error 11b = Not available / Not installed
5410	Blade Elevation Deviation – Left	Indicate the blade's left elevation deviation with respect to the reference elevation. Serves as an indication of how far the left end of the blade is above or below grade. A positive number indicates that the blade is above the desired grade. A negative value indicates the blade is below the desired grade.
5411	Blade Elevation Deviation – Right	Indicate the blade's right elevation deviation with respect to the reference elevation. Serves as an indication of how far the left end of the blade is above or below grade. A positive number indicates that the blade is above the desired grade. A negative value indicates the blade is below the desired grade.
5412	Blade Reference Elevation Offset – Left	Indicates the blade's left elevation offset with respect to the reference elevation. An offset of 0 m represents no offset from the reference elevation. A positive number indicates that the offset elevation is above the original reference elevation. A negative value indicates the offset elevation is below the original reference elevation.
5413	Blade Reference Elevation Offset – Right	Indicates the blade's right elevation offset with respect to the reference elevation. An offset of 0 m represents no offset from the reference elevation. A positive number

		indicates that the offset elevation is above the original reference elevation. A negative value indicates the offset elevation is below the original reference elevation.
5414	Aftertreatment 1 Diesel Exhaust Fluid Quick Thaw Heater Command	The command for the heater of the diesel exhaust fluid quick thaw tank for aftertreatment system 1 (exhaust bank 1). See SPN 4372 for the measured heater percentage for the heater of this same tank.
5415	Aftertreatment 2 Diesel Exhaust Fluid Quick Thaw Heater Command	The command for the heater of the diesel exhaust fluid quick thaw tank for aftertreatment system 2 (exhaust bank 2). See SPN 4438 for the measured heater percentage for the heater of this same tank.
5416	Engine Wait To Start Lamp Data	This parameter provides measured data from the Engine Wait To Start Lamp. See SPN 1081 for the command. 00b = Lamp deactived (off) 01b = Lamp actived (on) 10b = Error 11b = Not available
5417	Engine Fuel Filter (Suction Side) Intake Absolute Pressure	Absolute pressure of fuel at the intake of the fuel filter (suction side) located between the fuel tank and the fuel supply pump. See Figures SPN16_A & SPN16_B.
5418	Engine Fuel Actuator 1	Device used to control the flow of fuel to the engine.
5419	Engine Throttle Actuator 1	Device used to control the flow of air or air/fuel mix to the engine.
5420	Engine Turbocharger Compressor Bypass Actuator 1	Device used to control the compressor bypass.
5421	Engine Turbocharger 1 Wastegate Actuator 1	Primary device used to control the wastegate on turbocharger 1.
5422	Engine Intake Manifold 2 Absolute Pressure	The absolute pressure measurement of the air intake manifold for bank 2 or the second air intake manifold. If there are multiple air pressure sensors in the intake stream, this is the last one in flow direction before entering the combustion chamber.

5423	Aftertreatment 1 Fuel Pump Relay Control	Indicates how the device is controlling the aftertreatment 1 fuel pump relay. 00b = off 01b = on 10b = reserved for SAE assignment 11b = not available
5424	Aftertreatment 1 Fuel Flow Diverter Valve Control	Indicates how the device is controlling the aftertreatment 1 fuel flow diverter valve. When this valve is on it diverts fuel flow from the Aftertreatment 1 Regeneration Device.00b = off 01b = on 10b = reserved for SAE assignment 11b = not available
5425	Aftertreatment 1 Fuel Pressure 2 Actuator Control	Indicates how the device is controlling the aftertreatment 1 fuel pressure 2 regulating control valve. 0% = fully closed, 100%=fully open.
5426	Aftertreatment 2 Fuel Pump Relay Control	Indicates how the device is controlling the aftertreatment 2 fuel pump relay. 00b = off 01b = on 10b = reserved for SAE assignment 11b = not available
5427	Aftertreatment 2 Fuel Flow Diverter Valve Control	Indicates how the device is controlling the aftertreatment 2 fuel flow diverter valve. When this valve is on it diverts fuel flow from the Aftertreatment 2 Regeneration Device.00b = off 01b = on 10b = reserved for SAE assignment 11b = not available
5428	Aftertreatment 2 Fuel Pressure 2 Control	Indicates how the device is controlling the aftertreatment 2 fuel pressure 2 regulating control valve. 0% = fully closed, 100%=fully open.
5429	Engine Exhaust Gas Recirculation 2 Intake Absolute Pressure	EGR intake absolute pressure measured before the EGR 2 valve.
5430	Engine Exhaust Gas Recirculation 1 Intake Absolute Pressure	EGR intake absolute pressure measured before the EGR 1 valve.
5431	Engine Exhaust Gas Recirculation 1 Outlet Absolute Pressure (High Resolution)	EGR outlet absolute pressure is measured after the EGR 1 valve. See SPN 5019 for 1 byte resolution.
5432	Memory level	Signal which indicates that the air suspension control has memory levels selected or stored. Response to memory level request in ASC2 (byte 8.5). If the request was executed the respective status will be set. If the request was not executed « requested

		level not available » will be set in Suspension control refusal information (ASC1 byte 8.1). 0000b = No memory level 0001b = Memory level 1 selected 0010b = Memory level 2 selected 0011b = Memory level 3 selected 0100b = Memory level 4 selected 0101b = Memory level 5 selected 0110b = reserved 0111b = reserved 1000b = reserved 1001b = Memory level 1 stored 1010b = Memory level 2 stored 1011b = Memory level 3 stored 1100b = Memory level 4 stored 1101b = Memory level 5 stored 1110b = Error indicator 1111b = not available
5433	Memory level request	Signal which indicates that the air suspension control requests a memory level or a memory level shall be stored.The storage of the current memory level is requested by « Store memory level x ». The acknowledge is set in « memory level x stored » (ASC1 byte 8.5). A memory level demand is requested by « Memory level x request ». The acknowledge is set in « memory level x selected » (ASC1 byte 8.5) 0000b = No memory level request 0001b = Memory level 1 request 0010b = Memory level 2 request 0011b = Memory level 3 request 0100b = Memory level 4 request 0101b = Memory level 5 request 0110b = reserved 0111b = reserved 1000b = reserved 1001b = Store Memory level 1 1010b = Store Memory level 2 1011b = Store Memory level 3 1100b = Store Memory level 4 1101b = Store Memory level 5 1110b = Reserved 1111b = Don’t care
5434	Aftertreatment 1 Diesel Exhaust Fluid Tank Fill Valve Command	Commanded percentage of maximum Aftertreatment 1 Diesel Exhaust Fluid Tank Fill Valve opening. 100% means the fill valve is fully open providing maximum flow of diesel exhaust fluid into the diesel exhaust fluid tank.
5435	Aftertreatment 1 Diesel Exhaust Fluid Pump State	State of the aftertreatment 1 Diesel Exhaust Fluid dosing pump. Indicates whether or not the pump is operational.00b = pump operational 01b = pump error 10b = reserved for SAE assignment 11b = not available
5436	Aftertreatment 1 Diesel Exhaust Fluid Tank Drain Valve Command	Commanded percentage of maximum Aftertreatment 1 Diesel Exhaust Fluid Tank Drain Valve opening. 100% means the drain valve is fully open providing maximum flow of diesel exhaust fluid out of the diesel exhaust fluid tank.

5437	Aftertreatment 2 Diesel Exhaust Fluid Tank Fill Valve Command	Commanded percentage of maximum Aftertreatment 2 Diesel Exhaust Fluid Tank Fill Valve opening. 100% means the fill valve is fully open providing maximum flow of diesel exhaust fluid into the diesel exhaust fluid tank.
5438	Aftertreatment 2 Diesel Exhaust Fluid Pump State	State of Aftertreatment 2 Diesel Exhaust Fluid dosing pump. 00b = pump operational 01b = pump error 10b = reserved for SAE assignment 11b = not available
5439	Aftertreatment 2 Diesel Exhaust Fluid Tank Drain Valve Command	Commanded percentage of maximum Aftertreatment 2 Diesel Exhaust Fluid Tank Drain Valve opening. 100% means the the drain valve is fully open providing maximum flow of diesel exhaust fluid out of the diesel exhaust fluid tank.
5440	Aftertreatment 2 Hydrocarbon Doser	The doser used to inject fuel into the aftertreatment system
5441	Engine Fuel Injection Timing Error for Multiple Cylinders	To be defined
5442	Engine Fuel Injection Pressure Error for Multiple Cylinders	To be defined
5443	Aftertreatment 1 Hydrocarbon Dosing System	See document J1939-73 for SPN details.
5444	Engine Crankcase Breather Oil Separator Speed	The speed of a rotating (centrifugal) crankcase oil separator.
5445	Engine Throttle Valve 1 Operation Status	Used to identify the status of engine throttle valve 1 (SPN 51). 0000b = Normal 0001b = Alarm (fully operational but needs service) 0010b = Alarm High Severity (functional but transient performance may be reduced) 0011b = Derate Active (torque output reduced due to environmental conditions) 0100b = Controlled Shutdown Active (driving to the default position – usually this means closed) 0101b = Uncontrolled Shutdown Active (actuator current is off so it is limp) 0110b = Calibration in Progress (must be broadcast at least once per calibration process

		defined in SPN 3464) 0111b to 1101b = Reserved for future assignment 1110b = Error 1111b = Not available
5446	Engine Throttle Valve 2 Operation Status	Used to identify the status of engine throttle valve 2 (SPN 3673). 0000b = Normal 0001b = Alarm (fully operational but needs service) 0010b = Alarm High Severity (functional but transient performance may be reduced) 0011b = Derate Active (torque output reduced due to environmental conditions) 0100b = Controlled Shutdown Active (driving to the default position – usually this means closed) 0101b = Uncontrolled Shutdown Active (actuator current is off so it is limp) 0110b to 1101b = Reserved for future assignment 1110b = Error
5447	Engine Fuel Valve 1 Operation Status	Used to identify the status of Engine Fuel Valve 1. 0000b = Normal 0001b = Alarm (fully operational but needs service) 0010b = Alarm High Severity (functional but transient performance may be reduced) 0011b = Derate Active (torque output reduced due to environmental conditions) 0100b = Controlled Shutdown Active (driving to the default position – usually this means closed) 0101b = Uncontrolled Shutdown Active (actuator current is off so it is limp) 0110b = Test Mode Active 0111b to 1101b = Reserved for future assignment 1110b = Error
5448	Engine Fuel Valve 2 Operation Status	Used to identify the status of Engine Fuel Valve 2. 0000b = Normal 0001b = Alarm (fully operational but needs service) 0010b = Alarm High Severity (functional but transient performance may be reduced) 0011b = Derate Active (torque output reduced due to environmental conditions) 0100b = Controlled Shutdown Active (driving to the default position – usually this means closed) 0101b = Uncontrolled Shutdown Active (actuator current is off so it is limp) 0110b = Test Mode Active 0111b to 1101b = Reserved for future assignment 1110b = Error
5449	Engine Turbocharger Compressor Bypass Actuator 1 Operation Status	Used to identify the status of Engine Turbocharger Compressor Bypass Actuator 1. 0000b = Normal 0001b = Alarm (fully operational but needs service) 0010b = Alarm High Severity (functional but transient performance may be reduced) 0011b = Derate Active (torque output reduced due to environmental conditions) 0100b = Controlled Shutdown Active (driving to the default position – usually this means closed) 0101b

		= Uncontrolled Shutdown Active (actuator current is off so it is limp) 0110b to 1101b = Reserved for future assignment 1110b = Error
5450	Engine Turbocharger Compressor Bypass Actuator 2 Operation Status	Used to identify the status of Engine Turbocharger Compressor Bypass Actuator 2. 0000b = Normal 0001b = Alarm (fully operational but needs service) 0010b = Alarm High Severity (functional but transient performance may be reduced) 0011b = Derate Active (torque output reduced due to environmental conditions) 0100b = Controlled Shutdown Active (driving to the default position – usually this means closed) 0101b = Uncontrolled Shutdown Active (actuator current is off so it is limp) 0110b to 1101b = Reserved for future assignment 1110b = Error
5451	Engine Turbocharger Wastegate Actuator 1 Operation Status	Used to identify the status of Engine Turbocharger Wastegate Actuator 1. 0000b = Normal 0001b = Alarm (fully operational but needs service) 0010b = Alarm High Severity (functional but transient performance may be reduced) 0011b = Derate Active (torque output reduced due to environmental conditions) 0100b = Controlled Shutdown Active (driving to the default position – usually this means closed) 0101b = Uncontrolled Shutdown Active (actuator current is off so it is limp) 0110b = Calibration in Progress (must be broadcast at least once per calibration process defined in SPN 5386) 0111b to 1101b = Reserved for future assignment 1110b = Error
5452	Engine Turbocharger Wastegate Actuator 2 Operation Status	Used to identify the status of Engine Turbocharger Wastegate Actuator 2. 0000b = Normal 0001b = Alarm (fully operational but needs service) 0010b = Alarm High Severity (functional but transient performance may be reduced) 0011b = Derate Active (torque output reduced due to environmental conditions) 0100b = Controlled Shutdown Active (driving to the default position – usually this means closed) 0101b = Uncontrolled Shutdown Active (actuator current is off so it is limp) 0110b to 1101b = Reserved for future assignment 1110b = Error
5454	Aftertreatment 1 Diesel Particulate Filter Average Time Between Active Regenerations	Indicates the average time since last reset between active regenerations, that have not been forced to occur by manual request, for Aftertreatment device 1.If the manufacturer allows this parameter to be reset, this time is the average since last reset.

5455	Aftertreatment 2 Diesel Particulate Filter Average Time Between Active Regenerations	Indicates the average time since last reset between active regenerations, that have not been forced to occur by manual request, for Aftertreatment device 2.
5456	Aftertreatment 1 Hydrocarbon Doser Intake Fuel Temperature	Measured temperature of the intake fuel to the hydrocarbon dosing device.
5457	Engine Variable Geometry Turbocharger 1 Control Mode	Indicates if the variable geometry turbocharger control status is either open loop or closed loop. 00b = open loop 01b = closed loop 10b = SAE reserved 11b = not available
5458	Flexible Fuel Percentage	Measured signal that indicates the percentage of alcohol in the fuel currently being used. 0% means no alcohol in fuel, 100% means alcohol as fuel and nothing else.EXAMPLE: If a Bi-fuel vehicle has less than 10% ethanol in the gasoline/petrol, then the external test equipment shall display state 09h (See SPN 5837). In such a case, the system would be using gasoline/petrol (fuel) tables and OBD thresholds. SPN 5458 should either artificially display 0% or some number 10% or less if the system has such resolution. If the ethanol in the gasoline/petrol is above 10%, then the external test equipment shall display state 0Bh. SPN 5458 shall report the calculated ethanol/alcohol percentage.
5459	Aftertreatment 1 NOx Adsorber Regeneration Status	Indicates whether the NOx adsorber regeneration in the first aftertreatment system is active or inactive. 00b = Inactive 01b = Active 10b = Error indicator 11b = Not available
5460	Aftertreatment 2 NOx Adsorber Regeneration Status	Indicates whether the NOx adsorber regeneration in the second aftertreatment system is active or inactive 00b = Inactive 01b = Active 10b = Error indicator 11b = Not available
5461	Aftertreatment 1 NOx Adsorber Desulfation Status	Indicates whether the NOx adsorber desulfation regeneration in the first aftertreatment system is active or inactive00b = Inactive 01b = Active 10b = Error indicator 11b = Not available

5462	Aftertreatment 2 NOx Adsorber Desulfation Status	Indicates whether the NOx adsorber desulfation regeneration in the second aftertreatment system is active or inactive00b = Inactive 01b = Active 10b = Error indicator 11b = Not available
5463	Aftertreatment SCR Operator Inducement Active Traveled Distance	The distance traveled while SCR inducement (SPN 5246 is equal to level 1 to 5) is active. Distance is reset once inducement is no longer active for SCR (SPN 5246 = 0).Emission Control System Operator Inducement Severity, SPN 5826, may be active (is equal to level 1 to 5) due to an SCR condition specified by emissions regulations that is associated with SPN 5246.
5464	Hybrid Battery Pack Remaining Charge	Indicates the hybrid battery pack remaining charge. 0% means no charge remaining, 100% means full charge remaining.
5465	Engine Intake Manifold Pressure Control Mode	Indicates that the Boost Pressure Closed Loop Control status either open loop or closed loop. 00b = Open loop 01b = Closed loop 10b = SAE reserved 11b = Not available
5466	Aftertreatment 1 Diesel Particulate Filter Soot Load Regeneration Threshold	This parameter indicates the value that will first cause DPF regeneration in aftertreatment 1. There may be multiple parameters that cause DPF regeneration (e.g. Percent Soot Load, DPF delta pressure converted to normalized percentage, etc.). If there are multiple inputs to this parameter that may cause active DPF regeneration, the highest value shall always be reported.100% is the level at which active diesel particulate filter regeneration should be triggered. 100% level is the active regeneration trigger level (and if conditions are not favorable for regeneration, soot loading can continue beyond 100%). During normal operation and regeneration a value 0% will indicate a fully regenerated diesel particulate filter. Values of 25%, 50% and 75% will indicate the general level of soot prior to the 100% level where an active regeneration is needed.
5467	Aftertreatment 2 Diesel Particulate Filter Soot Load Regeneration Threshold	This parameter indicates the value that will first cause DPF regeneration in aftertreatment 2. There may be multiple parameters that cause DPF regeneration (e.g. Percent Soot Load, DPF delta pressure converted to normalized percentage, etc.). If there are multiple inputs to this parameter that may cause active DPF regeneration,

		the highest value shall always be reported.100% is the level at which active diesel particulate filter regeneration should be triggered. 100% level is the active regeneration trigger level (and if conditions are not favorable for regeneration, soot loading can continue beyond 100%). During normal operation and regeneration a value 0% will indicate a fully regenerated diesel particulate filter. Values of 25%, 50% and 75% will indicate the general level of soot prior to the 100% level where an active regeneration is needed.
5468	Engine Oil Relative Dielectricity (High Resolution)	Engine oil relative dielectricity used to describe the engine oil quality.
5469	Engine Fuel Filter Restricted Lamp Command	Command signal directly controlling the Engine Fuel Filter Restricted Lamp. 00b = Lamp Off 01b = Lamp On 10b = Reserved 11b = Not available
5470	Engine Fuel Filter Restricted Lamp Data	This parameter provides measured data from the Engine Fuel Filter Restricted Lamp. 00b = Lamp deactivated (Off) 01b = Lamp activated (On) 10b = Error 11b = Not available
5471	Engine Friction Percent Torque At Idle, Point 1	The static portion of the friction torque at speed point 1 (SPN 188) of the engine torque map in the engine configuration message. This parameter does not include Estimated Pumping – Percent Torque (SPN 5398) and is expected to change with temperature. The data is transmitted as a percent of the reference engine torque (SPN 544).
5472	Engine Friction Percent Torque, Point 2	The static portion of the friction torque at speed point 2 (SPN 528) of the engine torque map in the engine configuration message. This parameter does not include Estimated Pumping – Percent Torque (SPN 5398) and is expected to change with temperature. The data is transmitted as a percent of the reference engine torque (SPN 544).
5473	Engine Friction Percent Torque, Point 3	The static portion of the friction torque at speed point 3 (SPN 529) of the engine torque map in the engine configuration message. This parameter does not include Estimated Pumping – Percent Torque (SPN 5398) and is expected to change with

		temperature. The data is transmitted as a percent of the reference engine torque (SPN 544).
5474	Engine Friction Percent Torque, Point 4	The static portion of the friction torque at speed point 4 (SPN 530) of the engine torque map in the engine configuration message. This parameter does not include Estimated Pumping – Percent Torque (SPN 5398) and is expected to change with temperature. The data is transmitted as a percent of the reference engine torque (SPN 544).
5475	Engine Friction Percent Torque, Point 5	The static portion of the friction torque at speed point 5 (SPN 531) of the engine torque map in the engine configuration message. This parameter does not include Estimated Pumping – Percent Torque (SPN 5398) and is expected to change with temperature. The data is transmitted as a percent of the reference engine torque (SPN 544).
5476	Engine Friction Percent Torque, Point 6	For engine configuration map modes 1 and 2, this is the static portion of the friction torque at speed point 6 (SPN 532) of the engine torque map. For engine configuration map mode 3, this parameter is the static portion of the friction torque at the engine speed calculated by using Engine Gain (Kp) Of The Endspeed Governor (SPN 545) where torque is 0. This parameter does not include Estimated Pumping – Percent Torque (SPN 5398) and is expected to change with temperature. The data is transmitted as a percent of the reference engine torque (SPN 544)..
5477	Engine Friction Percent Torque, Point 7	The static portion of the friction torque at speed point 7 (SPN 533) of the engine torque map in the engine configuration message. This parameter does not include Estimated Pumping – Percent Torque (SPN 5398) and is expected to change with temperature. The data is transmitted as a percent of the reference engine torque (SPN 544).
5478	Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit 1 Loss of Prime (Obsolete)	Indicates that the Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit has lost prime. SPN will be used with FMI 31 (Condition Exists) to indicate that this device has lost prime.Duplicate – Use SPN 5392 instead.

5479	Aftertreatment 1 NOx Adsorber Catalyst Intake Temperature	The temperature measured at the intake of the NOx adsorber catalyst in exhaust bank 1.
5480	Aftertreatment 1 Diesel Exhaust Fluid Controller 1 Temperature	Temperature of the diesel exhaust fluid at the aftertreatment 1 diesel exhaust fluid controller. For controllers that have more exhaust emissions control functions than only diesel exhaust fluid control, see SPN 5486 – exhaust emission control ECU temperature or SPN 1136 – engine ECU temperature.
5481	Aftertreatment 1 NOx Adsorber Catalyst Outlet Temperature	The temperature measured at the outlet of the NOx adsorber catalyst in exhaust bank 1.
5482	Aftertreatment 1 NOx Adsorber Catalyst Missing	SPN will be used with FMI 31 (Condition Exists) to indicate the afterteatment NOx adsorber catalyst is missing in exhaust bank 1.
5483	Engine Turbocharger 1 Turbine Bypass Actuator 1 Position	Measures the position of the turbocharger turbine bypass actuator, where 0% represents bypass fully closed and 100% represents bypass fully open.In a single turbocharger configuration, « bypass » and « wastegate » refer to the same function and SPN 1188 should be used. In a configuration where there is more than one turbocharger, it is possible to bypass the first turbocharger without functioning as a wastegate, and SPN 5483 would refer to the bypass valve.
5484	Engine Fan Clutch 2 Output Driver	Indicates the status of the engine fan clutch 2 output driver.
5485	Aftertreatment 1 Diesel Exhaust Fluid Pump Orifice Flow	The Exhaust Emission Controller aftertreatment reagent pump orifice flow. Could indicate that the flow is being restricted.
5486	Exhaust Emission Controller ECU Temperature	The temperature of the exhaust emission control unit.
5487	Aftertreatment 1 Burner Unit Combustion Chamber Temperature	The temperature inside the combustion chamber for aftertreatment 1 burner unit type diesel particulate filters

5488	Aftertreatment 1 Diesel Exhaust Fluid Line Heater 5 State	The diesel exhaust fluid line heater 5 state for aftertreatment system 1 (exhaust bank 1). 00b = heater inactive 01b = heater active 10b = error 11b = not available
5489	Aftertreatment 1 Diesel Exhaust Fluid Line Heater 5 Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the diesel exhaust fluid line heater 5, by the manufacturer's control software in exhaust bank 1. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
5490	Aftertreatment 2 Diesel Exhaust Fluid Line Heater 5	Identifies the diesel exhaust fluid line heater 5 request for aftertreatment system 2 (exhaust bank 2). 00b = request for heater to be inactive 01b = request for heater to be active 10b = reserved for future assignment by SAE 11b = not available
5491	Aftertreatment 1 Diesel Exhaust Fluid Line Heater Relay 1	The Aftertreatment Diesel Exhaust Fluid Line Heater Relay 1 is used to energize one or more DEF line heaters.00b = Off 01b = On 10b = Error 11b = Not available
5492	Armrest 1 Switch 2	Status of the second switch located in armrest 1. 00b = Off 01b = On 10b = Reserved 11b = Don't care/take no action
5493	Armrest 2 Switch 1	Status of the first switch located in armrest 2. 00b = Off 01b = On 10b = Reserved 11b = Don't care/take no action
5494	Armrest 2 Switch 2	Status of the second switch located in armrest 2. 00b = Off 01b = On 10b = Reserved 11b = Don't care/take no action
5495	Aftertreatment 1 Diesel Particulate Filter Soot Mean Calibration Offset	Calibration offset for the soot Mean for Aftertreatment 1 Diesel Particulate Filter soot sensor.
5496	Aftertreatment 1 Diesel Particulate Filter Soot Standard Deviation Calibration Offset	Calibration offset for the soot standard deviation for Aftertreatment 1 Diesel Particulate Filter soot sensor.
5497	Aftertreatment 2 Diesel Particulate Filter Soot Mean Calibration Offset	Calibration offset for the soot Mean for Aftertreatment 2 Diesel Particulate Filter soot sensor.

5498	Aftertreatment 2 Diesel Particulate Filter Soot Standard Deviation Calibration Offset	Calibration offset for the soot standard deviation for Aftertreatment 2 Diesel Particulate Filter soot sensor.
5499	Intake Valve Actuation System Oil Pressure 1 Solenoid Control	Indicates the current command to the solenoid that controls the intake valve actuation system oil pressure 1 valve. This valve opens or closes a connection from the intake valve actuation oil rail to tank.00b = off 01b = on 10b = reserved for SAE assignment 11b = not available
5500	Intake Valve Actuation System Oil Pressure 2 Solenoid Control	Indicates the current command to the solenoid that controls the intake valve actuation system oil pressure 2 valve. This valve opens or closes a connection from the intake valve actuation oil rail to tank.00b = off 01b = on 10b = reserved for SAE assignment 11b = not available
5501	Aftertreatment 1 Diesel Particulate Filter Intake Temperature Set Point	Set point temperature for the particulate filter (DPF) regeneration at the intake to the DPF for Exhaust bank 1.
5502	Engine Unburned Fuel Percentage	The unburned amount of diesel fuel coming out of the engine. This fuel increases the temperature while oxidated in the DOC. Therefore, this amount of fuel also needs to be taken into account of the HCD temperature controller.
5503	Aftertreatment 1 Fuel Mass Rate	Mass rate of total fuel being delivered to aftertreatment 1 for DPF regeneration.
5504	Hydrocarbon Doser Purging Enable	Purging enable of the Hydrocarbon Doser (HCD). 00b = Purging not enabled 01b = Purging enabled – less urgent 10b = Purging enabled – urgent 11b = Not available
5505	Requested Fuel Mass Rate	Requested fuel dosing quantity from hydrocarbon doser.
5506	HC Doser Status	Indicates whether the HC Doser/ HC Dosing system is enabled or is waiting for regeneration. 000b = HC doser disabled 001b = HC doser active 010b = SAE reserved 011b = HC doser enabled, waiting for regeneration 100b = SAE reserved 101b = SAE reserved 110b = Error 111b = Not available

5507	HC Doser Injecting Status	Indicates whether the Hydrocarbon Doser (HCD) is presently injecting diesel fuel into the exhaust pipe. 00b = Injecting not active 01b = Injecting active 10b = Error 11b = Not available
5508	Diagnostic Status of HC Doser	Indicates whether an error is active in the Hydrocarbon Doser (HCD) or whether the internal cyclic system test of the HCD is presently active.This is not intended to replace the DM8/DM30 – Test results requirement for OBD. 000b = System test has executed and passed or System test has not yet executed 001b = Internal system test is in process 010b to 101b = SAE reserved 110b = Error — System test has failed 111b = Not available
5509	Hydrocarbon Doser Purging Required	Purging of the Hydrocarbon Doser (HCD) is required. Request could come from the HCD system. 00b = Purging not required 01b = Purging required – less urgent 10b = Purging required – urgent 11b = Not available
5510	Lubrication Cycle Mode Lock Command	Command signal to lock or unlock the ability to change the lubrication cycle mode. Locking the lubrication mode would prevent the changing of the lubrication cycle mode, perhaps by an operator.00b = Not Locked 01b = Locked 10b = Reserved 11b = No action
5511	Lubrication Cycle Set Command	Command signal to change the lubrication cycle. It gives the operator or technician the ability to the change the frequency of lubrication.000b = Cycle mode # 1 (Lowest Lubrication Frequency) 001b = Cycle mode # 2 010b = Cycle mode # 3 (Highest Lubrication Frequency) 011b to 110b = Reserved 111b = No action
5512	Lubrication Operation Mode Set Command	Command signal to change lubrication system operational mode. The mode set command gives the operator and/or technician the ability to change the operational mode when diagnosing and servicing of the system is required.Automatic is the normal operation mode of lubrication system. In this mode the operator has the privilege to change duty cycle mode, if the lubrication mode in not locked. In manual service mode the service tool temporary takes control of the pump controller for service purposes. The Test mode # x shall command the system to perform pre-defined greasing cycles in order to verify operation of the lubrication system. 000b =

		Automatic Mode 001b = Manual Service Mode 010b = Test Mode # 1 011b = Test Mode # 2 100b = Test Mode # 3 101b to 110b = Reserved 111b = Take no action
5513	Lubrication Pump Enable Command	Command signal to reset the lubrication pump. It allows the operator and/or technician to reset the paused lubrication pump and clear lubrication system faults. This shall enable the lubrication system to resume its normal operation.00b = No action (Normal pump operation) 01b = Reset pump operation 10b = Reserved 11b = Take no action
5514	Lubrication Timing Cycle Command	Command signal to enable or pause the lubrication activation clock 00b = Pause 01b = Enable 10b = Reserved 11b = Take no action Note: In some vehicles or machines the lubrication is only required when the vehicle or machine is in certain state (such as when a certain gear is engaged, operator's armrest in place etc.). To prevent unwanted grease lubrication, a timing cycle clock is used. This clock is only ticked for the time the vehicle or machine is in the defined state. Starting or stopping of the clock is controlled using an external input.
5515	Lubrication Cycle Mode Lock Status	Reports status of the ability to change the lubrication cycle mode. Locking the lubrication mode would prevent the changing of the lubrication cycle mode, perhaps by an operator00b = Not Locked 01b = Locked 10b = Error 11b = Not available
5516	Lubrication Cycle Mode Status	Reports the current lubrication cycle mode of the lubrication system 000b = Cycle mode # 1 (Lowest Lubrication Frequency) 001b = Cycle mode # 2 010b = Cycle mode # 3 (Highest Lubrication Frequency) 011b to 101b = Reserved 110b = Error 111b = Not available
5517	Lubrication Operation Mode Status	Reports the current operational mode status of the lubrication system. Automatic is the normal operation mode of lubrication system. In this mode the operator has the privilege to change duty cycle mode, if the lubrication mode in not locked. In manual service mode the service tool temporary takes control of the pump controller for service purposes. The test mode # x shall command the system to perform pre-defined greasing cycles in order to verify operation of the lubrication system. 000b = Automatic Mode 001b = Manual Service Mode 010b = Test Mode # 1 011b = Test

		Mode # 2 100b = Test Mode # 3 101b = Reserved 110b = Error 111b = Not Available Note: In general the lubrication system shall be operating in automatic mode but, it may also be changed into manual or test mode. These test and manual modes are used to perform service and diagnostic tests on the lubrication system. This SPN shall be used to report the current operating status of grease lubrication system.
5518	Lubrication Pump Enable Status	Reports the operational status of the lubrication system pump. In the disabled state, the lubrication pump will not run a lubrication cycle. In the enabled state, the lubrication system will perform normal operations.00b = Disabled 01b = Enabled 10b = Error 11b = Not available
5519	Lubrication Reservoir Level	Reports the status of the lubrication system reservior level. The lubrication reservoir stores the grease for the lubrication system. The lubrication pump draws grease from this reservoir and pushes it into the vehicle/chassis joints00b = Reservoir Not Low 01b = Reservoir Low 10b = Error 11b = Not available or not installed
5520	Lubrication Timing Cycle Status	Reports the status of the lubrication activation clock. 00b = Paused 01b = Enabled 10b = Error 11b = Not available or not installed Note: In some vehicles or machines, lubrication is only required when the vehicle or machine is in certain state e. g. when a certain gear is engaged. To prevent unwanted grease lubrication, a timing cycle clock is used. This clock only ticks for the time the vehicle or machine is in that defined state. Starting or stopping of the clock is controlled using an external input. The status of this timing cycle clock shall be reported to the operator by using this SPN.
5521	Lubrication System	The system used to lubricate joints on a vehicle/chassis
5522	Lubrication Pump Outlet Line 1 Pressure	The pressure observed at the pump outlet valve 1 in a vehicle/chassis lubrication system.
5523	Lubrication Pump Outlet Line 2 Pressure	The pressure observed at the pump outlet valve 2 in a vehicle/chassis lubrication system.

5524	Unexpected Lubrication Line 1 Pressure	Shows when pressure is present in line 1 when pressure is not expected.
5525	Unexpected Lubrication Line 2 Pressure	Shows when pressure is present in line 2 when pressure is not expected.
5526	Lubrication Line Pressure	Senses the pressure in the lubrication line.
5527	Lubrication Pump Actuator	This is the actuator that turns the lubrication pump on and off during a lubrication cycle on a vehicle/chassis lubrication system.
5528	Lubrication Pump Outlet Valve 1 Actuator	This actuator shifts valve 1 during a lubrication cycle on a vehicle/chassis lubrication system.
5529	Lubrication Pump Outlet Valve 2 Actuator	This actuator shifts valve 2 during a lubrication cycle on a vehicle/chassis lubrication system.
5530	Lubrication Pump	The mechanical pump that is used to pump lubricant in a vehicle/chassis lubrication system.
5531	Controller Internal Memory Battery	Battery that is internal to an electronic controller for persistence of data in memory.
5532	Switch Backlight Illumination Brightness Percent	Commanded switch backlight brightness level for all operator control switches. This is separate from the cab display illumination Brightness Percent parameter.Note: If a single device is used to control both the backlight brightness level of the cab display and switches, see SPN 1487.
5533	Hydraulic Oil Dynamic Viscosity	Dynamic viscosity of hydraulic oil. This hydraulic fluid is for the entire hydraulics system of a piece of equipment.
5534	Hydraulic Oil Density	Density of hydraulic oil. This hydraulic fluid is for the entire hydraulics system of a piece of equipment.

5535	Hydraulic Oil Relative Dielectricity (High Resolution)	Hydraulic oil relative dielectricity used to describe the hydraulic oil quality. This hydraulic fluid is for the entire hydraulics system of a piece of equipment.
5536	Hydraulic Oil Temperature (High Resolution)	Hydraulic Oil Temperature. This hydraulic fluid is for the entire hydraulics system of a piece of equipment.
5537	Engine Fuel Dynamic Viscosity	Dynamic viscosity of engine fuel
5538	Engine Fuel Density	Density of engine fuel
5539	Engine Fuel Dielectricity (High Resolution)	Engine fuel relative dielectricity.
5540	Engine Fuel 1 Temperature 1 (High Resolution)	Engine Fuel Temperature of the first fuel type. See also SPNs 174 or 3468 for alternate resolution.
5541	Engine Turbocharger 1 Turbine Outlet Pressure	Gage pressure of the combustion by-products exiting the turbine side of the turbocharger 1.
5542	Engine Turbocharger 1 Turbine Desired Outlet Pressure	The desired gage pressure of the combustion by-products exiting the turbine side of the turbocharger 1 at the current engine operating conditions.
5543	Engine Exhaust Brake Actuator Command	The control command applied to the engine exhaust brake actuator, where 0% represents no braking and 100% represents full braking.
5544	Engine Turbocharger 2 Turbine Outlet Pressure	Gage pressure of the combustion by-products exiting the turbine side of the turbocharger 2.
5545	Engine Turbocharger 2 Turbine Desired Outlet Pressure	The desired gage pressure of the combustion by-products exiting the turbine side of the turbocharger 2 at the current engine operating conditions.

5546	Engine Auxiliary Cooler Supply Valve 1 Actuator Command	The control command applied to the engine auxiliary cooler supply valve 1 actuator, where 0% represents closed and 100% represents open.See SPN 4197 for primary engine thermostat valve.
5547	Engine Auxiliary Cooler Supply Valve 2 Actuator Command	The control command applied to the engine auxiliary cooler supply valve 2 actuator, where 0% represents closed and 100% represents open.
5548	Engine Cold Start Fuel Igniter Command	The engine cold start fuel igniter control command, normalized to %, where 0% represents fully off and 100% represents fully on.
5549	Engine Cold Start Fuel Igniter Relay	The engine cold start fuel igniter relay control command. This command controls the relay, not the igniter. 00b = Off 01b = On 10b = Reserved 11b = Don’t care/take no action
5550	Engine Cold Start Fuel Igniter Relay Feedback	Feedback state of the engine cold start fuel igniter relay which indicates the status of the relay output. 00b = Off 01b = On 10b = Error 11b = Not available
5551	Magnet Generator Control	Command signal used to Enable and Disable the Generator controlling a Magnet. 00b = Off, Disable Generator 01b = On, Enable Generator 10b = Reserved 11b = Take No Action
5552	Supplemental Fan Enable Command	Enable/Disable command to Supplemental Fan. 00b = Disable 01b = Enable 10b = Reserved 11b = Don’t Care/Take no action
5553	Supplemental Fan Direction Command	Direction command to the Supplemental Fan. Fan can be commanded to run forward or reverse. 00b = Forward 01b = Reverse 10b = Reserved 11b = Don’t care/take no action (leave function as is)
5554	Supplemental Fan Speed Command	Speed command to Supplemental Fan.
5555	Supplemental Fan Power Hold	Command to allow the supplemental fan controller to remain alive independently of the electrical enable input to the fan. This allows the fan controller to remain alive after the key switch has disabled the electrical enable pin on the fan controller. For

		example, the fan can continue to run after a machine has been shutdown to provide cooling when the machine is no longer running00b = Disable 01b = Enable 10b = Reserved 11b = Don’t Care/Take no action
5556	Supplemental Fan Enable Status	Enable/Disable Status of Supplemental Fan. 00b = Disabled 01b = Enabled 10b = Error 11b = Not available/Not installed
5557	Supplemental Fan Direction Status	Rotational Direction of Supplemental Fan. Fan could be spinning forward or reverse. 00b = Forward 01b = Reverse 10b = Error 11b = Not available/Not installed
5558	Supplemental Fan Velocity Status	Status of the rotational velocity of Supplemental Fan. Used to indicate if the fan is spinning at the desired speed. If fan is not able to obtain the commanded speed, velocity error is indicated. If fan is unable to spin, the fan is in Fan Stall condition.0000b = At Velocity (Fan OK) 0001b = Velocity Error (unable to achieve commanded speed) 0010b = Fan Spin Up 0011b = Fan Spin Down 0100b = Fan Stall 0101b to 1101b = Reserved 1110b = Error 1111b = Not available
5559	Supplemental Fan Controller Temperature Status	Internal Controller Temperature Status of Supplemental Fan. 000b = High most severe 001b = High Least severe 010b = In Range 011b = Low Least severe 100b = Low Most severe 101b = Not Defined 110b = Error 111b = Not available
5560	Supplemental Fan Drive Status	The drive status of the Supplemental Fan. This status parameter indicates the overall health of the fan drive. It will indicate that the fan is working OK or if there is an internal fault such as open winding or internal short circuit.0000b = Normal = « OK » 0001b = Alarm = Fully operational but needs service 0010b = Alarm High Severity = Functional but transient performance may be reduced 0011b = Derate Active = Torque output reduced due to environmental conditions 0100b = Controlled Shutdown Active = Driving to the default position – usually this means closed 0101b = Uncontrolled Shutdown Active = Actuator current is off so it is limp 0110b to 1101b = Reserved for future assignment = Not used 1110b = Error 1111b = Not available

5561	Supplemental Fan Controller ECU Temperature	Measured temperature of Supplemental Fan Controller ECU.
5562	Supplemental Fan Speed	Measured speed of supplemental fan.
5563	Supplemental Fan Current	Measured electrical current of supplemental fan drive.
5564	Supplemental Fan Power	Estimated Power output of Supplemental Fan
5565	Coolant Level Engine Protection Shutdown Override Command	Overrides the engine protection shutdown functionality due to low coolant level. 00b = Disable engine protection shutdown override due to low coolant level 01b = Enable engine protection shutdown override due to low coolant level 10b = Reserved 11b = Don’t care/take no action
5566	Coolant Level Engine Protection Shutdown Status	Parameter which indicates the configuration of the coolant level engine protection shutdown. 00b = Disabled – calibration does not allow engine protection due to low coolant level or the override is currently active 01b = Enabled – calibration allows engine protection due to low coolant level and the override is currently not active 10b = Reserved 11b = Not Available
5567	Engine Speed Governor Gain Adjust	This parameter is used to adjust multiple gains at same time to attain engine stability across a broader range of applications.-32128 is least responsive 0 is normal +32127 is most responsive
5568	Engine Speed Governor Droop	This is the percent speed droop adjustment relative to rated speed setpoint. The Engine Speed Droop is equal to the following equation:100*[(Engine Speed at no load – Engine Speed at full rated load)/ (Engine Speed at full rated load)]. The engine speed will slow down as load is added. Allows for inexpensive load sharing between multiple engines.
5569	Diesel Particulate Filter 1 Soot Sensor ECU Internal Temperature	Internal temperature of the diesel particulate filter 1 soot sensor ECU.

5570	Diesel Particulate Filter 2 Soot Sensor ECU Internal Temperature	Internal temperature of the diesel particulate filter 2 soot sensor ECU.
5571	High Pressure Common Rail Fuel Pressure Relief Valve	Indicates the condition of the pressure relief valve. An example is that the pressure relief valve has opened due to high fuel rail pressure. FMI 0 is used in this case.
5572	Electrical Power Inverter/Converter	The electrical power inverter/converter is used to convert between DC voltage and AC voltage. The electrical power inverter/converter is a single box unit.
5573	Auxiliary Cab Air Conditioner	The auxiliary cab air conditioner is a supplemental air conditioning system used to cool the vehicle cab interior.
5574	Auxiliary Cab Heater	The auxiliary cab heater is a supplemental heating system used to heat the vehicle cab interior.
5575	Vehicle Hood Tilt Switch	Switch used to indicate the current position of the vehicle hood.
5576	Aftertreatment 1 Identification	Aftertreatment 1 identification data used to ensure proper matching of engine and aftertreatment system.
5577	Aftertreatment 2 Identification	Aftertreatment 2 identification data used to ensure proper matching of engine and aftertreatment system.
5578	Engine Fuel Delivery Absolute Pressure	Absolute pressure of fuel in system as delivered from supply pump to the injection pump. See also SPN 94 for Fuel Delivery Pressure (Gage).
5579	Engine Filtered Fuel Delivery Pressure	Gage pressure of fuel in system as delivered from supply pump to the injection pump after the pressure side fuel filter. See SPN 5580 for absolute pressure of fuel in system after the pressure side fuel filter.

5580	Engine Filtered Fuel Delivery Absolute Pressure	Absolute pressure of fuel in system as delivered from supply pump to the injection pump after the pressure side fuel filter. See SPN 5579 for gage pressure of fuel in system after the pressure side fuel filter.
5581	Calculated Ambient Air Temperature	Calculated temperature of air surrounding vehicle. Use SPN 171 for actual measured ambient air temperature.
5582	Static Roll Angle	The measured static roll angle between the vehicle y-axis and the ground plane about the X-axis. The sign of the roll angle is determined in accordance to the right-hand rule about the X-axis, as specified in SAE J670. Roll angle is the same for both Z-Down and Z-Up axis system, as specified in SAE J670, since both systems have positive X forward.
5583	Static Roll Angle Status	Status of the transmitted roll angle data. 000b = Sensor Busy 001b = Sensor OK 010b = Sensor Defect 011b = Sensor Reboots 100b = Angle Data Invalid 101b = Reserved 110b = Error 111b = Not available
5584	Engine Fuel Filter Degradation	The estimated percentage relative to the useful life of the engine fuel filter. This is not a calculation of the physical restriction of the filter. 0% is typical of a new filter. 100% is typical of an end of life filter, the filter should be replaced. The filter can operate past 100%.
5585	Engine Fuel 1 Injector Metering Rail 1 Cranking Pressure	Engine Fuel Injector Metering Rail 1 Pressure during engine cranking.
5586	Engine Fuel 1 Injector Metering Rail 2 Cranking Pressure	Engine Fuel Injector Metering Rail 2 Pressure during engine cranking.
5587	Engine Intake Manifold Temperatures Inconsistent	Indicates that there is a significant difference between multiple intake manifold temperature sensors.
5588	Proprietary Network #2	See document J1939-73 for SPN details.

5589	Aftertreatment 1 Secondary Air Absolute Pressure	Absolute pressure of the secondary air for aftertreatment 1. Secondary air is air provided to the exhaust system (per SAE J2403).For gage pressure, see SPN 3837.
5590	Aftertreatment 2 Secondary Air Absolute Pressure	Absolute pressure of the secondary air for aftertreatment 2. Secondary air is air provided to the exhaust system (per SAE J2403).For gage pressure, see SPN 3838.
5591	Aftertreatment 1 Diesel Particulate Filter Air Control Module	The control module used to control the aftertreatment 1 diesel particulate filter air system.
5592	Network Message Control Byte	See document J1939-31 for SPN details.
5593	NIECU Port	See document J1939-31 for SPN details.
5594	To Port	See document J1939-31 for SPN details.
5595	From Port	See document J1939-31 for SPN details.
5596	Filter Mode	See document J1939-31 for SPN details.
5597	NIECU Parameter Number	See document J1939-31 for SPN details.
5598	NIECU Parameter Data	See document J1939-31 for SPN details.
5599	PGN (Network Message)	See document J1939-31 for SPN details.
5600	Source Address (Network Message)	See document J1939-31 for SPN details.
5601	NAME (Network Message)	See document J1939-31 for SPN details.
5602	Number of SA/NAME Pairs	See document J1939-31 for SPN details.

5603	Cruise Control Disable Command	This parameter is used to disable cruise control from a source other than the driver controlled switch if cruise control is active. It is also used to inhibit cruise control from becoming active if it is not currently active. If this parameter is used to disable cruise control, then cruise control will need to be re-initialized and the previous set speed will not be retained.This parameter has priority over Cruise Control Resume Command (SPN 5604). See Figure PGN2560_A for an explanation of how this relates to other parameters. Use of this parameter is in addition to Cruise Control Enable Switch (SPN 596). The Cruise Control Enable Switch set to OFF has priority over the Cruise Control Disable Command set to allowed. This parameter is not the physical switch that enables cruise control. See SPN 596 for the physical switch. 00b = Cruise Control is allowed 01b = Cruise Control is not allowed 10b = Reserved 11b = Don’t care/take no action
5604	Cruise Control Resume Command	This parameter is used to request the cruise control to resume operation from a source other than the driver controlled switch. Implementers may wish to restrict the conditions in which cruise control will be resumed due to this parameter. Possible restrictions include only honoring this request if it is received within a certain time period after cruise control has been disabled, a vehicle speed differential has been exceeded since cruise control has been cancelled, etc.This request will only be honored if it is received from the same device as the one that sent the Cruise Control Pause Command (SPN 5605). Cruise Control Disable Command (SPN 5603) and Cruise Control Pause Command (SPN 5605) both have a higher priority than this parameter. See Figure PGN2560_A for an explanation of how this relates to other parameters. This parameter is not the physical switch that is used to resume cruise control. See SPN 601 for the physical switch. 00b = Cruise Control Resume not Requested 01b = Cruise Control Resume Requested 10b = Reserved 11b = Don’t Care/take no action
5605	Cruise Control Pause Command	This parameter is used to temporarily disable cruise control from a source other than the driver controlled switch if cruise control is active. If this parameter is used to disable cruise control, then cruise control will not need to be re-initialized and the previous set speed will be retained. In order for the cruise control system to resume to the previous set speed, a valid command must be received. Valid commands include

		(1) the Cruise Control Resume Switch (SPN 601), (2) the Cruise Control Set Switch (SPN 599), or (3) Cruise Control Resume Command (SPN 5604).This parameter has priority over Cruise Control Resume Command (SPN 5604). See Figure PGN2560_A for an explanation of how this relates to other parameters. This parameter is not the physical switch that is used to pause cruise control. See SPN 1633 for the physical switch. Receiving this parameter to disable cruise control has the same effect on cruise control as tapping the brake pedal. 00b = Cruise Control is allowed 01b = Cruise Control is not allowed 10b = Reserved 11b = Don't care/take no action
5606	Adaptive Cruise Control Readiness Status	This parameter is used to indicate an application's state of readiness for responding to commands from an adaptive cruise control system controller.00b = Off — Cruise Control System is not configured to accept commands from an adaptive cruise controller 01b = On — Cruise Control System is configured to accept commands from an adaptive cruise controller. 10b = Error Condition — Prevents system from responding to adaptive cruise controller commands even though it is configured. 11b = Not Available/Not Supported
5608	Source Address of Controlling Device for Disabling Cruise Control	The source address of the SAE J1939 device that is currently sending the Cruise Control Disable Command (SPN 5603).If there are multiple devices sending Cruise Control Disable Command with a value of 01b, then the value transmitted for this parameter will be the source address of the device that first began sending 01b for the command. If the device that first sent 01b for Cruise Control Disable Command is no longer sending 01b for the command, then the value of the Source Address of Controlling Device for Disabling Cruise Control shall be set to the source address of a device that is still sending the Cruise Control Disable Command with a value of 01b. See Figure PGN2560_A for an explanation of how this relates to other parameters. This parameter is supported by the device that has the capability to receive and process the Cruise Control Disable Command (SPN 5603). 254 (FEh) is used to indicate that the Source Address of Controlling Device for Disabling Cruise Control parameter is supported, but no device is currently inhibiting cruise control with the Cruise Control Disable Command (SPN 5603).

5609	Source Address of Controlling Device for Pausing Cruise Control	The source address of the SAE J1939 device that is currently sending the Cruise Control Pause Command (SPN 5605).If there are multiple devices sending Cruise Control Pause Command with a value of 01b, then the value transmitted for this parameter will be the source address of the device that first began sending 01b for the command. If the device that first sent 01b for Cruise Control Pause Command is no longer sending 01b for the command, then the value of the Source Address of Controlling Device for Pausing Cruise Control shall be set to the source address of a device that is still sending the Cruise Control Disable Command with a value of 01b. This parameter is supported by the device that has the capability to receive and process the Cruise Control Pause Command (SPN 5605). 254 (FEh) is used to indicate that the Source Address of Controlling Device for Pausing Cruise Control parameter is supported, but no device is currently inhibiting cruise control with the Cruise Control Pause Command (SPN 5605).
5610	Transmission input clutch calculated load	Identifies the calculated load on the clutch pressure plate of the transmission input clutch.
5611	Transmission shift cylinder #1 position sensor	Indicates the status of transmission shift cylinder #1 position sensor
5612	Transmission shift cylinder #2 position sensor	Indicates the status of transmission shift cylinder #2 position sensor.
5613	Vehicle attitude sensor	Identifies the status of the vehicle attitude sensor used to determine the grade of the road.
5614	Transmission Clutch Coarse Engagement Actuator	Identifies the status of the actuator that controls the coarse engagement of the transmission input clutch.
5615	Transmission Clutch Fine Engagement Actuator	Identifies the status of the actuator that controls the fine engagement of the tranmission input clutch.

5616	Transmission Clutch Coarse Disengagement Actuator	Identifies the status of the actuator that controls the coarse disengagement of the transmission input clutch.
5617	Transmission Clutch Fine Disengagement Actuator	Identifies the status of the actuator that controls the fine disengagement of the transmission input clutch.
5618	Transmission Gear Shift Cylinder 1 Actuator 1	Identifies the status of Transmission gear shift cylinder 1 actuator 1
5619	Transmission Gear Shift Cylinder 1 Actuator 2	Identifies the status of Transmission gear shift cylinder 1 actuator 2
5620	Transmission Gear Shift Cylinder 2 Actuator 1	Identifies the status of Transmission gear shift cylinder 2 actuator 1
5621	Transmission Gear Shift Cylinder 2 Actuator 2	Identifies the status of Transmission gear shift cylinder 2 actuator 2
5622	Transmission splitter engagement system	Used for the status of the system that controls the transmission splitter engagement.
5623	Transmission range engagement system	Used for the status of the transmission range engagement system.
5624	Trailer-VDC Active	The trailer-VDC (Vehicle Dynamic Control) is an electronic vehicle stability function within the (semi) trailer braking system. It acts to stabilize the (semi) trailer during dynamic maneuvers. VDC includes Roll Over Prevention (ROP) and/or Yaw Control (YC), However, the latter information is not individually available and the VDC active parameter will be set in both cases.This parameter maps the 6.4.2.2.36 VDC active parameter of the ISO 11992_2 bus (trailer-bus) to the SAE J1939 (vehicle bus). This makes it possible to warn the driver if one of the trailers activate the brakes because of an VDC function active in the trailer. 00b = VDC passive, but installed 01b = VDC active 10b = Reserved 11b = Not availble or not installed

5625	Engine Exhaust Bank 1 Pressure Regulator Position	The position of the Exhaust Pressure Regulator (EPR) in bank 1 expressed as a percentage of full travel. One hundred percent means the regulator is fully closed, providing the maximum restriction to exhaust gas flow from the engine. Zero percent means the regulator is fully open, providing the minimum available restriction.
5626	Engine Exhaust Pressure Regulator Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the Engine Exhaust Pressure Regulator (EPR) by the manufacturers software. When there are multiple failures, the most severe is transmitted.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
5627	Engine Exhaust Pressure Regulator Temperature Status	Used to identify the status of the Engine Exhaust Pressure Regulator (EPR) drive circuitry temperature. Temperature excursions may affect the torque output.000b = High most severe 001b = High Least severe 010b = In Range 011b = Low Least severe 100b = Low Most severe 101b = Not Defined 110b = Error 111b = Not available
5628	Engine Exhaust Pressure Regulator Control Operation Status	Used to identify the status of Engine Exhaust Pressure Regulator. 0000b = Normal 0001b = Alarm (fully operational but needs service) 0010b = Alarm High Severity (functional but transient performance may be reduced) 0011b = Derate Active (torque output reduced due to environmental conditions) 0100b = Controlled Shutdown Active (driving to the default position – usually this means closed) 0101b = Uncontrolled Shutdown Active (actuator current is off so it is limp) 0110b to 1101b = Reserved for future assignment 1110b = Error 1111b = Not available
5629	Diesel Particulate Filter Active Regeneration Inhibited Due to Low Exhaust Pressure	Indicates the state of diesel particulate filter active regeneration inhibition due to low exhaust pressure. 00b = not inhibited 01b = inhibited 10b = reserved for SAE assignment 11b = not available This SPN indicates the reason for the diesel particulate filter regeneration not being initiated or being exited prior to completion. When this state becomes active the system will not initiate an active regeneration or will exit an active regeneration. The state provides information that may be provided to the driver/service technician as to why the regeneration did not initiate or was exited.

5630	Park Brake Command	Request by a secondary device to command the Park Brake. The Park Brake controller should treat this as a request and should apply the Park Brake as determined by the controller.Feedback of the park brake actuation may utilize SPN 70, SPN 619 or SPN 5275. 00b = Park Brake apply not requested 01b = Park Brake apply requested 10b = SAE Reserved 11b = Don’t care/Take no action
5631	Engine Throttle Valve 1 Differential Pressure	The differential pressure between the intake and outlet of the throttle valve 1 (SPN 51). The differential pressure is measured from the intake with respect to the outlet of the throttle valve.
5632	Aftertreatment 1 Diesel Particulate Filter 1 Soot Sensor Analysis Request Frequency 1	First requested analysis frequency for the diesel particulate filter 1 soot sensor.
5633	Aftertreatment 1 Diesel Particulate Filter 1 Soot Sensor Analysis Request Frequency 2	Second requested analysis frequency for the diesel particulate filter 1 soot sensor.
5634	Aftertreatment 1 Diesel Particulate Filter 1 Soot Sensor Analysis Request Frequency 3	Third requested analysis frequency for the diesel particulate filter 1 soot sensor.
5635	Aftertreatment 1 Diesel Particulate Filter 1 Soot Sensor Analysis Request Frequency 4	Fourth requested analysis frequency for the diesel particulate filter 1 soot sensor.
5636	Aftertreatment 1 Diesel Particulate Filter 1 Soot Sensor Analysis Frequency 1	The analysis frequency associated with the frequency 1 soot signal for the diesel particulate filter 1 soot sensor. See SPN 5632.
5637	Aftertreatment 1 Diesel Particulate Filter 1 Soot Sensor Frequency 1 Soot Signal	The soot signal attenuation measurement for analysis frequency 1 for the diesel particulate filter 1 soot sensor. See SPN 5632.

5638	Aftertreatment 1 Diesel Particulate Filter 1 Soot Sensor Analysis Frequency 2	The analysis frequency associated with the frequency 2 soot signal for the diesel particulate filter 1 soot sensor. See SPN 5633.
5639	Aftertreatment 1 Diesel Particulate Filter 1 Soot Sensor Frequency 2 Soot Signal	The soot signal attenuation measurement for analysis frequency 2 for the diesel particulate filter 1 soot sensor. See SPN 5633.
5640	Aftertreatment 1 Diesel Particulate Filter 1 Soot Sensor Analysis Frequency 3	The analysis frequency associated with the frequency 3 soot signal for the diesel particulate filter 1 soot sensor. See SPN 5634.
5641	Aftertreatment 1 Diesel Particulate Filter 1 Soot Sensor Frequency 3 Soot Signal	The soot signal attenuation measurement for analysis frequency 3 for the diesel particulate filter 1 soot sensor. See SPN 5634.
5642	Aftertreatment 1 Diesel Particulate Filter 1 Soot Sensor Analysis Frequency 4	The analysis frequency associated with the frequency 4 soot signal for the diesel particulate filter 1 soot sensor. See SPN 5635.
5643	Aftertreatment 1 Diesel Particulate Filter 1 Soot Sensor Frequency 4 Soot Signal	The soot signal attenuation measurement for analysis frequency 4 for the diesel particulate filter 1 soot sensor. See SPN 5635.
5644	Aftertreatment 1 Diesel Particulate Filter 2 Soot Sensor Analysis Request Frequency 1	First requested analysis frequency for the diesel particulate filter 2 soot sensor.
5645	Aftertreatment 1 Diesel Particulate Filter 2 Soot Sensor Analysis Request Frequency 2	Second requested analysis frequency for the diesel particulate filter 2 soot sensor.

5646	Aftertreatment 1 Diesel Particulate Filter 2 Soot Sensor Analysis Request Frequency 3	Third requested analysis frequency for the diesel particulate filter 2 soot sensor.
5647	Aftertreatment 1 Diesel Particulate Filter 2 Soot Sensor Analysis Request Frequency 4	Fourth requested analysis frequency for the diesel particulate filter 2 soot sensor.
5648	Aftertreatment 1 Diesel Particulate Filter 2 Soot Sensor Analysis Frequency 1	The analysis frequency associated with the frequency 1 soot signal for the diesel particulate filter 2 soot sensor. See SPN 5644.
5649	Aftertreatment 1 Diesel Particulate Filter 2 Soot Sensor Frequency 1 Soot Signal	The soot signal attenuation measurement for analysis frequency 1 for the diesel particulate filter 2 soot sensor. See SPN 5644.
5650	Aftertreatment 1 Diesel Particulate Filter 2 Soot Sensor Analysis Frequency 2	The analysis frequency associated with the frequency 2 soot signal for the diesel particulate filter 2 soot sensor. See SPN 5645.
5651	Aftertreatment 1 Diesel Particulate Filter 2 Soot Sensor Frequency 2 Soot Signal	The soot signal attenuation measurement for analysis frequency 2 for the diesel particulate filter 2 soot sensor. See SPN 5645.
5652	Aftertreatment 1 Diesel Particulate Filter 2 Soot Sensor Analysis Frequency 3	The analysis frequency associated with the frequency 3 soot signal for the diesel particulate filter 2 soot sensor. See SPN 5646.
5653	Aftertreatment 1 Diesel Particulate Filter 2 Soot Sensor Frequency 3 Soot Signal	The soot signal attenuation measurement for analysis frequency 3 for the diesel particulate filter 2 soot sensor. See SPN 5646.

5654	Aftertreatment 1 Diesel Particulate Filter 2 Soot Sensor Analysis Frequency 4	The analysis frequency associated with the frequency 4 soot signal for the diesel particulate filter 2 soot sensor. See SPN 5647.
5655	Aftertreatment 1 Diesel Particulate Filter 2 Soot Sensor Frequency 4 Soot Signal	The soot signal attenuation measurement for analysis frequency 4 for the diesel particulate filter 2 soot sensor. See SPN 5647.
5656	Retarder Coolant Outlet Temperature	Temperature of liquid found in retarder cooling system.
5657	NAME Checksum / Error Code	See document J1939-81 for SPN details.
5658	Manufacturer Code Qualifier Flag	See document J1939-81 for SPN details.
5659	ECU Instance Qualifier Flag	See document J1939-81 for SPN details.
5660	Function Instance Qualifier Flag	See document J1939-81 for SPN details.
5661	Function Qualifier Flag	See document J1939-81 for SPN details.
5662	Vehicle System Qualifier Flag	See document J1939-81 for SPN details.
5663	Vehicle System Instance Qualifier Flag	See document J1939-81 for SPN details.
5664	Industry Group Qualifier Flag	See document J1939-81 for SPN details.
5665	Arbitrary Address Capable Qualifier Flag	See document J1939-81 for SPN details.
5666	NM Control Mode Indicator	See document J1939-81 for SPN details.

5667	Commanded Manufacturer Code	See document J1939-81 for SPN details.
5668	Commanded ECU Instance	See document J1939-81 for SPN details.
5669	Commanded Function Instance	See document J1939-81 for SPN details.
5670	Commanded Function	See document J1939-81 for SPN details.
5671	Commanded Vehicle System	See document J1939-81 for SPN details.
5672	Commanded Vehicle System Instance	See document J1939-81 for SPN details.
5673	Commanded Industry Group	See document J1939-81 for SPN details.
5674	Commanded Arbitrary Address Capable	See document J1939-81 for SPN details.
5675	Operator Shift Prompt	Command to activate an indicator that advises the operator to shift to a different gear. Typically this would be used as part of a fuel economy improvement or drivability aid.00b = indicator(s) inactive 01b = upshift indicator active 10b = downshift indicator active 11b = don’t care/take no action
5676	Forward Collision Advanced Emergency Braking System State	Current operational state of forward collision advanced emergency braking system (AEBS) 0000b = system is not ready (initialization not finished) 0001b = system is temporarily not available (e.g. due to boundary conditions necessary for operation) 0010b = system is deactivated by driver 0011b = system is ready and activated (no warning and no braking active) 0100b = driver overrides system 0101b = forward collision warning active (e.g. acoustic signal, cruise control turned off, torque limitation) 0110b = forward collision warning with braking (e.g. brake jerk or partial braking) 0111b = forward collision emergency braking active 1000b = system performance and/or sensitivity limited (no warning and no braking active) 1001b to 1101b = reserved for future use 1110b = error indication 1111b = not available / not

		installed Note: State 1000b – example use case: Used when system performance is limited but still able to meet minimum legal obligations present at the time of introduction or when one of a fused sensor is faulted but the emergency braking functionality is still available.
5677	Collision warning level	To implement different HMI (human machine interface) concepts, e.g. visual only, visual/audible, different warning tones etc., the AEBS provides different levels of collision warning.0000b = no warning 0001b = warning level 1 – lowest 0010b = warning level 2 0011b = warning level 3 0100b = warning level 4 0101b = warning level 5 0110b = warning level 6 0111b = warning level 7 – highest 1000b to 1110b = reserved 1111b = don't care / take no action Values between 0001b (lowest warning level) and 0111b (highest warning level) are increasing.
5678	Relevant object detected for advanced emergency braking system	Indication if the advanced emergency braking system (AEBS) is monitoring a relevant object 000b = No relevant object monitored 001b = Relevant object is being monitored 010b = Relevant object is not being detected reliably 011b to 101b = Reserved 110b = Error indication 111b = Signal not available / not installed
5679	Bend off probability of relevant object	Probabilty if monitored relevant object might start a turning maneuver, which could clear the travelling path of the host vehicle.000b = no indication for a bend off maneuver of the relevant object 001b = low probability for a bend off maneuver of the relevant object 010b = medium probability for a bend off maneuver of the relevant object 011b = high probability for a bend off maneuver of the relevant object 100b = highest probability for a bend off maneuver of the relevant object 101b = relevant object is already in a turning maneuver 110b = error indication 111b = signal not available / not installed
5680	Time to collision with relevant object	The time to collision is the duration after which the predicted travelling paths of host vehicle and relevant object lead to a distance of 0m between both.Note: It is up to the system manufacturer to choose a suitable calculation method to predict the travelling paths of both host vehicle and relevant object.

5681	Driver activation demand for Advanced Emergency Braking System	According to the Vienna world convention on road traffic the driver must be provided with means to deactivate an Advanced Emergency Braking System. This command is to be transmitted from the respective HMI unit to the AEBS unit.00b = the driver does not want the Advanced Emergency Braking System to warn or intervene at any time (deactivation of system) 01b = the driver wants the Advanced Emergency Braking System to warn or intervene if necessary (no deactivation of system) 10b = reserved 11b = don't' care / take no action Note: The signal has to be transmitted permanently to the AEBS showing the state selected once by the driver. Typically there is a deactivation push button present in the host vehicle for the driver to choose this state. Example: After ignition-on the signal is being transmitted as 01b (this will be the default state in Europe) all the time. As soon as the driver depresses the push button the signal's value has to change to 00b for the remaining ignition cycle as long as the driver does not depress the push button again.
5682	AEBS2 message Counter	The message counter is increased with every transmitted AEBS2 message. After reaching a value of Fh the next value will be 0.
5683	AEBS2 message checksum	Used to check the message checksum of the transmitting (HMI) unit within the AEBS2 system. Checksum = (Byte1 + Byte2 + Byte3 + Byte4 + Byte5 + Byte6 + Byte7 + (message counter & 0Fh) + message ID low byte + message ID mid low byte + message ID mid high byte + message ID high byte) Message Checksum = ((Checksum >> 4) + Checksum) & 0Fh
5684	Reference Engine Gas Mass Flow Rate	Configuration of the mass flow rate of gaseous fuel expected for 100% engine fuel valve control command. Note: The actuator will request this parameter from the ECU in order to determine what mass fuel flow to associate with a command of 100% from the ECU. This value does not change during operation.
5685	Barometric Absolute Pressure (High Resolution)	Barometric Absolute Pressure (High Resolution). See SPN 108 if high resolution is not needed.

5686	Engine Exhaust Gas Port 1 Difference from Average Temperature	The difference in temperature of exhaust port 1 from the average of all exhaust ports on an engine. If the port temperature is above the average temperature, then the temperature would be interpreted as above normal. For systems with three or fewer thresholds in either extreme (FMI 0, 1, 15, 16, 17 or 18) use SPN 1137.
5687	Engine Exhaust Gas Port 2 Difference from Average Temperature	The difference in temperature of exhaust port 2 from the average of all exhaust ports on an engine. If the port temperature is above the average temperature, then the temperature would be interpreted as above normal. For systems with three or fewer thresholds in either extreme (FMI 0, 1, 15, 16, 17 or 18) use SPN 1138.
5688	Engine Exhaust Gas Port 3 Difference from Average Temperature	The difference in temperature of exhaust port 3 from the average of all exhaust ports on an engine. If the port temperature is above the average temperature, then the temperature would be interpreted as above normal. For systems with three or fewer thresholds in either extreme (FMI 0, 1, 15, 16, 17 or 18) use SPN 1139.
5689	Engine Exhaust Gas Port 4 Difference from Average Temperature	The difference in temperature of exhaust port 4 from the average of all exhaust ports on an engine. If the port temperature is above the average temperature, then the temperature would be interpreted as above normal. For systems with three or fewer thresholds in either extreme (FMI 0, 1, 15, 16, 17 or 18) use SPN 1140.
5690	Engine Exhaust Gas Port 5 Difference from Average Temperature	The difference in temperature of exhaust port 5 from the average of all exhaust ports on an engine. If the port temperature is above the average temperature, then the temperature would be interpreted as above normal. For systems with three or fewer thresholds in either extreme (FMI 0, 1, 15, 16, 17 or 18) use SPN 1141.
5691	Engine Exhaust Gas Port 6 Difference from Average Temperature	The difference in temperature of exhaust port 6 from the average of all exhaust ports on an engine. If the port temperature is above the average temperature, then the temperature would be interpreted as above normal. For systems with three or fewer thresholds in either extreme (FMI 0, 1, 15, 16, 17 or 18) use SPN 1142.
5692	Engine Exhaust Gas Port 7 Difference from Average Temperature	The difference in temperature of exhaust port 7 from the average of all exhaust ports on an engine. If the port temperature is above the average temperature, then the

		temperature would be interpreted as above normal. For systems with three or fewer thresholds in either extreme (FMI 0, 1, 15, 16, 17 or 18) use SPN 1143.
5693	Engine Exhaust Gas Port 8 Difference from Average Temperature	The difference in temperature of exhaust port 8 from the average of all exhaust ports on an engine. If the port temperature is above the average temperature, then the temperature would be interpreted as above normal. For systems with three or fewer thresholds in either extreme (FMI 0, 1, 15, 16, 17 or 18) use SPN 1144.
5694	Engine Exhaust Gas Port 9 Difference from Average Temperature	The difference in temperature of exhaust port 9 from the average of all exhaust ports on an engine. If the port temperature is above the average temperature, then the temperature would be interpreted as above normal. For systems with three or fewer thresholds in either extreme (FMI 0, 1, 15, 16, 17 or 18) use SPN 1145.
5695	Engine Exhaust Gas Port 10 Difference from Average Temperature	The difference in temperature of exhaust port 10 from the average of all exhaust ports on an engine. If the port temperature is above the average temperature, then the temperature would be interpreted as above normal. For systems with three or fewer thresholds in either extreme (FMI 0, 1, 15, 16, 17 or 18) use SPN 1146.
5696	Engine Exhaust Gas Port 11 Difference from Average Temperature	The difference in temperature of exhaust port 11 from the average of all exhaust ports on an engine. If the port temperature is above the average temperature, then the temperature would be interpreted as above normal. For systems with three or fewer thresholds in either extreme (FMI 0, 1, 15, 16, 17 or 18) use SPN 1147.
5697	Engine Exhaust Gas Port 12 Difference from Average Temperature	The difference in temperature of exhaust port 12 from the average of all exhaust ports on an engine. If the port temperature is above the average temperature, then the temperature would be interpreted as above normal. For systems with three or fewer thresholds in either extreme (FMI 0, 1, 15, 16, 17 or 18) use SPN 1148.
5698	Engine Exhaust Gas Port 13 Difference from Average Temperature	The difference in temperature of exhaust port 13 from the average of all exhaust ports on an engine. If the port temperature is above the average temperature, then the temperature would be interpreted as above normal. For systems with three or fewer thresholds in either extreme (FMI 0, 1, 15, 16, 17 or 18) use SPN 1149.

5699	Engine Exhaust Gas Port 14 Difference from Average Temperature	The difference in temperature of exhaust port 14 from the average of all exhaust ports on an engine. If the port temperature is above the average temperature, then the temperature would be interpreted as above normal. For systems with three or fewer thresholds in either extreme (FMI 0, 1, 15, 16, 17 or 18) use SPN 1150.
5700	Engine Exhaust Gas Port 15 Difference from Average Temperature	The difference in temperature of exhaust port 16 from the average of all exhaust ports on an engine. If the port temperature is above the average temperature, then the temperature would be interpreted as above normal. For systems with three or fewer thresholds in either extreme (FMI 0, 1, 15, 16, 17 or 18) use SPN 1152.
5701	Engine Exhaust Gas Port 16 Difference from Average Temperature	The difference in temperature of exhaust port 16 from the average of all exhaust ports on an engine. If the port temperature is above the average temperature, then the temperature would be interpreted as above normal. For systems with three or fewer thresholds in either extreme (FMI 0, 1, 15, 16, 17 or 18) use SPN 1152.
5702	Engine Exhaust Gas Port 17 Difference from Average Temperature	The difference in temperature of exhaust port 17 from the average of all exhaust ports on an engine. If the port temperature is above the average temperature, then the temperature would be interpreted as above normal. For systems with three or fewer thresholds in either extreme (FMI 0, 1, 15, 16, 17 or 18) use SPN 1153.
5703	Engine Exhaust Gas Port 18 Difference from Average Temperature	The difference in temperature of exhaust port 18 from the average of all exhaust ports on an engine. If the port temperature is above the average temperature, then the temperature would be interpreted as above normal. For systems with three or fewer thresholds in either extreme (FMI 0, 1, 15, 16, 17 or 18) use SPN 1154.
5704	Engine Exhaust Gas Port 19 Difference from Average Temperature	The difference in temperature of exhaust port 19 from the average of all exhaust ports on an engine. If the port temperature is above the average temperature, then the temperature would be interpreted as above normal. For systems with three or fewer thresholds in either extreme (FMI 0, 1, 15, 16, 17 or 18) use SPN 1155.
5705	Engine Exhaust Gas Port 20 Difference from Average Temperature	The difference in temperature of exhaust port 20 from the average of all exhaust ports on an engine. If the port temperature is above the average temperature, then the

		temperature would be interpreted as above normal. For systems with three or fewer thresholds in either extreme (FMI 0, 1, 15, 16, 17 or 18) use SPN 1156.
5706	Aftertreatment 1 Diesel Exhaust Fluid Pump Heater	Percentage of heating applied to the aftertreatment 1 diesel exhaust fluid pump heater. A value of 0% means no heating applied, a value of 100% means full heating applied. The diesel exhaust fluid pump heater warms the diesel exhaust fluid in the diesel exhaust fluid pump. See SPN 5707 for the command for this pump heater.
5707	Aftertreatment 1 Diesel Exhaust Fluid Pump Heater Command	Command for the Aftertreatment 1 Diesel Exhaust Fluid Pump Heater. A value of 0% means no heating commanded, a value of 100% means full heating commanded. See SPN 5706 for the measured value of the Aftertreatment 1 Diesel Exhaust Fluid Heater.
5708	Engine Coolant Pressure 2	Gage pressure of liquid found in the engine coolant system – second instance. See SPN 7313 for alternate range and resolution.
5709	Aftertreatment 1 Outlet NOx Sensor Self-diagnosis Trigger	Signal to trigger the self-diagnosis of NOx sensor ATO1 (Aftertreatment Outlet Bank 1) 0000b = Diagnostic mode disabled 0001b = NOx Sensor ATO1 Self Diagnosis Request at Lambda=1.0 0010b = NOx Sensor ATO1 Self Diagnosis Request at partial load 0011b = NOx Sensor ATO1 Self Diagnosis Request at fuel cut 0100b = NOx Sensor ATO1 Self Diagnosis Request at After Run 0101b to 1110b = Reserved 1111b = Not supported
5710	Engine Exhaust 1 Intake NOx Sensor Self-diagnosis Trigger	Signal to trigger the self-diagnosis of NOx sensor EEB1h (Engine Exhaust Intake Bank 1) . This sensor is located at the intake of the aftertreatment system if an aftertreatment system exists.0000b = Diagnostic mode disabled 0001b = NOx Sensor EEB1h Self Diagnosis Request at Lambda=1.0 0010b = NOx Sensor EEB1h Self Diagnosis Request at partial load 0011b = NOx Sensor EEB1h Self Diagnosis Request at fuel cut 0100b = NOx Sensor EEB1h Self Diagnosis Request at after run 0101b = Reserved 0110b = Reserved 0111b = Reserved 1000b = Reserved 1001b = Reserved 1010b = Reserved 1011b = Reserved 1100b = Reserved 1101b = Reserved 1110b = Reserved 1111b = Not supported

5711	Aftertreatment 2 Outlet NOx Sensor Self-diagnosis Trigger	Signal to trigger the self-diagnosis of NOx sensor ATO2 (Aftertreatment Outlet Bank 2) 0000b = Diagnostic mode disabled 0001b = NOx Sensor ATO2 Self Diagnosis Request at Lambda=1.0 0010b = NOx Sensor ATO2 Self Diagnosis Request at partial load 0011b = NOx Sensor ATO2 Self Diagnosis Request at fuel cut 0100b = NOx Sensor ATO2 Self Diagnosis Request at After Run 0101b to 1110b = Reserved 1111b = Not supported
5712	Engine Exhaust 2 Intake NOx Sensor Self-diagnosis Trigger	Signal to trigger the self-diagnosis of NOx sensor EEB2h (Engine Exhaust Intake Bank 2) . This sensor is located at the intake of the aftertreatment system if an aftertreatment system exists.0000b = Diagnostic mode disabled 0001b = NOx Sensor EEB2h Self Diagnosis Request at Lambda=1.0 0010b = NOx Sensor EEB2h Self Diagnosis Request at partial load 0011b = NOx Sensor EEB2h Self Diagnosis Request at fuel cut 0100b = NOx Sensor EEB2h Self Diagnosis Request at after run 0101b = Reserved 0110b = Reserved 0111b = Reserved 1000b = Reserved 1001b = Reserved 1010b = Reserved 1011b = Reserved 1100b = Reserved 1101b = Reserved 1110b = Reserved 1111b = Not supported
5713	Aftertreatment 1 Outlet NOx Sensor 1 Self-diagnosis Status	Self-diagnosis result status for NOx sensor ATO1 (Aftertreatment Outlet Bank 1) 000b = Diagnosis not active 001b = NOx Sensor ATO1 Self Diagnosis active flag 010b = NOx Sensor ATO1 Self Diagnosis Result Complete 011b = NOx Sensor ATO1 Self Diagnosis aborted 100b = NOx Sensor ATO1 Self Diagnosis not possible 101b to 110b = Reserved 111b = Not Supported
5714	Engine Exhaust 1 NOx Sensor 1 Self-diagnosis Status	Self-diagnosis result status for the first NOx sensor in Engine Exhaust Bank 1 (EEB1h). This sensor is located at the intake of the aftertreatment system if an aftertreatment system exists. 000b = Diagnosis not active 001b = NOx Sensor EEB1h Self Diagnosis active flag 010b = NOx Sensor EEB1h Self Diagnosis Result Complete 011b = NOx Sensor EEB1h Self Diagnosis aborted 100b = NOx Sensor EEB1h Self Diagnosis not possible 101b = Reserved 110b = Reserved 111b = Not Supported
5715	Aftertreatment 2 Outlet NOx Sensor 1 Self-diagnosis Status	Self-diagnosis result status for NOx sensor ATO2 (Aftertreatment Outlet Bank 2) 000b = Diagnosis not active 001b = NOx Sensor ATO2 Self Diagnosis active flag

		010b = NOx Sensor ATO2 Self Diagnosis Result Complete 011b = NOx Sensor ATO2 Self Diagnosis aborted 100b = NOx Sensor ATO2 Self Diagnosis not possible 101b to 110b = Reserved 111b = Not Supported
5716	Engine Exhaust 2 NOx Sensor 1 Self-diagnosis Status	Self-diagnosis result status for NOx sensor EEB2h (Engine Exhaust Bank 2) . This sensor is located at the intake of the aftertreatment system if an aftertreatment system exists .000b = Diagnosis not active 001b = NOx Sensor EEB2h Self Diagnosis active flag 010b = NOx Sensor EEB2h Self Diagnosis Result Complete 011b = NOx Sensor EEB2h Self Diagnosis aborted 100b = NOx Sensor EEB2h Self Diagnosis not possible 101b = Reserved 110b = Reserved 111b = Not Supported
5717	Aftertreatment 1 Outlet NOx Sensor Self-diagnosis Final Result	Self-diagnosis result for NOx sensor ATO1 (Aftertreatment Outlet Bank 1) as a ratio of detected value to reference value defined by supplier.This result is used to determine if the signal resulting from the self-diagnosis test (as represented as a ratio to a reference value) is within an acceptable range. This will be determined by the receiver of the information and may differ depending on how the sensor is used and/or sensor application. This may mean that SPN 3226 may no longer be accurate as expected. This parameter is valid while the diagnosis feedback status of SPN 5713 = 010b (Diagnosis complete). It is broadcast as FFh at other times.
5718	Engine Exhaust 1 NOx Sensor Self-diagnosis Final Result	Self-diagnosis result for NOx sensor EEB1h (Engine Exhaust Bank 1) as a ratio of detected value to reference value defined by supplier. This sensor is located at the intake of the aftertreatment system if an aftertreatment system exists.This result is used to determine if the signal resulting from the self-diagnosis test (as represented as a ratio to a reference value) is within an acceptable range. This will be determined by the receiver of the information and may differ depending on how the sensor is used and/or sensor application. This may mean that SPN 3216 may no longer be accurate as expected. This parameter is valid while the diagnosis feedback status of SPN 5714 = 010b (Diagnosis complete). It is broadcast as FFh at other times.
5719	Aftertreatment 2 Outlet NOx Sensor Self-diagnosis Final Result	Self-diagnosis result for NOx sensor ATO2 (Aftertreatment Outlet Bank 2) as a ratio of detected value to reference value defined by supplier.This result is used to determine if the signal resulting from the self-diagnosis test (as represented as a ratio

		to a reference value) is within an acceptable range. This will be determined by the receiver of the information and may differ depending on how the sensor is used and/or sensor application. This may mean that SPN 3265 may no longer be accurate as expected. This parameter is valid while the diagnosis feedback status of SPN 5715 = 010b (Diagnosis complete). It is broadcast as FFh at other times.
5720	Engine Exhaust 2 Intake NOx Sensor Self-diagnosis Final Result	Self-diagnosis result for NOx sensor EEB2h (Engine Exhaust Bank 2) as a ratio of detected value to reference value defined by supplier. This sensor is located at the intake of the aftertreatment system if an aftertreatment system exists.This result is used to determine if the signal resulting from the self-diagnosis test (as represented as a ratio to a reference value) is within an acceptable range. This will be determined by the receiver of the information and may differ depending on how the sensor is used and/or sensor application. This may mean that SPN 3255 may no longer be accurate as expected. This parameter is valid while the diagnosis feedback status of SPN 5716 = 010b (Diagnosis complete). It is broadcast as FFh at other times.
5721	Aftertreatment 1 Outlet NOx Sensor Operation Hours	Counted hours that the NOx-sensor was operated with status « dewpoint reached
5722	Engine Exhaust 1 NOx Sensor Operation Hours	Counted hours that the NOx-sensor was operated with status « dewpoint reached ». This sensor is located at the intake of the aftertreatment system if an aftertreatment system exists.
5723	Aftertreatment 2 Outlet NOx Sensor Operation Hours	Counted hours that the NOx-sensor was operated with status « dewpoint reached
5724	Engine Exhaust 2 Intake NOx Sensor Operation Hours	Counted hours that the NOx-sensor was operated with status « dewpoint reached ». This sensor is located at the intake of the aftertreatment system if an aftertreatment system exists.
5725	Guidance system command exit/reason code	See document ISO 11783-7 for SPN details.

5726	Guidance Limit Status	See document ISO 11783-7 for SPN details.
5727	Drive Strategy Priority 1	See document ISO 11783-7 for SPN details.
5728	Drive Strategy Priority 2	See document ISO 11783-7 for SPN details.
5729	Drive Strategy Priority 3	See document ISO 11783-7 for SPN details.
5730	Drive Strategy Priority 4	See document ISO 11783-7 for SPN details.
5731	Drive Strategy Request State	See document ISO 11783-7 for SPN details.
5732	Drive Strategy Exit/Reason Code	See document ISO 11783-7 for SPN details.
5733	Drive Strategy Priority 1 Request	See document ISO 11783-7 for SPN details.
5734	Drive Strategy Priority 2 Request	See document ISO 11783-7 for SPN details.
5735	Drive Strategy Priority 3 Request	See document ISO 11783-7 for SPN details.
5736	Drive Strategy Priority 4 Request	See document ISO 11783-7 for SPN details.
5737	Restore Operator Drive Strategy Setting Request	See document ISO 11783-7 for SPN details.
5738	Engine Fuel System Water Drain Actuator	Fuel System Water Drain Actuator solenoid. This is the actuator which drains water which may be collected within the fuel system or fuel filter.
5739	Aftertreatment 2 Outlet Soot Sensor Heater	Internal heater of the Aftertreatment 2 Outlet Soot Sensor, exhaust bank 2.
5740	Aftertreatment 2 Outlet Soot	The soot measured at the outlet of the aftertreatment system in exhaust bank 2.

5741	Aftertreatment 1 Outlet Soot	The soot measured at the outlet of the aftertreatment system in exhaust bank 1.
5742	Aftertreatment Diesel Particulate Filter Temperature Sensor Module	Module will take temperature sensor inputs from the Aftertreatment Diesel Particulate Filter Temperature Sensors and multiplex the sensor values to the engine ECU via the J1939 network.
5743	Aftertreatment 1 SCR Temperature Sensor Module	Module will take temperature sensor inputs from the SCR Temperature Sensors in bank 1 and multiplex the sensor values to the engine ECU via the J1939 network.
5744	Aftertreatment 2 SCR System Missing	Indicates that the device is missing in exhaust bank 2, used with FMI 31 (Condition Exists).
5745	Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit 1 Heater	Aftertreatment DEF heater internal to the Aftertreatment Dosing Unit 1.
5746	Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit 1 Heater Relay	The status of the relay that controls Aftertreatment 1 diesel exhaust fluid dosing Unit 1 Heater. 00b = Off 01b = On 10b = Error 11b = Not available
5747	Aftertreatment 1 Outlet Soot Sensor Heater	Internal heater of the Aftertreatment 1 Outlet Soot Sensor, exhaust bank 1.
5748	Aftertreatment 2 Diesel Exhaust Fluid Dosing Unit 1 Loss of Prime	Indicates that the aftertreatment 2 diesel exhaust fluid dosing unit 1 has lost prime. SPN will be used with FMI 31 (Condition Exists) to indicate that this device has lost prime in exhaust system 2.
5749	Engine Exhaust Pressure 2	Gage pressure of the exhaust gasses as measured at the turbine intake of the turbocharger of exhaust bank 2. See SPN 1209 for exhaust bank 1.
5750	Wireless Rolling Message Counter	A counter incremented with each instance of the Wireless Status message. The counter shall increment from 0 to 64255, rolling over to 0 on the next increment after 64255. The enables recipients of the Wireless Status message to detect problems with the wireless transceiver if counter fails to increment or the counter prematurely resets to 0.

5751	Transmitter Command State	The command contained in the signal received by the wireless transceiver from an off-board transmitter. 0000b = Stop 0001b = Clear 0010b = Field Test 0011b = Transmitter Test 0100b = Standby 0101b to 1101b = Reserved 1110b = Error 1111b = Don’t Care 0000b – Stop – Received an RF messsage from a transmitter requesting a machine level « Stop. » 0001b – Clear – Received an RF message from a transmitter clearing a machine level « Stop » request. 0010b – Field Test – Used to request an acknowledgement of an RF signal from the onboard ECU, without adversely affecting the operation of the vehicle 0011b – Transmitter Test – A transmitter test RF message was requested by a transmitter, used to diagnose transmitter behaviors 0100b – Standby – No new Status message received at the time the message was communicated 1110b – Error – Device Error
5752	Transmitter ID 1	The ID of the off-board transmitter that sent the incoming message received by the wireless transceiver.
5753	Wireless Signal Strength 1	The absolute received signal strength of the signal received from the off-board transmitter. The signal strength is reported as a Received Signal Strength Indicator (RSSI) value calculated in dBm.
5754	Unique Beacon Message Identifier Number	The number is used to identify a wireless message originating from a device on a particular machine. Within a beacon request message (see SPN 5755 [Radio Beacon Direction]), this number is included in the transmitted beacon signal. Within a beacon request acknowledge (see SPN 5755 [Radio Beacon Direction]), this number is the number from the received beacon signal.
5755	Radio Beacon Direction	Indicates the function of a particular instance of the Radio Beacon Request message. The ‘Beacon Request’ state indicates the message is sent to a wireless transceiver to request a transmit of the special beacon message. The ‘Beacon Received Acknowledgement’ is sent from a wireless transceiver to report the reception of a special beacon message.00b = Beacon Request – Beacon request coming from an ECU 01b = Beacon Received Acknowledgement – Acknowledgement from wireless device 10b = Reserved 11b = Don’t Care 00b – Beacon Request – An ECU requests that a beacon message be transmitted from a wireless device on a machine. This

		status will always originate from the ECU, and be sent to a wireless device. The message associated with this state will not have an associated transmitter ID, or signal strength. 01b – Beacon Received Acknowledgement – Acknowledgement of a beacon transmission detected by an onboard wireless device. This status will always originate from the wireless device, and be sent to the ECU. The message associated with this state will have an associated transmitter ID and signal strength.
5756	Transmitter ID 2	The ID of the off-board transmitter that sent the incoming special beacon message received by the wireless transceiver.
5757	Wireless Signal Strength 2	The absolute received signal strength of the special beacon signal received from the off-board transmitter. The signal strength is reported as a Received Signal Strength Indicator (RSSI) value in dBm. This measurement method is identical to SPN 5753 [Wireless Signal Strength].
5758	Engine Exhaust 1 Gas Sensor 1 Power Supply	State signal which indicates when the Engine Exhaust 1 Intake 1 Gas Sensor driver output is being driven. On means the ECU is powering the Engine Exhaust 1 Intake 1 Gas Sensor. Note that the ECU is external to the sensor.00b = Off 01b = On: The ECU is powering the Aftertreatment 1 Intake 1 Gas Sensor 10b = Error 11b = Unavailable
5759	Aftertreatment 1 Outlet 1 Gas Sensor Power Supply	State signal which indicates when the Aftertreatment 1 Outlet 1 Gas Sensor driver output is being driven. On means the ECU is powering the Aftertreatment 1 Outlet 1 Gas Sensor. Note that the ECU is external to the sensor.00b = Off 01b = On: The ECU is powering the Aftertreatment 1 Outlet 1 Gas Sensor 10b = Error 11b = Unavailable
5760	Engine Exhaust 2 Gas Sensor 1 Power Supply	State signal which indicates when the Engine Exhaust 2 Intake 1 Gas Sensor driver output is being driven. On means the ECU is powering the Engine Exhaust 2 Intake 1 Gas Sensor. Note that the ECU is external to the sensor.00b = Off 01b = On: The ECU is powering the Aftertreatment 2 Intake 1 Gas Sensor 10b = Error 11b = Unavailable

5761	Aftertreatment 2 Outlet 1 Gas Sensor Power Supply	State signal which indicates when the Aftertreatment 2 Outlet 1 Gas Sensor driver output is being driven. On means the ECU is powering the Aftertreatment 2 Outlet 1 Gas Sensor. Note that the ECU is external to the sensor.00b = Off 01b = On: The ECU is powering the Aftertreatment 2 Outlet 1 Gas Sensor 10b = Error 11b = Unavailable
5762	Transmission Load Reduction Inhibit Request	Request signal to the transmission to inhibit activation of load reduction functions. Automatic transmissions may incorporate functions designed to reduce engine load during certain operating conditions (vehicle standstill at bus stop, traffic stop, etc.) for improved fuel consumption. However, other vehicle systems may have an interest in regular (higher) engine load levels for comfort features or to assist with heat generation. This signal requests that the transmission inhibit initiation of such load reduction functions or terminates their operation if they are already active. The transmission may choose to ignore this request during certain operating conditions as defined by the transmission manufacturer. 00b = Allow or resume transmission load reduction functions 01b = Inhibit or abort transmission load reduction functions 10b = Reserved 11b = Don’t care/take no action
5763	Engine Exhaust Gas Recirculation 1 Actuator 1 Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the Engine Exhaust Gas Recirculation 1 Actuator 1 by the manufacturer’s software. When there are multiple failures, the most severe is transmitted.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
5764	Engine Exhaust Gas Recirculation 1 Actuator 1 Temperature Status	Used to identify the status of the Engine Exhaust Gas Recirculation 1 Actuator 1 drive circuitry temperature. Temperature excursions may affect the torque output. 000b = High Most severe 001b = High Least severe 010b = In Range 011b = Low Least severe 100b = Low Most severe 101b = Not Defined 110b = Error 111b = Not available
5765	Engine Exhaust Gas Recirculation 1 Actuator 1 Temperature	Temperature of the Engine Exhaust Gas Recirculation 1 Actuator 1 drive circuitry. Temperature excursions may affect the torque output.

5766	Engine Exhaust Gas Recirculation 1 Actuator 1 Desired Position	The requested position of the Engine Exhaust Gas Recirculation 1 Actuator 1 by the engine ECU, where 0% represents fully closed and 100% represents fully open.This is the position that the device is attempting to achieve.
5767	Engine Exhaust Gas Recirculation 1 Actuator 2 Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the Engine Exhaust Gas Recirculation 1 Actuator 2 by the manufacturer's software. When there are multiple failures, the most severe is transmitted.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
5768	Engine Exhaust Gas Recirculation 1 Actuator 2 Temperature Status	Used to identify the status of the Engine Exhaust Gas Recirculation 1 Actuator 2 drive circuitry temperature. Temperature excursions may affect the torque output. 000b = High Most severe 001b = High Least severe 010b = In Range 011b = Low Least severe 100b = Low Most severe 101b = Not Defined 110b = Error 111b = Not available
5769	Engine Exhaust Gas Recirculation 1 Actuator 2 Temperature	Temperature of the Engine Exhaust Gas Recirculation 1 Actuator 2 drive circuitry. Temperature excursions may affect the torque output.
5770	Engine Exhaust Gas Recirculation 1 Actuator 2 Desired Position	The requested position of the Engine Exhaust Gas Recirculation 1 Actuator 2 by the engine ECU, where 0% represents fully closed and 100% represents fully open.This is the position that the device is attempting to achieve.
5771	Engine Exhaust Gas Recirculation 1 Actuator 1 Operation Status	Used to identify the status of Exhaust Gas Recirculation 1 Actuator 1 0000b = Normal 0001b = Alarm (fully operational but needs service) 0010b = Alarm High Severity (functional but transient performance may be reduced) 0011b = Derate Active (torque output reduced due to environmental conditions) 0100b = Controlled Shutdown Active (driving to the default position – usually this means closed) 0101b = Uncontrolled Shutdown Active (no torque is being applied from the actuator) 0110b to 1101b = Reserved for future assignment 1110b = Error 1111b = Not available
5772	Engine Exhaust Gas Recirculation 1 Actuator 2 Operation Status	Used to identify the status of Exhaust Gas Recirculation 1 Actuator 2 0000b = Normal 0001b = Alarm (fully operational but needs service) 0010b = Alarm High

		Severity (functional but transient performance may be reduced) 0011b = Derate Active (torque output reduced due to environmental conditions) 0100b = Controlled Shutdown Active (driving to the default position – usually this means closed) 0101b = Uncontrolled Shutdown Active (no torque is being applied from the actuator) 0110b to 1101b = Reserved for future assignment 1110b = Error 1111b = Not available
5773	Engine Exhaust Gas Recirculation 2 Actuator 1 Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the Engine Exhaust Gas Recirculation 2 Actuator 1 by the manufacturer's software. When there are multiple failures, the most severe is transmitted.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
5774	Engine Exhaust Gas Recirculation 2 Actuator 1 Temperature Status	Used to identify the status of the Engine Exhaust Gas Recirculation 2 Actuator 1 drive circuitry temperature. Temperature excursions may affect the torque output. 000b = High Most severe 001b = High Least severe 010b = In Range 011b = Low Least severe 100b = Low Most severe 101b = Not Defined 110b = Error 111b = Not available
5775	Engine Exhaust Gas Recirculation 2 Actuator 1 Temperature	Temperature of the Engine Exhaust Gas Recirculation 2 Actuator 1 drive circuitry. Temperature excursions may affect the torque output.
5776	Engine Exhaust Gas Recirculation 2 Actuator 1 Desired Position	The requested position of the Engine Exhaust Gas Recirculation 2 Actuator 1 by the engine ECU, where 0% represents fully closed and 100% represents fully open.This is the position that the device is attempting to achieve.
5777	Engine Exhaust Gas Recirculation 2 Actuator 2 Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the Engine Exhaust Gas Recirculation 2 Actuator 2 by the manufacturer's software. When there are multiple failures, the most severe is transmitted.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
5778	Engine Exhaust Gas Recirculation 2 Actuator 2 Temperature Status	Used to identify the status of the Engine Exhaust Gas Recirculation 2 Actuator 2 drive circuitry temperature. Temperature excursions may affect the torque output. 000b = High Most severe 001b = High Least severe 010b = In Range 011b = Low

		Least severe 100b = Low Most severe 101b = Not Defined 110b = Error 111b = Not available
5779	Engine Exhaust Gas Recirculation 2 Actuator 2 Temperature	Temperature of the Engine Exhaust Gas Recirculation 2 Actuator 2 drive circuitry. Temperature excursions may affect the torque output.
5780	Engine Exhaust Gas Recirculation 2 Actuator 2 Desired Position	The requested position of the Engine Exhaust Gas Recirculation 2 Actuator 2 by the engine ECU, where 0% represents fully closed and 100% represents fully open.This is the position that the device is attempting to achieve.
5781	Engine Exhaust Gas Recirculation 2 Actuator 1 Operation Status	Used to identify the status of Exhaust Gas Recirculation 2 Actuator 1 0000b = Normal 0001b = Alarm (fully operational but needs service) 0010b = Alarm High Severity (functional but transient performance may be reduced) 0011b = Derate Active (torque output reduced due to environmental conditions) 0100b = Controlled Shutdown Active (driving to the default position – usually this means closed) 0101b = Uncontrolled Shutdown Active (no torque is being applied from the actuator) 0110b to 1101b = Reserved for future assignment 1110b = Error 1111b = Not available
5782	Engine Exhaust Gas Recirculation 2 Actuator 2 Operation Status	Used to identify the status of Exhaust Gas Recirculation 2 Actuator 2 0000b = Normal 0001b = Alarm (fully operational but needs service) 0010b = Alarm High Severity (functional but transient performance may be reduced) 0011b = Derate Active (torque output reduced due to environmental conditions) 0100b = Controlled Shutdown Active (driving to the default position – usually this means closed) 0101b = Uncontrolled Shutdown Active (no torque is being applied from the actuator) 0110b to 1101b = Reserved for future assignment 1110b = Error 1111b = Not available
5783	Engine Throttle Valve 1 Temperature	Temperature of the engine throttle valve 1 drive circuitry (SPN 51). Temperature excursions may affect the torque output.
5784	Engine Throttle Valve 2 Temperature	Temperature of the engine throttle valve 2 drive circuitry (SPN 3673). Temperature excursions may affect the torque output.

5785	Engine Fuel Valve 1 Temperature	Temperature of the Engine Fuel Valve 1 drive circuitry. Temperature excursions may affect the torque output.
5786	Engine Fuel Valve 2 Temperature	Temperature of the Engine Fuel Valve 2 drive circuitry. Temperature excursions may affect the torque output.
5787	Engine Turbocharger Wastegate Actuator 2 Temperature	Temperature of the Engine Turbocharger Wastegate Actuator 2 drive circuitry. Temperature excursions may affect the torque output.
5788	Engine Turbocharger Wastegate Actuator 1 Temperature	Temperature of the Engine Turbocharger Wastegate Actuator 1 drive circuitry. Temperature excursions may affect the torque output.
5789	Engine Exhaust Pressure Actuator 1 Desired Position	The requested position of the Engine Exhaust Pressure Actuator 1 by the engine ECU, where 0% represents fully closed and 100% represents fully open.This is the position that the device is attempting to achieve.
5790	Engine Exhaust Pressure Actuator 1 Temperature	Temperature of the Engine Exhaust Pressure Actuator 1 drive circuitry. Temperature excursions may affect the torque output.
5791	Engine Turbocharger Compressor Bypass Actuator 1 Temperature	Temperature of the Engine Turbocharger Compressor Bypass Actuator 1 drive circuitry. Temperature excursions may affect the torque output.
5792	Engine Turbocharger Compressor Bypass Actuator 2 Temperature	Temperature of the Engine Turbocharger Compressor Bypass Actuator 2 drive circuitry. Temperature excursions may affect the torque output.
5793	Desired Engine Fueling State	Devices send this request to the engine controller to: (a) Shut off engine fueling, but remain prepared to re-start quickly by not shutting down the control system, or (b) Keep the engine running. 00b = Fueling not desired (shut off engine fueling) 01b = Fueling desired (keep engine running) 10b = Parameter supported, but no request 11b = Don’t care / Take no action If the engine controller receives this parameter from multiple sources, then ’01b-Fueling desired’ shall have priority over ’00b-Fueling not desired’. If this request can be honored by the receiving device as indicated by SPN 5795, then it shall be processed independently of other means to stop engine fueling

		(i.e., SPN 970 Engine Auxiliary Shutdown Switch or the Key switch). For example, if the engine is acting on SPN 5793 set to 01b (keep engine running) and the vehicle key switch is turned off, then the engine shall shut off. Use examples of this parameter include, but are not limited to: 1. In applications or situations where the engine can be physically disconnected from the hybrid powertrain, a command of 00b could be used to request the engine to stop running, and as a result, stop rotating. 2. In applications or situations where engine-driven accessories (power steering, etc.) must remain active while the engine is not running, a command of 00b could result in the engine no longer running even as it continues to be spun (motored) by the hybrid powertrain. 3. In applications or situations where components want to keep the engine running, such as an aftertreatment system, a command of 01b could be used to prevent the engine from honoring requests from other devices using this parameter to shut off fueling.
5794	Feedback Engine Fueling State	This parameter provides feedback to the network that SPN 5793 Desired Engine Fueling State was honored. SPN 5795 Engine Fueling Inhibit Allowed indicates the engine's current ability to honor requests via SPN 5793 Desired Engine Fueling State.00b = Fueling is or will be inhibited (SPN 5793 Desired Engine Fueling State = 00b from at least one network device and all other network devices have SPN 5793 Desired Engine Fueling State equal to something other than 01) 01b = Engine will be kept running (SPN 5793 Desired Engine Fueling State = 01b from at least one network device) 10b = No active request per SPN 5793 Desired Engine Fueling State or SPN 5795 Engine Fueling Inhibit Allowed = 00b. When SPN 5795 = 00b, then requests via SPN 5793 Desired Engine Fueling are ignored. 11b = Not Supported
5795	Engine Fueling Inhibit Allowed	This parameter is broadcast by the engine control system, and indicates to other devices on the network whether or not it will respond to requests to inhibit engine fueling via SPN 5793 Desired Engine Fueling State. With this information, devices that may wish to inhibit engine fueling at some time in the future can know whether or not their request will be honored before they issue a request.This parameter does not reflect the state of the engine controller due to requests received in SPN 5793 Desired Engine Fueling State. This parameter is intended to be used in conjunction with SPN 5793 Desired Engine Fueling State and SPN 5794 Feedback Engine

		Fueling State. 00b = Engine currently will not stop fueling in response to SPN 5793 Desired Engine Fueling State 01b = Engine will stop fueling in response to SPN 5793 Desired Engine Fueling State 10b = SAE Reserved 11b = Not Supported
5796	Aftertreatment 1 SCR Dosing Air Assist Pump	A stand alone air pump used to supply air to an air assisted dosing system, typically for systems not utilizing an air compressor as the source for the air.
5797	Aftertreatment Warm Up Diesel Oxidation Catalyst Temperature Sensor Module	A control module used to measure temperatures related to the aftertreatment warm up diesel oxidation (or close coupled) catalyst.
5798	Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit 1 Heater Temperature	The temperature nearest the heater in the DEF dosing unit 1.
5799	Aftertreatment 1 SCR Dosing Air Assist Pump Relay	A relay used to power a stand alone air pump used to supply air to an air assisted dosing system, typically for systems not utilizing an air compressor as the source for the air.
5800	Auxiliary valve 0 exit/reason code	See document ISO 11783-7 for SPN details.
5801	Auxiliary valve 1 exit/reason code	See document ISO 11783-7 for SPN details.
5802	Auxiliary valve 2 exit/reason code	See document ISO 11783-7 for SPN details.
5803	Auxiliary valve 3 exit/reason code	See document ISO 11783-7 for SPN details.
5804	Auxiliary valve 4 exit/reason code	See document ISO 11783-7 for SPN details.
5805	Auxiliary valve 5 exit/reason code	See document ISO 11783-7 for SPN details.
5806	Auxiliary valve 6 exit/reason code	See document ISO 11783-7 for SPN details.

5807	Cruise Control System Command State	Indicates the current state of the cruise control system due to the Cruise Control System Commands, which include Cruise Control Disable Command (SPN 5603), Cruise Control Resume Command (SPN 5604), Cruise Control Pause Command (SPN 5605) and Cruise Control Set Command(SPN 9843).000b = No Cruise Control System Command 001b = Cruise control has been disabled by Cruise Control Disable Command (SPN 5603) 010b = Cruise control has been disabled by Cruise Control Pause Command (SPN 5605) 011b = Cruise control has been re-activated by Cruise Control Resume Command (SPN 5604) and Cruise Control States (SPN 527) is equal to Resume (100b). Cruise Control System Command State will be equal to 011b as long as Cruise Control States is equal to Resume. Cruise Control System Command State will change to the appropriate value when Cruise Control States is no longer equal to Resume. 100b = Cruise control device has received a Cruise Control Resume Command (SPN 5604), but there is no previous set speed. 101b = Cruise control device has received a Cruise Control Set Command (SPN 9843), cruise control is active, and the cruise control set speed has been set to the current vehicle speed. 110b = SAE reserved 111b = Not Supported
5807	Auxiliary valve 7 exit/reason code	See document ISO 11783-7 for SPN details.
5808	Auxiliary valve 8 exit/reason code	See document ISO 11783-7 for SPN details.
5809	Auxiliary valve 9 exit/reason code	See document ISO 11783-7 for SPN details.
5810	Auxiliary valve 10 exit/reason code	See document ISO 11783-7 for SPN details.
5811	Auxiliary valve 11 exit/reason code	See document ISO 11783-7 for SPN details.
5812	Auxiliary valve 12 exit/reason code	See document ISO 11783-7 for SPN details.
5813	Auxiliary valve 13 exit/reason code	See document ISO 11783-7 for SPN details.
5814	Auxiliary valve 14 exit/reason code	See document ISO 11783-7 for SPN details.

5815	Auxiliary valve 15 exit/reason code	See document ISO 11783-7 for SPN details.
5816	Front hitch exit/reason code	See document ISO 11783-7 for SPN details.
5817	Front PTO exit/reason code	See document ISO 11783-7 for SPN details.
5818	Machine selected speed exit/reason code	See document ISO 11783-7 for SPN details.
5819	Rear hitch exit/reason code	See document ISO 11783-7 for SPN details.
5820	Rear PTO exit/reason code	See document ISO 11783-7 for SPN details.
5821	Wand Angle	A wand sensor measures the angle of deflection of a wand from its null position. This parameter reports the measured angle of a wand sensor.
5822	Wand Sensor Figure of Merit	Figure of Merit sensor status for a wand sensor. 00b = Sensor fully functional 01b = Sensor degraded 10b = Sensor failed 11b = Sensor not available
5823	Measured Linear Displacement	Distance to target as measured by the Linear Displacement Sensor.
5824	Linear Displacement Sensor Sensor Figure of Merit	Figure of Merit sensor status of Linear Displacement Sensor. 00b = Sensor fully functional 01b = Sensor degraded 10b = Sensor failed 11b = Sensor not available
5825	Driver Warning System Indicator Status	The desired illumination of the Euro VI defined driver warning system indicator for relevant malfunctions and diesel exhaust fluid (reagent) tank low level. Used for Euro VI implementations. See Euro VI implementing regulation Annex XIII, Section 4 for usage requirements.000b = Off – Used when driver warning system is non-active – which, by requirement, means the low-level and severe inducement systems are also non-active 001b = On – solid – Used when driver warning system is activated for any relevant malfunction 010b = reserved for SAE assignment 011b = reserved for SAE assignment 100b = On – fast blink (1 Hz) – Used for the second driver warning

		system detection threshold for diesel exhaust fluid level, where the visual alarm of the driver warning system is required to « escalate in intensity » 101b = reserved for SAE assignment 110b = reserved for SAE assignment 111b = not available Note: SPN 5825 is similar to SPN 5245. SPN 5825 is intended to be used in implementations where the warning indicator is used to convey diesel exhaust fluid tank low level and specific emission control malfunction information, whereas SPN 5245 is intended to be used in implementations where the warning indicator is used to convey diesel exhaust fluid tank low level information only. Thus, SPN 5825 is a superset of SPN 5245, and if both are utilized, will match only under certain conditions.
5826	Emission Control System Operator Inducement Severity	Severity status of the operator inducement system for anomalies with the emission control system, such as tampering, low diesel exhaust fluid (reagent) quality, diesel exhaust fluid (reagent) tank level, or EGR system errors. Higher numerical levels indicate more severe levels of inducement. Level 1 is the least severe. Used for Euro VI and Tier 4 implementations.000b = Driver Warning, Low-Level Inducement, and Severe Inducement Non-Active 001b = Inducement Level 1… Euro VI defined Driver Warning System Active ……. FMI 15 … Off Highway (Tier4) – DEF Warning …….. FMI 15 010b = Inducement Level 2 … Euro VI defined Low-Level Inducement Enabled ……. FMI 15 … Off Highway (Tier4) – DEF Warning, second level …….. FMI 15 011b = Inducement Level 3 … Euro VI defined Low-Level Inducement Active ……. FMI 16 … Off Highway (Tier4) – Low-Level Inducement Active ……..…….. FMI 16 100b = Inducement Level 4 … Euro VI defined Severe Inducement Enabled …… FMI 16 … Off Highway (Tier4) – Severe Inducement Active ……..…….. FMI 16 101b = Inducement Level 5 … Euro VI defined Severe Inducement Active …… FMI 0 … Off Highway (Tier4) – Final Inducement Active ……..…….. FMI 0 110b = Temporary Override of Inducement 111b = Not Available / Not Supported When this SPN is used in a DTC the recommended FMI usage is as shown. Reference Euro VI implementing regulation Annex XIII, Appendix 5, section 3.1.(b), 3.1.(c), and 3.1.(d) for details. Reference EU directive 97/68/EC amendment (2012/46/EU), EPA webinar nrci-scr-web-conf.2011-07-25, and JMLIT « Technical Guidelines for Urea Selective Catalytic Reduction System » Kokujikan 132-3, Feb.16, 2012 for Off

		Highway (Tier4) implementations. Note: SPN 5826 is similar to SPN 5246. SPN 5826 is intended to be used to indicate the severity status of the operator inducement system for anomalies with the SCR and EGR systems, whereas SPN 5246 is intended to be used to indicate the severity status of the operator inducement system for anomalies with the SCR system only. Thus, SPN 5826 is a superset of SPN 5246, and if both are utilized, will match only under certain conditions.
5827	Aftertreatment 1 Diesel Particulate Filter Average Distance Between Active Regenerations	Indicates the average distance since last reset between active regenerations, that have not been forced to occur by manual request, for aftertreatment device 1.If the manufacturer allows this parameter to be reset, this distance is the average since last reset.
5828	Aftertreatment 2 Diesel Particulate Filter Average Distance Between Active Regenerations	Indicates the average distance since last reset between active regenerations, that have not been forced to occur by manual request, for aftertreatment device 2.If the manufacturer allows this parameter to be reset, this distance is the average since last reset.
5829	Engine Exhaust Gas Recirculation 1 Valve 1 Position Error	The position error of the Exhaust Gas Recirculation 1 valve, determined as the actual position (SPN 27) minus the commanded position (SPN 2791).
5830	Engine Exhaust Gas Recirculation 1 Valve 2 Position Error	The position error of the Exhaust Gas Recirculation 1 valve 2, determined as the actual position (SPN 3821) minus the commanded position (SPN 3822).
5831	Engine Exhaust Gas Recirculation 2 Valve 1 Position Error	The position error of the Exhaust Gas Recirculation 2 valve, determined as the actual position (SPN 5264) minus the commanded position (SPN 5262).
5832	Engine Exhaust Gas Recirculation 2 Valve 2 Position Error	The position error of the Exhaust Gas Recirculation 2 valve 2, determined as the actual position (SPN 5265) minus the commanded position (SPN 5263).
5833	Engine Fuel Mass Flow Rate	Mass of liquid fuel consumed by engine per unit of time.
5834	Aftertreatment 2 Fuel Mass Rate	Mass rate of total fuel being delivered to Atertreatment 2 for DPF regeneration.

5835	Aftertreatment 1 Particulate Sensor	The particulate sensor measures the mass concentration of particulate matter in the exhaust downstream of the DPF in exhaust bank 1.
5836	Aftertreatment 2 Particulate Sensor	The particulate sensor measures the mass concentration of particulate matter in the exhaust downstream of the DPF in exhaust bank 2.
5837	Fuel Type	Type of fuel currently being utilized by the vehicle Data Byte – Scaling – External Display 00h = Not available – NONE 01h = Gasoline/petrol – GAS 02h = Methanol – METH 03h = Ethanol – ETH 04h = Diesel – DSL 05h = Liquefied Petroleum Gas (LPG) – LPG 06h = Compressed Natural Gas (CNG) – CNG 07h = Propane – PROP 08h = Battery/electric – ELEC 09h = Bi-fuel vehicle using gasoline – BI_GAS 0Ah = Bi-fuel vehicle using methanol – BI_METH 0Bh = Bi-fuel vehicle using ethanol – BI_ETH 0Ch = Bi-fuel vehicle using LPG – BI_LPG 0Dh = Bi-fuel vehicle using CNG – BI_CNG 0Eh = Bi-fuel vehicle using propane – BI_PROP 0Fh = Bi-fuel vehicle using battery – BI_ELEC [Not to be used] 10h = Bi-fuel vehicle using battery and combustion engine – BI_MIX [Not to be used] 11h = Hybrid vehicle using gasoline engine – HYB_GAS [Not to be used] 12h = Hybrid vehicle using gasoline engine on ethanol – HYB_ETH [Not to be used] 13h = Hybrid vehicle using diesel engine – HYB_DSL [Not to be used] 14h = Hybrid vehicle using battery – HYB_ELEC [Not to be used] 15h = Hybrid vehicle using battery and combustion engine – HYB_MIX [Not to be used] 16h = Hybrid vehicle in regeneration mode – HYB_REG [Not to be used] 17h = Natural Gas (NG) – NG 18h = Bi-fuel vehicle using NG – BI_NG 19h = Bi-fuel using diesel 1Ah = Natural Gas (Compressed or Liquefied Natural Gas) 1Bh = Dual Fuel – Diesel and CNG 1Ch = Dual Fuel – Diesel and LNG 1Dh = Fuel Cell Utilizing Hydrogen 1Eh = Hydrogen Internal Combustion Engine 1Fh to FDh = ISO/SAE reserved FEh = Error FFh = Not available (Parameter not supported) EXAMPLE: If a Bi-fuel vehicle has less than 10% ethanol in the gasoline/petrol, then the external test equipment shall display state 09h. In such a case, the system would be using gasoline/petrol (fuel) tables and OBD thresholds. SPN 5458 should either artificially display 0% or some number 10% or less if the system has such resolution. If the ethanol in the gasoline/petrol is above 10%, then the external test equipment shall display state 0Bh. SPN 5458 shall report the calculated ethanol/alcohol percentage. Note: « Not available » (Data 00h) shall be

		used for the following conditions where no fuel is being utilized: • Ignition Key On/Engine Off, for example, for bi-fuel vehicles when the vehicle cannot identify which fuel is being used before engine start • Vehicle using Start/Stop strategy with engine stopped. If FUEL_TYP is utilized on a single fuel vehicle, it can continue to indicate the previously utilized fuel type while the engine is in Decel Fuel Cut Off (DFCO) mode. It is not required to indicate 00h while in DFCO. For hybrid or battery vehicles the states 0Fh through 16h shall not be used. Parameters within the HSS and HSC1 messages may be used to communicate hybrid related mode status. Regarding fuel type 17h – Natural Gas – this applies to any type of natural gaseous fuel when the source (CNG, LPG, or other) is not relevant. Regarding fuel type 18h – Bi-fuel vehicle using NG; this applies to bi-fuel vehicles running Diesel and Natural Gas, where the source of the natural gaseous fuel is not relevant. See SPN 6317 for the requested fuel type.
5838	Engine Exhaust Gas Recirculation Valve Malfunction	See document J1939-73 for SPN details.
5839	Diesel Exhaust Fluid Consumption Malfunction	See document J1939-73 for SPN details.
5840	Diesel Exhaust Fluid Dosing Malfunction	See document J1939-73 for SPN details.
5841	Diesel Exhaust Fluid Quality Malfunction	See document J1939-73 for SPN details.
5842	SCR Monitoring System Malfunction	See document J1939-73 for SPN details.
5843	Engine OBD Warm-up Sequence	See document J1939-73 for SPN details.
5844	Model Year	See document J1939-73 for SPN details.

5845	Certification Engine Family Name	See document J1939-73 for SPN details.
5846	OBD Test Results	See document J1939-73 for SPN details.
5847	Emergency Braking Active	Signal which indicates an emergency braking situation (ref. ECE Regulation 13 paragraph 5.2.1.31) with high deceleration values. This signal can be used to activate the hazard lights (ref ECE Regulation 48 paragraph 6.23) to indicate other road users to the rear and front of the vehicle that a high retardation force has been applied to the vehicle relative to the prevailing road conditions.00b = inactive 01b = active 10b = reserved 11b = not available
5848	Aftertreatment 1 SCR Intermediate NH3	The amount of NH3 in the exhaust aftertreatment system measured by a NH3 sensor at an intermediate point in the SCR system, represented in NH3 molecule parts per million non-NH3 molecules in exhaust bank 1.
5849	Aftertreatment 1 SCR Intermediate NH3 Sensor Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the aftertreatment SCR intermediate NH3 sensor by the manufacturer's sensor control software in exhaust bank 1. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
5850	Aftertreatment 1 SCR Intermediate NH3 Reading Stable	Indicates that the NH3 reading of the aftertreatment SCR intermediate NH3 sensor is stable as determined by the manufacturer's control software in exhaust bank 1.00b = Reading is not stable 01b = Reading is stable 10b = Error 11b = Not available
5851	Aftertreatment 1 SCR Intermediate NH3 Sensor Power In Range	Indicates that the power supplied to the aftertreatment SCR intermediate NH3 sensor is within the manufacturer's specification in exhaust bank 1.00b = Power is not in range 01b = Power is in range 10b = Error 11b = Not available
5852	Aftertreatment 1 SCR Intermediate NH3 Sensor at Temperature	Indicates that the heater element of the aftertreatment SCR intermediate NH3 sensor is within the manufacturer's specified range for accurate measurements in exhaust bank 1.00b = Heater element is not in range 01b = Heater element is in range 10b = Error 11b = Not available

5853	Aftertreatment 1 SCR Intermediate NH3 Sensor Heater Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the heater of the outlet NH3 exhaust sensor by the manufacturer's sensor control software in exhaust bank 1. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
5854	Aftertreatment 1 SCR Intermediate NH3 Sensor Heater Control	Indicates the heater status in the warm-up process. Upon receiving a power-up command, the NH3 sensor ramps up according to a manufacturer defined profile. The Preheat 1, Preheat 2, and Automatic messages are regions within this profile in exhaust bank 1.00b = Automatic 01b = Preheat 2 10b = Preheat 1 11b = Heater off or not available
5855	Aftertreatment 2 SCR Intermediate NH3	The amount of NH3 in the exhaust aftertreatment system measured by a NH3 sensor at an intermediate point in the SCR system, represented in NH3 molecule parts per million non-NH3 molecules in exhaust bank 2.
5856	Aftertreatment 2 SCR Intermediate NH3 Sensor Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the aftertreatment SCR intermediate NH3 sensor by the manufacturer's sensor control software in exhaust bank 2. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
5857	Aftertreatment 2 SCR Intermediate NH3 Reading Stable	Indicates that the NH3 reading of the aftertreatment SCR intermediate NH3 sensor is stable as determined by the manufacturer's control software in exhaust bank 2.00b = Reading is not stable 01b = Reading is stable 10b = Error 11b = Not available
5858	Aftertreatment 2 SCR Intermediate NH3 Sensor Power In Range	Indicates that the power supplied to the aftertreatment SCR intermediate NH3 sensor is within the manufacturer's specification in exhaust bank 2.00b = Heater element is not in range 01b = Heater element is in range 10b = Error 11b = Not available
5859	Aftertreatment 2 SCR Intermediate NH3 Sensor at Temperature	Indicates that the heater element of the aftertreatment SCR intermediate NH3 sensor is within the manufacturer's specified range for accurate measurements in exhaust bank 2.00b = Heater element is not in range 01b = Heater element is in range 10b = Error 11b = Not available

5860	Aftertreatment 2 SCR Intermediate NH3 Sensor Heater Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the heater of the SCR intermediate NH3 exhaust sensor by the manufacturer’s sensor control software in exhaust bank 2. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
5861	Aftertreatment 2 SCR Intermediate NH3 Sensor Heater Control	Indicates the heater status in the warm-up process. Upon receiving a power-up command, the NH3 sensor ramps up according to a manufacturer defined profile. The Preheat 1, Preheat 2, and Automatic messages are regions within this profile in exhaust bank 1. 00b = Automatic 01b = Preheat 2 10b = Preheat 1 11b = Heater off or Not available
5862	Aftertreatment 1 SCR Intermediate Temperature	Temperature of engine combustion byproducts at an intermediate point in the SCR component in exhaust bank 1.
5863	Aftertreatment 1 SCR Intermediate Temperature Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the aftertreatment SCR intermediate temperature sensor by the manufacturer’s sensor control software in exhaust bank 1. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
5864	Aftertreatment 2 SCR Intermediate Temperature	Temperature of engine combustion byproducts at an intermediate point in the SCR component in exhaust bank 2.
5865	Aftertreatment 2 SCR Intermediate Temperature Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the aftertreatment SCR intermediate temperature sensor by the manufacturer’s sensor control software in exhaust bank 2. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
5866	Engine Fueling Inhibit Prevented Reason	If Engine Fueling Inhibit Allowed (SPN 5795) indicates that the engine will inhibit fueling, then this parameter and Engine Fueling Inhibit Prevented Reason Extension (SPN 8145) will indicate the reason.If SPN 8145 is state 13 (1101b) or lower, then

		SPN 5866, if supported, shall be set to the same value. If SPN 8145 is state 14 (1110b) or higher, then SPN 5866, if supported, shall be set to 14 (1110b). If more than one reason exists at the same time, then it is up to the manufacturer to decide which one to select. 0000b = Fueling inhibit allowed (SPN 5795 = 01b) 0001b = Aftertreatment regeneration is active or preparing to be active 0010b = Oil Distribution in engine is incomplete 0011b = Engine is cold 0100b = Service Override 0101b = Aftertreatment system is cold 0110b = Aftertreatment Protection 0111b = Engine load too high 1000b = Engine protection. Use other engine protection enumerations in this parameter when applicable. If the method of engine protection is not defined in other states, then use this state. 1001b = Insufficient SLI battery charge 1010b = Maximum number of engine fueling inhibit requests (SPN 5793 = 0) temporary limit exceeded. The temporary limit may be bounded by elapsed time, distance travelled, driving conditions, or something else that the manufacturer has specified. 1011b= Engine driven fan request 1100b = Low idle governor operation required 1101b = Vehicle speed is greater than zero 1110b = See Engine Fueling Inhibit Prevented Reason Extension (SPN 8145) 1111b = Not Supported
5867	Supply Gas Methane Percentage	The percentage of methane in the gas supplied to the engine.
5868	Spark Ignition Module Shutdown Relay Driver Control Circuit	Used to indicate faults with the spark ignition module shutdown relay driver control circuit.
5869	Auxiliary Device AC Power Supply Circuit Breaker Tripped	Used with FMI 31 (Condition Exists) to indicate that the circuit breaker that connects AC power to an auxiliary device has tripped.
5870	Alternator Heater Control Relay Driver Control Circuit	Used to indicate faults with the alternate heater relay driver control circuit.
5871	O2 Sensor Power Relay Driver Control Circuit	Used to indicate faults with the heated oxygen sensor (O2) relay driver control circuit.
5872	Hybrid System Warning Indicator	Signal from a hybrid system indicating that some aspect of its operation is not functioning correctly, and as a result, hybrid system operation may be altered or

		restricted. The indicator is typically a lamp. Distinctions in meaning between the continuous and flashing states are left to the hybrid system manufacturer.00b = Hybrid System Warning Indicator is off 01b = Hybrid System Warning Indicator is on continuously 10b = Hybrid System Warning Indicator is flashing 11b = Not available
5873	Hybrid System Overheat Indicator	Signal from a hybrid system indicating that at least one of its monitored temperatures is above normal acceptable limits, and as a result, hybrid system operation may be altered or restricted. The indicator is typically a lamp. Distinctions in meaning between the continuous and flashing states are left to the hybrid system manufacturer.00b = Hybrid System Temperature Indicator is off 01b = Hybrid System Temperature Indicator is on continuously 10b = Hybrid System Temperature Indicator is flashing 11b = Not available
5874	Hybrid System Stop Indicator	Signal from a hybrid system indicating that some aspect of its operation is not functioning correctly, and as a result, the vehicle must be stopped. The indicator is typically a lamp. Distinctions in meaning between the continuous and flashing states are left to the hybrid system manufacturer.00b = Hybrid System Stop Indicator is off 01b = Hybrid System Stop Indicator is on continuously 10b = Hybrid System Stop Indicator is flashing 11b = Not available
5875	Transmission Ratio Neutral	The transmission’s gear ratio in neutral. Intended to identify conditions related to gear ratio checks when neutral is expected.
5876	Transmission Ratio Forward Range Low	The transmission’s gear ratio in low forward range. Intended to identify conditions related to gear ratio checks when low forward range is expected.
5877	Transmission Ratio Forward Range 1	The transmission’s gear ratio in 1st forward range. Intended to identify conditions related to gear ratio checks when 1st forward range is expected.
5878	Transmission Ratio Forward Range 2	The transmission’s gear ratio in 2nd forward range. Intended to identify conditions related to gear ratio checks when 2nd forward range is expected.

5879	Transmission Ratio Forward Range 3	The transmission’s gear ratio in 3rd forward range. Intended to identify conditions related to gear ratio checks when 3rd forward range is expected.
5880	Transmission Ratio Forward Range 4	The transmission’s gear ratio in 4th forward range. Intended to identify conditions related to gear ratio checks when 4th forward range is expected.
5881	Transmission Ratio Forward Range 5	The transmission’s gear ratio in 5th forward range. Intended to identify conditions related to gear ratio checks when 5th forward range is expected.
5882	Transmission Ratio Forward Range 6	The transmission’s gear ratio in 6th forward range. Intended to identify conditions related to gear ratio checks when 6th forward range is expected.
5883	Transmission Ratio Forward Range 7	The transmission’s gear ratio in 7th forward range. Intended to identify conditions related to gear ratio checks when 7th forward range is expected.
5884	Transmission Ratio Forward Range 8	The transmission’s gear ratio in 8th forward range. Intended to identify conditions related to gear ratio checks when 8th forward range is expected.
5885	Transmission Ratio Forward Range 9	The transmission’s gear ratio in 9th forward range. Intended to identify conditions related to gear ratio checks when 9th forward range is expected.
5886	Transmission Ratio Forward Range 10	The transmission’s gear ratio in 10th forward range. Intended to identify conditions related to gear ratio checks when 10th forward range is expected.
5887	Transmission Ratio Reverse Range 1	The transmission’s gear ratio in 1st reverse range. Intended to identify conditions related to gear ratio checks when 1st reverse range is expected.
5888	Transmission Ratio Reverse Range 2	The transmission’s gear ratio in 2nd reverse range. Intended to identify conditions related to gear ratio checks when 2nd reverse range is expected.
5889	Hybrid System Fault	General fault within a hybrid system. The intent for this parameter is to indicate general fault conditions within a hybrid system that may consist of multiple discrete

		devices in cases where knowledge of the exact component experiencing the issue is not important (i.e. driver notification via a dash display).
5890	Hybrid System Temperature	Temperature issue with one or more components in the hybrid system. The intent for this parameter is to indicate temperature-related fault conditions within a hybrid system that may consist of multiple discrete devices in cases where knowledge of the exact component experiencing the issue is not important (i.e. driver notification via a dash display).
5891	Transmission Pressure Switch 1	First pressure switch of an automatic transmission.
5892	Transmission Pressure Switch 2	Second pressure switch of an automatic transmission.
5893	Transmission Pressure Switch 3	Third pressure switch of an automatic transmission.
5894	Transmission Pressure Switch 4	Fourth pressure switch of an automatic transmission.
5895	Transmission Pressure Switch 5	Fifth pressure switch of an automatic transmission.
5896	Transmission Pressure Switch 6	Sixth pressure switch of an automatic transmission.
5897	Transmission Pressure Switch 7	Seventh pressure switch of an automatic transmission.
5898	Transmission Pressure Switch 8	Eighth pressure switch of an automatic transmission.
5899	Transmission Pressure Switch 9	Ninth pressure switch of an automatic transmission.
5900	Transmission Pressure Control Solenoid 1	First pressure control solenoid of an automatic transmission.
5901	Transmission Pressure Control Solenoid 2	Second pressure control solenoid of an automatic transmission.

5902	Transmission Pressure Control Solenoid 3	Third pressure control solenoid of an automatic transmission.
5903	Transmission Pressure Control Solenoid 4	Fourth pressure control solenoid of an automatic transmission.
5904	Transmission Pressure Control Solenoid 5	Fifth pressure control solenoid of an automatic transmission.
5905	Transmission Pressure Control Solenoid 6	Sixth pressure control solenoid of an automatic transmission.
5906	Transmission Pressure Control Solenoid 7	Seventh pressure control solenoid of an automatic transmission.
5907	Transmission Pressure Control Solenoid 8	Eighth pressure control solenoid of an automatic transmission.
5908	Transmission Shift Solenoid 1	First shift solenoid of an automatic transmission.
5909	Transmission Shift Solenoid 2	Second shift solenoid of an automatic transmission.
5910	Transmission Shift Solenoid 3	Third shift solenoid of an automatic transmission.
5911	Transmission Shift Solenoid 4	Fourth shift solenoid of an automatic transmission.
5912	Transmission ECU Temperature	Internal temperature of the transmission control unit.
5913	Transmission Oil Temperature 2	Second instance of transmission lubricant temperature. This parameter may reflect the temperature of a second sump or oil supply. If only one instance of transmission lubricant temperature measurement exists, SPN 177 Transmission Oil Temperature 1 should be used.

5914	Transmission Oil Level 2 High / Low	Second instance of a transmission oil level indicator. Conveys the current volume of transmission sump oil compared to recommended volume. Positive values indicate overfill. Zero means the transmission fluid is filled to the recommended level. If only a one instance of transmission oil level measurement exists, SPN 3027 Transmission Oil Level 1 High / Low should be used.Parameter Specific Indicator: A value of FBh indicates conditions are not acceptable for a valid fluid level measurement.
5915	Transmission Oil Level 2 Countdown Timer	Countdown timer for the second instance of a transmission oil level indicator. Once all vehicle conditions (such as vehicle stopped, etc) are met, some transmissions may require a ‘settling time’ to allow the fluid level to normalize. This parameter indicates how much of the required settling time remains. When time reaches 0, a valid oil level measurement value will be broadcast in SPN 5914 Transmission Oil Level 2 High / Low. If only a single oil level is measured, SPN 3028 Transmission Oil Level 1 Countdown Timer should be used.0000b = less than 1 minute 0001b = One minute 0010b = Two minutes 0011b = Three minutes 0100b = Four minutes 0101b = Five minutes 0110b = Six minutes 0111b = Seven minutes 1000b = Eight minutes 1001b = Nine minutes 1010b = Ten minutes 1011b = Eleven minutes 1100b = Twelve minutes 1101b = Thirteen minutes 1110b = Error 1111b = Not Available
5916	Transmission Oil Level 2 Measurement Status	Measurement status for the second instance of a transmission oil level indicator. Indicates if conditions are acceptable to obtain a valid transmission oil level measurement as conveyed in SPN 5914 Transmission Oil Level 2 High / Low. If conditions are not acceptable, this parameter conveys to the operator what prevents conditions from being acceptable. Only one condition can be conveyed in this parameter at any given point in time. If multiple conditions exist, it is not important which condition is actually broadcast, as the driver must ‘correct’ each and every condition as it is presented before a valid oil level reading can be made. If multiple conditions exist that prevent a valid reading, the sender should broadcast one of those conditions until it is corrected; then the next condition can be conveyed to the operator, and so on. If only a single oil level is measured, use SPN 3026 Transmission Oil Level 1 Measurement Status.0000b = Conditions valid for transmission oil level measurement 0001b = Conditions not valid – Settling timer still counting down 0010b = Conditions not valid – Transmission in gear 0011b =

		Conditions not valid – Transmission fluid temperature too low 0100b = Conditions not valid – Transmission fluid temperature too high 0101b = Conditions not valid – Vehicle moving; output shaft speed too high 0110b = Conditions not valid – Vehicle not level 0111b = Conditions not valid – Engine speed too low 1000b = Conditions not valid – Engine speed too high 1001b = Conditions not valid – No request for reading 1010b = Not defined 1011b = Not defined 1100b = Not defined 1101b = Conditions not valid – Other 1110b = Error 1111b = Not available
5917	HVES1 Available Discharge Power	The rate at which the High Voltage Energy Storage 1 pack (or system) can currently provide energy for propulsion or other uses.
5918	HVES1 Available Charge Power	The rate at which the High Voltage Energy Storage 1 pack (or system) can currently receive energy from a regenerative or recharging system.
5919	HVES1 Voltage Level	The voltage level of the High Voltage Energy Storage 1 pack (or system). This parameter should be synchronized with SPN 5920 (HVES1 Current) such that a realized power value can be calculated. If the HVES component physically contains the contactors which connect it to the vehicle high voltage system, then this voltage is measured before those contactors.
5920	HVES1 Current	The current in or out of the High Voltage Energy Storage 1 pack (or system). This parameter should be synchronized with SPN 5919 (HVES1 Voltage Level) such that a realized power value can be calculated. This parameter is defined from the high voltage energy storage system’s point of view. A positive value represents current into (charging) the energy storage system. A negative value represents current out of (discharging) the energy storage system.
5921	HVES1 Fast Update State of Charge	Indicates the High Voltage Energy Storage 1 pack (or system) state of charge. 0% means no charge remaining, 100% means the system is fully charged in terms of physical limits of the energy storage system. Acceptable state of charge upper and lower boundaries for normal operation are defined in SPN 8118 (HVES1 Recommended Minimum State Of Charge) and SPN 8119 (HVES1 Recommended Maximum State Of Charge). The update rate and resolution of this parameter are

		intended for control purposes within a hybrid control system; for a simple periodic value, SPN 5464 (Hybrid Battery Pack Remaining Charge) may be of use.
5922	HVES1 Highest Cell Voltage	The highest voltage level reported by any cell in the High Voltage Energy Storage 1 pack (or system). If a single voltage sensor covers more than one cell, the value in this parameter is for the smallest group of cells measured. See HVES1 Highest Cell Voltage Module Number (SPN 8236) and HVES1 Highest Cell Voltage Cell Number (SPN 8237) for cell location information.
5923	HVES1 Lowest Cell Voltage	The lowest voltage level reported by any cell in the High Voltage Energy Storage 1 pack (or system). If a single voltage sensor covers more than one cell, the value in this parameter is for the smallest group of cells measured. See HVES1 Lowest Cell Voltage Module Number (SPN 8238) and HVES1 Lowest Cell Voltage Cell Number (SPN 8239) for cell location information.
5924	HVES1 Cell Voltage Differential Status	Indicates whether or not the differential between the highest and lowest cell voltages are within acceptable limits, according to the High Voltage Energy Storage 1 pack (or system). The actual voltage differential can be calculated by subtracting SPN 5923 (HVES1 Lowest Cell Voltage) from SPN 5922 (HVES1 Highest Cell Voltage).0000b = Cell-to-cell voltage differential is within acceptable limits 0001b = Cell-to-cell voltage differential exceeds acceptable limits but can be corrected via auto-balancing 0010b = Cell-to-cell voltage differential exceeds acceptable limits to a point where external maintenance balancing is required to restore battery performance 0011b = Cell-to-cell voltage differential exceeds acceptable limits to a point where external maintenance balancing cannot restore battery performance 0100b = Cell-to-cell voltage differential exceeds acceptable limits; it is not known whether balancing can restore battery performance 0101b to 1101b = Reserved 1110b = Error 1111b = Not Available
5925	Engine Oil Temperature 3	Temperature of the engine lubricant. Note: If there is only one engine oil temperature measurement, SPN 175 should be used. See also SPNs 175 and 1135 for additional engine oil temperature measurements.

5926	Engine Charge Air Cooler Differential Pressure	Differential Pressure across the engine charge air cooler.
5927	Engine Coolant Pump	Engine pump that circulates coolant through engine coolant system
5928	Engine Exhaust Gas Recirculation 1 Valve 1 Control 2	This is a second output used to command EGR valve 1 position for applications requiring 2 outputs to command EGR valve position (e.g. stepper motor). See SPN 2791 for the first output.
5929	Engine Exhaust Gas Recirculation 1 Catalyst 1 Performance Monitor	Monitors Engine Exhaust Gas Recirculation 1 Catalyst 1 performance. SPN 5929 may be used to report readiness, in-use ratio, test results and DTC. Reported in-use ratio is the lowest numerical ratio of the in-use ratios that are tracked separately for each required monitor that detects malfunctions of the system.
5930	Engine Exhaust Gas Recirculation 1 Catalyst 2 Performance Monitor	Monitors Engine Exhaust Gas Recirculation 1 Catalyst 2 performance. SPN 5930 may be used to report readiness, in-use ratio, test results and DTC. Reported in-use ratio is the lowest numerical ratio of the in-use ratios that are tracked separately for each required monitor that detects malfunctions of the system.
5931	Engine Exhaust Gas Recirculation 2 Catalyst 1 Performance Monitor	Monitors Engine Exhaust Gas Recirculation 2 Catalyst 1 performance. SPN 5931 may be used to report readiness, in-use ratio, test results and DTC. Reported in-use ratio is the lowest numerical ratio of the in-use ratios that are tracked separately for each required monitor that detects malfunctions of the system.
5932	Engine Exhaust Gas Recirculation 2 Catalyst 2 Performance Monitor	Monitors Engine Exhaust Gas Recirculation 1 Catalyst 1 performance. SPN 5932 may be used to report readiness, in-use ratio, test results and DTC. Reported in-use ratio is the lowest numerical ratio of the in-use ratios that are tracked separately for each required monitor that detects malfunctions of the system.
5933	Rear Steer Axle Group Weight Available	Indicates if a second (or rear) steer axle group weight is available. 00b = Rear Steer axle group not present 01b = Rear Steer axle group present 10b = Reserved 11b = Not available / not applicable Note: If there is only one steer axle, use SPN 4059.

5934	Rear Drive Axle Group Weight Available	Indicates if a second (or rear) drive axle group weight is available. 00b = Rear drive axle group not present 01b = Rear drive axle group present 10b = Reserved 11b = Not available / not applicable Note: If there is only one drive axle, use SPN 4061.
5935	Additional Axle Group Location	Location of the axle group, listed from front of the vehicle to rear. If the value of SPN 4073 is 15, then this SPN is used to indicate the axle group referred to by this PGN. Otherwise, this SPN should be broadcast as 15.0 = Reserved 1 = Rear Steer axle group 2 = Rear Drive axle group 3 to 15 = Reserved
5936	Additional Axle Group Location	Location of the axle group, listed from front of the vehicle to rear. If the value of SPN 4074 is 15, then this SPN is used to indicate the axle group referred to by this PGN. Otherwise, this SPN should be broadcast as 15.0 = Reserved 1 = Rear Steer axle group 2 = Rear Drive axle group 3 to 15 = Reserved
5937	Transmission Clutch 2 Pressure	Gage pressure of hydraulic actuation fluid for a second transmission clutch. In dual input clutch applications, this refers to the second input clutch.
5938	Transmission Oil Transmission Cooler Outlet Temperature	Temperature of transmission lubricant after it exits from the transmission cooler.
5939	Transmission Clutch 1 Temperature	Temperature of transmission clutch 1. May be calculated or measured.
5940	Transmission Clutch 2 Temperature	Temperature of transmission clutch 2. May be calculated or measured.
5941	Transmission Shift Rail 4 Position	The current position of transmission shift rail identified as rail #4.
5942	Transmission Shift Rail 5 Position	The current position of transmission shift rail identified as rail #5.
5943	Transmission Shift Rail 6 Position	The current position of transmission shift rail identified as rail #6.
5944	Transmission Clutch 1 Actuator Percent	The current modulated value for the transmission clutch 1 actuator, where 0% = no hydraulic pressure and 100% = full hydraulic pressure.

5945	Transmission Clutch 2 Actuator Percent	The current modulated value for the transmission clutch 2 actuator, where 0% = no hydraulic pressure and 100% = full hydraulic pressure.
5946	Transmission Hydraulic Pump Actuator 1 Percent	The current modulated value for the actuator that controls the transmission hydraulic pump, where 0% = no hydraulic pressure and 100% = full hydraulic pressure.
5947	Transmission Shift Actuator 1 Percent	The current modulated value for the transmission shift 1 actuator, where 0% = no hydraulic pressure and 100% = full hydraulic pressure.
5948	Transmission Shift Actuator 2 Percent	The current modulated value for the transmission shift 2 actuator, where 0% = no hydraulic pressure and 100% = full hydraulic pressure.
5949	Transmission Clutch 1 Cooling Actuator Status	Identifies the status of the actuator that cools transmission clutch 1. 00b = off 01b = on 10b = error 11b = not available
5950	Transmission Clutch 2 Cooling Actuator Status	Identifies the status of the actuator that cools transmission clutch 2. 00b = off 01b = on 10b = error 11b = not available
5951	Transmission Shift Rail 1 Actuator Status	Identifies the status of the actuator that moves the transmission shift rail identified as rail #1. 00b = off 01b = on 10b = error 11b = not available
5952	Transmission Shift Rail 2 Actuator Status	Identifies the status of the actuator that moves the transmission shift rail identified as rail #2. 00b = off 01b = on 10b = error 11b = not available
5953	Transmission Shift Rail 3 Actuator Status	Identifies the status of the actuator that moves the transmission shift rail identified as rail #3. 00b = off 01b = on 10b = error 11b = not available
5954	Transmission Shift Rail 4 Actuator Status	Identifies the status of the actuator that moves the transmission shift rail identified as rail #4. 00b = off 01b = on 10b = error 11b = not available
5955	Transmission Shift Rail 5 Actuator Status	Identifies the status of the actuator that moves the transmission shift rail identified as rail #5. 00b = off 01b = on 10b = error 11b = not available

5956	Transmission Shift Rail 6 Actuator Status	Identifies the status of the actuator that moves the transmission shift rail identified as rail #6. 00b = off 01b = on 10b = error 11b = not available
5957	Dual Clutch Transmission Selected Pre-selection Gear	The gear that the transmission will attempt to achieve during the current pre-selection event (shifting to a new gear on the non-engaged clutch of a dual clutch transmission (DCT)).
5958	Dual Clutch Transmission Current Pre-selection Gear	The gear currently engaged on the non-engaged clutch of a dual clutch transmission (DCT) or the last gear engaged on the non-engaged clutch while the transmission is in the process of pre-selecting to the new or selected pre-selection gear on the non-engaged clutch. Transitions toward a destination gear will not be indicated. Once the selected pre-selected gear has been engaged then DCT Current Pre-Selection Gear (SPN 5958) will reflect that gear.
5960	Dual Clutch Transmission Input Shaft 1 Speed	Rotational velocity of the primary shaft transferring power through clutch 1 into the dual clutch transmission (DCT).
5961	Dual Clutch Transmission Input Shaft 2 Speed	Rotational velocity of the primary shaft transferring power through clutch 2 into the dual clutch transmission (DCT).
5963	Aftertreatment 1 Total Diesel Exhaust Fluid Used	Total amount of DEF used by aftertreatment device 1 over the lifetime of the device.
5964	Aftertreatment 2 Total Diesel Exhaust Fluid Used	Total amount of DEF used by aftertreatment device 2 over the lifetime of the device.
5965	Aftertreatment 1 Diesel Exhaust Fluid Control Module 1 Relay Control	State signal which indicates when the DEF control module relay of aftertreatment 1 is being energized. On means the ECU is powering the Aftertreatment 1 DEF dosing unit relay. Note that the ECU is external to the relay.00b = Off 01b = On: The ECU is powering the DEF dosing unit relay 10b = Error 11b = Unavailable

5966	Aftertreatment 1 Diesel Exhaust Fluid Control Module 1 Power Supply 1	State signal which indicates when the DEF control module power supply of aftertreatment 1 is being driven. On means the ECU is powering the aftertreatment 1 DEF control module power supply. Note that the control module is external to the ECU.00b = Off 01b = On: The ECU is powering the DEF dosing unit power supply 10b = Error 11b = Unavailable
5967	Aftertreatment 2 Diesel Exhaust Fluid Control Module 1 Relay Control	State signal which indicates when the DEF control module 1 relay of aftertreatment 2 is being energized. On means the ECU is powering the Aftertreatment 2 DEF dosing unit relay. Note that the ECU is external to the relay.00b = Off 01b = On: The ECU is powering the DEF dosing unit relay 10b = Error 11b = Unavailable
5968	Aftertreatment 2 Diesel Exhaust Fluid Control Module 1 Power Supply 1	State signal which indicates when the DEF control module 1 power supply of aftertreatment 2 is being driven. On means the ECU is powering the aftertreatment 2 DEF control module 1 power supply. Note that the control module is external to the ECU.00b = Off 01b = On: The ECU is powering the DEF dosing unit power supply 10b = Error 11b = Unavailable
5969	Engine Exhaust Manifold Bank 2 Temperature 2	Temperature of combustion byproducts measured by a second sensor in engine bank 2 (right bank) exhaust manifold. This should be used for the sensor toward the rear of the engine on the bank 2 manifold.
5970	Engine Exhaust Manifold Bank 1 Temperature 2	Temperature of combustion byproducts measured by a second sensor in engine bank 1 (left bank) exhaust manifold. This should be used for the sensor toward the rear of the engine on the bank 1 manifold.
5971	Aftertreatment 2 Diesel Exhaust Fluid Dosing Unit 1 Heater	Aftertreatment DEF heater internal to the aftertreatment dosing unit 1 for the aftertreatment system 2.
5972	Aftertreatment 2 Diesel Exhaust Fluid Doser 1 Absolute Pressure (Duplicate, use SPN 4387)	The absolute pressure (measured closest to dosing valve) of the first or only DEF doser for aftertreatment system 2 (exhaust bank 2).(Obsolete – use SPN 4387)

5973	Aftertreatment 2 Diesel Exhaust Fluid Line Heater Relay 1	The aftertreatment system 2 diesel exhaust fluid line heater relay 1 is used to energize one or more DEF line heaters.00b = Off 01b = On 10b = Error 11b = Not available
5974	Aftertreatment 2 Diesel Exhaust Fluid Doser Valve 1	The aftertreatment diesel exhaust fluid doser used to inject diesel exhaust fluid
5975	Engine Fuel Pump Pressurizing Assembly 3	Engine Fuel Pump Pressurizing Assembly 3
5976	Engine Fuel Pump Pressurizing Assembly 4	Engine Fuel Pump Pressurizing Assembly 4
5977	Engine Fuel Injection Pump 2 Speed/Position Sensor	Speed/Position for engine fuel injection pump 2
5978	Aftertreatment 1 Diesel Particulate Filter Time to Next Active Regeneration	Indicates the time to the next active regeneration event of diesel particulate filter 1.
5979	Aftertreatment 2 Diesel Particulate Filter Time to Next Active Regeneration	Indicates the time to the next active regeneration event of diesel particulate filter 2.
5980	Engine Turbocharger Differential Speed	The difference between turbocharger speeds on engine systems with 2 or more turbochargers. If there are are more than 2 turbochargers, it will be the difference between the fastest and the slowest turbocharger speed.
5981	SLI Battery Pack State of Charge	Indicates the remaining charge of the battery pack used for starting the engine, for lighting, and for ignition (SLI). 0% means no charge remaining, 100% means full capacity at the battery pack’s current state of health. See SPN 5464 for hybrid battery pack.This parameter shall be used to report the capacity of the battery pack. If the state of charge of individual batteries within the battery pack is desired, use SPNs 7903, 7911, 7919, & 7927.

5982	SLI Battery Pack Capacity	Original or rated total reserve capacity of the battery pack used for starting the engine, for lighting, and for ignition (SLI).This parameter shall be used to report the capacity of the battery pack. If the capacity of individual batteries within the battery pack is desired, use SPNs 7902, 7912, 7920, & 7928.
5983	SLI Battery Pack Health	Capacity of the battery pack relative to its original specification for the battery pack used for starting the engine, for lighting, and for ignition (SLI). 0% means battery pack is not capable of holding any charge, 100% means battery pack is capable of holding its original full capacity.This parameter shall be used to report the health of the battery pack. If the health of individual batteries within the battery pack is desired, use SPNs 7905, 7913, 7921, & 7929.
5984	Switched Power Output #4 Command	Desired state of Switched Power Output #4. Used to set the desired state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
5985	Switched Power Output #3 Command	Desired state of Switched Power Output #3. Used to set the desired state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
5986	Switched Power Output #2 Command	Desired state of Switched Power Output #2. Used to set the desired state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
5987	Switched Power Output #1 Command	Desired state of Switched Power Output #1. Used to set the desired state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
5988	Switched Power Output #8 Command	Desired state of Switched Power Output #8. Used to set the desired state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
5989	Switched Power Output #7 Command	Desired state of Switched Power Output #7. Used to set the desired state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
5990	Switched Power Output #6 Command	Desired state of Switched Power Output #6. Used to set the desired state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action

5991	Switched Power Output #5 Command	Desired state of Switched Power Output #5. Used to set the desired state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
5992	Switched Power Output #12 Command	Desired state of Switched Power Output #12. Used to set the desired state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
5993	Switched Power Output #11 Command	Desired state of Switched Power Output #11. Used to set the desired state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
5994	Switched Power Output #10 Command	Desired state of Switched Power Output #10. Used to set the desired state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
5995	Switched Power Output #9 Command	Desired state of Switched Power Output #9. Used to set the desired state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
5996	Switched Power Output #16 Command	Desired state of Switched Power Output #16. Used to set the desired state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
5997	Switched Power Output #15 Command	Desired state of Switched Power Output #15. Used to set the desired state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
5998	Switched Power Output #14 Command	Desired state of Switched Power Output #14. Used to set the desired state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
5999	Switched Power Output #13 Command	Desired state of Switched Power Output #13. Used to set the desired state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
6000	Switched Power Output #20 Command	Desired state of Switched Power Output #20. Used to set the desired state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
6001	Switched Power Output #19 Command	Desired state of Switched Power Output #19. Used to set the desired state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action

6002	Switched Power Output #18 Command	Desired state of Switched Power Output #18. Used to set the desired state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
6003	Switched Power Output #17 Command	Desired state of Switched Power Output #17. Used to set the desired state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
6004	Switched Power Output #24 Command	Desired state of Switched Power Output #24. Used to set the desired state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
6005	Switched Power Output #23 Command	Desired state of Switched Power Output #23. Used to set the desired state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
6006	Switched Power Output #22 Command	Desired state of Switched Power Output #22. Used to set the desired state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
6007	Switched Power Output #21 Command	Desired state of Switched Power Output #21. Used to set the desired state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
6008	Switched Power Output #28 Command	Desired state of Switched Power Output #28. Used to set the desired state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
6009	Switched Power Output #27 Command	Desired state of Switched Power Output #27. Used to set the desired state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
6010	Switched Power Output #26 Command	Desired state of Switched Power Output #26. Used to set the desired state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
6011	Switched Power Output #25 Command	Desired state of Switched Power Output #25. Used to set the desired state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
6012	Switched Power Output #32 Command	Desired state of Switched Power Output #32. Used to set the desired state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action

6013	Switched Power Output #31 Command	Desired state of Switched Power Output #31. Used to set the desired state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
6014	Switched Power Output #30 Command	Desired state of Switched Power Output #30. Used to set the desired state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
6015	Switched Power Output #29 Command	Desired state of Switched Power Output #29. Used to set the desired state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
6016	Fused Output #4	State of Fused Output #4. Used to indicate the output state. 00b = Output not powered 01b = Output powered 10b = Reserved 11b = Take no action
6017	Fused Output #3	State of Fused Output #3. Used to indicate the output state. 00b = Output not powered 01b = Output powered 10b = Reserved 11b = Take no action
6018	Fused Output #2	State of Fused Output #2. Used to indicate the output state. 00b = Output not powered 01b = Output powered 10b = Reserved 11b = Take no action
6019	Fused Output #1	State of Fused Output #1. Used to indicate the output state. 00b = Output not powered 01b = Output powered 10b = Reserved 11b = Take no action
6020	Fused Output #8	State of Fused Output #8. Used to indicate the output state. 00b = Output not powered 01b = Output powered 10b = Reserved 11b = Take no action
6021	Fused Output #7	State of Fused Output #7. Used to indicate the output state. 00b = Output not powered 01b = Output powered 10b = Reserved 11b = Take no action
6022	Fused Output #6	State of Fused Output #6. Used to indicate the output state. 00b = Output not powered 01b = Output powered 10b = Reserved 11b = Take no action
6023	Fused Output #5	State of Fused Output #5. Used to indicate the output state. 00b = Output not powered 01b = Output powered 10b = Reserved 11b = Take no action

6024	Fused Output #12	State of Fused Output #12. Used to indicate the output state. 00b = Output not powered 01b = Output powered 10b = Reserved 11b = Take no action
6025	Fused Output #11	State of Fused Output #11. Used to indicate the output state. 00b = Output not powered 01b = Output powered 10b = Reserved 11b = Take no action
6026	Fused Output #10	State of Fused Output #10. Used to indicate the output state. 00b = Output not powered 01b = Output powered 10b = Reserved 11b = Take no action
6027	Fused Output #9	State of Fused Output #9. Used to indicate the output state. 00b = Output not powered 01b = Output powered 10b = Reserved 11b = Take no action
6028	Fused Output #16	State of Fused Output #16. Used to indicate the output state. 00b = Output not powered 01b = Output powered 10b = Reserved 11b = Take no action
6029	Fused Output #15	State of Fused Output #15. Used to indicate the output state. 00b = Output not powered 01b = Output powered 10b = Reserved 11b = Take no action
6030	Fused Output #14	State of Fused Output #14. Used to indicate the output state. 00b = Output not powered 01b = Output powered 10b = Reserved 11b = Take no action
6031	Fused Output #13	State of Fused Output #13. Used to indicate the output state. 00b = Output not powered 01b = Output powered 10b = Reserved 11b = Take no action
6032	Fused Output #20	State of Fused Output #20. Used to indicate the output state. 00b = Output not powered 01b = Output powered 10b = Reserved 11b = Take no action
6033	Fused Output #19	State of Fused Output #19. Used to indicate the output state. 00b = Output not powered 01b = Output powered 10b = Reserved 11b = Take no action
6034	Fused Output #18	State of Fused Output #18. Used to indicate the output state. 00b = Output not powered 01b = Output powered 10b = Reserved 11b = Take no action

6035	Fused Output #17	State of Fused Output #17. Used to indicate the output state. 00b = Output not powered 01b = Output powered 10b = Reserved 11b = Take no action
6036	Fused Output #24	State of Fused Output #24. Used to indicate the output state. 00b = Output not powered 01b = Output powered 10b = Reserved 11b = Take no action
6037	Fused Output #23	State of Fused Output #23. Used to indicate the output state. 00b = Output not powered 01b = Output powered 10b = Reserved 11b = Take no action
6038	Fused Output #22	State of Fused Output #22. Used to indicate the output state. 00b = Output not powered 01b = Output powered 10b = Reserved 11b = Take no action
6039	Fused Output #21	State of Fused Output #21. Used to indicate the output state. 00b = Output not powered 01b = Output powered 10b = Reserved 11b = Take no action
6040	Fused Output #28	State of Fused Output #28. Used to indicate the output state. 00b = Output not powered 01b = Output powered 10b = Reserved 11b = Take no action
6041	Fused Output #27	State of Fused Output #27. Used to indicate the output state. 00b = Output not powered 01b = Output powered 10b = Reserved 11b = Take no action
6042	Fused Output #26	State of Fused Output #26. Used to indicate the output state. 00b = Output not powered 01b = Output powered 10b = Reserved 11b = Take no action
6043	Fused Output #25	State of Fused Output #25. Used to indicate the output state. 00b = Output not powered 01b = Output powered 10b = Reserved 11b = Take no action
6044	Fused Output #32	State of Fused Output #32. Used to indicate the output state. 00b = Output not powered 01b = Output powered 10b = Reserved 11b = Take no action
6045	Fused Output #31	State of Fused Output #31. Used to indicate the output state. 00b = Output not powered 01b = Output powered 10b = Reserved 11b = Take no action

6046	Fused Output #30	State of Fused Output #30. Used to indicate the output state. 00b = Output not powered 01b = Output powered 10b = Reserved 11b = Take no action
6047	Fused Output #29	State of Fused Output #29. Used to indicate the output state. 00b = Output not powered 01b = Output powered 10b = Reserved 11b = Take no action
6048	Switched Output #4	State of Switched Output #4. Used to indicate the output state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
6049	Switched Output #3	State of Switched Output #3. Used to indicate the output state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
6050	Switched Output #2	State of Switched Output #2. Used to indicate the output state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
6051	Switched Output #1	State of Switched Output #1. Used to indicate the output state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
6052	Switched Output #8	State of Switched Output #8. Used to indicate the output state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
6053	Switched Output #7	State of Switched Output #7. Used to indicate the output state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
6054	Switched Output #6	State of Switched Output #6. Used to indicate the output state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
6055	Switched Output #5	State of Switched Output #5. Used to indicate the output state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
6056	Switched Output #12	State of Switched Output #12. Used to indicate the output state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action

6057	Switched Output #11	State of Switched Output #11. Used to indicate the output state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
6058	Switched Output #10	State of Switched Output #10. Used to indicate the output state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
6059	Switched Output #9	State of Switched Output #9. Used to indicate the output state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
6060	Switched Output #16	State of Switched Output #16. Used to indicate the output state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
6061	Switched Output #15	State of Switched Output #15. Used to indicate the output state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
6062	Switched Output #14	State of Switched Output #14. Used to indicate the output state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
6063	Switched Output #13	State of Switched Output #13. Used to indicate the output state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
6064	Switched Output #20	State of Switched Output #20. Used to indicate the output state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
6065	Switched Output #19	State of Switched Output #19. Used to indicate the output state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
6066	Switched Output #18	State of Switched Output #18. Used to indicate the output state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
6067	Switched Output #17	State of Switched Output #17. Used to indicate the output state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action

6068	Switched Output #24	State of Switched Output #24. Used to indicate the output state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
6069	Switched Output #23	State of Switched Output #23. Used to indicate the output state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
6070	Switched Output #22	State of Switched Output #22. Used to indicate the output state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
6071	Switched Output #21	State of Switched Output #21. Used to indicate the output state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
6072	Switched Output #28	State of Switched Output #28. Used to indicate the output state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
6073	Switched Output #27	State of Switched Output #27. Used to indicate the output state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
6074	Switched Output #26	State of Switched Output #26. Used to indicate the output state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
6075	Switched Output #25	State of Switched Output #25. Used to indicate the output state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
6076	Switched Output #32	State of Switched Output #32. Used to indicate the output state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
6077	Switched Output #31	State of Switched Output #31. Used to indicate the output state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
6078	Switched Output #30	State of Switched Output #30. Used to indicate the output state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action

6079	Switched Output #29	State of Switched Output #29. Used to indicate the output state. 00b = Output off 01b = Output on 10b = Reserved 11b = Take no action
6080	Fused Output #1 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Fused Output #1.
6081	Fused Output #2 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Fused Output #2.
6082	Fused Output #3 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Fused Output #3.
6083	Fused Output #4 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Fused Output #4.
6084	Fused Output #5 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Fused Output #5.
6085	Fused Output #6 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Fused Output #6.
6086	Fused Output #7 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Fused Output #7.
6087	Fused Output #8 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Fused Output #8.
6088	Fused Output #9 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Fused Output #9.
6089	Fused Output #10 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Fused Output #10.

6090	Fused Output #11 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Fused Output #11.
6091	Fused Output #12 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Fused Output #12.
6092	Fused Output #13 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Fused Output #13.
6093	Fused Output #14 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Fused Output #14.
6094	Fused Output #15 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Fused Output #15.
6095	Fused Output #16 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Fused Output #16.
6096	Fused Output #17 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Fused Output #17.
6097	Fused Output #18 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Fused Output #18.
6098	Fused Output #19 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Fused Output #19.
6099	Fused Output #20 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Fused Output #20.
6100	Fused Output #21 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Fused Output #21.

6101	Fused Output #22 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Fused Output #22.
6102	Fused Output #23 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Fused Output #23.
6103	Fused Output #24 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Fused Output #24.
6104	Fused Output #25 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Fused Output #25.
6105	Fused Output #26 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Fused Output #26.
6106	Fused Output #27 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Fused Output #27.
6107	Fused Output #28 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Fused Output #28.
6108	Fused Output #29 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Fused Output #29.
6109	Fused Output #30 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Fused Output #30.
6110	Fused Output #31 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Fused Output #31.
6111	Fused Output #32 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Fused Output #32.

6112	Switched Output #1 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Switched Output #1.
6113	Switched Output #2 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Switched Output #2.
6114	Switched Output #3 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Switched Output #3.
6115	Switched Output #4 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Switched Output #4.
6116	Switched Output #5 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Switched Output #5.
6117	Switched Output #6 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Switched Output #6.
6118	Switched Output #7 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Switched Output #7.
6119	Switched Output #8 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Switched Output #8.
6120	Switched Output #9 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Switched Output #9.
6121	Switched Output #10 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Switched Output #10.
6122	Switched Output #11 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Switched Output #11.

6123	Switched Output #12 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Switched Output #12.
6124	Switched Output #13 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Switched Output #13.
6125	Switched Output #14 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Switched Output #14.
6126	Switched Output #15 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Switched Output #15.
6127	Switched Output #16 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Switched Output #16.
6128	Switched Output #17 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Switched Output #17.
6129	Switched Output #18 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Switched Output #18.
6130	Switched Output #19 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Switched Output #19.
6131	Switched Output #20 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Switched Output #20.
6132	Switched Output #21 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Switched Output #21.
6133	Switched Output #22 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Switched Output #22.

6134	Switched Output #23 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Switched Output #23.
6135	Switched Output #24 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Switched Output #24.
6136	Switched Output #25 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Switched Output #25.
6137	Switched Output #26 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Switched Output #26.
6138	Switched Output #27 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Switched Output #27.
6139	Switched Output #28 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Switched Output #28.
6140	Switched Output #29 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Switched Output #29.
6141	Switched Output #30 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Switched Output #30.
6142	Switched Output #31 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Switched Output #31.
6143	Switched Output #32 Current	Measured electrical current flowing out of Power Distribution Module (PDM) Switched Output #32.
6144	Transmission Shift Rail 1	A diagnostic SPN that indicates a failure of the Transmission Shift Rail 1 component. This is different than the Shift Rail Position sensor.

6145	Transmission Shift Rail 2	A diagnostic SPN that indicates a failure of the Transmission Shift Rail 2 component. This is different than the Shift Rail Position sensor.
6146	Transmission Shift Rail 3	A diagnostic SPN that indicates a failure of the Transmission Shift Rail 3 component. This is different than the Shift Rail Position sensor.
6147	Transmission Shift Rail 4	A diagnostic SPN that indicates a failure of the Transmission Shift Rail 4 component. This is different than the Shift Rail Position sensor.
6148	Transmission Shift Rail 5	A diagnostic SPN that indicates a failure of the Transmission Shift Rail 5 component. This is different than the Shift Rail Position sensor.
6149	Transmission Shift Rail 6	A diagnostic SPN that indicates a failure of the Transmission Shift Rail 6 component. This is different than the Shift Rail Position sensor.
6150	Transmission Clutch 1	A diagnostic SPN that indicates a failure of the Transmission Clutch 1 component.
6151	Transmission Clutch 2	A diagnostic SPN that indicates a failure of the Transmission Clutch 2 component.
6152	Transmission Synchronizer 1	A diagnostic SPN that indicates a failure of the Transmission Synchronizer 1 component.
6153	Transmission Synchronizer 2	A diagnostic SPN that indicates a failure of the Transmission Synchronizer 2 component.
6154	Transmission Synchronizer 3	A diagnostic SPN that indicates a failure of the Transmission Synchronizer 3 component.
6155	Transmission Synchronizer 4	A diagnostic SPN that indicates a failure of the Transmission Synchronizer 4 component.

6156	Transmission Synchronizer 5	A diagnostic SPN that indicates a failure of the Transmission Synchronizer 5 component.
6157	Transmission Synchronizer 6	A diagnostic SPN that indicates a failure of the Transmission Synchronizer 6 component.
6158	Transmission Synchronizer 7	A diagnostic SPN that indicates a failure of the Transmission Synchronizer 7 component.
6159	Transmission Neutral Selector 2	A diagnostic SPN that indicates a failure of the Transmission Neutral Selector 2 component.
6160	Transmission Alternate Shift Schedule Selector	A diagnostic SPN that indicates a failure of the Transmission Alternate Shift Schedule Selector component.
6161	Engine Cylinder 1 Pressure	Engine Cylinder 1 Pressure
6162	Engine Cylinder 2 Pressure	Engine Cylinder 2 Pressure
6163	Engine Cylinder 3 Pressure	Engine Cylinder 3 Pressure
6164	Engine Cylinder 4 Pressure	Engine Cylinder 4 Pressure
6165	Engine Cylinder 5 Pressure	Engine Cylinder 5 Pressure
6166	Engine Cylinder 6 Pressure	Engine Cylinder 6 Pressure
6167	Engine Cylinder 7 Pressure	Engine Cylinder 7 Pressure
6168	Engine Cylinder 8 Pressure	Engine Cylinder 8 Pressure
6169	Engine Cylinder 9 Pressure	Engine Cylinder 9 Pressure

6170	Engine Cylinder 10 Pressure	Engine Cylinder 10 Pressure
6171	Engine Cylinder 11 Pressure	Engine Cylinder 11 Pressure
6172	Engine Cylinder 12 Pressure	Engine Cylinder 12 Pressure
6173	Engine Cylinder 13 Pressure	Engine Cylinder 13 Pressure
6174	Engine Cylinder 14 Pressure	Engine Cylinder 14 Pressure
6175	Engine Cylinder 15 Pressure	Engine Cylinder 15 Pressure
6176	Engine Cylinder 16 Pressure	Engine Cylinder 16 Pressure
6177	Engine Cylinder 17 Pressure	Engine Cylinder 17 Pressure
6178	Engine Cylinder 18 Pressure	Engine Cylinder 18 Pressure
6179	Engine Cylinder 19 Pressure	Engine Cylinder 19 Pressure
6180	Engine Cylinder 20 Pressure	Engine Cylinder 20 Pressure
6181	Engine Cylinder 1 Gaseous Fuel Valve	Actuator that controls flow of gas into Engine Cylinder 1
6182	Engine Cylinder 2 Gaseous Fuel Valve	Actuator that controls flow of gas into Engine Cylinder 2
6183	Engine Cylinder 3 Gaseous Fuel Valve	Actuator that controls flow of gas into Engine Cylinder 3

6184	Engine Cylinder 4 Gaseous Fuel Valve	Actuator that controls flow of gas into Engine Cylinder 4
6185	Engine Cylinder 5 Gaseous Fuel Valve	Actuator that controls flow of gas into Engine Cylinder 5
6186	Engine Cylinder 6 Gaseous Fuel Valve	Actuator that controls flow of gas into Engine Cylinder 6
6187	Engine Cylinder 7 Gaseous Fuel Valve	Actuator that controls flow of gas into Engine Cylinder 7
6188	Engine Cylinder 8 Gaseous Fuel Valve	Actuator that controls flow of gas into Engine Cylinder 8
6189	Engine Cylinder 9 Gaseous Fuel Valve	Actuator that controls flow of gas into Engine Cylinder 9
6190	Engine Cylinder 10 Gaseous Fuel Valve	Actuator that controls flow of gas into Engine Cylinder 10
6191	Engine Cylinder 11 Gaseous Fuel Valve	Actuator that controls flow of gas into Engine Cylinder 11
6192	Engine Cylinder 12 Gaseous Fuel Valve	Actuator that controls flow of gas into Engine Cylinder 12
6193	Engine Cylinder 13 Gaseous Fuel Valve	Actuator that controls flow of gas into Engine Cylinder 13
6194	Engine Cylinder 14 Gaseous Fuel Valve	Actuator that controls flow of gas into Engine Cylinder 14

6195	Engine Cylinder 15 Gaseous Fuel Valve	Actuator that controls flow of gas into Engine Cylinder 15
6196	Engine Cylinder 16 Gaseous Fuel Valve	Actuator that controls flow of gas into Engine Cylinder 16
6197	Engine Cylinder 17 Gaseous Fuel Valve	Actuator that controls flow of gas into Engine Cylinder 17
6198	Engine Cylinder 18 Gaseous Fuel Valve	Actuator that controls flow of gas into Engine Cylinder 18
6199	Engine Cylinder 19 Gaseous Fuel Valve	Actuator that controls flow of gas into Engine Cylinder 19
6200	Engine Cylinder 20 Gaseous Fuel Valve	Actuator that controls flow of gas into Engine Cylinder 20
6201	Engine Turbocharger Compressor Blowoff Actuator 1 Command	The command to blow off actuator 1, normalized to percent, where 0% nominally represents fully closed (No Flow) and 100% represents fully open (Max Flow). The purpose of Blow-off value is similar to that of Compressor bypass valve, however the blow-off valve releases the air at the high pressure compressor outlet to the low pressure turbine outlet.FB00h – FB64h is sent to calibrate to a specific position. The LSB specifies the position with a resolution of 1%/bit (eg, FB32h is sent to calibrate the actuator to 50%). FBFFh is sent to calibrate the actuator using its own algorithm. Calibration status from the actuator is received on SPN 6316.
6202	Engine Control Module 1 Ready for Use Lamp Data	This parameter provides measured data from the Engine Control Module 1 Ready for Use Lamp. 00b = Lamp deactivated (Off) 01b = Lamp activated (On) 10b = Error 11b = Not Available

6203	Engine Control Module 2 Ready for Use Lamp Data	This parameter provides measured data from the Engine Control Module 2 Ready for Use Lamp. 00b = Lamp deactivated (Off) 01b = Lamp activated (On) 10b = Error 11b = Not Available
6204	Engine Control Module 3 Ready for Use Lamp Data	This parameter provides measured data from the Engine Control Module 3 Ready for Use Lamp. 00b = Lamp deactivated (Off) 01b = Lamp activated (On) 10b = Error 11b = Not Available
6205	Engine Control Module 1 Ready for Use Lamp Command	Command signal directly controlling the Engine Control Module 1 Ready for use Lamp. This lamp is used to indicate whether ECM 1 can control the operation of the engine. In case of a failure in ECM 1, lamp will be turned OFF.00b = Lamp Off 01b = Lamp On 10b = Reserved 11b = Not available
6206	Engine Control Module 2 Ready for Use Lamp Command	Command signal directly controlling the Engine Control Module 2 Ready for Use Lamp. This lamp is used to indicate whether ECM 2 can control the operation of the engine. In case of a failure in ECM 2, lamp will be turned OFF.00b = Lamp Off 01b = Lamp On 10b = Reserved 11b = Not available
6207	Engine Control Module 3 Ready for Use Lamp Command	Command signal directly controlling the Engine Control Module 3 Ready for Use Lamp. This lamp is used to indicate whether ECM 3 can control the operation of the engine. In case of a failure in ECM 3, lamp will be turned OFF.00b = Lamp Off 01b = Lamp On 10b = Reserved 11b = Not available
6208	AEBS readiness state	Advanced emergency braking systems (AEBS) will limit the engine torque via TSC1 during warning and braking phases. Therefore the engine controller gives a feedback to the AEBS if it is configured and able to obey these limitation commands.00b = Off — engine is not configured to accept commands from an AEBS 01b = On — engine is configured to accept commands from an AEBS 10b = Condition exists that prevents system from responding to AEBS commands even though it is configured 11b = Not Available/Not Supported
6209	Engine Coolant Temperature 3	Third temperature of liquid found in the engine cooling system. See also SPNs 110, 4076 and 4193.

6210	Aftertreatment 1 Burner	Source for heat that initiates active regeneration (bank 1)
6211	Aftertreatment 2 Burner	Source for heat that initiates active regeneration (bank 2).
6212	Aftertreatment 1 Burner Unit Spark Plug	Spark plug used for ignition in an aftertreatment burner unit (bank 1)
6213	Aftertreatment 2 Burner Unit Spark Plug	Spark plug used for ignition in an aftertreatment burner unit (bank 2)
6214	Engine Ignition Control Module 1 Temperature	Measured internal temperature of the Engine Ignition Control Module 1 circuitry.
6215	Engine Ignition Control Module 2 Temperature	Measured internal temperature of the Engine Ignition Control Module 2 circuitry.
6216	Engine Ignition Control Module 1 State	This parameter is used to indicate the current state of Engine Ignition Control Module 1. 000b = Disabled (by user) 001b = Shutdown (due to alarm) 010b = Stalled (waiting for timing signals) 011b = Firing Ignition in Test Mode 100b = Firing Ignition in Normal Mode 101b = Reserved 110b = Error 111b = Not available
6217	Engine Ignition Control Module 2 State	This parameter is used to indicate the current state of Engine Ignition Control Module 2. 000b = Disabled (by user) 001b = Shutdown (due to alarm) 010b = Stalled (waiting for timing signals) 011b = Firing Ignition in Test Mode 100b = Firing Ignition in Normal Mode 101b = Reserved 110b = Error 111b = Not available
6218	Engine Spark Plug Secondary Voltage Tracking Reset	Command signal used to reset the ignition controller average, maximum, and minimum level tracking of the spark plug secondary voltages and to reset the learned misfire rate. Average secondary voltage tracking is reported in PGNs 64882 – 64887. Minimum secondary voltage tracking is reported in PGNs 64682 – 64687. Maximum secondary voltage tracking is reported in PGNs 64676 – 64681. Misfire rates are reported in PGNs 64673 – 64675.00b = Do not reset 01b = Reset 10b = Reserved 11b = Take no action

6219	Engine Ignition Control Maintenance Hours Reset	Used to reset the maintenance hour counter for an engine ignition control module. The hours remaining until required maintenance is performed are reported in PGN 64688.00b = Do not reset 01b = Reset 10b = Reserved 11b = Take no action
6220	Engine Ignition Control Module 1 Time Remaining	This parameter reports the time remaining before maintenance should be performed on engine ignition control module instance 1. Upon maintenance, the time is reset to its starting value using Reset PGN 56832, Ignition Control Maintenance Hours Reset, SPN 6219.
6221	Engine Ignition Control Module 2 Time Remaining	This parameter reports the time remaining before maintenance should be performed on engine ignition control module instance 2. Upon maintenance, the time is reset to its starting value using Reset PGN 56832, Ignition Control Maintenance Hours Reset, SPN 6219.
6222	Engine Spark Plug 1 Minimum Voltage	The smallest measured spark voltage of all measured spark events on Cylinder #1 since the last time this tracking data was reset. It is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6223	Engine Spark Plug 2 Minimum Voltage	The smallest measured spark voltage of all measured spark events on Cylinder #2 since the last time this tracking data was reset. It is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6224	Engine Spark Plug 3 Minimum Voltage	The smallest measured spark voltage of all measured spark events on Cylinder #3 since the last time this tracking data was reset. It is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6225	Engine Spark Plug 4 Minimum Voltage	The smallest measured spark voltage of all measured spark events on Cylinder #4 since the last time this tracking data was reset. It is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6226	Engine Spark Plug 5 Minimum Voltage	The smallest measured spark voltage of all measured spark events on Cylinder #5 since the last time this tracking data was reset. It is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.

6227	Engine Spark Plug 6 Minimum Voltage	The smallest measured spark voltage of all measured spark events on Cylinder #6 since the last time this tracking data was reset. It is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6228	Engine Spark Plug 7 Minimum Voltage	The smallest measured spark voltage of all measured spark events on Cylinder #7 since the last time this tracking data was reset. It is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6229	Engine Spark Plug 8 Minimum Voltage	The smallest measured spark voltage of all measured spark events on Cylinder #8 since the last time this tracking data was reset. It is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6230	Engine Spark Plug 9 Minimum Voltage	The smallest measured spark voltage of all measured spark events on Cylinder #9 since the last time this tracking data was reset. It is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6231	Engine Spark Plug 10 Minimum Voltage	The smallest measured spark voltage of all measured spark events on Cylinder #10 since the last time this tracking data was reset. It is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6232	Engine Spark Plug 11 Minimum Voltage	The smallest measured spark voltage of all measured spark events on Cylinder #11 since the last time this tracking data was reset. It is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6233	Engine Spark Plug 12 Minimum Voltage	The smallest measured spark voltage of all measured spark events on Cylinder #12 since the last time this tracking data was reset. It is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6234	Engine Spark Plug 13 Minimum Voltage	The smallest measured spark voltage of all measured spark events on Cylinder #13 since the last time this tracking data was reset. It is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.

6235	Engine Spark Plug 14 Minimum Voltage	The smallest measured spark voltage of all measured spark events on Cylinder #14 since the last time this tracking data was reset. It is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6236	Engine Spark Plug 15 Minimum Voltage	The smallest measured spark voltage of all measured spark events on Cylinder #15 since the last time this tracking data was reset. It is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6237	Engine Spark Plug 16 Minimum Voltage	The smallest measured spark voltage of all measured spark events on Cylinder #16 since the last time this tracking data was reset. It is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6238	Engine Spark Plug 17 Minimum Voltage	The smallest measured spark voltage of all measured spark events on Cylinder #17 since the last time this tracking data was reset. It is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6239	Engine Spark Plug 18 Minimum Voltage	The smallest measured spark voltage of all measured spark events on Cylinder #18 since the last time this tracking data was reset. It is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6240	Engine Spark Plug 19 Minimum Voltage	The smallest measured spark voltage of all measured spark events on Cylinder #19 since the last time this tracking data was reset. It is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6241	Engine Spark Plug 20 Minimum Voltage	The smallest measured spark voltage of all measured spark events on Cylinder #20 since the last time this tracking data was reset. It is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6242	Engine Spark Plug 21 Minimum Voltage	The smallest measured spark voltage of all measured spark events on Cylinder #21 since the last time this tracking data was reset. It is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.

6243	Engine Spark Plug 22 Minimum Voltage	The smallest measured spark voltage of all measured spark events on Cylinder #22 since the last time this tracking data was reset. It is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6244	Engine Spark Plug 23 Minimum Voltage	The smallest measured spark voltage of all measured spark events on Cylinder #23 since the last time this tracking data was reset. It is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6245	Engine Spark Plug 24 Minimum Voltage	The smallest measured spark voltage of all measured spark events on Cylinder #24 since the last time this tracking data was reset. It is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6246	Engine Spark Plug 1 Maximum Voltage	The largest measured spark voltage of all measured spark events on Cylinder #1 since the last time this tracking data was reset. It is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6247	Engine Spark Plug 2 Maximum Voltage	The largest measured spark voltage of all measured spark events on Cylinder #2 since the last time this tracking data was reset. It is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6248	Engine Spark Plug 3 Maximum Voltage	The largest measured spark voltage of all measured spark events on Cylinder #3 since the last time this tracking data was reset. It is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6249	Engine Spark Plug 4 Maximum Voltage	The largest measured spark voltage of all measured spark events on Cylinder #4 since the last time this tracking data was reset. It is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6250	Engine Spark Plug 5 Maximum Voltage	The largest measured spark voltage of all measured spark events on Cylinder #5 since the last time this tracking data was reset. It is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.

6251	Engine Spark Plug 6 Maximum Voltage	The largest measured spark voltage of all measured spark events on Cylinder #6 since the last time this tracking data was reset. It is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6252	Engine Spark Plug 7 Maximum Voltage	The largest measured spark voltage of all measured spark events on Cylinder #7 since the last time this tracking data was reset. It is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6253	Engine Spark Plug 8 Maximum Voltage	The largest measured spark voltage of all measured spark events on Cylinder #8 since the last time this tracking data was reset. It is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6254	Engine Spark Plug 9 Maximum Voltage	The largest measured spark voltage of all measured spark events on Cylinder #9 since the last time this tracking data was reset. It is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6255	Engine Spark Plug 10 Maximum Voltage	The largest measured spark voltage of all measured spark events on Cylinder #10 since the last time this tracking data was reset. It is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6256	Engine Spark Plug 11 Maximum Voltage	The largest measured spark voltage of all measured spark events on Cylinder #11 since the last time this tracking data was reset. It is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6257	Engine Spark Plug 12 Maximum Voltage	The largest measured spark voltage of all measured spark events on Cylinder #12 since the last time this tracking data was reset. It is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6258	Engine Spark Plug 13 Maximum Voltage	The largest measured spark voltage of all measured spark events on Cylinder #13 since the last time this tracking data was reset. It is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.

6259	Engine Spark Plug 14 Maximum Voltage	The largest measured spark voltage of all measured spark events on Cylinder #14 since the last time this tracking data was reset. It is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6260	Engine Spark Plug 15 Maximum Voltage	The largest measured spark voltage of all measured spark events on Cylinder #15 since the last time this tracking data was reset. It is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6261	Engine Spark Plug 16 Maximum Voltage	The largest measured spark voltage of all measured spark events on Cylinder #16 since the last time this tracking data was reset. It is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6262	Engine Spark Plug 17 Maximum Voltage	The largest measured spark voltage of all measured spark events on Cylinder #17 since the last time this tracking data was reset. It is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6263	Engine Spark Plug 18 Maximum Voltage	The largest measured spark voltage of all measured spark events on Cylinder #18 since the last time this tracking data was reset. It is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6264	Engine Spark Plug 19 Maximum Voltage	The largest measured spark voltage of all measured spark events on Cylinder #19 since the last time this tracking data was reset. It is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6265	Engine Spark Plug 20 Maximum Voltage	The largest measured spark voltage of all measured spark events on Cylinder #20 since the last time this tracking data was reset. It is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6266	Engine Spark Plug 21 Maximum Voltage	The largest measured spark voltage of all measured spark events on Cylinder #21 since the last time this tracking data was reset. It is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.

6267	Engine Spark Plug 22 Maximum Voltage	The largest measured spark voltage of all measured spark events on Cylinder #22 since the last time this tracking data was reset. It is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6268	Engine Spark Plug 23 Maximum Voltage	The largest measured spark voltage of all measured spark events on Cylinder #23 since the last time this tracking data was reset. It is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6269	Engine Spark Plug 24 Maximum Voltage	The largest measured spark voltage of all measured spark events on Cylinder #24 since the last time this tracking data was reset. It is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6270	Engine Spark Plug 1 Misfire Rate	The spark misfire rate for Cylinder #1. The misfire rate is conveyed as the percentage of total cylinder spark misfires compared to the total number of ignition events on Cylinder #1 since the last time this tracking data was reset. Any averaging associated with this rate is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6271	Engine Spark Plug 2 Misfire Rate	The spark misfire rate for Cylinder #2. The misfire rate is conveyed as the percentage of total cylinder spark misfires compared to the total number of ignition events on Cylinder #2 since the last time this tracking data was reset. Any averaging associated with this rate is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6272	Engine Spark Plug 3 Misfire Rate	The spark misfire rate for Cylinder #3. The misfire rate is conveyed as the percentage of total cylinder spark misfires compared to the total number of ignition events on Cylinder #3 since the last time this tracking data was reset. Any averaging associated with this rate is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6273	Engine Spark Plug 4 Misfire Rate	The spark misfire rate for Cylinder #4. The misfire rate is conveyed as the percentage of total cylinder spark misfires compared to the total number of ignition events on Cylinder #4 since the last time this tracking data was reset. Any averaging associated

		with this rate is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6274	Engine Spark Plug 5 Misfire Rate	The spark misfire rate for Cylinder #5. The misfire rate is conveyed as the percentage of total cylinder spark misfires compared to the total number of ignition events on Cylinder #5 since the last time this tracking data was reset. Any averaging associated with this rate is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6275	Engine Spark Plug 6 Misfire Rate	The spark misfire rate for Cylinder #6. The misfire rate is conveyed as the percentage of total cylinder spark misfires compared to the total number of ignition events on Cylinder #6 since the last time this tracking data was reset. Any averaging associated with this rate is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6276	Engine Spark Plug 7 Misfire Rate	The spark misfire rate for Cylinder #7. The misfire rate is conveyed as the percentage of total cylinder spark misfires compared to the total number of ignition events on Cylinder #7 since the last time this tracking data was reset. Any averaging associated with this rate is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6277	Engine Spark Plug 8 Misfire Rate	The spark misfire rate for Cylinder #8. The misfire rate is conveyed as the percentage of total cylinder spark misfires compared to the total number of ignition events on Cylinder #8 since the last time this tracking data was reset. Any averaging associated with this rate is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6278	Engine Spark Plug 9 Misfire Rate	The spark misfire rate for Cylinder #9. The misfire rate is conveyed as the percentage of total cylinder spark misfires compared to the total number of ignition events on Cylinder #9 since the last time this tracking data was reset. Any averaging associated with this rate is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.

6279	Engine Spark Plug 10 Misfire Rate	The spark misfire rate for Cylinder #10. The misfire rate is conveyed as the percentage of total cylinder spark misfires compared to the total number of ignition events on Cylinder #10 since the last time this tracking data was reset. Any averaging associated with this rate is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6280	Engine Spark Plug 11 Misfire Rate	The spark misfire rate for Cylinder #11. The misfire rate is conveyed as the percentage of total cylinder spark misfires compared to the total number of ignition events on Cylinder #11 since the last time this tracking data was reset. Any averaging associated with this rate is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6281	Engine Spark Plug 12 Misfire Rate	The spark misfire rate for Cylinder #12. The misfire rate is conveyed as the percentage of total cylinder spark misfires compared to the total number of ignition events on Cylinder #12 since the last time this tracking data was reset. Any averaging associated with this rate is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6282	Engine Spark Plug 13 Misfire Rate	The spark misfire rate for Cylinder #13. The misfire rate is conveyed as the percentage of total cylinder spark misfires compared to the total number of ignition events on Cylinder #13 since the last time this tracking data was reset. Any averaging associated with this rate is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6283	Engine Spark Plug 14 Misfire Rate	The spark misfire rate for Cylinder #14. The misfire rate is conveyed as the percentage of total cylinder spark misfires compared to the total number of ignition events on Cylinder #14 since the last time this tracking data was reset. Any averaging associated with this rate is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6284	Engine Spark Plug 15 Misfire Rate	The spark misfire rate for Cylinder #15. The misfire rate is conveyed as the percentage of total cylinder spark misfires compared to the total number of ignition events on Cylinder #15 since the last time this tracking data was reset. Any averaging

		associated with this rate is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6285	Engine Spark Plug 16 Misfire Rate	The spark misfire rate for Cylinder #16. The misfire rate is conveyed as the percentage of total cylinder spark misfires compared to the total number of ignition events on Cylinder #16 since the last time this tracking data was reset. Any averaging associated with this rate is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6286	Engine Spark Plug 17 Misfire Rate	The spark misfire rate for Cylinder #17. The misfire rate is conveyed as the percentage of total cylinder spark misfires compared to the total number of ignition events on Cylinder #17 since the last time this tracking data was reset. Any averaging associated with this rate is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6287	Engine Spark Plug 18 Misfire Rate	The spark misfire rate for Cylinder #18. The misfire rate is conveyed as the percentage of total cylinder spark misfires compared to the total number of ignition events on Cylinder #18 since the last time this tracking data was reset. Any averaging associated with this rate is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6288	Engine Spark Plug 19 Misfire Rate	The spark misfire rate for Cylinder #19. The misfire rate is conveyed as the percentage of total cylinder spark misfires compared to the total number of ignition events on Cylinder #19 since the last time this tracking data was reset. Any averaging associated with this rate is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6289	Engine Spark Plug 20 Misfire Rate	The spark misfire rate for Cylinder #20. The misfire rate is conveyed as the percentage of total cylinder spark misfires compared to the total number of ignition events on Cylinder #20 since the last time this tracking data was reset. Any averaging associated with this rate is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.

6290	Engine Spark Plug 21 Misfire Rate	The spark misfire rate for Cylinder #21. The misfire rate is conveyed as the percentage of total cylinder spark misfires compared to the total number of ignition events on Cylinder #21 since the last time this tracking data was reset. Any averaging associated with this rate is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6291	Engine Spark Plug 22 Misfire Rate	The spark misfire rate for Cylinder #22. The misfire rate is conveyed as the percentage of total cylinder spark misfires compared to the total number of ignition events on Cylinder #22 since the last time this tracking data was reset. Any averaging associated with this rate is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6292	Engine Spark Plug 23 Misfire Rate	The spark misfire rate for Cylinder #23. The misfire rate is conveyed as the percentage of total cylinder spark misfires compared to the total number of ignition events on Cylinder #23 since the last time this tracking data was reset. Any averaging associated with this rate is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6293	Engine Spark Plug 24 Misfire Rate	The spark misfire rate for Cylinder #24. The misfire rate is conveyed as the percentage of total cylinder spark misfires compared to the total number of ignition events on Cylinder #24 since the last time this tracking data was reset. Any averaging associated with this rate is reset using Reset PGN 56832, Engine Spark Plug Secondary Voltage Tracking Reset SPN 6218.
6294	Engine Turbocharger 1 Wastegate Actuator 2	Secondary device used to control the wastegate on turbocharger 1.
6295	Engine Turbocharger 2 Wastegate Actuator 1	Primary device used to control the wastegate on turbocharger 2.
6296	Engine Turbocharger 2 Wastegate Actuator 2	Secondary device used to control the wastegate on turbocharger 2.

6297	Engine Turbocharger 3 Wastegate Actuator 1	Primary device used to control the wastegate on turbocharger 3.
6298	Engine Turbocharger 3 Wastegate Actuator 2	Secondary device used to control the wastegate on turbocharger 3.
6299	Engine Turbocharger 4 Wastegate Actuator 1	Primary device used to control the wastegate on turbocharger 4.
6300	Engine Turbocharger 4 Wastegate Actuator 2	Secondary device used to control the wastegate on turbocharger 4.
6301	Water in Fuel Indicator 2	A second indicator of the presense of water in the fuel. See also SPN 97. 00b = No 01b = Yes 10b = Error 11b = Not available
6302	Engine Crankcase Pressure 2	Second instance of the gage pressure inside engine crankcase.
6303	Engine Coolant Level 2	Second sensor measuring volume of liquid found in engine cooling system to total cooling system volume. Typical monitoring location is in the coolant expansion tank. See also SPN 111.
6304	Brake Switch and Accelerator Pedal Position Incompatible	Used to indicate that both the Accelerator Pedal and the Brake Switch have been depressed at the same time.
6305	Powertrain Circuit Air Supply Pressure	Supply pressure to carry the pressure information for the powertrain circuit. This circuit typically would feed powertrain components such as throttles, gearbox actuators and aftertreatment actuators for EGR and SCR systems.
6306	Powertrain Circuit Air Supply Pressure Request	Command signal to influence the air pressure in the powertrain circuit. This parameter is the setpoint for the parameter SPN 6305.

6307	Source Address of Controlling Device for Fueling State	The J1939 source address of the device currently controlling the fueling state via SPN 5793. 254 (FEh) is used to indicate that the Source Address of Controlling Device for Fueling State parameter is supported, but no device is currently controlling the fueling state via SPN 5793.
6308	Wheel Lockup Status	Indicates status of impending brake and/or wheel lockup situation. Used to allow powertrain controls to prepare for an impending brake and/or wheel lockup situation. An example of this would be to prepare the clutch control to open the clutch to prevent an engine stall condition.00b = Brake and/or wheel lockup is NOT impending 01b = Brake and/or wheel lockup is impending 10b = Error 11b = Not available
6309	Aftertreatment 1 Diesel Exhaust Fluid Control Module 1 Power Supply 2	State signal which indicates when the DEF control module 1 power supply 2 of aftertreatment 1 is being driven. On means the ECU is powering the aftertreatment 1 DEF control module 1 power supply. Note that the control module is external to the ECU.00b = Off 01b = On: The ECU is powering the DEF dosing unit power supply 10b = Error 11b = Unavailable
6310	Aftertreatment 2 Diesel Exhaust Fluid Control Module 1 Power Supply 2	State signal which indicates when the DEF control module 1 power supply 2 of aftertreatment 2 is being driven. On means the ECU is powering the aftertreatment 2 DEF control module 1 power supply. Note that the control module is external to the ECU.00b = Off 01b = On: The ECU is powering the DEF dosing unit power supply 10b = Error 11b = Unavailable
6311	Engine Turbocharger Compressor Blowoff Actuator 1 Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the Engine Turbocharger Blowoff Actuator 1 by the manufacturer’s software. When there are multiple failures, the most severe is transmitted.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
6312	Engine Turbocharger Compressor Blowoff Actuator 1 Temperature Status	Used to identify the status of the Engine Turbocharger Compresssor Blowoff Actuator 1 drive circuitry temperature. Temperature excursions may affect the torque output.000b = High Most severe 001b = High Least severe 010b = In Range 011b = Low Least severe 100b = Low Most severe 101b = Not Defined 110b = Error 111b = Not available

6313	Engine Turbocharger Compressor Blowoff Actuator 1 Temperature	Temperature of the Engine Turbocharger Compressor Bypass Actuator 1 drive circuitry. Temperature excursions may affect the torque output.
6314	Engine Turbocharger Compressor Blowoff Actuator 1 Desired Position	The requested position of the Engine Turbocharger Compressor Blowoff actuator by the engine ECU, where 0% represents bypass fully closed and 100% represents fully open. This is the position that the device is attempting to achieve.
6315	Engine Turbocharger Compressor Blowoff Actuator 1 Position	Actual position of the turbocharger compressor blowoff actuator, where 0% represents fully closed and 100% represents fully open.
6316	Engine Turbocharger Compressor Blowoff Actuator 1 Operation Status	Used to identify the status of Engine Turbocharger Compressor Blowoff Actuator 1. 0000b = Normal 0001b = Alarm (fully operational but needs service) 0010b = Alarm High Severity (functional but transient performance may be reduced) 0011b = Derate Active (torque output reduced due to environmental conditions) 0100b = Controlled Shutdown Active (driving to the default position – usually this means closed) 0101b = Uncontrolled Shutdown Active (no torque is being applied from the actuator) 0110b = Calibration in Progress (must be broadcast at least once per calibration process defined in SPN 6201) 0111b to 1101b = Reserved for future assignment 1110b = Error 1111b = Not available
6317	Requested Fuel Type	Engine controller receives this request from another control module to select the type of fuel to be used for engine operation.00h = Not available – NONE 01h = Gasoline/petrol – GAS 02h = Methanol – METH 03h = Ethanol – ETH 04h = Diesel – DSL 05h = Liquefied Petroleum Gas (LPG) – LPG 06h = Compressed Natural Gas (CNG) – CNG 07h = Propane – PROP 08h to 16h = Reserved for use in SPN 5837 17h = Natural Gas (NG) – NG 18h = Reserved for use in SPN 5837 19h to FDh = SAE reserved FEh = Reserved for use in SPN 5837 FFh = Not supported See SPN 5837 for fuel type.
6318	Emergency Fuel Limit Inhibit Switch	Switch that inhibits the fuel limit function in emergency situations.

6319	Engine Total Hours of Gaseous Fuel Operation	Accumulated time of operation of engine when gaseous fuel is used. This parameter should be used only in multi-fuel engines. See SPN 247 for single fuel engines and for total hours for multi-fuel engines.
6320	Engine Total Hours of Diesel Fuel Operation	Accumulated time of operation of engine when diesel fuel is used. This parameter should be used only in multi-fuel engines. See SPN 247 for single fuel engines and for total hours for multi-fuel engines.
6321	Engine Oil Filter Differential Pressure (Extended Range)	Change in engine oil differential pressure measured across the oil filter element. The differential pressure is the measured as the pressure at the filter intake with respect to the pressure at the filter outlet. This differential pressure measurement is used to assess the filter restriction as it accumulates solid or semisolid material on the filter element.This SPN provides an extended range to the existing SPN 99 which can be used for an alternate range and scaling.
6322	Aftertreatment 1 SCR Desulfation too Frequent	Indicates that an SCR desulfation event is occurring too frequently. SPN will be used with FMI 31 (Condition Exists) to indicate the SCR desulfation event is occurring too frequently.
6323	Engine Fuel Supply Pump	Diagnostic SPN for the Engine Fuel Supply Pump.
6324	Aftertreatment 1 Diesel Exhaust Fluid Doser Valve 2	The second aftertreatment diesel exhaust fluid doser used to inject diesel exhaust fluid into the first aftertreatment exhaust bank.
6325	Aftertreatment 2 Diesel Exhaust Fluid Doser Valve 2	The second aftertreatment diesel exhaust fluid doser used to inject diesel exhaust fluid into the second aftertreatment exhaust bank.
6326	Aftertreatment 1 Diesel Exhaust Fluid Doser Valve 1 Heater	The internal heater in the aftertreatment 1 diesel exhaust fluid doser valve 1.
6327	Aftertreatment 1 Diesel Exhaust Fluid Doser Valve 2 Heater	The internal heater in the aftertreatment 1 diesel exhaust fluid doser valve 2.

6328	Aftertreatment 2 Diesel Exhaust Fluid Doser Valve 1 Heater	The internal heater in the aftertreatment 2 diesel exhaust fluid doser valve 1.
6329	Aftertreatment 2 Diesel Exhaust Fluid Doser Valve 2 Heater	The internal heater in the aftertreatment 2 diesel exhaust fluid doser valve 2.
6330	Engine Intake Air Source Valve	Status of the actuator/valve in the airbox used to source engine intake air from either the engine compartment or external to the vehicle.00b = Off 01b = On 10b = Error 11b = Not available
6331	Engine Intake Air Source Valve Position	The position feedback of the actuator/valve in the airbox used to source engine intake air from either the engine compartment or external to the vehicle.
6332	Engine Intake Air Source Valve Power Supply	The power supply used to provide voltage to the actuator/valve in the airbox used to source engine intake air from either the engine compartment or external to the vehicle.
6333	Engine Gas Substitution Fuel Percentage	Percentage of Gaseous fuel used. 0% means no Gaseous fuel used and 100% means completely gaseous fuel is used.Gas substitution is the process for a dual fuel engine system of substituting gas, e.g. natural gas, for some fraction of the primary combustion fuel, e.g. diesel fuel, in the engine combustion.
6334	Engine Timing Actuator 1 Requested Position	The requested position of actuator 1 on the Engine Timing System, as determined by external system such as operator, monitoring, or protection system. Requested position is sent to the Control Module sending the command the Engine Timing System. Engine Timing system has different timing positions and the timing positions may be used to determine intake and outlet valve timings.000b = Position Not Requested 001b = Diesel Mode Position 010b = Diesel Part Load Position 011b = Gas Mode Position 100b = Diesel Part Load / Gas Mode Position 101b to 110b = Reserved 111b = Not Available
6335	Engine Timing Actuator 2 Requested Position	The requested position of actuator 2 on the Engine Timing System, as determined by external system such as operator, monitoring or protection system. Requested

		position is sent to the Control Module sending the command the Engine Timing System. Engine Timing system has different timing positions and the timing positions may be used to determine intake and outlet valve timings.000b = Position Not Requested 001b = Diesel Mode Position 010b = Diesel Part Load Position 011b = Gas Mode Position 100b = Diesel Part Load / Gas Mode Position 101b to 110b = Reserved 111b = Not Available
6336	Engine Timing Actuator 1 Position Command	The commanded position of actuator 1 on the engine timing system by Engine Control Module. The engine timing system has different timing positions and the timing positions may be used to determine intake and outlet valve timings.000b = Reserved 001b = Diesel Mode Position 010b = Diesel Part Load Position 011b = Gas Mode Position 100b = Diesel Part Load / Gas Mode Position 101b to 110b = Reserved 111b = Not Available
6337	Engine Timing Actuator 2 Position Command	The commanded position of actuator 2 on the engine timing system by Engine Control Module. The engine timing system has different timing positions and the timing positions may be used to determine intake and outlet valve timings.000b = Reserved 001b = Diesel Mode Position 010b = Diesel Part Load Position 011b = Gas Mode Position 100b = Diesel Part Load / Gas Mode Position 101b to 110b = Reserved 111b = Not Available
6338	Joystick 1 Lamp 1 Status	Report the actual value of Joystick 1 Lamp 1 00b = Off 01b = On 10b = Flashing 11b = Not available
6339	Joystick 1 Lamp 2 Status	Report the actual value of Joystick 1 Lamp 2 00b = Off 01b = On 10b = Flashing 11b = Not available
6340	Joystick 1 Lamp 3 Status	Report the actual value of Joystick 1 Lamp 3 00b = Off 01b = On 10b = Flashing 11b = Not available
6341	Joystick 1 Lamp 4 Status	Report the actual value of Joystick 1 Lamp 4 00b = Off 01b = On 10b = Flashing 11b = Not available

6342	Joystick 1 Lamp 5 Status	Report the actual value of Joystick 1 Lamp 5 00b = Off 01b = On 10b = Flashing 11b = Not available
6343	Joystick 1 Lamp 6 Status	Report the actual value of Joystick 1 Lamp 6 00b = Off 01b = On 10b = Flashing 11b = Not available
6344	Joystick 1 Lamp 7 Status	Report the actual value of Joystick 1 Lamp 7 00b = Off 01b = On 10b = Flashing 11b = Not available
6345	Joystick 1 Lamp 8 Status	Report the actual value of Joystick 1 Lamp 8 00b = Off 01b = On 10b = Flashing 11b = Not available
6346	Joystick 1 Lamp 9 Status	Report the actual value of Joystick 1 Lamp 9 00b = Off 01b = On 10b = Flashing 11b = Not available
6347	Joystick 1 Lamp 10 Status	Report the actual value of Joystick 1 Lamp 10 00b = Off 01b = On 10b = Flashing 11b = Not available
6348	Joystick 2 Lamp 1 Status	Report the actual value of Joystick 2 Lamp 1 00b = Off 01b = On 10b = Flashing 11b = Not available
6349	Joystick 2 Lamp 2 Status	Report the actual value of Joystick 2 Lamp 2 00b = Off 01b = On 10b = Flashing 11b = Not available
6350	Joystick 2 Lamp 3 Status	Report the actual value of Joystick 2 Lamp 3 00b = Off 01b = On 10b = Flashing 11b = Not available
6351	Joystick 2 Lamp 4 Status	Report the actual value of Joystick 2 Lamp 4 00b = Off 01b = On 10b = Flashing 11b = Not available
6352	Joystick 2 Lamp 5 Status	Report the actual value of Joystick 2 Lamp 5 00b = Off 01b = On 10b = Flashing 11b = Not available

6353	Joystick 2 Lamp 6 Status	Report the actual value of Joystick 2 Lamp 6 00b = Off 01b = On 10b = Flashing 11b = Not available
6354	Joystick 2 Lamp 7 Status	Report the actual value of Joystick 2 Lamp 7 00b = Off 01b = On 10b = Flashing 11b = Not available
6355	Joystick 2 Lamp 8 Status	Report the actual value of Joystick 2 Lamp 8 00b = Off 01b = On 10b = Flashing 11b = Not available
6356	Joystick 2 Lamp 9 Status	Report the actual value of Joystick 2 Lamp 9 00b = Off 01b = On 10b = Flashing 11b = Not available
6357	Joystick 2 Lamp 10 Status	Report the actual value of Joystick 2 Lamp 10 00b = Off 01b = On 10b = Flashing 11b = Not available
6358	Joystick 3 Lamp 1 Status	Report the actual value of Joystick 3 Lamp 1 00b = Off 01b = On 10b = Flashing 11b = Not available
6359	Joystick 3 Lamp 2 Status	Report the actual value of Joystick 3 Lamp 2 00b = Off 01b = On 10b = Flashing 11b = Not available
6360	Joystick 3 Lamp 3 Status	Report the actual value of Joystick 3 Lamp 3 00b = Off 01b = On 10b = Flashing 11b = Not available
6361	Joystick 3 Lamp 4 Status	Report the actual value of Joystick 3 Lamp 4 00b = Off 01b = On 10b = Flashing 11b = Not available
6362	Joystick 3 Lamp 5 Status	Report the actual value of Joystick 3 Lamp 5 00b = Off 01b = On 10b = Flashing 11b = Not available
6363	Joystick 3 Lamp 6 Status	Report the actual value of Joystick 3 Lamp 6 00b = Off 01b = On 10b = Flashing 11b = Not available

6364	Joystick 3 Lamp 7 Status	Report the actual value of Joystick 3 Lamp 7 00b = Off 01b = On 10b = Flashing 11b = Not available
6365	Joystick 3 Lamp 8 Status	Report the actual value of Joystick 3 Lamp 8 00b = Off 01b = On 10b = Flashing 11b = Not available
6366	Joystick 3 Lamp 9 Status	Report the actual value of Joystick 3 Lamp 9 00b = Off 01b = On 10b = Flashing 11b = Not available
6367	Joystick 3 Lamp 10 Status	Report the actual value of Joystick 3 Lamp 10 00b = Off 01b = On 10b = Flashing 11b = Not available
6368	Number of Assembly Unit Identification Fields	Number of Assembly Unit Identification designators represented in the Assembly Unit Identification parameter group.
6369	Assembly Unit Identification	A combination of alphanumeric characters representing the Identification number of an assembly unit installed on a component. Multiple assembly unit IDs can be transmitted by appropriately setting Number of Assembly Unit Identification Fields (SPN 6368) .The ASCII character “*” is reserved as a delimiter.
6370	Soft Top Speed Limit Active	Indicates that the current Maximum Vehicle Speed Limit (SPN 74) has been temporarily increased to the Soft Top Speed Limit. Under certain conditions, the legal speed limit allowed by the Greenhouse Gas Regulations can be increased to a speed referred to as the « Soft Top Speed Limit » for a specified distance.See SPNs 6372, 6373, & 6914 for an explanation of the relevant distance parameters. 00b = Soft Top Speed Limit is Inactive 01b = Soft Top Speed Limit is Active 10b = Reserved 11b = Not Available
6371	Soft Top Ratio Limit Exceeded	Greenhouse Gas Regulations limit the overall distance that Soft Top Speed can be used in relation to the total distance traveled. This parameter indicates the allowable ratio has been exceeded and Soft Top Speed is unavailable. It will become available again when enough distance has been traveled without using Soft Top Speed to bring

		the ratio back under the limit.00b = Soft top ratio limit has not been exceeded 01b = Soft top ratio limit has been exceeded 10b = Reserved 11b = Not Available
6372	Soft Top Speed Limit Remaining Distance	Indicates the remaining distance that the vehicle can travel at the Soft Top Speed Limit within the larger reset window. The reset window may be distance (possibly indicated by SPN 6373), time, or something else as determined by the manufacturer.This parameter will decrement while the Soft Top Speed Limit Active (SPN 6370) is 1. When the Soft Top Speed Limit Remaining Distance parameter reaches 0, the Soft Top Speed Limit cannot be activated.
6373	Soft Top Speed Limit Reset Distance	This parameter will decrement as long as the vehicle is moving. When this parameter reaches 0, it will be reset to its maximum value and continue to decrement.
6374	Steering Controller ECU Temperature	Temperature of the steering controller ECU
6375	Steering Mode Switch	Switch used as an input to the electronic steering controller to determine the operator’s requested steering mode000b = 2 Wheel Steer Mode 001b = Circle Steer Mode 011b = Crab Steer Mode 100b to 101b = Reserved for future use 110b = Error 111b = Not Available
6376	Front Steering Axle Centered Status	The status of the front steering axle being centered. The axle is centered if the axle’s centerline is parallel to the vehicle’s X-axis, where the vehicle’s X-axis is as defined in SAE J67000b = Front Axle Centered 01b = Front Axle Not Centered 10b = Error 11b = Not Available
6377	Rear Steering Axle Centered Status	The status of the rear steering axle being centered. The axle is centered if the axle’s centerline is parallel to the vehicle’s X-axis, where the vehicle’s X-axis is as defined in SAE J67000b = Rear Axle Centered 01b = Rear Axle Not Centered 10b = Error 11b = Not Available

6378	2 Wheel Steer Actuator State	The current state of the actuator that control the 2 wheel steering mode 00b = 2 Wheel Steer actuator inactive 01b = 2 Wheel Steer actuator active 10b = Error 11b = Not Available
6379	4 Wheel Steer Actuator State	Signal which indicates the current state of the actuator that control the 4 wheel steering mode 00b = 4 Wheel Steer actuator inactive 01b = 4 Wheel Steer actuator active 10b = Error 11b = Not Available
6380	Circle Steer Mode Actuator State	Signal which indicates the current state of the actuator that control the circle steering mode 00b = Circle Steer Mode actuator inactive 01b = Circle Steer Mode actuator active 10b = Error 11b = Not Available
6381	Crab Steer Mode Actuator State	Signal which indicates the current state of the actuator that control the crab steering mode 00b = Crab Steer Mode actuator inactive 01b = Crab Steer Mode actuator active 10b = Error 11b = Not Available
6382	Steer Actuator Common Return 1	The first common return used by steering systems actuators.
6383	Steer Actuator Common Return 2	The second common return used by steering systems actuators.
6384	Engine Exhaust Pressure 1 (Extended Range)	Gage pressure of the exhaust gasses as measured at the turbine intake of the turbocharger. This SPN to be used for inline engines or exhaust bank 1 of multiple bank engines.See SPN 1209 for alternate resolution.
6385	Engine Starter Motor Relay Control	Command signal used to energize or de-energize the engine starter motor relay. 00b = Off 01b = On 10b = Reserved for SAE assignment 11b = Don’t care/take no action
6386	Engine Gas Substitution Fuel Percentage Command	Percentage of Gaseous fuel used, in terms of % mass of fuel. 0% means no Gaseous fuel used and 100 % means completely gaseous fuel is used.Gas substitution is the process for a dual fuel engine system of substituting gas, e.g. natural gas, for some fraction of the primary combustion fuel, e.g. diesel fuel, in the engine combustion.

6387	Engine Cylinder Gas Mass Flow Rate Command	Commanded Mass Flow rate of gaseous fuel delivered to the engine normalized per cylinder.
6388	Engine Cylinder Diesel Mass Flow Rate Command	Commanded Mass Flow rate of diesel fuel delivered to the engine normalized per cylinder.
6389	Engine Cylinder Torque	Calculated engine torque output per cylinder.
6390	Engine Cylinder Pressure Monitor 1 Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the Engine Cylinder Pressure Monitor 1. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
6391	Engine Cylinder Pressure Monitor 2 Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the Engine Cylinder Pressure Monitor 2. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
6392	Engine Desired Air Fuel Ratio	Reports the desired Air Fuel ratio for the engine. Air Fuel Ratio specifies the amount of air required to completely burn one unit of fuel in the engine to meet the required engine performance and emission standards.
6393	Engine Fuel System 1 Total Intake Mass Air Flow Rate	Mass Flow rate of air entering the engine (or the first fuel system on a configuration with more than 1 fuel system). This also includes the amount of exhaust gas recirculated, if any.
6394	Number of Combustion Cycles for Averaging	Defined number of combustion cycles used for calculating average parameters of combustion in each cylinder.
6395	Engine Configuration Identification	Used to identify the hardware configuration of engine family. Each number will have a reference to set of parameters such as, but not limited to, number of cylinders, piston displacement, bore size and firing angles.

6396	Engine Cylinder 1 Heat Release	The amount of heat produced during combustion in Engine cylinder 1. The negative range is to cover thermodynamic behavior during misfire.
6397	Engine Cylinder 1 Peak Pressure	Peak pressure in engine cylinder 1 in combustion cycle.
6398	Engine Cylinder 1 Synchronous Knock Level	Used to indicate the level of knock for engine cylinder 1. The level of knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more knock until 100% indicates the most severe level of knock allowed or measurable for the engine.Similar to SPN 1352. SPN 6398 is combined with other combustion information in PGN 61498, so that the message is combustion synchronous.
6399	Engine Cylinder 1 Pressure Sensor Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the engine cylinder 1 pressure sensor. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
6400	Engine Cylinder 2 Heat Release	The amount of heat produced during combustion in engine cylinder 2. The negative range is to cover thermodynamic behavior during misfire.
6401	Engine Cylinder 2 Peak Pressure	Peak pressure in engine cylinder 2 in combustion cycle.
6402	Engine Cylinder 2 Synchronous Knock Level	Used to indicate the level of knock for engine cylinder 2. The level of knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more knock until 100% indicates the most severe level of knock allowed or measurable for the engine.Similar to SPN 1353. SPN 6402 is combined with other combustion information in PGN 61499, so that the message is combustion synchronous.
6403	Engine Cylinder 2 Pressure Sensor Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the engine cylinder 2 pressure sensor. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.

6404	Engine Cylinder 3 Heat Release	The amount of heat produced during combustion in engine cylinder 3. The negative range is to cover thermodynamic behavior during misfire.
6405	Engine Cylinder 3 Peak Pressure	Peak pressure in engine cylinder 3 in combustion cycle.
6406	Engine Cylinder 3 Synchronous Knock Level	Used to indicate the level of knock for engine cylinder 3. The level of knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more knock until 100% indicates the most severe level of knock allowed or measurable for the engine.Similar to SPN 1354. SPN 6406 is combined with other combustion information in PGN 61500, so that the message is combustion synchronous.
6407	Engine Cylinder 3 Pressure Sensor Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the engine cylinder 3 pressure sensor. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
6408	Engine Cylinder 4 Heat Release	The amount of heat produced during combustion in engine cylinder 4. The negative range is to cover thermodynamic behavior during misfire.
6409	Engine Cylinder 4 Peak Pressure	Peak pressure in engine cylinder 4 in combustion cycle.
6410	Engine Cylinder 4 Synchronous Knock Level	Used to indicate the level of knock for engine cylinder 4. The level of knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more knock until 100% indicates the most severe level of knock allowed or measurable for the engine.Similar to SPN 1355. SPN 6410 is combined with other combustion information in PGN 61501, so that the message is combustion synchronous.
6411	Engine Cylinder 4 Pressure Sensor Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the engine cylinder 4 pressure sensor. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.

6412	Engine Cylinder 5 Heat Release	The amount of heat produced during combustion in engine cylinder 5. The negative range is to cover thermodynamic behavior during misfire.
6413	Engine Cylinder 5 Peak Pressure	Peak pressure in engine cylinder 5 in combustion cycle.
6414	Engine Cylinder 5 Synchronous Knock Level	Used to indicate the level of knock for engine cylinder 6. The level of knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more knock until 100% indicates the most severe level of knock allowed or measurable for the engine.Similar to SPN 1356. SPN 6414 is combined with other combustion information in PGN 61502, so that the message is combustion synchronous.
6415	Engine Cylinder 5 Pressure Sensor Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the engine cylinder 5 pressure sensor. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
6416	Engine Cylinder 6 Heat Release	The amount of heat produced during combustion in engine cylinder 6. The negative range is to cover thermodynamic behavior during misfire.
6417	Engine Cylinder 6 Peak Pressure	Peak pressure in engine cylinder 6 in combustion cycle.
6418	Engine Cylinder 6 Synchronous Knock Level	Used to indicate the level of knock for engine cylinder 6. The level of knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more knock until 100% indicates the most severe level of knock allowed or measurable for the engine.Similar to SPN 1357. SPN 6418 is combined with other combustion information in PGN 61503, so that the message is combustion synchronous.
6419	Engine Cylinder 6 Pressure Sensor Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the engine cylinder 6 pressure sensor. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.

6420	Engine Cylinder 7 Heat Release	The amount of heat produced during combustion in engine cylinder 7. The negative range is to cover thermodynamic behavior during misfire.
6421	Engine Cylinder 7 Peak Pressure	Peak pressure in engine cylinder 7 in combustion cycle.
6422	Engine Cylinder 7 Synchronous Knock Level	Used to indicate the level of knock for engine cylinder 7. The level of knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more knock until 100% indicates the most severe level of knock allowed or measurable for the engine.Similar to SPN 1358. SPN 6422 is combined with other combustion information in PGN 61504, so that the message is combustion synchronous.
6423	Engine Cylinder 7 Pressure Sensor Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the engine cylinder 7 pressure sensor. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
6424	Engine Cylinder 8 Heat Release	The amount of heat produced during combustion in engine cylinder 8. The negative range is to cover thermodynamic behavior during misfire.
6425	Engine Cylinder 8 Peak Pressure	Peak pressure in engine cylinder 8 in combustion cycle.
6426	Engine Cylinder 8 Synchronous Knock Level	Used to indicate the level of knock for engine cylinder 8. The level of knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more knock until 100% indicates the most severe level of knock allowed or measurable for the engine.Similar to SPN 1359. SPN 6426 is combined with other combustion information in PGN 61505, so that the message is combustion synchronous.
6427	Engine Cylinder 8 Pressure Sensor Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the engine cylinder 8 pressure sensor. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.

6428	Engine Cylinder 9 Heat Release	The amount of heat produced during combustion in engine cylinder 9. The negative range is to cover thermodynamic behavior during misfire.
6429	Engine Cylinder 9 Peak Pressure	Peak pressure in engine cylinder 9 in combustion cycle.
6430	Engine Cylinder 9 Synchronous Knock Level	Used to indicate the level of knock for engine cylinder 9. The level of knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more knock until 100% indicates the most severe level of knock allowed or measurable for the engine.Similar to SPN 1360. SPN 6430 is combined with other combustion information in PGN 61506, so that the message is combustion synchronous.
6431	Engine Cylinder 9 Pressure Sensor Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the engine cylinder 9 pressure sensor. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
6432	Engine Cylinder 10 Heat Release	The amount of heat produced during combustion in engine cylinder 10. The negative range is to cover thermodynamic behavior during misfire.
6433	Engine Cylinder 10 Peak Pressure	Peak pressure in engine cylinder 10 in combustion cycle.
6434	Engine Cylinder 10 Synchronous Knock Level	Used to indicate the level of knock for engine cylinder 10. The level of knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more knock until 100% indicates the most severe level of knock allowed or measurable for the engine.Similar to SPN 1361. SPN 6434 is combined with other combustion information in PGN 61507, so that the message is combustion synchronous.
6435	Engine Cylinder 10 Pressure Sensor Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the engine cylinder 10 pressure sensor. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.

6436	Engine Cylinder 11 Heat Release	The amount of heat produced during combustion in engine cylinder 11. The negative range is to cover thermodynamic behavior during misfire.
6437	Engine Cylinder 11 Peak Pressure	Peak pressure in engine cylinder 11 in combustion cycle.
6438	Engine Cylinder 11 Synchronous Knock Level	Used to indicate the level of knock for engine cylinder 11. The level of knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more knock until 100% indicates the most severe level of knock allowed or measurable for the engine.Similar to SPN 1362. SPN 6438 is combined with other combustion information in PGN 61508, so that the message is combustion synchronous.
6439	Engine Cylinder 11 Pressure Sensor Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the engine cylinder 11 pressure sensor. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
6440	Engine Cylinder 12 Heat Release	The amount of heat produced during combustion in engine cylinder 12. The negative range is to cover thermodynamic behavior during misfire.
6441	Engine Cylinder 12 Peak Pressure	Peak pressure in engine cylinder 12 in combustion cycle.
6442	Engine Cylinder 12 Synchronous Knock Level	Used to indicate the level of knock for engine cylinder 12. The level of knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more knock until 100% indicates the most severe level of knock allowed or measurable for the engine.Similar to SPN 1363. SPN 6442 is combined with other combustion information in PGN 61509, so that the message is combustion synchronous.
6443	Engine Cylinder 12 Pressure Sensor Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the engine cylinder 12 pressure sensor. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.

6444	Engine Cylinder 13 Heat Release	The amount of heat produced during combustion in engine cylinder 13. The negative range is to cover thermodynamic behavior during misfire.
6445	Engine Cylinder 13 Peak Pressure	Peak pressure in engine cylinder 13 in combustion cycle.
6446	Engine Cylinder 13 Synchronous Knock Level	Used to indicate the level of knock for engine cylinder 13. The level of knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more knock until 100% indicates the most severe level of knock allowed or measurable for the engine.Similar to SPN 1364. SPN 6446 is combined with other combustion information in PGN 61510, so that the message is combustion synchronous.
6447	Engine Cylinder 13 Pressure Sensor Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the engine cylinder 13 pressure sensor. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
6448	Engine Cylinder 14 Heat Release	The amount of heat produced during combustion in engine cylinder 14. The negative range is to cover thermodynamic behavior during misfire.
6449	Engine Cylinder 14 Peak Pressure	Peak pressure in engine cylinder 14 in combustion cycle.
6450	Engine Cylinder 14 Synchronous Knock Level	Used to indicate the level of knock for engine cylinder 14. The level of knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more knock until 100% indicates the most severe level of knock allowed or measurable for the engine.Similar to SPN 1365. SPN 6450 is combined with other combustion information in PGN 61511, so that the message is combustion synchronous.
6451	Engine Cylinder 14 Pressure Sensor Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the engine cylinder 14 pressure sensor. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.

6452	Engine Cylinder 15 Heat Release	The amount of heat produced during combustion in engine cylinder 15. The negative range is to cover thermodynamic behavior during misfire.
6453	Engine Cylinder 15 Peak Pressure	Peak pressure in engine cylinder 15 in combustion cycle.
6454	Engine Cylinder 15 Synchronous Knock Level	Used to indicate the level of knock for engine cylinder 15. The level of knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more knock until 100% indicates the most severe level of knock allowed or measurable for the engine.Similar to SPN 1366. SPN 6454 is combined with other combustion information in PGN 61512, so that the message is combustion synchronous.
6455	Engine Cylinder 15 Pressure Sensor Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the engine cylinder 15 pressure sensor. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
6456	Engine Cylinder 16 Heat Release	The amount of heat produced during combustion in engine cylinder 16. The negative range is to cover thermodynamic behavior during misfire.
6457	Engine Cylinder 16 Peak Pressure	Peak pressure in engine cylinder 16 in combustion cycle.
6458	Engine Cylinder 16 Synchronous Knock Level	Used to indicate the level of knock for engine cylinder 16. The level of knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more knock until 100% indicates the most severe level of knock allowed or measurable for the engine.Similar to SPN 1367. SPN 6458 is combined with other combustion information in PGN 61513, so that the message is combustion synchronous.
6459	Engine Cylinder 16 Pressure Sensor Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the engine cylinder 16 pressure sensor. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.

6460	Engine Cylinder 17 Heat Release	The amount of heat produced during combustion in engine cylinder 17. The negative range is to cover thermodynamic behavior during misfire.
6461	Engine Cylinder 17 Peak Pressure	Peak pressure in engine cylinder 17 in combustion cycle.
6462	Engine Cylinder 17 Synchronous Knock Level	Used to indicate the level of knock for engine cylinder 17. The level of knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more knock until 100% indicates the most severe level of knock allowed or measurable for the engine.Similar to SPN 1368. SPN 6462 is combined with other combustion information in PGN 61514, so that the message is combustion synchronous.
6463	Engine Cylinder 17 Pressure Sensor Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the engine cylinder 17 pressure sensor. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
6464	Engine Cylinder 18 Heat Release	The amount of heat produced during combustion in engine cylinder 18. The negative range is to cover thermodynamic behavior during misfire.
6465	Engine Cylinder 18 Peak Pressure	Peak pressure in engine cylinder 18 in combustion cycle.
6466	Engine Cylinder 18 Synchronous Knock Level	Used to indicate the level of knock for engine cylinder 18. The level of knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more knock until 100% indicates the most severe level of knock allowed or measurable for the engine.Similar to SPN 1369. SPN 6466 is combined with other combustion information in PGN 61515, so that the message is combustion synchronous.
6467	Engine Cylinder 18 Pressure Sensor Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the engine cylinder 18 pressure sensor. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.

6468	Engine Cylinder 19 Heat Release	The amount of heat produced during combustion in engine cylinder 19. The negative range is to cover thermodynamic behavior during misfire.
6469	Engine Cylinder 19 Peak Pressure	Peak pressure in engine cylinder 19 in combustion cycle.
6470	Engine Cylinder 19 Synchronous Knock Level	Used to indicate the level of knock for engine cylinder 19. The level of knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more knock until 100% indicates the most severe level of knock allowed or measurable for the engine.Similar to SPN 1370. SPN 6470 is combined with other combustion information in PGN 61516, so that the message is combustion synchronous.
6471	Engine Cylinder 19 Pressure Sensor Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the engine cylinder 19 pressure sensor. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
6472	Engine Cylinder 20 Heat Release	The amount of heat produced during combustion in engine cylinder 20. The negative range is to cover thermodynamic behavior during misfire.
6473	Engine Cylinder 20 Peak Pressure	Peak pressure in engine cylinder 20 in combustion cycle.
6474	Engine Cylinder 20 Synchronous Knock Level	Used to indicate the level of knock for engine cylinder 20. The level of knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more knock until 100% indicates the most severe level of knock allowed or measurable for the engine.Similar to SPN 1371. SPN 6474 is combined with other combustion information in PGN 61517, so that the message is combustion synchronous.
6475	Engine Cylinder 20 Pressure Sensor Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the engine cylinder 20 pressure sensor. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.

6476	Aftertreatment Diesel Exhaust Fluid Doser Cooldown Interrupt Count	Non-volatile record of the number of interrupted cooldown routines since the last clear event. The counter shall be reset by PGN 56832 request.
6477	Aftertreatment Diesel Exhaust Fluid Doser Purge Interrupt Count	Non-volatile record of the number of interrupted purge routines since the last clear event. The counter shall be reset by PGN 56832 request.
6478	Aftertreatment Diesel Exhaust Fluid Doser Cooldown Complete This Cycle	Indication of cooldown routine completion in the current power cycle. « Complete This Cycle » parameters are used to indicate to the engine controller that is powering the aftertreatment controller via relay that it is ok to remove power. 00b = Not complete 01b = Complete 10b = Error 11b = Not Supported
6479	Aftertreatment Diesel Exhaust Fluid Doser Cooldown Complete Last Cycle	Indication of cooldown routine completion in the previous power cycle. 00b = Not complete 01b = Complete 10b = Error 11b = Not Supported Note: One purpose for tracking the status of the Diesel Exhaust Fluid doser purge on the previous cycle is related to diagnostics. For instance, if the Diesel Exhaust Fluid dosing system determines thaw was unsuccessful or took longer than expected and the purge was interrupted on the previous cycle, this may be the suspected root cause.
6480	Aftertreatment Diesel Exhaust Fluid Doser Purge Complete This Cycle	Indication of purge routine completion in the current power cycle. « Complete This Cycle » parameters are used to indicate to the engine controller that is powering the aftertreatment controller via relay that it is ok to remove power. 00b = Not complete 01b = Complete 10b = Error 11b = Not Supported
6481	Aftertreatment Diesel Exhaust Fluid Doser Purge Complete Last Cycle	Indication of purge routine completion in the previous power cycle 00b = Not complete 01b = Complete 10b = Error 11b = Not Supported Note: One purpose for tracking the status of the Diesel Exhaust Fluid doser purge on the previous cycle is related to diagnostics. For instance, if the Diesel Exhaust Fluid dosing system determines thaw was unsuccessful or took longer than expected and the purge was interrupted on the previous cycle, this may be the suspected root cause.
6482	After-run Complete This Cycle	Indication of after-run routine completion in the current power cycle. « Complete This Cycle » parameters are used to indicate to the engine controller that is powering

		the aftertreatment controller via relay that it is ok to remove power. 00b = Not complete 01b = Complete 10b = Error 11b = Not Supported
6483	Engine Cylinder 1 Indicated Mean Effective Pressure	Average cylinder pressure calculated over defined number of combustion cycles for engine cylinder 1. Negative range is to cover thermodynamic behavior during misfire.
6484	Engine Cylinder 1 Average Start of Combustion Timing	Average start of combustion timing calculated over defined number of combustion cycles for engine cylinder 1 with reference to the crank angle. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
6485	Engine Cylinder 1 Average Center of Combustion Timing	Average timing calculated over defined number of combustion cycles for the center of combustion in engine cylinder 1 with reference to the crank angle. Center of Combustion is used to indicate the combustion efficiency. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
6486	Engine Cylinder 1 Average Combustion Duration	Average duration of combustion calculated over defined number of combustion cycles for engine cylinder 1 with reference to the crank angle. Combustion duration is the difference between end of combustion and start of combustion expressed, in this case, in terms of crank angle.
6487	Engine Cylinder 2 Indicated Mean Effective Pressure	Average cylinder pressure calculated over defined number of combustion cycles for engine cylinder 2. Negative range is to cover thermodynamic behavior during misfire.
6488	Engine Cylinder 2 Average Start of Combustion Timing	Average start of combustion timing calculated over defined number of combustion cycles for engine cylinder 2 with reference to the crank angle. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.

6489	Engine Cylinder 2 Average Center of Combustion Timing	Average timing calculated over defined number of combustion cycles for the center of combustion in engine cylinder 2 with reference to the crank angle. Center of Combustion is used to indicate the combustion efficiency. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
6490	Engine Cylinder 2 Average Combustion Duration	Average duration of combustion calculated over defined number of combustion cycles for engine cylinder 2 with reference to the crank angle. Combustion duration is the difference between end of combustion and start of combustion expressed, in this case, in terms of crank angle.
6491	Engine Cylinder 3 Indicated Mean Effective Pressure	Average cylinder pressure calculated over defined number of combustion cycles for engine cylinder 3. Negative range is to cover thermodynamic behavior during misfire.
6492	Engine Cylinder 3 Average Start of Combustion Timing	Average start of combustion timing calculated over defined number of combustion cycles for engine cylinder 3 with reference to the crank angle. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
6493	Engine Cylinder 3 Average Center of Combustion Timing	Average timing calculated over defined number of combustion cycles for the center of combustion in engine cylinder 3 with reference to the crank angle. Center of Combustion is used to indicate the combustion efficiency. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
6494	Engine Cylinder 3 Average Combustion Duration	Average duration of combustion calculated over defined number of combustion cycles for engine cylinder 3 with reference to the crank angle. Combustion duration is the difference between end of combustion and start of combustion expressed, in this case, in terms of crank angle.

6495	Engine Cylinder 4 Indicated Mean Effective Pressure	Average cylinder pressure calculated over defined number of combustion cycles for engine cylinder 4. Negative range is to cover thermodynamic behavior during misfire.
6496	Engine Cylinder 4 Average Start of Combustion Timing	Average start of combustion timing calculated over defined number of combustion cycles for engine cylinder 4 with reference to the crank angle. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
6497	Engine Cylinder 4 Average Center of Combustion Timing	Average timing calculated over defined number of combustion cycles for the center of combustion in engine cylinder 4 with reference to the crank angle. Center of Combustion is used to indicate the combustion efficiency. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
6498	Engine Cylinder 4 Average Combustion Duration	Average duration of combustion calculated over defined number of combustion cycles for engine cylinder 4 with reference to the crank angle. Combustion duration is the difference between end of combustion and start of combustion expressed, in this case, in terms of crank angle.
6499	Engine Cylinder 5 Indicated Mean Effective Pressure	Average cylinder pressure calculated over defined number of combustion cycles for engine cylinder 5. Negative range is to cover thermodynamic behavior during misfire.
6500	Engine Cylinder 5 Average Start of Combustion Timing	Average start of combustion timing calculated over defined number of combustion cycles for engine cylinder 5 with reference to the crank angle. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
6501	Engine Cylinder 5 Average Center of Combustion Timing	Average timing calculated over defined number of combustion cycles for the center of combustion in engine cylinder 5 with reference to the crank angle. Center of Combustion is used to indicate the combustion efficiency. When the combustion

		happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
6502	Engine Cylinder 5 Average Combustion Duration	Average duration of combustion calculated over defined number of combustion cycles for engine cylinder 5 with reference to the crank angle. Combustion duration is the difference between end of combustion and start of combustion expressed, in this case, in terms of crank angle.
6503	Engine Cylinder 6 Indicated Mean Effective Pressure	Average cylinder pressure calculated over defined number of combustion cycles for engine cylinder 6. Negative range is to cover thermodynamic behavior during misfire.
6504	Engine Cylinder 6 Average Start of Combustion Timing	Average start of combustion timing calculated over defined number of combustion cycles for engine cylinder 6 with reference to the crank angle. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
6505	Engine Cylinder 6 Average Center of Combustion Timing	Average timing calculated over defined number of combustion cycles for the center of combustion in engine cylinder 6 with reference to the crank angle. Center of Combustion is used to indicate the combustion efficiency. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
6506	Engine Cylinder 6 Average Combustion Duration	Average duration of combustion calculated over defined number of combustion cycles for engine cylinder 6 with reference to the crank angle. Combustion duration is the difference between end of combustion and start of combustion expressed, in this case, in terms of crank angle.
6507	Engine Cylinder 7 Indicated Mean Effective Pressure	Average cylinder pressure calculated over defined number of combustion cycles for engine cylinder 7. Negative range is to cover thermodynamic behavior during misfire.

6508	Engine Cylinder 7 Average Start of Combustion Timing	Average start of combustion timing calculated over defined number of combustion cycles for engine cylinder 7 with reference to the crank angle. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
6509	Engine Cylinder 7 Average Center of Combustion Timing	Average timing calculated over defined number of combustion cycles for the center of combustion in engine cylinder 7 with reference to the crank angle. Center of Combustion is used to indicate the combustion efficiency. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
6510	Engine Cylinder 7 Average Combustion Duration	Average duration of combustion calculated over defined number of combustion cycles for engine cylinder 7 with reference to the crank angle. Combustion duration is the difference between end of combustion and start of combustion expressed, in this case, in terms of crank angle.
6511	Engine Cylinder 8 Indicated Mean Effective Pressure	Average cylinder pressure calculated over defined number of combustion cycles for engine cylinder 8. Negative range is to cover thermodynamic behavior during misfire.
6512	Engine Cylinder 8 Average Start of Combustion Timing	Average start of combustion timing calculated over defined number of combustion cycles for engine cylinder 8 with reference to the crank angle. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
6513	Engine Cylinder 8 Average Center of Combustion Timing	Average timing calculated over defined number of combustion cycles for the center of combustion in engine cylinder 8 with reference to the crank angle. Center of Combustion is used to indicate the combustion efficiency. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.

6514	Engine Cylinder 8 Average Combustion Duration	Average duration of combustion calculated over defined number of combustion cycles for engine cylinder 8 with reference to the crank angle. Combustion duration is the difference between end of combustion and start of combustion expressed, in this case, in terms of crank angle.
6515	Engine Cylinder 9 Indicated Mean Effective Pressure	Average cylinder pressure calculated over defined number of combustion cycles for engine cylinder 9. Negative range is to cover thermodynamic behavior during misfire.
6516	Engine Cylinder 9 Average Start of Combustion Timing	Average start of combustion timing calculated over defined number of combustion cycles for engine cylinder 9 with reference to the crank angle. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
6517	Engine Cylinder 9 Average Center of Combustion Timing	Average timing calculated over defined number of combustion cycles for the center of combustion in engine cylinder 9 with reference to the crank angle. Center of Combustion is used to indicate the combustion efficiency. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
6518	Engine Cylinder 9 Average Combustion Duration	Average duration of combustion calculated over defined number of combustion cycles for engine cylinder 9 with reference to the crank angle. Combustion duration is the difference between end of combustion and start of combustion expressed, in this case, in terms of crank angle.
6519	Engine Cylinder 10 Indicated Mean Effective Pressure	Average cylinder pressure calculated over defined number of combustion cycles for engine cylinder 10. Negative range is to cover thermodynamic behavior during misfire.
6520	Engine Cylinder 10 Average Start of Combustion Timing	Average start of combustion timing calculated over defined number of combustion cycles for engine cylinder 10 with reference to the crank angle. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in

		terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
6521	Engine Cylinder 10 Average Center of Combustion Timing	Average timing calculated over defined number of combustion cycles for the center of combustion in engine cylinder 10 with reference to the crank angle. Center of Combustion is used to indicate the combustion efficiency. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
6522	Engine Cylinder 10 Average Combustion Duration	Average duration of combustion calculated over defined number of combustion cycles for engine cylinder 10 with reference to the crank angle. Combustion duration is the difference between end of combustion and start of combustion expressed, in this case, in terms of crank angle.
6523	Engine Cylinder 11 Indicated Mean Effective Pressure	Average cylinder pressure calculated over defined number of combustion cycles for engine cylinder 11. Negative range is to cover thermodynamic behavior during misfire.
6524	Engine Cylinder 11 Average Start of Combustion Timing	Average start of combustion timing calculated over defined number of combustion cycles for engine cylinder 11 with reference to the crank angle. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
6525	Engine Cylinder 11 Average Center of Combustion Timing	Average timing calculated over defined number of combustion cycles for the center of combustion in engine cylinder 11 with reference to the crank angle. Center of Combustion is used to indicate the combustion efficiency. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.

6526	Engine Cylinder 11 Average Combustion Duration	Average duration of combustion calculated over defined number of combustion cycles for engine cylinder 11 with reference to the crank angle. Combustion duration is the difference between end of combustion and start of combustion expressed, in this case, in terms of crank angle.
6527	Engine Cylinder 12 Indicated Mean Effective Pressure	Average cylinder pressure calculated over defined number of combustion cycles for engine cylinder 12. Negative range is to cover thermodynamic behavior during misfire.
6528	Engine Cylinder 12 Average Start of Combustion Timing	Average start of combustion timing calculated over defined number of combustion cycles for engine cylinder 12 with reference to the crank angle. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
6529	Engine Cylinder 12 Average Center of Combustion Timing	Average timing calculated over defined number of combustion cycles for the center of combustion in engine cylinder 12 with reference to the crank angle. Center of Combustion is used to indicate the combustion efficiency. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
6530	Engine Cylinder 12 Average Combustion Duration	Average duration of combustion calculated over defined number of combustion cycles for engine cylinder 12 with reference to the crank angle. Combustion duration is the difference between end of combustion and start of combustion expressed, in this case, in terms of crank angle.
6531	Engine Cylinder 13 Indicated Mean Effective Pressure	Average cylinder pressure calculated over defined number of combustion cycles for engine cylinder 13. Negative range is to cover thermodynamic behavior during misfire.
6532	Engine Cylinder 13 Average Start of Combustion Timing	Average start of combustion timing calculated over defined number of combustion cycles for engine cylinder 13 with reference to the crank angle. When the combustion

		happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
6533	Engine Cylinder 13 Average Center of Combustion Timing	Average timing calculated over defined number of combustion cycles for the center of combustion in engine cylinder 13 with reference to the crank angle. Center of Combustion is used to indicate the combustion efficiency. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
6534	Engine Cylinder 13 Average Combustion Duration	Average duration of combustion calculated over defined number of combustion cycles for engine cylinder 13 with reference to the crank angle. Combustion duration is the difference between end of combustion and start of combustion expressed, in this case, in terms of crank angle.
6535	Engine Cylinder 14 Indicated Mean Effective Pressure	Average cylinder pressure calculated over defined number of combustion cycles for engine cylinder 14. Negative range is to cover thermodynamic behavior during misfire.
6536	Engine Cylinder 14 Average Start of Combustion Timing	Average start of combustion timing calculated over defined number of combustion cycles for engine cylinder 14 with reference to the crank angle. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
6537	Engine Cylinder 14 Average Center of Combustion Timing	Average timing calculated over defined number of combustion cycles for the center of combustion in engine cylinder 14 with reference to the crank angle. Center of Combustion is used to indicate the combustion efficiency. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.

6538	Engine Cylinder 14 Average Combustion Duration	Average duration of combustion calculated over defined number of combustion cycles for engine cylinder 14 with reference to the crank angle. Combustion duration is the difference between end of combustion and start of combustion expressed, in this case, in terms of crank angle.
6539	Engine Cylinder 15 Indicated Mean Effective Pressure	Average cylinder pressure calculated over defined number of combustion cycles for engine cylinder 15. Negative range is to cover thermodynamic behavior during misfire.
6540	Engine Cylinder 15 Average Start of Combustion Timing	Average start of combustion timing calculated over defined number of combustion cycles for engine cylinder 15 with reference to the crank angle. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
6541	Engine Cylinder 15 Average Center of Combustion Timing	Average timing calculated over defined number of combustion cycles for the center of combustion in engine cylinder 15 with reference to the crank angle. Center of Combustion is used to indicate the combustion efficiency. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
6542	Engine Cylinder 15 Average Combustion Duration	Average duration of combustion calculated over defined number of combustion cycles for engine cylinder 15 with reference to the crank angle. Combustion duration is the difference between end of combustion and start of combustion expressed, in this case, in terms of crank angle.
6543	Engine Cylinder 16 Indicated Mean Effective Pressure	Average cylinder pressure calculated over defined number of combustion cycles for engine cylinder 16. Negative range is to cover thermodynamic behavior during misfire.
6544	Engine Cylinder 16 Average Start of Combustion Timing	Average start of combustion timing calculated over defined number of combustion cycles for engine cylinder 16 with reference to the crank angle. When the combustion

		happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
6545	Engine Cylinder 16 Average Center of Combustion Timing	Average timing calculated over defined number of combustion cycles for the center of combustion in engine cylinder 16 with reference to the crank angle. Center of Combustion is used to indicate the combustion efficiency. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
6546	Engine Cylinder 16 Average Combustion Duration	Average duration of combustion calculated over defined number of combustion cycles for engine cylinder 16 with reference to the crank angle. Combustion duration is the difference between end of combustion and start of combustion expressed, in this case, in terms of crank angle.
6547	Engine Cylinder 17 Indicated Mean Effective Pressure	Average cylinder pressure calculated over defined number of combustion cycles for engine cylinder 17. Negative range is to cover thermodynamic behavior during misfire.
6548	Engine Cylinder 17 Average Start of Combustion Timing	Average start of combustion timing calculated over defined number of combustion cycles for engine cylinder 17 with reference to the crank angle. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
6549	Engine Cylinder 17 Average Center of Combustion Timing	Average timing calculated over defined number of combustion cycles for the center of combustion in engine cylinder 17 with reference to the crank angle. Center of Combustion is used to indicate the combustion efficiency. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.

6550	Engine Cylinder 17 Average Combustion Duration	Average duration of combustion calculated over defined number of combustion cycles for engine cylinder 17 with reference to the crank angle. Combustion duration is the difference between end of combustion and start of combustion expressed, in this case, in terms of crank angle.
6551	Engine Cylinder 18 Indicated Mean Effective Pressure	Average cylinder pressure calculated over defined number of combustion cycles for engine cylinder 18. Negative range is to cover thermodynamic behavior during misfire.
6552	Engine Cylinder 18 Average Start of Combustion Timing	Average start of combustion timing calculated over defined number of combustion cycles for engine cylinder 18 with reference to the crank angle. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
6553	Engine Cylinder 18 Average Center of Combustion Timing	Average timing calculated over defined number of combustion cycles for the center of combustion in engine cylinder 18 with reference to the crank angle. Center of Combustion is used to indicate the combustion efficiency. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
6554	Engine Cylinder 18 Average Combustion Duration	Average duration of combustion calculated over defined number of combustion cycles for engine cylinder 18 with reference to the crank angle. Combustion duration is the difference between end of combustion and start of combustion expressed, in this case, in terms of crank angle.
6555	Engine Cylinder 19 Indicated Mean Effective Pressure	Average cylinder pressure calculated over defined number of combustion cycles for engine cylinder 19. Negative range is to cover thermodynamic behavior during misfire.
6556	Engine Cylinder 19 Average Start of Combustion Timing	Average start of combustion timing calculated over defined number of combustion cycles for engine cylinder 19 with reference to the crank angle. When the combustion

		happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
6557	Engine Cylinder 19 Average Center of Combustion Timing	Average timing calculated over defined number of combustion cycles for the center of combustion in engine cylinder 19 with reference to the crank angle. Center of Combustion is used to indicate the combustion efficiency. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
6558	Engine Cylinder 19 Average Combustion Duration	Average duration of combustion calculated over defined number of combustion cycles for engine cylinder 19 with reference to the crank angle. Combustion duration is the difference between end of combustion and start of combustion expressed, in this case, in terms of crank angle.
6559	Engine Cylinder 20 Indicated Mean Effective Pressure	Average cylinder pressure calculated over defined number of combustion cycles for engine cylinder 20. Negative range is to cover thermodynamic behavior during misfire.
6560	Engine Cylinder 20 Average Start of Combustion Timing	Average start of combustion timing calculated over defined number of combustion cycles for engine cylinder 20 with reference to the crank angle. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
6561	Engine Cylinder 20 Average Center of Combustion Timing	Average timing calculated over defined number of combustion cycles for the center of combustion in engine cylinder 20 with reference to the crank angle. Center of Combustion is used to indicate the combustion efficiency. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.

6562	Engine Cylinder 20 Average Combustion Duration	Average duration of combustion calculated over defined number of combustion cycles for engine cylinder 20 with reference to the crank angle. Combustion duration is the difference between end of combustion and start of combustion expressed, in this case, in terms of crank angle.
6563	Aftertreatment Trip Diesel Exhaust Fluid	DEF consumed during all or part of a journey.
6564	Engine Cylinder Pressure Monitor 1	Used to detect an issue with the first Engine Cylinder Pressure Monitor. This is an electronic module used to measure and calculate various parameters of the combustion in each cylinder.
6565	Engine Cylinder Pressure Monitor 2	Used to detect an issue with the second Engine Cylinder Pressure Monitor. This is an electronic module used to measure and calculate various parameters of the combustion in each cylinder.
6566	Transmission Air Supply Pressure Indicator	Indicates whether transmission air supply is sufficient 000b = Normal Pressure Range – The transmission supply air pressure is within the normal operational range. 001b = Low pressure – The transmission supply air pressure is within a range that may reduce the transmission's performance. 010b = Very low pressure – The transmission supply air pressure is below a range that will reduce the transmission's performance. 011b = No pressure – The transmission supply air pressure is below a range that will stop the transmission from functioning. 100b = Over pressure – The transmission supply air pressure is above a range that may reduce the transmission's performance. 101b = Not defined 110b = Error indicator 111b = Not available
6567	Transmission Mode 9 Indicator	Indicates that the transmission is operating under transmission mode 9 (SPN 6569) as commanded via the TC2 message (PGN 3328). The definition of the transmission mode is left to the discretion of the transmission manufacturer.00b = Transmission Mode 9 not active 01b = Transmission Mode 9 active 10b = Error indicator 11b = Not available

6568	Transmission Mode 10 Indicator	Indicates that the transmission is operating under transmission mode 10 (SPN 6570) as commanded via the TC2 message (PGN 3328). The definition of the transmission mode is left to the discretion of the transmission manufacturer.00b = Transmission Mode 10 not active 01b = Transmission Mode 10 active 10b = Error indicator 11b = Not available
6569	Transmission Mode 9	Indicates whether transmission mode 9 is enabled. Modes are manufacturer specific and are not necessarily mutually exclusive. See also SPN 6567.00b = Disable 01b = Enable 10b = Reserved 11b = Take no action
6570	Transmission Mode 10	Indicates whether transmission mode 10 is enabled. Modes are manufacturer specific and are not necessarily mutually exclusive. See also SPN 6568.00b = Disable 01b = Enable 10b = Reserved 11b = Take no action
6571	Engine Main Chamber Fuel Absolute Pressure	Absolute pressure of the gaseous fuel for the main chamber of the cylinder. This parameter is intended for applications, which use a pre and main chamber fuel systems, which report the pressure of more than one type of fuel.
6572	Engine Main Chamber Fuel Desired Absolute Pressure	Desired absolute pressure of the gaseous fuel for the main chamber of the cylinder. This parameter is intended for applications with pre and main chamber fuel systems, which report the pressure of more than one type of fuel.Engine
6573	Engine Prechamber Fuel Absolute Pressure	Absolute pressure of the gaseous fuel for the separate cylinder pre-chamber rail. This parameter is intended for applications, which use a pre and main chamber fuel systems, which report the pressure of more than one type of fuel.
6574	Engine Prechamber Fuel Desired Absolute Pressure	Desired absolute pressure of the gaseous fuel in the separate cylinder pre-chamber rail. This parameter is intended for applications with pre and main chamber fuel systems, which report the pressure of more than one type of fuel.
6575	Engine Main Chamber Air Fuel Ratio	Actual air to fuel ratio of the charge entering the cylinder main chamber.

6576	Engine Main Chamber Desired Air Fuel Ratio	Desired air to fuel ratio of the charge entering the cylinder main chamber.
6577	Engine Prechamber Air Fuel Ratio	Actual air to fuel ratio of the charge entering the cylinder prechamber.
6578	Engine Prechamber Desired Air Fuel Ratio	Desired air to fuel ratio of the charge entering the cylinder prechamber.
6579	Engine Exhaust NOx	Calculated NOx concentration for the total engine exhaust, prior to any aftertreatment of the exhaust. This parameter is primarily intended for engines that have separate NOx sensors in separate exhaust manifolds, but the engine does not have an NOx sensor in an exhaust line after combining the exhaust from the separate manifolds. This parameter represents the Nox concentration that would be measured by an NOx sensor in an exhaust line after combining the exhaust from the separate manifolds.Note: The individual NOx measurements for the separate exhaust manifolds are reported using the aftertreatment intake NOx parameters, such as SPN 3216 and SPN 3255. This SPN should not be used with engines with only one NOx sensor; instead, engines with only one NOx sensor should use SPN 3216.
6580	Engine Exhaust Desired NOx	Desired NOx concentration in the engine exhaust, prior to any aftertreatment of the exhaust.
6581	Aftertreatment 1 Hydrocarbon Doser 2	The second doser used to inject fuel into the aftertreatment system
6582	Transmission Hydraulic Pump Actuator 2 Percent	The current modulated value for actuator 2 that controls the transmission hydraulic pump, where 0% = no hydraulic pressure and 100% = full hydraulic pressure.
6583	Transmission Hydrostatic Loop 1 Pressure	Oil pressure in the transmission hydrostatic loop #1 between the pump and motor.
6584	Transmission Hydrostatic Loop 2 Pressure	Oil pressure in the transmission hydrostatic loop #2 between the pump and motor.

6585	Transmission Directional Output Shaft Speed	The rotational velocity and direction of the output shaft. Positive values are used for forward vehicle motion, negative values for reverse vehicle motion.SPN 191 should be used when direction is not used.
6586	Aftertreatment 1 SCR Intake Pressure	The gage pressure at the intake of the selective catalytic reduction system of Aftertreatment 1.
6587	Aftertreatment 2 SCR Intake Pressure	The gage pressure at the intake of the selective catalytic reduction system of Aftertreatment 2.
6588	Operator Shutdown With High Exhaust Temperature	Indicates that the operator previously performed a forced shutdown while the exhaust temperatures were high.
6589	Engine Fuel 1 Injector Metering Rail 1 Pressure 1	The pressure of fuel measured by first rail pressure sensor in the primary, or first, metering rail as delivered from the supply pump to the injector metering intake.Note: This is for the rail pressure from the 1st rail pressure sensor. This may be different than SPN 157 when used in multiple rail pressure sensor configurations. In an application with only one rail pressure sensor, SPN 157 will be used. However, in an application with multiple rail pressure sensors, SPN 157 data will be arbitrated from rail pressure sensors 1 and 2 in metering rail 1.
6590	Engine Fuel 1 Injector Metering Rail 1 Pressure 2	The pressure of fuel measured by the second rail pressure sensor in the primary, or first, metering rail as delivered from the supply pump to the injector metering intake.Note: This is for the rail pressure from the 2nd rail pressure sensor. This may be different than SPN 157 when used in multiple rail pressure sensor configurations. In an application with multiple rail pressure sensors, SPN 157 data will be arbitrated from rail pressure sensors 1 and 2 in metering rail 1.
6591	Engine Fuel 1 Injector Metering Rail 2 Pressure 1	The pressure of fuel measured by first rail pressure sensor in the metering rail 2 as delivered from the supply pump to the injector metering intake.Note: This is for the rail pressure from the 1st rail pressure sensor. This may be different than SPN 1349 when used in multiple rail pressure sensor configurations. In an application with only one rail pressure sensor, SPN 1349 will be used. However, in an application with

		multiple rail pressure sensors, SPN 1349 data will be arbitrated from rail pressure sensors 1 and 2 in metering rail 2.
6592	Engine Fuel 1 Injector Metering Rail 2 Pressure 2	The pressure of fuel measured by second rail pressure sensor in the metering rail 2 as delivered from the supply pump to the injector metering intake.Note: This is for the rail pressure from the 2nd rail pressure sensor. This may be different than SPN 1349 when used in multiple rail pressure sensor configurations. In an application with multiple rail pressure sensors, SPN 1349 data will be arbitrated from rail pressure sensors 1 and 2 in metering rail 2.
6593	Aftertreatment 1 Diesel Exhaust Fluid Dosing Requested Quantity (High Range)	Requested dosing quantity of diesel exhaust fluid. This SPN is a high range measurement. See SPN 4348 if high range is not needed.
6594	Aftertreatment 2 Diesel Exhaust Fluid Dosing Requested Quantity (High Range)	Requested dosing quantity of diesel exhaust fluid. This SPN is a high range measurement. See SPN 4401 if high range is not needed.
6595	Aftertreatment 1 Diesel Exhaust Fluid Actual Dosing Quantity (High Range)	Actual dosing quantity of diesel exhaust fluid. See SPN 4331 if high range measurement is not needed.
6596	Aftertreatment 2 Diesel Exhaust Fluid Actual Dosing Quantity (High Range)	Actual dosing quantity of diesel exhaust fluid. See SPN 4384 if high range measurement is not needed.
6597	Network Connection 1	Indicates a controller has sensed an issue at its first network connection.
6598	Network Connection 2	Indicates a controller has sensed an issue at its second network connection.
6599	Network Connection 3	Indicates a controller has sensed an issue at its third network connection.
6600	Dampened CNG Temperature	The temperature of Compressed Natural Gas in the pressure damper.

6601	Hydraulically Driven Fuel Pump Hydraulic Flow Bypass Valve	Valve used to bypass all hydraulic pump flow back to the hydraulic reservoir effectively ensuring that none of the hydraulically driven pumps in the system are actuated and hydraulic system parasitic load is minimized
6606	Engine Fuel 2 Tank 1 Level Signal Conditioner	Signal conditioning electronic module which packages and broadcasts the fuel 2 level in Tank 1
6607	Engine Fuel 2 Tank 2 Level Signal Conditioner	Signal conditioning electronic module which packages and broadcasts the fuel 2 level in Tank 2
6608	Engine Fuel 2 Tank 3 Level Signal Conditioner	Signal conditioning electronic module which packages and broadcasts the fuel 2 level in Tank 3.
6609	Engine Fuel 2 Tank 4 Level Signal Conditioner	Signal conditioning electronic module which packages and broadcasts the fuel 2 level in Tank 4.
6610	Engine Fuel Vaporizer 1 Discharge Temperature	The temperature of the fuel in its gaseous state at the outlet of the first fuel vaporizer
6611	Engine Fuel Vaporizer 2 Discharge Temperature	The temperature of the fuel in its gaseous state at the outlet of the second fuel vaporizer
6612	Engine Fuel Vaporizer 3 Discharge Temperature	The temperature of the fuel in its gaseous state at the outlet of the third fuel vaporizer
6613	Engine Fuel Vaporizer 4 Discharge Temperature	The temperature of the fuel in its gaseous state at the outlet of the fourth fuel vaporizer
6614	Hydraulically Driven Fuel Pump 1 Hydraulic Circuit Flow Rate	Flow rate of hydraulic fluid going through hydraulically driven fuel pump 1

6615	Hydraulically Driven Fuel Pump 2 Hydraulic Circuit Flow Rate	Flow rate of hydraulic fluid going through hydraulically driven fuel pump 2.
6616	Hydraulically Driven Fuel Pump 3 Hydraulic Circuit Flow Rate	Flow rate of hydraulic fluid going through hydraulically driven fuel pump 3.
6617	Hydraulically Driven Fuel Pump 4 Hydraulic Circuit Flow Rate	Flow rate of hydraulic fluid going through hydraulically driven fuel pump 4
6618	Hydraulically Driven Fuel Pump 1 Hydraulic Work	Hydraulic work performed by hydraulically driven fuel pump 1
6619	Hydraulically Driven Fuel Pump 2 Hydraulic Work	Hydraulic work performed by hydraulically driven fuel pump 2.
6620	Hydraulically Driven Fuel Pump 3 Hydraulic Work	Hydraulic work performed by hydraulically driven fuel pump 3.
6621	Hydraulically Driven Fuel Pump 4 Hydraulic Work	Hydraulic work performed by hydraulically driven fuel pump 4.
6622	Hydraulically Driven Fuel Pump 1	Hydraulically-Driven Fuel Pump 1
6623	Hydraulically Driven Fuel Pump 2	Hydraulically Driven Fuel Pump 2
6624	Hydraulically Driven Fuel Pump 3	Hydraulically Driven Fuel Pump 3
6625	Hydraulically Driven Fuel Pump 4	Hydraulically Driven Fuel Pump 4
6626	Hydraulically Driven Fuel Pump 1 Compression Stroke Valve	Valve used to direct hydraulic flow such that the hydraulically driven fuel pump 1 performs a compression stroke.

6627	Hydraulically Driven Fuel Pump 2 Compression Stroke Valve	Valve used to direct hydraulic flow such that the hydraulically driven fuel pump 2 performs a compression stroke.
6628	Hydraulically Driven Fuel Pump 3 Compression Stroke Valve	Valve used to direct hydraulic flow such that the hydraulically driven fuel pump 3 performs a compression stroke.
6629	Hydraulically Driven Fuel Pump 4 Compression Stroke Valve	Valve used to direct hydraulic flow such that the hydraulically driven fuel pump 4 performs a compression stroke.
6630	LNG Vaporizer 1	Heat exchanger device which transforms Liquid Natural Gas into Compressed Natural Gas.
6631	LNG Vaporizer 2	Second heat exchanger device which transforms Liquid Natural Gas into Compressed Natural Gas.
6632	LNG Vaporizer 3	Third heat exchanger device which transforms Liquid Natural Gas into Compressed Natural Gas.
6633	LNG Vaporizer 4	Fourth heat exchanger device which transforms Liquid Natural Gas into Compressed Natural Gas.
6634	Hydraulically Driven Fuel Pump 1 Selection Valve	Valve used to direct or block hydraulic flow to hydraulically driven fuel pump 1 in a multi-pump system
6635	Hydraulically Driven Fuel Pump 2 Selection Valve	Valve used to direct or block hydraulic flow to hydraulically driven fuel pump 2 in a multi-pump system
6636	Hydraulically Driven Fuel Pump 3 Selection Valve	Valve used to direct or block hydraulic flow to hydraulically driven fuel pump 3 in a multi-pump system
6637	Hydraulically Driven Fuel Pump 4 Selection Valve	Valve used to direct or block hydraulic flow to hydraulically driven fuel pump 4 in a multi-pump system

6638	Gaseous Fuel Tank 2 High Pressure Shutoff Valve	The gaseous fuel shutoff valve located at the tank. This valve blocks the flow of fuel away from tank 2.
6639	Gaseous Fuel Tank 3 High Pressure Shutoff Valve	The gaseous fuel shutoff valve located at the tank. This valve blocks the flow of fuel away from tank 3.
6640	Gaseous Fuel Tank 4 High Pressure Shutoff Valve	The gaseous fuel shutoff valve located at the tank. This valve blocks the flow of fuel away from tank 4.
6641	Gaseous Fuel Leakage 1	Reports diagnosed leakage in the gaseous fuel delivery system.
6642	Engine Fuel 2 Tank 1 Level	Fuel level in tank 1 containing the second fuel type. .
6643	Engine Fuel 2 Tank 2 Level	Fuel level in tank 2 containing the second fuel type.
6644	Engine Fuel 2 Tank 3 Level	Fuel level in tank 3 containing the second fuel type.
6645	Engine Fuel 2 Tank 4 Level	Fuel level in tank 4 containing the second fuel type.
6646	Engine Gaseous Fuel Supply Pressure 1 (Extended Range)	Pressure of gaseous fuel supply to fuel metering device in systems where the pressure range defined for SPN 159 is not sufficient.
6647	Gaseous Fuel High Pressure Shutoff Valve 1	The gaseous fuel shutoff valve located before the gas pressure regulator. This valve isolates the engine from the gas supply by stopping the high pressure gas from entering the engine.
6648	Engine Dual Fuel Differential Rail Pressure	The rail pressure difference between the first fuel type and second fuel type in a dual fuel engine.
6649	Gaseous Fuel Injection Pulse Correction Factor	A correction to the gaseous fuel injection pulse (expressed in msec) represented as a percentage. 100% means no correction, higher values indicate increased pulse time, lower values indicate decreased pulse time.

6650	Engine Throttle Valve 1 Position 2	The position of the valve used to regulate the supply of a fluid, usually air or fuel/air mixture, to an engine. This position is measured by a second sensor.
6651	Engine Knock 2	Value of 2nd sensor used to detect engine knock
6652	Aftertreatment 1 Three Way Catalyst Conversion Efficiency	The aftertreatment 1 three way catalyst conversion efficiency percentage. The catalyst conversion efficiency number in itself does not imply emissions compliance or system function or system malfunction.
6653	Engine Fuel 1 Injector Metering Rail 1 Cold Start Pressure	This diagnostic SPN is for injector metering rail 1 pressure when the engine is operating in the engine cold start emissions reduction strategy (SPN 3061).
6654	Engine Fuel 1 Injector Metering Rail 2 Cold Start Pressure	This diagnostic SPN is for injector metering rail 2 pressure when the engine is operating in the engine cold start emissions reduction strategy (SPN 3061).
6655	Maintain ECU Power Lamp	This lamp is used to notify an operator when it is necessary to maintain power to the ECU.
6656	Engine Gaseous Fuel Valve Nominal Duration Command	Amount of time the gaseous fuel valves are activated. It's a nominal value used for all the gaseous fuel valves in the engine.Note: Please see SPNs 6658 – 6677 for duration command for each gaseous fuel valves
6657	Engine Gaseous Fuel Valve Nominal Start of Actuation Command	The angle, relative to the TDC of each cylinder, with 0 being the TDC before the power stroke commences, at the which gaseous fuel valves are activated to open. It's a nominal value used for all the gaseous fuel valves in the engine.Timings after TDC are referred with positive values and timings before TDC are referred with negative values. Note: Please see SPNs 6678 – 6697 for Start of injection command for each gaseous fuel valves
6658	Engine Gaseous Fuel Valve 1 Duration Command	Amount of time the gaseous fuel valve 1 is activated.

6659	Engine Gaseous Fuel Valve 2 Duration Command	Amount of time the gaseous fuel valve 2 is activated.
6660	Engine Gaseous Fuel Valve 3 Duration Command	Amount of time the gaseous fuel valve 3 is activated.
6661	Engine Gaseous Fuel Valve 4 Duration Command	Amount of time the gaseous fuel valve 4 is activated.
6662	Engine Gaseous Fuel Valve 5 Duration Command	Amount of time the gaseous fuel valve 5 is activated.
6663	Engine Gaseous Fuel Valve 6 Duration Command	Amount of time the gaseous fuel valve 6 is activated.
6664	Engine Gaseous Fuel Valve 7 Duration Command	Amount of time the gaseous fuel valve 7 is activated.
6665	Engine Gaseous Fuel Valve 8 Duration Command	Amount of time the gaseous fuel valve 8 is activated.
6666	Engine Gaseous Fuel Valve 9 Duration Command	Amount of time the gaseous fuel valve 9 is activated.
6667	Engine Gaseous Fuel Valve 10 Duration Command	Amount of time the gaseous fuel valve 10 is activated.
6668	Engine Gaseous Fuel Valve 11 Duration Command	Amount of time the gaseous fuel valve 11 is activated.
6669	Engine Gaseous Fuel Valve 12 Duration Command	Amount of time the gaseous fuel valve 12 is activated.

6670	Engine Gaseous Fuel Valve 13 Duration Command	Amount of time the gaseous fuel valve 13 is activated.
6671	Engine Gaseous Fuel Valve 14 Duration Command	Amount of time the gaseous fuel valve 14 is activated.
6672	Engine Gaseous Fuel Valve 15 Duration Command	Amount of time the gaseous fuel valve 15 is activated.
6673	Engine Gaseous Fuel Valve 16 Duration Command	Amount of time the gaseous fuel valve 16 is activated.
6674	Engine Gaseous Fuel Valve 17 Duration Command	Amount of time the gaseous fuel valve 17 is activated.
6675	Engine Gaseous Fuel Valve 18 Duration Command	Amount of time the gaseous fuel valve 18 is activated.
6676	Engine Gaseous Fuel Valve 19 Duration Command	Amount of time the gaseous fuel valve 19 is activated.
6677	Engine Gaseous Fuel Valve 20 Duration Command	Amount of time the gaseous fuel valve 20 is activated.
6678	Engine Gaseous Fuel Valve 1 Start of Actuation Command	The angle, relative to the TDC of cylinder 1, with 0 being the TDC before the power stroke commences, at the which gaseous fuel valve 1 is activated to open.Timings after TDC are referred with positive values and timings before TDC are referred with negative values. This is the timing for the secondary fuel injector. See SPN 1413 for the primary fuel injector timing.
6679	Engine Gaseous Fuel Valve 2 Start of Actuation Command	The angle, relative to the TDC of cylinder 2, with 0 being the TDC before the power stroke commences, at the which gaseous fuel valve 2 is activated to open.Timings after TDC are referred with positive values and timings before TDC are referred with

		negative values. This is the timing for the secondary fuel injector. See SPN 1414 for the primary fuel injector timing.
6680	Engine Gaseous Fuel Valve 3 Start of Actuation Command	The angle, relative to the TDC of cylinder 3, with 0 being the TDC before the power stroke commences, at the which gaseous fuel valve 3 is activated to open.Timings after TDC are referred with positive values and timings before TDC are referred with negative values. This is the timing for the secondary fuel injector. See SPN 1415 for the primary fuel injector timing.
6681	Engine Gaseous Fuel Valve 4 Start of Actuation Command	The angle, relative to the TDC of cylinder 4, with 0 being the TDC before the power stroke commences, at the which gaseous fuel valve 4 is activated to open.Timings after TDC are referred with positive values and timings before TDC are referred with negative values. This is the timing for the secondary fuel injector. See SPN 1416 for the primary fuel injector timing.
6682	Engine Gaseous Fuel Valve 5 Start of Actuation Command	The angle, relative to the TDC of cylinder 5, with 0 being the TDC before the power stroke commences, at the which gaseous fuel valve 5 is activated to open.Timings after TDC are referred with positive values and timings before TDC are referred with negative values. This is the timing for the secondary fuel injector. See SPN 1417 for the primary fuel injector timing.
6683	Engine Gaseous Fuel Valve 6 Start of Actuation Command	The angle, relative to the TDC of cylinder 6, with 0 being the TDC before the power stroke commences, at the which gaseous fuel valve 6 is activated to open.Timings after TDC are referred with positive values and timings before TDC are referred with negative values. This is the timing for the secondary fuel injector. See SPN 1418 for the primary fuel injector timing.
6684	Engine Gaseous Fuel Valve 7 Start of Actuation Command	The angle, relative to the TDC of cylinder 7, with 0 being the TDC before the power stroke commences, at the which gaseous fuel valve 7 is activated to open.Timings after TDC are referred with positive values and timings before TDC are referred with negative values. This is the timing for the secondary fuel injector. See SPN 1419 for the primary fuel injector timing.

6685	Engine Gaseous Fuel Valve 8 Start of Actuation Command	The angle, relative to the TDC of cylinder 8, with 0 being the TDC before the power stroke commences, at the which gaseous fuel valve 8 is activated to open.Timings after TDC are referred with positive values and timings before TDC are referred with negative values. This is the timing for the secondary fuel injector. See SPN 1420 for the primary fuel injector timing.
6686	Engine Gaseous Fuel Valve 9 Start of Actuation Command	The angle, relative to the TDC of cylinder 9, with 0 being the TDC before the power stroke commences, at the which gaseous fuel valve 9 is activated to open.Timings after TDC are referred with positive values and timings before TDC are referred with negative values. This is the timing for the secondary fuel injector. See SPN 1421 for the primary fuel injector timing.
6687	Engine Gaseous Fuel Valve 10 Start of Actuation Command	The angle, relative to the TDC of cylinder 10, with 0 being the TDC before the power stroke commences, at the which gaseous fuel valve 10 is activated to open.Timings after TDC are referred with positive values and timings before TDC are referred with negative values. This is the timing for the secondary fuel injector. See SPN 1422 for the primary fuel injector timing.
6688	Engine Gaseous Fuel Valve 11 Start of Actuation Command	The angle, relative to the TDC of cylinder 11, with 0 being the TDC before the power stroke commences, at the which gaseous fuel valve 11 is activated to open.Timings after TDC are referred with positive values and timings before TDC are referred with negative values. This is the timing for the secondary fuel injector. See SPN 1423 for the primary fuel injector timing.
6689	Engine Gaseous Fuel Valve 12 Start of Actuation Command	The angle, relative to the TDC of cylinder 12, with 0 being the TDC before the power stroke commences, at the which gaseous fuel valve 12 is activated to open.Timings after TDC are referred with positive values and timings before TDC are referred with negative values. This is the timing for the secondary fuel injector. See SPN 1424 for the primary fuel injector timing.
6690	Engine Gaseous Fuel Valve 13 Start of Actuation Command	The angle, relative to the TDC of cylinder 13, with 0 being the TDC before the power stroke commences, at the which gaseous fuel valve 13 is activated to open.Timings after TDC are referred with positive values and timings before TDC are referred with

		negative values. This is the timing for the secondary fuel injector. See SPN 1425 for the primary fuel injector timing.
6691	Engine Gaseous Fuel Valve 14 Start of Actuation Command	The angle, relative to the TDC of cylinder 14, with 0 being the TDC before the power stroke commences, at the which gaseous fuel valve 14 is activated to open.Timings after TDC are referred with positive values and timings before TDC are referred with negative values. This is the timing for the secondary fuel injector. See SPN 1426 for the primary fuel injector timing.
6692	Engine Gaseous Fuel Valve 15 Start of Actuation Command	The angle, relative to the TDC of cylinder 15, with 0 being the TDC before the power stroke commences, at the which gaseous fuel valve 15 is activated to open.Timings after TDC are referred with positive values and timings before TDC are referred with negative values. This is the timing for the secondary fuel injector. See SPN 1427 for the primary fuel injector timing.
6693	Engine Gaseous Fuel Valve 16 Start of Actuation Command	The angle, relative to the TDC of cylinder 16, with 0 being the TDC before the power stroke commences, at the which gaseous fuel valve 16 is activated to open.Timings after TDC are referred with positive values and timings before TDC are referred with negative values. This is the timing for the secondary fuel injector. See SPN 1428 for the primary fuel injector timing.
6694	Engine Gaseous Fuel Valve 17 Start of Actuation Command	The angle, relative to the TDC of cylinder 17, with 0 being the TDC before the power stroke commences, at the which gaseous fuel valve 17 is activated to open.Timings after TDC are referred with positive values and timings before TDC are referred with negative values. This is the timing for the secondary fuel injector. See SPN 1429 for the primary fuel injector timing.
6695	Engine Gaseous Fuel Valve 18 Start of Actuation Command	The angle, relative to the TDC of cylinder 18, with 0 being the TDC before the power stroke commences, at the which gaseous fuel valve 18 is activated to open.Timings after TDC are referred with positive values and timings before TDC are referred with negative values. This is the timing for the secondary fuel injector. See SPN 1420 for the primary fuel injector timing.

6696	Engine Gaseous Fuel Valve 19 Start of Actuation Command	The angle, relative to the TDC of cylinder 19, with 0 being the TDC before the power stroke commences, at the which gaseous fuel valve 19 is activated to open.Timings after TDC are referred with positive values and timings before TDC are referred with negative values. This is the timing for the secondary fuel injector. See SPN 1431 for the primary fuel injector timing.
6697	Engine Gaseous Fuel Valve 20 Start of Actuation Command	The angle, relative to the TDC of cylinder 20, with 0 being the TDC before the power stroke commences, at the which gaseous fuel valve 20 is activated to open.Timings after TDC are referred with positive values and timings before TDC are referred with negative values. This is the timing for the secondary fuel injector. See SPN 1432 for the primary fuel injector timing.
6698	Engine Fuel Supply Pump Temperature	Temperature of the engine fuel supply pump. See Figure SPN16_A and Figure SPN16_B.
6699	Product Identification Code	See document ISO 11783-12 for SPN details.
6700	Product Identification Brand	See document ISO 11783-12 for SPN details.
6701	Product Identification Model	See document ISO 11783-12 for SPN details.
6702	Fire Apparatus Okay To Pump Interlock	The measured state of the Okay To Pump interlock of the fire apparatus. 00b = Okay to Pump Interlock Inactive 01b = Okay to Pump Interlock Active 10b = Error 11b = Not Available Note: « Okay to Pump » is incorporated into the NFPA 1901 Standard for Fire Appartus. It is a required indicator.
6703	Hydraulic Pressure Governor Increase Switch	Switch that commands hydraulic pressure governor to increase engine rpm resulting in expected increase of hydraulic discharge pressure.00b = Increase Switch Inactive 01b = Increase Switch Active 10b = Error 11b = Not available
6704	Hydraulic Pressure Governor Decrease Switch	Switch that commands hydraulic pressure governor to decrease engine rpm resulting in expected decrease of hydraulic discharge pressure.00b = Decrease Switch Inactive 01b = Decrease Switch Active 10b = Error 11b = Not available

6705	Hydraulic Pressure Governor Idle Switch	Switch that commands hydraulic pressure governor to decrease engine rpm to its idle position. 00b = Idle Switch Inactive 01b = Idle Switch Active 10b = Error 11b = Not available
6706	Hydraulic Pressure Governor Preset Switch	Switch that commands hydraulic pressure governor to increase or decrease engine rpm to achieve a predefined discharge pressure.00b = Preset Switch Inactive 01b = Preset Switch Active 10b = Error 11b = Not available
6707	Hydraulic Intake Pressure	Hydraulic pressure measured at the intake of the hydraulic pump.
6708	Hydraulic Discharge Pressure Set Point	Hydraulic pressure governing system discharge pressure set point.
6709	Engine Speed High Lamp Command	Command signal directly controlling the Engine Speed High Warning lamp. 00b = Lamp Off 01b = Lamp On 10b = Reserved 11b = Not available
6710	Engine Speed Very High Lamp Command	Command signal directly controlling the Engine Speed Very High Warning lamp. 00b = Lamp Off 01b = Lamp On 10b = Reserved 11b = Not available
6711	Engine Speed High Lamp Data	This parameter provides measured data from the Engine Speed High Warning Lamp. 00b = Lamp Deactivated (Off) 01b = Lamp Activated (On) 10b = Error 11b = Not available
6712	Engine Speed Very High Lamp Data	This parameter provides measured data from the Engine Speed Very High Warning Lamp. 00b = Lamp Deactivated (Off) 01b = Lamp Activated (On) 10b = Error 11b = Not available
6713	Engine Variable Geometry Turbocharger Actuator Software Identification	Software identification of the variable geometry turbocharger actuator
6714	ECU Hardware ID	The ECU Hardware ID provides information to identify a specific ECU hardware version. As an example, on a CAN network, this parameter can be used to uniquely

		identify the hardware version that is relevant for the interface of the ECU to the CAN network. On the ISO11783 network, this parameter is used to associate the hardware version of the ECU to a conformance test report of that hardware. The ASCII character “*” shall not be used in the ECU Hardware ID because it is used as a parameter delimiter in the parameter group. The ASCII character « # » is reserved as a field delimiter within the ECU Hardware ID parameter.
6715	Engine Gaseous Fuel Supply Desired Pressure	Desired gage pressure of gaseous fuel supply to the engine.
6716	Engine Fuel Filter (Suction Side) Degradation	The estimated percentage relative to the useful life of the engine fuel filter on the suction side which is located betwee the fuel tank and the fuel supply pump.Note: This is not a calculation of the physical restriction of the filter. 0% is typical of a new filter. 100% is typical of an end of life filter, the filter should be replaced. The filter can operate past 100%.
6717	Transmission Driveline Engaged Circuit	The circuit that communicates the ‘Driveline Engaged’ status via an analog signal, such as a switch feedback circuit. This analog signal would likely provide the information available on SPN 560, Transmission Driveline Engaged
6718	Load Share Active Circuit	The circuit that communicates the ‘Load Share Active’ status via an analog signal, such as a digital output signal from the ECU. This analog signal would likely provide the information available on SPN 6794 for Engine Load Share Status.
6719	Engine Fuel Injection Pump 1 Fuel Control Valve Command	The control command to fuel control valve in fuel pump 1, normalized to percent, where 0% represents fully closed and 100% represents fully open.
6720	Engine Fuel Injection Pump 2 Fuel Control Valve Command	The control command to fuel control valve in fuel pump 2, normalized to percent, where 0% represents fully closed and 100% represents fully open.
6721	Engine Fuel Injection Pump 2 Fuel Control Valve	Fuel control valve in fuel pump 2.

6722	Transmission 2 Forward Solenoid Valve	An actuator which, when energized, will drive the machine or some component thereof forward. See also SPN 741.
6723	Transmission 2 Reverse Solenoid Valve	An actuator which, when energized, will drive the machine or some component thereof backwards. See also SPN 4216.
6724	Vibration Actuator 1	First actuator for vibrating operation, such as on a vibrating compaction machine.
6725	Vibration Actuator 2	Second actuator for enabling vibrating operation, such as on a vibrating compaction machine.
6726	Vibration Actuator 3	Third actuator for enabling vibrating operation, such as on a vibrating compaction machine.
6727	Vibration Actuator 4	Fourth actuator for enabling vibrating operation, such as on a vibrating compaction machine.
6728	Vibration Sensor 1	The first sensor for reporting a condition of vibration action, such as frequency on a vibrating compaction machine
6729	Vibration Sensor 2	The second sensor for reporting a condition of vibration action, such as frequency on a vibrating compaction machine
6730	Engine Fan 2 Requested Percent Speed	Fan speed of the second fan in the system as a ratio of the actual fan drive (current speed) to the fully engaged fan drive (maximum fan speed). A two state fan (off/on) will use 0% and 100% respectively. A three state fan (off/intermediate/on) will use 0%, 50% and 100% respectively. A variable speed fan will use 0% to 100%. Multiple fan systems will use 0 to 100% to indicate the percent cooling capacity being provided. Feedback to this request is provided using the Estimated Percent Fan 2 Speed (see SPN 1550).Note that the intermediate fan speed of a three state fan will vary with different fan drives, therefore 50% is being used to indicate that the intermediate speed is required from the fan drive. Typically, the first fan in a system

		will be the fan closest to the radiator. The second fan will be located farthest from the radiator. SPN 986 shall be used for systems that have only one fan.
6731	Joystick 1 Button 13 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
6732	Joystick 1 Button 14 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
6733	Joystick 1 Button 15 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
6734	Joystick 1 Button 16 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
6735	Joystick 2 Button 13 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
6736	Joystick 2 Button 14 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
6737	Joystick 2 Button 15 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
6738	Joystick 2 Button 16 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
6739	Joystick 3 Button 13 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
6740	Joystick 3 Button 14 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available

6741	Joystick 3 Button 15 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
6742	Joystick 3 Button 16 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
6743	Joystick 4 Button 13 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
6744	Joystick 4 Button 14 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
6745	Joystick 4 Button 15 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
6746	Joystick 4 Button 16 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
6747	Joystick 5 Button 13 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
6748	Joystick 5 Button 14 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
6749	Joystick 5 Button 15 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
6750	Joystick 5 Button 16 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
6751	Joystick 6 Button 13 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available

6752	Joystick 6 Button 14 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
6753	Joystick 6 Button 15 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
6754	Joystick 6 Button 16 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
6755	Joystick 7 Button 13 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
6756	Joystick 7 Button 14 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
6757	Joystick 7 Button 15 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
6758	Joystick 7 Button 16 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
6759	Joystick 8 Button 13 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
6760	Joystick 8 Button 14 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
6761	Joystick 8 Button 15 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
6762	Joystick 8 Button 16 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available

6763	Joystick 9 Button 13 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
6764	Joystick 9 Button 14 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
6765	Joystick 9 Button 15 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
6766	Joystick 9 Button 16 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
6767	Joystick 10 Button 13 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
6768	Joystick 10 Button 14 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
6769	Joystick 10 Button 15 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
6770	Joystick 10 Button 16 Pressed Status	Reports when the joystick button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error Indicator 11b = Not Available
6771	Aftertreatment 1 Particulate Sensor Resistance	This sensor is located in the exhaust stream somewhere after the DPF, but not necessarily immediately after the DPF. It provides a resistance value that can be used to determine particulate matter in the exhaust stream. The value in this parameter is compensated to be the resistance at 200 degC.
6772	Aftertreatment 1 Particulate Sensor Heater State	The states of the particulate sensor heater. The heater will change states from 11b to 10b, 10b to 01b, and 01b to 00b in a typical heating event.00b = Heater is in closed loop control 01b = Heater is being held at a specified level 10b = Heater is in ramp up mode 11b = Heater is off

6773	Aftertreatment 1 Particulate Sensor Regeneration Status	The status of the most recent attempt of this power cycle to activate the particulate sensor regeneration process. This will not be updated until the regeneration is no longer active, as indicated by SPN 6774.Power cycle refers to the time that power has currently been applied to the ECU controlling the particulate sensor. 00b = Regeneration has not completed during this power cycle 01b = Regeneration was successful 10b = Regeneration failed 11b = Not available
6774	Aftertreatment 1 Particulate Sensor Regeneration State	Indicates if the particulate sensor regeneration is currently active, and if so, the reason for the regeneration.0000b = Regeneration is not active 0001b = Regneration is active and has been initiated by request via SPN 6783 0010b = Regeneration is active and has been initiated because of sensor conditions 0011b = Regeneration is active and has been initiated due to time based conditions 0100b to 1110b = SAE Reserved 1111b = Not Available When the regeneration is no longer active, SPN 6773 will be updated to reflect the status of the regeneration.
6775	Aftertreatment 1 Particulate Sensor Active Accumulation Time	This is the amount of time since the last successful regeneration completed. The sensor has been accumulating particulate matter since that time.
6776	Aftertreatment 1 Particulate Sensor Time Between Regenerations	This is the time between the last two successful regenerations of the particulate sensor for the current power cycle. This parameter reflects the time when the engine was running, not a duration based on a real time clock. If two successful particulate sensor regenerations have not ever occurred on this sensor during this power cycle, then this value shall be 0.
6777	Aftertreatment 1 Particulate Sensor Detection Status	Detection status of the particulate sensor 0000b = Initialization for particulate matter detection 0001b = Waiting for dew point (see SPN 6784) 0010b = Particulate matter detection 0011b = Heater is active for particulate sensor regeneration 0100b = Cooling after particulate sensor regeneration 0101b = Heater diagnostics test 0110b = Relearning particulate sensor resistance after particulate sensor regeneration 0111b = Sensor regeneration did not complete due to system parameters out of range (e.g., exhaust temperature out of range). Regeneration will restart once the values of the appropriate system parameters are conducive to regeneration. 1000b = Halt particulate matter detection. An irrecoverable fault likely occurred. Will remain in

		this state until a manual fault clear or a new power cycle has started. 1001b to 1110b = SAE Reserved 1111b = Not supported Power Cycle refers to the time that power has currently been applied to the ECU controlling the particulate sensor.
6778	Aftertreatment 1 Particulate Sensor Power Supply	State signal which indicates when the Aftertreatment 1 particulate sensor has power applied to it. Note that this is referring to the power supplied to the sensor, not the power supplied to the controller connected to the sensor.00b = Off 01b = On 10b = Error 11b = Unavailable
6779	Aftertreatment 1 Particulate Sensor Regeneration Failed Count	This is the number of times that the particulate sensor regeneration process has been attempted but failed to complete this power cycle.
6780	Aftertreatment 1 Particulate Sensor Temperature	Temperature of the particulate sensor.
6781	Aftertreatment 1 Particulate Sensor Maximum Resistance	This is the maximum resistance that the particulate sensor can measure.
6782	Aftertreatment 1 Particulate Sensor Shutdown Request	Aftertreatment 1 particulate sensor shutdown request. 00b = Shutdown request not active 01b = Shutdown request active 10b = SAE reserved 11b = Not available
6783	Aftertreatment 1 Particulate Sensor Regeneration Request	Another ECU would send this to request that the particulate sensor perform a regeneration of the sensor. A request would be considered active when this parameter transitions from 00b to 01b.00b = Regeneration not requested 01b = Regeneration requested 10b = SAE reserved 11b = Not available
6784	Aftertreatment 1 Particulate Sensor Dewpoint	Indicates that the temperature near the particulate sensor has exceeded the dew point. 00b = Dewpoint has not been reached 01b = Dewpoint has been reached 10b = SAE reserved 11b = Not available
6785	Aftertreatment 1 Particulate Sensor Exhaust Temperature	This is the temperature in the exhaust stream that is closest to the particulate sensor. This could be a calculated value or read from another sensor. The ECU transmitting this message to the particulate sensor controller will be aware of the temperature

		sensor that is closest to the particulate sensor, whereas the particulate sensor may not be aware of the location.
6787	LNG Tank 1 Vapor Pressure	Gage pressure of the vapor in the first tank in a multi-tank system (or unique tank if single-tank system).
6788	LNG Tank 2 Vapor Pressure	Gage pressure of the vapor in the second tank in a multi-tank system.
6789	LNG Tank 3 Vapor Pressure	Measures the vapor pressure of the third tank in a multi-tank system.
6790	LNG Tank 4 Vapor Pressure	Measures the vapor pressure of the fourth tank in a multi-tank system
6791	Engine Dual Fuel Mode	Actual dual fuel mode, off or on. 00b = Actual dual fuel mode off 01b = Actual dual fuel mode on 10b = Reserved 11b = Not available
6792	Engine Dual Fuel Mode Command	Request to enable dual fuel mode. 00b = De-activate dual fuel mode 01b = Activate dual fuel mode 10b = Reserved 11b = Not available
6793	Engine Unload Status	This signal indicates the status of an external request to unload the engine, such as the external unload request switch.00b = Not Requested 01b = Requested 10b = Error 11b = Not Available
6794	Engine Load Share Status	This signal indicates that the status of an engine load sharing feature. 0000b = Offline 0001b = Master 0010b = Slave 0011b = Loading 0100b = Unloading 0101b to 1101b = Reserved 1110b = Error 1111b = Unavailable
6795	Transmission 2 Shift Solenoid Valve	Provides proportional control of transmission synchronizer engagement on a second transmission. See also SPN 4217.Note: The modulation solenoid/valve unit provides a means for modulating hydraulic pressure applied in moving shift rails. This allows fine control of synchronization to be achieved.

6796	Engine Torque Curve Selection Command	This parameter will allow selection of a torque curve that is higher than the base curve. 0 = Indicates that this parameter is not presently requesting a different torque curve be used 1 = Indicates that Torque Curve 1 is selected 2 = Indicates that Torque Curve 2 is selected 3 to 13 = Indicates that Torque Curve 3 through 13 is selected 14 = SAE reserved 15 = Not supported
6797	Aftertreatment 1 SCR Intake Absolute Pressure	Used to read the pressure at the catalyst intake of the selective catalytic reduction system of aftertreatment 1.
6798	Aftertreatment 2 SCR Intake Absolute Pressure	Used to read the pressure at the catalyst intake of the selective catalytic reduction system of aftertreatment 2.
6799	Engine Fan Blade Pitch	The blade pitch of the primary engine cooling fan.
6800	Aftertreatment Derate Request	Indicates that the aftertreatment control system is requesting the engine control system to derate.
6801	Aftertreatment 2 SCR System	Indicates non-specific failures of the SCR system in exhaust bank 2, such as high temperature across the device.
6802	Aftertreatment 1 Diesel Exhaust Fluid Dosing System Frozen	All or part of the diesel exhaust fluid system (DEF tank, DEF supply lines, DEF pump, and DEF doser, etc.) in bank 1 is frozen.In situations where it is desired to report the DEF system frozen as a faulted condition, FMI 31 can be used with this SPN in diagnostic messages. A value of 01b for this parameter does not necessarily mean that a faulted condition exists. But if this SPN is included in a DTC to report a faulted condition, such as the system is frozen and can’t be thawed, then this parameter would be expected to be 01b. 00b = DEF system is not frozen 01b = DEF system is frozen 10b = Error 11b = Not available
6803	Aftertreatment 2 Diesel Exhaust Fluid Dosing System Frozen	All or part of the diesel exhaust fluid system (DEF tank, DEF supply lines, DEF pump, and DEF doser, etc.) in bank 2 is frozen.In situations where it is desired to report the DEF system frozen as a faulted condition, FMI 31 can be used with this SPN in diagnostic messages. A value of 01b for this parameter does not necessarily

		mean that a faulted condition exists. But if this SPN is included in a DTC to report a faulted condition, such as the system is frozen and can't be thawed, then this parameter would be expected to be 01b. 00b = DEF system is not frozen 01b = DEF system is frozen 10b = Error 11b = Not available
6805	Engine Protection Speed Derate	Engine speed has been derated for protection of the engine
6806	ECU 1 Interface Mismatch	Indicates that the data link interface version between ECUs is mismatched.
6807	Engine Desired Torque Request	This is the torque that the ECM desires to provide. It is a request made from the ECM to an external system. A valid value within the operating range indicates the engine is requesting an external controller to change the operation of the system so the engine can achieve a specific torque. This will most likely be accomplished by managing the load to the engine, but it is not limited to this method. A value of FBh indicates that the parameter is supported but there is no specific torque being requested by the engine.This parameter is in indicated torque as a percent of the reference engine torque. See PGN 65251 for the engine configuration message. Any change in torque as a result of this parameter would be reflected in SPN 513. In the event that an ECM transmits a valid value within the operating range for this parameter and a non-zero value for SPN 3644 at the same time, then the receiving controller should honor SPN 3644 and ignore this parameter.
6808	Maximum Vehicle Speed Limit (High Resolution)	Maximum vehicle velocity allowed. See SPN 74 for an alternate resolution.
6809	Cruise Control Set Speed (High Resolution)	Value of set (chosen) velocity of velocity control system. See SPN 86 for an alternate resolution. If an algorithm that can modify the cruise control set point exists in the system, such as Predictive Cruise Control or Adaptive Cruise Control, then Cruise Control Set Speed (SPN 6809) will not include the speed adjustment made by that algorithm. For the parameter that includes the adjustment, see Cruise Control Speed (SPN 7319) for the final speed used by the cruise control algorithm.

6810	Hybrid System OBD Related DTC Status	Signal from hybrid system indicating the status of OBD related DTCs 00b = Hybrid System does not have an active OBD related DTC 01b = Hybrid System has an active OBD related DTC 10b = SAE Reserved 11b = Not available See « SPN 6810 » in the supporting documentation tab for a description of the « Concept of Operation ».
6811	Engine Turbocharger 2 Lube Oil Pressure	Gage pressure of oil in the lubrication system for the 2nd turbocharger.
6812	Engine Turbocharger 3 Lube Oil Pressure	Gage pressure of oil in the lubrication system for the 3rd turbocharger.
6813	Engine Turbocharger 4 Lube Oil Pressure	Gage pressure of oil in the lubrication system for the 4th turbocharger.
6814	Engine Gaseous Fuel Vent Pressure	Gaseous fuel pressure through a vent pipe.
6815	Gaseous Fuel Accumulator Temperature	Gaseous fuel temperature at the outlet of the Gas Filter.
6816	Engine Fuel Return Pressure	Used to read fuel (or gas) pressure passing through the return line.
6817	Diesel Exhaust Fluid Tank 1 Empty Time	Indicates the time the Diesel Exhaust Fluid Tank 1 Level is indicated as empty. This will accumulate over the life of the product and will never be reset.
6818	Diesel Exhaust Fluid Quality Malfunction Time	Indicates the amount of time an error has been active due to detection of low Diesel Exhaust Fluid Quality. This will accumulate over the life of the product and will never be reset.
6819	Aftertreatment SCR Malfunction Time	Indicates the amount of time an error condition has been active due to a malfunction in the Aftertreatment SCR system.The source of the malfunction condition could be a component failure, detection of tampering, or other reason that prevents normal operation. This will accumulate over the life of the product and will never be reset. Although frozen DEF may prevent the Aftertreatment SCR system from operating

		normally, frozen DEF is not considered a malfunction for the purpose of this parameter. Refer to SPN 7938 for DEF frozen time.
6820	Switch Indication Illumination Brightness Percent	Commanded switch indication illumination brightness level for all operator control switches. This is separate from the cab display illumination Brightness Percent parameter.Note: If a single device is used to control both the indication brightness level of the cab display and switches, see SPN 1487. For switch backlight control, see SPN 5532.
6821	ADR Compliant Heater Installation	Indicates that the heater is installed in an ADR compliant vehicle. 00b = Heater installation is not ADR compliant 01b = Heater installation is ADR compliant 10b = Error 11b = Not Available Note: ADR is a European agreement concerning the international carriage of dangerous goods. developed by UN-ECE.
6822	ECU High Side Driver 1	Indicates that the broadcasting ECU has an issue with its 1st instance of an assignable or configurable high side driver. This generic diagnostic SPN should only be used if an applicable and more function-specific high side driver diagnostic SPN does not exist.
6823	ECU High Side Driver 2	Indicates that the broadcasting ECU has an issue with its 2nd instance of an assignable or configurable high side driver. This generic diagnostic SPN should only be used if an applicable and more function-specific high side driver diagnostic SPN does not exist.
6824	ECU High Side Driver 3	Indicates that the broadcasting ECU has an issue with its 3rd instance of an assignable or configurable high side driver. This generic diagnostic SPN should only be used if an applicable and more function-specific high side driver diagnostic SPN does not exist.
6825	ECU High Side Driver 4	Indicates that the broadcasting ECU has an issue with its 4th instance of an assignable or configurable high side driver. This generic diagnostic SPN should only be used if an applicable and more function-specific high side driver diagnostic SPN does not exist.

6826	ECU High Side Driver 5	Indicates that the broadcasting ECU has an issue with its 5th instance of an assignable or configurable high side driver. This generic diagnostic SPN should only be used if an applicable and more function-specific high side driver diagnostic SPN does not exist.
6827	ECU High Side Driver 6	Indicates that the broadcasting ECU has an issue with its 6th instance of an assignable or configurable high side driver. This generic diagnostic SPN should only be used if an applicable and more function-specific high side driver diagnostic SPN does not exist.
6828	Transmission Pressure Switch 10	Indicates an issue with the 10th transmission pressure switch.
6829	Aftertreatment 1 Particulate Sensor Exhaust Velocity	Velocity of the exhaust gas near the particulate sensor.
6830	Engine Main Bearing 12 Temperature	Temperature of the main bearing which supports the crankshaft of the engine.
6831	Engine Air Start Pressure (Extended Range)	Gage pressure of air in an engine starting system that utilizes compressed air to provide the force required to rotate the crankshaft.See SPN 82 for higher resolution.
6832	Engine Air Stop Pressure	Gage pressure of air in an engine stopping system that utilizes compressed air to provide the force required to stop the crankshaft. Engine stopping air is typically used for emergency engine stopping.
6833	Engine Gaseous Fuel Usage Inhibited	Used to request that the engine should not be allowed to use gaseous fuel for engine cylinder combustion. This state is relevant for dual fuel systems and would be used when conditions are detected that make it unsafe or not appropriate to use gaseous fuel at that time.00b = Gaseous Fuel Usage Not Inhibited 01b = Gaseous Fuel Usage Inhibited 10b = Error 11b = Not available
6834	Gaseous Fuel Leakage 1 Concentration	Percentage of detected gaseous fuel leak compared to the lower explosion limit (LEL). 100% means the measured value is on the lower explosion limit. 0% means no

		detected gaseous fuel in measurement point. The measurement point is typically in the engine crankcase.
6835	Gaseous Fuel Leakage 2 Concentration	Percentage of detected gaseous fuel leak compared to the lower explosion limit (LEL). 100% means the measured value is on the lower explosion limit. 0% means no detected gaseous fuel in measurement point. The second measurement point is either another location in the engine crankcase or a separate leak detection point outside the engine.
6836	Gaseous Fuel Leakage 3 Concentration	Percentage of detected gaseous fuel leak compared to the lower explosion limit (LEL). 100% means the measured value is on the lower explosion limit. 0% means no detected gaseous fuel in measurement point. The third measurement point is in a separate leak detection point outside the engine.
6837	Gas Leakage Detection 1 Pressure	Pressure measured in gas leakage detection point 1. Measured media is of the gas, meaning it could be air, inert gas, fuel air mixture or charge air mixture, depending on the failure mode detected. The measurement point is typically in the engine crankcase.
6838	Gas Leakage Detection 2 Pressure	Pressure measured in gas leakage detection point 2. Measured media is of the gas, meaning it could be air, inert gas, fuel air mixture or charge air mixture, depending on the failure mode detected. The second measurement point is either another location in the engine crankcase or a separate leak detection point outside the engine.
6839	Gas Leakage Detection 3 Pressure	Pressure measured in gas leakage detection point 3. Measured media is of the gas, meaning it could be air, inert gas, fuel air mixture or charge air mixture, depending on the failure mode detected. The third measurement point is in a separate leak detection point outside the engine.
6840	Bin Lift Count	Increments with each lift, whether or not net bin weight changes. The count rolls over at data range limit. The count can be reset using SPN 6898 in PGN 56832.
6841	Net Bin Weight	Mass of bin contents at most recent unload

6842	Bin Weighing Error Status	Bin weighing error status 0 = No error 1 = Bad lift cycle 2 = Weighing error: bin lifted, not emptied 3 = Weighing error: empty bin lifted, emptied 4 to 14 = Reserved 15 = Not available / not applicable
6843	Lift Axle 1 Status	Indicates the status of a tag axle 1. Numbering of lift/tag axles starts at front axle. SPN 1743 may be used if less detail is acceptable.000b = Down (tag axle is laden) 001b = Unloading (load is being transferred from the tag axle) 010b = Lifting (tag axle is moving up) 011b = Up (tag axle is up and stationary) 100b = Lowering (tag axle is moving down) 101b = Loading (load is being transferred to the tag axle) 110b = Error 111b = Not available
6844	Lift Axle 2 Status	Indicates the status of a tag axle 2. Numbering of lift/tag axles starts at front axle. SPN 1822 may be used if less detail is acceptable.000b = Down (tag axle is laden) 001b = Unloading (load is being transferred from the tag axle) 010b = Lifting (tag axle is moving up) 011b = Up (tag axle is up and stationary) 100b = Lowering (tag axle is moving down) 101b = Loading (load is being transferred to the tag axle) 110b = Error 111b = Not available
6845	Bin Instance	Gives the instance of the bin on the vehicle whose parameters are transmitted in the remainder of the PGN, with the first or only bin as instance 1.
6846	Display Remain Powered	Indicates the ECU needs the display (i.e. monitor device) to continue to remain powered after ignition key off. An ECU would use this when the ECU needs the display to remain powered after key off so the ECU can communicate to the operator while the ECU is performing certain activities after key off, such as an aftertreatment regeneration.Functionally, the display would remain powered after key off if it receives the ‘Remain Powered’ status prior to the key off event and would continue to remain powered after key off while it continues to receive this parameter with the ‘Remain Powered’ status or it stops receiving this parameter from the ECU. The ‘Remain Powered’ state indicates the ECU needs the monitor to remain powered after key off. The ‘OK to Shutoff’ state indicates the ECU does not need the monitor to stay powered after key off. 00b = OK to Shutoff 01b = Remain Powered 10b = Reserved 11b = Don’t care

6847	Haul Cycle Count	A counter incremented by 1 with each instance of a new haul cycle, defined as a dump to dump cycle. The counter shall increment from 0 to 64255, rolling over to 0 on the next increment after 64255.
6848	Haul Mode Status	The current operating state of the haul cycle. 0000b = Not in Haul Mode 0001b = Loading — Payload is being added to the machine 0010b = Approaching Loaded — Machine is near its maximum capacity 0011b = Loaded — Loading operation has been completed 0100b = Unloading — Payload is being removed from the machine 0101b = Unloaded — Machine is empty 0111b to 1011b = Reserved for Future Assignment by SAE 1110b = Error 1111b = Not Available
6849	Delivered Payload Weight	The delivered payload mass during the last haul cycle. This is the amount of material moved and delivered by a machine is a key work cycle parameter.Delivered payload weight is defined as the last loaded weight less the carry back weight (material left in the machine after unloading).
6850	Delivered Payload Confidence	The level of confidence of the delivered payload weight measurement. Higher confidence values indicate greater probability the delivered payload weight is the actual weight and providing feedback on the potential for improving system accuracy.
6851	Payload Weight	The current payload weight carried by the machine.
6852	Payload Weight Confidence	The level of confidence of the real time payload weight measurement (SPN 6851). Higher confidence values indicate greater probability the real time payload weight is the actual weight and providing feedback on the potential for improving system accuracy.
6853	Payload Carry Back Weight	The payload weight left on the machine after the last payload dump event.
6854	Payload Capacity Percentage	The current equipment payload plus the weight of any after-factory modifications reported as a percentage of the equipment’s maximum payload capacity. The equipment’s maximum payload capacity is the maximum capacity of the equipment before the added weight of any after-factory modifications.This differs from Payload

		Percentage (SPN 2600) as SPN 2600 is the current equipment payload reported as a percentage of the rated payload limit (i.e. payload reduced for added weight of any after-factory modification). 0% = factory clean unloaded weight, 100% = fully loaded.
6855	Payload Weight Sensor 1 Status	Status of the payload system sensor 1 measurement. 00b = Sensor fully functional 01b = Sensor degraded 10b = Error (Sensor failed) 11b = Not available
6856	Payload Weight Sensor 2 Status	Status of the payload system sensor 2 measurement. 00b = Sensor fully functional 01b = Sensor degraded 10b = Error (Sensor failed) 11b = Not available
6857	Payload Weight Sensor 3 Status	Status of the payload system sensor 3 measurement. 00b = Sensor fully functional 01b = Sensor degraded 10b = Error (Sensor failed) 11b = Not available
6858	Payload Weight Sensor 4 Status	Status of the payload system sensor 4 measurement. 00b = Sensor fully functional 01b = Sensor degraded 10b = Error (Sensor failed) 11b = Not available
6859	Payload Weight Sensor 5 Status	Status of the payload system sensor 5 measurement. 00b = Sensor fully functional 01b = Sensor degraded 10b = Error (Sensor failed) 11b = Not available
6860	Payload Weight Sensor 6 Status	Status of the payload system sensor 6 measurement. 00b = Sensor fully functional 01b = Sensor degraded 10b = Error (Sensor failed) 11b = Not available
6861	Payload Weight Sensor 7 Status	Status of the payload system sensor 7 measurement. 00b = Sensor fully functional 01b = Sensor degraded 10b = Error (Sensor failed) 11b = Not available
6862	Payload Weight Sensor 8 Status	Status of the payload system sensor 8 measurement. 00b = Sensor fully functional 01b = Sensor degraded 10b = Error (Sensor failed) 11b = Not available
6863	Payload Weight 1	Used in the measurement of the vehicle payload weight.
6864	Payload Weight 2	Used in the measurement of the vehicle payload weight.

6865	Payload Weight 3	Used in the measurement of the vehicle payload weight.
6866	Payload Weight 4	Used in the measurement of the vehicle payload weight.
6867	Payload Weight 5	Used in the measurement of the vehicle payload weight.
6868	Payload Weight 6	Used in the measurement of the vehicle payload weight.
6869	Payload Weight 7	Used in the measurement of the vehicle payload weight.
6870	Payload Weight 8	Used in the measurement of the vehicle payload weight.
6871	Payload Calibration Set Point Command	Specifies the current payload point being calibrated. The data specified in the 'Payload Calibration Commanded Weight' SPN (SPN 6872) or 'Payload Correction Factor Command' SPN (SPN 6873) shall be used for calibrating this specified payload point. When used with the 'Payload Calibration Commanded Weight' SPN (SPN 6872), it is possible to calibrate multiple points of the Payload Measurement system by loading the machine with up to 10 known calibration loads. When used with the Payload Correction Factor Command' SPN (SPN 6873), it is possible to adjust the calibrations for multiple points of the Payload Measurement system by specifying the system gain.Multipoint calibration of the Payload Measurement system is perfomed by loading the machine with up to 10 known calibration loads. For each calibration load the Payload Calibration Information Command PGN is sent with Payload Calibration Set Point Command SPN identifying the calibration point and the Payload Calibration Commanded Weight SPN holding the value of the load. Zero Point is used for empty which also sets the empty tare offset. End point identifies the last point. 0000b = Zero Point 0001b = Calibration Reference Point 1 0010b = Calibration Reference Point 2 0011b = Calibration Reference Point 3 0100b = Calibration Reference Point 4 0101b = Calibration Reference Point 5 0110b = Calibration Reference Point 6 0111b = Calibration Reference Point 7 1000b = Calibration Reference Point 8 1001b = Calibration Reference Point 9 1010b = End Point 1011b = Correction Point 1100b = Reset Calibration 1101b = Reserved 1110b = Error 1111b = Not Available

6872	Payload Calibration Commanded Weight	The true known mass of real load weight applicable for the calibration point specified in SPN 6871 and used for calibrating Payload system.Multipoint calibration of the Payload Measurement system is perfomed by loading the machine with up to 10 known calibration loads. For each calibration load the Payload Calibration Information Command PGN is sent with Payload Calibration Set Point Command SPN identifying the calibration point and the Payload Calibration Commanded Weight SPN holding the value of the load.
6873	Payload Correction Factor Command	The payload correction factor is used to fine tune the sensor gain value. Correction factor calibration of the Payload Measurement system is performed through a Payload Calibration Set Point SPN value of Correction Point and the Payload Correction Factor SPN value set to modify the current gain of the system by the required amount in %.
6874	Performance Bias Selection	Indicates the operating bias toward performance of the power source. 0% Functionality is biased toward fuel economy as much as possible. 50% Functionality is biased toward neither fuel economy or performance. 100% Functionality is biased toward performance as much as possible. For values between 0% and 50%, functionality is biased toward fuel economy, with values closer to 0% indicating more bias toward fuel economy. For values between 50% and 100%, functionality is biased toward performance, with values closer to 100% indicating more bias toward performance.
6875	Aftertreatment 1 Diesel Exhaust Fluid Doser Pressure	The SCR dosing diesel exhaust fluid gage pressure (measured closest to dosing valve) for aftertreatment system 1 (exhaust bank 1). This is the gage equivalent to SPN 4334.
6876	Aftertreatment 2 Diesel Exhaust Fluid Doser Pressure	The SCR dosing diesel exhaust fluid gage pressure (measured closest to dosing valve) for aftertreatment system 2 (exhaust bank 2). This is the gage equivalent to SPN 4387.
6877	SCR Operator Inducement Override Enable	Indicates if an operator inducement derate is allowed to be overridden. Note: Inducement override is only allowed under certain conditions approved by

		EPA/ARB. 00b = Override not allowed 01b = Override allowed 10b = SAE Reserved 11b = Not available
6878	SCR Operator Inducement Override Time Remaining	This parameter is used to indicate the time remaining during an operator inducement override event. See also SPN 7344 for an alternate SLOT.When an operator inducement is not active, this parameter indicates the maximum time that an operator inducement may be overridden. When an operator inducement is active this parameter indicates the remaining time that the currently active operator inducement may be overridden. See EU Commission directive 2012/46/EU. Appendix 1 Section 5.5 for more information.
6879	Number of SCR Operator Inducement Override Events Remaining	During an operator inducement event, the operator may be able to override the inducement multiple times. This parameter indicates the remaining number of times that the currently active inducement can be overridden during an operator inducement event. When this number has decremented to 0, then the operator can no longer override the current operator inducement event.This value will reset to the maximum number of allowed overrides once the inducement event is no longer active. This parameter shall never increment when an operator inducement is active. See EU Commission directive 2012/46/EU. Appendix 1 Section 5.5 for more information.
6880	Total Number of SCR Operator Inducement Override Events	Indicates total number of operator inducement override events activated throughout the lifetime of engine operation.This number will remain at the maximum value once it is reached. See EU Commission directive 2012/46/EU. Appendix 1 Section 5.5 for more information.
6881	SCR Operator Inducement Override Switch	The position of the operator inducement override switch. This switch function allows the operator to override an operator inducement derate.See EU Commission directive 2012/46/EU. Appendix 1 Section 5.5 for more information. 00b = Off 01b = On 10b = Error 11b = Not available
6882	Aftertreatment DOC Temperature Sensor Module	Module will take temperature sensor inputs from the Aftertreatment DOC Temperature Sensors and multiplex the sensor values to the engine ECU via the J1939 network.

6884	Engine Cold Ambient Elevated Idle Status	Indicates that the engine is elevating the idle speed due to cold strategies. 00b = No Idle Elevation Active – standard idle speed 01b = Idle Elevation Active 10b = Reserved for SAE assignment 11b = Unavailable
6885	Engine Fuel Valve 2 Differential Pressure	The differential pressure between the intake and the outlet of the second gaseous fuel valve.
6886	Engine Gaseous Fuel Supply Pressure Regulator	The fuel pressure regulator which regulates the pressure of gaseous fuel supply to the engine.
6887	Engine Turbocharger Wastegate Actuator 3 Temperature	Temperature of the Engine Turbocharger Wastegate Actuator 3 drive circuitry. Temperature excursions may affect the torque output.
6888	Engine Turbocharger Wastegate Actuator 4 Temperature	Temperature of the Engine Turbocharger Wastegate Actuator 4 drive circuitry. Temperature excursions may affect the torque output.
6889	Engine Turbocharger Wastegate Actuator 1 Power Supply	Power supply for engine turbocharger wastegate actuator 1.
6890	Engine Turbocharger Wastegate Actuator 2 Power Supply	Power supply for engine turbocharger wastegate actuator 2.
6891	Engine Turbocharger Wastegate Actuator 3 Power Supply	Power supply for engine turbocharger wastegate actuator 3.
6892	Engine Turbocharger Wastegate Actuator 4 Power Supply	Power supply for engine turbocharger wastegate actuator 4.
6893	PEMS Engine Fuel Mass Flow Rate	PEMS Engine Fuel Mass Flow Rate shall indicate the amount of fuel consumed by the engine per unit of time (does not include fuel injected directly into the aftertreatment system, but does include fuel injected into the engine cylinders for the purpose of being used in the aftertreatment system), in grams per second.PEMS Engine Fuel Mass Flow Rate shall be calculated as the sum of the fuel consumed over

		the last one second prior to the time when PEMS Engine Fuel Mass Flow Rate is updated. NOTE: PEMS Engine Fuel Mass Flow Rate shall indicate zero g/s when the engine is not running.
6894	Vehicle Fuel Rate	Vehicle Fuel Rate shall indicate the amount of fuel consumed by the engine and fuel injected directly into the aftertreatment system per unit of time, in grams per second.Vehicle Fuel Rate shall be calculated as the sum of the fuel consumed over the last 1 second prior to the time when Vehicle Fuel Rate is updated. NOTE: Vehicle Fuel Rate shall indicate zero g/s when the engine is not running.
6895	Engine Exhaust Flow Rate	Engine Exhaust Flow Rate shall indicate the measured/calculated exhaust gas mass flow upstream of the aftertreatment system.Engine Exhaust Flow Rate shall be calculated as the average exhaust flow rate over the last 1000 milliseconds prior to the time when Engine Exhaust Flow Rate is updated, multiplied by 3600 in order to convert the units from seconds to hours. NOTE: Engine Exhaust Flow Rate shall indicate zero kg/h when the engine is not running. See SPN 7852 for alternative range.
6896	Engine Fueling Inhibit Request Count	A signal issued by the engine control system indicating the number of devices from which the engine control system has received a « fueling not desired » request. Requests included in this count are either from an external device via SPN 5793 Desired Engine Fueling State equal to « 00b – Fueling not desired » or from internal logic within the engine control system acting similar to an external request.Multiple engine internal requests are counted as a single device (the engine control system itself). Internal requests reflected in this parameter are limited to those with the intent of temporarily suspending engine operation. Permanent shutdown intent, for example from the key switch or engine protection logic, is not reflected in this signal. Operating states where the engine control system suspends fueling without the intent for temporary shutdown (i.e. motoring above minimum idle speed) are also not reflected in this signal. 0000b to 1010b = Number of active fueling inhibit requests 1011b = More than 10 active fueling inhibit requests 1100b to 1110b = SAE Reserved 1111b = Not available

6897	Engine Fueling Desired Request Count	A signal issued by the engine control system indicating the number of devices from which the engine control system has received a « fueling desired » request. Requests included in this count are either from an external device via SPN 5793 Desired Engine Fueling State equal to « 01b – Fueling desired » or from internal logic within the engine control system acting similar to an external request.Multiple engine internal requests are counted as a single device (the engine control system itself). Internal requests reflected in this parameter are limited to those with the intent of preventing temporary suspension of engine operation. Engine internal « fueling desired » requests that lead to the engine broadcasting SPN 5795 Engine Fueling Inhibit Allowed equal to « 00b – Engine currently will not stop fueling in response to SPN 5793 Desired Engine Fueling State », with reason given in SPN 5866 Engine Fueling Inhibit Prevented Reason and/or SPN 8145 Engine Fueling Inhibit Prevented Reason Extension are not reflected in this parameter. 0000b to 1010b = Number of active fueling inhibit requests 1011b = More than 10 active fueling inhibit requests 1100b to 1110b = SAE Reserved 1111b = Not available
6898	Bin Lift Count Reset	Used to reset the bin lift count as reported in PGN 64594. 00b = Do not reset 01b = Reset 10b = Reserved 11b = Take no action
6899	Vehicle Acceleration Rate Limit Lamp Command	Command signal directly controlling the Vehicle Acceleration Rate Limit Lamp. 00b = Lamp Off 01b = Lamp On 10b = Reserved 11b = Not available NOTE: SPN 2979 is the original parameter used to provide vehicle acceleration rate limit status. This parameter is intended for vehicle systems in which there is a lamp controller/arbitrator that requires direct lamp control (typically to an instrument cluster). The effects of emission control limits, such as engine exhaust smoke control, are specifically excluded; they are not considered to be part of a function to limit vehicle acceleration.
6900	Vehicle Acceleration Rate Limit Lamp Data	This parameter provides measured data from the Vehicle Acceleration Rate Limit Lamp. 00b = Lamp deactivated (Off) 01b = Lamp activated (On) 10b = Error 11b = Not available

6901	Transmission Ratio Forward Range 11	The transmission's gear ratio in 11th forward range. Intended to identify conditions related to gear ratio checks (e.g. clutch slip) when 11th forward range is expected.
6902	Transmission Ratio Forward Range 12	The transmission's gear ratio in 12th forward range. Intended to identify conditions related to gear ratio checks (e.g. clutch slip) when 12th forward range is expected.
6903	Transmission Ratio Forward Range 13	The transmission's gear ratio in 13th forward range. Intended to identify conditions related to gear ratio checks (e.g. clutch slip) when 13th forward range is expected.
6904	Transmission Ratio Forward Range 14	The transmission's gear ratio in 14th forward range. Intended to identify conditions related to gear ratio checks (e.g. clutch slip) when 14th forward range is expected.
6905	Transmission Ratio Forward Range 15	The transmission's gear ratio in 15th forward range. Intended to identify conditions related to gear ratio checks (e.g. clutch slip) when 15th forward range is expected.
6906	Transmission Ratio Forward Range 16	The transmission's gear ratio in 16th forward range. Intended to identify conditions related to gear ratio checks (e.g. clutch slip) when 16th forward range is expected.
6907	Transmission Ratio Reverse Range 3	The transmission's gear ratio in 3rd reverse range. Intended to identify conditions related to gear ratio checks (i.e. clutch slip) when 3rd reverse range is expected.
6908	Transmission Ratio Reverse Range 4	The transmission's gear ratio in 4th reverse range. Intended to identify conditions related to gear ratio checks (i.e. clutch slip) when 4th reverse range is expected.
6909	Transmission Ratio Reverse Range 5	The transmission's gear ratio in 5th reverse range. Intended to identify conditions related to gear ratio checks (i.e. clutch slip) when 5th reverse range is expected.
6910	Transmission Ratio Reverse Range 6	The transmission's gear ratio in 6th reverse range. Intended to identify conditions related to gear ratio checks (i.e. clutch slip) when 6th reverse range is expected.
6911	Transmission Internal Component 1 Speed	Rotational velocity of transmission internal component #1, such as shaft, ring or carrier. It could be used for clutch slip detection.

6912	Transmission Internal Component 2 Speed	Rotational velocity of transmission internal component #2, such as shaft, ring or carrier. It could be used for clutch slip detection.
6913	Transmission Internal Component 3 Speed	Rotational velocity of transmission internal component #3, such as shaft, ring or carrier. It could be used for clutch slip detection.
6914	Soft Top Speed Limit Remaining Continuous Interval Distance	Indicates the remaining distance that the vehicle can continuously travel at the Soft Top Speed Limit. This parameter will decrement while the Soft Top Speed Limit Active (SPN 6370) is 1 and will reset to its maximum allowed value when the Soft Top Speed Limit Active (SPN 6370) changes from inactive to active.
6915	SCR System Cleaning Lamp Command	Command to control the SCR system cleaning lamp. 000b = Off 001b = On – solid 010b = reserved for SAE assignment 011b = reserved for SAE assignment 100b = On – fast blink (1 HZ) 101b = reserved for SAE assignment 110b = reserved for SAE assignment 111b = not available This SPN would be « off » when SCR system cleaning lamp is unlit. The « on – solid » should indicate that the SCR system needs to be cleaned at the lowest level of urgency and that operator intervention is required. The flashing state indicates a more severe condition requiring SCR system cleaning. This SPN shall not be used to convey information regarding operator switch feedback from SPNs 3695 and 3696.
6916	SCR System Cleaning Status	Indicates the state of SCR system cleaning. This is an aggregate of bank 1 and bank 2. It is a system status and not individual bank status.00b = not active 01b = active 10b = SCR system cleaning is needed – automatically initiated SCR system cleaning imminent 11b = not available
6917	SCR System Cleaning Inhibited Status	Indicates the state of SCR system cleaning inhibition. 00b = not inhibited 01b = inhibited 10b = reserved for SAE assignment 11b = not available This SPN indicates the reason for the SCR system cleaning event not being initiated or being exited prior to completion. When this state becomes active, the system will not initiate an SCR system cleaning or will exit SCR system cleaning. If the reason for inhibiting is not covered by SPNs 6918 thru 6932, a request for a status parameter should be

		submitted to the SAE Truck and Bus J1939 Request Processing Group to have the reason added.
6918	SCR System Cleaning Inhibited Due to Inhibit Switch	Indicates the state of SCR system cleaning inhibition due to the SCR system cleaning Inhibit Switch. 00b = not inhibited 01b = inhibited 10b = reserved for SAE assignment 11b = not available This SPN indicates the reason for the SCR system cleaning event not being initiated or being exited prior to completion. When this state becomes active, the system will not initiate an SCR system cleaning event or it will exit an SCR system cleaning event. The state provides information that may be provided to the driver/service technician as to why the SCR system cleaning event did not initiate or was exited.
6919	SCR System Cleaning Inhibited Due to Clutch Disengaged	Indicates the state of SCR system cleaning event inhibition due to the clutch being disengaged. 00b = not inhibited 01b = inhibited 10b = reserved for SAE assignment 11b = not available This SPN indicates the reason for the SCR system cleaning event not being initiated or being exited prior to completion. When this state becomes active, the system will not initiate an SCR system cleaning event or it will exit an SCR system cleaning event. The state provides information that may be provided to the driver/service technician as to why the SCR system cleaning event did not initiate or was exited.
6920	SCR System Cleaning Inhibited Due to Service Brake Active	Indicates the state of SCR system cleaning inhibition due to the service brake being active. 00b = not inhibited 01b = inhibited 10b = reserved for SAE assignment 11b = not available This SPN indicates the reason for the SCR system cleaning event not being initiated or being exited prior to completion. When this state becomes active, the system will not initiate an SCR system cleaning event or it will exit an SCR system cleaning event. The state provides information that may be provided to the driver/service technician as to why the SCR system cleaning event did not initiate or was exited.
6921	SCR System Cleaning Inhibited Due to PTO Active	Indicates the state of SCR system cleaning inhibition due to the PTO being active. 00b = not inhibited 01b = inhibited 10b = reserved for SAE assignment 11b = not available This SPN indicates the reason for the SCR system cleaning event not being

		initiated or being exited prior to completion. When this state becomes active, the system will not initiate an SCR system cleaning event or it will exit an SCR system cleaning event. The state provides information that may be provided to the driver/service technician as to why the SCR system cleaning event did not initiate or was exited.
6922	SCR System Cleaning Inhibited Due to Accelerator Pedal Off Idle	Indicates the state of SCR system cleaning inhibition due to the accelerator pedal being off idle. 00b = not inhibited 01b = inhibited 10b = reserved for SAE assignment 11b = not available This SPN indicates the reason for the SCR system cleaning event not being initiated or being exited prior to completion. When this state becomes active, the system will not initiate an SCR system cleaning event or it will exit an SCR system cleaning event. The state provides information that may be provided to the driver/service technician as to why the SCR system cleaning event did not initiate or was exited.
6923	SCR System Cleaning Inhibited Due to Out of Neutral	Indicates the state of SCR system cleaning inhibition due to the accelerator pedal being out of neutral. 00b = not inhibited 01b = inhibited 10b = reserved for SAE assignment 11b = not available This SPN indicates the reason for the SCR system cleaning event not being initiated or being exited prior to completion. When this state becomes active, the system will not initiate an SCR system cleaning event or it will exit an SCR system cleaning event. The state provides information that may be provided to the driver/service technician as to why the SCR system cleaning event did not initiate or was exited.
6924	SCR System Cleaning Inhibited Due to Vehicle Speed Above Allowed Speed	Indicates the state of SCR system cleaning inhibition due to the vehicle speed being above an allowed limit. 00b = not inhibited 01b = inhibited 10b = reserved for SAE assignment 11b = not available This SPN indicates the reason for the SCR system cleaning event not being initiated or being exited prior to completion. When this state becomes active, the system will not initiate an SCR system cleaning event or it will exit an SCR system cleaning event. The state provides information that may be provided to the driver/service technician as to why the SCR system cleaning event did not initiate or was exited.

6925	SCR System Cleaning Inhibited Due to Parking Brake Not Set	Indicates the state of SCR system cleaning inhibition due to the parking brake being not set. 00b = not inhibited 01b = inhibited 10b = reserved for SAE assignment 11b = not available This SPN indicates the reason for the SCR system cleaning event not being initiated or being exited prior to completion. When this state becomes active, the system will not initiate an SCR system cleaning event or it will exit an SCR system cleaning event. The state provides information that may be provided to the driver/service technician as to why the SCR system cleaning event did not initiate or was exited.
6926	SCR System Cleaning Inhibited Due to Low Exhaust Temperature	Indicates the state of SCR system cleaning inhibition due to the exhaust temperature being too low. This implies that the SCR system is too cold for cleaning.00b = not inhibited 01b = inhibited 10b = reserved for SAE assignment 11b = not available This SPN indicates the reason for the SCR system cleaning event not being initiated or being exited prior to completion. When this state becomes active, the system will not initiate an SCR system cleaning event or it will exit an SCR system cleaning event. The state provides information that may be provided to the driver/service technician as to why the SCR system cleaning event did not initiate or was exited.
6927	SCR System Cleaning Inhibited Due to System Fault Active	Indicates the state of SCR system cleaning inhibition due to a system fault being active. 00b = not inhibited 01b = inhibited 10b = reserved for SAE assignment 11b = not available This SPN indicates the reason for the SCR system cleaning event not being initiated or being exited prior to completion. When this state becomes active, the system will not initiate an SCR system cleaning event or it will exit an SCR system cleaning event. The state provides information that may be provided to the driver/service technician as to why the SCR system cleaning event did not initiate or was exited.
6928	SCR System Cleaning Inhibited Due to System Timeout	Indicates the state of SCR system cleaning inhibition due to a system timeout. 00b = not inhibited 01b = inhibited 10b = reserved for SAE assignment 11b = not available This SPN indicates the reason for the SCR system cleaning event not being initiated or being exited prior to completion. When this state becomes active, the system will not initiate an SCR system cleaning event or it will exit an SCR system cleaning

		event. The state provides information that may be provided to the driver/service technician as to why the SCR system cleaning event did not initiate or was exited.
6929	SCR System Cleaning Inhibited Due to Temporary System Lockout	Indicates the state of SCR system cleaning inhibition due to a temporary system lockout. 00b = not inhibited 01b = inhibited 10b = reserved for SAE assignment 11b = not available This SPN indicates the reason for the SCR system cleaning event not being initiated or being exited prior to completion. When this state becomes active, the system will not initiate an SCR system cleaning event or it will exit an SCR system cleaning event. The state provides information that may be provided to the driver/service technician as to why the SCR system cleaning event did not initiate or was exited.
6930	SCR System Cleaning Inhibited Due to Permanent System Lockout	Indicates the state of SCR system cleaning inhibition due to a permanent system lockout. 00b = not inhibited 01b = inhibited 10b = reserved for SAE assignment 11b = not available This SPN indicates the reason for the SCR system cleaning event not being initiated or being exited prior to completion. When this state becomes active, the system will not initiate an SCR system cleaning event or it will exit an SCR system cleaning event. The state provides information that may be provided to the driver/service technician as to why the SCR system cleaning event did not initiate or was exited.
6931	SCR System Cleaning Inhibited Due to Engine Not Warmed Up	Indicates the state of SCR system cleaning inhibition due to the engine not being warmed up. 00b = not inhibited 01b = inhibited 10b = reserved for SAE assignment 11b = not available This SPN indicates the reason for the SCR system cleaning event not being initiated or being exited prior to completion. When this state becomes active, the system will not initiate an SCR system cleaning event or it will exit an SCR system cleaning event. The state provides information that may be provided to the driver/service technician as to why the SCR system cleaning event did not initiate or was exited.
6932	SCR System Cleaning Inhibited Due to Vehicle Speed Below Allowed Speed	Indicates the state of SCR system cleaning inhibition due to the vehicle speed being less than the allowed vehicle speed.00b = not inhibited 01b = inhibited 10b = reserved for SAE assignment 11b = not available This SPN indicates the reason for

		the SCR system cleaning event not being initiated or being exited prior to completion. When this state becomes active, the system will not initiate an SCR system cleaning event or it will exit an SCR system cleaning event. The state provides information that may be provided to the driver/service technician as to why the SCR system cleaning event did not initiate or was exited.
6933	SCR System Cleaning Automatic Initiation Configuration	Indicates the configuration of SCR system cleaning automatic initiation. 00b = not enabled 01b = enabled 10b = reserved for SAE assignment 11b = not available
6934	SCR System Cleaning Forced Status	Indicates the forced execution status of SCR system cleaning. 000b = Not Active 001b = Active – Forced by Switch (See SPN 3696) 010b = Active – Forced by Service Tool 011b = Reserved for SAE Assignment 100b = Reserved for SAE Assignment 101b = Reserved for SAE Assignment 110b = Reserved for SAE Assignment 111b = not available This SPN indicates the forced execution status of SCR system cleaning. The SPN would be « Not Active » when the execution of SCR system cleaning has not been forced. Either of the states « Active – Forced by Switch » and « Active – Forced by Service Tool » will be active when execution of SCR system cleaning is forced, providing feedback as to which entity forced the execution of SCR system cleaning.
6935	Aftertreatment 1 SCR System Total Cleaning Time	Total amount of time that a cleaning event has been active in the SCR system in bank 1 over the lifetime of the device.
6936	Aftertreatment 1 SCR System Total Number of System Cleaning Events	Total number of cleaning events that have occurred on the SCR system in bank 1 over the lifetime of the device.
6937	Aftertreatment 1 SCR System Total Number of System Cleaning Inhibit Requests	Total number of cleaning inhibit requests on the SCR system in bank 1 by the operator over the lifetime of the device.
6938	Aftertreatment 1 SCR System Total Number of System Cleaning Manual Requests	Total number of manual cleaning requests on the SCR system in bank 1 by the operator over the lifetime of the device.

6939	Aftertreatment 1 SCR System Average Time Between System Cleaning Events	Indicates the average time since last reset between cleaning events for the SCR system in bank 1. If the manufacturer allows this parameter to be reset, this time is the average since last reset.
6940	Aftertreatment 1 SCR System Average Distance Between System Cleaning Events	Indicates the average distance since last reset between cleaning events for the SCR system in bank 1. If the manufacturer allows this parameter to be reset, this distance is the average since last reset.
6941	Aftertreatment 1 SCR System Time Since Last System Cleaning Event	Indicates the time since the last cleaning event of the SCR system in bank 1.
6942	Aftertreatment 2 SCR System Total System Cleaning Time	Total amount of time that a cleaning event has been active in the SCR system in bank 2 over the lifetime of the device.
6943	Aftertreatment 2 SCR System Total Number of System Cleaning Events	Total number of cleaning events that have occurred on the SCR system in bank 2 over the lifetime of the device.
6944	Aftertreatment 2 SCR System Total Number of System Cleaning Inhibit Requests	Total number of cleaning inhibit requests on the SCR system in bank 2 by the operator over the lifetime of the device.
6945	Aftertreatment 2 SCR System Total Number of System Cleaning Manual Requests	Total number of manual cleaning requests on the SCR system in bank 2 by the operator over the lifetime of the device.
6946	Aftertreatment 2 SCR System Average Time Between System Cleaning Events	Indicates the average time since last reset between cleaning events for the SCR system in bank 2. If the manufacturer allows this parameter to be reset, this time is the average since last reset.
6947	Aftertreatment 2 SCR System Average Distance Between System Cleaning Events	Indicates the average distance since last reset between cleaning events for the SCR system in bank 2. If the manufacturer allows this parameter to be reset, this distance is the average since last reset.

6948	Aftertreatment 2 SCR System Time Since Last System Cleaning Event	Indicates the time since the last cleaning event of the SCR system in bank 2.
6949	Number of Axles on the Vehicle	The number of axles monitored for tire parameters. A maximum of 12 axles is defined.
6950	Number of Tires on the Vehicle	The total number of tires monitored for tire parameters. A maximum of 250 tires is defined.
6951	Axle 1 Monitored Tire Count	The number of tires on Axle 1 which are monitored by the tire monitor controller. The axle number increments from front to rear of the vehicle when facing the vehicle in the forward vehicle travel orientation. If the axle is not monitored by the tire monitor controller, then 'Not Available' value (Fh) should be reported.
6952	Axle 2 Monitored Tire Count	The number of tires on Axle 2 which are monitored by the tire monitor controller. The axle number increments from front to rear of the vehicle when facing the vehicle in the forward vehicle travel orientation. If the axle is not monitored by the tire monitor controller, then 'Not Available' value (Fh) should be reported.
6953	Axle 3 Monitored Tire Count	The number of tires on Axle 3 which are monitored by the tire monitor controller. The axle number increments from front to rear of the vehicle when facing the vehicle in the forward vehicle travel orientation. If the axle is not monitored by the tire monitor controller, then 'Not Available' value (Fh) should be reported.
6954	Axle 4 Monitored Tire Count	The number of tires on Axle 4 which are monitored by the tire monitor controller. The axle number increments from front to rear of the vehicle when facing the vehicle in the forward vehicle travel orientation. If the axle is not monitored by the tire monitor controller, then 'Not Available' value (Fh) should be reported.
6955	Axle 5 Monitored Tire Count	The number of tires on Axle 5 which are monitored by the tire monitor controller. The axle number increments from front to rear of the vehicle when facing the vehicle in the forward vehicle travel orientation. If the axle is not monitored by the tire monitor controller, then 'Not Available' value (Fh) should be reported.

6956	Axle 6 Monitored Tire Count	The number of tires on Axle 6 which are monitored by the tire monitor controller. The axle number increments from front to rear of the vehicle when facing the vehicle in the forward vehicle travel orientation. If the axle is not monitored by the tire monitor controller, then 'Not Available' value (Fh) should be reported.
6957	Axle 7 Monitored Tire Count	The number of tires on Axle 7 which are monitored by the tire monitor controller. The axle number increments from front to rear of the vehicle when facing the vehicle in the forward vehicle travel orientation. If the axle is not monitored by the tire monitor controller, then 'Not Available' value (Fh) should be reported.
6958	Axle 8 Monitored Tire Count	The number of tires on Axle 8 which are monitored by the tire monitor controller. The axle number increments from front to rear of the vehicle when facing the vehicle in the forward vehicle travel orientation. If the axle is not monitored by the tire monitor controller, then 'Not Available' value (Fh) should be reported.
6959	Axle 9 Monitored Tire Count	The number of tires on Axle 9 which are monitored by the tire monitor controller. The axle number increments from front to rear of the vehicle when facing the vehicle in the forward vehicle travel orientation. If the axle is not monitored by the tire monitor controller, then 'Not Available' value (Fh) should be reported.
6960	Axle 10 Monitored Tire Count	The number of tires on Axle 10 which are monitored by the tire monitor controller. The axle number increments from front to rear of the vehicle when facing the vehicle in the forward vehicle travel orientation. If the axle is not monitored by the tire monitor controller, then 'Not Available' value (Fh) should be reported.
6961	Axle 11 Monitored Tire Count	The number of tires on Axle 11 which are monitored by the tire monitor controller. The axle number increments from front to rear of the vehicle when facing the vehicle in the forward vehicle travel orientation. If the axle is not monitored by the tire monitor controller, then 'Not Available' value (Fh) should be reported.
6962	Axle 12 Monitored Tire Count	The number of tires on Axle 12 which are monitored by the tire monitor controller. The axle number increments from front to rear of the vehicle when facing the vehicle

		in the forward vehicle travel orientation. If the axle is not monitored by the tire monitor controller, then ‘Not Available’ value (Fh) should be reported.
6963	Number of Tire Sensors	Total count of monitored tire sensor identification numbers represented in this instance of the parameter group.
6964	Tire Number	The number of the monitored tire that corresponds with the Tire Sensor Identification Number (SPN 6966). In order to specify the monitored tire by location, use the Tire Location SPN 6965.The value FFh indicates this SPN is not used.
6965	Tire Location	The location of monitored tire that corresponds with the Tire Sensor Identification Number (SPN 6966). In order to specify the monitored tire by tire number, use the Tire Number SPN 6964.The high order 4 bits indicate the vehicle axle position of the tire sensor, counting front to back on the vehicle, with the value 0 representing the front axle on the vehicle. The low order 4 bits indicate the position of the tire sensor along the axle, counting left to right when facing in the direction of normal vehicle travel (forward), with the value 0 representing the left most tire sensor position on the axle. The value FFh indicates not available. It is recommended that output devices add 1 to the position number (range 1 to 15, not 0 to 14) for use by drivers and service technicians. Examples: Tire location of 00h indicates the Tire is the left front tire. Tire location of 23h indicates the Tire is on the 3rd axle, 4th tire from the left.
6966	Tire Sensor Identification Number	The identification number of the tire specified in the tire number (SPN 6964) or tire location (SPN 6965).
6967	Total Number of Antennas Used	Total count of antennas used in the specified vehicle system.
6968	Antenna Number	Number of the antenna used to communicate signal strength of a group of sensors. If a single antenna is used this will default to 01h. When multiple antennas are used, the first antenna will have a value of 1, 2nd antenna will be 2, 3rd antenna will be 3 and so on. Antenna location is not identified in this SPN.When multiple antennas are used on the same vehicle, the antenna number will increment to show the signal strength of specific sensors with respect to the referenced antenna.

6969	Total Number of Tire Sensors Monitored	Total number of tire sensors monitored for the specified antenna in this instance of the parameter group.
6970	Tire Sensor Number	The number of the monitored tire sensor that corresponds with the tire wireless signal strength indicator. The location of the numbered tire is reported in the tire sensor location SPN (SPN 6965). The value FFh indicates this SPN is not used.
6971	Tire Location	The location of monitored tire on the vehicle. The high order 4 bits indicate the vehicle axle position of the tire sensor, counting front to back on the vehicle, with the value 0 representing the front axle on the vehicle. The low order 4 bits indicate the position of the tire sensor along the axle, counting left to right when facing in the direction of normal vehicle travel (forward), with the value 0 representing the left most tire sensor position on the axle. The value FFh indicates not available. It is recommended that output devices add 1 to the position number (range 1 to 15, not 0 to 14) for use by drivers and service technicians. Examples: Tire Sensor 1 location of 00h indicates Tire Sensor 1 is the left front tire sensor. Tire 1 Sensor Location of 23h indicates Tire Sensor 1 is on the 3rd axle, 4th tire from the left.
6972	Tire Wireless Signal Strength Indicator	The wireless signal strength between the tire pressure sensor and the specified antenna, for the tire specified in the tire sensor number or tire sensor Location.
6973	Tire Location	The location of monitored tire on the vehicle. The high order 4 bits indicate the vehicle axle position of the tire, counting front to back on the vehicle, with the value 0 representing the front axle on the vehicle. If the upper 4 bits have a value of 0 to 13 it implies axle position, however 14 (Eh) would mean use these settings (other SPNs in tire configuration command information) for all axles. The low order 4 bits indicate the position of the tire along the axle, counting left to right when facing in the direction of normal vehicle travel (forward), with the value 0 representing the left most tire position on the axle. If the lower 4 bits have a value of 0 to 13 it implies tire position along the axle, however 14 (Eh) would mean use these settings (other SPNs in tire configuration command information) for all tires on the specified axle. The value EEh indicates configure all tires identically on all axles. The value FFh indicates unavailable. It is recommended that output devices add 1 to the position

		number (range 1 to 15, not 0 to 14) for use by drivers and service technicians. Examples: Tire 1 location of 00h indicates Tire 1 is the left front tire. Tire 1 Location of 23h indicates Tire 1 is on the 3rd axle, 4th tire from the left.
6974	Cold Inflation Pressure Setting	Configurable value of the cold inflation pressure of the tire. Cold inflation pressure is the default/reference inflation pressure suggested by the manufacturer for a specific tire.
6975	Under Pressure Percentage Threshold Setting	Configurable percent deviation from the set cold inflation pressure, for the under tire pressure alert.
6976	Extreme Under Pressure Percentage Threshold Setting	Configurable percent deviation from the set cold inflation pressure, for the extreme under tire pressure alert.
6977	Over Pressure Percentage Threshold Setting	Configurable percentage deviation from the set cold inflation pressure, for the over tire pressure alert.
6978	Over Temperature Setting	Configurable constant temperature above which an over temperature alert will trigger.
6979	Tire Location	The location of monitored tire on the vehicle. The high order 4 bits indicate the vehicle axle position of the tire sensor, counting front to back on the vehicle, with the value 0 representing the front axle on the vehicle. The low order 4 bits indicate the position of the tire sensor along the axle, counting left to right when facing in the direction of normal vehicle travel (forward), with the value 0 representing the left most tire sensor position on the axle. The value FFh indicates not available. It is recommended that output devices add 1 to the position number (range 1 to 15, not 0 to 14) for use by drivers and service technicians. Examples: Tire Sensor 1 location of 00h indicates Tire Sensor 1 is the left front tire sensor. Tire 1 Sensor Location of 23h indicates Tire Sensor 1 is on the 3rd axle, 4th tire from the left.
6980	Cold Inflation Pressure	The cold inflation pressure of the tire. Cold inflation pressure is the default/reference inflation pressure suggested by the manufacturer for a specific tire.

6981	Under Pressure Percentage Threshold	The percentage deviation from the set cold inflation pressure, for the under tire pressure alert.
6982	Extreme Under Pressure Percentage Threshold	The percentage deviation from the set cold inflation pressure, for the extreme under tire pressure alert.
6983	Over Pressure Percentage Threshold	The percentage deviation from the set cold inflation pressure, for the over tire pressure alert.
6984	Over Temperature	The temperature above which the over temperature alert will trigger.
6985	Tire Configuration Information	Command signal used to initiate change in the tire configuration of the vehicle system. On receipt of this reset, necessary changes will be made in the tire configuration command information.00b = Take No Action 01b = Reset 10b = Reserved 11b = Not Applicable
6986	Tire Sensor Information	Command signal used to initiate change in the tire sensor identification information. 00b = Take no action 01b = Reset 10b = Reserved 11b = Not applicable
6987	Tire Location	Identifies which tire is associated with the parametric data in PGN 64578. Refer to SPN 929 for further details and examples. The low order 4 bits represent a position number, counting left to right when facing in the direction of normal vehicle travel (forward). The high order 4 bits represent a position number, counting front to back on the vehicle. The value FFh indicates not available.
6988	Tire Pressure (Extended Range)	Pressure at which air is contained in cavity formed by tire and rim. See SPN 241 for alternate tire pressure with a lower range and coarser resolution.
6989	Required Tire Pressure	The required tire pressure at which air is contained in cavity formed by tire and rim. This pressure of the tire is compensated to meet the specific physical environmental conditions (temperature) of the vehicle.

6990	Extended Tire Pressure Support	Defines the choice of using the tire pressure (PGN 65268) or Extended Tire Pressure (PGN 64578). The state value ’01b’ indicates the extended tire pressure SPN is used for the pressure data. Any other value indicates the extended tire pressure SPN is not being used.00b = Not Using Extended Tire Pressure 01b = Using Extended Tire Pressure 10b = Error 11b = Not Available/Not Supported
6991	Number of Engine Cylinders to Exclude from Combustion	Request to the engine ECU for the number of cylinders to exclude from combustion (cut-out or skip) for a given instance in time. The engine ECU can decide on the cylinders to exclude from combustion. One of the use cases would be sending this parameter at low engine loads. If this parameter is set to 3 for a 6 cylinder engine, the receiving engine ECM would know the request is to exclude 3 of the 6 cylinders.If the sending node is to specify the cylinders to exclude from combustion, use SPN 6992-7015 Engine Cylinder xx Exclude from Combustion Request. Otherwise, those SPNs can be set to (11b – Do not care status). Alternatively, the application can choose to ignore updating this SPN (FFh to be sent), if specific cylinders are requested to be cut out. Should there be a discrepency between SPNs 6991 and the group of SPNs 6992-7015, the recepient will determine which has priority.
6992	Engine Cylinder 1 Exclude from Combustion Request	Request to the engine ECU to exclude (skip or cut-out) cylinder 1 from combustion. 00b = Exclude from Combustion 01b = Include for Combustion 10b = Reserved 11b = Not available/Do not care
6993	Engine Cylinder 2 Exclude from Combustion Request	Request to the engine ECU to exclude (skip or cut-out) cylinder 2 from combustion. 00b = Exclude from Combustion 01b = Include for Combustion 10b = Reserved 11b = Not available/Do not care
6994	Engine Cylinder 3 Exclude from Combustion Request	Request to the engine ECU to exclude (skip or cut-out) cylinder 3 from combustion. 00b = Exclude from Combustion 01b = Include for Combustion 10b = Reserved 11b = Not available/Do not care
6995	Engine Cylinder 4 Exclude from Combustion Request	Request to the engine ECU to exclude (skip or cut-out) cylinder 4 from combustion. 00b = Exclude from Combustion 01b = Include for Combustion 10b = Reserved 11b = Not available/Do not care

6996	Engine Cylinder 5 Exclude from Combustion Request	Request to the engine ECU to exclude (skip or cut-out) cylinder 5 from combustion. 00b = Exclude from Combustion 01b = Include for Combustion 10b = Reserved 11b = Not available/Do not care
6997	Engine Cylinder 6 Exclude from Combustion Request	Request to the engine ECU to exclude (skip or cut-out) cylinder 6 from combustion. 00b = Exclude from Combustion 01b = Include for Combustion 10b = Reserved 11b = Not available/Do not care
6998	Engine Cylinder 7 Exclude from Combustion Request	Request to the engine ECU to exclude (skip or cut-out) cylinder 7 from combustion. 00b = Exclude from Combustion 01b = Include for Combustion 10b = Reserved 11b = Not available/Do not care
6999	Engine Cylinder 8 Exclude from Combustion Request	Request to the engine ECU to exclude (skip or cut-out) cylinder 8 from combustion. 00b = Exclude from Combustion 01b = Include for Combustion 10b = Reserved 11b = Not available/Do not care
7000	Engine Cylinder 9 Exclude from Combustion Request	Request to the engine ECU to exclude (skip or cut-out) cylinder 9 from combustion. 00b = Exclude from Combustion 01b = Include for Combustion 10b = Reserved 11b = Not available/Do not care
7001	Engine Cylinder 10 Exclude from Combustion Request	Request to the engine ECU to exclude (skip or cut-out) cylinder 10 from combustion. 00b = Exclude from Combustion 01b = Include for Combustion 10b = Reserved 11b = Not available/Do not care
7002	Engine Cylinder 11 Exclude from Combustion Request	Request to the engine ECU to exclude (skip or cut-out) cylinder 11 from combustion. 00b = Exclude from Combustion 01b = Include for Combustion 10b = Reserved 11b = Not available/Do not care
7003	Engine Cylinder 12 Exclude from Combustion Request	Request to the engine ECU to exclude (skip or cut-out) cylinder 12 from combustion. 00b = Exclude from Combustion 01b = Include for Combustion 10b = Reserved 11b = Not available/Do not care

7004	Engine Cylinder 13 Exclude from Combustion Request	Request to the engine ECU to exclude (skip or cut-out) cylinder 13 from combustion. 00b = Exclude from Combustion 01b = Include for Combustion 10b = Reserved 11b = Not available/Do not care
7005	Engine Cylinder 14 Exclude from Combustion Request	Request to the engine ECU to exclude (skip or cut-out) cylinder 14 from combustion. 00b = Exclude from Combustion 01b = Include for Combustion 10b = Reserved 11b = Not available/Do not care
7006	Engine Cylinder 15 Exclude from Combustion Request	Request to the engine ECU to exclude (skip or cut-out) cylinder 15 from combustion. 00b = Exclude from Combustion 01b = Include for Combustion 10b = Reserved 11b = Not available/Do not care
7007	Engine Cylinder 16 Exclude from Combustion Request	Request to the engine ECU to exclude (skip or cut-out) cylinder 16 from combustion. 00b = Exclude from Combustion 01b = Include for Combustion 10b = Reserved 11b = Not available/Do not care
7008	Engine Cylinder 17 Exclude from Combustion Request	Request to the engine ECU to exclude (skip or cut-out) cylinder 17 from combustion. 00b = Exclude from Combustion 01b = Include for Combustion 10b = Reserved 11b = Not available/Do not care
7009	Engine Cylinder 18 Exclude from Combustion Request	Request to the engine ECU to exclude (skip or cut-out) cylinder 18 from combustion. 00b = Exclude from Combustion 01b = Include for Combustion 10b = Reserved 11b = Not available/Do not care
7010	Engine Cylinder 19 Exclude from Combustion Request	Request to the engine ECU to exclude (skip or cut-out) cylinder 19 from combustion. 00b = Exclude from Combustion 01b = Include for Combustion 10b = Reserved 11b = Not available/Do not care
7011	Engine Cylinder 20 Exclude from Combustion Request	Request to the engine ECU to exclude (skip or cut-out) cylinder 20 from combustion. 00b = Exclude from Combustion 01b = Include for Combustion 10b = Reserved 11b = Not available/Do not care

7012	Engine Cylinder 21 Exclude from Combustion Request	Request to the engine ECU to exclude (skip or cut-out) cylinder 21 from combustion. 00b = Exclude from Combustion 01b = Include for Combustion 10b = Reserved 11b = Not available/Do not care
7013	Engine Cylinder 22 Exclude from Combustion Request	Request to the engine ECU to exclude (skip or cut-out) cylinder 22 from combustion. 00b = Exclude from Combustion 01b = Include for Combustion 10b = Reserved 11b = Not available/Do not care
7014	Engine Cylinder 23 Exclude from Combustion Request	Request to the engine ECU to exclude (skip or cut-out) cylinder 23 from combustion. 00b = Exclude from Combustion 01b = Include for Combustion 10b = Reserved 11b = Not available/Do not care
7015	Engine Cylinder 24 Exclude from Combustion Request	Request to the engine ECU to exclude (skip or cut-out) cylinder 24 from combustion. 00b = Exclude from Combustion 01b = Include for Combustion 10b = Reserved 11b = Not available/Do not care
7016	Engine Fuel 2 Pump Hydraulic Flow Control Valve	Position of hydraulic pump flow control valve opening; 0% = fully closed, 100% = fully open.
7017	Engine Fuel 2 Pump Hydraulic Swash Plate Angle	Position of hydraulic swash plate angle within hydraulic pump. 0% represents the lowest possible flow, 100% represents the maximum flow.
7018	Engine Fuel 2 Pump Hydraulic Directional Valve	Position of hydraulic directional valve to control application of hydraulic oil flow. 0% is no flow to the appliance; 100% is full flow to the appliance.
7019	Engine Fuel 2 Pump Hydraulic Pressure	Hydraulic pressure in the lines of the hydraulically driven fuel 2 pump.
7020	LNG Vaporizer Coolant Outlet Temperature	Temperature of coolant at outlet of liquified natural gas vaporizer. This parameter is also used to determine if coolant has reached freezing temperature.
7021	Engine Fuel 2 Injector Metering Rail 1 Pressure	The pressure of fuel 2 measured by first rail pressure sensor in the primary, or first, metering rail as delivered from the supply pump to the injector metering intake.

7022	Engine Fuel 2 Injector Metering Rail 2 Pressure	The pressure of fuel 2 measured by first rail pressure sensor in the metering rail 2 as delivered from the supply pump to the injector metering intake.
7023	Engine Fuel 2 Injector Metering Rail 1 Temperature	The temperature of fuel 2 measured by first rail temperature sensor in the primary, or first, metering rail as delivered from the supply pump to the injector metering intake.
7024	Engine Fuel 2 Injector Metering Rail 2 Temperature	The temperature of fuel 2 measured by first rail temperature sensor in the metering rail 2 as delivered from the supply pump to the injector metering intake.
7025	Engine Staged Turbocharger Solenoid Status	Current state of the staged turbocharger solenoid, normalized to percent, 0% represents not actuated and 100% represents fully actuated.
7026	Engine Diesel Fuel Metering Valve	Smart device used to control diesel fuel supply to the high pressure fuel pump.
7027	Engine Diesel Fuel Metering Valve Power Supply	The power supply to the engine diesel fuel metering valve.
7028	Engine Diesel Fuel Metering Valve Temperature	Temperature of the engine diesel fuel metering valve. This is not the temperature of the diesel fuel.
7029	Engine Diesel Fuel Metering Valve Position	The position of the fuel control valve that is controlling diesel fuel flow to the fuel pump.
7030	Aftertreatment 1 Control Module	The control module used to control the aftertreatment system. This SPN to be used for inline engines or for exhaust bank 1 of multiple bank engines.
7031	Aftertreatment 2 Control Module	The control module used to control the aftertreatment system in exhaust bank 2.
7032	Aftertreatment System has Shutdown Engine	Indicates that the aftertreatment system has shut down the engine.

7033	Heat Exchanger Debris Purge Inhibit Switch	Indicates the state of a switch available to the operator that will inhibit the system from purging the debris from the heat exchanger.00b = not active 01b = active 10b = error 11b = not available This SPN would be « not active » when purging the debris from the heat exchanger is allowed to occur (purging the debris from the heat exchanger is not inhibited). The ECU shall inhibit purging the debris from the heat exchanging when SPN 7033 is in the ON state. Purging the debris from the heat exchanger shall be activated by SPN 7034 when it is in the ON state and SPN 7033 is in the OFF state.
7034	Heat Exchanger Debris Purge Force Switch	Indicates the state of a switch available to the operator that forces the system to purge the debris from the heat exchanger.00b = not active 01b = active 10b = error 11b = not available This SPN would be « not active » when purging the debris from the heat exchanger is requested by another algorithm, such as a time based purge (purging the debris from the heat exchanger is not being forced by the operator). The ECU shall inhibit purging the debris from the heat exchanging when SPN 7033 is in the ON state. Purging the debris from the heat exchanger shall be activated by SPN 7034 when it is in the ON state and SPN 7033 is in the OFF state.
7035	Heat Exchanger Debris Purge Status	Indicates whether the system is currently purging debris from the heat exchanger. 00b = Inactive 01b = Active 10b = SAE reserved 11b = Not available
7036	Heat Exchanger Debris Purge Approaching	Status signal which indicates that purging the debris from the heat exchanger is imminent. 00b = Not approaching 01b = Approaching 10b = SAE reserved 11b = Not available
7037	Transmission Override Control Mode	The override control mode defines the type of control mode used to control transmission operation. 00b = Override disabled – Disable any existing control commanded by the source of this command. 01b = Speed control – Control speed to the included « desired speed » value. 10b = Torque control – Control torque to the included « desired torque » value. 11b = Speed/torque limit control – Limit speed and/or torque based on the included limit values.

7038	Transmission Override Control Mode Priority	This field is used as an input to the transmission to determine the priority of the Override Control Mode received in the Torque/Speed Control message. The default is 11b (Low priority). It is not required to use the same priority during the entire override function.The four priority levels defined are: 00b = Highest priority 01b = High priority 10b = Medium priority 11b = Low priority 00b – Highest Priority = Used for situations that require immediate action by the receiving device in order to provide safe vehicle operation. This level of priority should only be used in safety critical conditions. 01b – High Priority = Used for control situations that require prompt action in order to provide safe vehicle operation. 10b – Medium Priority = Used for powertrain control operations which are related to assuring that the vehicle is in a stable operating condition. 11b – Low Priority = Used to indicate that the associated command desires powertrain control but is needed for function which may be overridden by other devices.
7039	Transmission Requested Output Shaft Speed	Used to request output shaft speed of the transmission which has a output through a driveline to the wheels of a machine/vehicle.
7040	Transmission Requested Torque / Torque Limit	Requested transmission output torque measured as a percentage of Transmission Reference Torque (SPN 7778). This is the output torque at which the transmission is expected to operate if the torque control mode is active or the output torque which the transmission shall not exceed if the torque limit mode is active.Note: 0% to 125% for (positive) powered torque requests, -125% to 0% for (negative) retarding torque requests. Does not define rotational direction.
7041	Message Counter	The message counter is used to detect situations where the transmitting ECU malfunction repeats the same frame all the time. The receiver of the information may use the counter parameter to detect this situation.Note: The initial value of the 4 bit message counter for the first message during a driving cycle is arbitrary. In every following message the counter is incremented by 1 (0 follows 15).
7042	Message Checksum	The message checksum is used to verify the signal path from the transmitting device to the receiving device. The message checksum is calculated using the first 7 data bytes, the message counter and the bytes of the message identifier. It is calculated as

		follows: Message Checksum = ((Byte 1 + Byte 2 + Byte 3 + Byte 4 + Byte 5 + Byte 6 + Byte 7 + Message ID low order byte + Message ID mid low byte + Message ID mid high byte + Message ID high order byte) & FFh) Where Message ID low order byte = Source Address from 29-bit header Message ID mid low byte = PDU Specific (PS) from 29-bit header Message ID mid high byte = PDU Format (PF) from 29-bit header Message ID high order byte = 6 bits of '0' followed by EDP and DP bits from 29-bit header
7043	Engine End Bearing 1 Temperature	Temperature of end bearing of the connecting rod for cylinder 1 on the engine
7044	Engine End Bearing 2 Temperature	Temperature of end bearing of the connecting rod for cylinder 2 on the engine
7045	Engine End Bearing 3 Temperature	Temperature of end bearing of the connecting rod for cylinder 3 on the engine
7046	Engine End Bearing 4 Temperature	Temperature of end bearing of the connecting rod for cylinder 4 on the engine
7047	Engine End Bearing 5 Temperature	Temperature of end bearing of the connecting rod for cylinder 5 on the engine
7048	Engine End Bearing 6 Temperature	Temperature of end bearing of the connecting rod for cylinder 6 on the engine
7049	Engine End Bearing 7 Temperature	Temperature of end bearing of the connecting rod for cylinder 7 on the engine
7050	Engine End Bearing 8 Temperature	Temperature of end bearing of the connecting rod for cylinder 8 on the engine
7051	Engine End Bearing 9 Temperature	Temperature of end bearing of the connecting rod for cylinder 9 on the engine
7052	Engine End Bearing 10 Temperature	Temperature of end bearing of the connecting rod for cylinder 10 on the engine
7053	Engine End Bearing 11 Temperature	Temperature of end bearing of the connecting rod for cylinder 11 on the engine
7054	Engine End Bearing 12 Temperature	Temperature of end bearing of the connecting rod for cylinder 12 on the engine

7055	Engine End Bearing 13 Temperature	Temperature of end bearing of the connecting rod for cylinder 13 on the engine
7056	Engine End Bearing 14 Temperature	Temperature of end bearing of the connecting rod for cylinder 14 on the engine
7057	Engine End Bearing 15 Temperature	Temperature of end bearing of the connecting rod for cylinder 15 on the engine
7058	Engine End Bearing 16 Temperature	Temperature of end bearing of the connecting rod for cylinder 16 on the engine
7059	Engine End Bearing 17 Temperature	Temperature of end bearing of the connecting rod for cylinder 17 on the engine
7060	Engine End Bearing 18 Temperature	Temperature of end bearing of the connecting rod for cylinder 18 on the engine
7061	Engine End Bearing 19 Temperature	Temperature of end bearing of the connecting rod for cylinder 19 on the engine
7062	Engine End Bearing 20 Temperature	Temperature of end bearing of the connecting rod for cylinder 20 on the engine
7063	Engine Gaseous Fuel Supply Pressure 2	Second gage pressure measurement of gaseous fuel supply to fuel metering device. If only one sensor is used for gas supply pressure measurement, use SPN 159 instead.
7064	Engine Gaseous Fuel Supply Unit Intake Pressure	Pressure of gaseous fuel supply measured at the intake of gaseous fuel supply unit. Gaseous fuel valve unit contains block and bleed valves to regulate the flow of gaseous fuel from the plant to engine.Gas Supply Unit Intake Pressure
7065	Engine Gaseous Fuel Supply Shutoff Valve 1 Intake Pressure	Pressure of gaseous fuel supply measured at shutoff valve 1 in gaseous fuel supply unit. Shutoff valves are used to regulate gaseous fuel supply to engine.
7066	Engine Gaseous Fuel Supply Shutoff Valve 2 Intake Pressure	Pressure of gaseous fuel supply measured at shutoff valve 2 in gaseous fuel supply unit. Shutoff valves are used to regulate gaseous fuel supply to engine.
7067	Plant Gaseous Fuel Supply Outlet Pressure	Pressure of the gaseous fuel supplied from the plant room for one or more engines. Based on the application, plant room will contain fuel tank for gas, vaporizer and heater and cooler compartments.

7068	Plant Inert Gas Supply Outlet Pressure	Pressure of the purge gas supplied to the engine. Inert gas is used to remove gaseous fuel build-up in the engines and in the fuel supply lines when gaseous fuel is not in operation.
7069	Aftertreatment 1 Diesel Exhaust Fluid Line Heater Relay 2	The Aftertreatment Diesel Exhaust Fluid Line Heater Relay 2 is used to energize one or more DEF line heaters.00b = Off 01b = On 10b = Error 11b = Not available
7070	Aftertreatment 1 Particulate Sensor Heater Resistance	The resistance of the particulate sensor heater.
7071	Engine Oil Mist 1 Concentration	Percentage of detected oil mist in compartment 1 compared to the lower explosion limit (LEL). 100% means the measured value is on the lower explosion limit, whereas 0% means no detected oil mist in the air. This measurement is typically taken in crankcase compartment. Note. For a V engine, 2 cylinders may share a compartment. Compartment 1 is referred to the one closer to flywheel of the engine.
7072	Engine Oil Mist 2 Concentration	Percentage of detected oil mist in compartment 2 compared to the lower explosion limit (LEL). 100% means the measured value is on the lower explosion limit,whereas 0% means no detected oil mist in the air.
7073	Engine Oil Mist 3 Concentration	Percentage of detected oil mist in compartment 3 compared to the lower explosion limit (LEL). 100% means the measured value is on the lower explosion limit,whereas 0% means no detected oil mist in the air.
7074	Engine Oil Mist 4 Concentration	Percentage of detected oil mist in compartment 4 compared to the lower explosion limit (LEL). 100% means the measured value is on the lower explosion limit,whereas 0% means no detected oil mist in the air.
7075	Engine Oil Mist 5 Concentration	Percentage of detected oil mist in compartment 5 compared to the lower explosion limit (LEL). 100% means the measured value is on the lower explosion limit,whereas 0% means no detected oil mist in the air.

7076	Engine Oil Mist 6 Concentration	Percentage of detected oil mist in compartment 6 compared to the lower explosion limit (LEL). 100% means the measured value is on the lower explosion limit,whereas 0% means no detected oil mist in the air.
7077	Engine Oil Mist 7 Concentration	Percentage of detected oil mist in compartment 7 compared to the lower explosion limit (LEL). 100% means the measured value is on the lower explosion limit,whereas 0% means no detected oil mist in the air.
7078	Engine Oil Mist 8 Concentration	Percentage of detected oil mist in compartment 8 compared to the lower explosion limit (LEL). 100% means the measured value is on the lower explosion limit,whereas 0% means no detected oil mist in the air.
7079	Engine Oil Mist 9 Concentration	Percentage of detected oil mist in compartment 9 compared to the lower explosion limit (LEL). 100% means the measured value is on the lower explosion limit,whereas 0% means no detected oil mist in the air.
7080	Engine Oil Mist 10 Concentration	Percentage of detected oil mist in compartment 10 compared to the lower explosion limit (LEL). 100% means the measured value is on the lower explosion limit,whereas 0% means no detected oil mist in the air.
7081	Engine Gaseous Fuel Supply Shutoff Valve 1 Position	Position of shutoff valve 1, which is used to control the flow of gaseous fuel through the fuel supply unit. 0% represents valve fully closed and 100% represents valve fully open.
7082	Engine Gaseous Fuel Supply Shutoff Valve 2 Position	Position of shutoff valve 2, which is used to control the flow of gaseous fuel through the fuel supply unit. 0% represents valve fully closed and 100% represents valve fully open.
7083	Engine Gaseous Fuel Supply Bleed Valve 1 Position	Position of bleed valve 1, which is used to control the flow of gaseous fuel through the fuel supply unit. 0% represents valve fully closed and 100% represents valve fully open.

7084	Engine Gaseous Fuel Supply Bleed Valve 2 Position	Position of bleed valve 2, which is used to control the flow of gaseous fuel through the fuel supply unit. 0% represents valve fully closed and 100% represents valve fully open.
7085	Engine Gaseous Fuel Supply Bleed Valve 3 Position	Position of bleed valve 3, which is used to control the flow of gaseous fuel through the fuel supply unit. 0% represents valve fully closed and 100% represents valve fully open.
7086	Aftertreatment 2 Diesel Exhaust Fluid Pump Heater	Percentage of heating applied to the aftertreatment 2 diesel exhaust fluid pump heater. A value of 0% means no heating applied, a value of 100% means full heating applied. The diesel exhaust fluid pump heater warms the diesel exhaust fluid in the diesel exhaust fluid pump.
7087	Aftertreatment 2 Diesel Exhaust Fluid Pump Heater Command	Command for the Aftertreatment 2 Diesel Exhaust Fluid Pump Heater. A value of 0% means no heating commanded, a value of 100% means full heating commanded.
7088	Engine Cylinder Head Bypass Actuator 1 Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in Engine Cylinder Head Bypass Actuator 1 by the manufacturer's software. When there are multiple failures, the most severe is transmitted.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported. Cylinder Head bypass valve is used to release the air at the high pressure compressor outlet into turbocharger turbine intake when intake pressure exceeds exhaust pressure at lower engine speeds and thereby controlling compressure surge.
7089	Engine Cylinder Head Bypass Actuator 1 Temperature Status	Identifies the status of the Engine Cylinder Head Bypass Blowoff Actuator 1 drive circuitry temperature. Temperature excursions may affect the torque output.Cylinder Head bypass valve is used to release the air at the high pressure compressor outlet into turbocharger turbine inlet when intake pressure exceeds exhaust pressure at lower engine speeds and thereby controlling compressure surge. 000b = High Most severe 001b = High Least severe 010b = In Range 011b = Low Least severe 100b = Low Most severe 101b = Not Defined 110b = Error 111b = Not available

7090	Engine Cylinder Head Bypass Actuator 1 Temperature	Temperature of the Engine Cylinder Head Bypass Actuator 1 drive circuitry. Temperature excursions may affect the torque output.Cylinder Head bypass valve is used to release the air at the high pressure compressor outlet into turbocharger turbine inlet when intake pressure exceeds exhaust pressure at lower engine speeds and thereby controlling compressure surge.
7091	Engine Cylinder Head Bypass Actuator 1 Desired Position	Requested position of Engine Cylinder Head Bypass actuator by engine ECM, where 0% represents bypass fully closed and 100% represents fully open. This is the position that the device is attempting to achieve.Cylinder Head bypass valve is used to release the air at the high pressure compressor outlet into turbocharger turbine inlet when intake pressure exceeds exhaust pressure at lower engine speeds and thereby controlling compressure surge.
7092	Engine Cylinder Head Bypass Actuator 1 Position	Actual position of Engine Cylinder Head Bypass actuator, where 0% represents fully closed and 100% represents fully open.Cylinder Head bypass valve is used to release the air at the high pressure compressor outlet into turbocharger turbine inlet when intake pressure exceeds exhaust pressure at lower engine speeds and thereby controlling compressure surge.
7093	Engine Cylinder Head Bypass Actuator 1 Operation Status	Identifies the status of Engine Cylinder Head Bypass Actuator 1. Cylinder head bypass valve is used to release the air at the high pressure compressor outlet into turbocharger turbine inlet when intake pressure exceeds exhaust pressure at lower engine speeds and thereby controlling compressure surge. 0000b = Normal 0001b = Alarm (fully operational but needs service) 0010b = Alarm High Severity (functional but transient performance may be reduced) 0011b = Derate Active (torque output reduced due to environmental conditions) 0100b = Controlled Shutdown Active (driving to the default position – usually this means closed) 0101b = Uncontrolled Shutdown Active (no torque is being applied from the actuator) 0110b = Calibration in Progress (must be broadcast at least once per calibration process defined in SPN 3464) 0111b to 1101b = Reserved for future assignment 1110b = Error 1111b = Not available

7094	Engine Cylinder Head Bypass Actuator 1 Command	Command to cylinder head bypass actuator 1, normalized to percent, where 0% nominally represents fully closed (No Flow) and 100% represents fully open (Max Flow). The purpose of the cylinder bypass valve is to release the air at the high pressure compressor outlet into turbocharger turbine inlet when intake pressure exceeds exhaust pressure at lower engine speeds and thereby controlling compressure surge.FB00h – FB64h is sent to calibrate to a specific position. The LSB specifies the position with a resolution of 1%/bit (eg, FB32h is sent to calibrate the actuator to 50%). FBFFh is sent to calibrate the actuator using its own algorithm. Calibration status from the actuator is received on SPN 7093.
7095	SCR Operator Inducement Total Time	Indicates the time that operator inducement has been active. This will accumulate over the life of the product and will never be reset.
7096	Engine Fuel 1 Injector Metering Rail 1 Pressure 1 (Extended Range)	The pressure of fuel measured by first rail pressure sensor in the primary, or first, metering rail as delivered from the supply pump to the injector metering intake.
7097	Engine Fuel 1 Injector Metering Rail 1 Pressure 2 (Extended Range)	The pressure of fuel measured by the second rail pressure sensor in the primary, or first, metering rail as delivered from the supply pump to the injector metering intake.
7098	Engine Fuel 1 Injector Metering Rail 2 Pressure 1 (Extended Range)	The pressure of fuel measured by first rail pressure sensor in the metering rail 2 as delivered from the supply pump to the injector metering intake.
7099	Engine Fuel 1 Injector Metering Rail 2 Pressure 2 (Extended Range)	The pressure of fuel measured by second rail pressure sensor in the metering rail 2 as delivered from the supply pump to the injector metering intake.
7100	Engine Fuel 1 Injector Metering Rail 1 Desired Pressure	The desired pressure of fuel in the primary, or first, metering rail as delivered from the supply pump to the injector metering intake.
7101	Engine Fuel 1 Injector Metering Rail 2 Desired Pressure	The desired pressure of fuel in metering rail 2 as delivered from the supply pump to the injector metering intake.
7102	Engine Fuel Filter Circulating Pump	The engine fuel filter circulating pump is used with the suction side fuel filter. It pumps fuel through the filter several times before sending to the fuel supply pump.

7103	Engine Fuel Metering Rail Pump	Engine fuel metering rail pump.
7104	Engine Fuel Supply Pump Intake Pressure	Gage pressure of fuel at the fuel supply pump intake. See Figures SPN16_A & SPN16_B. See also SPN 1381.
7105	Aftertreatment 1 Inconsistent Configuration Detected	Identifies the hardware configuration of Aftertreatment 1 system.
7106	Aftertreatment 2 Inconsistent Configuration Detected	Identifies the hardware configuration of Aftertreatment 2 system.
7107	Aftertreatment 1 Diesel Exhaust Fluid Pump	State of the aftertreatment 1 Diesel Exhaust Fluid dosing pump. Indicates if the pump is currently active (pumping).00b = Off 01b = On 10b = Error 11b = Not available The aftertreatment 1 Diesel Exhaust Fluid dosing pump is a device that delivers a pressurized DEF to the DEF injector. This can be mixed with or without pressurized air. Note: SPN 5435 provides operational status of the pump. See also SPN 3361 – Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit On a system that does not have an electrically driven valve on the injector, 'DEF Dosing Unit' is the only SPN needed as the pump is directly metering DEF into the exhaust stream. On a DEF system that has an electrically driven injector, the injector is actually metering the dosing quantity and the pump is just supplying pressure to the injector. In the second case, the « DEF dosing unit » SPN would be used for the electrically driven injector and the « DEF Pump » SPN would be used for the pump supplying pressure to the injector.
7108	Aftertreatment 2 Diesel Exhaust Fluid Pump	State of the Aftertreatment 2 Diesel Exhaust Fluid dosing pump. Indicates if the pump is currently active (pumping).00b = Off 01b = On 10b = Error 11b = Not available The Aftertreatment 2 Diesel Exhaust Fluid dosing pump is a device that delivers a pressurized DEF to the DEF injector. This can be mixed with or without pressurized air. Note: SPN 5438 provides operational status of the pump. See also SPN 4451 – Aftertreatment 2 Diesel Exhaust Fluid Dosing Unit 1 On a system that does not have an electrically driven valve on the injector, 'DEF Dosing Unit' is the only SPN needed as the pump is directly metering DEF into the exhaust stream. On a DEF system that has an electrically driven injector, the injector is actually metering

		the dosing quantity and the pump is just supplying pressure to the injector. In the second case, the « DEF dosing unit » SPN would be used for the electrically driven injector and the « DEF Pump » SPN would be used for the pump supplying pressure to the injector.
7109	Engine Fuel Flow 1 Output 1	The fuel flow 1 output 1 device is used to measure fuel flow as part of a fuel flow transducer that uses two fuel flow outputs (fuel flow 1 output 1 and fuel flow 1 output 2) to measure volumetric fuel usage of an engine over time.
7110	Engine Fuel Flow 1 Output 2	The fuel flow 1 output 2 device is used to measure fuel flow as part of a fuel flow transducer that uses two fuel flow outputs (fuel flow 1 output 1 and fuel flow 1 output 2) to measure volumetric fuel usage of an engine over time.
7111	Engine Fuel Flow 2 Output 1	The fuel flow 2 output 1 is used to measure fuel flow as part of a fuel flow transducer that uses two fuel flow speed sensors to measure volumetric fuel usage of an engine over time.
7112	Engine Fuel Flow 2 Output 2	The fuel flow 2 output 2 is used to measure fuel flow as part of a fuel flow transducer that uses two fuel flow speed sensors to measure volumetric fuel usage of an engine over time.
7113	Tire 1 Pressure	Indicates the pressure diagnostics of tire 1.
7114	Tire 2 Pressure	Indicates the pressure diagnostics of tire 2.
7115	Tire 3 Pressure	Indicates the pressure diagnostics of tire 3.
7116	Tire 4 Pressure	Indicates the pressure diagnostics of tire 4.
7117	Tire 5 Pressure	Indicates the pressure diagnostics of tire 5.
7118	Tire 6 Pressure	Indicates the pressure diagnostics of tire 6.

7119	Tire 7 Pressure	Indicates the pressure diagnostics of tire 7.
7120	Tire 8 Pressure	Indicates the pressure diagnostics of tire 8.
7121	Tire 9 Pressure	Indicates the pressure diagnostics of tire 9.
7122	Tire 10 Pressure	Indicates the pressure diagnostics of tire 10.
7123	Tire 11 Pressure	Indicates the pressure diagnostics of tire 11.
7124	Tire 12 Pressure	Indicates the pressure diagnostics of tire 12.
7125	Tire 13 Pressure	Indicates the pressure diagnostics of tire 13.
7126	Tire 14 Pressure	Indicates the pressure diagnostics of tire 14.
7127	Tire 15 Pressure	Indicates the pressure diagnostics of tire 15.
7128	Tire 16 Pressure	Indicates the pressure diagnostics of tire 16.
7129	Tire 17 Pressure	Indicates the pressure diagnostics of tire 17.
7130	Tire 18 Pressure	Indicates the pressure diagnostics of tire 18.
7131	Tire 19 Pressure	Indicates the pressure diagnostics of tire 19.
7132	Tire 20 Pressure	Indicates the pressure diagnostics of tire 20.
7133	Tire 21 Pressure	Indicates the pressure diagnostics of tire 21.
7134	Tire 22 Pressure	Indicates the pressure diagnostics of tire 22.

7135	Tire 23 Pressure	Indicates the pressure diagnostics of tire 23.
7136	Tire 24 Pressure	Indicates the pressure diagnostics of tire 24.
7137	Tire 25 Pressure	Indicates the pressure diagnostics of tire 25.
7138	Tire 26 Pressure	Indicates the pressure diagnostics of tire 26.
7139	Tire 27 Pressure	Indicates the pressure diagnostics of tire 27.
7140	Tire 28 Pressure	Indicates the pressure diagnostics of tire 28.
7141	Tire 29 Pressure	Indicates the pressure diagnostics of tire 29.
7142	Tire 30 Pressure	Indicates the pressure diagnostics of tire 30.
7143	Tire 31 Pressure	Indicates the pressure diagnostics of tire 31.
7144	Tire 32 Pressure	Indicates the pressure diagnostics of tire 32.
7145	Tire 33 Pressure	Indicates the pressure diagnostics of tire 33.
7146	Tire 34 Pressure	Indicates the pressure diagnostics of tire 34.
7147	Tire 35 Pressure	Indicates the pressure diagnostics of tire 35.
7148	Tire 36 Pressure	Indicates the pressure diagnostics of tire 36.
7149	Tire 37 Pressure	Indicates the pressure diagnostics of tire 37.
7150	Tire 38 Pressure	Indicates the pressure diagnostics of tire 38.

7151	Tire 39 Pressure	Indicates the pressure diagnostics of tire 39.
7152	Tire 40 Pressure	Indicates the pressure diagnostics of tire 40.
7153	Tire 1 Temperature	Indicates the temperature diagnostics of tire 1.
7154	Tire 2 Temperature	Indicates the temperature diagnostics of tire 2.
7155	Tire 3 Temperature	Indicates the temperature diagnostics of tire 3.
7156	Tire 4 Temperature	Indicates the temperature diagnostics of tire 4.
7157	Tire 5 Temperature	Indicates the temperature diagnostics of tire 5.
7158	Tire 6 Temperature	Indicates the temperature diagnostics of tire 6.
7159	Tire 7 Temperature	Indicates the temperature diagnostics of tire 7.
7160	Tire 8 Temperature	Indicates the temperature diagnostics of tire 8.
7161	Tire 9 Temperature	Indicates the temperature diagnostics of tire 9.
7162	Tire 10 Temperature	Indicates the temperature diagnostics of tire 10.
7163	Tire 11 Temperature	Indicates the temperature diagnostics of tire 11.
7164	Tire 12 Temperature	Indicates the temperature diagnostics of tire 12.
7165	Tire 13 Temperature	Indicates the temperature diagnostics of tire 13.
7166	Tire 14 Temperature	Indicates the temperature diagnostics of tire 14.

7167	Tire 15 Temperature	Indicates the temperature diagnostics of tire 15.
7168	Tire 16 Temperature	Indicates the temperature diagnostics of tire 16.
7169	Tire 17 Temperature	Indicates the temperature diagnostics of tire 17.
7170	Tire 18 Temperature	Indicates the temperature diagnostics of tire 18.
7171	Tire 19 Temperature	Indicates the temperature diagnostics of tire 19.
7172	Tire 20 Temperature	Indicates the temperature diagnostics of tire 20.
7173	Tire 21 Temperature	Indicates the temperature diagnostics of tire 21.
7174	Tire 22 Temperature	Indicates the temperature diagnostics of tire 22.
7175	Tire 23 Temperature	Indicates the temperature diagnostics of tire 23.
7176	Tire 24 Temperature	Indicates the temperature diagnostics of tire 24.
7177	Tire 25 Temperature	Indicates the temperature diagnostics of tire 25.
7178	Tire 26 Temperature	Indicates the temperature diagnostics of tire 26.
7179	Tire 27 Temperature	Indicates the temperature diagnostics of tire 27.
7180	Tire 28 Temperature	Indicates the temperature diagnostics of tire 28.
7181	Tire 29 Temperature	Indicates the temperature diagnostics of tire 29.
7182	Tire 30 Temperature	Indicates the temperature diagnostics of tire 30.

7183	Tire 31 Temperature	Indicates the temperature diagnostics of tire 31.
7184	Tire 32 Temperature	Indicates the temperature diagnostics of tire 32.
7185	Tire 33 Temperature	Indicates the temperature diagnostics of tire 33.
7186	Tire 34 Temperature	Indicates the temperature diagnostics of tire 34.
7187	Tire 35 Temperature	Indicates the temperature diagnostics of tire 35.
7188	Tire 36 Temperature	Indicates the temperature diagnostics of tire 36.
7189	Tire 37 Temperature	Indicates the temperature diagnostics of tire 37.
7190	Tire 38 Temperature	Indicates the temperature diagnostics of tire 38.
7191	Tire 39 Temperature	Indicates the temperature diagnostics of tire 39.
7192	Tire 40 Temperature	Indicates the temperature diagnostics of tire 40.
7193	Tire 1 Sensor Enable Status	Indicates the diagnostics associated with enable status of the sensor on Tire 1.
7194	Tire 2 Sensor Enable Status	Indicates the diagnostics associated with enable status of the sensor on Tire 2.
7195	Tire 3 Sensor Enable Status	Indicates the diagnostics associated with enable status of the sensor on Tire 3.
7196	Tire 4 Sensor Enable Status	Indicates the diagnostics associated with enable status of the sensor on Tire 4.
7197	Tire 5 Sensor Enable Status	Indicates the diagnostics associated with enable status of the sensor on Tire 5.
7198	Tire 6 Sensor Enable Status	Indicates the diagnostics associated with enable status of the sensor on Tire 6.

7199	Tire 7 Sensor Enable Status	Indicates the diagnostics associated with enable status of the sensor on Tire 7.
7200	Tire 8 Sensor Enable Status	Indicates the diagnostics associated with enable status of the sensor on Tire 8.
7201	Tire 9 Sensor Enable Status	Indicates the diagnostics associated with enable status of the sensor on Tire 9.
7202	Tire 10 Sensor Enable Status	Indicates the diagnostics associated with enable status of the sensor on Tire 10.
7203	Tire 11 Sensor Enable Status	Indicates the diagnostics associated with enable status of the sensor on Tire 11.
7204	Tire 12 Sensor Enable Status	Indicates the diagnostics associated with enable status of the sensor on Tire 12.
7205	Tire 13 Sensor Enable Status	Indicates the diagnostics associated with enable status of the sensor on Tire 13.
7206	Tire 14 Sensor Enable Status	Indicates the diagnostics associated with enable status of the sensor on Tire 14.
7207	Tire 15 Sensor Enable Status	Indicates the diagnostics associated with enable status of the sensor on Tire 15.
7208	Tire 16 Sensor Enable Status	Indicates the diagnostics associated with enable status of the sensor on Tire 16.
7209	Tire 17 Sensor Enable Status	Indicates the diagnostics associated with enable status of the sensor on Tire 17.
7210	Tire 18 Sensor Enable Status	Indicates the diagnostics associated with enable status of the sensor on Tire 18.
7211	Tire 19 Sensor Enable Status	Indicates the diagnostics associated with enable status of the sensor on Tire 19.
7212	Tire 20 Sensor Enable Status	Indicates the diagnostics associated with enable status of the sensor on Tire 20.
7213	Tire 21 Sensor Enable Status	Indicates the diagnostics associated with enable status of the sensor on Tire 21.
7214	Tire 22 Sensor Enable Status	Indicates the diagnostics associated with enable status of the sensor on Tire 22.

7215	Tire 23 Sensor Enable Status	Indicates the diagnostics associated with enable status of the sensor on Tire 23.
7216	Tire 24 Sensor Enable Status	Indicates the diagnostics associated with enable status of the sensor on Tire 24.
7217	Tire 25 Sensor Enable Status	Indicates the diagnostics associated with enable status of the sensor on Tire 25.
7218	Tire 26 Sensor Enable Status	Indicates the diagnostics associated with enable status of the sensor on Tire 26.
7219	Tire 27 Sensor Enable Status	Indicates the diagnostics associated with enable status of the sensor on Tire 27.
7220	Tire 28 Sensor Enable Status	Indicates the diagnostics associated with enable status of the sensor on Tire 28.
7221	Tire 29 Sensor Enable Status	Indicates the diagnostics associated with enable status of the sensor on Tire 29.
7222	Tire 30 Sensor Enable Status	Indicates the diagnostics associated with enable status of the sensor on Tire 30.
7223	Tire 31 Sensor Enable Status	Indicates the diagnostics associated with enable status of the sensor on Tire 31.
7224	Tire 32 Sensor Enable Status	Indicates the diagnostics associated with enable status of the sensor on Tire 32.
7225	Tire 33 Sensor Enable Status	Indicates the diagnostics associated with enable status of the sensor on Tire 33.
7226	Tire 34 Sensor Enable Status	Indicates the diagnostics associated with enable status of the sensor on Tire 34.
7227	Tire 35 Sensor Enable Status	Indicates the diagnostics associated with enable status of the sensor on Tire 35.
7228	Tire 36 Sensor Enable Status	Indicates the diagnostics associated with enable status of the sensor on Tire 36.
7229	Tire 37 Sensor Enable Status	Indicates the diagnostics associated with enable status of the sensor on Tire 37.
7230	Tire 38 Sensor Enable Status	Indicates the diagnostics associated with enable status of the sensor on Tire 38.

7231	Tire 39 Sensor Enable Status	Indicates the diagnostics associated with enable status of the sensor on Tire 39.
7232	Tire 40 Sensor Enable Status	Indicates the diagnostics associated with enable status of the sensor on Tire 40.
7233	Tire 1 Leak Status	Indicates the diagnostics associated with the leak status of tire 1.
7234	Tire 2 Leak Status	Indicates the diagnostics associated with the leak status of tire 2.
7235	Tire 3 Leak Status	Indicates the diagnostics associated with the leak status of tire 3.
7236	Tire 4 Leak Status	Indicates the diagnostics associated with the leak status of tire 4.
7237	Tire 5 Leak Status	Indicates the diagnostics associated with the leak status of tire 5.
7238	Tire 6 Leak Status	Indicates the diagnostics associated with the leak status of tire 6.
7239	Tire 7 Leak Status	Indicates the diagnostics associated with the leak status of tire 7.
7240	Tire 8 Leak Status	Indicates the diagnostics associated with the leak status of tire 8.
7241	Tire 9 Leak Status	Indicates the diagnostics associated with the leak status of tire 9.
7242	Tire 10 Leak Status	Indicates the diagnostics associated with the leak status of tire 10.
7243	Tire 11 Leak Status	Indicates the diagnostics associated with the leak status of tire 11.
7244	Tire 12 Leak Status	Indicates the diagnostics associated with the leak status of tire 12.
7245	Tire 13 Leak Status	Indicates the diagnostics associated with the leak status of tire 13.
7246	Tire 14 Leak Status	Indicates the diagnostics associated with the leak status of tire 14.

7247	Tire 15 Leak Status	Indicates the diagnostics associated with the leak status of tire 15.
7248	Tire 16 Leak Status	Indicates the diagnostics associated with the leak status of tire 16.
7249	Tire 17 Leak Status	Indicates the diagnostics associated with the leak status of tire 17.
7250	Tire 18 Leak Status	Indicates the diagnostics associated with the leak status of tire 18.
7251	Tire 19 Leak Status	Indicates the diagnostics associated with the leak status of tire 19.
7252	Tire 20 Leak Status	Indicates the diagnostics associated with the leak status of tire 20.
7253	Tire 21 Leak Status	Indicates the diagnostics associated with the leak status of tire 21.
7254	Tire 22 Leak Status	Indicates the diagnostics associated with the leak status of tire 22.
7255	Tire 23 Leak Status	Indicates the diagnostics associated with the leak status of tire 23.
7256	Tire 24 Leak Status	Indicates the diagnostics associated with the leak status of tire 24.
7257	Tire 25 Leak Status	Indicates the diagnostics associated with the leak status of tire 25.
7258	Tire 26 Leak Status	Indicates the diagnostics associated with the leak status of tire 26.
7259	Tire 27 Leak Status	Indicates the diagnostics associated with the leak status of tire 27.
7260	Tire 28 Leak Status	Indicates the diagnostics associated with the leak status of tire 28.
7261	Tire 29 Leak Status	Indicates the diagnostics associated with the leak status of tire 29.
7262	Tire 30 Leak Status	Indicates the diagnostics associated with the leak status of tire 30.

7263	Tire 31 Leak Status	Indicates the diagnostics associated with the leak status of tire 31.
7264	Tire 32 Leak Status	Indicates the diagnostics associated with the leak status of tire 32.
7265	Tire 33 Leak Status	Indicates the diagnostics associated with the leak status of tire 33.
7266	Tire 34 Leak Status	Indicates the diagnostics associated with the leak status of tire 34.
7267	Tire 35 Leak Status	Indicates the diagnostics associated with the leak status of tire 35.
7268	Tire 36 Leak Status	Indicates the diagnostics associated with the leak status of tire 36.
7269	Tire 37 Leak Status	Indicates the diagnostics associated with the leak status of tire 37.
7270	Tire 38 Leak Status	Indicates the diagnostics associated with the leak status of tire 38.
7271	Tire 39 Leak Status	Indicates the diagnostics associated with the leak status of tire 39.
7272	Tire 40 Leak Status	Indicates the diagnostics associated with the leak status of tire 40.
7273	Tire 1 Sensor Electrical Fault	Indicates the diagnostics associated with the sensor electrical fault for Tire 1.
7274	Tire 2 Sensor Electrical Fault	Indicates the diagnostics associated with the sensor electrical fault for Tire 2.
7275	Tire 3 Sensor Electrical Fault	Indicates the diagnostics associated with the sensor electrical fault for Tire 3.
7276	Tire 4 Sensor Electrical Fault	Indicates the diagnostics associated with the sensor electrical fault for Tire 4.
7277	Tire 5 Sensor Electrical Fault	Indicates the diagnostics associated with the sensor electrical fault for Tire 5.
7278	Tire 6 Sensor Electrical Fault	Indicates the diagnostics associated with the sensor electrical fault for Tire 6.

7279	Tire 7 Sensor Electrical Fault	Indicates the diagnostics associated with the sensor electrical fault for Tire 7.
7280	Tire 8 Sensor Electrical Fault	Indicates the diagnostics associated with the sensor electrical fault for Tire 8.
7281	Tire 9 Sensor Electrical Fault	Indicates the diagnostics associated with the sensor electrical fault for Tire 9.
7282	Tire 10 Sensor Electrical Fault	Indicates the diagnostics associated with the sensor electrical fault for Tire 10.
7283	Tire 11 Sensor Electrical Fault	Indicates the diagnostics associated with the sensor electrical fault for Tire 11.
7284	Tire 12 Sensor Electrical Fault	Indicates the diagnostics associated with the sensor electrical fault for Tire 12.
7285	Tire 13 Sensor Electrical Fault	Indicates the diagnostics associated with the sensor electrical fault for Tire 13.
7286	Tire 14 Sensor Electrical Fault	Indicates the diagnostics associated with the sensor electrical fault for Tire 14.
7287	Tire 15 Sensor Electrical Fault	Indicates the diagnostics associated with the sensor electrical fault for Tire 15.
7288	Tire 16 Sensor Electrical Fault	Indicates the diagnostics associated with the sensor electrical fault for Tire 16.
7289	Tire 17 Sensor Electrical Fault	Indicates the diagnostics associated with the sensor electrical fault for Tire 17.
7290	Tire 18 Sensor Electrical Fault	Indicates the diagnostics associated with the sensor electrical fault for Tire 18.
7291	Tire 19 Sensor Electrical Fault	Indicates the diagnostics associated with the sensor electrical fault for Tire 19.
7292	Tire 20 Sensor Electrical Fault	Indicates the diagnostics associated with the sensor electrical fault for Tire 20.
7293	Tire 21 Sensor Electrical Fault	Indicates the diagnostics associated with the sensor electrical fault for Tire 21.
7294	Tire 22 Sensor Electrical Fault	Indicates the diagnostics associated with the sensor electrical fault for Tire 22.

7295	Tire 23 Sensor Electrical Fault	Indicates the diagnostics associated with the sensor electrical fault for Tire 23.
7296	Tire 24 Sensor Electrical Fault	Indicates the diagnostics associated with the sensor electrical fault for Tire 24.
7297	Tire 25 Sensor Electrical Fault	Indicates the diagnostics associated with the sensor electrical fault for Tire 25.
7298	Tire 26 Sensor Electrical Fault	Indicates the diagnostics associated with the sensor electrical fault for Tire 26.
7299	Tire 27 Sensor Electrical Fault	Indicates the diagnostics associated with the sensor electrical fault for Tire 27.
7300	Tire 28 Sensor Electrical Fault	Indicates the diagnostics associated with the sensor electrical fault for Tire 28.
7301	Tire 29 Sensor Electrical Fault	Indicates the diagnostics associated with the sensor electrical fault for Tire 29.
7302	Tire 30 Sensor Electrical Fault	Indicates the diagnostics associated with the sensor electrical fault for Tire 30.
7303	Tire 31 Sensor Electrical Fault	Indicates the diagnostics associated with the sensor electrical fault for Tire 31.
7304	Tire 32 Sensor Electrical Fault	Indicates the diagnostics associated with the sensor electrical fault for Tire 32.
7305	Tire 33 Sensor Electrical Fault	Indicates the diagnostics associated with the sensor electrical fault for Tire 33.
7306	Tire 34 Sensor Electrical Fault	Indicates the diagnostics associated with the sensor electrical fault for Tire 34.
7307	Tire 35 Sensor Electrical Fault	Indicates the diagnostics associated with the sensor electrical fault for Tire 35.
7308	Tire 36 Sensor Electrical Fault	Indicates the diagnostics associated with the sensor electrical fault for Tire 36.
7309	Tire 37 Sensor Electrical Fault	Indicates the diagnostics associated with the sensor electrical fault for Tire 37.
7310	Tire 38 Sensor Electrical Fault	Indicates the diagnostics associated with the sensor electrical fault for Tire 38.

7311	Tire 39 Sensor Electrical Fault	Indicates the diagnostics associated with the sensor electrical fault for Tire 39.
7312	Tire 40 Sensor Electrical Fault	Indicates the diagnostics associated with the sensor electrical fault for Tire 40.
7313	Engine Coolant Pressure 2 (Extended Range)	Gage pressure of liquid found in engine coolant system – second instance. See also SPN 5708 for alternate range and resolution.
7314	Engine Fuel Rack Fuel Supply Temperature	Temperature of fuel in the engine fuel rack.
7315	Propulsion System Active	Indicates when the hybrid system or electric vehicle system is ready to provide or is actively providing propulsion as defined in ARB regulation 13CCR1971.1, which includes the amendments up to the Board hearing date of August 2012. This parameter is called out by the 1971.1 regulation in several areas including, but not limited to: the ignition cycle counter [1971.1 paragraphs (d)(5.5.2)(B) and (d)(5.5.2)(C)], permanent fault code erasure [(d)(2.3.1)(C)(ii)b.3.v], and denominator incrementing [(d)(4.3.2)(J)(i)] requirements. For example, « for hybrid vehicles, 'ignition cycle' means a driving cycle that begins when the propulsion system active definition is met for at least two seconds plus or minus one second, and ends when the propulsion system active definition is no longer met. »NOTE: The parameter name contains the word « active » so that it matches the naming in the ARB regulation. However, this parameter not only indicates that the hybrid system or electric vehicle system is actively aiding or retarding vehicle motion (i.e., generating any positive or negative torque on the driveline); it also shall be asserted when the hybrid system or powertrain system is ready to participate in such activities if vehicle conditions or operator input warrant. Therefore, this parameter is asserted when the vehicle is ready to provide propulsion (e.g., vehicle is ready to be driven, ready to be shifted from « park » to « drive ») and doesn't change state again until the system is neither ready to provide, nor actively providing, propulsion. This parameter is required for hybrid vehicles because there is a difference between a conventional vehicle, where powertrain readiness is equivalent to « Engine Running », and a hybrid vehicle, where the engine may or may not be running and yet the vehicle could move. However, if the engine is running (engine speed is nonzero), this parameter

		shall be set to 1. If the engine speed is zero, then this parameter shall be set based on the hybrid system operating state. For heavy duty vehicles, the hybrid system needs to inform the OBD related components of its propulsion active or readiness state to allow the components to perform OBD related functions. Propulsion System Active cannot be used as an indication of propulsion availability as it is required to indicate « active » whenever the engine in a hybrid system is running. This is regardless of the hybrid system's ability or powertrain system's ability to provide propulsion power. See SPN 8267 for an indication of hybrid system propulsion availability. This message may be used by the Hybrid System Controller to communicate to other OBD related components (e.g engine) the status of the overall hybrid system. It should not be sent by individual hybrid system components (e.g. batteries, inverters, etc.) . This message may also be used on electric vehicles to communicate the status of the powertrain system on the electric vehicle. 00b = Propulsion System is not ready to move vehicle if commanded by operator 01b = Propulsion System is ready to move, or is moving the vehicle as commanded by operator 10b = SAE Reserved 11b = Not Available
7316	Predictive Cruise Control Set Speed Offset	The amount by which the actual set point used by the cruise control algorithm should be changed as determined by external factors (e.g., anticipated road grade).If SPN 7317 indicates Enabled (0001b) and if the cruise control algorithm determines that the offset will be honored, then the value in SPN 7316 will be added to the Cruise Control Set Speed indicated by SPN 86 (also SPN 6809). This sum will be the present set point used by the cruise control algorithm. If the cruise control algorithm determines that the offset will not be honored, then the cruise control set point is the value in SPN 86 (and SPN 6809). SPN 86 and SPN 6809 both reflect the selected cruise control set speed; they do not include the offset in SPN 7316. See Cruise Control Speed (SPN 7319) for a parameter that will include the offset in SPN 7316.
7317	Predictive Cruise Control State	Indicates the state of the PCC controller. If this parameter is 0001b, the cruise control set point may be modified by the Predictive Cruise Control Set Speed Offset (SPN 7316) . For states other than 0001, the value in Predictive Cruise Control Set Speed Offset (SPN 7316) shall be ignored. Predictive Cruise Control Set Speed Offset Status (SPN 7318) will indicate of the cruise control algorithm has adjusted its set

		point by the value specified in Predictive Cruise Control Set Speed Offset (SPN 7316). In the event that more than one reason for not being functional (0010b to 1000b) is active at the same time, it is up to the manufacturer to decide which reason is reported. It is expected that 0111b (inhibited by driver) would have priority over the other states that indicate non-functional. 0000b = Disabled 0001b = Enabled 0010b = Enabled, but not functional due to vehicle position not available 0011b = Enabled, but not functional due to map position not available 0100b = Enabled, but not functional due to road grade info not available 0101b = Enabled, but not functional due to predicted path not available 0110b = Enabled, but not functional due to vehicle speed below speed threshold 0111b = Enabled, but not functional due to inhibited by driver 1000b = Enabled, but not functional due to self test 1001b to 1101b = SAE Reserved 1110b = Error 1111b = Not Available
7318	Predictive Cruise Control Set Speed Offset Status	This parameter indicates if the cruise control algorithm is currently adding the value in Predictive Cruise Control Set Speed Offset (SPN 7316) to the Cruise Control Set Speed (SPN 86 or SPN 6809) for its set point. The final set point will be reported in Cruise Control Speed (SPN 7319).00b = Cruise Control Speed (SPN 7319) does not include Predictive Cruise Control Set Speed Offset (SPN 7316) 01b = Cruise Control Speed (SPN 7319) includes Predictive Cruise Control Set Speed Offset (SPN 7316) 10b = SAE Reserved 11b = Not available
7319	Cruise Control Speed	This parameter is the vehicle speed that the cruise control algorithm is currently using as its cruise control set point.Cruise Control Speed (SPN 7319) will include the effects of other algorithms, such as Predictive Cruise Control, Adaptive Cruise Control, etc., that may adjust the cruise control speed from the Cruise Control Set Speed (SPNs 86 and 6809). If there are no other algorithms currently adjusting the cruise control set speed, then Cruise Control Speed (SPN 7319) will be the same value as Cruise Control Set Speed (SPN 6809).
7320	Engine Multiple Cylinder Knock Level	Used to indicate the knock level for multiple cylinders. If able to detect knock level for an individual cylinder, then SPN 1352 thru 1375 should be used.

7321	Aftertreatment 1 Particulate Sensor Heater High Side Driver Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the aftertreatment particulate sensor heater high side driver by the manufacturer's sensor control software in exhaust bank 1. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported. This parameter is only valid if Aftertreatment 1 Particulate Sensor Heater High Side Driver Diagnostic Status (SPN 7322) is equal to 000b, 010b or 011b.
7322	Aftertreatment 1 Particulate Sensor Heater High Side Driver Diagnostic Status	The value of this parameter is not retained when power is removed from the particulate sensor. 000b = Tests monitored continuously. There are no enable or pause conditions. See Aftertreatment 1 Particulate Sensor Heater High Side Driver Preliminary FMI (SPN 7321) for result. 001b = Tests supported but not completed this power cycle. Enable or pause conditions have not been satisfied, which has prevented tests from executing. When tests have completed, this parameter shall change to 010b. Aftertreatment 1 Particulate Sensor Heater High Side Driver Preliminary FMI (SPN 7321) is not valid at the present time. 010b = Enable or pause conditions have allowed tests to execute this power cycle. If tests are executed while this parameter is 010b, then this parameter shall change to 011b. To assure that recipients of this parameter detect this state change, this parameter shall be set to this value for at least 3 consecutive broadcasts. See Aftertreatment 1 Particulate Sensor Heater High Side Driver Preliminary FMI (SPN 7321) for the most recent result. 011b = Enable or pause conditions have allowed tests to execute this power cycle. If tests are executed while this parameter is 011b, then this parameter shall change to 010b. To assure that recipients of this parameter detect this state change, this parameter shall be set to this value for at least 3 consecutive broadcasts. See Aftertreatment 1 Particulate Sensor Heater High Side Driver Preliminary FMI (SPN 7321) for the most recent result. 100b to 110b = SAE Reserved 111b = Not Available. Aftertreatment 1 Particulate Sensor Heater High Side Driver Preliminary FMI (SPN 7321) is not valid.
7323	Aftertreatment 1 Particulate Sensor Heater Low Side Driver Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the aftertreatment particulate sensor heater high side driver by the manufacturer's sensor control software in exhaust bank 1. In the case of multiple failures the most severe is

		communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported. This parameter is only valid if Aftertreatment 1 Particulate Sensor Heater Low Side Driver Diagnostic Status (SPN 7324) is equal to 000b, 010b or 011b.
7324	Aftertreatment 1 Particulate Sensor Heater Low Side Driver Diagnostic Status	The value of this parameter is not retained when power is removed from the particulate sensor. 000b = Tests monitored continuously. There are no enable or pause conditions. See Aftertreatment 1 Particulate Sensor Heater Low Side Driver Preliminary FMI (SPN 7323) for result. 001b = Tests supported but not completed this power cycle. Enable or pause conditions have not been satisfied, which has prevented tests from executing. When tests have completed, this parameter shall change to 010b. Aftertreatment 1 Particulate Sensor Heater Low Side Driver Preliminary FMI (SPN 7323) is not valid at the present time. 010b = Enable or pause conditions have allowed tests to execute this power cycle. If tests are executed while this parameter is 010b, then this parameter shall change to 011b. To assure that recipients of this parameter detect this state change, this parameter shall be set to this value for at least 3 consecutive broadcasts. See Aftertreatment 1 Particulate Sensor Heater Low Side Driver Preliminary FMI (SPN 7323) for the most recent result. 011b = Enable or pause conditions have allowed tests to execute this power cycle. If tests are executed while this parameter is 011b, then this parameter shall change to 010b. To assure that recipients of this parameter detect this state change, this parameter shall be set to this value for at least 3 consecutive broadcasts. See Aftertreatment 1 Particulate Sensor Heater Low Side Driver Preliminary FMI (SPN 7323) for the most recent result. 100b to 110b = SAE Reserved 111b = Not Available. Aftertreatment 1 Particulate Sensor Heater Low Side Driver Preliminary FMI (SPN 7323) is not valid.
7325	Aftertreatment 1 Particulate Sensor Input Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the aftertreatment particulate sensor input by the manufacturer’s sensor control software in exhaust bank 1. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported. This parameter is only valid if Aftertreatment 1 Particulate Sensor Input Diagnostic Status (SPN 7326) is equal to 000b, 010b or 011b.

7326	Aftertreatment 1 Particulate Sensor Input Diagnostic Status	The value of this parameter is not retained when power is removed from the particulate sensor. 000b = Tests monitored continuously. There are no enable or pause conditions. See Aftertreatment 1 Particulate Sensor Input Preliminary FMI (SPN 7325) for result. 001b = Tests supported but not completed this power cycle. Enable or pause conditions have not been satisfied, which has prevented tests from executing. When tests have completed, this parameter shall change to 010b. Aftertreatment 1 Particulate Sensor Input Preliminary FMI (SPN 7325) is not valid at the present time. 010b = Enable or pause conditions have allowed tests to execute this power cycle. If tests are executed while this parameter is 010b, then this parameter shall change to 011b. To assure that recipients of this parameter detect this state change, this parameter shall be set to this value for at least 3 consecutive broadcasts. See Aftertreatment 1 Particulate Sensor Input Preliminary FMI (SPN 7325) for the most recent result. 011b = Enable or pause conditions have allowed tests to execute this power cycle. If tests are executed while this parameter is 011b, then this parameter shall change to 010b. To assure that recipients of this parameter detect this state change, this parameter shall be set to this value for at least 3 consecutive broadcasts. See Aftertreatment 1 Particulate Sensor Input Preliminary FMI (SPN 7325) for the most recent result. 100b to 110b = SAE Reserved 111b = Not Available. Aftertreatment 1 Particulate Sensor Input Preliminary FMI (SPN 7325) is not valid.
7327	Aftertreatment 1 Particulate Sensor Power Supply Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the aftertreatment particulate sensor power supply by the manufacturer’s sensor control software in exhaust bank 1. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported. This parameter is only valid if Aftertreatment 1 Particulate Sensor Power Supply Diagnostic Status (SPN 7328) is equal to 000b, 010b or 011b.
7328	Aftertreatment 1 Particulate Sensor Power Supply Diagnostic Status	The value of this parameter is not retained when power is removed from the particulate sensor. 000b = Tests monitored continuously. There are no enable or pause conditions. See Aftertreatment 1 Particulate Sensor Power Supply Preliminary FMI (SPN 7327) for result. 001b = Tests supported but not completed this power cycle. Enable or pause conditions have not been satisfied, which has prevented tests

		from executing. When tests have completed, this parameter shall change to 010b. Aftertreatment 1 Particulate Sensor Power Supply Preliminary FMI (SPN 7327) is not valid at the present time. 010b = Enable or pause conditions have allowed tests to execute this power cycle. If tests are executed while this parameter is 010b, then this parameter shall change to 011b. To assure that recipients of this parameter detect this state change, this parameter shall be set to this value for at least 3 consecutive broadcasts. See Aftertreatment 1 Particulate Sensor Power Supply Preliminary FMI (SPN 7327) for the most recent result. 011b = Enable or pause conditions have allowed tests to execute this power cycle. If tests are executed while this parameter is 011b, then this parameter shall change to 010b. To assure that recipients of this parameter detect this state change, this parameter shall be set to this value for at least 3 consecutive broadcasts. See Aftertreatment 1 Particulate Sensor Power Supply Preliminary FMI (SPN 7327) for the most recent result. 100b to 110b = SAE Reserved 111b = Not Available. Aftertreatment 1 Particulate Sensor Power Supply Preliminary FMI (SPN 7327) is not valid.
7329	Aftertreatment 1 Particulate Sensor Heater Power Supply Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the aftertreatment particulate sensor heater power supply by the manufacturer's sensor control software in exhaust bank 1. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported. This parameter is only valid if Aftertreatment 1 Particulate Sensor Heater Power Supply Diagnostic Status (SPN 7330) is equal to 000b, 010b or 011b.
7330	Aftertreatment 1 Particulate Sensor Heater Power Supply Diagnostic Status	The value of this parameter is not retained when power is removed from the particulate sensor. 000b = Tests monitored continuously. There are no enable or pause conditions. See Aftertreatment 1 Particulate Sensor Heater Power Supply Preliminary FMI (SPN 7329) for result. 001b = Tests supported but not completed this power cycle. Enable or pause conditions have not been satisfied, which has prevented tests from executing. When tests have completed, this parameter shall change to 010b. Aftertreatment 1 Particulate Sensor Heater Power Supply Preliminary FMI (SPN 7329) is not valid at the present time. 010b = Enable or pause conditions have allowed tests to execute this power cycle. If tests are executed while this parameter is 010b, then this parameter shall change to 011b. To assure that

		recipients of this parameter detect this state change, this parameter shall be set to this value for at least 3 consecutive broadcasts. See Aftertreatment 1 Particulate Sensor Heater Power Supply Preliminary FMI (SPN 7329) for the most recent result. 011b = Enable or pause conditions have allowed tests to execute this power cycle. If tests are executed while this parameter is 011b, then this parameter shall change to 010b. To assure that recipients of this parameter detect this state change, this parameter shall be set to this value for at least 3 consecutive broadcasts. See Aftertreatment 1 Particulate Sensor Heater Power Supply Preliminary FMI (SPN 7329) for the most recent result. 100b to 110b = SAE Reserved 111b = Not Available. Aftertreatment 1 Particulate Sensor Heater Power Supply Preliminary FMI (SPN 7329) is not valid.
7331	Aftertreatment Thermal Management Inhibit Request	Provides state of inhibit request for Aftertreatment thermal management from external system. Aftertreatment Thermal Management indicates that the exhaust temperatures have been controlled for expected functioning of the aftertreatment system – This is not just limited to temperature increase for regeneration of DPF or SCR. Inhibit request is active when temperature change in aftertreatment system leads to deviation in the normal functioning of the external system and external system requests thermal management to be suspended for some duration. Status of SPN 7332 indicates whether the inhibit request is accepted. 00b = Do not inhibit 01b = Inhibit 10b = Reserved for SAE assignment 11b = Not Available
7332	Aftertreatment Thermal Management Status	Indicates whether Aftertreatment Thermal Management process is active. Aftertreatment Thermal Management indicates that the exhaust temperatures have been controlled for the normal functioning of the aftertreatment system – This is not just limited to temperature increase for regeneration of DPF or SCR. ’00b’ – Not Active State may also be due to inhibit request in SPN 7331. 00b = Not active 01b = Active 10b = Reserved for SAE assignment 11b = Not available
7333	Cylinder Fuel Rate	Cylinder fuel rate shall indicate the amount of fuel injected into the cylinder for combustion during the most recent intake stroke of the engine.NOTE: Cylinder fuel rate shall indicate zero mg/stroke when the engine is not running.

7334	Extended Identifier Type (Least Significant Byte)	See document J1939-21 for SPN details.
7335	Extended Identifier Type	See document J1939-21 for SPN details.
7336	Extended Identifier Type (Most Significant Byte)	See document J1939-21 for SPN details.
7337	Control Indicating Extended Identifier Type	See document J1939-21 for SPN details.
7338	Extended Identifier (Least Significant Byte)	See document J1939-21 for SPN details.
7339	Extended Identifier	See document J1939-21 for SPN details.
7340	Extended Identifier (Most Significant Byte)	See document J1939-21 for SPN details.
7341	SCR Operator Inducement Emergency Override Total Reset Occurrences	The total number of times the feature, which allows the operator to override the inducement strategies (as described in SPN 6880) during emergencies, such as hurricanes, has been reset.This counter can not be reset.
7342	SCR Operator Inducement Override Mode	Indicates the functional mode of SCR operator inducement override. 000b = Not Available 001b = Available – Not Active 010b = Active 011b = Active Extended 100b = Expired 101b to 110b = Not Defined 111b = Not Available Note: This is SPN is intended for special emergency situations, such as natural disasters. Check legal implications before using this SPN.
7343	SCR Operator Inducement Override Renewal Required	Indicates the required operator inducement override renewal state. 00b = Not Required 01b = Required 10b = Error 11b = Not Available

7344	SCR Operator Inducement Override Time Remaining (Extended Range)	Used to indicate the time remaining during an operator inducement override event. When an operator inducement is active this parameter indicates the remaining time that the currently active operator inducement may be overridden.See also SPN 6878 for an alternate SLOT.
7345	Heartbeat Sequence Number	See document ISO 11783-7 for SPN details.
7346	Diesel Exhaust Fluid Speed of Sound	The speed of sound in the fluid that is in the diesel exhaust fluid tank.
7347	Fire Suppression Water Tank Level	Liquid level of the fire apparatus water tank.
7348	Fire Suppression Class-A Foam Tank Level	Liquid level of the Class-A foam agent tank.
7349	Fire Suppression Class-B Foam Tank Level	Liquid level of the Class-B foam agent tank.
7350	Fire Suppression Compressed Air Foam System Air Pressure	Compressed Air Foam System (CAFS) air compressor pressure.
7351	Aftertreatment 1 Outlet Corrected NOx	The corrected outlet NOx value for aftertreatment 1 shall include all learned adaptions and offsets that are used to adjust the raw signal.2016 MY and later engines with NOx sensors may be required to output a ‘corrected’ NOx sensor signal in addition to the raw NOx sensor signal out using SPN 3226. A value of FB00h shall be provided when ambient or engine operating conditions do not permit the sensor to operate in data collection mode.
7352	Aftertreatment 2 Outlet Corrected NOx	The corrected outlet NOx value for aftertreatment 2 shall include all learned adaptions and offsets that are used to adjust the raw signal.2016 MY and later engines with NOx sensors may be required to output a ‘corrected’ NOx sensor signal in addition to the raw NOx sensor signal out using SPN 3265. A value of FB00h shall be

		provided when ambient or engine operating conditions do not permit the sensor to operate in data collection mode.
7353	Engine Exhaust 1 Corrected Nox	The corrected NOx value for exhaust bank 1 shall include all learned adaptions and offsets that are used to adjust the raw signal. This sensor is located at the intake of the SCR system if an SCR system exists.2016 MY and later engines with NOx sensors may be required to output a 'corrected' NOx sensor signal in addition to the raw NOx sensor signal out using SPN 3216. A value of FB00h shall be provided when ambient or engine operating conditions do not permit the sensor to operate in data collection mode.
7354	Engine Exhaust 2 Corrected Nox	The corrected intake Selective Catalytic Reduction NOx value for aftertreatment 2 shall include all learned adaptions and offsets that are used to adjust the raw signal. This sensor is located at the intake of the SCR system if an SCR system exists.2016 MY and later engines with NOx sensors may be required to output a 'corrected' NOx sensor signal in addition to the raw NOx sensor signal out using SPN 3255. A value of FB00h shall be provided when ambient or engine operating conditions do not permit the sensor to operate in data collection mode.
7355	Engine Timing Advance	Ignition timing as a command to the ignition control module. Positive values command an increasingly advanced timing from TDC. The same timing applies to all cylinders. Use SPN 7356 – SPN 7379 for cylinder specific timing offsets from this timing.
7356	Engine Cylinder 1 Ignition Timing Offset	The ignition timing offset for Cylinder 1 from the engine timing advance (SPN 7355) as a command to the ignition control module. Positive values command an increasingly advanced timing.
7357	Engine Cylinder 2 Ignition Timing Offset	The ignition timing offset for Cylinder 2 from the engine timing advance (SPN 7355) as a command to the ignition control module. Positive values command an increasingly advanced timing.

7358	Engine Cylinder 3 Ignition Timing Offset	The ignition timing offset for Cylinder 3 from the engine timing advance (SPN 7355) as a command to the ignition control module. Positive values command an increasingly advanced timing.
7359	Engine Cylinder 4 Ignition Timing Offset	The ignition timing offset for Cylinder 4 from the engine timing advance (SPN 7355) as a command to the ignition control module. Positive values command an increasingly advanced timing.
7360	Engine Cylinder 5 Ignition Timing Offset	The ignition timing offset for Cylinder 5 from the engine timing advance (SPN 7355) as a command to the ignition control module. Positive values command an increasingly advanced timing.
7361	Engine Cylinder 6 Ignition Timing Offset	The ignition timing offset for Cylinder 6 from the engine timing advance (SPN 7355) as a command to the ignition control module. Positive values command an increasingly advanced timing.
7362	Engine Cylinder 7 Ignition Timing Offset	The ignition timing offset for Cylinder 7 from the engine timing advance (SPN 7355) as a command to the ignition control module. Positive values command an increasingly advanced timing.
7363	Engine Cylinder 8 Ignition Timing Offset	The ignition timing offset for Cylinder 8 from the engine timing advance (SPN 7355) as a command to the ignition control module. Positive values command an increasingly advanced timing.
7364	Engine Cylinder 9 Ignition Timing Offset	The ignition timing offset for Cylinder 9 from the engine timing advance (SPN 7355) as a command to the ignition control module. Positive values command an increasingly advanced timing.
7365	Engine Cylinder 10 Ignition Timing Offset	The ignition timing offset for Cylinder 10 from the engine timing advance (SPN 7355) as a command to the ignition control module. Positive values command an increasingly advanced timing.

7366	Engine Cylinder 11 Ignition Timing Offset	The ignition timing offset for Cylinder 11 from the engine timing advance (SPN 7355) as a command to the ignition control module. Positive values command an increasingly advanced timing.
7367	Engine Cylinder 12 Ignition Timing Offset	The ignition timing offset for Cylinder 12 from the engine timing advance (SPN 7355) as a command to the ignition control module. Positive values command an increasingly advanced timing.
7368	Engine Cylinder 13 Ignition Timing Offset	The ignition timing offset for Cylinder 13 from the engine timing advance (SPN 7355) as a command to the ignition control module. Positive values command an increasingly advanced timing.
7369	Engine Cylinder 14 Ignition Timing Offset	The ignition timing offset for Cylinder 14 from the engine timing advance (SPN 7355) as a command to the ignition control module. Positive values command an increasingly advanced timing.
7370	Engine Cylinder 15 Ignition Timing Offset	The ignition timing offset for Cylinder 15 from the engine timing advance (SPN 7355) as a command to the ignition control module. Positive values command an increasingly advanced timing.
7371	Engine Cylinder 16 Ignition Timing Offset	The ignition timing offset for Cylinder 16 from the engine timing advance (SPN 7355) as a command to the ignition control module. Positive values command an increasingly advanced timing.
7372	Engine Cylinder 17 Ignition Timing Offset	The ignition timing offset for Cylinder 17 from the engine timing advance (SPN 7355) as a command to the ignition control module. Positive values command an increasingly advanced timing.
7373	Engine Cylinder 18 Ignition Timing Offset	The ignition timing offset for Cylinder 18 from the engine timing advance (SPN 7355) as a command to the ignition control module. Positive values command an increasingly advanced timing.

7374	Engine Cylinder 19 Ignition Timing Offset	The ignition timing offset for Cylinder 19 from the engine timing advance (SPN 7355) as a command to the ignition control module. Positive values command an increasingly advanced timing.
7375	Engine Cylinder 20 Ignition Timing Offset	The ignition timing offset for Cylinder 20 from the engine timing advance (SPN 7355) as a command to the ignition control module. Positive values command an increasingly advanced timing.
7376	Engine Cylinder 21 Ignition Timing Offset	The ignition timing offset for Cylinder 21 from the engine timing advance (SPN 7355) as a command to the ignition control module. Positive values command an increasingly advanced timing.
7377	Engine Cylinder 22 Ignition Timing Offset	The ignition timing offset for Cylinder 22 from the engine timing advance (SPN 7355) as a command to the ignition control module. Positive values command an increasingly advanced timing.
7378	Engine Cylinder 23 Ignition Timing Offset	The ignition timing offset for Cylinder 23 from the engine timing advance (SPN 7355) as a command to the ignition control module. Positive values command an increasingly advanced timing.
7379	Engine Cylinder 24 Ignition Timing Offset	The ignition timing offset for Cylinder 24 from the engine timing advance (SPN 7355) as a command to the ignition control module. Positive values command an increasingly advanced timing.
7380	Engine Turbocharger Compressor Blowoff Actuator 1 Motor Current Disable	Command to disable power to motor in the actuator to prevent unnecessary load on the component. 00b = Do Not Disable 01b = Disable 10b = Reserved 11b = Don’t Care/Take No Action
7381	Engine Turbocharger Wastegate Actuator 1 Motor Current Disable	Command to disable power to motor in the actuator to prevent unnecessary load on the component. 00b = Do Not Disable 01b = Disable 10b = Reserved 11b = Don’t Care/Take No Action

7382	Engine Cylinder Head Bypass Actuator 1 Motor Current Disable	Command to disable power to motor in the actuator to prevent unnecessary load on the component. 00b = Do Not Disable 01b = Disable 10b = Reserved 11b = Don't Care/Take No Action
7383	Engine Throttle Valve 1 Motor Current Disable	Command to disable power to motor in the actuator to prevent unnecessary load on the component. 00b = Do Not Disable 01b = Disable 10b = Reserved 11b = Don't Care/Take No Action
7384	Engine Cold Start Cylinder 1 Fuel Injection Timing	Fuel injection timing cylinder 1 during cold start. Advanced timing should use FMIs assocated with data above range (e.g. FMIs 0, 15, 16) Retarded timing should use FMIs assocated with data below range (e.g. FMIs 1, 17,18)
7385	Engine Cold Start Cylinder 2 Fuel Injection Timing	Fuel injection timing cylinder 2 during cold start. Advanced timing should use FMIs assocated with data above range (e.g. FMIs 0, 15, 16) Retarded timing should use FMIs assocated with data below range (e.g. FMIs 1, 17,18)
7386	Engine Cold Start Cylinder 3 Fuel Injection Timing	Fuel injection timing cylinder 3 during cold start. Advanced timing should use FMIs assocated with data above range (e.g. FMIs 0, 15, 16) Retarded timing should use FMIs assocated with data below range (e.g. FMIs 1, 17,18)
7387	Engine Cold Start Cylinder 4 Fuel Injection Timing	Fuel injection timing cylinder 4 during cold start. Advanced timing should use FMIs assocated with data above range (e.g. FMIs 0, 15, 16) Retarded timing should use FMIs assocated with data below range (e.g. FMIs 1, 17,18)
7388	Engine Cold Start Cylinder 5 Fuel Injection Timing	Fuel injection timing cylinder 5 during cold start. Advanced timing should use FMIs assocated with data above range (e.g. FMIs 0, 15, 16) Retarded timing should use FMIs assocated with data below range (e.g. FMIs 1, 17,18)
7389	Engine Cold Start Cylinder 6 Fuel Injection Timing	Fuel injection timing cylinder 6 during cold start. Advanced timing should use FMIs assocated with data above range (e.g. FMIs 0, 15, 16) Retarded timing should use FMIs assocated with data below range (e.g. FMIs 1, 17,18)

7390	Engine Cold Start Cylinder 7 Fuel Injection Timing	Fuel injection timing cylinder 7 during cold start. Advanced timing should use FMIs assocated with data above range (e.g. FMIs 0, 15, 16) Retarded timing should use FMIs assocated with data below range (e.g. FMIs 1, 17,18)
7391	Engine Cold Start Cylinder 8 Fuel Injection Timing	Fuel injection timing cylinder 8 during cold start. Advanced timing should use FMIs assocated with data above range (e.g. FMIs 0, 15, 16) Retarded timing should use FMIs assocated with data below range (e.g. FMIs 1, 17,18)
7392	Engine Cold Start Fuel Injection Timing for All Cylinders	Fuel injection timing for all cylinders during cold start. Advanced timing should use FMIs assocated with data above range (e.g. FMIs 0, 15, 16) Retarded timing should use FMIs assocated with data below range (e.g. FMIs 1, 17,18)
7393	Aftertreatment 1 Particulate Sensor Current	Raw aftertreatment 1 PM sensor electrical current reading.
7394	Engine Fuel Isolation Control	Control setting for fuel isolation. In a single injector dual fuel system when using just diesel fuel, diesel must not be allowed to migrate into the gaseous fuel system. When the fuel isolation valve is closed the engine uses dual fuel by allowing the mechanical regulator controls the gaseous fuel to a pressure lower than the diesel fuel. When the fuel isolation valve is open the mechanical regulator does not see diesel fuel pressure so the gaseous fuel is off which prevents diesel fuel from migrating to the gaseous fuel system.00b = Gaseous Fuel Migration is Prevented 01b = Gaseous Fuel is Used 10b = Reserved 11b = Don’t care / take no action
7395	Fuel Tank Transfer Pump Pressure	Gage pressure of the fuel in the system as delivered by the transfer pump.
7396	Tractor Brake Caliper Lining Clearance Axle 1 Left	Brake caliper lining clearance for left brake on tractor axle 1. 00b = Caliper lining clearance is adequate 01b = Caliper lining clearance is low 10b = Error 11b = Not available / not applicable
7397	Tractor Brake Caliper Lining Clearance Axle 1 Right	Brake caliper lining clearance for right brake on tractor axle 1. 00b = Caliper lining clearance is adequate 01b = Caliper lining clearance is low 10b = Error 11b = Not available / not applicable

7398	Tractor Brake Caliper Lining Clearance Axle 2 Left	Brake caliper lining clearance for left brake on tractor axle 2. 00b = Caliper lining clearance is adequate 01b = Caliper lining clearance is low 10b = Error 11b = Not available / not applicable
7399	Tractor Brake Caliper Lining Clearance Axle 2 Right	Brake caliper lining clearance for right brake on tractor axle 2. 00b = Caliper lining clearance is adequate 01b = Caliper lining clearance is low 10b = Error 11b = Not available / not applicable
7400	Tractor Brake Caliper Lining Clearance Axle 3 Left	Brake caliper lining clearance for left brake on tractor axle 3. 00b = Caliper lining clearance is adequate 01b = Caliper lining clearance is low 10b = Error 11b = Not available / not applicable
7401	Tractor Brake Caliper Lining Clearance Axle 3 Right	Brake caliper lining clearance for right brake on tractor axle 3. 00b = Caliper lining clearance is adequate 01b = Caliper lining clearance is low 10b = Error 11b = Not available / not applicable
7402	Tractor Brake Caliper Lining Clearance Axle 4 Left	Brake caliper lining clearance for left brake on tractor axle 4. 00b = Caliper lining clearance is adequate 01b = Caliper lining clearance is low 10b = Error 11b = Not available / not applicable
7403	Tractor Brake Caliper Lining Clearance Axle 4 Right	Brake caliper lining clearance for right brake on tractor axle 4. 00b = Caliper lining clearance is adequate 01b = Caliper lining clearance is low 10b = Error 11b = Not available / not applicable
7404	Tractor Brake Caliper Lining Clearance Axle 5 Left	Brake caliper lining clearance for left brake on tractor axle 5. 00b = Caliper lining clearance is adequate 01b = Caliper lining clearance is low 10b = Error 11b = Not available / not applicable
7405	Tractor Brake Caliper Lining Clearance Axle 5 Right	Brake caliper lining clearance for right brake on tractor axle 5. 00b = Caliper lining clearance is adequate 01b = Caliper lining clearance is low 10b = Error 11b = Not available / not applicable

7406	Trailer Brake Caliper Lining Clearance Axle 1 Left	Brake caliper lining clearance for left brake on trailer axle 1. 00b = Caliper lining clearance is adequate 01b = Caliper lining clearance is low 10b = Error 11b = Not available / not applicable
7407	Trailer Brake Caliper Lining Clearance Axle 1 Right	Brake caliper lining clearance for right brake on trailer axle 1. 00b = Caliper lining clearance is adequate 01b = Caliper lining clearance is low 10b = Error 11b = Not available / not applicable
7408	Trailer Brake Caliper Lining Clearance Axle 2 Left	Brake caliper lining clearance for left brake on trailer axle 2. 00b = Caliper lining clearance is adequate 01b = Caliper lining clearance is low 10b = Error 11b = Not available / not applicable
7409	Trailer Brake Caliper Lining Clearance Axle 2 Right	Brake caliper lining clearance for right brake on trailer axle 2. 00b = Caliper lining clearance is adequate 01b = Caliper lining clearance is low 10b = Error 11b = Not available / not applicable
7410	Trailer Brake Caliper Lining Clearance Axle 3 Left	Brake caliper lining clearance for left brake on trailer axle 3. 00b = Caliper lining clearance is adequate 01b = Caliper lining clearance is low 10b = Error 11b = Not available / not applicable
7411	Trailer Brake Caliper Lining Clearance Axle 3 Right	Brake caliper lining clearance for right brake on trailer axle 3. 00b = Caliper lining clearance is adequate 01b = Caliper lining clearance is low 10b = Error 11b = Not available / not applicable
7412	Trailer Brake Caliper Lining Clearance Axle 4 Left	Brake caliper lining clearance for left brake on trailer axle 4. 00b = Caliper lining clearance is adequate 01b = Caliper lining clearance is low 10b = Error 11b = Not available / not applicable
7413	Trailer Brake Caliper Lining Clearance Axle 4 Right	Brake caliper lining clearance for right brake on trailer axle 4. 00b = Caliper lining clearance is adequate 01b = Caliper lining clearance is low 10b = Error 11b = Not available / not applicable

7414	Trailer Brake Caliper Lining Clearance Axle 5 Left	Brake caliper lining clearance for left brake on trailer axle 5. 00b = Caliper lining clearance is adequate 01b = Caliper lining clearance is low 10b = Error 11b = Not available / not applicable
7415	Trailer Brake Caliper Lining Clearance Axle 5 Right	Brake caliper lining clearance for right brake on trailer axle 5. 00b = Caliper lining clearance is adequate 01b = Caliper lining clearance is low 10b = Error 11b = Not available / not applicable
7416	Aftertreatment 1 Diesel Exhaust Fluid Pump Power Relay	The state of the aftertreatment 1 diesel exhaust fluid pump power relay. 00b = not active – no power is being applied to the relay 01b = active – power is being applied to the relay 10b = error 11b = not available
7417	Aftertreatment 1 Diesel Exhaust Fluid Control Module Circuit Breaker	The status of the circuit breaker that is used to power the diesel exhaust control module. 00b = off 01b = on 10b = error 11b = not available
7418	Hybrid System Engine Assist Status	Provides the engine an indication of when the hybrid system is not mechanically assisting rotation (i.e. not motoring) the engine. When this parameter is in state 00b, the engine can perform operations while free of potential hybrid system assistance.When this parameter is in state 01b, the hybrid system may or may not mechanically assist engine rotation. While this parameter is in state 01b, the engine should not perform operations that need to be free from hybrid system assistance. 00b = Hybrid system is not mechanically assisting engine rotation 01b = Hybrid system may or may not mechanically assist engine rotation 10b = Error 11b = Not Available
7420	Applied Vehicle Speed Limit (High Resolution)	The vehicle speed limit in effect. See SPN 2595 for alternate resolution. Note: If a maximum vehicle speed limit is not selected, then the first byte of this parameter will be equal to FBh.
7421	Engine Charge Air Cooler Bypass Valve 1 Command	Desired percentage of charge air cooler Bypass Valve 1 opening. 0% means no air is bypassed. 100% means full bypass capacity.

7422	Engine Charge Air Cooler Bypass Valve 2 Command	Desired percentage of charge air cooler Bypass Valve 2 opening. 0% means no air is bypassed. 100% means full bypass capacity.
7423	Engine Coolant System Thermostat 2	Indicate the status of the second Engine Coolant System thermostat. See SPN 1659 for the first thermostat.
7424	Diesel Exhaust Fluid Lamp	Indicates the status of the Diesel Exhaust Fluid Lamp circuit.
7425	Operator Inducement Torque Derate Level 1	This is the first torque derate that will be applied to the engine operation due to operator inducement. The torque derate indicated in this parameter will be active when the value in Operator Inducement Time to Torque Derate Level 1 (SPN 7426) has decremented to 0.This parameter is a percentage of how much the engine's capabilities will be reduced as indicated by the Advertised Engine Torque Curve. 0% represents no torque derate and 100% represents a full torque derate. This parameter will be set to 0% when no operator inducement is active. For systems where SPN 5246 or SPN 5826 are supported, operator inducement is active if at least one of SPN 5246 or SPN 5826 is not equal to 000b. This parameter is expected to be less than Operator Inducement Torque Derate Level 2 (SPN 7427) if a second level of derate exists.
7426	Operator Inducement Time to Torque Derate Level 1	This parameter provides the time until Operator Inducement Torque Derate Level 1 (SPN 7425) is activated. When operator inducement is not active, this parameter will be set to FB00h. For systems where SPN 5246 or SPN 5826 are supported, operator inducement is active if at least one of SPN 5246 or SPN 5826 is not equal to 000b. If SPN 7426 has decremented to 0, it will remain at 0 until the condition that caused it to decrement has been corrected. When operator inducement is active and there are two levels of torque derate, then Operator Inducement Time to Torque Derate Level 1 (SPN 7426) is expected to be smaller than Operator Inducement Time to Torque Derate Level 2 (SPN 7428) unless both SPN 7426 and SPN 7428 are equal to 0. See SPN 7719 for the time until final inducement action. If the operator inducement has been temporarily overridden, then this parameter will pause and not decrement until the override is removed. For systems where SPN 5246 or SPN 5826 are supported,

		operator inducement is active if at least one of SPN 5246 or SPN 5826 is not equal to 110b – Temporary Override of Inducement.
7427	Operator Inducement Torque Derate Level 2	This is the second torque derate that will be applied to the engine operation due to operator inducement. The torque derate level indicated in this parameter will be applied when the value in Operator Inducement Time to Torque Derate Level 2 (SPN 7428) has decremented to 0.This parameter is a percentage of how much the engine's capabilities will be reduced as indicated by the Advertised Engine Torque Curve. 0% represents no torque derate and 100% represents a full torque derate. This parameter will be set to 0% when no operator inducement is active. For systems where SPN 5246 or SPN 5826 are supported, operator inducement is active if at least one of SPN 5246 or SPN 5826 is not equal to 000b. This parameter is expected to be a greater than Operator Inducement Torque Derate Level 1 (SPN 7425) unless a second level of derate does not exist, in which case Operator Inducement Torque Derate Level 2 (SPN 7427) will be 0.
7428	Operator Inducement Time to Torque Derate Level 2	This parameter provides the time until Operator Inducement Torque Derate Level 2 (SPN 7427) is activated. When operator inducement is not active or if a second level of derate does not exist, then this parameter will be set to FB00h. For systems where SPN 5246 or SPN 5826 are supported, operator inducement is active if at least one of SPN 5246 or SPN 5826 is not equal to 000b. If SPN 7428 has decremented to 0, it will remain at 0 until the condition that caused it to decrement has been corrected. This parameter is expected to be a greater than Operator Inducement Time to Torque Derate Level 1 (SPN 7426) if the current inducement event will impose a second torque derate level. See SPN 7719 for the time until final inducement action. If the operator inducement has been temporarily overridden, then this parameter will pause and not decrement until the override is removed. or systems where SPN 5246 or SPN 5826 are supported, operator inducement is active if at least one of SPN 5246 or SPN 5826 is not equal to 110b – Temporary Override of Inducement.
7429	Vehicle Speed Control Override Request	Speed control override requested. Indicates that the minimum restriction of speed is desired, for instance when travelling downhill towards an impending uphill grade. This is not a request to inhibit engine brakes (or other speed limiting device) but to

		delay activation or use the highest speed tolerance within limits set for vehicle speed.00b = No speed control override requested 01b = Speed control override requested 10b = Reserved 11b = Don’t care/take no action
7430	Predictive Cruise Control Driveline Disengage Inhibit Request	Request to temporarily inhibit a fuel saving feature that would normally open the driveline. Under certain conditions and with knowledge of the terrain, inhibiting this feature may improve fuel economy.SPN 683 Disengage Driveline Request has priority over this parameter. However, the sender of SPN 683 should consider this parameter and not request driveline disengagement if it is for fuel economy purposes. 00b = No Inhibit Request 01b = Driveline Disengage Inhibit Request 10b = Reserved 11b = Don’t care/take no action
7431	Predictive Cruise Control Event in Range	Indicates that an event, such as a grade, is detected within the range of the predictive cruise control (PCC) look-ahead distance.00b = No PCC event in range 01b = PCC event in range 10b = Error 11b = Not available Note: Intended to be sent regardless of whether or not PCC is active. Can be used to indicate an upcoming event or a missed opportunity.
7432	Roadway Present Grade	Road grade at present vehicle position. Positive numbers indicate uphill grade, negative are downhill for present vehicle direction of travel. For grades beyond the limits of the parameter, the limit value shall be reported.Parameter Specific Indicator: A value of FBh indicates the parameter is supported but the present grade cannot be determined.
7433	Roadway Next Grade	Road grade at an upcoming distance. If SPN 9199 is supported, then this the road grade at the distance specified by SPN 9199. Positive numbers indicate uphill grade, negative are downhill for vehicle direction of travel. For grades beyond the limits of the parameter, the limit value shall be reported.Parameter Specific Indicator: A value of FBh indicates the parameter is supported but the upcoming grade cannot be determined.
7434	Predictive Cruise Control Speed Event Indicator	Indicates to the operator that a predictive cruise control (PCC) speed event is active. Typically, this will correspond to a Predictive Cruise Control Set Speed Offset (SPN

		7316) request to increase or decrease vehicle speed from the nominal cruise set point.00b = No speed event is active 01b = Increased speed event is active 10b = Decreased speed event is active 11b = Not available
7435	Vehicle Speed Control Override Event Indicator	Indicates to the operator that a Speed Control override event is active. « Speed Control » refers to retarders or methods of automatically limiting vehicle speed, for instance on downhill grades. An active event indicates that vehicle speed may exceed the nominal set point for speed control. Typically, this will correspond to a Vehicle Speed Control Override Request (SPN 7429).00b = Speed Control event is not active 01b = Speed Control event is active 10b = Reserved 11b = Not available
7436	Predictive Cruise Control Enable Switch	Indicates whether predictive cruise control (PCC) is enabled. When not enabled, the predictive cruise control does not calculate a speed offset or identify predictive cruise events, and the predictive cruise control state (SPN 7317) shall not be « enabled ».00b = Predictive cruise control is not enabled 01b = Predictive cruise control is enabled 10b = Error 11b = Not available
7437	Predictive Cruise Control Deactivation Request	Indicates that the operator has requested to deactivate the predictive cruise control (PCC) function. If enabled, the PCC device may still provide notification of events in range, road grade, and other information. But if requested to be deactivated by this parameter, the predictive cruise device shall set its state (SPN 7317) to « Enabled, but not functional due to inhibited by driver ». 00b = Predictive cruise control is not requested to be deactived 01b = Predictive cruise control is requested to be deactived 10b = Error 11b = Not available
7438	Predictive Cruise Control Maximum Positive Offset	Maximum speed increase that the predictive cruise control (PCC) is allowed to request. This may be adjusted by the operator (either directly or indirectly) to tailor the performance of the PCC system.This parameter is used in conjunction with maximum negative offset (SPN 7439) and cruise set speed (SPN 86 or SPN 6809) to define the operating range of the PCC system.
7439	Predictive Cruise Control Maximum Negative Offset	Maximum speed decrease that the predictive cruise control (PCC) is allowed to request. This may be adjusted by the operator (either directly or indirectly) to tailor

		the performance of the PCC system.This parameter is used in conjunction with maximum positive offset (SPN 7438) and cruise set speed (SPN 86 or SPN 6809) to define the operating range of the PCC system.
7440	Aftertreatment Active Regeneration Inhibited Due to Low Exhaust Pressure	The state of aftertreatment active regeneration inhibition due to low exhaust pressure. Aftertreatment Regeneration is a process of increasing the temperature at the exhaust and thereby removing the deposits on aftertreatment components such as DPF or SCR Catalyst and increasing their efficiency. This SPN indicates the reason for the regeneration not being initiated or being exited prior to completion. When this state becomes active the system will not initiate an active regeneration or will exit an active regeneration. The state provides information that may be provided to the driver/service technician as to why the regeneration did not initiate or was exited. 00b = Not Inhibited 01b = Inhibited 10b = Reserved for SAE assignment 11b = Not Available
7441	Aftertreatment Ambient Air Temperature	Temperature of ambient air near the aftertreatment components such as DEF tank and DEF lines.
7442	Inert Gas Supply Valve Position	Position of inert gas supply valve used to control the flow of inert gas into the engine to purge the system.0% represents valve fully closed and 100% represents valve fully open.
7443	Stop All Implement Operations Transition Number	See document ISO 11783-7 for SPN details.
7444	Tractor Facility Response – Limit/Request Status Reporting	See document ISO 11783-7 for SPN details.
7445	Tractor Facility Request – Limit/Request Status Reporting	See document ISO 11783-7 for SPN details.
7446	ISOBUS Compliance Certification Message Revision	See document ISO 11783-7 for SPN details.

7447	Implement In-Work State	See document ISO 11783-7 for SPN details.
7448	Hybrid System Service Indicator	Signal from the hybrid system indicating that the hybrid system or one of its components requires servicing (e.g. oil change, coolant change).00b = Hybrid Service Indicator is off 01b = Hybrid Service Indicator is on continously 10b = Hybrid Service Indicator is flashing 11b = Not Available
7449	Hybrid System Motor Overspeed Indicator	Signal from the hybrid system indicating that the hybrid system motor is exceeding maximum speed limit. 00b = Hybrid System Motor Overspeed Indicator is off 01b = Hybrid System Motor Overspeed Indicator is on continously 10b = Hybrid System Motor Overspeed Indicator is flashing 11b = Not Available
7450	Hybrid System Motor Overspeed Audible Alarm	Signal from the hybrid system indicating that the overspeed audible alarm should be activated. 00b = Motor Overspeed Audible Alarm is off 01b = Motor Overspeed Audible Alarm is on 10b = Error 11b = Not Available
7451	Hybrid System Electric Alternator Indicator	Signal from the hybrid system indicating that the electric alternator is failed or needs servicing. The alternator Indicator (e.g. dash lamp) is to be activated.00b = Alternator Indicator is off 01b = Alternator Indicator is on 10b = Alternator Indicator is flashing 11b = Not Available
7452	Hybrid System Regenerative Braking Indicator	Signal from the hybrid system indicating when regenerative braking is active. 00b = Regenerative braking is inactive, but not disabled 01b = Regenerative braking is active 10b = Regenerative braking is disabled due to normal operating conditions or because a faulted condition is active 11b = Not Available
7453	Hybrid System Initialization Indicator	Signal indicating when the hybrid system or electric vehicle system is initialized and ready to start the engine or other power source (e.g. fuel cell). The intent is that this would drive an indicator for the vehicle operator. If the operator attempts to start the engine or power source while this indicator is active, it may not start because the system is initializing. When the indicator is not active in a hybrid system, the system initialization is complete and the engine may start. When the indicator is not active in an electric vehicle, the system initialization is complete and the vehicle is ready to

		move.00b = System Initialization Indicator is not active 01b = System Initialization Indicator is active 10b = Error 11b = Not Available
7454	Hybrid System High Voltage Exposure Indicator	This signal indicates the condition and state of the the hybrid system or electric vehicle system high voltage exposure detection system (e.g. High Voltage Interlock Loop [HVIL]). The high voltage exposure detection system is used to detect situations on a vehicle where personnel or property may be exposed to high voltage.The Error state indicates that the detection system may not be operational, and exposure status cannot be determined. For example, the detection system may not be operational due to electrical issues detected within its circuitry (e.g. short to battery, short to ground) or it has been intentionally disabled. 00b = System is operational and intact; no potential high voltage exposure has been detected 01b = System is operational and has detected a compromise; potential high voltage exposure exists 10b = Error 11b = Not Available
7455	Engine Total Gaseous Fuel Volume Used	Accumulated volume of engine gaseous fuel used during vehicle operation, in standard cubic meters. See SPN 1040 for alternate units.
7456	Engine Total Gaseous Idle Fuel Volume Used	Accumulated volume of engine gaseous fuel used during vehicle operation under idle conditions, in standard cubic meters.
7457	Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit 2	The diesel exhaust fluid dosing unit is a device that mixes the diesel exhaust fluid and air, and delivers a metered quantity of this mixture to the exhaust stream. This can also refer to a device that delivers diesel exhaust fluid to an aftertreatment diesel exhaust fluid dosing valve without air assistance.This parameter refers to the second dosing unit in bank 1.
7458	Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit 2 Input Lines	The diesel exhaust fluid dosing unit is a device that mixes the diesel exhaust fluid and air, such that it contains an input line from the air tank and an input line from the diesel exhaust fluid tank.This parameter refers to the input lines of the second dosing unit in bank 1.

7459	Aftertreatment 1 Diesel Exhaust Fluid Doser 2 Absolute Pressure	The SCR doser 2 diesel exhaust fluid absolute pressure (measured closest to dosing valve) for aftertreatment system 1 (exhaust bank 1).
7460	Aftertreatment 1 Diesel Exhaust Fluid Doser 2 Temperature	The temperature (measured closest to dosing valve) of the second DEF dosing unit for aftertreatment system 1 (exhaust bank 1).
7461	Aftertreatment 1 Diesel Exhaust Fluid Pump 2 Motor Speed	Rotational speed of the motor driving the second pump for the diesel exhaust fluid used in aftertreatment system 1 (exhaust bank 1).
7462	Aftertreatment 2 Diesel Exhaust Fluid Dosing Unit 2	The diesel exhaust fluid dosing unit is a device that mixes the diesel exhaust fluid and air, and delivers a metered quantity of this mixture to the exhaust stream. This can also refer to a device that delivers diesel exhaust fluid to an aftertreatment diesel exhaust fluid dosing valve without air assistance.This parameter refers to the second dosing unit in bank 2.
7463	Aftertreatment 2 Diesel Exhaust Fluid Dosing Unit 2 Input Lines	The diesel exhaust fluid dosing unit is a device that mixes the diesel exhaust fluid and air, such that it contains an input line from the air tank and an input line from the diesel exhaust fluid tank.This parameter refers to the input lines of the second dosing unit in bank 2.
7464	Aftertreatment 2 Diesel Exhaust Fluid Doser 2 Absolute Pressure	The SCR doser 2 diesel exhaust fluid absolute pressure (measured closest to dosing valve) for aftertreatment system 2 (exhaust bank 2).
7465	Aftertreatment 2 Diesel Exhaust Fluid Doser 2 Temperature	The temperature (measured closest to doser valve) of the second DEF doser unit for aftertreatment system 2 (exhaust bank 2).
7466	Aftertreatment 2 Diesel Exhaust Fluid Pump 2 Motor Speed	Rotational speed of the motor driving the second pump for the diesel exhaust fluid used in aftertreatment system 2 (exhaust bank 2).
7467	Aftertreatment 2 SCR Temperature Sensor Module	Module which will take temperature sensor inputs from the SCR Temperature Sensors in bank 2 and multiplex the sensor values to the engine ECU via the J1939 network.

7468	Engine Oil Pressure (High Resolution/Extended Range)	Gage pressure of oil in engine lubrication system as provided by oil pump. See SPN 100 for alternate resolution.
7469	Engine Fuel Delivery Pressure (High Resolution/Extended Range)	Gage pressure of fuel in system as delivered from supply pump to the injection pump. See SPN 94 for alternate resolution.See also SPN 5578 for Engine Fuel Delivery Absolute Pressure.
7470	Engine Oil Filter Intake Pressure (High Resolution/Extended Range)	Gage pressure of the engine oil before the oil reaches the oil filter. See SPN 1208 for alternate resolution.
7471	Engine Oil Filter Differential Pressure (Extended Range)	Change in engine oil pressure, measured across the filter, due to the filter and any accumulation of solid or semisolid material on or in the filter. See SPN 99 for alternate resolution.
7472	Engine Fuel Supply Pump Intake Absolute Pressure (Extended Range)	Absolute pressure of fuel at the fuel supply pump intake. See Figures SPN16_A & SPN16_B. See SPN 1381 for alternate resolution.Engine Fuel Supply Pump Intake Absolute Pressure (Extended Range)
7473	Driver Alertness Warning	Indicates when a distracted driving condition is detected. This signal can be used independent of the technology and ECU used to estimate the distracted driver condition.000b = No distracted driving condition detected 001b = Level 1 – Mild distraction or extended driving condition detected 010b = Level 2 – Degradation in driving behavior detected 011b = Level 3 – Driver alertness warning 100b to 110b = Reserved 111b = Not Available
7474	Driver Alertness Level	Indicates the alertness level of the driver measured by the driver alertness warning system. 100 % means driver is fully attentive. This signal can be used independent of the technology and ECU used to estimate the driver alertness condition.
7475	Driver Alertness Warning System State	Indicates the various system state in the driver alertness warning system. This signal can be used independent of the technology and ECU used to estimate the driver alertness condition.000b = System installed but disabled 001b = Initializing 010b =

		System temporarily not available 011b = System available 100b = System monitoring driver behavior 101b to 110b = Reserved 111b = Not Available / Not Installed
7476	Left Distance to Lane Mark from Vehicle’s Middle	Distance between middle of the vehicle front and the inner/right edge of the nearest lane mark on the left side as measured from the Forward Lane Imager. The value represents the lane width at camera position. Measured values greater than 5 m results in value 251.Note that the middle of the vehicle is used instead of the position of the optical sensor and this sensor is responsible to add an offset when it is not positioned at the middle of the vehicle (set as a parameter to this sensor for information hiding). Parameter specific values for this parameter are as follows: 251 = not in range 252 = not reliable 253 = reserved / not used 254 = error 255 = not available or not installed
7477	Right Distance to Lane Mark from Vehicle’s Middle	Distance between middle of the vehicle front and the inner/left edge of the nearest lane mark on the right side as measured from the Forward Lane Imager. The value represents the lane width at camera position. Measured values greater than 5 m results in value 251.Note that the middle of the vehicle is used instead of the position of the optical sensor and this sensor is responsible to add an offset when it is not positioned at the middle of the vehicle (set as a parameter to this sensor for information hiding). Parameter specific values for this parameter are as follows: 251 = not in range 252 = not reliable 253 = reserved / not used 254 = error 255 = not available or not installed
7478	Road Curvature Based on Lane Marks	The road curvature parameter is based on lane marks as measured by the FLI. It is the mean value of the road curvature of the lane marks on the left and right side of the lane. In case one of the lane mark is not recognized anymore, the value is set to the value of other side. The SPN represents the road curvature computed at the camera position.Positive values are used for left curves. Curvature is the inverst of the radius and is zero for straight roads. Parameter specific values for this parameter are as follows: FB01h = not in range FB02h = not reliable FB03h to FBFFh = reserved for parameter specific indicator FC00h to FDFFh = reserved range for future indicator bits FExxh (65024 – 65279) = error indicator FFxxh (65280 – 65535) = not available or not installed

7479	Lane Departure Angle Left	Angle between left lane mark and vehicle driving direction. The angle is positive while vehicle is moving towards the lane marks, and negative if not. Measured values outside the limits are represented by signal value 251.Parameter specific values for this parameter are as follows: 251 = not in range 252 = not reliable 253 = reserved / not used 254 = error 255 = not available or not installed
7480	Lane Departure Angle Right	Angle between right lane mark and vehicle driving direction. The angle is positive while vehicle is moving towards the lane marks, and negative if not. Measured values outside the limits are represented by signal value 251.Parameter specific values for this parameter are as follows: 251 = not in range 252 = not reliable 253 = reserved / not used 254 = error 255 = not available or not installed
7481	Lane Mark Quality on the Left Side	The quality of the nearest lane mark on the left side of the vehicle. 000b = no lane marks detected 001b = low reliablity of detected lane marks 010b = good reliablity of detected lane marks 011b = perfect recognition of lane marks 100b to 101b = reserved for future use 110b = error 111b = not available or not installed
7482	Lane Mark Quality on the Right Side	The quality of the nearest lane mark on the right side of the vehicle. 000b = no lane marks detected 001b = low reliablity of detected lane marks 010b = good reliablity of detected lane marks 011b = perfect recognition of lane marks 100b to 101b = reserved for future use 110b = error 111b = not available or not installed
7483	Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit 3	The diesel exhaust fluid dosing unit is a device that mixes the diesel exhaust fluid and air, and delivers a metered quantity of this mixture to the exhaust stream. This can also refer to a device that delivers diesel exhaust fluid to an aftertreatment diesel exhaust fluid dosing valve without air assistance.This parameter refers to the third dosing unit in bank 1.
7484	Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit 3 Input Lines	The diesel exhaust fluid dosing unit is a device that mixes the diesel exhaust fluid and air, such that it contains an input line from the air tank and an input line from the diesel exhaust fluid tank.This parameter refers to the input lines of the second dosing unit in bank 1.

7485	Aftertreatment 1 Diesel Exhaust Fluid Doser 3 Absolute Pressure	The absolute pressure (measured closest to dosing valve) of the third DEF dosing unit for aftertreatment system 1 (exhaust bank 1).
7486	Aftertreatment 1 Diesel Exhaust Fluid Doser 3 Temperature	The temperature (measured closest to dosing valve) of the third DEF dosing unit for aftertreatment system 1 (exhaust bank 1).
7487	Aftertreatment 1 Diesel Exhaust Fluid Pump 3 Motor Speed	Rotational speed of the motor driving the third pump for the diesel exhaust fluid used in aftertreatment system 1 (exhaust bank 1).
7488	Aftertreatment 1 Diesel Exhaust Fluid Doser Valve 3	The third aftertreatment diesel exhaust fluid doser used to inject diesel exhaust fluid into the first aftertreatment exhaust bank.
7489	Aftertreatment 2 Diesel Exhaust Fluid Dosing Unit 3	The diesel exhaust fluid dosing unit is a device that mixes the diesel exhaust fluid and air, and delivers a metered quantity of this mixture to the exhaust stream. This can also refer to a device that delivers diesel exhaust fluid to an aftertreatment diesel exhaust fluid dosing valve without air assistance.This parameter refers to the third dosing unit in bank 2.
7490	Aftertreatment 2 Diesel Exhaust Fluid Dosing Unit 3 Input Lines	The diesel exhaust fluid dosing unit is a device that mixes the diesel exhaust fluid and air, such that it contains an input line from the air tank and an input line from the diesel exhaust fluid tank.This parameter refers to the input lines of the second dosing unit in bank 2.
7491	Aftertreatment 2 Diesel Exhaust Fluid Doser 3 Absolute Pressure	The absolute pressure (measured closest to dosing valve) of the third DEF doser for aftertreatment system 2 (exhaust bank 2).
7492	Aftertreatment 2 Diesel Exhaust Fluid Doser 3 Temperature	The temperature (measured closest to dosing valve) of the third DEF doser for aftertreatment system 2 (exhaust bank 2).
7493	Aftertreatment 2 Diesel Exhaust Fluid Pump 3 Motor Speed	Rotational speed of the motor driving the third pump for the diesel exhaust fluid used in aftertreatment system 2 (exhaust bank 2).

7494	Aftertreatment 2 Diesel Exhaust Fluid Doser Valve 3	The third aftertreatment diesel exhaust fluid doser used to inject diesel exhaust fluid into the second aftertreatment exhaust bank.
7495	Cruise Control Adjusted Maximum Speed	Present maximum vehicle velocity at which cruise can be set. This parameter is expected to change during run-time due to functionality that could influence the behavior of the cruise control algorithm. This functionality may include, but is not limited to, a different maximum cruise speed that is dependent on driving conditions, driver performance, etc.If this parameter is supported, then it has priority over SPN 87. Without any adjustments, SPN 87 and this parameter will be the same value. SPN 87 is not expected to change, and if an adjustment is made to reward the driver or penalize the driver, then SPN 87 would not reflect that adjustment. This parameter will reflect that adjustment.
7496	Cruise Control Retarder Active Speed Offset	The additional speed above the operator selected cruise control set speed at which the retarder will activate when cruise control is active.
7497	SLI Cranking Predicted Minimum Battery Voltage	Prediction of the minimum battery voltage used for starting the engine, for lighting, and for ignition (SLI) during a crank event, under present battery conditions.This parameter shall be used to report the predicted minimum cranking voltage of the battery pack. If the predicted minimum cranking voltage of individual batteries within the battery pack is desired, use SPNs 7906, 7914, 7922, & 7930.
7498	SLI Battery 2 Net Current	Net flow of electrical current into/out of the second battery or second set of batteries used for starting the engine, for lighting, and for ignition (SLI).
7499	ECU 2 Interface Mismatch	Indicates that the data link interface version between ECUs is mismatched.
7500	Gaseous Fuel Leakage 2	Reports diagnosed leakage in the gaseous fuel delivery system.
7501	Engine Charge Air Cooler 2 Bypass	Controls whether combustion air passes through the charge air cooler 2.
7502	Aftertreatment Engine Speed Increase request	Indicates whether the aftertreatment desires engine speed control in order to increase the engine speed. This is meant to notify the operator that the aftertreatment is

		requesting an increase in engine speed for thermal purposes.The operator is expected to utilize the engine speed increase allowed switch SPN 7579 in response to this request. 00b = No Request 01b = Aftertreatment Engine Speed Control Desired 10b = Urgent Aftertreatment Engine Speed Control Desired 11b = Not Available
7503	Aftertreatment Engine Load Request	Indicates whether the aftertreatment desires engine load to be applied. This is meant to notify the operator that the aftertreatment is requesting engine load for thermal purposes.The operator is expected to add load to the engine to satisfy this request. 00b = No Request 01b = Aftertreatment Engine Load Desired 10b = Urgent Aftertreatment Engine Load Desired 11b = Not Available
7504	Aftertreatment 1 SCR System Sulfation Level	Indicates the sulfur level in the SCR system for aftertreatment 1. . 100% level could be the regeneration trigger level (and if conditions are not favorable for regeneration, sulfation loading can continue beyond 100%). During normal operation and regeneration a value 0% will indicate a fully regenerated SCR system. Values of 25%, 50% and 75% will indicate the general level of sulfur prior to the 100% level where regeneration could be needed.
7505	Engine Fuel Valve 3 Intake Absolute Pressure	Absolute pressure of gas on intake side of the third fuel system control valve, using standard convention for determining position.In a system with more than 2 fuel system control valves, the front left is #1 (SPN 1390), the front right is #2 (SPN 3466), the rear left is #3 (SPN 7505), and the rear right is #4 (SPN 7506).
7506	Engine Fuel Valve 4 Intake Absolute Pressure	Absolute pressure of gas on intake side of the third fuel system control valve, using standard convention for determining position.In a system with more than 2 fuel system control valves, the front left is #1 (SPN 1390), the front right is #2 (SPN 3466), the rear left is #3 (SPN 7505), and the rear right is #4 (SPN 7506).
7507	Engine Fuel Valve 3 Differential Pressure	The differential pressure between the intake and the outlet of gaseous fuel valve 3.
7508	Engine Fuel Valve 4 Differential Pressure	The differential pressure between the intake and the outlet of gaseous fuel valve 4.

7509	Engine Fuel System 3 Gas Mass Flow Rate	Gas mass flow rate delivered to an engine through its third fuel control system. In a system with more than 2 fuel systems, the front left is #1 (SPN 1241), the front right is #2 (SPN 3467), the rear left is #3 (SPN 7509), and the rear right is #4 (SPN 7510).
7510	Engine Fuel System 4 Gas Mass Flow Rate	Gas mass flow rate delivered to an engine through its fourth fuel control system. In a system with more than 2 fuel systems, the front left is #1 (SPN 1241), the front right is #2 (SPN 3467), the rear left is #3 (SPN 7509), and the rear right is #4 (SPN 7510).
7511	Engine Fuel Valve 3 Position	The position of a gaseous fuel valve that is metering the fuel flow to the engine. 0% indicates no fuel flow through valve and 100% means maximum fuel flow through valve.
7512	Engine Fuel Valve 4 Position	The position of a gaseous fuel valve that is metering the fuel flow to the engine. 0% indicates no fuel flow through valve and 100% means maximum fuel flow through valve.
7513	Engine Fuel 2 Injector Metering Rail 1 Pressure 2	The second pressure of fuel 2 measured by first rail pressure sensor in the primary, or first, metering rail as delivered from the supply pump to the injector metering intake.
7514	Engine Fuel 2 Injector Metering Rail 1 Temperature 2	The second temperature of fuel 2 measured by first rail temperature sensor in the primary, or first, metering rail as delivered from the supply pump to the injector metering intake.
7515	Request to Permit DEF Hydraulic Stiffness Check	A request to permit the DEF hydraulic stiffness check. The request continues to be broadcast until the stiffness check is finished or the corresponding permission status indicates an error.00b = no request 01b = request to permit DEF hydraulic stiffness check or stiffness check is running 10b = reserved 11b = don’t care The DEF hydraulic stiffness check is implemented in order to check for malfunctions and wear (damage) of the DEF dosing system and may be required by OBD legislation.
7516	Request to Permit DEF Dosing Test Injection	A request to permit the DEF dosing test injection. The request continues to be broadcast until the test injection is finished or the corresponding permission status indicates an error.000b = no request 001b = request to permit DEF Dosing Test

		Injection or test injection is running 010b = urgent request to permit DEF Dosing Test Injection or test injection is running 011b to 110b = reserved 111b = don’t care
7517	Aftertreatment 1 Diesel Exhaust Fluid Hydraulic Stiffness Check Permission Status	After a request to permit the DEF hydraulic stiffness check has been indicated, this permission status is expected by the DEF control unit for aftertreatment system 1.00b = not allowed 01b = DEF hydraulic stiffness check allowed 10b = error 11b = not available
7518	Aftertreatment 1 Diesel Exhaust Fluid Dosing Test Injection Permission Status	After a request to permit the DEF dosing test injection has been indicated, this permission status is expected by the DEF control unit for aftertreatment system 1.00b = not allowed 01b = DEF dosing test injection allowed 10b = error 11b = not available
7519	Aftertreatment 2 Diesel Exhaust Fluid Hydraulic Stiffness Check Permission Status	After a request to permit the DEF hydraulic stiffness check has been indicated, this permission status is expected by the DEF control unit for aftertreatment system 2.00b = not allowed 01b = DEF hydraulic stiffness check allowed 10b = error 11b = not available
7520	Aftertreatment 2 Diesel Exhaust Fluid Dosing Test Injection Permission Status	After a request to permit the DEF dosing test injection has been indicated, this permission status is expected by the DEF control unit for aftertreatment system 2.00b = not allowed 01b = DEF dosing test injection allowed 10b = error 11b = not available
7521	Aftertreatment 1 Diesel Exhaust Fluid Control Module 2 Relay Control	State signal which indicates when the DEF control module 2 relay of aftertreatment 1 is being energized. On means the ECU is powering the Aftertreatment 1 DEF dosing unit relay. Note that the ECU is external to the relay.00b = Off 01b = On: The ECU is powering the DEF dosing unit relay 10b = Error 11b = Unavailable
7522	Aftertreatment 1 Diesel Exhaust Fluid Control Module 2 Power Supply 1	State signal which indicates when the DEF control module 2 power supply of aftertreatment 1 is being driven. On means the ECU is powering the aftertreatment 1 DEF control module power supply. Note that the control module is external to the ECU.00b = Off 01b = On: The ECU is powering the DEF dosing unit power supply 10b = Error 11b = Unavailable

7523	Aftertreatment 1 Diesel Exhaust Fluid Control Module 2 Power Supply 2	State signal which indicates when the DEF control module 2 power supply 2 of aftertreatment 1 is being driven. On means the ECU is powering the aftertreatment 1 DEF control module power supply. Note that the control module is external to the ECU.00b = Off 01b = On: The ECU is powering the DEF dosing unit power supply 10b = Error 11b = Unavailable
7524	Aftertreatment 1 SCR System 2 State	Actual state of SCR system 2 0000b = Dormant (sleep mode) 0001b = Preparing dosing readiness (wake up; prepare to operate; wait for start) 0010b = Normal dosing operation 0011b = System error pending 0100b = Purging (SCR dosing system is removing residual DEF from system prior to shutdown) 0101b = Protect mode against heat (pressure buildup) 0110b = Protect mode against cold (defreeze) 0111b = Shutoff (wait for after-run) 1000b = Diagnosis (after-run) 1001b = Service test mode, dosing allowed 1010b = Service test mode, dosing not allowed 1011b = Ok to Power Down (SCR dosing system has complete housekeeping and power may safely be removed.) 1100b = Priming (Pressure Buildup) 1101b = Reserved for future assignment by SAE 1110b = Error 1111b = Not available
7525	Aftertreatment 2 SCR System 2 State	Actual state of SCR system 2 0000b = Dormant (sleep mode) 0001b = Preparing dosing readiness (wake up; prepare to operate; wait for start) 0010b = Normal dosing operation 0011b = System error pending 0100b = Purging (SCR dosing system is removing residual DEF from system prior to shutdown) 0101b = Protect mode against heat (pressure buildup) 0110b = Protect mode against cold (defreeze) 0111b = Shutoff (wait for after-run) 1000b = Diagnosis (after-run) 1001b = Service test mode, dosing allowed 1010b = Service test mode, dosing not allowed 1011b = Ok to Power Down (SCR dosing system has complete housekeeping and power may safely be removed.) 1100b = Priming (Pressure Buildup) 1101b = Reserved for future assignment by SAE 1110b = Error 1111b = Not available
7526	Aftertreatment 2 Diesel Exhaust Fluid Line Heater Relay 2	The aftertreatment system 2 diesel exhaust fluid line heater relay 2 is used to energize one or more DEF line heaters.00b = Off 01b = On 10b = Error 11b = Not available
7527	Aftertreatment 2 Diesel Exhaust Fluid Line Heater Relay 3	The aftertreatment system 2 diesel exhaust fluid line heater relay 3 is used to energize one or more DEF line heaters.00b = Off 01b = On 10b = Error 11b = Not available

7528	Aftertreatment 1 Diesel Exhaust Fluid Controller 2 Temperature	Temperature of the diesel exhaust fluid at the aftertreatment 1 diesel exhaust fluid controller 2.
7529	Aftertreatment 2 Diesel Exhaust Fluid Controller Temperature	Temperature of the diesel exhaust fluid at the aftertreatment 2 diesel exhaust fluid controller.
7530	Aftertreatment 1 Diesel Exhaust Fluid Tank Volume 2	Second measurement of the ratio of volume of diesel exhaust fluid to the total volume of the diesel exhaust fluid storage container for aftertreatment system 1 (exhaust bank 1). 0% is empty and 100% is full. See SPN 1761 and SPN 3517 for alternate measurements.Parameter Specific Indicator: A value of FBh indicates conditions are not acceptable for a valid measurement.
7531	Aftertreatment 2 Diesel Exhaust Fluid Tank Volume 2	Second measurement of the ratio of volume of diesel exhaust fluid to the total volume of the diesel exhaust fluid storage container for aftertreatment system 2 (exhaust bank 2). 0% is empty and 100% is full. See SPN 4426 and SPN 4428 for alternate measurements.Parameter Specific Indicator: A value of FBh indicates conditions are not acceptable for a valid measurement.
7532	Aftertreatment 2 Diesel Exhaust Fluid Control Module 2 Relay Control	State signal which indicates when the DEF control module 2 relay of aftertreatment 2 is being energized. On means the ECU is powering the Aftertreatment 2 DEF dosing unit relay. Note that the ECU is external to the relay.00b = Off 01b = On: The ECU is powering the DEF dosing unit relay 10b = Error 11b = Unavailable
7533	Aftertreatment 2 Diesel Exhaust Fluid Control Module 2 Power Supply 1	State signal which indicates when the DEF control module 2 power supply of aftertreatment 2 is being driven. On means the ECU is powering the aftertreatment 2 DEF control module power supply. Note that the control module is external to the ECU.00b = Off 01b = On: The ECU is powering the DEF dosing unit relay 10b = Error 11b = Unavailable
7534	Aftertreatment 2 Diesel Exhaust Fluid Control Module 2 Power Supply 2	State signal which indicates when the DEF control module 2 power supply 2 of aftertreatment 2 is being driven. On means the ECU is powering the aftertreatment 2 DEF control module power supply. Note that the control module is external to the

		ECU.00b = Off 01b = On: The ECU is powering the DEF dosing unit relay 10b = Error 11b = Unavailable
7535	Aftertreatment 2 Diesel Exhaust Fluid Controller 2 Temperature	Temperature of the diesel exhaust fluid at the aftertreatment 2 diesel exhaust fluid controller 2.
7536	Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit 2 Diverter Valve	Command to the valve which determines whether the diesel exhaust fluid on dosing unit 2 is delivered to the injector or is routed back to the diesel exhaust fluid tank. Zero directs all diesel exhaust fluid flow to the injector, 100% sends all diesel exhaust fluid back to the tank.
7537	Aftertreatment 2 Diesel Exhaust Fluid Dosing Unit 2 Diverter Valve	Command to the valve which determines whether the diesel exhaust fluid of dosing unit 2 is delivered to the injector or is routed back to the diesel exhaust fluid tank. Zero directs all diesel exhaust fluid flow to the injector, 100% sends all diesel exhaust fluid back to the tank.
7538	Aftertreatment 1 Diesel Exhaust Fluid Controller 2	The diesel exhaust fluid controller 2 has the ability to read attributes of the SCR system, including but not limited to, diesel exhaust fluid level, diesel exhaust fluid temperature, diesel exhaust fluid quality, and diesel exhaust fluid dosing rate.
7539	Aftertreatment 2 Diesel Exhaust Fluid Controller 2	The diesel exhaust fluid controller 2 has the ability to read attributes of the SCR system, including but not limited to, diesel exhaust fluid level, diesel exhaust fluid temperature, diesel exhaust fluid quality, and diesel exhaust fluid dosing rate.
7540	Aftertreatment 1 Diesel Exhaust Fluid Line Heater Relay 3	The aftertreatment diesel exhaust fluid line heater relay 3 is used to energize one or more DEF line heaters.00b = Off 01b = On 10b = Error 11b = Not available
7541	Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit 2 Loss of Prime	Indicates that the aftertreatment 1 diesel exhaust fluid dosing unit has lost prime. SPN will be used with FMI 31 (Condition Exists) to indicate that this device has lost prime in exhaust system 2.

7542	Aftertreatment 2 Diesel Exhaust Fluid Dosing Unit 2 Loss of Prime	Indicates that the aftertreatment 2 diesel exhaust fluid dosing unit has lost prime. SPN will be used with FMI 31 (Condition Exists) to indicate that this device has lost prime in exhaust system 2.
7543	Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit 2 Heater Temperature	The temperature nearest the heater in the DEF dosing unit 2.
7544	Aftertreatment 2 Diesel Exhaust Fluid Dosing Unit 1 Heater Temperature	The temperature nearest the heater in the DEF dosing unit.
7545	Aftertreatment 2 Diesel Exhaust Fluid Dosing Unit 2 Heater Temperature	The temperature nearest the heater in the DEF dosing unit 2.
7546	Aftertreatment 1 Diesel Exhaust Fluid Doser Valve 4	The fourth aftertreatment diesel exhaust fluid doser used to inject diesel exhaust fluid into the first aftertreatment exhaust bank.
7547	Aftertreatment 2 Diesel Exhaust Fluid Doser Valve 4	The fourth aftertreatment diesel exhaust fluid doser used to inject diesel exhaust fluid into the second aftertreatment exhaust bank.
7548	Hybrid System Protection Override Switch	Indicates the Protection Override switch position. This switch allows the operator to override hybrid system protection features and failure modes allowing hybrid system to continue to operate if possible.00b = Not Active 01b = Active 10b = Error 11b = Not Available
7549	Hybrid System Propulsion Coolant Level Switch	Indicates the coolant level switch position in the hybrid system propulsion (e.g. electric motor, generator) cooling system.00b = Coolant Level is not sufficient 01b = Coolant Level is sufficient 10b = Error 11b = Not Available

7550	Hybrid System Power Electronics Coolant Level Switch	Indicates the coolant level switch position in the hybrid system power electronics (e.g. Inverters, DC/DC converters) cooling system.00b = Coolant Level is not sufficient 01b = Coolant Level is sufficient 10b = Error 11b = Not Available
7551	Hybrid System Off-Board Charger Connection Status	Indicates the off-board plug-in charger connection status. One of the uses of this signal is to protect against vehicle motion while a charger is plugged in.00b = Off-board charger is not connected 01b = Off-board charger is connected 10b = Error 11b = Not available
7552	Hybrid System Regenerative Braking Disable Switch	Indicates the regenerative braking disable switch position. This switch gives the operator the ability to disable all regenerative braking from all inputs (e.g. such as during slippery road conditions).00b = Regenerative Braking Disable Switch is off. Regenerative braking is allowed. 01b = Regenerative Braking Disable Switch is on. Regenerative braking is not allowed. 10b = Error 11b = Not Available
7553	Hybrid System Brake Pedal Regenerative Braking Disable Switch	Indicates the brake pedal regenerative braking disable switch position. This switch allows the operator to disable regenerative braking (e.g. such as during slippery road conditions) that is controlled by brake pedal application. Regenerative braking is still allowed if requested by other inputs (e.g. coasting regenerative braking level selector (SPN 7556)). 00b = Brake pedal regenerative braking disable switch is off. When this switch is off, regenerative braking may be activated by brake pedal application. 01b = Brake pedal regenerative braking disable switch is on. When this switch is on, regenerative braking shall not be activated by brake pedal application. 10b = Error 11b = Not Available
7554	Hybrid System Propulsion Disable Switch	When the operator enables this switch, the propulsion aspect of hybrid system operation will be disabled. However, hybrid powered accessories may be on and the engine may still run. Regenerative braking is allowed unless disabled by SPN 7552 (Hybrid System Regenerative Braking Disable Switch) or SPN 7559 (Hybrid System Regenerative Braking Disable Request). Engine starting by the hybrid system is allowed. Movement of the vehicle by the hybrid system is not allowed.This feature may allow technicians to test the engine independent of hybrid system propulsion (e.g. control engine fueling using the accelerator pedal without Hybrid System

		assistance). Another use may be to operate a parallel hybrid system in a conventional engine/transmission mode. Note: This parameter is not related to SPN 7315 (Propulsion System Active). 00b = Off; hybrid propulsion is allowed. 01b = On; hybrid propulsion is not allowed. 10b = Error 11b = Not Available
7555	Hybrid System Shutdown Switch	When the operator enables this switch, all hybrid system functionality is disabled including propulsion, regenerative braking, and hybrid powered accessories. For electric hybrids, the hybrid system shall be placed in an electrically off state where high voltage is isolated to energy storage devices only (e.g. open contactors, discharge capacitive energy). One use of this switch is as an emergency stop capability.Note: Engine operation is still allowed. 00b = Off; hybrid system may operate normally. 01b = On; hybrid system functionality is not allowed. 10b = Error 11b = Not Available
7556	Hybrid System Coasting Regenerative Braking Level Selector	Indicates the coasting regenerative braking level selector position. Coasting regenerative braking occurs when neither the accelerator nor the brake pedal are depressed.The coasting regenerative braking level is the position of the driver's selector, that may be expressed as percent and determined by the ratio of current position to the maximum possible position. The physical device may be a lever, rotary dial, combination of switches, or other device that the driver can use to select the type or amount of coasting regenerative braking needed.
7557	Hybrid System Protection Override Request	Indicates the hybrid system protection override request state. This request allows overriding of hybrid system protection features and failure modes allowing hybrid systems to continue to operate, if possible. This is not the physical switch that performs the protection override.See SPN 7548 for the signal for the physical switch. 00b = Not active 01b = Active 10b = Reserved 11b = Don't care / take no action
7558	Hybrid System Propulsion Disable Request	Indicates the Hybrid System Disable Request state. The signal gives network controllers the ability to disable the propulsion aspect of hybrid system operation when this request is on. However, hybrid powered accessories may be on and the engine may still run. Regenerative braking is allowed unless disabled by SPN 7552 (Hybrid System Regenerative Braking Disable Switch) or SPN 7559 (Hybrid System

		Regenerative Braking Disable Request). Engine starting by the hybrid system is allowed. Movement of the vehicle by the hybrid system is not allowed. This is not the physical switch that performs the hybrid system propulsion disable. See SPN 7554 for the physical switch.This feature may allow technicians to test the engine independent of hybrid system propulsion (e.g. control engine fueling using the accelerator pedal without Hybrid System assistance). Another use may be to operate a parallel hybrid system in a conventional engine/transmission mode. Note: This parameter is not related to SPN 7315 (Propulsion System Active). 00b = Off; hybrid propulsion is allowed 01b = On; hybrid propulsion is not allowed 10b = Reserved 11b = Don't Care / Take No Action
7559	Hybrid System Regenerative Braking Disable Request	Indicates the hybrid system regenerative braking disable request state. This signal gives network controllers the ability to disable all regenerative braking. This is not the operator controlled switch that performs regenerative braking disable (See SPN 7552).00b = Regenerative braking disable request is not active. Regenerative braking is allowed. 01b = Regenerative braking disable request is active. Regenerative braking is not allowed. 10b = Reserved 11b = Don't care / take no action
7560	Hybrid System Shutdown Command	Indicates the Hybrid System Shutdown Request state. The signal gives network controllers the ability to disable all hybrid system functionality including propulsion, regenerative braking, and hybrid powered accessories. For electric hybrids, the hybrid system shall be placed in an electrically off state where high voltage is isolated to energy storage devices only (e.g. open contactors, discharge capacitive energy). One use of this request is as an emergency stop capability.Note: Engine operation is still allowed. This is not the physical switch that performs the hybrid system propulsion disable. See SPN 7555 for the physical switch. 00b = Off; hybrid system may operate normally 01b = On; hybrid system functionality is not allowed 10b = Reserved 11b = Don't Care / Take No Action
7561	Aftertreatment 1 Diesel Exhaust Fluid Line Heater 5	The diesel exhaust fluid line heater 5 request for aftertreatment system 1 (exhaust bank 1). 00b = request for heater to be inactive 01b = request for heater to be active 10b = reserved for future assignment by SAE 11b = not available

7562	Aftertreatment 1 Diesel Exhaust Fluid Line Heater 6	The diesel exhaust fluid line heater 6 request for aftertreatment system 1 (exhaust bank 1). 00b = request for heater to be inactive 01b = request for heater to be active 10b = reserved for future assignment by SAE 11b = not available
7563	Aftertreatment 1 Diesel Exhaust Fluid Line Heater 7	The diesel exhaust fluid line heater 7 request for aftertreatment system 1 (exhaust bank 1). 00b = request for heater to be inactive 01b = request for heater to be active 10b = reserved for future assignment by SAE 11b = not available
7564	Aftertreatment 1 Diesel Exhaust Fluid Line Heater 8	The diesel exhaust fluid line heater 8 request for aftertreatment system 1 (exhaust bank 1). 00b = request for heater to be inactive 01b = request for heater to be active 10b = reserved for future assignment by SAE 11b = not available
7565	Aftertreatment 1 Diesel Exhaust Fluid Line Heater 9	The diesel exhaust fluid line heater 9 request for aftertreatment system 1 (exhaust bank 1). 00b = request for heater to be inactive 01b = request for heater to be active 10b = reserved for future assignment by SAE 11b = not available
7566	Aftertreatment 1 Diesel Exhaust Fluid Line Heater 10	The diesel exhaust fluid line heater 10 request for aftertreatment system 1 (exhaust bank 1). 00b = request for heater to be inactive 01b = request for heater to be active 10b = reserved for future assignment by SAE 11b = not available
7567	Aftertreatment 2 Diesel Exhaust Fluid Line Heater 6	The diesel exhaust fluid line heater 6 request for aftertreatment system 2 (exhaust bank 2). 00b = request for heater to be inactive 01b = request for heater to be active 10b = reserved for future assignment by SAE 11b = not available
7568	Aftertreatment 2 Diesel Exhaust Fluid Line Heater 7	The diesel exhaust fluid line heater 7 request for aftertreatment system 2 (exhaust bank 2). 00b = request for heater to be inactive 01b = request for heater to be active 10b = reserved for future assignment by SAE 11b = not available
7569	Aftertreatment 2 Diesel Exhaust Fluid Line Heater 8	The diesel exhaust fluid line heater 8 request for aftertreatment system 2 (exhaust bank 2). 00b = request for heater to be inactive 01b = request for heater to be active 10b = reserved for future assignment by SAE 11b = not available

7570	Aftertreatment 2 Diesel Exhaust Fluid Line Heater 9	The diesel exhaust fluid line heater 9 request for aftertreatment system 2 (exhaust bank 2). 00b = request for heater to be inactive 01b = request for heater to be active 10b = reserved for future assignment by SAE 11b = not available
7571	Aftertreatment 2 Diesel Exhaust Fluid Line Heater 10	The diesel exhaust fluid line heater 10 request for aftertreatment system 2 (exhaust bank 2). 00b = request for heater to be inactive 01b = request for heater to be active 10b = reserved for future assignment by SAE 11b = not available
7572	Aftertreatment 1 Diesel Exhaust Fluid Tank Temperature 2	The second temperature of aftertreatment 1 diesel exhaust fluid in the storage tank.
7573	Aftertreatment 1 Diesel Exhaust Fluid Tank Heater 2	Percentage of heating applied to the second diesel exhaust fluid tank heater on aftertreatment 1. A value of 0% means no heating applied, a value of 100% means full heating applied. The diesel exhaust fluid tank heater warms the diesel exhaust fluid in the diesel exhaust fluid tank.
7574	Aftertreatment 2 Diesel Exhaust Fluid Tank Temperature 2	The second temperature of aftertreatment 2 diesel exhaust fluid in the storage tank.
7575	Aftertreatment 2 Diesel Exhaust Fluid Tank Heater 2	Percentage of heating applied to the second diesel exhaust fluid tank heater on aftertreatment 2. A value of 0% means no heating applied, a value of 100% means full heating applied. The diesel exhaust fluid tank heater warms the diesel exhaust fluid in the diesel exhaust fluid tank.
7576	Glow Plug Control Module	The control module used to control the operation of the glow plugs.
7577	Glow Plug Control Module Internal Temperature	Internal temperature of the glow plug control module.
7579	Elevated Engine Speed Allowed Switch	Indicates the state of a switch to indicate the control system is permitted to automatically elevate the engine speed as needed for strategies such as cold mode, aftertreatment regeneration, etc. This is not a direct command to increase the engine speed but rather an acknowledgement by the operator that the speed could be

		increased automatically, such as in response to an indication to the operator from SPN 7502. However, SPN 7502 is not the only method that could request this behavior. Therefore, SPN 7502 is not required in order to use this SPN.00b = Not allowed to elevate engine speed 01b = Allowed to elevate engine speed 10b = Error 11b = Not Available
7580	Aftertreatment Regeneration Engine Speed Allowed Switch	If this parameter is 01b, then the aftertreatment control system is permitted to perform an aftertreatment regeneration, but the aftertreatment control system is not allowed to take control of the engine speed for the purposes of regeneration. A regeneration will be allowed if the engine speed is high enough due to normal operating conditions, but will not command a regeneration.If this parameter is 00b, then an aftertreatment regeneration is not allowed even if engine speed is high enough for a regeneration. 00b = Aftertreatment regeneration is not allowed when engine speed exceeds regeneration threshold 01b = Aftertreatment regeneration is allowed when engine speed exceeds regeneration threshold 10b = Error 11b = Not Available
7581	Engine Gaseous Fuel Pressure Regulator Intake Pressure	The pressure of the fuel at the intake of the pressure regulator.
7583	Number of Tire Sensors	Total count of monitored tire sensor identification numbers represented in this instance of the parameter group.
7584	Tire Number	The number of the monitored tire that corresponds with the tire sensor identification number SPN 7586. In order to specify the monitored tire by location, use the tire location SPN 7585.The value FFh indicates this SPN is not used.
7585	Tire Location	The location of monitored tire that corresponds with the tire sensor identification number SPN 7586. In order to specify the monitored tire by tire number, use the tire number SPN 7584.The high order 4 bits indicate the vehicle axle position of the tire sensor, counting front to back on the vehicle, with the value 0 representing the front axle on the vehicle. The low order 4 bits indicate the position of the tire sensor along the axle, counting left to right when facing in the direction of normal vehicle travel (forward), with the value 0 representing the left most tire sensor position on the axle.

		The value FFh indicates not available. It is recommended that output devices add 1 to the position number (range 1 to 15, not 0 to 14) for use by drivers and service technicians. Examples: Tire Sensor 1 location of 00h indicates Tire Sensor 1 is the left front tire sensor. Tire 1 Sensor Location of 23h indicates Tire Sensor 1 is on the 3rd axle, 4th tire from the left.
7586	Tire Sensor Identification Number	The identification number of tire sensor for the tire specified in the tire sensor tire number (SPN 7584) or tire sensor location (SPN 7585).
7587	Tire Sensor Enable Setting	Command signal used to enable/disable the tire sensor. On receipt of this command, the tire sensor may either be enabled or disabled.00b = Off / Isolate / Disable 01b = On / Enable 10b = Reserved / Not Defined 11b = Don't Care / Take No Action
7588	Aftertreatment Diesel Exhaust Fluid Heater Circuit Breaker	The status of the circuit breaker that is used to heat the diesel exhaust fluid. 00b = off 01b = on 10b = error 11b = not available
7589	Alternator Setpoint Voltage Command	Setpoint voltage command to alternator. The setpoint voltage is the point that is regulated by the alternator. This may or may not be the output of the alternator.
7590	Alternator Excitation Maximum Current Limit	Command sent to alternator to set the maximum excitation current of the alternator.
7591	Alternator Torque Ramp Time Command	Sets the torque ramp rate in which the alternator can respond to a change in electrical load. 100% represents the reference engine torque (SPN 544).This value will be applied if the alternator speed is less than Alternator Torque Ramp Maximum Speed Command (SPN 7592). This value is not applied if the alternator speed is greater than Alternator Torque Ramp Maximum Speed Command.
7592	Alternator Torque Ramp Maximum Speed Command	The Alternator Torque Ramp Time Command (SPN 7591) is applied if the alternator speed is less than Alternator Torque Ramp Maximum Speed Command (SPN 7592). If the alternator speed is greater than Alternator Torque Ramp Maximum Speed Command, then the alternator's default ramp setting is applied.

7593	Engine Fuel Actuator 3 Control Command	The control command to fuel actuator 3, normalized to percent, where 0% represents fully closed and 100% represents fully open. Typically, this fuel actuator is used to regulate low pressure natural gas flow rate, mixing into the air flow, which together then come into the engine. Using the standard convention for determining the position. Left/front is #1 (SPN 633), left/rear is #2 (SPN 1244), right/front is #3 (SPN 7593) and right/rear is #4 (SPN 7594).
7594	Engine Fuel Actuator 4 Control Command	The control command to fuel actuator 4, normalized to percent, where 0% represents fully closed and 100% represents fully open. Typically, this fuel actuator is used to regulate low pressure natural gas flow rate, mixing into the air flow, which together then come into the engine. Using the standard convention for determining the position. Left/front is #1 (SPN 633), left/rear is #2 (SPN 1244), right/front is #3 (SPN 7593) and right/rear is #4 (SPN 7594).
7595	Engine Throttle Valve 2 Differential Pressure	The differential pressure between the intake and outlet of the throttle valve 2 (SPN 3673). The differential pressure is measured from the intake with respect to the outlet of the throttle valve.
7596	Engine Diesel Fuel Demand Rate	Amount of diesel fuel that would be consumed by an engine per unit of time if it were not substituting gaseous fuel. This parameter is the sum of SPN 183 and the amount of diesel fuel that is being displaced by gaseous fuel. If the engine is not actually substituting gaseous fuel, then this parameter will be the same as SPN 183.
7597	Engine Total Diesel Fuel Demand	Accumulated amount of liquid fuel that would have been used during engine operation, including actual diesel fuel used and the diesel fuel that was displaced by gaseous fuel.This is the cumulative value of SPN 7596.
7598	Aftertreatment 1 Diesel Exhaust Fluid Backflow Valve 1	The first diesel exhaust fluid backflow valve in aftertreatment 1 which controls the quantity of DEF flowing from the pump to the tank.
7599	Aftertreatment 1 Diesel Exhaust Fluid Backflow Valve 2	The second diesel exhaust fluid backflow valve in aftertreatment 1 which controls the quantity of DEF flowing from the pump to the tank.

7600	Aftertreatment 2 Diesel Exhaust Fluid Backflow Valve 1	The first diesel exhaust fluid backflow valve in aftertreatment 2 which controls the quantity of DEF flowing from the pump to the tank.
7601	Aftertreatment 2 Diesel Exhaust Fluid Backflow Valve 2	The second diesel exhaust fluid backflow valve in aftertreatment 2 which controls the quantity of DEF flowing from the pump to the tank.
7602	Aftertreatment 1 Diesel Exhaust Fluid Controller 1 Identification	Aftertreatment controller identification used to ensure proper matching of diesel exhaust fluid dosing unit 1 and aftertreatment 1 system
7603	Aftertreatment 1 Diesel Exhaust Fluid Controller 2 Identification	Aftertreatment controller identification used to ensure proper matching of diesel exhaust fluid dosing unit 2 and aftertreatment 1 system
7604	Aftertreatment 2 Diesel Exhaust Fluid Controller 1 Identification	Aftertreatment controller identification used to ensure proper matching of diesel exhaust fluid dosing unit 1 and aftertreatment 2 system
7605	Aftertreatment 2 Diesel Exhaust Fluid Controller 2 Identification	Aftertreatment controller identification used to ensure proper matching of diesel exhaust fluid dosing unit 2 and aftertreatment 2 system
7606	Aftertreatment Diesel Exhaust Fluid Tank Volume	The derived diesel exhaust fluid tank volume in applications with multiple level sensors in a single tank. The SPN data will be derived from all level sensors in the tank.Note: This SPN can be derived from any of the aftertreatment tank level sensors including SPN 1761, SPN 7530, SPN 4426 or SPN 7531. 0 % = Empty 100% = Full Parameter Specific Indicator: A value of FBh indicates conditions are not acceptable for a valid measurement.
7607	Aftertreatment Diesel Exhaust Fluid Tank Temperature	The derived diesel exhaust fluid tank temperature in applications with multiple temperature sensors in a single tank. The SPN data will be derived from all temperature sensors in the tank.Note: This SPN can be derived from any of the aftertreatment tank temperature sensors including SPN 3031, SPN 7572, SPN 4427 or SPN 7574.
7608	Total Engine Energy	The total amount of energy delivered by the engine. It is accumulated over the life of the engine.

7609	Engine Cylinder 1 Low Frequency Knock Level	Indicates the level of low frequency knock for engine cylinder 1. This knock occurs at frequencies below the typical knock level reported on SPNs 1352 & 6398. The level of low frequency knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more low frequency knock until 100% indicates the most severe level of low frequency knock allowed or measurable for the engine. If only one knock level is supported per cylinder, use SPN(s) 1352 (and 6398).
7610	Engine Cylinder 2 Low Frequency Knock Level	Indicates the level of low frequency knock for engine cylinder 2. This knock occurs at frequencies below the typical knock level reported on SPNs 1353 & 6402. The level of low frequency knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more low frequency knock until 100% indicates the most severe level of low frequency knock allowed or measurable for the engine. If only one knock level is supported per cylinder, use SPN(s) 1353 (and 6402).
7611	Engine Cylinder 3 Low Frequency Knock Level	Indicates the level of low frequency knock for engine cylinder 3. This knock occurs at frequencies below the typical knock level reported on SPNs 1354 & 6406. The level of low frequency knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more low frequency knock until 100% indicates the most severe level of low frequency knock allowed or measurable for the engine. If only one knock level is supported per cylinder, use SPN(s) 1354 (and 6406).
7612	Engine Cylinder 4 Low Frequency Knock Level	Indicates the level of low frequency knock for engine cylinder 4. This knock occurs at frequencies below the typical knock level reported on SPNs 1355 & 6410. The level of low frequency knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more low frequency knock until 100% indicates the most severe level of low frequency knock allowed or measurable for the engine. If only one knock level is supported per cylinder, use SPN(s) 1355 (and 6410).
7613	Engine Cylinder 5 Low Frequency Knock Level	Indicates the level of low frequency knock for engine cylinder 5. This knock occurs at frequencies below the typical knock level reported on SPNs 1356 & 6414. The level of low frequency knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more low frequency knock until 100% indicates

		the most severe level of low frequency knock allowed or measurable for the engine. If only one knock level is supported per cylinder, use SPN(s) 1356 (and 6414).
7614	Engine Cylinder 6 Low Frequency Knock Level	Indicates the level of low frequency knock for engine cylinder 6. This knock occurs at frequencies below the typical knock level reported on SPNs 1357 & 6418. The level of low frequency knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more low frequency knock until 100% indicates the most severe level of low frequency knock allowed or measurable for the engine. If only one knock level is supported per cylinder, use SPN(s) 1357 (and 6418).
7615	Engine Cylinder 7 Low Frequency Knock Level	Indicates the level of low frequency knock for engine cylinder 7. This knock occurs at frequencies below the typical knock level reported on SPNs 1358 & 6422. The level of low frequency knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more low frequency knock until 100% indicates the most severe level of low frequency knock allowed or measurable for the engine. If only one knock level is supported per cylinder, use SPN(s) 1358 (and 6422).
7616	Engine Cylinder 8 Low Frequency Knock Level	Indicates the level of low frequency knock for engine cylinder 8. This knock occurs at frequencies below the typical knock level reported on SPNs 1359 & 6426. The level of low frequency knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more low frequency knock until 100% indicates the most severe level of low frequency knock allowed or measurable for the engine. If only one knock level is supported per cylinder, use SPN(s) 1359 (and 6426).
7617	Engine Cylinder 9 Low Frequency Knock Level	Indicates the level of low frequency knock for engine cylinder 9. This knock occurs at frequencies below the typical knock level reported on SPNs 1360 & 6430. The level of low frequency knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more low frequency knock until 100% indicates the most severe level of low frequency knock allowed or measurable for the engine. If only one knock level is supported per cylinder, use SPN(s) 1360 (and 6430).
7618	Engine Cylinder 10 Low Frequency Knock Level	Indicates the level of low frequency knock for engine cylinder 10. This knock occurs at frequencies below the typical knock level reported on SPNs 1361 & 6434. The

		level of low frequency knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more low frequency knock until 100% indicates the most severe level of low frequency knock allowed or measurable for the engine. If only one knock level is supported per cylinder, use SPN(s) 1361 (and 6434).
7619	Engine Cylinder 11 Low Frequency Knock Level	Indicates the level of low frequency knock for engine cylinder 11. This knock occurs at frequencies below the typical knock level reported on SPNs 1362 & 6438. The level of low frequency knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more low frequency knock until 100% indicates the most severe level of low frequency knock allowed or measurable for the engine. If only one knock level is supported per cylinder, use SPN(s) 1362 (and 6438).
7620	Engine Cylinder 12 Low Frequency Knock Level	Indicates the level of low frequency knock for engine cylinder 12. This knock occurs at frequencies below the typical knock level reported on SPNs 1363 & 6442. The level of low frequency knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more low frequency knock until 100% indicates the most severe level of low frequency knock allowed or measurable for the engine. If only one knock level is supported per cylinder, use SPN(s) 1363 (and 6442).
7621	Engine Cylinder 13 Low Frequency Knock Level	Indicates the level of low frequency knock for engine cylinder 13. This knock occurs at frequencies below the typical knock level reported on SPNs 1364 & 6446. The level of low frequency knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more low frequency knock until 100% indicates the most severe level of low frequency knock allowed or measurable for the engine. If only one knock level is supported per cylinder, use SPN(s) 1364 (and 6446).
7622	Engine Cylinder 14 Low Frequency Knock Level	Indicates the level of low frequency knock for engine cylinder 14. This knock occurs at frequencies below the typical knock level reported on SPNs 1365 & 6450. The level of low frequency knock is reported using a relative scale where 0% is least level

		of knock, and increasing levels indicate more low frequency knock until 100% indicates the most severe level of low frequency knock allowed or measurable for the engine. If only one knock level is supported per cylinder, use SPN(s) 1365 (and 6450).
7623	Engine Cylinder 15 Low Frequency Knock Level	Indicates the level of low frequency knock for engine cylinder 15. This knock occurs at frequencies below the typical knock level reported on SPNs 1366 & 6454. The level of low frequency knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more low frequency knock until 100% indicates the most severe level of low frequency knock allowed or measurable for the engine. If only one knock level is supported per cylinder, use SPN(s) 1366 (and 6454).
7624	Engine Cylinder 16 Low Frequency Knock Level	Indicates the level of low frequency knock for engine cylinder 16. This knock occurs at frequencies below the typical knock level reported on SPNs 1367 & 6458. The level of low frequency knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more low frequency knock until 100% indicates the most severe level of low frequency knock allowed or measurable for the engine. If only one knock level is supported per cylinder, use SPN(s) 1367 (and 6458).
7625	Engine Cylinder 17 Low Frequency Knock Level	Indicates the level of low frequency knock for engine cylinder 17. This knock occurs at frequencies below the typical knock level reported on SPNs 1368 & 6462. The level of low frequency knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more low frequency knock until 100% indicates the most severe level of low frequency knock allowed or measurable for the engine. If only one knock level is supported per cylinder, use SPN(s) 1368 (and 6462).
7626	Engine Cylinder 18 Low Frequency Knock Level	Indicates the level of low frequency knock for engine cylinder 18. This knock occurs at frequencies below the typical knock level reported on SPNs 1369 & 6466. The level of low frequency knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more low frequency knock until 100%

		indicates the most severe level of low frequency knock allowed or measurable for the engine. If only one knock level is supported per cylinder, use SPN(s) 1369 (and 6466).
7627	Engine Cylinder 19 Low Frequency Knock Level	Indicates the level of low frequency knock for engine cylinder 19. This knock occurs at frequencies below the typical knock level reported on SPNs 1370 & 6470. The level of low frequency knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more low frequency knock until 100% indicates the most severe level of low frequency knock allowed or measurable for the engine. If only one knock level is supported per cylinder, use SPN(s) 1370 (and 6470).
7628	Engine Cylinder 20 Low Frequency Knock Level	Indicates the level of low frequency knock for engine cylinder 20. This knock occurs at frequencies below the typical knock level reported on SPNs 1371 & 6474. The level of low frequency knock is reported using a relative scale where 0% is least level of knock, and increasing levels indicate more low frequency knock until 100% indicates the most severe level of low frequency knock allowed or measurable for the engine. If only one knock level is supported per cylinder, use SPN(s) 1371 (and 6474).
7629	Engine Cylinder 1 Maximum Pressure Increase Rate	The maximum slope, in degrees of crank angle, of the pressure increase in engine cylinder 1 during the combustion cycle.
7630	Engine Cylinder 2 Maximum Pressure Increase Rate	The maximum slope, in degrees of crank angle, of the pressure increase in engine cylinder 2 during the combustion cycle.
7631	Engine Cylinder 3 Maximum Pressure Increase Rate	The maximum slope, in degrees of crank angle, of the pressure increase in engine cylinder 3 during the combustion cycle.
7632	Engine Cylinder 4 Maximum Pressure Increase Rate	The maximum slope, in degrees of crank angle, of the pressure increase in engine cylinder 4 during the combustion cycle.

7633	Engine Cylinder 5 Maximum Pressure Increase Rate	The maximum slope, in degrees of crank angle, of the pressure increase in engine cylinder 5 during the combustion cycle.
7634	Engine Cylinder 6 Maximum Pressure Increase Rate	The maximum slope, in degrees of crank angle, of the pressure increase in engine cylinder 6 during the combustion cycle.
7635	Engine Cylinder 7 Maximum Pressure Increase Rate	The maximum slope, in degrees of crank angle, of the pressure increase in engine cylinder 7 during the combustion cycle.
7636	Engine Cylinder 8 Maximum Pressure Increase Rate	The maximum slope, in degrees of crank angle, of the pressure increase in engine cylinder 8 during the combustion cycle.
7637	Engine Cylinder 9 Maximum Pressure Increase Rate	The maximum slope, in degrees of crank angle, of the pressure increase in engine cylinder 9 during the combustion cycle.
7638	Engine Cylinder 10 Maximum Pressure Increase Rate	The maximum slope, in degrees of crank angle, of the pressure increase in engine cylinder 10 during the combustion cycle.
7639	Engine Cylinder 11 Maximum Pressure Increase Rate	The maximum slope, in degrees of crank angle, of the pressure increase in engine cylinder 11 during the combustion cycle.
7640	Engine Cylinder 12 Maximum Pressure Increase Rate	The maximum slope, in degrees of crank angle, of the pressure increase in engine cylinder 12 during the combustion cycle.
7641	Engine Cylinder 13 Maximum Pressure Increase Rate	The maximum slope, in degrees of crank angle, of the pressure increase in engine cylinder 13 during the combustion cycle.
7642	Engine Cylinder 14 Maximum Pressure Increase Rate	The maximum slope, in degrees of crank angle, of the pressure increase in engine cylinder 14 during the combustion cycle.
7643	Engine Cylinder 15 Maximum Pressure Increase Rate	The maximum slope, in degrees of crank angle, of the pressure increase in engine cylinder 15 during the combustion cycle.

7644	Engine Cylinder 16 Maximum Pressure Increase Rate	The maximum slope, in degrees of crank angle, of the pressure increase in engine cylinder 16 during the combustion cycle.
7645	Engine Cylinder 17 Maximum Pressure Increase Rate	The maximum slope, in degrees of crank angle, of the pressure increase in engine cylinder 17 during the combustion cycle.
7646	Engine Cylinder 18 Maximum Pressure Increase Rate	The maximum slope, in degrees of crank angle, of the pressure increase in engine cylinder 18 during the combustion cycle.
7647	Engine Cylinder 19 Maximum Pressure Increase Rate	The maximum slope, in degrees of crank angle, of the pressure increase in engine cylinder 19 during the combustion cycle.
7648	Engine Cylinder 20 Maximum Pressure Increase Rate	The maximum slope, in degrees of crank angle, of the pressure increase in engine cylinder 20 during the combustion cycle.
7649	Engine Exhaust 1 NOx 2	The second measurement of the amount of combined NO and NO2 in the exhaust, represented in NOx molecule parts per million non-NOx molecules in exhaust bank 1. This sensor is located at the intake of the SCR system if an SCR system exists.
7650	Aftertreatment 1 Intake Percent Oxygen 2	The second measurement of the actual oxidation factor (Percent Oxygen) of the gas within the exhaust stream. For positive values, the parameter represents the percent oxygen in excess of the amount required for stoichiometric combustion. For negative values, the parameter is proportional to the amount of oxygen being pumped by the sensor. This value is measured by a sensor at the aftertreatment intake in exhaust bank 1.A value of -12% (0000h) indicates rich, a value of 21% (FAFFh) indicates lean. These data points could optionally be used with switching O2 sensors to indicate those states as alternatives to broadcasting the threshold %O2 values. Diagnostic Tools could change display to use the text « Rich » or « Lean » in place of the implied %O2 values which would also be acceptable for display.
7651	Aftertreatment 1 Intake Gas Sensor 2 Power In Range	Indicates that the second measurement of power supplied to the aftertreatment intake gas sensor, either NOx or O2, is within the manufacturer’s specification in exhaust

		bank 1. This parameter reports the status as reported by the sensor.00b = Not in range 01b = In range 10b = Error 11b = Not available
7652	Aftertreatment 1 Intake Gas Sensor 2 at Temperature	Indicates that the heater element of the aftertreatment intake gas second sensor, either NOx or O2, is within the manufacturer's specified range for accurate measurements in exhaust bank 1.00b = Not in range 01b = In range 10b = Error 11b = Not available
7653	Engine Exhaust 1 NOx 2 Reading Stable	Indicates that the NOx reading of the second NOx sensor is stable as determined by the manufacturer's control software in exhaust bank 1. This sensor is located at the intake of the SCR system if an SCR system exists. 00b = Not stable 01b = Stable 10b = Error 11b = Not available
7654	Aftertreatment 1 Intake Wide-Range Percent Oxygen 2 Reading Stable	Indicates that the second measurement of the percent oxygen reading of the aftertreatment intake gas sensor, either NOx or O2, is stable as determined by the manufacturer's control software in exhaust bank 1.00b = Not stable 01b = Stable 10b = Error 11b = Not available
7655	Aftertreatment 1 Intake Gas Sensor 2 Heater Preliminary FMI	Used to identify the second applicable J1939-73 FMI detected in the heater of the intake exhaust gas sensor, either NOx or O2, by the manufacturer's sensor control software in exhaust bank 1. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
7656	Aftertreatment 1 Intake Gas Sensor 2 Heater Control	Indicates the heater status in the warm-up process. Upon receiving a power-up command, the second gas sensor ramps up according to a manufacturer defined profile. The Preheat 1, Preheat 2, and Automatic messages are regions within this profile in exhaust bank 1.00b = Automatic 01b = Preheat 2 10b = Preheat 1 11b = Heater off
7657	Engine Exhaust 1 NOx Sensor 2 Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the second NOx sensor by the manufacturer's sensor control software in exhaust bank 1. In the case of multiple failures the most severe is communicated. This sensor is located at the intake of the

		SCR system if an SCR system exists.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
7658	Engine Exhaust 1 NOx Sensor 2 Self-diagnosis Status	Self-diagnosis result status for the second NOx sensor in Engine Exhaust Bank 1 (EEB1h). This sensor is located at the intake of the aftertreatment system if an aftertreatment system exists. 000b = Diagnosis not active 001b = NOx Sensor EEB1h Self Diagnosis active flag 010b = NOx Sensor EEB1h Self Diagnosis Result Complete 011b = NOx Sensor EEB1h Self Diagnosis aborted 100b = NOx Sensor EEB1h Self Diagnosis not possible 101b = Reserved 110b = Reserved 111b = Not Supported
7659	Aftertreatment 1 Intake Oxygen Sensor 2 Preliminary FMI	Used to identify the second applicable J1939-73 FMI detected in the aftertreatment intake oxygen sensor by the manufacturer’s sensor control software in exhaust bank 1. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
7660	Aftertreatment 1 Outlet NOx 2	The second measurement of the amount of combined NO and NO2 in the exhaust exiting the aftertreatment system measured by a NOx sensor at the aftertreatment outlet, represented in NOx molecule parts per million non-NOx molecules in exhaust bank 1.
7661	Aftertreatment 1 Outlet Percent Oxygen 2	The second measurement of the actual oxidation factor (percent oxygen) of the gas within the exhaust stream. For positive values, the parameter represents the percent oxygen in excess of the amount required for stoichiometric combustion. For negative values, the parameter is proportional to the amount of oxygen being pumped by the sensor. This value is measured by a sensor at the aftertreatment outlet in exhaust bank 1.A value of -12% (0000h) indicates rich, a value of 21% (FAFFh) indicates lean. These data points could optionally be used with switching O2 sensors to indicate those states as alternatives to broadcasting the threshold %O2 values. Diagnostic Tools could change display to use the text « Rich » or « Lean » in place of the implied %O2 values which would also be acceptable for display.

7662	Aftertreatment 1 Outlet Gas Sensor 2 Power In Range	Indicates that the second measurement of power supplied to the aftertreatment outlet gas sensor, either NOx or O2, is within the manufacturer's specification in exhaust bank 1. This parameter reports the status as reported by the sensor.00b = Not in range 01b = In range 10b = Error 11b = Not available
7663	Aftertreatment 1 Outlet Gas Sensor 2 at Temperature	Indicates that the heater element of the aftertreatment outlet gas second sensor, either NOx or O2, is within the manufacturer's specified range for accurate measurements in exhaust bank 1.00b = Not in range 01b = In range 10b = Error 11b = Not available
7664	Aftertreatment 1 Outlet NOx 2 Reading Stable	Indicates that the NOx reading of the aftertreatment outlet NOx second sensor is stable as determined by the manufacturer's control software in exhaust bank 1.00b = Not stable 01b = Stable 10b = Error 11b = Not available
7665	Aftertreatment 1 Outlet Wide-Range Percent Oxygen 2 Reading Stable	Indicates that the percent oxygen reading of the aftertreatment outlet gas second sensor, either NOx or O2, is stable as determined by the manufacturer's control software in exhaust bank 1.00b = Not stable 01b = Stable 10b = Error 11b = Not available
7666	Aftertreatment 1 Outlet Gas Sensor 2 Heater Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the heater of the outlet exhaust gas second sensor, either NOx or O2, by the manufacturer's sensor control software in exhaust bank 1. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
7667	Aftertreatment 1 Outlet Gas Sensor 2 Heater Control	Indicates the heater status in the warm-up process. Upon receiving a power-up command, the gas second sensor ramps up according to a manufacturer defined profile. The Preheat 1, Preheat 2, and Automatic messages are regions within this profile in exhaust bank 1.00b = Automatic 01b = Preheat 2 10b = Preheat 1 11b = Heater off
7668	Aftertreatment 1 Outlet NOx Sensor 2 Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the aftertreatment outlet NOx second sensor by the manufacturer's sensor control software in exhaust bank 1.

		In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
7669	Aftertreatment 1 Outlet NOx Sensor 2 Self-diagnosis Status	Self-diagnosis result status for NOx second sensor ATO1 (Aftertreatment Outlet Bank 1) 000b = Diagnosis not active 001b = NOx Sensor ATO1 Self Diagnosis active flag 010b = NOx Sensor ATO1 Self Diagnosis Result Complete 011b = NOx Sensor ATO1 Self Diagnosis aborted 100b = NOx Sensor ATO1 Self Diagnosis not possible 101b to 110b = Reserved 111b = Not Supported
7670	Aftertreatment 1 Outlet Oxygen Sensor 2 Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the aftertreatment outlet oxygen second sensor by the manufacturer’s sensor control software in exhaust bank 1. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported.
7671	Engine Exhaust 2 NOx 2	The amount of combined NO and NO2 in the exhaust measured by the second NOx sensor at the aftertreatment intake, represented in NOx molecule parts per million non-NOx molecules in exhaust bank 2. This sensor is located at the intake of the SCR system if an SCR system exists.For a single exhaust bank system, refer to parameters in PGNs 61454, 61455, 64946, 64947, 64948, and 65247.
7672	Aftertreatment 2 Intake Percent Oxygen 2	The actual oxidation factor (percent oxygen) of the gas within the exhaust stream. For positive values, the parameter represents the percent oxygen in excess of the amount required for stoichiometric combustion. For negative values, the parameter is proportional to the amount of oxygen being pumped by the sensor. This value is measured by the second sensor at the aftertreatment intake in exhaust bank 2.For a single exhaust bank system, refer to parameters in PGNs 61454, 61455, 64946, 64947, 64948, and 65247. A value of -12% (0000h) indicates rich, a value of 21% (FAFFh) indicates lean. These data points could optionally be used with switching O2 sensors to indicate those states as alternatives to broadcasting the threshold %O2 values. Diagnostic Tools could change display to use the text « Rich » or « Lean » in place of the implied %O2 values which would also be acceptable for display.

7673	Aftertreatment 2 Intake Gas Sensor 2 Power In Range	Indicates that the power supplied to the aftertreatment intake gas second sensor, either NOx or O2, is within the manufacturer's specification in exhaust bank 2.For a single exhaust bank system, refer to parameters in PGNs 61454, 61455, 64946, 64947, 64948, and 65247. This parameter reports the status as reported by the sensor. 00b = Not in range 01b = In range 10b = Error 11b = Not available
7674	Aftertreatment 2 Intake Gas Sensor 2 at Temperature	Indicates that the heater element of the aftertreatment intake gas second sensor, either NOx or O2, is within the manufacturer's specified range for accurate measurements in exhaust bank 2.For a single exhaust bank system, refer to parameters in PGNs 61454, 61455, 64946, 64947, 64948, and 65247. 00b = Not in range 01b = In range 10b = Error 11b = Not available
7675	Engine Exhaust 2 NOx 2 Reading Stable	Indicates that the NOx reading of the second NOx sensor is stable as determined by the manufacturer's control software in exhaust bank 2. This sensor is located at the intake of the SCR system if an SCR system exists.For a single exhaust bank system, refer to parameters in PGNs 61454, 61455, 64946, 64947, 64948, and 65247. 00b = Not stable 01b = Stable 10b = Error 11b = Not available
7676	Aftertreatment 2 Intake Wide-Range Percent Oxygen 2 Reading Stable	Indicates that the percent oxygen reading of the aftertreatment intake gas second sensor, either NOx or O2, is stable as determined by the manufacturer's control software in exhaust bank 2.For a single exhaust bank system, refer to parameters in PGNs 61454, 61455, 64946, 64947, 64948, and 65247. 00b = Not stable 01b = Stable 10b = Error 11b = Not available
7677	Aftertreatment 2 Intake Gas Sensor 2 Heater Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the heater of the intake exhaust gas second sensor, either NOx or O2, by the manufacturer's sensor control software in exhaust bank 2. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported. For a single exhaust bank system, refer to parameters in PGNs 61454, 61455, 64946, 64947, 64948, and 65247.
7678	Aftertreatment 2 Intake Gas Sensor 2 Heater Control	Indicates the heater status in the warm-up process. Upon receiving a power-up command, the second gas sensor ramps up according to a manufacturer defined

		profile. The Preheat 1, Preheat 2, and Automatic messages are regions within this profile in exhaust bank 2.For a single exhaust bank system, refer to parameters in PGNs 61454, 61455, 64946, 64947, 64948, and 65247. 00b = Automatic 01b = Preheat 2 10b = Preheat 1 11b = Heater off
7679	Engine Exhaust 2 NOx Sensor 2 Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the second NOx sensor by the manufacturer's sensor control software in exhaust bank 2. This sensor is located at the intake of the SCR system if an SCR system exists. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported. For a single exhaust bank system, refer to parameters in PGNs 61454, 61455, 64946, 64947, 64948, and 65247.
7680	Engine Exhaust 2 Intake NOx Sensor 2 Self-diagnosis Status	Self-diagnosis result status for NOx second sensor EEB2h (Engine Exhaust Bank 2) . This sensor is located at the intake of the aftertreatment system if an aftertreatment system exists.000b = Diagnosis not active 001b = NOx Sensor EEB2h Self Diagnosis active flag 010b = NOx Sensor EEB2h Self Diagnosis Result Complete 011b = NOx Sensor EEB2h Self Diagnosis aborted 100b = NOx Sensor EEB2h Self Diagnosis not possible 101b = Reserved 110b = Reserved 111b = Not Supported
7681	Aftertreatment 2 Intake Oxygen Sensor 2 Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the aftertreatment intake oxygen second sensor by the manufacturer's sensor control software in exhaust bank 2. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported. For a single exhaust bank system, refer to parameters in PGNs 61454, 61455, 64946, 64947, 64948, and 65247.
7682	Aftertreatment 2 Outlet NOx 2	The amount of combined NO and NO2 in the exhaust entering the aftertreatment system measured by the second NOx sensor at the aftertreatment outlet, represented in NOx molecule parts per million non-NOx molecules in exhaust bank 2.For a single exhaust bank system, refer to parameters in PGNs 61454, 61455, 64946, 64947, 64948, and 65247.

7683	Aftertreatment 2 Outlet Percent Oxygen 2	The actual oxidation factor (percent oxygen) of the gas within the exhaust stream. For positive values, the parameter represents the percent oxygen in excess of the amount required for stoichiometric combustion. For negative values, the parameter is proportional to the amount of oxygen being pumped by the sensor. This value is measured by the second sensor at the aftertreatment outlet in exhaust bank 2.For a single exhaust bank system, refer to parameters in PGNs 61454, 61455, 64946, 64947, 64948, and 65247. A value of -12% (0000h) indicates rich, a value of 21% (FAFFh) indicates lean. These data points could optionally be used with switching O2 sensors to indicate those states as alternatives to broadcasting the threshold %O2 values. Diagnostic Tools could change display to use the text « Rich » or « Lean » in place of the implied %O2 values which would also be acceptable for display.
7684	Aftertreatment 2 Outlet Gas Sensor 2 Power In Range	Indicates that the power supplied to the aftertreatment outlet gas second sensor, either NOx or O2, is within the manufacturer's specification in exhaust bank 2.For a single exhaust bank system, refer to parameters in PGNs 61454, 61455, 64946, 64947, 64948, and 65247. This parameter reports the status as reported by the sensor. 00b = Not in range 01b = In range 10b = Error 11b = Not available
7685	Aftertreatment 2 Outlet Gas Sensor 2 at Temperature	Indicates that the heater element of the aftertreatment outlet gas second sensor, either NOx or O2, is within the manufacturer's specified range for accurate measurements in exhaust bank 2.For a single exhaust bank system, refer to parameters in PGNs 61454, 61455, 64946, 64947, 64948, and 65247. 00b = Not in range 01b = In range 10b = Error 11b = Not available
7686	Aftertreatment 2 Outlet NOx 2 Reading Stable	Indicates that the NOx reading of the aftertreatment outlet NOx second sensor is stable as determined by the manufacturer's control software in exhaust bank 2.For a single exhaust bank system, refer to parameters in PGNs 61454, 61455, 64946, 64947, 64948, and 65247. 00b = Not stable 01b = Stable 10b = Error 11b = Not available
7687	Aftertreatment 2 Outlet Wide-Range Percent Oxygen 2 Reading Stable	Indicates that the percent oxygen reading of the aftertreatment outlet gas second sensor, either NOx or O2, is stable as determined by the manufacturer's control software in exhaust bank 2.For a single exhaust bank system, refer to parameters in

		PGNs 61454, 61455, 64946, 64947, 64948, and 65247. 00b = Not stable 01b = Stable 10b = Error 11b = Not available
7688	Aftertreatment 2 Outlet Gas Sensor 2 Heater Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the heater of the outlet exhaust gas second sensor, either NOx or O2, by the manufacturer's sensor control software in exhaust bank 2. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported. For a single exhaust bank system, refer to parameters in PGNs 61454, 61455, 64946, 64947, 64948, and 65247.
7689	Aftertreatment 2 Outlet Gas Sensor 2 Heater Control	Indicates the heater status in the warm-up process. Upon receiving a power-up command, the gas second sensor ramps up according to a manufacturer defined profile. The Preheat 1, Preheat 2, and Automatic messages are regions within this profile in exhaust bank 2.For a single exhaust bank system, refer to parameters in PGNs 61454, 61455, 64946, 64947, 64948, and 65247. 00b = Automatic 01b = Preheat 2 10b = Preheat 1 11b = Heater off
7690	Aftertreatment 2 Outlet NOx Sensor 2 Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the aftertreatment outlet NOx second sensor by the manufacturer's sensor control software in exhaust bank 2. In the case of multiple failures the most severe is communicated.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported. For a single exhaust bank system, refer to parameters in PGNs 61454, 61455, 64946, 64947, 64948 and 65247.
7691	Aftertreatment 2 Outlet NOx Sensor 2 Self-diagnosis Status	Self-diagnosis result status for second NOx sensor ATO2 (Aftertreatment Outlet Bank 2) 000b = Diagnosis not active 001b = NOx Sensor ATO2 Self Diagnosis active flag 010b = NOx Sensor ATO2 Self Diagnosis Result Complete 011b = NOx Sensor ATO2 Self Diagnosis aborted 100b = NOx Sensor ATO2 Self Diagnosis not possible 101b to 110b = Reserved 111b = Not Supported
7692	Aftertreatment 2 Outlet Oxygen Sensor 2 Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in the aftertreatment outlet oxygen second sensor by the manufacturer's sensor control software in exhaust bank 2. In the case of multiple failures the most severe is communicated.A value of 31 is

		sent to indicate that no failure has been detected or this parameter is not supported. For a single exhaust bank system, refer to parameters in PGNs 61454, 61455, 64946, 64947, 64948 and 65247.
7693	Payload Temperature 1 (duplicate, use SPN 7703)	Temperature of payload at measurement point 1.
7694	Transmission Auto-Neutral (Manual Return) Enable Switch	This enable switch is for optional use with interfaces using SPN 7695 [Transmission Auto-Neutral (Manual Return) Request] or another vehicle input configured for Auto-Neutral (Manual Return) functionality. When supported by the vehicle system and transmission manufacturer, this switch allows the operator to prohibit the transmission from responding to temporary Auto-Neutral requests made via SPN 7695 or another designated Auto-Neutral (Manual Return) input.00b = Off; transmission will not respond to Auto-Neutral (Manual Return) requests made via SPN 7695 or other designated input. 01b = On; transmission may respond to Auto-Neutral (Manual Return) requests made via SPN 7695 or other designated input. 10b = Error 11b = Not Available
7695	Transmission Auto-Neutral (Manual Return) Request	This parameter conveys a vehicle system desire to override the operator's current shift selector request (e.g. Drive, Reverse) and shift the transmission into Neutral. « Manual Return » indicates this parameter has the ability to initiate a transmission shift to Neutral, but it does not provide any capability for the transmission to automatically return to range after Neutral is achieved, or after the request is revoked. See parameter SPN 7696 for transmission status and response to this request.Entry Criteria: The transmission shall only respond to this Auto-Neutral request when the shift selector is in a Non-Neutral position. If the vehicle system and transmission both support SPN 7694 [Transmission Auto-Neutral (Manual Return) Enable Switch], the transmission shall only respond to this Auto-Neutral request when SPN 7694 = 01b. When the transmission receives SPN 7695 = 01b, and all other transmission manufacturer-specific criteria are satisfied (e.g. vehicle is stopped), the transmission shall shift to Neutral. Exit Criteria: To exit from the resulting Auto-Neutral state, the vehicle operator must provide shift selector input (i.e. the « Manual Return ») before the vehicle can be driven. The exact shift selector input or sequence required to exit

		the Auto-Neutral state may be transmission manufacturer specific. In applications where transmission range selection is accomplished through a mechanical linkage, the shift selector will need to be physically moved in order to exit the Auto-Neutral state. The transmission may opt to honor the shift selector input only when this parameter is set to the 00b state, or it may opt to do so for any/all other states. If the shift selector input is honored for states other than 00b, this parameter must return to 00b before the transmission will honor another request to the Auto-Neutral state. Note: SPN 683 [Disengage Driveline Request] differs from this parameter in that SPN 683 provides a method to « simply disengage the driveline, e.g., to prevent engine drag torque from causing high wheel slip on slippery surfaces. » SPN 7695 puts the driveline in a Neutral state such that other vehicle activities (e.g. PTO operation) can occur. SPN 7696 provides explicit feedback that Neutral has or has not been achieved in response to SPN 7695. 00b = No request to shift to Auto-Neutral state 01b = Request to shift to Auto-Neutral state 10b = Reserved 11b = Don't Care / Take No Action
7696	Transmission Auto-Neutral (Manual Return) State	Indicates the transmission response to a Neutral request from SPN 7695 [Transmission Auto-Neutral (Manual Return) Request] or other vehicle input configured for Auto-Neutral (Manual Return) functionality. The applicability of the states and state transitions depend on transmission manufacturer options and implementation (e.g. function entry and exit criteria) of the Auto-Neutral (Manual Return) function.Note: While SPN 523 ETC2 Transmission Current Gear can be used to determine if the transmission has attained a Neutral state; SPN 7696 indicates if that Neutral state resulted from SPN 7695 or another input configured for this functionality. 000b = No request received; conditions are such that an Auto-Neutral request would be honored. 001b = No request received; conditions are such that an Auto-Neutral request would NOT be honored. 010b = Auto-Neutral request received; shift to Auto-Neutral state is pending. 011b = Auto-Neutral request received; shift to Auto-Neutral state has been achieved. 100b = Auto-Neutral request received; shift to Auto-Neutral state is inhibited. 101b = Reserved 110b = Error 111b = Not Available
7697	Aftertreatment 1 Diesel Exhaust Fluid Controller Sensor Supply Voltage	The sensor supply voltage from the aftertreatment diesel exhaust fluid controller for bank 1.

7698	Aftertreatment 2 Diesel Exhaust Fluid Controller Sensor Supply Voltage	The sensor supply voltage from the aftertreatment diesel exhaust fluid controller for bank 2.
7699	Total Delivered Payload Weight	The accumulated delivered payload mass over the life of the product. This should be a monotonically increasing number that sums delivered payload weights (SPN 6849) If transactions are supported (Payload Delivery Transaction Status, SPN 7702) then total delivered payload weight may not be incremented until the transaction is complete in order to account for cancelled or otherwise incomplete transactions. If transactions are not supported, then every delivered payload can be accumulated as the haul cycle completes.
7700	Total Haul Cycle Count	The total accumulated number of haul cycles over the life of the product. This should be a monotonically increasing number that sums Haul Cycle Count (SPN 6847). If transactions are supported via Payload Delivery Transaction Status (SPN 7702) then total haul cycle count may not be incremented until the transaction is complete in order to account for cancelled or otherwise incomplete transactions. If transactions are not supported, then every haul cycle count can be accumulated as the haul cycle completes.
7701	Total Payload Transaction Count	The accumulated number of completed payload delivery transactions over the life of the product. If transaction status monitoring is supported via Payload Delivery Transaction Status (SPN 7702) then total payload transaction count may increment when the transaction status transitions from « Transaction In Progress » to « Transaction Complete ». If transaction status monitoring is not supported then total payload transaction count may be determined by an application specific means.
7702	Payload Delivery Transaction Status	The current state of the payload delivery transaction. When a transaction is in progress, a receiving node may monitor Haul Cycle Count (SPN 6847) and Delivered Payload Weight (SPN 6849) in order to track the progress of a transaction, where the haul cycle count represents the number of haul cycles within the transaction and delivered payload weight represents the payload weight delivered within the transaction. Each transaction can be comprised of one-to-many haul cycles. Certain

		equipment may require multiple haul cycles in order to complete a payload transaction. Haul Cycle Count (SPN 6847) and the corresponding Delivered Payload Weight (SPN 6849) may be used in order to determine the number of haul cycles and amount of delivered payload for the active transaction. If transaction status monitoring is available, when the status transitions from « Transaction In Progress » to « Transaction Complete », the Total Payload Transaction Count (SPN 7701) may increment, accompanied by an increment to the Total Haul Cycle Count (SPN 7700) by the amount represented by Haul Cycle Count (SPN 6847) and and increment to the Total Delivered Payload Weight (SPN 7699) by the amount represented by Delivered Payload Weight (SPN 6849). 0000b = Transaction Not In Progress 0001b = Transaction In Progress 0010b = Transaction Complete 0011b to 1011b = Reserved for Future Assignment by SAE 1110b = Error 1111b = Not Available
7703	Payload Temperature 1	Temperature of payload at measurement point 1. Measurement position is manufacturer or regulation specific.
7704	Payload Temperature 2	Temperature of payload at measurement point 2. Measurement position is manufacturer or regulation specific.
7705	Payload Temperature 3	Temperature of payload at measurement point 3. Measurement position is manufacturer or regulation specific.
7706	Payload Temperature 4	Temperature of payload at measurement point 4. Measurement position is manufacturer or regulation specific.
7707	Payload Temperature 5	Temperature of payload at measurement point 5. Measurement position is manufacturer or regulation specific.
7708	Engine Turbocharger Compressor Bypass Actuator 1 Motor Current Disable	Command to disable power to motor in bypass actuator 1 to prevent unnecessary load on the component. 00b = Do Not Disable 01b = Disable 10b = Reserved 11b = Don’t Care/Take No Action

7709	Engine Turbocharger Compressor Bypass Actuator 2 Motor Current Disable	Command to disable power to motor in bypass actuator 2 to prevent unnecessary load on the component. 00b = Do Not Disable 01b = Disable 10b = Reserved 11b = Don't Care/Take No Action
7710	Engine Turbocharger Wastegate Actuator 2 Motor Current Disable	Command to disable power to motor in wastegate actuator 2 to prevent unnecessary load on the component. 00b = Do Not Disable 01b = Disable 10b = Reserved 11b = Don't Care/Take No Action
7711	Vehicle Trailer Status	Indicates a trailer is connected to the towing mechanism. This is not intended to indicate that the trailer is latched.00b = Trailer is not detected 01b = Trailer is detected 10b = Error 11b = Not available
7712	Battery Potential / Power Input 3	This parameter measures the third source of battery potential as measured at the input of the ECU/actuator etc. coming from one or more batteries, irrespective of the distance between the component and the battery. This SPN is also used when ECUs are interconnected in a series configuration, where the source of power is coming directly or indirectly from the same battery/batteries.
7713	Battery Potential / Power Input 4	This parameter measures the fourth source of battery potential as measured at the input of the ECU/actuator etc. coming from one or more batteries, irrespective of the distance between the component and the battery. This SPN is also used when ECUs are interconnected in a series configuration, where the source of power is coming directly or indirectly from the same battery/batteries.
7714	SLI Battery 3 Net Current	Net flow of electrical current into/out of the third battery or third set of batteries used for starting the engine, for lighting, and for ignition (SLI).
7715	SLI Battery 4 Net Current	Net flow of electrical current into/out of the fourth battery or fourth set of batteries used for starting the engine, for lighting, and for ignition (SLI).
7716	Differential Lock State – Rear Axle 3	State used which indicates the condition of the rear axle 3 differential lock. The differential locks are located as defined in figure SPN 564_A.00b = Differential lock disengaged 01b = Differential lock engaged 10b = Error 11b = Not available

7717	Camshaft Phase Actuator Position	Position of the camshaft phase actuator.
7718	Camshaft Phase Actuator Command	Command to control the camshaft phase actuator position.
7719	Operator Inducement Time to Final Inducement Action	Indicates the time until the inducement strategy enforces the final level of engine emissions operator inducement. The final level of inducement can include derating the engine, shutting down the engine, or restricting the engine to low idle.When operator inducement is not active, this parameter will be set to FB00h. For systems where SPN 5246 or SPN 5826 are supported, operator inducement is active if at least one of SPN 5246 or SPN 5826 is not equal to 000b. If SPN 7719 has decremented to 0, it will remain at 0 until the condition that caused it to decrement has been corrected. See also SPNs 7425 and 7428 for other levels of inducement. If the operator inducement has been temporarily overridden, then this parameter will pause and not decrement until the override is removed. For systems where SPN 5246 or SPN 5826 are supported, operator inducement is active if at least one of SPN 5246 or SPN 5826 is not equal to 110b – Temporary Override of Inducement.
7720	Engine Common Rail Oil Pressure	Gage pressure of oil in common rail’s lubrication system as provided by oil pump.
7721	Engine Common Rail Oil Absolute Pressure	Absolute pressure of oil in common rail’s lubrication system as provided by oil pump.
7722	Engine Fuel 2 Temperature 1	Temperature of fuel (or gas) of the second fuel type.
7723	Left Front Cab Door Latch Position	Status of the left front cab door latch (driver door for left-hand steer vehicles). Door latches may have 3 positions indicating fully open, 1st detent or « ajar », and 2nd detent or fully closed.000b = Door Latch Open 001b = Door Latch Fully Closed/Latched 010b = Door Latch Ajar 011b = Reserved 100b = Reserved 101b = Reserved 110b = Error 111b = Not Available
7724	Right Front Cab Door Latch Position	Status of the right front cab door latch (passenger door for left-hand steer vehicles). Door latches may have 3 positions indicating fully open, 1st detent or « ajar », and 2nd detent or fully closed.000b = Door Latch Open 001b = Door Latch Fully

		Closed/Latched 010b = Door Latch Ajar 011b = Reserved 100b = Reserved 101b = Reserved 110b = Error 111b = Not Available
7725	Left Rear Cab Door Latch Position	Status of the left rear cab door latch. Door latches may have 3 positions indicating fully open, 1st detent or « ajar », and 2nd detent or fully closed.000b = Door Latch Open 001b = Door Latch Fully Closed/Latched 010b = Door Latch Ajar 011b = Reserved 100b = Reserved 101b = Reserved 110b = Error 111b = Not Available
7726	Right Rear Cab Door Latch Position	Status of the right rear cab door latch. Door latches may have 3 positions indicating fully open, 1st detent or « ajar », and 2nd detent or fully closed.000b = Door Latch Open 001b = Door Latch Fully Closed/Latched 010b = Door Latch Ajar 011b = Reserved 100b = Reserved 101b = Reserved 110b = Error 111b = Not Available
7727	Cab Doors Lock Actuation Command	Commands cab door latch state change: lock or unlock. 000b = Unlock left front cab door latch (driver door on LH steer vehicles) 001b = Unlock right front cab door latch (front passenger door for LH steer vehicles) 010b = Unlock left rear cab door latch 011b = Unlock right rear cab door latch 100b = Unlock all cab door latches 101b = Lock all cab door latches 110b = Reserved 111b = Take no action
7728	Remote Cab Door Lock Request	Request to the cab door lock controller from Remote Keyless Entry or or other external device to lock or unlock doors.This parameter is different from Cab Doors Lock Actuation Command (SPN 7727) because this is a request to actuate door locks. Based on security or interlocks, a controller can decide to command the latches with the Actuation Command Message. 000b = Request unlock left front cab door latch (driver door on LH steer vehicles) 001b = Request unlock right front cab door latch (front passenger door for LH steer vehicles) 010b = Request unlock left rear cab door latch 011b = Request unlock right rear cab door latch 100b = Request unlock all cab door latches 101b = Request lock all cab door latches 110b = Reserved 111b = Take no action
7729	Left Front Window Position Command	Commands position change of left front window (driver door window on left-hand steer vehicles). 000b = Window move up 001b = Window move down 010b =

		Window auto up 011b = Window auto down 100b = Reserved 101b = Reserved 110b = Reserved 111b = Take no action
7730	Right Front Window Position Command	Commands position change of right front window (passenger door window on left-hand steer vehicles). 000b = Window move up 001b = Window move down 010b = Window auto up 011b = Window auto down 100b = Reserved 101b = Reserved 110b = Reserved 111b = Take no action
7731	Left Rear Window Position Command	Commands position change of left rear window. 000b = Window move up 001b = Window move down 010b = Window auto up 011b = Window auto down 100b = Reserved 101b = Reserved 110b = Reserved 111b = Take no action
7732	Right Rear Window Position Command	Commands position change of the right rear window. 000b = Window move up 001b = Window move down 010b = Window auto up 011b = Window auto down 100b = Reserved 101b = Reserved 110b = Reserved 111b = Take no action
7733	Mirror Left 1 Horizontal Command	Commands horizontal position change of the primary mirror on the left side (driver side for left-hand steer vehicles).00b = Move left 01b = Move right 10b = Reserved 11b = Take no action
7734	Mirror Left 1 Vertical Command	Commands vertical position change of the primary mirror on the left side (driver side for left-hand steer vehicles).00b = Move up 01b = Move down 10b = Reserved 11b = Take no action
7735	Mirror Right 1 Horizontal Command	Commands horizontal position change of the primary mirror on the right side (passenger side for lefthand steer vehicles).00b = Move left 01b = Move right 10b = Reserved 11b = Take no action
7736	Mirror Right 1 Vertical Command	Commands vertical position change of the primary mirror on the right side (passenger side for lefthand steer vehicles).00b = Move up 01b = Move down 10b = Reserved 11b = Take no action

7737	Mirror Left 2 Horizontal Command	Commands horizontal position change of the second mirror on the left side (driver side for left-hand steer vehicles).00b = Move left 01b = Move right 10b = Reserved 11b = Take no action
7738	Mirror Left 2 Vertical Command	Commands vertical position change of the second mirror on the left side (driver side for left-hand steer vehicles).00b = Move up 01b = Move down 10b = Reserved 11b = Take no action
7739	Mirror Right 2 Horizontal Command	Commands horizontal position change of the second mirror on the right side (passenger side for lefthand steer vehicles).00b = Move left 01b = Move right 10b = Reserved 11b = Take no action
7740	Mirror Right 2 Vertical Command	Commands vertical position change of the second mirror on the right side (passenger side for lefthand steer vehicles).00b = Move up 01b = Move down 10b = Reserved 11b = Take no action
7741	Mirror Left 1 Heat Command	Command to activate heater for primary mirror on the left side (driver side for left-hand steer vehicle). Mirror heat may be expected to latch in the « on » state upon receipt of the command, stay on while the command is « take no action » and turn off upon receipt of the « off » command.00b = Mirror heat off 01b = Mirror heat on 10b = Reserved 11b = Take no action
7742	Mirror Right 1 Heat Command	Command to activate heater for primary mirror on the right side (passenger side for left-hand steer vehicle). Mirror heat may be expected to latch in the « on » state upon receipt of the command, stay on while the command is « take no action » and turn off upon receipt of the « off » command.00b = Mirror heat off 01b = Mirror heat on 10b = Reserved 11b = Take no action
7743	Mirror Left 2 Heat Command	Command to activate heater for second mirror on the left side (driver side for left-hand steer vehicle). Mirror heat may be expected to latch in the « on » state upon receipt of the command, stay on while the command is « take no action » and turn off upon receipt of the « off » command.00b = Mirror heat off 01b = Mirror heat on 10b = Reserved 11b = Take no action

7744	Mirror Right 2 Heat Command	Command to activate heater for second mirror on the right side (passenger side for left-hand steer vehicle). Mirror heat may be expected to latch in the « on » state upon receipt of the command, stay on while the command is « take no action » and turn off upon receipt of the « off » command.00b = Mirror heat off 01b = Mirror heat on 10b = Reserved 11b = Take no action
7745	Engine Start Request	Indicates the sender's desire to start the engine. The engine start arbitrator latches this signal and, if possible, completes the engine start regardless of a change of state of this signal. Use Engine Start Abort Request (SPN 7747) to un-latch the start request and cancel an engine start that is in progress.The sender of this signal may increase the broadcast rate temporarily to once every 20 ms during an active request. It may also monitor Engine Start Request Latch Status (SPN 7754) from the arbitrator to determine when the request is latched. Once latched the sender may return to sending 00b – Start not requested. 00b = Start not requested 01b = Start requested, operator type 10b = Start requested, automatic type 11b = Not available
7746	Engine Start Consent	Indicates the sender's consent to start the engine for different start types. An operator-requested engine start is a start that is initiated directly by the operator (i.e. via the key switch). An automatic engine start is one that is initiated by a vehicle system without direct operator interaction (i.e. as part of engine off at stop operation, etc).This parameter has no error state. In case of an error condition (for example, a switch input state cannot be determined) the consenter is forced to choose one of the valid consent states. The « not available » state is not to be used to indicate an error condition. Use Engine Start Abort Request (SPN 7747) to cancel an engine start that is in progress. An Engine Start Consent value of « No Consent » does not abort an ongoing start as the consent signal can only prevent a start before it is initiated. 000b = No consent 001b = Consent to operator-requested start only 010b = Consent to automatic start only 011b = Consent to both, operator-requested and automatic start 100b to 110b = Reserved 111b = Not available
7747	Engine Start Abort Request	Indicates the sender's desire to abort an engine start. This signal is used by requesters and consenters to request that the arbitrator cancel an engine start that is in progress.The sender of this signal may increase the broadcast rate temporarily to once

		every 20 ms during an active request. It may monitor Engine Start Request Latch Status (SPN 7754) from the arbitrator to determine when the request is un-latched. Once un-latched the sender can return to sending 00b – Abort not requested. 00b = Abort not requested 01b = Abort requested 10b = Reserved 11b = Don't care / Take no action
7748	Engine Starter 1 Feedback	Feedback of the current state of first engine starter. This signal is intended to be used by the arbitrator as feedback to its command signal (SPN 7753).Additional details regarding the starter state may be available in SPN 1675. 000b = Starter not commanded 001b = Starter command latched, starter active 010b = Starter command unlatched, start completed (returns to 0 – Starter not commanded after 1000 ms) 011b = Starter command unlatched, start abort command received from arbitrator (returns to 0 – Starter not commanded after 1000 ms) 100b = Starter command unlatched, start aborted by starter controller (returns to 0 – Starter not commanded after 1000 ms). 101b to 110b = Reserved 111b = Not available
7749	Engine Starter 2 Feedback	Feedback of the current state of second engine starter. This signal is intended to be used by the arbitrator as feedback to its command signal (SPN 7753).Additional details regarding the starter state may be available in SPN 1675. 000b = Starter not commanded 001b = Starter command latched, starter active 010b = Starter command unlatched, start completed (returns to 0 – Starter not commanded after 1000 ms) 011b = Starter command unlatched, start abort command received from arbitrator (returns to 0 – Starter not commanded after 1000 ms) 100b = Starter command unlatched, start aborted by starter controller (returns to 0 – Starter not commanded after 1000 ms). 101b to 110b = Reserved 111b = Not available
7750	Engine Start Control Message Counter	Message counter to allow detection of data integrity issues. The counter is incremented every time a device sends out the Engine Start Control message. When the counter has reached a value of 15 it starts over at 0 for the next message cycle. Receiving devices shall treat the message content as invalid when two consecutive messages from the same source address contain non-sequential counter values.

7751	Engine Start Control Checksum	Checksum to allow detection of data integrity issues. The receiving node shall calculate the checksum and compare its calculated value with the received checksum. In case of a mismatch the message shall be discarded.The message checksum is calculated using the first 7 data bytes, including the message counter, and the bytes of the message identifier. It is calculated as follows: Checksum = (Byte1 + Byte2 + Byte3 + Byte4 + Byte5 + Byte6 + Byte7 + message ID low byte + message ID mid low byte + message ID mid high byte + message ID high byte)
7752	Engine Start Control Message Rate	This signal is sent by the arbitrator to control the rate at which other participants send the Engine Start Control Message (ENGSC). The arbitrator sets this signal to the slower rate after the first engine start attempt after initial power-up is completed (either successful or not). After the initial start attempt the arbitrator returns to the faster rate from the time it latches another start request to the time this request is completed (successful or not).Senders of the ENGSC message shall broadcast at a rate of once every 20 ms when this signal is not available from the arbitrator, for example during initial system initialization. When this signal is available, senders shall follow the rate instructed by the arbitrator unless the sending device has a need to broadcast at the 20 ms rate, which it may do. 00b = Once every 20 ms 01b = Once every 250 ms or on change but no faster than 20 ms 10b = Reserved 11b = Not available
7753	Engine Starter Command	Command from the arbitrator to the engine starter controller(s). The arbitrator takes input from consenters and requesters to initiate an engine start. This signal is used by the arbitrator to command the first or second starter instance. Starter controllers shall be configured to act as either starter controller 1 or starter controller 2. This assignment is the responsibility of the system integrator. Each starter controller shall crank the engine only when this signal is active for that starter instance. The starter controller shall latch the start request signal and crank the engine until the starter controller has determined that either: a) The engine is running b) The starter command from the arbitrator indicates « 3 – Command withdrawn – abort engine start » c) The starter controller has determined that an engine start is not possible due to other considerations (i.e. electrical, thermal, mechanical, etc). The arbitrator shall send « 3 – Command withdrawn – abort engine start » to cancel a start that is already

		in progress. « 0 – Command not active » does not cancel an engine start that has already begun. Both starter instances operate on the same engine. 000b = Command not active 001b = Command active for starter 1 010b = Command active for starter 2 011b = Command withdrawn – abort engine start 100b to 110b = Reserved 111b = Don’t care / Take no action
7754	Engine Start Request Latch Status	Indicates the arbitrator’s latch status for engine start requests. All « unlatched » states shall transition to state « 0 – Start Request not received » after 1000 ms unless a different state becomes more appropriate in the meantime. While this time may appear long, it is intended to bridge the time it may take a receiving controller to recover from a reset due to a temporary drop of voltage during the crank event.0000b = Start request not received – waiting for start request 0001b = Start request latched – waiting for consent (the arbitrator will wait for a manufacturer-defined amount of time before timing out) 0010b = Start request latched – consent confirmed, starter commanded 0011b = Start request unlatched – start completed 0100b = Start request unlatched – consent not established within allowed time 0101b = Start request unlatched – start aborted due to abort request 0110b = Start request unlatched – start could not be completed because the starter command was not successful 0111b to 1110b = Reserved 1111b = Not available
7755	Operator Engine Start Consent Summary	Arbitrator’s summary of the consent statuses of all devices which the arbitrator considers for operator start requests. The purpose of this parameter is for requesters to determine if an operator start request would be honored at the current time.00b = No consent – At least one participating device does not consent 01b = Consent – All participating devices consent 10b = Error – Consent signal from at least one required consenter is missing 11b = Not available
7756	Automatic Engine Start Consent Summary	Arbitrator’s summary of the consent statuses of all devices which the arbitrator considers for automatic start requests. The purpose of this parameter is for requesters to determine if an automatic start request would be honored at the current time.00b = No consent – At least one participating device does not consent 01b = Consent – All participating devices consent 10b = Error – Consent signal from at least one required consenter is missing 11b = Not available

7757	Engine Start Arbitrator Message Counter	Message counter to allow detection of data integrity issues. The counter is incremented every time a device sends out the Engine Start Control message. When the counter has reached a value of 15 it starts over at 0 for the next message cycle. Receiving devices shall treat the message content as invalid when two consecutive messages from the same source address contain non-sequential counter values.
7758	Engine Start Arbitrator Checksum	Checksum to allow detection of data integrity issues. The receiving node shall calculate the checksum and compare its calculated value with the received checksum. In case of a mismatch the message shall be discarded.The message checksum is calculated using the first 7 data bytes, including the message counter, and the bytes of the message identifier. It is calculated as follows: Checksum = (Byte1 + Byte2 + Byte3 + Byte4 + Byte5 + Byte6 + Byte7 + message ID low byte + message ID mid low byte + message ID mid high byte + message ID high byte)
7759	Engine Stop-Start Disable Command	Engine Stop-Start Disable Command indicates the desire to disable the engine stop-start functionality during propulsion modes. For momentary switches, this parameter does not indicate the state of the switch contacts, but the operator desired state.If defueling requests (SPN 5793) are used, this command is not intended to disable all defueling requests to the engine, but only those related to engine stop-start during vehicle propulsion modes. For example, defueling due to idle shutdown features or non-propulsion hybrid modes would not be disabled due to this parameter. An example of where this command would be used is on an emergency response vehicle that may want to disable engine stop-start while responding to an emergency. 00b = Automatic engine stop-start may be allowed 01b = Automatic engine stop-start shall be disabled 10b = Reserved 11b = Don’t care/Take no action
7760	Requested Engine Speed Acceleration Rate Limit	This parameter is intended to be received by a device sending speed commands to an engine (e.g. TSC1 or proprietary command). The sending device should issue speed commands such that this acceleration rate is not exceeded.A value of FB00h indicates no request for an acceleration rate limit. For Example: If acceleration rate limit is 50 RPM/sec, the actual speed acceleration cannot be numerically greater than 50.

7761	Requested Engine Speed Deceleration Rate Limit	This parameter is intended to be received by a device sending speed commands to an engine (e.g. TSC1 or proprietary command). The sending device should issue speed commands such that this deceleration rate is not exceeded.A value of FB00h indicates no request for a deceleration rate limit. For Example: If deceleration rate limit is 50 RPM/sec, the actual speed deceleration cannot be numerically greater than 50.
7762	Engine Valve Control Module 1	This is the first electronic unit to used to control the valves on the engine.
7763	Engine Valve Control Module 2	This is the second electronic unit to used to control the valves on the engine.
7764	Engine Valve Control Module 3	This is the third electronic unit to used to control the valves on the engine.
7765	Engine Valve Control Module 4	This is the fourth electronic unit to used to control the valves on the engine.
7766	Engine Valve Control Module 5	This is the fifth electronic unit to used to control the valves on the engine.
7767	Engine Valve Control Module 6	This is the sixth electronic unit to used to control the valves on the engine.
7768	Engine Valve Control Module 7	This is the seventh electronic unit to used to control the valves on the engine.
7769	Engine Valve Control Module 8	This is the eighth electronic unit to used to control the valves on the engine.
7770	Engine Valve Control Module 1 Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in Engine Valve Control Module 1 by the manufacturer's software. When there are multiple failures, the most severe is transmitted.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported. Engine Valve Control Module 1 is the first module used to control the valves on the engine.
7771	Engine Valve Control Module 2 Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in Engine Valve Control Module 2 by the manufacturer's software. When there are multiple failures, the most severe is transmitted.A value of 31 is sent to indicate that no failure has been detected

		or this parameter is not supported. Engine Valve Control Module 2 is the second module used to control the valves on the engine.
7772	Engine Valve Control Module 3 Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in Engine Valve Control Module 3 by the manufacturer's software. When there are multiple failures, the most severe is transmitted.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported. Engine Valve Control Module 3 is the third module used to control the valves on the engine.
7773	Engine Valve Control Module 4 Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in Engine Valve Control Module 4 by the manufacturer's software. When there are multiple failures, the most severe is transmitted.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported. Engine Valve Control Module 4 is the fourth module used to control the valves on the engine.
7774	Engine Valve Control Module 5 Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in Engine Valve Control Module 5 by the manufacturer's software. When there are multiple failures, the most severe is transmitted.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported. Engine Valve Control Module 5 is the fifth module used to control the valves on the engine.
7775	Engine Valve Control Module 6 Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in Engine Valve Control Module 6 by the manufacturer's software. When there are multiple failures, the most severe is transmitted.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported. Engine Valve Control Module 6 is the sixth module used to control the valves on the engine.
7776	Engine Valve Control Module 7 Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in Engine Valve Control Module 7 by the manufacturer's software. When there are multiple failures, the most severe is transmitted.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported. Engine Valve Control Module 7 is the seventh module used to control the valves on the engine.

7777	Engine Valve Control Module 8 Preliminary FMI	Used to identify the applicable J1939-73 FMI detected in Engine Valve Control Module 8 by the manufacturer's software. When there are multiple failures, the most severe is transmitted.A value of 31 is sent to indicate that no failure has been detected or this parameter is not supported. Engine Valve Control Module 8 is the eighth module used to control the valves on the engine.
7778	Transmission Reference Torque	This parameter is the 100% reference value for all defined transmission output torque parameters. For a given vehicle application, it is only defined once and doesn't change.
7779	Maximum Forward Transmission Output Shaft Speed	Maximum transmission output shaft speed that can be achieved in the forward direction, based on current operating conditions.
7780	Maximum Reverse Transmission Output Shaft Speed	Maximum transmission output shaft speed that can be achieved in the reverse direction, based on current operating conditions.
7781	Barometric Absolute Pressure 2	Second absolute air pressure measurement of the atmosphere. See SPN 108 or SPN 5685 as the primary barometric pressure measurement.
7782	Engine Protection Due To Turbocharger Overspeed	Engine has been derated to limit turbocharger speed.
7783	Aftertreatment 1 Diesel Exhaust Fluid Requested Quantity of Integrator (High Resolution)	Represents the command for the diesel exhaust fluid quantity integrator in the dosing control unit. See SPN 4350 for alternate resolution.
7784	Aftertreatment 2 Diesel Exhaust Fluid Requested Quantity of Integrator (High Resolution)	Represents the command for the diesel exhaust fluid quantity integrator in the dosing control unit. See SPN 4403 for alternate resolution.
7785	Engine Fluid Bund Level	Ratio of the volume of engine fluid within the bund containment frame to the maximum capacity of the bund containment frame. The bund containment frame is used to contain engine fluid leaks including, but not limited to, engine fuel tank leaks.

7786	Aftertreatment 1 Diesel Exhaust Fluid Actual Quantity of Integrator (High Resolution)	The SCR requested diesel exhaust fluid integrator total quantity for aftertreatment system 1 (exhaust bank 1). See SPN 4333 for alternate resolution.
7787	Aftertreatment 2 Diesel Exhaust Fluid Actual Quantity of Integrator (High Resolution)	The SCR requested diesel exhaust fluid integrator total quantity for aftertreatment system 2 (exhaust bank 2). See SPN 4386 for alternate resolution.
7788	Transmission Shift Selector Requested Vehicle Direction	This parameter indicates the direction selected by the operator via the active transmission shift selector. Some regulations (e.g., Federal Motor Vehicle Safety Standards 102) require specific Engine Stop-Start behavior based on operator selected direction. This parameter provides the necessary direction information for this purpose. Neutral or range commands made by other vehicle functions (e.g., automatic neutral functions) will not be reflected in this parameter. For selectors that use momentary contacts, this parameter would not reflect the current state of the physical contacts, but rather the direction that the operator has selected. Where applicable, it conveys the transmission's de-bounced interpretation of the selector inputs. 000b = No direction selected – Park 001b = No direction selected – Neutral 010b = Forward direction selected 011b = Reverse direction selected 100b to 101b = 4 SAE Reserved 110b = Error 111b = Not supported
7789	Engine Fueling Desired Reason	This parameter conveys the reason a device wants the engine running. This SPN is intended to be used in conjunction with Desired Engine Fueling State (SPN 5793). When a device sends Desired Engine Fueling State = « Fueling Desired » either alone or in combination with Engine Start Request = « Start requested, automatic type », then SPN 7789 may be used to convey a reason for why the device desires the engine to run. If more than one reason exists at the same time, the reason with highest importance (as defined by the device sending this parameter) is indicated. 00h = Desired Engine Fueling State (SPN 5793) from this device does not equal 01b 01h = Lubrication distribution in device is incomplete 02h = Engine exhaust is needed as a heat source (i.e. regeneration) 03h = Engine coolant is needed as a heat source 04h = Engine is needed for cooling system operation 05h = Engine is needed for charging the SLI batteries 06h = Engine is needed for charging the hybrid stored energy source

		07h = Device protection (no fault condition present) is active 08h = Device preparation for engine shutdown is in progress 09h = Service Override is active 0Ah = Device has detected one or more fault conditions 0Bh = Engine is needed for engine driven accessory operation 0Ch = Engine is needed for PTO operation 0Dh = Engine is needed for DEF dosing system operation 0Eh = Engine is needed for DEF dosing system component protection 0Fh = Engine is needed for DEF dosing system diagnosis 10h = Engine is needed for the Diesel Particulate Filter diagnosis 11h to F9h = SAE Reserved (for future reasons) FAh = Engine operation is needed to perform normal device functions not specifically listed FBh to FEh = SAE Reserved FFh = Not supported
7790	Front Hitch Roll Angle	See document ISO 11783-7 for SPN details.
7791	Front Hitch Roll Limit State	See document ISO 11783-7 for SPN details.
7792	Front Hitch Roll Exit/Reason Code	See document ISO 11783-7 for SPN details.
7793	Front Hitch Pitch Angle	See document ISO 11783-7 for SPN details.
7794	Front Hitch Pitch Limit State	See document ISO 11783-7 for SPN details.
7795	Front Hitch Pitch Exit/Reason Code	See document ISO 11783-7 for SPN details.
7796	Front Hitch Roll Command	See document ISO 11783-7 for SPN details.
7797	Front Hitch Roll Sensitivity Command	See document ISO 11783-7 for SPN details.
7798	Front Hitch Pitch Command	See document ISO 11783-7 for SPN details.
7799	Front Hitch Pitch Sensitivity Command	See document ISO 11783-7 for SPN details.

7800	Front Hitch Roll Sensitivity	See document ISO 11783-7 for SPN details.
7801	Front Hitch Pitch Sensitivity	See document ISO 11783-7 for SPN details.
7802	Rear Hitch Roll Angle	See document ISO 11783-7 for SPN details.
7803	Rear Hitch Roll Limit State	See document ISO 11783-7 for SPN details.
7804	Rear Hitch Roll Exit/Reason Code	See document ISO 11783-7 for SPN details.
7805	Rear Hitch Pitch Angle	See document ISO 11783-7 for SPN details.
7806	Rear Hitch Pitch Limit State	See document ISO 11783-7 for SPN details.
7807	Rear Hitch Pitch Exit/Reason Code	See document ISO 11783-7 for SPN details.
7808	Rear Hitch Roll Command	See document ISO 11783-7 for SPN details.
7809	Rear Hitch Roll Sensitivity Command	See document ISO 11783-7 for SPN details.
7810	Rear Hitch Pitch Command	See document ISO 11783-7 for SPN details.
7811	Rear Hitch Pitch Sensitivity Command	See document ISO 11783-7 for SPN details.
7812	Rear Hitch Roll Sensitivity	The current sensitivity of the rear hitch roll control expressed as a percentage of the maximum gain. 0% indicates minimal gain in the control loop; 100%, the maximum gain. Values near zero may result in no reaction by the control loop.

7813	Rear Hitch Pitch Sensitivity	The current sensitivity of the rear hitch pitch control expressed as a percentage of the maximum gain. 0% indicates minimal gain in the control loop; 100%, the maximum gain. Values near zero may result in no reaction by the control loop.
7814	Fire Pump Water Tank Level	Measures the level of water in tank plumbed to the fire pump.
7815	Fire Pump Discharge Pressure	Monitors the pressure on the discharge (outlet) side of a fire pump.
7816	Fire Pump Intake Pressure	Monitors the pressure on the intake (inlet) side of a fire pump.
7817	Class-A Foam Tank Level	Measures the level of (Class-A) Foam tank level in fire apparatus.
7818	Class-B Foam Tank Level	Measures the level of (Class-B) Foam tank level in fire apparatus.
7819	CAFS Air Pressure	Measures the air pressure in fire apparatus Compressed Air Foam systems (CAFS).
7820	GPS Antenna	GPS antenna used on positioning devices.
7821	Satellite Communication Antenna	Satellite communication antenna used for telematic devices.
7822	Cellular Communication Antenna	Cellular communication antenna used on telematics devices.
7823	Incorrect Antenna for Cellular Radio	Incorrect antenna detected by cellular radio.
7824	Incorrect Antenna for Satellite Radio	Incorrect antenna detected by satellite radio.
7825	Fire Pump Operation Time	Accumulated time that the fire pump is enaged.
7826	Fire Pump Engagement Cycles	Accumulated number of times the fire pump has been engaged.
7827	Transmission Communications Failure Idle Torque Limit	This parameter is provided to the engine from the transmission as an idle governor torque limit to be invoked by the engine in the event that CAN communication with

		the transmission is lost.The data is transmitted in indicated torque as a percent of reference engine torque (see the engine configuration message, PGN 65251). The percent torque value will not be less than zero and it includes the torque developed in the cylinders required to overcome friction. Please note that the « Transmission Communications Failure Idle Torque Limit » only applies to the engine's idle governor. It does not alter the engine's torque map. Full accelerator torque and other similar torque requests are still allowed to access the full torque map. It is recommended that engines use reception of the ETC#1 message as a transmission « heartbeat ». In the event that the ETC#1 message is not received in a time period of 5 times its' broadcast rate (5 x 10 ms = 50 ms), the engine should invoke the last received idle torque limit in the current ignition cycle, holding the engine idle torque to less than or equal to the value of the « Transmission Failure Mode Idle Torque Limit » parameter. The engine may release the limit when transmission-to-engine communication is re-established. A value of FBh indicates that no « Transmission Communications Failure Idle Torque Limit » is currently desired, but the transmission supports the parameter. A value of FFh indicates that the « Transmission Communications Failure Idle Torque Limit » is not supported by the transmission. It is expected that the engine will include that last received « Transmission Communications Failure Idle Torque Limit » in the engine configuration PGN-65251 as parameter SPN 7828 « Engine Default Idle Torque Limit ».
7828	Engine Default Idle Torque Limit	Companion parameter to « Transmission Communications Failure Idle Torque Limit » (SPN 7827). This « echo » parameter provides confirmation to the transmission that the engine has received and will invoke the requested SPN 7827 « Transmission Communications Failure Idle Torque Limit » in the event that CAN communication is lost between the two devices.The data is transmitted in indicated torque as a percent of reference engine torque (see the engine configuration message, PGN 65251). The percent torque value will not be less than zero and it includes the torque developed in the cylinders required to overcome friction. Please note that the « Engine Default Idle Torque Limit » only applies to the Engine's idle governor. It does not alter the engine's torque map. Full accelerator torque and other similar torque requests are still allowed to access the full torque map. It is recommended that engines use reception of the ETC#1 message as a transmission « heartbeat ». In the

		event that the ETC#1 message is not received in a time period of 5 times its' broadcast rate (5 x 10 ms = 50 ms), the engine should invoke the last received idle torque limit in the current ignition cycle, holding the engine idle torque to less than or equal to the value of the « Transmission Communications Failure Idle Torque Limit » parameter. The engine may release the limit when transmission-to-engine communication is re-established. If the engine supports this protection logic, the « Engine Default Idle Torque Limit » parameter should be set equal to the « Transmission Communications Failure Idle Torque Limit » parameter last received in the Transmission Configuration 2 message (PGN 65099). Otherwise, an « Engine Default Idle Torque Limit » value of FBh indicates that no « Transmission Communications Failure Idle Torque Limit » has been received or set in this ignition cycle. If the engine does not support this logic, an « Engine Default Idle Torque Limit » value of FFh should be set.
7829	Transmission Idle Governor Fueling Inhibit	This parameter is a command provided to the Engine Control Module (ECM) from the Transmission Control Module (TCM) to inhibit idle governor fueling in the unlikely event that transmission has detected a failure preventing driveline disengagement. This parameter is not intended for engine stop-start functionality or other normal (non-failure mode) operation.Please note that the « Transmission Idle Governor Fueling Inhibit » only applies to the Engine's idle governor. It does not alter the engine's torque map. Full accelerator pedal torque and other similar torque requests are still allowed to access the full torque map when the « Transmission Idle Governor Fueling Inhibit » is active. 00b = « Transmission Idle Governor Fueling Inhibit » is not currently desired. 01b = Transmission is currently commanding the Engine to inhibit idle governor fueling. 10b = Reserved for future SAE use. 11b = Don't care/take no action. It is expected that the engine will include the « Transmission Idle Governor Fueling Inhibit Support » in the EC2 PGN 64895 as parameter SPN 7830.
7830	Transmission Idle Governor Fueling Inhibit Support	Companion parameter to « Transmission Idle Governor Fueling Inhibit » (SPN 7829). This « configuration » parameter provides confirmation to the Transmission that the engine supports the « Transmission Idle Governor Fueling Inhibit » feature.00b = Indicates that the engine does not support the « Transmission Idle Governor Fueling

		Inhibit » feature 01b = Indicates that the engine will respond to a « Transmission Idle Governor Fueling Inhibit » command from the Transmission, should it be received 10b = Reserved for future SAE use 11b = Not supported
7831	Generator Trip kW Hours Export	The total kilowatt-hours that have been exported by the generator since the last reset of the trip kWh meter.This value will be reset by the user at will.
7832	Generator Trip kVAr Hours Export	The trip AC reactive energy exported by the generstor since the last reset of the trip kVArh meter. This value will be reset by the user at will.
7833	Canister Vent Valve	The state of the canister vent value used to allow fresh air into the charcoal vapor canister. 00b = Vent Valve is Closed 01b = Vent Valve is Open 10b = Error 11b = Not Available
7834	Canister Purge Valve Command	The commanded positon of the canister purge valve used to allow fuel vapors from the charcoal canister into the intake manifold.A value of 0 % indicates fully closed, a value of 100 % indicates fully open.
7835	Gasoline Fuel Tank Pressure	The gage pressure of the vapor in the gasoline fuel tank.
7836	Cruise Control Driver Cancellation Status	State signal which indicates that the cruise control is cancelled by driver action. Driver actions could include switch off, brake pedal activation, clutch pedal actuation, cancel switch, or other reasons determined by the cruise control application.This parameter will be set to 01b if Cruise Control States (SPN 527) goes to 00b (Off/disabled) due to a driver action This parameter will be set to 00b if Cruise Control States (SPN 527) leaves the state 00b (Off/disabled) OR if there are conditions, not initiated by the driver, that also cancelled cruise control. E.g. low vehicle speed. Initial state of Cruise control cancelled by driver action after ignition on is 00b. 00b = Driver action has not cancelled cruise control 01b = Cruise control cancelled by driver action 10b = Error 11b = Not available
7837	Estimated Engine Parasitic Losses – Percent Torque (High Resolution)	Indicates the estimated amount of torque loss due to engine parasitics, such as cooling fan, air compressor, air conditioning, etc. It is expressed as a percent of Engine

		Reference Torque.If there are multiple devices on a network that provide this parameter, then users of this data shall add each of these values to determine the total torque loss due to engine parasitics. Devices that provide this parameter shall use the value of Engine Reference Torque transmitted by the engine during the current key cycle to determine the percent torque loss as seen by the engine. See SPN 2978 for alternate resolution. If both SPN 2978 and SPN 7837 are supported by a single source address, consumers of the parasitic data should only use one of these values. Note: Refer to section 5.2.1 in SAE J1939-71.
7838	Engine Load Threshold Exceeded Output	ECU output used to signal when the engine load has exceeded some predefined limit.
7839	Engine Load Share Master Output	ECU output used to indicate when the engine is acting as a master engine.
7840	Engine Speed Governor Mode	Indicates the engine speed governor operating mode. 00b = Isochronous Mode 01b = Droop Mode 10b = Error 11b = Not Available
7841	Bus Tie Breaker 1	The measured state of first tie breaker on the electrical power bus. 000b = Open 001b = Closed 010b = Locked Out 011b = Transitioning to Open state 100b = Transitioning to Closed state 101b = Available for SAE assignment 110b = Error 111b = Not Available
7842	Bus Tie Breaker 2	The measured state of second tie breaker on the electrical power bus. 000b = Open 001b = Closed 010b = Locked Out 011b = Transitioning to Open state 100b = Transitioning to Closed state 101b = Available for SAE assignment 110b = Error 111b = Not Available
7843	Engine Load Group	The engine load group for the reporting engine. An Engine Load Group is a set of engines tied together for sharing the electrical power bus load. Load Group assignments are manufacturer specific.
7844	Engine Clutch Engage Request Status	Indicates if the engine has an external request to establish its operating conditions to be appropriate for engagement of the transmission or gearbox.00b = Engine does not

		have an external request 01b = Engine has an external request 10b = Error 11b = Not available
7845	Engine Marine Operating Mode Status	The operating mode of the engine for marine functions. 000b = Maintenance Mode 001b = Electrical Power Generation (EPG) mode 010b = Propulsion Constant Speed Mode 011b = Propulsion Variable Speed Mode 100b to 101b = Reserved 110b = Error 111b = Not available
7846	Engine Speed 4	The engine speed as measured by speed sensor 4. Notes: This is for the engine speed from the 4th engine speed sensor. This may be different than SPN 190 when used in multiple engine speed sensor configurations. In an application with multiple engine speed sensors, SPN 190 data can be derived from any of the speed sensors.
7847	Ready For Clutch Engagement Status	Indicates the engine operating conditions are appropriate for engagement of the transmission or gearbox clutch.00b = Engine Not Ready For Clutch Engagement 01b = Engine is Ready For Clutch Engagement 10b = Error 11b = Not available
7848	Aftertreatment 1 SCR System Conditions Not Met for Active Cleaning	Indicates that SCR System 1 is not able to begin or continue an active cleaning event at the current engine operating conditions.00b = SCR System Cleaning not Inhibited 01b = SCR System Cleaning Inhibited 10b = Reserved for SAE Assignment 11b = Not available This SPN would indicate that the SCR system (bank 1) is not able to begin or continue an active cleaning event due to current engine operating conditions. The conditions on these SPNs are exclusive to the conditions in the PGN 64586. Examples of these other conditions are: – Engine Speed/Load Conditions not met – Engine is a working mode scenario SPN 6917 should be set to inhibited when SPN 7848 goes to inhibited status.
7849	Aftertreatment 2 SCR System Sulfation Level	Indicates the sulfur level in the SCR system for aftertreatment 2. 100% level could be the regeneration trigger level (and if conditions are not favorable for regeneration, sulfation loading can continue beyond 100%). During normal operation and regeneration a value 0% will indicate a fully regenerated SCR system. Values of 25%, 50% and 75% will indicate the general level of sulfur prior to the 100% level where regeneration could be needed.

7850	Engine Intake 2 Air Temperature	Temperature of air entering through a second vehicle air induction system.
7851	Aftertreatment System Enable Status	Indicates that the aftertreatment system is enabled or disabled. Enabled indicates the system will dose at regular intervals.00b = Aftertreatment System is Disabled 01b = Aftertreatment System is Enabled 10b = Error 11b = Not available Note: In some marine applications it may be desireable to enable or disable the aftertreatment system. To disable the system the user will need to get a migratory exemption from EPA 1042.915.
7852	Engine Exhaust Flow Rate (Extended Range)	Engine Exhaust Flow Rate shall indicate the measured/calculated exhaust gas mass flow upstream of the aftertreatment system.See SPN 6895 for alternative range.
7853	Air Conditioner Compressor Status	Signal which indicates if the Air Conditioner compressor is on or off. 00b = Air Conditioner Compressor is OFF 01b = Air Conditioner Compressor is ON 10b = Error 11b = Not Available
7854	Aftertreatment 1 Particulate Sensor Module	The Aftertreatment 1 Particulate Sensor Module will take sensor inputs from the particulate sensor(s) in bank 1 and multiplex the sensor values to the engine ECU via the J1939 network.
7855	Engine Fueling Not Desired Reason	This parameter conveys the reason a device wants the engine to inhibit fuelling. This SPN is intended to be used in conjunction with Desired Engine Fueling State (SPN 5793). When a device sends Desired Engine Fueling State = « Fueling Not Desired », this SPN may be used to convey a reason for why the device desires the engine inhibit fuelling If more than one reason exists at the same time, the reason with highest importance (as defined by the device sending this parameter) is indicated. 0 = Desired Engine Fueling State (SPN 5793) from this device does not equal 00b 1 = Idle Shutdown Timer has expired 2 = External power source has been connected (shore power) 3 = Body builder – unspecified reason 4 = Engine Stop-Start 5 to 249 = SAE Reserved (for future reasons) 250 = Fueling is not desired due to unspecified reason 251 to 254 = SAE reserved 255 = Not supported

7856	Aux Valve 0 Port Flow Command (High Resolution)	See document ISO 11783-7 for SPN details.
7857	Aux Valve 1 Port Flow Command (High Resolution)	See document ISO 11783-7 for SPN details.
7858	Aux Valve 2 Port Flow Command (High Resolution)	See document ISO 11783-7 for SPN details.
7859	Aux Valve 3 Port Flow Command (High Resolution)	See document ISO 11783-7 for SPN details.
7860	Aux Valve 4 Port Flow Command (High Resolution)	See document ISO 11783-7 for SPN details.
7861	Aux Valve 5 Port Flow Command (High Resolution)	See document ISO 11783-7 for SPN details.
7862	Aux Valve 6 Port Flow Command (High Resolution)	See document ISO 11783-7 for SPN details.
7863	Aux Valve 7 Port Flow Command (High Resolution)	See document ISO 11783-7 for SPN details.
7864	Aux Valve 8 Port Flow Command (High Resolution)	See document ISO 11783-7 for SPN details.
7865	Aux Valve 9 Port Flow Command (High Resolution)	See document ISO 11783-7 for SPN details.
7866	Aux Valve 10 Port Flow Command (High Resolution)	See document ISO 11783-7 for SPN details.

7867	Aux Valve 11 Port Flow Command (High Resolution)	See document ISO 11783-7 for SPN details.
7868	Aux Valve 12 Port Flow Command (High Resolution)	See document ISO 11783-7 for SPN details.
7869	Aux Valve 13 Port Flow Command (High Resolution)	See document ISO 11783-7 for SPN details.
7870	Aux Valve 14 Port Flow Command (High Resolution)	See document ISO 11783-7 for SPN details.
7871	Aux Valve 15 Port Flow Command (High Resolution)	See document ISO 11783-7 for SPN details.
7872	Aux Valve 0 Standard or High Resolution Mode	See document ISO 11783-7 for SPN details.
7873	Aux Valve 1 Standard or High Resolution Mode	See document ISO 11783-7 for SPN details.
7874	Aux Valve 2 Standard or High Resolution Mode	See document ISO 11783-7 for SPN details.
7875	Aux Valve 3 Standard or High Resolution Mode	See document ISO 11783-7 for SPN details.
7876	Aux Valve 4 Standard or High Resolution Mode	See document ISO 11783-7 for SPN details.
7877	Aux Valve 5 Standard or High Resolution Mode	See document ISO 11783-7 for SPN details.

7878	Aux Valve 6 Standard or High Resolution Mode	See document ISO 11783-7 for SPN details.
7879	Aux Valve 7 Standard or High Resolution Mode	See document ISO 11783-7 for SPN details.
7880	Aux Valve 8 Standard or High Resolution Mode	See document ISO 11783-7 for SPN details.
7881	Aux Valve 9 Standard or High Resolution Mode	See document ISO 11783-7 for SPN details.
7882	Aux Valve 10 Standard or High Resolution Mode	See document ISO 11783-7 for SPN details.
7883	Aux Valve 11 Standard or High Resolution Mode	See document ISO 11783-7 for SPN details.
7884	Aux Valve 12 Standard or High Resolution Mode	See document ISO 11783-7 for SPN details.
7885	Aux Valve 13 Standard or High Resolution Mode	See document ISO 11783-7 for SPN details.
7886	Aux Valve 14 Standard or High Resolution Mode	See document ISO 11783-7 for SPN details.
7887	Aux Valve 15 Standard or High Resolution Mode	See document ISO 11783-7 for SPN details.
7888	Operator Vehicle Mode Request	Operator Vehicle Mode Request is the operator intended vehicle mode. This parameter can be from only one source on the vehicle. In the case of a Diesel-Electric

		Hybrid, the source of this parameter may be a vehicle controller that monitors the operator interface for commands.Off is entered following key off. Low Voltage Accessory mode is when low voltage accessories may be powered from the SLI battery. The Stored Energy Source is disconnected. No propulsion is available in this mode. In this mode, gear selector requests to exit neutral or park are not honored. Stored Energy Source Active mode is when both the low voltage accessories and the Stored Energy Source are online. No propulsion is allowed. In this mode, gear selector requests to exit neutral or park are not honored. In a Diesel-Electric hybrid, the high voltage accessories will be available in this mode. Propulsion Active mode is when both the low voltage accessories and the Stored Energy Source are online. Propulsion is allowed. In this mode, gear selector requests may be honored. In a Diesel-Electric hybrid, the high voltage accessories will be available in this mode. 0 = Off 1 = Low Voltage Accessory 2 = Stored Energy Source Active 3 = Propulsion Active 4 = to13 – Reserved 14 = Error 15 = Not Available
7889	Hybrid Propulsion Mode Request	Hybrid Propulsion Mode Request is the operator intended propulsion mode. This parameter can be from only one source on the vehicle. Response to this request can be found in the Hybrid Propulsion Mode Status (SPN 7896) and Hybrid Propulsion Mode Transition Status (SPN 7897) parameters. In the case of a Diesel-Electric Hybrid, the source of this parameter may be a vehicle controller that monitors the operator interface for commands. Vehicle Performance may be reduced using Performance Bias Selection (SPN 6874) in any of these modes.Stored Energy Source Sustaining: In this mode, normal hybrid operation is desired. This state is characterized by the Stored Energy Source being online. In a Diesel-Electric hybrid, this operating mode is characterized as HVES charge sustaining where the energy for the vehicle is supplied by the combination of engine and HVES. The Stored Energy Source Set Point Request (SPN 7892) may be used to set an operating charge level for the HVES. Engine stop-start is available in this mode unless specifically disabled, however, engine off is still considered charge sustaining while operating in Engine stop-start. Stored Energy Source Increasing: In this mode the Stored Energy Source is online and the system is requested to increase the stored energy level to the Stored Energy Source Set Point Request (SPN 7892). Progress towards the set point can be monitored using the Stored Energy Source Level (SPN 7895) parameter. When the

		set point is achieved, the system will hold the set point. The rate at which energy is increased is set based on the Stored Energy Charge/Discharge Rate Request (SPN 7891). In a Diesel-Electric Hybrid, this mode would be characterized by the HVES being charged by an onboard engine (fuel cell etc.) or external source. This may be used to pre-condition the HVES in anticipation of a hybrid Stored Energy Source Only mode of operation. Store Energy Source Depleting: In this mode the Stored Energy Source is online. This state prioritizes use of the Stored Energy Source with the intent to reduce the energy stored. The requested Stored Energy Source Set Point Request (SPN 7892) may be used. Progress towards the set point can be monitor using the Stored Energy Source Level (SPN 7895). When the set point is achieved, the system will attempt to hold the set point. In a Diesel-Electric hybrid, this mode would be characterized by the HVES being discharged in general. The engine may be operational. Stored Energy Source Offline: In this mode the Stored Energy Source is offline and is not used as a source of propulsion and/or accessory power. In a Diesel-Electric hybrid, this mode would be characterized by engine (fuel cell, etc.) only operation. Stored Energy Source Only: In this mode the Stored Energy Source is online and is the only source of propulsion and/or accessory power. In a Diesel-Electric hybrid, this mode is characterized as « HVES only » operation. The engine is not operational. 0 = No mode requested 1 = Stored Energy Source Sustaining 2 = Stored Energy Source Increasing 3 = Stored Energy Source Depleting 4 = Stored Energy Source Offline 5 = Stored Energy Source Only 6 to 13 = Reserved 14 = Error 15 = Not Available
7890	External Energy Source Connection Demand	External Energy Source Connection Demand indicates how the hybrid system should engage with the external energy source that is temporarily connected to the vehicle.This parameter allows for two external energy source connections. Propulsion may or may not be allowed as defined by the Operator Vehicle Mode Request (SPN 7888). The state of the engine (fuel cell etc.) is dictated by the Hybrid Propulsion Mode Request (SPN 7889). This parameter can be from only one source. In the case of a Diesel-Electric Hybrid, the source of this parameter may be a vehicle controller or the connected charger. Status of the connection can be found in the External Energy Source Connection Status (SPN 7898) parameter. Perform Connection Verification is requested to connect and ensure a proper connection between an

		external energy source and the onboard stored energy source. If the connection is not verified, the External Energy Source Connection Status (SPN 7898) will indicate state 1 Connection – Error (Verification failed). Energy Source and Drain: An external source of power is connected to the vehicle that may be used to assist the onboard systems in managing the Stored Energy Source level (SPN 7895) to the Stored Energy Source Set Point Request (SPN 7892). In a Diesel-Electric hybrid, this type of External Energy Source may be energy depleting or increasing from an HVES point of view depending on the operation of the vehicle and controls. This option may be used in the case of a trolley bus where energy can be sourced from, or drain to, the utility grid. Energy Source: An external source of power is connected to increase stored energy. In the case of a plug-in hybrid or electric vehicle, this could be the Electric Vehicle Supply Equipment (EVSE) as defined in SAE J1772. It is intended to increase the state of charge of the HVES. Energy Drain: An external power drain is connected that decreases stored energy. In the case of a plug-in hybrid, this device will reduce the HVES state of charge. This device may also be used to drain a capacitor-based stored energy source prior to maintenance. Disconnect Request: The external energy device is requesting the hybrid system to disconnect due to a normal shutdown or failure mode. 0 = No Connection 1 = Perform Connection 1 Verification 2 = Energy Drain or Source Connection 1 3 = Energy Source Connection 1 4 = Energy Drain Connection 1 5 = Perform Connection 2 Verification 6 = Energy Drain or Source Connection 2 7 = Energy Source Connection 2 8 = Energy Drain Connection 2 9 to 13 = Reserved 14 = Disconnect Request 15 = No Request/Take no action
7891	Stored Energy Source Charge/Discharge Rate Request	Stored Energy Source Charge/Discharge Rate Request is used to control the rate at which the stored energy is changed in Energy Increasing or Energy Depleting modes.A value of FBh indicates a request for the default charge/discharge rate. In a Diesel-Electric Hybrid, it is the percentage of the maximum charging rate allowed by the system. The system will control the charging rate to its maximum allowed when at 100%. This parameter provides the ability to charge the HVES at different rates. If there are multiple sources of this parameter the greatest charge/discharge rate is used.

7892	Stored Energy Source Set Point Request	Stored Energy Source Set Point Request is used to set the percentage that the Stored Energy Source should be managed to by the system.A value of FBh indicates a request for the default set point. In the case of a Diesel-Electric Hybrid, the percentage (0-100%) is the percentage of HVES capacity available for use. This is a percentage of the useable HVES capacity (i.e., not the actual capacity, or State of Charge). If there are multiple sources of this parameter the level closest to 100% is used. Stored Energy Source Level (SPN 7895) provides a status of the actual level versus this set point.
7893	Stored Energy Source Only Mode Allowed	Stored Energy Source Only Mode Allowed is sent by the Hybrid System controller to indicate when Stored Energy Source Only Mode is available for use and/or allowed to be used.In a Diesel-Electric Hybrid, Stored Energy Source Only mode is characterized as « HVES only » operation. The engine is not operational. This parameter may be set to 00b when operating conditions such as high vehicle speeds, low HVES state of charge, or degraded HVES would inhibit use of this mode. 00b = Mode NOT allowed 01b = Mode allowed 10b = Error 11b = Not available
7894	Stored Energy Source Increasing Mode Allowed	Stored Energy Source Increasing Mode Allowed is sent by the Hybrid System controller to indicate when the Stored Energy Source Increasing Mode is available for use and/or allowed to be used.In a Diesel-Electric hybrid, this parameter may be set to 00b when operating conditions such as high vehicle speeds, high HVES state of charge, or degraded HVES would inhibit use of this mode. 00b = Mode NOT allowed 01b = Mode allowed 10b = Error 11b = Not available
7895	Stored Energy Source Level	Stored Energy Source Level indicates the current operating stored energy source capacity. In a Diesel-Electric Hybrid, this is the current percentage of the HVES useable capacity. When the state of charge is below the minimum HVES useable capacity, this parameter shall be set to 0 percent. When the state of charge of the HVES is above the maximum HVES useable capacity, this parameter shall be set to 100%. When charging the HVES, this parameter may be used to determine the progress towards the Stored Energy Source Set Point Request (SPN 7892). This parameter may also be used as a “fuel level” indicator for the vehicle operator. For example, a HVES manufacturer may define the HVES useable capacity to be between

		a notional 30% to 70% state of charge (SOC). In this example, the 0% stored energy level would be the equivalent of 30% or lower SOC and the 100% stored energy source level would be the equivalent of 70% or higher SOC.
7896	Hybrid Propulsion Mode Status	Hybrid Propulsion Mode Status is the current Hybrid System Controller propulsion mode. This parameter would typically echo the Hybrid Propulsion Mode Request (SPN 7889) assuming the request was honored and the Hybrid System controller successfully transitioned to the requested mode. See Hybrid Propulsion Mode Request (SPN 7889) for the detailed state definitions. This parameter will also communicate a change in mode status that occurred due to exceeding operational limits for a mode as reported in Hybrid Propulsion Mode Transition Status (SPN 7897).0 = No mode requested 1 = Stored Energy Source Sustaining 2 = Stored Energy Source Increasing 3 = Stored Energy Source Depleting 4 = Stored Energy Source Offline 5 = Stored Energy Source Only 6 to 13 = Reserved 14 = Error 15 = Not Available
7897	Hybrid Propulsion Mode Transition Status	Hybrid Propulsion Mode Transition Status is sent by the Hybrid System controller to indicate the reason for a mode transition occurring or being denied. This parameter provides confirmation of any mode transition requested via the Hybrid Propulsion Mode Request (SPN 7889) parameter, or conveys why the transition has been denied.0 = No transition requested 1 = Transition requested and in process 2 = Requested mode denied – Requested mode not available 3 = Requested mode denied – Vehicle Speed unacceptable for requested mode 4 = Requested mode denied – HVES State of Charge unacceptable for requested mode 5 = Requested mode denied – Temporary limit exceeded. The temporary limit may be bounded by elapsed time, distance travelled, driving conditions, or something else that the manufacturer has specified. 6 = Requested mode denied – HVES temporary limit threshold exceeded for one or more HVES 7 to 12 = Reserved 13 = Requested mode denied- reason not specified 14 = Error 15 = Not available
7898	External Energy Source Connection Status	External Energy Source Connection Status provides feedback to the External Energy Source Connection Demand (SPN 7890). This parameter allows for status of two external energy source connections. See External Energy Source Connection Demand

		(SPN 7890) for the detailed state definitions. In the case of a Diesel-Electric Hybrid, this parameter is sent by the hybrid system or Power System manager.0000b = No Connection 0001b = Connection 1 – Error (Verification failed) 0010b = Connection 1 – Verification in Process 0011b = Connection 1 – Energy Source and Drain 0100b = Connection 1 – Energy Source 0101b = Connection 1 – Energy Drain 0110b = Connection 2 – Error (Verification failed) 0111b = Connection 2 – Verification in Process 1000b = Connection 2 – Energy Source and Drain 1001b = Connection 2 – Energy Source 1010b = Connection 2 – Energy Drain 1011b to 1101b = Reserved 1110b = Error 1111b = Not Available
7899	Diesel Exhaust Fluid Quality Malfunction Evaluation Period Active	This parameter is used to notify the operator that a DEF Quality and DEF Level evaluation period, also known as a judgement period, is currently active.The judgement period is required by the Japanese Ministry of Land, Interior, and Transport (JMLIT) when an indirect method is used to judge the quality of the DEF in the DEF tank. The judgement period would be activated only after the operator has filled the DEF to a level as specified in the Japanese legislation. See « Technical Guideline for Urea Selective Catalytic Reduction System » (JMLIT Kokijikan No. 91 of August 26, 2008). 00b = Not active 01b = Active 10b = SAE reserved 11b = Not supported
7900	SLI Battery Pack 1 Battery 1 Net Current	Net flow of electrical current into/out of the first battery in the first set of batteries (battery pack) used for starting the engine, for lighting, and for ignition (SLI).
7901	SLI Battery Pack 1 Battery 1 Temperature	Temperature of the first battery in the first set of batteries (battery pack) used for starting the engine, for lighting, and for ignition (SLI).The relation to physical location is determined by the equipment manufacturer.
7902	SLI Battery Pack 1 Battery 1 Voltage	Voltage of the first battery in the first set of batteries (battery pack) used for starting the engine, for lighting, and for ignition (SLI).The relation to physical location is determined by the equipment manufacturer.
7903	SLI Battery Pack 1 Battery 1 State of Charge	Indicates the remaining charge of the first battery in the first battery pack used for starting the engine, for lighting, and for ignition (SLI). 0% means no charge

		remaining, 100% means full capacity at the battery's current state of health.Parameter Specific Indicator: A value of FB00h indicates conditions are not acceptable for a valid measurement.
7904	SLI Battery Pack 1 Battery 1 Capacity	Total reserve capacity of the first battery in the first battery pack used for starting the engine, for lighting, and for ignition (SLI). This value could be the original capacity, rated capacity, or the capacity received in SPN 9368.Parameter Specific Indicator: A value of FB00h indicates the capacity cannot be reported because the battery controller has not been informed of the battery capacity in SPN 9368.
7905	SLI Battery Pack 1 Battery 1 Health	Capacity of the first battery in the first battery pack relative to its original specification for the battery pack used for starting the engine, for lighting, and for ignition (SLI). 0% means battery pack is not capable of holding any charge, 100% means battery pack is capable of holding its original full capacity.Parameter Specific Indicator: A value of FBh indicates conditions are not acceptable for a valid measurement.
7906	SLI Battery Pack 1 Battery 1 Predicted Minimum Cranking Voltage	Prediction of the minimum battery voltage of the first battery in the first battery pack used for starting the engine, for lighting, and for ignition (SLI) during a crank event, under present battery conditions.Parameter Specific Indicator: A value of FBh indicates conditions are not acceptable for a valid measurement.
7907	SLI Battery Pack 1 Sensor 1 Initialization Status	The battery sensor may go through an initialization process when it is first connected to a battery. This parameter reports the battery sensor's progress through the initialization process.0 = Initialization process has not started. 1 to 9 = Initialization process is in progress. 1 represents the beginning of the process and 9 represents the initialization process is almost complete. 10 = Initialization process is complete. The initialization process is determined by the manufacturer. This parameter is never expected to change to a lower value as long as the sensor remains connected to the battery. If the sensor is disconnected from the battery, then the battery sensor's initialization process may be restarted once the sensor is reconnected to the battery. Manufacturers may not support all 11 steps. For example, one manufacturer may

		support 0, 1, & 10. Another may support 0, 2, 6, 10. Note: SPNs SPNs 7903, 7905, or 7906 may be equal to FBh while this parameter is less than 10.
7908	SLI Battery Pack 1 Battery 2 Net Current	Net flow of electrical current into/out of the second battery in the first set of batteries (battery pack) used for starting the engine, for lighting, and for ignition (SLI).
7909	SLI Battery Pack 1 Battery 2 Temperature	Temperature of the second battery in the first set of batteries (battery pack) used for starting the engine, for lighting, and for ignition (SLI).The relation to physical location is determined by the equipment manufacturer.
7910	SLI Battery Pack 1 Battery 2 Voltage	Voltage of the second battery in the first set of batteries (battery pack) used for starting the engine, for lighting, and for ignition (SLI).The relation to physical location is determined by the equipment manufacturer.
7911	SLI Battery Pack 1 Battery 2 State of Charge	Indicates the remaining charge of the second battery in the first battery pack used for starting the engine, for lighting, and for ignition (SLI). 0% means no charge remaining, 100% means full capacity at the battery's current state of health.Parameter Specific Indicator: A value of FB00h indicates conditions are not acceptable for a valid measurement.
7912	SLI Battery Pack 1 Battery 2 Capacity	Total reserve capacity of the second battery in the first battery pack used for starting the engine, for lighting, and for ignition (SLI). This value could be the original capacity, rated capacity, or the capacity received in SPN 9369.Parameter Specific Indicator: A value of FB00h indicates the capacity cannot be reported because the battery controller has not been informed of the battery capacity in SPN 9369.
7913	SLI Battery Pack 1 Battery 2 Health	Capacity of the second battery in the first battery pack relative to its original specification for the battery pack used for starting the engine, for lighting, and for ignition (SLI). 0% means battery pack is not capable of holding any charge, 100% means battery pack is capable of holding its original full capacity.Parameter Specific Indicator: A value of FBh indicates conditions are not acceptable for a valid measurement.

7914	SLI Battery Pack 1 Battery 2 Predicted Minimum Cranking Voltage	Prediction of the minimum battery voltage of the second battery in the first battery pack used for starting the engine, for lighting, and for ignition (SLI) during a crank event, under present battery conditions.Parameter Specific Indicator: A value of FBh indicates conditions are not acceptable for a valid measurement.
7915	SLI Battery Pack 1 Sensor 2 Initialization Status	The battery sensor may go through an initialization process when it is first connected to a battery. This parameter reports the battery sensor's progress through the initialization process.0 = Initialization process has not started. 1 to 9 = Initialization process is in progress. 1 represents the beginning of the process and 9 represents the initialization process is almost complete. 10 = Initialization process is complete. The initialization process is determined by the manufacturer. This parameter is never expected to change to a lower value as long as the sensor remains connected to the battery. If the sensor is disconnected from the battery, then the battery sensor's initialization process may be restarted once the sensor is reconnected to the battery. Manufacturers may not support all 11 steps. For example, one manufacturer may support 0, 1, & 10. Another may support 0, 2, 6, 10. Note: SPNs 7911, 7913, or 7914 may be equal to FBh while this parameter is less than 10.
7916	SLI Battery Pack 1 Battery 3 Net Current	Net flow of electrical current into/out of the third battery in the first set of batteries (battery pack) used for starting the engine, for lighting, and for ignition (SLI).
7917	SLI Battery Pack 1 Battery 3 Temperature	Temperature of the third battery in the first set of batteries (battery pack) used for starting the engine, for lighting, and for ignition (SLI).The relation to physical location is determined by the equipment manufacturer.
7918	SLI Battery Pack 1 Battery 3 Voltage	Voltage of the third battery in the first set of batteries (battery pack) used for starting the engine, for lighting, and for ignition (SLI).The relation to physical location is determined by the equipment manufacturer.
7919	SLI Battery Pack 1 Battery 3 State of Charge	Indicates the remaining charge of the third battery in the first battery pack used for starting the engine, for lighting, and for ignition (SLI). 0% means no charge remaining, 100% means full capacity at the battery's current state of health.Parameter

		Specific Indicator: A value of FB00h indicates conditions are not acceptable for a valid measurement.
7920	SLI Battery Pack 1 Battery 3 Capacity	Total reserve capacity of the third battery in the first battery pack used for starting the engine, for lighting, and for ignition (SLI). This value could be the original capacity, rated capacity, or the capacity received in SPN 9370.Parameter Specific Indicator: A value of FB00h indicates the capacity cannot be reported because the battery controller has not been informed of the battery capacity in SPN 9370.
7921	SLI Battery Pack 1 Battery 3 Health	Capacity of the third battery in the first battery pack relative to its original specification for the battery pack used for starting the engine, for lighting, and for ignition (SLI). 0% means battery pack is not capable of holding any charge, 100% means battery pack is capable of holding its original full capacity.Parameter Specific Indicator: A value of FBh indicates conditions are not acceptable for a valid measurement.
7922	SLI Battery Pack 1 Battery 3 Predicted Minimum Cranking Voltage	Prediction of the minimum battery voltage of the third battery in the first battery pack used for starting the engine, for lighting, and for ignition (SLI) during a crank event, under present battery conditions.Parameter Specific Indicator: A value of FBh indicates conditions are not acceptable for a valid measurement.
7923	SLI Battery Pack 1 Sensor 3 Initialization Status	The battery sensor may go through an initialization process when it is first connected to a battery. This parameter reports the battery sensor’s progress through the initialization process.0 = Initialization process has not started. 1 to 9 = Initialization process is in progress. 1 represents the beginning of the process and 9 represents the initialization process is almost complete. 10 = Initialization process is complete. The initialization process is determined by the manufacturer. This parameter is never expected to change to a lower value as long as the sensor remains connected to the battery. If the sensor is disconnected from the battery, then the battery sensor’s initialization process may be restarted once the sensor is reconnected to the battery. Manufacturers may not support all 11 steps. For example, one manufacturer may support 0, 1, & 10. Another may support 0, 2, 6, 10. Note: SPNs 7919, 7921, or 7922 may be equal to FBh while this parameter is less than 10.

7924	SLI Battery Pack 1 Battery 4 Net Current	Net flow of electrical current into/out of the fourth battery in the first set of batteries (battery pack) used for starting the engine, for lighting, and for ignition (SLI).
7925	SLI Battery Pack 1 Battery 4 Temperature	Temperature of the fourth battery in the first set of batteries (battery pack) used for starting the engine, for lighting, and for ignition (SLI).The relation to physical location is determined by the equipment manufacturer.
7926	SLI Battery Pack 1 Battery 4 Voltage	Voltage of the fourth battery in the first set of batteries (battery pack) used for starting the engine, for lighting, and for ignition (SLI).The relation to physical location is determined by the equipment manufacturer.
7927	SLI Battery Pack 1 Battery 4 State of Charge	Indicates the remaining charge of the fourth battery in the first battery pack used for starting the engine, for lighting, and for ignition (SLI). 0% means no charge remaining, 100% means full capacity at the battery's current state of health.Parameter Specific Indicator: A value of FB00h indicates conditions are not acceptable for a valid measurement.
7928	SLI Battery Pack 1 Battery 4 Capacity	Total reserve capacity of the fourth battery in the first battery pack used for starting the engine, for lighting, and for ignition (SLI). This value could be the original capacity, rated capacity, or the capacity received in SPN 9371.Parameter Specific Indicator: A value of FB00h indicates the capacity cannot be reported because the battery controller has not been informed of the battery capacity in SPN 9371.
7929	SLI Battery Pack 1 Battery 4 Health	Capacity of the fourth battery in the first battery pack relative to its original specification for the battery pack used for starting the engine, for lighting, and for ignition (SLI). 0% means battery pack is not capable of holding any charge, 100% means battery pack is capable of holding its original full capacity.Parameter Specific Indicator: A value of FBh indicates conditions are not acceptable for a valid measurement.
7930	SLI Battery Pack 1 Battery 4 Predicted Minimum Cranking Voltage	Prediction of the minimum battery voltage of the fourth battery in the first battery pack used for starting the engine, for lighting, and for ignition (SLI) during a crank

		event, under present battery conditions.Parameter Specific Indicator: A value of FBh indicates conditions are not acceptable for a valid measurement.
7931	SLI Battery Pack 1 Sensor 4 Initialization Status	The battery sensor may go through an initialization process when it is first connected to a battery. This parameter reports the battery sensor's progress through the initialization process.0 = Initialization process has not started. 1 to 9 = Initialization process is in progress. 1 represents the beginning of the process and 9 represents the initialization process is almost complete. 10 = Initialization process is complete. The initialization process is determined by the manufacturer. This parameter is never expected to change to a lower value as long as the sensor remains connected to the battery. If the sensor is disconnected from the battery, then the battery sensor's initialization process may be restarted once the sensor is reconnected to the battery. Manufacturers may not support all 11 steps. For example, one manufacturer may support 0, 1, & 10. Another may support 0, 2, 6, 10. Note: SPNs 7927, 7929, or 7930 may be equal to FBh while this parameter is less than 10.
7932	Aftertreatment 1 SCR System Soot	The amount of soot present in the SCR system in bank 1.
7933	Aftertreatment 2 SCR System Soot	The amount of soot present in the SCR system in bank 2.
7934	Aftertreatment 1 SCR System Hydrocarbon	The ratio of the mass of hydrocarbon present in the aftertreatment system compared to the maximum allowable mass of hydrocarbon for the aftertreatment system. 100% represents the maximum percentage of hydrocarbon loading that can safely be handled by the aftertreatment system, but hydrocarbon loading can continue beyond 100%.
7935	Aftertreatment 2 SCR System Hydrocarbon	The ratio of the mass of hydrocarbon present in the aftertreatment 2 system compared to the maximum allowable mass of hydrocarbon for the aftertreatment system. 100% represents the maximum percentage of hydrocarbon loading that can safely be handled by the aftertreatment system, but hydrocarbon loading can continue beyond 100%.

7936	Navigation Control Module	Used to report problems with the Navigation Control Module. This could be used to, among other diagnostic conditions, report that ADASIS messages transmitted by the Navigation Control Module are no longer being received.
7937	Engine Electric Lift Pump Temperature	The temperature of the engine electric lift pump for the engine fuel supply. This is not the temperature of the fuel going through the fuel lift pump.
7938	Diesel Exhaust Fluid Frozen Time	Indicates the amount of time the diesel exhaust fluid is frozen while key switch is on. This will accumulate over the life of the product, and will never be reset.This parameter is not for engine applications that are capable of being derated.
7939	Hydraulic Line Pressure	The pressure of the hydraulic fluid, measured in the hydraulic line.
7940	Mechanical Movement Angle	The angle of rotation of the mechanical component. The increase and decrease of the value (i.e. rotation about the X-axis) is in accordance to the right-hand rule, as specified in SAE J670, with the positive X axis directed inward along the center line of the rotating shaft of the sensor. The angle value increases when the sensor shaft is rotated clockwise (as observed facing the rotating shaft toward the sensor) and the angle value decreases when the sensor shaft is rotated counterclockwise. The reported angle will wrap around if the sensor is capable of making more than a single rotation. When rotating clockwise the angle will go from 359.99 to 0.00, and when rotating counterclockwise the angle will go from 0.00 to 359.99. The 0 degree position is relative to the mounting of the sensor in the system and may require calibration to associate the raw angle to the specific system context.
7941	Railroad Mode Switch	Switch signal which indicates the position of the Railroad mode switch. 00b = Railroad mode switch passive (City/Highway mode) 01b = Railroad mode switch active (Railroad mode) 10b = Error 11b = Not available Note: This switch signal to be used to inform the ABS/ASR ECU or other ECUs that the vehicle is operating in a railroad mode vs. a normal driving mode. Railroad mode is when a vehicle (i.e. vocational truck) has deployed the railroad gear such that the vehicle can be driven on a railroad track. This switch signal may originate from an operator switch, or within the railroad operation system installed on the vehicle.

7942	Railroad Mode	Signal which indicates the current state of the Railroad Mode / Function. 00b = Inactive (Driving mode: Steer Axle on ground) 01b = Active (Railroad mode: Steer Axle lifted off ground) 10b = Error 11b = Not available Note: This status signal may be used to indicate which mode the ECU (e.g., ASR/ABS) is operating (railroad mode vs. a normal driving mode). Railroad mode is when a vehicle (i.e. vocational truck) has deployed the railroad gear such that the vehicle can be driven on a railroad track.
7943	Electrified Accessory Motor Enable Command	Enable and direction command to this electrified Accessory Motor. 00b = Accessory Motor Off 01b = Accessory Motor On Normal/Default Direction 10b = Accessory Motor On Reverse Direction 11b = Don’t Care/Take no action
7944	Electrified Accessory Motor Power Hold	Command to allow this Electrified Accessory Motor to remain alive independently of the electrical enable input to the Accessory Motor. For example, this could allow continued device operation after the keyswitch has turned off.00b = Power Hold Disabled 01b = Power Hold Enabled 10b = Reserved 11b = Don’t Care/Take no action
7945	Electrified Accessory Motor Speed Command	Speed command to this Electrified Accessory Motor. Note: Both Speed Command and Percent Speed Command cannot be used at the same time. Always set the unused speed command to Not Available.If both commands are set to Not Available, a preprogrammed default speed will be used.
7946	Electrified Accessory Motor Percent Speed Command	Speed command to this Electrified Accessory Motor in percentage of maximum speed. Note: Both Speed Command and Percent Speed Command cannot be used at the same time. Always set the unused speed command to Not Available. If both commands are set to Not Available, a preprogrammed default speed will be used.
7947	Electrified Accessory Motor Enable Status	Enable and direction status of this Electrified Accessory Motor system or component. 00b = Accessory Motor Off 01b = Accessory Motor On – Normal, Forward, or Default Direction 10b = Accessory Motor On – Reverse Direction 11b = Not available

7948	Electrified Accessory Motor Controller Status Reason Code	Provides the reason code describing the unique failure of this Electrified Accessory Motor system or component.If a detailed reason code is not used by the supporting application, or this reason code is Not Available, the Electrified Accessory Motor Service Indicator (SPN 7953) and Electrified Accessory Motor Operating Status (SPN 7954) may be used to determine functional status of this Electrified Accessory motor system or component. 0000b = Normal Operation 0001b = Unable to Start 0010b = Over-Voltage Protection Shutdown 0011b = Under-Voltage Protection Shutdown 0100b = Over-Temperature Protection Shutdown 0101b = Speed Limited due to current (i.e. amperage) protection limit 0110b = Speed limited due to maximum system design capability (e.g. PWM control limit or physical limit of system) 0111b = Speed limited due to torque limit 1000b = Speed limited due to over-temperature protection 1001b = Reserved 1010b = Reserved 1011b = Reserved 1100b = Reserved 1101b = Reserved 1110b = Reserved 1111b = Not Available
7949	Electrified Accessory Motor Controller Command Status	Indicates the source of the speed command to this Electrified Accessory Motor system or component. 00b is communicated when the controller is self-controlled (e.g. based on a temperature sensor). 01b is communicated when responding to the Electrified Accessory Motor Speed Command (SPN 7945) or Electrified Accessory Motor Percent Speed Command (SPN 7946). 10b is communicated when neither an internal nor external command is provided (e.g. failed temperature sensor or loss of the command message). 00b = Internal Command 01b = External Command 10b = Default Command 11b = Not Available
7950	Electrified Accessory Motor Speed	Speed of this Electrified Accessory Motor.
7951	Electrified Accessory Motor Medium Temperature	A temperature measured and reported by the device. It may be used for direct or remote (e.g. by another controller) control of the pump. For example, this may be the temperature of the fluid flowing through the pump, or some other temperature relating to the pump or controller.
7952	Electrified Accessory Motor Power	Calculated electrical power consumed by this Electrified Accessory Motor.

7953	Electrified Accessory Motor Service Indicator	Indicates that service is required for this Electrified Accessory Motor system or component. An active indication may convey a need for component replacement or periodic service. The Electrified Accessory Motor Controller Status Reason Code (SPN 7948) may provide additional detail as to the nature of the system status.00b = Service Not Required 01b = Service Required 10b = Reserved 11b = Not Available
7954	Electrified Accessory Motor Operating Status	Indicates the operating status of this Electrified Accessory Motor system or component. This parameter is used to inform other devices that this system or component is no longer performing to its operational capacity and that reduced, or no flow of the medium (e.g. coolant, oil, air, etc.) can be expected. Derated or Not Operable condition may require other vehicle systems to modify their operation.The Electrified Accessory Motor Controller Status Reason Code (SPN 7949) may provide additional detail as to the nature of the system status. 00b = Normal Operation 01b = Derated Operation 10b = Not Operable 11b = Not Available
7967	Power Electronics Coolant Pump Enable Command	Enable and direction command to the Power Electonics Coolant Pump. 00b = Accessory Motor Off 01b = Accessory Motor On Normal/Default Direction 10b = Accessory Motor On Reverse Direction 11b = Don’t Care/Take no action
7968	Power Electronics Coolant Pump Power Hold	Command to allow the Power Electronics Coolant Pump to remain alive independently of the electrical enable input to the Accessory Motor. For example, this could allow continued device operation after the keyswitch has turned off.00b = Power Hold Disabled 01b = Power Hold Enabled 10b = Reserved 11b = Don’t Care/Take no action
7969	Power Electronics Coolant Pump Speed Command	Speed command to the Power Electronics Coolant Pump. Note: Both Speed Command and Percent Speed Command cannot be used at the same time. Always set the unused speed command to Not Available. If both commands are set to Not Available, a preprogrammed default speed will be used.
7970	Power Electronics Coolant Pump Percent Speed Command	Speed command to the Power Electronics Coolant Pump in percentage of maximum speed. Note: Both Speed Command and Percent Speed Command cannot be used at

		the same time. Always set the unused speed command to Not Available. If both commands are set to Not Available, a preprogrammed default speed will be used.
7971	Power Electronics Coolant Pump Enable Status	Enable and direction status of the Power Electronics Coolant Pump system or component. 00b = Accessory Motor Off 01b = Accessory Motor On – Normal, Forward, or Default Direction 10b = Accessory Motor On – Reverse Direction 11b = Not available
7972	Power Electronics Coolant Pump Controller Status Reason Code	Provides the reason code describing the unique failure of the Power Electronics Coolant Pump system or component.If a detailed reason code is not used by the supporting application, or this reason code is Not Available, the Power Electronics Coolant Pump Service Indicator (SPN 7977) and Power Electronics Coolant Pump Operating Status (SPN 7978) may be used to determine functional status of the Power Electronics Coolant Pump system or component. 0000b = Normal Operation 0001b = Unable to Start 0010b = Over-Voltage Protection Shutdown 0011b = Under-Voltage Protection Shutdown 0100b = Over-Temperature Protection Shutdown 0101b = Speed Limited due to current (i.e. amperage) protection limit 0110b = Speed limited due to maximum system design capability (e.g. PWM control limit or physical limit of system) 0111b = Speed limited due to torque limit 1000b = Speed limited due to over-temperature protection 1001b = Reserved 1010b = Reserved 1011b = Reserved 1100b = Reserved 1101b = Reserved 1110b = Reserved 1111b = Not Available
7973	Power Electronics Coolant Pump Controller Command Status	Indicates the source of the speed command to the Power Electronics Coolant Pump system or component. 00b is communicated when the controller is self-controlled (e.g. based on a temperature sensor). 01b is communicated when responding to the Power Electronics Coolant Pump Speed Command (SPN 7969) or Power Electronics Coolant Pump Percent Speed Command (SPN 7970). 10b is communicated when neither an internal nor external command is provided (e.g. failed temperature sensor or loss of the command message). 00b = Internal Command 01b = External Command 10b = Default Command 11b = Not Available
7974	Power Electronics Coolant Pump Motor Speed	Motor Speed of the Power Electronics Coolant Pump.

7975	Power Electronics Coolant Pump Control Temperature	A temperature measured and reported by the device. It may be used for direct or remote (e.g. by another controller) control of the pump. For example, this may be the temperature of the fluid flowing through the pump, or some other temperature relating to the pump or controller.
7976	Power Electronics Coolant Pump Power	Calculated electrical power consumed by the Power Electronics Coolant Pump.
7977	Power Electronics Coolant Pump Service Indicator	Indicates that service is required for the Power Electronics Coolant Pump system or component. An active indication may convey a need for component replacement or periodic service. The Power Electronics Coolant Pump Controller Status Reason Code (SPN 7972) may provide additional detail as to the nature of the system status. 00b = Service Not Required 01b = Service Required 10b = Reserved 11b = Not Available
7978	Power Electronics Coolant Pump Operating Status	Indicates the operating status of the Power Electronics Coolant Pump system or component. This parameter is used to inform other devices that this system or component is no longer performing to its operational capacity and that reduced, or no flow, of the coolant can be expected. Derated or Not Operable condition may require other vehicle systems to modify their operation. The Power Electronics Coolant Pump Controller Status Reason Code (SPN 7972) may provide additional detail as to the nature of the system status. 00b = Normal Operation 01b = Derated Operation 10b = Not Operable 11b = Not Available
7979	Propulsion Motor Coolant Pump Enable Command	Enable and direction command to the Propulsion Motor Coolant Pump. 00b = Accessory Motor Off 01b = Accessory Motor On Normal/Default Direction 10b = Accessory Motor On Reverse Direction 11b = Don’t Care/Take no action
7980	Propulsion Motor Coolant Pump Power Hold	Command to allow the Propulsion Motor Coolant Pump to remain alive independently of the electrical enable input to the Accessory Motor. For example, this could allow continued device operation after the keyswitch has turned off.00b = Power Hold Disabled 01b = Power Hold Enabled 10b = Reserved 11b = Don’t Care/Take no action

7981	Propulsion Motor Coolant Pump Speed Command	Speed command to the Propulsion Motor Coolant Pump. Note: Both Speed Command and Percent Speed Command cannot be used at the same time. Always set the unused speed command to Not Available. If both commands are set to Not Available, a preprogrammed default speed will be used.
7982	Propulsion Motor Coolant Pump Percent Speed Command	Speed command to the Propulsion Motor Coolant Pump in percentage of maximum speed. Note: Both Speed Command and Percent Speed Command cannot be used at the same time. Always set the unused speed command to Not Available. If both commands are set to Not Available, a preprogrammed default speed will be used.
7983	Propulsion Motor Coolant Pump Enable Status	Enable and direction status of the Propulsion Motor Coolant Pump system or component. 00b = Accessory Motor Off 01b = Accessory Motor On – Normal, Forward, or Default Direction 10b = Accessory Motor On – Reverse Direction 11b = Not available
7984	Propulsion Motor Coolant Pump Controller Status Reason Code	Provides the reason code describing the unique failure of the Propulsion Motor Coolant Pump system or component.If a detailed reason code is not used by the supporting application, or this reason code is Not Available, the Propulsion Motor Coolant Pump Service Indicator (SPN 7989) and Propulsion Motor Coolant Pump Operating Status (SPN 7990) may be used to determine functional status of the Propulsion Motor Coolant Pump system or component. 0000b = Normal Operation 0001b = Unable to Start 0010b = Over-Voltage Protection Shutdown 0011b = Under-Voltage Protection Shutdown 0100b = Over-Temperature Protection Shutdown 0101b = Speed Limited due to current (i.e. amperage) protection limit 0110b = Speed limited due to maximum system design capability (e.g. PWM control limit or physical limit of system) 0111b = Speed limited due to torque limit 1000b = Speed limited due to over-temperature protection 1001b = Reserved 1010b = Reserved 1011b = Reserved 1100b = Reserved 1101b = Reserved 1110b = Reserved 1111b = Not Available
7985	Propulsion Motor Coolant Pump Controller Command Status	Indicates the source of the speed command to the Propulsion Motor Coolant Pump system or component. 00b is communicated when the controller is self-controlled (e.g. based on a temperature sensor). 01b is communicated when responding to the

		Propulsion Motor Coolant Pump Speed Command (SPN 7981) or Propulsion Motor Coolant Pump Percent Speed Command (SPN 7982). 10b is communicated when neither an internal nor external command is provided (e.g. failed temperature sensor or loss of the command message). 00b = Internal Command 01b = External Command 10b = Default Command 11b = Not Available
7986	Propulsion Motor Coolant Pump Motor Speed	Motor Speed of the Propulsion Motor Coolant Pump.
7987	Propulsion Motor Coolant Pump Control Temperature	A temperature measured and reported by the device. It may be used for direct or remote (e.g. by another controller) control of the pump. For example, this may be the temperature of the fluid flowing through the pump, or some other temperature relating to the pump or controller.
7988	Propulsion Motor Coolant Pump Power	Calculated electrical power consumed by the Propulsion Motor Coolant Pump.
7989	Propulsion Motor Coolant Pump Service Indicator	Indicates that service is required for the Propulsion Motor Coolant Pump system or component. An active indication may convey a need for component replacement or periodic service. The Propulsion Motor Coolant Pump Controller Status Reason Code (SPN 7984) may provide additional detail as to the nature of the system status. 00b = Service Not Required 01b = Service Required 10b = Reserved 11b = Not Available
7990	Propulsion Motor Coolant Pump Operating Status	Indicates the operating status of the Propulsion Motor Coolant Pump system or component. This parameter is used to inform other devices that this system or component is no longer performing to its operational capacity and that reduced, or no flow, of the coolant can be expected. Derated or Not Operable condition may require other vehicle systems to modify their operation. The Propulsion Motor Coolant Pump Controller Status Reason Code (SPN 7984) may provide additional detail as to the nature of the system status. 00b = Normal Operation 01b = Derated Operation 10b = Not Operable 11b = Not Available

7991	Propulsion Motor Oil Pump Enable Command	Enable and direction command to the Propulsion Motor Oil Pump. 00b = Accessory Motor Off 01b = Accessory Motor On Normal/Default Direction 10b = Accessory Motor On Reverse Direction 11b = Don't Care/Take no action
7992	Propulsion Motor Oil Pump Power Hold	Command to allow the Propulsion Motor Oil Pump to remain alive independently of the electrical enable input to the Accessory Motor. For example, this could allow continued device operation after the keyswitch has turned off.00b = Power Hold Disabled 01b = Power Hold Enabled 10b = Reserved 11b = Don't Care/Take no action
7993	Propulsion Motor Oil Pump Speed Command	Speed command to the Propulsion Motor Oil Pump. Note: Both Speed Command and Percent Speed Command cannot be used at the same time. Always set the unused speed command to Not Available. If both commands are set to Not Available, a preprogrammed default speed will be used.
7994	Propulsion Motor Oil Pump Percent Speed Command	Speed command to the Propulsion Motor Oil Pump in percentage of maximum speed. Note: Both Speed Command and Percent Speed Command cannot be used at the same time. Always set the unused speed command to Not Available. If both commands are set to Not Available, a preprogrammed default speed will be used.
7995	Propulsion Motor Oil Pump Enable Status	Enable and direction status of the Propulsion Motor Oil Pump system or component. 00b = Accessory Motor Off 01b = Accessory Motor On – Normal, Forward, or Default Direction 10b = Accessory Motor On – Reverse Direction 11b = Not available
7996	Propulsion Motor Oil Pump Controller Status Reason Code	Provides the reason code describing the unique failure of the Propulsion Motor Oil Pump system or component. If a detailed reason code is not used by the supporting application, or this reason code is Not Available, the Propulsion Motor Oil Pump Service Indicator (SPN 8001) and Propulsion Motor Oil Pump Operating Status (SPN 8002) may be used to determine functional status of the Propulsion Motor Oil Pump system or component. 0000b = Normal Operation 0001b = Unable to Start 0010b = Over-Voltage Protection Shutdown 0011b = Under-Voltage Protection Shutdown 0100b = Over-Temperature Protection Shutdown 0101b = Speed Limited due to

		current (i.e. amperage) protection limit 0110b = Speed limited due to maximum system design capability (e.g. PWM control limit or physical limit of system) 0111b = Speed limited due to torque limit 1000b = Speed limited due to over-temperature protection 1001b = Reserved 1010b = Reserved 1011b = Reserved 1100b = Reserved 1101b = Reserved 1110b = Reserved 1111b = Not Available
7997	Propulsion Motor Oil Pump Controller Command Status	Indicates the source of the speed command to the Propulsion Motor Oil Pump system or component. 00b is communicated when the controller is self-controlled (e.g. based on a temperature sensor). 01b is communicated when responding to the Propulsion Motor Oil Pump Speed Command (SPN 7993) or Propulsion Motor Oil Pump Percent Speed Command (SPN 7994). 10b is communicated when neither an internal nor external command is provided (e.g. failed temperature sensor or loss of the command message). 00b = Internal Command 01b = External Command 10b = Default Command 11b = Not Available
7998	Propulsion Motor Oil Pump Motor Speed	Motor Speed of the Propulsion Motor Oil Pump.
7999	Propulsion Motor Oil Pump Control Temperature	A temperature measured and reported by the device. It may be used for direct or remote (e.g. by another controller) control of the pump. For example, this may be the temperature of the fluid flowing through the pump, or some other temperature relating to the pump or controller.
8000	Propulsion Motor Oil Pump Power	Calculated electrical power consumed by the Propulsion Motor Oil Pump.
8001	Propulsion Motor Oil Pump Service Indicator	Indicates that service is required for the Propulsion Motor Oil Pump system or component. An active indication may convey a need for component replacement or periodic service. The Propulsion Motor Oil Pump Controller Status Reason Code (SPN 7996) may provide additional detail as to the nature of the system status. 00b = Service Not Required 01b = Service Required 10b = Reserved 11b = Not Available
8002	Propulsion Motor Oil Pump Operating Status	Indicates the operating status of the Propulsion Motor Oil Pump system or component. This parameter is used to inform other devices that this system or

		component is no longer performing to its operational capacity and that reduced, or no flow, of the coolant can be expected. Derated or Not Operable condition may require other vehicle systems to modify their operation. The Propulsion Motor Oil Pump Controller Status Reason Code (SPN 7996) may provide additional detail as to the nature of the system status. 00b = Normal Operation 01b = Derated Operation 10b = Not Operable 11b = Not Available
8003	Power Electronics Coolant Fan 1 Enable Command	Enable and direction command to the Power Electonics Coolant Fan 1. 00b = Accessory Motor Off 01b = Accessory Motor On Normal/Default Direction 10b = Accessory Motor On Reverse Direction 11b = Don't Care/Take no action
8004	Power Electronics Coolant Fan 1 Power Hold	Command to allow the Power Electronics Coolant Fan 1 to remain alive independently of the electrical enable input to the Accessory Motor. For example, this could allow continued device operation after the keyswitch has turned off.00b = Power Hold Disabled 01b = Power Hold Enabled 10b = Reserved 11b = Don't Care/Take no action
8005	Power Electronics Coolant Fan 1 Speed Command	Speed command to the Power Electronics Coolant Fan 1. Note: Both Speed Command and Percent Speed Command cannot be used at the same time. Always set the unused speed command to Not Available. If both commands are set to Not Available, a preprogrammed default speed will be used.
8006	Power Electronics Coolant Fan 1 Percent Speed Command	Speed command to the Power Electronics Coolant Fan 1 in percentage of maximum speed. Note: Both Speed Command and Percent Speed Command cannot be used at the same time. Always set the unused speed command to Not Available. If both commands are set to Not Available, a preprogrammed default speed will be used.
8007	Power Electronics Coolant Fan 1 Enable Status	Enable and direction status of the Power Electronics Coolant Fan 1 system or component. 00b = Accessory Motor Off 01b = Accessory Motor On – Normal, Forward, or Default Direction 10b = Accessory Motor On – Reverse Direction 11b = Not available

8008	Power Electronics Coolant Fan 1 Controller Status Reason Code	Provides the reason code describing the unique failure of the Power Electronics Coolant Fan 1 system or component.If a detailed reason code is not used by the supporting application, or this reason code is Not Available, the Power Electronics Coolant Fan 1 Service Indicator (SPN 8013) and Power Electronics Coolant Fan 1 Operating Status (SPN 8014) may be used to determine functional status of the Power Electronics Coolant Fan 1 system or component. 0000b = Normal Operation 0001b = Unable to Start 0010b = Over-Voltage Protection Shutdown 0011b = Under-Voltage Protection Shutdown 0100b = Over-Temperature Protection Shutdown 0101b = Speed Limited due to current (i.e. amperage) protection limit 0110b = Speed limited due to maximum system design capability (e.g. PWM control limit or physical limit of system) 0111b = Speed limited due to torque limit 1000b = Speed limited due to over-temperature protection 1001b = Reserved 1010b = Reserved 1011b = Reserved 1100b = Reserved 1101b = Reserved 1110b = Reserved 1111b = Not Available
8009	Power Electronics Coolant Fan 1 Controller Command Status	Indicates the source of the speed command to the Power Electronics Coolant Fan 1 system or component. 00b is communicated when the controller is self-controlled (e.g. based on a temperature sensor). 01b is communicated when responding to the Power Electronics Coolant Fan 1 Speed Command (SPN 8005) or Power Electronics Coolant Fan 1 Percent Speed Command (SPN 8006). 10b is communicated when neither an internal nor external command is provided (e.g. failed temperature sensor or loss of the command message). 00b = Internal Command 01b = External Command 10b = Default Command 11b = Not Available
8010	Power Electronics Coolant Fan 1 Motor Speed	Motor Speed of the Power Electronics Coolant Fan 1.
8011	Power Electronics Coolant Fan 1 Control Temperature	A temperature measured and reported by the device. It may be used for direct or remote (by another controller) control of the Fan 1. For example, this may be the temperature of the fluid flowing through the Fan 1, or some other temperature relating to the Fan 1 or controller.
8012	Power Electronics Coolant Fan 1 Power	Calculated electrical power consumed by the Power Electronics Coolant Fan 1.

8013	Power Electronics Coolant Fan 1 Service Indicator	Indicates that service is required for the Power Electronics Coolant Fan 1 system or component. An active indication may convey a need for component replacement or periodic service. The Power Electronics Coolant Fan 1 Controller Status Reason Code (SPN 8008) may provide additional detail as to the nature of the system status. 00b = Service Not Required 01b = Service Required 10b = Reserved 11b = Not Available
8014	Power Electronics Coolant Fan 1 Operating Status	Indicates the operating status of the Power Electronics Coolant Fan 1 system or component. This parameter is used to inform other devices that this system or component is no longer performing to its operational capacity and that reduced, or no flow, of the coolant can be expected. Derated or Not Operable condition may require other vehicle systems to modify their operation. The Power Electronics Coolant Fan 1 Controller Status Reason Code (SPN 8008) may provide additional detail as to the nature of the system status. 00b = Normal Operation 01b = Derated Operation 10b = Not Operable 11b = Not Available
8015	Power Electronics Coolant Fan 2 Enable Command	Enable and direction command to the Power Electonics Coolant Fan 2. 00b = Accessory Motor Off 01b = Accessory Motor On Normal/Default Direction 10b = Accessory Motor On Reverse Direction 11b = Don’t Care/Take no action
8016	Power Electronics Coolant Fan 2 Power Hold	Command to allow the Power Electronics Coolant Fan 2 to remain alive independently of the electrical enable input to the Accessory Motor. For example, this could allow continued device operation after the keyswitch has turned off.00b = Power Hold Disabled 01b = Power Hold Enabled 10b = Reserved 11b = Don’t Care/Take no action
8017	Power Electronics Coolant Fan 2 Speed Command	Speed command to the Power Electronics Coolant Fan 2. Note: Both Speed Command and Percent Speed Command cannot be used at the same time. Always set the unused speed command to Not Available. If both commands are set to Not Available, a preprogrammed default speed will be used.
8018	Power Electronics Coolant Fan 2 Percent Speed Command	Speed command to the Power Electronics Coolant Fan 2 in percentage of maximum speed. Note: Both Speed Command and Percent Speed Command cannot be used at

		the same time. Always set the unused speed command to Not Available. If both commands are set to Not Available, a preprogrammed default speed will be used.
8019	Power Electronics Coolant Fan 2 Enable Status	Enable and direction status of the Power Electronics Coolant Fan 2 system or component. 00b = Accessory Motor Off 01b = Accessory Motor On – Normal, Forward, or Default Direction 10b = Accessory Motor On – Reverse Direction 11b = Not available
8020	Power Electronics Coolant Fan 2 Controller Status Reason Code	Provides the reason code describing the unique failure of the Power Electronics Coolant Fan 2 system or component.If a detailed reason code is not used by the supporting application, or this reason code is Not Available, the Power Electronics Coolant Fan 2 Service Indicator (SPN 8025) and Power Electronics Coolant Fan 2 Operating Status (SPN 8026) may be used to determine functional status of the Power Electronics Coolant Fan 2 system or component. 0000b = Normal Operation 0001b = Unable to Start 0010b = Over-Voltage Protection Shutdown 0011b = Under-Voltage Protection Shutdown 0100b = Over-Temperature Protection Shutdown 0101b = Speed Limited due to current (i.e. amperage) protection limit 0110b = Speed limited due to maximum system design capability (e.g. PWM control limit or physical limit of system) 0111b = Speed limited due to torque limit 1000b = Speed limited due to over-temperature protection 1001b = Reserved 1010b = Reserved 1011b = Reserved 1100b = Reserved 1101b = Reserved 1110b = Reserved 1111b = Not Available
8021	Power Electronics Coolant Fan 2 Controller Command Status	Indicates the source of the speed command to the Power Electronics Coolant Fan 2 system or component. 00b is communicated when the controller is self-controlled (e.g. based on a temperature sensor). 01b is communicated when responding to the Power Electronics Coolant Fan 2 Speed Command (SPN 8017) or Power Electronics Coolant Fan 2 Percent Speed Command (SPN 8018). 10b is communicated when neither an internal nor external command is provided (e.g. failed temperature sensor or loss of the command message). 00b = Internal Command 01b = External Command 10b = Default Command 11b = Not Available
8022	Power Electronics Coolant Fan 2 Motor Speed	Motor Speed of the Power Electronics Coolant Fan 2.

8023	Power Electronics Coolant Fan 2 Control Temperature	A temperature measured and reported by the device. It may be used for direct or remote (by another controller) control of the Fan 2. For example, this may be the temperature of the fluid flowing through the Fan 2, or some other temperature relating to the Fan 2 or controller.
8024	Power Electronics Coolant Fan 2 Power	Calculated electrical power consumed by the Power Electronics Coolant Fan 2.
8025	Power Electronics Coolant Fan 2 Service Indicator	Indicates that service is required for the Power Electronics Coolant Fan 2 system or component. An active indication may convey a need for component replacement or periodic service. The Power Electronics Coolant Fan 2 Controller Status Reason Code (SPN 8020) may provide additional detail as to the nature of the system status. 00b = Service Not Required 01b = Service Required 10b = Reserved 11b = Not Available
8026	Power Electronics Coolant Fan 2 Operating Status	Indicates the operating status of the Power Electronics Coolant Fan 2 system or component. This parameter is used to inform other devices that this system or component is no longer performing to its operational capacity and that reduced, or no flow, of the coolant can be expected. Derated or Not Operable condition may require other vehicle systems to modify their operation. The Power Electronics Coolant Fan 2 Controller Status Reason Code (SPN 8020) may provide additional detail as to the nature of the system status. 00b = Normal Operation 01b = Derated Operation 10b = Not Operable 11b = Not Available
8027	Power Electronics Coolant Fan 3 Enable Command	Enable and direction command to the Power Electonics Coolant Fan 3. 00b = Accessory Motor Off 01b = Accessory Motor On Normal/Default Direction 10b = Accessory Motor On Reverse Direction 11b = Don’t Care/Take no action
8028	Power Electronics Coolant Fan 3 Power Hold	Command to allow the Power Electronics Coolant Fan 3 to remain alive independently of the electrical enable input to the Accessory Motor. For example, this could allow continued device operation after the keyswitch has turned off.00b = Power Hold Disabled 01b = Power Hold Enabled 10b = Reserved 11b = Don’t Care/Take no action

8029	Power Electronics Coolant Fan 3 Speed Command	Speed command to the Power Electronics Coolant Fan 3. Note: Both Speed Command and Percent Speed Command cannot be used at the same time. Always set the unused speed command to Not Available. If both commands are set to Not Available, a preprogrammed default speed will be used.
8030	Power Electronics Coolant Fan 3 Percent Speed Command	Speed command to the Power Electronics Coolant Fan 3 in percentage of maximum speed. Note: Both Speed Command and Percent Speed Command cannot be used at the same time. Always set the unused speed command to Not Available. If both commands are set to Not Available, a preprogrammed default speed will be used.
8031	Power Electronics Coolant Fan 3 Enable Status	Enable and direction status of the Power Electronics Coolant Fan 3 system or component. 00b = Accessory Motor Off 01b = Accessory Motor On – Normal, Forward, or Default Direction 10b = Accessory Motor On – Reverse Direction 11b = Not available
8032	Power Electronics Coolant Fan 3 Controller Status Reason Code	Provides the reason code describing the unique failure of the Power Electronics Coolant Fan 3 system or component. If a detailed reason code is not used by the supporting application, or this reason code is Not Available, the Power Electronics Coolant Fan 3 Service Indicator (SPN 8037) and Power Electronics Coolant Fan 3 Operating Status (SPN 8038) may be used to determine functional status of the Power Electronics Coolant Fan 3 system or component.0000b = Normal Operation 0001b = Unable to Start 0010b = Over-Voltage Protection Shutdown 0011b = Under-Voltage Protection Shutdown 0100b = Over-Temperature Protection Shutdown 0101b = Speed Limited due to current (i.e. amperage) protection limit 0110b = Speed limited due to maximum system design capability (e.g. PWM control limit or physical limit of system) 0111b = Speed limited due to torque limit 1000b = Speed limited due to over-temperature protection 1001b = Reserved 1010b = Reserved 1011b = Reserved 1100b = Reserved 1101b = Reserved 1110b = Reserved 1111b = Not Available
8033	Power Electronics Coolant Fan 3 Controller Command Status	Indicates the source of the speed command to the Power Electronics Coolant Fan 3 system or component. 00b is communicated when the controller is self-controlled (e.g. based on a temperature sensor). 01b is communicated when responding to the Power Electronics Coolant Fan 3 Speed Command (SPN 8029) or Power Electronics

		Coolant Fan 3 Percent Speed Command (SPN 8030). 10b is communicated when neither an internal nor external command is provided (e.g. failed temperature sensor or loss of the command message). 00b = Internal Command 01b = External Command 10b = Default Command 11b = Not Available
8034	Power Electronics Coolant Fan 3 Motor Speed	Motor Speed of the Power Electronics Coolant Fan 3.
8035	Power Electronics Coolant Fan 3 Control Temperature	A temperature measured and reported by the device. It may be used for direct or remote (by another controller) control of the Fan 3. For example, this may be the temperature of the fluid flowing through the Fan 3, or some other temperature relating to the Fan 3 or controller.
8036	Power Electronics Coolant Fan 3 Power	Calculated electrical power consumed by the Power Electronics Coolant Fan 3.
8037	Power Electronics Coolant Fan 3 Service Indicator	Indicates that service is required for the Power Electronics Coolant Fan 3 system or component. An active indication may convey a need for component replacement or periodic service. The Power Electronics Coolant Fan 3 Controller Status Reason Code (SPN 8032) may provide additional detail as to the nature of the system status. 00b = Service Not Required 01b = Service Required 10b = Reserved 11b = Not Available
8038	Power Electronics Coolant Fan 3 Operating Status	Indicates the operating status of the Power Electronics Coolant Fan 3 system or component. This parameter is used to inform other devices that this system or component is no longer performing to its operational capacity and that reduced, or no flow, of the coolant can be expected. Derated or Not Operable condition may require other vehicle systems to modify their operation. The Power Electronics Coolant Fan 3 Controller Status Reason Code (SPN 8032) may provide additional detail as to the nature of the system status. 00b = Normal Operation 01b = Derated Operation 10b = Not Operable 11b = Not Available

8039	Propulsion Motor Coolant Fan 1 Enable Command	Enable and direction command to the Propulsion Motor Coolant Fan 1. 00b = Accessory Motor Off 01b = Accessory Motor On Normal/Default Direction 10b = Accessory Motor On Reverse Direction 11b = Don’t Care/Take no action
8040	Propulsion Motor Coolant Fan 1 Power Hold	Command to allow the Propulsion Motor Coolant Fan 1 to remain alive independently of the electrical enable input to the Accessory Motor. For example, this could allow continued device operation after the keyswitch has turned off.00b = Power Hold Disabled 01b = Power Hold Enabled 10b = Reserved 11b = Don’t Care/Take no action
8041	Propulsion Motor Coolant Fan 1 Speed Command	Speed command to the Propulsion Motor Coolant Fan 1. Note: Both Speed Command and Percent Speed Command cannot be used at the same time. Always set the unused speed command to Not Available. If both commands are set to Not Available, a preprogrammed default speed will be used.
8042	Propulsion Motor Coolant Fan 1 Percent Speed Command	Speed command to the Propulsion Motor Coolant Fan 1 in percentage of maximum speed. Note: Both Speed Command and Percent Speed Command cannot be used at the same time. Always set the unused speed command to Not Available. If both commands are set to Not Available, a preprogrammed default speed will be used.
8043	Propulsion Motor Coolant Fan 1 Enable Status	Enable and direction status of the Propulsion Motor Coolant Fan 1 system or component. 00b = Accessory Motor Off 01b = Accessory Motor On – Normal, Forward, or Default Direction 10b = Accessory Motor On – Reverse Direction 11b = Not available
8044	Propulsion Motor Coolant Fan 1 Controller Status Reason Code	Provides the reason code describing the unique failure of the Propulsion Motor Coolant Fan 1 system or component.If a detailed reason code is not used by the supporting application, or this reason code is Not Available, the Propulsion Motor Coolant Fan 1 Service Indicator (SPN 8049) and Propulsion Motor Coolant Fan 1 Operating Status (SPN 8050) may be used to determine functional status of the Propulsion Motor Coolant Fan 1 system or component. 0000b = Normal Operation 0001b = Unable to Start 0010b = Over-Voltage Protection Shutdown 0011b = Under-Voltage Protection Shutdown 0100b = Over-Temperature Protection Shutdown

		0101b = Speed Limited due to current (i.e. amperage) protection limit 0110b = Speed limited due to maximum system design capability (e.g. PWM control limit or physical limit of system) 0111b = Speed limited due to torque limit 1000b = Speed limited due to over-temperature protection 1001b = Reserved 1010b = Reserved 1011b = Reserved 1100b = Reserved 1101b = Reserved 1110b = Reserved 1111b = Not Available
8045	Propulsion Motor Coolant Fan 1 Controller Command Status	Indicates the source of the speed command to the Propulsion Motor Coolant Fan 1 system or component. 00b is communicated when the controller is self-controlled (e.g. based on a temperature sensor). 01b is communicated when responding to the Propulsion Motor Coolant Fan 1 Speed Command (SPN 8041) or Propulsion Motor Coolant Fan 1 Percent Speed Command (SPN 8042). 10b is communicated when neither an internal nor external command is provided (e.g. failed temperature sensor or loss of the command message). 00b = Internal Command 01b = External Command 10b = Default Command 11b = Not Available
8046	Propulsion Motor Coolant Fan 1 Motor Speed	Motor Speed of the Propulsion Motor Coolant Fan 1.
8047	Propulsion Motor Coolant Fan 1 Control Temperature	A temperature measured and reported by the device. It may be used for direct or remote (by another controller) control of the Fan 1. For example, this may be the temperature of the fluid flowing through the Fan 1, or some other temperature relating to the Fan 1 or controller.
8048	Propulsion Motor Coolant Fan 1 Power	Calculated electrical power consumed by the Propulsion Motor Coolant Fan 1.
8049	Propulsion Motor Coolant Fan 1 Service Indicator	Indicates that service is required for the Propulsion Motor Coolant Fan 1 system or component. An active indication may convey a need for component replacement or periodic service. The Propulsion Motor Coolant Fan 1 Controller Status Reason Code (SPN 8044) may provide additional detail as to the nature of the system status. 00b = Service Not Required 01b = Service Required 10b = Reserved 11b = Not Available

8050	Propulsion Motor Coolant Fan 1 Operating Status	Indicates the operating status of the Propulsion Motor Coolant Fan 1 system or component. This parameter is used to inform other devices that this system or component is no longer performing to its operational capacity and that reduced, or no flow, of the coolant can be expected. Derated or Not Operable condition may require other vehicle systems to modify their operation. The Propulsion Motor Coolant Fan 1 Controller Status Reason Code (SPN 8044) may provide additional detail as to the nature of the system status. 00b = Normal Operation 01b = Derated Operation 10b = Not Operable 11b = Not Available
8051	Propulsion Motor Coolant Fan 2 Enable Command	Enable and direction command to the Power Motor Coolant Fan 2. 00b = Accessory Motor Off 01b = Accessory Motor On Normal/Default Direction 10b = Accessory Motor On Reverse Direction 11b = Don’t Care/Take no action
8052	Propulsion Motor Coolant Fan 2 Power Hold	Command to allow the Propulsion Motor Coolant Fan 2 to remain alive independently of the electrical enable input to the Accessory Motor. For example, this could allow continued device operation after the keyswitch has turned off.00b = Power Hold Disabled 01b = Power Hold Enabled 10b = Reserved 11b = Don’t Care/Take no action
8053	Propulsion Motor Coolant Fan 2 Speed Command	Speed command to the Propulsion Motor Coolant Fan 2. Note: Both Speed Command and Percent Speed Command cannot be used at the same time. Always set the unused speed command to Not Available. If both commands are set to Not Available, a preprogrammed default speed will be used.
8054	Propulsion Motor Coolant Fan 2 Percent Speed Command	Speed command to the Propulsion Motor Coolant Fan 2 in percentage of maximum speed. Note: Both Speed Command and Percent Speed Command cannot be used at the same time. Always set the unused speed command to Not Available. If both commands are set to Not Available, a preprogrammed default speed will be used.
8055	Propulsion Motor Coolant Fan 2 Enable Status	Enable and direction status of the Propulsion Motor Coolant Fan 2 system or component. 00b = Accessory Motor Off 01b = Accessory Motor On – Normal, Forward, or Default Direction 10b = Accessory Motor On – Reverse Direction 11b = Not available

8056	Propulsion Motor Coolant Fan 2 Controller Status Reason Code	Provides the reason code describing the unique failure of the Propulsion Motor Coolant Fan 2 system or component.If a detailed reason code is not used by the supporting application, or this reason code is Not Available, the Propulsion Motor Coolant Fan 2 Service Indicator (SPN 8061) and Propulsion Motor Coolant Fan 2 Operating Status (SPN 8062) may be used to determine functional status of the Propulsion Motor Coolant Fan 2 system or component. 0000b = Normal Operation 0001b = Unable to Start 0010b = Over-Voltage Protection Shutdown 0011b = Under-Voltage Protection Shutdown 0100b = Over-Temperature Protection Shutdown 0101b = Speed Limited due to current (i.e. amperage) protection limit 0110b = Speed limited due to maximum system design capability (e.g. PWM control limit or physical limit of system) 0111b = Speed limited due to torque limit 1000b = Speed limited due to over-temperature protection 1001b = Reserved 1010b = Reserved 1011b = Reserved 1100b = Reserved 1101b = Reserved 1110b = Reserved 1111b = Not Available
8057	Propulsion Motor Coolant Fan 2 Controller Command Status	Indicates the source of the speed command to the Propulsion Motor Coolant Fan 2 system or component. 00b is communicated when the controller is self-controlled (e.g. based on a temperature sensor). 01b is communicated when responding to the Propulsion Motor Coolant Fan 2 Speed Command (SPN 8053) or Propulsion Motor Coolant Fan 2 Percent Speed Command (SPN 8054). 10b is communicated when neither an internal nor external command is provided (e.g. failed temperature sensor or loss of the command message). 00b = Internal Command 01b = External Command 10b = Default Command 11b = Not Available
8058	Propulsion Motor Coolant Fan 2 Motor Speed	Motor Speed of the Propulsion Motor Coolant Fan 2.
8059	Propulsion Motor Coolant Fan 2 Control Temperature	A temperature measured and reported by the device. It may be used for direct or remote (by another controller) control of the Fan 2. For example, this may be the temperature of the fluid flowing through the Fan 2, or some other temperature relating to the Fan 2 or controller.

8060	Propulsion Motor Coolant Fan 2 Power	Calculated electrical power consumed by the Propulsion Motor Coolant Fan 2.
8061	Propulsion Motor Coolant Fan 2 Service Indicator	Indicates that service is required for the Propulsion Motor Coolant Fan 2 system or component. An active indication may convey a need for component replacement or periodic service. The Propulsion Motor Coolant Fan 2 Controller Status Reason Code (SPN 8056) may provide additional detail as to the nature of the system status. 00b = Service Not Required 01b = Service Required 10b = Reserved 11b = Not Available
8062	Propulsion Motor Coolant Fan 2 Operating Status	Indicates the operating status of the Propulsion Motor Coolant Fan 2 system or component. This parameter is used to inform other devices that this system or component is no longer performing to its operational capacity and that reduced, or no flow, of the coolant can be expected. Derated or Not Operable condition may require other vehicle systems to modify their operation. The Propulsion Motor Coolant Fan 2 Controller Status Reason Code (SPN 8056) may provide additional detail as to the nature of the system status. 00b = Normal Operation 01b = Derated Operation 10b = Not Operable 11b = Not Available
8063	Propulsion Motor Coolant Fan 3 Enable Command	Enable and direction command to the Propulsion Motor Coolant Fan 3. 00b = Accessory Motor Off 01b = Accessory Motor On Normal/Default Direction 10b = Accessory Motor On Reverse Direction 11b = Don’t Care/Take no action
8064	Propulsion Motor Coolant Fan 3 Power Hold	Command to allow the Propulsion Motor Coolant Fan 3 to remain alive independently of the electrical enable input to the Accessory Motor. For example, this could allow continued device operation after the keyswitch has turned off.00b = Power Hold Disabled 01b = Power Hold Enabled 10b = Reserved 11b = Don’t Care/Take no action
8065	Propulsion Motor Coolant Fan 3 Speed Command	Speed command to the Propulsion Motor Coolant Fan 3. Note: Both Speed Command and Percent Speed Command cannot be used at the same time. Always set the unused speed command to Not Available. If both commands are set to Not Available, a preprogrammed default speed will be used.

8066	Propulsion Motor Coolant Fan 3 Percent Speed Command	Speed command to the Propulsion Motor Coolant Fan 3 in percentage of maximum speed. Note: Both Speed Command and Percent Speed Command cannot be used at the same time. Always set the unused speed command to Not Available. If both commands are set to Not Available, a preprogrammed default speed will be used.
8067	Propulsion Motor Coolant Fan 3 Enable Status	Enable and direction status of the Propulsion Motor Coolant Fan 3 system or component. 00b = Accessory Motor Off 01b = Accessory Motor On – Normal, Forward, or Default Direction 10b = Accessory Motor On – Reverse Direction 11b = Not available
8068	Propulsion Motor Coolant Fan 3 Controller Status Reason Code	Provides the reason code describing the unique failure of the Propulsion Motor Coolant Fan 3 system or component.If a detailed reason code is not used by the supporting application, or this reason code is Not Available, the Propulsion Motor Coolant Fan 3 Service Indicator (SPN 8073) and Propulsion Motor Coolant Fan 3 Operating Status (SPN 8074) may be used to determine functional status of the Propulsion Motor Coolant Fan 3 system or component. 0000b = Normal Operation 0001b = Unable to Start 0010b = Over-Voltage Protection Shutdown 0011b = Under-Voltage Protection Shutdown 0100b = Over-Temperature Protection Shutdown 0101b = Speed Limited due to current (i.e. amperage) protection limit 0110b = Speed limited due to maximum system design capability (e.g. PWM control limit or physical limit of system) 0111b = Speed limited due to torque limit 1000b = Speed limited due to over-temperature protection 1001b = Reserved 1010b = Reserved 1011b = Reserved 1100b = Reserved 1101b = Reserved 1110b = Reserved 1111b = Not Available
8069	Propulsion Motor Coolant Fan 3 Controller Command Status	Indicates the source of the speed command to the Propulsion Motor Coolant Fan 3 system or component. 00b is communicated when the controller is self-controlled (e.g. based on a temperature sensor). 01b is communicated when responding to the Propulsion Motor Coolant Fan 3 Speed Command (SPN 8065) or Propulsion Motor Coolant Fan 3 Percent Speed Command (SPN 8066). 10b is communicated when neither an internal nor external command is provided (e.g. failed temperature sensor or loss of the command message). 00b = Internal Command 01b = External Command 10b = Default Command 11b = Not Available

8070	Propulsion Motor Coolant Fan 3 Motor Speed	Motor Speed of the Propulsion Motor Coolant Fan 3.
8071	Propulsion Motor Coolant Fan 3 Control Temperature	A temperature measured and reported by the device. It may be used for direct or remote (by another controller) control of the Fan 3. For example, this may be the temperature of the fluid flowing through the Fan 3, or some other temperature relating to the Fan 3 or controller.
8072	Propulsion Motor Coolant Fan 3 Power	Calculated electrical power consumed by the Propulsion Motor Coolant Fan 3.
8073	Propulsion Motor Coolant Fan 3 Service Indicator	Indicates that service is required for the Propulsion Motor Coolant Fan 3 system or component. An active indication may convey a need for component replacement or periodic service. The Propulsion Motor Coolant Fan 3 Controller Status Reason Code (SPN 8068) may provide additional detail as to the nature of the system status. 00b = Service Not Required 01b = Service Required 10b = Reserved 11b = Not Available
8074	Propulsion Motor Coolant Fan 3 Operating Status	Indicates the operating status of the Propulsion Motor Coolant Fan 3 system or component. This parameter is used to inform other devices that this system or component is no longer performing to its operational capacity and that reduced, or no flow, of the coolant can be expected. Derated or Not Operable condition may require other vehicle systems to modify their operation. The Propulsion Motor Coolant Fan 3 Controller Status Reason Code (SPN 8068) may provide additional detail as to the nature of the system status. 00b = Normal Operation 01b = Derated Operation 10b = Not Operable 11b = Not Available
8075	HVES1 Highest Cell Temperature	The highest temperature level reported by any cell in the High Voltage Energy Storage 1 pack (or system). If a single temperature sensor covers more than one cell, the value in this parameter is for the smallest group of cells measured. See HVES1 Highest Cell Temperature Module Number (SPN 8241) and HVES1 Highest Cell Temperature Cell Number (SPN 8242) for cell location information.

8076	HVES1 Lowest Cell Temperature	The lowest temperature level reported by any cell in the High Voltage Energy Storage 1 pack (or system). If a single temperature sensor covers more than one cell, the value in this parameter is for the smallest group of cells measured. See HVES1 Lowest Cell Temperature Module Number (SPN 8243) and HVES1 Lowest Cell Temperature Cell Number (SPN 8244) for cell location information.
8077	HVES1 Average Cell Temperature	The average temperature level of all cells in the High Voltage Energy Storage 1 pack (or system).
8078	HVES1 Cell Temperature Differential Status	Indicates whether or not the differential between the highest and lowest cell temperatures are within acceptable limits per the High Voltage Energy Storage 1 pack (or system). The actual temperature differential can be calculated by subtracting SPN 8076 (HVES1 Lowest Cell Temperature) from SPN 8075 (HVES1 Highest Cell Temperature).00b = Cell-to-cell temperature differential is within acceptable limits 01b = Cell-to-cell temperature differential exceeds acceptable limits 10b = Error 11b = Not Available
8079	HVES1 Discharge Capacity	The amount of stored electrical charge in the High Voltage Energy Storage 1 pack (or system) that is available for use by the hybrid system, i.e. “how full is the tank”. See HVES1 Discharge Energy Capacity (SPN 8205) for kilowatt-hours (kWh).
8080	HVES1 Charge Capacity	The amount of unused electrical charge storage in the High Voltage Energy Storage 1 pack (or system) that is available to be filled by charging, i.e. “how much empty space is remaining in the tank”. See HVES1 Charge Energy Capacity (SPN 8206) for kilowatt-hours (kWh).
8081	HVES1 Cell Balancing Count	The number of cells that are currently being balanced in the High Voltage Energy Storage 1 pack (or system).
8082	HVES1 Discharge Current Limit	The maximum permissible current flow out of the High Voltage Energy Storage 1 pack (or system). This parameter is defined from the high voltage energy storage system’s point of view.A negative value represents current flowing out of the energy

		storage system (discharging the system); as such, the current limit value must be between -1600 and 0 Amps.
8083	HVES1 Charge Current Limit	The maximum permissible current flow into the High Voltage Energy Storage 1 pack (or system). This parameter is defined from the high voltage energy storage system's point of view.A positive value represents current flowing into the energy storage system (charging the system); as such current limit value must be between 0 and +1612.75 Amps.
8084	HVES1 Minimum Cell State of Charge	Indicates the state of charge of the lowest-charged cell in the High Voltage Energy Storage 1 pack (or system). 0% means no charge remaining, 100% means the cell is fully charged. If a single state of charge value covers more than one cell, the value in this parameter is for the smallest group of cells measured. See HVES1 Lowest Cell State of Charge Module Number (SPN 8247) and HVES1 Lowest Cell State of Charge Cell Number (SPN 8248) for cell location information.
8085	HVES1 Maximum Cell State of Charge	Indicates the state of charge of the highest-charged cell in the High Voltage Energy Storage 1 pack (or system). 0% means no charge remaining, 100% means the cell is fully charged. If a single state of charge value covers more than one cell, the value in this parameter is for the smallest group of cells measured. See HVES1 Highest Cell State of Charge Module Number (SPN 8245) and HVES1 Highest Cell State of Charge Cell Number (SPN 8246) for cell location information.
8086	HVES1 Bus Voltage	The voltage level of the high voltage bus, as measured by the High Voltage Energy Storage 1 pack (or system) on the bus side (not the battery side) of its contactors.
8087	HVES1 Ignition Voltage	The voltage level at the ignition input of the High Voltage Energy Storage 1 pack (or system) controller.
8088	HVES1 Intake Coolant Temperature	The temperature of liquid coolant as it enters the High Voltage Energy Storage 1 pack (or system).

8089	HVES1 Outlet Coolant Temperature	The temperature of liquid coolant as it exits the High Voltage Energy Storage 1 pack (or system).
8090	HVES1 Maximum Charge Voltage Limit	The maximum voltage level not to be exceeded while charging the High Voltage Energy Storage 1 pack (or system). If this parameter is not supported, the maximum charge voltage should be limited to SPN 8117 (HVES1 Recommended Maximum Operating Voltage).
8091	HVES1 High-Voltage Bus (Positive) Contactor State	Position of the High Voltage Energy Storage 1 pack (or system) positive side bus contactor. When this contactor is closed, the positive side of HVES1 is connected to the positive side of the high-voltage bus. In systems where all contactors are controlled as a single unit (i.e. all contactors can only be either all open or all closed), this parameter may be used to convey the overall contactor status.00b = Contactor Open 01b = Contactor Closed 10b = Error 11b = Not Available
8092	HVES1 High-Voltage Bus (Negative) Contactor State	Position of the High Voltage Energy Storage 1 pack (or system) negative side bus contactor. When this contactor is closed, the negative side of HVES1 is connected to the negative side of the high-voltage bus. If a system controls the positive, negative, and center contactors as a single unit (i.e. all contactors can only be either all open or all closed), then SPN 8091 (HVES1 High-Voltage Bus (Positive) Contactor State) should be used to convey overall contactor status.00b = Contactor Open 01b = Contactor Closed 10b = Error 11b = Not Available
8093	HVES1 High-Voltage Bus Disconnect Forewarning	Indicates that the High Voltage Energy Storage 1 pack (or system) is about to disconnect from the high voltage bus due to unacceptable conditions.0000b = Disconnect not pending 0001b = Disconnect imminent due to battery pack voltage approaching minimum acceptable level 0010b = Disconnect imminent due to battery pack voltage approaching maximum acceptable level 0011b = Disconnect imminent due to module voltage approaching minimum acceptable level 0100b = Disconnect imminent due to module voltage approaching maximum acceptable level 0101b = Disconnect imminent due to cell voltage approaching minimum acceptable level 0110b = Disconnect imminent due to cell voltage approaching maximum acceptable level 0111b = Disconnect imminent due to battery pack current approaching

		maximum acceptable level 1000b to 1100b = Reserved 1101b = Disconnect imminent – no reason given 1110b = Error 1111b = Not Available
8094	HVES1 High-Voltage Bus Pre-Charge Relay State	Position of the high-voltage bus contactor pre-charge relay. When this relay is closed, the High Voltage Energy Storage 1 pack (or system) is bringing the high-voltage bus up to its operating level.00b = Relay Open 01b = Relay Closed 10b = Error 11b = Not Available
8095	HVES1 Center of Pack Contactor State	Position of the center high-voltage contactor. When this contactor is closed, the positive half of the High Voltage Energy Storage 1 pack (or system) is connected to the negative half. If a system controls the positive, negative, and center contactors as a single unit (i.e. all contactors can only be either all open or all closed), then SPN 8091 (HVES1 High-Voltage Bus (Positive) Contactor State) should be used.00b = Contactor Open 01b = Contactor Closed 10b = Error 11b = Not Available
8096	HVES1 High-Voltage Bus Active Isolation Test Status	Status of the high-voltage bus electrical active isolation test as performed by the High Voltage Energy Storage 1 pack (or system).0000b = No test requested / No test in process 0001b = Test requested but not yet in process 0010b = Test in process 0011b = Test complete; isolation acceptable 0100b = Test complete; isolation marginal 0101b = Test complete; isolation fault 0110b to 1101b = Reserved 1110b = Error 1111b = Not available
8097	HVES1 High-Voltage Bus Passive Isolation Test Status	Status of the high-voltage bus electrical passive isolation test as performed by the High Voltage Energy Storage 1 pack (or system).0000b = No test requested / No test in process 0001b = Test requested but not yet in process 0010b = Test in process 0011b = Test complete; isolation acceptable 0100b = Test complete; isolation marginal 0101b = Test complete; isolation fault 0110b to 1101b = Reserved 1110b = Error 1111b = Not available
8098	HVES1 HVIL Status	Status of the High Voltage Interlock Loop from the viewpoint of the High Voltage Energy Storage 1 pack (or system).00b = HVIL Closed 01b = HVIL Open 10b = Error 11b = Not Available

8099	HVES1 Inertia Switch Status	Switch indicating that an impact has been sensed by the High Voltage Energy Storage 1 pack (or system). The impact indication may require action by another controller, or by the HVES1 control module itself. For example, a controller may elect to take HVES1 off-line to reduce an electrocution hazard during or after a vehicle crash.00b = No impact sensed 01b = Impact sensed 10b = Error 11b = Not Available
8100	HVES1 State of Charge Status	Status of the High Voltage Energy Storage 1 pack (or system) State of Charge (SOC). Note: A given HVES controller may not support all of the states.0000b = SOC level is acceptable. 0001b = SOC is approaching its recommended lower limit 0010b = SOC is at its recommended lower limit 0011b = SOC is below its recommended lower limit 0100b = SOC is approaching its recommended upper limit 0101b = SOC is at its recommended upper limit 0110b = SOC is above its recommended upper limit 0111b to 1101b = Reserved 1110b = Error 1111b = Not Available
8101	HVES1 Cell Balance Status	Indicates whether or not the cells in the High Voltage Energy Storage 1 pack (or system) are balanced. 00b = Cells are balanced 01b = Cells are unbalanced 10b = Error 11b = Not Available
8102	HVES1 Cell Balancing Active	Indicates whether or not the cells in the High Voltage Energy Storage 1 pack (or system) are currently being balanced.00b = Cell balancing is not active 01b = Cell balancing is active 10b = Error 11b = Not Available
8103	HVES1 Discharge Power Limit Due to State of Charge	Indicates whether or not HVES1 discharge power is being limited due to state of charge. 00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
8104	HVES1 Discharge Power Limit Due to Battery Temperature	Indicates whether or not HVES1 discharge power is being limited due to battery temperature. 00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
8105	HVES1 Discharge Power Limit Due to Battery Diagnostic Condition	Indicates whether or not HVES1 discharge power is being limited due to a battery diagnostic condition. 00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available

8106	HVES1 Discharge Power Limit Due to Battery or Cell Voltage	Indicates whether or not HVES1 discharge power is being limited due to a battery or cell voltage level. 00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
8107	HVES1 Discharge Power Limit Due to Battery Current	Indicates whether or not HVES1 discharge power is being limited due to battery current. 00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
8108	HVES1 Discharge Power Limit Due to an Undefined Cause	Indicates whether or not HVES1 discharge power is being limited due to an undefined cause. 00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
8109	HVES1 Charge Power Limit Due to State of Charge	Indicates whether or not HVES1 charge power is being limited due to state of charge. 00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
8110	HVES1 Charge Power Limit Due to Battery Temperature	Indicates whether or not HVES1 charge power is being limited due to battery temperature. 00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
8111	HVES1 Charge Power Limit Due to Battery Diagnostic Condition	Indicates whether or not HVES1 charge power is being limited due to a battery diagnostic condition. 00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
8112	HVES1 Charge Power Limit Due to Battery or Cell Voltage	Indicates whether or not HVES1 charge power is being limited due to a battery or cell voltage level. 00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
8113	HVES1 Charge Power Limit Due to Battery Current	Indicates whether or not HVES1 charge power is being limited due to battery current. 00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available

8114	HVES1 Charge Power Limit Due to an Undefined Cause	Indicates whether or not HVES1 charge power is being limited due to an undefined cause. 00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
8115	HVES1 Nominal Voltage	Per the HVES manufacturer, this is the nominal operating voltage of the High Voltage Energy Storage 1 pack (or system), e.g. “300V” or “600V”.
8116	HVES1 Recommended Minimum Operating Voltage	Per the HVES manufacturer, this is the minimum recommended voltage level for High Voltage Energy Storage 1 pack (or system) operation. Operating below this value may compromise HVES life.
8117	HVES1 Recommended Maximum Operating Voltage	Per the HVES manufacturer, this is the maximum recommended voltage level for High Voltage Energy Storage 1 pack (or system) operation. Operating above this value may compromise HVES life.
8118	HVES1 Recommended Minimum State Of Charge	Per the HVES manufacturer, this is the recommended minimum state of charge for High Voltage Energy Storage 1 pack (or system) operation. Operating below this value may compromise HVES life.
8119	HVES1 Recommended Maximum State Of Charge	Per the HVES manufacturer, this is the recommended maximum state of charge for High Voltage Energy Storage 1 pack (or system) operation. Operating above this value may compromise HVES life.
8120	HVES1 Recommended Maximum Operating Temperature	Per the HVES manufacturer, this is the recommended maximum temperature for High Voltage Energy Storage 1 pack (or system) operation. Operating above this value may damage HVES hardware, or compromise HVES life.
8121	HVES1 State of Health	This signal represents the expected remaining « Life » of the High Voltage Energy Storage 1 pack (or system), in percent. Battery life is a manufacturer-specific measure of how well the energy storage system is functioning relative to its nominal (rated) and end (failed) states. This value should begin at 100%, and end at 0% when “no” energy is able to be put in or taken out. “No” could be absolute zero, or it could be some rated value of the pack.The pack supplier can develop their own algorithm to

		calculate this parameter, but in general it is a reverse Amp Hour Counter, reflecting the expected Amp Hours of energy throughput remaining in the Hybrid Battery.
8122	HVES1 Contactor Open Under Load Count	This signal represents the number of times the contactors inside the High Voltage Energy Storage 1 pack (or system) have opened while current is flowing through them. The current level (that determines if an opening event will be counted) shall be defined by the HVES manufacturer, but in general should be a current level at which the contactor life may be reduced if repeated cycles occur.
8123	HVES1 High-Voltage Bus Connect Command	Command to connect the High Voltage Energy Storage 1 pack (or system) to the high-voltage bus. The emergency contactor closure request may be used in situations where one or more faults in the hybrid powertrain prevent normal operation, but the vehicle operator desires operation due to a perceived emergency situation. Receivers of this command should always support state 10b (Emergency contactor closure request), even if the criteria for closing the contactor are the same as used in response to state 01b.00b = Open Contactor; Disconnect HVES from high-voltage bus 01b = Close Contactor; Connect HVES to high-voltage bus 10b = Emergency contactor closure request 11b = Don’t care/Take no action
8124	HVES1 Power-Down Command	Command to shut down the High Voltage Energy Storage 1 pack (or system). A normal power-down may involve steps that take some period of time (tests, writing of data, etc.). However, an emergency power-down should shut down the storage system as quickly as possible, such as in the event of a vehicle accident. Receivers of this command should always support state 10b (Execute emergency power-down), even if the actual power-down process is the same as that used during a « normal » power-down.00b = Power-down not requested 01b = Execute normal power-down 10b = Execute emergency power-down 11b = Don’t care/Take no action
8125	HVES1 High-Voltage Bus Active Isolation Test Command	Command for the High Voltage Energy Storage 1 pack (or system) to perform an active electrical isolation test on the high voltage bus.An active isolation test might use a generated signal (e.g. an injected AC signal) and then monitor changes in the measurements of the isolated circuits. 00b = Active Isolation Test not requested 01b = Active Isolation Test request 10b = Reserved 11b = Don’t care/Take no action

8126	HVES1 High-Voltage Bus Passive Isolation Test Command	Command for the High Voltage Energy Storage 1 pack (or system) to perform a passive electrical isolation test on the high voltage bus.A passive isolation test uses additional circuitry (e.g. a high impedance network) to monitor the delta between the high voltage connections (e.g. positive and negative buses). 00b = Passive Isolation Test not requested 01b = Passive Isolation Test request 10b = Reserved 11b = Don't care/Take no action
8127	HVES1 Cell Balancing Command	Command for the High Voltage Energy Storage 1 pack (or system) to perform cell balancing. 00b = Cell Balancing not requested 01b = Cell Balancing requested 10b = Reserved 11b = Don't care/Take no action
8128	Total Number of Satellites in View	Indicates the number of satellites in view of the positioning and locating system receiver.
8129	Horizontal Dilution of Precision	Provides the dilution of precision in the horizontal (X-Y plane axis) direction as calculated by the positioning and locating system receiver. The dilution of precision factor is calculated from the observed positions of the observed satellites (at least 4 must be tracked for this data to be valid) and the measured position of the receiver. Lower values mean more accurate position data.
8130	Vertical Dilution of Precision	Provides the dilution of precision in the vertical (Z axis) direction as calculated by the positioning and locating system receiver. The dilution of precision factor is calculated from the observed positions of the observed satellites (at least 4 must be tracked for this data to be valid) and the measured position of the receiver. Lower values mean more accurate positioning information.
8131	Position Dilution of Precision	Provides the dilution of precision for the overall position (X-Y-Z coordinate system) as calculated by the positioning and locating system receiver. The dilution of precision factor is calculated from the observed satellites (at least 4 must be tracked for this data to be valid) and the measured position of the receiver. Lower values mean more accurate positioning information.

8132	Time Dilution of Precision	Provides the estimated receiver clock error as calculated by the positioning and locating system receiver from the satellites' clock data. The dilution of precision factor is calculated from the observed satellites (at least 4 must be tracked for this data to be valid). Lower values mean that the positioning and locating system's receiver will provide a more accurate position calculation.
8133	Current Region	Command sent to forward imager which specifies the operator's desired region to assist with object recognition.Message shall use the 2-character string country codes in ISO 3166-1 alpha-2. Typical examples from ISO 3166-1 alpha-2 are: France: FR United States: US Germany: DE Note: 2 ASCII space characters (2020h) indicate the region is not detected/selected and FFFFh = Not available
8134	Current Sub-Region	Command sent to all Forward Imager which specifies the operator's desired sub-region to assist with object recognition.This signal will be dependent on Current Region and shall use the 3-character string subdivision codes in ISO 3166-2 standard. Typical examples from ISO 3166-2 are: CA: California NY: New York BY: Bavaria 13: Tokyo Note: 3 ASCII space characters (202020h) indicate the sub-region is not detected/selected and FFFFFFh = Not available.
8135	Right Side Lane Departure Optical Warning Command	Indicates that the forward lane imaging system is commanding an optical warning for the lane departure on the right side of the vehicle.Used for driving optical alert devices with minimal internal logic (ie. Those that do not support SPNs 1700 and 1701). 00b = No optical warning on the right side 01b = Active optical warning on the right side 10b = Reserved 11b = Not available
8136	Left Side Lane Departure Optical Warning Command	Indicates that the forward lane imaging system is commanding an optical warning for the lane departure on the left side of the vehicle.Used for driving optical alert devices with minimal internal logic (ie. Those that do not support SPNs 1700 and 1701). 00b = No optical warning on the left side 01b = Active optical warning on the left side 10b = Reserved 11b = Not available
8137	Right Side Lane Departure Acoustical Warning Command	Indicates that the forward lane imaging system is commanding an acoustical warning for the lane departure on the right side of the vehicle.Used for driving acoustical alert

		devices with minimal internal logic (ie. Those that do not support SPNs 1700 and 1701). 00b = No acoustical warning on the right side 01b = Active acoustical warning on the right side 10b = Reserved 11b = Not available
8138	Left Side Lane Departure Acoustical Warning Command	Indicates that the forward lane imaging system is commanding an acoustical warning for the lane departure on the left side of the vehicle.Used for driving acoustical alert devices with minimal internal logic (ie. Those that do not support SPNs 1700 and 1701). 00b = No acoustical warning on the left side 01b = Active acoustical warning on the left side 10b = Reserved 11b = Not available
8139	Left Wheel Lane Departure Distance	The measured distance of departure of the left wheel on the left side of the lane, as measured from the left edge of the left tire to the right edge of the current lane's left marker.A distance of 0 indicates the left edge of the left tire is aligned with the right edge of the lane's left marker. Positive distance values indicate the left tire has departed the left side of the lane by the reported distance. Negative distance values indicate the left tire is within the lane at the reported distance from the lane's left edge. Measured values greater than 125 cm results in value 251. 251 = Greater than 125 cm / Not in range 252 = Lane marker not reliable 253 = Reserved 254 = Error 255 = Not available
8140	Right Wheel Lane Departure Distance	The measured distance of departure of the right wheel on the right side of the lane, as measured from the right edge of the right tire to the left edge of the current lane's right marker.A distance of 0 indicates the right edge of the right tire is aligned with the left edge of the lane's right marker. Positive distance values indicate the right tire is within the lane at the reported distance from the lane's right edge. Negative distance values indicate the right tire has departed the right side of the lane by the reported distance. Measured values greater than 125 cm results in value 251. 251 = not in range 252 = not reliable 253 = reserved / not used 254 = error 255 = not available or not installed
8141	Lane Departure Warning System State	Indicates the status of Lane Departure Warning system. 0000b = System is not ready (initialization not finished) 0001b = System is temporarily not available (not all activation conditions fulfulled) 0010b = System is deactivated by driver 0011b =

		System is ready (no warnings active) 0100b = Active warning suppressed by operator behavior (e.g. turn signal) 0101b = System is warning lane departure 0110b to 1101b = Reserved 1110b = Error 1111b = Not available
8142	Forward Lane Imager Status	Indicates the status of the Forward Looking Imager. 0000b = Imager fully operational 0001b = Imager warming up / initializing 0010b = Imager partially blocked / partially blind 0011b = Imager fully blocked / fully blind 0100b = Imager misaligned 0101b = Imager view degraded but functional 0110b = Reserved 0111b = Reserved 1000b = Reserved 1001b = Reserved 1010b = Reserved 1011b = Reserved 1100b = Reserved 1101b = Reserved 1110b = Error 1111b = Not Available
8143	Right Lane Marker Type	Indicates the type of lane marker detected by the Forward Lane Imager on the right side. 0000b = Processing or not identified 0001b = Solid 0010b = Road edge 0011b = Dashed 0100b = Double lane marker 0101b = Raised lane marker (e.g. Bott's dots) 0110b to 1101b = Reserved 1110b = Error 1111b = Not available
8144	Left Lane Marker Type	Indicates the type of lane marker detected by the Forward Lane Imager on the left side. 0000b = Processing or not identified 0001b = Solid 0010b = Road edge 0011b = Dashed 0100b = Double lane marker 0101b = Raised lane marker (e.g. Bott's dots) 0110b to 1101b = Reserved 1110b = Error 1111b = Not available
8145	Engine Fueling Inhibit Prevented Reason Extension	If Engine Fueling Inhibit Allowed (SPN 5795) indicates that the engine will inhibit fueling, then this parameter indicate the reason. If more than one reason exists at the same time, then it is up to the manufacturer to decide which one to select.See SPN 5866 for an earlier version of this parameter. If this parameter and SPN 5866 are not in agreement, then this parameter shall be considered the primary reason. 000000b = Fueling inhibit allowed (SPN 5795 = 01b) 000001b = Aftertreatment regeneration is active or preparing to be active 000010b = Oil Distribution in engine is incomplete 000011b = Engine is cold 000100b = Service Override 000101b = Aftertreatment system is cold 000110b = Aftertreatment Protection 000111b = Engine load too high 001000b = Engine protection. Use other engine protection enumerations in this parameter when applicable. If the method of engine protection is not defined in other states, then use this state. 001001b = Insufficient SLI battery charge 001010b =

		Maximum number of engine fueling inhibit requests (SPN 5793 = 0) temporary limit exceeded. The temporary limit may be bounded by elapsed time, distance travelled, driving conditions, or something else that the manufacturer has specified. 001011b = Engine driven fan request 001100b = Low idle governor operation required 001101b = Vehicle speed is greater than zero 001110b = Service brake pedal is not depressed 001111b = Parking brake is not applied 010000b = Transmission is in Reverse 010001b = Clutch pedal is not depressed 010010b = PTO is active 010011b = Stability/Slip Control event is active 010100b = Stability/Slip Control system has a fault 010101b = Interlock is active (e.g., door interlock, hood interlock, etc.) 010110b = Starter system has a fault 010111b to 111110b = SAE Reserved 111111b = Not Supported
8146	Engine Exhaust 1 Gas Sensor 2 Power Supply	State signal which indicates when the Engine Exhaust 1 Intake 2 Gas Sensor driver output is being driven. 00b = Off 01b = On: The ECU is powering the Engine Exhaust 1 Intake 2 Gas Sensor 10b = Error 11b = Unavailable
8147	Aftertreatment 1 Outlet 2 Gas Sensor Power Supply	State signal which indicates when the Aftertreatment 1 Outlet 2 Gas Sensor driver output is being driven. 00b = Off 01b = On: The ECU is powering the Aftertreatment 1 Outlet 2 Gas Sensor 10b = Error 11b = Unavailable
8148	Aftertreatment System Enable Command	Request to enable Aftertreatment system. 00b = De-activate Aftertreatment System 01b = Activate Aftertreatment System 10b = Reserved 11b = Don’t care/Take no Action Note: In some marine applications it may be desireable to enable or disable the aftertreatment system. SPN 7851 indicates the status of the aftertreatment system.
8149	Aftertreatment Diesel Exhaust Fluid Doser Ready Status	Indicates the aftertreatment systems operating conditions are appropriate for dosing. Note: Operating conditions may include but not limited to Diesel Exhaust Fluid tank level and Diesel Exhaust Fluid tank temperature are within the operating threshold. 00b = Aftertreatment Not Ready to Dose 01b = Aftertreatment Ready to Dose 10b = Error 11b = Not available
8150	Engine Exhaust Gas Restriction Valve Control	Desired percentage of maximum Exhaust Gas Restriction opening for valve. 0% means valve is closed. 100% means maximum valve opening (full gas flow).

8151	Engine Exhaust Gas Restriction Valve Position	The position of the exhaust gas restriction valve expressed as a percentage of full travel. 0% means the valve is closed and no exhaust gas is flowing into the intake air stream. 100% means the valve is fully opened.
8152	Aftertreatment 1 Diesel Exhaust Fluid Doser 2 Pressure	The SCR doser 2 diesel exhaust fluid gage pressure (measured closest to dosing valve) for aftertreatment system 1 (exhaust bank 1). This is the gage equivalent to SPN 7459 .
8153	Aftertreatment 2 Diesel Exhaust Fluid Doser 2 Pressure	The SCR doser 2 diesel exhaust fluid gage pressure (measured closest to dosing valve) for aftertreatment system 2 (exhaust bank). This is the gage equivalent to SPN 7464 .
8154	Well Stimulation Pump Suction Pressure	The pressure on the suction side of the well stimulation pump.
8155	Well Stimulation Pump Discharge Pressure	The pressure on the discharge side of the well stimulation pump.
8156	Well Stimulation Pump Gear Box Oil Pressure	The oil pressure measured in the well stimulation pump gear box.
8157	Well Stimulation Pump Gear Box Oil Temperature	Temperature of the oil in the well stimulation pump gear box.
8158	Well Stimulation Pump Speed	The operating speed of the well stimulation pump.
8159	Engine Oil Pressure Switch	Measured engine oil pressure with respect to the pre-set threshold. 00b = OK (Engine Oil Pressure Above Min Threshold) 01b = Not OK (Engine Oil Pressure Below Min Threshold) 10b = Error (Switch State Cannot Be Determined) 11b = Not Available
8160	Aftertreatment 1 Diesel Oxidation Catalyst Intake Pressure	Aftertreatment 1 Diesel Oxidation Catalyst absolute pressure measured at the DOC intake in exhaust bank 1.

8161	Aftertreatment 1 Diesel Oxidation Catalyst Outlet Pressure	Aftertreatment 1 Diesel Oxidation Catalyst absolute pressure measured at the DOC outlet in exhaust bank 1.
8162	Aftertreatment 1 DOC Intake to DPF Outlet Delta Pressure	Aftertreatment 1 Diesel Oxidation Catalyst intake to Diesel Particulate Filter outlet differential pressure in exhaust bank 1.
8163	Aftertreatment 2 Diesel Oxidation Catalyst Intake Pressure	Aftertreatment 2 Diesel Oxidation Catalyst absolute pressure measured at the DOC intake in exhaust bank 1.
8164	Aftertreatment 2 Diesel Oxidation Catalyst Outlet Pressure	Aftertreatment 2 Diesel Oxidation Catalyst absolute pressure measured at the DOC outlet in exhaust bank 1.
8165	Aftertreatment 2 DOC Intake to DPF Outlet Delta Pressure	Aftertreatment 2 Diesel Oxidation Catalyst intake to Diesel Particulate Filter outlet differential pressure in exhaust bank 1.
8166	Directional Vehicle Speed	The velocity and direction of the vehicle. Positive values are used for forward vehicle motion, negative values for reverse vehicle motion. This SPN is intended for control purposes where vehicle direction is required. It is not intended to replace SPN 84.
8167	Oil Debris Monitor Ferrous Bins 1 and 2 Identification Number	Identification number of the Oil Debris Monitoring (ODM) sensor being reported for Ferrous bins 1 and 2. Identification numbers are application specific.
8168	Oil Debris Monitor Ferrous Bin 1 Count	Total number of particles detected in Ferrous bin 1. Bin sizes are application specific.
8169	Oil Debris Monitor Ferrous Bin 2 Count	Total number of particles detected in Ferrous bin 2. Bin sizes are application specific.
8170	Oil Debris Monitor Ferrous Bins 3 and 4 Identification Number	Identification number of the Oil Debris Monitoring (ODM) sensor being reported for Ferrous bins 3 and 4. Identification numbers are application specific.

8171	Oil Debris Monitor Ferrous Bin 3 Count	Total number of particles detected in Ferrous bin 3. Bin sizes are application specific.
8172	Oil Debris Monitor Ferrous Bin 4 Count	Total number of particles detected in Ferrous bin 4. Bin sizes are application specific.
8173	Oil Debris Monitor Ferrous Bins 5 and 6 Identification Number	Identification number of the Oil Debris Monitoring (ODM) sensor being reported for Ferrous bins 5 and 6. Identification numbers are application specific.
8174	Oil Debris Monitor Ferrous Bin 5 Count	Total number of particles detected in Ferrous bin 5. Bin sizes are application specific.
8175	Oil Debris Monitor Ferrous Bin 6 Count	Total number of particles detected in Ferrous bin 6. Bin sizes are application specific.
8176	Oil Debris Monitor Non-Ferrous Bins 1 and 2 Identification Number	Identification number of the Oil Debris Monitoring (ODM) sensor being reported for Non-Ferrous bins 1 and 2. Identification numbers are application specific.
8177	Oil Debris Monitor Non-Ferrous Bin 1 Count	Total number of particles detected in Non-Ferrous bin 1. Bin sizes are application specific.
8178	Oil Debris Monitor Non-Ferrous Bin 2 Count	Total number of particles detected in Non-Ferrous bin 2. Bin sizes are application specific.
8179	Oil Debris Monitor Non-Ferrous Bins 3 and 4 Identification Number	Identification number of the Oil Debris Monitoring (ODM) sensor being reported for Non-Ferrous bins 3 and 4. Identification numbers are application specific.
8180	Oil Debris Monitor Non-Ferrous Bin 3 Count	Total number of particles detected in Non-Ferrous bin 3. Bin sizes are application specific.
8181	Oil Debris Monitor Non-Ferrous Bin 4 Count	Total number of particles detected in Non-Ferrous bin 4. Bin sizes are application specific.

8182	Oil Debris Monitor Non-Ferrous Bins 5 and 6 Identification Number	Identification number of the Oil Debris Monitoring (ODM) sensor being reported for Non-Ferrous bins 5 and 6. Identification numbers are application specific.
8183	Oil Debris Monitor Non-Ferrous Bin 5 Count	Total number of particles detected in Non-Ferrous bin 5. Bin sizes are application specific.
8184	Oil Debris Monitor Non-Ferrous Bin 6 Count	Total number of particles detected in Non-Ferrous bin 6. Bin sizes are application specific.
8185	Oil Debris Monitor Status Identification Number	Identification number of the Oil Debris Monitoring (ODM) sensor being reported. Identification numbers are application specific.
8186	Oil Debris Monitor Total number of Sensors	Total number of Oil Debris Monitoring (ODM) sensors configured for this application.
8187	Oil Debris Monitor Environment Status	Status of the electrical and mechanical environment surrounding the Oil Debris Monitor (ODM) Sensor. 00b = Acceptable environment 01b = Excessive noise in signal 10b = Reserved 11b = Not available
8188	Oil Debris Monitor Sensing Element Status	Status of the Oil Debris Monitor (ODM) sensing element. 00b = Sensing element OK 01b = Fault with sensing element 10b = Reserved 11b = Not available
8189	Oil Debris Monitor Signal Processing Electronics Status	Status of the Oil Debris Monitor (ODM) signal processing electronics. 00b = Electronics functioning normally 01b = Fault in electronics 10b = Reserved 11b = Not available
8190	Oil Debris Monitor Electronics Temperature Status	Temperature indicator for the Oil Debris Monitor (ODM) Electronics. 00b = Acceptable temperature 01b = Temperature is outside of limits 10b = Reserved 11b = Not available
8191	Oil Debris Monitor Configuration Identification Number	Identification number of the Oil Debris Monitoring (ODM) sensor being configured. Identification numbers are application specific.

8192	Oil Debris Monitor Ferrous Bin 1 Count Command	New starting value for total count of particles detected in Ferrous bin 1. NOTE: The value FFFFFFh indicates « Do Not Change » (i.e. the current count value of the Oil Debris Monitor for this bin will not be modified).
8193	Oil Debris Monitor Ferrous Bin 2 Count Command	New starting value for total count of particles detected in Ferrous bin 2. NOTE: The value FFFFFFh indicates « Do Not Change » (i.e. the current count value of the Oil Debris Monitor for this bin will not be modified).
8194	Oil Debris Monitor Ferrous Bin 3 Count Command	New starting value for total count of particles detected in Ferrous bin 3. NOTE: The value FFFFFFh indicates « Do Not Change » (i.e. the current count value of the Oil Debris Monitor for this bin will not be modified).
8195	Oil Debris Monitor Ferrous Bin 4 Count Command	New starting value for total count of particles detected in Ferrous bin 4. NOTE: The value FFFFFFh indicates « Do Not Change » (i.e. the current count value of the Oil Debris Monitor for this bin will not be modified).
8196	Oil Debris Monitor Ferrous Bin 5 Count Command	New starting value for total count of particles detected in Ferrous bin 5. NOTE: The value FFFFFFh indicates « Do Not Change » (i.e. the current count value of the Oil Debris Monitor for this bin will not be modified).
8197	Oil Debris Monitor Ferrous Bin 6 Count Command	New starting value for total count of particles detected in Ferrous bin 6. NOTE: The value FFFFFFh indicates « Do Not Change » (i.e. the current count value of the Oil Debris Monitor for this bin will not be modified).
8198	Oil Debris Monitor Non-Ferrous Bin 1 Count Command	New starting value for total count of particles detected in Non-Ferrous bin 1. NOTE: The value FFFFFFh indicates « Do Not Change » (i.e. the current count value of the Oil Debris Monitor for this bin will not be modified).
8199	Oil Debris Monitor Non-Ferrous Bin 2 Count Command	New starting value for total count of particles detected in Non-Ferrous bin 2. NOTE: The value FFFFFFh indicates « Do Not Change » (i.e. the current count value of the Oil Debris Monitor for this bin will not be modified).

8200	Oil Debris Monitor Non-Ferrous Bin 3 Count Command	New starting value for total count of particles detected in Non-Ferrous bin 3. NOTE: The value FFFFFFh indicates « Do Not Change » (i.e. the current count value of the Oil Debris Monitor for this bin will not be modified).
8201	Oil Debris Monitor Non-Ferrous Bin 4 Count Command	New starting value for total count of particles detected in Non-Ferrous bin 4. NOTE: The value FFFFFFh indicates « Do Not Change » (i.e. the current count value of the Oil Debris Monitor for this bin will not be modified).
8202	Oil Debris Monitor Non-Ferrous Bin 5 Count Command	New starting value for total count of particles detected in Non-Ferrous bin 5. NOTE: The value FFFFFFh indicates « Do Not Change » (i.e. the current count value of the Oil Debris Monitor for this bin will not be modified).
8203	Oil Debris Monitor Non-Ferrous Bin 6 Count Command	New starting value for total count of particles detected in Non-Ferrous bin 6. NOTE: The value FFFFFFh indicates « Do Not Change » (i.e. the current count value of the Oil Debris Monitor for this bin will not be modified).
8204	HVES1 Electronics Temperature	The temperature of the electronics or control modules in the High Voltage Energy Storage 1 pack (or system). If there are mulitple temperature sensors then this parameter would be set to the maximum sensor reading.
8205	HVES1 Discharge Energy Capacity	The amount of stored electrical energy in High Voltage Energy Storage 1 pack (or system) that is available for use by the hybrid system, i.e. “how full is the tank”. See HVES1 Discharge Capacity (SPN 8079) for Ampere-hours (Ah).
8206	HVES1 Charge Energy Capacity	The amount of unused electrical energy storage available to be filled by charging High Voltage Energy Storage 1 pack (or system), i.e. “how much empty space is remaining in the tank”. See HVES1 Charge Capacity (SPN 8080) for Ampere-hours (Ah).
8207	HVES1 Internal Charger Status	Indicates that the charger in the HVES1 is on. External chargers may use the External Energy Source Connection Status (SPN 7898) and related SPNs.00b = Charging off 01b = Charging on 10b = Error 11b = Not Available

8208	HVES1 Recommended Minimum Operating Temperature	Per the HVES manufacturer, this is the recommended minimum temperature for High Voltage Energy Storage 1 pack (or system) operation. Operating below this value may damage HVES hardware, or compromise HVES life.
8209	HVES1 Cell Maximum Voltage Limit	Per the HVES manufacturer, this is the maximum cell voltage for High Voltage Energy Storage 1 pack (or system) operation. Operating above this value may damage HVES hardware, or compromise HVES life.
8210	HVES1 Cell Minimum Voltage Limit	Per the HVES manufacturer, this is the minimum cell voltage for High Voltage Energy Storage 1 pack (or system) operation. Operating below this value may damage HVES hardware, or compromise HVES life.
8211	HVES1 Total Energy Throughput	The total energy throughput which has flowed through High Voltage Energy Storage 1 pack (or system). This parameter is the sum of the absolute values of the Energy into and out of HVES1.
8212	HVES1 Total Accumulated Charge	The total accumulated amp hours which have flowed through High Voltage Energy Storage 1 pack (or system). This parameter is the sum of the absolute values of the Ampere hours into and out of HVES1.
8213	HVES1 Enable Internal Charger Command	When the HVES has an internal charger this parameter will enable it. External chargers may use the External Energy Source Connection Demand (SPN 7890) and related SPNs.00b = Disable charging 01b = Enable charging 10b = Reserved 11b = Not Supported
8214	HVES1 Module 1 Operational Status	Operational Status of the High Voltage Energy Storage 1 Module 1. Not Operational is used when the module is initializing or not able to function (e.g. internal module level monitors have failed). Operational indicates that the module is fully functional. Error is used when the module status is not known (e.g. no communication established between HVES1 controller and the module, power lost, etc.)00b = Not Operational 01b = Operational 10b = Error 11b = Not Available

8215	HVES1 Module 2 Operational Status	Operational Status of the High Voltage Energy Storage 1 Module 2. Not Operational is used when the module is initializing or not able to function (e.g. internal module level monitors have failed). Operational indicates that the module is fully functional. Error is used when the module status is not known (e.g. no communication established between HVES1 controller and the module, power lost, etc.)00b = Not Operational 01b = Operational 10b = Error 11b = Not Available
8216	HVES1 Module 3 Operational Status	Operational Status of the High Voltage Energy Storage 1 Module 3. Not Operational is used when the module is initializing or not able to function (e.g. internal module level monitors have failed). Operational indicates that the module is fully functional. Error is used when the module status is not known (e.g. no communication established between HVES1 controller and the module, power lost, etc.)00b = Not Operational 01b = Operational 10b = Error 11b = Not Available
8217	HVES1 Module 4 Operational Status	Operational Status of the High Voltage Energy Storage 1 Module 4. Not Operational is used when the module is initializing or not able to function (e.g. internal module level monitors have failed). Operational indicates that the module is fully functional. Error is used when the module status is not known (e.g. no communication established between HVES1 controller and the module, power lost, etc.)00b = Not Operational 01b = Operational 10b = Error 11b = Not Available
8218	HVES1 Module 5 Operational Status	Operational Status of the High Voltage Energy Storage 1 Module 5. Not Operational is used when the module is initializing or not able to function (e.g. internal module level monitors have failed). Operational indicates that the module is fully functional. Error is used when the module status is not known (e.g. no communication established between HVES1 controller and the module, power lost, etc.)00b = Not Operational 01b = Operational 10b = Error 11b = Not Available
8219	HVES1 Module 6 Operational Status	Operational Status of the High Voltage Energy Storage 1 Module 6. Not Operational is used when the module is initializing or not able to function (e.g. internal module level monitors have failed). Operational indicates that the module is fully functional. Error is used when the module status is not known (e.g. no communication

		established between HVES1 controller and the module, power lost, etc.)00b = Not Operational 01b = Operational 10b = Error 11b = Not Available
8220	HVES1 Module 7 Operational Status	Operational Status of the High Voltage Energy Storage 1 Module 7. Not Operational is used when the module is initializing or not able to function (e.g. internal module level monitors have failed). Operational indicates that the module is fully functional. Error is used when the module status is not known (e.g. no communication established between HVES1 controller and the module, power lost, etc.)00b = Not Operational 01b = Operational 10b = Error 11b = Not Available
8221	HVES1 Module 8 Operational Status	Operational Status of the High Voltage Energy Storage 1 Module 8. Not Operational is used when the module is initializing or not able to function (e.g. internal module level monitors have failed). Operational indicates that the module is fully functional. Error is used when the module status is not known (e.g. no communication established between HVES1 controller and the module, power lost, etc.)00b = Not Operational 01b = Operational 10b = Error 11b = Not Available
8222	HVES1 Module 9 Operational Status	Operational Status of the High Voltage Energy Storage 1 Module 9. Not Operational is used when the module is initializing or not able to function (e.g. internal module level monitors have failed). Operational indicates that the module is fully functional. Error is used when the module status is not known (e.g. no communication established between HVES1 controller and the module, power lost, etc.)00b = Not Operational 01b = Operational 10b = Error 11b = Not Available
8223	HVES1 Module 10 Operational Status	Operational Status of the High Voltage Energy Storage 1 Module 10. Not Operational is used when the module is initializing or not able to function (e.g. internal module level monitors have failed). Operational indicates that the module is fully functional. Error is used when the module status is not known (e.g. no communication established between HVES1 controller and the module, power lost, etc.)00b = Not Operational 01b = Operational 10b = Error 11b = Not Available
8224	HVES1 Module 11 Operational Status	Operational Status of the High Voltage Energy Storage 1 Module 11. Not Operational is used when the module is initializing or not able to function (e.g. internal module

		level monitors have failed). Operational indicates that the module is fully functional. Error is used when the module status is not known (e.g. no communication established between HVES1 controller and the module, power lost, etc.)00b = Not Operational 01b = Operational 10b = Error 11b = Not Available
8225	HVES1 Module 12 Operational Status	Operational Status of the High Voltage Energy Storage 1 Module 12. Not Operational is used when the module is initializing or not able to function (e.g. internal module level monitors have failed). Operational indicates that the module is fully functional. Error is used when the module status is not known (e.g. no communication established between HVES1 controller and the module, power lost, etc.)00b = Not Operational 01b = Operational 10b = Error 11b = Not Available
8226	HVES1 Module 13 Operational Status	Operational Status of the High Voltage Energy Storage 1 Module 13. Not Operational is used when the module is initializing or not able to function (e.g. internal module level monitors have failed). Operational indicates that the module is fully functional. Error is used when the module status is not known (e.g. no communication established between HVES1 controller and the module, power lost, etc.)00b = Not Operational 01b = Operational 10b = Error 11b = Not Available
8227	HVES1 Module 14 Operational Status	Operational Status of the High Voltage Energy Storage 1 Module 14. Not Operational is used when the module is initializing or not able to function (e.g. internal module level monitors have failed). Operational indicates that the module is fully functional. Error is used when the module status is not known (e.g. no communication established between HVES1 controller and the module, power lost, etc.)00b = Not Operational 01b = Operational 10b = Error 11b = Not Available
8228	HVES1 Module 15 Operational Status	Operational Status of the High Voltage Energy Storage 1 Module 15. Not Operational is used when the module is initializing or not able to function (e.g. internal module level monitors have failed). Operational indicates that the module is fully functional. Error is used when the module status is not known (e.g. no communication established between HVES1 controller and the module, power lost, etc.)00b = Not Operational 01b = Operational 10b = Error 11b = Not Available

8229	HVES1 Module 16 Operational Status	Operational Status of the High Voltage Energy Storage 1 Module 16. Not Operational is used when the module is initializing or not able to function (e.g. internal module level monitors have failed). Operational indicates that the module is fully functional. Error is used when the module status is not known (e.g. no communication established between HVES1 controller and the module, power lost, etc.)00b = Not Operational 01b = Operational 10b = Error 11b = Not Available
8230	HVES1 Thermal Management System SLI Input Power	In multiple HVES configurations, this is the low-voltage power consumed by the HVES1 Thermal Management System (TMS). If there is only one HVES, or a single TMS for all HVES, then this represents the total low-voltage power consumed.
8231	HVES1 Thermal Management System High-Voltage Input Power	In multiple HVES configurations, this is the high-voltage power consumed by the HVES1 Thermal Management System (TMS). If there is only one HVES, or a single TMS for all HVES, then this represents the total high voltage power consumed.
8232	HVES1 Thermal Management System Compressor Speed	When the High Voltage Energy Storage 1 Thermal Management System is equipped with an active cooling system (e.g. air conditioner), this is the Compressor Speed.
8233	HVES1 Thermal Management System Relative Humidty	When the High Voltage Energy Storage 1 Thermal Management System is equipped with a relative humidity sensor, this is the measured Relative Humidity.
8234	HVES1 Thermal Management System Heater Status	This is the state of the High Voltage Energy Storage 1 heater 00b = Heater Off 01b = Heater On 10b = Error 11b = Not Available
8235	HVES1 Thermal Management System Mode	Indicates the operating mode of the Thermal Management System. The heat transfer medium may be (e.g. liquid or air). The cooling system may be fans, liquid coolant, or a combination of mediums. The system may include an air and/or liquid conditioning system with active Cooling, Heating, and/or Drying capabilities.0000b = Off 0001b = Circulating 0010b = Cooling 0011b = Heating 0100b = Drying 0101b to 1101b = Reserved 1110b = Faulted 1111b = Not Available
8236	HVES1 Highest Cell Voltage Module Number	Identifies the location of the module containing the HVES1 Highest Cell Voltage (SPN 5922).

8237	HVES1 Highest Cell Voltage Cell Number	Identifies the location of HVES1 Highest Cell Voltage (SPN 5922) within the HVES1 Highest Cell Voltage Module Number (SPN 8236).
8238	HVES1 Lowest Cell Voltage Module Number	Identifies the location of the module containing the HVES1 Lowest Cell Voltage (SPN 5923).
8239	HVES1 Lowest Cell Voltage Cell Number	Identifies the location of the HVES1 Lowest Cell Voltage (SPN 5923) within the HVES1 Lowest Cell Voltage Module Number (SPN 8238).
8240	HVES1 Average Cell Voltage	The average cell voltage in the High Voltage Energy Storage 1 pack (or system).
8241	HVES1 Highest Cell Temperature Module Number	Identifies the location of the module containing the HVES1 Highest Cell Temperature (SPN 8075).
8242	HVES1 Highest Cell Temperature Cell Number	Identifies the location of the HVES1 Highest Cell Temperature (SPN 8075) within the HVES1 Highest Cell Temperature Module Number (SPN 8241).
8243	HVES1 Lowest Cell Temperature Module Number	Identifies the location of the module containing the HVES1 Lowest Cell Temperature (SPN 8076).
8244	HVES1 Lowest Cell Temperature Cell Number	Identifies the location of the HVES1 Lowest Cell Temperature (SPN 8076) within the HVES1 Lowest Cell Temperature Module Number (SPN 8243).
8245	HVES1 Highest Cell State of Charge Module Number	Identifies the location of the module containing the HVES1 Highest Cell State of Charge (SPN 8085).
8246	HVES1 Highest Cell State of Charge Cell Number	Identifies the location of the HVES1 Highest Cell State of Charge (SPN 8085) within the HVES1 Highest Cell State of Charge Module Number (SPN 8245).
8247	HVES1 Lowest Cell State of Charge Module Number	Identifies the location of the module containing the HVES1 Lowest Cell State of Charge (SPN 8084).

8248	HVES1 Lowest Cell State of Charge Cell Number	Identifies the location of the HVES1 Lowest Cell State of Charge (SPN 8084) within the HVES1 Lowest Cell State of Charge Module Number (SPN 8247).
8249	Hydraulic Pump 1 Case Drain Flow Rate	Calculated flow rate of the hydraulic oil passing through the case drain of Hydraulic Pump 1.
8250	Hydraulic Pump 2 Case Drain Flow Rate	Calculated flow rate of the hydraulic oil passing through the case drain of Hydraulic Pump 2.
8251	Hydraulic Pump 3 Case Drain Flow Rate	Calculated flow rate of the hydraulic oil passing through the case drain of Hydraulic Pump 3.
8252	Hydraulic Pump 4 Case Drain Flow Rate	Calculated flow rate of the hydraulic oil passing through the case drain of Hydraulic Pump 4.
8253	Hydraulic Pump 5 Case Drain Flow Rate	Calculated flow rate of the hydraulic oil passing through the case drain of Hydraulic Pump 5.
8254	Hydraulic Pump 6 Case Drain Flow Rate	Calculated flow rate of the hydraulic oil passing through the case drain of Hydraulic Pump 6.
8255	Hydraulic Pump 1 Case Drain Oil Temperature	The temperature of the hydraulic oil passing through the case drain of Hydraulic Pump 1.
8256	Hydraulic Pump 2 Case Drain Oil Temperature	The temperature of the hydraulic oil passing through the case drain of Hydraulic Pump 2.
8257	Hydraulic Pump 3 Case Drain Oil Temperature	The temperature of the hydraulic oil passing through the case drain of Hydraulic Pump 3.
8258	Hydraulic Pump 4 Case Drain Oil Temperature	The temperature of the hydraulic oil passing through the case drain of Hydraulic Pump 4.

8259	Hydraulic Pump 5 Case Drain Oil Temperature	The temperature of the hydraulic oil passing through the case drain of Hydraulic Pump 5.
8260	Hydraulic Pump 6 Case Drain Oil Temperature	The temperature of the hydraulic oil passing through the case drain of Hydraulic Pump 6.
8261	Hydraulic Pump 1 Efficiency	Calculated efficiency (calculated actual flow rate/theoretical) of Hydraulic Pump 1.
8262	Hydraulic Pump 2 Efficiency	Calculated efficiency (calculated actual flow rate/theoretical) of Hydraulic Pump 2.
8263	Hydraulic Pump 3 Efficiency	Calculated efficiency (calculated actual flow rate/theoretical) of Hydraulic Pump 3.
8264	Hydraulic Pump 4 Efficiency	Calculated efficiency (calculated actual flow rate/theoretical) of Hydraulic Pump 4.
8265	Hydraulic Pump 5 Efficiency	Calculated efficiency (calculated actual flow rate/theoretical) of Hydraulic Pump 5.
8266	Hydraulic Pump 6 Efficiency	Calculated efficiency (calculated actual flow rate/theoretical) of Hydraulic Pump 6.
8267	Hybrid System Propulsion Disable Status	Indicates if the hybrid system is in a state where propulsion is not available. This may be due to Hybrid System Propulsion Disable Request (SPN 7558), Hybrid System Propulsion Disable Switch (SPN 7554), or Hybrid System Off-Board Charger Connection Status (SPN 7551) being active. It may also be due to other internal hybrid reasons for propulsion being disabled (e.g. charging, pre-charge not complete, warm-up modes).00b = Propulsion not disabled 01b = Propulsion is disabled 10b = Error 11b = Not Available Note: Propulsion System Active (SPN 7315) should not be used as an indication of propulsion being disabled as it is required to indicate that the propulsion system is active whenever the engine is running regardless of the state of the hybrid systems ability to provide propulsion power.
8268	DHCP Status	DHCP Client Status. This parameter is intended to provide feedback on the status of obtaining an IP address. When no physical link is available and DHCP is enabled, an Error response is appropriate.0000b = Not Configured (static IP) 0001b = Obtaining IP 0010b = IP Leased 0011b = Contacting DHCP Server 0100b = SAE Reserved

		0101b = SAE Reserved 0110b = SAE Reserved 0111b = SAE Reserved 1000b = SAE Reserved 1001b = SAE Reserved 1010b = SAE Reserved 1011b = SAE Reserved 1100b = SAE Reserved 1101b = SAE Reserved 1110b = Error 1111b = Not Available
8269	Ethernet Link Status	Ethernet Link Status. When there is no physical connection, the status shall report 00. 00b = Ethernet Link Down 01b = Ethernet Link Up 10b = Error 11b = Not Supported
8270	IPv4 Address Octet 1	This value is the first of 4 octets in the ECU's assigned Internet Protocol (IP) address. The address is separated into 4 bytes, 1 per octet of the address. Byte 1 is the first octet of the address. Byte 2 is the second and so forth. If the IP address is not configured or not assigned, the byte positions shall be filled with FFh.Example: Octet1.Octet2.Octet3.Octet4 Byte1.Byte2.Byte3.Byte4 SPN 8270.SPN 8271.SPN 8272.SPN 8273
8271	IPv4 Address Octet 2	This value is the second of 4 octets in the ECU's assigned Internet Protocol (IP) address. The address is separated into 4 bytes, 1 per octet of the address. Byte 1 is the first octet of the address. Byte 2 is the second and so forth. If the IP address is not configured or not assigned, the byte positions shall be filled with FFh.Example: Octet1.Octet2.Octet3.Octet4 Byte1.Byte2.Byte3.Byte4 SPN 8270.SPN 8271.SPN 8272.SPN 8273
8272	IPv4 Address Octet 3	This value is the third of 4 octets in the ECU's assigned Internet Protocol (IP) address. The address is separated into 4 bytes, 1 per octet of the address. Byte 1 is the first octet of the address. Byte 2 is the second and so forth. If the IP address is not configured or not assigned, the byte positions shall be filled with FFh.Example: Octet1.Octet2.Octet3.Octet4 Byte1.Byte2.Byte3.Byte4 SPN 8270.SPN 8271.SPN 8272.SPN 8273
8273	IPv4 Address Octet 4	This value is the fourth of 4 octets in the ECU's assigned Internet Protocol (IP) address. The address is separated into 4 bytes, 1 per octet of the address. Byte 1 is the first octet of the address. Byte 2 is the second and so forth. If the IP address is not configured or not assigned, the byte positions shall be filled with FFh.Example:

		Octet1.Octet2.Octet3.Octet4 Byte1.Byte2.Byte3.Byte4 SPN 8270.SPN 8271.SPN 8272.SPN 8273
8274	Subnet Mask Octet 1	This value is the first of 4 octets in the ECU's configured Subnet mask. The subnet mask is separated into 4 bytes, 1 per octet of the mask. Byte 1 is the first octet of the mask. Byte 2 is the second and so forth. If the Subnet mask is not configured, the byte positions shall be filled with FFh.Example: Octet1.Octet2.Octet3.Octet4 Byte1.Byte2.Byte3.Byte4 SPN 8274.SPN 8275.SPN 8276.SPN 8277
8275	Subnet Mask Octet 2	This value is the second of 4 octets in the ECU's configured Subnet mask. The subnet mask is separated into 4 bytes, 1 per octet of the mask. Byte 1 is the first octet of the mask. Byte 2 is the second and so forth. If the Subnet mask is not configured, the byte positions shall be filled with FFh.Example: Octet1.Octet2.Octet3.Octet4 Byte1.Byte2.Byte3.Byte4 SPN 8274.SPN 8275.SPN 8276.SPN 8277
8276	Subnet Mask Octet 3	This value is the third of 4 octets in the ECU's configured Subnet mask. The subnet mask is separated into 4 bytes, 1 per octet of the mask. Byte 1 is the first octet of the mask. Byte 2 is the second and so forth. If the Subnet mask is not configured, the byte positions shall be filled with FFh.Example: Octet1.Octet2.Octet3.Octet4 Byte1.Byte2.Byte3.Byte4 SPN 8274.SPN 8275.SPN 8276.SPN 8277
8277	Subnet Mask Octet 4	This value is the fourth of 4 octets in the ECU's configured Subnet mask. The subnet mask is separated into 4 bytes, 1 per octet of the mask. Byte 1 is the first octet of the mask. Byte 2 is the second and so forth. If the Subnet mask is not configured, the byte positions shall be filled with FFh.Example: Octet1.Octet2.Octet3.Octet4 Byte1.Byte2.Byte3.Byte4 SPN 8274.SPN 8275.SPN 8276.SPN 8277
8278	Default Gateway Octet 1	This value is the first of 4 octets in the ECU's configured or assigned Default Gateway IP address. The Default Gateway IP address is separated into 4 bytes, 1 per octet of the address Byte 1 is the first octet of the address Byte 2 is the second and so forth. If the Default Gateway IP address is not configured or assigned, the byte positions shall be filled with FFh.Example: Octet1.Octet2.Octet3.Octet4 Byte1.Byte2.Byte3.Byte4 SPN 8278.SPN 8279.SPN 8280.SPN 8281

8279	Default Gateway Octet 2	This value is the second of 4 octets in the ECU's configured or assigned Default Gateway IP address. The Default Gateway IP address is separated into 4 bytes, 1 per octet of the address Byte 1 is the first octet of the address Byte 2 is the second and so forth. If the Default Gateway IP address is not configured or assigned, the byte positions shall be filled with FFh.Example: Octet1.Octet2.Octet3.Octet4 Byte1.Byte2.Byte3.Byte4 SPN 8278.SPN 8279.SPN 8280.SPN 8281
8280	Default Gateway Octet 3	This value is the third of 4 octets in the ECU's configured or assigned Default Gateway IP address. The Default Gateway IP address is separated into 4 bytes, 1 per octet of the address Byte 1 is the first octet of the address Byte 2 is the second and so forth. If the Default Gateway IP address is not configured or assigned, the byte positions shall be filled with FFh.Example: Octet1.Octet2.Octet3.Octet4 Byte1.Byte2.Byte3.Byte4 SPN 8278.SPN 8279.SPN 8280.SPN 8281
8281	Default Gateway Octet 4	This value is the fourth of 4 octets in the ECU's configured or assigned Default Gateway IP address. The Default Gateway IP address is separated into 4 bytes, 1 per octet of the address Byte 1 is the first octet of the address Byte 2 is the second and so forth. If the Default Gateway IP address is not configured or assigned, the byte positions shall be filled with FFh.Example: Octet1.Octet2.Octet3.Octet4 Byte1.Byte2.Byte3.Byte4 SPN 8278.SPN 8279.SPN 8280.SPN 8281
8282	MAC Address Octet 1	This value is the first of 6 octets in the ECU's assigned MAC address. The address is separated into 6 bytes, 1 per octet of the address. Byte 1 is the first octet of the address. Byte 2 is the second and so forth. If the MAC address is not configured or not assigned, the byte positions shall be filled with FFh.Example: Octet1:Octet2:Octet3:Octet4:Octet5:Octet6 Byte1:Byte2:Byte3:Byte4:Byte5:Byte6 SPN 8282:SPN 8283:SPN 8284:SPN 8285:SPN 8286:SPN 8287
8283	MAC Address Octet 2	This value is the second of 6 octets in the ECU's assigned MAC address. The address is separated into 6 bytes, 1 per octet of the address. Byte 1 is the first octet of the address. Byte 2 is the second and so forth. If the MAC address is not configured or not assigned, the byte positions shall be filled with FFh.Example:

		Octet1:Octet2:Octet3:Octet4:Octet5:Octet6 Byte1:Byte2:Byte3:Byte4:Byte5:Byte6 SPN 8282:SPN 8283:SPN 8284:SPN 8285:SPN 8286:SPN 8287
8284	MAC Address Octet 3	This value is the third of 6 octets in the ECU's assigned MAC address. The address is separated into 6 bytes, 1 per octet of the address. Byte 1 is the first octet of the address. Byte 2 is the second and so forth. If the MAC address is not configured or not assigned, the byte positions shall be filled with FFh.Example: Octet1:Octet2:Octet3:Octet4:Octet5:Octet6 Byte1:Byte2:Byte3:Byte4:Byte5:Byte6 SPN 8282:SPN 8283:SPN 8284:SPN 8285:SPN 8286:SPN 8287
8285	MAC Address Octet 4	This value is the fourth of 6 octets in the ECU's assigned MAC address. The address is separated into 6 bytes, 1 per octet of the address. Byte 1 is the first octet of the address. Byte 2 is the second and so forth. If the MAC address is not configured or not assigned, the byte positions shall be filled with FFh.Example: Octet1:Octet2:Octet3:Octet4:Octet5:Octet6 Byte1:Byte2:Byte3:Byte4:Byte5:Byte6 SPN 8282:SPN 8283:SPN 8284:SPN 8285:SPN 8286:SPN 8287
8286	MAC Address Octet 5	This value is the fifth of 6 octets in the ECU's assigned MAC address. The address is separated into 6 bytes, 1 per octet of the address. Byte 1 is the first octet of the address. Byte 2 is the second and so forth. If the MAC address is not configured or not assigned, the byte positions shall be filled with FFh.Example: Octet1:Octet2:Octet3:Octet4:Octet5:Octet6 Byte1:Byte2:Byte3:Byte4:Byte5:Byte6 SPN 8282:SPN 8283:SPN 8284:SPN 8285:SPN 8286:SPN 8287
8287	MAC Address Octet 6	This value is the sixth of 6 octets in the ECU's assigned MAC address. The address is separated into 6 bytes, 1 per octet of the address. Byte 1 is the first octet of the address. Byte 2 is the second and so forth. If the MAC address is not configured or not assigned, the byte positions shall be filled with FFh.Example: Octet1:Octet2:Octet3:Octet4:Octet5:Octet6 Byte1:Byte2:Byte3:Byte4:Byte5:Byte6 SPN 8282:SPN 8283:SPN 8284:SPN 8285:SPN 8286:SPN 8287
8288	Host Name	The Host Name of the sending ECU for its embedded Ethernet port. Host Names can be up to 63 characters in length.

8289	Fuel System Control Module	The electronic control unit for a fuel system. This control unit may be used to control multiple fuel actuators and measure fuel parameters.
8290	Engine Gaseous Fuel Pressure Regulator Intake Temperature	The temperature of the fuel at the intake of the pressure regulator.
8291	Transmission Manual Mode Indicator	This parameter indicates if the operator has selected a Manual Mode of the transmission. When a Manual Mode is active, the operator has directly and intentionally restricted the available transmission ranges for the given vehicle direction. A Manual Mode may require direct operator input before any shifts are initiated (e.g. « Upshift » or « Downshift » inputs), or may just prevent the transmission from achieving its maximum range in that direction (e.g. via selection of « Low » or another range below the maximum). When not in Manual Mode, the transmission always selects the optimum range for current operating conditions, and initiates any shifts as needed.Manual Modes are typically associated with forward ranges. However, Manual Modes may also be available in applications where the transmission supports multiple reverse ranges. Manual Mode should not be indicated when the transmission is in Park or Neutral, nor when another vehicle function (e.g. engine braking, adaptive cruise control) modifies the shift schedule or available transmission ranges. 00b = Transmission is not in a Manual Mode 01b = Transmission is in a Manual Mode 10b = Reserved 11b = Not Available
8292	Electrified Accessory Motor 1	Indicates this instance of the Electrified Accessory Motor. Multiple instances can be controlled with the same command PGN by setting each unique instance parameter to 0b.0b = Command applied to this Accessory Motor Instance 1b = No Command applied to this Accessory Motor Instance
8293	Electrified Accessory Motor 2	Indicates this instance of the Electrified Accessory Motor. Multiple instances can be controlled with the same command PGN by setting each unique instance parameter to 0b.0b = Command applied to this Accessory Motor Instance 1b = No Command applied to this Accessory Motor Instance

8294	Electrified Accessory Motor 3	Indicates this instance of the Electrified Accessory Motor. Multiple instances can be controlled with the same command PGN by setting each unique instance parameter to 0b.0b = Command applied to this Accessory Motor Instance 1b = No Command applied to this Accessory Motor Instance
8295	Electrified Accessory Motor 4	Indicates this instance of the Electrified Accessory Motor. Multiple instances can be controlled with the same command PGN by setting each unique instance parameter to 0b.0b = Command applied to this Accessory Motor Instance 1b = No Command applied to this Accessory Motor Instance
8296	Electrified Accessory Motor 5	Indicates this instance of the Electrified Accessory Motor. Multiple instances can be controlled with the same command PGN by setting each unique instance parameter to 0b.0b = Command applied to this Accessory Motor Instance 1b = No Command applied to this Accessory Motor Instance
8297	Electrified Accessory Motor 6	Indicates this instance of the Electrified Accessory Motor. Multiple instances can be controlled with the same command PGN by setting each unique instance parameter to 0b.0b = Command applied to this Accessory Motor Instance 1b = No Command applied to this Accessory Motor Instance
8298	Electrified Accessory Motor 7	Indicates this instance of the Electrified Accessory Motor. Multiple instances can be controlled with the same command PGN by setting each unique instance parameter to 0b.0b = Command applied to this Accessory Motor Instance 1b = No Command applied to this Accessory Motor Instance
8299	Electrified Accessory Motor 8	Indicates this instance of the Electrified Accessory Motor. Multiple instances can be controlled with the same command PGN by setting each unique instance parameter to 0b.0b = Command applied to this Accessory Motor Instance 1b = No Command applied to this Accessory Motor Instance
8300	Electrified Accessory Motor 9	Indicates this instance of the Electrified Accessory Motor. Multiple instances can be controlled with the same command PGN by setting each unique instance parameter to

		0b.0b = Command applied to this Accessory Motor Instance 1b = No Command applied to this Accessory Motor Instance
8301	Electrified Accessory Motor 10	Indicates this instance of the Electrified Accessory Motor. Multiple instances can be controlled with the same command PGN by setting each unique instance parameter to 0b.0b = Command applied to this Accessory Motor Instance 1b = No Command applied to this Accessory Motor Instance
8302	Electrified Accessory Motor 11	Indicates this instance of the Electrified Accessory Motor. Multiple instances can be controlled with the same command PGN by setting each unique instance parameter to 0b.0b = Command applied to this Accessory Motor Instance 1b = No Command applied to this Accessory Motor Instance
8303	Electrified Accessory Motor 12	Indicates this instance of the Electrified Accessory Motor. Multiple instances can be controlled with the same command PGN by setting each unique instance parameter to 0b.0b = Command applied to this Accessory Motor Instance 1b = No Command applied to this Accessory Motor Instance
8304	Electrified Accessory Motor 13	Indicates this instance of the Electrified Accessory Motor. Multiple instances can be controlled with the same command PGN by setting each unique instance parameter to 0b.0b = Command applied to this Accessory Motor Instance 1b = No Command applied to this Accessory Motor Instance
8305	Electrified Accessory Motor 14	Indicates this instance of the Electrified Accessory Motor. Multiple instances can be controlled with the same command PGN by setting each unique instance parameter to 0b.0b = Command applied to this Accessory Motor Instance 1b = No Command applied to this Accessory Motor Instance
8306	Electrified Accessory Motor 15	Indicates this instance of the Electrified Accessory Motor. Multiple instances can be controlled with the same command PGN by setting each unique instance parameter to 0b.0b = Command applied to this Accessory Motor Instance 1b = No Command applied to this Accessory Motor Instance

8308	Electrified Accessory Motor Instance	Indicates the electrified accessory instance that is providing status. 0000b = Instance 1 0001b = Instance 2 0010b = Instance 3 0011b = Instance 4 0100b = Instance 5 0101b = Instance 6 0110b = Instance 7 0111b = Instance 8 1000b = Instance 9 1001b = Instance 10 1010b = Instance 11 1011b = Instance 12 1100b = Instance 13 1101b = Instance 14 1110b = Instance 15 1111b = Not available / Instance not specified
8309	Aftertreatment 2 Diesel Exhaust Fluid Dosing Unit 1 Heater Relay	Relay used to provide power to the Aftertreatment DEF dosing unit 2 heater.
8310	Engine Fuel System 2 Total Intake Mass Air Flow Rate	Mass Flow rate of air entering the second fuel system of the engine. This also includes the amount of exhaust gas recirculated, if any.
8311	Engine Fuel Rack 2 Actuator	Actuator that positions the fuel rack 2 to control fuel supply to the injectors.
8312	Dump Body Roll Angle	The angle between the dump body y-axis and the ground plane (i.e. rotation about the X-axis). The roll angle for a roll to the right is reported with a positive value. Roll angle is the same for both Z-Down and Z-Up axis systems, since both systems have positive X-axis directed forward. The sign of the value is in accordance to the right-hand rule, as specified in SAE J670.
8313	Dump Body Raise Angle	The angular position of the dump body referenced to the vehicle chassis. 0 degrees represents the body in its resting position.
8314	Dump Body Raise Position Relative to Recommended Maximum	The angular position of the dump body expressed as a percentage of the maximum recommended body raised position. 100% represents the maximum default raised position of the dump body and is measured related to level ground.Note: Depending on the machine orientation it may be possible to raise body above recommended maximum position, equally it may not be possible to reach maximum recommended position.
8315	Dump Body Ejector Blade Position	The dump body ejector blade is used to push material out of the dump body of a dump truck. 0% represents the fully retracted position and 100% represents the fully extended position.

8316	Ethernet Network 1	Ethernet Network 1 communications port.
8317	Ethernet Network 2	Ethernet Network 2 communications port.
8318	Engine Exhaust Bank 2 Pressure Regulator Control Command	The control command to the Engine Exhaust Pressure Regulator in bank 2, normalized to percent. 100 percent means the regulator is fully closed, providing the maximum restriction to exhaust gas flow from the engine. Zero percent means the regulator is fully open, providing the minimum available restriction.
8319	Engine Exhaust Bank 2 Pressure Regulator Position	The position of the Exhaust Pressure Regulator (EPR) in bank 2 expressed as a percentage of full travel. One hundred percent means the regulator is fully closed, providing the maximum restriction to exhaust gas flow from the engine. Zero percent means the regulator is fully open, providing the minimum available restriction.
8320	Engine Exhaust Bank 1 Pressure Regulator Temperature	Temperature of the exhaust pressure regulator in bank 1.
8321	Engine Exhaust Bank 2 Pressure Regulator Temperature	Temperature of the exhaust pressure regulator in bank 2.
8322	Engine Exhaust Bank 1 Pressure Regulator Actuator	Actuator that controls the engine exhaust pressure regulator for bank 1. The control command to the actuator, normalized to percent, where 0% nominally represents fully closed, providing the maximum restriction to exhaust gas flow from the engine and 100% represents fully open, providing the minimum available restriction.
8323	Engine Exhaust Bank 2 Pressure Regulator Actuator	Actuator that controls the engine exhaust pressure regulator for bank 2. The control command to the actuator, normalized to percent, where 0% nominally represents fully closed, providing the maximum restriction to exhaust gas flow from the engine and 100% represents fully open, providing the minimum available restriction.
8324	Gaseous Fuel High Pressure Shutoff Valve 2	The gaseous fuel shutoff valve located after the gas pressure regulator. This valve isolates the engine from the gas supply by stopping the high pressure gas from entering the engine.

8325	Engine Exhaust Gas Restriction Valve Temperature	The temperature measured closest to Engine Exhaust Gas Restriction Valve.
8326	Aftertreatment Total Diesel Exhaust Fluid Used	Total amount of DEF used by aftertreatment device 1 and aftertreatment device 2 over the lifetime of the system.See SPNs 5963 and 5964 for individual device accumulation.
8327	Aftertreatment 1 SCR Intake High Temperature Time	Indicates the time the aftertreatment 1 SCR intake temperature is above a manufacturer specified threshold. This is the temperature of engine combustion byproducts entering the SCR in exhaust bank 1. This will accumulate over the life of the product and will never be reset.
8328	DC/AC Accessory Inverter 1 Device Maximum Frequency	Signal to the DC/AC Accessory Inverter indicating the maximum frequency of the devices(s) attached to the inverter output. Each output may control multiple devices (e.g. electric motors) if they all operate at the same frequency.
8329	DC/AC Accessory Inverter 1 Device Minimum Frequency	Signal to the DC/AC Accessory Inverter indicating the minimum frequency of the device(s) attached to the inverter output. Each output may control multiple devices (e.g. electric motors) if they all operate at the same frequency.
8330	DC/AC Accessory Inverter 1 Device Rated Frequency	Signal to the DC/AC Accessory Inverter indicating the rated frequency of the device(s) attached to the inverter output. Each output may control multiple devices (e.g. electric motors) if they all operate at the same frequency.
8331	DC/AC Accessory Inverter 1 Device Rated RMS Voltage	Signal to the DC/AC Accessory Inverter indicating the rated RMS voltage of the device(s) attached to the inverter output. Each output may control multiple devices (e.g. electric motors) if they all operate at the same frequency.
8332	DC/AC Accessory Inverter 1 Device Frequency Rate of Change Limit	Signal to the DC/AC Accessory Inverter indicating the frequency rate of change limit of the device(s) attached to the inverter output (Note: Increasing and decreasing rates can be controlled by the same signal). Each output may control multiple devices (e.g. electric motors) if they all operate at the same frequency.

8333	DC/AC Accessory Inverter 1 Frequency Command	Command to the DC/AC Accessory Inverter indicating the Inverter frequency desired for the device(s) attached to the inverter output. Each output may control multiple devices (e.g. electric motors) if they all operate at the same frequency.
8334	DC/AC Accessory Inverter 1 Device 1 Status	Signal to the DC/AC Accessory Inverter indicating the state of the device attached to the inverter output. Each output may control multiple devices (e.g. electric motors) if they all operate at the same frequency.The Faulted Off state will be communicated when the device has a fault due to an overload condition or other fault resulting in a shutdown. The Faulted On state will be communicated when the device has a fault that has resulted in an operational state that is running but no longer controllable. The Error state is used when the operational state of the device is unknown. 000b = On 001b = Off 010b = Faulted On 011b = Faulted Off 100b = Reserved for SAE Assignment 101b = Reserved for SAE Assignment 110b = Error 111b = Not Available
8335	DC/AC Accessory Inverter 1 Device 2 Status	Signal to the DC/AC Accessory Inverter indicating the state of the device attached to the inverter output. Each output may control multiple devices (e.g. electric motors) if they all operate at the same frequency.The Faulted Off state will be communicated when the device has a fault due to an overload condition or other fault resulting in a shutdown. The Faulted On state will be communicated when the device has a fault that has resulted in an operational state that is running but no longer controllable. The Error state is used when the operational state of the device is unknown. 000b = On 001b = Off 010b = Faulted On 011b = Faulted Off 100b = Reserved for SAE Assignment 101b = Reserved for SAE Assignment 110b = Error 111b = Not Available
8336	DC/AC Accessory Inverter 1 Operational Command	Command to the DC/AC Accessory Inverter to enable this output. Each output may control multiple devices (e.g. electric motors) if they all operate at the same frequency.00b = Disable DC/AC Accessory Inverter Output 01b = Enable DC/AC Accessory Inverter Output 10b = Power down DC/AC Accessory Inverter Controller 11b = Not Available

8337	DC/AC Accessory Inverter 1 Frequency	Present operating frequency of this DC/AC Accessory Inverter output.
8338	DC/AC Accessory Inverter 1 AC Side RMS Voltage	Present operating AC Side line to line RMS voltage of this DC/AC Accessory Inverter output. In a three phase balanced motor, this is the RMS voltage across one phase of the motor.
8339	DC/AC Accessory Inverter 1 AC Side Power	Present operating AC Side power of this DC/AC Accessory Inverter output.
8340	DC/AC Accessory Inverter 1 Operational Status	Operating Status of this DC/AC Accessory Inverter output. The Inverter Output Faulted state will be communicated when the inverter output has shutdown due to an overload condition or other fault.000b = Output Disabled 001b = Output Enabled 010b = Output Faulted On 011b = Output Faulted Off 100b = Normal Power Down in Process 101b = Reserved 110b = Error 111b = Not Available
8341	DC/AC Accessory Inverter 1 Loadshed Request	Loadshed Request from this DC/AC Accessory Inverter output. The Loadshed Requested state is an indication that the inverter output powering this device has a malfunction and is in a limit condition and if the load of the output is not reduced, the inverter will take steps to protect itself. The Loadshed Requested, Shutdown Imminent state is an indication that the loadshed needs have not been met and the output will be shutdown in a limited amount of time.00b = No Loadshed Requested 01b = Loadshed Requested 10b = Loadshed Requested, Shutdown Imminent 11b = Don’t Care/Take No Action
8342	DC/AC Accessory Inverter 2 Device Maximum Frequency	Signal to the DC/AC Accessory Inverter indicating the maximum frequency of the devices(s) attached to the inverter output. Each output may control multiple devices (e.g. electric motors) if they all operate at the same frequency.
8343	DC/AC Accessory Inverter 2 Device Minimum Frequency	Signal to the DC/AC Accessory Inverter indicating the minimum frequency of the device(s) attached to the inverter output. Each output may control multiple devices (e.g. electric motors) if they all operate at the same frequency.

8344	DC/AC Accessory Inverter 2 Device Rated Frequency	Signal to the DC/AC Accessory Inverter indicating the rated frequency of the device(s) attached to the inverter output. Each output may control multiple devices (e.g. electric motors) if they all operate at the same frequency.
8345	DC/AC Accessory Inverter 2 Device Rated RMS Voltage	Signal to the DC/AC Accessory Inverter indicating the rated RMS voltage of the device(s) attached to the inverter output. Each output may control multiple devices (e.g. electric motors) if they all operate at the same frequency.
8346	DC/AC Accessory Inverter 2 Device Frequency Rate of Change Limit	Signal to the DC/AC Accessory Inverter indicating the frequency rate of change limit of the device(s) attached to the inverter output (Note: Increasing and decreasing rates can be controlled by the same signal). Each output may control multiple devices (e.g. electric motors) if they all operate at the same frequency.
8347	DC/AC Accessory Inverter 2 Frequency Command	Command to the DC/AC Accessory Inverter indicating the Inverter frequency desired for the device(s) attached to the inverter output. Each output may control multiple devices (e.g. electric motors) if they all operate at the same frequency.
8348	DC/AC Accessory Inverter 2 Device 1 Status	Signal to the DC/AC Accessory Inverter indicating the state of the device attached to the inverter output. Each output may control multiple devices (e.g. electric motors) if they all operate at the same frequency.The Faulted Off state will be communicated when the device has a fault due to an overload condition or other fault resulting in a shutdown. The Faulted On state will be communicated when the device has a fault that has resulted in an operational state that is running but no longer controllable. The Error state is used when the operational state of the device is unknown. 000b = On 001b = Off 010b = Faulted On 011b = Faulted Off 100b = Reserved for SAE Assignment 101b = Reserved for SAE Assignment 110b = Error 111b = Not Available
8349	DC/AC Accessory Inverter 2 Device 2 Status	Signal to the DC/AC Accessory Inverter indicating the state of the device attached to the inverter output. Each output may control multiple devices (e.g. electric motors) if they all operate at the same frequency.The Faulted Off state will be communicated when the device has a fault due to an overload condition or other fault resulting in a shutdown. The Faulted On state will be communicated when the device has a fault

		that has resulted in an operational state that is running but no longer controllable. The Error state is used when the operational state of the device is unknown. 000b = On 001b = Off 010b = Faulted On 011b = Faulted Off 100b = Reserved for SAE Assignment 101b = Reserved for SAE Assignment 110b = Error 111b = Not Available
8350	DC/AC Accessory Inverter 2 Operational Command	Command to the DC/AC Accessory Inverter to enable this output. Each output may control multiple devices (e.g. electric motors) if they all operate at the same frequency.00b = Disable DC/AC Accessory Inverter Output 01b = Enable DC/AC Accessory Inverter Output 10b = Power down DC/AC Accessory Inverter Controller 11b = Not Available
8351	DC/AC Accessory Inverter 2 Frequency	Present operating frequency of this DC/AC Accessory Inverter output.
8352	DC/AC Accessory Inverter 2 AC Side RMS Voltage	Present operating AC Side line to line RMS voltage of this DC/AC Accessory Inverter output. In a three phase balanced motor, this is the RMS voltage across one phase of the motor.
8353	DC/AC Accessory Inverter 2 AC Side Power	Present operating AC Side power of this DC/AC Accessory Inverter output.
8354	DC/AC Accessory Inverter 2 Operational Status	Operating Status of this DC/AC Accessory Inverter output. The Inverter Output Faulted state will be communicated when the inverter output has shutdown due to an overload condition or other fault.000b = Output Disabled 001b = Output Enabled 010b = Output Faulted On 011b = Output Faulted Off 100b = Normal Power Down in Process 101b = Reserved 110b = Error 111b = Not Available
8355	DC/AC Accessory Inverter 2 Loadshed Request	Loadshed Request from this DC/AC Accessory Inverter output. The Loadshed Requested state is an indication that the inverter output powering this device has a malfunction and is in a limit condition and if the load of the output is not reduced, the inverter will take steps to protect itself. The Loadshed Requested, Shutdown Imminent state is an indication that the loadshed needs have not been met and the

		output will be shutdown in a limited amount of time.00b = No Loadshed Requested 01b = Loadshed Requested 10b = Loadshed Requested, Shutdown Imminent 11b = Don’t Care/Take No Action
8356	DC/AC Accessory Inverter 3 Device Maximum Frequency	Signal to the DC/AC Accessory Inverter indicating the maximum frequency of the devices(s) attached to the inverter output. Each output may control multiple devices (e.g. electric motors) if they all operate at the same frequency.
8357	DC/AC Accessory Inverter 3 Device Minimum Frequency	Signal to the DC/AC Accessory Inverter indicating the minimum frequency of the device(s) attached to the inverter output. Each output may control multiple devices (e.g. electric motors) if they all operate at the same frequency.
8358	DC/AC Accessory Inverter 3 Device Rated Frequency	Signal to the DC/AC Accessory Inverter indicating the rated frequency of the device(s) attached to the inverter output. Each output may control multiple devices (e.g. electric motors) if they all operate at the same frequency.
8359	DC/AC Accessory Inverter 3 Device Rated RMS Voltage	Signal to the DC/AC Accessory Inverter indicating the rated RMS voltage of the device(s) attached to the inverter output. Each output may control multiple devices (e.g. electric motors) if they all operate at the same frequency.
8360	DC/AC Accessory Inverter 3 Device Frequency Rate of Change Limit	Signal to the DC/AC Accessory Inverter indicating the frequency rate of change limit of the device(s) attached to the inverter output (Note: Increasing and decreasing rates can be controlled by the same signal). Each output may control multiple devices (e.g. electric motors) if they all operate at the same frequency.
8361	DC/AC Accessory Inverter 3 Frequency Command	Command to the DC/AC Accessory Inverter indicating the Inverter frequency desired for the device(s) attached to the inverter output. Each output may control multiple devices (e.g. electric motors) if they all operate at the same frequency.
8362	DC/AC Accessory Inverter 3 Device 1 Status	Signal to the DC/AC Accessory Inverter indicating the state of the device attached to the inverter output. Each output may control multiple devices (e.g. electric motors) if they all operate at the same frequency.The Faulted Off state will be communicated when the device has a fault due to an overload condition or other fault resulting in a

		shutdown. The Faulted On state will be communicated when the device has a fault that has resulted in an operational state that is running but no longer controllable. The Error state is used when the operational state of the device is unknown. 000b = On 001b = Off 010b = Faulted On 011b = Faulted Off 100b = Reserved for SAE Assignment 101b = Reserved for SAE Assignment 110b = Error 111b = Not Available
8363	DC/AC Accessory Inverter 3 Device 2 Status	Signal to the DC/AC Accessory Inverter indicating the state of the device attached to the inverter output. Each output may control multiple devices (e.g. electric motors) if they all operate at the same frequency.The Faulted Off state will be communicated when the device has a fault due to an overload condition or other fault resulting in a shutdown. The Faulted On state will be communicated when the device has a fault that has resulted in an operational state that is running but no longer controllable. The Error state is used when the operational state of the device is unknown. 000b = On 001b = Off 010b = Faulted On 011b = Faulted Off 100b = Reserved for SAE Assignment 101b = Reserved for SAE Assignment 110b = Error 111b = Not Available
8364	DC/AC Accessory Inverter 3 Operational Command	Command to the DC/AC Accessory Inverter to enable this output. Each output may control multiple devices (e.g. electric motors) if they all operate at the same frequency.00b = Disable DC/AC Accessory Inverter Output 01b = Enable DC/AC Accessory Inverter Output 10b = Power down DC/AC Accessory Inverter Controller 11b = Not Available
8365	DC/AC Accessory Inverter 3 Frequency	Present operating frequency of this DC/AC Accessory Inverter output.
8366	DC/AC Accessory Inverter 3 AC Side RMS Voltage	Present operating AC Side line to line RMS voltage of this DC/AC Accessory Inverter output. In a three phase balanced motor, this is the RMS voltage across one phase of the motor.
8367	DC/AC Accessory Inverter 3 AC Side Power	Present operating AC Side power of this DC/AC Accessory Inverter output.

8368	DC/AC Accessory Inverter 3 Operational Status	Operating Status of this DC/AC Accessory Inverter output. The Inverter Output Faulted state will be communicated when the inverter output has shutdown due to an overload condition or other fault.000b = Output Disabled 001b = Output Enabled 010b = Output Faulted On 011b = Output Faulted Off 100b = Normal Power Down in Process 101b = Reserved 110b = Error 111b = Not Available
8369	DC/AC Accessory Inverter 3 Loadshed Request	Loadshed Request from this DC/AC Accessory Inverter output. The Loadshed Requested state is an indication that the inverter output powering this device has a malfunction and is in a limit condition and if the load of the output is not reduced, the inverter will take steps to protect itself. The Loadshed Requested, Shutdown Imminent state is an indication that the loadshed needs have not been met and the output will be shutdown in a limited amount of time.00b = No Loadshed Requested 01b = Loadshed Requested 10b = Loadshed Requested, Shutdown Imminent 11b = Don’t Care/Take No Action
8370	DC/AC Accessory Inverter 4 Device Maximum Frequency	Signal to the DC/AC Accessory Inverter indicating the maximum frequency of the devices(s) attached to the inverter output. Each output may control multiple devices (e.g. electric motors) if they all operate at the same frequency.
8371	DC/AC Accessory Inverter 4 Device Minimum Frequency	Signal to the DC/AC Accessory Inverter indicating the minimum frequency of the device(s) attached to the inverter output. Each output may control multiple devices (e.g. electric motors) if they all operate at the same frequency.
8372	DC/AC Accessory Inverter 4 Device Rated Frequency	Signal to the DC/AC Accessory Inverter indicating the rated frequency of the device(s) attached to the inverter output. Each output may control multiple devices (e.g. electric motors) if they all operate at the same frequency.
8373	DC/AC Accessory Inverter 4 Device Rated RMS Voltage	Signal to the DC/AC Accessory Inverter indicating the rated RMS voltage of the device(s) attached to the inverter output. Each output may control multiple devices (e.g. electric motors) if they all operate at the same frequency.
8374	DC/AC Accessory Inverter 4 Device Frequency Rate of Change Limit	Signal to the DC/AC Accessory Inverter indicating the frequency rate of change limit of the device(s) attached to the inverter output (Note: Increasing and decreasing rates

		can be controlled by the same signal). Each output may control multiple devices (e.g. electric motors) if they all operate at the same frequency.
8375	DC/AC Accessory Inverter 4 Frequency Command	Command to the DC/AC Accessory Inverter indicating the Inverter frequency desired for the device(s) attached to the inverter output. Each output may control multiple devices (e.g. electric motors) if they all operate at the same frequency.
8376	DC/AC Accessory Inverter 4 Device 1 Status	Signal to the DC/AC Accessory Inverter indicating the state of the device attached to the inverter output. Each output may control multiple devices (e.g. electric motors) if they all operate at the same frequency.The Faulted Off state will be communicated when the device has a fault due to an overload condition or other fault resulting in a shutdown. The Faulted On state will be communicated when the device has a fault that has resulted in an operational state that is running but no longer controllable. The Error state is used when the operational state of the device is unknown. 000b = On 001b = Off 010b = Faulted On 011b = Faulted Off 100b = Reserved for SAE Assignment 101b = Reserved for SAE Assignment 110b = Error 111b = Not Available
8377	DC/AC Accessory Inverter 4 Device 2 Status	Signal to the DC/AC Accessory Inverter indicating the state of the device attached to the inverter output. Each output may control multiple devices (e.g. electric motors) if they all operate at the same frequency.The Faulted Off state will be communicated when the device has a fault due to an overload condition or other fault resulting in a shutdown. The Faulted On state will be communicated when the device has a fault that has resulted in an operational state that is running but no longer controllable. The Error state is used when the operational state of the device is unknown. 000b = On 001b = Off 010b = Faulted On 011b = Faulted Off 100b = Reserved for SAE Assignment 101b = Reserved for SAE Assignment 110b = Error 111b = Not Available
8378	DC/AC Accessory Inverter 4 Operational Command	Command to the DC/AC Accessory Inverter to enable this output. Each output may control multiple devices (e.g. electric motors) if they all operate at the same frequency.00b = Disable DC/AC Accessory Inverter Output 01b = Enable DC/AC

		Accessory Inverter Output 10b = Power down DC/AC Accessory Inverter Controller 11b = Not Available
8379	DC/AC Accessory Inverter 4 Frequency	Present operating frequency of this DC/AC Accessory Inverter output.
8380	DC/AC Accessory Inverter 4 AC Side RMS Voltage	Present operating AC Side line to line RMS voltage of this DC/AC Accessory Inverter output. In a three phase balanced motor, this is the RMS voltage across one phase of the motor.
8381	DC/AC Accessory Inverter 4 AC Side Power	Present operating AC Side power of this DC/AC Accessory Inverter output.
8382	DC/AC Accessory Inverter 4 Operational Status	Operating Status of this DC/AC Accessory Inverter output. The Inverter Output Faulted state will be communicated when the inverter output has shutdown due to an overload condition or other fault.000b = Output Disabled 001b = Output Enabled 010b = Output Faulted On 011b = Output Faulted Off 100b = Normal Power Down in Process 101b = Reserved 110b = Error 111b = Not Available
8383	DC/AC Accessory Inverter 4 Loadshed Request	Loadshed Request from this DC/AC Accessory Inverter output. The Loadshed Requested state is an indication that the inverter output powering this device has a malfunction and is in a limit condition and if the load of the output is not reduced, the inverter will take steps to protect itself. The Loadshed Requested, Shutdown Imminent state is an indication that the loadshed needs have not been met and the output will be shutdown in a limited amount of time.00b = No Loadshed Requested 01b = Loadshed Requested 10b = Loadshed Requested, Shutdown Imminent 11b = Don’t Care/Take No Action
8384	HVES Fan Enable Command	Enable and direction command to this HVES fan. 00b = Fan Off 01b = Fan On Normal/Default Direction 10b = Fan On Reverse Direction 11b = Don’t Care/Take no action

8385	HVES Fan Power Hold	Command to allow this HVES fan to remain alive independently of the electrical enable input to the fan. For example, this could allow continued device operation after the keyswitch has turned off.00b = Power Hold Disabled 01b = Power Hold Enabled 10b = Reserved 11b = Don’t Care/Take no action
8386	HVES Fan Speed Command	Speed command to this HVES fan. Note: Both Speed Command and Percent Speed Command (SPN 8387) cannot be used at the same time. Always set the unused speed command to Not Available. If both commands are set to Not Available, a preprogrammed default speed will be used.
8387	HVES Fan Percent Speed Command	Speed command to this HVES fan in percentage of maximum speed. Note: Both Speed Command (SPN 8386) and Percent Speed Command cannot be used at the same time. Always set the unused speed command to Not Available. If both commands are set to Not Available, a preprogrammed default speed will be used.
8388	HVES Fan Instance 1	Indicates the HVES Fan Instance that is being commanded. Multiple instances can be controlled with the same command PGN by setting each unique instance parameter to 0b.0b = Command applied to this Fan Instance 1b = No Command applied to this Fan Instance
8389	HVES Fan Instance 2	Indicates the HVES Fan Instance that is being commanded. Multiple instances can be controlled with the same command PGN by setting each unique instance parameter to 0b.0b = Command applied to this Fan Instance 1b = No Command applied to this Fan Instance
8390	HVES Fan Instance 3	Indicates the HVES Fan Instance that is being commanded. Multiple instances can be controlled with the same command PGN by setting each unique instance parameter to 0b.0b = Command applied to this Fan Instance 1b = No Command applied to this Fan Instance
8391	HVES Fan Instance 4	Indicates the HVES Fan Instance that is being commanded. Multiple instances can be controlled with the same command PGN by setting each unique instance parameter to

		0b.0b = Command applied to this Fan Instance 1b = No Command applied to this Fan Instance
8392	HVES Fan Instance 5	Indicates the HVES Fan Instance that is being commanded. Multiple instances can be controlled with the same command PGN by setting each unique instance parameter to 0b.0b = Command applied to this Fan Instance 1b = No Command applied to this Fan Instance
8393	HVES Fan Instance 6	Indicates the HVES Fan Instance that is being commanded. Multiple instances can be controlled with the same command PGN by setting each unique instance parameter to 0b.0b = Command applied to this Fan Instance 1b = No Command applied to this Fan Instance
8394	HVES Fan Instance 7	Indicates the HVES Fan Instance that is being commanded. Multiple instances can be controlled with the same command PGN by setting each unique instance parameter to 0b.0b = Command applied to this Fan Instance 1b = No Command applied to this Fan Instance
8395	HVES Fan Instance 8	Indicates the HVES Fan Instance that is being commanded. Multiple instances can be controlled with the same command PGN by setting each unique instance parameter to 0b.0b = Command applied to this Fan Instance 1b = No Command applied to this Fan Instance
8396	HVES Fan Instance 9	Indicates the HVES Fan Instance that is being commanded. Multiple instances can be controlled with the same command PGN by setting each unique instance parameter to 0b.0b = Command applied to this Fan Instance 1b = No Command applied to this Fan Instance
8397	HVES Fan Instance 10	Indicates the HVES Fan Instance that is being commanded. Multiple instances can be controlled with the same command PGN by setting each unique instance parameter to 0b.0b = Command applied to this Fan Instance 1b = No Command applied to this Fan Instance

8398	HVES Fan Instance 11	Indicates the HVES Fan Instance that is being commanded. Multiple instances can be controlled with the same command PGN by setting each unique instance parameter to 0b.0b = Command applied to this Fan Instance 1b = No Command applied to this Fan Instance
8399	HVES Fan Instance 12	Indicates the HVES Fan Instance that is being commanded. Multiple instances can be controlled with the same command PGN by setting each unique instance parameter to 0b.0b = Command applied to this Fan Instance 1b = No Command applied to this Fan Instance
8400	HVES Fan Instance 13	Indicates the HVES Fan Instance that is being commanded. Multiple instances can be controlled with the same command PGN by setting each unique instance parameter to 0b.0b = Command applied to this Fan Instance 1b = No Command applied to this Fan Instance
8401	HVES Fan Instance 14	Indicates the HVES Fan Instance that is being commanded. Multiple instances can be controlled with the same command PGN by setting each unique instance parameter to 0b.0b = Command applied to this Fan Instance 1b = No Command applied to this Fan Instance
8402	HVES Fan Instance 15	Indicates the HVES Fan Instance that is being commanded. Multiple instances can be controlled with the same command PGN by setting each unique instance parameter to 0b.0b = Command applied to this Fan Instance 1b = No Command applied to this Fan Instance
8403	HVES Fan Enable Status	Enable and direction status of this HVES fan. 00b = Fan Off 01b = Fan On – Normal, Forward, or Default Direction 10b = Fan On – Reverse Direction 11b = Not available
8404	HVES Fan Status Reason Code	Provides the reason code describing the unique failure of this HVES fan. If a detailed reason code is not used by the supporting application, or this reason code is Not Available, the HVES Fan Service Indicator (SPN 8409) and HVES fan Operating Status (SPN 8410) may be used to determine functional status of this HVES fan.0000b = Normal Operation 0001b = Unable to Start 0010b = Over-Voltage

		Protection Shutdown 0011b = Under-Voltage Protection Shutdown 0100b = Over-Temperature Protection Shutdown 0101b = Speed Limited due to current (i.e. amperage) protection limit 0110b = Speed limited due to maximum system design capability (e.g. PWM control limit or physical limit of system) 0111b = Reserved 1000b = Reserved 1001b = Reserved 1010b = Reserved 1011b = Reserved 1100b = Reserved 1101b = Reserved 1110b = Reserved 1111b = Not Available
8405	HVES Fan Command Status	Indicates the source of the speed command to this HVES fan. 00b is communicated when the fan is self-controlled (e.g. based on a temperature sensor). 01b is communicated when responding to the HVES Fan Speed Command (SPN 8386) or HVES Fan Percent Speed Command (SPN 8387). 10b is communicated when neither an internal nor external command is provided (e.g. failed temperature sensor or loss of the command message). 00b = Internal Command 01b = External Command 10b = Default Command 11b = Not Available
8406	HVES Fan Speed	Speed of this HVES fan.
8407	HVES Fan Medium Temperature	A temperature measured and reported by the device. It may be used for direct or remote (e.g. by another controller) control of the pump. For example, this may be the temperature of the fluid flowing through the pump, or some other temperature relating to the pump or controller.
8408	HVES Fan Power	Calculated electrical power consumed by this HVES fan.
8409	HVES Fan Service Indicator	Indicates that service is required for this HVES fan. An active indication may convey a need for component replacement or periodic service. The HVES Fan Status Reason Code (SPN 8404) may provide additional detail as to the nature of the system status.00b = Service Not Required 01b = Service Required 10b = Reserved 11b = Not Available
8410	HVES Fan Operating Status	Indicates the operating status of this HVES fan. This parameter is used to inform other devices that this system or component is no longer performing to its operational capacity and that reduced, or no flow of the medium (e.g. coolant, oil, air, etc.) can be

		expected. Derated or Not Operable condition may require other vehicle systems to modify their operation.The HVES Fan Status Reason Code (SPN 8404) may provide additional detail as to the nature of the system status. 00b = Normal Operation 01b = Derated Operation 10b = Not Operable 11b = Not Available
8411	HVES Fan Instance	Indicates the instance of the HVES fan that is providing status in systems controlled by a master ECU. 0000b = Instance 1 0001b = Instance 2 0010b = Instance 3 0011b = Instance 4 0100b = Instance 5 0101b = Instance 6 0110b = Instance 7 0111b = Instance 8 1000b = Instance 9 1001b = Instance 10 1010b = Instance 11 1011b = Instance 12 1100b = Instance 13 1101b = Instance 14 1110b = Instance 15 1111b = Not available / Instance not specified
8412	HVES1 Operation Consent	This parameter provides an indication to the HVES1 pack (or system) that an external device is ready for HVES1 to proceed with normal operation. In applications which support this parameter, the HVES1 (or system) may only proceed with normal operation if consent is given. The HVES1 operation that is allowed based on this consent is manufacturer dependent.00b = Consent revoked; system component does not consent to HVES1 operation 01b = Consent given; system component consents to HVES1 operation 10b = Error 11b = Not Available
8413	HVES1 High-Voltage Bus Connection Status	This parameter provides high level feedback on the HVES1 pack (or system) high voltage bus connection. For specific contactor information, see HVES1 High-Voltage Bus (Positive) Contactor State (SPN 8091), HVES1 High-Voltage Bus (Negative) Contactor State (SPN 8092), HVES1 Center of Pack Contactor State (SPN 8095), and HVES1 High-Voltage Bus Pre-Charge Relay State (SPN 8094).0000b = Disconnected. One or more contactors are open. State may result from the HVES1 High-Voltage Bus Connect Command (SPN 8123) or due to a limit being exceeded. 0001b = Connected. All contactors are closed and the precharge relay is open. Typically results from the HVES1 High-Voltage Bus Connect Command (SPN 8123). 0010b = Connection in Process. May be rapidly transitioned through depending on HVES design, but indicates that the precharge relay is closed and/or one or more contactors may also be closed or in the process of being closed. 0011b = Disconnection in Process. May be rapidly transitioned through depending on HVES

		design, but indicates that HVES1 is in the process of disconnecting itself from the high voltage bus. 0100b = Disconnected; Precharge Failed. Indicates that the pre-charge function status cannot be determined or did not complete (e.g. Relay failure, insufficient HVES voltage, etc.). 0101b = Reserved 0110b = Reserved 0111b = Reserved 1000b = Reserved 1001b = Reserved 1010b = Reserved 1011b = Reserved 1100b = Reserved 1101b = Reserved 1110b = Error 1111b = Not Available
8414	HVES1 Operational Status	Provides feedback on where the HVES1 pack (or system) is in its operating spectrum, and includes feedback in response to the Operation Consent [i.e. HVES1 Operation Consent (SPN 8412)] and Power Down Command [i.e. HVES1 Power Down Command (SPN 8124)] parameters.0000b = Initialization in process. The HVES controller is powering up. This process may include both internal HVES controller checks, as well as system checks being run by the HVES controller. 0001b = Initialization Complete, awaiting Operation Consent. HVES controller is ready from its perspective, but requires one or more positive Operation Consent indications before becoming fully operational. Some applications may not support this state. 0010b = Operational. 0011b = Normal Power-Down in Process. This state is a response to Power Down Command state 01b. 0100b = Emergency Power-Down In Process. This state is a response to Power Down Command state 10b. 0101b = Disabled by external command. The HVES is in a non-operational state due to a Power Down Command, or the result of Operation Consent being revoked. 0110b = Disabled by internal decision of HVES controller (e.g. malfunction, protection) 0111b = Reserved 1000b = Reserved 1001b = Reserved 1010b = Reserved 1011b = Reserved 1100b = Reserved 1101b = Reserved 1110b = Error 1111b = Not Available
8415	Driver Side Fuel Receptacle 1 Cover Status	Indicates if the cover for the first fuel receptacle on the driver side is attached or detached. 00b = Receptacle cover is detached 01b = Receptacle cover is attached 10b = Error 11b = Not available
8416	Driver Side Fuel Receptacle 2 Cover Status	Indicates if the cover for the second fuel receptacle on the driver side is attached or detached. 00b = Receptacle cover is detached 01b = Receptacle cover is attached 10b = Error 11b = Not available

8417	Passenger Side Fuel Receptacle 1 Cover Status	Indicates if the cover for the first fuel receptacle on the passenger side is attached or detached. 00b = Receptacle cover is detached 01b = Receptacle cover is attached 10b = Error 11b = Not available
8418	Passenger Side Fuel Receptacle 2 Cover Status	Indicates if the cover for the second fuel receptacle on the passenger side is attached or detached. 00b = Receptacle cover is detached 01b = Receptacle cover is attached 10b = Error 11b = Not available
8419	Front Fuel Receptacle Cover Status	Indicates if the cover for the fuel receptacle at the front of the vehicle is attached or detached. 00b = Receptacle cover is detached 01b = Receptacle cover is attached 10b = Error 11b = Not available
8420	Fuel Storage Compartment 1 Temperature 1	The ambient temperature in the first fuel storage compartment. If there is more than 1 sensor, then this is the first sensor. Note that this is not the temperature of the fuel in the fuel tank.
8421	Fuel Storage Compartment 1 Temperature 2	The ambient temperature as measured by the second temperature sensor in the first fuel storage compartment. Note that this is not the temperature of the fuel in the fuel tank.
8422	Fuel Storage Compartment 2 Temperature 1	The ambient temperature in the second fuel storage compartment. If there is more than 1 sensor, then this is the first sensor. Note that this is not the temperature of the fuel in the fuel tank.
8423	Fuel Storage Compartment 2 Temperature 2	The ambient temperature as measured by the second temperature sensor in the second fuel storage compartment. Note that this is not the temperature of the fuel in the fuel tank.
8424	Fuel Storage Compartment 3 Temperature 1	The ambient temperature in the third fuel storage compartment. If there is more than 1 sensor, then this is the first sensor. Note that this is not the temperature of the fuel in the fuel tank.

8425	Fuel Storage Compartment 3 Temperature 2	The ambient temperature as measured by the second temperature sensor in the third fuel storage compartment. Note that this is not the temperature of the fuel in the fuel tank.
8426	Fuel Tank Receptacle Cover Detached During Operation	The condition of the fuel tank receptacle cover becoming detached during system operation.
8427	Engine Crank Requested While Fuel Tank Receptacle Cover Detached	Indicates a situation where engine crank was requested while the fuel tank receptacle cover was detached.
8428	Fuel Supply Estimated Remaining Distance	Estimated remaining distance based on existing fuel supply.
8429	Engine Self-Induced Derate Inhibit	Parameter to indicate if the genset control system allows the Engine Control Module to impose its own induced derate.00b = Engine is allowed to impose a self-induced derate 01b = Engine is inhibited from imposing a self-induced derate 10b = SAE Reserved 11b = Don’t care / take no action
8430	Engine Load Setpoint Request	Setpoint request (in kW) sent to the engine by a genset control system.
8431	HVES1 High-Voltage Bus Active Isolation Test Results	The isolation resistance expressed in Ohms per Volt that resulted from the High-Voltage Bus Active Isolation Test.See HVES1 High-Voltage Bus Active Isolation Test Status (SPN 8096) for test status and HVES1 High-Voltage Bus Active Isolation Test Command (SPN 8125) for the command to run the test.
8432	HVES1 High-Voltage Bus Passive Isolation Test Results	The isolation resistance expressed in Ohms per Volt that resulted from the High-Voltage Bus Passive Isolation Test.See HVES1 High-Voltage Bus Passive Isolation Test Status (SPN 8097) for test status and HVES1 High-Voltage Bus Active Isolation Test Command (SPN 8126) for the command to run the test.
8433	HVES1 High-Voltage Bus High Side Resistor Connect Request	This parameter is used to request connection of the HVES1 High-Voltage bus high side resistor in order to perform an isolation test. See also HVES1 High-Voltage Bus

		Low Side Resistor Connect Request (SPN 8434).00b = Connection not Requested 01b = Connection Requested 10b = Reserved 11b = Don’t care/take no action
8434	HVES1 High-Voltage Bus Low Side Resistor Connect Request	This parameter is used to request connection of the HVES1 High-Voltage bus low side resistor in order to perform an isolation test. See also HVES1 High-Voltage Bus High Side Resistor Connect Request (SPN 8433).00b = Connection not Requested 01b = Connection Requested 10b = Reserved 11b = Don’t care/take no action
8435	Engine Self-Induced Derate Load	The self-induced derate load that the Engine Control Module is trying to achieve. A value of 0% means there is no active derate.
8436	Engine Power Derate Request	Derate request made from the engine control system to an external system, where the engine is requesting an external device to reduce the load being applied. A zero value indicates no derate, while any other value indicates the amount of load (in kW) to be reduced.See also SPN 3644 for a Derate Request in percent.
8438	Idle Speed Request	Requested idle speed. Allows an operator or ECU to modify the engine idle setpoint within a range supported by the engine. Requests above or below the supported range should result in a speed at the limit of the supported range. Should be 0 when the idle control state (SPN 8439) is not active. A value of FBh indicates the desired speed is pre-programmed in the engine. This setting impacts Point 1 on the Engine Configuration.Intended for the vehicle controller to modify engine idle speed to match vehicle operating conditions and modes (cab temperature, air supply, battery state, operator selection, etc.)
8439	Idle Control Enable State	Indicates whether enabling conditions (switch position, park brake, transmission neutral status, etc.) have been met for an idle speed request. Similar to a cruise control enable switch, this parameter does not activate the request, but may be used to provide indication of availability. This parameter does not inhibit or apply to Engine Operator Primary Intermediate Speed Select (SPN 2880).00b = Conditions are not met for idle speed request 01b = Conditions for idle speed request have been met 10b = Error 11b = Not available

8440	Idle Control Request Activation	Indicates whether the idle speed request (SPN 8438) should be honored. This parameter does not inhibit or apply to Engine Operator Primary Intermediate Speed Select (SPN 2880).00b = Idle speed request is not active 01b = Idle speed request is active 10b = Error 11b = Not available
8441	Engine External Idle Request Feedback	Indicates that the engine is altering the idle speed due to a request from an external source. 00b = No Idle Alteration Active – standard idle speed 01b = Idle Alteration Active 10b = Error 11b = Not available
8442	Aftertreatment 1 Diesel Exhaust Fluid Doser Valve 1 Command	Command (in percent) sent to the diesel exhaust fluid (DEF) injector to control the amount of DEF being injected into the aftreatment exhaust stream.0% closes the valve; 100% fully opens the valve.
8443	Engine Alternator Winding 7 Temperature	Temperature of this winding inside the alternator.
8444	Engine Alternator Winding 8 Temperature	Temperature of this winding inside the alternator.
8445	Engine Alternator Winding 9 Temperature	Temperature of this winding inside the alternator.
8446	Engine Alternator Winding 10 Temperature	Temperature of this winding inside the alternator.
8447	Engine Alternator Winding 11 Temperature	Temperature of this winding inside the alternator.
8448	Engine Alternator Winding 12 Temperature	Temperature of this winding inside the alternator.
8449	Alternator Air Cooler Air Intake Temperature	Temperature of air entering the air cooler in an alternator

8450	Alternator Air Cooler Air Outlet Temperature	Temperature of air after it exits from the air cooler in an alternator.
8451	Power Rectifier Diode 1 Temperature	Temperature of this diode used in power rectifier.
8452	Power Rectifier Diode 2 Temperature	Temperature of this diode used in power rectifier.
8453	Power Rectifier Diode 3 Temperature	Temperature of this diode used in power rectifier.
8454	Power Rectifier Diode 4 Temperature	Temperature of this diode used in power rectifier.
8455	Power Rectifier Diode 5 Temperature	Temperature of this diode used in power rectifier.
8456	Power Rectifier Diode 6 Temperature	Temperature of this diode used in power rectifier.
8457	Power Rectifier Diode 7 Temperature	Temperature of this diode used in power rectifier.
8458	Power Rectifier Diode 8 Temperature	Temperature of this diode used in power rectifier.
8459	Power Rectifier Diode 9 Temperature	Temperature of this diode used in power rectifier.
8460	Power Rectifier Diode 10 Temperature	Temperature of this diode used in power rectifier.

8461	Power Rectifier Diode 11 Temperature	Temperature of this diode used in power rectifier.
8462	Power Rectifier Diode 12 Temperature	Temperature of this diode used in power rectifier.
8463	Engine Alternator Winding 4 Temperature	Temperature of this winding inside the alternator.
8464	Engine Alternator Winding 5 Temperature	Temperature of this winding inside the alternator.
8465	Engine Alternator Winding 6 Temperature	Temperature of this winding inside the alternator.
8466	Alternator Oil Cooler Oil Intake Temperature	Temperature of lubricant as it enters the oil cooler of an alternator.
8467	Alternator Oil Cooler Oil Outlet Temperature	Temperature of lubricant after it exits the oil cooler of an alternator.
8468	Alternator Oil Cooler Coolant Intake Temperature	Temperature of liquid as it enters the oil cooler of an alternator.
8469	Alternator Oil Cooler Coolant Outlet Temperature	Temperature of liquid after it exits the oil cooler of an alternator.
8470	Alternator Aftercooler Coolant Pump Outlet Temperature	Temperature of liquid at the aftercooler coolant pump outlet.
8471	Alternator Aftercooler Coolant Outlet Temperature	Temperature of liquid at the aftercooler outlet.

8472	Alternator Aftercooler Coolant Pump Outlet Pressure	Pressure of liquid at the aftercooler pump outlet
8473	Engine Coolant Pump Coolant Outlet Pressure	Engine coolant pressure at the coolant pump outlet.
8474	Aftertreatment 1 Diesel Exhaust Fluid Pump Power Supply	State signal which indicates when the aftertreatment 1 Diesel Exhaust Fluid (DEF) pump power output is being driven. On means the ECU is powering the aftertreatment 1 DEF pump power output. Note that the ECU is external to the DEF pump.00b = Off 01b = On: The ECU is powering the aftertreatment 1 DEF pump power output 10b = Error 11b = Unavailable
8475	Power Electronics Coolant Fill Switch	Indicates the coolant fill switch position for the power electronics cooling system. This switch is used to enable the pump for filling the cooling system. When the switch is in the On state, the pump is to be running.00b = Off 01b = On 10b = Error 11b = Not available
8476	Propulsion Motor Coolant Fill Switch	Indicates the coolant fill switch position for the propulsion motor cooling system. This switch is used to enable the pump for filling the cooling system. When the switch is in the On state, the pump is to be running.00b = Off 01b = On 10b = Error 11b = Not available
8477	Engine Mixer 1 Intake Pressure	The pressure at the intake of the air and fuel mixer.
8478	Engine Turbocharger 2 Calculated Turbine Outlet Temperature	Calculated value of turbocharger compressor outlet air temperature, which is the temperature of air exiting the turbocharger compressor and before entering charge air cooler. The estimate is based on turbo speed and measured turbocharger compressor intake temperature. Use SPN 1185 for actual measured outlet temperature.
8479	Engine Turbocharger 3 Calculated Turbine Outlet Temperature	Calculated value of turbocharger compressor outlet air temperature, which is the temperature of air exiting the turbocharger compressor and before entering charge air cooler. The estimate is based on turbo speed and measured turbocharger compressor intake temperature. Use SPN 1186 for actual measured outlet temperature.

8480	Engine Turbocharger 4 Calculated Turbine Outlet Temperature	Calculated value of turbocharger compressor outlet air temperature, which is the temperature of air exiting the turbocharger compressor and before entering charge air cooler. The estimate is based on turbo speed and measured turbocharger compressor intake temperature. Use SPN 1187 for actual measured outlet temperature.
8481	Aftertreatment 2 Diesel Exhaust Fluid Pump Power Relay	The state of the aftertreatment 2 diesel exhaust fluid pump power relay. 00b = Not active – No power is being applied to the relay 01b = Active – Power is being applied to the relay 10b = Error 11b = Not available
8482	Aftertreatment 2 Diesel Exhaust Fluid Pump (Obsolete – Use SPN 7108)	State of the Aftertreatment 2 Diesel Exhaust Fluid dosing pump. Indicates if the pump is currently active (pumping).00b = Off 01b = On 10b = Error 11b = Not available The Aftertreatment 2 Diesel Exhaust Fluid dosing pump is a device that delivers a pressurized DEF to the DEF injector. This can be mixed with or without pressurized air. Note: SPN 5438 provides operational status of the pump. See also SPN 4451 – Aftertreatment 2 Diesel Exhaust Fluid Dosing Unit 1 On a system that does not have an electrically driven valve on the injector, 'DEF Dosing Unit' is the only SPN needed as the pump is directly metering DEF into the exhaust stream. On a DEF system that has an electrically driven injector, the injector is actually metering the dosing quantity and the pump is just supplying pressure to the injector. In the second case, the « DEF dosing unit » SPN would be used for the electrically driven injector and the « DEF Pump » SPN would be used for the pump supplying pressure to the injector.
8483	Aftertreatment 2 Diesel Exhaust Fluid Control Module Circuit Breaker	The status of the circuit breaker that is used to power the Diesel Exhaust Fluid control module. 00b = Off 01b = On 10b = Error 11b = Not available
8484	Demanded Brake Application Pressure	Gage pressure of the compressed air or fluid in the vehicle braking system that is used to apply brake shoes (or pads) against the brake drums (or discs). This is the brake application pressure demanded by the vehicle operator and / or another vehicle system.

8485	Engine Exhaust 2 Intake 2 Gas Sensor Power Supply	State signal which indicates when the Engine Exhaust 2 Intake 2 Gas Sensor driver output is being driven. On means the ECU is powering the Engine Exhaust 2 Intake 2 Gas Sensor. Note that the ECU is external to the sensor.00b = Off 01b = On: The ECU is powering the Aftertreatment 2 Intake 2 Gas Sensor 10b = Error 11b = Unavailable
8486	Aftertreatment 2 Outlet 2 Gas Sensor Power Supply	State signal which indicates when the Aftertreatment 2 Outlet 2 Gas Sensor driver output is being driven. On means the ECU is powering the Aftertreatment 2 Outlet 2 Gas Sensor. Note that the ECU is external to the sensor.00b = Off 01b = On: The ECU is powering the Aftertreatment 2 Outlet 2 Gas Sensor 10b = Error 11b = Unavailable
8487	Engine Charge Air Cooler Intake Coolant Temperature	Temperature of the fluid in the low temperature circuit measured at the fluid intake of the charge air cooler.
8488	Engine Charge Air Cooler Outlet Coolant Temperature	Temperature of the fluid in the low temperature circuit measured at the fluid outlet of the charge air cooler.
8489	Engine Intake Coolant Temperature	Temperature of the coolant at the intake of the engine block.
8490	Engine Turbocharger 1 Difference from Average Speed	The difference in speed of turbocharger 1 from the average of all turbochargers on an engine. If the speed is above the average speed, then the speed would be interpreted as above normal. When speed is above average it is referred as positive and if speed is below average it is referred as negative.
8491	Engine Turbocharger 2 Difference from Average Speed	The difference in speed of turbocharger 2 from the average of all turbochargers on an engine. If the speed is above the average speed, then the speed would be interpreted as above normal. When speed is above average it is referred as positive and if speed is below average it is referred as negative.
8492	Engine Turbocharger 3 Difference from Average Speed	The difference in speed of turbocharger 3 from the average of all turbochargers on an engine. If the speed is above the average speed, then the speed would be interpreted

		as above normal. When speed is above average it is referred as positive and if speed is below average it is referred as negative.
8493	Engine Turbocharger 4 Difference from Average Speed	The difference in speed of turbocharger 4 from the average of all turbochargers on an engine. If the speed is above the average speed, then the speed would be interpreted as above normal. When speed is above average it is referred as positive and if speed is below average it is referred as negative.
8494	Engine Fuel Valve 1 Differential Pressure (High Resolution)	The differential pressure between the intake and the outlet of the first or only gaseous fuel valve. See SPN 1391 for alternate range and resolution.
8495	Lock Status of Door 11	Lock status of bus door 11 00b = Unlocked 01b = Locked 10b = Error 11b = Not available
8496	Open Status of Door 11	Open status of bus door 11 00b = Door closed 01b = Door opened 10b = Error 11b = Not available
8497	Enable Status of Door 11	Enable status of bus door 11. Enabled means the bus doors are able to be automatically opened or closed. 00b = Door disabled 01b = Door enabled 10b = Error 11b = Not available
8498	Lock Status of Door 12	Lock status of bus door 12 00b = Unlocked 01b = Locked 10b = Error 11b = Not available
8499	Open Status of Door 12	Open status of bus door 12 00b = Door closed 01b = Door opened 10b = Error 11b = Not available
8500	Enable Status of Door 12	Enable status of bus door 12. Enabled means the bus doors are able to be automatically opened or closed. 00b = Door disabled 01b = Door enabled 10b = Error 11b = Not available
8501	Lock Status of Door 13	Lock status of bus door 13 00b = Unlocked 01b = Locked 10b = Error 11b = Not available

8502	Open Status of Door 13	Open status of bus door 13 00b = Door closed 01b = Door opened 10b = Error 11b = Not available
8503	Enable Status of Door 13	Enable status of bus door 13. Enabled means the bus doors are able to be automatically opened or closed. 00b = Door disabled 01b = Door enabled 10b = Error 11b = Not available
8504	Lock Status of Door 14	Lock status of bus door 14 00b = Unlocked 01b = Locked 10b = Error 11b = Not available
8505	Open Status of Door 14	Open status of bus door 14 00b = Door closed 01b = Door opened 10b = Error 11b = Not available
8506	Enable Status of Door 14	Enable status of bus door 14. Enabled means the bus doors are able to be automatically opened or closed. 00b = Door disabled 01b = Door enabled 10b = Error 11b = Not available
8507	Lock Status of Door 15	Lock status of bus door 15 00b = Unlocked 01b = Locked 10b = Error 11b = Not available
8508	Open Status of Door 15	Open status of bus door 15 00b = Door closed 01b = Door opened 10b = Error 11b = Not available
8509	Enable Status of Door 15	Enable status of bus door 15. Enabled means the bus doors are able to be automatically opened or closed. 00b = Door disabled 01b = Door enabled 10b = Error 11b = Not available
8510	Lock Status of Door 16	Lock status of bus door 16 00b = Unlocked 01b = Locked 10b = Error 11b = Not available
8511	Open Status of Door 16	Open status of bus door 16 00b = Door closed 01b = Door opened 10b = Error 11b = Not available

8512	Enable Status of Door 16	Enable status of bus door 16. Enabled means the bus doors are able to be automatically opened or closed. 00b = Door disabled 01b = Door enabled 10b = Error 11b = Not available
8513	Lock Status of Door 17	Lock status of bus door 17 00b = Unlocked 01b = Locked 10b = Error 11b = Not available
8514	Open Status of Door 17	Open status of bus door 17 00b = Door closed 01b = Door opened 10b = Error 11b = Not available
8515	Enable Status of Door 17	Enable status of bus door 17. Enabled means the bus doors are able to be automatically opened or closed. 00b = Door disabled 01b = Door enabled 10b = Error 11b = Not available
8516	Lock Status of Door 18	Lock status of bus door 18 00b = Unlocked 01b = Locked 10b = Error 11b = Not available
8517	Open Status of Door 18	Open status of bus door 18 00b = Door closed 01b = Door opened 10b = Error 11b = Not available
8518	Enable Status of Door 18	Enable status of bus door 18. Enabled means the bus doors are able to be automatically opened or closed. 00b = Door disabled 01b = Door enabled 10b = Error 11b = Not available
8519	Lock Status of Door 19	Lock status of bus door 19 00b = Unlocked 01b = Locked 10b = Error 11b = Not available
8520	Open Status of Door 19	Open status of bus door 19 00b = Door closed 01b = Door opened 10b = Error 11b = Not available
8521	Enable Status of Door 19	Enable status of bus door 19. Enabled means the bus doors are able to be automatically opened or closed. 00b = Door disabled 01b = Door enabled 10b = Error 11b = Not available

8522	Lock Status of Door 20	Lock status of bus door 20 00b = Unlocked 01b = Locked 10b = Error 11b = Not available
8523	Open Status of Door 20	Open status of bus door 20 00b = Door closed 01b = Door opened 10b = Error 11b = Not available
8524	Enable Status of Door 20	Enable status of bus door 20. Enabled means the bus doors are able to be automatically opened or closed. 00b = Door disabled 01b = Door enabled 10b = Error 11b = Not available
8525	Lock Status of Door 21	Lock status of bus door 21 00b = Unlocked 01b = Locked 10b = Error 11b = Not available
8526	Open Status of Door 21	Open status of bus door 21 00b = Door closed 01b = Door opened 10b = Error 11b = Not available
8527	Enable Status of Door 21	Enable status of bus door 21. Enabled means the bus doors are able to be automatically opened or closed. 00b = Door disabled 01b = Door enabled 10b = Error 11b = Not available
8528	Lock Status of Door 22	Lock status of bus door 22 00b = Unlocked 01b = Locked 10b = Error 11b = Not available
8529	Open Status of Door 22	Open status of bus door 22 00b = Door closed 01b = Door opened 10b = Error 11b = Not available
8530	Enable Status of Door 22	Enable status of bus door 22. Enabled means the bus doors are able to be automatically opened or closed. 00b = Door disabled 01b = Door enabled 10b = Error 11b = Not available
8531	Lock Status of Door 23	Lock status of bus door 23 00b = Unlocked 01b = Locked 10b = Error 11b = Not available

8532	Open Status of Door 23	Open status of bus door 23 00b = Door closed 01b = Door opened 10b = Error 11b = Not available
8533	Enable Status of Door 23	Enable status of bus door 23. Enabled means the bus doors are able to be automatically opened or closed. 00b = Door disabled 01b = Door enabled 10b = Error 11b = Not available
8534	Lock Status of Door 24	Lock status of bus door 24 00b = Unlocked 01b = Locked 10b = Error 11b = Not available
8535	Open Status of Door 24	Open status of bus door 24 00b = Door closed 01b = Door opened 10b = Error 11b = Not available
8536	Enable Status of Door 24	Enable status of bus door 24. Enabled means the bus doors are able to be automatically opened or closed. 00b = Door disabled 01b = Door enabled 10b = Error 11b = Not available
8537	Lock Status of Door 25	Lock status of bus door 25 00b = Unlocked 01b = Locked 10b = Error 11b = Not available
8538	Open Status of Door 25	Open status of bus door 25 00b = Door closed 01b = Door opened 10b = Error 11b = Not available
8539	Enable Status of Door 25	Enable status of bus door 25. Enabled means the bus doors are able to be automatically opened or closed. 00b = Door disabled 01b = Door enabled 10b = Error 11b = Not available
8540	Lock Status of Door 26	Lock status of bus door 26 00b = Unlocked 01b = Locked 10b = Error 11b = Not available
8541	Open Status of Door 26	Open status of bus door 26 00b = Door closed 01b = Door opened 10b = Error 11b = Not available

8542	Enable Status of Door 26	Enable status of bus door 26. Enabled means the bus doors are able to be automatically opened or closed. 00b = Door disabled 01b = Door enabled 10b = Error 11b = Not available
8543	Lock Status of Door 27	Lock status of bus door 27 00b = Unlocked 01b = Locked 10b = Error 11b = Not available
8544	Open Status of Door 27	Open status of bus door 27 00b = Door closed 01b = Door opened 10b = Error 11b = Not available
8545	Enable Status of Door 27	Enable status of bus door 27. Enabled means the bus doors are able to be automatically opened or closed. 00b = Door disabled 01b = Door enabled 10b = Error 11b = Not available
8546	Lock Status of Door 28	Lock status of bus door 28 00b = Unlocked 01b = Locked 10b = Error 11b = Not available
8547	Open Status of Door 28	Open status of bus door 28 00b = Door closed 01b = Door opened 10b = Error 11b = Not available
8548	Enable Status of Door 28	Enable status of bus door 28. Enabled means the bus doors are able to be automatically opened or closed. 00b = Door disabled 01b = Door enabled 10b = Error 11b = Not available
8549	Lock Status of Door 29	Lock status of bus door 29 00b = Unlocked 01b = Locked 10b = Error 11b = Not available
8550	Open Status of Door 29	Open status of bus door 29 00b = Door closed 01b = Door opened 10b = Error 11b = Not available
8551	Enable Status of Door 29	Enable status of bus door 29. Enabled means the bus doors are able to be automatically opened or closed. 00b = Door disabled 01b = Door enabled 10b = Error 11b = Not available

8552	Lock Status of Door 30	Lock status of bus door 30 00b = Unlocked 01b = Locked 10b = Error 11b = Not available
8553	Open Status of Door 30	Open status of bus door 30 00b = Door closed 01b = Door opened 10b = Error 11b = Not available
8554	Enable Status of Door 30	Enable status of bus door 30. Enabled means the bus doors are able to be automatically opened or closed. 00b = Door disabled 01b = Door enabled 10b = Error 11b = Not available
8555	Rationality Fault SPN	See document J1939-73 for SPN details.
8556	Rationality Fault SPN Data Value	See document J1939-73 for SPN details.
8557	Supported in Rationality Fault SPN Data Value	See document J1939-73 for SPN details.
8558	Hybrid System Engine Stop-Start Remaining Percentage	Indicates the remaining percentage of engine stop-start operation allowed by the hybrid system. The calculation of the percentage is manufacturer specific. It is an operational limitation, not a functional one, meaning the hybrid system could provide additional stop-start as there is no failure, but it is operationally restricted at this point in time to protect the long term life of the hybrid components supporting stop-start operation (e.g. Hybrid Battery). 100% means that the maximum stop-start operation is available. 0% means no stop-start operation is available. Possible uses of this parameter may include optimizing when engine stop should occur (e.g. stopping engine at a longer stop versus a short stop light).
8560	DC/DC 1 Operational Command	Command to enable or disable operation. 0000b = Disable – in this mode all high voltage switching is disabled 0001b = Operate in standby mode; system is waiting for command to enter buck or boost mode 0010b = Operate in buck mode; energy flows from high voltage side to low side 0011b = Operate in boost mode; energy flows from low voltage side to high side 0100b = Power down DC/DC Converter 0101b = Reserved 0110b = Reserved 0111b = Reserved 1000b = Reserved 1001b = Reserved

		1010b = Reserved 1011b = Reserved 1100b = Reserved 1101b = Reserved 1111b = Don’t care/ Take No Action
8561	DC/DC 1 Low Side Voltage Buck Setpoint	The set point for regulating the low side voltage during buck mode.
8562	DC/DC 1 High Side Voltage Boost Setpoint	The set point for regulating the high side voltage during boost mode.
8563	DC/DC 1 High Side Voltage Minimum Limit Request	The minimum allowed high side voltage requested by a separate device. Under normal conditions this requested limit would be reflected in SPN 8824.
8564	DC/DC 1 High Side Voltage Maximum Limit Request	The maximum allowed high side voltage requested by a separate device. Under normal conditions this requested limit would be reflected in SPN 8825.
8565	DC/DC 1 High Side Current Maximum Limit Request	The maximum allowed high side current requested by a separate device. Under normal conditions this requested limit would be reflected in SPN 8826.
8566	DC/DC 1 Low Side Voltage Minimum Limit Request	The minimum allowed low side voltage requested by a separate device. Under normal conditions this requested limit would be reflected in SPN 8827.
8567	DC/DC 1 Low Side Voltage Maximum Limit Request	The maximum allowed low side voltage requested by a separate device. Under normal conditions this requested limit would be reflected in SPN 8828.
8568	DC/DC 1 Low Side Current Maximum Limit Request	The maximum allowed low side current requested by a separate device. Under normal conditions this requested limit would be reflected in SPN 8829.
8569	DC/DC 1 Operational Status	Operating state of the DC/DC Converter 0000b = Disabled 0001b = Initialization in process. The device is powering up. This process may include both internal checks, as well as system checks being run by the DC/DC Converter. 0010b = Operational – Standby 0011b = Operational – Buck mode 0100b = Operational – Boost mode 0101b = Normal power down in process 0110b = Disabled due to malfunction or protection 0111b = Reserved 1000b = Reserved 1001b = Reserved 1010b = Reserved

		1011b = Reserved 1100b = Reserved 1101b = Manufacturer assignable state (only applicable if none of the above apply) 1110b = Error 1111b = Not Available
8570	DC/DC 1 HVIL Status	High Voltage Interlock Loop (HVIL) state of the DC/DC Converter. 00b = HVIL Closed 01b = HVIL Open 10b = Error 11b = Not Available
8571	DC/DC 1 Loadshed Request	The loadshed request is a request to the controlling device to reduce the DC/DC Converter loads. The Loadshed Requested state is an indication that this DC/DC Converter has a malfunction or is in a limit condition and if the load of the output is not reduced, the DC/DC Converter may take steps to protect itself. The Loadshed Requested, Shutdown Imminent state is an indication that the loadshed request has not been met and the output may be shutdown in a limited amount of time.00b = No Loadshed Requested 01b = Loadshed Requested 10b = Loadshed Requested, Shutdown Imminent 11b = Don’t Care/Take No Action
8572	DC/DC 1 Power Limit due to High Side Current	Indicates whether or not output power is being limited due to high side current (see SPN 8588) approaching or exceeding the maximum limit (see SPN 8565).00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
8573	DC/DC 1 Power Limit due to Low Side Current	Indicates whether or not output power is being limited due to low side current (see SPN 8586) approaching or exceeding the maximum limit (see SPN 8568).00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
8574	DC/DC 1 Power Limit due to High Side Voltage Minimum	Indicates whether or not output power is being limited due to high side voltage (see SPN 8587) approaching or falling below the minimum limit (see SPN 8563).00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
8575	DC/DC 1 Power Limit due to High Side Voltage Maximum	Indicates whether or not output power is being limited due to high side voltage (see SPN 8587) approaching or exceeding the maximum limit (see SPN 8564).00b = No

		power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
8576	DC/DC 1 Power Limit due to Low Side Voltage Minimum	Indicates whether or not output power is being limited due to low side voltage (see SPN 8585) approaching or falling below the minimum limit (see SPN 8566).00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
8577	DC/DC 1 Power Limit due to Low Side Voltage Maximum	Indicates whether or not output power is being limited due to low side voltage (see SPN 8585) approaching or exceeding the maximum limit (see SPN 8567).00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
8578	DC/DC 1 Power Limit due to Converter Temperature	Indicates whether or not output power is being limited due to Converter Temperature (see SPN 8592) approaching or exceeding the maximum limit.00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
8579	DC/DC 1 Power Limit due to Electronic Filter Temperature	Indicates whether or not output power is being limited due to Output Electronic Filter Temperature (see SPN 8693) approaching or exceeding the maximum limit.00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not available
8580	DC/DC 1 Power Limit due to Power Electronics Temperature	Indicates whether or not output power is being limited due to Power Electronics Temperature (see SPN 8594) approaching or exceeding the maximum limit.00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
8581	DC/DC 1 Power Limit due to SLI Battery Terminal Voltage	Indicates whether or not output power is being limited due to the SLI battery terminal voltage (see SPN 8589) approaching or exceeding limits (see SPN 8817).00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available

8582	DC/DC 1 Power Limit due to SLI Battery Terminal Temperature	Indicates whether or not output power is being limited due to the SLI battery terminal temperature (see SPN 8591) approaching or exceeding limits (see SPN 8819).00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
8583	DC/DC 1 Power Limit due to SLI Battery Terminal Current	Indicates whether or not output power is being limited due to the SLI battery terminal current (see SPN 8590) approaching or exceeding limits (see SPN 8818).00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
8584	DC/DC 1 Power Limit due to Undefined Reason	Indicates whether or not output power is being limited due to an undefined reason. 00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
8585	DC/DC 1 Low Side Voltage	Indicates the measured SLI battery or low side voltage measured at the point of control inside the DC/DC Converter.
8586	DC/DC 1 Low Side Current	Indicates the measured SLI battery or low side current measured at the point of control inside the DC/DC Converter. The current is positive if the converter is charging the SLI battery from the hybrid battery.
8587	DC/DC 1 High Side Voltage	Indicates the measured HVES or high side voltage measured at the point of control inside the DC/DC Converter.
8588	DC/DC 1 High Side Current	Indicates the measured HVES or high side current measured at the point of control inside the DC/DC Converter. The current is negative if the converter is charging the SLI battery from the hybrid battery.
8589	DC/DC 1 SLI Battery Terminal Voltage	Parameter indicating the SLI battery terminal voltage for control use by the DC/DC converter.

8590	DC/DC 1 SLI Battery Terminal Current	Parameter indicating the SLI battery terminal current for control use by the DC/DC converter. The current is positive if the SLI battery or low side voltage source is being charged from the HVES.
8591	DC/DC 1 SLI Battery Terminal Temperature	Parameter indicating the SLI battery terminal temperature for control use by the DC/DC converter.
8592	DC/DC 1 Converter Temperature	Parameter indicating the temperature of the DC/DC Converter (e.g, controller, circuit board, enclosure).
8593	DC/DC 1 Converter Electronic Filter Temperature	Parameter indicating the temperature of the electronic components that make up the DC/DC Converter filter.
8594	DC/DC 1 Power Electronics Temperature	Parameter indicating the temperature of the DC/DC Converter power electronics components (e.g, switch or heatsink).
8595	Transmit PGNs Commanded Port	Identifies the ECU communication port of the target Configurable ECU for this instance of PGN 28928. The identification of each ECU communication port is ECU specific. The correlation of ECU communication port to a physical network connection is also ECU specific. Users of this message need to work with the manufacturer of each target Configurable ECU to understand the communication port assignment for each ECU physical port.0000b = Current port (Indicates the ECU communication port through which PGN 28928 is received) 0001b = Port 1 0010b = Port 2 0011b = Port 3 0100b = Port 4 0101b = Port 5 0110b = Port 6 0111b = Port 7 1000b = Port 8 1001b = Port 9 1010b = Port 10 1011b = SAE Reserved 1100b = SAE Reserved 1101b = SAE Reserved 1110b = SAE Reserved 1111b = SAE Reserved
8596	Transmit PGNs Transaction Mode	Identifies the command or action being commanded to the target Configurable ECU of this instance of PGN 28928.0000b = Request Port Transmit Status – Identifies the message as a request for the list of configurable transmit PGNs on port the identified in SPN 8595 and their current transmit status. All bits in SPN 8597 and SPN 8598 shall be set to 1 by the sender and will be ignored by the receiver. 0001b = Configure Port Transmit State – Identifies the message as a request to configure the transmit

		behaviors of one or more PGNs on port identified in SPN 8595. SPN 8597 and SPN 8598 are used to specify the PGN and the desired transmit capability of each PGN. The sender of this message only needs to include PGNs that are to have their transmit capability changed. PGNs that are not to have their transmit capability changed do not need to be included in this message. 0010b = Cancel Pending Changes – Identifies the message as a request to cancel all pending PGN transmit changes for any PGNs on port identified in SPN 8595. All pending changes shall be cleared and no changes will be made. All bits in SPN 8597 and SPN 8598 shall be set to 1 by the sender and will be ignored by the receiver. 0011b = Global Revert to Default – Identifies the message as a request to reset the transmit behaviors of all PGNs on the port identified in SPN 8595 to their default settings. All bits in SPN 8597 and SPN 8598 shall be set to 1 by the sender and will be ignored by the receiver. 0100b = Partial Revert to Default – Identifies the message as a request to reset the transmit behaviors to their default settings for the specified list of PGNs on the port identified in SPN 8595. All bits in SPN 8598 for these Configurable Transmit PGNs shall be set to 1 and ignored by the receiver. 0101b = SAE Reserved 0110b = SAE Reserved 0111b = SAE Reserved 1000b = SAE Reserved 1001b = SAE Reserved 1010b = SAE Reserved 1011b = SAE Reserved 1100b = SAE Reserved 1101b = SAE Reserved 1110b = SAE Reserved 1111b = SAE Reserved
8597	Commanded Transmit PGN	Identifies the PGN to be acted on by the associated SPN 8598.
8598	Commanded Transmit PGN Requested State	Identifies the transmit enable state being commanded for the specified PGN on the port identified in SPN 8595. This parameter is only valid when SPN 8596 is set to ‘Configure Port Transmit State’ (1). For transaction modes where this parameter is not applicable, this parameter shall be set to 11b.00b = PGN shall be disabled for transmit 01b = PGN shall be enabled for transmit 10b = SAE Reserved 11b = Not Available
8599	Transmit PGNs Port	Identifies the ECU communications port of the responding Configurable ECU that is in context for this instance of PGN 64471. If changes are accepted by the Configurable ECU, then this is the port affected. The identification of each ECU communication port is ECU specific. The correlation of ECU communication port to

		a physical network connection is ECU specific. Users of this message need to work with the manufacturer of the transmitting Configurable ECU to understand the port assignment for each physical port. Port numbering must be the same between this parameter and SPN 8595 in PGN 28928.0000b = Current port (Indicates the ECU communication port through which PGN 64471 is transmitted) 0001b = Port 1 0010b = Port 2 0011b = Port 3 0100b = Port 4 0101b = Port 5 0110b = Port 6 0111b = Port 7 1000b = Port 8 1001b = Port 9 1010b = Port 10 1011b = SAE Reserved 1100b = SAE Reserved 1101b = SAE Reserved 1110b = SAE Reserved 1111b = SAE Reserved
8600	Transmit PGNs Port Pending Changes Status	Indicates if there are any pending transmit changes for the specified ECU communication port. 0b = No pending changes to the transmit status for any supported PGNs for the port identified in SPN 8599. 1b = Transmit changes are pending for one or more supported PGNs on the port identified in SPN 8599.
8601	Transmit PGNs Port Command Status	Indicates the overall success in performing the commanded transaction in PGN 28928. 000b = Positive Acknowledgment – PGN 28928 commanded transaction was processed without issue. 001b = Negative Acknowledgment – PGN 28928 command was received but one or more transactions were rejected. 010b = No Configurable PGNs exist for the port identified in SPN 8599. 011b = SAE Reserved 100b = SAE Reserved 101b = SAE Reserved 110b = SAE Reserved 111b = Not Available
8602	Configurable Transmit PGN	Identifies the PGN for which the associated SPNs 8603, 8604, & 8605 apply.
8603	Configurable Transmit PGN Current Transmit Status	Indicates the current transmit status of the associated PGN on the port identified in SPN 8599. 00b = PGN is currently configured for transmit on the port identified in SPN 8599. 01b = PGN is not currently configured for transmit on the port identified in SPN 8599. 10b = The PGN transmit capability cannot be modified. Note: This state shall only be used when SPN 8601 is set to NACK (001b). 11b = Not Available
8604	Configurable Transmit PGN Pending Change Status	Indicates if there is a pending change to the transmit capability of the associated PGN on the port identified in SPN 8599.00b = Pending transmit change to disable for the port identified in SPN 8599. 01b = Pending transmit change to enable for the port

		identified in SPN 8599. 10b = No pending transmit change for the port identified in SPN 8599. 11b = Not Available
8605	Configurable Transmit PGN Modified Status	Indicates if able to honor the transmit status change request issued in the triggering PGN 28928 message for the associated PGN on the port identified in SPN 8595. This parameter is reported as '0' only if the received PGN 28928 requested a transmit behavior change to this PGN and the change could not be honored.00b = PGN's transmit status could not be modified 01b = PGN's transmit status was not requested to be modified 10b = PGN's transmit status could be modified as requested 11b = Not Available
8606	Auxiliary PWM Input 1	Identifies the first PWM port on an actuator. Consult manufacturer to identify which input is PWM Input 1.
8607	Engine Mixer 2 Intake Pressure	The pressure at the intake of the second air and fuel mixer.
8608	Engine Operating Mode Command	Command signal identifying the desired preconfigured engine operating mode. In some off-highway applications it may be desirable to have multiple preconfigured operating modes available for selection by the operator. Examples would be an economy mode, a ploughing mode or a PTO mode.0000b = Not presently requesting a specific Engine Operating Mode be used 0001b = Engine Operating Mode 1 is requested 0010b = Engine Operating Mode 2 is requested 0011b = Engine Operating Mode 3 is requested 0100b = Engine Operating Mode 4 is requested 0101b = Engine Operating Mode 5 is requested 0110b = Engine Operating Mode 6 is requested 0111b = Engine Operating Mode 7 is requested 1000b = Engine Operating Mode 8 is requested 1001b = Engine Operating Mode 9 is requested 1010b = Engine Operating Mode 10 is requested 1011b = Engine Operating Mode 11 is requested 1100b = Engine Operating Mode 12 is requested 1101b = Engine Operating Mode 13 is requested 1110b = SAE Reserved 1111b = Not available / Take no action
8609	Transmission Software / Hardware Incompatible	The transmission controller has determined that the transmission control system hardware is not compatible with current transmission controller software.

8610	Transmission Hardware Indeterminate	The transmission controller is unable to identify the control system hardware that is currently installed in the transmission.
8611	Water In Charge Air Duct After Charge Air Cooler Indicator	Signal which indicates the presence of water in charge air duct after charge air cooler. 00b = No 01b = Yes 10b = Error 11b = Not available
8612	Engine Overloaded Indicator	Signal which indicates that the engine is overloaded. 00b = No 01b = Yes 10b = Error 11b = Not available
8613	Source Address of Active or Pending Transmission Requested Gear	This parameter indicates the source address of the device whose SPN 525 [Transmission Requested Gear] request is currently being acted upon by the transmission. If transmission response to a device's SPN 525 request is pending, that device's source address should be reflected here, even though the pending request may or may not be achieved immediately due to operating conditions. If the transmission does not intend to honor a device's SPN 525 request, this parameter should not reflect that device's source address.This parameter is applicable to specific (e.g. "4') SPN 525 requests, relative (e.g. "Downshift One Gear") SPN 525 requests, and other parameter specific indicators defined in SPN 525. For example, if a device has requested the transmission to "downshift one gear", and that shift is pending or the downshift target gear is being actively maintained, this parameter should reflect that device's source address. When there is no active SPN 525 request or the transmission does not intend to honor a device's SPN 525 request, this parameter may be the source address of the ECU transmitting the message [e.g. SA 03 – Transmission #1]. For example, this value would be appropriate in an application that has a mechanical shift selector mechanism, and there are currently no active SPN 525 requests to modify the range being specified via the shift linkage. Note that in vehicles with a J1939-based shift selector, this parameter will most often indicate the source address of the active shift selector [e.g. SA 05 – Primary Shift Console].
8614	Engine Shutdown Command	Command to shut down the engine. If this parameter is received as 01b, then the engine should behave as if the key switch was turned off. An example of how this parameter could be used is an ECU would send 01b for this parameter if the operator depressed a start/stop pushbutton switch to shut down the engine.This parameter is

		different from Desired Engine Fueling State (SPN 5793), which is typically associated with automatic engine stop-start functionality that operates during a drive cycle. SPN 8614 would override such functionality, just like turning off the vehicle key switch. This parameter is also different from Engine Auxiliary Shutdown Switch (SPN 970), which is typically associated with secondary or remote shutdown methods, such as might be used in emergency situations. It is possible that applications would use SPN 8614 as the primary way of shutting down the engine and use SPN 970 as an alternative way of shutting down the engine. 00b = No command to shut down the engine 01b = Shut down the engine 10b = SAE Reserved 11b = Not Available
8615	Transmission Pressure Control Solenoid 9	Ninth pressure control solenoid of an automatic transmission.
8616	Transmission Pressure Control Solenoid 10	Tenth pressure control solenoid of an automatic transmission.
8617	Transmission Pressure Control Solenoid 11	Eleventh pressure control solenoid of an automatic transmission.
8618	Transmission Pressure Control Solenoid 12	Twelfth pressure control solenoid of an automatic transmission.
8619	Engine Exhaust Manifold Absolute Pressure 1	Absolute pressure of the exhaust gasses as measured at the engine exhaust manifold, location 1.
8620	Engine Exhaust Manifold Absolute Pressure 2	Absolute pressure of the exhaust gasses as measured at the engine exhaust manifold, location 2.
8621	Non-Volatile Memory (NVM)	Indicates that the control module has determined there is an issue with its Non-Volatile Memory (NVM).

8622	Engine Prelube Oil Low Pressure Threshold	The minimum value that the engine oil pressure (SPN 100 and SPN 7468) must exceed in order to start the engine.This parameter is intended for applications that have an external means of lubricating the engine before starting the engine.
8629	Total Aftertreatment Operating Hours	Accumulated time of operation of aftertreatment system. Operating hours are accumulated only when there is air flowing thru the aftertreatment system.
8630	Actual Maximum Available Engine – Percent Fuel	The percent of torque limited fuel relative to the engine standard torque fuel. The torque limited fuel in the Actual Maximum Available Engine – Percent Fuel shall take into consideration all engine torque derates (e.g. fault / event derates, various temperature derates, altitude derates, etc.) that are active in the system and number of known inactive cylinders. This does not take into account the air fuel ratio control (AFC) as it is a smoke limiting device that will naturally increase above the torque limits as the boost increases with engine load.If there are no active torque derates, this parameter will be transmitted at 100%.
8631	Engine Turbocharger 1 Efficiency	Calculated efficiency (calculated actual flow rate/theoretical) of Engine Turbocharger 1.
8632	Engine Turbocharger 2 Efficiency	Calculated efficiency (calculated actual flow rate/theoretical) of Engine Turbocharger 2.
8633	Engine Turbocharger 3 Efficiency	Calculated efficiency (calculated actual flow rate/theoretical) of Engine Turbocharger 3.
8634	Engine Turbocharger 4 Efficiency	Calculated efficiency (calculated actual flow rate/theoretical) of Engine Turbocharger 4.
8635	Alternator Bearing Header Intake Pressure	Pressure of the lube oil at the intake of alternator bearing header.
8636	Alternator Oil Cooler Discharge Pump Pressure	Pressure of the lube oil at the alternator oil cooler discharge pump.

8637	Engine Oil Cooler Discharge Pump Pressure	Pressure of the lube oil at engine oil cooler discharge pump.
8638	Engine Oil Cooler Intake Temperature	Temperature of lube oil at engine cooler intake.
8639	Engine PTO Governor Disable Switch	Customer or body builder installed switch to prevent operation of engine in PTO mode. 00b = Off (PTO mode allowed) 01b = On (PTO mode is not allowed) 10b = Error 11b = Not Available
8640	Well Stimulation Pump Vibration 1	The vibration measured on the well stimulation pump by the first sensor.
8641	Well Stimulation Pump Vibration 2	The vibration measured on the well stimulation pump by the second sensor.
8642	Well Stimulation Pump Vibration 3	The vibration measured on the well stimulation pump by the third sensor.
8643	Well Stimulation Pump Vibration 4	The vibration measured on the well stimulation pump by the fourth sensor.
8644	Well Stimulation Pump Vibration 5	The vibration measured on the well stimulation pump by the fifth sensor.
8645	Well Stimulation Pump Vibration 6	The vibration measured on the well stimulation pump by the sixth sensor.
8646	Well Stimulation Pump Vibration 7	The vibration measured on the well stimulation pump by the seventh sensor.
8647	Well Stimulation Pump Vibration 8	The vibration measured on the well stimulation pump by the eighth sensor.
8648	Well Stimulation Pump Rod Load	The load on the plungers of the well stimulation pump.
8649	Well Stimulation Pump Cavitation Status	Indicates the level of cavitation detected on the well stimulation pump. 000b = No Cavitation 001b = Low 010b = Medium 011b = High 100b = Reserved 101b = Reserved 110b = Error 111b = Not Available

8650	Well Stimulation Pump Flow Rate	The amount of fluid that is being pumped by the well stimulation pump.
8651	Well Stimulation Pump Fluid End Valve Leak	Indicates the leakage detected in the well stimulation pump fluid end. 00b = No Leak Detected 01b = Leak Detected 10b = Error 11b = Not Available
8652	Well Stimulation Pump Plunger Diameter	The diameter of the well stimulation pump plungers
8653	Well Stimulation Pump Stroke Length	The stroke length of the plunger in a well stimulation pump.
8654	Well Stimulation Pump Gear Ratio	Actual ratio of input shaft speed to output shaft speed.
8655	Well Stimulation Pump Rated Speed	The rated speed of the well stimulation pump.
8656	Well Stimulation Pump Fluid End Working Hours	The accumulated time of operation of the fluid end of the pump while under operating conditions.
8657	Well Stimulation Pump Power End Working Hours	The accumulated time of operation of the power end of the pump while under operating conditions.
8658	Well Stimulation Pump Working Hours	The accumulated amount of time the Well Stimulation Pump has spent working.
8659	Well Stimulation Pump Cycle Count	The total number of cycles on the well stimulation pump. A cycle is defined as a working stage from start to finish.
8660	Well Stimulation Pump Oil Viscosity	Dynamic viscosity of the well stimulation pump oil.
8661	Well Stimulation Pump Oil Density	Density of the well stimulation pump oil.

8662	Well Stimulation Pump Oil Relative Dielectricity	Well stimulation pump oil relative dielectricity used to describe the well stimulation pump oil quality.
8663	Well Stimulation Pump Oil Temperature	Temperature of the well stimulation pump lubricant.
8664	Engine Operating Mode Selection	Identifies the current engine operating mode. In some off-highway applications it may be desirable to have multiple preconfigured operating modes available for selection by the operator. Examples would be an economy mode, a plowing mode or a PTO mode.0000b = Engine not operating in a specific Engine Operating Mode 0001b = Engine Operating Mode 1 is selected 0010b = Engine Operating Mode 2 is selected 0011b = Engine Operating Mode 3 is selected 0100b = Engine Operating Mode 4 is selected 0101b = Engine Operating Mode 5 is selected 0110b = Engine Operating Mode 6 is selected 0111b = Engine Operating Mode 7 is selected 1000b = Engine Operating Mode 8 is selected 1001b = Engine Operating Mode 9 is selected 1010b = Engine Operating Mode 10 is selected 1011b = Engine Operating Mode 11 is selected 1100b = Engine Operating Mode 12 is selected 1101b = Engine Operating Mode 13 is selected 1110b = Error 1111b = Not available
8665	Auxiliary Valve 0 Flow	See document ISO 11783 for SPN details.
8666	Auxiliary Valve 1 Flow	See document ISO 11783 for SPN details.
8667	Auxiliary Valve 2 Flow	See document ISO 11783 for SPN details.
8668	Auxiliary Valve 3 Flow	See document ISO 11783 for SPN details.
8669	Auxiliary Valve 4 Flow	See document ISO 11783 for SPN details.
8670	Auxiliary Valve 5 Flow	See document ISO 11783 for SPN details.
8671	Auxiliary Valve 6 Flow	See document ISO 11783 for SPN details.

8672	Auxiliary Valve 7 Flow	See document ISO 11783 for SPN details.
8673	Auxiliary Valve 8 Flow	See document ISO 11783 for SPN details.
8674	Auxiliary Valve 9 Flow	See document ISO 11783 for SPN details.
8675	Auxiliary Valve 10 Flow	See document ISO 11783 for SPN details.
8676	Auxiliary Valve 11 Flow	See document ISO 11783 for SPN details.
8677	Auxiliary Valve 12 Flow	See document ISO 11783 for SPN details.
8678	Auxiliary Valve 13 Flow	See document ISO 11783 for SPN details.
8679	Auxiliary Valve 14 Flow	See document ISO 11783 for SPN details.
8680	Auxiliary Valve 15 Flow	See document ISO 11783 for SPN details.
8681	Auxiliary Valve 16 Flow	See document ISO 11783 for SPN details.
8682	Auxiliary Valve 17 Flow	See document ISO 11783 for SPN details.
8683	Auxiliary Valve 18 Flow	See document ISO 11783 for SPN details.
8684	Auxiliary Valve 19 Flow	See document ISO 11783 for SPN details.
8685	Auxiliary Valve 20 Flow	See document ISO 11783 for SPN details.
8686	Auxiliary Valve 21 Flow	See document ISO 11783 for SPN details.
8687	Auxiliary Valve 22 Flow	See document ISO 11783 for SPN details.

8688	Auxiliary Valve 23 Flow	See document ISO 11783 for SPN details.
8689	Auxiliary Valve 24 Flow	See document ISO 11783 for SPN details.
8690	Auxiliary Valve 25 Flow	See document ISO 11783 for SPN details.
8691	Auxiliary Valve 26 Flow	See document ISO 11783 for SPN details.
8692	Auxiliary Valve 27 Flow	See document ISO 11783 for SPN details.
8693	Auxiliary Valve 28 Flow	See document ISO 11783 for SPN details.
8694	Auxiliary Valve 29 Flow	See document ISO 11783 for SPN details.
8695	Auxiliary Valve 30 Flow	See document ISO 11783 for SPN details.
8696	Auxiliary Valve 31 Flow	See document ISO 11783 for SPN details.
8697	Auxiliary Valve 0 Automation Status	See document ISO 11783 for SPN details.
8698	Auxiliary Valve 1 Automation Status	See document ISO 11783 for SPN details.
8699	Auxiliary Valve 2 Automation Status	See document ISO 11783 for SPN details.
8700	Auxiliary Valve 3 Automation Status	See document ISO 11783 for SPN details.
8701	Auxiliary Valve 4 Automation Status	See document ISO 11783 for SPN details.

8702	Auxiliary Valve 5 Automation Status	See document ISO 11783 for SPN details.
8703	Auxiliary Valve 6 Automation Status	See document ISO 11783 for SPN details.
8704	Auxiliary Valve 7 Automation Status	See document ISO 11783 for SPN details.
8705	Auxiliary Valve 8 Automation Status	See document ISO 11783 for SPN details.
8706	Auxiliary Valve 9 Automation Status	See document ISO 11783 for SPN details.
8707	Auxiliary Valve 10 Automation Status	See document ISO 11783 for SPN details.
8708	Auxiliary Valve 11 Automation Status	See document ISO 11783 for SPN details.
8709	Auxiliary Valve 12 Automation Status	See document ISO 11783 for SPN details.
8710	Auxiliary Valve 13 Automation Status	See document ISO 11783 for SPN details.
8711	Auxiliary Valve 14 Automation Status	See document ISO 11783 for SPN details.
8712	Auxiliary Valve 15 Automation Status	See document ISO 11783 for SPN details.

8713	Auxiliary Valve 16 Automation Status	See document ISO 11783 for SPN details.
8714	Auxiliary Valve 17 Automation Status	See document ISO 11783 for SPN details.
8715	Auxiliary Valve 18 Automation Status	See document ISO 11783 for SPN details.
8716	Auxiliary Valve 19 Automation Status	See document ISO 11783 for SPN details.
8717	Auxiliary Valve 20 Automation Status	See document ISO 11783 for SPN details.
8718	Auxiliary Valve 21 Automation Status	See document ISO 11783 for SPN details.
8719	Auxiliary Valve 22 Automation Status	See document ISO 11783 for SPN details.
8720	Auxiliary Valve 23 Automation Status	See document ISO 11783 for SPN details.
8721	Auxiliary Valve 24 Automation Status	See document ISO 11783 for SPN details.
8722	Auxiliary Valve 25 Automation Status	See document ISO 11783 for SPN details.
8723	Auxiliary Valve 26 Automation Status	See document ISO 11783 for SPN details.

8724	Auxiliary Valve 27 Automation Status	See document ISO 11783 for SPN details.
8725	Auxiliary Valve 28 Automation Status	See document ISO 11783 for SPN details.
8726	Auxiliary Valve 29 Automation Status	See document ISO 11783 for SPN details.
8727	Auxiliary Valve 30 Automation Status	See document ISO 11783 for SPN details.
8728	Auxiliary Valve 31 Automation Status	See document ISO 11783 for SPN details.
8729	Auxiliary Valve 0 Exit/Reason Code	See document ISO 11783 for SPN details.
8730	Auxiliary Valve 1 Exit/Reason Code	See document ISO 11783 for SPN details.
8731	Auxiliary Valve 2 Exit/Reason Code	See document ISO 11783 for SPN details.
8732	Auxiliary Valve 3 Exit/Reason Code	See document ISO 11783 for SPN details.
8733	Auxiliary Valve 4 Exit/Reason Code	See document ISO 11783 for SPN details.
8734	Auxiliary Valve 5 Exit/Reason Code	See document ISO 11783 for SPN details.
8735	Auxiliary Valve 6 Exit/Reason Code	See document ISO 11783 for SPN details.
8736	Auxiliary Valve 7 Exit/Reason Code	See document ISO 11783 for SPN details.
8737	Auxiliary Valve 8 Exit/Reason Code	See document ISO 11783 for SPN details.

8738	Auxiliary Valve 9 Exit/Reason Code	See document ISO 11783 for SPN details.
8739	Auxiliary Valve 10 Exit/Reason Code	See document ISO 11783 for SPN details.
8740	Auxiliary Valve 11 Exit/Reason Code	See document ISO 11783 for SPN details.
8741	Auxiliary Valve 12 Exit/Reason Code	See document ISO 11783 for SPN details.
8742	Auxiliary Valve 13 Exit/Reason Code	See document ISO 11783 for SPN details.
8743	Auxiliary Valve 14 Exit/Reason Code	See document ISO 11783 for SPN details.
8744	Auxiliary Valve 15 Exit/Reason Code	See document ISO 11783 for SPN details.
8745	Auxiliary Valve 16 Exit/Reason Code	See document ISO 11783 for SPN details.
8746	Auxiliary Valve 17 Exit/Reason Code	See document ISO 11783 for SPN details.
8747	Auxiliary Valve 18 Exit/Reason Code	See document ISO 11783 for SPN details.
8748	Auxiliary Valve 19 Exit/Reason Code	See document ISO 11783 for SPN details.

8749	Auxiliary Valve 20 Exit/Reason Code	See document ISO 11783 for SPN details.
8750	Auxiliary Valve 21 Exit/Reason Code	See document ISO 11783 for SPN details.
8751	Auxiliary Valve 22 Exit/Reason Code	See document ISO 11783 for SPN details.
8752	Auxiliary Valve 23 Exit/Reason Code	See document ISO 11783 for SPN details.
8753	Auxiliary Valve 24 Exit/Reason Code	See document ISO 11783 for SPN details.
8754	Auxiliary Valve 25 Exit/Reason Code	See document ISO 11783 for SPN details.
8755	Auxiliary Valve 26 Exit/Reason Code	See document ISO 11783 for SPN details.
8756	Auxiliary Valve 27 Exit/Reason Code	See document ISO 11783 for SPN details.
8757	Auxiliary Valve 28 Exit/Reason Code	See document ISO 11783 for SPN details.
8758	Auxiliary Valve 29 Exit/Reason Code	See document ISO 11783 for SPN details.
8759	Auxiliary Valve 30 Exit/Reason Code	See document ISO 11783 for SPN details.

8760	Auxiliary Valve 31 Exit/Reason Code	See document ISO 11783 for SPN details.
8761	Front PTO Output Shaft Speed	See document ISO 11783 for SPN details.
8762	Rear PTO Output Shaft Speed	See document ISO 11783 for SPN details.
8763	Front PTO Automation Status	See document ISO 11783 for SPN details.
8764	Rear PTO Automation Status	See document ISO 11783 for SPN details.
8765	Front PTO Exit/Reason Code	See document ISO 11783 for SPN details.
8766	Rear PTO Exit/Reason Code	See document ISO 11783 for SPN details.
8767	Front Hitch Position	See document ISO 11783 for SPN details.
8768	Rear Hitch Position	See document ISO 11783 for SPN details.
8769	Front Hitch Automation Status	See document ISO 11783 for SPN details.
8770	Rear Hitch Automation Status	See document ISO 11783 for SPN details.
8771	Front Hitch Exit/Reason Code	See document ISO 11783 for SPN details.
8772	Rear Hitch Exit/Reason Code	See document ISO 11783 for SPN details.
8773	Machine Speed	See document ISO 11783 for SPN details.
8774	Machine Speed Automation Status	See document ISO 11783 for SPN details.
8775	Machine Speed Exit/Reason Code	See document ISO 11783 for SPN details.

8776	External Guidance Curvature	See document ISO 11783 for SPN details.
8777	External Guidance Automation Status	See document ISO 11783 for SPN details.
8778	External Guidance Exit/Reason Code	See document ISO 11783 for SPN details.
8779	Auxiliary Valve 0 Flow Request	See document ISO 11783 for SPN details.
8780	Auxiliary Valve 1 Flow Request	See document ISO 11783 for SPN details.
8781	Auxiliary Valve 2 Flow Request	See document ISO 11783 for SPN details.
8782	Auxiliary Valve 3 Flow Request	See document ISO 11783 for SPN details.
8783	Auxiliary Valve 4 Flow Request	See document ISO 11783 for SPN details.
8784	Auxiliary Valve 5 Flow Request	See document ISO 11783 for SPN details.
8785	Auxiliary Valve 6 Flow Request	See document ISO 11783 for SPN details.
8786	Auxiliary Valve 7 Flow Request	See document ISO 11783 for SPN details.
8787	Auxiliary Valve 8 Flow Request	See document ISO 11783 for SPN details.
8788	Auxiliary Valve 9 Flow Request	See document ISO 11783 for SPN details.
8789	Auxiliary Valve 10 Flow Request	See document ISO 11783 for SPN details.
8790	Auxiliary Valve 11 Flow Request	See document ISO 11783 for SPN details.

8791	Auxiliary Valve 12 Flow Request	See document ISO 11783 for SPN details.
8792	Auxiliary Valve 13 Flow Request	See document ISO 11783 for SPN details.
8793	Auxiliary Valve 14 Flow Request	See document ISO 11783 for SPN details.
8794	Auxiliary Valve 15 Flow Request	See document ISO 11783 for SPN details.
8795	Auxiliary Valve 16 Flow Request	See document ISO 11783 for SPN details.
8796	Auxiliary Valve 17 Flow Request	See document ISO 11783 for SPN details.
8797	Auxiliary Valve 18 Flow Request	See document ISO 11783 for SPN details.
8798	Auxiliary Valve 19 Flow Request	See document ISO 11783 for SPN details.
8799	Auxiliary Valve 20 Flow Request	See document ISO 11783 for SPN details.
8800	Auxiliary Valve 21 Flow Request	See document ISO 11783 for SPN details.
8801	Auxiliary Valve 22 Flow Request	See document ISO 11783 for SPN details.
8802	Auxiliary Valve 23 Flow Request	See document ISO 11783 for SPN details.
8803	Auxiliary Valve 24 Flow Request	See document ISO 11783 for SPN details.
8804	Auxiliary Valve 25 Flow Request	See document ISO 11783 for SPN details.
8805	Auxiliary Valve 26 Flow Request	See document ISO 11783 for SPN details.
8806	Auxiliary Valve 27 Flow Request	See document ISO 11783 for SPN details.

8807	Auxiliary Valve 28 Flow Request	See document ISO 11783 for SPN details.
8808	Auxiliary Valve 29 Flow Request	See document ISO 11783 for SPN details.
8809	Auxiliary Valve 30 Flow Request	See document ISO 11783 for SPN details.
8810	Auxiliary Valve 31 Flow Request	See document ISO 11783 for SPN details.
8811	Front PTO Output Shaft Speed Request	See document ISO 11783 for SPN details.
8812	Rear PTO Output Shaft Speed Request	See document ISO 11783 for SPN details.
8813	Front Hitch Position Request	See document ISO 11783 for SPN details.
8814	Rear Hitch Position Request	See document ISO 11783 for SPN details.
8815	Machine Speed Request	See document ISO 11783 for SPN details.
8816	External Guidance Curvature Request	See document ISO 11783 for SPN details.
8817	DC/DC 1 SLI Battery Terminal Voltage Maximum Limit Request	The maximum allowed SLI Battery Voltage (at the battery terminals) requested by a separate system device.
8818	DC/DC 1 SLI Battery Terminal Charge Current Maximum Limit Request	The maximum allowed SLI Battery charging current (at the battery terminals) requested by a separate device.
8819	DC/DC 1 SLI Battery Temperature Maximum Limit Request	The maximum allowed SLI Battery Temperature requested by a separate device.

8820	DC/DC 1 Low Side Power	Indicates the measured SLI battery or low side power measured at the DC/DC Converter. The low side power is positive if the converter is charging the SLI battery from the hybrid battery (i.e. Buck Mode). The low side power is negative if the converter is charging the hybrid battery from the SLI battery (i.e. Boost Mode).
8821	DC/DC 1 High Side Power	Indicates the measured HVES or high side power measured at the DC/DC Converter. The high side power is positive if the converter is charging the hybrid battery from the SLI battery (i.e. Boost Mode). The high side power is negative if the converter is charging the SLI battery from the hybrid battery (i.e. Buck Mode).
8822	DC/DC 1 Coolant In Temperature	Parameter indicating the temperature of the DC/DC Converter Coolant measured at the input of the converter
8823	DC/DC 1 Coolant Out Temperature	Parameter indicating the temperature of the DC/DC Converter Coolant measured at the output of the converter
8824	DC/DC 1 High Side Voltage Minimum Limit Setting	Reports the active minimum limit on the high side voltage of the DC/DC Converter. The setting may be requested by a separate device (via SPN 8563) or determined by the DC/DC Controller based on operating conditions.
8825	DC/DC 1 High Side Voltage Maximum Limit Setting	Reports the active maximum limit on the high side voltage of the DC/DC Converter. The setting may be requested by a separate device (via SPN 8564) or determined by the DC/DC Controller based on operating conditions.
8826	DC/DC 1 High Side Current Maximum Limit Setting	Reports the active maximum limit on the high side current of the DC/DC Converter. The setting may be requested by a separate device (via SPN 8565) or determined by the DC/DC Controller based on operating conditions.
8827	DC/DC 1 Low Side Voltage Minimum Limit Setting	Reports the active minimum limit on the low side voltage of the DC/DC Converter. The setting may be requested by a separate device (via SPN 8566) or determined by the DC/DC Controller based on operating conditions.

8828	DC/DC 1 Low Side Voltage Maximum Limit Setting	Reports the active maximum limit on the low side voltage of the DC/DC Converter. The setting may be requested by a separate device (via SPN 8567) or determined by the DC/DC Controller based on operating conditions.
8829	DC/DC 1 Low Side Current Maximum Limit Setting	Reports the active maximum limit on the low side current of the DC/DC Converter. The setting may be requested by a separate device (via SPN 8568) or determined by the DC/DC Controller based on operating conditions.
8830	DC/DC 1 SLI Battery Terminal Voltage Maximum Limit Setting	Reports the active SLI Battery Voltage maximum limit (at the battery terminals). The setting may be requested by a separate device (via SPN 8817) or determined by the DC/DC Controller based on operating conditions.
8831	DC/DC 1 SLI Battery Terminal Charge Current Maximum Limit Setting	Reports the active SLI Battery charging current maximum limit (at the battery terminals). The setting may be requested by a separate device (via SPN 8818) or determined by the DC/DC Controller based on operating conditions.
8832	DC/DC 1 SLI Battery Temperature Maximum Limit Setting	Reports the active SLI Battery Temperature maximum limit. The setting may be requested by a separate device (via SPN 8819) or determined by the DC/DC Controller based on operating conditions.
8833	DC/DC 1 Total High Side Energy	Indicates the total lifetime energy converted by the DC/DC from the high side (e.g. HVES) during buck mode.
8834	DC/DC 1 Total Low Side Energy	Indicates the total lifetime energy converted by the DC/DC from the low side (e.g. SLI battery) during boost mode.
8835	DC/DC 1 Total High Side Charge	Indicates the total lifetime charge converted by the DC/DC from the high side (e.g. HVES) during buck mode.
8836	DC/DC 1 Total Low Side Charge	Indicates the total lifetime charge converted by the DC/DC from the low side (e.g. SLI battery) during boost mode.

8837	Receive SPNs Commanded Port	Identifies the ECU communication port of the target Configurable ECU for this instance of PGN 28160. The identification of each ECU communication port is ECU specific. The correlation of ECU communication port to a physical network connection is also ECU specific. Users of this message need to work with the manufacturer of each target Configurable ECU to understand the communication port assignment for each ECU physical port.0000b = Current port (Indicates the ECU communication port through which PGN 28160 is received) 0001b = Port 1 0010b = Port 2 0011b = Port 3 0100b = Port 4 0101b = Port 5 0110b = Port 6 0111b = Port 7 1000b = Port 8 1001b = Port 9 1010b = Port 10 1011b = SAE Reserved 1100b = SAE Reserved 1101b = SAE Reserved 1110b = SAE Reserved 1111b = SAE Reserved
8838	Receive SPNs Transaction Mode	Identifies the command or action being commanded to the target Configurable ECU of this instance of PGN 28160.0000b = Request Port Receive Status – Identifies the message as a request for the list of configurable receive SPNs on the port identified in SPN 8837 and their current receive status. All bits in SPN 8839, SPN 8840, and SPN 8841 shall be set to 1 by the sender and will be ignored by the receiver. 0001b = Configure Port Receive State – Identifies the message as a request to configure the receive behaviors of one or more SPNs on the port identified in SPN 8837. SPN 8839, SPN 8840, and SPN 8841 are used to specify each SPN, its desired receive capability, and the source address of the device that will provide each SPN. The sender of this message only needs to include SPNs that are to have their receive capability changed. SPNs that are not to have their receive capability changed do not need to be included in this message. 0010b = Cancel Pending Changes – Identifies the message as a request to cancel all pending SPN receive changes for any SPNs on the port identified in SPN 8837. All pending changes shall be cleared and no changes will be made. All bits in SPN 8839, SPN 8840, and SPN 8841 shall be set to 1 and will be ignored by the receiver. 0011b = Global Revert to Default – Identifies the message as a request to reset the receive behaviors of all SPNs on the port identified in SPN 8837 to their default settings. All bits in SPN 8839, SPN 8840, and SPN 8841 shall be set to 1 and will be ignored by the receiver. 0100b = Partial Revert to Default – Identifies the message as a request to reset the receive behaviors to their default settings for the specified list of SPNs on the port identified in SPN 8837. All bits in SPN 8840 and SPN 8841 shall be set to 1 and will be ignored by the receiver. 0101b

		= SAE Reserved 0110b = SAE Reserved 0111b = SAE Reserved 1000b = SAE Reserved 1001b = SAE Reserved 1010b = SAE Reserved 1011b = SAE Reserved 1100b = SAE Reserved 1101b = SAE Reserved 1110b = SAE Reserved 1111b = SAE Reserved
8839	Commanded Receive SPN	Identifies the SPN to be acted on by the associated SPN 8840.
8840	Commanded Receive SPN Requested State	Identifies the receive enable state being commanded for the specified SPN on the port identified in SPN 8837. This parameter is only valid when SPN 8838 is set to 'Configure Port Receive State' (1). For transaction modes where this parameter is not applicable, this parameter shall be set to 1.00b = SPN reception shall be disabled for the source address identified in SPN 8841. 01b = SPN reception shall be enabled for the source address identified in SPN 8841. 10b = SAE Reserved 11b = Not Available
8841	Commanded Receive SPN Source Address	The source address from which the Configurable ECU shall receive the SPN identified in SPN 8839. 0 to 253 = Source Address that the Configurable ECU should use to receive the Configurable Receive SPN. 254 = The command in SPN 8840 applies to all source addresses in which the Configurable ECU is currently configured to receive the SPN contained in SPN 8839. 255 = The command in SPN 8840 applies to all valid source addresses (0 to 253).
8842	Receive SPNs Port	Identifies the ECU communications port of the responding Configurable ECU that is in context for this instance of PGN 64462. If changes are accepted by the Configurable ECU, then this is the port affected. The identification of each ECU communication port is ECU specific. The correlation of ECU communication port to a physical network connection is ECU specific. Users of this message need to work with the manufacturer of the receiving Configurable ECU to understand the port assignment for each physical port. Port numbering must be the same between this parameter and SPN 8837 in PGN 28160.0000b = Current port (Indicates the ECU communication port through which PGN 64462 is received) 0001b = Port 1 0010b = Port 2 0011b = Port 3 0100b = Port 4 0101b = Port 5 0110b = Port 6 0111b = Port 7 1000b = Port 8 1001b = Port 9 1010b = Port 10 1011b = SAE Reserved 1100b = SAE Reserved 1101b = SAE Reserved 1110b = SAE Reserved 1111b = SAE Reserved

8843	Receive SPNs Port Pending Changes Status	Indicates if there are any pending receive changes for the port identified in SPN 8842. 0b = No pending changes to the receive status for any supported SPNs for the port identified in SPN 8842. 1b = Receive changes are pending for one or more supported SPNs on the port identified in SPN 8842.
8844	Receive SPNs Port Command Status	Indicates the overall success in performing the commanded transaction in PGN 28160. 000b = Positive Acknowledgment – PGN 28160 command was processed without issue. 001b = Negative Acknowledgment – PGN 28160 command was received but one or more transactions were rejected. 010b = No Configurable SPNs exist for the port identified in SPN 8842. 011b = SAE Reserved 100b = SAE Reserved 101b = SAE Reserved 110b = SAE Reserved 111b = Not available
8845	Configurable Receive SPN	Identifies the SPN for which the associated SPNs 8846, 8847, & 8848 apply.
8846	Configurable Receive SPN Source Address	The source address of a device from which the Configurable ECU is to receive the SPN identified in SPN 8845. 0 to 253 = Source Address in which this ECU is configured to receive the Configurable Receive SPN. Note: If the Configurable Receive SPN can be received from multiple source addresses, then the SPN in SPN 8842 would be included in the list for every supported source address. 254 = No source address has been configured for this Configurable Receive SPN. 255 = The Configurable ECU will process the Configurable Receive SPN from any source address on the port identified in SPN 8842.
8847	Configurable Receive SPN Modified Status	Indicates if the Configurable ECU is able to honor the request issued in PGN 28160 for the associated SPN identified on SPN 8845 on the port identified in SPN 8842.00b = SPN's receive status could not be modified. Note: This state shall only be used when SPN 8844 is set to NACK (001b). 01b = SPN's receive status was not requested to be modified. 10b = SPN's receive status could be modified as requested. 11b = Not available
8848	Configurable Receive SPN Detailed Status	Bit 5: Source Address Pending Status 1 – The use of the source address in SPN 8846 is pending and will take effect after the next significant trigger (e.g., power cycle). 0 – The source address in SPN 8846 is a source address in which the Configurable ECU

		receives this SPN.Bit 4: Source Address Configuration Capability 1 – The source address in SPN 8846 can be modified by PGN 28160. 0 – The source address in SPN 8846 cannot be modified by PGN 28160. Bit 3: Pending Receive Disable Status 1 – SPN receive status is pending to be disabled for the port identified in SPN 8842. 0 – SPN receive status is not pending to be disabled for the port identified in SPN 8842. Bit 2: Pending Receive Enable Status 1 – SPN receive status is pending to be enabled for the port identified in SPN 8842 from the source address identified in SPN 8846. 0 – SPN receive status is not pending to be enabled for the port identified in SPN 8842 Bit 1: Current Receive Status 1 – SPN receive status is enabled for the port identified in SPN 8842 from the source address identified in SPN 8846. 0 – SPN receive status is disabled for the port identified in SPN 8842 from the source address identified in SPN 8846.
8849	Transfer Case Direction Status	Indicates the vehicle direction capability based on the current transfer case or « power shuttle » state. Such devices are typically downstream of the traditional powertrain, and simply change the rotational direction of the powertrain output. They allow the vehicle or machine to move forwards and backwards at a given speed.00b = Forward 01b = Reverse 10b = Error 11b = Not Available
8850	Engine Turbocharger 2 Oil Temperature	Temperature of the lubricant for the second turbocharger.
8851	DC/AC Accessory Inverter 1 HVIL Status	High Voltage Interlock Loop (HVIL) state of the DC/AC Accessory Inverter 1. 00b = HVIL Closed 01b = HVIL Open 10b = Error 11b = Not Available
8852	DC/AC Accessory Inverter 2 HVIL Status	High Voltage Interlock Loop (HVIL) state of the DC/AC Accessory Inverter 2. 00b = HVIL Closed 01b = HVIL Open 10b = Error 11b = Not Available
8853	DC/AC Accessory Inverter 3 HVIL Status	High Voltage Interlock Loop (HVIL) state of the DC/AC Accessory Inverter 3. 00b = HVIL Closed 01b = HVIL Open 10b = Error 11b = Not Available
8854	DC/AC Accessory Inverter 4 HVIL Status	High Voltage Interlock Loop (HVIL) state of the DC/AC Accessory Inverter 4. 00b = HVIL Closed 01b = HVIL Open 10b = Error 11b = Not Available

8855	Active Shift Console Request	Requests the shift console or shift selector that the operator desires to be active. See SPN 2945 (Active Shift Console Indicator) for feedback on which shift console is currently active.00b = Use Primary Shift Console 01b = Use Secondary Shift Console 10b = Reserved 11b = Don’t Care / Take No Action Note: In some applications such as refuse trucks, the transmission can be operated from two positions in the vehicle. The transmission control unit will accept changes in transmission requested gear (SPN 525) from the operator only from the active shift console. The transmission control unit determines which shift console is active based on an input (such as this SPN) controlled by the operator and transmission system state criteria.
8856	Engine Oil Level High / Low	Conveys the amount of current volume of engine oil compared to recommended volume. Positive values indicate overfill. Zero means the engine oil is filled to the recommended level. Negative values indicate the amount in which the oil is below the recommended level.Parameter Specific Indicator: A value of FBh indicates conditions are not acceptable for a valid fluid level measurement.
8857	Diesel Particulate Filter Active Regeneration Availability Status	Indicates that diesel particulate filter active regeneration is available for initiation through Aftertreatment Regeneration Force Switch (SPN 3696).00b = Not ready for initiation 01b = Ready for initiation 10b = Reserved 11b = Not Available
8858	Aftertreatment 1 SCR System Cleaning Incomplete	Indicates that a selective catalytic reduction (SCR) system cleaning event of the SCR system in bank 1 failed to complete within the expected duration.
8859	Aftertreatment 2 SCR System Cleaning Incomplete	Indicates that a selective catalytic reduction (SCR) system cleaning event of the SCR system in bank 2 failed to complete within the expected duration.
8860	Well Stimulation Pump Gear Box Oil Pressure Low Threshold	Pressure at which the gearbox oil pressure is considered at the lowest acceptable pressure.
8861	Well Stimulation Pump Gear Box Oil Pressure High Threshold	Pressure at which the gearbox oil pressure is considered at the highest acceptable pressure.

8862	Well Stimulation Pump Gear Box Oil Temperature Low Threshold	Temperature at which the gearbox oil temperature is considered at the lowest acceptable temperature.
8863	Well Stimulation Pump Gear Box Oil Temperature High Threshold	Temperature at which the gearbox oil temperature is considered at the highest acceptable temperature.
8864	Well Stimulation Pump Suction Pressure Low Threshold	Pressure at which the suction pressure is considered at the lowest acceptable pressure.
8865	Well Stimulation Pump Suction Pressure High Threshold	Pressure at which the suction pressure is considered at the highest acceptable pressure.
8866	Well Stimulation Pump Discharge Pressure High Threshold	Pressure at which the discharge pressure is considered at the highest acceptable pressure.
8867	Well Stimulation Pump Crankshaft Speed Low Threshold	The minimum speed of Well stimulation pump crankshaft that is considered to be valid.
8868	Well Stimulation Pump Crankshaft Speed High Threshold	Well stimulation pump crankshaft speed that has been considered to be the highest acceptable speed.
8869	Well Stimulation Pump Rod Load High Threshold	Rod load force at which the rod load is considered at the highest acceptable force.
8870	Well Stimulation Pump Plunger Firing Order	Well stimulation pump plunger firing order 0000b = Firing order 1-2-3 0001b = Firing order 1-5-2-3-4 0010b = Reserved 0011b = Reserved 0100b = Reserved 0101b = Reserved 0110b = Reserved 0111b = Reserved 1000b = Reserved 1001b = Reserved 1010b = Reserved 1011b = Reserved 1100b = Reserved 1101b = Reserved 1110b = Reserved 1111b = Don’t Care / Take no action
8871	Well Stimulation Pump Gear Box Oil Pressure Low Threshold Setting	Configurable pressure at which the gearbox oil pressure is considered at the lowest acceptable pressure.

8872	Well Stimulation Pump Gear Box Oil Pressure High Threshold Setting	Configurable pressure at which the gearbox oil pressure is considered at the highest acceptable pressure.
8873	Well Stimulation Pump Gear Box Oil Temperature Low Threshold Setting	Configurable temperature at which the gearbox oil temperature is considered at the lowest acceptable temperature.
8874	Well Stimulation Pump Gear Box Oil Temperature High Threshold Setting	Configurable temperature at which the gearbox oil temperature is considered at the highest acceptable temperature.
8875	Well Stimulation Pump Suction Pressure Low Threshold Setting	Configurable pressure at which the suction pressure is considered at the lowest acceptable pressure.
8876	Well Stimulation Pump Suction Pressure High Threshold Setting	Configurable pressure at which the suction pressure is considered at the highest acceptable pressure.
8877	Well Stimulation Pump Discharge Pressure High Threshold Setting	Configurable pressure at which the discharge pressure is considered at the highest acceptable pressure.
8878	Well Stimulation Pump Crankshaft Speed Low Threshold Setting	Configurable well stimulation pump crankshaft speed that has been considered to be the lowest acceptable speed.
8879	Well Stimulation Pump Crankshaft Speed High Threshold Setting	Configurable well stimulation pump crankshaft speed that has been considered to be the highest acceptable speed.
8880	Well Stimulation Pump Rod Load High Threshold Setting	Rod load force at which the rod load is considered at the highest acceptable force.
8881	Well Stimulation Pump Plunger Firing Order Setting	Well stimulation pump plunger firing order 0000b = Firing order 1-2-3 0001b = Firing order 1-5-2-3-4 0010b = Reserved 0011b = Reserved 0100b = Reserved 0101b = Reserved 0110b = Reserved 0111b = Reserved 1000b = Reserved 1001b =

		Reserved 1010b = Reserved 1011b = Reserved 1100b = Reserved 1101b = Reserved 1110b = Error 1111b = Not available
8882	Well Stimulation Pump Maintenance Interval Hours	The hours accumulated since the last maintenance interval on the well stimulation pump.
8883	Well Stimulation Pump Valve Operation Hours	The hours accumulated since the last time a valve replacement was performed on the well stimulation pump.
8884	Well Stimulation Pump Packing Operation Hours	The hours accumulated since the last time a packing replacement was performed on the well stimulation pump.
8885	Well Stimulation Pump Valve Seat Operation Hours	The hours accumulated since the last time a valve seat replacement was performed on the well stimulation pump.
8886	Engine Exhaust Gas Recirculation 2 Cooler Bypass Actuator	The actuator controlling the cooler bypass valve on the second Exhaust Gas Recirculation (EGR) device.
8887	Exhaust Particulate Control System Diagnostic Time	The total time the exhaust particulate control diagnostic codes have been active. Total time only includes the active time for codes which have been active above a predetermined time threshold. The time for a code that has been active less than the predetermined time threshold (for example, 20 hours) will not be included in this total time. This parameter will accumulate over the life of the product and will never be reset.(Reference EU Commission Delegated Regulation 2016-8381 final ANNEXES 1-5)
8888	Exhaust Particulate Control System Diagnostic Count	The total occurrences of diagnostic codes for the exhaust particulate control system that have been active above a predetermined time threshold. A code that has been active less than the predetermined time threshold (for example, 20 hours) will not be included in the total occurrences. This parameter will accumulate over the life of the product and will never be reset.(Reference EU Commission Delegated Regulation 2016-8381 final ANNEXES 1-5)

8889	DC/AC Accessory Inverter 1 DC Side Power	Power measured at the DC Side input to the DC/AC Accessory Inverter.
8890	DC/AC Accessory Inverter 1 DC Side Voltage	DC Side input voltage measured at the point of control inside the DC/AC Accessory Inverter.
8891	DC/AC Accessory Inverter 1 DC Side Current	DC Side input current measured at the point of control inside the DC/AC Accessory Inverter.
8892	DC/DC 2 Operational Command	Command to enable or disable operation. 0000b = Disable – in this mode all high voltage switching is disabled 0001b = Operate in standby mode; system is waiting for command to enter buck or boost mode 0010b = Operate in buck mode; energy flows from high voltage side to low side 0011b = Operate in boost mode; energy flows from low voltage side to high side 0100b = Power down DC/DC Converter 0101b = Reserved 0110b = Reserved 0111b = Reserved 1000b = Reserved 1001b = Reserved 1010b = Reserved 1011b = Reserved 1100b = Reserved 1101b = Reserved 1111b = Don’t care/ Take No Action
8893	DC/DC 2 Low Side Voltage Buck Setpoint	The set point for regulating the low side voltage during buck mode.
8894	DC/DC 2 High Side Voltage Boost Setpoint	The set point for regulating the high side voltage during boost mode.
8895	DC/DC 2 Operational Status	Operating state of the DC/DC Converter 0000b = Disabled 0001b = Initialization in process. The device is powering up. This process may include both internal checks, as well as system checks being run by the DC/DC Converter. 0010b = Operational – Standby 0011b = Operational – Buck mode 0100b = Operational – Boost mode 0101b = Normal power down in process 0110b = Disabled due to malfunction or protection 0111b = Reserved 1000b = Reserved 1001b = Reserved 1010b = Reserved 1011b = Reserved 1100b = Reserved 1101b = Manufacturer assignable state (only applicable if none of the above apply) 1110b = Error 1111b = Not Available

8896	DC/DC 2 HVIL Status	High Voltage Interlock Loop (HVIL) state of the DC/DC Converter. 00b = HVIL Closed 01b = HVIL Open 10b = Error 11b = Not Available
8897	DC/DC 2 Loadshed Request	The loadshed request is a request to the controlling device to reduce the DC/DC Converter loads. The Loadshed Requested state is an indication that this DC/DC Converter has a malfunction or is in a limit condition and if the load of the output is not reduced, the DC/DC Converter may take steps to protect itself. The Loadshed Requested, Shutdown Imminent state is an indication that the loadshed request has not been met and the output may be shutdown in a limited amount of time.00b = No Loadshed Requested 01b = Loadshed Requested 10b = Loadshed Requested, Shutdown Imminent 11b = Don't Care/Take No Action
8898	DC/DC 2 Power Limit due to High Side Current	Indicates whether or not output power is being limited due to high side current (see SPN 8914) approaching or exceeding the maximum limit (see SPN 8946).00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
8899	DC/DC 2 Power Limit due to Low Side Current	Indicates whether or not output power is being limited due to low side current (see SPN 8912) approaching or exceeding the maximum limit (see SPN 8943).00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
8900	DC/DC 2 Power Limit due to High Side Voltage Minimum	Indicates whether or not output power is being limited due to high side voltage (see SPN 8913) approaching or falling below the minimum limit (see SPN 8944).00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
8901	DC/DC 2 Power Limit due to High Side Voltage Maximum	Indicates whether or not output power is being limited due to high side voltage (see SPN 8913) approaching or exceeding the maximum limit (see SPN 8945).00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available

8902	DC/DC 2 Power Limit due to Low Side Voltage Minimum	Indicates whether or not output power is being limited due to low side voltage (see SPN 8911) approaching or falling below the minimum limit (see SPN 8941).00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
8903	DC/DC 2 Power Limit due to Low Side Voltage Maximum	Indicates whether or not output power is being limited due to low side voltage (see SPN 8911) approaching or exceeding the maximum limit (see SPN 8942).00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
8904	DC/DC 2 Power Limit due to Converter Temperature	Indicates whether or not output power is being limited due to Converter Temperature (see SPN 8936) approaching or exceeding the maximum limit.00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
8905	DC/DC 2 Power Limit due to Electronic Filter Temperature	Indicates whether or not output power is being limited due to Output Electronic Filter Temperature (see SPN 8937) approaching or exceeding the maximum limit.00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not available
8906	DC/DC 2 Power Limit due to Power Electronics Temperature	Indicates whether or not output power is being limited due to Power Electronics Temperature (see SPN 8938) approaching or exceeding the maximum limit.00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
8907	DC/DC 2 Power Limit due to SLI Battery Terminal Voltage	Indicates whether or not output power is being limited due to the SLI battery terminal voltage (see SPN 8915) approaching or exceeding limits (see SPN 8933).00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
8908	DC/DC 2 Power Limit due to SLI Battery Terminal Current	Indicates whether or not output power is being limited due to the SLI battery terminal current (see SPN 8916) approaching or exceeding limits (see SPN 8934).00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available

8909	DC/DC 2 Power Limit due to SLI Battery Terminal Temperature	Indicates whether or not output power is being limited due to the SLI battery terminal temperature (see SPN 8917) approaching or exceeding limits (see SPN 8935).00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
8910	DC/DC 2 Power Limit due to Undefined Reason	Indicates whether or not output power is being limited due to an undefined reason. 00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
8911	DC/DC 2 Low Side Voltage	Indicates the measured SLI battery or low side voltage measured at the point of control inside the DC/DC Converter.
8912	DC/DC 2 Low Side Current	Indicates the measured SLI battery or low side current measured at the point of control inside the DC/DC Converter. The current is positive if the converter is charging the SLI battery from the hybrid battery.
8913	DC/DC 2 High Side Voltage	Indicates the measured HVES or high side voltage measured at the point of control inside the DC/DC Converter.
8914	DC/DC 2 High Side Current	Indicates the measured HVES or high side current measured at the point of control inside the DC/DC Converter. The current is negative if the converter is charging the SLI battery from the hybrid battery.
8915	DC/DC 2 SLI Battery Terminal Voltage	Parameter indicating the SLI battery terminal voltage for control use by the DC/DC converter.
8916	DC/DC 2 SLI Battery Terminal Current	Parameter indicating the SLI battery terminal current for control use by the DC/DC converter. The current is positive if the SLI battery or low side voltage source is being charged from the HVES.
8917	DC/DC 2 SLI Battery Terminal Temperature	Parameter indicating the SLI battery terminal temperature for control use by the DC/DC converter.

8918	DC/DC 2 Low Side Power	Indicates the measured SLI battery or low side power measured at the DC/DC Converter. The low side power is positive if the converter is charging the SLI battery from the hybrid battery (i.e. Buck Mode). The low side power is negative if the converter is charging the hybrid battery from the SLI battery (i.e. Boost Mode).
8919	DC/DC 2 High Side Power	Indicates the measured HVES or high side power measured at the DC/DC Converter. The high side power is positive if the converter is charging the hybrid battery from the SLI battery (i.e. Boost Mode). The high side power is negative if the converter is charging the SLI battery from the hybrid battery (i.e. Buck Mode).
8920	DC/DC 2 Total High Side Energy	Indicates the total lifetime energy converted by the DC/DC from the high side (e.g. HVES) during buck mode.
8921	DC/DC 2 Total Low Side Energy	Indicates the total lifetime energy converted by the DC/DC from the low side (e.g. SLI battery) during boost mode.
8922	DC/DC 2 Total High Side Charge	Indicates the total lifetime charge converted by the DC/DC from the high side (e.g. HVES) during buck mode.
8923	DC/DC 2 Total Low Side Charge	Indicates the total lifetime charge converted by the DC/DC from the low side (e.g. SLI battery) during boost mode.
8924	DC/DC 2 High Side Voltage Minimum Limit Setting	Reports the active minimum limit on the high side voltage of the DC/DC Converter. The setting may be requested by a separate device (see SPN 8944) or determined by the DC/DC Controller based on operating conditions.
8925	DC/DC 2 High Side Voltage Maximum Limit Setting	Reports the active maximum limit on the high side voltage of the DC/DC Converter. The setting may be requested by a separate device (see SPN 8945) or determined by the DC/DC Controller based on operating conditions.
8926	DC/DC 2 High Side Current Maximum Limit Setting	Reports the active maximum limit on the high side current of the DC/DC Converter. The setting may be requested by a separate device (see SPN 8946) or determined by the DC/DC Controller based on operating conditions.

8927	DC/DC 2 Low Side Voltage Minimum Limit Setting	Reports the active minimum limit on the low side voltage of the DC/DC Converter. The setting may be requested by a separate device(see SPN 8941) or determined by the DC/DC Controller based on operating conditions.
8928	DC/DC 2 Low Side Voltage Maximum Limit Setting	Reports the active maximum limit on the low side voltage of the DC/DC Converter. The setting may be requested by a separate device (see SPN 8942) or determined by the DC/DC Controller based on operating conditions.
8929	DC/DC 2 Low Side Current Maximum Limit Setting	Reports the active maximum limit on the low side current of the DC/DC Converter. The setting may be requested by a separate device (see SPN 8943) or determined by the DC/DC Controller based on operating conditions.
8930	DC/DC 2 SLI Battery Terminal Voltage Maximum Limit Setting	Reports the active SLI Battery Voltage maximum limit (at the battery terminals). The setting may be requested by a separate device (see SPN 8933) or determined by the DC/DC Controller based on operating conditions.
8931	DC/DC 2 SLI Battery Terminal Charge Current Maximum Limit Setting	Reports the active SLI Battery charging current maximum limit (at the battery terminals). The setting may be requested by a separate device (see SPN 8934) or determined by the DC/DC Controller based on operating conditions.
8932	DC/DC 2 SLI Battery Temperature Maximum Limit Setting	Reports the active SLI Battery Temperature maximum limit. The setting may be requested by a separate device (see SPN 8935) or determined by the DC/DC Controller based on operating conditions.
8933	DC/DC 2 SLI Battery Terminal Voltage Maximum Limit Request	The maximum allowed SLI Battery Voltage (at the battery terminals) requested by a separate system device.
8934	DC/DC 2 SLI Battery Terminal Charge Current Maximum Limit Request	The maximum allowed SLI Battery charging current (at the battery terminals) requested by a separate device.
8935	DC/DC 2 SLI Battery Temperature Maximum Limit Request	The maximum allowed SLI Battery Temperature requested by a separate device.

8936	DC/DC 2 Converter Temperature	Parameter indicating the temperature of the DC/DC Converter (e.g, controller, circuit board, enclosure).
8937	DC/DC 2 Converter Electronic Filter Temperature	Parameter indicating the temperature of the electronic components that make up the DC/DC Converter filter.
8938	DC/DC 2 Power Electronics Temperature	Parameter indicating the temperature of the DC/DC Converter power electronics components (e.g, switch or heatsink).
8939	DC/DC 2 Coolant In Temperature	Parameter indicating the temperature of the DC/DC Converter Coolant measured at the input of the converter
8940	DC/DC 2 Coolant Out Temperature	Parameter indicating the temperature of the DC/DC Converter Coolant measured at the output of the converter
8941	DC/DC 2 Low Side Voltage Minimum Limit Request	The minimum allowed low side voltage requested by a separate device. Under normal conditions this requested limit would be reflected in SPN 8927.
8942	DC/DC 2 Low Side Voltage Maximum Limit Request	The maximum allowed low side voltage requested by a separate device. Under normal conditions this requested limit would be reflected in SPN 8928.
8943	DC/DC 2 Low Side Current Maximum Limit Request	The maximum allowed low side current requested by a separate device. Under normal conditions this requested limit would be reflected in SPN 8929.
8944	DC/DC 2 High Side Voltage Minimum Limit Request	The minimum allowed high side voltage requested by a separate device. Under normal conditions this requested limit would be reflected in SPN 8924.
8945	DC/DC 2 High Side Voltage Maximum Limit Request	The maximum allowed high side voltage requested by a separate device. Under normal conditions this requested limit would be reflected in SPN 8925.
8946	DC/DC 2 High Side Current Maximum Limit Request	The maximum allowed high side current requested by a separate device. Under normal conditions this requested limit would be reflected in SPN 8926.

8947	DC/DC 3 Operational Command	Command to enable or disable operation. 0000b = Disable – in this mode all high voltage switching is disabled 0001b = Operate in standby mode; system is waiting for command to enter buck or boost mode 0010b = Operate in buck mode; energy flows from high voltage side to low side 0011b = Operate in boost mode; energy flows from low voltage side to high side 0100b = Power down DC/DC Converter 0101b = Reserved 0110b = Reserved 0111b = Reserved 1000b = Reserved 1001b = Reserved 1010b = Reserved 1011b = Reserved 1100b = Reserved 1101b = Reserved 1111b = Don't care/ Take No Action
8948	DC/DC 3 Low Side Voltage Buck Setpoint	The set point for regulating the low side voltage during buck mode.
8949	DC/DC 3 High Side Voltage Boost Setpoint	The set point for regulating the high side voltage during boost mode.
8950	DC/DC 3 Operational Status	Operating state of the DC/DC Converter 0000b = Disabled 0001b = Initialization in process. The device is powering up. This process may include both internal checks, as well as system checks being run by the DC/DC Converter. 0010b = Operational – Standby 0011b = Operational – Buck mode 0100b = Operational – Boost mode 0101b = Normal power down in process 0110b = Disabled due to malfunction or protection 0111b = Reserved 1000b = Reserved 1001b = Reserved 1010b = Reserved 1011b = Reserved 1100b = Reserved 1101b = Manufacturer assignable state (only applicable if none of the above apply) 1110b = Error 1111b = Not Available
8951	DC/DC 3 HVIL Status	High Voltage Interlock Loop (HVIL) state of the DC/DC Converter. 00b = HVIL Closed 01b = HVIL Open 10b = Error 11b = Not Available
8952	DC/DC 3 Loadshed Request	The loadshed request is a request to the controlling device to reduce the DC/DC Converter loads. The Loadshed Requested state is an indication that this DC/DC Converter has a malfunction or is in a limit condition and if the load of the output is not reduced, the DC/DC Converter may take steps to protect itself. The Loadshed Requested, Shutdown Imminent state is an indication that the loadshed request has not been met and the output may be shutdown in a limited amount of time.00b = No

		Loadshed Requested 01b = Loadshed Requested 10b = Loadshed Requested, Shutdown Imminent 11b = Don’t Care/Take No Action
8953	DC/DC 3 Power Limit due to High Side Current	Indicates whether or not output power is being limited due to high side current (see SPN 8969) approaching or exceeding the maximum limit (see SPN 9001).00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
8954	DC/DC 3 Power Limit due to Low Side Current	Indicates whether or not output power is being limited due to low side current (see SPN 8967) approaching or exceeding the maximum limit (see SPN 8998).00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
8955	DC/DC 3 Power Limit due to High Side Voltage Minimum	Indicates whether or not output power is being limited due to high side voltage (see SPN 8968) approaching or falling below the minimum limit (see SPN 8999).00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
8956	DC/DC 3 Power Limit due to High Side Voltage Maximum	Indicates whether or not output power is being limited due to high side voltage (see SPN 8968) approaching or exceeding the maximum limit (see SPN 9000).00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
8957	DC/DC 3 Power Limit due to Low Side Voltage Minimum	Indicates whether or not output power is being limited due to low side voltage (see SPN 8966) approaching or falling below the minimum limit (see SPN 8996).00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
8958	DC/DC 3 Power Limit due to Low Side Voltage Maximum	Indicates whether or not output power is being limited due to low side voltage (see SPN 8966) approaching or exceeding the maximum limit (see SPN 8997).00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available

8959	DC/DC 3 Power Limit due to Converter Temperature	Indicates whether or not output power is being limited due to Converter Temperature (see SPN 8991) approaching or exceeding the maximum limit.00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
8960	DC/DC 3 Power Limit due to Electronic Filter Temperature	Indicates whether or not output power is being limited due to Output Electronic Filter Temperature (see SPN 8992) approaching or exceeding the maximum limit.00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not available
8961	DC/DC 3 Power Limit due to Power Electronics Temperature	Indicates whether or not output power is being limited due to Power Electronics Temperature (see SPN 8993) approaching or exceeding the maximum limit.00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
8962	DC/DC 3 Power Limit due to SLI Battery Terminal Voltage	Indicates whether or not output power is being limited due to the SLI battery terminal voltage (see SPN 8970) approaching or exceeding limits (see SPN 8988).00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
8963	DC/DC 3 Power Limit due to SLI Battery Terminal Current	Indicates whether or not output power is being limited due to the SLI battery terminal current (see SPN 8971) approaching or exceeding limits (see SPN 8989).00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
8964	DC/DC 3 Power Limit due to SLI Battery Terminal Temperature	Indicates whether or not output power is being limited due to the SLI battery terminal temperature (see SPN 8972) approaching or exceeding limits (see SPN 8990).00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
8965	DC/DC 3 Power Limit due to Undefined Reason	Indicates whether or not output power is being limited due to an undefined reason. 00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available

8966	DC/DC 3 Low Side Voltage	Indicates the measured SLI battery or low side voltage measured at the point of control inside the DC/DC Converter.
8967	DC/DC 3 Low Side Current	Indicates the measured SLI battery or low side current measured at the point of control inside the DC/DC Converter. The current is positive if the converter is charging the SLI battery from the hybrid battery.
8968	DC/DC 3 High Side Voltage	Indicates the measured HVES or high side voltage measured at the point of control inside the DC/DC Converter.
8969	DC/DC 3 High Side Current	Indicates the measured HVES or high side current measured at the point of control inside the DC/DC Converter. The current is negative if the converter is charging the SLI battery from the hybrid battery.
8970	DC/DC 3 SLI Battery Terminal Voltage	Parameter indicating the SLI battery terminal voltage for control use by the DC/DC converter.
8971	DC/DC 3 SLI Battery Terminal Current	Parameter indicating the SLI battery terminal current for control use by the DC/DC converter. The current is positive if the SLI battery or low side voltage source is being charged from the HVES.
8972	DC/DC 3 SLI Battery Terminal Temperature	Parameter indicating the SLI battery terminal temperature for control use by the DC/DC converter.
8973	DC/DC 3 Low Side Power	Indicates the measured SLI battery or low side power measured at the DC/DC Converter. The low side power is positive if the converter is charging the SLI battery from the hybrid battery (i.e. Buck Mode). The low side power is negative if the converter is charging the hybrid battery from the SLI battery (i.e. Boost Mode).
8974	DC/DC 3 High Side Power	Indicates the measured HVES or high side power measured at the DC/DC Converter. The high side power is positive if the converter is charging the hybrid battery from the SLI battery (i.e. Boost Mode). The high side power is negative if the converter is charging the SLI battery from the hybrid battery (i.e. Buck Mode).

8975	DC/DC 3 Total High Side Energy	Indicates the total lifetime energy converted by the DC/DC from the high side (e.g. HVES) during buck mode.
8976	DC/DC 3 Total Low Side Energy	Indicates the total lifetime energy converted by the DC/DC from the low side (e.g. SLI battery) during boost mode.
8977	DC/DC 3 Total High Side Charge	Indicates the total lifetime charge converted by the DC/DC from the high side (e.g. HVES) during buck mode.
8978	DC/DC 3 Total Low Side Charge	Indicates the total lifetime charge converted by the DC/DC from the low side (e.g. SLI battery) during boost mode.
8979	DC/DC 3 High Side Voltage Minimum Limit Setting	Reports the active minimum limit on the high side voltage of the DC/DC Converter. The setting may be requested by a separate device (see SPN 8999) or determined by the DC/DC Controller based on operating conditions.
8980	DC/DC 3 High Side Voltage Maximum Limit Setting	Reports the active maximum limit on the high side voltage of the DC/DC Converter. The setting may be requested by a separate device (see SPN 9000) or determined by the DC/DC Controller based on operating conditions.
8981	DC/DC 3 High Side Current Maximum Limit Setting	Reports the active maximum limit on the high side current of the DC/DC Converter. The setting may be requested by a separate device (see SPN 9001) or determined by the DC/DC Controller based on operating conditions.
8982	DC/DC 3 Low Side Voltage Minimum Limit Setting	Reports the active minimum limit on the low side voltage of the DC/DC Converter. The setting may be requested by a separate device(see SPN 8996) or determined by the DC/DC Controller based on operating conditions.
8983	DC/DC 3 Low Side Voltage Maximum Limit Setting	Reports the active maximum limit on the low side voltage of the DC/DC Converter. The setting may be requested by a separate device (see SPN 8997) or determined by the DC/DC Controller based on operating conditions.

8984	DC/DC 3 Low Side Current Maximum Limit Setting	Reports the active maximum limit on the low side current of the DC/DC Converter. The setting may be requested by a separate device (see SPN 8998) or determined by the DC/DC Controller based on operating conditions.
8985	DC/DC 3 SLI Battery Terminal Voltage Maximum Limit Setting	Reports the active SLI Battery Voltage maximum limit (at the battery terminals). The setting may be requested by a separate device (see SPN 8988) or determined by the DC/DC Controller based on operating conditions.
8986	DC/DC 3 SLI Battery Terminal Charge Current Maximum Limit Setting	Reports the active SLI Battery charging current maximum limit (at the battery terminals). The setting may be requested by a separate device (see SPN 8989) or determined by the DC/DC Controller based on operating conditions.
8987	DC/DC 3 SLI Battery Temperature Maximum Limit Setting	Reports the active SLI Battery Temperature maximum limit. The setting may be requested by a separate device (see SPN 8990) or determined by the DC/DC Controller based on operating conditions.
8988	DC/DC 3 SLI Battery Terminal Voltage Maximum Limit Request	The maximum allowed SLI Battery Voltage (at the battery terminals) requested by a separate system device.
8989	DC/DC 3 SLI Battery Terminal Charge Current Maximum Limit Request	The maximum allowed SLI Battery charging current (at the battery terminals) requested by a separate device.
8990	DC/DC 3 SLI Battery Temperature Maximum Limit Request	The maximum allowed SLI Battery Temperature requested by a separate device.
8991	DC/DC 3 Converter Temperature	Parameter indicating the temperature of the DC/DC Converter (e.g, controller, circuit board, enclosure).
8992	DC/DC 3 Converter Electronic Filter Temperature	Parameter indicating the temperature of the electronic components that make up the DC/DC Converter filter.

8993	DC/DC 3 Power Electronics Temperature	Parameter indicating the temperature of the DC/DC Converter power electronics components (e.g, switch or heatsink).
8994	DC/DC 3 Coolant In Temperature	Parameter indicating the temperature of the DC/DC Converter Coolant measured at the input of the converter
8995	DC/DC 3 Coolant Out Temperature	Parameter indicating the temperature of the DC/DC Converter Coolant measured at the output of the converter
8996	DC/DC 3 Low Side Voltage Minimum Limit Request	The minimum allowed low side voltage requested by a separate device. Under normal conditions this requested limit would be reflected in SPN 8982.
8997	DC/DC 3 Low Side Voltage Maximum Limit Request	The maximum allowed low side voltage requested by a separate device. Under normal conditions this requested limit would be reflected in SPN 8983.
8998	DC/DC 3 Low Side Current Maximum Limit Request	The maximum allowed low side current requested by a separate device. Under normal conditions this requested limit would be reflected in SPN 8984.
8999	DC/DC 3 High Side Voltage Minimum Limit Request	The minimum allowed high side voltage requested by a separate device. Under normal conditions this requested limit would be reflected in SPN 8979.
9000	DC/DC 3 High Side Voltage Maximum Limit Request	The maximum allowed high side voltage requested by a separate device. Under normal conditions this requested limit would be reflected in SPN 8980.
9001	DC/DC 3 High Side Current Maximum Limit Request	The maximum allowed high side current requested by a separate device. Under normal conditions this requested limit would be reflected in SPN 8981.
9002	DC/DC 4 Operational Command	Command to enable or disable operation. 0000b = Disable – in this mode all high voltage switching is disabled 0001b = Operate in standby mode; system is waiting for command to enter buck or boost mode 0010b = Operate in buck mode; energy flows from high voltage side to low side 0011b = Operate in boost mode; energy flows from low voltage side to high side 0100b = Power down DC/DC Converter 0101b = Reserved 0110b = Reserved 0111b = Reserved 1000b = Reserved 1001b = Reserved

		1010b = Reserved 1011b = Reserved 1100b = Reserved 1101b = Reserved 1111b = Don’t care/ Take No Action
9003	DC/DC 4 Low Side Voltage Buck Setpoint	The set point for regulating the low side voltage during buck mode.
9004	DC/DC 4 High Side Voltage Boost Setpoint	The set point for regulating the high side voltage during boost mode.
9005	DC/DC 4 Operational Status	Operating state of the DC/DC Converter 0000b = Disabled 0001b = Initialization in process. The device is powering up. This process may include both internal checks, as well as system checks being run by the DC/DC Converter. 0010b = Operational – Standby 0011b = Operational – Buck mode 0100b = Operational – Boost mode 0101b = Normal power down in process 0110b = Disabled due to malfunction or protection 0111b = Reserved 1000b = Reserved 1001b = Reserved 1010b = Reserved 1011b = Reserved 1100b = Reserved 1101b = Manufacturer assignable state (only applicable if none of the above apply) 1110b = Error 1111b = Not Available
9006	DC/DC 4 HVIL Status	High Voltage Interlock Loop (HVIL) state of the DC/DC Converter. 00b = HVIL Closed 01b = HVIL Open 10b = Error 11b = Not Available
9007	DC/DC 4 Loadshed Request	The loadshed request is a request to the controlling device to reduce the DC/DC Converter loads. The Loadshed Requested state is an indication that this DC/DC Converter has a malfunction or is in a limit condition and if the load of the output is not reduced, the DC/DC Converter may take steps to protect itself. The Loadshed Requested, Shutdown Imminent state is an indication that the loadshed request has not been met and the output may be shutdown in a limited amount of time.00b = No Loadshed Requested 01b = Loadshed Requested 10b = Loadshed Requested, Shutdown Imminent 11b = Don’t Care/Take No Action
9008	DC/DC 4 Power Limit due to High Side Current	Indicates whether or not output power is being limited due to high side current (see SPN 9024) approaching or exceeding the maximum limit (see SPN 9056).00b = No

		power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
9009	DC/DC 4 Power Limit due to Low Side Current	Indicates whether or not output power is being limited due to low side current (see SPN 9022) approaching or exceeding the maximum limit (see SPN 9053).00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
9010	DC/DC 4 Power Limit due to High Side Voltage Minimum	Indicates whether or not output power is being limited due to high side voltage (see SPN 9023) approaching or falling below the minimum limit (see SPN 9054).00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
9011	DC/DC 4 Power Limit due to High Side Voltage Maximum	Indicates whether or not output power is being limited due to high side voltage (see SPN 9023) approaching or exceeding the maximum limit (see SPN 9055).00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
9012	DC/DC 4 Power Limit due to Low Side Voltage Minimum	Indicates whether or not output power is being limited due to low side voltage (see SPN 9021) approaching or falling below the minimum limit (see SPN 9051).00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
9013	DC/DC 4 Power Limit due to Low Side Voltage Maximum	Indicates whether or not output power is being limited due to low side voltage (see SPN 9021) approaching or exceeding the maximum limit (see SPN 9052).00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
9014	DC/DC 4 Power Limit due to Converter Temperature	Indicates whether or not output power is being limited due to Converter Temperature (see SPN 9046) approaching or exceeding the maximum limit.00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available

9015	DC/DC 4 Power Limit due to Electronic Filter Temperature	Indicates whether or not output power is being limited due to Output Electronic Filter Temperature (see SPN 9047) approaching or exceeding the maximum limit.00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not available
9016	DC/DC 4 Power Limit due to Power Electronics Temperature	Indicates whether or not output power is being limited due to Power Electronics Temperature (see SPN 9048) approaching or exceeding the maximum limit.00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
9017	DC/DC 4 Power Limit due to SLI Battery Terminal Voltage	Indicates whether or not output power is being limited due to the SLI battery terminal voltage (see SPN 9025) approaching or exceeding limits (see SPN 9043).00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
9018	DC/DC 4 Power Limit due to SLI Battery Terminal Current	Indicates whether or not output power is being limited due to the SLI battery terminal current (see SPN 9026) approaching or exceeding limits (see SPN 9044).00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
9019	DC/DC 4 Power Limit due to SLI Battery Terminal Temperature	Indicates whether or not output power is being limited due to the SLI battery terminal temperature (see SPN 9027) approaching or exceeding limits (see SPN 9045).00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
9020	DC/DC 4 Power Limit due to Undefined Reason	Indicates whether or not output power is being limited due to an undefined reason. 00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
9021	DC/DC 4 Low Side Voltage	Indicates the measured SLI battery or low side voltage measured at the point of control inside the DC/DC Converter.

9022	DC/DC 4 Low Side Current	Indicates the measured SLI battery or low side current measured at the point of control inside the DC/DC Converter. The current is positive if the converter is charging the SLI battery from the hybrid battery.
9023	DC/DC 4 High Side Voltage	Indicates the measured HVES or high side voltage measured at the point of control inside the DC/DC Converter.
9024	DC/DC 4 High Side Current	Indicates the measured HVES or high side current measured at the point of control inside the DC/DC Converter. The current is negative if the converter is charging the SLI battery from the hybrid battery.
9025	DC/DC 4 SLI Battery Terminal Voltage	Parameter indicating the SLI battery terminal voltage for control use by the DC/DC converter.
9026	DC/DC 4 SLI Battery Terminal Current	Parameter indicating the SLI battery terminal current for control use by the DC/DC converter. The current is positive if the SLI battery or low side voltage source is being charged from the HVES.
9027	DC/DC 4 SLI Battery Terminal Temperature	Parameter indicating the SLI battery terminal temperature for control use by the DC/DC converter.
9028	DC/DC 4 Low Side Power	Indicates the measured SLI battery or low side power measured at the DC/DC Converter. The low side power is positive if the converter is charging the SLI battery from the hybrid battery (i.e. Buck Mode). The low side power is negative if the converter is charging the hybrid battery from the SLI battery (i.e. Boost Mode).
9029	DC/DC 4 High Side Power	Indicates the measured HVES or high side power measured at the DC/DC Converter. The high side power is positive if the converter is charging the hybrid battery from the SLI battery (i.e. Boost Mode). The high side power is negative if the converter is charging the SLI battery from the hybrid battery (i.e. Buck Mode).
9030	DC/DC 4 Total High Side Energy	Indicates the total lifetime energy converted by the DC/DC from the high side (e.g. HVES) during buck mode.

9031	DC/DC 4 Total Low Side Energy	Indicates the total lifetime energy converted by the DC/DC from the low side (e.g. SLI battery) during boost mode.
9032	DC/DC 4 Total High Side Charge	Indicates the total lifetime charge converted by the DC/DC from the high side (e.g. HVES) during buck mode.
9033	DC/DC 4 Total Low Side Charge	Indicates the total lifetime charge converted by the DC/DC from the low side (e.g. SLI battery) during boost mode.
9034	DC/DC 4 High Side Voltage Minimum Limit Setting	Reports the active minimum limit on the high side voltage of the DC/DC Converter. The setting may be requested by a separate device (see SPN 9054) or determined by the DC/DC Controller based on operating conditions.
9035	DC/DC 4 High Side Voltage Maximum Limit Setting	Reports the active maximum limit on the high side voltage of the DC/DC Converter. The setting may be requested by a separate device (see SPN 9055) or determined by the DC/DC Controller based on operating conditions.
9036	DC/DC 4 High Side Current Maximum Limit Setting	Reports the active maximum limit on the high side current of the DC/DC Converter. The setting may be requested by a separate device (see SPN 9056) or determined by the DC/DC Controller based on operating conditions.
9037	DC/DC 4 Low Side Voltage Minimum Limit Setting	Reports the active minimum limit on the low side voltage of the DC/DC Converter. The setting may be requested by a separate device(see SPN 9051) or determined by the DC/DC Controller based on operating conditions.
9038	DC/DC 4 Low Side Voltage Maximum Limit Setting	Reports the active maximum limit on the low side voltage of the DC/DC Converter. The setting may be requested by a separate device (see SPN 9052) or determined by the DC/DC Controller based on operating conditions.
9039	DC/DC 4 Low Side Current Maximum Limit Setting	Reports the active maximum limit on the low side current of the DC/DC Converter. The setting may be requested by a separate device (see SPN 9053) or determined by the DC/DC Controller based on operating conditions.

9040	DC/DC 4 SLI Battery Terminal Voltage Maximum Limit Setting	Reports the active SLI Battery Voltage maximum limit (at the battery terminals). The setting may be requested by a separate device (see SPN 9043) or determined by the DC/DC Controller based on operating conditions.
9041	DC/DC 4 SLI Battery Terminal Charge Current Maximum Limit Setting	Reports the active SLI Battery charging current maximum limit (at the battery terminals). The setting may be requested by a separate device (see SPN 9044) or determined by the DC/DC Controller based on operating conditions.
9042	DC/DC 4 SLI Battery Temperature Maximum Limit Setting	Reports the active SLI Battery Temperature maximum limit. The setting may be requested by a separate device (see SPN 9045) or determined by the DC/DC Controller based on operating conditions.
9043	DC/DC 4 SLI Battery Terminal Voltage Maximum Limit Request	The maximum allowed SLI Battery Voltage (at the battery terminals) requested by a separate system device.
9044	DC/DC 4 SLI Battery Terminal Charge Current Maximum Limit Request	The maximum allowed SLI Battery charging current (at the battery terminals) requested by a separate device.
9045	DC/DC 4 SLI Battery Temperature Maximum Limit Request	The maximum allowed SLI Battery Temperature requested by a separate device.
9046	DC/DC 4 Converter Temperature	Parameter indicating the temperature of the DC/DC Converter (e.g, controller, circuit board, enclosure).
9047	DC/DC 4 Converter Electronic Filter Temperature	Parameter indicating the temperature of the electronic components that make up the DC/DC Converter filter.
9048	DC/DC 4 Power Electronics Temperature	Parameter indicating the temperature of the DC/DC Converter power electronics components (e.g, switch or heatsink).
9049	DC/DC 4 Coolant In Temperature	Parameter indicating the temperature of the DC/DC Converter Coolant measured at the input of the converter

9050	DC/DC 4 Coolant Out Temperature	Parameter indicating the temperature of the DC/DC Converter Coolant measured at the output of the converter
9051	DC/DC 4 Low Side Voltage Minimum Limit Request	The minimum allowed low side voltage requested by a separate device. Under normal conditions this requested limit would be reflected in SPN 9037.
9052	DC/DC 4 Low Side Voltage Maximum Limit Request	The maximum allowed low side voltage requested by a separate device. Under normal conditions this requested limit would be reflected in SPN 9038.
9053	DC/DC 4 Low Side Current Maximum Limit Request	The maximum allowed low side current requested by a separate device. Under normal conditions this requested limit would be reflected in SPN 9039.
9054	DC/DC 4 High Side Voltage Minimum Limit Request	The minimum allowed high side voltage requested by a separate device. Under normal conditions this requested limit would be reflected in SPN 9034.
9055	DC/DC 4 High Side Voltage Maximum Limit Request	The maximum allowed high side voltage requested by a separate device. Under normal conditions this requested limit would be reflected in SPN 9035.
9056	DC/DC 4 High Side Current Maximum Limit Request	The maximum allowed high side current requested by a separate device. Under normal conditions this requested limit would be reflected in SPN 9036.
9057	Propulsion Motor 1 Speed	Rotational velocity of the first electric motor used to power vehicle propulsion. This motor may include power generation / regeneration.
9058	Propulsion Motor 2 Speed	Rotational velocity of the second electric motor used to power vehicle propulsion. This motor may include power generation / regeneration.
9059	Propulsion Motor 1 Temperature	Temperature of the first electric motor used to power vehicle propulsion. This motor may include power generation / regeneration.
9060	Propulsion Motor 2 Temperature	Temperature of the second electric motor used to power vehicle propulsion. This motor may include power generation / regeneration.

9061	Propulsion Motor 1 Torque	Measured or calculated torque output of the first electric motor used to power vehicle propulsion. This motor may include power generation / regeneration.
9062	Propulsion Motor 2 Torque	Measured or calculated torque output of the second electric motor used to power vehicle propulsion. This motor may include power generation / regeneration.
9063	Propulsion Motor 1 Speed 1	The Propulsion Motor 1 speed as measured by the first speed sensor or speed sensor channel.
9064	Propulsion Motor 1 Speed 2	The Propulsion Motor 1 speed as measured by the second speed sensor or speed sensor channel.
9065	Propulsion Motor 2 Speed 1	The Propulsion Motor 2 speed as measured by the first speed sensor or speed sensor channel.
9066	Propulsion Motor 2 Speed 2	The Propulsion Motor 2 speed as measured by the second speed sensor or speed sensor channel.
9067	Propulsion Motor 1 Speed Sensors	Indicates a fault with one or more speed sensors or speed sensor channels (e.g. encoder or resolver) in Propulsion Motor 1.
9068	Propulsion Motor 2 Speed Sensors	Indicates a fault with one or more speed sensors or speed sensor channels (e.g. encoder or resolver) in Propulsion Motor 2.
9069	Propulsion Motor 1 Inverter Phase U Current	Current output of phase U of Propulsion Motor 1 Inverter. Note: Manufacturer-specific phase nomenclature (e.g. 1,2,3 or a,b,c) may differ.
9070	Propulsion Motor 1 Inverter Phase V Current	Current output of phase V of Propulsion Motor 1 Inverter. Note: Manufacturer-specific phase nomenclature (e.g. 1,2,3 or a,b,c) may differ.
9071	Propulsion Motor 1 Inverter Phase W Current	Current output of phase W of Propulsion Motor 1 Inverter. Note: Manufacturer-specific phase nomenclature (e.g. 1,2,3 or a,b,c) may differ.

9072	Propulsion Motor 2 Inverter Phase U Current	Current output of phase U of Propulsion Motor 2 Inverter. Note: Manufacturer-specific phase nomenclature (e.g. 1,2,3 or a,b,c) may differ.
9073	Propulsion Motor 2 Inverter Phase V Current	Current output of phase V of Propulsion Motor 2 Inverter. Note: Manufacturer-specific phase nomenclature (e.g. 1,2,3 or a,b,c) may differ.
9074	Propulsion Motor 2 Inverter Phase W Current	Current output of phase W of Propulsion Motor 2 Inverter. Note: Manufacturer-specific phase nomenclature (e.g. 1,2,3 or a,b,c) may differ.
9075	Propulsion Motor 1 Inverter Phase U Voltage	Voltage output of phase U of Propulsion Motor 1 Inverter. Note: Manufacturer-specific phase nomenclature (e.g. 1,2,3 or a,b,c) may differ.
9076	Propulsion Motor 1 Inverter Phase V Voltage	Voltage output of phase V of Propulsion Motor 1 Inverter. Note: Manufacturer-specific phase nomenclature (e.g. 1,2,3 or a,b,c) may differ.
9077	Propulsion Motor 1 Inverter Phase W Voltage	Voltage output of phase W of Propulsion Motor 1 Inverter. Note: Manufacturer-specific phase nomenclature (e.g. 1,2,3 or a,b,c) may differ.
9078	Propulsion Motor 2 Inverter Phase U Voltage	Voltage output of phase U of Propulsion Motor 2 Inverter. Note: Manufacturer-specific phase nomenclature (e.g. 1,2,3 or a,b,c) may differ.
9079	Propulsion Motor 2 Inverter Phase V Voltage	Voltage output of phase V of Propulsion Motor 2 Inverter. Note: Manufacturer-specific phase nomenclature (e.g. 1,2,3 or a,b,c) may differ.
9080	Propulsion Motor 2 Inverter Phase W Voltage	Voltage output of phase W of Propulsion Motor 2 Inverter. Note: Manufacturer-specific phase nomenclature (e.g. 1,2,3 or a,b,c) may differ.
9081	Propulsion Motor 1 Inverter Phase U Power Module Switch	Indicates a fault in the Phase U power module switch (e.g. transistor, IGBT or MOSFET) in Propulsion Motor 1 Inverter. Includes saturation and/or desaturation faults where applicable.Note: Manufacturer-specific phase nomenclature (e.g. 1,2,3 or a,b,c) may differ.

9082	Propulsion Motor 1 Inverter Phase V Power Module Switch	Indicates a fault in the Phase V power module switch (e.g. transistor, IGBT or MOSFET) in Propulsion Motor 1 Inverter. Includes saturation and/or desaturation faults where applicable.Note: Manufacturer-specific phase nomenclature (e.g. 1,2,3 or a,b,c) may differ.
9083	Propulsion Motor 1 Inverter Phase W Power Module Switch	Indicates a fault in the Phase W power module switch (e.g. transistor, IGBT or MOSFET) in Propulsion Motor 1 Inverter. Includes saturation and/or desaturation faults where applicable.Note: Manufacturer-specific phase nomenclature (e.g. 1,2,3 or a,b,c) may differ.
9084	Propulsion Motor 2 Inverter Phase U Power Module Switch	Indicates a fault in the Phase U power module switch (e.g. transistor, IGBT or MOSFET) in Propulsion Motor 2 Inverter. Includes saturation and/or desaturation faults where applicable.Note: Manufacturer-specific phase nomenclature (e.g. 1,2,3 or a,b,c) may differ.
9085	Propulsion Motor 2 Inverter Phase V Power Module Switch	Indicates a fault in the Phase V power module switch (e.g. transistor, IGBT or MOSFET) in Propulsion Motor 2 Inverter. Includes saturation and/or desaturation faults where applicable.Note: Manufacturer-specific phase nomenclature (e.g. 1,2,3 or a,b,c) may differ.
9086	Propulsion Motor 2 Inverter Phase W Power Module Switch	Indicates a fault in the Phase W power module switch (e.g. transistor, IGBT or MOSFET) in Propulsion Motor 2 Inverter. Includes saturation and/or desaturation faults where applicable.Note: Manufacturer-specific phase nomenclature (e.g. 1,2,3 or a,b,c) may differ.
9087	Propulsion Motor 1 Inverter Phase U Power Module Switch Temperature	Indicates the temperature of the Phase U power module switch (e.g. transistor, IGBT or MOSFET) in Propulsion Motor 1 Inverter.Note: Manufacturer-specific phase nomenclature (e.g. 1,2,3 or a,b,c) may differ.
9088	Propulsion Motor 1 Inverter Phase V Power Module Temperature	Indicates the temperature of the Phase V power module switch (e.g. transistor, IGBT or MOSFET) in Propulsion Motor 1 Inverter.Note: Manufacturer-specific phase nomenclature (e.g. 1,2,3 or a,b,c) may differ.

9089	Propulsion Motor 1 Inverter Phase W Power Module Temperature	Indicates the temperature of the Phase W power module switch (e.g. transistor, IGBT or MOSFET) in Propulsion Motor 1 Inverter.Note: Manufacturer-specific phase nomenclature (e.g. 1,2,3 or a,b,c) may differ.
9090	Propulsion Motor 2 Inverter Phase U Power Module Temperature	Indicates the temperature of the Phase U power module switch (e.g. transistor, IGBT or MOSFET) in Propulsion Motor 2 Inverter.Note: Manufacturer-specific phase nomenclature (e.g. 1,2,3 or a,b,c) may differ.
9091	Propulsion Motor 2 Inverter Phase V Power Module Temperature	Indicates the temperature of the Phase V power module switch (e.g. transistor, IGBT or MOSFET) in Propulsion Motor 2 Inverter.Note: Manufacturer-specific phase nomenclature (e.g. 1,2,3 or a,b,c) may differ.
9092	Propulsion Motor 2 Inverter Phase W Power Module Temperature	Indicates the temperature of the Phase W power module switch (e.g. transistor, IGBT or MOSFET) in Propulsion Motor 2 Inverter.Note: Manufacturer-specific phase nomenclature (e.g. 1,2,3 or a,b,c) may differ.
9093	Propulsion Motor 1 Inverter Phase U Power Module Switch Power Supply Voltage	Indicates the voltage being supplied to the Phase U power module switch (e.g. transistor, IGBT or MOSFET) in Propulsion Motor 1 Inverter.Note: Manufacturer-specific phase nomenclature (e.g. 1,2,3 or a,b,c) may differ.
9094	Propulsion Motor 1 Inverter Phase V Power Module Switch Power Supply Voltage	Indicates the voltage being supplied to the Phase V power module switch (e.g. transistor, IGBT or MOSFET) in Propulsion Motor 1 Inverter.Note: Manufacturer-specific phase nomenclature (e.g. 1,2,3 or a,b,c) may differ.
9095	Propulsion Motor 1 Inverter Phase W Power Module Switch Power Supply Voltage	Indicates the voltage being supplied to the Phase W power module switch (e.g. transistor, IGBT or MOSFET) in Propulsion Motor 1 Inverter.Note: Manufacturer-specific phase nomenclature (e.g. 1,2,3 or a,b,c) may differ.
9096	Propulsion Motor 2 Inverter Phase U Power Module Switch Power Supply Voltage	Indicates the voltage being supplied to the Phase U power module switch (e.g. transistor, IGBT or MOSFET) in Propulsion Motor 2 Inverter.Note: Manufacturer-specific phase nomenclature (e.g. 1,2,3 or a,b,c) may differ.

9097	Propulsion Motor 2 Inverter Phase V Power Module Switch Power Supply Voltage	Indicates the voltage being supplied to the Phase V power module switch (e.g. transistor, IGBT or MOSFET) in Propulsion Motor 2 Inverter.Note: Manufacturer-specific phase nomenclature (e.g. 1,2,3 or a,b,c) may differ.
9098	Propulsion Motor 2 Inverter Phase W Power Module Switch Power Supply Voltage	Indicates the voltage being supplied to the Phase W power module switch (e.g. transistor, IGBT or MOSFET) in Propulsion Motor 2 Inverter.Note: Manufacturer-specific phase nomenclature (e.g. 1,2,3 or a,b,c) may differ.
9099	Propulsion Motor 1 Inverter AC Current Output	The AC current being produced by Propulsion Motor 1 Inverter.
9100	Propulsion Motor 2 Inverter AC Current Output	The AC current being produced by Propulsion Motor 2 Inverter.
9101	Propulsion Motor 1 Inverter DC High Voltage Bus Input	Indicates the DC input voltage from the high voltage bus as measured at the point of control inside Propulsion Motor 1 Inverter.
9102	Propulsion Motor 2 Inverter DC High Voltage Bus Input	Indicates the DC input voltage from the high voltage bus as measured at the point of control inside Propulsion Motor 2 Inverter.
9103	Propulsion Motor 1 Inverter HVIL Status	High-Voltage Interlock Status as determined by Propulsion Motor 1 Inverter.
9104	Propulsion Motor 2 Inverter HVIL Status	High-Voltage Interlock Status as determined by Propulsion Motor 2 Inverter.
9105	Propulsion Motor 1 Inverter Ignition Voltage	Indicates the ignition voltage supplied to the controller of Propulsion Motor 1 Inverter.
9106	Propulsion Motor 2 Inverter Ignition Voltage	Indicates the ignition voltage supplied to the controller of Propulsion Motor 2 Inverter.

9107	Propulsion Motor 1 Inverter Power Module Switch Temperature	Indicates the overall power module switch (e.g. transistor, IGBT or MOSFET) temperature in Propulsion Motor 1 Inverter.
9108	Propulsion Motor 2 Inverter Power Module Switch Temperature	Indicates the overall power module switch (e.g. transistor, IGBT or MOSFET) temperature in Propulsion Motor 2 Inverter.
9109	Propulsion Motor 1 Inverter Power Module Switch	Indicates a fault (either high side or low side) within the power module switch (e.g. transistor, IGBT or MOSFET) assembly in Propulsion Motor 1 Inverter. Includes saturation and/or desaturation faults, where applicable.
9110	Propulsion Motor 2 Inverter Power Module Switch	Indicates a fault (either high side or low side) within the power module switch (e.g. transistor, IGBT or MOSFET) assembly in Propulsion Motor 2 Inverter. Includes saturation and/or desaturation faults, where applicable.
9111	Propulsion Motor 1 Inverter DC Isolation Resistance	Indicates the DC isolation resistance between Propulsion Motor 1 Inverter and ground.
9112	Propulsion Motor 2 Inverter DC Isolation Resistance	Indicates the DC isolation resistance between Propulsion Motor 2 Inverter and ground.
9113	Propulsion Motor 1 Inverter AC Isolation Resistance	Indicates the AC isolation resistance between Propulsion Motor 1 Inverter and ground.
9114	Propulsion Motor 2 Inverter AC Isolation Resistance	Indicates the AC isolation resistance between Propulsion Motor 2 Inverter and ground.
9115	Propulsion Motor 1 Inverter Phase Current Imbalance	Indicates that the current outputs from the 3 phases in Propulsion Motor 1 Inverter are not balanced.
9116	Propulsion Motor 2 Inverter Phase Current Imbalance	Indicates that the current outputs from the 3 phases in Propulsion Motor 2 Inverter are not balanced.

9117	Propulsion Motor 1 Inverter SLI Voltage	The low voltage (SLI) supplied to Propulsion Motor 1 Inverter.
9118	Propulsion Motor 2 Inverter SLI Voltage	The low voltage (SLI) supplied to Propulsion Motor 2 Inverter.
9119	HVES1 Temperature	The temperature of High Voltage Energy Storage 1 pack (or system). The value may be determined from a unique sensor specifically for this purpose, or by aggregating various temperature sensor readings within the pack (or system).
9120	HVES1 Pre-Charge Failed to Complete	Indicates that this HVES instance failed to complete the pre-charging process.
9121	HVES1 Voltage Sensors	Indicate a fault with one or more voltage sensors within this HVES instance.
9122	HVES1 Module Voltage 1	Module-level voltage measurement instance 1 for this HVES instance. Note: Depending on how modules and sensors are grouped within a given battery pack, this measurement instance may refer to an individual module or a group of modules.
9123	HVES1 Module Voltage 2	Module-level voltage measurement instance 2 for this HVES instance. Note: Depending on how modules and sensors are grouped within a given battery pack, this measurement instance may refer to an individual module or a group of modules.
9124	HVES1 Module Voltage 3	Module-level voltage measurement instance 3 for this HVES instance. Note: Depending on how modules and sensors are grouped within a given battery pack, this measurement instance may refer to an individual module or a group of modules.
9125	HVES1 Module Voltage 4	Module-level voltage measurement instance 4 for this HVES instance. Note: Depending on how modules and sensors are grouped within a given battery pack, this measurement instance may refer to an individual module or a group of modules.

9126	HVES1 Module Voltage 5	Module-level voltage measurement instance 5 for this HVES instance. Note: Depending on how modules and sensors are grouped within a given battery pack, this measurement instance may refer to an individual module or a group of modules.
9127	HVES1 Module Voltage 6	Module-level voltage measurement instance 6 for this HVES instance. Note: Depending on how modules and sensors are grouped within a given battery pack, this measurement instance may refer to an individual module or a group of modules.
9128	HVES1 Module Voltage 7	Module-level voltage measurement instance 7 for this HVES instance. Note: Depending on how modules and sensors are grouped within a given battery pack, this measurement instance may refer to an individual module or a group of modules.
9129	HVES1 Module Voltage 8	Module-level voltage measurement instance 8 for this HVES instance. Note: Depending on how modules and sensors are grouped within a given battery pack, this measurement instance may refer to an individual module or a group of modules.
9130	HVES1 Module Voltage 9	Module-level voltage measurement instance 9 for this HVES instance. Note: Depending on how modules and sensors are grouped within a given battery pack, this measurement instance may refer to an individual module or a group of modules.
9131	HVES1 Module Voltage 10	Module-level voltage measurement instance 10 for this HVES instance. Note: Depending on how modules and sensors are grouped within a given battery pack, this measurement instance may refer to an individual module or a group of modules.
9132	HVES1 Module Voltage 11	Module-level voltage measurement instance 11 for this HVES instance. Note: Depending on how modules and sensors are grouped within a given battery pack, this measurement instance may refer to an individual module or a group of modules.
9133	HVES1 Module Voltage 12	Module-level voltage measurement instance 12 for this HVES instance. Note: Depending on how modules and sensors are grouped within a given battery pack, this measurement instance may refer to an individual module or a group of modules.

9134	HVES1 Module Voltage 13	Module-level voltage measurement instance 13 for this HVES instance. Note: Depending on how modules and sensors are grouped within a given battery pack, this measurement instance may refer to an individual module or a group of modules.
9135	HVES1 Module Voltage 14	Module-level voltage measurement instance 14 for this HVES instance. Note: Depending on how modules and sensors are grouped within a given battery pack, this measurement instance may refer to an individual module or a group of modules.
9136	HVES1 Module Voltage 15	Module-level voltage measurement instance 15 for this HVES instance. Note: Depending on how modules and sensors are grouped within a given battery pack, this measurement instance may refer to an individual module or a group of modules.
9137	HVES1 Module Voltage 16	Module-level voltage measurement instance 16 for this HVES instance. Note: Depending on how modules and sensors are grouped within a given battery pack, this measurement instance may refer to an individual module or a group of modules.
9138	HVES1 Module Current 1	Module-level current measurement instance 1 for this HVES instance. Note: Depending on how modules and sensors are grouped within a given battery pack, this measurement instance may refer to an individual module or a group of modules.
9139	HVES1 Module Current 2	Module-level current measurement instance 2 for this HVES instance. Note: Depending on how modules and sensors are grouped within a given battery pack, this measurement instance may refer to an individual module or a group of modules.
9140	HVES1 Module Current 3	Module-level current measurement instance 3 for this HVES instance. Note: Depending on how modules and sensors are grouped within a given battery pack, this measurement instance may refer to an individual module or a group of modules.
9141	HVES1 Module Current 4	Module-level current measurement instance 4 for this HVES instance. Note: Depending on how modules and sensors are grouped within a given battery pack, this measurement instance may refer to an individual module or a group of modules.

9142	HVES1 Module Current 5	Module-level current measurement instance 5 for this HVES instance. Note: Depending on how modules and sensors are grouped within a given battery pack, this measurement instance may refer to an individual module or a group of modules.
9143	HVES1 Module Current 6	Module-level current measurement instance 6 for this HVES instance. Note: Depending on how modules and sensors are grouped within a given battery pack, this measurement instance may refer to an individual module or a group of modules.
9144	HVES1 Module Current 7	Module-level current measurement instance 7 for this HVES instance. Note: Depending on how modules and sensors are grouped within a given battery pack, this measurement instance may refer to an individual module or a group of modules.
9145	HVES1 Module Current 8	Module-level current measurement instance 8 for this HVES instance. Note: Depending on how modules and sensors are grouped within a given battery pack, this measurement instance may refer to an individual module or a group of modules.
9146	HVES1 Module Current 9	Module-level current measurement instance 9 for this HVES instance. Note: Depending on how modules and sensors are grouped within a given battery pack, this measurement instance may refer to an individual module or a group of modules.
9147	HVES1 Module Current 10	Module-level current measurement instance 10 for this HVES instance. Note: Depending on how modules and sensors are grouped within a given battery pack, this measurement instance may refer to an individual module or a group of modules.
9148	HVES1 Module Current 11	Module-level current measurement instance 11 for this HVES instance. Note: Depending on how modules and sensors are grouped within a given battery pack, this measurement instance may refer to an individual module or a group of modules.
9149	HVES1 Module Current 12	Module-level current measurement instance 12 for this HVES instance. Note: Depending on how modules and sensors are grouped within a given battery pack, this measurement instance may refer to an individual module or a group of modules.

9150	HVES1 Module Current 13	Module-level current measurement instance 13 for this HVES instance. Note: Depending on how modules and sensors are grouped within a given battery pack, this measurement instance may refer to an individual module or a group of modules.
9151	HVES1 Module Current 14	Module-level current measurement instance 14 for this HVES instance. Note: Depending on how modules and sensors are grouped within a given battery pack, this measurement instance may refer to an individual module or a group of modules.
9152	HVES1 Module Current 15	Module-level current measurement instance 15 for this HVES instance. Note: Depending on how modules and sensors are grouped within a given battery pack, this measurement instance may refer to an individual module or a group of modules.
9153	HVES1 Module Current 16	Module-level current measurement instance 16 for this HVES instance. Note: Depending on how modules and sensors are grouped within a given battery pack, this measurement instance may refer to an individual module or a group of modules.
9154	HVES1 Module Temperature 1	Module-level temperature measurement instance 1 for this HVES instance. Note: Depending on how modules and sensors are grouped within a given battery pack, this measurement instance may refer to an individual module or a group of modules.
9155	HVES1 Module Temperature 2	Module-level temperature measurement instance 2 for this HVES instance. Note: Depending on how modules and sensors are grouped within a given battery pack, this measurement instance may refer to an individual module or a group of modules.
9156	HVES1 Module Temperature 3	Module-level temperature measurement instance 3 for this HVES instance. Note: Depending on how modules and sensors are grouped within a given battery pack, this measurement instance may refer to an individual module or a group of modules.
9157	HVES1 Module Temperature 4	Module-level temperature measurement instance 4 for this HVES instance. Note: Depending on how modules and sensors are grouped within a given battery pack, this measurement instance may refer to an individual module or a group of modules.

9158	HVES1 Module Temperature 5	Module-level temperature measurement instance 5 for this HVES instance. Note: Depending on how modules and sensors are grouped within a given battery pack, this measurement instance may refer to an individual module or a group of modules.
9159	HVES1 Module Temperature 6	Module-level temperature measurement instance 6 for this HVES instance. Note: Depending on how modules and sensors are grouped within a given battery pack, this measurement instance may refer to an individual module or a group of modules.
9160	HVES1 Module Temperature 7	Module-level temperature measurement instance 7 for this HVES instance. Note: Depending on how modules and sensors are grouped within a given battery pack, this measurement instance may refer to an individual module or a group of modules.
9161	HVES1 Module Temperature 8	Module-level temperature measurement instance 8 for this HVES instance. Note: Depending on how modules and sensors are grouped within a given battery pack, this measurement instance may refer to an individual module or a group of modules.
9162	HVES1 Module Temperature 9	Module-level temperature measurement instance 9 for this HVES instance. Note: Depending on how modules and sensors are grouped within a given battery pack, this measurement instance may refer to an individual module or a group of modules.
9163	HVES1 Module Temperature 10	Module-level temperature measurement instance 10 for this HVES instance. Note: Depending on how modules and sensors are grouped within a given battery pack, this measurement instance may refer to an individual module or a group of modules.
9164	HVES1 Module Temperature 11	Module-level temperature measurement instance 11 for this HVES instance. Note: Depending on how modules and sensors are grouped within a given battery pack, this measurement instance may refer to an individual module or a group of modules.
9165	HVES1 Module Temperature 12	Module-level temperature measurement instance 12 for this HVES instance. Note: Depending on how modules and sensors are grouped within a given battery pack, this measurement instance may refer to an individual module or a group of modules.

9166	HVES1 Module Temperature 13	Module-level temperature measurement instance 13 for this HVES instance. Note: Depending on how modules and sensors are grouped within a given battery pack, this measurement instance may refer to an individual module or a group of modules.
9167	HVES1 Module Temperature 14	Module-level temperature measurement instance 14 for this HVES instance. Note: Depending on how modules and sensors are grouped within a given battery pack, this measurement instance may refer to an individual module or a group of modules.
9168	HVES1 Module Temperature 15	Module-level temperature measurement instance 15 for this HVES instance. Note: Depending on how modules and sensors are grouped within a given battery pack, this measurement instance may refer to an individual module or a group of modules.
9169	HVES1 Module Temperature 16	Module-level temperature measurement instance 16 for this HVES instance. Note: Depending on how modules and sensors are grouped within a given battery pack, this measurement instance may refer to an individual module or a group of modules.
9170	Transfer Case Actual Gear Ratio	Actual ratio of input shaft speed to output shaft speed of the transfer case.
9171	Transfer Case Message Counter	The message counter is used to detect situations where the transmitting ECU malfunction repeats the same frame all the time. The receiver of the information may use the counter parameter to detect this situation. The transmitting device will increase the message counter in every cycle. The message counter will count from 0 to 7 and then wrap.The values 8h thru Eh are SAE reserved and should be ignored by the receiver. Value Fh (all bits set to 1) will indicate that the message counter is not available. For compatibility purposes, TCI should also be honored if the message counter is not available from the transmitting device.
9172	Transfer Case Message Checksum	The message checksum is used to verify the signal path from the transmitting device to the receiving device. The message checksum is calculated using the first 7 data bytes, the message counter and the bytes of the message identifier. It is calculated as follows: Checksum = (Byte1 + Byte2 + Byte3 + Byte4 + Byte5 + Byte6 + Byte7 + (message counter & 0Fh) + message ID low byte + message ID mid low byte + message ID mid high byte + message ID high byte) Message Checksum =

		(((Checksum >> 6) & 03h) + (Checksum >>3) + Checksum) & 07h Value Fh (all bits set to 1) will indicate that the checksum is not available. For compatibility purposes, TCI should also be honored if the checksum is not available from the transmitting device.
9173	Engine Protection Derate Override Command	Command signal to override engine protection derate. This is to temporarily override an engine protection derate due to coolant temperature, oil pressure etc. This is for applications such as fire, rescue, and military vehicles to help them get out of emergency situations. The Engine Protection Derate Override Command SPN shall apply to derate applications only (i.e. applications that do not shut the engine down). Vehicles using SPN 1237 Engine Shutdown Override Switch, may still use that SPN to override engine derates as has been industry standard practice. The engine will default to normal derate mode when error or loss of messages occur which will be similar to TSC1 override mode. 00b = Override disabled 01b = Override active 10b = Reserved 11b = Don't care/take no action Note: When engine receives this command indicating derate override active, an engine will remove a derate due to engine protection and will operate at normal full power. When a command is received to disable derate override, the engine will return to derate to protect the engine when needed.
9174	Engine Protection Derate Override Status	Status of overriding an engine protection derate. This is to temporarily override an engine protection derate due to coolant temperature, oil pressure etc… This is for applications such as fire, rescue, and military vehicles to help them get out of emergency situations. The Engine Protection Derate Override Status SPN shall apply to derate applications only (i.e. applications that do not shut the engine down). Vehicles using SPN 1237 Engine Shutdown Override Switch, may still use that SPN to override engine derates as has been industry standard practice. The engine will default to normal derate mode when error or loss of messages occur which will be similar to TSC1 override mode. 00b = Override disabled 01b = Override active 10b = Error 11b = Not Available Note: When engine receives this command indicating derate override active, an engine will remove a derate due to engine protection and will operate at normal full power. When a command is received to disable derate override, the engine will return to derate to protect the engine when needed.

9175	Aftertreatment DEF Dosing Mode Command	Request the aftertreatment system to run in standard or reduced mode. Standard indicates that the system will dose at higher capacity where the reduced mode will dose at a lower capacity. (e.g., IMO 3 to IMO 2 in Marine Applications) 000b = Standard DEF Dosing Mode 001b = Reduced DEF Dosing Mode 010b = Reserved 011b = Reserved 100b = Reserved 101b = Reserved 110b = Reserved for status error value (SPN 9176) 111b = Don't care/Take no Action Note: In some marine applications it may be desirable to enable a reduced aftertreatment system operating mode. SPN 9176 indicates the mode of the aftertreatment system. Reference SPN 8148 for Aftertreatment System Enable Command. SPN 8148 must indicate Activate Aftertreatment System for Standard or Reduced mode operation to be selected.
9176	Aftertreatment DEF Dosing Mode Status	Indicates that the aftertreatment system is dosing in standard or reduced mode. Standard indicates that the system will dose at maximum capacity where the reduced mode will dose at minimum capacity (e.g., IMO 3 to IMO 2 in Marine Applications). 000b = Standard DEF Dosing Mode 001b = Reduced DEF Dosing Mode 010b = Reserved 011b = Reserved 100b = Reserved 101b = Reserved 110b = Error 111b = Not Available Note: In some marine applications it may be desirable to enable a reduced aftertreatment system operating mode. SPN 9176 indicates the mode of the aftertreatment system. Reference SPN 7851 for Aftertreatment System Enable Status. SPN 7851 must indicate Aftertreatment System is Enabled for Standard or Reduced mode operation.
9177	Aftertreatment 1 Intake Oxygen Pumping Current	Electrical pumping current directly measured from a Lambda sensor for the purpose of calculating an air/fuel ratio. This sensor is located furthest upstream of the intake of aftertreatment 1 system.Negative electrical current values are possible with richer air/fuel ratios.
9178	Aftertreatment 1 Outlet Oxygen Pumping Current	Electrical pumping current directly measured from a Lambda sensor for the purpose of calculating an air/fuel ratio. This sensor is located closest to the outlet of aftertreatment 1 system.Negative electrical current values are possible with richer air/fuel ratios.

9179	SCR Operator Inducement Emergency Override Total Activation Time	The total time duration the SCR Operator Inducement Override Mode (SPN 7342) has been active. Note: Euro Stage V states this timer can not be reset.
9180	Rudder Position	See NMEA 2000. Rudder position is byte 5 of the Rudder Message (PGN 127245). This SPN is only used to communicate diagnostics related to the rudder position.
9181	Grade Threshold Indicator 1	This parameter indicates whether or not the transmitting device has sensed a vehicle grade equal to or exceeding a manufacturer-defined threshold. The manufacturer-defined threshold could be a simple fixed value or a dynamic value that changes based on other inputs or operating conditions.This parameter may be used to indicate positive (uphill) or negative (downhill) grade thresholds based on the transmitter threshold settings. For example, if the transmitter threshold is +3% and it senses an uphill grade of 3%, 01b would be indicated. On an uphill grade of only +2.9%, 00b would be indicated. Conversely, if the transmitter threshold is -3% and it senses a downhill grade of -3%, 01b would be indicated. On a downhill grade of only -2.9%, 00b would be indicated. Grade Threshold Indicator (GTI) parameters may be mixed and matched to accomplish different vehicle functionality: Example 1: A transmitter and receiver could use a single GTI parameter as a simple on/off input. A grade-related vehicle function could activate or deactivate based on the GTI parameter state values. Example 2: A transmitter and receiver could utilize multiple GTI parameters with incremental thresholds. The transmitter could associate thresholds of 1%, 2.5% and 4% grades respectively with parameters Grade Threshold Indicator 1, 2 and 3. The receiver would then change behavior as the indicators vary with the vehicle grade. Example 3: A transmitter and receiver could utilize a pair of GTI parameters to define a grade « window » for certain behaviors. The vehicle could have one behavior within the grade window, and different behaviors depending on which side of the grade window is exceeded. 00b = Current grade does not exceed the threshold 01b = Current grade is equal to or exceeds the threshold 10b = Error 11b = Not Available
9182	Grade Threshold Indicator 2	This parameter indicates whether or not the transmitting device has sensed a vehicle grade equal to or exceeding a manufacturer-defined threshold. The manufacturer-defined threshold could be a simple fixed value or a dynamic value that changes

		based on other inputs or operating conditions.This parameter may be used to indicate positive (uphill) or negative (downhill) grade thresholds based on the transmitter threshold settings. For example, if the transmitter threshold is +3% and it senses an uphill grade of 3%, 01b would be indicated. On an uphill grade of only +2.9%, 00b would be indicated. Conversely, if the transmitter threshold is -3% and it senses a downhill grade of -3%, 01b would be indicated. On a downhill grade of only -2.9%, 00b would be indicated. Grade Threshold Indicator (GTI) parameters may be mixed and matched to accomplish different vehicle functionality: Example 1: A transmitter and receiver could use a single GTI parameter as a simple on/off input. A grade-related vehicle function could activate or deactivate based on the GTI parameter state values. Example 2: A transmitter and receiver could utilize multiple GTI parameters with incremental thresholds. The transmitter could associate thresholds of 1%, 2.5% and 4% grades respectively with parameters Grade Threshold Indicator 1, 2 and 3. The receiver would then change behavior as the indicators vary with the vehicle grade. Example 3: A transmitter and receiver could utilize a pair of GTI parameters to define a grade « window » for certain behaviors. The vehicle could have one behavior within the grade window, and different behaviors depending on which side of the grade window is exceeded. 00b = Current grade does not exceed the threshold 01b = Current grade is equal to or exceeds the threshold 10b = Error 11b = Not Available
9183	Grade Threshold Indicator 3	This parameter indicates whether or not the transmitting device has sensed a vehicle grade equal to or exceeding a manufacturer-defined threshold. The manufacturer-defined threshold could be a simple fixed value or a dynamic value that changes based on other inputs or operating conditions.This parameter may be used to indicate positive (uphill) or negative (downhill) grade thresholds based on the transmitter threshold settings. For example, if the transmitter threshold is +3% and it senses an uphill grade of 3%, 01b would be indicated. On an uphill grade of only +2.9%, 00b would be indicated. Conversely, if the transmitter threshold is -3% and it senses a downhill grade of -3%, 01b would be indicated. On a downhill grade of only -2.9%, 00b would be indicated. Grade Threshold Indicator (GTI) parameters may be mixed and matched to accomplish different vehicle functionality: Example 1: A transmitter and receiver could use a single GTI parameter as a simple on/off input. A grade-related vehicle function could activate or deactivate based on the GTI parameter state

		values. Example 2: A transmitter and receiver could utilize multiple GTI parameters with incremental thresholds. The transmitter could associate thresholds of 1%, 2.5% and 4% grades respectively with parameters Grade Threshold Indicator 1, 2 and 3. The receiver would then change behavior as the indicators vary with the vehicle grade. Example 3: A transmitter and receiver could utilize a pair of GTI parameters to define a grade « window » for certain behaviors. The vehicle could have one behavior within the grade window, and different behaviors depending on which side of the grade window is exceeded. 00b = Current grade does not exceed the threshold 01b = Current grade is equal to or exceeds the threshold 10b = Error 11b = Not Available
9184	Grade Threshold Indicator 4	This parameter indicates whether or not the transmitting device has sensed a vehicle grade equal to or exceeding a manufacturer-defined threshold. The manufacturer-defined threshold could be a simple fixed value or a dynamic value that changes based on other inputs or operating conditions.This parameter may be used to indicate positive (uphill) or negative (downhill) grade thresholds based on the transmitter threshold settings. For example, if the transmitter threshold is +3% and it senses an uphill grade of 3%, 01b would be indicated. On an uphill grade of only +2.9%, 00b would be indicated. Conversely, if the transmitter threshold is -3% and it senses a downhill grade of -3%, 01b would be indicated. On a downhill grade of only -2.9%, 00b would be indicated. Grade Threshold Indicator (GTI) parameters may be mixed and matched to accomplish different vehicle functionality: Example 1: A transmitter and receiver could use a single GTI parameter as a simple on/off input. A grade-related vehicle function could activate or deactivate based on the GTI parameter state values. Example 2: A transmitter and receiver could utilize multiple GTI parameters with incremental thresholds. The transmitter could associate thresholds of 1%, 2.5% and 4% grades respectively with parameters Grade Threshold Indicator 1, 2 and 3. The receiver would then change behavior as the indicators vary with the vehicle grade. Example 3: A transmitter and receiver could utilize a pair of GTI parameters to define a grade « window » for certain behaviors. The vehicle could have one behavior within the grade window, and different behaviors depending on which side of the grade window is exceeded. 00b = Current grade does not exceed the threshold 01b = Current grade is equal to or exceeds the threshold 10b = Error 11b = Not Available

9185	Grade Threshold Indicator 5	This parameter indicates whether or not the transmitting device has sensed a vehicle grade equal to or exceeding a manufacturer-defined threshold. The manufacturer-defined threshold could be a simple fixed value or a dynamic value that changes based on other inputs or operating conditions.This parameter may be used to indicate positive (uphill) or negative (downhill) grade thresholds based on the transmitter threshold settings. For example, if the transmitter threshold is +3% and it senses an uphill grade of 3%, 01b would be indicated. On an uphill grade of only +2.9%, 00b would be indicated. Conversely, if the transmitter threshold is -3% and it senses a downhill grade of -3%, 01b would be indicated. On a downhill grade of only -2.9%, 00b would be indicated. Grade Threshold Indicator (GTI) parameters may be mixed and matched to accomplish different vehicle functionality: Example 1: A transmitter and receiver could use a single GTI parameter as a simple on/off input. A grade-related vehicle function could activate or deactivate based on the GTI parameter state values. Example 2: A transmitter and receiver could utilize multiple GTI parameters with incremental thresholds. The transmitter could associate thresholds of 1%, 2.5% and 4% grades respectively with parameters Grade Threshold Indicator 1, 2 and 3. The receiver would then change behavior as the indicators vary with the vehicle grade. Example 3: A transmitter and receiver could utilize a pair of GTI parameters to define a grade « window » for certain behaviors. The vehicle could have one behavior within the grade window, and different behaviors depending on which side of the grade window is exceeded. 00b = Current grade does not exceed the threshold 01b = Current grade is equal to or exceeds the threshold 10b = Error 11b = Not Available
9186	Grade Threshold Indicator 6	This parameter indicates whether or not the transmitting device has sensed a vehicle grade equal to or exceeding a manufacturer-defined threshold. The manufacturer-defined threshold could be a simple fixed value or a dynamic value that changes based on other inputs or operating conditions.This parameter may be used to indicate positive (uphill) or negative (downhill) grade thresholds based on the transmitter threshold settings. For example, if the transmitter threshold is +3% and it senses an uphill grade of 3%, 01b would be indicated. On an uphill grade of only +2.9%, 00b would be indicated. Conversely, if the transmitter threshold is -3% and it senses a downhill grade of -3%, 01b would be indicated. On a downhill grade of only -2.9%, 00b would be indicated. Grade Threshold Indicator (GTI) parameters may be mixed

		and matched to accomplish different vehicle functionality: Example 1: A transmitter and receiver could use a single GTI parameter as a simple on/off input. A grade-related vehicle function could activate or deactivate based on the GTI parameter state values. Example 2: A transmitter and receiver could utilize multiple GTI parameters with incremental thresholds. The transmitter could associate thresholds of 1%, 2.5% and 4% grades respectively with parameters Grade Threshold Indicator 1, 2 and 3. The receiver would then change behavior as the indicators vary with the vehicle grade. Example 3: A transmitter and receiver could utilize a pair of GTI parameters to define a grade « window » for certain behaviors. The vehicle could have one behavior within the grade window, and different behaviors depending on which side of the grade window is exceeded. 00b = Current grade does not exceed the threshold 01b = Current grade is equal to or exceeds the threshold 10b = Error 11b = Not Available
9187	Well Stimulation Pump Fluid End Trip Hours	The hours accumulated since the last fluid end replacement on the well stimulation pump (since the last reset of the trip meter).This value will be reset by the user.
9188	Well Stimulation Pump Power End Trip Hours	The hours accumulated since the last power end replacement on the well stimulation pump (since the last reset of the trip meter).This value will be reset by the user.
9189	Well Stimulation Pump Power End Serial Number	The serial number of the power end of a well stimulation pump.
9190	Well Stimulation Pump Fluid End Serial Number	The serial number of the fluid end of a well stimulation pump.
9191	Well Stimulation Pump Total Fluid Pumped	Accumulated amount of fluid pumped during well stimulation operation.
9192	Well Stimulation Pump Trip Fluid Pumped	Fluid pumped during all or part of a well stimulation operation.
9193	Well Stimulation Pump Suction Pressure Calibration Set Point	Specifies the current suction pressure whose calibration status is being reported. Multipoint calibration of the suction pressure system is perfomed by increasing the

		pressure with up to 10 known calibration pressures. For each calibration pressure, the Well Stimulation Pump Calibration Information Command PGN is sent with Suction Pressure Calibration Set Point Command SPN identifying the calibration set point.Zero Point is used for empty which also sets the empty tare offset. End point identifies the last point. 0000b = Zero Point 0001b = Calibration Reference Point 1 0010b = Calibration Reference Point 2 0011b = Calibration Reference Point 3 0100b = Calibration Reference Point 4 0101b = Calibration Reference Point 5 0110b = Calibration Reference Point 6 0111b = Calibration Reference Point 7 1000b = Calibration Reference Point 8 1001b = Calibration Reference Point 9 1010b = End Point 1011b = Correction Point 1100b = Reset Calibration 1101b = Reserved 1110b = Error 1111b = Not Available
9194	Well Stimulation Pump Suction Pressure Calibration Set Point Status	Indicates the state of the Calibrated Sensor. 00b = Not OK 01b = OK 10b = Error 11b = Not available
9195	Well Stimulation Pump Discharge Pressure Calibration Set Point	Specifies the current discharge pressure whose calibration status is being reported. Multipoint calibration of the discharge pressure system is perfomed by increasing the pressure with up to 10 known calibration pressures. For each calibration pressure, the Well Stimulation Pump Calibration Information Command PGN is sent with Discharge Pressure Calibration Set Point Command SPN identifying the calibration set point.Zero Point is used for empty which also sets the empty tare offset. End point identifies the last point. 0000b = Zero Point 0001b = Calibration Reference Point 1 0010b = Calibration Reference Point 2 0011b = Calibration Reference Point 3 0100b = Calibration Reference Point 4 0101b = Calibration Reference Point 5 0110b = Calibration Reference Point 6 0111b = Calibration Reference Point 7 1000b = Calibration Reference Point 8 1001b = Calibration Reference Point 9 1010b = End Point 1011b = Correction Point 1100b = Reset Calibration 1101b = Reserved 1110b = Error 1111b = Not Available
9196	Well Stimulation Pump Discharge Pressure Calibration Set Point Status	Indicates the state of the Calibrated Sensor. 00b = Not OK 01b = OK 10b = Error 11b = Not available

9197	Well Stimulation Pump Suction Pressure Calibration Set Point Command	Specifies the current suction pressure being calibrated. Multipoint calibration of the suction pressure system is perfomed by increasing the pressure with up to 10 known calibration pressures. For each calibration pressure, the Well Stimulation Pump Calibration Information Command PGN is sent with Suction Pressure Calibration Set Point Command SPN identifying the calibration set point.Zero Point is used for empty which also sets the empty tare offset. End point identifies the last point. 0000b = Zero Point 0001b = Calibration Reference Point 1 0010b = Calibration Reference Point 2 0011b = Calibration Reference Point 3 0100b = Calibration Reference Point 4 0101b = Calibration Reference Point 5 0110b = Calibration Reference Point 6 0111b = Calibration Reference Point 7 1000b = Calibration Reference Point 8 1001b = Calibration Reference Point 9 1010b = End Point 1011b = Correction Point 1100b = Reset Calibration 1101b = Reserved 1110b = Error 1111b = Not Available
9198	Well Stimulation Pump Discharge Pressure Calibration Set Point Command	Specifies the current discharge pressure whose calibration status is being reported. Multipoint calibration of the discharge pressure system is perfomed by increasing the pressure with up to 10 known calibration pressures. For each calibration pressure, the Well Stimulation Pump Calibration Information Command PGN is sent with Discharge Pressure Calibration Set Point Command SPN identifying the calibration set point.Zero Point is used for empty which also sets the empty tare offset. End point identifies the last point. 0000b = Zero Point 0001b = Calibration Reference Point 1 0010b = Calibration Reference Point 2 0011b = Calibration Reference Point 3 0100b = Calibration Reference Point 4 0101b = Calibration Reference Point 5 0110b = Calibration Reference Point 6 0111b = Calibration Reference Point 7 1000b = Calibration Reference Point 8 1001b = Calibration Reference Point 9 1010b = End Point 1011b = Correction Point 1100b = Reset Calibration 1101b = Reserved 1110b = Error 1111b = Not Available
9199	Roadway Next Grade Distance	The distance from the current vehicle position to the grade indicated in SPN 7433.
9200	DC/AC Accessory Inverter 1 AC Side RMS Current	Present operating AC Side output RMS line Current of this DC/AC Accessory Inverter. When connected to a balanced three phase motor, this would be the current in each individual phase of the motor.

9201	DC/AC Accessory Inverter 2 AC Side RMS Current	Present operating AC Side output RMS line Current of this DC/AC Accessory Inverter. When connected to a balanced three phase motor, this would be the current in each individual phase of the motor.
9202	DC/AC Accessory Inverter 3 AC Side RMS Current	Present operating AC Side output RMS line Current of this DC/AC Accessory Inverter. When connected to a balanced three phase motor, this would be the current in each individual phase of the motor.
9203	DC/AC Accessory Inverter 4 AC Side RMS Current	Present operating AC Side output RMS line Current of this DC/AC Accessory Inverter. When connected to a balanced three phase motor, this would be the current in each individual phase of the motor.
9204	DC/AC Accessory Inverter 1 Controller Temperature	Temperature of the DC/AC Accessory Inverter (e.g, controller, circuit board, enclosure).
9205	DC/AC Accessory Inverter 1 Inverter Electronic Filter Temperature	Temperature of the electronic components that make up the DC/AC Accessory Inverter filter.
9206	DC/AC Accessory Inverter 1 Power Electronics Temperature	Temperature of the DC/AC Accessory Inverter power electronics components (e.g, switch or heatsink).
9207	DC/AC Accessory Inverter 1 Coolant In Temperature	Temperature of the DC/AC Accessory Inverter Coolant measured at the input of the accessory inverter.
9208	DC/AC Accessory Inverter 1 Coolant Out Temperature	Temperature of the DC/AC Accessory Inverter Coolant measured at the output of the accessory inverter.
9209	DC/AC Accessory Inverter 1 Ignition Voltage	Ignition voltage supplied to the DC/AC Accessory Inverter controller.
9210	DC/AC Accessory Inverter 1 SLI Voltage	Low voltage (SLI) supplied to the DC/AC Accessory Inverter controller.

9211	DC/AC Accessory Inverter 1 Power Limited due to DC Side Current	Output power is being limited due to DC Side input current (see SPN 8891) approaching or exceeding the maximum limit (See SPN 9226).00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
9212	DC/AC Accessory Inverter 1 Power Limited due to AC Side RMS Current	AC Side Output power is being limited due to AC Side output RMS current (see SPN 9200) approaching or exceeding the maximum limit (See SPN 9228).00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
9213	DC/AC Accessory Inverter 1 Power Limited due to DC Side Voltage Minimum	Output power is being limited due to DC Side input voltage (see SPN 8890) approaching or falling below the minimum limit (SPN 9225).00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
9214	DC/AC Accessory Inverter 1 Frequency Command below Minimum	Output frequency is being limited due to frequency command (see SPN 8333) approaching or falling below the minimum limit (SPN 8329).00b = No frequency limit for this reason 01b = Frequency limited for this reason 10b = Error 11b = Not Available
9215	DC/AC Accessory Inverter 1 Frequency Command exceeds Maximum	Output frequency is being limited due to frequency command (see SPN 8333) approaching or exceeding the maximum limit (SPN 8328).00b = No frequency limit for this reason 01b = Frequency limited for this reason 10b = Error 11b = Not Available
9216	DC/AC Accessory Inverter 1 Power Limited due to Controller Temperature	Output power is being limited due to the controller temperature (see SPN 9204) approaching or exceeding the maximum limit.00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
9217	DC/AC Accessory Inverter 1 Power Limited due to Electronic Filter Temperature	Output power is being limited due to electronic filter temperature (see SPN 9205) approaching or exceeding the maximum limit.00b = No frequency limit for this reason 01b = Frequency limited for this reason 10b = Error 11b = Not Available

9218	DC/AC Accessory Inverter 1 Power Limited due to Power Electronics Temperature	Output power is being limited due to power electronics temperature (see SPN 9206) approaching or exceeding the maximum limit.00b = No frequency limit for this reason 01b = Frequency limited for this reason 10b = Error 11b = Not Available
9219	DC/AC Accessory Inverter 1 Power Limited due to Rate of Change Limit	Output power is being limited due to the frequency approaching or exceeding the rate of change limit (see SPN 8332).00b = No frequency limit for this reason 01b = Frequency limited for this reason 10b = Error 11b = Not Available
9220	DC/AC Accessory Inverter 1 Power Limited due to Undefined Reason	Output power is being limited due to an undefined reason. 00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
9221	DC/AC Accessory Inverter 1 DC Side Voltage Minimum Limit Request	The minimum allowed DC Side input voltage requested by a separate device. Under normal conditions this requested limit would be reflected in SPN 9225.
9222	DC/AC Accessory Inverter 1 DC Side Current Maximum Limit Request	The maximum allowed DC Side input current requested by a separate device. Under normal conditions this requested limit would be reflected in SPN 9226.
9223	DC/AC Accessory Inverter 1 AC Side RMS Voltage Maximum Limit Request	The maximum allowed AC Side line to line RMS voltage requested by a separate device. Under normal conditions this requested limit would be reflected in SPN 9227.
9224	DC/AC Accessory Inverter 1 AC Side RMS Current Maximum Limit Request	The maximum allowed AC Side output RMS line current requested by a separate device. Under normal conditions this requested limit would be reflected in SPN 9228.
9225	DC/AC Accessory Inverter 1 DC Side Voltage Minimum Limit Setting	Reports the active minimum limit on the DC Side input voltage of the DC/AC Accessory Inverter. The setting may be requested by a separate device (via SPN 9221) or determined by the DC/AC Controller based on operating conditions.

9226	DC/AC Accessory Inverter 1 DC Side Current Maximum Limit Setting	Reports the active maximum limit on the DC Side input current of the DC/AC Accessory Inverter. The setting may be requested by a separate device (via SPN 9222) or determined by the DC/AC Controller based on operating conditions.
9227	DC/AC Accessory Inverter 1 AC Side RMS Voltage Maximum Limit Setting	Reports the active maximum limit on the AC Side output line to line RMS voltage of the DC/AC Accessory Inverter. The setting may be requested by a separate device (via SPN 9223) or determined by the DC/AC Controller based on operating conditions.
9228	DC/AC Accessory Inverter 1 AC Side RMS Current Maximum Limit Setting	Reports the active maximum limit on the AC side output RMS line current of the DC/AC Accessory Inverter. The setting may be requested by a separate device (via SPN 9224) or determined by the DC/AC Controller based on operating conditions.
9229	DC/AC Accessory Inverter 1 Total DC Input Charge	Total lifetime charge converted by the DC/AC from the DC Side.
9230	DC/AC Accessory Inverter 1 Total DC Input Energy	Total lifetime energy converted by the DC/AC from the DC Side.
9231	DC/AC Accessory Inverter 2 Controller Temperature	Temperature of the DC/AC Accessory Inverter (e.g, controller, circuit board, enclosure).
9232	DC/AC Accessory Inverter 2 Inverter Electronic Filter Temperature	Temperature of the electronic components that make up the DC/AC Accessory Inverter filter.
9233	DC/AC Accessory Inverter 2 Power Electronics Temperature	Temperature of the DC/AC Accessory Inverter power electronics components (e.g, switch or heatsink).
9234	DC/AC Accessory Inverter 2 Coolant In Temperature	Temperature of the DC/AC Accessory Inverter Coolant measured at the input of the accessory inverter.

9235	DC/AC Accessory Inverter 2 Coolant Out Temperature	Temperature of the DC/AC Accessory Inverter Coolant measured at the output of the accessory inverter.
9236	DC/AC Accessory Inverter 2 DC Side Power	Power measured at the DC Side input to the DC/AC Accessory Inverter.
9237	DC/AC Accessory Inverter 2 DC Side Voltage	DC Side input voltage measured at the point of control inside the DC/AC Accessory Inverter.
9238	DC/AC Accessory Inverter 2 DC Side Current	DC Side input current measured at the point of control inside the DC/AC Accessory Inverter.
9239	DC/AC Accessory Inverter 2 Ignition Voltage	Ignition voltage supplied to the DC/AC Accessory Inverter controller.
9240	DC/AC Accessory Inverter 2 SLI Voltage	Low voltage (SLI) supplied to the DC/AC Accessory Inverter controller.
9241	DC/AC Accessory Inverter 2 Power Limited due to DC Side Current	Output power is being limited due to DC Side input current (see SPN 9238) approaching or exceeding the maximum limit (See SPN 9256).00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
9242	DC/AC Accessory Inverter 2 Power Limited due to AC Side RMS Current	AC Side Output power is being limited due to AC Side output RMS current (see SPN 9201) approaching or exceeding the maximum limit (See SPN 9258).00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
9243	DC/AC Accessory Inverter 2 Power Limited due to DC Side Voltage Minimum	Output power is being limited due to DC Side input voltage (see SPN 9237) approaching or falling below the minimum limit (SPN 9255).00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available

9244	DC/AC Accessory Inverter 2 Frequency Command below Minimum	Output frequency is being limited due to frequency command (see SPN 8347) approaching or falling below the minimum limit (SPN 8343).00b = No frequency limit for this reason 01b = Frequency limited for this reason 10b = Error 11b = Not Available
9245	DC/AC Accessory Inverter 2 Frequency Command exceeds Maximum	Output frequency is being limited due to frequency command (see SPN 8347) approaching or exceeding the maximum limit (SPN 8342).00b = No frequency limit for this reason 01b = Frequency limited for this reason 10b = Error 11b = Not Available
9246	DC/AC Accessory Inverter 2 Power Limited due to Controller Temperature	Output power is being limited due to the controller temperature (see SPN 9231) approaching or exceeding the maximum limit.00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
9247	DC/AC Accessory Inverter 2 Power Limited due to Electronic Filter Temperature	Output power is being limited due to electronic filter temperature (see SPN 9232) approaching or exceeding the maximum limit.00b = No frequency limit for this reason 01b = Frequency limited for this reason 10b = Error 11b = Not Available
9248	DC/AC Accessory Inverter 2 Power Limited due to Power Electronics Temperature	Output power is being limited due to power electronics temperature (see SPN 9233) approaching or exceeding the maximum limit.00b = No frequency limit for this reason 01b = Frequency limited for this reason 10b = Error 11b = Not Available
9249	DC/AC Accessory Inverter 2 Power Limited due to Rate of Change Limit	Output power is being limited due to the frequency approaching or exceeding the rate of change limit (see SPN 8346).00b = No frequency limit for this reason 01b = Frequency limited for this reason 10b = Error 11b = Not Available
9250	DC/AC Accessory Inverter 2 Power Limited due to Undefined Reason	Output power is being limited due to an undefined reason. 00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
9251	DC/AC Accessory Inverter 2 DC Side Voltage Minimum Limit Request	The minimum allowed DC Side input voltage requested by a separate device. Under normal conditions this requested limit would be reflected in SPN 9255.

9252	DC/AC Accessory Inverter 2 DC Side Current Maximum Limit Request	The maximum allowed DC Side input current requested by a separate device. Under normal conditions this requested limit would be reflected in SPN 9256.
9253	DC/AC Accessory Inverter 2 AC Side RMS Voltage Maximum Limit Request	The maximum allowed AC Side line to line RMS voltage requested by a separate device. Under normal conditions this requested limit would be reflected in SPN 9257.
9254	DC/AC Accessory Inverter 2 AC Side RMS Current Maximum Limit Request	The maximum allowed AC Side output RMS line current requested by a separate device. Under normal conditions this requested limit would be reflected in SPN 9258.
9255	DC/AC Accessory Inverter 2 DC Side Voltage Minimum Limit Setting	Reports the active minimum limit on the DC Side input voltage of the DC/AC Accessory Inverter. The setting may be requested by a separate device (via SPN 9251) or determined by the DC/AC Controller based on operating conditions.
9256	DC/AC Accessory Inverter 2 DC Side Current Maximum Limit Setting	Reports the active maximum limit on the DC Side input current of the DC/AC Accessory Inverter. The setting may be requested by a separate device (via SPN 9252) or determined by the DC/AC Controller based on operating conditions.
9257	DC/AC Accessory Inverter 2 AC Side RMS Voltage Maximum Limit Setting	Reports the active maximum limit on the AC Side output line to line RMS voltage of the DC/AC Accessory Inverter. The setting may be requested by a separate device (via SPN 9253) or determined by the DC/AC Controller based on operating conditions.
9258	DC/AC Accessory Inverter 2 AC Side RMS Current Maximum Limit Setting	Reports the active maximum limit on the AC side output RMS line current of the DC/AC Accessory Inverter. The setting may be requested by a separate device (via SPN 9254) or determined by the DC/AC Controller based on operating conditions.
9259	DC/AC Accessory Inverter 2 Total DC Input Charge	Total lifetime charge converted by the DC/AC from the DC Side.

9260	DC/AC Accessory Inverter 2 Total DC Input Energy	Total lifetime energy converted by the DC/AC from the DC Side.
9261	DC/AC Accessory Inverter 3 Controller Temperature	Temperature of the DC/AC Accessory Inverter (e.g, controller, circuit board, enclosure).
9262	DC/AC Accessory Inverter 3 Inverter Electronic Filter Temperature	Temperature of the electronic components that make up the DC/AC Accessory Inverter filter.
9263	DC/AC Accessory Inverter 3 Power Electronics Temperature	Temperature of the DC/AC Accessory Inverter power electronics components (e.g, switch or heatsink).
9264	DC/AC Accessory Inverter 3 Coolant In Temperature	Temperature of the DC/AC Accessory Inverter Coolant measured at the input of the accessory inverter.
9265	DC/AC Accessory Inverter 3 Coolant Out Temperature	Temperature of the DC/AC Accessory Inverter Coolant measured at the output of the accessory inverter.
9266	DC/AC Accessory Inverter 3 DC Side Power	Power measured at the DC Side input to the DC/AC Accessory Inverter.
9267	DC/AC Accessory Inverter 3 DC Side Voltage	DC Side input voltage measured at the point of control inside the DC/AC Accessory Inverter.
9268	DC/AC Accessory Inverter 3 DC Side Current	DC Side input current measured at the point of control inside the DC/AC Accessory Inverter.
9269	DC/AC Accessory Inverter 3 Ignition Voltage	Ignition voltage supplied to the DC/AC Accessory Inverter controller.

9270	DC/AC Accessory Inverter 3 SLI Voltage	Low voltage (SLI) supplied to the DC/AC Accessory Inverter controller.
9271	DC/AC Accessory Inverter 3 Power Limited due to DC Side Current	Output power is being limited due to DC Side input current (see SPN 9268) approaching or exceeding the maximum limit (See SPN 9286).00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
9272	DC/AC Accessory Inverter 3 Power Limited due to AC Side RMS Current	AC Side Output power is being limited due to AC Side output RMS current (see SPN 9202) approaching or exceeding the maximum limit (See SPN 9288).00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
9273	DC/AC Accessory Inverter 3 Power Limited due to DC Side Voltage Minimum	Output power is being limited due to DC Side input voltage (see SPN 9267) approaching or falling below the minimum limit (SPN 9285).00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
9274	DC/AC Accessory Inverter 3 Frequency Command below Minimum	Output frequency is being limited due to frequency command (see SPN 8361) approaching or falling below the minimum limit (SPN 8357).00b = No frequency limit for this reason 01b = Frequency limited for this reason 10b = Error 11b = Not Available
9275	DC/AC Accessory Inverter 3 Frequency Command exceeds Maximum	Output frequency is being limited due to frequency command (see SPN 8361) approaching or exceeding the maximum limit (SPN 8356).00b = No frequency limit for this reason 01b = Frequency limited for this reason 10b = Error 11b = Not Available
9276	DC/AC Accessory Inverter 3 Power Limited due to Controller Temperature	Output power is being limited due to the controller temperature (see SPN 9261) approaching or exceeding the maximum limit.00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
9277	DC/AC Accessory Inverter 3 Power Limited due to Electronic Filter Temperature	Output power is being limited due to electronic filter temperature (see SPN 9262) approaching or exceeding the maximum limit.00b = No frequency limit for this reason 01b = Frequency limited for this reason 10b = Error 11b = Not Available

9278	DC/AC Accessory Inverter 3 Power Limited due to Power Electronics Temperature	Output power is being limited due to power electronics temperature (see SPN 9263) approaching or exceeding the maximum limit.00b = No frequency limit for this reason 01b = Frequency limited for this reason 10b = Error 11b = Not Available
9279	DC/AC Accessory Inverter 3 Power Limited due to Rate of Change Limit	Output power is being limited due to the frequency approaching or exceeding the rate of change limit (see SPN 8360).00b = No frequency limit for this reason 01b = Frequency limited for this reason 10b = Error 11b = Not Available
9280	DC/AC Accessory Inverter 3 Power Limited due to Undefined Reason	Output power is being limited due to an undefined reason. 00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
9281	DC/AC Accessory Inverter 3 DC Side Voltage Minimum Limit Request	The minimum allowed DC Side input voltage requested by a separate device. Under normal conditions this requested limit would be reflected in SPN 9285.
9282	DC/AC Accessory Inverter 3 DC Side Current Maximum Limit Request	The maximum allowed DC Side input current requested by a separate device. Under normal conditions this requested limit would be reflected in SPN 9286.
9283	DC/AC Accessory Inverter 3 AC Side RMS Voltage Maximum Limit Request	The maximum allowed AC Side line to line RMS voltage requested by a separate device. Under normal conditions this requested limit would be reflected in SPN 9287.
9284	DC/AC Accessory Inverter 3 AC Side RMS Current Maximum Limit Request	The maximum allowed AC Side output RMS line current requested by a separate device. Under normal conditions this requested limit would be reflected in SPN 9288.
9285	DC/AC Accessory Inverter 3 DC Side Voltage Minimum Limit Setting	Reports the active minimum limit on the DC Side input voltage of the DC/AC Accessory Inverter. The setting may be requested by a separate device (via SPN 9281) or determined by the DC/AC Controller based on operating conditions.

9286	DC/AC Accessory Inverter 3 DC Side Current Maximum Limit Setting	Reports the active maximum limit on the DC Side input current of the DC/AC Accessory Inverter. The setting may be requested by a separate device (via SPN 9282) or determined by the DC/AC Controller based on operating conditions.
9287	DC/AC Accessory Inverter 3 AC Side RMS Voltage Maximum Limit Setting	Reports the active maximum limit on the AC Side output line to line RMS voltage of the DC/AC Accessory Inverter. The setting may be requested by a separate device (via SPN 9283) or determined by the DC/AC Controller based on operating conditions.
9288	DC/AC Accessory Inverter 3 AC Side RMS Current Maximum Limit Setting	Reports the active maximum limit on the AC side output RMS line current of the DC/AC Accessory Inverter. The setting may be requested by a separate device (via SPN 9284) or determined by the DC/AC Controller based on operating conditions.
9289	DC/AC Accessory Inverter 3 Total DC Input Charge	Total lifetime charge converted by the DC/AC from the DC Side.
9290	DC/AC Accessory Inverter 3 Total DC Input Energy	Total lifetime energy converted by the DC/AC from the DC Side.
9291	DC/AC Accessory Inverter 4 Controller Temperature	Temperature of the DC/AC Accessory Inverter (e.g, controller, circuit board, enclosure).
9292	DC/AC Accessory Inverter 4 Inverter Electronic Filter Temperature	Temperature of the electronic components that make up the DC/AC Accessory Inverter filter.
9293	DC/AC Accessory Inverter 4 Power Electronics Temperature	Temperature of the DC/AC Accessory Inverter power electronics components (e.g, switch or heatsink).
9294	DC/AC Accessory Inverter 4 Coolant In Temperature	Temperature of the DC/AC Accessory Inverter Coolant measured at the input of the accessory inverter.

9295	DC/AC Accessory Inverter 4 Coolant Out Temperature	Temperature of the DC/AC Accessory Inverter Coolant measured at the output of the accessory inverter.
9296	DC/AC Accessory Inverter 4 DC Side Power	Power measured at the DC Side input to the DC/AC Accessory Inverter.
9297	DC/AC Accessory Inverter 4 DC Side Voltage	DC Side input voltage measured at the point of control inside the DC/AC Accessory Inverter.
9298	DC/AC Accessory Inverter 4 DC Side Current	DC Side input current measured at the point of control inside the DC/AC Accessory Inverter.
9299	DC/AC Accessory Inverter 4 Ignition Voltage	Ignition voltage supplied to the DC/AC Accessory Inverter controller.
9300	DC/AC Accessory Inverter 4 SLI Voltage	Low voltage (SLI) supplied to the DC/AC Accessory Inverter controller.
9301	DC/AC Accessory Inverter 4 Power Limited due to DC Side Current	Output power is being limited due to DC Side input current (see SPN 9298) approaching or exceeding the maximum limit (See SPN 9316).00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
9302	DC/AC Accessory Inverter 4 Power Limited due to AC Side RMS Current	AC Side Output power is being limited due to AC Side output RMS current (see SPN 9203) approaching or exceeding the maximum limit (See SPN 9318).00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
9303	DC/AC Accessory Inverter 4 Power Limited due to DC Side Voltage Minimum	Output power is being limited due to DC Side input voltage (see SPN 9297) approaching or falling below the minimum limit (SPN 9315).00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available

9304	DC/AC Accessory Inverter 4 Frequency Command below Minimum	Output frequency is being limited due to frequency command (see SPN 8375) approaching or falling below the minimum limit (SPN 8371).00b = No frequency limit for this reason 01b = Frequency limited for this reason 10b = Error 11b = Not Available
9305	DC/AC Accessory Inverter 4 Frequency Command exceeds Maximum	Output frequency is being limited due to frequency command (see SPN 8375) approaching or exceeding the maximum limit (SPN 8370).00b = No frequency limit for this reason 01b = Frequency limited for this reason 10b = Error 11b = Not Available
9306	DC/AC Accessory Inverter 4 Power Limited due to Controller Temperature	Output power is being limited due to the controller temperature (see SPN 9291) approaching or exceeding the maximum limit.00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
9307	DC/AC Accessory Inverter 4 Power Limited due to Electronic Filter Temperature	Output power is being limited due to electronic filter temperature (see SPN 9292) approaching or exceeding the maximum limit.00b = No frequency limit for this reason 01b = Frequency limited for this reason 10b = Error 11b = Not Available
9308	DC/AC Accessory Inverter 4 Power Limited due to Power Electronics Temperature	Output power is being limited due to power electronics temperature (see SPN 9293) approaching or exceeding the maximum limit.00b = No frequency limit for this reason 01b = Frequency limited for this reason 10b = Error 11b = Not Available
9309	DC/AC Accessory Inverter 4 Power Limited due to Rate of Change Limit	Output power is being limited due to the frequency approaching or exceeding the rate of change limit (see SPN 8374).00b = No frequency limit for this reason 01b = Frequency limited for this reason 10b = Error 11b = Not Available
9310	DC/AC Accessory Inverter 4 Power Limited due to Undefined Reason	Output power is being limited due to an undefined reason. 00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
9311	DC/AC Accessory Inverter 4 DC Side Voltage Minimum Limit Request	The minimum allowed DC Side input voltage requested by a separate device. Under normal conditions this requested limit would be reflected in SPN 9315.

9312	DC/AC Accessory Inverter 4 DC Side Current Maximum Limit Request	The maximum allowed DC Side input current requested by a separate device. Under normal conditions this requested limit would be reflected in SPN 9316.
9313	DC/AC Accessory Inverter 4 AC Side RMS Voltage Maximum Limit Request	The maximum allowed AC Side line to line RMS voltage requested by a separate device. Under normal conditions this requested limit would be reflected in SPN 9317.
9314	DC/AC Accessory Inverter 4 AC Side RMS Current Maximum Limit Request	The maximum allowed AC Side output RMS line current requested by a separate device. Under normal conditions this requested limit would be reflected in SPN 9318.
9315	DC/AC Accessory Inverter 4 DC Side Voltage Minimum Limit Setting	Reports the active minimum limit on the DC Side input voltage of the DC/AC Accessory Inverter. The setting may be requested by a separate device (via SPN 9311) or determined by the DC/AC Controller based on operating conditions.
9316	DC/AC Accessory Inverter 4 DC Side Current Maximum Limit Setting	Reports the active maximum limit on the DC Side input current of the DC/AC Accessory Inverter. The setting may be requested by a separate device (via SPN 9312) or determined by the DC/AC Controller based on operating conditions.
9317	DC/AC Accessory Inverter 4 AC Side RMS Voltage Maximum Limit Setting	Reports the active maximum limit on the AC Side output line to line RMS voltage of the DC/AC Accessory Inverter. The setting may be requested by a separate device (via SPN 9313) or determined by the DC/AC Controller based on operating conditions.
9318	DC/AC Accessory Inverter 4 AC Side RMS Current Maximum Limit Setting	Reports the active maximum limit on the AC side output RMS line current of the DC/AC Accessory Inverter. The setting may be requested by a separate device (via SPN 9314) or determined by the DC/AC Controller based on operating conditions.
9319	DC/AC Accessory Inverter 4 Total DC Input Charge	Total lifetime charge converted by the DC/AC from the DC Side.

9320	DC/AC Accessory Inverter 4 Total DC Input Energy	Total lifetime energy converted by the DC/AC from the DC Side.
9321	DC/AC Accessory Inverter 5 Device Maximum Frequency	Signal to the DC/AC Accessory Inverter indicating the maximum frequency of the devices(s) attached to the inverter output. Each output may control multiple devices (e.g. electric motors) if they all operate at the same frequency.
9322	DC/AC Accessory Inverter 5 Device Minimum Frequency	Signal to the DC/AC Accessory Inverter indicating the minimum frequency of the device(s) attached to the inverter output. Each output may control multiple devices (e.g. electric motors) if they all operate at the same frequency.
9323	DC/AC Accessory Inverter 5 Device Rated Frequency	Signal to the DC/AC Accessory Inverter indicating the rated frequency of the device(s) attached to the inverter output. Each output may control multiple devices (e.g. electric motors) if they all operate at the same frequency.
9324	DC/AC Accessory Inverter 5 Device Rated RMS Voltage	Signal to the DC/AC Accessory Inverter indicating the rated RMS voltage of the device(s) attached to the inverter output. Each output may control multiple devices (e.g. electric motors) if they all operate at the same frequency.
9325	DC/AC Accessory Inverter 5 Device Frequency Rate of Change Limit	Signal to the DC/AC Accessory Inverter indicating the frequency rate of change limit of the device(s) attached to the inverter output (Note: Increasing and decreasing rates can be controlled by the same signal). Each output may control multiple device
9326	DC/AC Accessory Inverter 5 Frequency Command	Command to the DC/AC Accessory Inverter indicating the Inverter frequency desired for the device(s) attached to the inverter output. Each output may control multiple devices (e.g. electric motors) if they all operate at the same frequency.
9327	DC/AC Accessory Inverter 5 Device 1 Status	Signal to the DC/AC Accessory Inverter indicating the state of the device attached to the inverter output. Each output may control multiple devices (e.g. electric motors) if they all operate at the same frequency.The Faulted Off state will be communicated when the device has a fault due to an overload condition or other fault resulting in a shutdown. The Faulted On state will be communicated when the device has a fault that has resulted in an operational state that is running but no longer controllable. The

		Error state is used when the operational state of the device is unknown. 000b = On 001b = Off 010b = Faulted On 011b = Faulted Off 100b = Reserved for SAE Assignment 101b = Reserved for SAE Assignment 110b = Error 111b = Not Available
9328	DC/AC Accessory Inverter 5 Device 2 Status	Signal to the DC/AC Accessory Inverter indicating the state of the device attached to the inverter output. Each output may control multiple devices (e.g. electric motors) if they all operate at the same frequency.The Faulted Off state will be communicated when the device has a fault due to an overload condition or other fault resulting in a shutdown. The Faulted On state will be communicated when the device has a fault that has resulted in an operational state that is running but no longer controllable. The Error state is used when the operational state of the device is unknown. 000b = On 001b = Off 010b = Faulted On 011b = Faulted Off 100b = Reserved for SAE Assignment 101b = Reserved for SAE Assignment 110b = Error 111b = Not Available
9329	DC/AC Accessory Inverter 5 Operational Command	Command to the DC/AC Accessory Inverter to enable this output. Each output may control multiple devices (e.g. electric motors) if they all operate at the same frequency.00b = Disable DC/AC Accessory Inverter Output 01b = Enable DC/AC Accessory Inverter Output 10b = Power down DC/AC Accessory Inverter Controller 11b = Not Available
9330	DC/AC Accessory Inverter 5 Frequency	Present operating frequency of this DC/AC Accessory Inverter output.
9331	DC/AC Accessory Inverter 5 AC Side RMS Voltage	Present operating AC Side line to line RMS voltage of this DC/AC Accessory Inverter output. In a three phase balanced motor, this is the RMS voltage across one phase of the motor.
9332	DC/AC Accessory Inverter 5 AC Side Power	Present operating AC Side power of this DC/AC Accessory Inverter output.

9333	DC/AC Accessory Inverter 5 AC Side RMS Current	Present operating AC Side output RMS line Current of this DC/AC Accessory Inverter. When connected to a balanced three phase motor, this would be the current in each individual phase of the motor.
9334	DC/AC Accessory Inverter 5 Operational Status	Operating Status of this DC/AC Accessory Inverter output. The Inverter Output Faulted state will be communicated when the inverter output has shutdown due to an overload condition or other fault.000b = Output Disabled 001b = Output Enabled 010b = Output Faulted On 011b = Output Faulted Off 100b = Normal Power Down in Process 101b = Reserved 110b = Error 111b = Not Available
9335	DC/AC Accessory Inverter 5 Loadshed Request	Loadshed Request from this DC/AC Accessory Inverter output. The Loadshed Requested state is an indication that the inverter output powering this device has a malfunction and is in a limit condition and if the load of the output is not reduced, the inverter will take steps to protect itself. The Loadshed Requested, Shutdown Imminent state is an indication that the loadshed needs have not been met and the output will be shutdown in a limited amount of time.00b = No Loadshed Requested 01b = Loadshed Requested 10b = Loadshed Requested, Shutdown Imminent 11b = Don’t Care/Take No Action
9336	DC/AC Accessory Inverter 5 HVIL Status	High Voltage Interlock Loop (HVIL) state of the DC/AC Accessory Inverter 5. 00b = HVIL Closed 01b = HVIL Open 10b = Error 11b = Not Available
9337	DC/AC Accessory Inverter 5 Controller Temperature	Temperature of the DC/AC Accessory Inverter (e.g, controller, circuit board, enclosure).
9338	DC/AC Accessory Inverter 5 Inverter Electronic Filter Temperature	Temperature of the electronic components that make up the DC/AC Accessory Inverter filter.
9339	DC/AC Accessory Inverter 5 Power Electronics Temperature	Temperature of the DC/AC Accessory Inverter power electronics components (e.g, switch or heatsink).

9340	DC/AC Accessory Inverter 5 Coolant In Temperature	Temperature of the DC/AC Accessory Inverter Coolant measured at the input of the accessory inverter.
9341	DC/AC Accessory Inverter 5 Coolant Out Temperature	Temperature of the DC/AC Accessory Inverter Coolant measured at the output of the accessory inverter.
9342	DC/AC Accessory Inverter 5 DC Side Power	Power measured at the DC Side input to the DC/AC Accessory Inverter.
9343	DC/AC Accessory Inverter 5 DC Side Voltage	DC Side input voltage measured at the point of control inside the DC/AC Accessory Inverter.
9344	DC/AC Accessory Inverter 5 DC Side Current	DC Side input current measured at the point of control inside the DC/AC Accessory Inverter.
9345	DC/AC Accessory Inverter 5 Ignition Voltage	Ignition voltage supplied to the DC/AC Accessory Inverter controller.
9346	DC/AC Accessory Inverter 5 SLI Voltage	Low voltage (SLI) supplied to the DC/AC Accessory Inverter controller.
9347	DC/AC Accessory Inverter 5 Power Limited due to DC Side Current	Output power is being limited due to DC Side input current (see SPN 9344) approaching or exceeding the maximum limit (See SPN 9362).00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
9348	DC/AC Accessory Inverter 5 Power Limited due to AC Side RMS Current	AC Side Output power is being limited due to AC Side output RMS current (see SPN 9333) approaching or exceeding the maximum limit (See SPN 9364).00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
9349	DC/AC Accessory Inverter 5 Power Limited due to DC Side Voltage Minimum	Output power is being limited due to DC Side input voltage (see SPN 9343) approaching or falling below the minimum limit (SPN 9361).00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available

9350	DC/AC Accessory Inverter 5 Frequency Command below Minimum	Output frequency is being limited due to frequency command (see SPN 9326) approaching or falling below the minimum limit (SPN 9322).00b = No frequency limit for this reason 01b = Frequency limited for this reason 10b = Error 11b = Not Available
9351	DC/AC Accessory Inverter 5 Frequency Command exceeds Maximum	Output frequency is being limited due to frequency command (see SPN 9326) approaching or exceeding the maximum limit (SPN 9321).00b = No frequency limit for this reason 01b = Frequency limited for this reason 10b = Error 11b = Not Available
9352	DC/AC Accessory Inverter 5 Power Limited due to Controller Temperature	Output power is being limited due to the controller temperature (see SPN 9337) approaching or exceeding the maximum limit.00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
9353	DC/AC Accessory Inverter 5 Power Limited due to Electronic Filter Temperature	Output power is being limited due to electronic filter temperature (see SPN 9338) approaching or exceeding the maximum limit.00b = No frequency limit for this reason 01b = Frequency limited for this reason 10b = Error 11b = Not Available
9354	DC/AC Accessory Inverter 5 Power Limited due to Power Electronics Temperature	Output power is being limited due to power electronics temperature (see SPN 9339) approaching or exceeding the maximum limit.00b = No frequency limit for this reason 01b = Frequency limited for this reason 10b = Error 11b = Not Available
9355	DC/AC Accessory Inverter 5 Power Limited due to Rate of Change Limit	Output power is being limited due to the frequency approaching or exceeding the rate of change limit (see SPN 9325).00b = No frequency limit for this reason 01b = Frequency limited for this reason 10b = Error 11b = Not Available
9356	DC/AC Accessory Inverter 5 Power Limited due to Undefined Reason	Output power is being limited due to an undefined reason. 00b = No power limit for this reason 01b = Power limited for this reason 10b = Error 11b = Not Available
9357	DC/AC Accessory Inverter 5 DC Side Voltage Minimum Limit Request	The minimum allowed DC Side input voltage requested by a separate device. Under normal conditions this requested limit would be reflected in SPN 9361.

9358	DC/AC Accessory Inverter 5 DC Side Current Maximum Limit Request	The maximum allowed DC Side input current requested by a separate device. Under normal conditions this requested limit would be reflected in SPN 9362.
9359	DC/AC Accessory Inverter 5 AC Side RMS Voltage Maximum Limit Request	The maximum allowed AC Side line to line RMS voltage requested by a separate device. Under normal conditions this requested limit would be reflected in SPN 9363.
9360	DC/AC Accessory Inverter 5 AC Side RMS Current Maximum Limit Request	The maximum allowed AC Side output RMS line current requested by a separate device. Under normal conditions this requested limit would be reflected in SPN 9364.
9361	DC/AC Accessory Inverter 5 DC Side Voltage Minimum Limit Setting	Reports the active minimum limit on the DC Side input voltage of the DC/AC Accessory Inverter. The setting may be requested by a separate device (via SPN 9357) or determined by the DC/AC Controller based on operating conditions.
9362	DC/AC Accessory Inverter 5 DC Side Current Maximum Limit Setting	Reports the active maximum limit on the DC Side input current of the DC/AC Accessory Inverter. The setting may be requested by a separate device (via SPN 9358) or determined by the DC/AC Controller based on operating conditions.
9363	DC/AC Accessory Inverter 5 AC Side RMS Voltage Maximum Limit Setting	Reports the active maximum limit on the AC Side output line to line RMS voltage of the DC/AC Accessory Inverter. The setting may be requested by a separate device (via SPN 9359) or determined by the DC/AC Controller based on operating conditions.
9364	DC/AC Accessory Inverter 5 AC Side RMS Current Maximum Limit Setting	Reports the active maximum limit on the AC side output RMS line current of the DC/AC Accessory Inverter. The setting may be requested by a separate device (via SPN 9360) or determined by the DC/AC Controller based on operating conditions.
9365	DC/AC Accessory Inverter 5 Total DC Input Charge	Total lifetime charge converted by the DC/AC from the DC Side.

9366	DC/AC Accessory Inverter 5 Total DC Input Energy	Total lifetime energy converted by the DC/AC from the DC Side.
9367	Engine Actual Exhaust 2 Oxygen	The actual amount of oxygen in the second exhaust represented as a percentage by volume with respect to the total volume of exhaust gases leaving the engine.
9368	SLI Battery Pack 1 Battery 1 Capacity Setting	Informs the battery controller of the capacity of its associated battery. This parameter applies to the first battery in the first set of batteries (battery pack) used for starting the engine, for lighting, and for ignition (SLI) .
9369	SLI Battery Pack 1 Battery 2 Capacity Setting	Informs the battery controller of the capacity of its associated battery. This parameter applies to the second battery in the first set of batteries (battery pack) used for starting the engine, for lighting, and for ignition (SLI) .
9370	SLI Battery Pack 1 Battery 3 Capacity Setting	Informs the battery controller of the capacity of its associated battery. This parameter applies to the third battery in the first set of batteries (battery pack) used for starting the engine, for lighting, and for ignition (SLI) .
9371	SLI Battery Pack 1 Battery 4 Capacity Setting	Informs the battery controller of the capacity of its associated battery. This parameter applies to the fourth battery in the first set of batteries (battery pack) used for starting the engine, for lighting, and for ignition (SLI).
9372	Engine Idle Management Pending Event Lamp Command	Command signal directly controlling the Engine Idle Management Pending Event Lamp. An engine start-up or shutdown is considered an event.00b = Lamp Off 01b = Lamp On 10b = Reserved 11b = Not available
9373	Automatic Start Request Inhibit Indicator	State signal indicating an engine request for the Automatic Start Request Inhibit Indicator to be active or inactive. The start inhibit indicator can be of lamp or text form, located on (but not limited to) the shift console, instrument cluster, or cab display.Engine manufacturers may want to indicate that they currently cannot perform the requested start. This could be due to inappropriate engine conditions or other restrictions. Distinctions in meaning between the continuous and flashing are left to the engine manufacturer. 00b = Inactive; automatic start is not inhibited 01b =

		Active (on continuously); automatic start is inhibited 10b = Active (flashing) 11b = Take no action
9374	Engine Idle Management Pending Event Override	Command signal which allows the operator to override an impending engine idle management start-up or an impending engine idle management shutdown.00b = Off (not requesting an override) 01b = On (requesting an override) 10b = Error 11b = Not available
9375	Instantaneous Estimated Engine Power Rate Limit	Estimate of the maximum power load rate the engine can sustain at that moment in time.
9376	Engine Crankshaft Damper	Indicates the vibration damper on the engine crankshaft has triggered a diagnostic event.
9377	Engine Idle Management Active Total Time	Total accumulated time the engine is off due to the engine idle management system.
9378	Engine Speed Low Indicator Output	ECU output used to signal when the engine speed has dropped below a predefined limit. NOTE – This SPN is used to diagnose the engine speed low indicator output and should not be used to indicate a malfunction of the actual parameter engine speed.
9379	Engine Exhaust Gas Recirculation 1 Cooler Intake Pressure	Exhaust gas recirculation gage pressure is measured at the EGR cooler intake.
9380	Engine Exhaust Gas Recirculation 2 Cooler Intake Pressure	Exhaust gas recirculation 2 (EGR2) gage pressure is measured at the EGR2 cooler intake.
9381	SHM Version	See document J1939-76 for SPN details.
9382	Sequence Number	See document J1939-76 for SPN details.

9383	SDM Data CRC	See document J1939-76 for SPN details.
9384	Inverted SDM Source Address	See document J1939-76 for SPN details.
9385	Inverted SDM PS Value	See document J1939-76 for SPN details.
9386	Inverted SDM PF Value	See document J1939-76 for SPN details.
9387	Inverted SDM Data Page	See document J1939-76 for SPN details.
9388	Inverted SDM Extended Data Page	See document J1939-76 for SPN details.
9389	Inverted SDM Priority	See document J1939-76 for SPN details.
9390	Serial Peripheral Interface (SPI) Bus	Serial Peripheral Interface (SPI) bus communication within the reporting controller.
9391	Transmission Load Reduction Input	Indicates a fault with an input to a transmission function that reduces load on the engine under certain conditions.
9392	Accelerator Pedal 1 Low Idle Switch 2	Switch signal which indicates the state of the 2nd low idle switch instance on accelerator pedal 1. The low idle switch is defined in SAE Recommended Practice J1843.
9393	Engine Response During Transmission Shift	Requested engine response was unacceptable during a transmission shift event. For example, an engine did not reach a requested TSC1 torque limit.
9394	Engine Torque Response for Drivetrain Protection	Requested engine torque response was unacceptable for a drivetrain protection event. For example, an engine did not reach a requested TSC1 torque limit.
9395	Engine Speed Response for Drivetrain Protection	Requested engine speed response was unacceptable for a drivetrain protection event. For example, an engine did not reach a requested TSC1 speed limit.

9396	Engine Power Level for Drivetrain Protection	The engine power level was unacceptable for a drivetrain protection event. For example, an engine did not reach a requested TSC1 limits.
9397	Engine Torque Response for PTO Protection	Requested engine torque response was unacceptable for a PTO protection event. For example, an engine did not reach a requested TSC1 torque limit.
9398	Engine Speed Response for PTO Protection	Requested engine speed response was unacceptable for a PTO protection event. For example, an engine did not reach a requested TSC1 speed limit.
9399	Engine Response for Manufacturer-Specific Functionality 1	Requested engine response was unacceptable for a manufacturer-specific use. For example, an engine did not reach a requested TSC1 torque limit.
9400	Engine Response for Manufacturer-Specific Functionality 2	Requested engine response was unacceptable for a manufacturer-specific use. For example, an engine did not reach a requested TSC1 torque limit.
9401	Propulsion Inverter 1 Internal Power Supply 1 Voltage	Voltage output of power supply 1 in propulsion inverter 1.
9402	Propulsion Inverter 1 Internal Power Supply 2 Voltage	Voltage output of power supply 2 in propulsion inverter 1.
9403	Propulsion Inverter 1 Internal Power Supply 3 Voltage	Voltage output of power supply 3 in propulsion inverter 1.
9404	Propulsion Inverter 1 Internal Power Supply 4 Voltage	Voltage output of power supply 4 in propulsion inverter 1.
9405	Propulsion Inverter 1 Internal Power Supply 5 Voltage	Voltage output of power supply 5 in propulsion inverter 1.
9406	Propulsion Inverter 1 Internal Power Supply 6 Voltage	Voltage output of power supply 6 in propulsion inverter 1.

9407	Propulsion Inverter 1 Internal Power Supply 7 Voltage	Voltage output of power supply 7 in propulsion inverter 1.
9408	Propulsion Inverter 1 Internal Power Supply 8 Voltage	Voltage output of power supply 8 in propulsion inverter 1.
9409	Propulsion Inverter 2 Internal Power Supply 1 Voltage	Voltage output of power supply 1 in propulsion inverter 2.
9410	Propulsion Inverter 2 Internal Power Supply 2 Voltage	Voltage output of power supply 2 in propulsion inverter 2.
9411	Propulsion Inverter 2 Internal Power Supply 3 Voltage	Voltage output of power supply 3 in propulsion inverter 2.
9412	Propulsion Inverter 2 Internal Power Supply 4 Voltage	Voltage output of power supply 4 in propulsion inverter 2.
9413	Propulsion Inverter 2 Internal Power Supply 5 Voltage	Voltage output of power supply 5 in propulsion inverter 2.
9414	Propulsion Inverter 2 Internal Power Supply 6 Voltage	Voltage output of power supply 6 in propulsion inverter 2.
9415	Propulsion Inverter 2 Internal Power Supply 7 Voltage	Voltage output of power supply 7 in propulsion inverter 2.
9416	Propulsion Inverter 2 Internal Power Supply 8 Voltage	Voltage output of power supply 8 in propulsion inverter 2.
9417	Propulsion Inverter 1 Serial Peripheral Interface (SPI) Bus	Serial Peripheral Interface (SPI) bus communication within the propulsion inverter 2 controller.

9418	Propulsion Inverter 2 Serial Peripheral Interface (SPI) Bus	Serial Peripheral Interface (SPI) bus communication within the propulsion inverter 1 controller.
9419	HVES1 Module 1 State of Health	Indicates the expected remaining « Life » of this module. Battery life is a manufacturer-specific measure of how well the energy storage system is functioning relative to its nominal (rated) and end (failed) states.
9420	HVES1 Module 2 State of Health	Indicates the expected remaining « Life » of this module. Battery life is a manufacturer-specific measure of how well the energy storage system is functioning relative to its nominal (rated) and end (failed) states.
9421	HVES1 Module 3 State of Health	Indicates the expected remaining « Life » of this module. Battery life is a manufacturer-specific measure of how well the energy storage system is functioning relative to its nominal (rated) and end (failed) states.
9422	HVES1 Module 4 State of Health	Indicates the expected remaining « Life » of this module. Battery life is a manufacturer-specific measure of how well the energy storage system is functioning relative to its nominal (rated) and end (failed) states.
9423	HVES1 Module 5 State of Health	Indicates the expected remaining « Life » of this module. Battery life is a manufacturer-specific measure of how well the energy storage system is functioning relative to its nominal (rated) and end (failed) states.
9424	HVES1 Module 6 State of Health	Indicates the expected remaining « Life » of this module. Battery life is a manufacturer-specific measure of how well the energy storage system is functioning relative to its nominal (rated) and end (failed) states.
9425	HVES1 Module 7 State of Health	Indicates the expected remaining « Life » of this module. Battery life is a manufacturer-specific measure of how well the energy storage system is functioning relative to its nominal (rated) and end (failed) states.

9426	HVES1 Module 8 State of Health	Indicates the expected remaining « Life » of this module. Battery life is a manufacturer-specific measure of how well the energy storage system is functioning relative to its nominal (rated) and end (failed) states.
9427	HVES1 Module 9 State of Health	Indicates the expected remaining « Life » of this module. Battery life is a manufacturer-specific measure of how well the energy storage system is functioning relative to its nominal (rated) and end (failed) states.
9428	HVES1 Module 10 State of Health	Indicates the expected remaining « Life » of this module. Battery life is a manufacturer-specific measure of how well the energy storage system is functioning relative to its nominal (rated) and end (failed) states.
9429	HVES1 Module 11 State of Health	Indicates the expected remaining « Life » of this module. Battery life is a manufacturer-specific measure of how well the energy storage system is functioning relative to its nominal (rated) and end (failed) states.
9430	HVES1 Module 12 State of Health	Indicates the expected remaining « Life » of this module. Battery life is a manufacturer-specific measure of how well the energy storage system is functioning relative to its nominal (rated) and end (failed) states.
9431	HVES1 Module 13 State of Health	Indicates the expected remaining « Life » of this module. Battery life is a manufacturer-specific measure of how well the energy storage system is functioning relative to its nominal (rated) and end (failed) states.
9432	HVES1 Module 14 State of Health	Indicates the expected remaining « Life » of this module. Battery life is a manufacturer-specific measure of how well the energy storage system is functioning relative to its nominal (rated) and end (failed) states.
9433	HVES1 Module 15 State of Health	Indicates the expected remaining « Life » of this module. Battery life is a manufacturer-specific measure of how well the energy storage system is functioning relative to its nominal (rated) and end (failed) states.

9434	HVES1 Module 16 State of Health	Indicates the expected remaining « Life » of this module. Battery life is a manufacturer-specific measure of how well the energy storage system is functioning relative to its nominal (rated) and end (failed) states.
9435	Hybrid Powertrain Speed Mismatch	A mismatch in rotational speeds has been detected between major components of the hybrid powertrain (e.g. engine and electric drive system).
9436	Propulsion Inverter 1 Control Module	Control module used for Propulsion Inverter 1.
9437	Propulsion Inverter 2 Control Module	Control module used for Propulsion Inverter 2.
9438	Joystick System	Reports the status of all joysticks within the operating system.
9439	Joystick 1 Module	Reports the status of the joystick 1 module.
9440	Joystick 2 Module	Reports the status of the joystick 2 module.
9441	Joystick 3 Module	Reports the status of the joystick 3 module.
9442	Joystick 4 Module	Reports the status of the joystick 4 module.
9443	Joystick 5 Module	Reports the status of the joystick 5 module.
9444	Joystick 6 Module	Reports the status of the joystick 6 module.
9445	Keypad System	Reports the status of all keypads within the operating system.
9446	Keypad 2	Keypad 2 associated with controller application.
9447	Keypad 3	Keypad 3 associated with controller application.

9448	Keypad 4	Keypad 4 associated with controller application.
9449	Keypad 5	Keypad 5 associated with controller application.
9450	Keypad 6	Keypad 6 associated with controller application.
9451	Steering Helm System	Reports the status of all steering helms within the operating system.
9452	Steering Helm 1 Module	Reports the status of the steering helm 1 module.
9453	Steering Helm 2 Module	Reports the status of the steering helm 2 module.
9454	Steering Helm 3 Module	Reports the status of the steering helm 3 module.
9455	Steering Helm 1 Module Port Communication	Reports the status of steering helm module 1 on the port communications network.
9456	Steering Helm 2 Module Port Communication	Reports the status of steering helm module 2 on the port communications network.
9457	Steering Helm 3 Module Port Communication	Reports the status of steering helm module 3 on the port communications network.
9458	Steering Helm 1 Module Starboard Communication	Reports the status of steering helm module 1 on the starboard communication network.
9459	Steering Helm 2 Module Starboard Communication	Reports the status of steering helm module 2 on the starboard communication network.
9460	Steering Helm 3 Module Starboard Communication	Reports the status of steering helm module 3 on the starboard communication network.

9461	Throttle Lever Module System	Reports the status of all throttle levers within the operating system.
9462	Throttle Lever Module 1	Reports the status of the throttle lever 1 module.
9463	Throttle Lever Module 2	Reports the status of the throttle lever 2 module.
9464	Throttle Lever Module 3	Reports the status of the throttle lever 3 module.
9465	Throttle Lever Module 1 Port Lever	Reports the status of the port throttle lever on throttle module 1.
9466	Throttle Lever Module 1 Starboard Lever	Reports the status of the starboard throttle lever on throttle module 1.
9467	Throttle Lever Module 2 Port Lever	Reports the status of the port throttle lever on throttle module 2.
9468	Throttle Lever Module 2 Starboard Lever	Reports the status of the starboard throttle lever on throttle module 2.
9469	Throttle Lever Module 3 Port Lever	Reports the status of the port throttle lever on throttle module 3.
9470	Throttle Lever Module 3 Starboard Lever	Reports the status of the starboard throttle lever on throttle module 3.
9471	Transmission 1 Control Module	Reports the status of the transmission 1 control module.
9472	Transmission 2 Control Module	Reports the status of the transmission 2 control module.
9473	Transmission 3 Control Module	Reports the status of the transmission 3 control module.
9474	Transmission 4 Control Module	Reports the status of the transmission 4 control module.
9475	Transmission 2 Oil Pressure	Gage pressure of lubrication fluid in transmission 2, measured after pump.

9476	Transmission 3 Oil Pressure	Gage pressure of lubrication fluid in transmission 3, measured after pump.
9477	Transmission 4 Oil Pressure	Gage pressure of lubrication fluid in transmission 4, measured after pump.
9478	Transmission 2 Input Shaft Speed	Rotational velocity of the primary shaft transferring power into transmission 2. When a torque converter is present, it is the output of the torque converter.
9479	Transmission 3 Input Shaft Speed	Rotational velocity of the primary shaft transferring power into transmission 3. When a torque converter is present, it is the output of the torque converter.
9480	Transmission 4 Input Shaft Speed	Rotational velocity of the primary shaft transferring power into transmission 4. When a torque converter is present, it is the output of the torque converter.
9481	Transmission 2 Output Shaft Speed	Calculated speed of the transmission 2 output shaft.
9482	Transmission 3 Output Shaft Speed	Calculated speed of the transmission 3 output shaft.
9483	Transmission 4 Output Shaft Speed	Calculated speed of the transmission 4 output shaft.
9484	Transmission 3 Oil Temperature	Temperature of transmission #3 lubricant.
9485	Transmission 4 Oil Temperature	Temperature of transmission #4 lubricant.
9486	Transmission 3 Forward Solenoid Valve	An actuator which, when energized, will drive the machine or some component thereof forward.
9487	Transmission 4 Forward Solenoid Valve	An actuator which, when energized, will drive the machine or some component thereof forward.
9488	Transmission 3 Reverse Solenoid Valve	An actuator which, when energized, will drive the machine or some component thereof backwards.

9489	Transmission 4 Reverse Solenoid Valve	An actuator which, when energized, will drive the machine or some component thereof backwards.
9490	Steering Angle Drive Motor 1	Reports the status of the steering angle drive motor 1 assembly.
9491	Steering Angle Drive Motor 2	Reports the status of the steering angle drive motor 2 assembly.
9492	Steering Angle Drive Motor 3	Reports the status of the steering angle drive motor 3 assembly.
9493	Steering Angle Drive Motor 4	Reports the status of the steering angle drive motor 4 assembly.
9494	Steering Angle Drive Motor 1 Temperature	Reports the status of the temperature for steering angle drive motor 1 assembly.
9495	Steering Angle Drive Motor 2 Temperature	Reports the status of the temperature for steering angle drive motor 2 assembly.
9496	Steering Angle Drive Motor 3 Temperature	Reports the status of the temperature for steering angle drive motor 3 assembly.
9497	Steering Angle Drive Motor 4 Temperature	Reports the status of the temperature for steering angle drive motor 4 assembly.
9498	Steering Angle Drive Motor 1 Position	Reports the status of the position for the steering angle drive motor 1 assembly.
9499	Steering Angle Drive Motor 2 Position	Reports the status of the position for the steering angle drive motor 2 assembly.
9500	Steering Angle Drive Motor 3 Position	Reports the status of the position for the steering angle drive motor 3 assembly.

9501	Steering Angle Drive Motor 4 Position	Reports the status of the position for the steering angle drive motor 4 assembly.
9502	Propeller 1 Speed	Speed of the number 1 drive propeller.
9503	Propeller 2 Speed	Speed of the number 2 drive propeller.
9504	Propeller 3 Speed	Speed of the number 3 drive propeller.
9505	Propeller 4 Speed	Speed of the number 4 drive propeller.
9506	Proprietary Network 3	Identifies the action to be performed on the Proprietary Network 3 communications port.
9507	Proprietary Network 4	Identifies the action to be performed on the Proprietary Network 4 communications port.
9508	ECU 3 Interface Mismatch	Indicates that the data link interface version between ECUs is mismatched.
9509	ECU 4 Interface Mismatch	Indicates that the data link interface version between ECUs is mismatched.
9510	Accelerator Pedal Position 4	The ratio of actual position of the fourth analog engine speed/torque request input device (such as an accelerator pedal or throttle lever) to the maximum position of the input device. This parameter is intended for the fourth accelerator control in an application. If an application has only one accelerator control, use SPN 91. In marine applications, this will typically be the operator’s fourth throttle lever.
9511	J1939 Network #11	
9512	Operator Control Panel (OCP) 2	Second operator interface with one or more operator controls, gages, or displays.
9513	Operator Control Panel (OCP) 3	Third operator interface with one or more operator controls, gages, or displays.

9514	Operator Control Panel (OCP) 4	Fourth operator interface with one or more operator controls, gages, or displays.
9515	DC/DC 1 Low Side Voltage Buck Default Setpoint	The set point for the converter default low side voltage during buck mode. This setting may be used for when communication has been lost with the controlling device. When set to Not Available (FFFFh), no default setting is provided and the system should disable its output.
9516	DC/DC 2 Low Side Voltage Buck Default Setpoint	The set point for the converter default low side voltage during buck mode. This setting may be used for when communication has been lost with the controlling device. When set to Not Available (FFFFh), no default setting is provided and the system should disable its output.
9517	DC/DC 3 Low Side Voltage Buck Default Setpoint	The set point for the converter default low side voltage during buck mode. This setting may be used for when communication has been lost with the controlling device. When set to Not Available (FFFFh), no default setting is provided and the system should disable its output.
9518	DC/DC 4 Low Side Voltage Buck Default Setpoint	The set point for the converter default low side voltage during buck mode. This setting may be used for when communication has been lost with the controlling device. When set to Not Available (FFFFh), no default setting is provided and the system should disable its output.
9519	DC/DC 1 Low Side Voltage Buck Default Setting	Reports the converter active Low Side Voltage Buck Default Setting. The default may be requested by a separate device (via SPN 9515).Note: Report Not Available (FFFFh) when no default has been set.
9520	DC/DC 2 Low Side Voltage Buck Default Setting	Reports the converter active Low Side Voltage Buck Default Setting. The default may be requested by a separate device (via SPN 9516).Note: Report Not Available (FFFFh) when no default has been set.
9521	DC/DC 3 Low Side Voltage Buck Default Setting	Reports the converter active Low Side Voltage Buck Default Setting. The default may be requested by a separate device (via SPN 9517).Note: Report Not Available (FFFFh) when no default has been set.

9522	DC/DC 4 Low Side Voltage Buck Default Setting	Reports the converter active Low Side Voltage Buck Default Setting. The default may be requested by a separate device (via SPN 9518).Note: Report Not Available (FFFFh) when no default has been set.
9523	DC/AC Accessory Inverter 1 AC Side Default Frequency Request	This setting may be used to set a default frequency command for when communication has been lost with the controlling device. When set to Not Available (FFh), no default setting is provided and the system should disable its output.
9524	DC/AC Accessory Inverter 2 AC Side Default Frequency Request	This setting may be used to set a default frequency command for when communication has been lost with the controlling device. When set to Not Available (FFh), no default setting is provided and the system should disable its output.
9525	DC/AC Accessory Inverter 3 AC Side Default Frequency Request	This setting may be used to set a default frequency command for when communication has been lost with the controlling device. When set to Not Available (FFh), no default setting is provided and the system should disable its output.
9526	DC/AC Accessory Inverter 4 AC Side Default Frequency Request	This setting may be used to set a default frequency command for when communication has been lost with the controlling device. When set to Not Available (FFh), no default setting is provided and the system should disable its output.
9527	DC/AC Accessory Inverter 5 AC Side Default Frequency Request	This setting may be used to set a default frequency command for when communication has been lost with the controlling device. When set to Not Available (FFh), no default setting is provided and the system should disable its output.
9528	DC/AC Accessory Inverter 1 AC Side Motor Starting RMS Voltage Request	Signal to the DC/AC Accessory Inverter indicating the requested AC side RMS voltage for starting the attached accessory motor. In a V/Hz variable speed motor control application, this voltage typically may be set to a non-zero value when an accessory motor is first started to allow it to move (i.e. overcome resistive drop at startup).
9529	DC/AC Accessory Inverter 1 DC Side Voltage Maximum Limit Request	The maximum allowed DC Side input voltage requested by a separate device. Under normal conditions this requested limit would be reflected in SPN 9531.

9530	DC/AC Accessory Inverter 1 DC Side Current Minimum Limit Request	The minimum allowed DC Side input current requested by a separate device. Under normal conditions this requested limit would be reflected in SPN 9532.
9531	DC/AC Accessory Inverter 1 DC Side Voltage Maximum Limit Setting	Reports the active maximum limit on the DC Side input voltage of the DC/AC Accessory Inverter. The setting may be requested by a separate device (via SPN 9529) or determined by the DC/AC Controller based on operating conditions.
9532	DC/AC Accessory Inverter 1 DC Side Current Minimum Limit Setting	Reports the active minimum limit on the DC Side input current of the DC/AC Accessory Inverter. The setting may be requested by a separate device (via SPN 9530) or determined by the DC/AC Controller based on operating conditions.
9533	DC/AC Accessory Inverter 1 AC Side Default Frequency Command Setting	Reports the active AC Side Default Frequency Command Setting of the DC/AC Accessory Inverter. The setting may be requested by a separate device (via SPN 9523).Note: Report Not Available (FFh) when no default has been set.
9534	DC/AC Accessory Inverter 2 AC Side Motor Starting RMS Voltage Request	Signal to the DC/AC Accessory Inverter indicating the requested AC side RMS voltage for starting the attached accessory motor. In a V/Hz variable speed motor control application, this voltage typically may be set to a non-zero value when an accessory motor is first started to allow it to move (i.e. overcome resistive drop at startup).
9535	DC/AC Accessory Inverter 2 DC Side Voltage Maximum Limit Request	The maximum allowed DC Side input voltage requested by a separate device. Under normal conditions this requested limit would be reflected in SPN 9537.
9536	DC/AC Accessory Inverter 2 DC Side Current Minimum Limit Request	The minimum allowed DC Side input current requested by a separate device. Under normal conditions this requested limit would be reflected in SPN 9538.
9537	DC/AC Accessory Inverter 2 DC Side Voltage Maximum Limit Setting	Reports the active maximum limit on the DC Side input voltage of the DC/AC Accessory Inverter. The setting may be requested by a separate device (via SPN 9535) or determined by the DC/AC Controller based on operating conditions.

9538	DC/AC Accessory Inverter 2 DC Side Current Minimum Limit Setting	Reports the active minimum limit on the DC Side input current of the DC/AC Accessory Inverter. The setting may be requested by a separate device (via SPN 9536) or determined by the DC/AC Controller based on operating conditions.
9539	DC/AC Accessory Inverter 2 AC Side Default Frequency Command Setting	Reports the active AC Side Default Frequency Command Setting of the DC/AC Accessory Inverter. The setting may be requested by a separate device (via SPN 9524).Note: Report Not Available (FFh) when no default has been set.
9540	DC/AC Accessory Inverter 3 AC Side Motor Starting RMS Voltage Request	Signal to the DC/AC Accessory Inverter indicating the requested AC side RMS voltage for starting the attached accessory motor. In a V/Hz variable speed motor control application, this voltage typically may be set to a non-zero value when an accessory motor is first started to allow it to move (i.e. overcome resistive drop at startup).
9541	DC/AC Accessory Inverter 3 DC Side Voltage Maximum Limit Request	The maximum allowed DC Side input voltage requested by a separate device. Under normal conditions this requested limit would be reflected in SPN 9543.
9542	DC/AC Accessory Inverter 3 DC Side Current Minimum Limit Request	The minimum allowed DC Side input current requested by a separate device. Under normal conditions this requested limit would be reflected in SPN 9544.
9543	DC/AC Accessory Inverter 3 DC Side Voltage Maximum Limit Setting	Reports the active maximum limit on the DC Side input voltage of the DC/AC Accessory Inverter. The setting may be requested by a separate device (via SPN 9541 or determined by the DC/AC Controller based on operating conditions.
9544	DC/AC Accessory Inverter 3 DC Side Current Minimum Limit Setting	Reports the active minimum limit on the DC Side input current of the DC/AC Accessory Inverter. The setting may be requested by a separate device (via SPN 9542) or determined by the DC/AC Controller based on operating conditions.
9545	DC/AC Accessory Inverter 3 AC Side Default Frequency Command Setting	Reports the active AC Side Default Frequency Command Setting of the DC/AC Accessory Inverter. The setting may be requested by a separate device (via SPN 9525).Note: Report Not Available (FFh) when no default has been set.

9546	DC/AC Accessory Inverter 4 AC Side Motor Starting RMS Voltage Request	Signal to the DC/AC Accessory Inverter indicating the requested AC side RMS voltage for starting the attached accessory motor. In a V/Hz variable speed motor control application, this voltage typically may be set to a non-zero value when an accessory motor is first started to allow it to move (i.e. overcome resistive drop at startup).
9547	DC/AC Accessory Inverter 4 DC Side Voltage Maximum Limit Request	The maximum allowed DC Side input voltage requested by a separate device. Under normal conditions this requested limit would be reflected in SPN 9549.
9548	DC/AC Accessory Inverter 4 DC Side Current Minimum Limit Request	The minimum allowed DC Side input current requested by a separate device. Under normal conditions this requested limit would be reflected in SPN 9550.
9549	DC/AC Accessory Inverter 4 DC Side Voltage Maximum Limit Setting	Reports the active maximum limit on the DC Side input voltage of the DC/AC Accessory Inverter. The setting may be requested by a separate device (via SPN 9547) or determined by the DC/AC Controller based on operating conditions.
9550	DC/AC Accessory Inverter 4 DC Side Current Minimum Limit Setting	Reports the active minimum limit on the DC Side input current of the DC/AC Accessory Inverter. The setting may be requested by a separate device (via SPN 9548) or determined by the DC/AC Controller based on operating conditions.
9551	DC/AC Accessory Inverter 4 AC Side Default Frequency Command Setting	Reports the active AC Side Default Frequency Command Setting of the DC/AC Accessory Inverter. The setting may be requested by a separate device (via SPN 9526).Note: Report Not Available (FFh) when no default has been set.
9552	DC/AC Accessory Inverter 5 AC Side Motor Starting RMS Voltage Request	Signal to the DC/AC Accessory Inverter indicating the requested AC side RMS voltage for starting the attached accessory motor. In a V/Hz variable speed motor control application, this voltage typically may be set to a non-zero value when an accessory motor is first started to allow it to move (i.e. overcome resistive drop at startup).

9553	DC/AC Accessory Inverter 5 DC Side Voltage Maximum Limit Request	The maximum allowed DC Side input voltage requested by a separate device. Under normal conditions this requested limit would be reflected in SPN 9555.
9554	DC/AC Accessory Inverter 5 DC Side Current Minimum Limit Request	The minimum allowed DC Side input current requested by a separate device. Under normal conditions this requested limit would be reflected in SPN 9556.
9555	DC/AC Accessory Inverter 5 DC Side Voltage Maximum Limit Setting	Reports the active maximum limit on the DC Side input voltage of the DC/AC Accessory Inverter. The setting may be requested by a separate device (via SPN 9553) or determined by the DC/AC Controller based on operating conditions.
9556	DC/AC Accessory Inverter 5 DC Side Current Minimum Limit Setting	Reports the active minimum limit on the DC Side input current of the DC/AC Accessory Inverter. The setting may be requested by a separate device (via SPN 9554) or determined by the DC/AC Controller based on operating conditions.
9557	DC/AC Accessory Inverter 5 AC Side Default Frequency Command Setting	Reports the active AC Side Default Frequency Command Setting of the DC/AC Accessory Inverter. The setting may be requested by a separate device (via SPN 9527).Note: Report Not Available (FFh) when no default has been set.
9558	DC/DC 1 Controller Input Ignition Voltage	Ignition voltage (i.e. switched) supplied to the DC/DC Converter controller.
9559	DC/DC 1 Controller Input SLI Voltage	Voltage (i.e not switched) supplied to the DC/DC Converter controller.
9560	DC/DC 2 Controller Input Ignition Voltage	Ignition voltage (i.e. switched) supplied to the DC/DC Converter controller.
9561	DC/DC 2 Controller Input SLI Voltage	Voltage (i.e not switched) supplied to the DC/DC Converter controller.

9562	DC/DC 3 Controller Input Ignition Voltage	Ignition voltage (i.e. switched) supplied to the DC/DC Converter controller.
9563	DC/DC 3 Controller Input SLI Voltage	Voltage (i.e not switched) supplied to the DC/DC Converter controller.
9564	DC/DC 4 Controller Input Ignition Voltage	Ignition voltage (i.e. switched) supplied to the DC/DC Converter controller.
9565	DC/DC 4 Controller Input SLI Voltage	Voltage (i.e not switched) supplied to the DC/DC Converter controller.
9566	Transmission Shift Solenoid 5	Fifth shift solenoid of an automatic transmission.
9567	Transmission Shift Solenoid 6	Sixth shift solenoid of an automatic transmission.
9569	Remote Road Speed Limit Request	Indicates a request to temporarily limit the maximum vehicle speed. The value is sent from a body builder platform or other vehicle system.As this request may be used to fulfill regulatory purposes, it shall override any other higher road speed limits that are currently in effect. The sender may monitor Applied Vehicle Speed Limit (SPN 2595) or Applied Vehicle Speed Limit (High Resolution) (SPN 7420) to ensure the requested limit has been realized. A value of FBh indicates that the parameter is supported, but there is currently no active request.
9570	Economy Mode Total Estimated Fuel Saved	Total volume of estimated fuel saved during economy mode of operation over the lifetime of the application. This is in comparison to operating in a non-economy mode.
9571	Economy Mode Trip Estimated Fuel Saved	Total volume of estimated fuel saved during all or part of a journey while operating in economy mode, since the last trip reset. This is in comparison to operating in a non-economy mode.

9572	Economy Mode Total Fuel Used	Total volume of fuel used during economy mode operation over the lifetime of the application.
9573	Economy Mode Trip Fuel Used	Total volume of fuel used during all or part of a journey while operating in economy mode, since the last trip reset.
9574	Economy Mode Total Hours Active	Total accumulated operating time in economy mode over the lifetime of the application.
9575	Economy Mode Trip Hours Active	Total accumulated operating time in economy mode since the last trip reset.
9576	Economy Mode Estimated Instantaneous Fuel Savings Rate	Estimated instantaneous fuel savings rate while operating in economy mode. This is in comparison to operating in a non-economy mode.
9577	Economy Mode Estimated Instantaneous Fuel Savings Rate Percent	Estimated instantaneous fuel savings rate percentage while operating in economy mode. This value is calculated by dividing Economy Mode Estimated Instantaneous Fuel Savings Percent (SPN 9576) by the current non-economy mode estimated instantaneous fuel rate * 100b.
9578	Economy Mode Total Hours Inactive	Total accumulated operating time while economy mode is installed but not in use.
9579	Economy Mode Trip Hours Inactive	Trip operating time accumulated while economy mode is installed but not in use, since last trip reset.
9580	HVES1 Bus Voltage Negative to Chassis Ground Voltage	Voltage difference between the most negative terminal of the HVES battery and chassis measured on the hybrid system bus side (not the battery side) of any HVES contained output contactor. This voltage may be used for system level monitoring of battery shorts to chassis within the HVES.
9581	HVES1 Voltage Level Negative to Chassis Ground Voltage	Voltage difference between the most negative terminal of the HVES battery and chassis measured at the battery side of any HVES contained output contactor. This

		voltage may be used for system level monitoring of battery shorts to chassis within the HVES.
9582	DC/AC Accessory Inverter 1 DC Side Negative to Chassis Ground Voltage	The voltage level of the high voltage DC side, as measured by the DC/AC between the negative side of the High Voltage DC Side input and the chassis of the DC/AC enclosure. This voltage can be used for system level monitoring of DC Side High Voltage shorts to chassis within the DC/AC.
9583	DC/AC Accessory Inverter 2 DC Side Negative to Chassis Ground Voltage	The voltage level of the high voltage DC side, as measured by the DC/AC between the negative side of the High Voltage DC Side input and the chassis of the DC/AC enclosure. This voltage can be used for system level monitoring of DC Side High Voltage shorts to chassis within the DC/AC.
9584	DC/AC Accessory Inverter 3 DC Side Negative to Chassis Ground Voltage	The voltage level of the high voltage DC side, as measured by the DC/AC between the negative side of the High Voltage DC Side input and the chassis of the DC/AC enclosure. This voltage can be used for system level monitoring of DC Side High Voltage shorts to chassis within the DC/AC.
9585	DC/AC Accessory Inverter 4 DC Side Negative to Chassis Ground Voltage	The voltage level of the high voltage DC side, as measured by the DC/AC between the negative side of the High Voltage DC Side input and the chassis of the DC/AC enclosure. This voltage can be used for system level monitoring of DC Side High Voltage shorts to chassis within the DC/AC.
9586	DC/AC Accessory Inverter 5 DC Side Negative to Chassis Ground Voltage	The voltage level of the high voltage DC side, as measured by the DC/AC between the negative side of the High Voltage DC Side input and the chassis of the DC/AC enclosure. This voltage can be used for system level monitoring of DC Side High Voltage shorts to chassis within the DC/AC.
9587	DC/DC 1 High Side Negative to Chassis Ground Voltage	The voltage level of the high voltage DC side, as measured by the DC/DC between the negative side of the High Voltage DC Side input and the chassis of the DC/DC enclosure. This voltage can be used for system level monitoring of DC Side High Voltage shorts to chassis within the DC/DC.

9588	DC/DC 2 High Side Negative to Chassis Ground Voltage	The voltage level of the high voltage DC side, as measured by the DC/DC between the negative side of the High Voltage DC Side input and the chassis of the DC/DC enclosure. This voltage can be used for system level monitoring of DC Side High Voltage shorts to chassis within the DC/DC.
9589	DC/DC 3 High Side Negative to Chassis Ground Voltage	The voltage level of the high voltage DC side, as measured by the DC/DC between the negative side of the High Voltage DC Side input and the chassis of the DC/DC enclosure. This voltage can be used for system level monitoring of DC Side High Voltage shorts to chassis within the DC/DC.
9590	DC/DC 4 High Side Negative to Chassis Ground Voltage	The voltage level of the high voltage DC side, as measured by the DC/DC between the negative side of the High Voltage DC Side input and the chassis of the DC/DC enclosure. This voltage can be used for system level monitoring of DC Side High Voltage shorts to chassis within the DC/DC.
9591	Engine Pre-Chamber Fuel Valve 1 Duration	Amount of time the pre-chamber fuel valve 1 is activated.
9592	Engine Pre-Chamber Fuel Valve 2 Duration	Amount of time the pre-chamber fuel valve 2 is activated.
9593	Engine Pre-Chamber Fuel Valve 3 Duration	Amount of time the pre-chamber fuel valve 3 is activated.
9594	Engine Pre-Chamber Fuel Valve 4 Duration	Amount of time the pre-chamber fuel valve 4 is activated.
9595	Engine Pre-Chamber Fuel Valve 5 Duration	Amount of time the pre-chamber fuel valve 5 is activated.
9596	Engine Pre-Chamber Fuel Valve 6 Duration	Amount of time the pre-chamber fuel valve 6 is activated.

9597	Engine Pre-Chamber Fuel Valve 7 Duration	Amount of time the pre-chamber fuel valve 7 is activated.
9598	Engine Pre-Chamber Fuel Valve 8 Duration	Amount of time the pre-chamber fuel valve 8 is activated.
9599	Engine Pre-Chamber Fuel Valve 9 Duration	Amount of time the pre-chamber fuel valve 9 is activated.
9600	Engine Pre-Chamber Fuel Valve 10 Duration	Amount of time the pre-chamber fuel valve 10 is activated.
9601	Engine Pre-Chamber Fuel Valve 11 Duration	Amount of time the pre-chamber fuel valve 11 is activated.
9602	Engine Pre-Chamber Fuel Valve 12 Duration	Amount of time the pre-chamber fuel valve 12 is activated.
9603	Engine Pre-Chamber Fuel Valve 13 Duration	Amount of time the pre-chamber fuel valve 13 is activated.
9604	Engine Pre-Chamber Fuel Valve 14 Duration	Amount of time the pre-chamber fuel valve 14 is activated.
9605	Engine Pre-Chamber Fuel Valve 15 Duration	Amount of time the pre-chamber fuel valve 15 is activated.
9606	Engine Pre-Chamber Fuel Valve 16 Duration	Amount of time the pre-chamber fuel valve 16 is activated.
9607	Engine Pre-Chamber Fuel Valve 17 Duration	Amount of time the pre-chamber fuel valve 17 is activated.

9608	Engine Pre-Chamber Fuel Valve 18 Duration	Amount of time the pre-chamber fuel valve 18 is activated.
9609	Engine Pre-Chamber Fuel Valve 19 Duration	Amount of time the pre-chamber fuel valve 19 is activated.
9610	Engine Pre-Chamber Fuel Valve 20 Duration	Amount of time the pre-chamber fuel valve 20 is activated.
9611	Engine Pre-Chamber Fuel Valve 1 Start of Actuation Command	The angle, relative to the TDC of cylinder 1 with 0 being the TDC before the power stroke commences, at the which pre-chamber fuel valve 1 is activated to open.
9612	Engine Pre-Chamber Fuel Valve 2 Start of Actuation Command	The angle, relative to the TDC of cylinder 2 with 0 being the TDC before the power stroke commences, at the which pre-chamber fuel valve 2 is activated to open.
9613	Engine Pre-Chamber Fuel Valve 3 Start of Actuation Command	The angle, relative to the TDC of cylinder 3 with 0 being the TDC before the power stroke commences, at the which pre-chamber fuel valve 3 is activated to open.
9614	Engine Pre-Chamber Fuel Valve 4 Start of Actuation Command	The angle, relative to the TDC of cylinder 4 with 0 being the TDC before the power stroke commences, at the which pre-chamber fuel valve 4 is activated to open.
9615	Engine Pre-Chamber Fuel Valve 5 Start of Actuation Command	The angle, relative to the TDC of cylinder 5 with 0 being the TDC before the power stroke commences, at the which pre-chamber fuel valve 5 is activated to open.
9616	Engine Pre-Chamber Fuel Valve 6 Start of Actuation Command	The angle, relative to the TDC of cylinder 6 with 0 being the TDC before the power stroke commences, at the which pre-chamber fuel valve 6 is activated to open.
9617	Engine Pre-Chamber Fuel Valve 7 Start of Actuation Command	The angle, relative to the TDC of cylinder 7 with 0 being the TDC before the power stroke commences, at the which pre-chamber fuel valve 7 is activated to open.
9618	Engine Pre-Chamber Fuel Valve 8 Start of Actuation Command	The angle, relative to the TDC of cylinder 8 with 0 being the TDC before the power stroke commences, at the which pre-chamber fuel valve 8 is activated to open.

9619	Engine Pre-Chamber Fuel Valve 9 Start of Actuation Command	The angle, relative to the TDC of cylinder 9 with 0 being the TDC before the power stroke commences, at the which pre-chamber fuel valve 9 is activated to open.
9620	Engine Pre-Chamber Fuel Valve 10 Start of Actuation Command	The angle, relative to the TDC of cylinder 10 with 0 being the TDC before the power stroke commences, at the which pre-chamber fuel valve 10 is activated to open.
9621	Engine Pre-Chamber Fuel Valve 11 Start of Actuation Command	The angle, relative to the TDC of cylinder 11 with 0 being the TDC before the power stroke commences, at the which pre-chamber fuel valve 11 is activated to open.
9622	Engine Pre-Chamber Fuel Valve 12 Start of Actuation Command	The angle, relative to the TDC of cylinder 12 with 0 being the TDC before the power stroke commences, at the which pre-chamber fuel valve 12 is activated to open.
9623	Engine Pre-Chamber Fuel Valve 13 Start of Actuation Command	The angle, relative to the TDC of cylinder 13 with 0 being the TDC before the power stroke commences, at the which pre-chamber fuel valve 13 is activated to open.
9624	Engine Pre-Chamber Fuel Valve 14 Start of Actuation Command	The angle, relative to the TDC of cylinder 14 with 0 being the TDC before the power stroke commences, at the which pre-chamber fuel valve 14 is activated to open.
9625	Engine Pre-Chamber Fuel Valve 15 Start of Actuation Command	The angle, relative to the TDC of cylinder 15 with 0 being the TDC before the power stroke commences, at the which pre-chamber fuel valve 15 is activated to open.
9626	Engine Pre-Chamber Fuel Valve 16 Start of Actuation Command	The angle, relative to the TDC of cylinder 16 with 0 being the TDC before the power stroke commences, at the which pre-chamber fuel valve 16 is activated to open.
9627	Engine Pre-Chamber Fuel Valve 17 Start of Actuation Command	The angle, relative to the TDC of cylinder 17 with 0 being the TDC before the power stroke commences, at the which pre-chamber fuel valve 17 is activated to open.
9628	Engine Pre-Chamber Fuel Valve 18 Start of Actuation Command	The angle, relative to the TDC of cylinder 18 with 0 being the TDC before the power stroke commences, at the which pre-chamber fuel valve 18 is activated to open.
9629	Engine Pre-Chamber Fuel Valve 19 Start of Actuation Command	The angle, relative to the TDC of cylinder 19 with 0 being the TDC before the power stroke commences, at the which pre-chamber fuel valve 19 is activated to open.

9630	Engine Pre-Chamber Fuel Valve 20 Start of Actuation Command	The angle, relative to the TDC of cylinder 20 with 0 being the TDC before the power stroke commences, at the which pre-chamber fuel valve 20 is activated to open.
9631	HVES1 Controller	Controller used for this instance of this HVES.
9632	HVES1 Module 1 Controller	Controller used for this battery module instance of this HVES instance.
9633	HVES1 Module 2 Controller	Controller used for this battery module instance of this HVES instance.
9634	HVES1 Module 3 Controller	Controller used for this battery module instance of this HVES instance.
9635	HVES1 Module 4 Controller	Controller used for this battery module instance of this HVES instance.
9636	HVES1 Module 5 Controller	Controller used for this battery module instance of this HVES instance.
9637	HVES1 Module 6 Controller	Controller used for this battery module instance of this HVES instance.
9638	HVES1 Module 7 Controller	Controller used for this battery module instance of this HVES instance.
9639	HVES1 Module 8 Controller	Controller used for this battery module instance of this HVES instance.
9640	HVES1 Module 9 Controller	Controller used for this battery module instance of this HVES instance.
9641	HVES1 Module 10 Controller	Controller used for this battery module instance of this HVES instance.
9642	HVES1 Module 11 Controller	Controller used for this battery module instance of this HVES instance.
9643	HVES1 Module 12 Controller	Controller used for this battery module instance of this HVES instance.
9644	HVES1 Module 13 Controller	Controller used for this battery module instance of this HVES instance.
9645	HVES1 Module 14 Controller	Controller used for this battery module instance of this HVES instance.

9646	HVES1 Module 15 Controller	Controller used for this battery module instance of this HVES instance.
9647	HVES1 Module 16 Controller	Controller used for this battery module instance of this HVES instance.
9648	Engine Fuel Pump Intake Oil Pressure	Oil pressure at the intake of the engine fuel pump.
9649	Engine Gaseous Fuel Supply Pressure Regulator Control Command	The command to the fuel pressure regulator which regulates the pressure of gaseous fuel supply to the engine. This command is normalized to percent, where 0% nominally represents fully closed and 100% represents fully open.
9650	Engine Pre-Chamber Fuel Valve Nominal Duration Command	Amount of time the pre-chamber fuel valves are activated. It's a nominal value used for all the prechamber fuel valves in the engine.Note: Please see SPNs 9591-9610 for duration command for each pre-chamber fuel valves.
9651	Engine Pre-Chamber Fuel Valve Nominal Start of Actuation Command	The angle, relative to the TDC of each cylinder, with 0 being the TDC before the power stroke commences, at the which pre-chamber fuel valves are activated to open. It's a nominal value used for all the pre-chamber fuel valves in the engine.Timings after TDC are referred with positive values and timings before TDC are referred with negative values. Note: Please see SPNs 9611 – 9630 for start of injection command for each pre-chamber fuel valves.
9652	Articulation Angular Velocity	Angular velocity of deflection of an articulated transit vehicle (rotation angle about the vehicle's z-axis). An increasing clockwise angle is indicated with a positive angular velocity and an increasing counterclockwise angle is indicated with a negative angular velocity.This parameter is defined according to a Z-Down axis system and the sign of the value is in accordance to the right-hand rule, as specified in SAE J670. As specified in SAE J670, a Z-Down axis system has positive X directed forward, positive Y to the right, and positive Z directed down.
9653	Engine Oil Pressure 2	Gage pressure of oil in engine lubrication system as provided by oil pump – second instance.

9654	Operator Station In Control Location	Identifies the location of the operator station that is currently in control of the system. 00h = Bridge 01h = Port Wing 02h = Starboard Wing 03h = Tower 04h = Engine Room 05h = Aft. Station 06h = Fly Bridge 07h = Bow Station 08h to FDh = Reserved FEh = Error FFh = Not Available
9655	Operator Station Lockout	Indicates the status of a lockout to prevent changing the active control station. Lockout active indicates a change is not permitted to the active control station.00b = Station Lockout Inactive 01b = Station Lockout Active 10b = Error 11b = Not available
9656	Engine Throttle Synchronization Mode Current Setting	The current setting of the engine throttle synchronization mode. Throttle synchronization mode indicates which throttle, if any, is to be used for the synchronized throttle.0000b = Not Synchronized 0001b = Synchronized Center 0010b = Synchronized Port 0011b = Synchronized Starboard 0100b = Synchronized Master 0101b = Reserved 0110b = Reserved 0111b = Reserved 1000b = Reserved 1001b = Reserved 1010b = Reserved 1011b = Reserved 1100b = Reserved 1101b = Reserved 1110b = Error 1111b = Not available
9657	Trolling Mode (Extended Range)	The active status of the Trolling Mode (Extended Range). In traditional trolling mode, engine speed remains constant while the throttle lever changes the amount of slip within the transmission clutches. In advanced trolling mode, the throttle lever controls clutch slip and engine speed.See SPN 2616 for alternate range and resolution. 00h = No Troll 01h = Traditional Troll Active 02h = Advanced Troll Active 03h to FDh = Reserved FEh = Error FFh = Not Available
9658	Trolling Mode Current Setting	The current setting of the Trolling Mode. In traditional trolling mode, engine speed remains constant while the throttle lever changes the amount of slip within the transmission clutches. In advanced trolling mode, the throttle lever controls clutch slip and engine speed.00h = No Troll 01h = Traditional Troll Active 02h = Advanced Troll Active 03h to FDh = Reserved FEh = Error FFh = Not Available
9659	Vessel Engine Set Speed	The (chosen) vessel speed that has been selected by the operator.

9660	Vessel Speed Control Mode	The vessel set speed type that is selected by the operator. 00h = No Set Speed 01h = Slow Vessel Mode 02h = Synchronization Mode 03h = Trolling Mode 04h to FDh = Reserved FEh = Error FFh = Not Available
9661	Operator Station Location Setting	Configurable location of the selected operator station. 00h = Bridge 01h = Port Wing 02h = Starboard Wing 03h = Tower 04h = Engine Room 05h = Aft. Station 06h = Fly Bridge 07h = Bow Station 08h to FDh = Reserved FEh = Error FFh = Not Available / Take no action
9662	Trolling Mode Setting Command	The commanded setting of the Trolling Mode. In traditional trolling mode, engine speed remains constant while the throttle lever changes the amount of slip within the transmission clutches. In advanced trolling mode, the throttle lever controls clutch slip and engine speed.00h = No Troll 01h = Traditional Troll Active 02h = Advanced Troll Active 03h to FDh = Reserved FEh = Error FFh = Not Available / Take no action
9663	Engine Throttle Synchronization Mode Command	The setting of the throttle synchronization mode. Throttle synchronization mode is used to indicate which throttle, if any, is used to be used for the synchronized throttle.0000b = Not Synchronized 0001b = Synchronized Center 0010b = Synchronized Port 0011b = Synchronized Starboard 0100b = Synchronized Master 0101b = Reserved 0110b = Reserved 0111b = Reserved 1000b = Reserved 1001b = Reserved 1010b = Reserved 1011b = Reserved 1100b = Reserved 1101b = Reserved 1110b = Error 1111b = Not available/Take no action
9664	Engine Trolling Mode Set Speed	The (chosen) vessel trolling speed that has been selected by the operator
9665	Station Throttle Position Match	Indicates whether the throttle position at the currently selected station and the throttle lever position at the station where the transfer is occuring is within the correct range to allow the transfer to occur.00b = Throttle positions do not match 01b = Throttle positions match 10b = Error 11b = Not Available or Not Installed
9666	Station Gear Position Match	Indicates whether the gear position at the currently selected station is in neutral and the gear lever position at the station where the transfer is occuring is in neutral in

		order to allow the transfer to occur.00b = Neutral 01b = Not in neutral 10b = Error 11b = Not Available or Not Installed
9667	Operator Station Active Button Status	The button used to request a station to become the active station when another station is currently in control.00b = Button not pressed 01b = Button pressed 10b = Error 11b = Not Available
9668	Trolling Mode Button Status	The button used to change the current type of trolling mode that is selected. 00b = Button not pressed 01b = Button pressed 10b = Error 11b = Not Available
9669	Engine Throttle Lever Synchronization Button Status	The button that is used to enable or disable syncronization of the engine throttles. When synchronization mode is activated, an operator uses one throttle lever to control the speed of multiple engines.00b = Button not pressed 01b = Button pressed 10b = Error 11b = Not Available
9670	Gear Lockout Button Status	This button is used to prevent the transmissions from being shifted into gear. When the button is pressed, the transmissions will be locked in neutral.00b = Button not pressed 01b = Button pressed 10b = Error 11b = Not Available
9671	Slow Vessel Mode Button Status	Reports when the slow vessel mode button has been pressed. 00b = Button not pressed 01b = Button pressed 10b = Error 11b = Not Available
9672	Operator Station Active Lamp Status	Reports when the operator station active lamp is illuminated. 00b = Off 01b = On 10b = Error 11b = Not Available
9673	Trolling Mode Lamp Status	Reports when the trolling mode lamp is illuminated. 00b = Off 01b = On 10b = Error 11b = Not Available
9674	Engine Throttle Lever Synchronization Lamp Status	Reports when the throttle lever synchronization lamp is illuminated. When synchronization mode is activated, an operator uses one throttle lever to control the speed of multiple engines.00b = Off 01b = On 10b = Error 11b = Not Available

9675	Gear Lockout Lamp Status	Reports when the gear lockout lamp is illuminated. 00b = Off 01b = On 10b = Error 11b = Not Available
9677	Engine Idle Management Status	Indicates the current state or mode of operation by the engine idle manangement system. 0000b = Off 0001b = Locked 0010b = Disabled 0011b = Activation conditions not met (Not able to begin or continue due to current engine operating conditions) 0100b = Shutdown conditions not met 0101b = Shutdown conditions pending 0110b = Shutdown 0111b = Restart conditions not met 1000b = Restart conditions pending 1001b = Auto start inhibited 1010b = Reserved 1011b = Reserved 1100b = Reserved 1101b = Reserved 1110b = Error 1111b = Not Available Notes: This parameter returns the current status/mode of the Engine Idle Management Control System. This parameter describes the feedback from the engine idle management controller. Used by display panels, control vans, other controllers. « Off » indicates the feature is not monitoring the vehicle. « Locked » indicates an automatic start/stop is impossible until the key is turned off. « Disabled » indicates a system problem has caused the feature to be disabled. « Activation Conditions Not Met » indicates the vehicle is considered to be in a working state « Shutdown Conditions Not Met » indicates the engine needs to be running (e.g.,battery voltage low) « Shutdown Conditions Pending » indicates all conditions are met and the engine will shutdown « Shutdown » indicates engine idle management system has shutdown the engine « Restart Conditions Not Met » indicates the engine restart criteria (e.g., drop in coolant temp) is not met « Restart Conditions Pending » indicates one of the engine restart criteria has requested a restart « Auto-Start Inhibited » indicates the use of the Engine Idle Management Control System as the primary start method is not available
9678	Engine Idle Management Restart Reason	Used to indicate the condition requesting the engine to restart when the idle management system is active. 0000b = Operator input request 0001b = Low engine coolant temperature 0010b = Low battery voltage 0011b = Low transmission oil temperature 0100b = Low power end lube oil temperature 0101b = Low battery pack #1 state of charge 0110b = Low battery pack #2 state of charge 0111b = Reserved 1000b = Reserved 1001b = Reserved 1010b = Reserved 1011b = Reserved 1100b = Reserved 1101b = Reserved 1110b = Error 1111b = Not available

9679	Engine Idle Management Shutdown Reason	Used to indicate the condition requesting the engine to shutdown when the idle management system is active. 0000b = Operator input request 0001b = Engine coolant temperature 0010b = Battery voltage 0011b = Transmission oil temperature 0100b = Power end lube oil temperature 0101b = Battery pack #1 state of charge 0110b = Battery pack #2 state of charge 0111b = Reserved 1000b = Reserved 1001b = Reserved 1010b = Reserved 1011b = Reserved 1100b = Reserved 1101b = Reserved 1110b = Error 1111b = Not available
9680	Engine Stop-Start Automatic Stop Active Lamp Data	Provides measured data from the engine stop-start automatic stop active lamp. 00b = Lamp deactivated (Off) 01b = Lamp activated (On) 10b = Error 11b = Not available
9681	Engine Stop-Start Automatic Start Failed Lamp Data	Provides measured data from the engine stop-start automatic start failed lamp. 00b = Lamp deactivated (Off) 01b = Lamp activated (On) 10b = Error 11b = Not available
9682	Engine Stop-Start Enabled Lamp Data	Provides measured data from the engine stop-start enabled lamp. 00b = Lamp deactivated (Off) 01b = Lamp activated (On) 10b = Error 11b = Not available
9683	Engine Stop-Start Automatic Stop Active Lamp Command	Command signal directly controlling the engine stop-start automatic stop active lamp. 00b = Lamp off 01b = Lamp on 10b = Reserved 11b = Not available Note: SPN 9680 should be used for reporting diagnostics of the engine stop-start automatic stop active lamp.
9684	Engine Stop-Start Automatic Start Failed Lamp Command	Command signal directly controlling the engine stop-start automatic start failed lamp. 00b = Lamp off 01b = Lamp on 10b = Reserved 11b = Not available Note: SPN 9681 should be used for reporting diagnostics of the engine stop-start automatic start failed lamp.
9685	Engine Stop-Start Enabled Lamp Command	Command signal directly controlling the engine stop-start enabled lamp. 00b = Lamp off 01b = Lamp on 10b = Reserved 11b = Not available Note: SPN 9682 should be used for reporting diagnostics of the engine stop-start enabled lamp.
9686	Drivetrain 1 Water Intrusion	Used to detect water entry into drivetrain 1.

9687	Drivetrain 2 Water Intrusion	Used to detect water entry into drivetrain 2.
9688	Drivetrain 3 Water Intrusion	Used to detect water entry into drivetrain 3.
9689	Drivetrain 4 Water Intrusion	Used to detect water entry into drivetrain 4.
9690	Slow Vessel Mode Lamp Status	Reports when the slow vessel mode lamp is illuminated. 00b = Off 01b = On 10b = Error 11b = Not Available
9691	Propulsion Motor Coolant Fan 1	This instance of the Propulsion Motor Coolant Fan.
9692	Propulsion Motor Coolant Fan 2	This instance of the Propulsion Motor Coolant Fan.
9693	Propulsion Motor Coolant Fan 3	This instance of the Propulsion Motor Coolant Fan.
9694	Propulsion Motor Coolant Fan 4	This instance of the Propulsion Motor Coolant Fan.
9695	Propulsion Motor Coolant Fan 5	This instance of the Propulsion Motor Coolant Fan.
9696	Propulsion Motor Coolant Fan 6	This instance of the Propulsion Motor Coolant Fan.
9697	Propulsion Motor Coolant Fan 7	This instance of the Propulsion Motor Coolant Fan.
9698	Propulsion Motor Coolant Fan 8	This instance of the Propulsion Motor Coolant Fan.
9699	Propulsion Motor Coolant Fan 9	This instance of the Propulsion Motor Coolant Fan.
9700	Propulsion Motor Coolant Fan 10	This instance of the Propulsion Motor Coolant Fan.
9701	Propulsion Motor Coolant Fan 11	This instance of the Propulsion Motor Coolant Fan.
9702	Propulsion Motor Coolant Fan 12	This instance of the Propulsion Motor Coolant Fan.

9703	Propulsion Motor Coolant Fan 13	This instance of the Propulsion Motor Coolant Fan.
9704	Propulsion Motor Coolant Fan 14	This instance of the Propulsion Motor Coolant Fan.
9705	Propulsion Motor Coolant Fan 15	This instance of the Propulsion Motor Coolant Fan.
9706	Hybrid Propulsion Mode Requested Maximum Speed	The requested maximum speed for the vehicle while in a Hybrid Propulsion Mode (see SPN 7889) other than Mode 1 – Stored Energy Source Sustaining.This shall be the operating vehicle speed limit while in the range defined by Hybrid Propulsion Mode Requested Distance (SPN 9707). If another vehicle speed limit is active within the hybrid system, the lower of the values must be used. A value of FBh indicates that the sender supports this parameter, but is currently not requesting a limit. A value of FFh indicates that this parameter is not supported by the sender. See Hybrid Propulsion Mode Maximum Speed Setting (SPN 9708) for an indication of the current setting.
9707	Hybrid Propulsion Mode Requested Distance	The requested distance to maintain a Hybrid Propulsion Mode (see SPN 7889) other than Mode 1 – Stored Energy Source Sustaining.When the distance is met, or a protective mode is activated (e.g. HVES charge is depleted while in Mode 5 – Stored Energy Source Only), the Hybrid Propulsion System is no longer required to maintain the selected mode (e.g. may revert back to Mode 1 as if SPN 7889 was received with Mode 1 requested). When SPN 7889 is changed, the value of Hybrid Propulsion Mode Requested Distance is used as the starting point for the countdown indicated in Hybrid Propulsion Mode Remaining Distance SPN (9709). A value of FB00h indicates that the sender supports this parameter, but there is currently no requested distance (e.g any requested distance should be set to default, or the requested mode should be maintained for as long as possible.) When a value of FFFFh is received the maximum distance is not supported by the sender and the distance is defined as unlimited or default as set by the manufacturer.
9708	Hybrid Propulsion Mode Maximum Speed Setting	The maximum speed setting as requested using Hybrid Propulsion Mode Requested Maximum Speed (SPN 9706). A value of FBh indicates that the sender supports this

		parameter, but there is currently no requested limit. A value of FFh indicates that this parameter is not supported.
9709	Hybrid Propulsion Mode Remaining Distance	While in a Hybrid Propulsion Mode (see SPN 7889) other than Mode 1 – Stored Energy Source Sustaining, this reports a count down of the remaining distance until the mode is exited. When the requested Hybrid Propulsion Mode (see SPN 7889) changes, it is set to currently received Hybrid Propulsion Mode Requested Distance (SPN 9707) or a default value set by the manufacturer if no Hybrid Propulsion Mode Requested Distance has been set.Note: the distance may not be achieved if the mode is exited (e.g. HVES charge is depleted while in Mode 5 – Stored Energy Source Only).
9711	Operator Presence State	See document ISO 11783-7 for SPN details.
9712	Operator Awareness State	See document ISO 11783-7 for SPN details.
9713	Operator Presence and Awareness Status Checksum	See document ISO 11783-7 for SPN details.
9714	Front hitch yaw angle	See document ISO 11783 for SPN details.
9715	Front hitch yaw angle reference frame	See document ISO 11783 for SPN details.
9716	Front hitch yaw angle actual control mode	See document ISO 11783 for SPN details.
9717	Front hitch yaw limit status	See document ISO 11783 for SPN details.
9718	Front hitch yaw exit/reason code	See document ISO 11783 for SPN details.
9719	Front hitch yaw command	See document ISO 11783 for SPN details.

9720	Rear hitch yaw angle	See document ISO 11783 for SPN details.
9721	Rear hitch yaw angle reference frame	See document ISO 11783 for SPN details.
9722	Rear hitch yaw angle actual control mode	See document ISO 11783 for SPN details.
9723	Rear hitch yaw limit status	See document ISO 11783 for SPN details.
9724	Rear hitch yaw exit/reason code	See document ISO 11783 for SPN details.
9725	Rear hitch yaw command	See document ISO 11783 for SPN details.
9726	Guidance System Remote Engage Switch Status	See document ISO 11783-7 for SPN details.
9727	Port Flow Extended Resolution Command	See document ISO 11783-7 for SPN details.
9728	Extend Port Estimated Flow (High Resolution)	See document ISO 11783-7 for SPN details.
9729	Retract Port Estimated Flow (High Resolution)	See document ISO 11783-7 for SPN details.
9730	General-purpose valve exit/reason code	See document ISO 11783-7 for SPN details.
9731	Country Code	See document ISO 11783-7 for SPN details.

9732	Auxiliary valve number 0 high resolution estimated flow	See document ISO 11783-7 for SPN details.
9733	Auxiliary valve number 1 high resolution estimated flow	See document ISO 11783-7 for SPN details.
9734	Auxiliary valve number 2 high resolution estimated flow	See document ISO 11783-7 for SPN details.
9735	Auxiliary valve number 3 high resolution estimated flow	See document ISO 11783-7 for SPN details.
9736	Auxiliary valve number 4 high resolution estimated flow	See document ISO 11783-7 for SPN details.
9737	Auxiliary valve number 5 high resolution estimated flow	See document ISO 11783-7 for SPN details.
9738	Auxiliary valve number 6 high resolution estimated flow	See document ISO 11783-7 for SPN details.
9739	Auxiliary valve number 7 high resolution estimated flow	See document ISO 11783-7 for SPN details.
9740	Auxiliary valve number 8 high resolution estimated flow	See document ISO 11783-7 for SPN details.
9741	Auxiliary valve number 9 high resolution estimated flow	See document ISO 11783-7 for SPN details.
9742	Auxiliary valve number 10 high resolution estimated flow	See document ISO 11783-7 for SPN details.

9743	Auxiliary valve number 11 high resolution estimated flow	See document ISO 11783-7 for SPN details.
9744	Auxiliary valve number 12 high resolution estimated flow	See document ISO 11783-7 for SPN details.
9745	Auxiliary valve number 13 high resolution estimated flow	See document ISO 11783-7 for SPN details.
9746	Auxiliary valve number 14 high resolution estimated flow	See document ISO 11783-7 for SPN details.
9747	Auxiliary valve number 15 high resolution estimated flow	See document ISO 11783-7 for SPN details.
9748	Road Departure Advanced Emergency Braking System State	Current operational state of road departure advanced emergency braking system (AEBS) 0000b = system is not ready (initialization not finished) 0001b = system is temporarily not available (e.g. due to boundary conditions necessary for operation) 0010b = system is deactivated by driver 0011b = system is ready and activated (no warning and no braking active) 0100b = driver overrides system 0101b = road departure warning active (e.g. acoustic signal, cruise control turned off, torque limitation) 0110b = road departure warning with braking (e.g. brake jerk or partial braking) 0111b = road departure emergency braking active 1000b = system performance and/or sensitivity limited (no warning and no braking active) 1001b to 1101b = reserved for future use 1110b = error indication 1111b = not available / not installed Note: State 1000b – example use case: Used when system performance is limited but still able to meet minimum legal obligations present at the time of introduction or when one of a fused sensor is faulted but the emergency braking functionality is still available.
9749	Right Side Lane Departure Haptic Warning Command	Indicates that the forward lane imaging system is commanding an haptic warning for the lane departure on the right side of the vehicle.Used for driving haptic alert devices with minimal internal logic (ie. Those that do not support SPNs 1700 and 1701). 00b

		= No haptic warning on the right side 01b = Active haptic warning on the right side 10b = Reserved 11b = Not available
9750	Left Side Lane Departure Haptic Warning Command	Indicates that the forward lane imaging system is commanding an haptic warning for the lane departure on the left side of the vehicle.Used for driving haptic alert devices with minimal internal logic (ie. Those that do not support SPNs 1700 and 1701). 00b = No haptic warning on the left side 01b = Active haptic warning on the left side 10b = Reserved 11b = Not available
9751	Lane Keeping Assist Enable Command	Command to enable/disable lane keeping assist system. 00b = Disable lane keeping assist 01b = Enable lane keeping assist 10b = Reserved 11b = Don´t care
9752	Lane Centering Enable Command	Command to enable/disable lane centering system. 00b = Disable lane centering 01b = Enable lane centering 10b = Reserved 11b = Don´t care
9753	Lane Keeping Assist Status Right Side	Indicates the current status of lane keeping assist feature for right side lane marker. 000b = Lane Keeping Assist Not Available for Right Side 001b = Lane Keeping Assist Available for Right Side 010b = Lane Keeping Assist Suppressed for Right Side 011b = Lane Keeping Assist Active for Right Side 100b = BlindSpot Assist Active for Right Side 101b = Reserved 110b = Error 111b = Not available
9754	Lane Keeping Assist Status Left Side	Indicates the current status of lane keeping assist feature for left side lane marker. 000b = Lane Keeping Assist Not Available for Left Side 001b = Lane Keeping Assist Available for Left Side 010b = Lane Keeping Assist Suppressed for Left Side 011b = Lane Keeping Assist Active for Left Side 100b = BlindSpot Assist Active for Left Side 101b = Reserved 110b = Error 111b = Not available
9755	Lane Keeping Assist Indication Enable Status	Indicates whether lane keeping assist is enabled. 00b = Lane Keeping Assist disabled 01b = Lane Keeping Assist enabled 10b = Error 11b = Not available
9756	Lane Keeping Assist System State	Indicates the current state of the Lane Keep Assist feature. 0000b = System is not ready (initialization not finished) 0001b = System is temporarily not available (not all activation conditions fulfulled) 0010b = System is deactivated by driver 0011b =

		System is ready (no warnings active) 0100b = Active lane keeping suppressed by operator behavior (e.g. turn signal) 0101b = System is actuating 0110b = Reserved 0111b = Reserved 1000b = Reserved 1001b = Reserved 1010b = Reserved 1011b = Reserved 1100b = Reserved 1101b = Reserved 1110b = Error 1111b = Not Available
9757	Active Steering Driver Preference	Indicates the current preference for active steering mode selected by the driver. 000b = Active Steering Mode #1 001b = Active Steering Mode #2 010b = Active Steering Mode #3 011b = Active Steering Mode #4 100b = Active Steering Mode #5 101b = Active Steering Mode #6 110b = Error 111b = Not available/Not valid
9758	Lane Centering Indication Enable State	Indicates whether lane centering indication is enabled. 00b = Lane Centering Indication disabled 01b = Lane Centering Indication enabled 10b = Error 11b = Not available
9759	Lane Centering System Status	Indicates the current state of the Lane Centering feature. 0000b = System is not ready (initialization not finished) 0001b = System is temporarily not available (not all activation conditions fulfulled) 0010b = System is deactivated by driver 0011b = System is ready 0100b = Lane Centering suppressed by operator behavior (e.g. turn signal) 0101b = Lane Centering System is actuating 0110b = Reserved 0111b = Reserved 1000b = Reserved 1001b = Reserved 1010b = Reserved 1011b = Reserved 1100b = Reserved 1101b = Reserved 1110b = Error 1111b = Not Available
9760	Requested Active Steering Driver Preference Mode	The requested active steering mode to the active steering system from the operators interface. This parameter is the driver’s request, the state is shown in SPN 9757.000b = Requested Active Steering Mode #1 001b = Requested Active Steering Mode #2 010b = Requested Active Steering Mode #3 011b = Requested Active Steering Mode #4 100b = Requested Active Steering Mode #5 101b = Requested Active Steering Mode #6 110b = Error 111b = Don’t Care/Take No Action
9761	On Board Programming Initiate Inhibit	Indicates that programming is inhibited. Signal should be used by the target to prevent being programmed, or by the operator to decline/cancel programming.00b = Programming is not inhibited 01b = Programming is inhibited 10b = Reserved 11b = Don’t care/take no action

9763	Accelerator Pedal 1 Position Output 1	
9764	Accelerator Pedal 2 Position Output 1	
9765	Accelerator Pedal 3 Position Output 1	
9766	On Board Programming Target ECU Address	Source address of target device to be programmed, for which the message parameters apply. When SPN 9767 (On Board Programming Status) parameter indicates no updates are available for all supported targets, this parameter may be set to 255.
9767	On Board Programming Status	Status of a software update. 0000b = Software Up to Date: no new software is available 0001b = Available for Installation: updated software is available 0010b = In process/Installing: update has been initiated and progressing 0011b = Unsuccessful — Non-Operational: software update was unsuccesful and target ECU is not functional. 0100b = Unsuccessful – Operational: software update was unsuccesful and target ECU is restored to operation. 0101b = Declined or aborted by operator 0110b = Declined or aborted by target device 0111b = Reserved 1000b = Reserved 1001b = Reserved 1010b = Reserved 1011b = Reserved 1100b = Reserved 1101b = Reserved 1110b = Reserved 1111b = Not Available
9768	OBP Interlock – Overall Status	Indicates whether all interlocks for on board programming (OBP) have been satisfied. This parameter should be set to On whever any of the other OBP Interlocks are on. This allows a receiving device to know whether programming is permitted without necessarily being aware of the other interlock parameters.00b = Off: Programming is premitted. All interlocks are satisfied 01b = On: Programming is inhibited. One of more interlocks are not satisfied. 10b = Error 11b = Not available
9769	OBP Interlock – Engine Speed	Engine speed requirement is not met to allow initiation of on board programming (OBP). 00b = Off: Engine speed is permitting on board programming 01b = On: On board programming is inhibited due to engine speed. 10b = Error 11b = Not available

9770	OBP Interlock – Key Switch Position	Key switch position requirement is not met to allow initiation of on board programming (OBP). 00b = Off: Key switch position is permitting on board programming 01b = On: On board programming is inhibited due to key switch position 10b = Error 11b = Not available
9771	OBP Interlock – Park Brake	Park brake requirement is not met to allow initiation of on board programming (OBP). 00b = Off: Park brake is permitting on board programming 01b = On: On board programming is inhibited due to park brake 10b = Error 11b = Not available
9772	OBP Interlock – Power Supply Insufficient	Power supply (e.g. SLI battery state of charge) is not sufficient to allow initiation of on board programming (OBP).00b = Off: Power supply is sufficient to permit on board programming 01b = On: On board programming is inhibited due to insufficient power supply 10b = Error 11b = Not available
9773	OBP Interlock – Target Not Ready	Indicates whether the target is not ready to accept on board programming (OBP). 00b = Off: Target is not inhibiting on board programming 01b = On: Target has indicated that it is currently unable to accept on board programming 10b = Error 11b = Not available
9774	On Board Programming Progress	Amount of programming progress completed in relation to the total expected duration of the programming event.
9775	OBP Key Switch Request	Request to turn the key switch to the ignition or run position and/or prevent the ignition bus from turning off during on board programming (OBP).00b = On board programming device is not requesting key switch on. 01b = On board programming device is requesting key switch on. 10b = Reserved 11b = Don’t care/take no action
9776	On Board Programming Initiate ECU Address	Source address of target device for which on board programming is to be initiated. Source addresses 254 and 255 are not valid.
9777	On Board Programming Initiate Request	Signal indicating that programming should be initiated. Could come from operator controls or target device. Actual initiation may be subject to, or delayed by, operating conditions or interlocks.00b = On board programming not requested 01b = Initiation

		of on board programming is requested 10b = Reserved 11b = Don’t care/take no action
9778	Preprogrammed PTO Governor Set Speed 1	This speed corresponds to the PTO governed speed when PTO Governor State (SPN 976) is equal to Preprogrammed PTO Governor Set Speed 1 (01010b).
9779	Preprogrammed PTO Governor Set Speed 2	This speed corresponds to the PTO governed speed when PTO Governor State (SPN 976) is equal to Preprogrammed PTO Governor Set Speed 2 (01011b).
9780	Preprogrammed PTO Governor Set Speed 3	This speed corresponds to the PTO governed speed when PTO Governor State (SPN 976) is equal to Preprogrammed PTO Governor Set Speed 3 (01100b).
9781	Preprogrammed PTO Governor Set Speed 4	This speed corresponds to the PTO governed speed when PTO Governor State (SPN 976) is equal to Preprogrammed PTO Governor Set Speed 4 (01101b).
9782	Preprogrammed PTO Governor Set Speed 5	This speed corresponds to the PTO governed speed when PTO Governor State (SPN 976) is equal to Preprogrammed PTO Governor Set Speed 5 (01110b).
9783	Preprogrammed PTO Governor Set Speed 6	This speed corresponds to the PTO governed speed when PTO Governor State (SPN 976) is equal to Preprogrammed PTO Governor Set Speed 6 (01111b).
9784	Preprogrammed PTO Governor Set Speed 7	This speed corresponds to the PTO governed speed when PTO Governor State (SPN 976) is equal to Preprogrammed PTO Governor Set Speed 7 (10000b).
9785	Preprogrammed PTO Governor Set Speed 8	This speed corresponds to the PTO governed speed when PTO Governor State (SPN 976) is equal to Preprogrammed PTO Governor Set Speed 8 (10001b).
9786	Minimum PTO Governor Set Speed	The minimum allowed engine speed (user programmable) in which preprogrammed PTO governor set speeds 1-8 can be set.
9787	Maximum PTO Governor Set Speed	The maximum allowed engine speed (user programmable) in which preprogrammed PTO governor set speeds 1-8 can be set.

9788	PTO Governor Accelerator Override Maximum Speed	The maximum engine speed allowed while accelerator pedal is overriding the PTO governor.
9789	Stationary Inverter External Protection Input	Signal input to the ECU indicating that it stop all functions. For stationary non-vehicular applications of inverters.
9790	Stationary Inverter Shut Down from Data Link Information	Stationary Inverter commanded to shutdown via the datalink. For stationary non-vehicular applications of inverters.
9791	Stationary Inverter Automatic Start Safety Interlock Circuit	Indicates whether the inverter Automatic Start feature may be activated or not. May be determined from multiple inputs, such as cabinet door or safety switch.For stationary non-vehicular applications of inverters.
9792	Package Circuit Breaker Status	The state of the package circuit breaker. Generic circuit breaker for various applications. 000b = Open 001b = Closed 010b = Locked Out 011b = Transitioning to Open state 100b = Transitioning to Closed state 101b = Available for SAE assignment 110b = Error 111b = Not Available
9793	Stationary Inverter Circuit Breaker Status	The state of the inverter circuit breaker. For stationary non-vehicular applications of inverters. 000b = Open 001b = Closed 010b = Locked Out 011b = Transitioning to Open state 100b = Transitioning to Closed state 101b = Available for SAE assignment 110b = Error 111b = Not Available
9794	Stationary Inverter Average AC RMS Voltage	Average Line to Line AC RMS voltage measured at the inverter output. For stationary non-vehicular applications of inverters.
9795	Stationary Inverter Average Line-Neutral AC RMS Voltage	Average Line to Neutral AC RMS voltage measured at the inverter output. For stationary non-vehicular applications of inverters.
9796	Stationary Inverter Average AC Frequency	Average AC frequency measured at the inverter output. For stationary non-vehicular applications of inverters.

9797	Stationary Inverter Average AC RMS Current	Average AC RMS current measured at the inverter output. For stationary non-vehicular applications of inverters.
9798	Stationary Inverter Total Reactive Power	The total reactive power delivered by the inverter. For stationary non-vehicular applications of inverters.
9799	Stationary Inverter Overall Power Factor	The average power factor of the inverter. For stationary non-vehicular applications of inverters.
9800	Stationary Inverter Overall Power Factor Lagging	Lead/lag status for inverter average power factor. For stationary non-vehicular applications of inverters. 00b = Leading 01b = Lagging 10b = Error 11b = Not Available or Not Installed
9801	Stationary Inverter Total Real Power	Total real power delivered by the inverter. For stationary non-vehicular applications of inverters.
9802	Stationary Inverter Total Apparent Power	The total apparent power delivered by the inverter. For stationary non-vehicular applications of inverters.
9803	Stationary Inverter Not Ready to Automatically Parallel State	This parameter indicates whether or not all systems required to operate the inverter and close to the bus are prepared to operate automatically. If systems are not ready to operate in parallel, the status parameter is reflected as the ACTIVE state.For stationary non-vehicular applications of inverters. 00b = Inactive (ready to parallel) 01b = Active (not ready to parallel) 10b = Error 11b = Not available
9804	Stationary Inverter Auxiliary Shutdown Switch	Switch signal which requests that all inverter functions stop. For stationary non-vehicular applications of inverters. 00b = Off 01b = On 10b = Error 11b = Not available
9805	Stationary Inverter to Bus Phase Sequence Mismatch	Phase sequence mismatch between the inverter and the bus. Typically used with FMI 31 to indicate that the condition exists.For stationary non-vehicular applications of inverters.

9806	Stationary Inverter to Bus Dead Bus	Indicator of whether the bus is considered dead for closing to the stationary inverter. This indicator will be based on parameters such as bus voltage and dead bus threshold values.For stationary non-vehicular applications of inverters. 00b = Bus is not dead 01b = Bus is dead 10b = Error 11b = Not Available or Not Installed
9807	Stationary Inverter to Bus Phase Match	Indicator of whether phase difference between the stationary inverter and the bus is adequate for paralleling.For stationary non-vehicular applications of inverters. 00b = Phases do not match 01b = Phases match 10b = Error 11b = Not Available or Not Installed
9808	Stationary Inverter to Bus Frequency Match	Indicator of whether the frequency difference between the stationary inverter and the bus is adequate for paralleling.For stationary non-vehicular applications of inverters. 00b = Frequencies do not match 01b = Frequencies match 10b = Error 11b = Not Available or Not Installed
9809	Stationary Inverter to Bus Voltage Match	Indicator of whether the voltage difference the stationary inverter and the bus is adequate for paralleling. For stationary non-vehicular applications of inverters. 00b = Voltages do not match 01b = Voltages match 10b = Error 11b = Not Available or Not Installed
9810	Stationary Inverter to Bus In Sync	Indicator of whether the stationary inverter and the bus are properly synchronized for paralleling. This indicator will be based on parameters such as Voltage Match, Frequency Match, and Phase Match.For stationary non-vehicular applications of inverters. 00b = Not synchronized 01b = Synchronized 10b = Error 11b = Not Available or Not Installed
9811	Stationary Inverter to Bus AC Phase Difference	The phase difference between the stationary inverter and the bus voltage. For stationary non-vehicular applications of inverters.
9812	Engine Exhaust NOx Sensor Power Supply	State signal which indicates when the engine exhaust NOx sensor power supply driver output is being driven. On means the ECU is powering the engine exhaust NOx sensor. Note that the ECU is external to the sensor.00b = Off 01b = On: The ECU is

		powering the Engine Exhaust NOx Sensor Power Supply 10b = Error 11b = Unavailable
9813	Well Stimulation Pump Oil Filter Differential Pressure	Change in pump gear box oil pressure, measured across the filter, due to the filter and any accumulation of solid or semisolid material on or in the filter. The differential pressure is measured as the difference between inlet and outlet of the filter.
9814	Well Stimulation Pump Oil Filter Outlet Pressure	Pump Oil pressure (gage) measured just downstream of oil filter.
9815	Well Stimulation Pump Oil Filter Bypass Switch Status	Displays Pump Oil Filter Switch Status 00b = Not bypassing 01b = Bypassing 10b = Error 11b = Not available
9816	Generator Coolant Fan Enable Command	Enable and direction command to the Generator Coolant Fan. 00b = Accessory Motor Off 01b = Accessory Motor On Normal/Default Direction 10b = Accessory Motor On Reverse Direction 11b = Don’t Care/Take no action
9817	Generator Coolant Fan Power Hold	Command to allow the Generator Coolant Fan to remain alive independently of the electrical enable input to the Accessory Motor. For example, this could allow continued device operation after the keyswitch has turned off.00b = Power Hold Disabled 01b = Power Hold Enabled 10b = Reserved 11b = Don’t Care/Take no action
9818	Generator Coolant Fan Speed Command	Speed command to the Generator Coolant Fan. Note: Both Speed Command and Percent Speed Command cannot be used at the same time. Always set the unused speed command to Not Available. If both commands are set to Not Available, a preprogrammed default speed will be used.
9819	Generator Coolant Fan Percent Speed Command	Speed command to the Generator Coolant Fan in percentage of maximum speed. Note: Both Speed Command and Percent Speed Command cannot be used at the same time. Always set the unused speed command to Not Available. If both commands are set to Not Available, a preprogrammed default speed will be used.

9820	Generator Coolant Fan Enable Status	Enable and direction status of this Generator Coolant Fan Motor system or component. 00b = Accessory Motor Off 01b = Accessory Motor On – Normal, Forward, or Default Direction 10b = Accessory Motor On – Reverse Direction 11b = Not available
9821	Generator Coolant Fan Controller Status Reason Code	Provides the reason code describing the unique failure of this Generator Coolant Fan Motor system or component.If a detailed reason code is not used by the supporting application, or this reason code is Not Available, the Generator Coolant Fan Service Indicator (SPN 9826) and Generator Coolant Fan Operating Status (SPN 9827) may be used to determine functional status of this Generator Coolant Fan mystem or component. 0000b = Normal Operation 0001b = Unable to Start 0010b = Over-Voltage Protection Shutdown 0011b = Under-Voltage Protection Shutdown 0100b = Over-Temperature Protection Shutdown 0101b = Speed Limited due to current (i.e. amperage) protection limit 0110b = Speed limited due to maximum system design capability (e.g. PWM control limit or physical limit of system) 0111b = Speed limited due to torque limit 1000b = Speed limited due to over-temperature protection 1001b = Reserved 1010b = Reserved 1011b = Reserved 1100b = Reserved 1101b = Reserved 1110b = Reserved 1111b = Not Available
9822	Generator Coolant Fan Controller Command Status	Indicates the source of the speed command to this Generator Coolant Fan system or component. 00b is communicated when the controller is self-controlled (e.g. based on a temperature sensor). 01b is communicated when responding to the Generator Coolant Fan Speed Command (SPN 9818) or Generator Coolant Fan Percent Speed Command (SPN 9819). 10b is communicated when neither an internal nor external command is provided (e.g. failed temperature sensor or loss of the command message). 00b = Internal Command 01b = External Command 10b = Default Command 11b = Not Available
9823	Generator Coolant Fan Motor Speed	Motor Speed of the Generator Coolant Fan.
9824	Generator Coolant Fan Control Temperature	A temperature measured and reported by the device. It may be used for direct or remote (e.g. by another controller) control of the pump. For example, this may be the

		temperature of the fluid flowing through the pump, or some other temperature relating to the pump or controller.
9825	Generator Coolant Fan Power	Calculated electrical power consumed by the Generator Coolant Fan.
9826	Generator Coolant Fan Service Indicator	Indicates that service is required for the Generator Coolant Fan system or component. An active indication may convey a need for component replacement or periodic service. The Generator Coolant Fan Motor Controller Status Reason Code (SPN 9821) may provide additional detail as to the nature of the system status.00b = Service Not Required 01b = Service Required 10b = Reserved 11b = Not Available
9827	Generator Coolant Fan Operating Status	Indicates the operating status of the Generator Coolant Fan system or component. This parameter is used to inform other devices that this system or component is no longer performing to its operational capacity and that reduced, or no flow of the medium (e.g. coolant, oil, air, etc.) can be expected. Derated or Not Operable condition may require other vehicle systems to modify their operation.The Generator Coolant Fan Controller Status Reason Code (SPN 9821) may provide additional detail as to the nature of the system status. 00b = Normal Operation 01b = Derated Operation 10b = Not Operable 11b = Not Available
9829	Generator Coolant Pump Enable Command	Enable and direction command to the Generator Coolant Pump. 00b = Accessory Motor Off 01b = Accessory Motor On Normal/Default Direction 10b = Accessory Motor On Reverse Direction 11b = Don’t Care/Take no action
9830	Generator Coolant Pump Power Hold	Command to allow the Generator Coolant Pump to remain alive independently of the electrical enable input to the Accessory Motor. For example, this could allow continued device operation after the keyswitch has turned off.00b = Power Hold Disabled 01b = Power Hold Enabled 10b = Reserved 11b = Don’t Care/Take no action
9831	Generator Coolant Pump Speed Command	Speed command to the Generator Coolant Pump. Note: Both Speed Command and Percent Speed Command cannot be used at the same time. Always set the unused

		speed command to Not Available. If both commands are set to Not Available, a preprogrammed default speed will be used.
9832	Generator Coolant Pump Percent Speed Command	Speed command to the Generator Coolant Pump in percentage of maximum speed. Note: Both Speed Command and Percent Speed Command cannot be used at the same time. Always set the unused speed command to Not Available. If both commands are set to Not Available, a preprogrammed default speed will be used.
9833	Generator Coolant Pump Enable Status	Enable and direction status of the Generator Coolant Pump system or component. 00b = Accessory Motor Off 01b = Accessory Motor On – Normal, Forward, or Default Direction 10b = Accessory Motor On – Reverse Direction 11b = Not available
9834	Generator Coolant Pump Controller Status Reason Code	Provides the reason code describing the unique failure of the Generator Coolant Pump system or component. If a detailed reason code is not used by the supporting application, or this reason code is Not Available, the Generator Coolant Pump Service Indicator (SPN 9839) and Generator Coolant Pump Operating Status (SPN 9840) may be used to determine functional status of this Electrified Accessory motor system or component. 0000b = Normal Operation 0001b = Unable to Start 0010b = Over-Voltage Protection Shutdown 0011b = Under-Voltage Protection Shutdown 0100b = Over-Temperature Protection Shutdown 0101b = Speed Limited due to current (i.e. amperage) protection limit 0110b = Speed limited due to maximum system design capability (e.g. PWM control limit or physical limit of system) 0111b = Speed limited due to torque limit 1000b = Speed limited due to over-temperature protection 1001b = Reserved 1010b = Reserved 1011b = Reserved 1100b = Reserved 1101b = Reserved 1110b = Reserved 1111b = Not Available
9835	Generator Coolant Pump Controller Command Status	Indicates the source of the speed command to the Generator Coolant Pump system or component. 00b is communicated when the controller is self-controlled (e.g. based on a temperature sensor). 01b is communicated when responding to the Generator Coolant Pump Speed Command (SPN 9831) or Generator Coolant Pump Percent Speed Command (SPN 9832). 10b is communicated when neither an internal nor external command is provided (e.g. failed temperature sensor or loss of the command

		message). 00b = Internal Command 01b = External Command 10b = Default Command 11b = Not Available
9836	Generator Coolant Pump Motor Speed	Motor Speed of the Generator Coolant Pump.
9837	Generator Coolant Pump Control Temperature	A temperature measured and reported by the device. It may be used for direct or remote (e.g. by another controller) control of the pump. For example, this may be the temperature of the fluid flowing through the pump, or some other temperature relating to the pump or controller.
9838	Generator Coolant Pump Power	Calculated electrical power consumed by the Generator Coolant Pump.
9839	Generator Coolant Pump Service Indicator	Indicates that service is required for the Generator Coolant Pump system or component. An active indication may convey a need for component replacement or periodic service. The Generator Coolant Pump Controller Status Reason Code (SPN 9834) may provide additional detail as to the nature of the system status.00b = Service Not Required 01b = Service Required 10b = Reserved 11b = Not Available
9840	Generator Coolant Pump Operating Status	Indicates the operating status of the Generator Coolant Pump system or component. This parameter is used to inform other devices that this system or component is no longer performing to its operational capacity and that reduced, or no flow of the medium (e.g. coolant, oil, air, etc.) can be expected. Derated or Not Operable condition may require other vehicle systems to modify their operation.The Generator Coolant Pump Controller Status Reason Code (SPN 9834) may provide additional detail as to the nature of the system status. 00b = Normal Operation 01b = Derated Operation 10b = Not Operable 11b = Not Available
9842	Momentary Operator Key Switch	Momentary switch (possibly a push button switch) that indicates the operator’s desire to enter accessory mode, enter run mode, enter crank mode, activate the propulsion system, or initiate another behavior as determined by the manufacturer. This momentary switch may encompass functionality similar to a traditional rotary key switch. Receivers of this parameter are responsible for determining the sequence of

		supported operating modes.Controllers that transmit Engine Start Request (SPN 7745) may read this parameter to determine when to send Start requested, operator type (01b). Controllers that transmit Operator Vehicle Mode Request (SPN 7888) may read this parameter to determine the state of SPN 7888. Controllers that transmit Engine Starter Mode (SPN 1675) may read this parameter to determine if the operator desires to start the engine. For example, in a conventional engine application, depressing this switch may indicate the operator's desire to start the engine. In a Diesel-Electric Hybrid or an Electric Vehicle application, depressing this switch may activate the hybrid or electric system for use. 00b = Button is not depressed by the operator 01b = Button is depressed by the operator 10b = Error 11b = Not Available
9843	Cruise Control Set Command	This parameter is used to set the cruise control speed from a source other than the driver controlled switch when Cruise Control Enable Switch (SPN 596) is ON and Cruise Control Disable Command (SPN 5603), if supported, indicates allowed.See Figure PGN2560_A for an explanation of how this relates to other parameters. This parameter is not the physical switch that sets the cruise control set speed. See SPN 599 for the physical switch.
9844	Source Address of Controlling Device for Setting Cruise Control	The source address of the SAE J1939 device that is currently sending the Cruise Control Set Command (SPN 9843).If there are multiple devices sending Cruise Control Set Command with a value of 01b, then the value transmitted for this parameter will be the source address of the device that first began sending 01b for the command. If the device that first sent 01b for Cruise Control Set Command is no longer sending 01b for the command, then the value of the Source Address of Controlling Device for Set Cruise Control shall be set to the source address of a device that is still sending the Cruise Control Set Command with a value of 01b. See Figure PGN2560_A for an explanation of how this relates to other parameters. This parameter is supported by the device that has the capability to receive and process the Cruise Control Set Command (SPN 9843). 254 (FEh) is used to indicate that the Source Address of Controlling Device for Set Cruise Control parameter is supported, but no device is currently setting the cruise control speed with the Cruise Control Set Command (SPN 9843).

9845	Configured Engine Cylinder Pressure Timing 1	Configured timing location #1 for combustion pressure reporting in ECCP1-20. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9846	Configured Engine Cylinder Pressure Timing 2	Configured timing location #2 for combustion pressure reporting in ECCP1-20. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9847	Configured Engine Cylinder Pressure Timing 3	Configured timing location #3 for combustion pressure reporting in ECCP1-20. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9848	Configured Engine Cylinder Pressure Timing 4	Configured timing location #4 for combustion pressure reporting in ECCP1-20. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9849	Engine Cylinder Pressure Timing 1	Commanded timing location #1 for in-cylinder pressure reports in ECCP1-20. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9850	Engine Cylinder Pressure Timing 2	Commanded timing location #2 for in-cylinder pressure reports in ECCP1-20. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9851	Engine Cylinder Pressure Timing 3	Commanded timing location #3 for in-cylinder pressure reports in ECCP1-20. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing

		is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9852	Engine Cylinder Pressure Timing 4	Commanded timing location #4 for in-cylinder pressure reports in ECCP1-20. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9853	Engine Cylinder 1 Timing 1 Pressure	In-cylinder pressure for Cylinder #1 at user-defined timing location #1 as per SPN 9845. Will report FB00h (64256) when engine is not running.
9854	Engine Cylinder 1 Timing 2 Pressure	In-cylinder pressure for Cylinder #1 at user-defined timing location #2 as per SPN 9846. Will report FB00h (64256) when engine is not running.
9855	Engine Cylinder 1 Timing 3 Pressure	In-cylinder pressure for Cylinder #1 at user-defined timing location #3 as per SPN 9847. Will report FB00h (64256) when engine is not running.
9856	Engine Cylinder 1 Timing 4 Pressure	In-cylinder pressure for Cylinder #1 at user-defined timing location #4 as per SPN 9848. Will report FB00h (64256) when engine is not running.
9857	Engine Cylinder 2 Timing 1 Pressure	In-cylinder pressure for Cylinder #2 at user-defined timing location #1 as per SPN 9845. Will report FB00h (64256) when engine is not running.
9858	Engine Cylinder 2 Timing 2 Pressure	In-cylinder pressure for Cylinder #2 at user-defined timing location #2 as per SPN 9846. Will report FB00h (64256) when engine is not running.
9859	Engine Cylinder 2 Timing 3 Pressure	In-cylinder pressure for Cylinder #2 at user-defined timing location #3 as per SPN 9847. Will report FB00h (64256) when engine is not running.
9860	Engine Cylinder 2 Timing 4 Pressure	In-cylinder pressure for Cylinder #2 at user-defined timing location #4 as per SPN 9848. Will report FB00h (64256) when engine is not running.

9861	Engine Cylinder 3 Timing 1 Pressure	In-cylinder pressure for Cylinder #3 at user-defined timing location #1 as per SPN 9845. Will report FB00h (64256) when engine is not running.
9862	Engine Cylinder 3 Timing 2 Pressure	In-cylinder pressure for Cylinder #3 at user-defined timing location #2 as per SPN 9846. Will report FB00h (64256) when engine is not running.
9863	Engine Cylinder 3 Timing 3 Pressure	In-cylinder pressure for Cylinder #3 at user-defined timing location #3 as per SPN 9847. Will report FB00h (64256) when engine is not running.
9864	Engine Cylinder 3 Timing 4 Pressure	In-cylinder pressure for Cylinder #3 at user-defined timing location #4 as per SPN 9848. Will report FB00h (64256) when engine is not running.
9865	Engine Cylinder 4 Timing 1 Pressure	In-cylinder pressure for Cylinder #4 at user-defined timing location #1 as per SPN 9845. Will report FB00h (64256) when engine is not running.
9866	Engine Cylinder 4 Timing 2 Pressure	In-cylinder pressure for Cylinder #4 at user-defined timing location #2 as per SPN 9846. Will report FB00h (64256) when engine is not running.
9867	Engine Cylinder 4 Timing 3 Pressure	In-cylinder pressure for Cylinder #4 at user-defined timing location #3 as per SPN 9847. Will report FB00h (64256) when engine is not running.
9868	Engine Cylinder 4 Timing 4 Pressure	In-cylinder pressure for Cylinder #4 at user-defined timing location #4 as per SPN 9848. Will report FB00h (64256) when engine is not running.
9869	Engine Cylinder 5 Timing 1 Pressure	In-cylinder pressure for Cylinder #5 at user-defined timing location #1 as per SPN 9845. Will report FB00h (64256) when engine is not running.
9870	Engine Cylinder 5 Timing 2 Pressure	In-cylinder pressure for Cylinder #5 at user-defined timing location #2 as per SPN 9846. Will report FB00h (64256) when engine is not running.
9871	Engine Cylinder 5 Timing 3 Pressure	In-cylinder pressure for Cylinder #5 at user-defined timing location #3 as per SPN 9847. Will report FB00h (64256) when engine is not running.

9872	Engine Cylinder 5 Timing 4 Pressure	In-cylinder pressure for Cylinder #5 at user-defined timing location #4 as per SPN 9848. Will report FB00h (64256) when engine is not running.
9873	Engine Cylinder 6 Timing 1 Pressure	In-cylinder pressure for Cylinder #6 at user-defined timing location #1 as per SPN 9845. Will report FB00h (64256) when engine is not running.
9874	Engine Cylinder 6 Timing 2 Pressure	In-cylinder pressure for Cylinder #6 at user-defined timing location #2 as per SPN 9846. Will report FB00h (64256) when engine is not running.
9875	Engine Cylinder 6 Timing 3 Pressure	In-cylinder pressure for Cylinder #6 at user-defined timing location #3 as per SPN 9847. Will report FB00h (64256) when engine is not running.
9876	Engine Cylinder 6 Timing 4 Pressure	In-cylinder pressure for Cylinder #6 at user-defined timing location #4 as per SPN 9848. Will report FB00h (64256) when engine is not running.
9877	Engine Cylinder 7 Timing 1 Pressure	In-cylinder pressure for Cylinder #7 at user-defined timing location #1 as per SPN 9845. Will report FB00h (64256) when engine is not running.
9878	Engine Cylinder 7 Timing 2 Pressure	In-cylinder pressure for Cylinder #7 at user-defined timing location #2 as per SPN 9846. Will report FB00h (64256) when engine is not running.
9879	Engine Cylinder 7 Timing 3 Pressure	In-cylinder pressure for Cylinder #7 at user-defined timing location #3 as per SPN 9847. Will report FB00h (64256) when engine is not running.
9880	Engine Cylinder 7 Timing 4 Pressure	In-cylinder pressure for Cylinder #7 at user-defined timing location #4 as per SPN 9848. Will report FB00h (64256) when engine is not running.
9881	Engine Cylinder 8 Timing 1 Pressure	In-cylinder pressure for Cylinder #8 at user-defined timing location #1 as per SPN 9845. Will report FB00h (64256) when engine is not running.
9882	Engine Cylinder 8 Timing 2 Pressure	In-cylinder pressure for Cylinder #8 at user-defined timing location #2 as per SPN 9846. Will report FB00h (64256) when engine is not running.

9883	Engine Cylinder 8 Timing 3 Pressure	In-cylinder pressure for Cylinder #8 at user-defined timing location #3 as per SPN 9847. Will report FB00h (64256) when engine is not running.
9884	Engine Cylinder 8 Timing 4 Pressure	In-cylinder pressure for Cylinder #8 at user-defined timing location #4 as per SPN 9848. Will report FB00h (64256) when engine is not running.
9885	Engine Cylinder 9 Timing 1 Pressure	In-cylinder pressure for Cylinder #9 at user-defined timing location #1 as per SPN 9845. Will report FB00h (64256) when engine is not running.
9886	Engine Cylinder 9 Timing 2 Pressure	In-cylinder pressure for Cylinder #9 at user-defined timing location #2 as per SPN 9846. Will report FB00h (64256) when engine is not running.
9887	Engine Cylinder 9 Timing 3 Pressure	In-cylinder pressure for Cylinder #9 at user-defined timing location #3 as per SPN 9847. Will report FB00h (64256) when engine is not running.
9888	Engine Cylinder 9 Timing 4 Pressure	In-cylinder pressure for Cylinder #9 at user-defined timing location #4 as per SPN 9848. Will report FB00h (64256) when engine is not running.
9889	Engine Cylinder 10 Timing 1 Pressure	In-cylinder pressure for Cylinder #10 at user-defined timing location #1 as per SPN 9845. Will report FB00h (64256) when engine is not running.
9890	Engine Cylinder 10 Timing 2 Pressure	In-cylinder pressure for Cylinder #10 at user-defined timing location #2 as per SPN 9846. Will report FB00h (64256) when engine is not running.
9891	Engine Cylinder 10 Timing 3 Pressure	In-cylinder pressure for Cylinder #10 at user-defined timing location #3 as per SPN 9847. Will report FB00h (64256) when engine is not running.
9892	Engine Cylinder 10 Timing 4 Pressure	In-cylinder pressure for Cylinder #10 at user-defined timing location #4 as per SPN 9848. Will report FB00h (64256) when engine is not running.
9893	Engine Cylinder 11 Timing 1 Pressure	In-cylinder pressure for Cylinder #11 at user-defined timing location #1 as per SPN 9845. Will report FB00h (64256) when engine is not running.

9894	Engine Cylinder 11 Timing 2 Pressure	In-cylinder pressure for Cylinder #11 at user-defined timing location #2 as per SPN 9846. Will report FB00h (64256) when engine is not running.
9895	Engine Cylinder 11 Timing 3 Pressure	In-cylinder pressure for Cylinder #11 at user-defined timing location #3 as per SPN 9847. Will report FB00h (64256) when engine is not running.
9896	Engine Cylinder 11 Timing 4 Pressure	In-cylinder pressure for Cylinder #11 at user-defined timing location #4 as per SPN 9848. Will report FB00h (64256) when engine is not running.
9897	Engine Cylinder 12 Timing 1 Pressure	In-cylinder pressure for Cylinder #12 at user-defined timing location #1 as per SPN 9845. Will report FB00h (64256) when engine is not running.
9898	Engine Cylinder 12 Timing 2 Pressure	In-cylinder pressure for Cylinder #12 at user-defined timing location #2 as per SPN 9846. Will report FB00h (64256) when engine is not running.
9899	Engine Cylinder 12 Timing 3 Pressure	In-cylinder pressure for Cylinder #12 at user-defined timing location #3 as per SPN 9847. Will report FB00h (64256) when engine is not running.
9900	Engine Cylinder 12 Timing 4 Pressure	In-cylinder pressure for Cylinder #12 at user-defined timing location #4 as per SPN 9848. Will report FB00h (64256) when engine is not running.
9901	Engine Cylinder 13 Timing 1 Pressure	In-cylinder pressure for Cylinder #13 at user-defined timing location #1 as per SPN 9845. Will report FB00h (64256) when engine is not running.
9902	Engine Cylinder 13 Timing 2 Pressure	In-cylinder pressure for Cylinder #13 at user-defined timing location #2 as per SPN 9846. Will report FB00h (64256) when engine is not running.
9903	Engine Cylinder 13 Timing 3 Pressure	In-cylinder pressure for Cylinder #13 at user-defined timing location #3 as per SPN 9847. Will report FB00h (64256) when engine is not running.
9904	Engine Cylinder 13 Timing 4 Pressure	In-cylinder pressure for Cylinder #13 at user-defined timing location #4 as per SPN 9848. Will report FB00h (64256) when engine is not running.

9905	Engine Cylinder 14 Timing 1 Pressure	In-cylinder pressure for Cylinder #14 at user-defined timing location #1 as per SPN 9845. Will report FB00h (64256) when engine is not running.
9906	Engine Cylinder 14 Timing 2 Pressure	In-cylinder pressure for Cylinder #14 at user-defined timing location #2 as per SPN 9846. Will report FB00h (64256) when engine is not running.
9907	Engine Cylinder 14 Timing 3 Pressure	In-cylinder pressure for Cylinder #14 at user-defined timing location #3 as per SPN 9847. Will report FB00h (64256) when engine is not running.
9908	Engine Cylinder 14 Timing 4 Pressure	In-cylinder pressure for Cylinder #14 at user-defined timing location #4 as per SPN 9848. Will report FB00h (64256) when engine is not running.
9909	Engine Cylinder 15 Timing 1 Pressure	In-cylinder pressure for Cylinder #15 at user-defined timing location #1 as per SPN 9845. Will report FB00h (64256) when engine is not running.
9910	Engine Cylinder 15 Timing 2 Pressure	In-cylinder pressure for Cylinder #15 at user-defined timing location #2 as per SPN 9846. Will report FB00h (64256) when engine is not running.
9911	Engine Cylinder 15 Timing 3 Pressure	In-cylinder pressure for Cylinder #15 at user-defined timing location #3 as per SPN 9847. Will report FB00h (64256) when engine is not running.
9912	Engine Cylinder 15 Timing 4 Pressure	In-cylinder pressure for Cylinder #15 at user-defined timing location #4 as per SPN 9848. Will report FB00h (64256) when engine is not running.
9913	Engine Cylinder 16 Timing 1 Pressure	In-cylinder pressure for Cylinder #16 at user-defined timing location #1 as per SPN 9845. Will report FB00h (64256) when engine is not running.
9914	Engine Cylinder 16 Timing 2 Pressure	In-cylinder pressure for Cylinder #16 at user-defined timing location #2 as per SPN 9846. Will report FB00h (64256) when engine is not running.
9915	Engine Cylinder 16 Timing 3 Pressure	In-cylinder pressure for Cylinder #16 at user-defined timing location #3 as per SPN 9847. Will report FB00h (64256) when engine is not running.

9916	Engine Cylinder 16 Timing 4 Pressure	In-cylinder pressure for Cylinder #16 at user-defined timing location #4 as per SPN 9848. Will report FB00h (64256) when engine is not running.
9917	Engine Cylinder 17 Timing 1 Pressure	In-cylinder pressure for Cylinder #17 at user-defined timing location #1 as per SPN 9845. Will report FB00h (64256) when engine is not running.
9918	Engine Cylinder 17 Timing 2 Pressure	In-cylinder pressure for Cylinder #17 at user-defined timing location #2 as per SPN 9846. Will report FB00h (64256) when engine is not running.
9919	Engine Cylinder 17 Timing 3 Pressure	In-cylinder pressure for Cylinder #17 at user-defined timing location #3 as per SPN 9847. Will report FB00h (64256) when engine is not running.
9920	Engine Cylinder 17 Timing 4 Pressure	In-cylinder pressure for Cylinder #17 at user-defined timing location #4 as per SPN 9848. Will report FB00h (64256) when engine is not running.
9921	Engine Cylinder 18 Timing 1 Pressure	In-cylinder pressure for Cylinder #18 at user-defined timing location #1 as per SPN 9845. Will report FB00h (64256) when engine is not running.
9922	Engine Cylinder 18 Timing 2 Pressure	In-cylinder pressure for Cylinder #18 at user-defined timing location #2 as per SPN 9846. Will report FB00h (64256) when engine is not running.
9923	Engine Cylinder 18 Timing 3 Pressure	In-cylinder pressure for Cylinder #18 at user-defined timing location #3 as per SPN 9847. Will report FB00h (64256) when engine is not running.
9924	Engine Cylinder 18 Timing 4 Pressure	In-cylinder pressure for Cylinder #18 at user-defined timing location #4 as per SPN 9848. Will report FB00h (64256) when engine is not running.
9925	Engine Cylinder 19 Timing 1 Pressure	In-cylinder pressure for Cylinder #19 at user-defined timing location #1 as per SPN 9845. Will report FB00h (64256) when engine is not running.
9926	Engine Cylinder 19 Timing 2 Pressure	In-cylinder pressure for Cylinder #19 at user-defined timing location #2 as per SPN 9846. Will report FB00h (64256) when engine is not running.

9927	Engine Cylinder 19 Timing 3 Pressure	In-cylinder pressure for Cylinder #19 at user-defined timing location #3 as per SPN 9847. Will report FB00h (64256) when engine is not running.
9928	Engine Cylinder 19 Timing 4 Pressure	In-cylinder pressure for Cylinder #19 at user-defined timing location #4 as per SPN 9848. Will report FB00h (64256) when engine is not running.
9929	Engine Cylinder 20 Timing 1 Pressure	In-cylinder pressure for Cylinder #20 at user-defined timing location #1 as per SPN 9845. Will report FB00h (64256) when engine is not running.
9930	Engine Cylinder 20 Timing 2 Pressure	In-cylinder pressure for Cylinder #20 at user-defined timing location #2 as per SPN 9846. Will report FB00h (64256) when engine is not running.
9931	Engine Cylinder 20 Timing 3 Pressure	In-cylinder pressure for Cylinder #20 at user-defined timing location #3 as per SPN 9847. Will report FB00h (64256) when engine is not running.
9932	Engine Cylinder 20 Timing 4 Pressure	In-cylinder pressure for Cylinder #20 at user-defined timing location #4 as per SPN 9848. Will report FB00h (64256) when engine is not running.
9933	Engine Cylinder Mass Fraction Burned Location 1	Commanded value to use for x% mass fraction burned when reporting Engine Cylinder Instantaneous Combustion Timing, Location 1 in ECCT1-20.
9934	Engine Cylinder Mass Fraction Burned Location 2	Commanded value to use for y% mass fraction burned when reporting Engine Cylinder Instantaneous Combustion Timing, Location 2 in ECCT1-20.
9935	Configured Engine Cylinder Mass Fraction Burned Location 1	Configured value in use for x% mass fraction burned when reporting Engine Cylinder Instantaneous Combustion Timing, Location 1 in ECCT1-20.
9936	Configured Engine Cylinder Mass Fraction Burned Location 2	Configured value in use for y% mass fraction burned when reporting Engine Cylinder Instantaneous Combustion Timing, Location 2 in ECCT1-20.
9937	Engine Cylinder 1 Instantaneous Start of Combustion Timing	Instantaneous Start of Combustion timing is defined as the crank angle for which less than 5% of the fuel mass has been burned in the present engine cycle. The data will

		report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9938	Engine Cylinder 1 Instantaneous Center of Combustion Timing	Instantaneous Center of Combustion timing is defined as the crank angle for which 50% of the fuel mass has been burned in the present engine cycle. The data will report FB00h (64256) when the engine is not running. Center of Combustion is used to indicate the combustion efficiency. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9939	Engine Cylinder 1 Instantaneous Combustion Timing, Point 1	Engine Cylinder 1 Instantaneous Combustion Timing, Point 1 is defined as the crank angle for which x% of the fuel mass has been burned by Cylinder 1 in the present engine cycle. x% is defined in SPN 9935. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9940	Engine Cylinder 1 Instantaneous Combustion Timing, Point 2	Engine Cylinder 1 Instantaneous Combustion Timing, Point 2 is defined as the crank angle for which y% of the fuel mass has been burned by Cylinder 1 in the present engine cycle. y% is defined in SPN 9936. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9941	Engine Cylinder 2 Instantaneous Start of Combustion Timing	Instantaneous Start of Combustion timing is defined as the crank angle for which less than 5% of the fuel mass has been burned in the present engine cycle. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.

9942	Engine Cylinder 2 Instantaneous Center of Combustion Timing	Instantaneous Center of Combustion timing is defined as the crank angle for which 50% of the fuel mass has been burned in the present engine cycle. The data will report FB00h (64256) when the engine is not running. Center of Combustion is used to indicate the combustion efficiency. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9943	Engine Cylinder 2 Instantaneous Combustion Timing, Point 1	Engine Cylinder 2 Instantaneous Combustion Timing, Point 1 is defined as the crank angle for which x% of the fuel mass has been burned by Cylinder 2 in the present engine cycle. x% is defined in SPN 9935. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9944	Engine Cylinder 2 Instantaneous Combustion Timing, Point 2	Engine Cylinder 2 Instantaneous Combustion Timing, Point 2 is defined as the crank angle for which y% of the fuel mass has been burned by Cylinder 2 in the present engine cycle. y% is defined in SPN 9936. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9945	Engine Cylinder 3 Instantaneous Start of Combustion Timing	Instantaneous Start of Combustion timing is defined as the crank angle for which less than 5% of the fuel mass has been burned in the present engine cycle. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9946	Engine Cylinder 3 Instantaneous Center of Combustion Timing	Instantaneous Center of Combustion timing is defined as the crank angle for which 50% of the fuel mass has been burned in the present engine cycle. The data will report FB00h (64256) when the engine is not running. Center of Combustion is used to indicate the combustion efficiency. When the combustion happens after the TDC

		(Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9947	Engine Cylinder 3 Instantaneous Combustion Timing, Point 1	Engine Cylinder 3 Instantaneous Combustion Timing, Point 1 is defined as the crank angle for which x% of the fuel mass has been burned by Cylinder 3 in the present engine cycle. x% is defined in SPN 9935. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9948	Engine Cylinder 3 Instantaneous Combustion Timing, Point 2	Engine Cylinder 3 Instantaneous Combustion Timing, Point 2 is defined as the crank angle for which y% of the fuel mass has been burned by Cylinder 3 in the present engine cycle. y% is defined in SPN 9936. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9949	Engine Cylinder 4 Instantaneous Start of Combustion Timing	Instantaneous Start of Combustion timing is defined as the crank angle for which less than 5% of the fuel mass has been burned in the present engine cycle. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9950	Engine Cylinder 4 Instantaneous Center of Combustion Timing	Instantaneous Center of Combustion timing is defined as the crank angle for which 50% of the fuel mass has been burned in the present engine cycle. The data will report FB00h (64256) when the engine is not running. Center of Combustion is used to indicate the combustion efficiency. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.

9951	Engine Cylinder 4 Instantaneous Combustion Timing, Point 1	Engine Cylinder 4 Instantaneous Combustion Timing, Point 1 is defined as the crank angle for which x% of the fuel mass has been burned by Cylinder 4 in the present engine cycle. x% is defined in SPN 9935. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9952	Engine Cylinder 4 Instantaneous Combustion Timing, Point 2	Engine Cylinder 4 Instantaneous Combustion Timing, Point 2 is defined as the crank angle for which y% of the fuel mass has been burned by Cylinder 4 in the present engine cycle. y% is defined in SPN 9936. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9953	Engine Cylinder 5 Instantaneous Start of Combustion Timing	Instantaneous Start of Combustion timing is defined as the crank angle for which less than 5% of the fuel mass has been burned in the present engine cycle. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9954	Engine Cylinder 5 Instantaneous Center of Combustion Timing	Instantaneous Center of Combustion timing is defined as the crank angle for which 50% of the fuel mass has been burned in the present engine cycle. The data will report FB00h (64256) when the engine is not running. Center of Combustion is used to indicate the combustion efficiency. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9955	Engine Cylinder 5 Instantaneous Combustion Timing, Point 1	Engine Cylinder 5 Instantaneous Combustion Timing, Point 1 is defined as the crank angle for which x% of the fuel mass has been burned by Cylinder 5 in the present engine cycle. x% is defined in SPN 9935. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead

		Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9956	Engine Cylinder 5 Instantaneous Combustion Timing, Point 2	Engine Cylinder 5 Instantaneous Combustion Timing, Point 2 is defined as the crank angle for which y% of the fuel mass has been burned by Cylinder 5 in the present engine cycle. y% is defined in SPN 9936. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9957	Engine Cylinder 6 Instantaneous Start of Combustion Timing	Instantaneous Start of Combustion timing is defined as the crank angle for which less than 5% of the fuel mass has been burned in the present engine cycle. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9958	Engine Cylinder 6 Instantaneous Center of Combustion Timing	Instantaneous Center of Combustion timing is defined as the crank angle for which 50% of the fuel mass has been burned in the present engine cycle. The data will report FB00h (64256) when the engine is not running. Center of Combustion is used to indicate the combustion efficiency. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9959	Engine Cylinder 6 Instantaneous Combustion Timing, Point 1	Engine Cylinder 6 Instantaneous Combustion Timing, Point 1 is defined as the crank angle for which x% of the fuel mass has been burned by Cylinder 6 in the present engine cycle. x% is defined in SPN 9935. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.

9960	Engine Cylinder 6 Instantaneous Combustion Timing, Point 2	Engine Cylinder 6 Instantaneous Combustion Timing, Point 2 is defined as the crank angle for which y% of the fuel mass has been burned by Cylinder 6 in the present engine cycle. y% is defined in SPN 9936. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9961	Engine Cylinder 7 Instantaneous Start of Combustion Timing	Instantaneous Start of Combustion timing is defined as the crank angle for which less than 5% of the fuel mass has been burned in the present engine cycle. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9962	Engine Cylinder 7 Instantaneous Center of Combustion Timing	Instantaneous Center of Combustion timing is defined as the crank angle for which 50% of the fuel mass has been burned in the present engine cycle. The data will report FB00h (64256) when the engine is not running. Center of Combustion is used to indicate the combustion efficiency. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9963	Engine Cylinder 7 Instantaneous Combustion Timing, Point 1	Engine Cylinder 7 Instantaneous Combustion Timing, Point 1 is defined as the crank angle for which x% of the fuel mass has been burned by Cylinder 7 in the present engine cycle. x% is defined in SPN 9935. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9964	Engine Cylinder 7 Instantaneous Combustion Timing, Point 2	Engine Cylinder 7 Instantaneous Combustion Timing, Point 2 is defined as the crank angle for which y% of the fuel mass has been burned by Cylinder 7 in the present engine cycle. y% is defined in SPN 9936. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead

		Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9965	Engine Cylinder 8 Instantaneous Start of Combustion Timing	Instantaneous Start of Combustion timing is defined as the crank angle for which less than 5% of the fuel mass has been burned in the present engine cycle. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9966	Engine Cylinder 8 Instantaneous Center of Combustion Timing	Instantaneous Center of Combustion timing is defined as the crank angle for which 50% of the fuel mass has been burned in the present engine cycle. The data will report FB00h (64256) when the engine is not running. Center of Combustion is used to indicate the combustion efficiency. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9967	Engine Cylinder 8 Instantaneous Combustion Timing, Point 1	Engine Cylinder 8 Instantaneous Combustion Timing, Point 1 is defined as the crank angle for which x% of the fuel mass has been burned by Cylinder 8 in the present engine cycle. x% is defined in SPN 9935. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9968	Engine Cylinder 8 Instantaneous Combustion Timing, Point 2	Engine Cylinder 8 Instantaneous Combustion Timing, Point 2 is defined as the crank angle for which y% of the fuel mass has been burned by Cylinder 8 in the present engine cycle. y% is defined in SPN 9936. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.

9969	Engine Cylinder 9 Instantaneous Start of Combustion Timing	Instantaneous Start of Combustion timing is defined as the crank angle for which less than 5% of the fuel mass has been burned in the present engine cycle. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9970	Engine Cylinder 9 Instantaneous Center of Combustion Timing	Instantaneous Center of Combustion timing is defined as the crank angle for which 50% of the fuel mass has been burned in the present engine cycle. The data will report FB00h (64256) when the engine is not running. Center of Combustion is used to indicate the combustion efficiency. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9971	Engine Cylinder 9 Instantaneous Combustion Timing, Point 1	Engine Cylinder 9 Instantaneous Combustion Timing, Point 1 is defined as the crank angle for which x% of the fuel mass has been burned by Cylinder 9 in the present engine cycle. x% is defined in SPN 9935. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9972	Engine Cylinder 9 Instantaneous Combustion Timing, Point 2	Engine Cylinder 9 Instantaneous Combustion Timing, Point 2 is defined as the crank angle for which y% of the fuel mass has been burned by Cylinder 9 in the present engine cycle. y% is defined in SPN 9936. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9973	Engine Cylinder 10 Instantaneous Start of Combustion Timing	Instantaneous Start of Combustion timing is defined as the crank angle for which less than 5% of the fuel mass has been burned in the present engine cycle. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of

		positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9974	Engine Cylinder 10 Instantaneous Center of Combustion Timing	Instantaneous Center of Combustion timing is defined as the crank angle for which 50% of the fuel mass has been burned in the present engine cycle. The data will report FB00h (64256) when the engine is not running. Center of Combustion is used to indicate the combustion efficiency. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9975	Engine Cylinder 10 Instantaneous Combustion Timing, Point 1	Engine Cylinder 10 Instantaneous Combustion Timing, Point 1 is defined as the crank angle for which x% of the fuel mass has been burned by Cylinder 10 in the present engine cycle. x% is defined in SPN 9935. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9976	Engine Cylinder 10 Instantaneous Combustion Timing, Point 2	Engine Cylinder 10 Instantaneous Combustion Timing, Point 2 is defined as the crank angle for which y% of the fuel mass has been burned by Cylinder 10 in the present engine cycle. y% is defined in SPN 9936. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9977	Engine Cylinder 11 Instantaneous Start of Combustion Timing	Instantaneous Start of Combustion timing is defined as the crank angle for which less than 5% of the fuel mass has been burned in the present engine cycle. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.

9978	Engine Cylinder 11 Instantaneous Center of Combustion Timing	Instantaneous Center of Combustion timing is defined as the crank angle for which 50% of the fuel mass has been burned in the present engine cycle. The data will report FB00h (64256) when the engine is not running. Center of Combustion is used to indicate the combustion efficiency. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9979	Engine Cylinder 11 Instantaneous Combustion Timing, Point 1	Engine Cylinder 11 Instantaneous Combustion Timing, Point 1 is defined as the crank angle for which x% of the fuel mass has been burned by Cylinder 11 in the present engine cycle. x% is defined in SPN 9935. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9980	Engine Cylinder 11 Instantaneous Combustion Timing, Point 2	Engine Cylinder 11 Instantaneous Combustion Timing, Point 2 is defined as the crank angle for which y% of the fuel mass has been burned by Cylinder 11 in the present engine cycle. y% is defined in SPN 9936. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9981	Engine Cylinder 12 Instantaneous Start of Combustion Timing	Instantaneous Start of Combustion timing is defined as the crank angle for which less than 5% of the fuel mass has been burned in the present engine cycle. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9982	Engine Cylinder 12 Instantaneous Center of Combustion Timing	Instantaneous Center of Combustion timing is defined as the crank angle for which 50% of the fuel mass has been burned in the present engine cycle. The data will report FB00h (64256) when the engine is not running. Center of Combustion is used to indicate the combustion efficiency. When the combustion happens after the TDC

		(Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9983	Engine Cylinder 12 Instantaneous Combustion Timing, Point 1	Engine Cylinder 12 Instantaneous Combustion Timing, Point 1 is defined as the crank angle for which x% of the fuel mass has been burned by Cylinder 12 in the present engine cycle. x% is defined in SPN 9935. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9984	Engine Cylinder 12 Instantaneous Combustion Timing, Point 2	Engine Cylinder 12 Instantaneous Combustion Timing, Point 2 is defined as the crank angle for which y% of the fuel mass has been burned by Cylinder 12 in the present engine cycle. y% is defined in SPN 9936. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9985	Engine Cylinder 13 Instantaneous Start of Combustion Timing	Instantaneous Start of Combustion timing is defined as the crank angle for which less than 5% of the fuel mass has been burned in the present engine cycle. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9986	Engine Cylinder 13 Instantaneous Center of Combustion Timing	Instantaneous Center of Combustion timing is defined as the crank angle for which 50% of the fuel mass has been burned in the present engine cycle. The data will report FB00h (64256) when the engine is not running. Center of Combustion is used to indicate the combustion efficiency. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.

9987	Engine Cylinder 13 Instantaneous Combustion Timing, Point 1	Engine Cylinder 13 Instantaneous Combustion Timing, Point 1 is defined as the crank angle for which x% of the fuel mass has been burned by Cylinder 13 in the present engine cycle. x% is defined in SPN 9935. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9988	Engine Cylinder 13 Instantaneous Combustion Timing, Point 2	Engine Cylinder 13 Instantaneous Combustion Timing, Point 2 is defined as the crank angle for which y% of the fuel mass has been burned by Cylinder 13 in the present engine cycle. y% is defined in SPN 9936. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9989	Engine Cylinder 14 Instantaneous Start of Combustion Timing	Instantaneous Start of Combustion timing is defined as the crank angle for which less than 5% of the fuel mass has been burned in the present engine cycle. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9990	Engine Cylinder 14 Instantaneous Center of Combustion Timing	Instantaneous Center of Combustion timing is defined as the crank angle for which 50% of the fuel mass has been burned in the present engine cycle. The data will report FB00h (64256) when the engine is not running. Center of Combustion is used to indicate the combustion efficiency. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9991	Engine Cylinder 14 Instantaneous Combustion Timing, Point 1	Engine Cylinder 14 Instantaneous Combustion Timing, Point 1 is defined as the crank angle for which x% of the fuel mass has been burned by Cylinder 14 in the present engine cycle. x% is defined in SPN 9935. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead

		Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9992	Engine Cylinder 14 Instantaneous Combustion Timing, Point 2	Engine Cylinder 14 Instantaneous Combustion Timing, Point 2 is defined as the crank angle for which y% of the fuel mass has been burned by Cylinder 14 in the present engine cycle. y% is defined in SPN 9936. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9993	Engine Cylinder 15 Instantaneous Start of Combustion Timing	Instantaneous Start of Combustion timing is defined as the crank angle for which less than 5% of the fuel mass has been burned in the present engine cycle. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9994	Engine Cylinder 15 Instantaneous Center of Combustion Timing	Instantaneous Center of Combustion timing is defined as the crank angle for which 50% of the fuel mass has been burned in the present engine cycle. The data will report FB00h (64256) when the engine is not running. Center of Combustion is used to indicate the combustion efficiency. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9995	Engine Cylinder 15 Instantaneous Combustion Timing, Point 1	Engine Cylinder 15 Instantaneous Combustion Timing, Point 1 is defined as the crank angle for which x% of the fuel mass has been burned by Cylinder 15 in the present engine cycle. x% is defined in SPN 9935. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.

9996	Engine Cylinder 15 Instantaneous Combustion Timing, Point 2	Engine Cylinder 15 Instantaneous Combustion Timing, Point 2 is defined as the crank angle for which y% of the fuel mass has been burned by Cylinder 15 in the present engine cycle. y% is defined in SPN 9936. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9997	Engine Cylinder 16 Instantaneous Start of Combustion Timing	Instantaneous Start of Combustion timing is defined as the crank angle for which less than 5% of the fuel mass has been burned in the present engine cycle. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9998	Engine Cylinder 16 Instantaneous Center of Combustion Timing	Instantaneous Center of Combustion timing is defined as the crank angle for which 50% of the fuel mass has been burned in the present engine cycle. The data will report FB00h (64256) when the engine is not running. Center of Combustion is used to indicate the combustion efficiency. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
9999	Engine Cylinder 16 Instantaneous Combustion Timing, Point 1	Engine Cylinder 16 Instantaneous Combustion Timing, Point 1 is defined as the crank angle for which x% of the fuel mass has been burned by Cylinder 16 in the present engine cycle. x% is defined in SPN 9935. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
10000	Engine Cylinder 16 Instantaneous Combustion Timing, Point 2	Engine Cylinder 16 Instantaneous Combustion Timing, Point 2 is defined as the crank angle for which y% of the fuel mass has been burned by Cylinder 16 in the present engine cycle. y% is defined in SPN 9936. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead

		Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
10001	Engine Cylinder 17 Instantaneous Start of Combustion Timing	Instantaneous Start of Combustion timing is defined as the crank angle for which less than 5% of the fuel mass has been burned in the present engine cycle. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
10002	Engine Cylinder 17 Instantaneous Center of Combustion Timing	Instantaneous Center of Combustion timing is defined as the crank angle for which 50% of the fuel mass has been burned in the present engine cycle. The data will report FB00h (64256) when the engine is not running. Center of Combustion is used to indicate the combustion efficiency. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
10003	Engine Cylinder 17 Instantaneous Combustion Timing, Point 1	Engine Cylinder 17 Instantaneous Combustion Timing, Point 1 is defined as the crank angle for which x% of the fuel mass has been burned by Cylinder 17 in the present engine cycle. x% is defined in SPN 9935. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
10004	Engine Cylinder 17 Instantaneous Combustion Timing, Point 2	Engine Cylinder 17 Instantaneous Combustion Timing, Point 2 is defined as the crank angle for which y% of the fuel mass has been burned by Cylinder 17 in the present engine cycle. y% is defined in SPN 9936. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.

10005	Engine Cylinder 18 Instantaneous Start of Combustion Timing	Instantaneous Start of Combustion timing is defined as the crank angle for which less than 5% of the fuel mass has been burned in the present engine cycle. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
10006	Engine Cylinder 18 Instantaneous Center of Combustion Timing	Instantaneous Center of Combustion timing is defined as the crank angle for which 50% of the fuel mass has been burned in the present engine cycle. The data will report FB00h (64256) when the engine is not running. Center of Combustion is used to indicate the combustion efficiency. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
10007	Engine Cylinder 18 Instantaneous Combustion Timing, Point 1	Engine Cylinder 18 Instantaneous Combustion Timing, Point 1 is defined as the crank angle for which x% of the fuel mass has been burned by Cylinder 18 in the present engine cycle. x% is defined in SPN 9935. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
10008	Engine Cylinder 18 Instantaneous Combustion Timing, Point 2	Engine Cylinder 18 Instantaneous Combustion Timing, Point 2 is defined as the crank angle for which y% of the fuel mass has been burned by Cylinder 18 in the present engine cycle. y% is defined in SPN 9936. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
10009	Engine Cylinder 19 Instantaneous Start of Combustion Timing	Instantaneous Start of Combustion timing is defined as the crank angle for which less than 5% of the fuel mass has been burned in the present engine cycle. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of

		positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
10010	Engine Cylinder 19 Instantaneous Center of Combustion Timing	Instantaneous Center of Combustion timing is defined as the crank angle for which 50% of the fuel mass has been burned in the present engine cycle. The data will report FB00h (64256) when the engine is not running. Center of Combustion is used to indicate the combustion efficiency. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
10011	Engine Cylinder 19 Instantaneous Combustion Timing, Point 1	Engine Cylinder 19 Instantaneous Combustion Timing, Point 1 is defined as the crank angle for which x% of the fuel mass has been burned by Cylinder 19 in the present engine cycle. x% is defined in SPN 9935. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
10012	Engine Cylinder 19 Instantaneous Combustion Timing, Point 2	Engine Cylinder 19 Instantaneous Combustion Timing, Point 2 is defined as the crank angle for which y% of the fuel mass has been burned by Cylinder 19 in the present engine cycle. y% is defined in SPN 9936. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
10013	Engine Cylinder 20 Instantaneous Start of Combustion Timing	Instantaneous Start of Combustion timing is defined as the crank angle for which less than 5% of the fuel mass has been burned in the present engine cycle. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.

10014	Engine Cylinder 20 Instantaneous Center of Combustion Timing	Instantaneous Center of Combustion timing is defined as the crank angle for which 50% of the fuel mass has been burned in the present engine cycle. The data will report FB00h (64256) when the engine is not running. Center of Combustion is used to indicate the combustion efficiency. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
10015	Engine Cylinder 20 Instantaneous Combustion Timing, Point 1	Engine Cylinder 20 Instantaneous Combustion Timing, Point 1 is defined as the crank angle for which x% of the fuel mass has been burned by Cylinder 20 in the present engine cycle. x% is defined in SPN 9935. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
10016	Engine Cylinder 20 Instantaneous Combustion Timing, Point 2	Engine Cylinder 20 Instantaneous Combustion Timing, Point 2 is defined as the crank angle for which y% of the fuel mass has been burned by Cylinder 20 in the present engine cycle. y% is defined in SPN 9936. The data will report FB00h (64256) when the engine is not running. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
10017	Engine Cylinder 1 Instantaneous Peak Combustion Pressure Timing	The timing in crank angle degrees of the observed peak pressure during the current combustion cycle. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
10018	Engine Cylinder 1 Instantaneous Indicated Mean Effective Pressure	The indicated mean effective pressure (IMEP) is the work delivered to the piston over the entire cycle, per unit displaced volume. This SPN reports for the current engine cycle. See SPN 6483 for an average value. Negative range is to cover thermodynamic behavior during misfire.

10019	Engine Cylinder 1 Indicated Mean Effective Pressure Coefficient of Variance	The indicated mean effective pressure coefficient of variance is the variability seen in IMEP over the number of engine cycles in SPN6394 represented as a percentage.
10020	Engine Cylinder 2 Instantaneous Peak Combustion Pressure Timing	The timing in crank angle degrees of the observed peak pressure during the current combustion cycle. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
10021	Engine Cylinder 2 Instantaneous Indicated Mean Effective Pressure	The indicated mean effective pressure (IMEP) is the work delivered to the piston over the entire cycle, per unit displaced volume. This SPN reports for the current engine cycle. See SPN 6487 for an average value. Negative range is to cover thermodynamic behavior during misfire.
10022	Engine Cylinder 2 Indicated Mean Effective Pressure Coefficient of Variance	The indicated mean effective pressure coefficient of variance is the variability seen in IMEP over the number of engine cycles in SPN6394 represented as a percentage.
10023	Engine Cylinder 3 Instantaneous Peak Combustion Pressure Timing	The timing in crank angle degrees of the observed peak pressure during the current combustion cycle. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
10024	Engine Cylinder 3 Instantaneous Indicated Mean Effective Pressure	The indicated mean effective pressure (IMEP) is the work delivered to the piston over the entire cycle, per unit displaced volume. This SPN reports for the current engine cycle. See SPN 6491 for an average value. Negative range is to cover thermodynamic behavior during misfire.
10025	Engine Cylinder 3 Indicated Mean Effective Pressure Coefficient of Variance	The indicated mean effective pressure coefficient of variance is the variability seen in IMEP over the number of engine cycles in SPN6394 represented as a percentage.

10026	Engine Cylinder 4 Instantaneous Peak Combustion Pressure Timing	The timing in crank angle degrees of the observed peak pressure during the current combustion cycle. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
10027	Engine Cylinder 4 Instantaneous Indicated Mean Effective Pressure	The indicated mean effective pressure (IMEP) is the work delivered to the piston over the entire cycle, per unit displaced volume. This SPN reports for the current engine cycle. See SPN 6495 for an average value. Negative range is to cover thermodynamic behavior during misfire.
10028	Engine Cylinder 4 Indicated Mean Effective Pressure Coefficient of Variance	The indicated mean effective pressure coefficient of variance is the variability seen in IMEP over the number of engine cycles in SPN6394 represented as a percentage.
10029	Engine Cylinder 5 Instantaneous Peak Combustion Pressure Timing	The timing in crank angle degrees of the observed peak pressure during the current combustion cycle. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
10030	Engine Cylinder 5 Instantaneous Indicated Mean Effective Pressure	The indicated mean effective pressure (IMEP) is the work delivered to the piston over the entire cycle, per unit displaced volume. This SPN reports for the current engine cycle. See SPN 6499 for an average value. Negative range is to cover thermodynamic behavior during misfire.
10031	Engine Cylinder 5 Indicated Mean Effective Pressure Coefficient of Variance	The indicated mean effective pressure coefficient of variance is the variability seen in IMEP over the number of engine cycles in SPN6394 represented as a percentage.
10032	Engine Cylinder 6 Instantaneous Peak Combustion Pressure Timing	The timing in crank angle degrees of the observed peak pressure during the current combustion cycle. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.

10033	Engine Cylinder 6 Instantaneous Indicated Mean Effective Pressure	The indicated mean effective pressure (IMEP) is the work delivered to the piston over the entire cycle, per unit displaced volume. This SPN reports for the current engine cycle. See SPN 6503 for an average value. Negative range is to cover thermodynamic behavior during misfire.
10034	Engine Cylinder 6 Indicated Mean Effective Pressure Coefficient of Variance	The indicated mean effective pressure coefficient of variance is the variability seen in IMEP over the number of engine cycles in SPN6394 represented as a percentage.
10035	Engine Cylinder 7 Instantaneous Peak Combustion Pressure Timing	The timing in crank angle degrees of the observed peak pressure during the current combustion cycle. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
10036	Engine Cylinder 7 Instantaneous Indicated Mean Effective Pressure	The indicated mean effective pressure (IMEP) is the work delivered to the piston over the entire cycle, per unit displaced volume. This SPN reports for the current engine cycle. See SPN 6507 for an average value. Negative range is to cover thermodynamic behavior during misfire.
10037	Engine Cylinder 7 Indicated Mean Effective Pressure Coefficient of Variance	The indicated mean effective pressure coefficient of variance is the variability seen in IMEP over the number of engine cycles in SPN6394 represented as a percentage.
10038	Engine Cylinder 8 Instantaneous Peak Combustion Pressure Timing	The timing in crank angle degrees of the observed peak pressure during the current combustion cycle. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
10039	Engine Cylinder 8 Instantaneous Indicated Mean Effective Pressure	The indicated mean effective pressure (IMEP) is the work delivered to the piston over the entire cycle, per unit displaced volume. This SPN reports for the current engine cycle. See SPN 6511 for an average value. Negative range is to cover thermodynamic behavior during misfire.

10040	Engine Cylinder 8 Indicated Mean Effective Pressure Coefficient of Variance	The indicated mean effective pressure coefficient of variance is the variability seen in IMEP over the number of engine cycles in SPN6394 represented as a percentage.
10041	Engine Cylinder 9 Instantaneous Peak Combustion Pressure Timing	The timing in crank angle degrees of the observed peak pressure during the current combustion cycle. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
10042	Engine Cylinder 9 Instantaneous Indicated Mean Effective Pressure	The indicated mean effective pressure (IMEP) is the work delivered to the piston over the entire cycle, per unit displaced volume. This SPN reports for the current engine cycle. See SPN 6515 for an average value. Negative range is to cover thermodynamic behavior during misfire.
10043	Engine Cylinder 9 Indicated Mean Effective Pressure Coefficient of Variance	The indicated mean effective pressure coefficient of variance is the variability seen in IMEP over the number of engine cycles in SPN6394 represented as a percentage.
10044	Engine Cylinder 10 Instantaneous Peak Combustion Pressure Timing	The timing in crank angle degrees of the observed peak pressure during the current combustion cycle. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
10045	Engine Cylinder 10 Instantaneous Indicated Mean Effective Pressure	The indicated mean effective pressure (IMEP) is the work delivered to the piston over the entire cycle, per unit displaced volume. This SPN reports for the current engine cycle. See SPN 6519 for an average value. Negative range is to cover thermodynamic behavior during misfire.
10046	Engine Cylinder 10 Indicated Mean Effective Pressure Coefficient of Variance	The indicated mean effective pressure coefficient of variance is the variability seen in IMEP over the number of engine cycles in SPN6394 represented as a percentage.

10047	Engine Cylinder 11 Instantaneous Peak Combustion Pressure Timing	The timing in crank angle degrees of the observed peak pressure during the current combustion cycle. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
10048	Engine Cylinder 11 Instantaneous Indicated Mean Effective Pressure	The indicated mean effective pressure (IMEP) is the work delivered to the piston over the entire cycle, per unit displaced volume. This SPN reports for the current engine cycle. See SPN 6523 for an average value. Negative range is to cover thermodynamic behavior during misfire.
10049	Engine Cylinder 11 Indicated Mean Effective Pressure Coefficient of Variance	The indicated mean effective pressure coefficient of variance is the variability seen in IMEP over the number of engine cycles in SPN6394 represented as a percentage.
10050	Engine Cylinder 12 Instantaneous Peak Combustion Pressure Timing	The timing in crank angle degrees of the observed peak pressure during the current combustion cycle. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
10051	Engine Cylinder 12 Instantaneous Indicated Mean Effective Pressure	The indicated mean effective pressure (IMEP) is the work delivered to the piston over the entire cycle, per unit displaced volume. This SPN reports for the current engine cycle. See SPN 6527 for an average value. Negative range is to cover thermodynamic behavior during misfire.
10052	Engine Cylinder 12 Indicated Mean Effective Pressure Coefficient of Variance	The indicated mean effective pressure coefficient of variance is the variability seen in IMEP over the number of engine cycles in SPN6394 represented as a percentage.
10053	Engine Cylinder 13 Instantaneous Peak Combustion Pressure Timing	The timing in crank angle degrees of the observed peak pressure during the current combustion cycle. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.

10054	Engine Cylinder 13 Instantaneous Indicated Mean Effective Pressure	The indicated mean effective pressure (IMEP) is the work delivered to the piston over the entire cycle, per unit displaced volume. This SPN reports for the current engine cycle. See SPN 6531 for an average value. Negative range is to cover thermodynamic behavior during misfire.
10055	Engine Cylinder 13 Indicated Mean Effective Pressure Coefficient of Variance	The indicated mean effective pressure coefficient of variance is the variability seen in IMEP over the number of engine cycles in SPN6394 represented as a percentage.
10056	Engine Cylinder 14 Instantaneous Peak Combustion Pressure Timing	The timing in crank angle degrees of the observed peak pressure during the current combustion cycle. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
10057	Engine Cylinder 14 Instantaneous Indicated Mean Effective Pressure	The indicated mean effective pressure (IMEP) is the work delivered to the piston over the entire cycle, per unit displaced volume. This SPN reports for the current engine cycle. See SPN 6535 for an average value. Negative range is to cover thermodynamic behavior during misfire.
10058	Engine Cylinder 14 Indicated Mean Effective Pressure Coefficient of Variance	The indicated mean effective pressure coefficient of variance is the variability seen in IMEP over the number of engine cycles in SPN6394 represented as a percentage.
10059	Engine Cylinder 15 Instantaneous Peak Combustion Pressure Timing	The timing in crank angle degrees of the observed peak pressure during the current combustion cycle. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
10060	Engine Cylinder 15 Instantaneous Indicated Mean Effective Pressure	The indicated mean effective pressure (IMEP) is the work delivered to the piston over the entire cycle, per unit displaced volume. This SPN reports for the current engine cycle. See SPN 6539 for an average value. Negative range is to cover thermodynamic behavior during misfire.

10061	Engine Cylinder 15 Indicated Mean Effective Pressure Coefficient of Variance	The indicated mean effective pressure coefficient of variance is the variability seen in IMEP over the number of engine cycles in SPN6394 represented as a percentage.
10062	Engine Cylinder 16 Instantaneous Peak Combustion Pressure Timing	The timing in crank angle degrees of the observed peak pressure during the current combustion cycle. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
10063	Engine Cylinder 16 Instantaneous Indicated Mean Effective Pressure	The indicated mean effective pressure (IMEP) is the work delivered to the piston over the entire cycle, per unit displaced volume. This SPN reports for the current engine cycle. See SPN 6543 for an average value. Negative range is to cover thermodynamic behavior during misfire.
10064	Engine Cylinder 16 Indicated Mean Effective Pressure Coefficient of Variance	The indicated mean effective pressure coefficient of variance is the variability seen in IMEP over the number of engine cycles in SPN6394 represented as a percentage.
10065	Engine Cylinder 17 Instantaneous Peak Combustion Pressure Timing	The timing in crank angle degrees of the observed peak pressure during the current combustion cycle. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
10066	Engine Cylinder 17 Instantaneous Indicated Mean Effective Pressure	The indicated mean effective pressure (IMEP) is the work delivered to the piston over the entire cycle, per unit displaced volume. This SPN reports for the current engine cycle. See SPN 6547 for an average value. Negative range is to cover thermodynamic behavior during misfire.
10067	Engine Cylinder 17 Indicated Mean Effective Pressure Coefficient of Variance	The indicated mean effective pressure coefficient of variance is the variability seen in IMEP over the number of engine cycles in SPN6394 represented as a percentage.

10068	Engine Cylinder 18 Instantaneous Peak Combustion Pressure Timing	The timing in crank angle degrees of the observed peak pressure during the current combustion cycle. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
10069	Engine Cylinder 18 Instantaneous Indicated Mean Effective Pressure	The indicated mean effective pressure (IMEP) is the work delivered to the piston over the entire cycle, per unit displaced volume. This SPN reports for the current engine cycle. See SPN 6551 for an average value. Negative range is to cover thermodynamic behavior during misfire.
10070	Engine Cylinder 18 Indicated Mean Effective Pressure Coefficient of Variance	The indicated mean effective pressure coefficient of variance is the variability seen in IMEP over the number of engine cycles in SPN6394 represented as a percentage.
10071	Engine Cylinder 19 Instantaneous Peak Combustion Pressure Timing	The timing in crank angle degrees of the observed peak pressure during the current combustion cycle. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.
10072	Engine Cylinder 19 Instantaneous Indicated Mean Effective Pressure	The indicated mean effective pressure (IMEP) is the work delivered to the piston over the entire cycle, per unit displaced volume. This SPN reports for the current engine cycle. See SPN 6555 for an average value. Negative range is to cover thermodynamic behavior during misfire.
10073	Engine Cylinder 19 Indicated Mean Effective Pressure Coefficient of Variance	The indicated mean effective pressure coefficient of variance is the variability seen in IMEP over the number of engine cycles in SPN6394 represented as a percentage.
10074	Engine Cylinder 20 Instantaneous Peak Combustion Pressure Timing	The timing in crank angle degrees of the observed peak pressure during the current combustion cycle. When the combustion happens after the TDC (Top Dead Center) of this cylinder, the timing is referred in terms of positive angle and if combustion happens before TDC, the timing is referred in terms of negative angle.

10075	Engine Cylinder 20 Instantaneous Indicated Mean Effective Pressure	The indicated mean effective pressure (IMEP) is the work delivered to the piston over the entire cycle, per unit displaced volume. This SPN reports for the current engine cycle. See SPN 6559 for an average value. Negative range is to cover thermodynamic behavior during misfire.
10076	Engine Cylinder 20 Indicated Mean Effective Pressure Coefficient of Variance	The indicated mean effective pressure coefficient of variance is the variability seen in IMEP over the number of engine cycles in SPN6394 represented as a percentage.
10077	Engine Cylinder 1 Compression Gamma Ratio	The compression gamma ratio is defined as Log(pressure)/Log(volume) of the cylinder pressure curve during the compression stroke of the current engine cycle for engine cylinder 1. The SPN will report FB00h (64256) when the engine is not running.
10078	Engine Cylinder 1 Expansion Gamma Ratio	The expansion gamma ratio is defined as Log(pressure)/Log(volume) of the cylinder pressure curve during the expansion stroke of the current engine cycle for engine cylinder 1. The SPN will report FB00h (64256) when the engine is not running.
10079	Engine Cylinder 2 Compression Gamma Ratio	The compression gamma ratio is defined as Log(pressure)/Log(volume) of the cylinder pressure curve during the compression stroke of the current engine cycle for engine cylinder 2. The SPN will report FB00h (64256) when the engine is not running.
10080	Engine Cylinder 2 Expansion Gamma Ratio	The expansion gamma ratio is defined as Log(pressure)/Log(volume) of the cylinder pressure curve during the expansion stroke of the current engine cycle for engine cylinder 2. The SPN will report FB00h (64256) when the engine is not running.
10081	Engine Cylinder 3 Compression Gamma Ratio	The compression gamma ratio is defined as Log(pressure)/Log(volume) of the cylinder pressure curve during the compression stroke of the current engine cycle for engine cylinder 3. The SPN will report FB00h (64256) when the engine is not running.

10082	Engine Cylinder 3 Expansion Gamma Ratio	The expansion gamma ratio is defined as Log(pressure)/Log(volume) of the cylinder pressure curve during the expansion stroke of the current engine cycle for engine cylinder 3. The SPN will report FB00h (64256) when the engine is not running.
10083	Engine Cylinder 4 Compression Gamma Ratio	The compression gamma ratio is defined as Log(pressure)/Log(volume) of the cylinder pressure curve during the compression stroke of the current engine cycle for engine cylinder 4. The SPN will report FB00h (64256) when the engine is not running.
10084	Engine Cylinder 4 Expansion Gamma Ratio	The expansion gamma ratio is defined as Log(pressure)/Log(volume) of the cylinder pressure curve during the expansion stroke of the current engine cycle for engine cylinder 4. The SPN will report FB00h (64256) when the engine is not running.
10085	Engine Cylinder 5 Compression Gamma Ratio	The compression gamma ratio is defined as Log(pressure)/Log(volume) of the cylinder pressure curve during the compression stroke of the current engine cycle for engine Cylinder 5. The SPN will report FB00h (64256) when the engine is not running.
10086	Engine Cylinder 5 Expansion Gamma Ratio	The expansion gamma ratio is defined as Log(pressure)/Log(volume) of the cylinder pressure curve during the expansion stroke of the current engine cycle for engine Cylinder 5. The SPN will report FB00h (64256) when the engine is not running.
10087	Engine Cylinder 6 Compression Gamma Ratio	The compression gamma ratio is defined as Log(pressure)/Log(volume) of the cylinder pressure curve during the compression stroke of the current engine cycle for engine Cylinder 6. The SPN will report FB00h (64256) when the engine is not running.
10088	Engine Cylinder 6 Expansion Gamma Ratio	The expansion gamma ratio is defined as Log(pressure)/Log(volume) of the cylinder pressure curve during the expansion stroke of the current engine cycle for engine Cylinder 6. The SPN will report FB00h (64256) when the engine is not running.
10089	Engine Cylinder 7 Compression Gamma Ratio	The compression gamma ratio is defined as Log(pressure)/Log(volume) of the cylinder pressure curve during the compression stroke of the current engine cycle for

		engine Cylinder 7. The SPN will report FB00h (64256) when the engine is not running.
10090	Engine Cylinder 7 Expansion Gamma Ratio	The expansion gamma ratio is defined as Log(pressure)/Log(volume) of the cylinder pressure curve during the expansion stroke of the current engine cycle for engine Cylinder 7. The SPN will report FB00h (64256) when the engine is not running.
10091	Engine Cylinder 8 Compression Gamma Ratio	The compression gamma ratio is defined as Log(pressure)/Log(volume) of the cylinder pressure curve during the compression stroke of the current engine cycle for engine Cylinder 8. The SPN will report FB00h (64256) when the engine is not running.
10092	Engine Cylinder 8 Expansion Gamma Ratio	The expansion gamma ratio is defined as Log(pressure)/Log(volume) of the cylinder pressure curve during the expansion stroke of the current engine cycle for engine Cylinder 8. The SPN will report FB00h (64256) when the engine is not running.
10093	Engine Cylinder 9 Compression Gamma Ratio	The compression gamma ratio is defined as Log(pressure)/Log(volume) of the cylinder pressure curve during the compression stroke of the current engine cycle for engine Cylinder 9. The SPN will report FB00h (64256) when the engine is not running.
10094	Engine Cylinder 9 Expansion Gamma Ratio	The expansion gamma ratio is defined as Log(pressure)/Log(volume) of the cylinder pressure curve during the expansion stroke of the current engine cycle for engine Cylinder 9. The SPN will report FB00h (64256) when the engine is not running.
10095	Engine Cylinder 10 Compression Gamma Ratio	The compression gamma ratio is defined as Log(pressure)/Log(volume) of the cylinder pressure curve during the compression stroke of the current engine cycle for engine Cylinder 10. The SPN will report FB00h (64256) when the engine is not running.
10096	Engine Cylinder 10 Expansion Gamma Ratio	The expansion gamma ratio is defined as Log(pressure)/Log(volume) of the cylinder pressure curve during the expansion stroke of the current engine cycle for engine Cylinder 10. The SPN will report FB00h (64256) when the engine is not running.

10097	Engine Cylinder 11 Compression Gamma Ratio	The compression gamma ratio is defined as Log(pressure)/Log(volume) of the cylinder pressure curve during the compression stroke of the current engine cycle for engine Cylinder 11. The SPN will report FB00h (64256) when the engine is not running.
10098	Engine Cylinder 11 Expansion Gamma Ratio	The expansion gamma ratio is defined as Log(pressure)/Log(volume) of the cylinder pressure curve during the expansion stroke of the current engine cycle for engine Cylinder 11. The SPN will report FB00h (64256) when the engine is not running.
10099	Engine Cylinder 12 Compression Gamma Ratio	The compression gamma ratio is defined as Log(pressure)/Log(volume) of the cylinder pressure curve during the compression stroke of the current engine cycle for engine Cylinder 12. The SPN will report FB00h (64256) when the engine is not running.
10100	Engine Cylinder 12 Expansion Gamma Ratio	The expansion gamma ratio is defined as Log(pressure)/Log(volume) of the cylinder pressure curve during the expansion stroke of the current engine cycle for engine Cylinder 12. The SPN will report FB00h (64256) when the engine is not running.
10101	Engine Cylinder 13 Compression Gamma Ratio	The compression gamma ratio is defined as Log(pressure)/Log(volume) of the cylinder pressure curve during the compression stroke of the current engine cycle for engine Cylinder 13. The SPN will report FB00h (64256) when the engine is not running.
10102	Engine Cylinder 13 Expansion Gamma Ratio	The expansion gamma ratio is defined as Log(pressure)/Log(volume) of the cylinder pressure curve during the expansion stroke of the current engine cycle for engine Cylinder 13. The SPN will report FB00h (64256) when the engine is not running.
10103	Engine Cylinder 14 Compression Gamma Ratio	The compression gamma ratio is defined as Log(pressure)/Log(volume) of the cylinder pressure curve during the compression stroke of the current engine cycle for engine Cylinder 14. The SPN will report FB00h (64256) when the engine is not running.

10104	Engine Cylinder 14 Expansion Gamma Ratio	The expansion gamma ratio is defined as Log(pressure)/Log(volume) of the cylinder pressure curve during the expansion stroke of the current engine cycle for engine Cylinder 14. The SPN will report FB00h (64256) when the engine is not running.
10105	Engine Cylinder 15 Compression Gamma Ratio	The compression gamma ratio is defined as Log(pressure)/Log(volume) of the cylinder pressure curve during the compression stroke of the current engine cycle for engine Cylinder 15. The SPN will report FB00h (64256) when the engine is not running.
10106	Engine Cylinder 15 Expansion Gamma Ratio	The expansion gamma ratio is defined as Log(pressure)/Log(volume) of the cylinder pressure curve during the expansion stroke of the current engine cycle for engine Cylinder 15. The SPN will report FB00h (64256) when the engine is not running.
10107	Engine Cylinder 16 Compression Gamma Ratio	The compression gamma ratio is defined as Log(pressure)/Log(volume) of the cylinder pressure curve during the compression stroke of the current engine cycle for engine Cylinder 16. The SPN will report FB00h (64256) when the engine is not running.
10108	Engine Cylinder 16 Expansion Gamma Ratio	The expansion gamma ratio is defined as Log(pressure)/Log(volume) of the cylinder pressure curve during the expansion stroke of the current engine cycle for engine Cylinder 16. The SPN will report FB00h (64256) when the engine is not running.
10109	Engine Cylinder 17 Compression Gamma Ratio	The compression gamma ratio is defined as Log(pressure)/Log(volume) of the cylinder pressure curve during the compression stroke of the current engine cycle for engine Cylinder 17. The SPN will report FB00h (64256) when the engine is not running.
10110	Engine Cylinder 17 Expansion Gamma Ratio	The expansion gamma ratio is defined as Log(pressure)/Log(volume) of the cylinder pressure curve during the expansion stroke of the current engine cycle for engine Cylinder 17. The SPN will report FB00h (64256) when the engine is not running.
10111	Engine Cylinder 18 Compression Gamma Ratio	The compression gamma ratio is defined as Log(pressure)/Log(volume) of the cylinder pressure curve during the compression stroke of the current engine cycle for

		engine Cylinder 18. The SPN will report FB00h (64256) when the engine is not running.
10112	Engine Cylinder 18 Expansion Gamma Ratio	The expansion gamma ratio is defined as Log(pressure)/Log(volume) of the cylinder pressure curve during the expansion stroke of the current engine cycle for engine Cylinder 18. The SPN will report FB00h (64256) when the engine is not running.
10113	Engine Cylinder 19 Compression Gamma Ratio	The compression gamma ratio is defined as Log(pressure)/Log(volume) of the cylinder pressure curve during the compression stroke of the current engine cycle for engine Cylinder 19. The SPN will report FB00h (64256) when the engine is not running.
10114	Engine Cylinder 19 Expansion Gamma Ratio	The expansion gamma ratio is defined as Log(pressure)/Log(volume) of the cylinder pressure curve during the expansion stroke of the current engine cycle for engine Cylinder 19. The SPN will report FB00h (64256) when the engine is not running.
10115	Engine Cylinder 20 Compression Gamma Ratio	The compression gamma ratio is defined as Log(pressure)/Log(volume) of the cylinder pressure curve during the compression stroke of the current engine cycle for engine Cylinder 20. The SPN will report FB00h (64256) when the engine is not running.
10116	Engine Cylinder 20 Expansion Gamma Ratio	The expansion gamma ratio is defined as Log(pressure)/Log(volume) of the cylinder pressure curve during the expansion stroke of the current engine cycle for engine Cylinder 20. The SPN will report FB00h (64256) when the engine is not running.
10117	Power Electronics Coolant Fan 1	Indicates this instance of the Power Electronics Coolant Fan.
10118	Power Electronics Coolant Fan 2	Indicates this instance of the Power Electronics Coolant Fan.
10119	Power Electronics Coolant Fan 3	Indicates this instance of the Power Electronics Coolant Fan.
10120	Power Electronics Coolant Fan 4	Indicates this instance of the Power Electronics Coolant Fan.

10121	Power Electronics Coolant Fan 5	Indicates this instance of the Power Electronics Coolant Fan.
10122	Power Electronics Coolant Fan 6	Indicates this instance of the Power Electronics Coolant Fan.
10123	Power Electronics Coolant Fan 7	Indicates this instance of the Power Electronics Coolant Fan.
10124	Power Electronics Coolant Fan 8	Indicates this instance of the Power Electronics Coolant Fan.
10125	Power Electronics Coolant Fan 9	Indicates this instance of the Power Electronics Coolant Fan.
10126	Power Electronics Coolant Fan 10	Indicates this instance of the Power Electronics Coolant Fan.
10127	Power Electronics Coolant Fan 11	Indicates this instance of the Power Electronics Coolant Fan.
10128	Power Electronics Coolant Fan 12	Indicates this instance of the Power Electronics Coolant Fan.
10129	Power Electronics Coolant Fan 13	Indicates this instance of the Power Electronics Coolant Fan.
10130	Power Electronics Coolant Fan 14	Indicates this instance of the Power Electronics Coolant Fan.
10131	Power Electronics Coolant Fan 15	Indicates this instance of the Power Electronics Coolant Fan.
516096	Manufacturer Assignable SPN (first entry)	See document J1939-73 for SPN details.
516097	Manufacturer Assignable SPN	See document J1939-73 for SPN details.
516098	Manufacturer Assignable SPN	See document J1939-73 for SPN details.
516099	Manufacturer Assignable SPN	See document J1939-73 for SPN details.
516100	Manufacturer Assignable SPN	See document J1939-73 for SPN details.

516101	Manufacturer Assignable SPN	See document J1939-73 for SPN details.
516102	Manufacturer Assignable SPN	See document J1939-73 for SPN details.
516103	Manufacturer Assignable SPN	See document J1939-73 for SPN details.
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524286	Manufacturer Assignable SPN	See document J1939-73 for SPN details.
524287	Manufacturer Assignable SPN (last entry)	See document J1939-73 for SPN details.