https://truckmanualshub.com/

Kenworth Heavy Duty Body Builder Manual 2016



KENWORTH®

A PACCAR COMPANY

https://truckmanualshub.com/

This page intentionally left blank.

https://truckmanualshub.com/

Kenworth Heavy Duty 2.1m Cab Body Builder Manual








KENWORTH®

A PACCAR COMPANY

Body Builder Manual Contents

https://truckmanualshub.com/

SECTION 1: INTRODUCTION **1-1**
SAFETY SIGNALS 2-1

SECTION 2: SAFETY & COMPLIANCE **2-1**
FEDERAL MOTOR VEHICLE SAFETY STANDARDS COMPLIANCE 2-2
DIMENSIONS 3-1
ABBREVIATIONS 3-1
TURNING RADIUS 3-1

SECTION 3: DIMENSIONS **3-1**
OVERALL DIMENSIONS 3-5
T680 Standard Hood Daycab 3-6
T680 MX (SHORT) HOOD DAYCAB 3-7
T880 Standard Hood Daycab 3-8
T880 MX (SHORT) HOOD DAYCAB 3-9
T680 Standard Hood 40” Sleeper 3-10
T680 MX (SHORT) HOOD 40” Sleeper 3-11
T880 Standard Hood 40” Sleeper 3-12
T880 MX (SHORT) HOOD 40” Sleeper 3-13
T680 Standard Hood 52” Sleeper 3-14
T680 MX (SHORT) HOOD 52” sleeper 3-15
T880 Standard Hood with 52” sleeper 3-16
T880 MX (SHORT) HOOD with 52” sleeper 3-17
T680 Standard Hood with 76” high-roof sleeper 3-18
T680 MX (SHORT) HOOD with 76” high-roof sleeper 3-19
T680 Standard Hood with 76” mid-roof sleeper 3-20
T680 MX (SHORT) HOOD with 76” mid-roof sleeper 3-21
T880 Standard Hood with 76” mid-roof sleeper 3-22
T880 MX (SHORT) HOOD with 76” mid-roof sleeper 3-23
RIDE HEIGHTS 3-24
REAR SUSPENSION LAYOUTS 3-26
AG400L Tandem 3-27
AG400 or AG460 Tandem 3-28
AG460 Tandem 3-29
AG690 TRIdem 3-30
Reyco 79KB Single Rear Axle 3-31
Reyco 102 Tandem Rear Axle 3-32
Neway ADz 123 Single Rear Axle 3-33
Neway ADz 246 Tandem Suspension 3-34
Neway ADz 369 Tridem Suspension 3-35
Hendrickson Primaax ex Tandem Suspension 3-36
Hendrickson Primaax EX Tridem Suspension 3-37
Hendrickson HMX Tandem Suspension 3-38
Hendrickson RT Tandem Suspension 3-39
Chalmers 856-46 Tandem Suspension 3-40
Lift AXLES (pushers and tags) 3-42
Axle TRACK AND TIRE WIDTH 3-45

https://truckmanualshub.com/

SECTION 4: PTO MOUNTING & PROGRAMMING **4-1**
PTO Mounting 4-1
PTO Clearances 4-6
T680/880 Transmission PTO Application Guide 4-8
PACCAR MX ENGINES - PTO PROGRAMMING:. 4-23

SECTION 5: EXHAUST & AFTERTREATMENT **5-1**
Exhaust and After-treatment Information 5-1
General Guidelines for DEF System 5-3
Measurement Reference Points 5-5
General Exhaust Information 5-9

SECTION 6: FRAME LAYOUTS **6-1**
FRAME LAYOUTS 6-1
Common Optional Components 6-2
FRAME LAYOUT INDEX. 6-4

SECTION 7: BODY MOUNTING **7-1**
FRAME INFORMATION 7-1
Critical Clearances. 7-2
Body Mounting Using Brackets 7-3
Mounting Holes 7-5
BODY MOUNTING USING U–BOLTS 7-6

SECTION 8: FRAME MODIFICATIONS **8-1**
FRAME MODIFICATIONS 8-1
DRILLING RAILS 8-1
MODIFYING FRAME LENGTH 8-2
Changing Wheelbase 8-3
Crossmembers. 8-5
WELDING 8-6
Torque Requirements 8-7

SECTION 9: ELECTRICAL **9-1**
ELECTRICAL 9-1
Body Builder Connection Points 9-3
Lift Axles (Pushers & Tag) 9-19

SECTION 10: ROUTING **10-1**
Routing. 10-1
Routing Requirements 10-2
Vehicle identification labels 10-2

Figures

https://truckmanualshub.com/

FIGURE 2-1: Incomplete Vehicle Certification Document 2-2
FIGURE 2-2: Locations Of Certification Labels - Driver's Door And Frame 2-2
FIGURE 2-3: Aerodynamic Mirror Oat Sensor Location 2-7
FIGURE 2-4: Instrument Cluster For T680/T880. 2-7
FIGURE 3-1: Prospecter Turn Circle Analysis 3-4
FIGURE 4-1: Medium Duty Manual Transmission PTOs 4-1
FIGURE 4-2: Heavy Duty Manual Transmission PTOs 4-1
FIGURE 4-3: Thru-Shaft PTO 4-2
FIGURE 4-4: Allison 4000 Series Transmission PTO Locations. 4-2
FIGURE 4-5: Allison 3000 Series Transmission PTO Locations. 4-2
FIGURE 4-6: REPTO Location Shown 4-3
FIGURE 4-7: PTO Icon 4-3
FIGURE 4-8: PTO Telltale Location 4-4
FIGURE 4-9: Relay Wiring Diagram 4-4
FIGURE 4-10: 2013+ MX-11 And MX-13 Pin-Out 4-5
FIGURE 4-11: 2013+ ISX15, ISX12, PX-9 Pin-Out 4-5
FIGURE 4-12: Single Acting And Dual Acting PTOs 4-13
FIGURE 4-13: Single-Acting Eaton PTO 4-15
FIGURE 4-14: Double-Acting Eaton PTO 4-15
FIGURE 4-15: Allison Transmission-Mounted PTOs 4-16
FIGURE 4-16: Auto Susp Dump W/ Allison Mtd PTO 4-17
FIGURE 4-17: Eoa Reversible PTO Example 4-18
FIGURE 4-18: Air Actuated PTO (No Interlock) 4-18
FIGURE 4-19: Rear Axle Declutch Telltale 4-19
FIGURE 4-20: Split Shaft PTO Example #1 4-19
FIGURE 4-21: Pump Mode Example 4-20
FIGURE 4-22: Sample Chassis Node And EOA Manifold. 4-21
FIGURE 4-23: Wiring Diagram 4-22
FIGURE 4-24: In-Cab PTO Control For T680/T880 4-24
FIGURE 4-25: In-Cab PTO Control – ESA Settings For T680/T880. 4-25
FIGURE 4-25: Hard-Wired Remote PTO Control 4-26
FIGURE 4-27: Hardwired Remote PTO Control – ESA Settings For T680/T880 4-28
FIGURE 4-28: Remote PTO Control Over BCAN With PTO On/Off Switch Hardwired To CECU 4-29
FIGURE 4-29: Remote PTO Control Over BCAN With Hardwired PTO Engagement Feedback To Engine– ESA Settings T680/T880 4-31
FIGURE 4-30: Remote PTO Control Over BCAN With Hardwired PTO Engagement Feedback To Engine – ESA Settings T680/T880 4-32
FIGURE 4-31: Remote PTO Control Over BCAN With PTO On/Off Switch Signal Over BCAN 4-33
FIGURE 4-32: Remote PTO Control Over BCAN With PTO On/Off Switch Signal Over BCAN – ESA Settings For T680/T880 4-35
FIGURE 4-33: Remote PTO Control Over BCAN With PTO On/Off Switch Signal Over BCAN – ESA Settings For T680/T880 4-36
FIGURE 5-1: Measurement Location Of DEF Supply Module (Pump) 5-5
FIGURE 5-2: Measurement Location Of DEF Dosing Module (Injector) 5-5
FIGURE 5-3: Orientation Of Dosing Module. 5-6
FIGURE 5-4: Rh Under Cab Exhaust With Small, Medium, Or Large Tanks 5-6
FIGURE 5-5: Horizontal Exhaust With Small, Medium, Or Large Tanks. 5-7
FIGURE 5-6: Vertical Exhaust With Small, Medium, Or Large Tanks. 5-7
FIGURE 5-7: Routing DEF Lines 5-8
FIGURE 5-8: Supply Module Allowed Clocking Angles. 5-8
FIGURE 5-9: Isometric View Of Right Hand Under DPF/SCR With Single Side Of Cab Tailpipe. 5-10
FIGURE 5-10: Isometric View Of Right Hand Under DPF/SCR With Single Side Of Cab Tailpipe 5-10

https://truckmanualshub.com/

Figures

FIGURE 5-11: Right View Of Right Hand Under DPF/SCR With Single Side Of Cab Tailpipe 5-11
FIGURE 5-12: Back View Of Right Hand Under DPF/SCR With Single Side Of Cab Tailpipe 5-12
FIGURE 5-13: Isometric View Of Right Hand Under DPF/SCR With Dual Side Of Cab Tailpipe 5-12
FIGURE 5-14: Isometric View Of Right Hand Under DPF/SCR With Dual Side Of Cab Tailpipe 5-12
FIGURE 5-15: Right View Of Right Hand Under DPF/SCR With Dual Side Of Cab Tailpipe . 5-13
FIGURE 5-16: Back View Of Right Hand Under DPF/SCR With Dual Side Of Cab Tailpipe . 5-13
FIGURE 5-17: Isometric View Of Right Hand Under DPF/SCR With Single Back Of Cab Tailpipe 5-14
FIGURE 5-18: Isometric View Of Right Hand Under DPF/SCR With Single Back Of Cab Tailpipe 5-14
FIGURE 5-19: Right View Of Right Hand Under DPF/SCR With Single Back Of Cab Tailpipe 5-15
FIGURE 5-20: Back View Of Right Hand Under DPF/SCR With Single Back Of Cab Tailpipe 5-15
FIGURE 5-21: Isometric View Of Right Hand Under DPF/SCR With Ground-Dump Tailpipe 5-16
FIGURE 5-22: Isometric View Of Right Hand Under DPF/SCR With Ground-Dump Tailpipe . 5-16
FIGURE 5-23: Right View Of Right Hand Under DPF/SCR With Ground-Dump Tailpipe . . . 5-17
FIGURE 5-24: Back View Of Right Hand Under DPF/SCR With Ground-Dump Tailpipe . . . 5-17
FIGURE 5-25: Isometric View Of Independent Back Of Cab DPF/SCR With Back Of Cab Tailpipe 5-18
FIGURE 5-26: Isometric View Of Independent Back Of Cab DPF/SCR With Back Of Cab Tailpipe 5-18
FIGURE 5-27: Right View Of Independent Back Of Cab DPF/SCR With Back Of Cab Tailpipe 5-19
FIGURE 5-28: Back View Of Independent Back Of Cab DPF/SCR With Back Of Cab Tailpipe 5-19
FIGURE 5-29: Isometric View Of Horizontal Crossover DPF/SCR With Ground-Dump Tailpipe 5-20
FIGURE 5-30: Isometric View Of Horizontal Crossover DPF/SCR With Ground-Dump Tailpipe 5-20
FIGURE 5-31: Right View Of Horizontal Crossover DPF/SCR With Ground-Dump Tailpipe . 5-21
FIGURE 5-32: Back View Of Horizontal Crossover DPF/SCR With Ground-Dump Tailpipe. . 5-21
FIGURE 5-33: Isometric View Of Right Hand Under DPF/SCR With Single Side Of Cab Tailpipe (52” Sleeper) 5-22
FIGURE 5-34: Isometric View Of Right Hand Under DPF/SCR With Single Side Of Cab Tailpipe (52” Sleeper) 5-22
FIGURE 5-35: Right View Of Right Hand Under DPF/SCR With Single Side Of Cab Tailpipe (52” Sleeper) 5-23
FIGURE 5-36: Rear View Of Right Hand Under DPF/SCR With Single Side Of Cab Tailpipe (52” Sleeper) 5-23
FIGURE 5-37: Isometric View Of Right Hand Under DPF/SCR With Dual Side Of Cab Tailpipe (52” Sleeper) 5-24
FIGURE 5-38: Isometric View Of Right Hand Under DPF/SCR With Dual Side Of Cab Tailpipe (52” Sleeper) 5-24
FIGURE 5-39: Right View Of Right Hand Under DPF/SCR With Dual Side Of Cab Tailpipe (52” Sleeper) 5-25
FIGURE 5-40: Rear View Of Right Hand Under DPF/SCR With Dual Side Of Cab Tailpipe (52” Sleeper) 5-25
FIGURE 5-41: Isometric View Of Right Hand Under DPF/SCR With Single Back Of Sleeper Tailpipe (52” Sleeper) 5-26
FIGURE 5-42: Isometric View Of Right Hand Under DPF/SCR With Single Back Of Sleeper Tailpipe (52” Sleeper) 5-26

Figures

https://truckmanualshub.com/

FIGURE 5-43: Right View Of Right Hand Under DPF/SCR With Single Back Of Sleeper Tailpipe (52" Sleeper) . . . 5-27
FIGURE 5-44: Rear View Of Right Hand Under DPF/SCR With Single Back Of Sleeper Tailpipe (52" Sleeper) . . . 5-27
FIGURE 5-45: Isometric View Of Right Hand Under DPF/SCR With Dual Back Of Sleeper Tailpipes (52" Sleeper) . . . 5-28
FIGURE 5-46: Isometric View Of Right Hand Under DPF/SCR With Dual Back Of Sleeper Tailpipes (52" Sleeper) . . . 5-28
FIGURE 5-47: Right View Of Right Hand Under DPF/SCR With Dual Back Of Sleeper Tailpipes (52" Sleeper) . . . 5-29
FIGURE 5-48: Rear View Of Right Hand Under DPF/SCR With Dual Back Of Sleeper Tailpipes (52" Sleeper) . . . 5-29
FIGURE 5-49: Isometric View Of Horizontal Crossover DPF/SCR With Single Back Of Sleeper Tailpipe (52" Sleeper) . . . 5-30
FIGURE 5-50: Isometric View Of Horizontal Crossover DPF/SCR With Single Back Of Sleeper Tailpipe (52" Sleeper) . . . 5-30
FIGURE 5-51: Right View Of Horizontal Crossover DPF/SCR With Single Back Of Sleeper Tailpipe (52" Sleeper) . . . 5-31
FIGURE 5-52: Rear View Of Horizontal Crossover DPF/SCR With Single Back Of Sleeper Tailpipe (52" Sleeper) . . . 5-31
FIGURE 5-53: Isometric View Of Horizontal Crossover DPF/SCR With Dual Back Of Sleeper Tailpipes (52" Sleeper) . . . 5-32
FIGURE 5-54: Isometric View Of Horizontal Crossover DPF/SCR With Dual Back Of Sleeper Tailpipes (52" Sleeper) . . . 5-32
FIGURE 5-55: Right View Of Horizontal Crossover DPF/SCR With Dual Back Of Sleeper Tailpipes (52" Sleeper) . . . 5-33
FIGURE 5-56: Rear View Of Horizontal Crossover DPF/SCR With Dual Back Of Sleeper Tailpipes (52" Sleeper) . . . 5-34
FIGURE 5-57 . . . 5-34
FIGURE 5-58: Dimension A = Top Of Rail Frame Height From Prospector – Frame Depth. . . 5-35
FIGURE 6-1: Def Tank Dimensions. . . . 6-3
FIGURE 7-1: Minimum Clearance Between Top Of Rear Tires And Body Structure Overhang. 7-2
FIGURE 7-2: Minimum Back Of Cab Clearance . . . 7-3
FIGURE 7-3: Spacer Between Frame Sill And Body Rail - Rubber Or Plastic . . . 7-4
FIGURE 7-4: High Compression Spring . . . 7-4
FIGURE 7-5: Rubber Spacer Between Brackets Between The Mounting Bolt And Upper Bracket . . . 7-4
FIGURE 7-6: Crossmember-Gusset Hole Pattern Requirements: [Inch (Mm)] . . . 7-5
FIGURE 7-7: Acceptable U-Bolt Mounting With Wood And Fabricated Spacers [Inch (Mm)] . 7-6
FIGURE 7-8: Clearance Space For Air Lines And Cables . . . 7-7
FIGURE 7-9: Example Of Fishplate Bracket At Rear End Of Body, Used With U-Bolts . . . 7-8
FIGURE 8-1: Detail Of Frame Extension And Joint Welding . . . 8-2
FIGURE 8-2: Frame Insert. . . . 8-3
FIGURE 8-3: Comparison Of Original, Shortened, And Extended Wheelbases. . . . 8-4
FIGURE 8-4: Crossmember Added When Distance Exceeds 60 Inches (1524 Mm) . . . 8-5
FIGURE 9-1: Namux 4 System Diagram . . . 9-1
FIGURE 9-2: Diagnostic Connector Comparison . . . 9-2
FIGURE 9-3: 2016+ Service Environment. . . . 9-2
FIGURE 9-4: 12 Pin Connector . . . 9-3
FIGURE 9-5: Spare Circuit Connector Detail . . . 9-3
FIGURE 9-6: Grounding Buss Bar Design . . . 9-4
FIGURE 9-7: Grounding Point - Cab Interior Behind Driver's Side Kick Panel . . . 9-4
FIGURE 9-8: Grounding Point - Cab Exterior Lh Side Of Firewall. . . . 9-4
FIGURE 9-9: Spare Circuit Location Under-Dash (P096) . . . 9-6
FIGURE 9-10: Spare Circuit Location On Power Distribution Center (Dash-Side, P001) . . . 9-7
FIGURE 9-11: Spare Circuit Diagram (P001 And P096) . . . 9-8

https://truckmanualshub.com/

Figures

FIGURE 9-12: Electric Engaged Equipment Connector 9-9
FIGURE 9-13: Air Solenoid Bank And Chassis Node 9-9
FIGURE 9-14: Rear Axle Controls And Sensors Connector. 9-10
FIGURE 9-15: B-Can Connector 9-10
FIGURE 9-16: Chassis Harness From Cab Mount To Front Of Frame 9-11
FIGURE 9-17: Chassis Harness From Cab Mount To Boc 9-12
FIGURE 9-18: Connectors Near Front Cab Mount 9-12
FIGURE 9-19: Connector Near Boc 9-13
FIGURE 9-20: Vcan Connectors. 9-13
FIGURE 9-21: Firewall Connectors 9-13
FIGURE 9-22: Chassis Node And Electric Over Air Solenoid Bank. 9-14
FIGURE 9-23: Installing Additional Switches Onto The Chassis Side. 9-15
FIGURE 9-24: Installing Additional Gauges On The Dash 9-16
FIGURE 9-25: Installing Sensors On The Chassis Side For Gauges 9-17
FIGURE 9-26: Typical Installation Of Sensors Diagram 9-18
FIGURE 9-27: Spare Power Connector 9-18
FIGURE 9-28: Truck Lift Axles (Separate Switches). 9-19
FIGURE 9-29: Truck Lift Axles (Single Switch) 9-19
FIGURE 9-30: Eoa Trailer Lift Axles 9-20
FIGURE 9-31: Mx-13 Connection Location. 9-22
FIGURE 9-32: Mx-11 Connection Location. 9-22
FIGURE 9-33: Isx15 Connection Location. 9-23
FIGURE 9-34: Isx12 Connection Location: 9-23
FIGURE 9-35: Mating Connector: Packard Pn 12020786 9-30
FIGURE 9-36: Junction Box Boc Or Eof 9-30
FIGURE 9-37: Dash Access 9-31
FIGURE 9-38: Engine Access 9-31
FIGURE 9-39: J1939 Access 9-32
FIGURE 9-40: J1939 Access 9-32
FIGURE 9-41: J1939 Access 9-33
FIGURE 9-42: Trim Panel Removal 9-34
FIGURE 9-43: Gauge Installation 9-34
FIGURE 9-44: Switch Installation 9-35
FIGURE 9-45: Cluster Removal 9-35
FIGURE 9-46: Telltale Installation Diagnostics & Service Tool Connection 9-36
FIGURE 10-1: Clamp And Butterfly Clamp 10-1
FIGURE 10-2: Butterfly Tie 10-1
FIGURE 10-3: Tie Strap 10-1
FIGURE 10-4: Heavy Duty (Hd) Mount. 10-2
FIGURE 10-5: Definition Of Measurements.. 10-4

Tables

https://truckmanualshub.com/

TABLE 3-1. Abbreviations Used 3-1
TABLE 3-2. Turning Radius 3-1
TABLE 3-3. Ride Heights. 3-24
TABLE 3-4. Rear Suspension Options 3-27
TABLE 3-18. Axle Width Calculation. 3-45
TABLE 3-19. Ground Clearance for Fuel Tanks 3-47
TABLE 3-20. Ground Clearance for Battery Boxes 3-48
TABLE 4-1. 4-9
TABLE 4-2. 4-10
TABLE 4-3. 4-11
Table 4-4. Current single-acting PTOs include: 4-14
Table 4-6. Reversible PTO States to Ports 4-18
Table 4-7. In cab PTO Control – ESA Settings for T680/T880. 4-24
Table 4-8 In-Cab PTO Control – PEP Settings 4-26
Table 4-9. J1939 signals from CECU (SA 0x31) to Engine over VCAN 4-27
Table 4-10. Hard-wired Remote PTO Control – ESA Settings for T680/T880 4-27
Table 4-11. Hardwired Remote PTO Control – PEP Settings 4-29
Table 4-12. J1939 signals from CECU (SA 0x31) to Engine over VCAN 4-30
Table 4-13. Engine Fault Codes 4-30
Table 4-14 4-30
Table 4-15. Hardwired Remote PTO Control – PEP Settings 4-32
Table 4-16. J1939 signals from CECU (SA 0x31) to Engine over VCAN 4-34
Table 4-17 4-34
Table 4-18. Hardwired Remote PTO Control – PEP Settings 4-37
TABLE 5-1. 5-3
Table 5-2. 5-34
TABLE 6-1. 6-1
TABLE 6-2. Fuel Tank Overall Length (in) 6-2
TABLE 6-3. Battery Box Centerframe Lengths (in) 6-2
TABLE 6-5. . . . . . **6-8**
TABLE 6-6. . . . . . **6-9**
TABLE 6-7. . . . . . **6-10**
TABLE 6-8. . . . . . **6-11**
TABLE 6-9. . . . . . **6-12**
TABLE 6-10. . . . . . **6-13**
TABLE 6-11. . . . . . **6-14**
TABLE 6-12. . . . . . **6-15**
TABLE 6-13. . . . . . **6-16**
TABLE 6-14. . . . . . **6-17**
TABLE 6-15. . . . . . **6-18**
TABLE 6-16. . . . . . **6-19**
TABLE 6-17. . . . . . **6-20**
TABLE 6-18. . . . . . **6-21**
TABLE 6-19. . . . . . **6-22**
TABLE 6-20. . . . . . **6-23**
TABLE 6-21. . . . . . **6-24**
TABLE 6-22. . . . . . **6-25**
TABLE 6-23. . . . . . **6-26**
TABLE 6-24. . . . . . **6-27**
TABLE 6-25. . . . . . **6-28**
TABLE 6-26. . . . . . **6-29**
TABLE 6-27. . . . . . **6-30**
TABLE 6-28. . . . . . **6-31**
TABLE 6-29. . . . . . **6-32**

https://truckmanualshub.com/

Tables

TABLE 6-30. 6-33
TABLE 7-1. Single Steel Rails 7-1
TABLE 7-2. Inserted Steel Rails 7-1
TABLE 8-1. Customary Grade 8 UNF or UNC. 8-7
TABLE 8-2. U.S. Customary – Grade 8. Metric Class 10.9 8-7
TABLE 9-1: Wire Number General Categories 9-5
TABLE 9-2. Truck Lift Axle Logic 9-20
TABLE 9-3. Air Solenoid Types 9-20
TABLE 9-4. MX engine (P111C/J111C) 9-21
TABLE 9-5. ISX Remote Throttle/PTO Connector P111A/J111A: 9-23
TABLE 9-6. EoA Chassis Node Guide 9-24
TABLE 9-7. EoA CECU Guide. 9-24
TABLE 9-8. CECU Parameters 9-25
TABLE 9-9. Interlocks 9-27
TABLE 10-1. Exhaust – System Clearance 10-4

https://truckmanualshub.com/

This page intentionally left blank.

https://truckmanualshub.com/

Section 1
Introduction



This manual was created to provide body builders with appropriate information and guidelines useful in the body planning and installation process. This information will be helpful when installing bodies or other associated equipment.

This manual contains appropriate dimensional information, guidelines for mounting bodies, guidelines for modifying frames, electrical wiring information, and other information useful in the body installation process. This manual is specific to chassis with 2013 EPA emissions engines.

The Body Builder Manual can be very useful when specifying a vehicle, particularly when the body builder is involved in the vehicle definition and ordering process. Early in the process, professional body builders can often contribute valuable information that reduces the ultimate cost of the body installation.

In the interest of continuing product development, Kenworth reserves the right to change specifications or products at any time without prior notice. It is the responsibility of the user to ensure that he is working with the latest released information. Check Kenworth.com for the latest released version.

If you require additional information or reference materials, please contact your local Kenworth dealer.

https://truckmanualshub.com/

This page intentionally left blank.

https://truckmanualshub.com/

SAFETY SIGNALS

We've put a number of alerting messages in this book. Please read and follow them. They are there for your protection and information. These alerting messages can help you avoid injury to yourself or others and help prevent costly damage to the vehicle.

Key symbols and "signal words" are used to indicate what kind of message is going to follow. Pay special attention to comments prefaced by "WARNING", "CAUTION", and "NOTE." Please don't ignore any of these alerts.

Warnings, cautions, and notes

WARNING



When you see this word and symbol, the message that follows is especially vital. It signals a **potentially hazardous situation** which, if not avoided, could result in death or serious injury. This message will tell you what the hazard is, what can happen if you don't heed the warning, and how to avoid it.

Example:

WARNING! Be sure to use a circuit breaker designed to meet liftgate amperage requirements. An incorrectly specified circuit breaker could result in a electrical overload or fire situation. Follow the liftgate installation instructions and use a circuit breaker with the recommended capacity.

CAUTION



Signals a **potentially hazardous situation** which, if not avoided, could result in minor or moderate injury or damage to the vehicle.

Example:

CAUTION: Never use a torch to make a hole in the rail. Use the appropriate drill bit.

NOTE



Provides general information: for example, the note could warn you on how to avoid damaging your vehicle or how to drive the vehicle more efficiently.

Example:

Note: Be sure to provide maintenance access to the battery box and fuel tank fill neck.

Please take the time to read these messages when you see them, and remember:

WARNING
Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION
Signals a potentially hazardous situation which, if not avoided, could result in minor or moderate injury or damage to the vehicle.

NOTE
Useful information that is related to the topic being discussed.

https://truckmanualshub.com/

FEDERAL MOTOR VEHICLE SAFETY STANDARDS COMPLIANCE

As an Original Equipment Manufacturer (OEM), Kenworth Truck Co. ensures that our products comply with all applicable U.S. or Canadian Federal Motor Vehicle Safety Standards. However, the fact that this vehicle has no fifth wheel and that a Body Builder (Intermediate or Final Stage Manufacturer) will be doing additional modifications means that the vehicle was incomplete when it left the build plant. See next section and Appendix A for additional information.

Incomplete Vehicle Certification

An Incomplete Vehicle Document is shipped with the vehicle, certifying that the vehicle is not complete. See Figure 2–1. In addition, affixed to the driver's side door frame or edge is an Incomplete Vehicle Certification label. See Figure 2–2. For further information on Vehicle Certification and Identification, see APPENDIX A "VEHICLE IDENTIFICATION."

NOTE

These documents list the U.S. or Canadian Federal Motor Vehicle Safety Standard regulations that the vehicle complied with when it left the build plant. You should be aware that if you add, modify or alter any of the components or systems covered by these regulations, it is your responsibility as the Intermediate or Final Stage Manufacturer to ensure that the complete vehicle is in compliance with the particular regulations upon completion of the modifications.



FIGURE 2-1. Incomplete Vehicle Certification Document

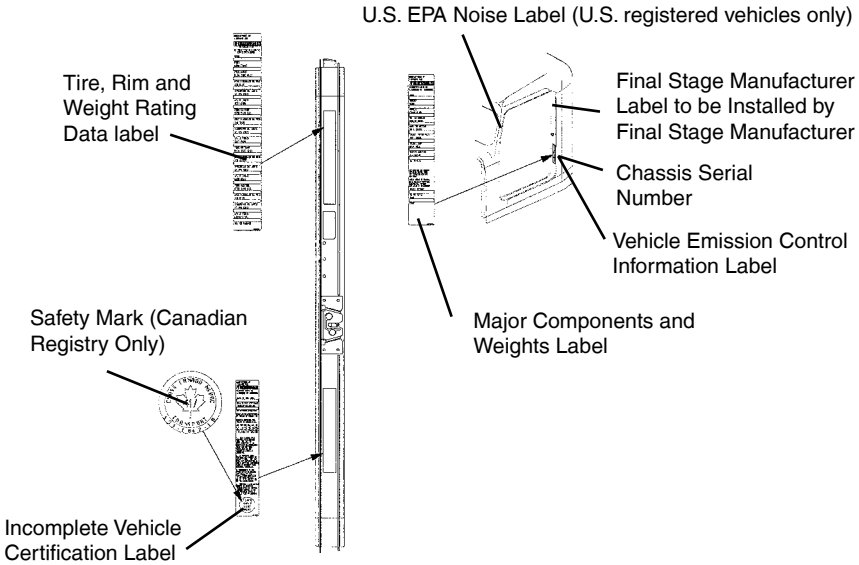


FIGURE 2-2. Locations of Certification Labels - Driver's Door and Frame

As the Intermediate or Final Stage Manufacturer, you should retain the Incomplete Vehicle Document for your records. In addition, you should record and retain the manufacturer and serial number of the tires on the vehicle. Upon completion of the vehicle (installation of the body and any other modifications), you should affix your certification label to the vehicle as required by Federal law. This tag identifies you as the "Intermediate or Final Stage Manufacturer" and certifies that the vehicle complies with Federal Motor Vehicle Safety Standards. (See Figure 2–2.) Be advised that regulations affecting the intermediate and final stage manufacturer may change without notice. Ensure you are referencing the most updated copy of the regulation during the certification and documentation processes.

In part, if the final stage manufacturer can complete and certify the vehicle within the instruction in the incomplete vehicle document (IVD) the certification label would need a statement that reads, "This vehicle has been completed in accordance with the prior manufacturers, IVD where applicable. This vehicle conforms to all applicable Federal Motor Vehicle Safety Standards [and Bumper and Theft Prevention Standards if applicable] in effect in (month, year)."

However, if the vehicle can not be completed and certified with in the guidance provided in the IVD, the final stage manufacturer must ensure the vehicle conforms to all applicable Federal Motor Vehicle Safety Standards (FMVSS). The final stage manufactures certification label would need a statement that reads, "This vehicle conforms to all applicable Federal Motor Vehicle Safety Standards [and Bumper and Theft Prevention Standards if applicable] in effect in (month, year)."

https://truckmanualshub.com/

These statements are just part of the changes to the new certification regulation. Please refer to the Feb 15, 2005 final rule for all of the details related to this regulation. You can contact NTEA Technical Services Department at 1-800-441-NTEA for a copy of the final rule (DocID 101760).

For Canadian final stage manufacturers see:

http://www.gazette.gc.ca/index-eng.html; and
http://www.tc.gc.ca/eng/acts-regulations/menu.htm for the regulations.

Or contact:

Transport Canada
Tower C, Place de Ville, 330 Sparks Street
Ottawa, Ontario K1A 0N5
(613) 990-2309
TTY: 1-888-675-6863

Noise and Emissions Requirements

NOTE

This truck may be equipped with specific emissions control components/systems* in order to meet applicable Federal and California noise and exhaust emissions requirements. Tampering with these emissions control components/systems* is against the rules that are established by the U.S Code of Federal Regulations, Environment Canada Regulations and California Air Resources Board (CARB). These emissions control components/systems* may only be replaced with original equipment parts.

Additionally, most vehicles in North America will be equipped with a Greenhouse Gas (GHG) “Vehicle Emission Control Information” door label indicating its certified configuration. The vehicle components listed on this label are considered emission control devices.

Modifying (i.e. altering, substituting, relocating) any of the emissions control components/systems defined above will affect the noise and emissions performance/certification. Modifications that alter the overall shape and aerodynamic performance of a tractor will also affect the emission certification. If modifications are required, they must first be approved by the manufacturer. Unapproved modifications could negatively affect emissions performance/certification. There is no guarantee that proposed modifications will be approved.

Tires may be substituted provided the new tires possess a Coefficient of rolling resistance (Crr) equal to or lower than Crr of the original tires. Consult with your tire supplier(s) for appropriate replacement tires.

Contact the engine manufacturer for any requirements and restrictions **prior** to any modifications.

- For Cummins Contact 1-800-DIESELS or your local Cummins distributor. Reference AEB 21.102.

It is possible to relocate the DEF tank, however the relocation requirements need to be followed. Any variance from the relocation requirements may cause the emissions control components/systems to operate improperly potentially resulting in engine de-rate. See page 4-3 for relocation requirements.

NOTE

All 2013 engine emissions certified vehicles will be equipped with an On-Board Diagnostics (OBD) system. The OBD system is designed to detect malfunctions of any engine or vehicle component that may increase exhaust emissions or interfere with the proper performance of the OBD system itself.

https://truckmanualshub.com/

All diesel engines will be equipped with an On-Board Diagnostics (OBD) system. The OBD system consists of computer program on one or more of the vehicle's Electronic Control Units (ECUs). This program uses information from the control system and from additional sensors to detect malfunctions. When a malfunction is detected, information is stored in the ECU(s) for diagnostic purposes. A Malfunction Indicator Light (MIL) is illuminated in the dash to alert the driver of the need for service of an emission-related component or system.

To ensure compliance to emissions regulations, the final configuration of certain features of the completed vehicle must meet specific requirements. This section describes requirements relevant for only the most common or critical modifications done by body builders. For a complete description of acceptable modifications, see the application guidance available from the manufacturer of the engine installed in the chassis.

Fuel System

The following are highlights of some of the more common or critical aspects of this system.

The overall system restriction may not exceed the restriction limitations set forth by the engine manufacturer for both supply and return.

- Ensure that fuel lines are not pinched or can potentially be damaged when installed between body and frame
- Fuel lines must be routed and secured without dips or sags
- There must be easy access to filter(s) and fill cap
- The tank vent may not obstructed
- Added accessories (heaters, generators) cannot introduce air into system
- Fuel tank must be located so that the full level is not above cylinder head
- "Ultra Low Sulfur Fuel Only" labels must be present on the dash and fuel fill
- Modification of the pressure side secondary filter and plumbing is not allowed without engine manufacturer approval
- Body installation of fuel tank or routing of lines must not cause significant increase in fuel temperature
- Fuel hoses shall meet or exceed OEM supplied hose material construction specifications

Compressed Air System

The following are highlights of some of the more common or critical aspects of this system.

- Air system modification must meet applicable FMVSS regulations
- Compressed Air tank may not be modified (exception – addition or removal of fittings or relocation of the tank)
- Added devices or bodywork may not interfere with or rub air lines
- Air supply to the engine doser may not be restricted or disconnected
- Air lines should be routed, protected from heat, and properly secured to prevent damage from other components
- Care should be taken so that air lines do not rub against other components
- Care should be taken to protect the air system from heat sources.

https://truckmanualshub.com/

Exhaust and Exhaust After-treatment System

The following are highlights of some of the more common or critical aspects of this system.

- The following after-treatment and exhaust system components may not be modified:
  - DPF assembly
  - SCR Catalyst assembly
  - Exhaust pipes between the engine and after-treatment devices (DPF, SCR Catalyst) and between after-treatment devices
  - NO_x Sensor
- The following modifications may only be done within the guidelines of the “DEF System Relocation Guide.”
  - Modifications to Diesel Exhaust Fluid (DEF) throttle, suction, or pressure lines
  - Modification or relocation of the DEF tank
  - Modification of coolant lines to and from the DEF tank
- All DEF and coolant lines should be routed, protected, and properly secured to prevent damage during vehicle operation or other components
- If relocation of the DCU or ACM is necessary, use existing frame brackets and mount inside of frame flanges where necessary. Do not extend the harnesses
- The DPF, the SCR catalyst, or their mounting may not be modified
- The NO_x sensor may not been relocated or altered in any way
- Exhaust pipes used for tailpipes/stacks must be properly sized, and must prevent water from entering
- Ensure adequate clearance between the exhaust and body panels, hoses, and wire harnesses
- The body in the vicinity of the DPF must be able to withstand temperatures up to 400°C (750°F)
- Do not add thermal insulation to the external surface of the DPF
- The SCR water drain hole may not be blocked
- Allow adequate clearance (25mm (1 inch)) for servicing the DPF sensors, wiring, and clamped joints
- Drainage may not come in contact with the DPF, SCR catalyst, sensors or wiring
- Allow sufficient clearance for removing sensors from DPF. Thermistors require four inches. Other sensors require one inch
- Wiring should be routed, protected from heat, and properly secured to prevent damage from other components
- The exhaust system from an auxiliary power unit (APU) must not be connected to any part of the vehicle after-treatment system or vehicle tail pipe.

Cooling System

The following are highlights of some of the more common or critical aspects of this system.

- Modifications to the design or locations of fill or vent lines, heater or defroster core, and surge tank are not recommended
- Additional accessories plumbed into the engine cooling system are not permitted, at the risk of voiding vehicle warranty
- Coolant level sensor tampering will void warranty

https://truckmanualshub.com/

- When installing auxiliary equipment in front of the vehicle, or additional heat exchangers, ensure that adequate air flow is available to the vehicle cooling system. Refer to engine manufacturer application guidelines for further detail
- When installing FEPTO drivelines, the lower radiator anti-recirculation seal must be retained with FEPTO driveline clearance modification only
- Changes made to cooling fan circuit and controls are not allowed, with the exception of AC minimum fan on time parameter
- See owner's manual for appropriate winter front usage

Electrical System

The following are highlights of some of the more common or critical aspects of this system.

- Electrical harnesses providing battery power and electronic control signals to engine and emissions control/vehicle OBD components including datalinks may not be spliced. These emissions control/vehicle OBD components include the following:
  - throttle pedal
  - vehicle speed sensor
  - after-treatment wiring
- If the alternator or battery is substituted, it must meet the requirements of the engine manufacture's guidelines. This includes alternator ground voltage drop and alternator ground cable effectiveness. See the engine manufacture's guidelines for recommended test procedure. Additionally the maximum voltage differential and the peak-peak voltage differential between the engine ECM block ground stud and battery negative terminal may not exceed 500 mV under any combination of loads or operating conditions.
- Only an OBD compliant battery disconnect switch may be installed on vehicles equipped EPA 2013 and beyond compliant diesel engines. An OBD compliant switch and harness, even in the off position, supply a small amount of power to the engine controller and enable certain emissions critical functions (e.g. DEF line purge). Any modifications to the electrical system which interrupt this power supply will cause OBD fault codes and illumination of the MIL. In addition, such a modification will render the engine non-compliant with certain emission regulations. As a general rule of thumb, you can remove and replace a battery disconnect switch on a truck equipped with a battery disconnect switch at the factory. However, if a battery disconnect switch was not installed in the factory a significant harness modification is required before a battery disconnect switch can be added. Installation of aftermarket transfer-cases must address the vehicle speed sensor position. The standard position of the speed sensor is at the transmission tail shaft. When a transfer-case is added it is best to relocate the sensor to the axle side output shaft of the transfer-case. This is typically accomplished by adding a tone wheel into the driveline yoke assembly.
- Wiring extensions for the after-treatment wiring are available for relocating the DEF tank from your dealer via Paccar Parts. For relocation of DEF tank, refer to the after-treatment section of this manual.
- The emission system requires an accurate Outside Air Temperature (OAT) reading in order to properly run its control algorithms. The OAT sensor is located in the driver's side mirror assembly on Kenworth trucks and is shown in the figures below. If the body builder needs to modify the mirror assembly in any way, it is important the OAT sensor stay positioned on the mirror assembly. Running the vehicle without the OAT sensor connected will cause the MIL lamp to illuminate. If needed, a replacement sensor can be ordered from your Kenworth dealer.

https://truckmanualshub.com/



FIGURE 2-3: Aerodynamic Mirror OAT Sensor Location

- Coolant Sensor considerations are given in the Cooling section above
- The OBD/Diagnostic connector port is located below the dash to the left of the steering wheel. This connector and its location may not be changed.
- All vehicles equipped with EPA 2013 compliant diesel and bi-fueled engines must be equipped with a Malfunction Indicator Lamp (MIL) lamp. This lamp is required to be an engine outline symbol as defined by ISO (International Standards Organization). The figure below shows the instrument cluster and MIL lamp position. Note this lamp location is fixed with respect to the controls and its location may not be changed if you are updating the warning lamp cards.

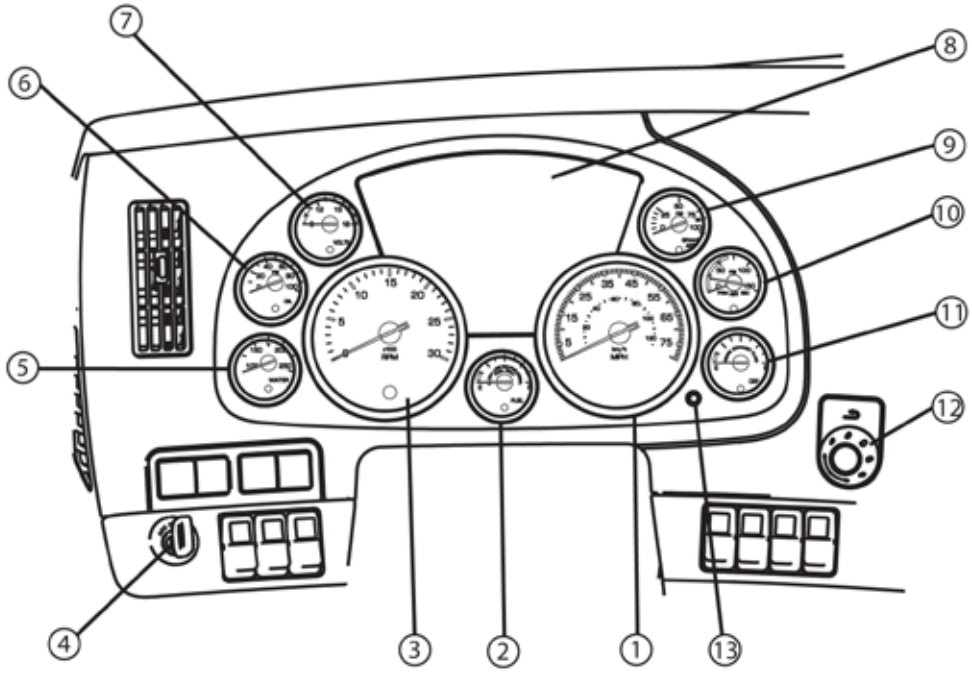


FIGURE 2-4: Instrument Cluster for T680/T880 used with EPA 2013 Emission compliant engines. The Check Engine lamp and/or the MIL will appear in the Driver Performance Center (#8). See T680/T880 Operator's Manual for more information.

- In addition to the sensors and lamps above, the emission system also depends on signals from the exhaust DPF (Diesel Particulate Filter), SCR (Selective Catalytic Reduction), and NOx sensor. Wiring between these devices, the Dosing Control Unit (DCU) and engine ECM should not be tampered with or altered in any way.

https://truckmanualshub.com/

Air Intake System

The following are highlights of some of the more common or critical aspects of this system.

- The air intake screen may not be blocked, either fully or partially
- Modification to the air intake system may not restrict airflow. For example, pipe diameter may not be reduced
- All sensors must be retained in existing locations
- To retain system seal, proper clamp torque must be used. Refer to service manual for proper clamp torque

Charge Air Cooler System

The following are highlights of some of the more common or critical aspects of this system.

- The Charge Air Cooler may not be modified
- The installation of engine overspeed shutdown devices must not introduce restriction in the intake system
- All plumbing associated with the charge air cooler may not be modified

https://truckmanualshub.com/

DIMENSIONS

This section has been designed to provide enough information to successfully layout chassis in the body planning process. Optional equipment may not be depicted. Please contact your local Kenworth dealer if more dimensional information is desired.

ABBREVIATIONS

Throughout this section, and in other sections as well, abbreviations are used to describe certain characteristics on your vehicle. The chart below lists the abbreviated terms used.

TABLE 3-1. Abbreviations Used

CA	BACK OF CAB TO CENTERLINE OF REAR AXLE OR CENTERLINE OF TANDEMS ON TANDEM SUSPENSION
EOF	FRAME RAIL OVERHANG BEHIND REAR AXLE – MEASURED FROM THE CENTERLINE OF TANDEMS
FS	FRONT SUSPENSION HEIGHT
RS	REAR SUSPENSION HEIGHT
WB	WHEELBASE
SOC	SIDE OF CAB
BOC	BACK OF CAB

TURNING RADIUS

Approximate turning radius specifications are listed in the following tables as a general guide. It is important to note that optional components may alter the results.

TABLE 3-2. Turning Radius

Model	Steering Gear	Front Axle	Front Wheel	Front Tire	Rear Suspension	Wheel Base (in.)	Turning Radius (ft)
T680/T880	Single Gear HD94 or THP60	Dana Spicer E-1202I 12K or E13221 13.2K	Accuride 50487 or Alcoa 88367 22.5 X 8.25	295/75R22.5	Tandem 52” Axle Spacing	181	26.7
						193	26.9
						201	28.0
						213	29.7
						220	30.6
						232	32.3
						240	33.4
						252	35.0
						260	36.1
						272	37.7
						280	38.8
						291	40.4
						303	42.0
						323	44.7
						331	45.8

TABLE 3-2 CONTINUES ON NEXT PAGE…

https://truckmanualshub.com/

TABLE 3-2 CONTINUED

Model	Steering Gear	Front Axle	Front Wheel	Front Tire	Rear Suspension	Wheel Base (in.)	Turning Radius (ft)
T680/T880	Single Gear HD94 or THP60	Meritor MFS12 or MFS13 Dana Spicer E-12021 12K or E-13221 13.2K	Accuride 50487 or Alcoa 88367 22.5 X 8.25	11R22.5	Tandem 52” Axle Spacing	181	26.9
						193	27.4
						201	28.5
						213	30.2
						220	31.2
						232	32.9
						240	34.0
						252	35.7
						260	36.8
						272	38.4
						280	39.6
						291	41.1
						303	42.8
						323	45.6
						331	46.7
T880	Single Gear SD110 or TAS85	Meritor MFS14 Dana Spicer E-14621	Alcoa 89365 22.5 X 9	315/80R22.5	Tandem 52” Axle Spacing	181	26.9
						193	26.9
						201	27.9
						213	29.6
						220	30.5
						232	32.2
						240	33.2
						252	34.0
						260	35.1
						272	36.7
						280	37.8
						291	39.2
						303	40.8
						323	43.4
						331	44.5
T880	Dual Gears HD94 or THP60	Meritor MFS20 Standard Track Dana Spicer D2000 20K Standard Track	Alcoa 89365 22.5 X 9	315/80R22.5	Tandem 52” Axle Spacing	181	28.1
						193	28.6
						201	29.7
						213	31.5
						220	32.5
						232	34.2
						240	35.3
						252	35.2
						260	36.3
						272	38.0
						280	39.1
						291	40.6
						303	42.2
						323	45.0
						331	46.0

TABLE 3-2 CONTINUES ON NEXT PAGE…

https://truckmanualshub.com/

TABLE 3-2 CONTINUED

Model	Steering Gear	Front Axle	Front Wheel	Front Tire	Rear Suspension	Wheel Base (in.)	Turning Radius (ft)
T880	Dual Gears HD94 or THP60	Meritor MFS20 Standard Track Dana Spicer D2000 20K Standard Track	Alcoa 82362 22.5 X 12.25	385/65R22.5	Tandem 52” Axle Spacing	181	28.1
						193	28.6
						201	29.8
						213	31.5
						220	32.5
						232	34.2
						240	35.4
						252	35.3
						260	36.4
						272	38.0
						280	39.1
						291	40.6
						303	42.2
						323	45.0
						331	46.1
T880	Dual Gears HD94 or THP60	Meritor MFS20 Standard Track Dana Spicer D2000 20K Standard Track	Alcoa 82362 22.5 X 12.25	425/65R22.5	Tandem 52” Axle Spacing	181	28.1
						193	28.6
						201	29.8
						213	31.5
						220	32.5
						232	34.2
						240	35.4
						252	36.7
						260	37.8
						272	39.5
						280	40.7
						291	42.2
						303	43.9
						323	46.8
						331	47.9

https://truckmanualshub.com/

Prospector Turn Circle Analysis:

Please see Figure 3-2 as an example of Kenworth's turn circle calculation made in Prospector for your specific chassis. Your local Kenworth dealer can provide this information to you.

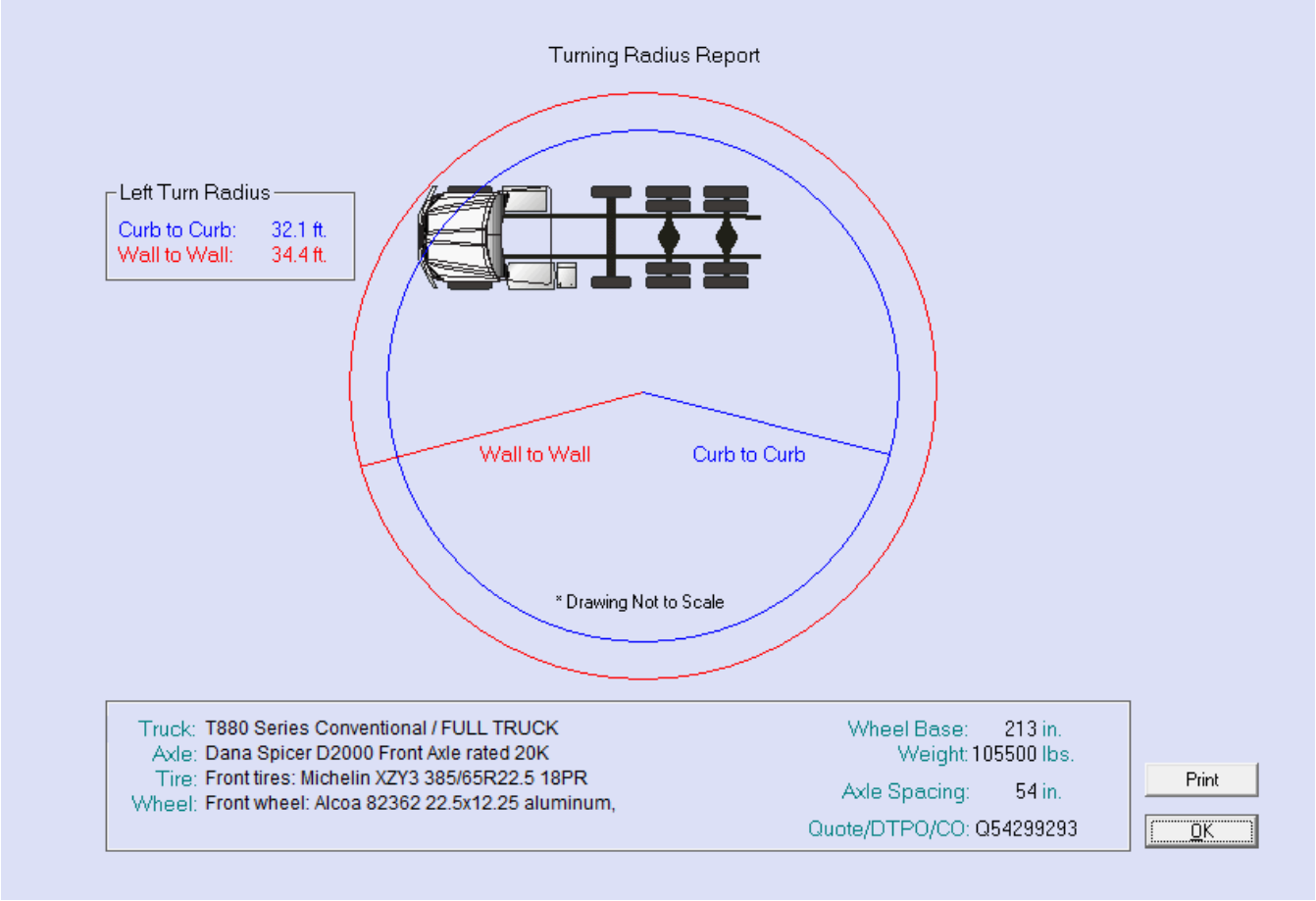


FIGURE 3-1. Prospecter Turn Circle Analysis

Please consult your local Kenworth Dealer for this information, as it is chassis specific.

https://truckmanualshub.com/

OVERALL DIMENSIONS

This section includes drawings and charts of the following Class 8 models: T680 and T880, including 40”, 52”, and 76” sleepers

On the pages that follow, detail drawings show particular views of each vehicle, all dimensions are in inches (in). They illustrate important measurements critical to designing bodies of all types. See the “Contents” at the beginning of the manual to locate the drawing that you need.

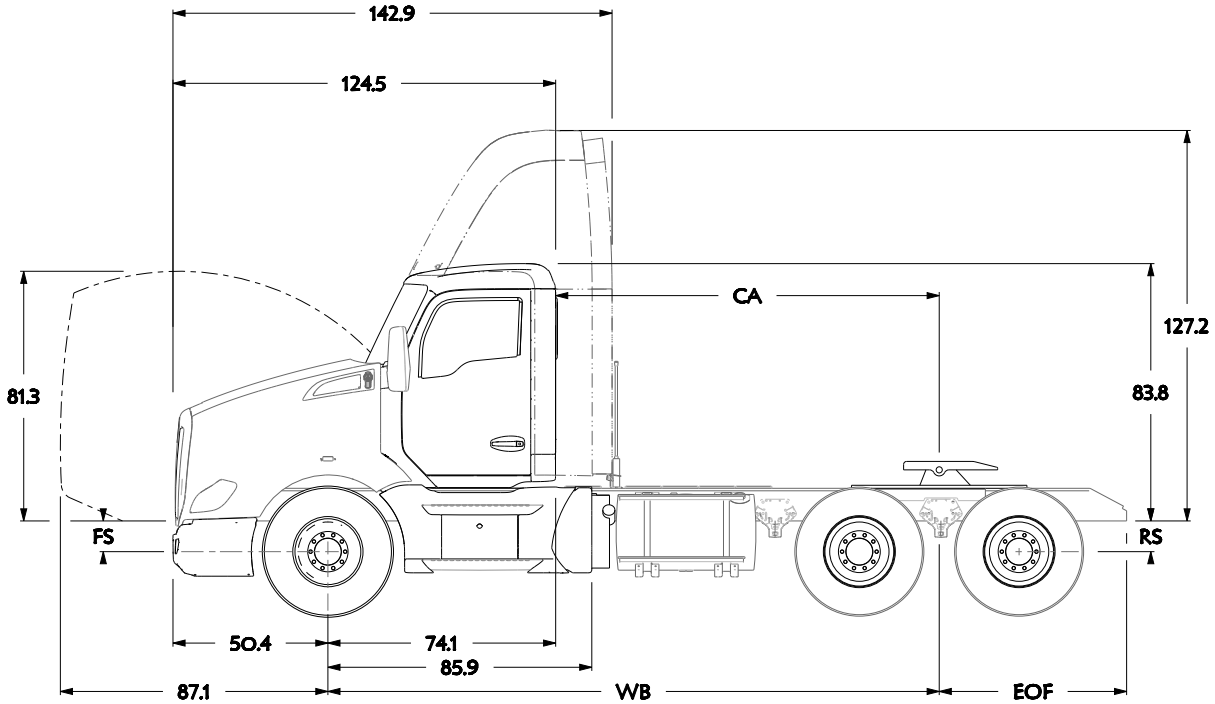
Note: To determine overall height please locate the chart Table 3-3 on page 3-12 and add that value to the height. All heights are given from the bottom of the frame rail.

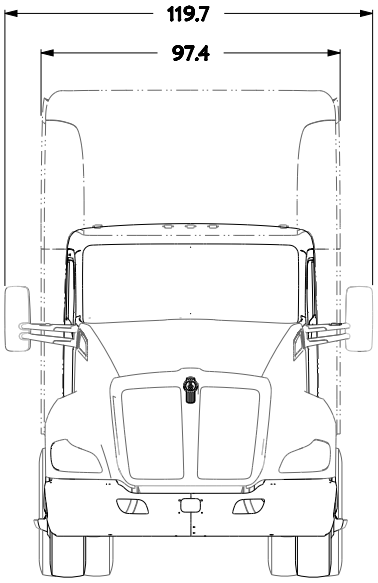
Kenworth also offers .dxf files and frame layouts of ordered chassis four weeks prior to build. Please speak with your salesman to request this feature when specifying your chassis.

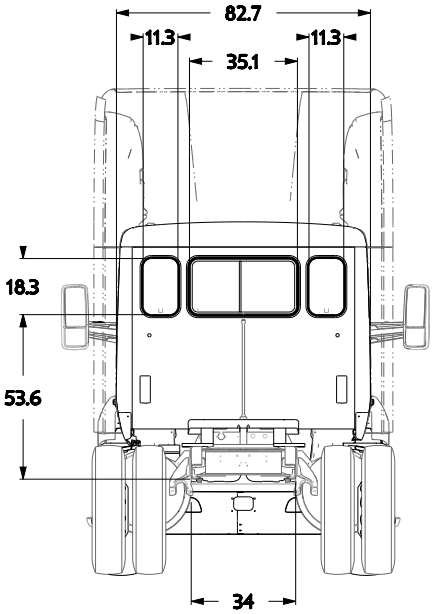
https://truckmanualshub.com/

T680 STANDARD HOOD DAYCAB

The following drawings are of a standard T680 Standard Hood Daycab, shown with standard chassis components.



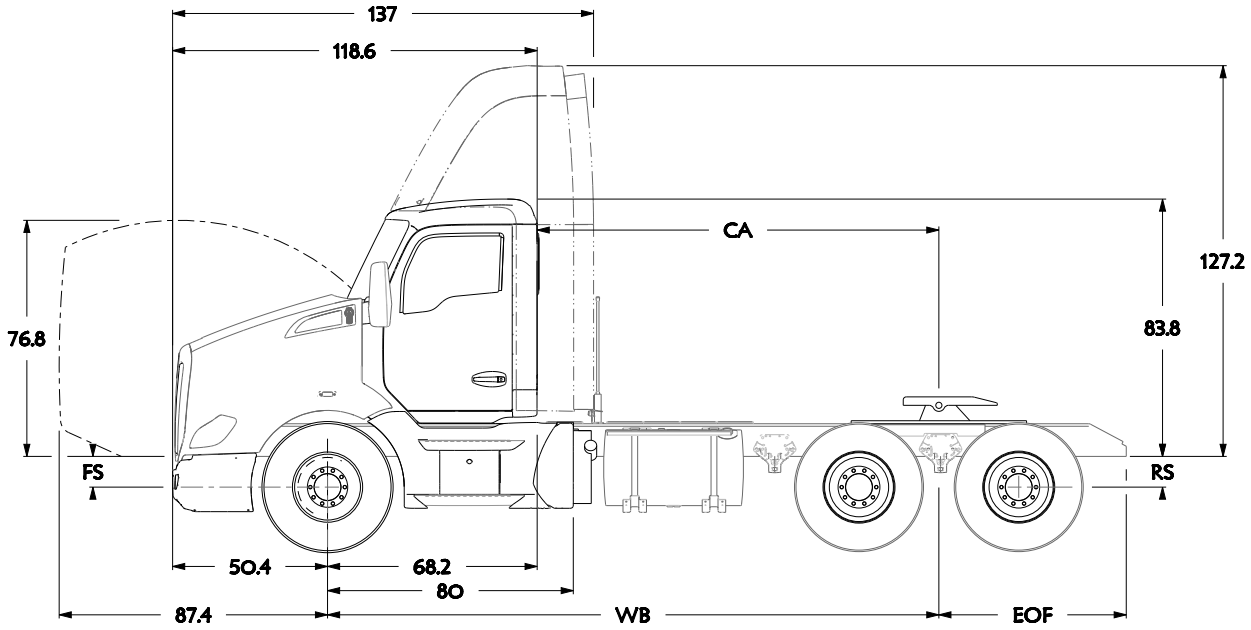


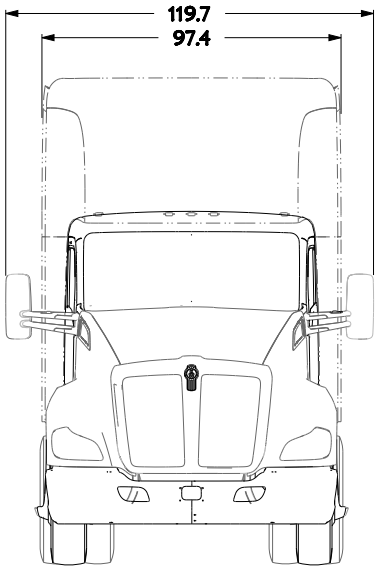


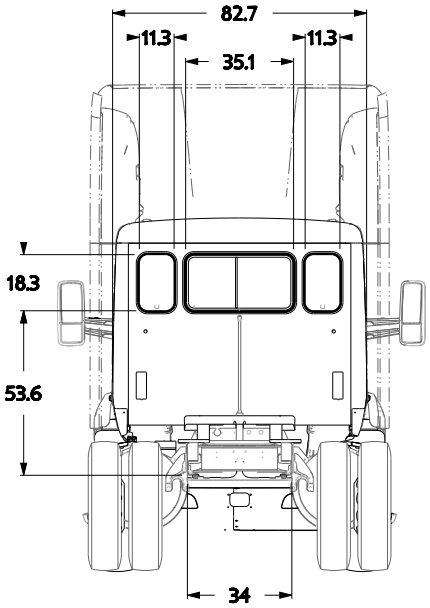
https://truckmanualshub.com/

T680 MX (SHORT) HOOD DAYCAB

The following drawings are of a standard T680 MX (Short) Hood Daycab, shown with standard chassis components.



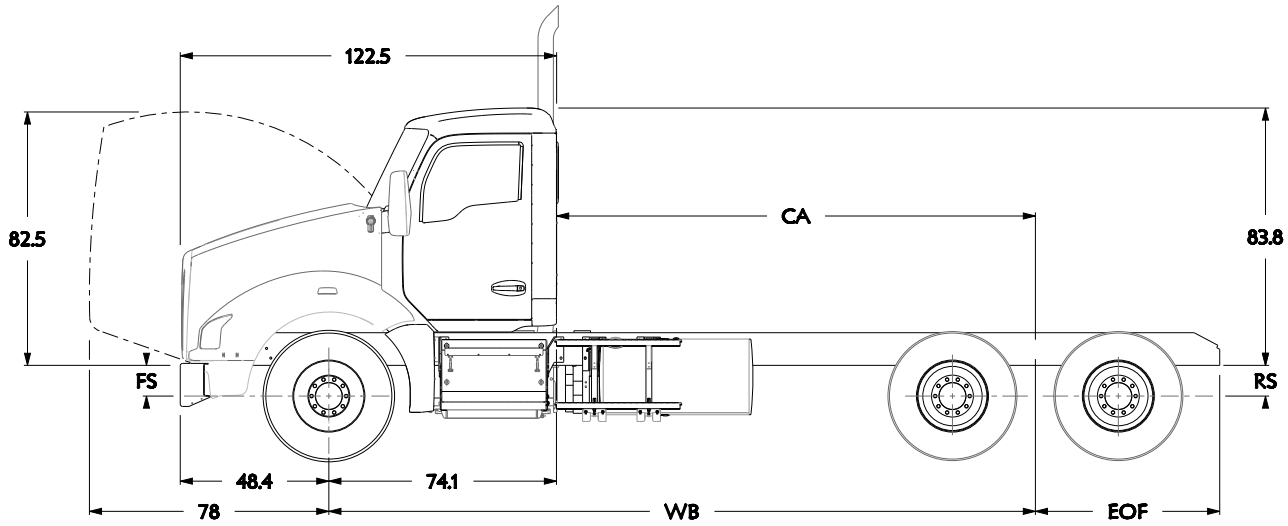


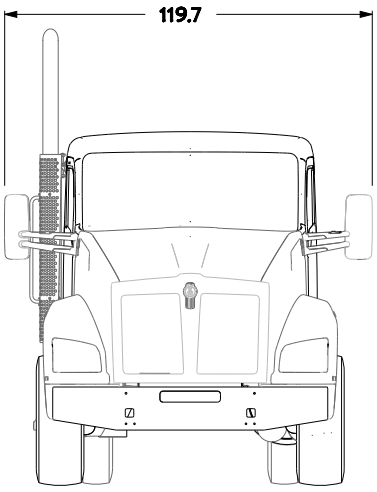


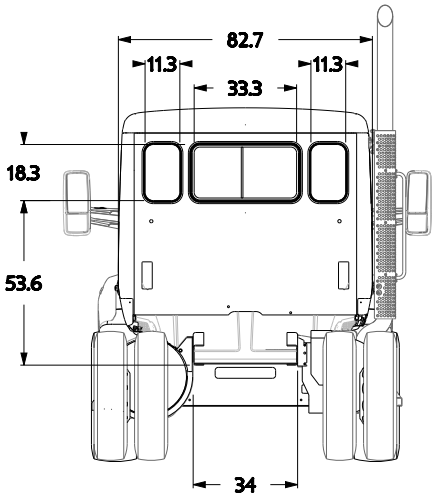
https://truckmanualshub.com/

T880 STANDARD HOOD DAYCAB

The following drawings are of a standard T880 Standard Hood Daycab, shown with standard chassis components.



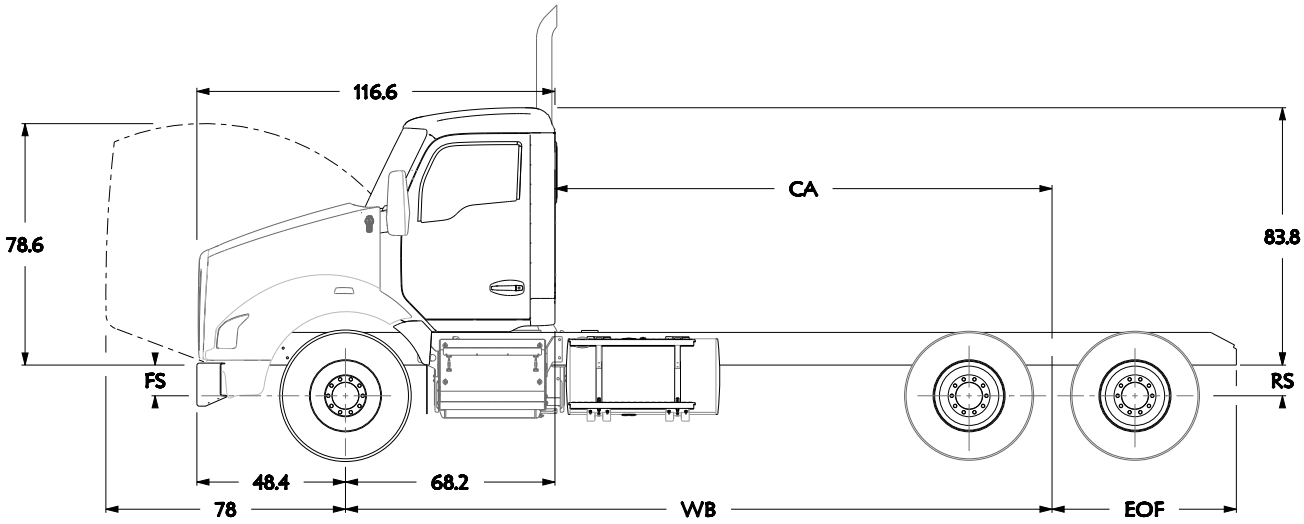


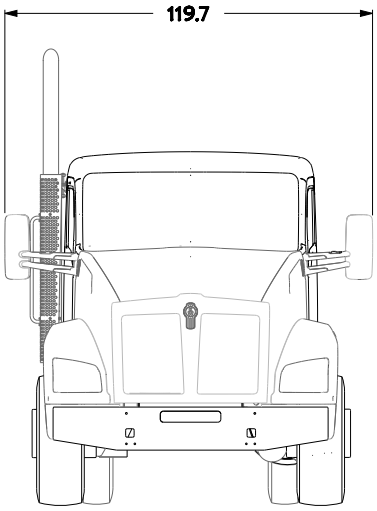


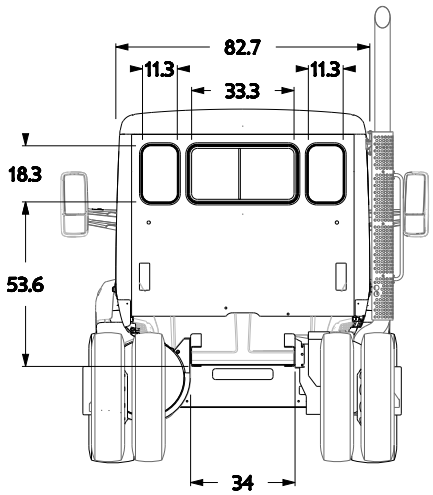
https://truckmanualshub.com/

T880 MX (SHORT) HOOD DAYCAB

The following drawings are of a standard T880 MX (Short) Hood Daycab, shown with standard chassis components.



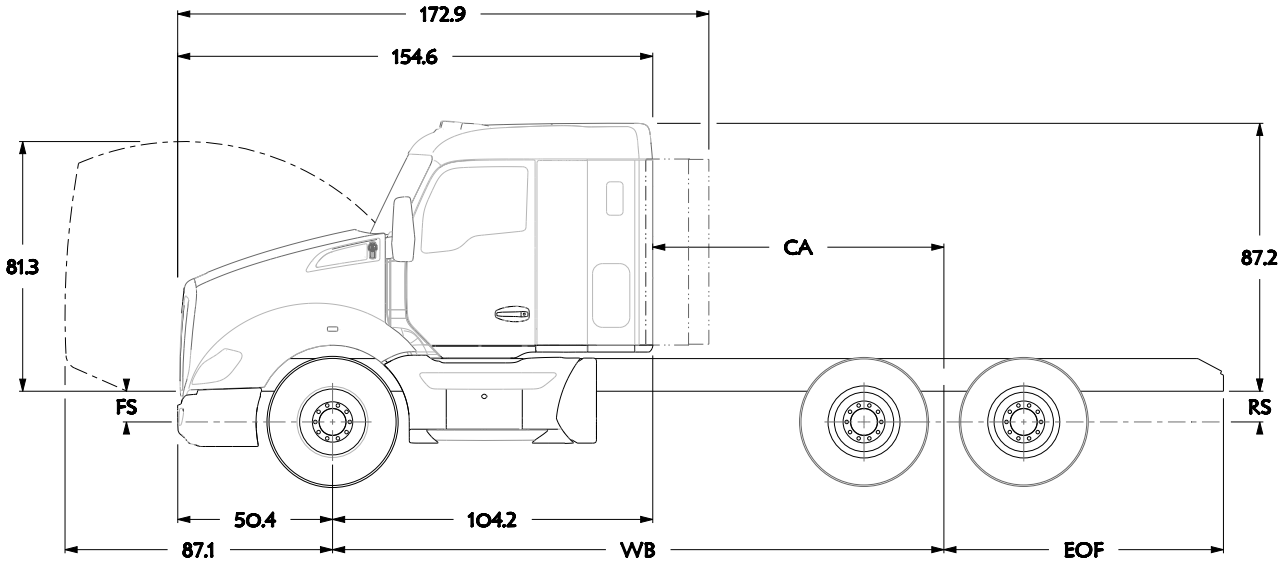


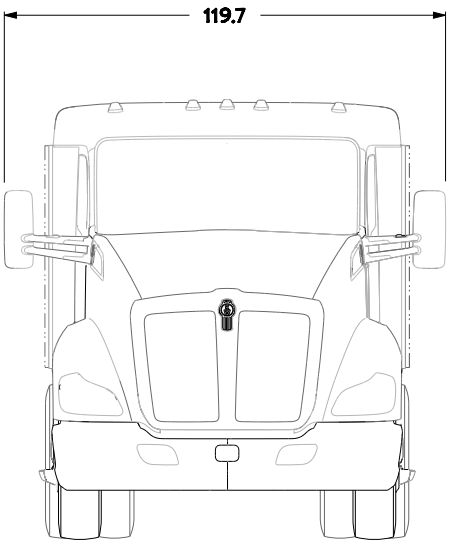


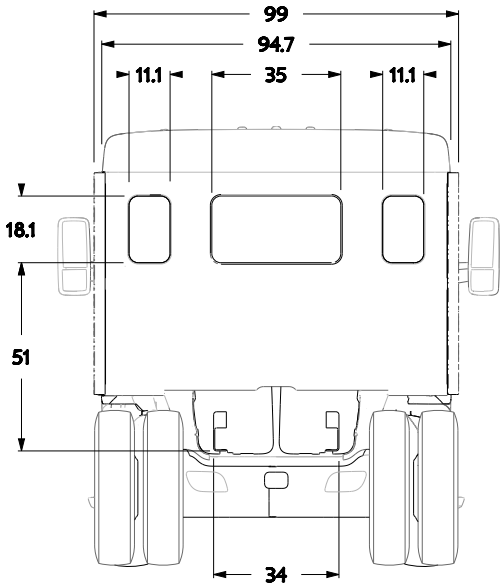
https://truckmanualshub.com/

T680 STANDARD HOOD 40” SLEEPER

The following drawings are of a standard T680 Standard Hood 40” Sleeper, shown with standard chassis components.



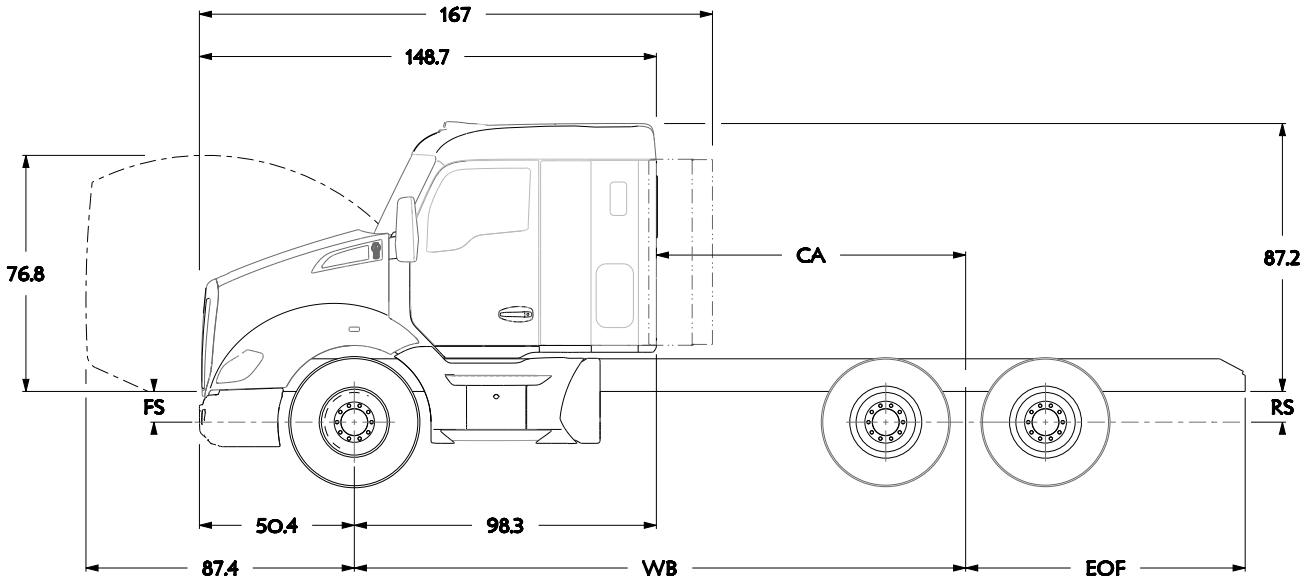


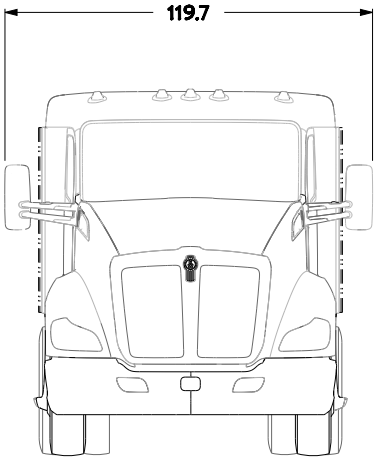


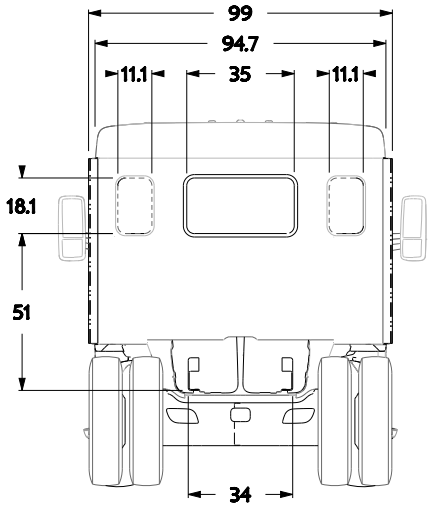
https://truckmanualshub.com/

T680 MX (SHORT) HOOD 40” SLEEPER

The following drawings are of a standard T680 MX (Short) Hood 40” Sleeper, shown with standard chassis components.



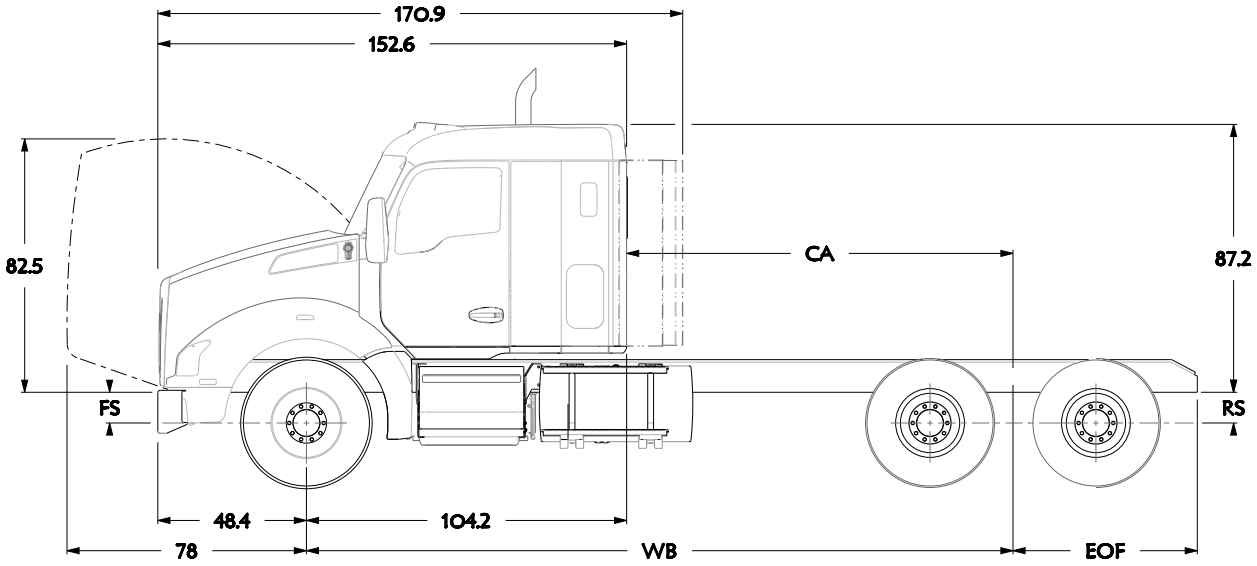


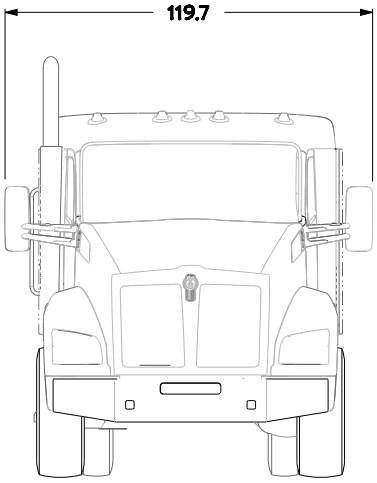


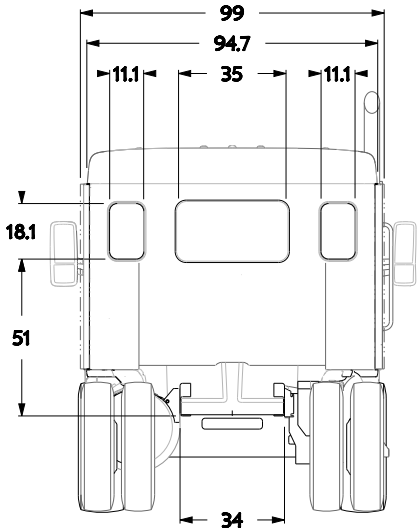
https://truckmanualshub.com/

T880 STANDARD HOOD 40” SLEEPER

The following drawings are of a standard T880 Standard Hood 40” Sleeper, shown with standard chassis components.



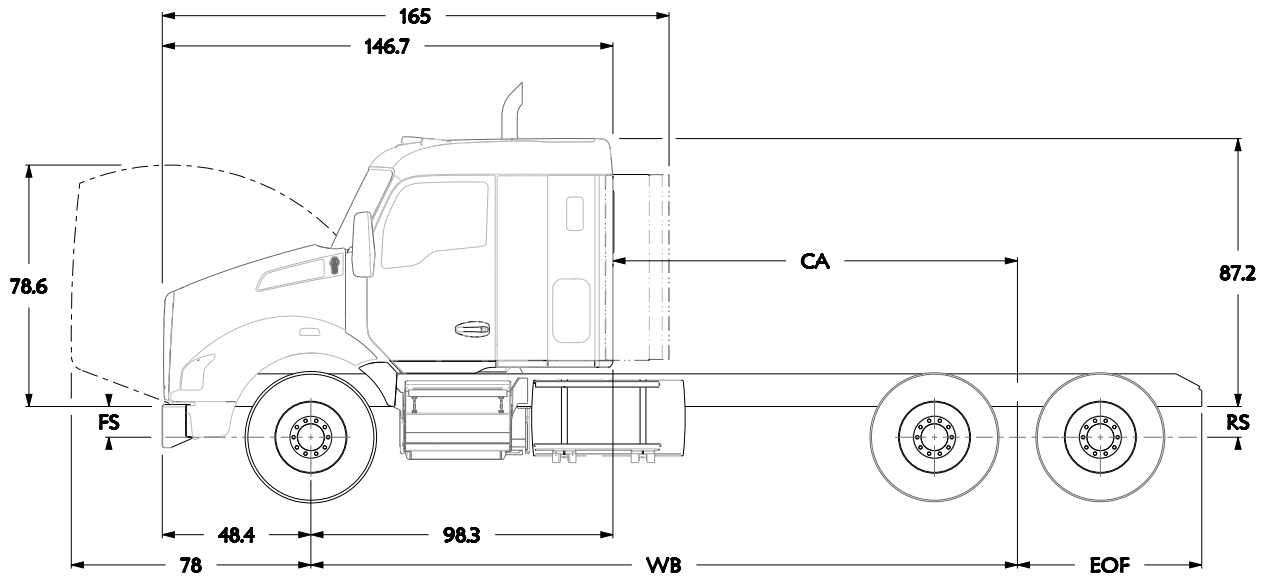


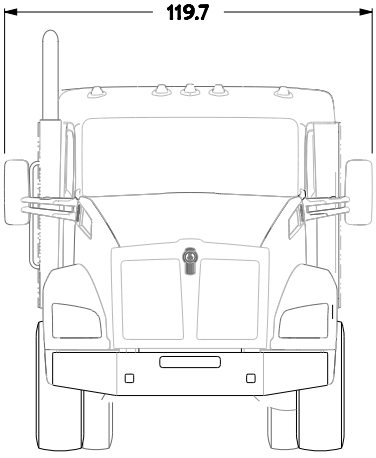


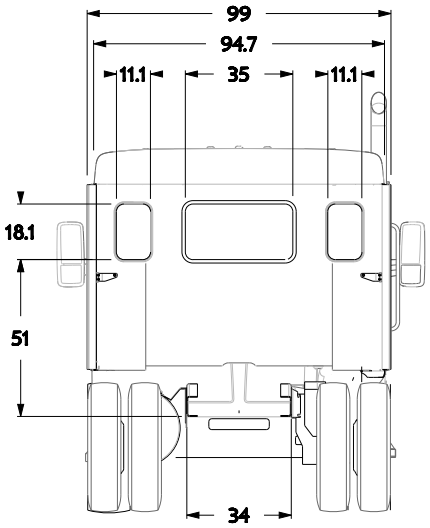
https://truckmanualshub.com/

T880 MX (SHORT) HOOD 40” SLEEPER

The following drawings are of a standard T880 MX (Short) Hood 40” Sleeper, shown with standard chassis components.



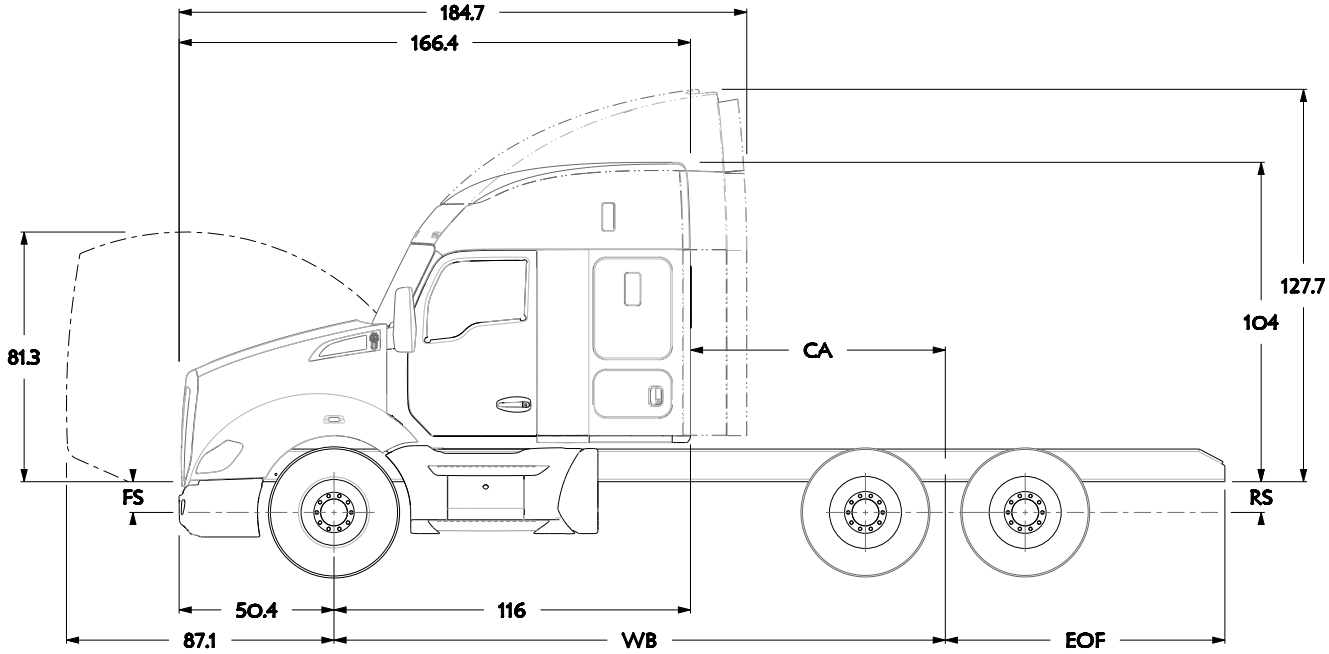


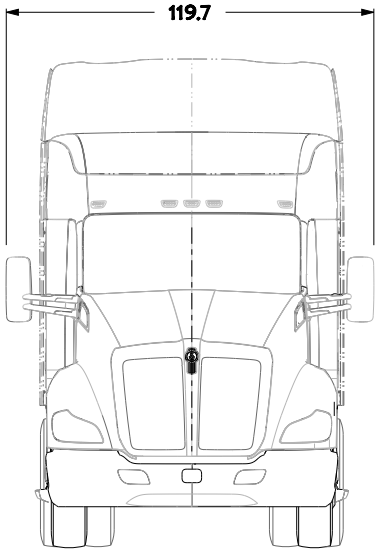


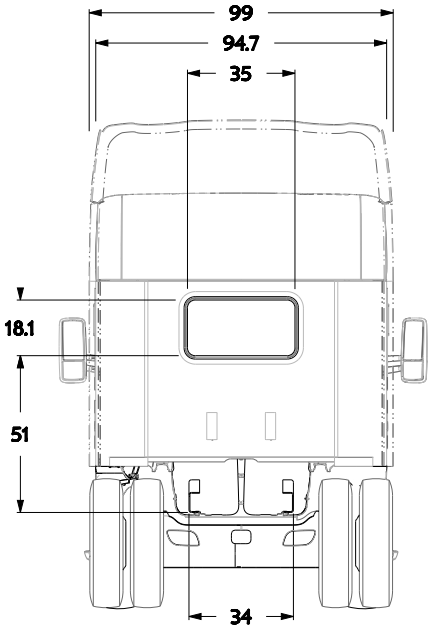
https://truckmanualshub.com/

T680 STANDARD HOOD 52” SLEEPER

The following drawings are of a standard T680 Standard Hood 52” Sleeper, shown with standard chassis components.



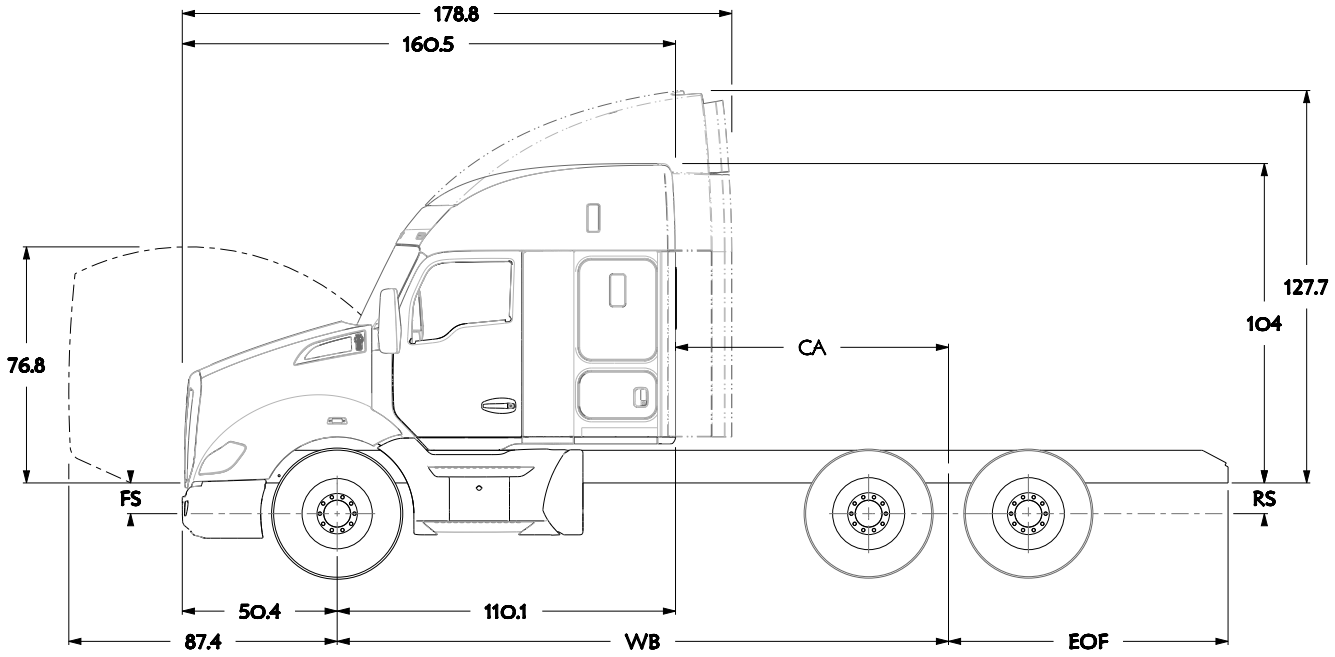


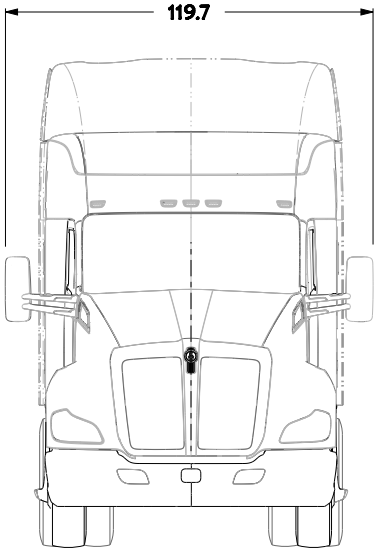


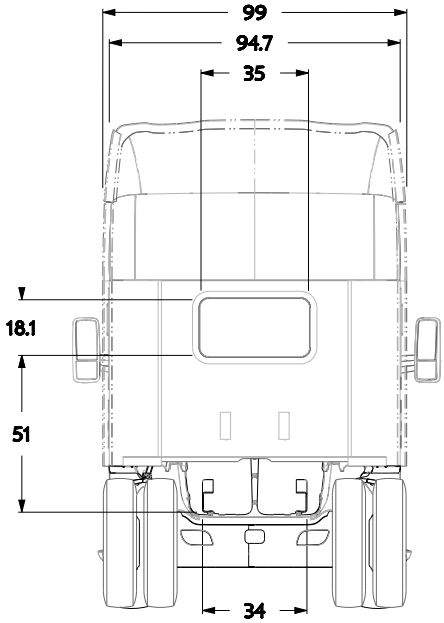
https://truckmanualshub.com/

T680 MX (SHORT) HOOD 52” SLEEPER

The following drawings are of a standard T880 MX (Short) Hood 52” Sleeper, shown with standard chassis components.



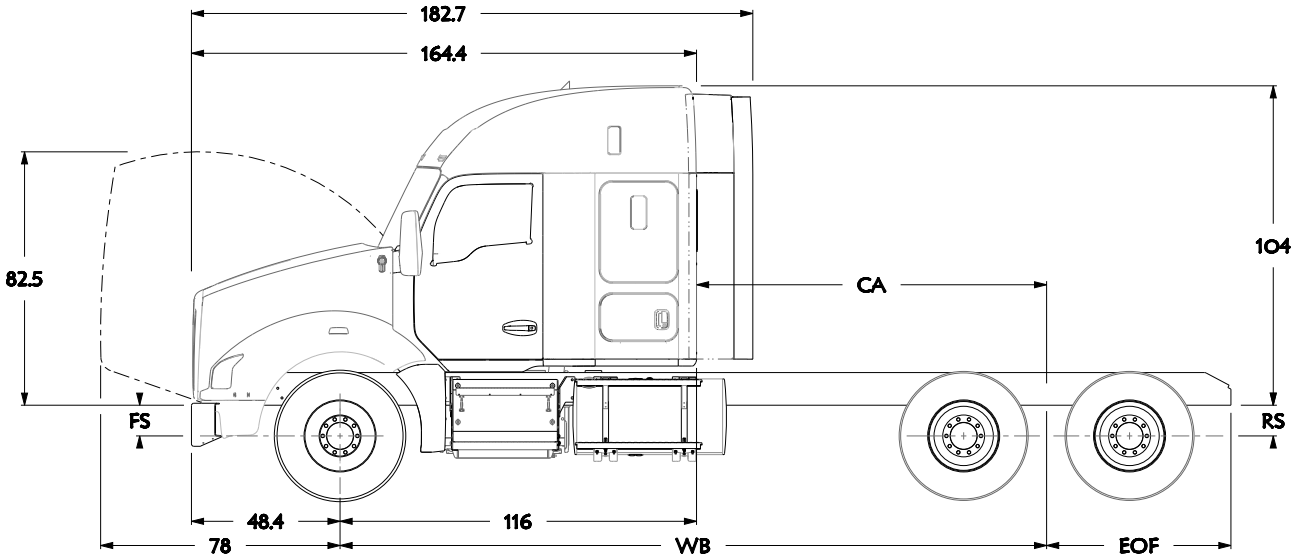


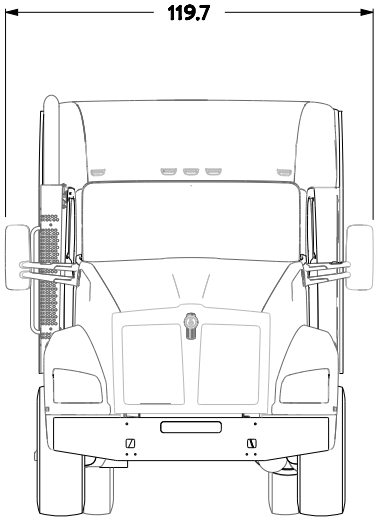


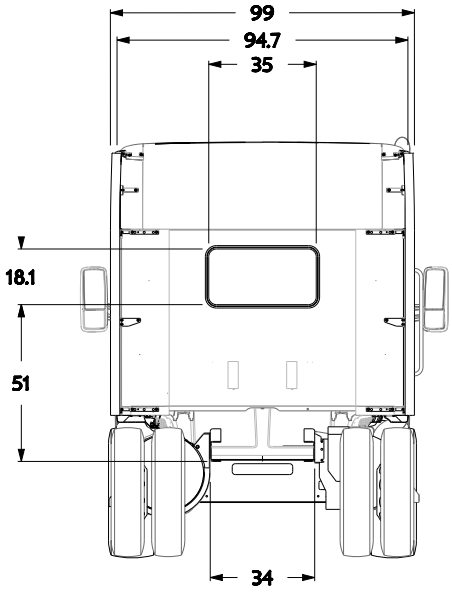
https://truckmanualshub.com/

T880 STANDARD HOOD WITH 52” SLEEPER

The following drawings are of a standard T880 Standard Hood with 52” Sleeper, shown with standard chassis components.



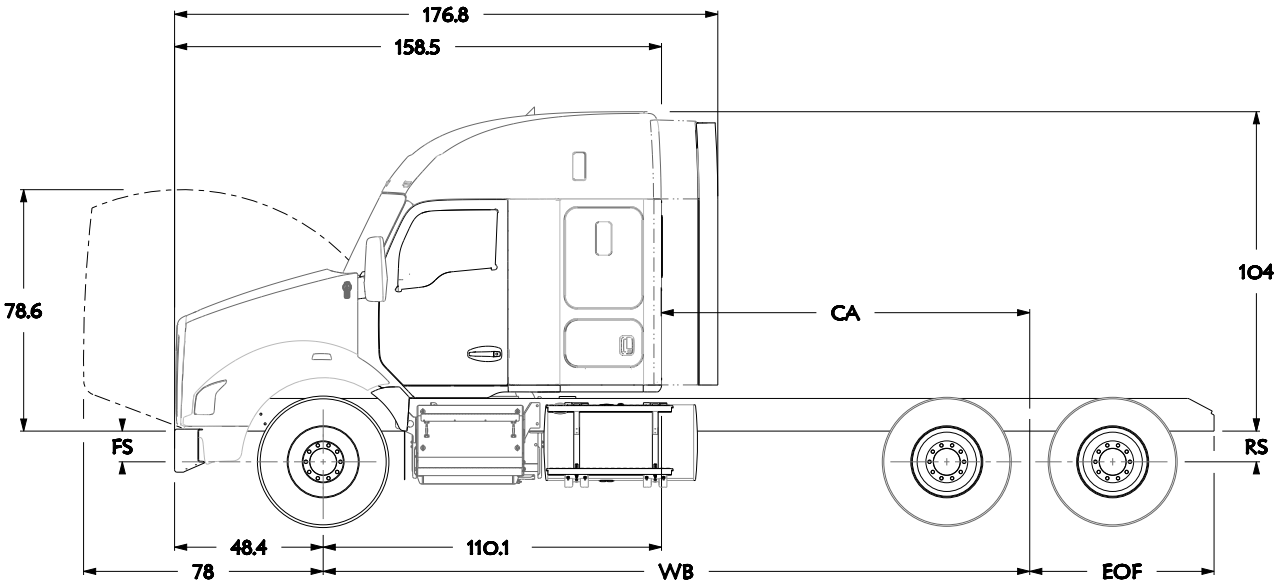


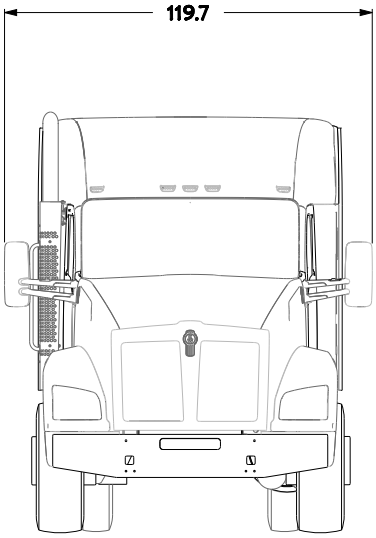


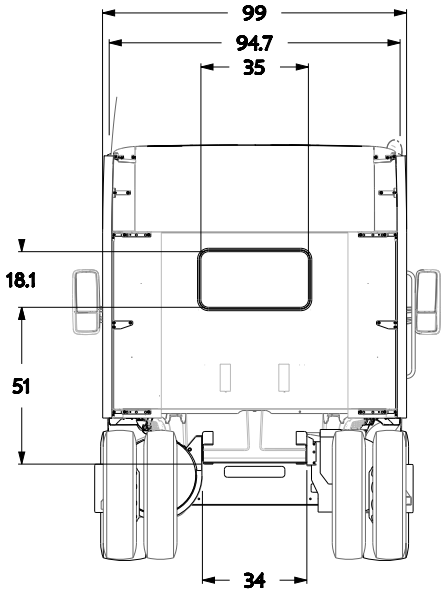
https://truckmanualshub.com/

T880 MX (SHORT) HOOD WITH 52” SLEEPER

The following drawings are of a standard T880 MX (Short) hood with 52” Sleeper, shown with standard chassis components.



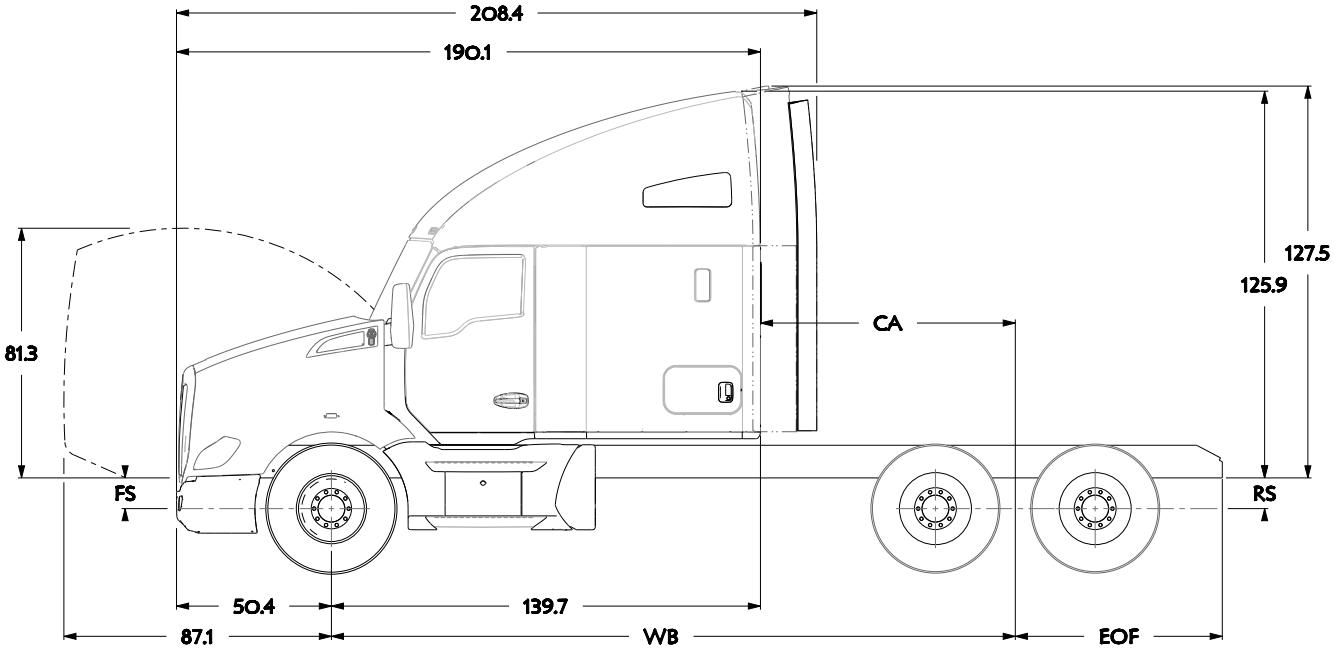


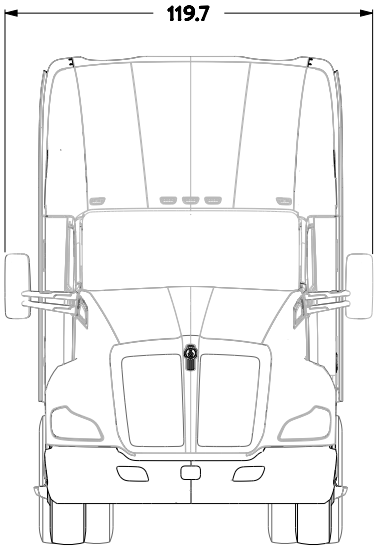


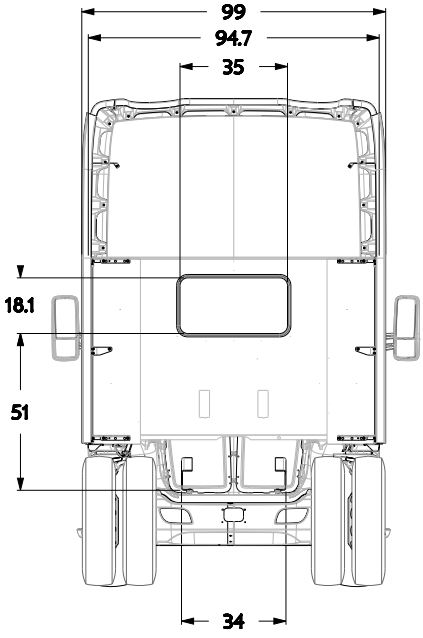
https://truckmanualshub.com/

T680 STANDARD HOOD WITH 76” HIGH-ROOF SLEEPER

The following drawings are of a standard T680 Standard Hood with 76” High-Roof Sleeper, shown with standard chassis components.



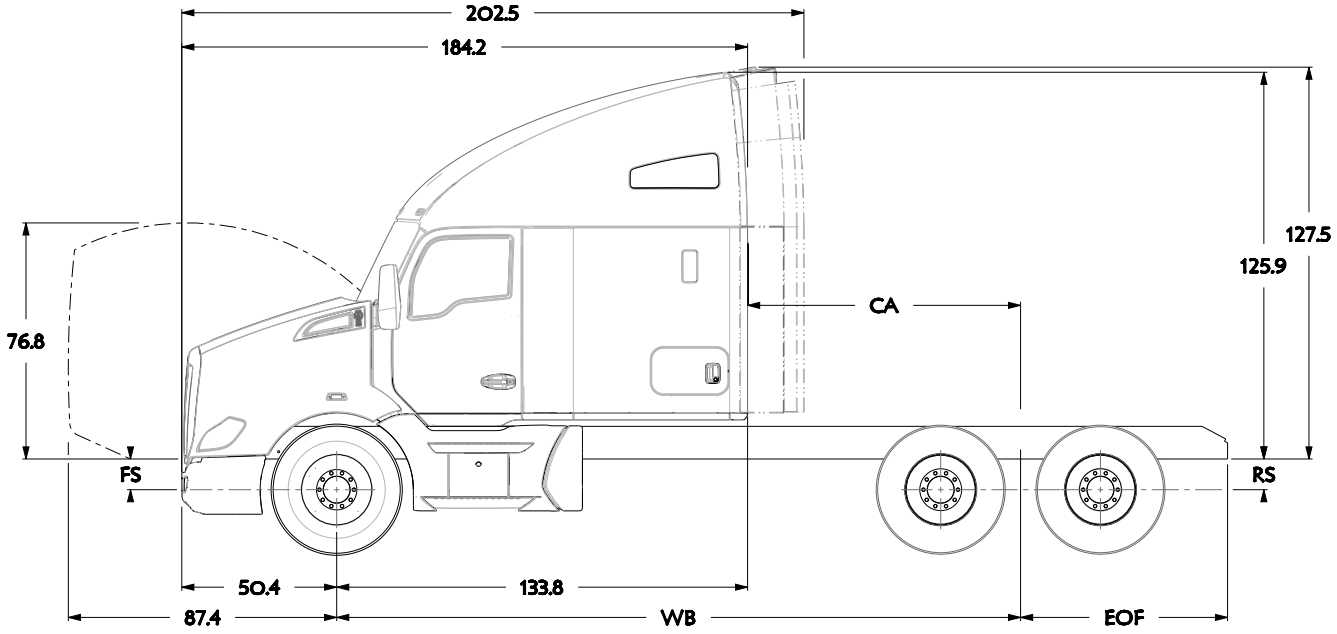


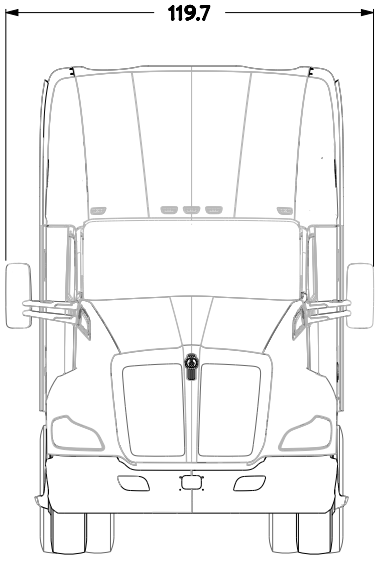


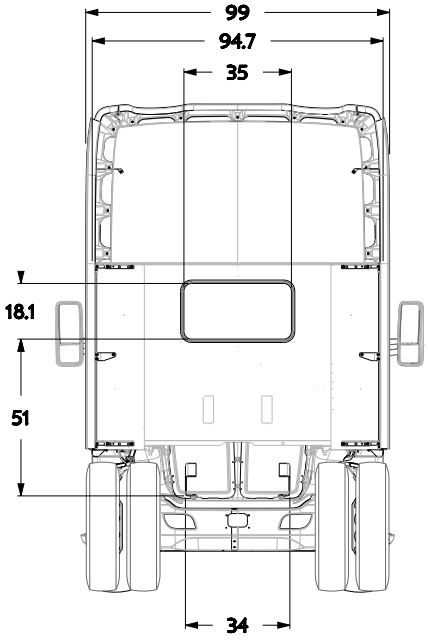
https://truckmanualshub.com/

T680 MX (SHORT) HOOD WITH 76” HIGH-ROOF SLEEPER

The following drawings are of a standard T680 MX (Short) hood with 76” High-Roof Sleeper, shown with standard chassis components.



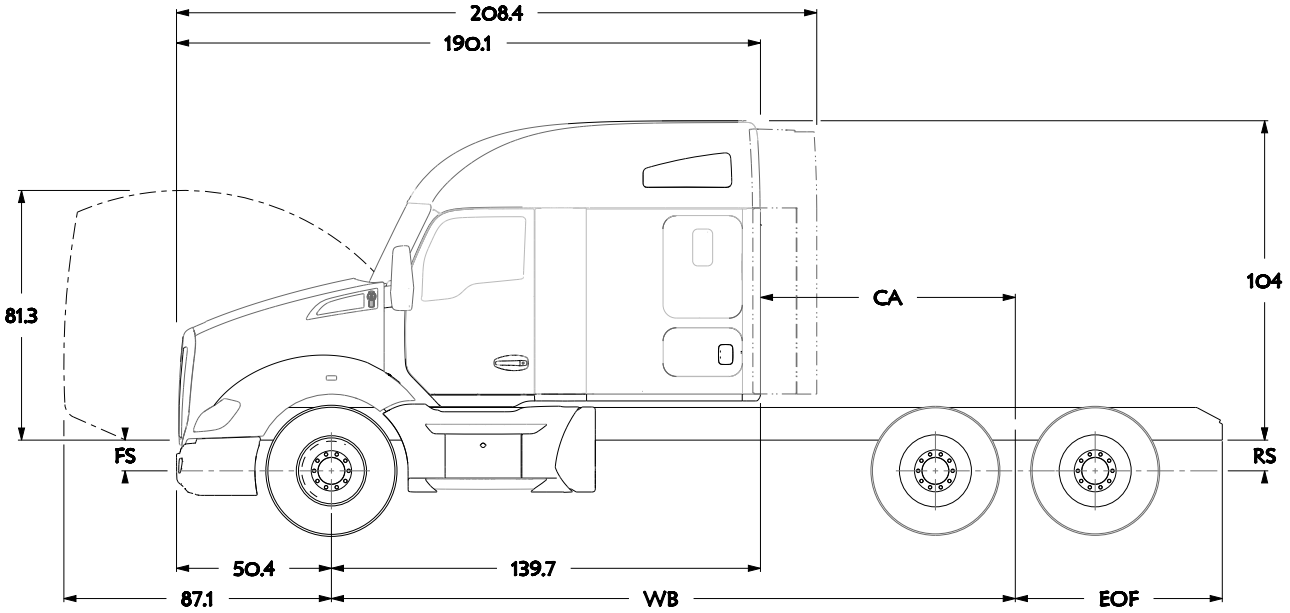


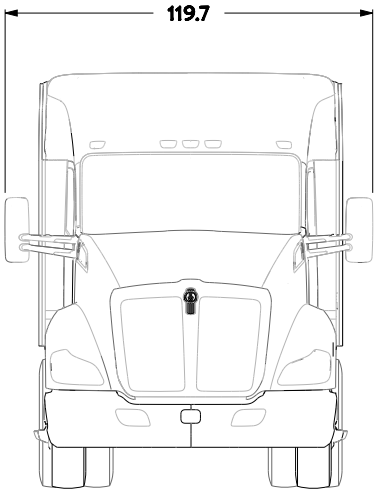


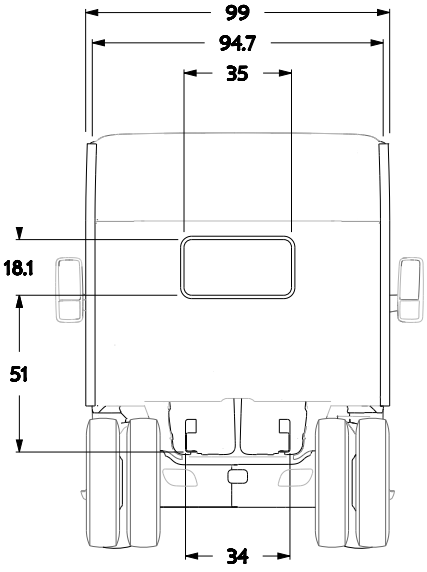
https://truckmanualshub.com/

T680 STANDARD HOOD WITH 76” MID-ROOF SLEEPER

The following drawings are of a standard T680 Standard Hood with 76” Mid-Roof Sleeper, shown with standard chassis components.



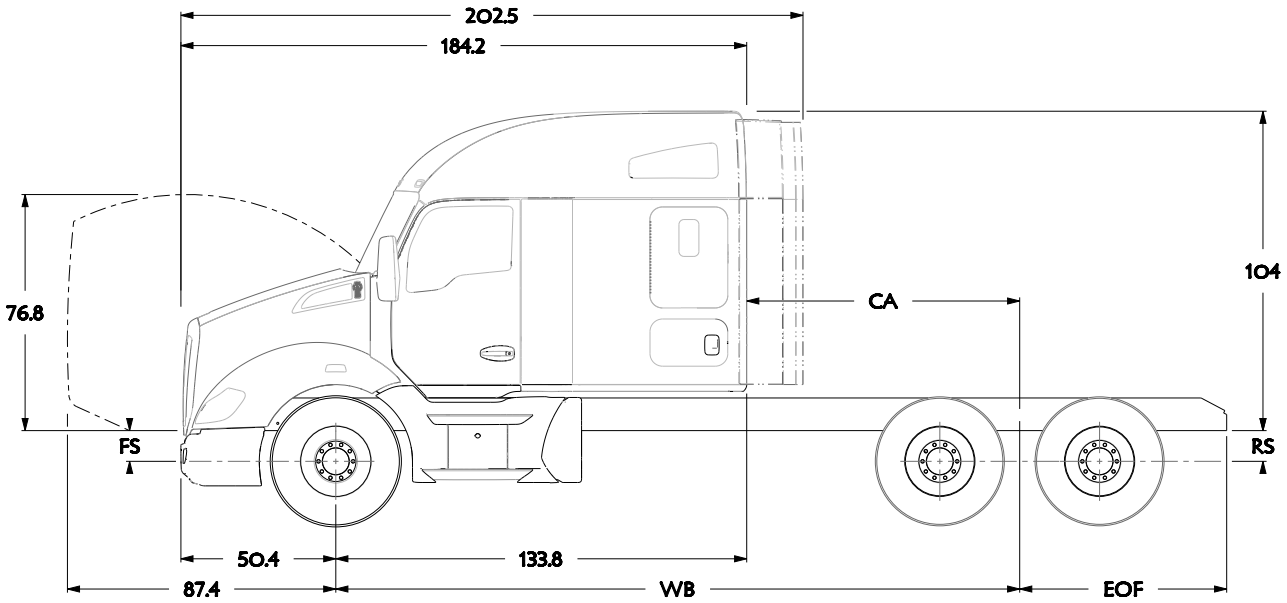


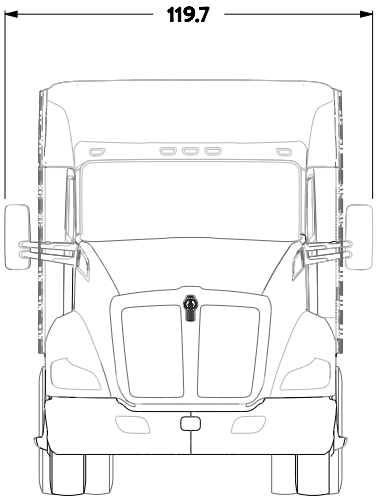


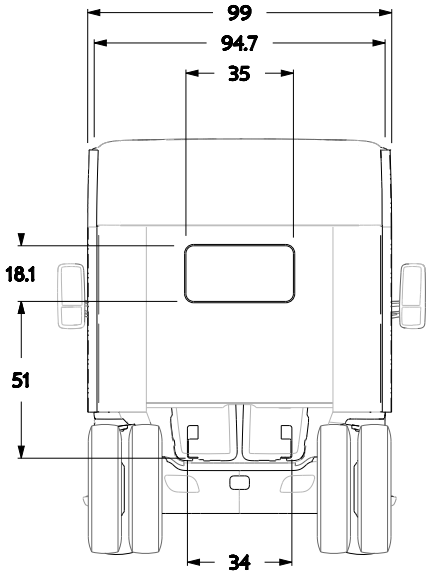
https://truckmanualshub.com/

T680 MX (SHORT) HOOD WITH 76” MID-ROOF SLEEPER

The following drawings are of a standard T680 MX (Short) hood with 76” Mid-Roof Sleeper, shown with standard chassis components.



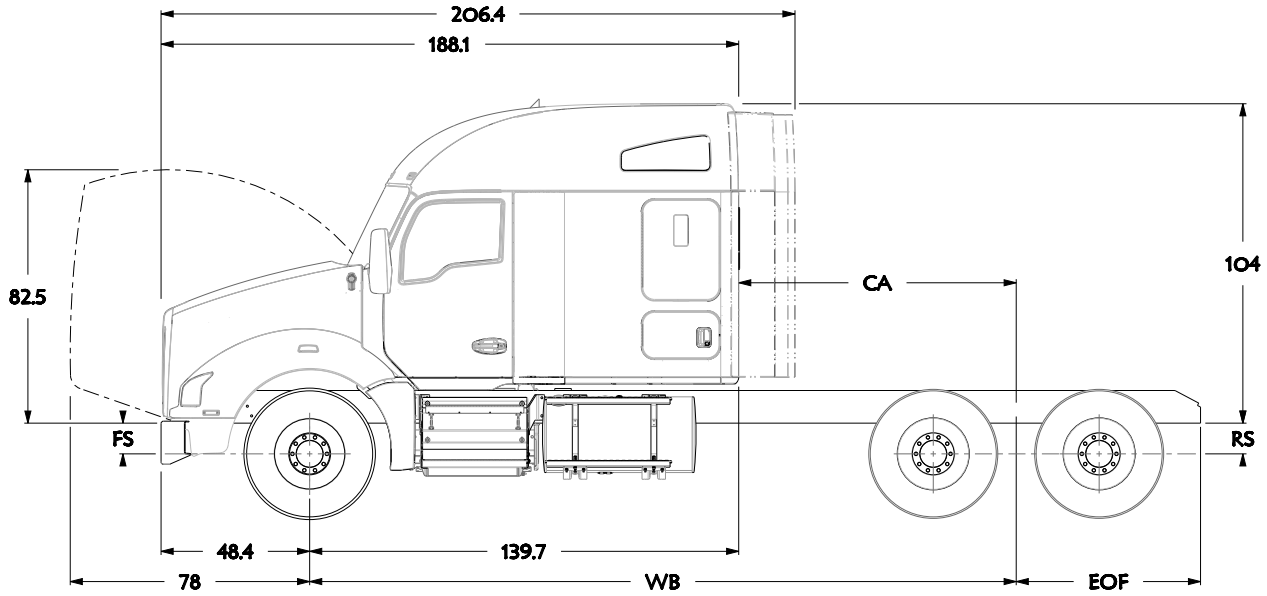


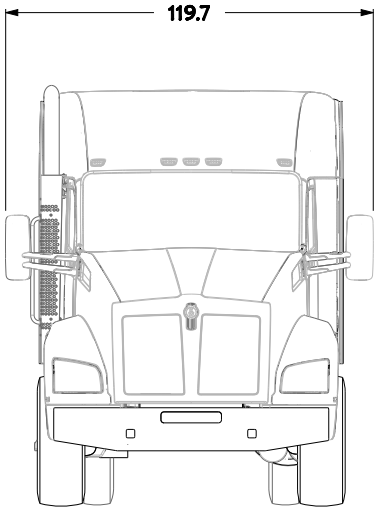


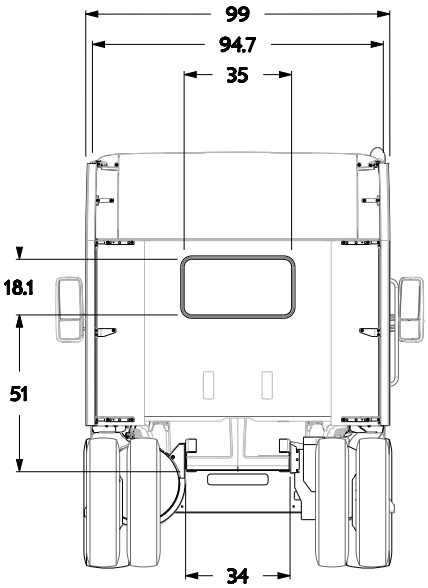
https://truckmanualshub.com/

T880 STANDARD HOOD WITH 76” MID-ROOF SLEEPER

The following drawings are of a standard T880 Standard Hood with 76” Mid-Roof Sleeper, shown with standard chassis components.



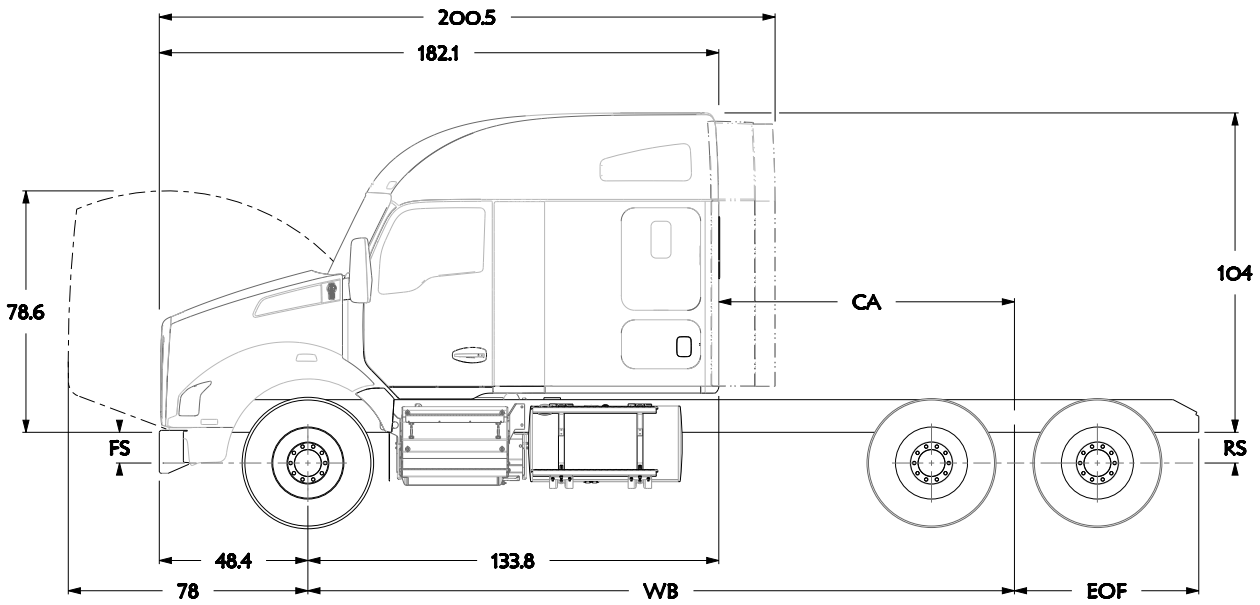


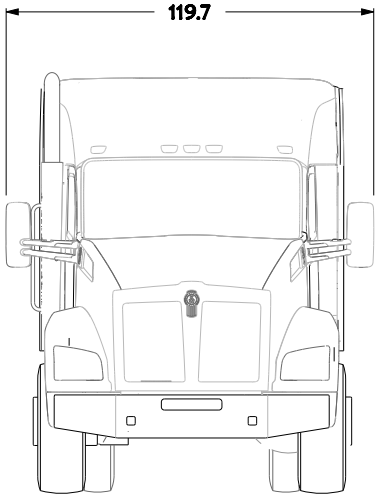


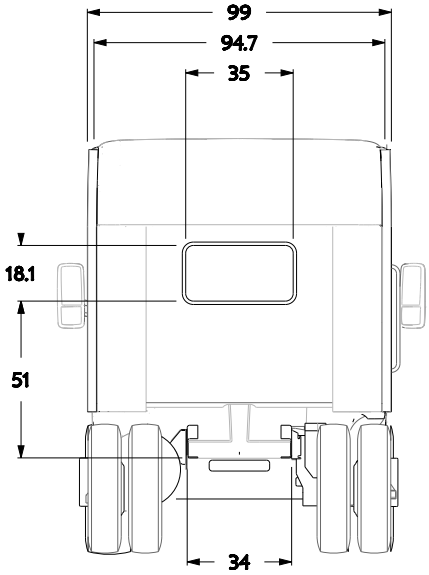
https://truckmanualshub.com/

T880 MX (SHORT) HOOD WITH 76” MID-ROOF SLEEPER

The following drawings are of a standard T880 MX (Short) hood with 76” Mid-Roof Sleeper, shown with standard chassis components.







https://truckmanualshub.com/

RIDE HEIGHTS

The front (FS) and rear (RS) suspension ride heights are provided as a basic tool to determine the overall height of the cab, height of exhaust components, and frame heights. The heights are all calculated from the centerlines of the axles, please be sure to include the tire radius dimension to determine overall height. Note: the frame rail height itself will not affect the overall height as all components are located from the bottom of the frame rail.

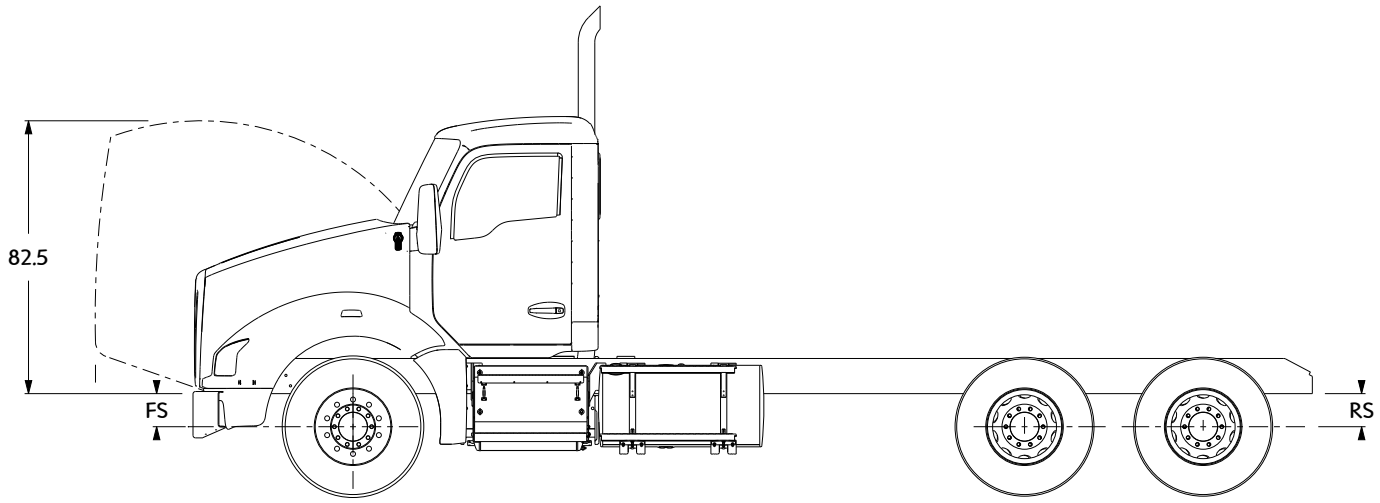


TABLE 3-3. Ride Heights. To calculate the frame height use the following formulas:

Front Frame Height = FS + 1/2 Front Tire Diameter
Rear Frame Height = RS + 1/2 Rear Tire Diameter

Front Suspension (T680/T880)

Front Suspension (FS)	Laden:	Unladen:
12K Taperleaf	10.3”	11.5”
13.2K Taperleaf	10.3”	11.5”
14.6K Taperleaf	10.3”	11.7”
16K Taperleaf	10.6”	12.3”
20K Taperleaf	10.4”	11.9”
22K Multi-stage Taperleaf	10.7”	12.7”

https://truckmanualshub.com/

Rear Suspension (All Models). Common Rear Suspensions are shown here, for detailed suspensions please use the Rear suspension layouts on pages 3-18 to 3-33.

Rear Suspension	Laden:	Unladen:
Kenworth AG400L	8.5”	8.5”
Kenworth AG400	9”	9”
Kenworth AG460	10.5”	10.5”
Kenworth AG690 Tridem	10.5”	10.5”
Reyco 79KB 23K Rating	8.3”	10.8”
Reyco 102 38K Rating	9.2”	10.8”
Chalmers 854-40-L-HS 40K Rating	9.6”	11”
Chalmers 854-46-H 46K Rating	10.1”	12.4”
Chalmers 854-50-H-HS 50K Rating	10.8”	12.5”
Chalmers 865-65-XL 65K Rating	13”	15.7”
Hend HMX400 16.5” Saddle	9.5”	10.6”
Hend HMX400 17.5” Saddle	10.5”	11.6”
Hend HMX460 46K 16.5” Saddle	9.5”	10.6”
Hend HMX460 46K 17.5” Saddle	10.5”	11.6”
Hendrickson Primaax EX 46K Rating	10”	10”
Hendrickson RT463 6” Saddle 46K Rating	10”	11.1”
Hendrickson RT463 7.19” Saddle 46K Rating	11.2”	12.5”
Hend RT523 52K 6” Saddle	9.9”	11”
Neway ADZ246 46K Rating	10” or 12”	10” or 12”
Neway ADZ252 52K Rating	10” or 12”	10” or 12”
Neway ADZ369 69K Tridem	10” or 12”	10” or 12”
Neway ADZ378 78K Tridem	10”	10”

https://truckmanualshub.com/

REAR SUSPENSION LAYOUTS

The rear suspension layouts are provided as a tool to help layout bodies prior to arrival. The applicable dimensions are shown. Be sure to check the axle spacing that is shown, as alternate spacings may exist and could change some of the dimensions. The dimensions shown below are the most typical installations, in special cases some hole locations will move. If you are planning on using the holes shown for your body installation, please confirm with your local KW dealer that the drawing below will be the installation used on your specific truck. Ensure that proper torque is used to reinstall any suspension components. See Tables 7-1 and 7-2 on page 7-7.

It would be a good idea in this case to order the frame layout of your chassis along with your truck order. This can be done on any Kenworth truck, and will be provided 4 weeks ahead of the build schedule.

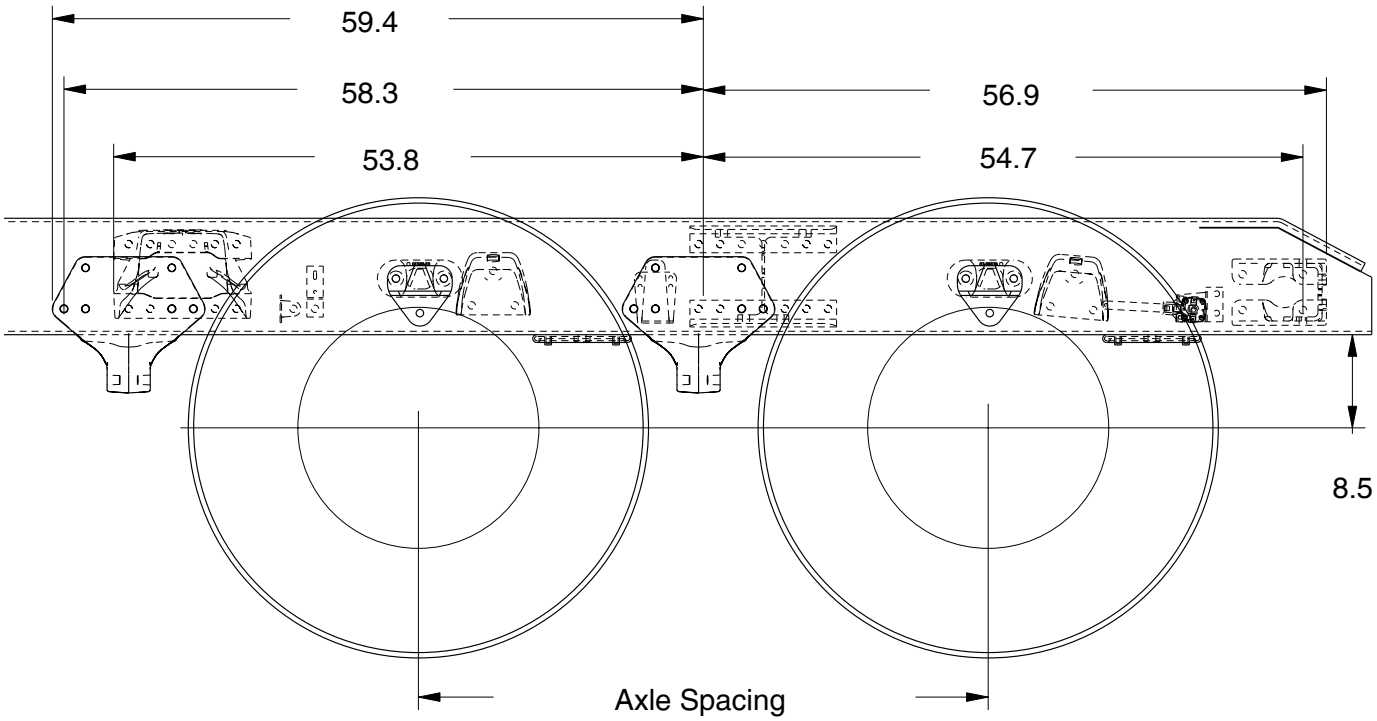
If there are hole locations that are not detailed please work with your local Kenworth Dealer to request that information.

Additionally optional axle spacings are shown in the charts, if you would like details on the frame drilling with optional spacings, please contact your local Kenworth dealer.

NOTE: Actual axle spacing can depart from nominal due to axle slant requirements. Final axle spacing can vary by more than an inch from nominal in some cases. If precise axle spacing is critical due to body installation or state/local regulatory requirements please contact Kenworth Applications/technical Support for assistance.

https://truckmanualshub.com/

AG400L TANDEM



AG400L Suspensions

Note: “54” Axle Spacing dmensions shown

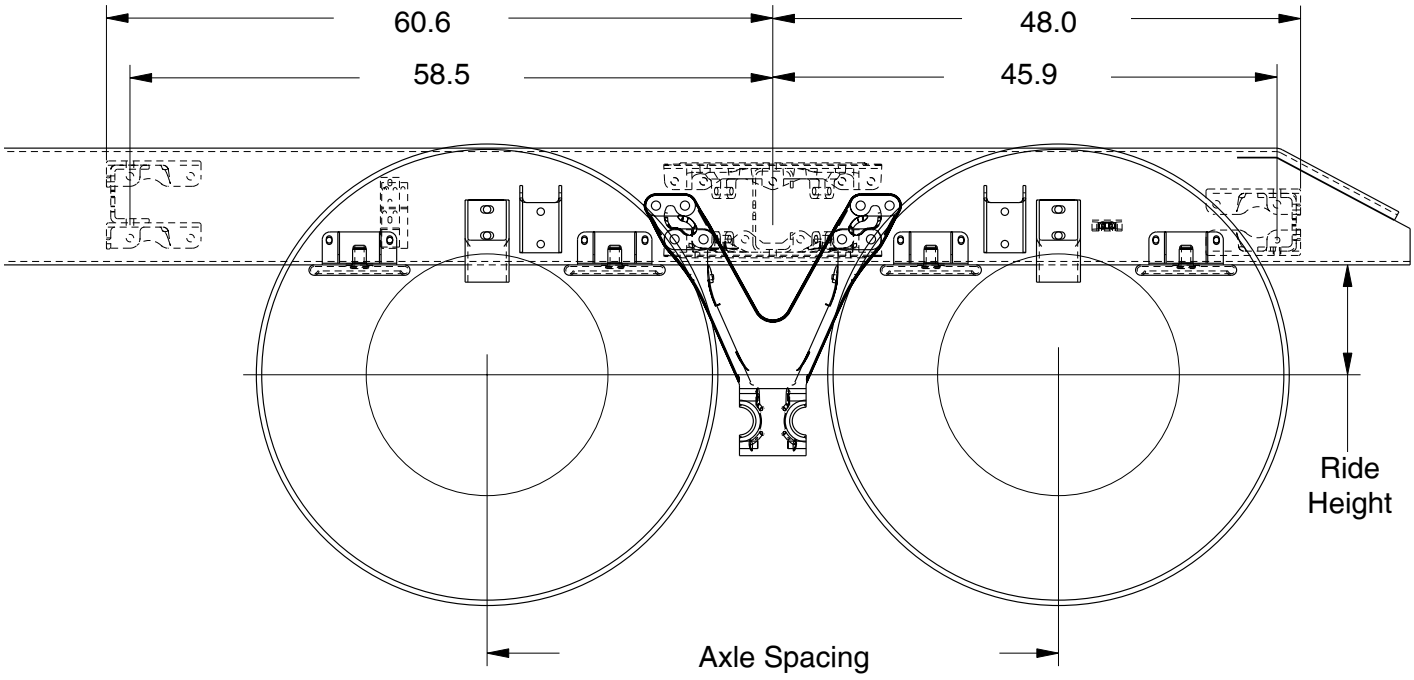
TABLE 3-4. Rear Suspension Options

Suspension Type	Rating	Axle Spacing	Laden Ride Height	Unladen Ride Height
AG400L Tandem	40K	52"	8.5"	8.5"
AG400L Tandem	40K	54"	8.5"	8.5"

NOTE: Actual axle spacing can depart from nominal due to axle slant requirements. Final axle spacing can vary by more than an inch from nominal in some cases. If precise axle spacing is critical due to body installation or state/local regulatory requirements please contact Kenworth Applications/technical Support for assistance.

https://truckmanualshub.com/

AG400 OR AG460 TANDEM



AG400 Suspensions

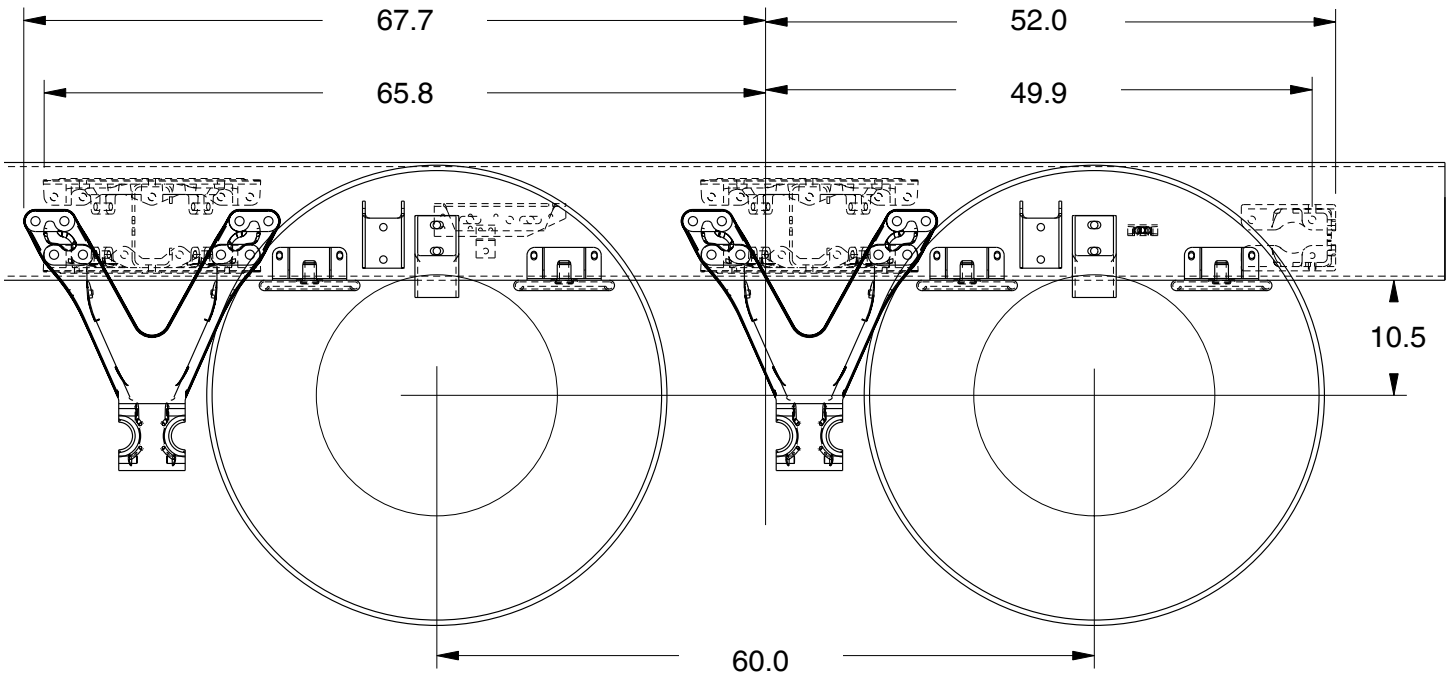
TABLE 3-5. Rear Suspension Options

Suspension Type	Rating	Axle Spacing	Laden Ride Height	Unladen Ride Height
AG400 Tandem	40K	52"	9"	9"
AG400 Tandem	40K	54"	9"	9"
AG460 Tandem	46K	54”	10.5”	10.5”

NOTE: Actual axle spacing can depart from nominal due to axle slant requirements. Final axle spacing can vary by more than an inch from nominal in some cases. If precise axle spacing is critical due to body installation or state/local regulatory requirements please contact Kenworth Applications/technical Support for assistance.

https://truckmanualshub.com/

AG460 TANDEM



AG460 Suspensions

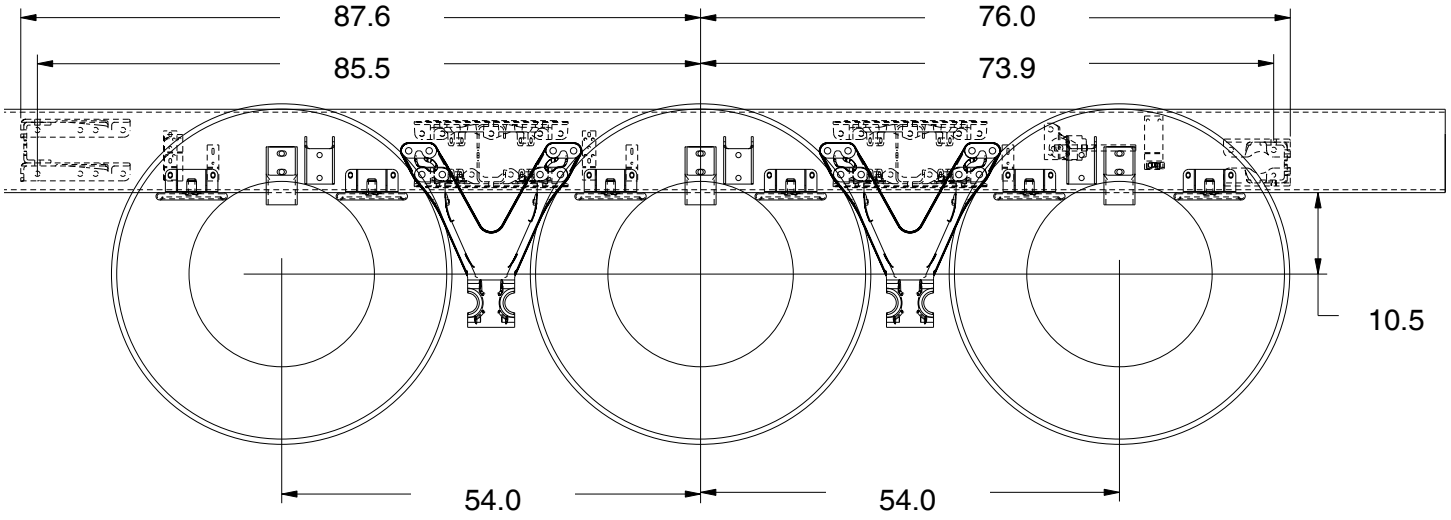
TABLE 3-6. Rear Suspension Options

Suspension Type	Rating	Axle Spacing	Laden Ride Height	Unladen Ride Height
AG460 Tandem 60" Spacing	46K	60"	10.5"	10.5"

NOTE: Actual axle spacing can depart from nominal due to axle slant requirements. Final axle spacing can vary by more than an inch from nominal in some cases. If precise axle spacing is critical due to body installation or state/local regulatory requirements please contact Kenworth Applications/technical Support for assistance.

https://truckmanualshub.com/

AG690 TRIDEM



AG690 Tridem Suspension

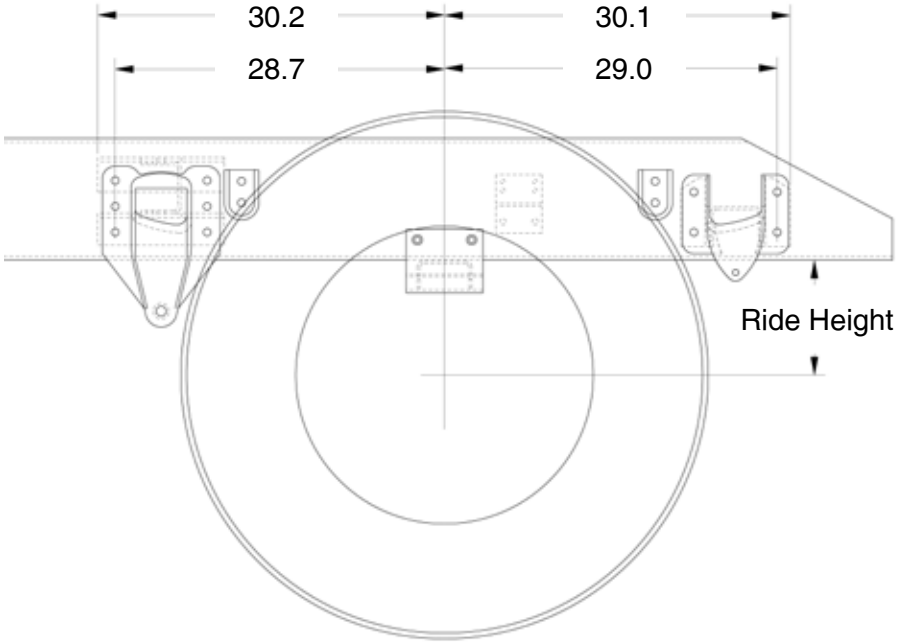
TABLE 3-7. Rear Suspension Options

Suspension Type	Rating	Axle Spacing	Laden Ride Height	Unladen Ride Height
AG690 Tridem	69K	108" (54" + 54")	10.5"	10.5"

NOTE: Actual axle spacing can depart from nominal due to axle slant requirements. Final axle spacing can vary by more than an inch from nominal in some cases. If precise axle spacing is critical due to body installation or state/local regulatory requirements please contact Kenworth Applications/technical Support for assistance.

https://truckmanualshub.com/

REYCO 79KB SINGLE REAR AXLE



Optional Reyco 79KB Suspensions

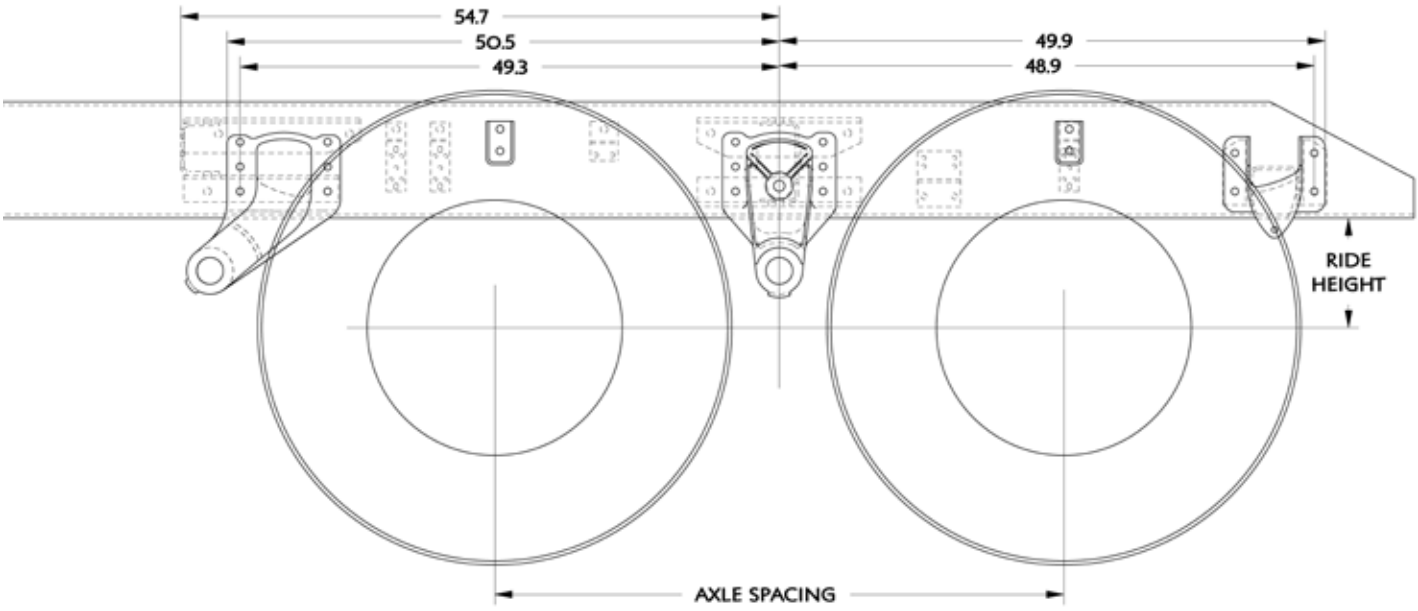
TABLE 3-8. Rear Suspension Options

Suspension Type	Rating	Axle Spacing	Laden Ride Height	Unladen Ride Height
Reyco 79KB single	20K	-	8.3”	10.8”
Reyco 79KB single	23K	-	8.3”	10.8”
Reyco 79KB single	26K	-	8.2”	11.3”
Reyco 79KB single	31K	-	9.6”	12.2”

https://truckmanualshub.com/

REYCO 102 TANDEM REAR AXLE

Shown with a 52” Axle Spacing



Reyco 102 Suspension Data

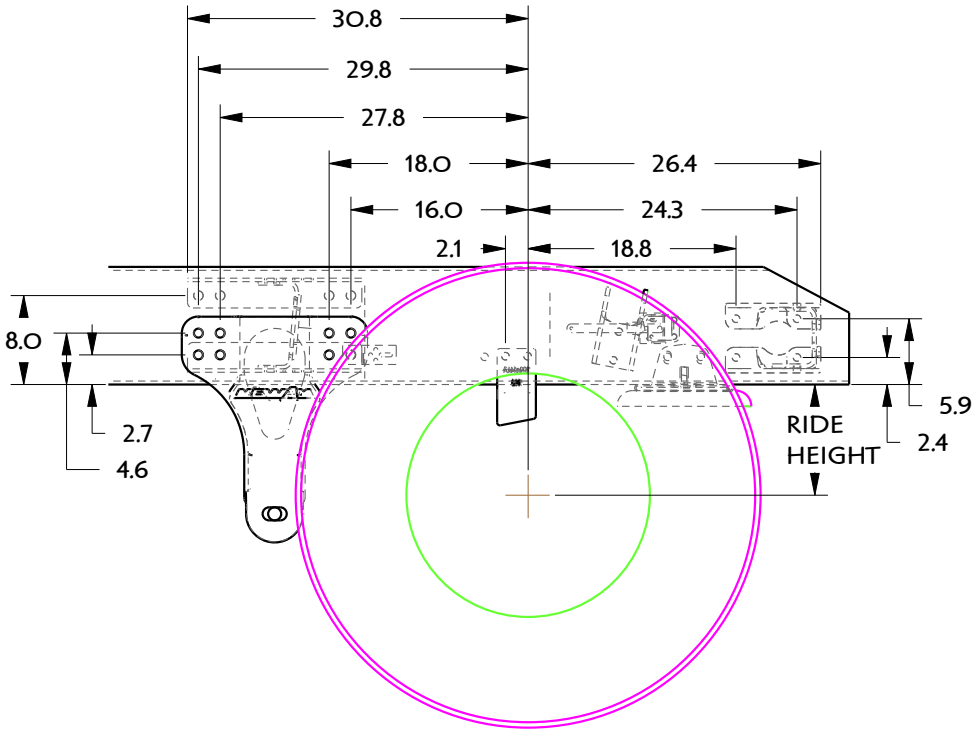
TABLE 3-9. Rear Suspension Options

Suspension Type	Rating	Axle Spacing	Laden Ride Height	Unladen Ride Height
Reyco 102 Tandem	38K	52”	9.2”	10.8”

NOTE: Actual axle spacing can depart from nominal due to axle slant requirements. Final axle spacing can vary by more than an inch from nominal in some cases. If precise axle spacing is critical due to body installation or state/local regulatory requirements please contact Kenworth Applications/technical Support for assistance.

https://truckmanualshub.com/

NEWAY ADZ 123 SINGLE REAR AXLE



Optional Neway ADZ Single Suspensions

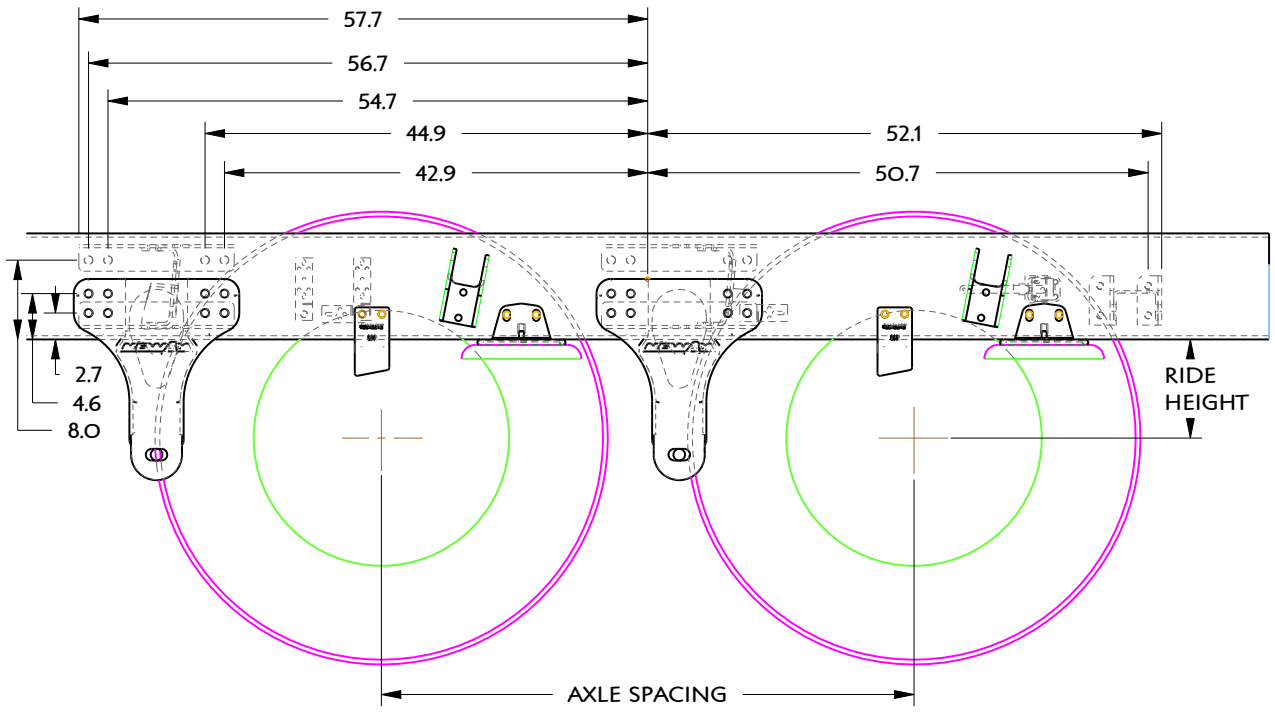
TABLE 3-10. Rear Suspension Options

Suspension Type	Rating	Axle Spacing	Laden Ride Height	Unladen Ride Height
Neway ADZ123 single	23K	-	10”	10”
Neway ADZ126 single	26K	-	10”	10”

https://truckmanualshub.com/

NEWAY ADZ 246 TANDEM SUSPENSION

Shown with a 54” Axle Spacing



Optional Neway ADZ Tandem Suspensions

TABLE 3-11. Rear Suspension Options

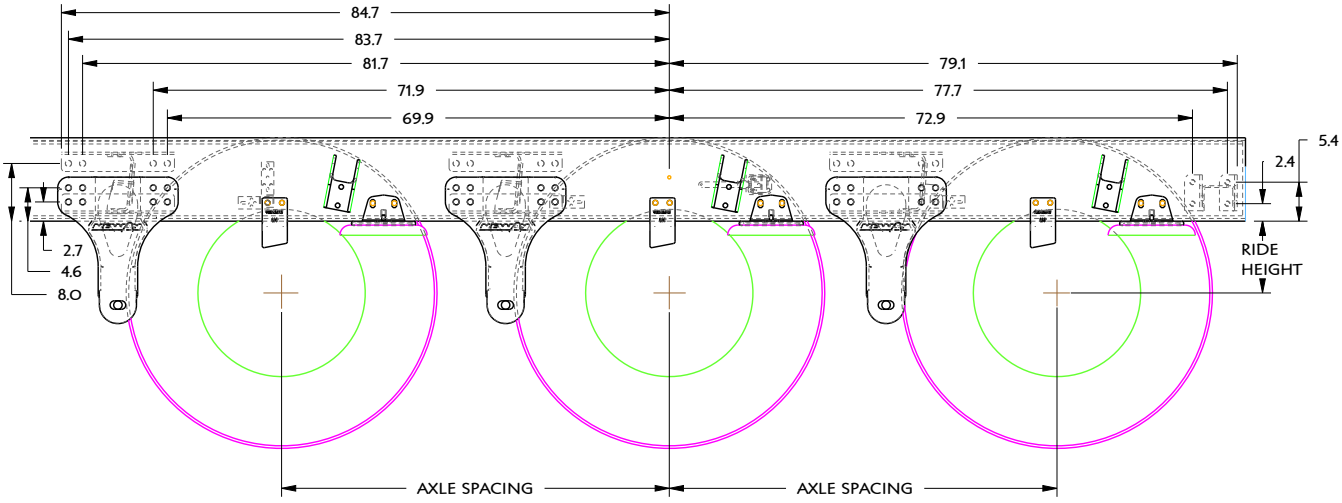
Suspension Type	Rating	Axle Spacing	Laden Ride Height	Unladen Ride Height
Neway ADZ246 tandem	46K	54”	10”	10”
Neway ADZ246 tandem	46K	60”	10”	10”
Neway ADZ246 tandem	46K	72”	10”	10”
Neway ADZ252 tandem	52K	54”	10”	10”
Neway ADZ252 tandem	52K	54”	12”	12”
Neway ADZ252 tandem	52K	60”	10”	10”
Neway ADZ252 tandem	52K	60”	12”	12”

NOTE: Actual axle spacing can depart from nominal due to axle slant requirements. Final axle spacing can vary by more than an inch from nominal in some cases. If precise axle spacing is critical due to body installation or state/local regulatory requirements please contact Kenworth Applications/technical Support for assistance.

https://truckmanualshub.com/

NEWAY ADZ 369 TRIDEM SUSPENSION

Shown with 54” Axle Spacings



Optional Neway ADZ Tridem Suspensions

TABLE 3-12. Rear Suspension Options

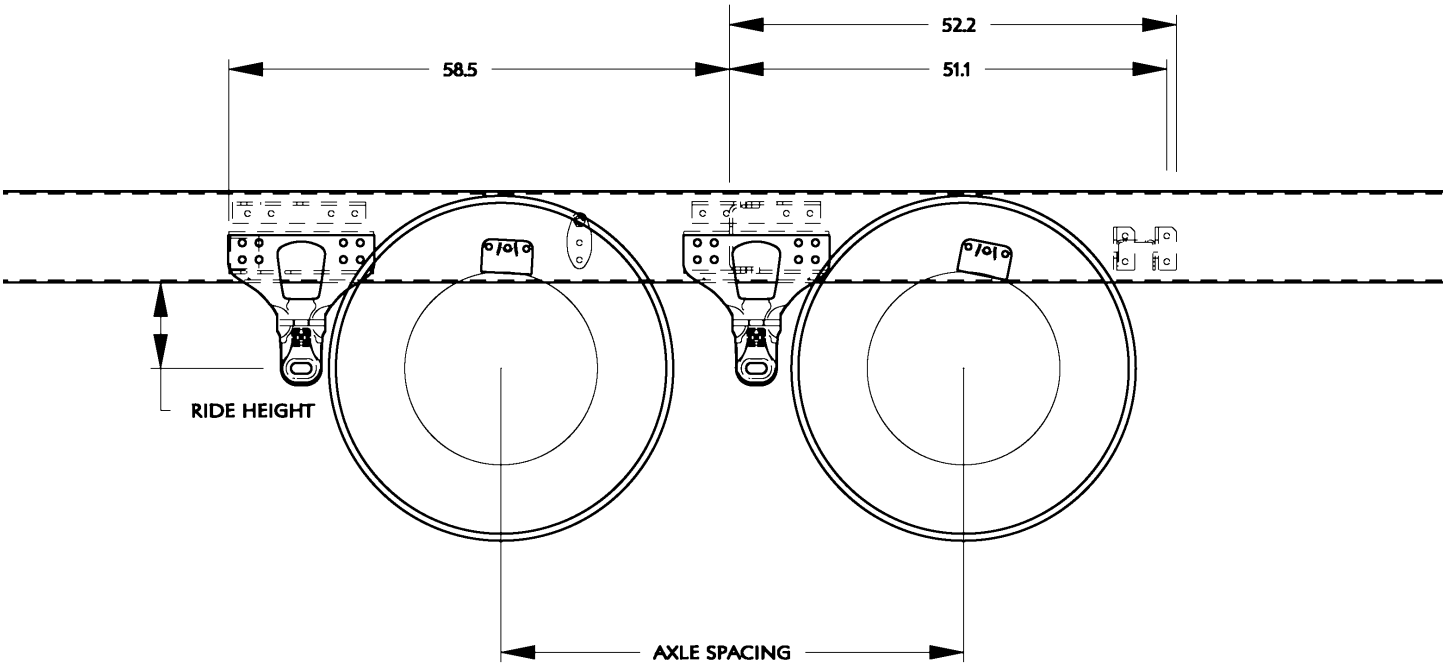
Suspension Type	Rating	Axle Spacing	Laden Ride Height	Unladen Ride Height
Neway ADZ369 tridem	69K	54”	10”	10”
Neway ADZ369 tridem	69K	54”	12”	12”
Neway ADZ369 tridem	69K	60”	12”	12”
Neway ADZ378 tridem	78K	54”	10”	10”
Neway AD378 tridem	78K	60”	10”	10”

NOTE: Actual axle spacing can depart from nominal due to axle slant requirements. Final axle spacing can vary by more than an inch from nominal in some cases. If precise axle spacing is critical due to body installation or state/local regulatory requirements please contact Kenworth Applications/technical Support for assistance.

https://truckmanualshub.com/

HENDRICKSON PRIMAAX EX TANDEM SUSPENSION

Shown with 54” Axle Spacings



Optional Hendrickson Primaax EX Tandem Suspensions

TABLE 3-13. Rear Suspension Options

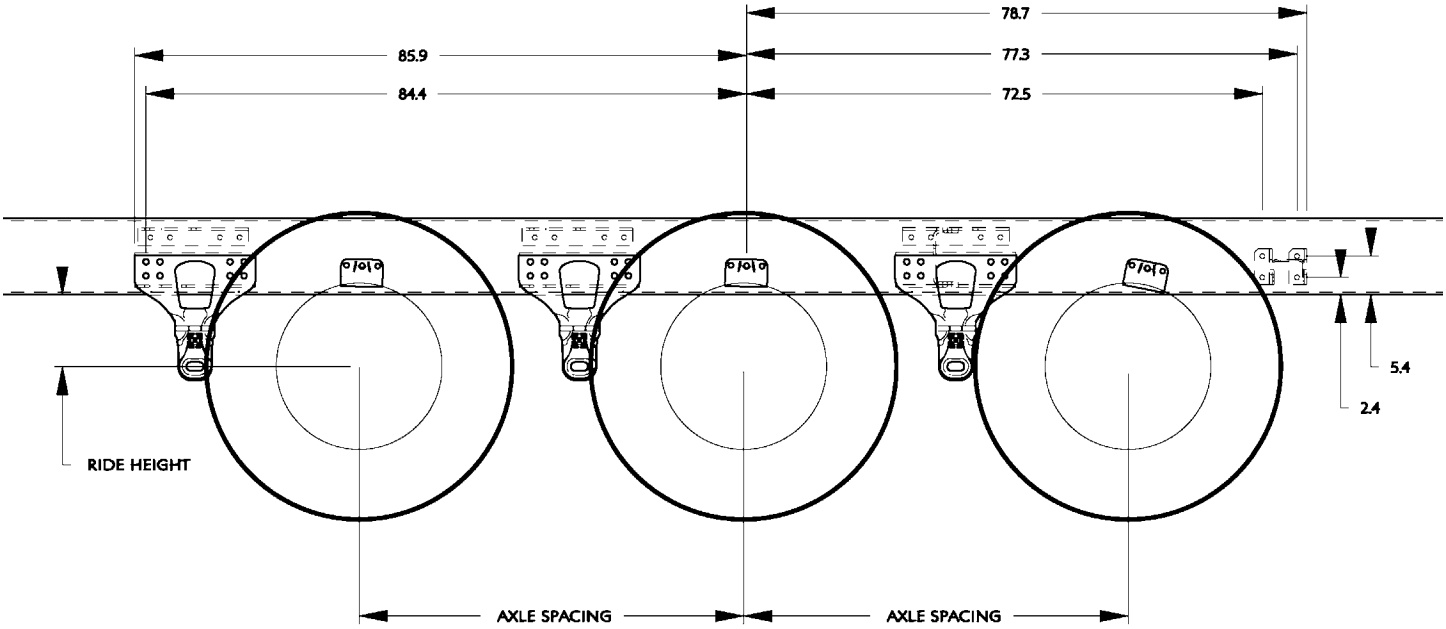
Suspension Type	Rating	Axle Spacing	Laden Ride Height	Unladen Ride Height
Hendrickson Primaax Tandem	46K	54”	10”	10”
Hendrickson Primaax Tandem	46K	60”	10”	10”
Hendrickson Primaax Tandem	46K	72”	10”	10”

NOTE: Actual axle spacing can depart from nominal due to axle slant requirements. Final axle spacing can vary by more than an inch from nominal in some cases. If precise axle spacing is critical due to body installation or state/local regulatory requirements please contact Kenworth Applications/technical Support for assistance.

https://truckmanualshub.com/

HENDRICKSON PRIMAAX EX TRIDEM SUSPENSION

Shown with 54” Axle Spacings



Optional Hendrickson Primaax EX Tridem Suspensions

TABLE 3-14. Rear Suspension Options

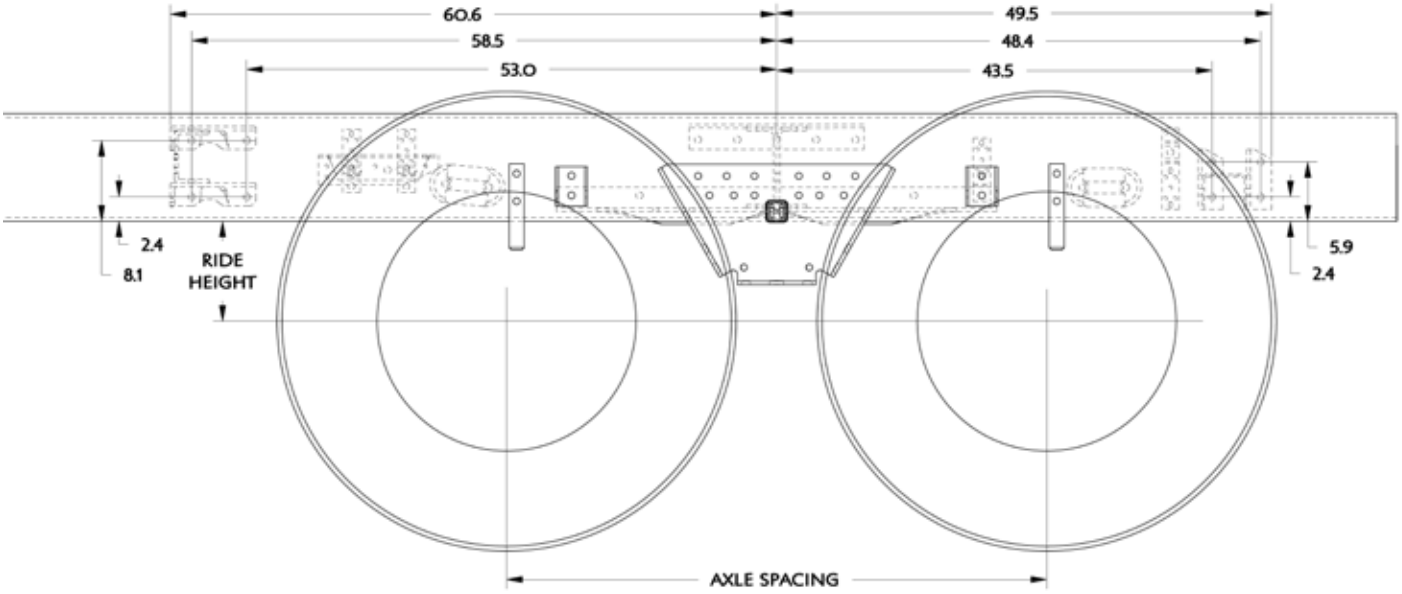
Suspension Type	Rating	Axle Spacing	Laden Ride Height	Unladen Ride Height
Hendrickson Primaax Tridem	69K	54”	10”	10”
Hendrickson Primaax Tridem	69K	60”	10”	10”

NOTE: Actual axle spacing can depart from nominal due to axle slant requirements. Final axle spacing can vary by more than an inch from nominal in some cases. If precise axle spacing is critical due to body installation or state/local regulatory requirements please contact Kenworth Applications/technical Support for assistance.

https://truckmanualshub.com/

HENDRICKSON HMX TANDEM SUSPENSION

Shown with 54” Axle Spacing



Optional Hendrickson HMX Tandem Suspensions

TABLE 3-15. Rear Suspension Options

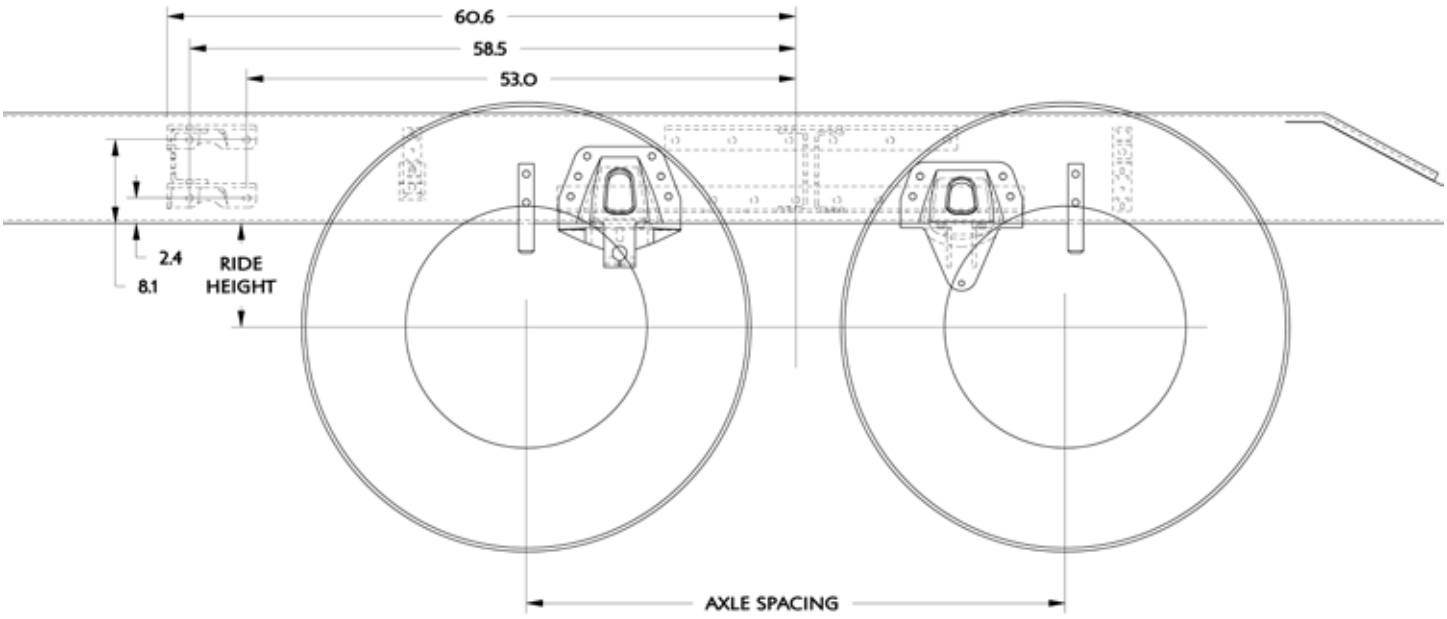
Suspension Type	Rating	Axle Spacing	Laden Ride Height	Unladen Ride Height
Hendrickson HMX400 16.5” saddle	40K	54”	9.5”	10.6”
Hendrickson HMX400 17.5” saddle	40K	54”	10.5”	11.6”
Hendrickson HMX460 16.5” saddle	46K	54”	9.5”	10.6”
Hendrickson HMX460 17.5” saddle	46K	54”	10.5”	11.6”
Hendrickson HMX460 18.5” saddle	46K	54”	11.5”	12.6”
Hendrickson HMX460 18.5” saddle	46K	60”	11.5”	12.6”

NOTE: Actual axle spacing can depart from nominal due to axle slant requirements. Final axle spacing can vary by more than an inch from nominal in some cases. If precise axle spacing is critical due to body installation or state/local regulatory requirements please contact Kenworth Applications/technical Support for assistance.

https://truckmanualshub.com/

HENDRICKSON RT TANDEM SUSPENSION

Shown with a 54” Axle Spacing Without Track Rods



Optional Hendrickson RT Tandem Suspensions

TABLE 3-16. Rear Suspension Options

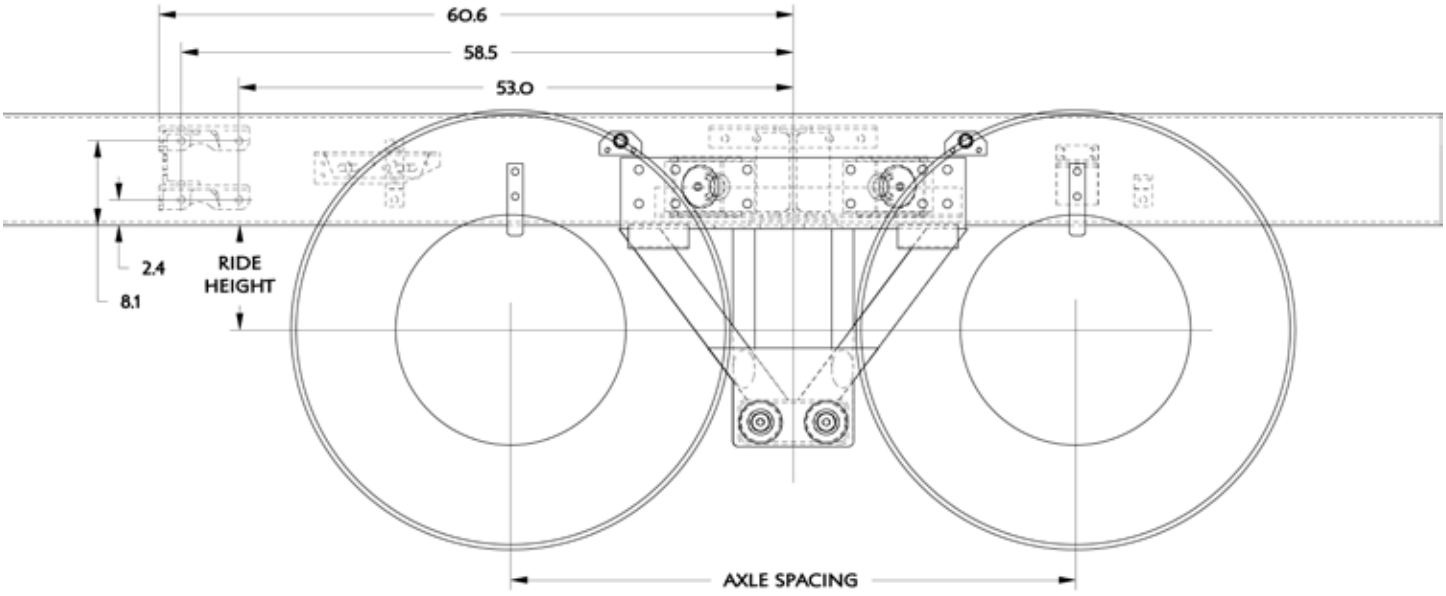
Suspension Type	Rating	Axle Spacing	Laden Ride Height	Unladen Ride Height
Hendrickson RT463 6” saddle	46K	52”	10.0”	11.1”
Hendrickson RT463 6” saddle	46K	54”	10.0”	11.1”
Hendrickson RT463 7.19” saddle	46K	54”	11.2”	12.5”
Hendrickson RT463 7.94” saddle	46K	54”	11.9”	13.3”
Hendrickson RT463 6” saddle	46K	60”	10.0”	11.1”
Hendrickson RT463 7.94” saddle	46K	60”	11.9”	13.0”
Hendrickson RTE463 7.19” saddle	46K	52”	10.5”	11.6”
Hendrickson RT523 6” saddle	52K	52”	9.9”	11.0”
Hendrickson RT523 6” saddle	52K	54”	9.9”	11.0”
Hendrickson RT523 7.19” saddle	52K	54”	11.1”	12.2”
Hendrickson RT523 11” saddle	52K	54”	14.9”	16.0”
Hendrickson RT523 6” saddle	52K	60”	9.9”	11.0”
Hendrickson RT523 7.19” saddle	52K	60”	11.1”	12.2”

NOTE: Actual axle spacing can depart from nominal due to axle slant requirements. Final axle spacing can vary by more than an inch from nominal in some cases. If precise axle spacing is critical due to body installation or state/local regulatory requirements please contact Kenworth Applications/technical Support for assistance.

https://truckmanualshub.com/

CHALMERS 856-46 TANDEM SUSPENSION

Shown with a 54” Axle Spacing



Optional Chalmers Tandem Suspensions

TABLE 3-17. Rear Suspension Options

Suspension Type	Rating	Axle Spacing	Laden Ride Height	Unladen Ride Height
Chalmers 854-40-L	40K	54”	8.9”	11.1”
Chalmers 854-40-L-HS	40K	54”	9.6”	11.1”
Chalmers 854-40-H	40K	54”	10.2”	12.4”
Chalmers 854-40-H-HS	40K	54”	10.9”	12.4”
Chalmers 854-46-L	46K	54”	8.9”	11.3”
Chalmers 854-46-L-HS	46K	54”	9.6”	11.3”
Chalmers 854-46-H	46K	54”	10.1”	12.5”
Chalmers 854-46-H-HS	46K	54”	10.9”	12.5”
Chalmers 854-50-L	50K	54”	8.9”	11.3”
Chalmers 854-50-L-HS	50K	54”	9.6”	11.3”
Chalmers 854-50-H	50K	54”	10.1”	12.5”

TABLE 3-17 CONTINUES ON NEXT PAGE…

https://truckmanualshub.com/

TABLE 3-17 CONTINUED

Suspension Type	Rating	Axle Spacing	Laden Ride Height	Unladen Ride Height
Chalmers 854-50-H-HS	50K	54”	10.9”	12.5”
Chalmers 854-52-L-HS	52K	54”	9.6”	11.3”
Chalmers 854-52-H-HS	52K	54”	10.9”	12.5”
Chalmers 860-40-L	40K	60”	8.9”	11.1”
Chalmers 860-46-L	46K	60”	8.9”	11.3”
Chalmers 860-46-L-HS	46K	60”	9.6”	11.3”
Chalmers 860-46-H	46K	60”	10.1”	12.5”
Chalmers 860-46-H-HS	46K	60”	10.9”	12.5”
Chalmers 860-52-H	52K	60”	10.9”	12.5”
Chalmers 872-46-H-HS	46K	72”	11.0”	12.5”

NOTE: Actual axle spacing can depart from nominal due to axle slant requirements. Final axle spacing can vary by more than an inch from nominal in some cases. If precise axle spacing is critical due to body installation or state/local regulatory requirements please contact Kenworth Applications/technical Support for assistance.

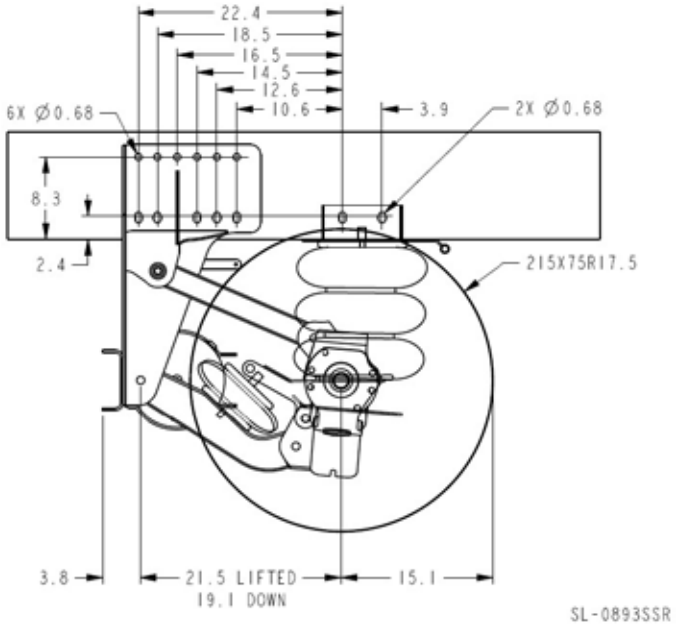
https://truckmanualshub.com/

LIFT AXLES (PUSHERS AND TAGS)

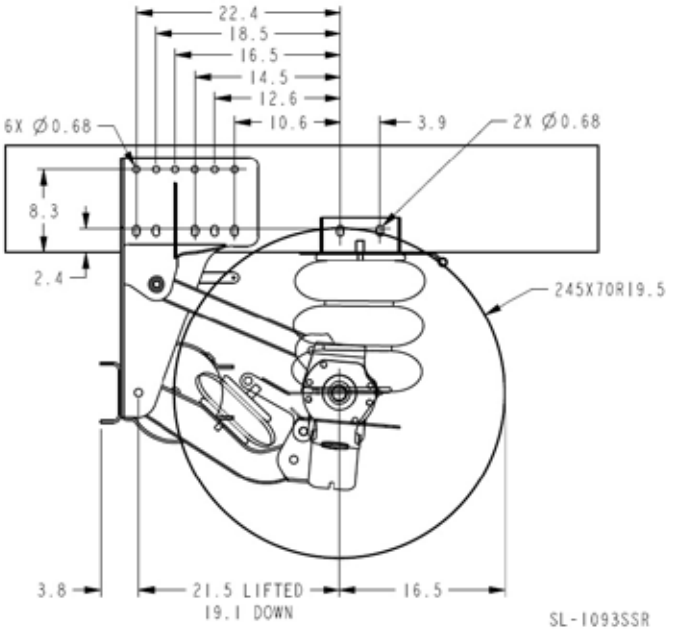
The rear pusher axle layouts are provided as a tool to help layout bodies prior to arrival. The applicable dimensions are shown. When using the pusher layouts to determine available frame space please be aware that clearances required are not shown. For information that may not be detailed in these drawings work with your local Kenworth Dealer to request that information.

Kenworth will automatically install highest lift axle kit as applicable based on chassis frame height and loading conditions. Lift axle available run range it utilized, along with frame height and lift axle tire size to identify applicable kits that can be installed. Installing highest lift axle kit will maximize ground clearance when axle is in lifted state. If needed, kit may be lowered in order to clear driveline when in lifted state.

Watson & Chalin 8K Steerable (SL0893SSR)

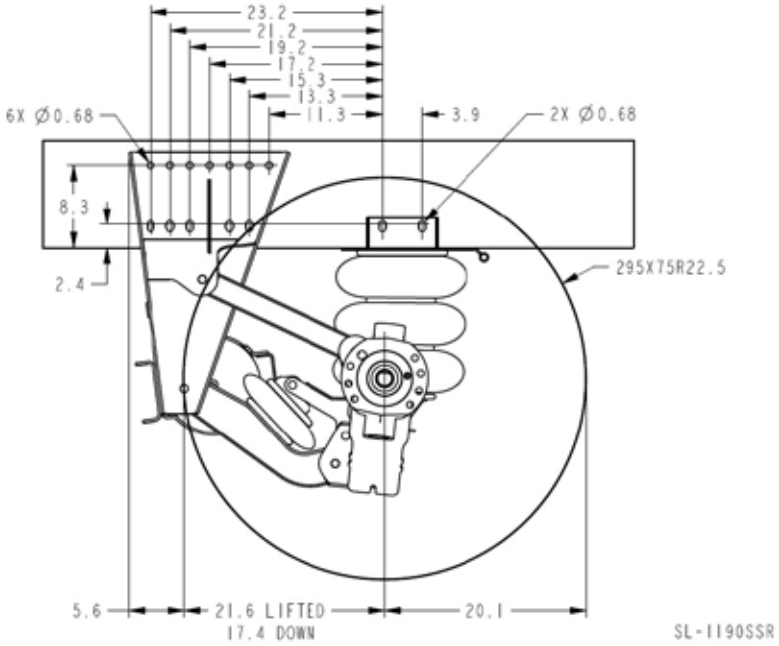


Watson & Chalin 10K Steerable (SL1093SSR)



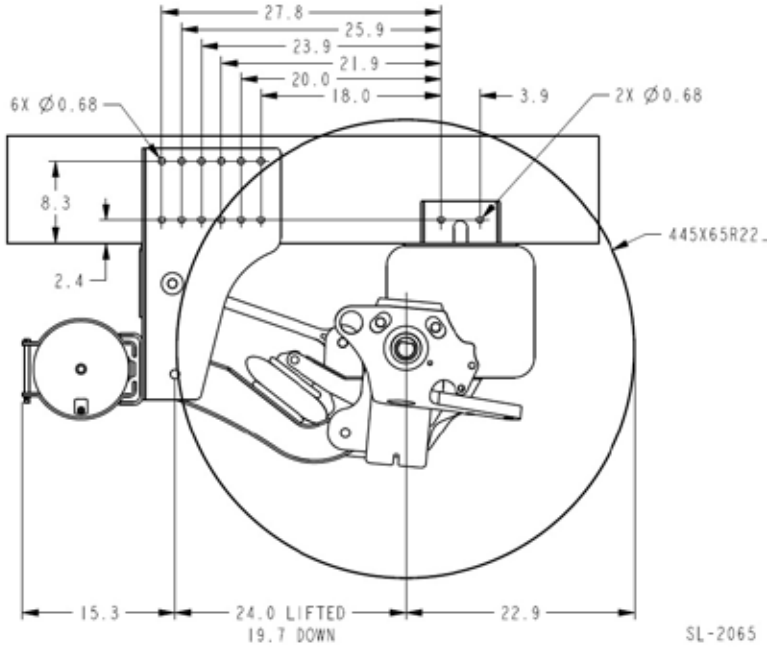
/

Watson & Chalin Tru Track Alumilite 13.5K Steerable (SL1190SSR)



/

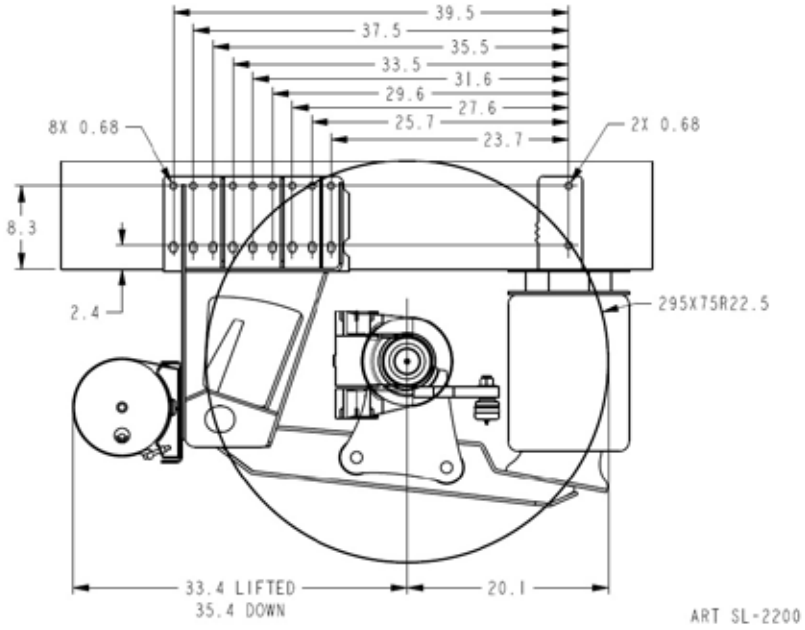
Watson & Chalin Tru Track 20K Steerable (SL2065)



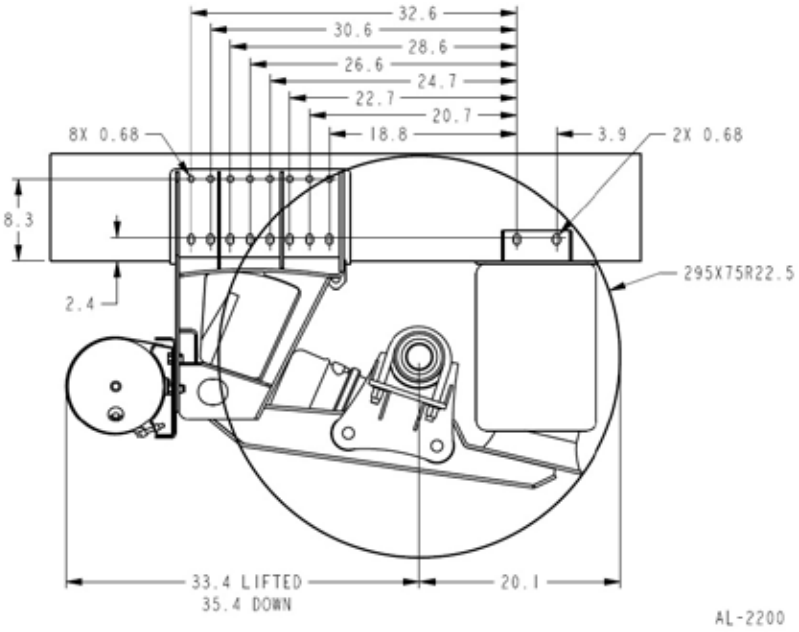
/

https://truckmanualshub.com/

Watson & Chalin 23K Steerable (SL2200) *Use with Duals Only*



Watson & Chalin 23K Non-Steerable (AL2200)



https://truckmanualshub.com/

AXLE TRACK AND TIRE WIDTH

The dimensions provided in this section are representative of some typical product combinations. The purpose this section is to demonstrate some of the typical dimensions.

- Axle Track: The distance between the dual tire centerlines on a dual tire arrangement or the distance between the tire centerlines on a single tire arrangement.
- Width: The distance over the outermost tire sidewall to sidewall.

These dimensions may be significant to the following:

- Appearance relative to other tires and chassis mounted equipment.
- Load carrying capacity. Different wheel disc offset can have a positive or negative impact on the axle carrying capacity of the axle.

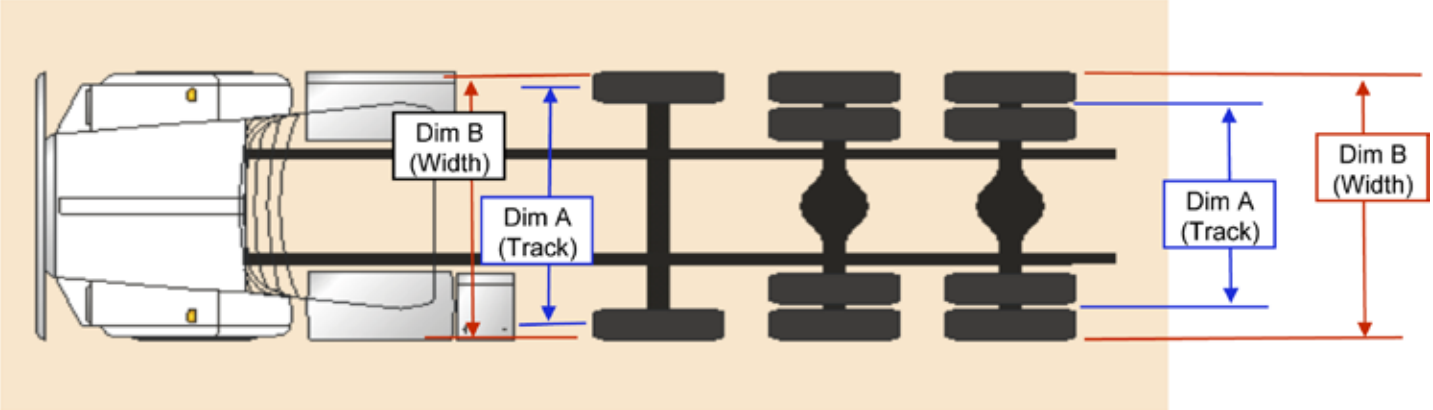


TABLE 3-18. Axle Width Calculation.

Axle - Drive	Wheel	Tire	Configuration	Track Dim "A"	Overall Width Dim "B:
Meritor RT46-160(P)(EH) 46K Dual Dana Spicer D46-170(H)(P) 46K Dual	Alcoa 88367 22.5X8.25	11R22.5	4-4	73.3"	97.8"
Meritor RT46-160(P)(EH) 46K Dual Dana Spicer D46-170(H)(P) 46K Dual	Alcoa 98363 24.5X8.25	11R24.5	4-4	73.6"	98.0"
Meritor RT46-160WT(P)(EH) 46K Dual Wide Track Dana Spicer D46-170W(H)(P) 46K Dual Wide Track	Alcoa 88367 22.5X8.25	11R22.5	4-4	79.2"	103.7"
Meritor RT46-160WT(P)(EH) 46K Dual Wide Track Dana Spicer D46-170W(H)(P) 46K Dual Wide Track	Alcoa 98363 24.5X8.25	11R24.5	4-4	79.5"	103.9"
Dana Spicer D46-170(H)(P) 46K Dual Meritor RT46-160(P)(EH) 46K Dual	Alcoa 82262 22.5X12.25	425/65R22.5	2-4	72.7	88.9"
Meritor RT46-160WT(P)(EH) 46K Dual Wide Track Dana Spicer D46-170W(H)(P) 46K Dual Wide Track	Alcoa 82262 22.5X12.25	425/65R22.5	2-4	78.7"	94.9"

TABLE 3-18 CONTINUES ON NEXT PAGE...

https://truckmanualshub.com/

TABLE 3-18 CONTINUED

Axle - Steer	Wheel	Tire	Brake Drum Type	Track Dim "A"	Overall Width Dim "B:
Meritor MFS13 Std Track Dana Spicer E-1322I 13.2K	Alcoa 98363 24.5X8.25	11R24.5	CAST	80.2"	91.0"
Meritor MFS13 Wide Track Dana Spicer E-1322W 13.2K	Alcoa 98363 24.5X8.25	11R24.5	CAST	82.2"	93.0"
Meritor MFS20 Std Track Dana Spicer D2000 20K	Alcoa 82362 22.5X12.25	425/65R22.5	CAST	86.5"	102.7"
Meritor MFS20 Std Track Dana Spicer D2000 20K	Alcoa 82462 22.5X12.25	425/65R22.5	CAST	82.6"	98.8"

Lift Axle Model	Wheel	Tire	Wheel Orientation	Track Dim "A"	Overall Width Dim "B"
W&C SL0893SSR 8K Steerable	Alcoa 66480 17.5x6	215/75R17.5	Same as FR	77.3"	85.8"
W&C SL1093SSR Steerable 10K	Alcoa 77349 19.5x7.5	265/70R19.5	Same as FR	78.5"	88.5"
W&C SL1190SSR Steerable 13.5K	Alcoa 88367 22.5x8.25	255/70R22.5	Same as FR	80.4"	90.7"
W&C SL2065 Steerable 20K	Alcoa 82362 22.5x12.25	425/65R22.5	Same as FR	83.6"	99.8"
W&C SL2200 Steerable 23K	Alcoa 88367 22.5x8.25	295/75R22.5	Same as RR, dual	78.2"	102.8"
W&C AL2200-STD Track Non-Steerable 23K	Alcoa 88367 22.5x8.25	11R22.5	Same as RR, dual	72.2"	96.6"
W&C AL2200-STD Track Non-Steerable 23K	Alcoa 82362 22.5x12.25	425/65R22.5	Same as RR, single	78.4"	94.7"
W&C AL2200-Wide Track Non-Steerable 23K	Alcoa 89465 22.5x9	315/80R22.5	Same as FR, single	64.7"	77.3"
W&C AL2200-Wide Track Non-Steerable 23K	Alcoa 84362 22.5x14	445/50R22.5	Same as RR, single	80.6"	97.7"

https://truckmanualshub.com/

GROUND CLEARANCE

This information is provided as a reference, not all optional equipment is included. In order to calculate the height on your specific chassis, please use the ride height information provided on page 3-14. For comparison the FS value shown is 11.4” unladen and 10.4” laden.

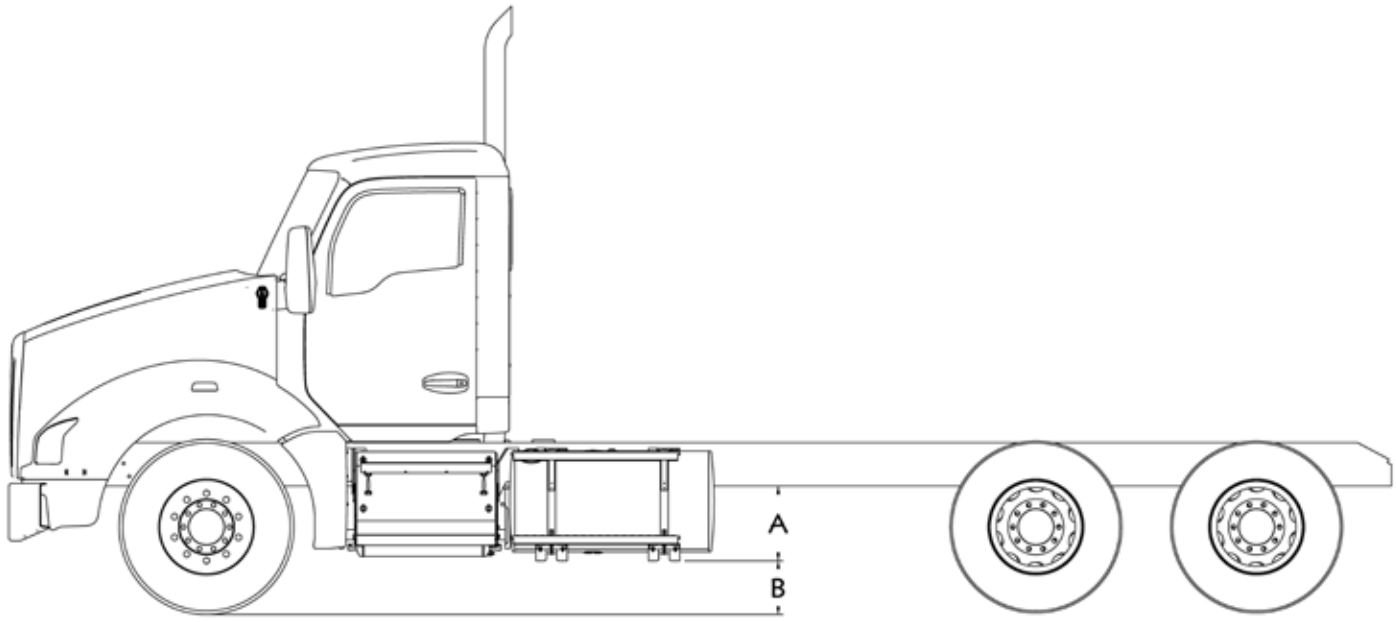


TABLE 3-19. Ground Clearance for Fuel Tanks

Front Suspension	Front Tires	Rear Suspension	Rear Tires	Fuel Tank Size	Component	Dimension “A” Distance from Bottom of Frame Rail (in)	Dimension “B” Ground Clearance (in)	
							Unladen	Laden
20K Taperleaf Spring	425/65R22.5	Hendrickson HMX 460 17.5” Saddle Height	11R24.5	22” Diameter	Fuel Tank	16.3	17.2	14.9
					DEF Tank	15.3	18.2	15.9
				24.5” Diameter	Fuel Tank	18.2	15.3	13
					DEF Tank	15.8	17.7	15.4
				28.5” Diameter	Fuel Tank	21.4	12	9.7
					DEF Tank	17.2	16.2	13.9

https://truckmanualshub.com/

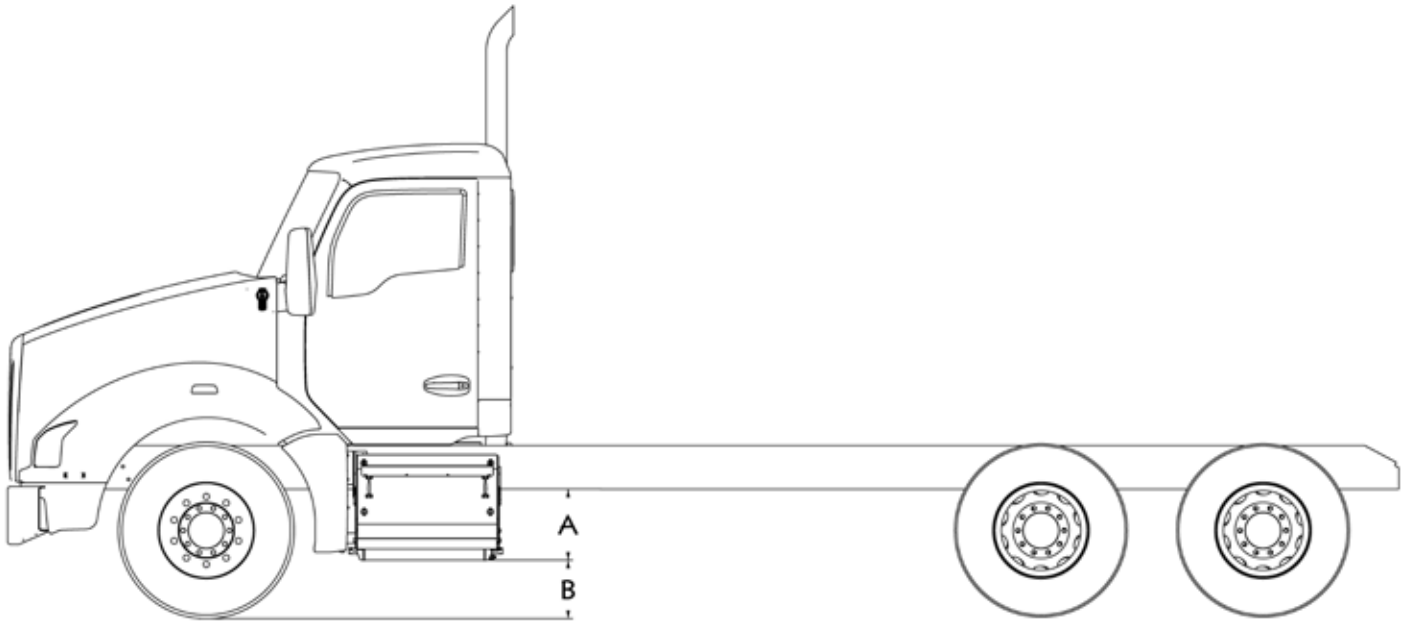


TABLE 3-20. Ground Clearance for Battery Boxes

Front Suspension	Front Tires	Rear Suspension	Rear Tires	Component	Dimension "A" Distance from Bottom of Frame Rail (in)	Dimension "B" Ground Clearance (in)	
						Unladen	Laden
20K Taper-leaf Spring	425/65R22.5 Tires	Hendrickson HMX 460 17.5" Saddle Height	11R24.5	Battery Box with Air Tanks	17.3	16.2	13.9
				Vocational Battery Box with Air Tanks	17.8	15.7	13.4
				DPF[1] Box	15.6	17.8	15.5

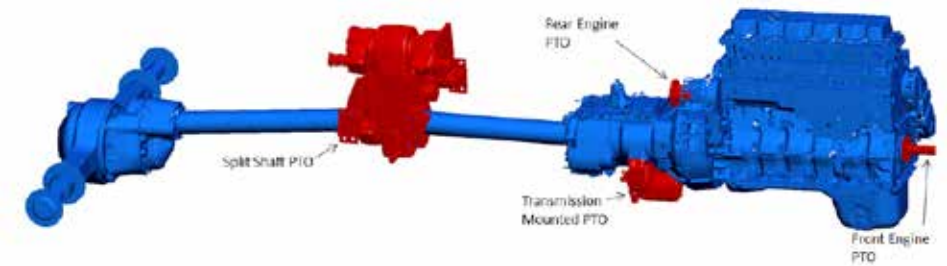
[1] Dimensions shown are for daycabs with high route exhaust. Sleeper ground clearance is reduced by 1.3 inches.

https://truckmanualshub.com/

PTO MOUNTING

PTOs

Power Take-Offs (PTOs) are mechanical gearboxes that attach to transmissions, or are attached to the front of the engine (FEPTO), rear of the engine (REPTO) or mounted between the driveline (split shaft PTO). They are used to transfer the power of the vehicle engine to auxiliary components, most commonly a hydraulic pump.



Manual/automated-manual transmission mounted PTOs

This is the most common type of PTO. On a manual transmission there are two locations for PTO's: on medium duty transmissions there are 6 bolt PTO locations on the right and left (figure X.1 below); on heavy duty manual transmissions there is a 6 bolt PTO on the right and an 8 bolt PTO on the bottom left (figure X.2 below). There are also options for a thru-shaft or extended countershaft PTO. On a thru shaft PTO, the counter shaft extends out through the back of the transmission which can be used to power a PTO (figure X.3 below). When using a thru-shaft PTO the vehicle must be spec'd with the correct option since not all transmissions will be set up for use with thru shaft PTO's. For more information go to www.roadranger.com and enter "PTO Installation Guide" in the search bar in the upper right corner.



FIGURE 4-1. Medium Duty Manual Transmission PTOs



FIGURE 4-2. Heavy Duty Manual Transmission PTOs

https://truckmanualshub.com/



FIGURE 4-3. Thru-Shaft PTO

Automatic transmission mounted PTOs

On Allison transmissions there are two locations for PTO's. The Allison 4000 series has PTO locations at 1 and 8 o'clock viewed from the back of the transmission. The 4000HS transmissions do not have any PTO locations. The 3000 series Allison transmissions have PTO locations at 4 and 8 o'clock. For more information on using PTO's with an Allison transmission go to www.allisontransmission.com and refer to the "Rugged Duty Series Brochure" and "PTO Request Flyer" which is available in a 1000/2000 version and a 3000/4000 version.



FIGURE 4-4. Allison 4000 Series Transmission PTO Locations



FIGURE 4-5. Allison 3000 Series Transmission PTO Locations

https://truckmanualshub.com/

Rear engine PTOs

Rear Engine PTO (REPTO) is commonly used in cement mixer and feed lot applications. The REPTO is driven off the rear gear train on the engine. There is a 1350/1410 flange on the bell housing in the 1 o'clock position that can be used to attach a hydraulic pump or driveshaft.



FIGURE 4-6. REPTO Location Shown

The REPTO flange will always be turning when the engine is running and the output rotation is the same as the engine. The Cummins ISL9 and PX-9 REPTO turns at a rate of 1.15:1. The Cummins ISX12 REPTO turns at a rate of 1.32:1. The PACCAR MX-13 REPTO turns at a rate of 1.2:1 and PACCAR MX-11 REPTO turns at a rate of 1.3:1.

PTO Telltale:

With key switch to "RUN" position, all the telltale icons will turn on briefly. PTO icon below will be illuminated green to the left side of the Driver Performance Center.



FIGURE 4-7. PTO Icon

If the factory did not install the PTO or did not install the PTO pre-wire (T680-T880) you may have to install wiring from the PTO engagement switch to the instrument panel harness to illuminate this icon. To do this:

Your dealer will have access to your truck's Instrumentation diagram. That drawing will have a picture of the cluster and will help identify how to turn on the PTO ICON you saw doing the key switch test above.

https://truckmanualshub.com/

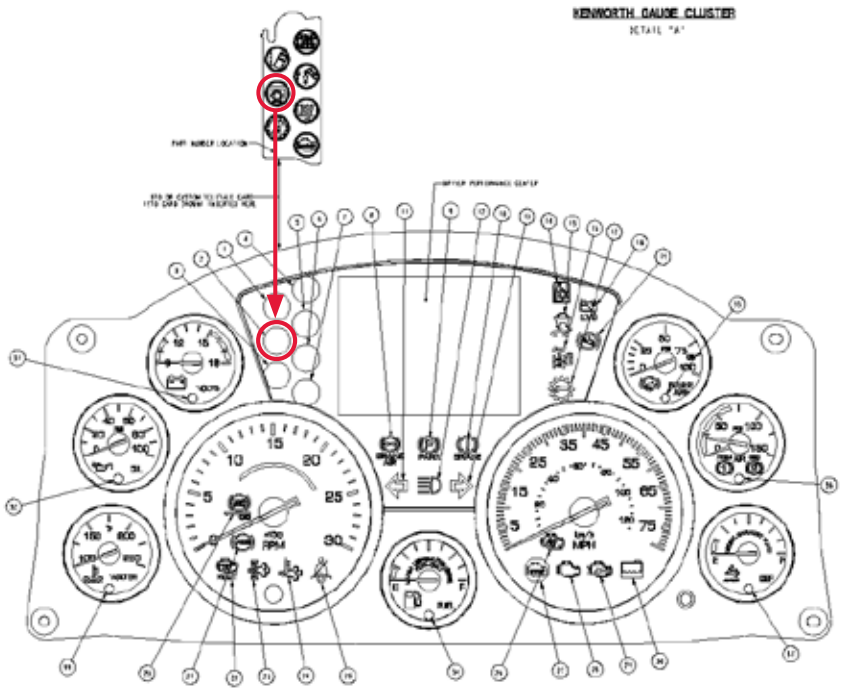


FIGURE 4-8. PTO Telltale Location

The standard telltale card has a GREEN PTO icon in position #2 (shown above). To activate this icon, locate where (6) RED, GREEN and YELLOW labeled 2-way connectors are taped to the instrument panel harness on the left side of the cup holder. One of these 2-way connectors has a GREEN label with the text “EDITABLE TELLTALE #2 P025”. A gray wire goes to pin 2 of this connector. When that gray wire is grounded the PTO icon will turn on. No programing is needed, and it can be easily tested before wiring with a ground wire jumper.

Eaton Automated Transmission PTO Signal:

If a PTO is installed in an Eaton automated transmission the automated transmission controller also needs to know when the PTO is engaged. If factory-installed, a relay will be present sending a signal to the Eaton transmission controller that the PTO is engaged.

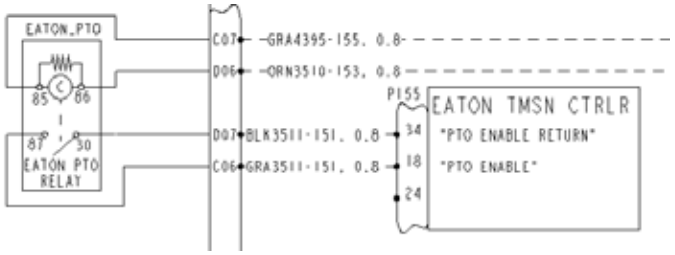


FIGURE 4-9. Relay Wiring Diagram

Engine PTO Signal:

The engine also needs to know when the PTO is engaged to allow different idle speeds and record PTO run time. There is an optional REMOTE PTO/THROTTLE connector on the engine harness. It is a 12-pin Deutsch connector (Deutsch P/N DT06-12SA-P012) located on-engine (reference Section 9: Electrical for location of connector)

This connector is pinned differently depending on engine. Below are the pin outs for 2013+ emission engines.

https://truckmanualshub.com/

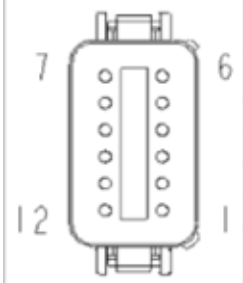
Mating View	Contact	Function
	1	REMOTE PTO RESUME
	2	REMOTE PTO SET
	3	COMMON RTN #1 (SWITCH)
	4	REMOTE THROTTLE SIGNAL
	5	PTO ON / OFF
	6	
	7	IGNITION POWER
	8	GROUND
	9	
	10	POWER SUPPLY (5V)
	11	COMMON (+12VDC)/ ENGINE SYSTEM POWER
	12	

FIGURE 4-10. 2013+ MX-11 and MX-13 Pin-Out

For the MX engines pin 5 is the PTO signal. This signal needs to be +12V. Since the PTO engagement switch is a ground side switch, a relay needs to be added to provide the correct input to the engine ECU.

2013+ Cummins ISX15, ISX12, ISL, PX-8

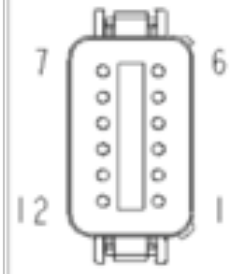
Mating View	Contact	Function
	1	PTO RESUME
	2	PTO SET
	3	COMMON RTN #1 (SWITCH)
	4	REMOTE THROTTLE SIGNAL
	5	PTO ON / OFF
	6	REMOTE THROTTLE ENABLE
	7	SWITCHED POWER (IGN)
	8	GROUND
	9	TORQUE LIMIT SWITCH
	10	REMOTE THROTTLE SUPPLY (5V)
	11	REMOTE THROTTLE RETURN
	12	REMOTE THROTTLE ON/OFF

FIGURE 4-11. 2013+ ISX15, ISX12, PX-9 Pin-Out

For the Cummins engines pin 5 is the PTO signal. This signal needs to be low signal. Since the PTO engagement switch is a ground side the PTO switch can be wired directly to pin 5.

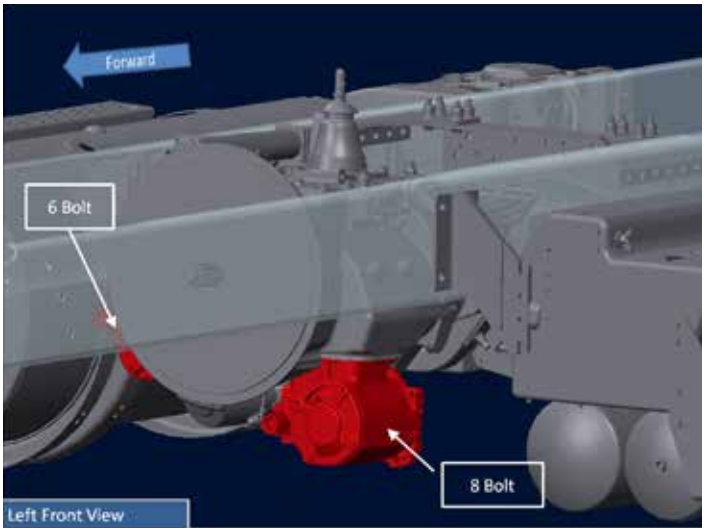
https://truckmanualshub.com/

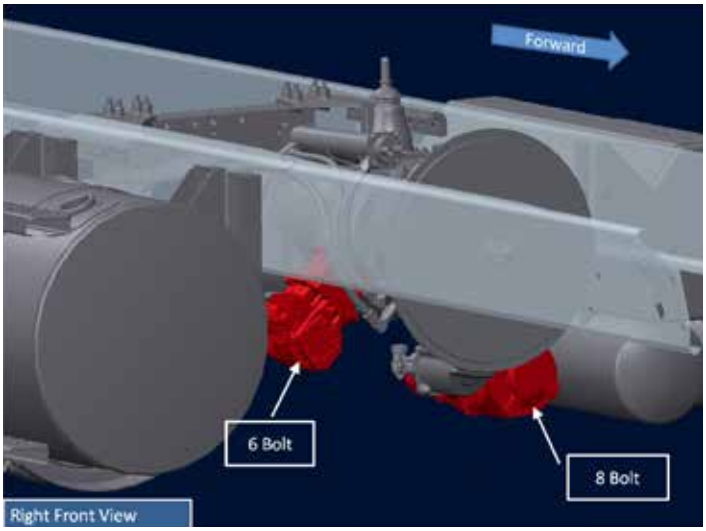
PTO CLEARANCES

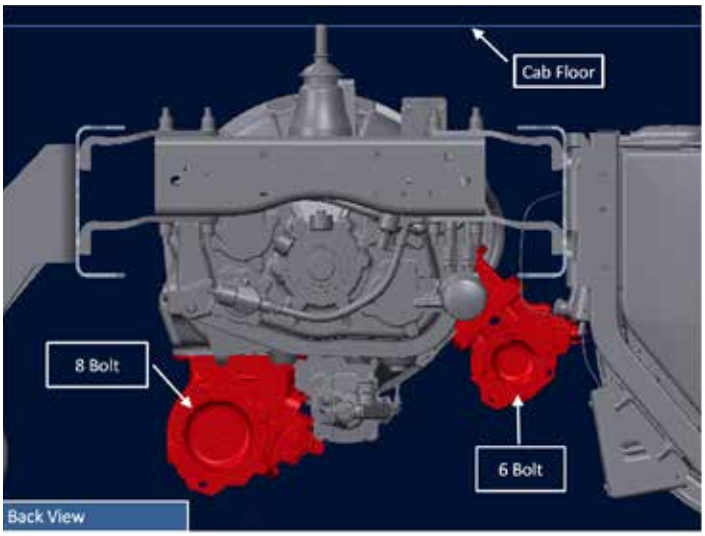
The following visuals are provided to help aid in determining PTO locations and clearances. For specific dimensions please work through your local Kenworth dealer. Note: Installations depict multiple PTOs.

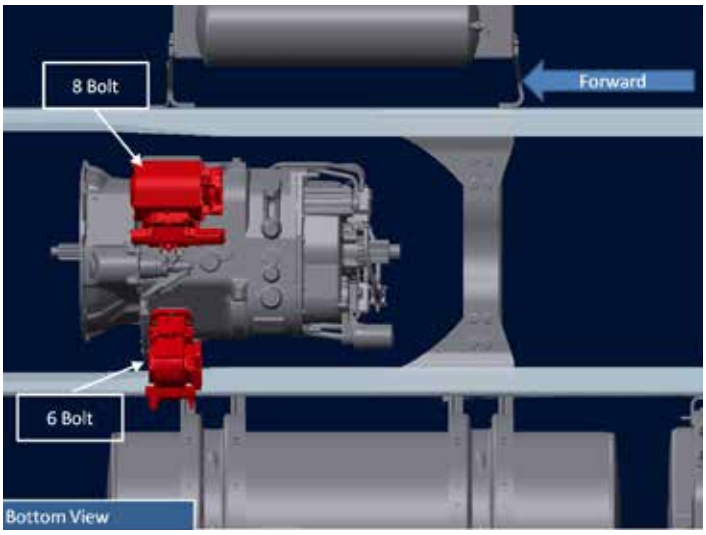
In order to ensure the PTO area remains clear of air equipment, electrical and emissions equipment, Kenworth recommends always ordering PTO controls, even when installing the PTO aftermarket. Kenworth does offer a variety of factory installed PTOs. Contact your local dealer for assistance.

Manual Transmission:



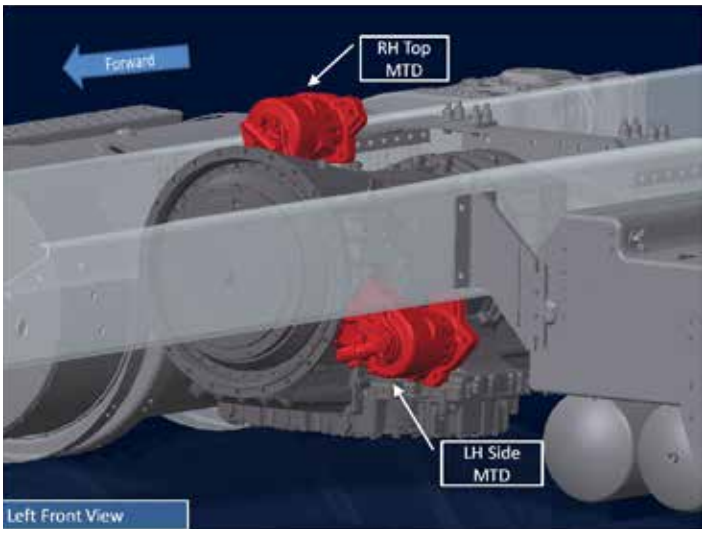


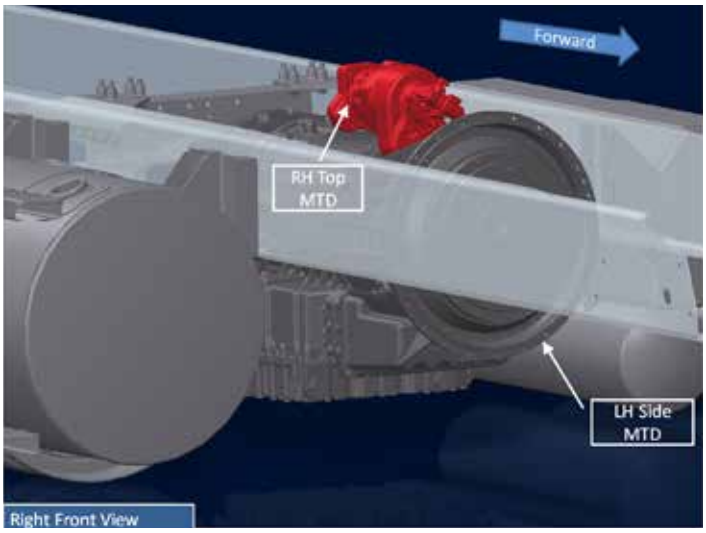


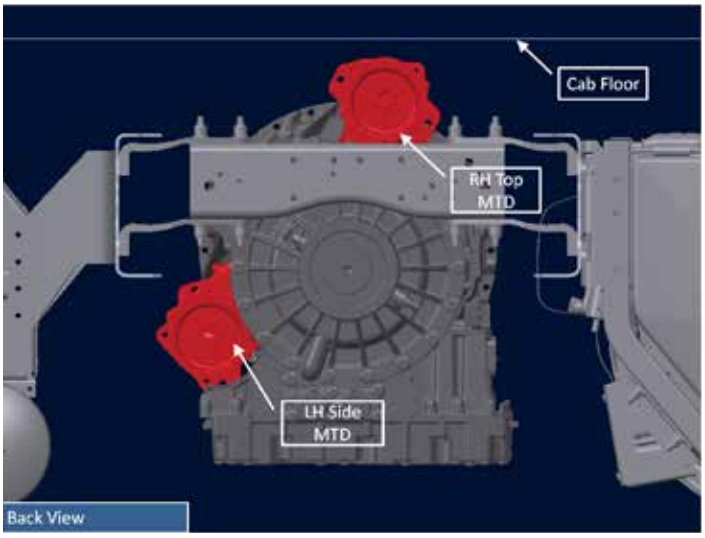


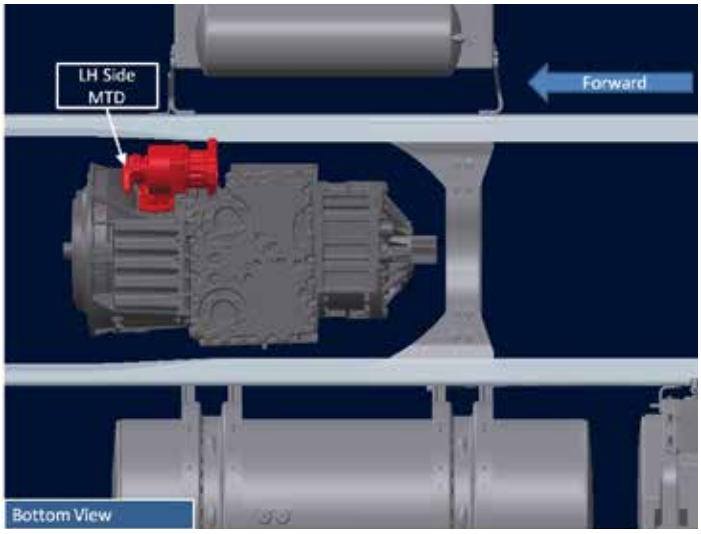
https://truckmanualshub.com/

Allison Transmission:









https://truckmanualshub.com/

T680/880 TRANSMISSION PTO APPLICATION GUIDE

This application guide indicates if a PTO has sufficient clearance to truck components in various mounting configurations. A green “ok” indicates that there is sufficient clearance to other truck components. A red “x” indicates that there minimal or no clearance and the application is not recommended. The truck components investigated in this guide include frame rails, Set Back Front Axle (SBFA) rear shackle, SBFA Front Air Suspension (FAS) rear shackle, over-bell frame brace, coolant return manifold, transmission clutch actuator, and exhaust system components.

Usage Notes:

1. This application guide is only applicable to T680/880 trucks.
2. Only the specified PTO configurations have been analyzed. Please submit an OAR to review other models and/or configurations.
3. Horizontal crossover exhaust limits access behind PTO’s for shaft drives and other PTO attachments.
4. Fuel tank cross bracing may interfere with PTO’s and/or PTO attachments (such as hydraulic pumps). If this is an issue, the cross brace may be moved to an alternate fuel tank support. “
5. Eaton FR transmissions require the use of a 30° adapter when installing Chelsea or Muncie transmission PTO’s in the right hand position.
6. Eaton RT & Ultrashift Plus transmissions require the use of a 49° adapter when installing Chelsea transmission PTO’s in the right hand position.
7. Eaton RT & Ultrashift Plus transmissions require the use of a 55° adapter when installing Muncie transmission PTO’s in the right hand position.
8. Eaton transmissions require the use of a 6 to 8 Bolt adapter when installing a 6 bolt PTO in the bottom position.

https://truckmanualshub.com/

10-Bolt PTO's for Allison Transmissions

TABLE 4-1.

			4000 Series		3000 Series - 1 & 8 Housing		3000 Series - 4 & 8 Housing	
Brand	**PTO**	**Truck Model**	**1 o'clock**	**8 o'clock**	**1 o'clock**	**8 o'clock**	**4 o'clock**	**8 o'clock**
Chelsea	267-M3XK	All	x	x	ok	x	x	x
	267-M5XK	All	ok	ok	ok	x	ok	ok
	277-B5XS	T680/880	ok	ok	ok	x	ok	ok
		T680SH/880SH	ok	x	ok	x	ok	ok
	859-B5XS	All	ok	x	x	x	x	x
	870X-B3RS	All	ok	x	ok	x	x	x
	870X-B5RS	All	ok	x	ok	x	x	x
	890-B5XS	All	ok	x	ok	x	x	ok
Muncie	CD05-M3CX	All	ok	ok	ok	ok	ok	ok
	CD10-M1CX, DX	T680/880	ok	x	ok	x	ok	ok
		T680SH/880SH	ok	x	ok	x	x	ok
	CD10-M3CX, DX	T680/880	ok	x	ok	x	ok	ok
		T680SH/880SH	ok	x	ok	x	x	ok
	CS10-P1CX, EX	All	x	x	x	x	x	x
	CS10-P3CX, EX	All	x	x	x	x	x	x
	CS24-P1BX, KX	All	ok	x	ok	x	x	x
	CS24-P3BX, KX	T680/880	ok	ok	ok	x	ok	ok
		T680SH/880SH	ok	ok	ok	x	x	ok
	CS41-P1CX, EX	All	ok	x	x	x	x	x
	CS41-P3CX, EX	All	ok	x	x	x	x	x
	HS24-P1BX, KX	T680/880	ok	x	x	x	ok	x
		T680SH/880SH	ok	x	x	x	ok	ok
	HS24-P3BX, KX	All	ok	ok	ok	x	x	ok

https://truckmanualshub.com/

6 & 8 Bolt PTO's for Eaton Transmissions

TABLE 4-2.

			FR		RT		Ultrashift Plus	
Brand	**Style**	**PTO**	**Bottom**	**Right**	**Bottom**	**Right**	**Bottom**	**Right**
Chelsea	6-Bolt	230-V3XD/XK	ok	ok1,2,3	ok	ok1,2,3	ok	ok1,2,3
		236-V3XD/XK	Recomend 238	ok1,2,3	Recomend 238	ok1,2,3	Recomend 238	ok1,2,3
		270-B3XD/XK	ok	ok1,2,3	ok	ok1,2,3	ok	ok1,2,3
		340-V5XD	ok	ok1,2,3	ok	ok1,2,3	ok	ok1,2,3
		442-V3XK	Recomend 489	ok1,2,3	Recomend 489	ok1,2,3	Recomend 489	ok1,2,3
		660-V3XK	Recomend 680	ok1,2,3	Recomend 680	ok1,2,3	Recomend 680	ok1,2,3
	8-Bolt	238-V3XD/XK	ok	n/a	ok	n/a	ok	n/a
		489-V3XK	ok	n/a	ok	n/a	ok	n/a
		680-V3XK	ok	n/a	ok	n/a	ok	n/a
		823-V3XS	ok	n/a	ok	n/a	ok	n/a
		880-V3XS/XV4	ok	n/a	ok	n/a	ok	n/a
		885-V3XS4	ok	n/a	ok	n/a	ok	n/a
Muncie	6-Bolt	CS6-P1BX/KX	Recomend CS8	ok1,2,3	Recomend CS8	ok1,2,3	x	ok1,2,3
		SH6-P1BX/KX	Recomend SH8	ok1,2,3	Recomend SH8	ok1,2,3	x	ok1,2,3
		TG6-P1BX/KX	Recomend TG8	ok1,2,3	Recomend TG8	ok1,2,3	Recomend TG8	ok1,2,3
	8-Bolt	828S-U1CX/EG	ok	n/a	ok	n/a	x	n/a
		CS8-P1BX/KX	ok	n/a	ok	n/a	ok	n/a
		SH8-P1BX/KX	ok	n/a	ok	n/a	ok	n/a
		TG8S-P1BX/KX	ok	n/a	ok	n/a	ok	n/a

NOTES:

1) Not available with AG130 Front Air Suspension

2) Not available with Horizontal Crossover or Right Hand Behind Fairing Exhaust Systems

3) Restricted PTO access with RH Cab Step Assembly DPF-SCR exhaust systems with Vertical BOS tailpipes or RH Horizontal Tailpipe below rail

4) The Optional Hydraulic Clutch Orientation must be used with this PTO

https://truckmanualshub.com/

Dual PTO Compatibility for Eaton Transmissions

TABLE 4-3.

	Chelsea								Muncie						
	RH (6-Bolt) PTO's														
		RT			FR			Ultrashift+		RT		FR		Ultrashift+	
	Model	230/236-V3	340X-V5	442/660-V3	230/236-V3	340X-V5	442/660-V3	340X-V5	442/660-V3	Model	CS/SH6-P1	TG6-P1	CS/SH6-P1	TG6-P1	CS/SH6-P1	TG6-P1
LH (6 & 8-Bolt) PTO's	230/236-V3	S	S	S	S	S	S	ok	ok	828S-U1	S	S	S	S	ok	ok
	238-V3	S	S	S	S	S	S	ok	ok	CS/SH8-P1	S	S	S	S	ok	ok
	340X-V5	S	S	S	S	S	S	ok	ok	TG8S-P1	S	S	S	S	ok	ok
	442/660-V3	S	S	S	S	S	S	ok	ok							
	489/680-V3	S	S	S	S	S	S	ok	ok							
	823-V3	S	S	S	S	S	S	ok	ok							
	880-V3	x	x	O	x	O	x	ok	ok							
	885-V3	x	x	O	x	O	x	ok	ok							

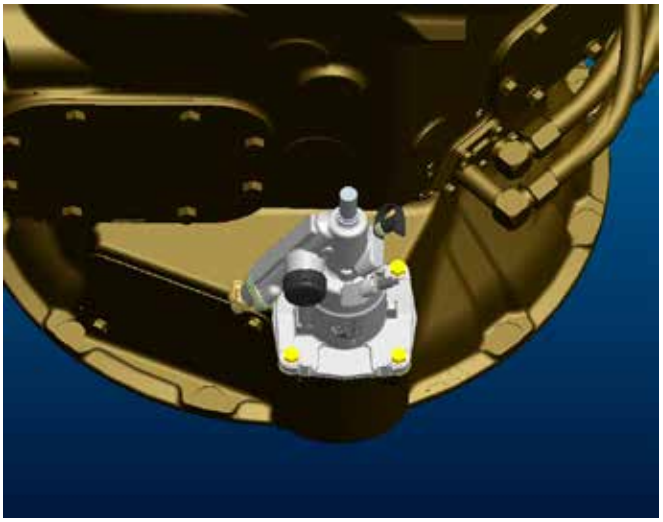
S = Standard Hydraulic Clutch Actuator Configuration
O = Optional Hydraulic Clutch Actuator Configuration

https://truckmanualshub.com/

HYDRAULIC CLUTCH ACTUATOR CONFIGURATIONS:

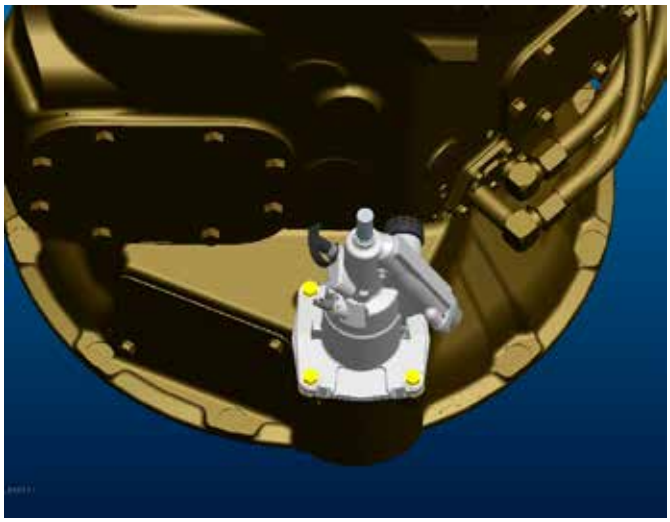
Only used with T680/T880 trucks with Eaton FR or RT transmissions

The Clutch Actuator Configuration is driven by the PTO informational sales codes. There is not a specific sales code which specifies the configuration.



Standard Configuration

Air assist connection faces driver's side
Used with All but Chelsea 880 and 885 PTOs



Optional Configuration

Air assist connection faces passenger's side
Used with Chelsea 880 and 885 PTOs

PTO Controls:

The T680/880 models have been designed to use electric in-dash switches to control air solenoids (Electric Over Air system, or EOA) which engage/disengage transmission PTOs. This system allows for increased control and interlock opportunities. This also keeps air lines for transmission PTO controls from routing inside the cab. In cab air valve actuators for transmission PTO control are still available and are located on the cab floor on the LH side of the driver's seat. Air valve style transmission PTO actuators should not be installed on the dash due to the difficulty of air-line routing. Customer installed transmission PTO controls for use with customer installed transmission PTO's include a chassis and dash harness pre-wire to ease the installation of in-dash transmission PTO controls at the body builder. It is strongly recommended that the truck be coded for this if transmission PTO(s) could be installed after initial in-service date.

The EOA system is used to control PTO engagement. There are three different types of PTOs supported in the EOA software:

Single-Acting PTOs – these types of PTOs have a single air control. A single chassis node output controls the air solenoid, tand the air pressure engages the PTO – the lack of air pressure at the control port disengages the PTO.

Double-Acting PTOs – these types of PTOs have a dual air control. One air signal controls the engagement and one air signal controls the disengagement. This can be achieved in one of two ways:

- A single-acting PTO is configured – the engage air control port is connected to the chassis node output and a pilot inversion valve in the chassis air plumbing is connected to the second disengage air control port.
- Two chassis node outputs control the PTO. One chassis node output and solenoid is connected to the engage air control port of the PTO, and one chassis node output and solenoid is connected to the disengage air control port.

Reversible PTOs – have three different operational states. Inactive – not engaged to driveline (no air control ports active). Main direction –engaged to driveline (main air control port pressureized). Opposite direction –engaged to driveline (opposite air control port pressurized). If the vehicle is specified with a pTO installation from the factory, a protected PTO on/off switch will be used. It will connect to the instrument panel harness ith a switch connector labeled "EOA x" x eing a number between 1 and 10.

https://truckmanualshub.com/

PTO Functionality Description

Power Take-Off (PTO)

The PTO category covers both ‘Single-Acting’ and ‘Double-Acting’ PTOs. Single-acting PTOs require air pressure on the input cylinder to activate the function and will deactivate via an internal spring when air pressure is removed; air-on/spring-off. Dual-acting PTOs require air pressure an input cylinder to activate and air pressure on a different input cylinder to deactivate; air-on/air-off. This information is provided for additional clarification since the system appears identical from an electronics-control aspect.

The PTO type depends on the actual brand and part number. Most examples in this document show double-acting. Whenever **any** PTO is engaged, a feedback signal will activate a single cluster telltale.

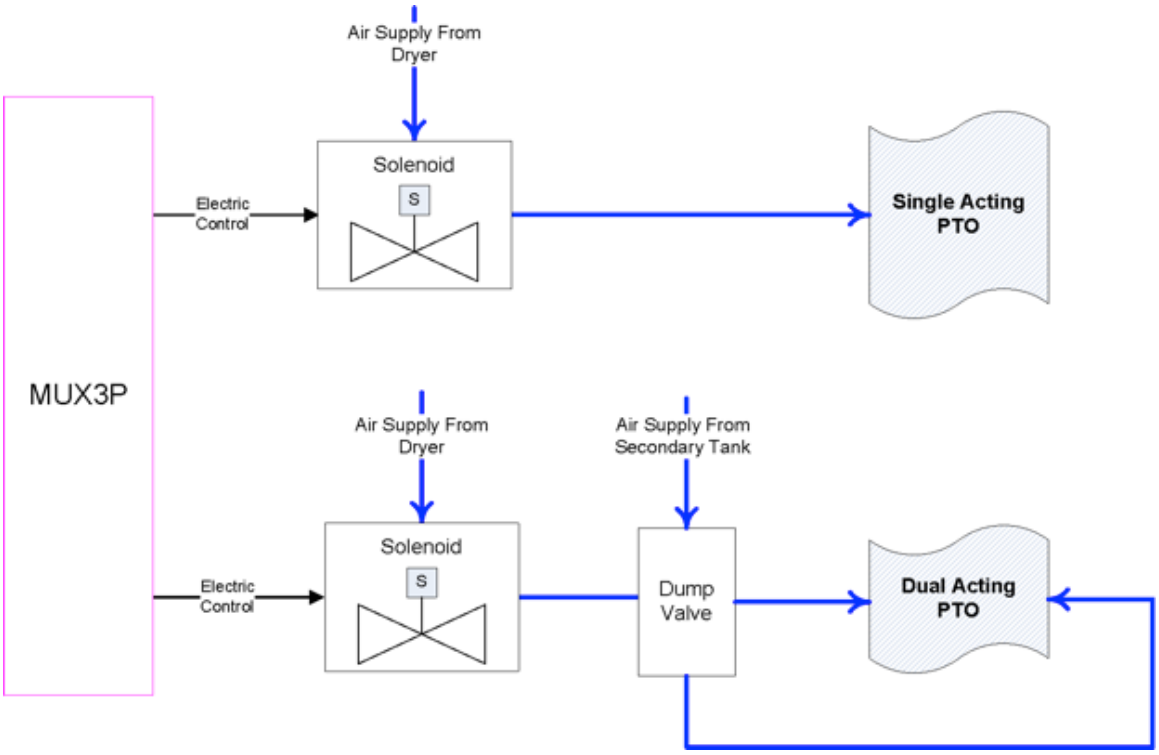


FIGURE 4-12. Single Acting and Dual Acting PTOs

https://truckmanualshub.com/

TABLE 4-4. Current single-acting PTOs include:

Model	Supplier	Mounting	Hyd. Clutch Actuator	Actuator Type
238/489/680	Chelsea	Bottom	Standard	Single
CS/SH/TG8	Muncie			
885	Chelsea		Optional	Single
230/236/442/660	Chelsea	RH	Standard	Single
CS/SH/TG6	Muncie			

TABLE 4-5. Current double-acting PTOs include:

Model	Supplier	Mounting	Hyd. Clutch Actuator	Actuator Type
823	Chelsea	Bottom	Standard	Double
828	Muncie			
340 (reversible)	Chelsea			
880			Optional	Double
340 (reversible)	Chelsea	RH	Standard	Double
541		Back	Any	

Eaton Transmission-Mounted PTO

When a PTO is ordered on an Eaton brand transmission it is controlled with EoA System. The PTO can be a single-acting or double-acting and have one or two PTOs attached to the transmission. Optional park brake interlocks are available via sales codes.

All PTOs have an engaged feedback signal that is routed to the cluster to illuminate a PTO. When any PTO is actively engaged the cluster telltale will illuminate.

Figure 4-13 shows the system diagram for a single-acting Eaton mounted transmission PTO. Signal flow is as follows:

- The dash switch labelled “PTO Switch #1” is activated by the user.
- The signal is received by the CECU and the optional interlocks are checked and verified.
- The Chassis Node receives a multiplexed CAN message to activate and send a power signal to the appropriately assigned solenoid.
- The solenoid activates and allows supplied air pressure to flow to the piped PTO port.
- The PTO activates and the ball switch closes sending a hardwired signal.
- The CECU and Engine ECM received this signal.
- The CECU sends a CAN message to the Cluster to activate the PTO telltale and the Engine changes state to “PTO Mode”

https://truckmanualshub.com/

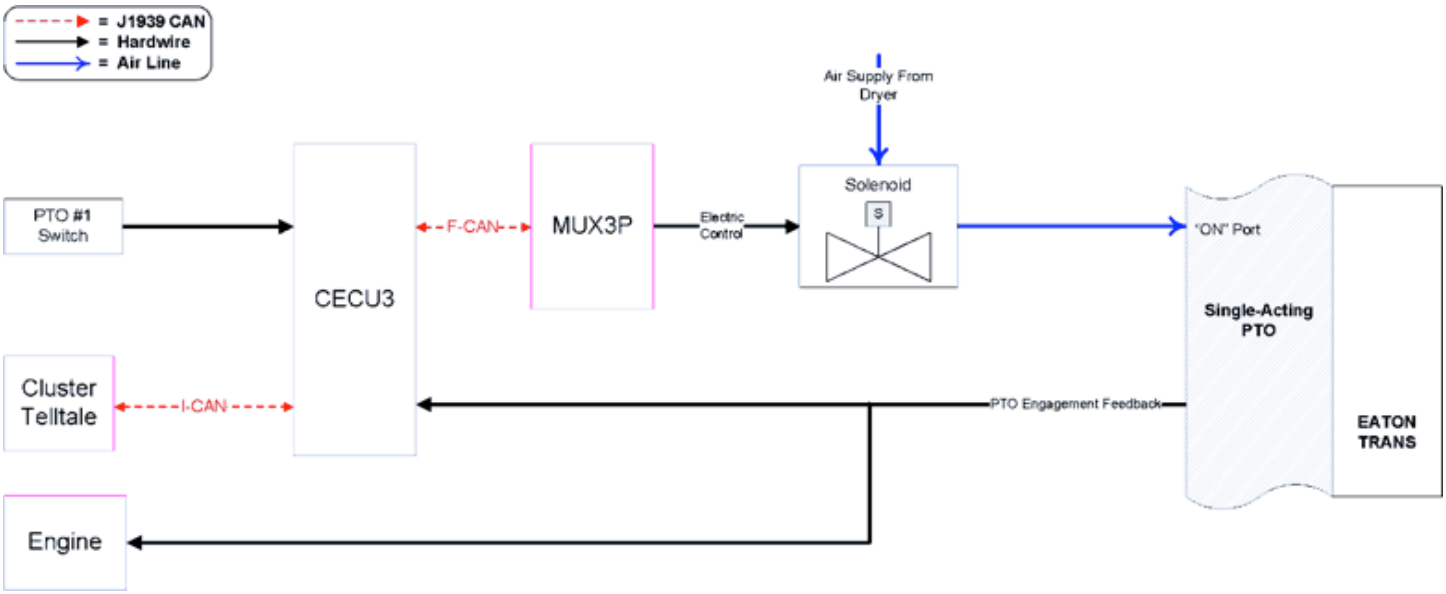


FIGURE 4-13. Single-Acting Eaton PTO

The signal flow is the same for double-acting PTOs. The difference is that an inversion dump valve provides air pressure to the “off” port when the EoA solenoid is not being command on.

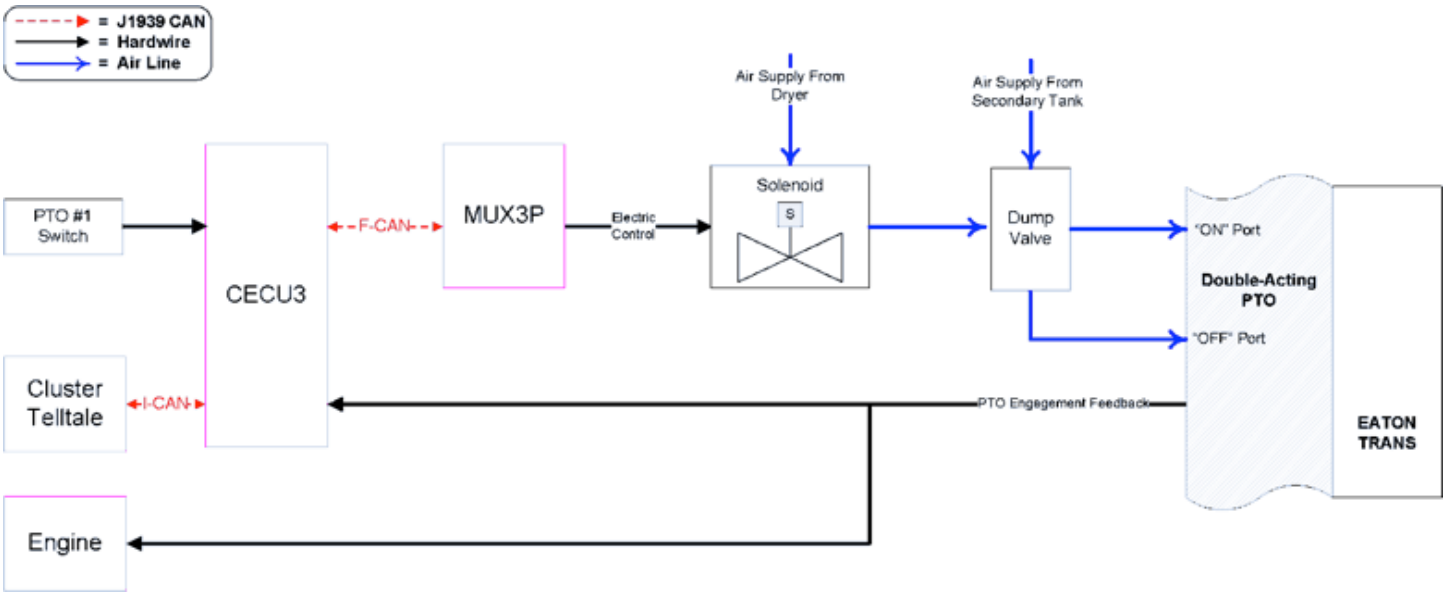


FIGURE 4-14. Double-Acting Eaton PTO

Allison Transmission-Mounted PTO (a.k.a. Electric-Over-Hydraulic)

When a transmission PTO is ordered on an Allison brand transmission, it is always Electric-over-Hydraulic (EoH). From the controls aspect, it looks like an “electric-only” type switch. The switch and telltales do not distinguish the difference between EoH and EoA.

https://truckmanualshub.com/

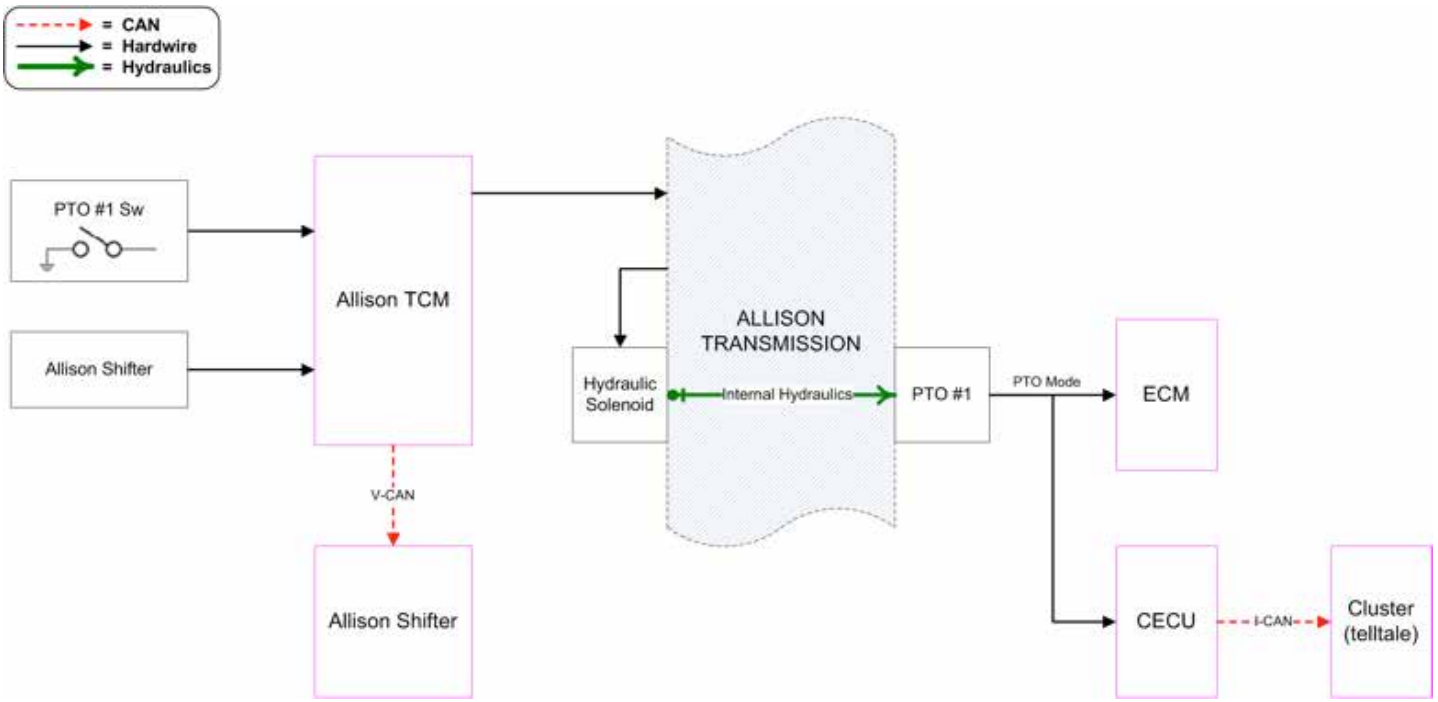


FIGURE 4-15. Allison Transmission-Mounted PTOs

Transmission PTO with Auto Suspension Dump/Inflate

This feature requires Air Suspension Dump functionality. Upon PTO activation, if not already dumped, the NAMUX system will command the air suspension to deflate (“dump”) before the PTO is engaged. When the PTO switch is deactivated the air suspension will re-inflate. This feature is an optional sales code, but coded standard on some applications; such as those with boom cranes.

With Allison transmission mounted PTOs the CECU EoA system does not directly know when the PTO is active since the switch is wired directly to the TCM. In this case, the ECM is broadcasting a CAN messages indicating that the engine is in PTO Mode. This is used as a proxy for the CECU to know when the PTO is active.

For Eaton mounted PTOs all functionality occurs within the CECU. When either the PTO switch is activated or the CECU receives a message that the ECM is in PTO Mode CECU will begin the Auto Suspension Dump functionality. First, the CECU checks applicable interlocks. If appropriate, it will send a CAN message to the Chassis Node requesting PTO solenoid activation and Suspension Dump activation.

https://truckmanualshub.com/

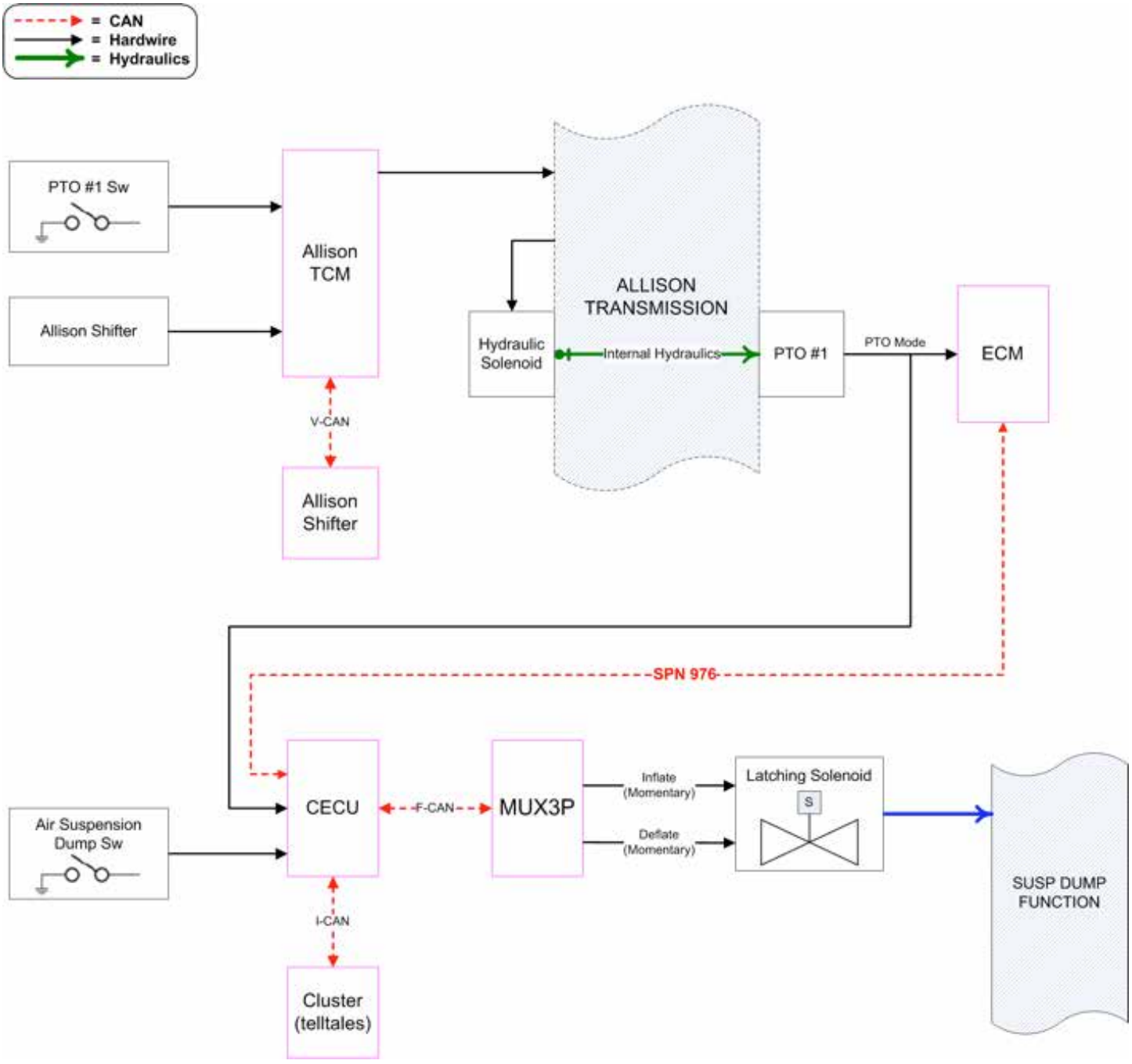


FIGURE 4-16. Auto Susp Dump w/ Allison mtd PTO

Reversible PTO (a.k.a. Fwd/Rev PTO, a.k.a. 2-Position PTO)

Some transmission-mounted PTOs have two directions of spin. The Reversible PTO switch (3-position switch) provides two CECU inputs for forward & reverse and there are two non-latching solenoids pressurizing two single-acting cylinders on the PTO, see the figure below.

https://truckmanualshub.com/

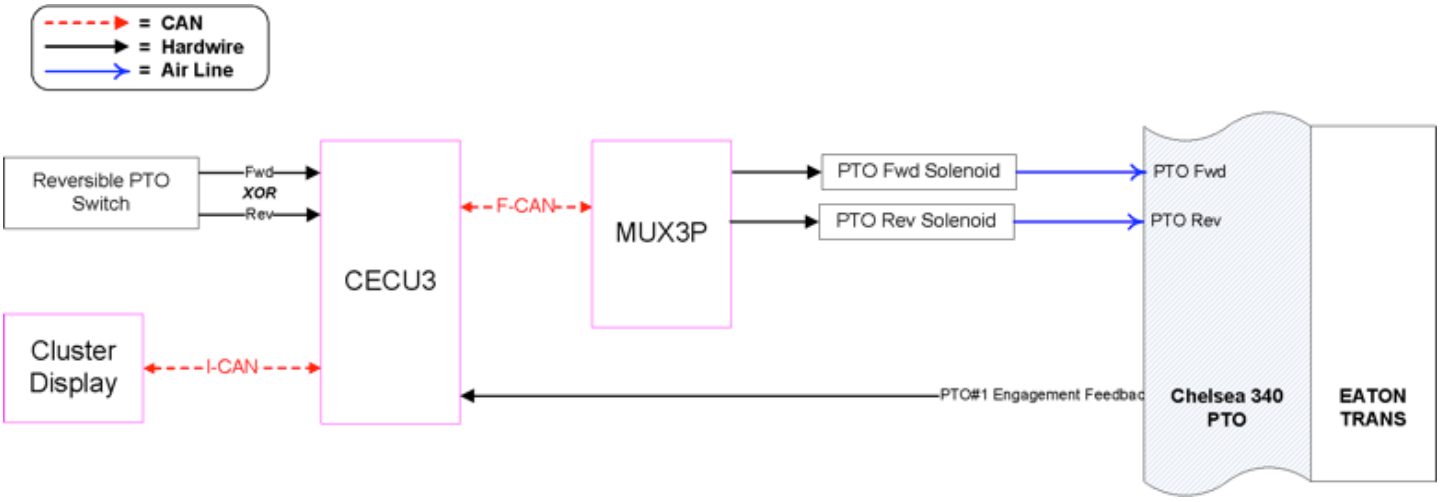


FIGURE 4-17. EoA Reversible PTO Example

		PTO States		
		Forward	**Reverse**	**OFF**
Ports	Fwd	X		
	Rev		X	

TABLE 4-6. Reversible PTO States to Ports

Non-EoA Air Actuated PTOs

NGP models do not offer air controls mounted on the dash. In cases where the customer must have air controls, they are mounted on the floor or side of seat. The block diagram is shown in Figure 4-18.

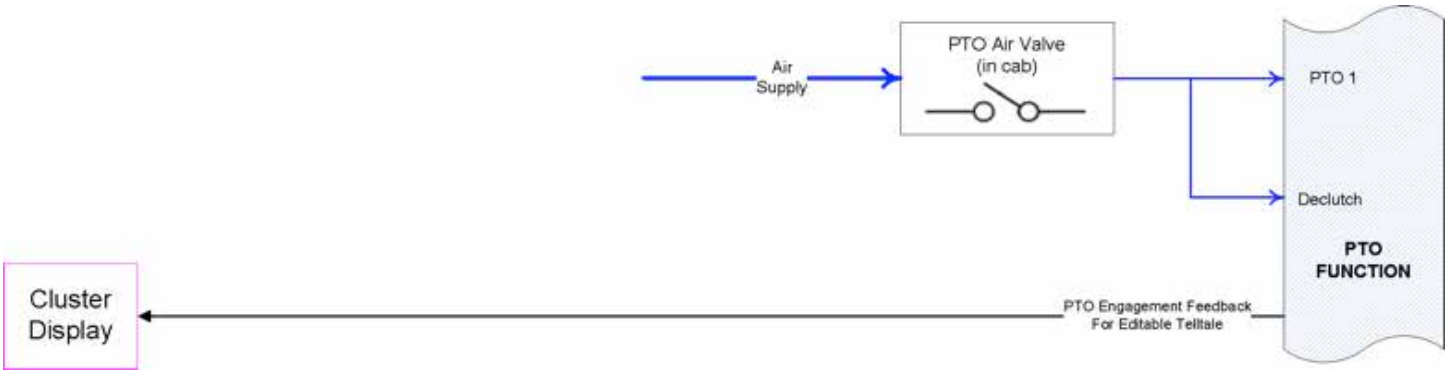


FIGURE 4-18. Air Actuated PTO (No Interlock)

PTO (Split-Shaft, Transfer Case, etc.)

Split-shaft PTOs are gearboxes between the transmission and rear axles. Much like transmission mounted PTOs, they take driveline power from the transmission and divert it (“take it off”) to equipment such as pumps, winches, etc. Where they differ is split-shaft PTOs are not mounted to the transmission and can handle significantly more power and torque than a traditional transmission-mounted PTO.

These gearboxes have a few different configurations; some split-shaft PTOs have a single pneumatic cylinder that simultaneously declutches the rear axle when activating the PTO,

Figure 4-20. This is known as “Pump Mode”. Other split-shaft PTOs have independent controls for PTO engagement and rear axle declutch. This allows the drive while the PTO is running. Others have an additional PTO output pad that is separate from the main PTO output gear.

Transmission mounted PTOs, split-shaft PTOs, and non-EoA controlled PTOs are not exclusive to the type and can be combined in nearly any configuration.

When the Rear Axle Declutch function is active a positive feedback signal activates a telltale in the cluster editable area. The PTO active telltale is the same a transmission mounted PTO, see Figure 3-9..



FIGURE 4-19. Rear Axle Declutch Telltale

Figure 4-20 shows an example configuration where the customer has ordered a SS PTO with separate switches for Rear Axle Declutch.

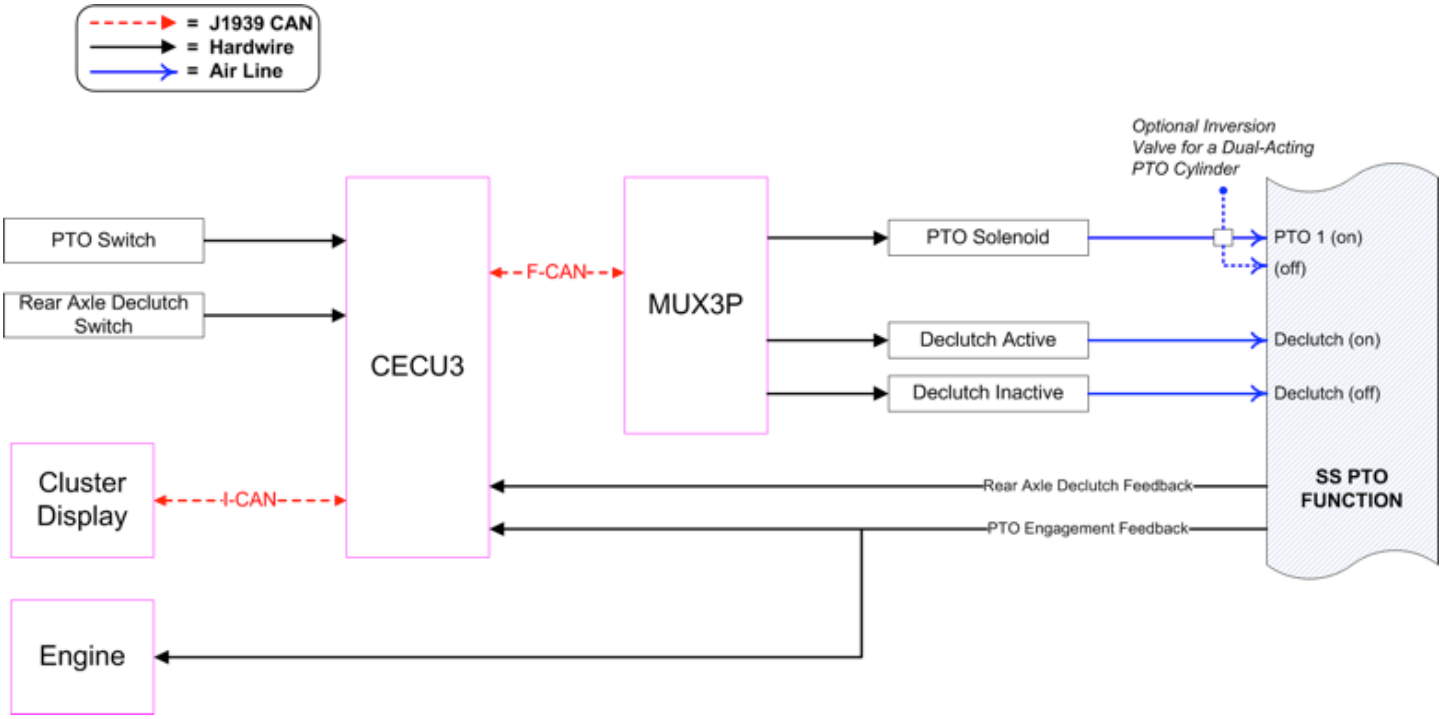


FIGURE 4-20. Split Shaft PTO Example #1

Split-Shaft PTO - Pump Mode

When the PTO controls are specified/configured to have a single switch controlling both the PTO Engage and Rear Axle Declutch it is called “Pump Mode.” The controls and air piping architecture pressurizes the ports such that the PTO is engaged and rear axle declutched at the same time. This is a common term used in the industry. When engaged, two separate telltales will illuminate (from actual wired feedback) indicating the state of both PTO and Rear Axle Declutch. Park Brake must be engaged to activate Pump Mode, if not, a popup message on the cluster will appear telling the driver to do so.

Note that the functions themselves are not unique. Controlling both functions with a single switch is convenient and offers additional interlocks. Positive feedback signals activate a PTO and Rear Axle Declutch telltales within the cluster editable telltale area.

In the example below, a Pump Mode configuration is shown with dual-acting PTO ports. Notice that this is similar to Figure 4-20 except the Rear Axle Declutch cylinder is plumbed to activate/deactivate at the same time with the PTO engage switch.

https://truckmanualshub.com/

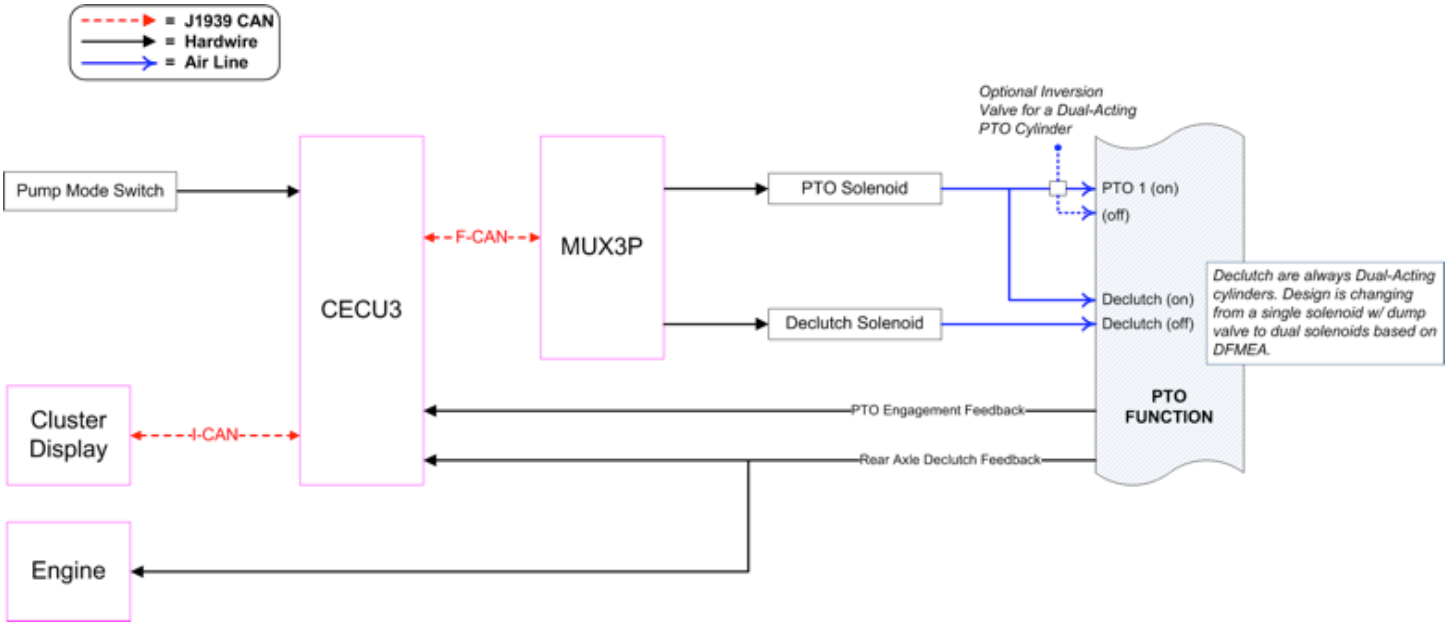


FIGURE 4-21. Pump Mode Example

Electric Over Air System Interlocking

By utilizing the Cab ECU to control the EOA system, the EOA switching has capabilities to be interlocked with other functions such as park brake application, vehicle speed, neutral gear selected, or a combination of these functions. Switch activation will only occur if the interlock criteria are met. If the Cab ECU detects the switch is in the on position and if applicable, the park brake interlock is validated by the Cab ECU, the Cab ECU will send a signal to the chassis node via F-CAN. The EOA valve will be the same number as on the dash switch. Electronic Service Application (ESA) can be used to add or remove the PTO engage park brake interlock. Depending on the application and the PTO type, the switches and wiring may differ.

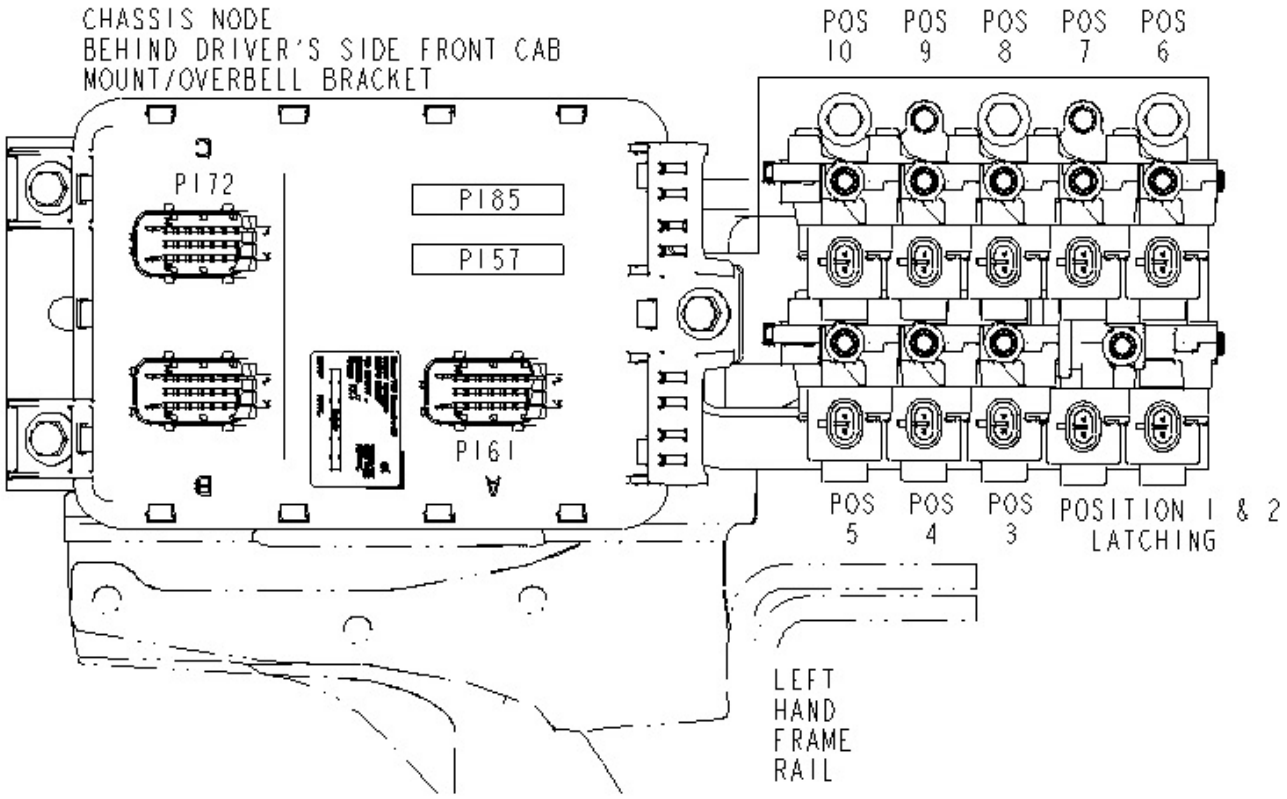
For single-acting PTOs, the chassis node will energize the coil on the EOA valve allowing air to engage the PTO.

For dual-acting PTOs, the PTO's pilot valve will provide the air function to switch the air between engage and disengage.

For reversible PTOs, a three-position switch is utilized and each direction is protected for forward and reverse functionality. Each position controls a separate EOA solenoid, dedicated to either forward or reverse (see Figure 3-7).

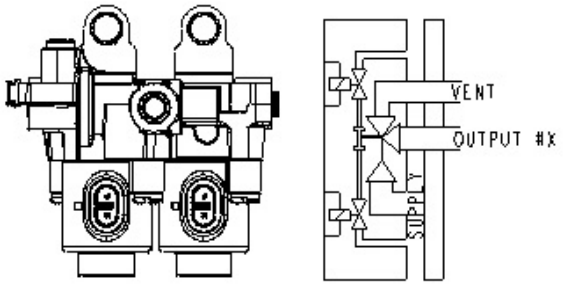
https://truckmanualshub.com/

FIGURE 4-22. Sample Chassis Node and EOA Manifold. (configured to match Figure 3-13)



LATCHING SOLENOID INFO

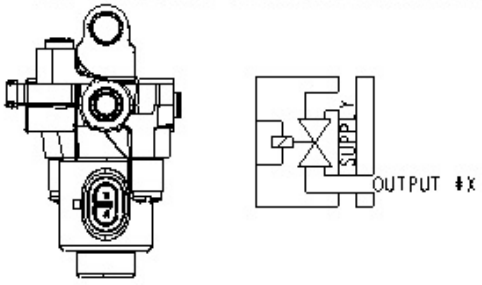
POSITION 1 & 2 IS OCCUPIED BY A LATCHING SOLENOID
A LATCHING SOLENOID HAS TWO CONNECTION POINTS AND TWO COILS. THE COILS CONTROL VALVES THAT APPLY AIR TO POSITION AN INTERNAL PILOT SHUTTLE.
WHEN BOTH COILS ARE "OFF" THE PILOT SHUTTLE REMAINS IN ITS POSITION.
THE PILOT SHUTTLE IS SHOWN IN THE "OFF" POSITION. THE AIR SUSPENSION IS BEING LOWERED
ON: OUTPUT RECEIVES SUPPLY AIR
OFF: OUTPUT IS VENTED



LATCHING SOLENOID AND THE DIAGRAM SYMBOL

SINGLE SOLENOID INFO

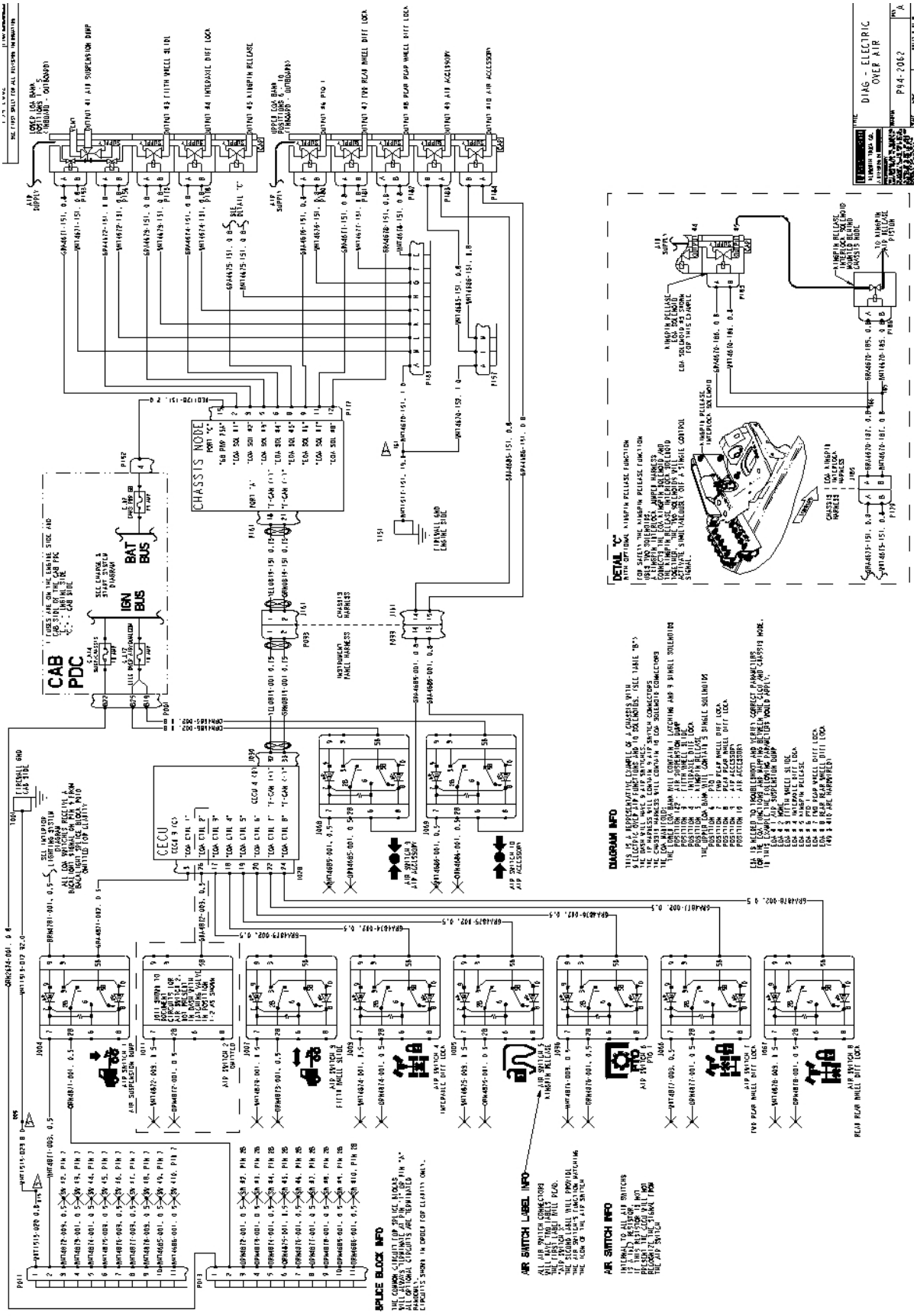
POSITIONS 3 - 10 ARE OCCUPIED BY A SINGLE SOLENOIDS
A SINGLE SOLENOID HAS ONE CONNECTION AND ONE COIL
WHEN THE COIL IS ACTIVE IT POSITIONS THE VALVE TO ALLOW SUPPLY AIR TO BE DIRECTED TO THE OUTPUT PORT.
WHEN THE COIL IS INACTIVE THE OUTPUT PORT WILL BE VENTED



SINGLE SOLENOID AND THE DIAGRAM SYMBOL

https://truckmanualshub.com/

FIGURE 4-23. Wiring Diagram for Chassis Node, Cab Switches, and EOA Manifold. (configured to match Figure 3-12)



https://truckmanualshub.com/

PACCAR MX ENGINES - PTO PROGRAMMING:

Acronyms and Abbreviations

BBM	Body Builder Module
B-CAN	Body Builder CAN
CAN	Controller Area Network signal defined by SAE J1939
CECU	Cab Electronic Control Unit
DAVIE	DAF advanced vehicle investigation equipment
ESA	Electronic Service Analyst, a PC based diagnostic service tool that supports Kenworth multiplexed cab electronics
V-CAN	Vehicle CAN
PEP	PACCAR Engine Pro
PTO	Power Take Off

Introduction

This section is intended to be used in conjunction with the PACCAR MX Programming Guide. There are a number of parameters that must be set to enable PTO functionality on PACCAR MX Engines. The MX Programming Guide explains how to set these parameters for your application in section 12 "*Power Take-Off Engine Speed Control (PTO Mode)*".

This section explains how to configure trucks with MX engines in one of the four PTO options as listed below:

1. In-Cab PTO control
2. Hardwired Remote PTO Control
3. Remote PTO Control over BCAN with hardwired PTO Engagement Feedback to Engine
4. Remote PTO Control over BCAN with PTO ON/OFF Switch Signal over BCAN

Note:

Engine control for PTO functionality using TSC1 message is not offered at this time.

Depending on the configuration used, it may require one or more of the following:

1. Electrical Wiring Installation
2. Reprogramming of MX Engine using PEP and DAVIE
3. Reprogramming of CECU using ESA

This section explains only the parameter configurations that are specific to one of the four options listed above. There are a number of common parameters that must be configured which are explained in section 12 "*Power Take-Off Engine Speed Control (PTO Mode)*" of the MX Programming Guide.

https://truckmanualshub.com/

1. In Cab PTO Control

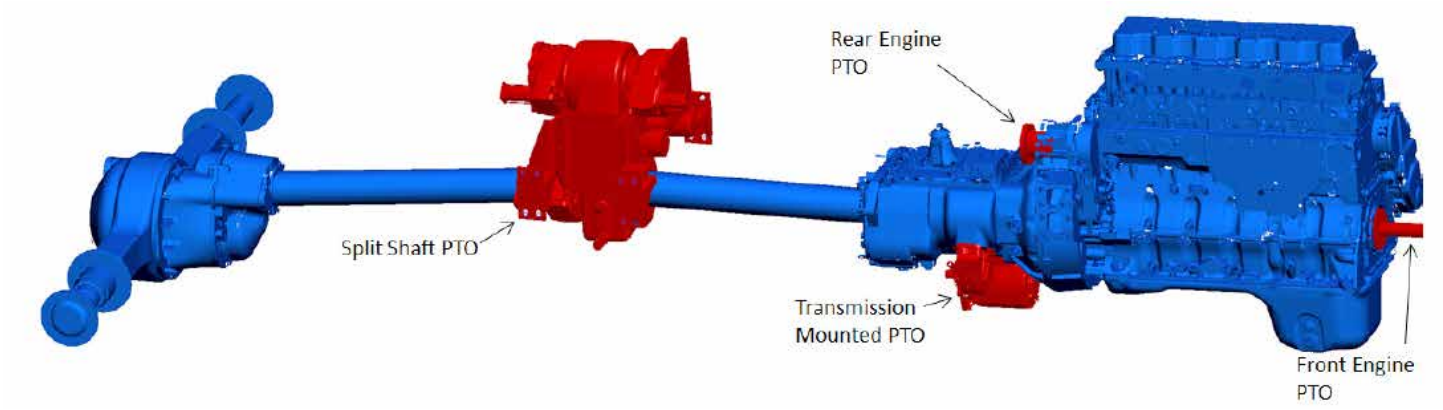


FIGURE 4-24. In-Cab PTO Control for T680/T880

To activate In-Cab PTO Control, there is a PTO switch in the cab that needs to be turned ON by the operator. This PTO ON/OFF switch is hardwired to the CECU which activates the PTO equipment. The PTO engagement feedback signal wire must be connected to CECU and Engine as shown in the diagram. Refer to “Electrical” section of this manual for more information on wiring.

When the PTO switch is ON and the engine receives signal that PTO is engaged, the engine changes its state to “PTO Mode” and the CECU will activate the PTO telltale on the cluster. For more information on engine behavior in PTO mode, please refer MX Programming Guide.

The engine speed in PTO Mode can be controlled by the cruise control switches or the accelerator pedal inside the cab depending on how the MX Engine is configured. This is explained in Section 1.2 in the BBM. Refer to the MX programming guide for further details on engine speed control in PTO Mode.

1.1. CECU Configuration for T680/T880 using ESA

To configure In-Cab PTO Control, the following parameters must be set in CECU for T680/T880 using ESA as shown in Table 4-7:

TABLE 4-7. In cab PTO Control – ESA Settings for T680/T880

Parameter	Attribute
Engine Make	PACCAR
PTO Control Present	Enable

https://truckmanualshub.com/

Figure 4-25 shows the screenshot indicating where these parameters can be found in ESA.

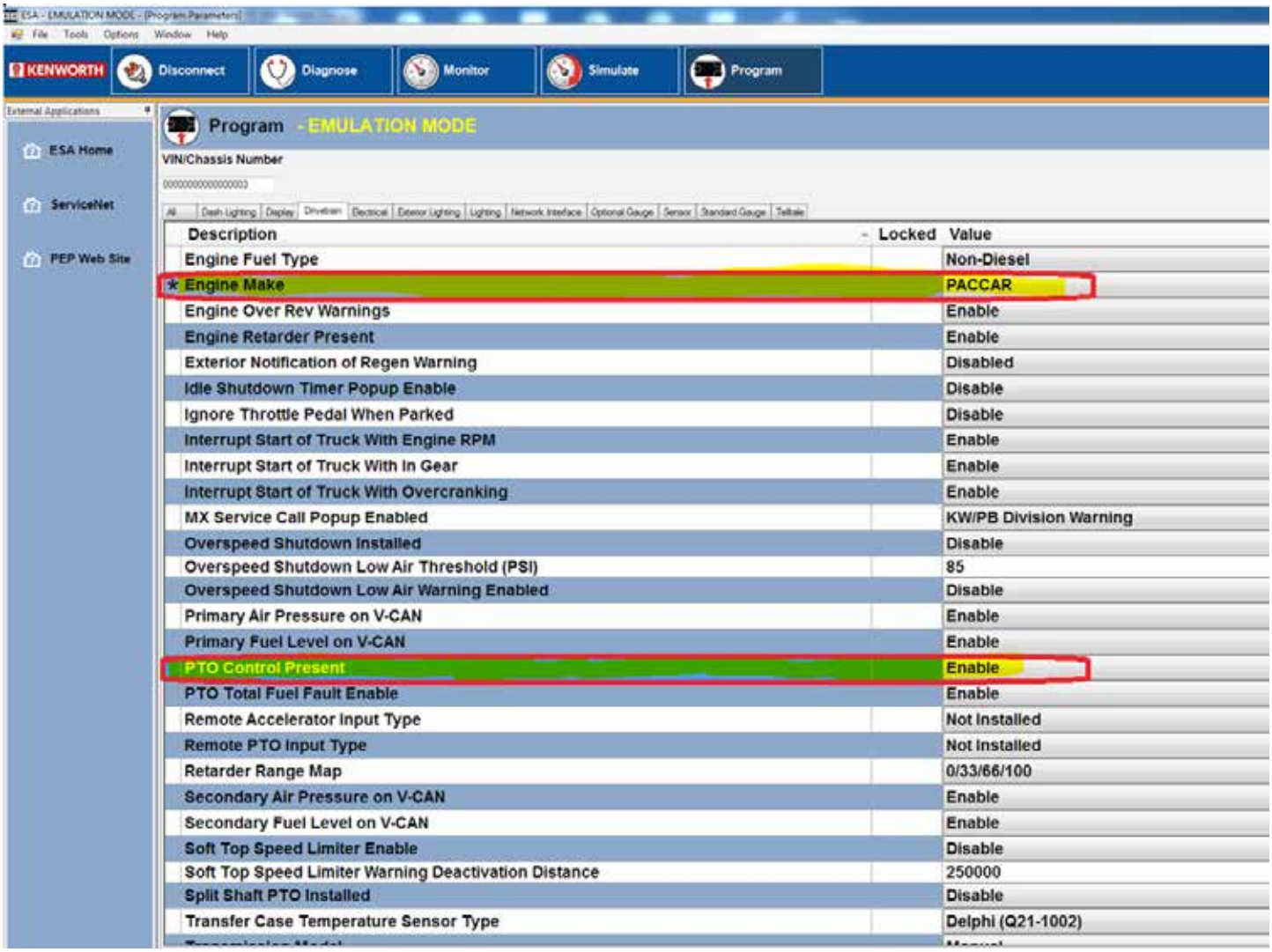


FIGURE 4-25. In-Cab PTO Control – ESA Settings for T680/T880

1.2. MX Engine Parameter Configuration using PEP

There are two ways to configure In-Cab PTO Control depending on application:

1. In-Cab PTO Control with Accelerator Pedal
2. In-Cab PTO Control without Accelerator Pedal.

For both these options, the configuration on CECU is the same as described in section 1.1. The engine should be configured differently depending on whether the accelerator pedal is needed along with the cruise control switch for In-Cab PTO control. This is done by selecting the right sales code using PEP as explained below.

In PEP, click "*Edit Parameters*" button to enable editing and scroll down to PTO section "*PTO Mode Preferences*". Towards the end of the section, there will be an entry for "*Type of PTO Controls – Enable/Disable (S074)*" which can be edited by making a selection from a dropdown menu. From this dropdown menu, select one of the sales codes shown in Table 4-8.

https://truckmanualshub.com/

TABLE 4-8 In-Cab PTO Control – PEP Settings

Description	Kenworth Sales Code
Cab Controls with Accelerator Pedal	KW 1000212
Cab Controls without Accelerator Pedal	KW 1000350

Once the selection is made, scroll to the top of the page or to the bottom of the page to "*Save*" the changes. Once the changes are saved, select "Submit" and download the new file when it becomes available and program it on the engine using DAVIE.

2. Hard-Wired Remote PTO Control

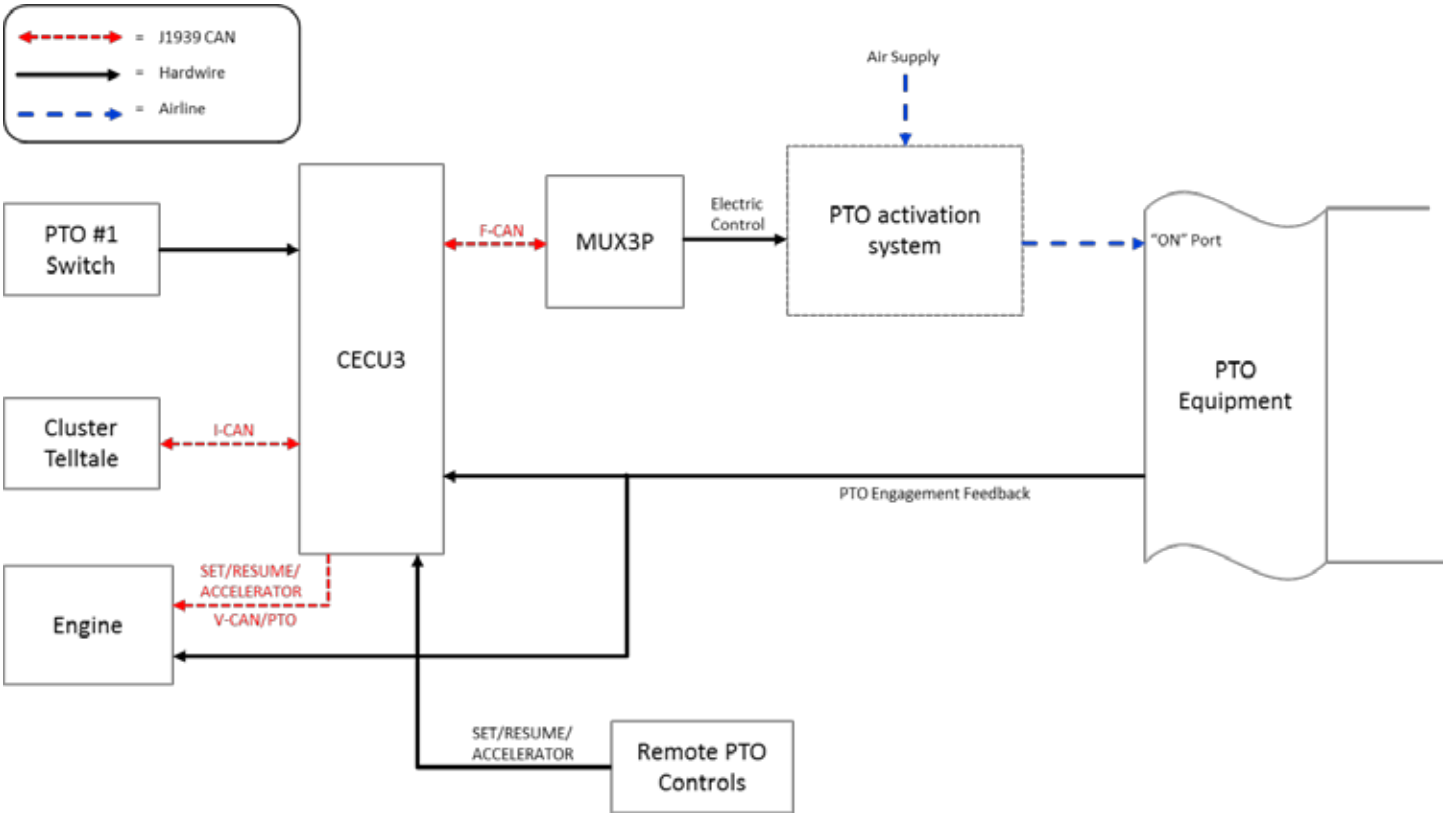


FIGURE 4-25. Hard-Wired Remote PTO Control

To activate Hard-Wired Remote PTO Control, there is a PTO switch in the cab that needs to be turned ON by the operator. This PTO ON/OFF switch is hardwired to the CECU which activates the PTO equipment. The PTO engagement feedback signal wire must be connected to CECU and Engine as shown in the diagram. Refer section "Electrical" of this manual for more information on wiring.

When the PTO switch is ON and the engine receives signal that PTO is engaged, the engine changes its state to "PTO Mode" and the CECU will activate the PTO telltale on the cluster. For more information on engine behavior in PTO mode, please refer MX Programming Guide.

The engine speed is controlled by the customer installed Remote PTO Controls. The Remote PTO Controls have digital Set and Resume signals and an analog Accelerator signal hardwired to the CECU. The CECU sends these inputs to the Engine via V-CAN using standard SAE messages as shown in Table 4-9. The Remote PTO Controls are hardwired to the CECU using 12-pin PACCAR connector as explained in "Electrical" section of this manual.

https://truckmanualshub.com/

TABLE 4-9. J1939 signals from CECU (SA 0x31) to Engine over VCAN

Label	Description
SPN974	Remote Accelerator Pedal Position
SPN979	Engine Remote PTO Governor Preprogrammed Speed Control Switch
SPN3447	Remote PTO Governor Preprogrammed Speed Control Switch #2
SPN982	Engine PTO Resume Switch
SPN984	Engine PTO Set Switch

2.1. CECU Configuration for T680/T880 using ESA

To configure Hard-Wired Remote PTO Control, the following parameters must be set in CECU for T680/T880 using ESA as shown in Table 4-10:

TABLE 4-10. Hard-wired Remote PTO Control – ESA Settings for T680/T880

Parameter	Attribute
Engine Make	PACCAR
PTO Control Present	Enable
Remote Accelerator Input Type	Analog Input
Remote PTO Input Type	Digital Input

https://truckmanualshub.com/

Figure 4-27 shows the screenshot indicating where these parameters can be found in ESA.

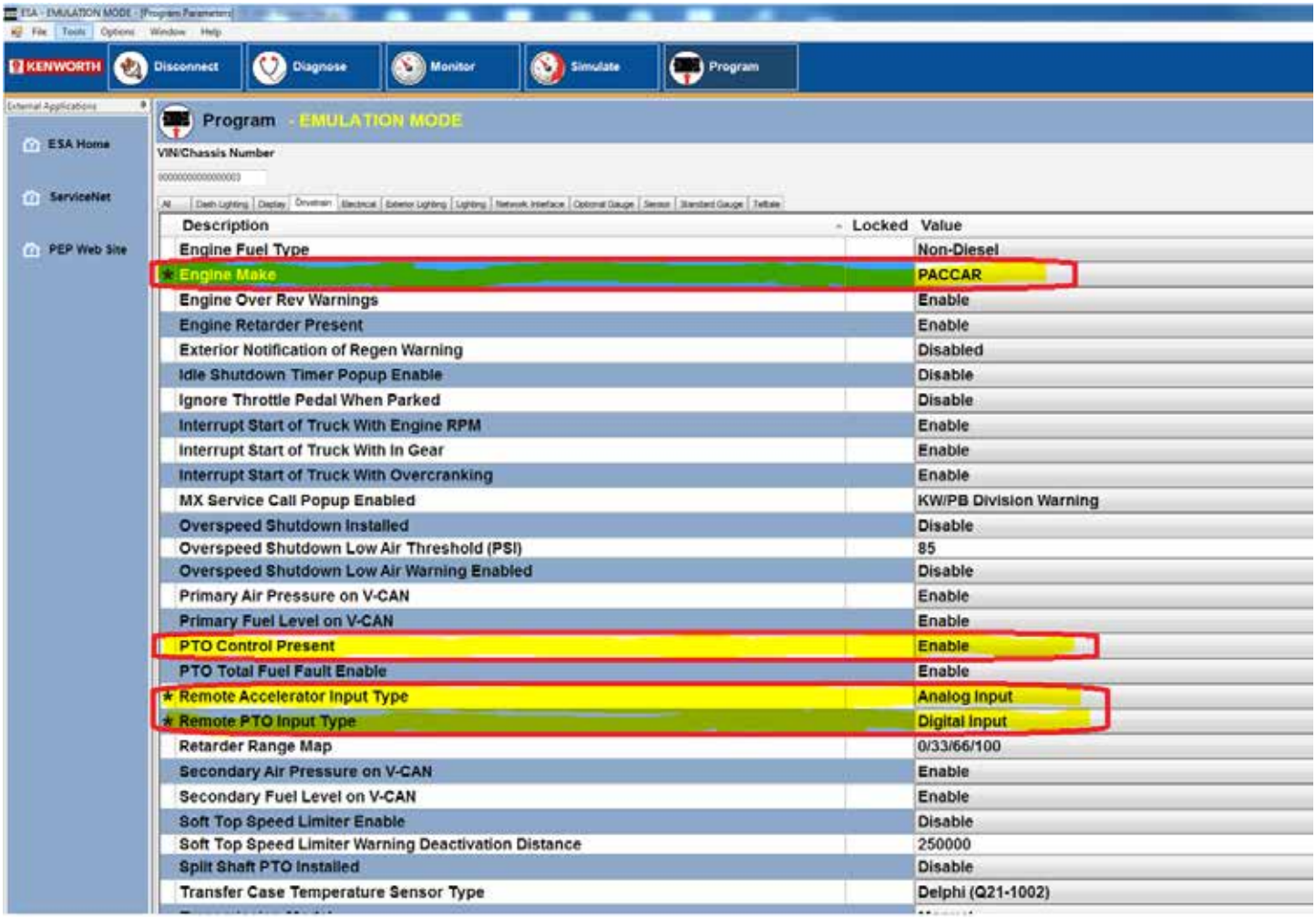


FIGURE 4-27. Hardwired Remote PTO Control – ESA Settings for T680/T880

2.2. MX Engine Parameter Configuration using PEP

There are two ways to configure remote PTO Control depending on application:

1. Remote PTO Control with Accelerator Pedal
2. Remote PTO Control without Accelerator Pedal.

For both these options, the configuration on CECU is the same as described in section 2.1. The engine should be configured differently depending on whether the accelerator pedal is needed along with the cruise control switch for Hardwired Remote PTO control. This is done by selecting the right sales code using PEP as explained below.

In PEP, click "*Edit Parameters*" button to enable editing and scroll down to PTO section "*PTO Mode Preferences*". Towards the end of the section, there will be an entry for "*Type of PTO Controls – Enable/Disable (S074)*" which can be edited by making a selection from a dropdown menu. From this dropdown menu, select one of the sales codes shown in Table 4-11

TABLE 4-11. Hardwired Remote PTO Control – PEP Settings

Description	Kenworth Sales Code
Remote Station with Accelerator Pedal	KW 1000330
Remote Station without Accelerator Pedal	KW 1000340

Once the selection is made, scroll to the top of the page or to the bottom of the page to "*Save*" the changes. Once the changes are saved, select "Submit" and download the new file when it becomes available and program it on the engine using DAVIE.

3. Remote PTO Control over BCAN with hardwired PTO Engagement Feedback to Engine

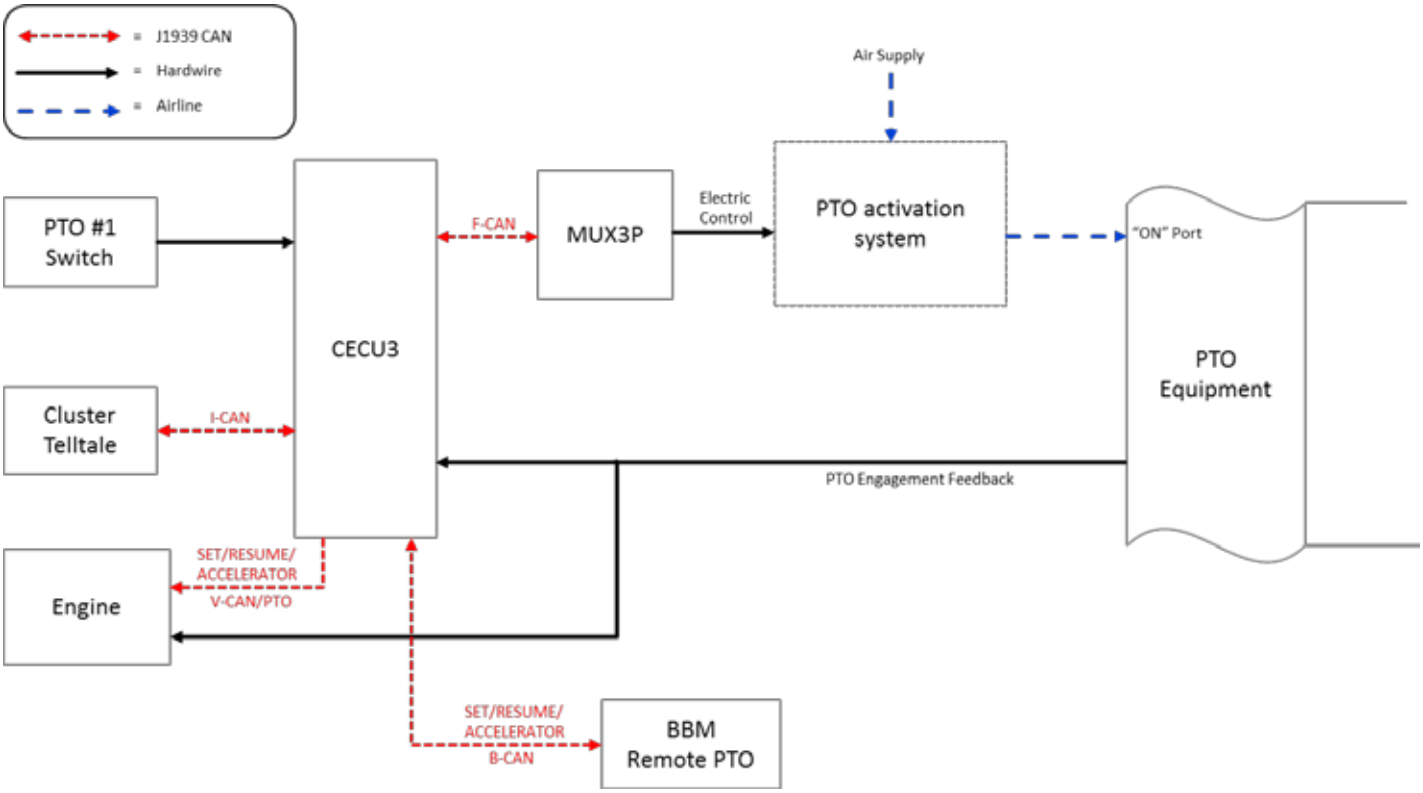


FIGURE 4-28. Remote PTO Control over BCAN with PTO ON/OFF Switch Hardwired to CECU

To activate Remote PTO Control over BCAN as shown here, there is a PTO switch in the cab that needs to be turned ON by the operator. This PTO ON/OFF switch is hardwired to the CECU which activates the PTO equipment. The PTO engagement feedback signal wire must be connected to CECU and Engine as shown in the diagram. Refer to "Electrical" section of this manual for more information on wiring.

When the PTO switch is ON and the engine receives signal that PTO is engaged, the engine changes its state to "PTO Mode" and the CECU will activate the PTO telltale on the cluster. For more information on engine behavior in PTO mode, please refer MX Programming Guide.

The engine speed is controlled by the customer installed PTO Control on the BBM. The CECU gets the "Set", "Resume" and "Accelerator" signal from the Body Builder Module over B-CAN. The CECU sends these signals to the Engine via V-CAN using standard SAE messages as shown in Table 4-12. The PTO engagement feedback is hardwired to the CECU and the engine using 12-pin PACCAR connector as explained in "Electrical" section of this manual.

https://truckmanualshub.com/

TABLE 4-12. J1939 signals from CECU (SA 0x31) to Engine over VCAN

Label	Description
SPN974	Remote Accelerator Pedal Position
SPN979	Engine Remote PTO Governor Preprogrammed Speed Control Switch
SPN3447	Remote PTO Governor Preprogrammed Speed Control Switch #2
SPN982	Engine PTO Resume Switch
SPN984	Engine PTO Set Switch

NOTE: When the engine is configured for this PTO option, the Engine expects the J1939 messages from the BBM whenever the key switch is in the ignition position. If the key is turned ON without having a PTO signal from BBM over B-CAN, the engine will log these active fault codes shown in Table 4-13. These codes will become inactive when the BBM starts sending signals. This can be avoided if the ignition and the BBM PTO controls are powered ON at the same time.

TABLE 4-13. Engine Fault Codes

Engine Fault Code	Description
P0221	CAN Communication – Message (EEC2) out of range – Remote accelerator pedal position
U153B	CAN Communication – Message (PTO) out of range – Engine PTO resume switch
U1837	CAN Communication – Message (PTO) out of range – Engine PTO governor preprogrammed speed.
P253B	CAN Communication – Message (PTO) out of range – Engine PTO governor set switch.

3.1. CECU Configuration for T680/T880 using ESA

To configure Remote PTO Control over BCAN with hardwired PTO Engagement Feedback to Engine, the following parameters must be set in CECU for T680/T880 using ESA as shown in Table 4-14.

TABLE 4-14. Remote PTO Control over BCAN with hardwired PTO Engagement Feedback to Engine– ESA Settings T680/T880

Parameter	Attribute
Engine Make	PACCAR
PTO Control Present	Enable
Remote Accelerator Input Type	BCAN Input
Remote PTO Input Type	BCAN Input
Gateway Engine CCVS Message (PGN 65265)	Gateway or Route to BCAN
Gateway Engine EEC1 Message (PGN 61444)	Gateway or Route to BCAN
Gateway Transmission ETC2 Message (PGN 61445)	Gateway or Route to BCAN

Figure 4-29 and Figure 4-30 show the screenshot indicating where these parameters can be found in ESA.

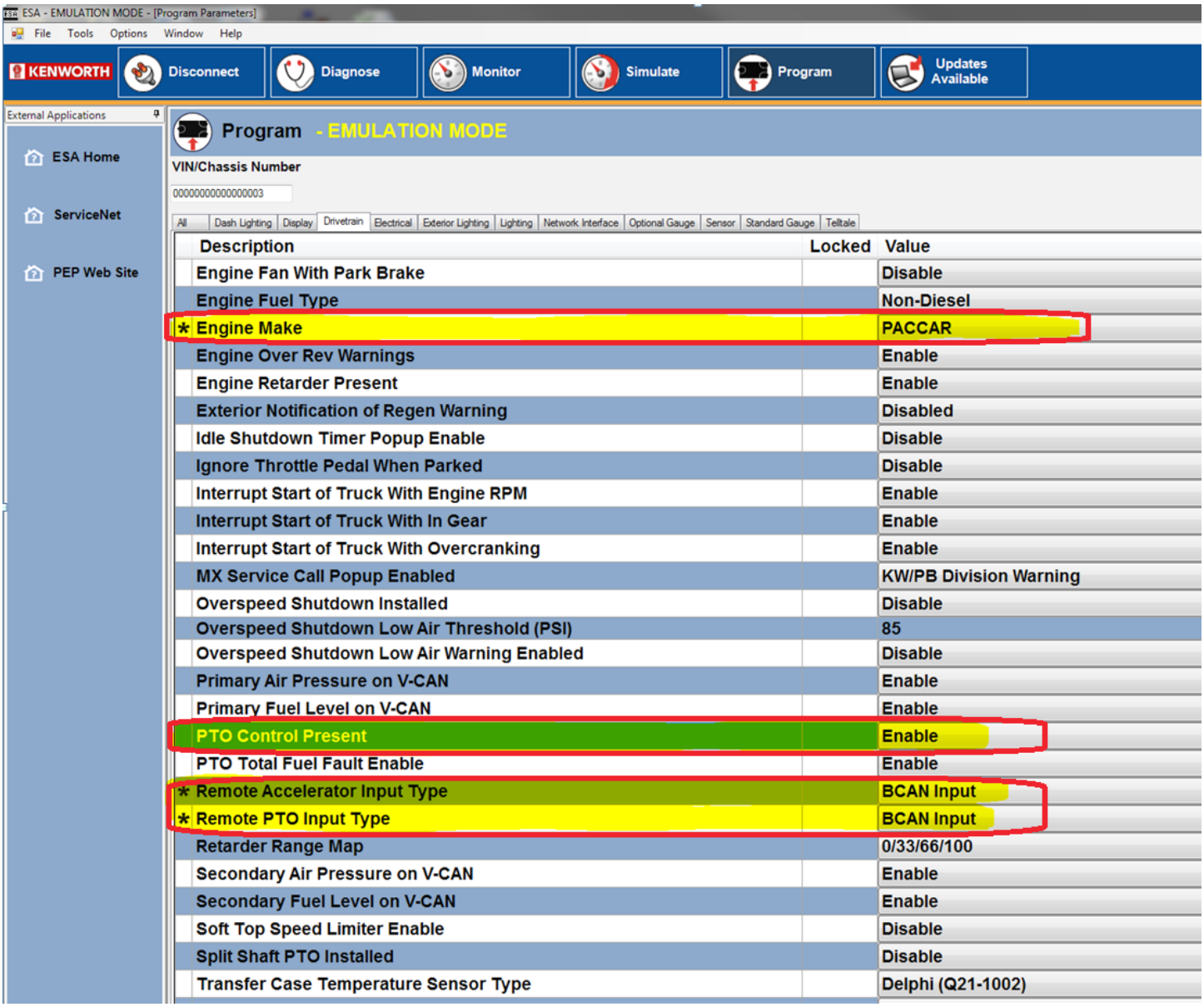


FIGURE 4-29. Remote PTO Control over BCAN with hardwired PTO Engagement Feedback to Engine– ESA Settings T680/T880

https://truckmanualshub.com/

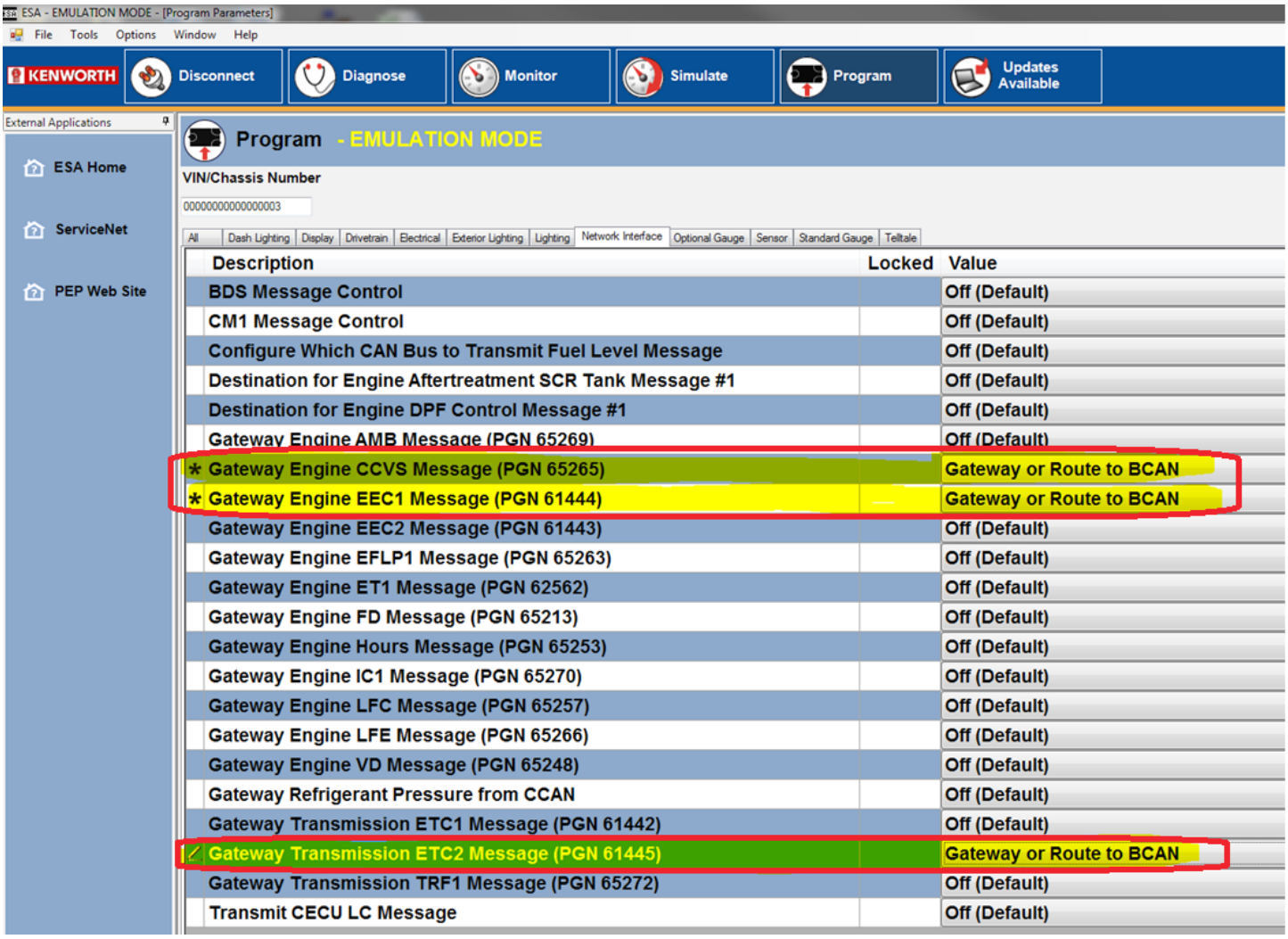


FIGURE 4-30. Remote PTO Control over BCAN with hardwired PTO Engagement Feedback to Engine – ESA Settings T680/T880

3.2. MX Engine Parameter Configuration using PEP

There are two ways to configure remote PTO Control depending on application:

1. Remote PTO Control with Accelerator Pedal
2. Remote PTO Control without Accelerator Pedal.

For both these options, the configuration on CECU is the same as described in section 3.1. The engine should be configured for one of the above options which is done by selecting the right sales code using PEP as explained below.

In PEP, click "*Edit Parameters*" button to enable editing and scroll down to PTO section "*PTO Mode Preferences*". Towards the end of the section, there will be an entry for "*Type of PTO Controls – Enable/Disable (S074)*" which can be edited by making a selection from a dropdown menu. From this dropdown menu, select one of the sales codes shown in Table 4-15.

TABLE 4-15. Hardwired Remote PTO Control – PEP Settings

Description	Kenworth Sales Code
Remote Station with Accelerator Pedal	KW 1000330
Remote Station without Accelerator Pedal	KW 1000340

https://truckmanualshub.com/

Once the selection is made, scroll to the top of the page or to the bottom of the page to "*Save*" the changes. Once the changes are saved, select "Submit" and download the new file when it becomes available and program it on the engine using DAVIE.

Please refer to "Electrical" section of this manual for details on wiring connections to set up Remote PTO Controllers with MX engines.

4. Remote PTO Control over BCAN with PTO ON/OFF Switch Signal over BCAN

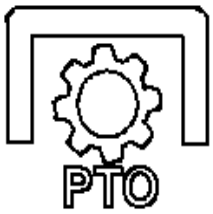


FIGURE 4-31. Remote PTO Control over BCAN with PTO ON/OFF Switch Signal over BCAN

To set up Remote PTO Control over BCAN as shown here, there is an ON/OFF switch located on the customer installed BBM. The "PTO ON/OFF" signal is sent from the BBM to the CECU over B-CAN which sends this signal to the Engine over V-CAN. The PTO engagement feedback signal wire must be connected to the CECU by the customer. Refer to "Electrical" section of this manual for more information on wiring.

When the PTO switch is ON and the engine receives signal that PTO is engaged, the engine changes its state to "PTO Mode" and the CECU will activate the PTO telltale on the cluster. For more information on engine behavior in PTO mode, please refer MX Programming Guide.

The engine speed is controlled by the customer installed PTO Control on the BBM. The CECU gets the "SET", "RESUME" and "ACCELERATOR" signal from the BBM over B-CAN. The CECU sends them to the Engine via V-CAN using standard SAE messages as shown in Table 4-16.

https://truckmanualshub.com/

TABLE 4-16. J1939 signals from CECU (SA 0x31) to Engine over VCAN

Label	Description
SPN974	Remote Accelerator Pedal Position
SPN979	Engine Remote PTO Governor Preprogrammed Speed Control Switch
SPN3447	Remote PTO Governor Preprogrammed Speed Control Switch #2
SPN982	Engine PTO Resume Switch
SPN984	Engine PTO Set Switch

NOTE: When the engine is configured for this PTO option, the Engine expects the J1939 messages from the BBM whenever the key switch is in the ignition position. If the key is turned ON without having a PTO signal from BBM over B-CAN, the engine will log these active fault codes shown in Table 4-17. These codes will become inactive when the BBM starts sending signals. This can be avoided if the ignition and the BBM PTO controls are powered ON at the same time.

Engine Fault Code	Description
P0221	CAN Communication – Message (EEC2) out of range – Remote accelerator pedal position
U153B	CAN Communication – Message (PTO) out of range – Engine PTO resume switch
U1837	CAN Communication – Message (PTO) out of range – Engine PTO governor preprogrammed speed.
U1838	CAN Communication – Message (PTO) out of range – Engine PTO governor enable switch.
P253B	CAN Communication – Message (PTO) out of range – Engine PTO governor set switch.

4.1. CECU Configuration for T680/T880 using ESA

To configure Remote PTO Control over BCAN with PTO ON/OFF Switch Signal over BCAN, the following parameters must be set in CECU for T680/T880 using ESA as shown in Table 4-17:

TABLE 4-17. Remote PTO Control over BCAN with PTO ON/OFF Switch Signal over BCAN – ESA Settings for T680/T880

Parameter	Attribute
Engine Make	PACCAR
PTO Control Present	Enable
Remote Accelerator Input Type	BCAN Input
Remote PTO Input Type	BCAN Input
Gateway Engine CCVS Message (PGN 65265)	Gateway or Route to BCAN
Gateway Engine EEC1 Message (PGN 61444)	Gateway or Route to BCAN
Gateway Transmission ETC2 Message (PGN 61445)	Gateway or Route to BCAN

Figure 4-32 and Figure 4-33 show the screenshot indicating where these parameters can be found in ESA.

https://truckmanualshub.com/

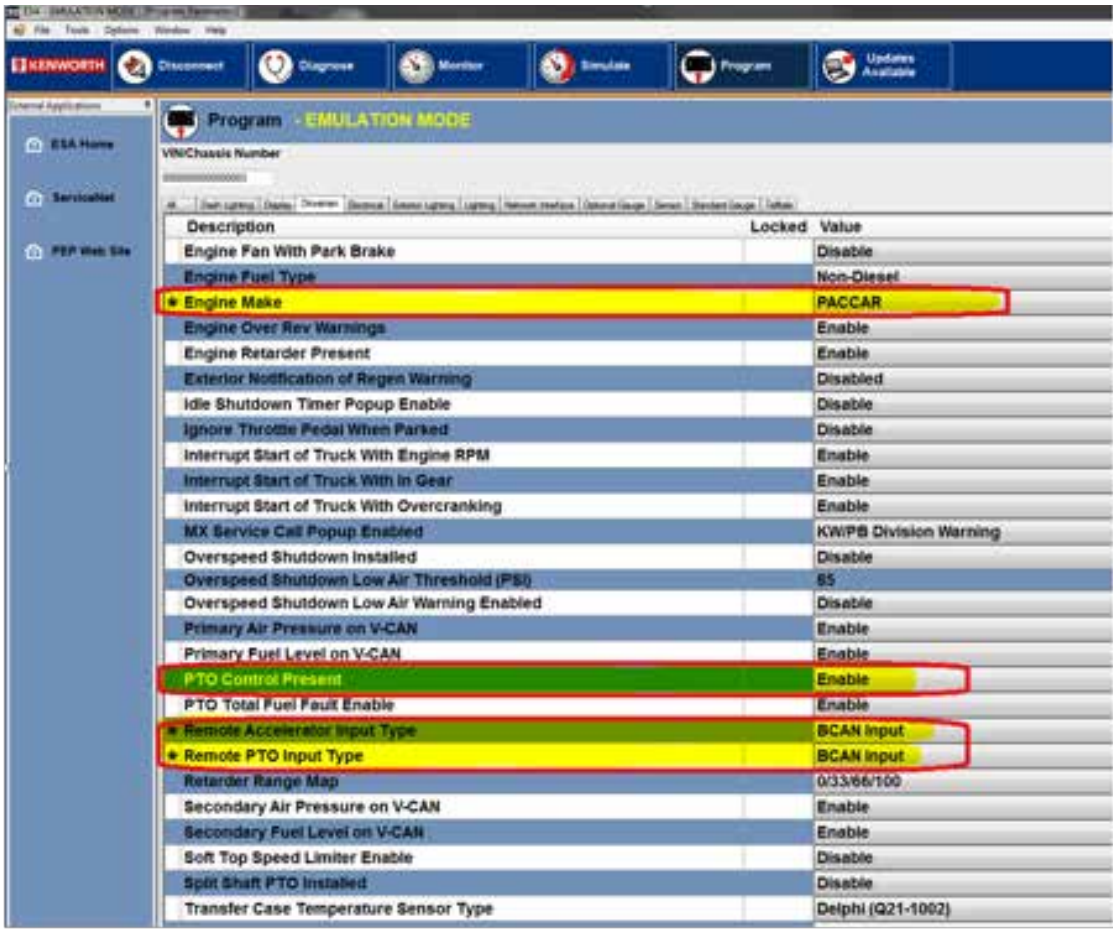


FIGURE 4-32. Remote PTO Control over BCAN with PTO ON/OFF Switch Signal over BCAN – ESA Settings for T680/T880

https://truckmanualshub.com/

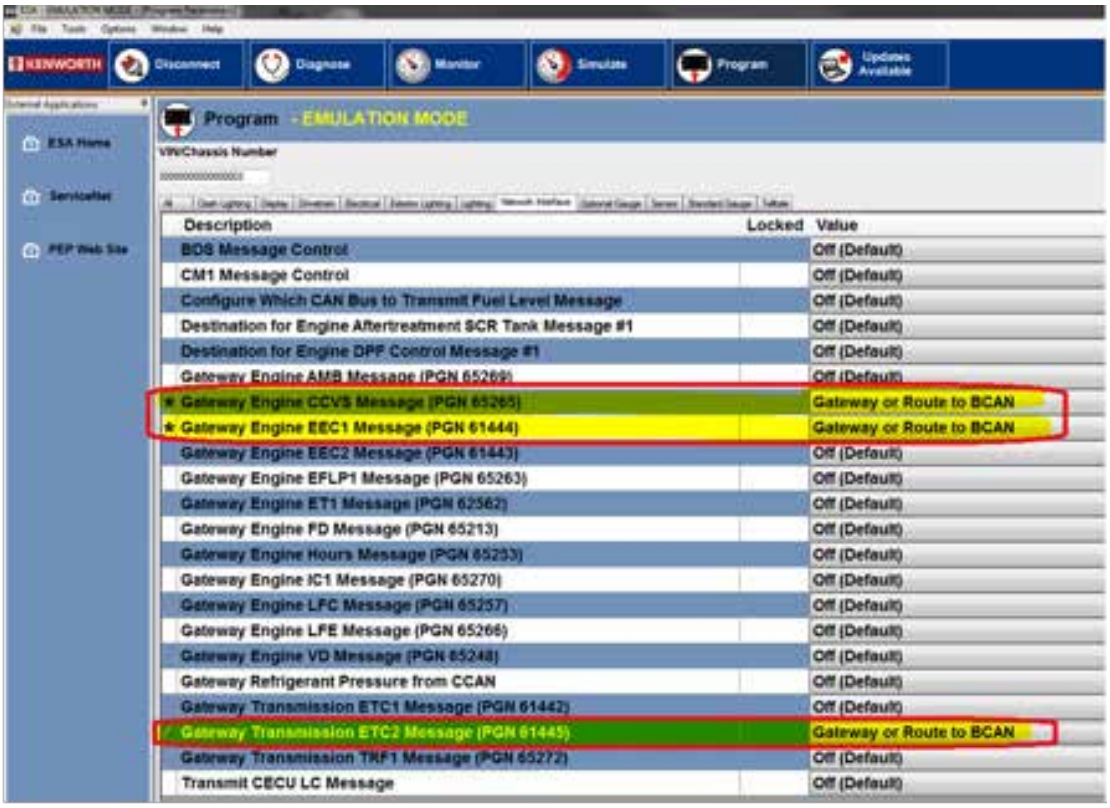


FIGURE 4-33. Remote PTO Control over BCAN with PTO ON/OFF Switch Signal over BCAN – ESA Settings for T680/T880

4.2. MX Engine Parameter Configuration using PEP

To configure Remote PTO Control over B-CAN with PTO ON/OFF Switch Signal sent over B-CAN, the engine should be configured to select the correct signal source using PEP as explained below.

In PEP, click "*Edit Parameters*" button to enable editing and scroll down to PTO section "*PTO Mode Preferences*". Towards the end of the section, there will be an entry for "*Signal source for PTO main switch (N102)* which must be set to 1.

Parameter Code: N102
Function: PTO SPEED CONTROL
Description: Signal source for PTO main switch.
Calculation: 0 = Hardwired
1 = CAN

There are two ways to configure remote PTO Control depending on application:

1. Remote PTO Control with Accelerator Pedal
2. Remote PTO Control without Accelerator Pedal.

For both these options, the configuration on CECU is the same as described in section 4.1. The engine should be configured for one of the above options which is done by selecting the right sales code using PEP as explained below.

https://truckmanualshub.com/

In PEP, click "*Edit Parameters*" button to enable editing and scroll down to PTO section "*PTO Mode Preferences*". Towards the end of the section, there will be an entry for "*Type of PTO Controls – Enable/Disable (S074)*" which can be edited by making a selection from a dropdown menu. From this dropdown menu, select one of the sales codes shown in Table 4-18.

TABLE 4-18. Hardwired Remote PTO Control – PEP Settings

Description	Kenworth Sales Code
Remote Station with Accelerator Pedal	KW 1000330
Remote Station without Accelerator Pedal	KW 1000340

Once these selections are made, scroll to the top of the page or to the bottom of the page to "*Save*" the changes. Once the changes are saved, select "Submit" and download the new file when it becomes available and program it on the engine using DAVIE.

Please refer to "Electrical" section of this manual for details on wiring connections for remote PTO with MX engines.

5. Reference

Paccar MX Engine can be programmed to have preset values for multiple features when operating in PTO mode. The features available when configuring PTO Mode with PACCAR MX Engines are described in the MX Programming Guide.

https://truckmanualshub.com/

This page intentionally left blank.

https://truckmanualshub.com/

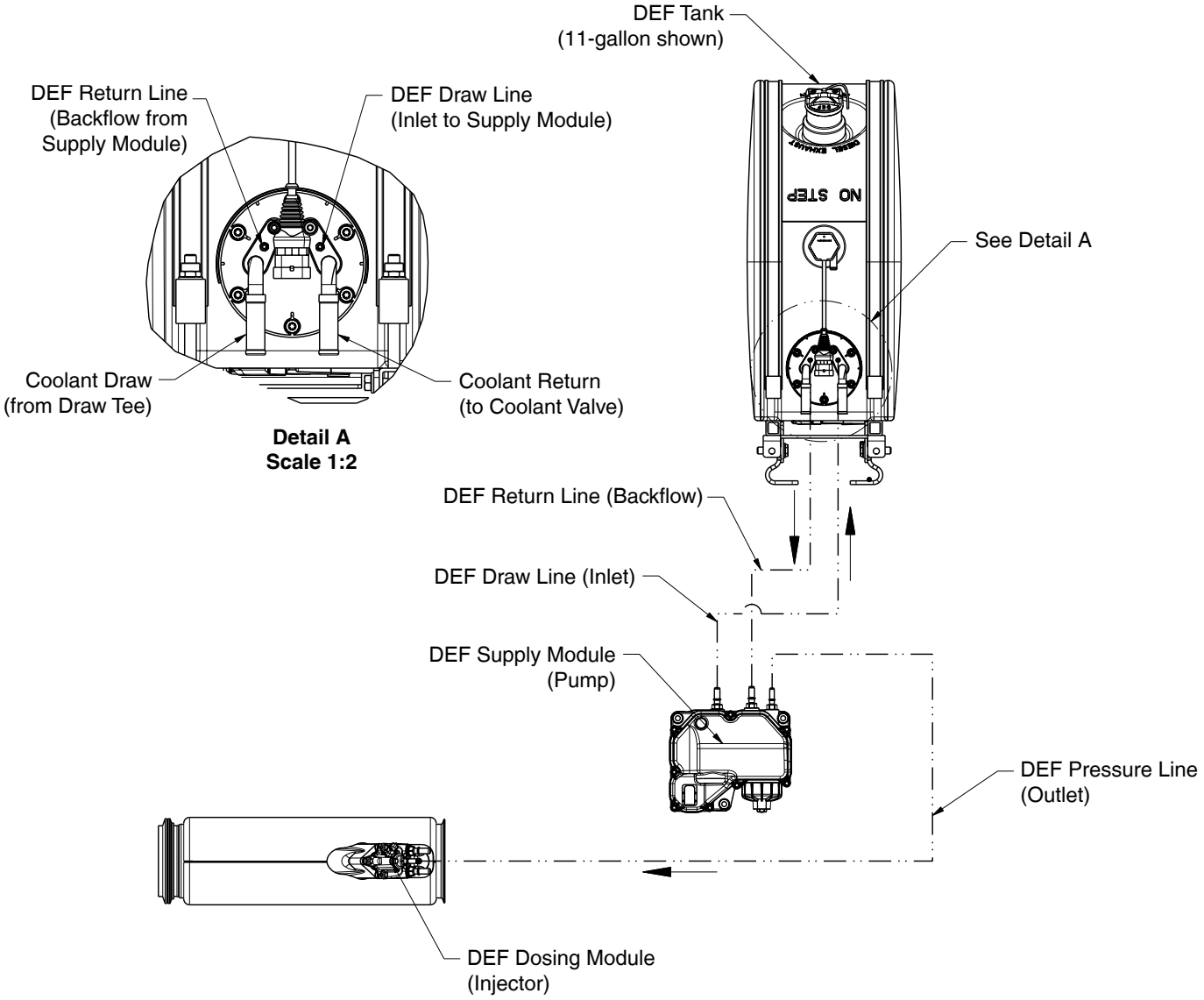
EXHAUST AND AFTER-TREATMENT INFORMATION

The following section is designed to give you information regarding the exhaust and after-treatment systems on Kenworth chassis.

All Kenworth's equipped with 2013 emission level engines will utilize Selective Catalyst Reduction (SCR). SCR is a process in which Diesel Exhaust Fluid (DEF) is injected into the exhaust down stream of the engine. DEF is converted to ammonia by the heat of the exhaust system. Inside of the SCR canister a catalyst causes a chemical reaction to occur between the ammonia and NOx, turning it into water and nitrogen. For more information on the specific details of how SCR works, please contact your local Kenworth dealer.

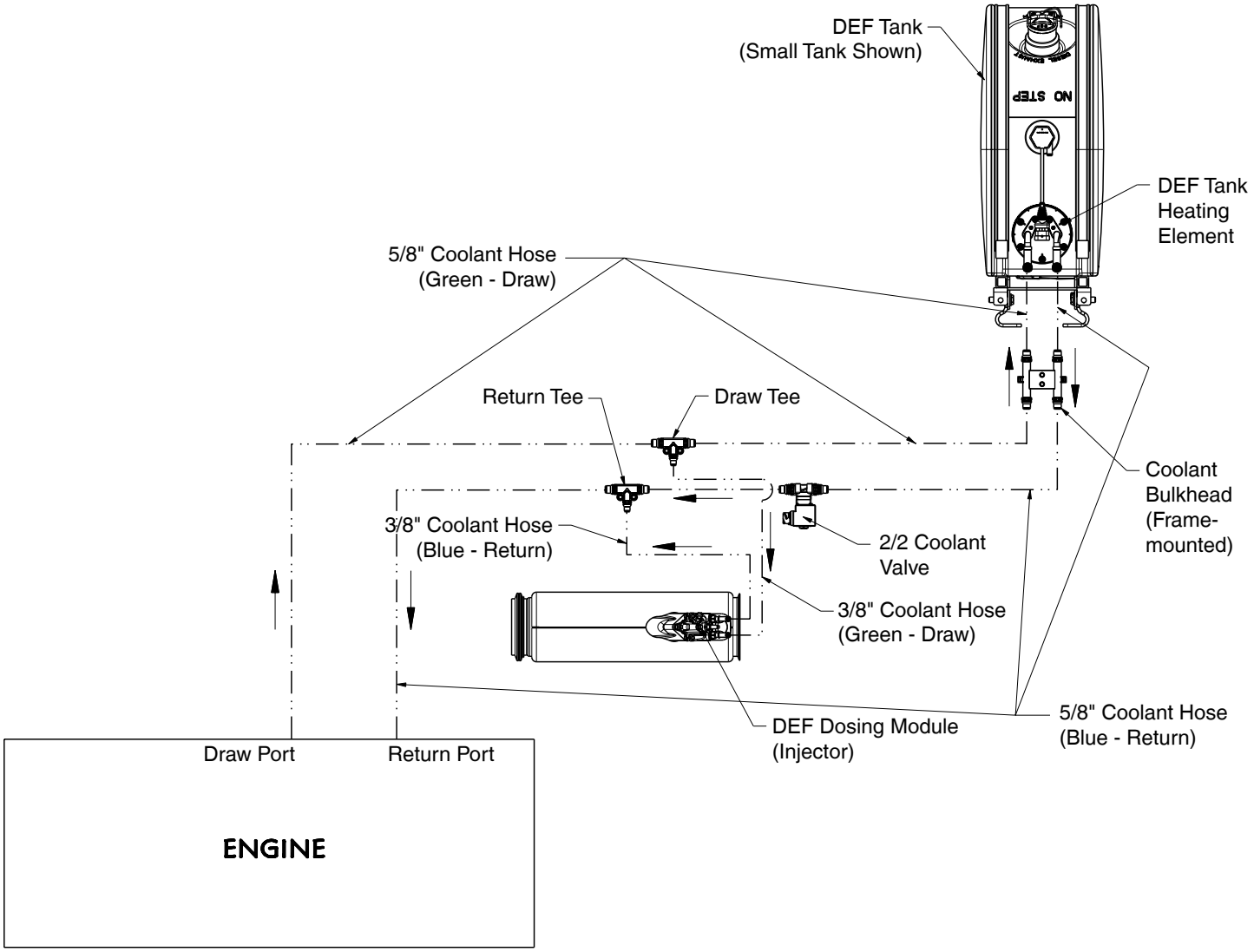
DEF System Schematic:

On most Kenworth chassis the DEF Supply Module (or pump) is integrated into the DEF tank. Kenworth does not allow relocation of this pump. The following schematic details how the DEF lines route to the after-treatment system.



https://truckmanualshub.com/

DEF will freeze at approximately 11° F. In order to keep DEF from freezing all tanks will be heated with engine coolant. The following schematic shows the routing of these lines. The coolant lines that run to and from the SCR system must not be tampered with, or used for a source of heat and/or cooling for other components on the chassis. It is critical that the system is not compromised in any manner.



https://truckmanualshub.com/

GENERAL GUIDELINES FOR DEF SYSTEM

The installation of the DEF tank is a critical component of the SCR system. While Kenworth does not recommended relocating the DEF tank, there are applications and body installations that will require it. The guidelines below must be strictly followed by any entity relocating the tank. Failure to follow the guidelines completely and accurately may result in engine shutdown situations.

PACCAR-approved DEF hoses are required when retrofitting for system to function properly. The use of unapproved hoses for DEF lines will void warranty and may cause engine shutdown situations. The DEF pump (or Supply Module) can not be relocated from the DEF tank.

Kenworth offers a variety of DEF tank sizes to meet every application. The DEF tank volume is regulated by the E.P.A. Kenworth advises against modifying the tank volume after the truck has been delivered from the factory. These are estimated nominal (published) maximum fuel capacities for various DEF tanks, engines, and fill ratios. Dosing rates for these calculations are also shown.

TABLE 5-1.

		Nominal Fuel Volume (Gallons)							
	DEF Tank	Standard Fill Ration (˜2:1)				Optional Fill Ratio (1:1-2:1 Code)			
		ISX15	ISX12	MX	PX	ISX15	ISX12	MX	PX
Round Tanks	Small	165	175	125	205	205	220	170	225
	Medium	305	325	235	380	415	440	320	510
	Large	460	490	355	570	625	660	480	770
Aero Tanks	Medium Aero	310	330	240	385	420	445	345	520
	Large Aero	395	415	305	485	575	610	470	710
Other	Rectangular	110	115	85	135	160	170	115	195
	CBOC	100	110	80	125	150	160	125	190

https://truckmanualshub.com/

INSTALLATION REQUIREMENTS AND DIMENSIONS FOR DEF SYSTEM

When relocating any DEF system components, the locations must meet the guidelines below. Failure to comply may result in non-conformance to EPA standards and engine shutdown.

DEF piping relative heights: In order to ensure proper functionality of DEF system, the height differences in the guidelines below must be followed during line routing and component placement.

With all relocating procedures, general clearances and routing guidelines must be followed. See section 9 of this manual for general routing guidelines.

When relocating the components the maximum pressure DEF hose length, from Supply module to Dosing Module, is 3 meters (118").

Maintain a minimum of 3" clearance to shielded exhaust components when routing DEF lines to prevent possible melting.

If the DEF tank is relocated the coolant lines will need to be modified. During this process if the tank is moved forward on the chassis (ie closer to the engine) it is necessary to remove excess coolant lines and maintain the original routing path. If the tank is moved rearward on the chassis the additional length of cooling line required to complete the installation must be installed in a straight section of the existing coolant routing lines. This process will minimizes the change in coolant flow by minimizing changes in restrictions. Changes in restriction are added with excessive line length and bends. Work with your local Kenworth dealer if you are unsure about the coolant line modifications.

https://truckmanualshub.com/

MEASUREMENT REFERENCE POINTS

For the all relocation procedures, the measurement points will referenced in the guidelines are taken from the following specific points:

Supply Module: The supply module is commonly called a pump. The measurement point on the supply module is the top of the DEF fluid pressure line. See Figure 5-1.



FIGURE 5-1: Measurement Location of DEF Supply Module (Pump)

Dosing Module: The dosing module is commonly called an injector, this injector is located on the SCR mixing pipe which is between the DPF and SCR canister. The measurement point on the dosing module is the top of the DEF fluid pressure line. See Figure 5-2.

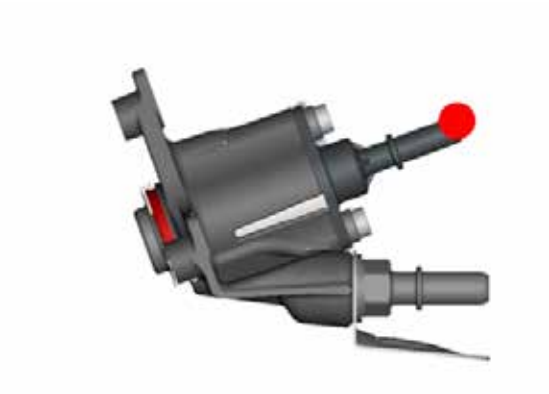


FIGURE 5-2: Measurement Location of DEF Dosing Module (Injector)

The following relocation guidelines are dependant on exhaust configuration and DEF tank type and location.

The Dosing Module should not ever need to be relocated, however if it is removed for any reason, it is critical that the module be reinstalled at the correct orientation. Figure 5-3 below illustrates the correct installation orientations. The angle references the vertical plane.

https://truckmanualshub.com/

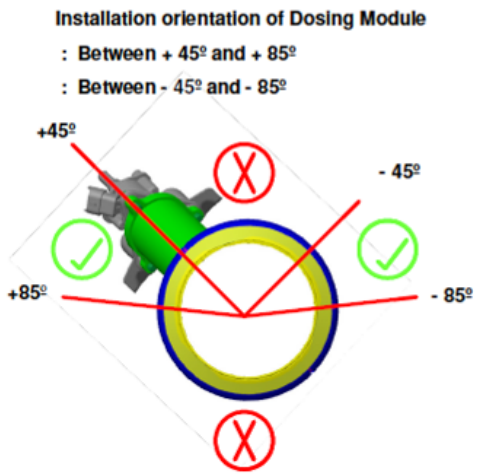


FIGURE 5-3: Orientation of Dosing Module

Right Hand Under DPF and SCR with Small, Medium, or Large DEF Tanks

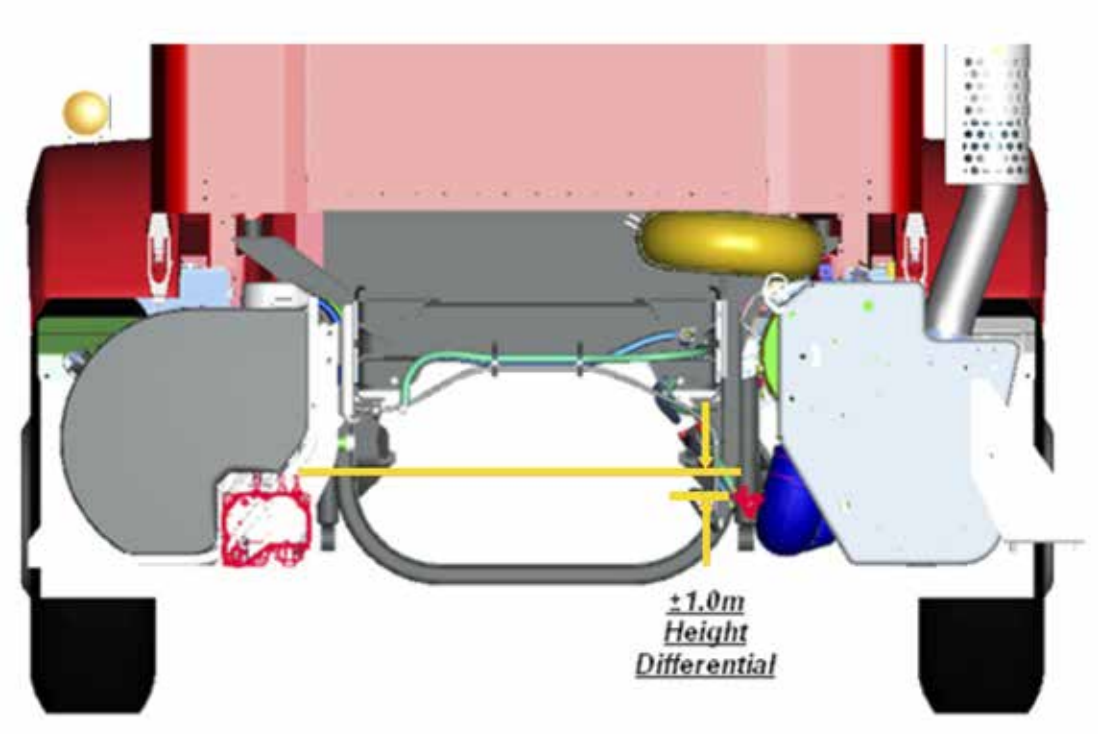


FIGURE 5-4: RH Under Cab Exhaust with Small, Medium, or Large Tanks.

The height differential between the supply module and dosing module can not exceed one meter. The supply module is integrated into the DEF tank assembly, separation of the module from the tank is not allowed.

When relocating the components the maximum pressure DEF hose length, from Supply module to Dosing Module, is 3 meters (118").

DEF Pressure hose must include a “trap” in the routing if Dosing Module is below the highest point of the Supply Module (See Figure 5-9 on page 5-9).

https://truckmanualshub.com/

Horizontal (Crossover) DPF and SCR with Small, Medium, or Large DEF Tanks

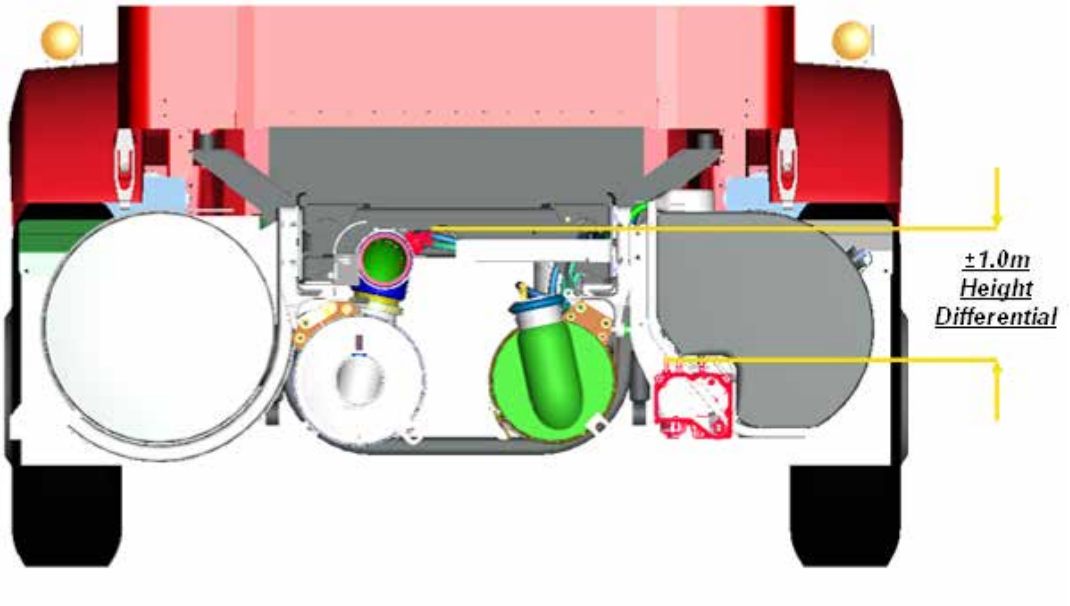


FIGURE 5-5: Horizontal Exhaust with Small, Medium, or Large Tanks.

The height differential between the supply module and dosing module can not exceed one meter. The supply module is integrated into the DEF tank assembly, separation of the module from the tank is not allowed.

When relocating the components the maximum pressure DEF hose length, from Supply module to Dosing Module, is 3 meters (118").

Vertical DPF and SCR with Small, Medium, or Large DEF Tanks

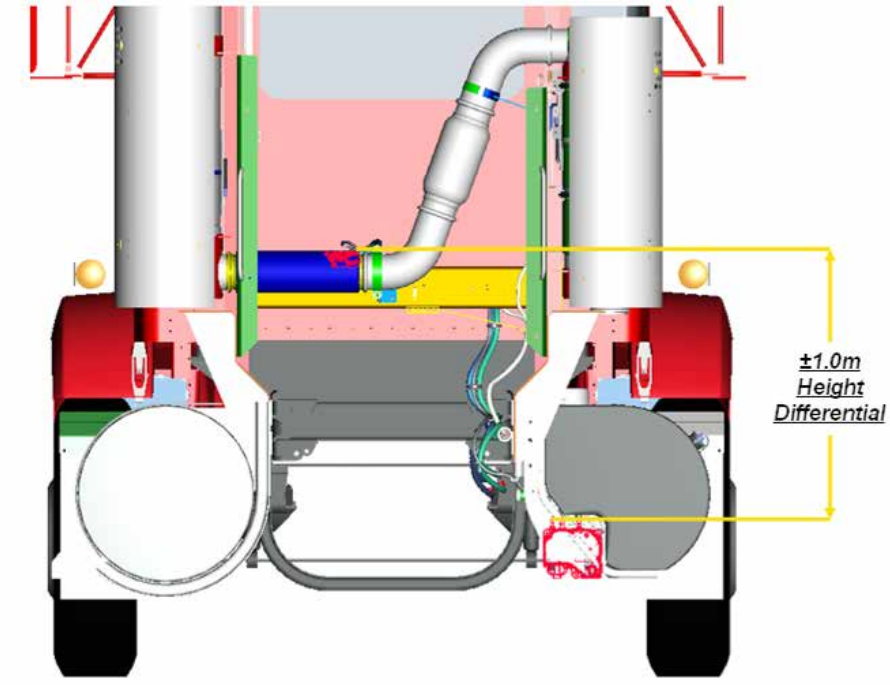


FIGURE 5-6: Vertical Exhaust with Small, Medium, or Large Tanks.

https://truckmanualshub.com/

The height differential between the supply module and dosing module can not exceed one meter. The supply module is integrated into the DEF tank assembly, separation of the module from the tank is not allowed.

When relocating the components the maximum pressure DEF hose length, from Supply module to Dosing Module, is 3 meters (118").

Routing to the Dosing Module (Injector)

A DEF pressure line “trap” is no longer required after EPA 2013 emissions level engine. The dosing module (injector) is now able to be the lowest point in the presure line routing. See Figure 5-7 below for typical routing with RHUC exhaust and RH DEF tank shown. Also shown in this figure is the coolant line routing for T680 and T880 models.

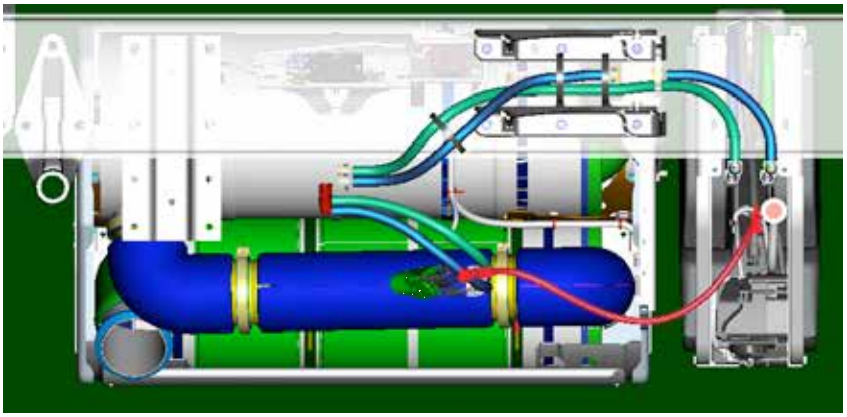


FIGURE 5-7: Routing DEF Lines

DEF Supply Module Mounting Requirements

The Supply Module (or Pump) standard mounting location is on the DEF tank assembly. Body builders may need to relocate this component, and should follow the location and length restrictions above. Additionally the mounting and the orientation of the Supply Module must not exceed 45° (from vertical) in two directions as shown in Figure 5-8 below.

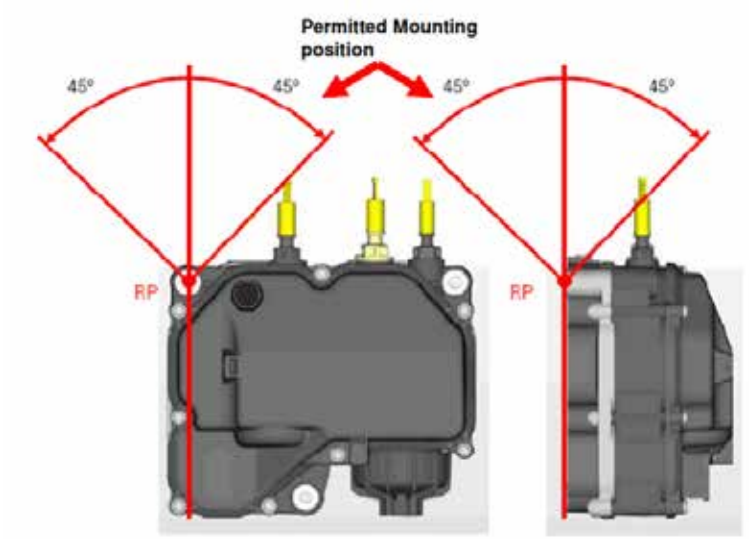
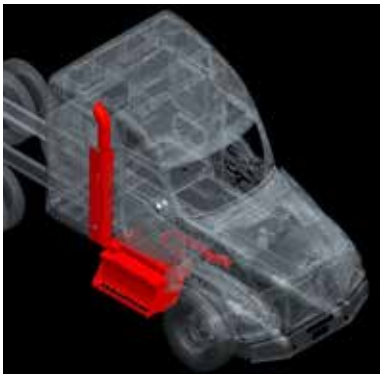


FIGURE 5-8: Supply Module Allowed Clocking Angles

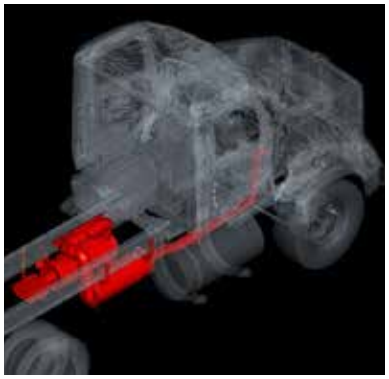
https://truckmanualshub.com/

GENERAL EXHAUST INFORMATION

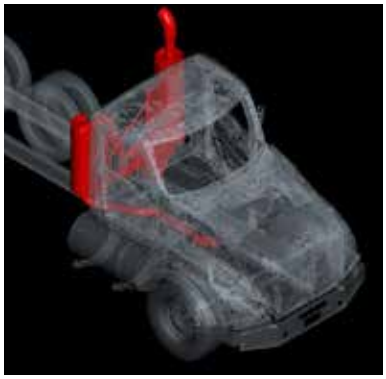
Kenworth will offer three main DPF and SCR exhaust systems on heavy duty chassis in 2013. A Right Hand Under DPF and SCR system, in which both canisters are located underneath the cab access step. A horizontal system with both the DPF and SCR located horizontally with a cross over pipe in the frame, and an Independent DPF and SCR located vertically back of cab on stanchion brackets.



RH Under DPF and SCR



Horizontal DPF and SCR



Independent Back of Cab

The following images depict the typical exhaust routings for each system, and can be used to determine exhaust routing paths for systems you choose. Dimensional information can be found in Section 5 of this manual.

Body Builders must not modify (including altering, substituting, and relocating) the DPF and SCR canisters. The exhaust piping after it exits the SCR canister may be modified, however using smaller diameter piping or piping with numerous bends is not recommend as the backpressure requirements of the system may be exceeded.

https://truckmanualshub.com/

Right Hand Under DPF/SCR on DayCav with Single Side of Cab Tailpipe

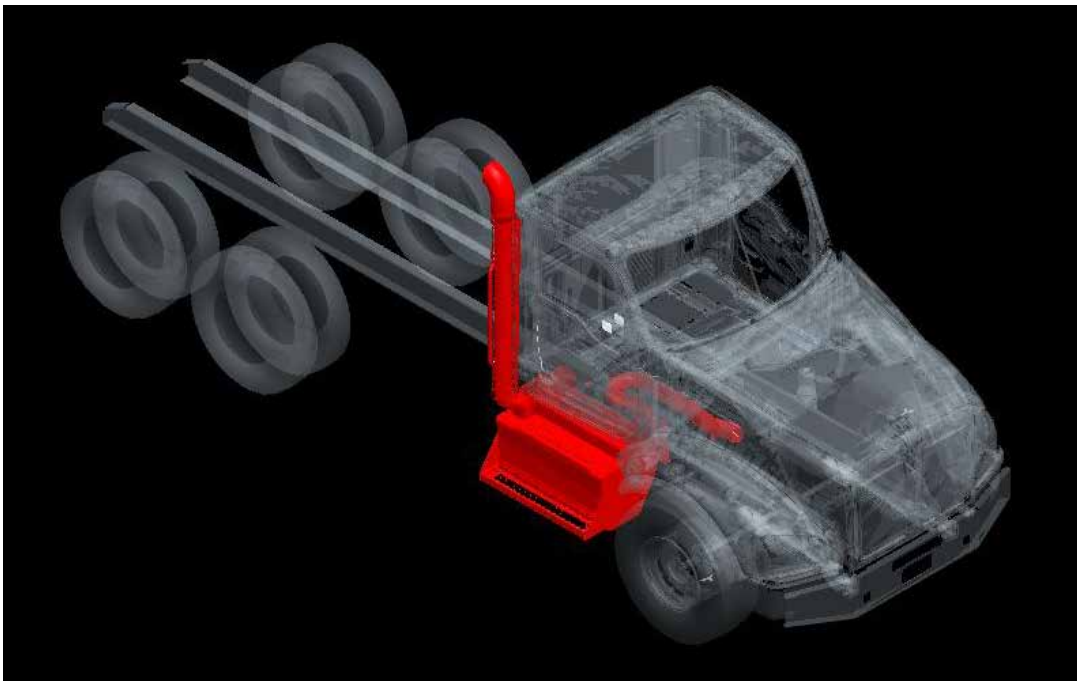


FIGURE 5-9: Isometric view of Right Hand Under DPF/SCR with Single Side of Cab Tailpipe

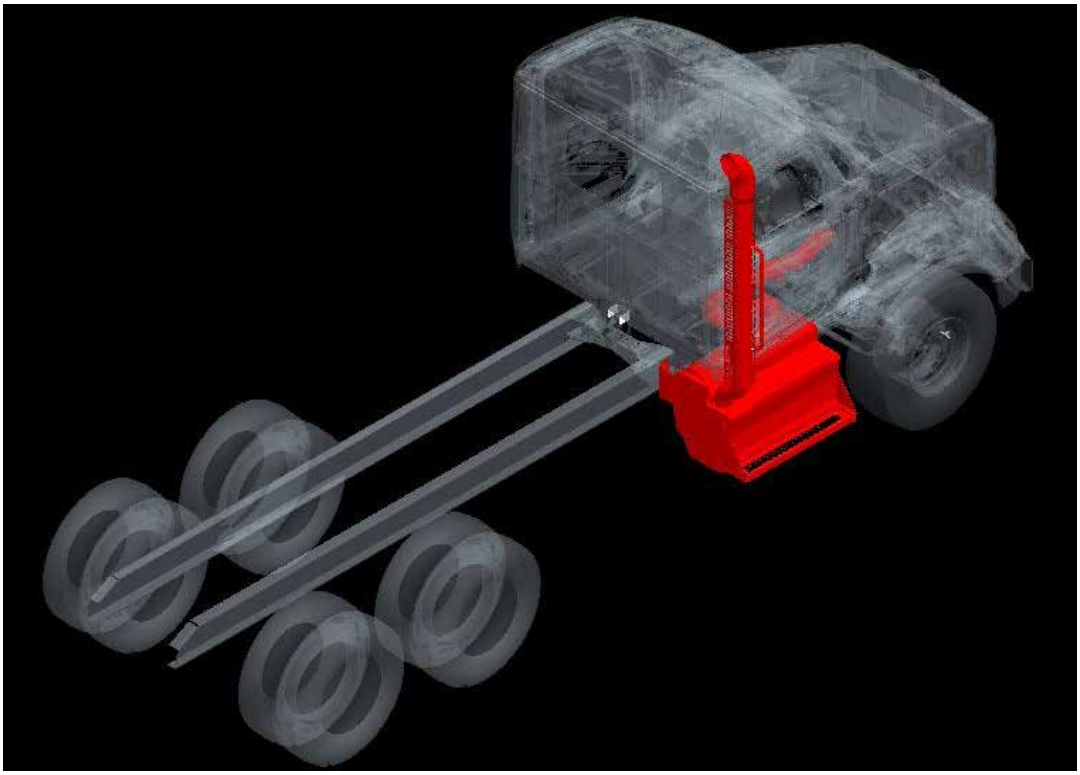


FIGURE 5-10: Isometric view of Right Hand Under DPF/SCR with Single Side of Cab Tailpipe

https://truckmanualshub.com/

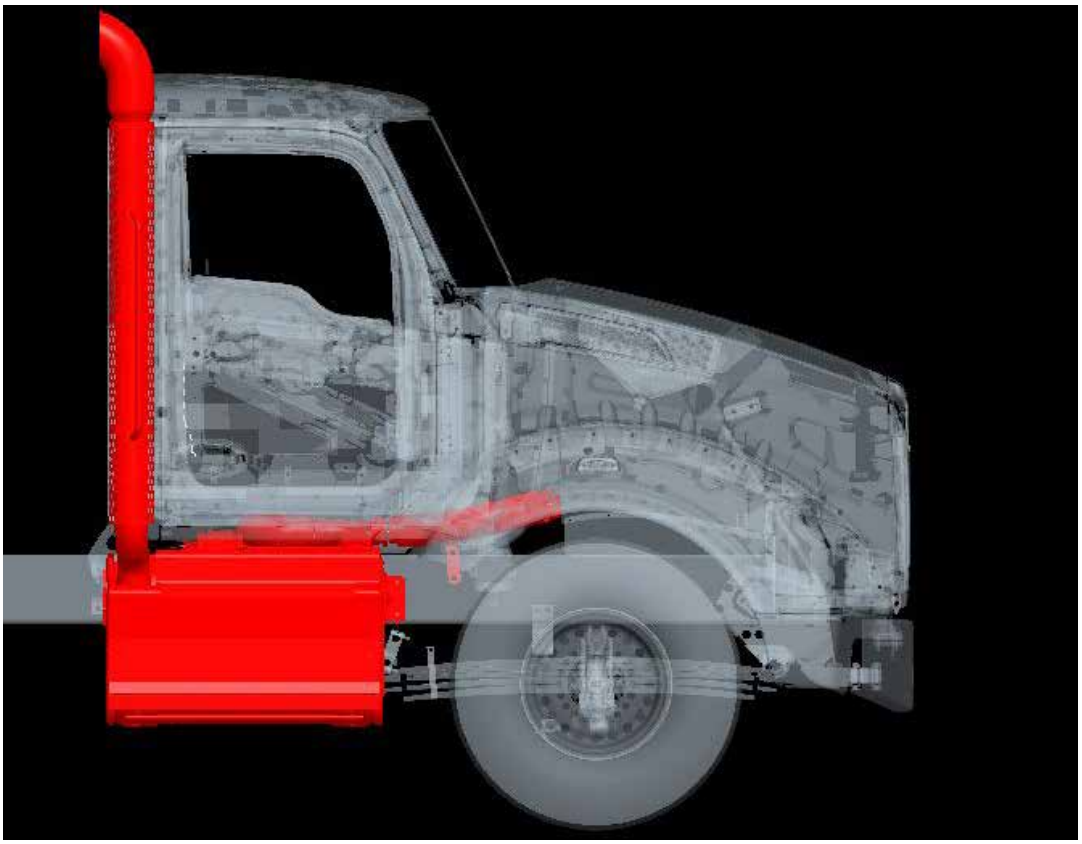


FIGURE 5-11: Right view of Right Hand Under DPF/SCR with Single Side of Cab Tailpipe

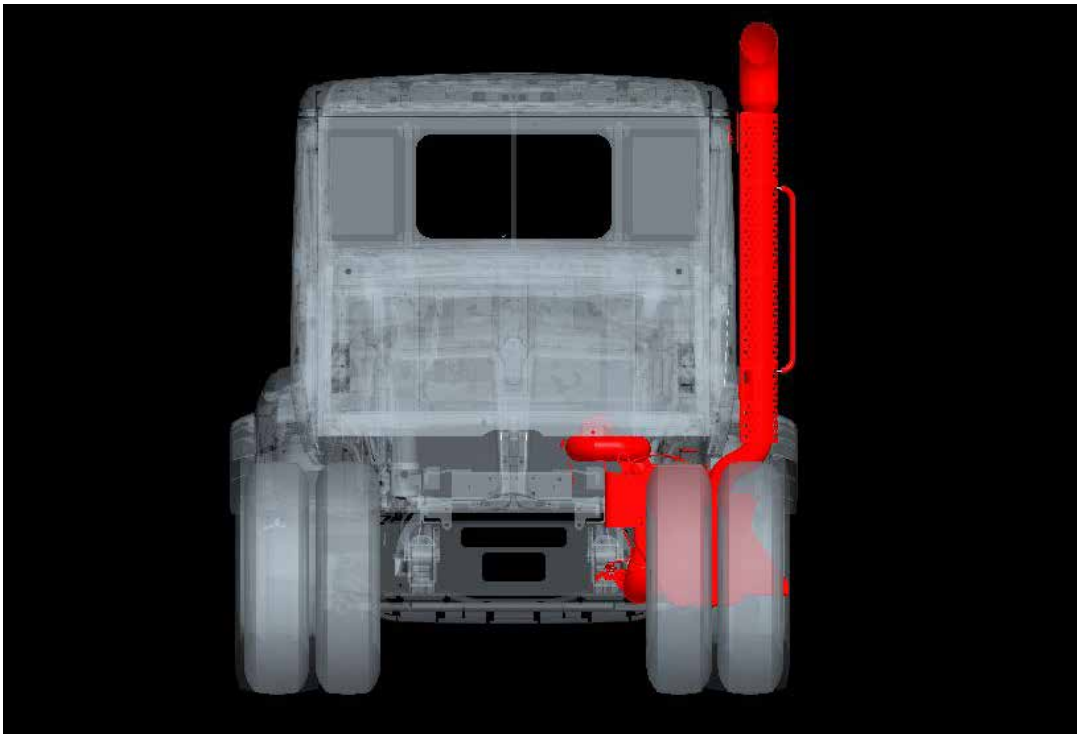


FIGURE 5-12: Back view of Right Hand Under DPF/SCR with Single Side of Cab Tailpipe

https://truckmanualshub.com/

Right Hand Under DPF/SCR on DayCab with Dual Side of Cab Tailpipes

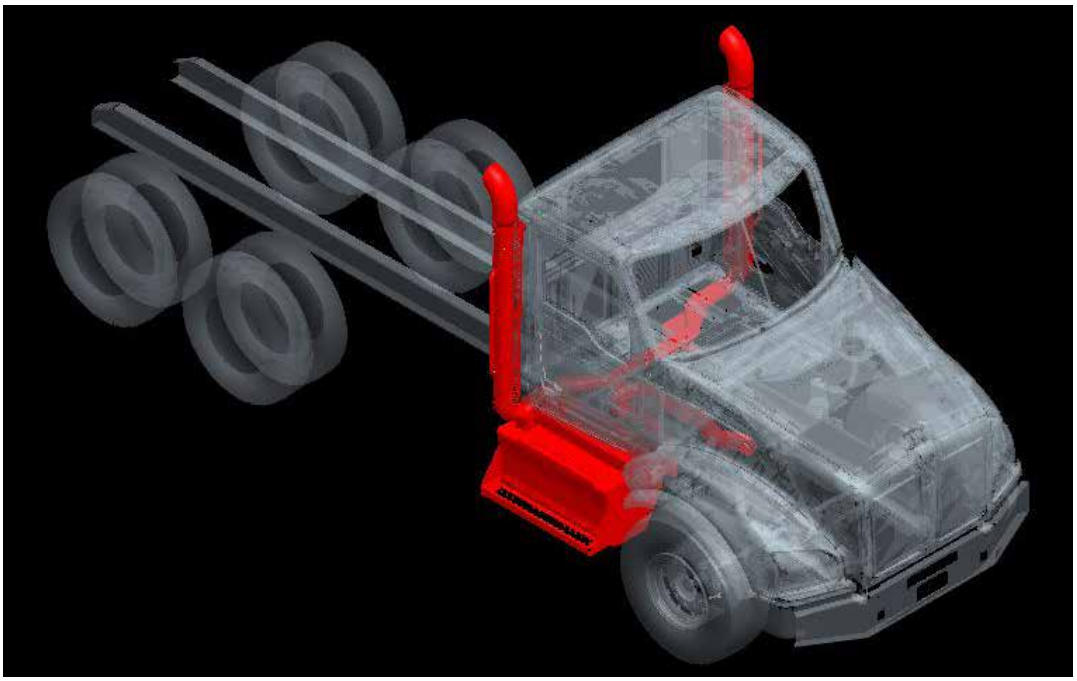


FIGURE 5-13: Isometric view of Right Hand Under DPF/SCR with Dual Side of Cab Tailpipe

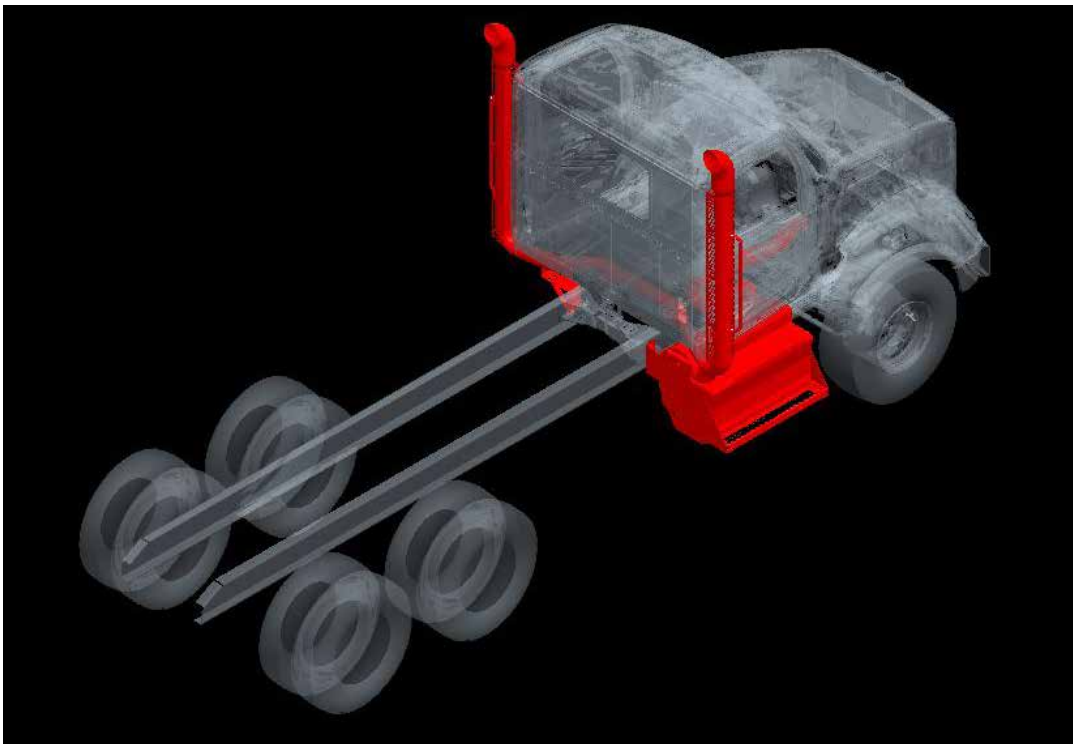


FIGURE 5-14: Isometric view of Right Hand Under DPF/SCR with Dual Side of Cab Tailpipe

https://truckmanualshub.com/

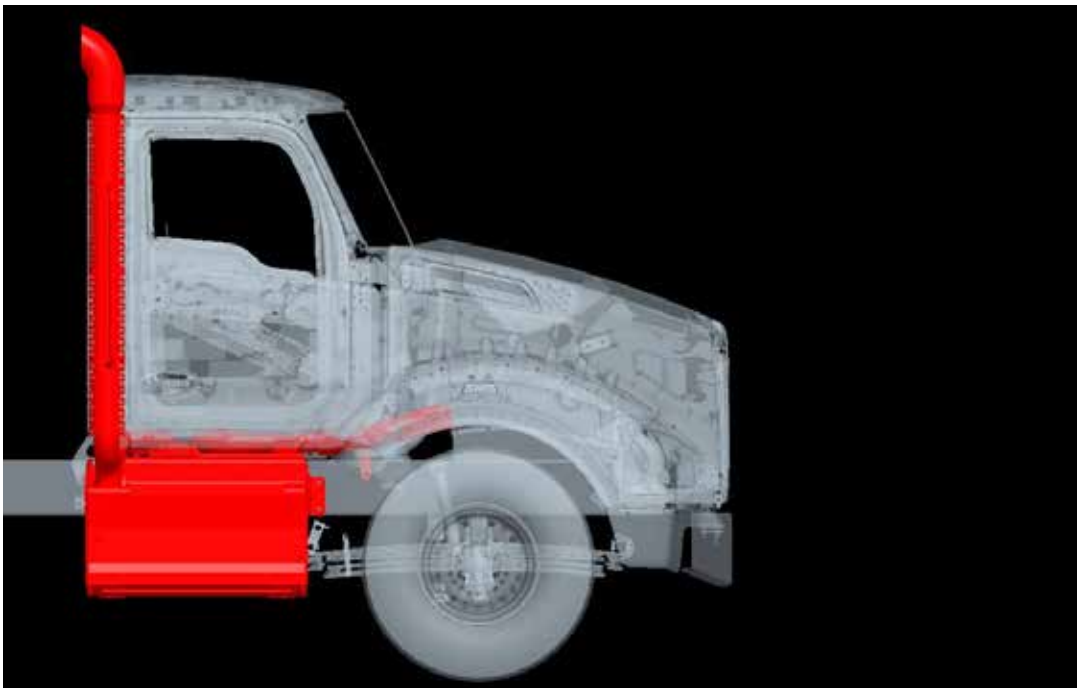


FIGURE 5-15: Right View of Right Hand Under DPF/SCR with Dual Side of Cab Tailpipe

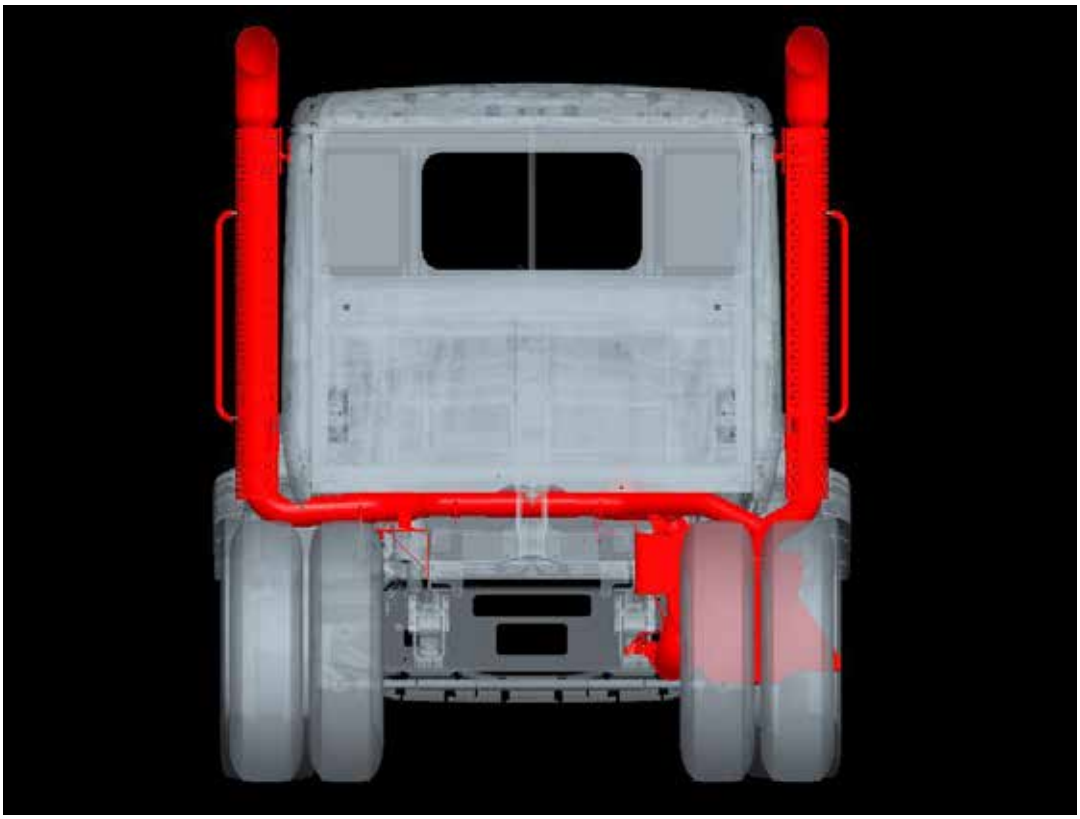


FIGURE 5-16: Back View of Right Hand Under DPF/SCR with Dual Side of Cab Tailpipe

https://truckmanualshub.com/

Right Hand Under DPF/SCR on DayCab with Single Back of Cab Tailpipe

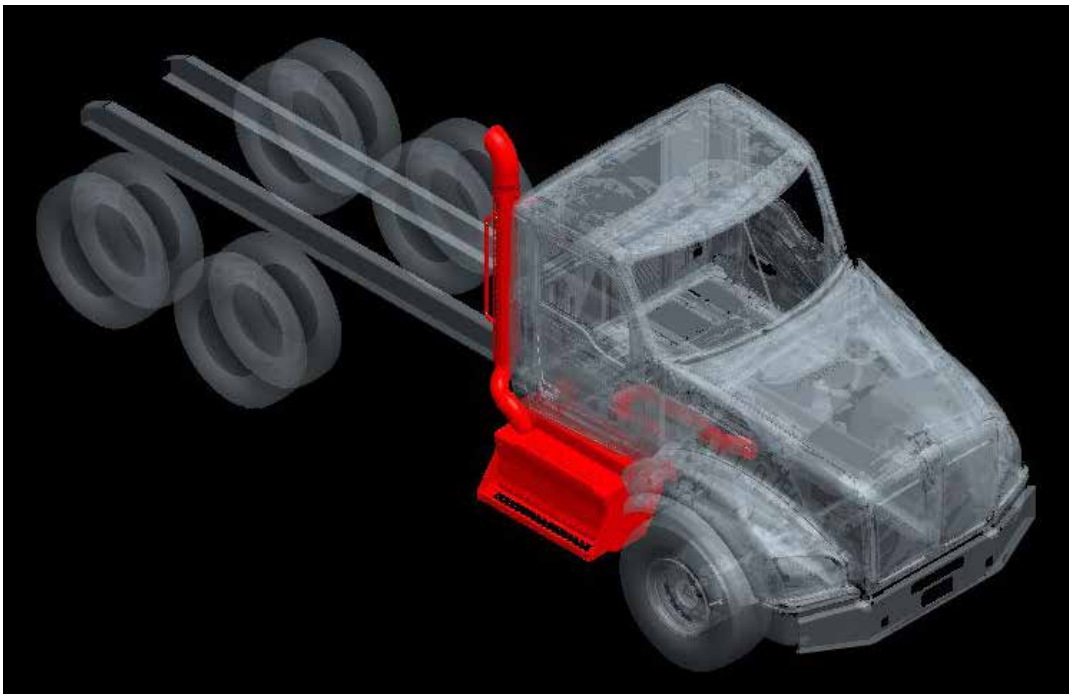


FIGURE 5-17: Isometric View of Right Hand Under DPF/SCR with Single Back of Cab Tailpipe

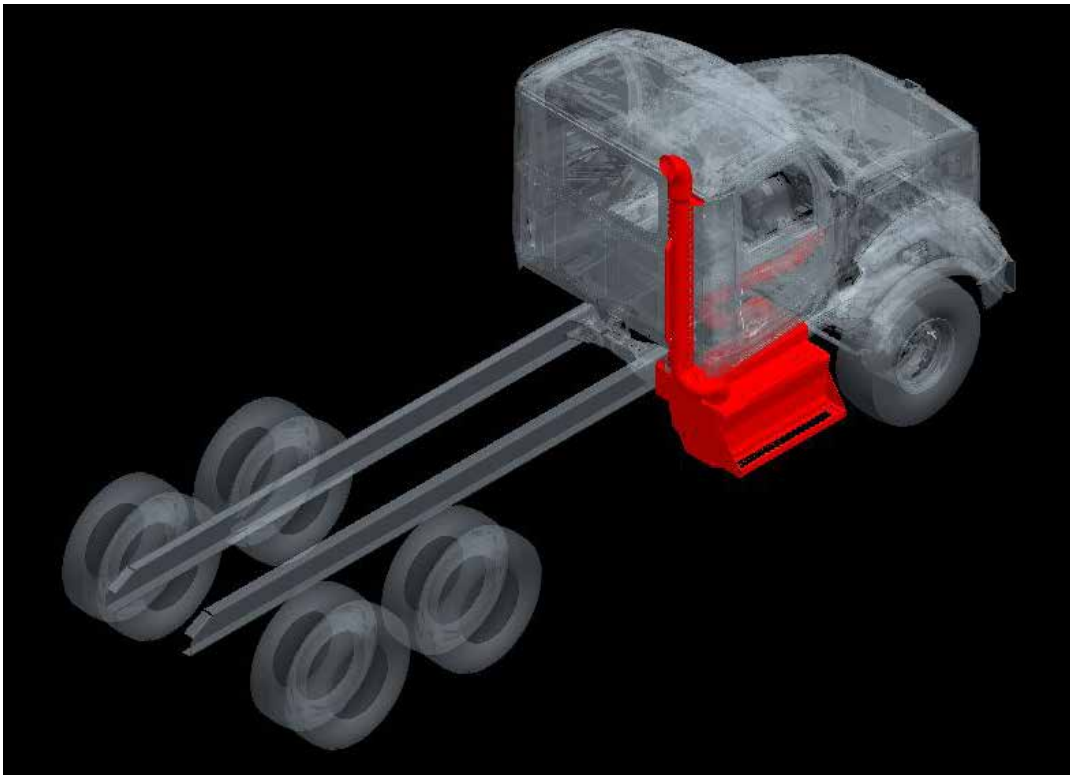


FIGURE 5-18: Isometric View of Right Hand Under DPF/SCR with Single Back of Cab Tailpipe

https://truckmanualshub.com/

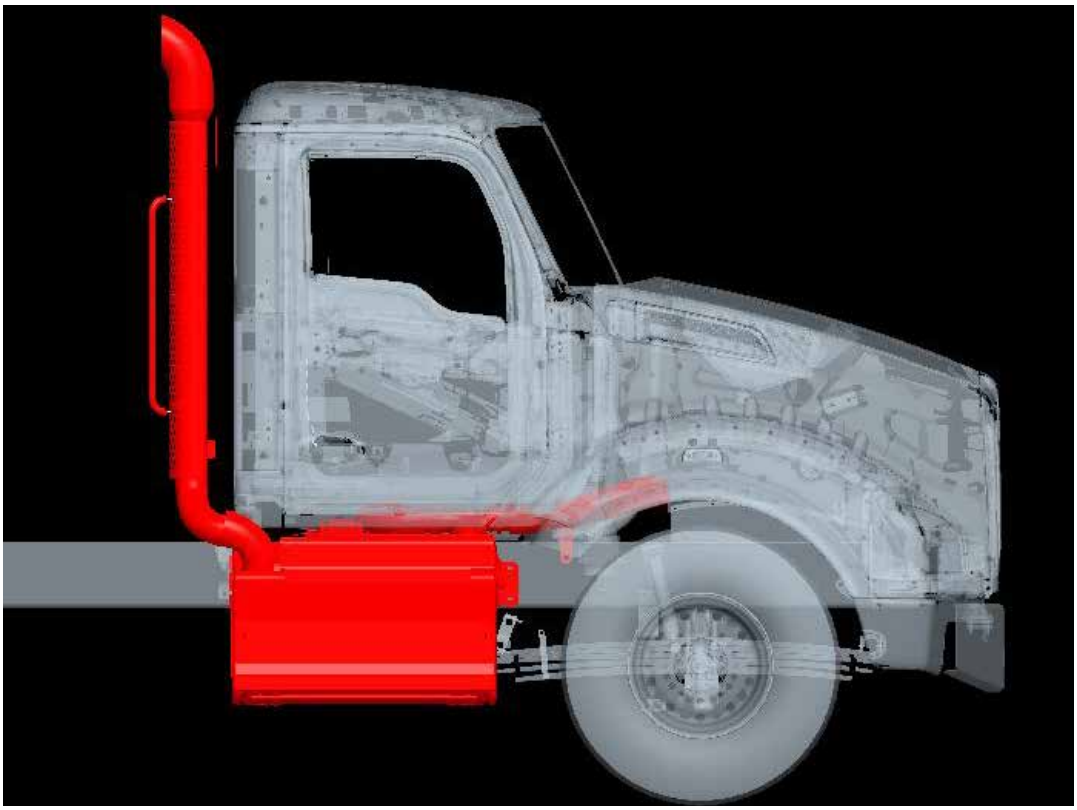


FIGURE 5-19: Right View of Right Hand Under DPF/SCR with Single Back of Cab Tailpipe

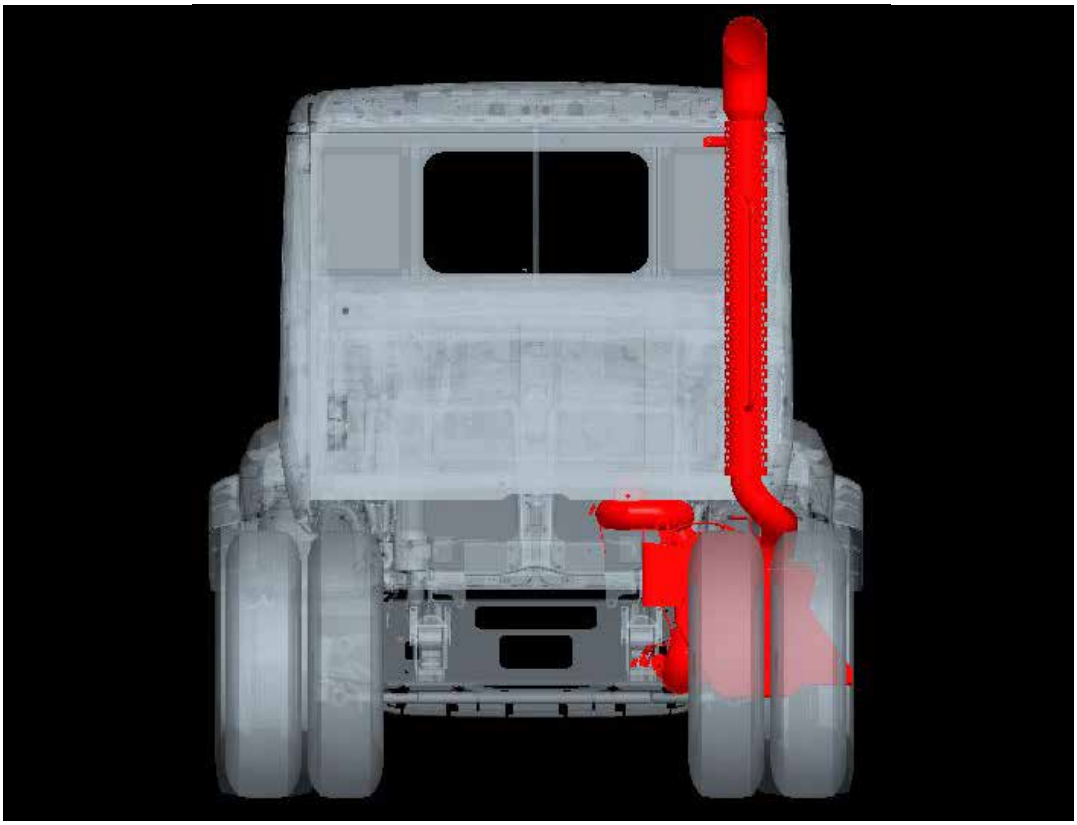


FIGURE 5-20: Back View of Right Hand Under DPF/SCR with Single Back of Cab Tailpipe

https://truckmanualshub.com/

Right Hand Under DPF/SCR on DayCab with Ground-Dump Tailpipe

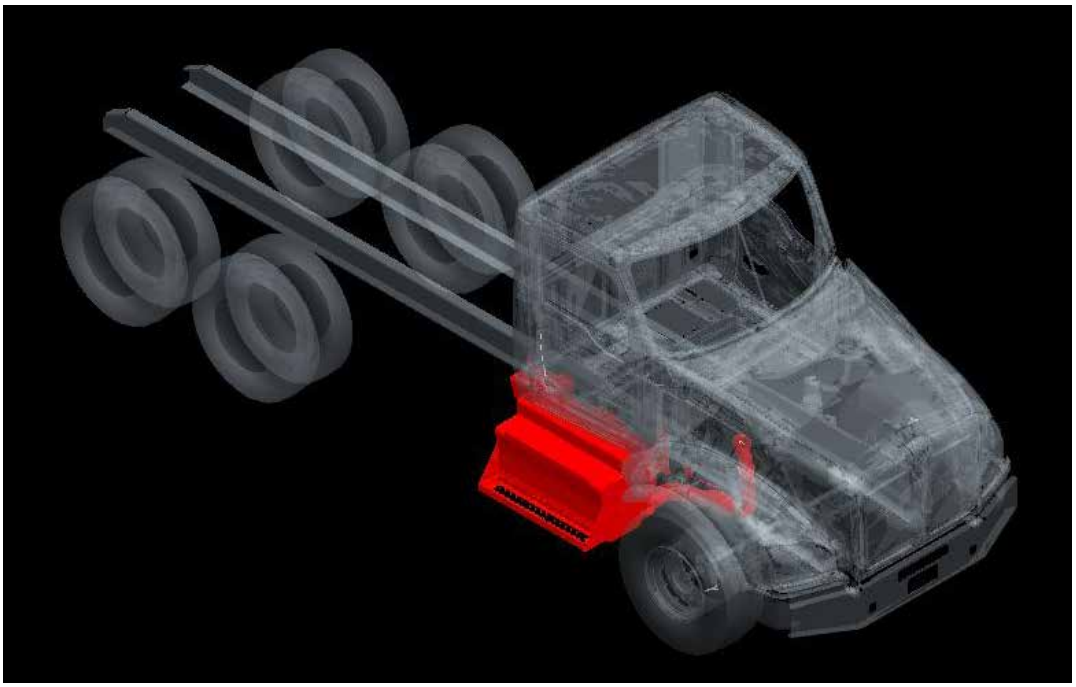


FIGURE 5-21: Isometric View of Right Hand Under DPF/SCR with Ground-Dump Tailpipe

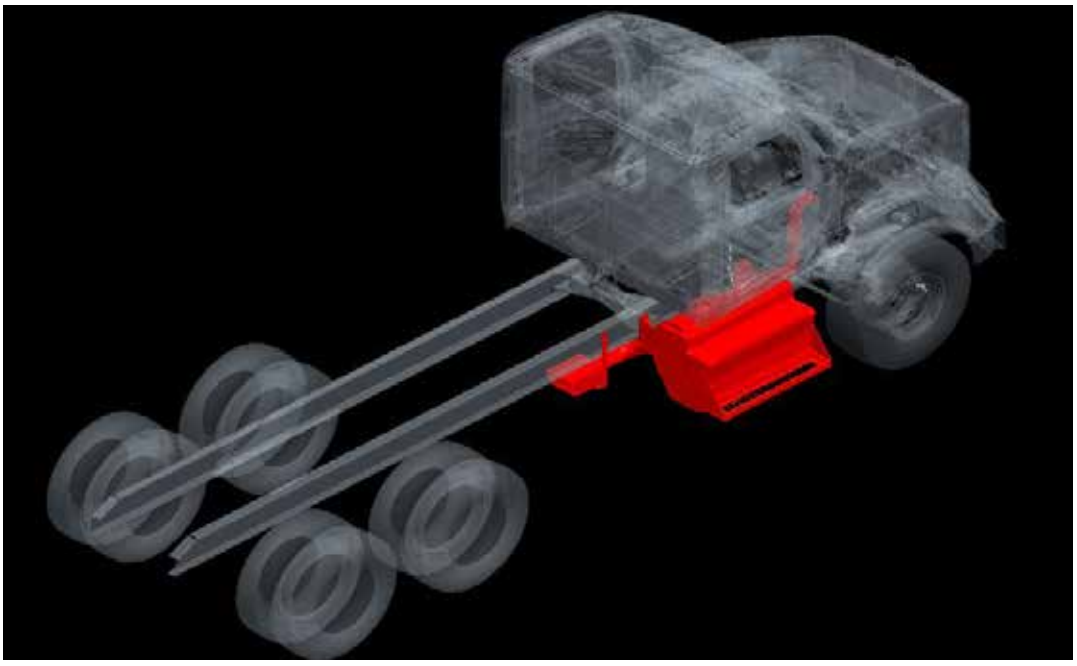


FIGURE 5-22: Isometric View of Right Hand Under DPF/SCR with Ground-Dump Tailpipe

https://truckmanualshub.com/

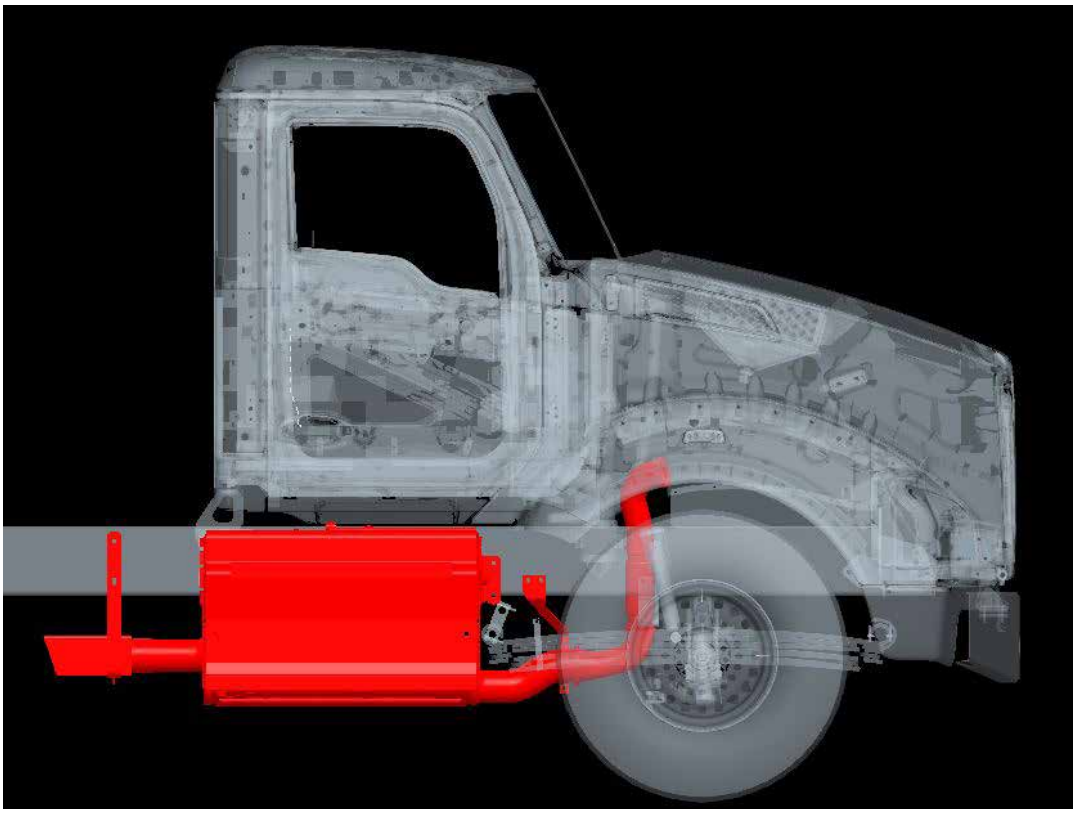


FIGURE 5-23: Right View of Right Hand Under DPF/SCR with Ground-Dump Tailpipe

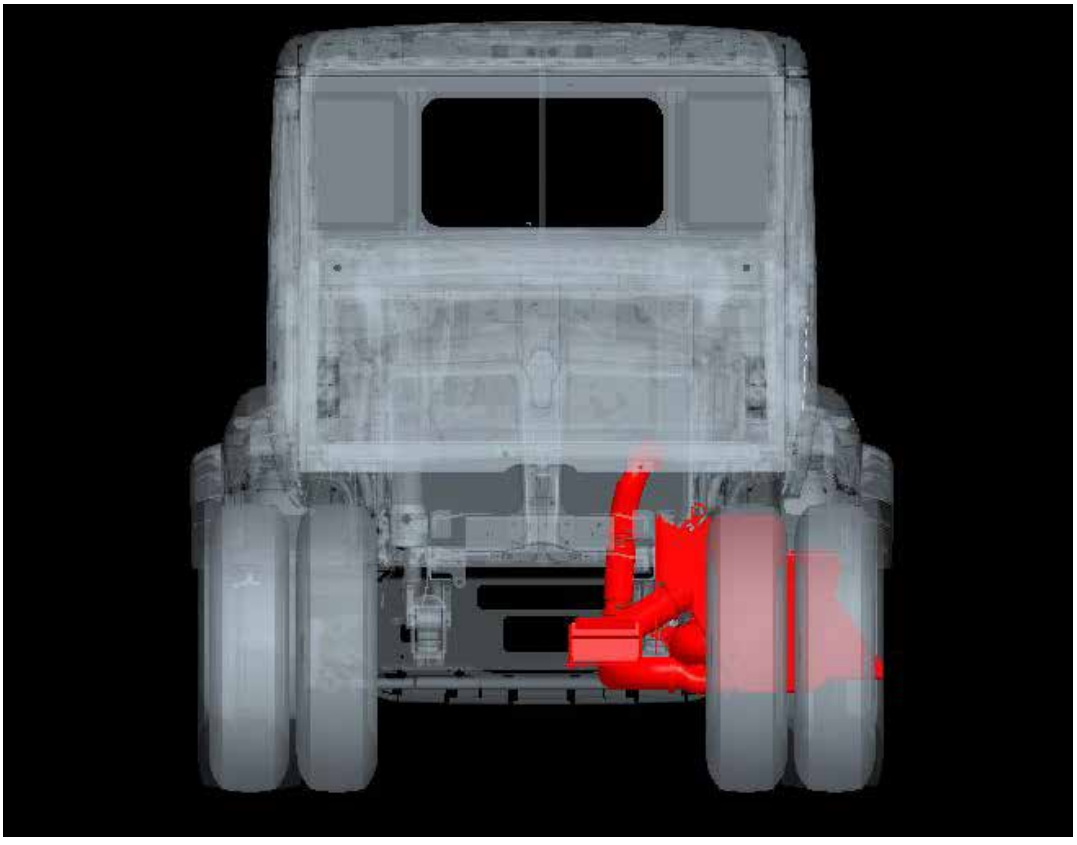


FIGURE 5-24: Back View of Right Hand Under DPF/SCR with Ground-Dump Tailpipe

https://truckmanualshub.com/

Independent Back of Cab DPF/SCR on DayCab with Back of Cab Tailpipe

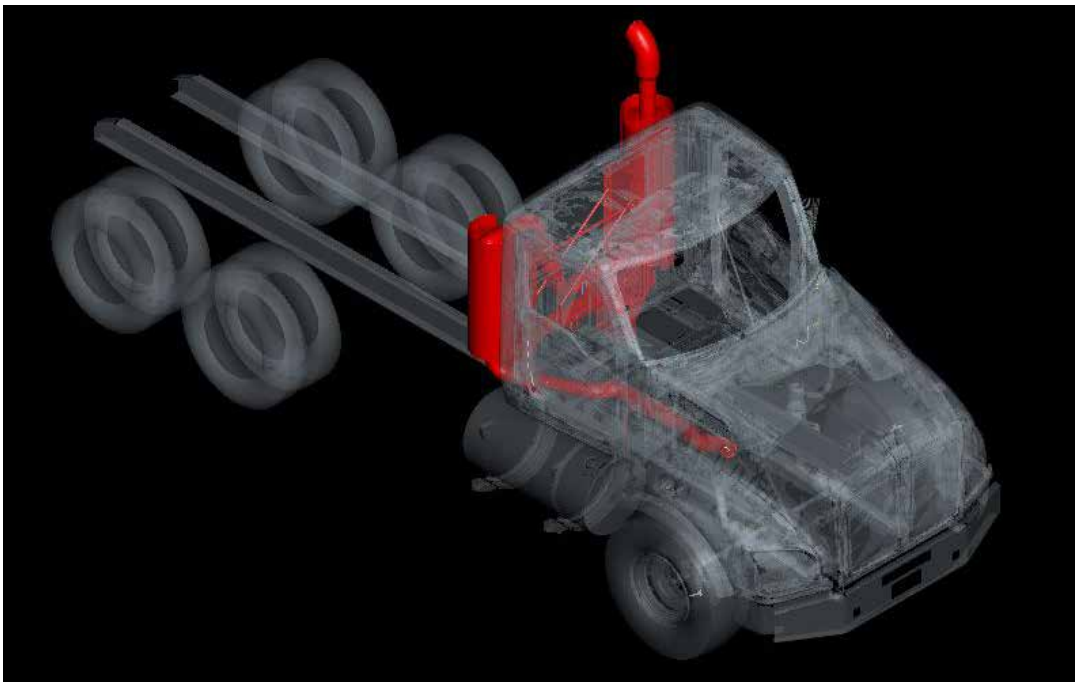


FIGURE 5-25: Isometric View of Independent Back of Cab DPF/SCR with Back of Cab Tailpipe

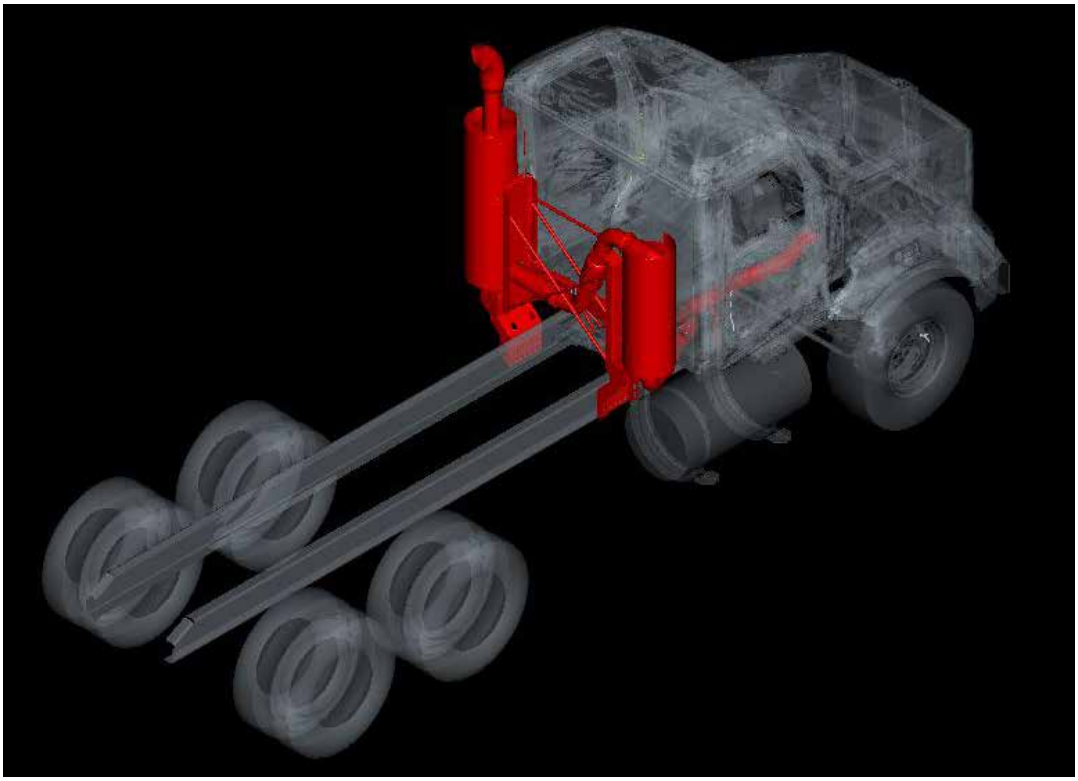


FIGURE 5-26: Isometric View of Independent Back of Cab DPF/SCR with Back of Cab Tailpipe

https://truckmanualshub.com/

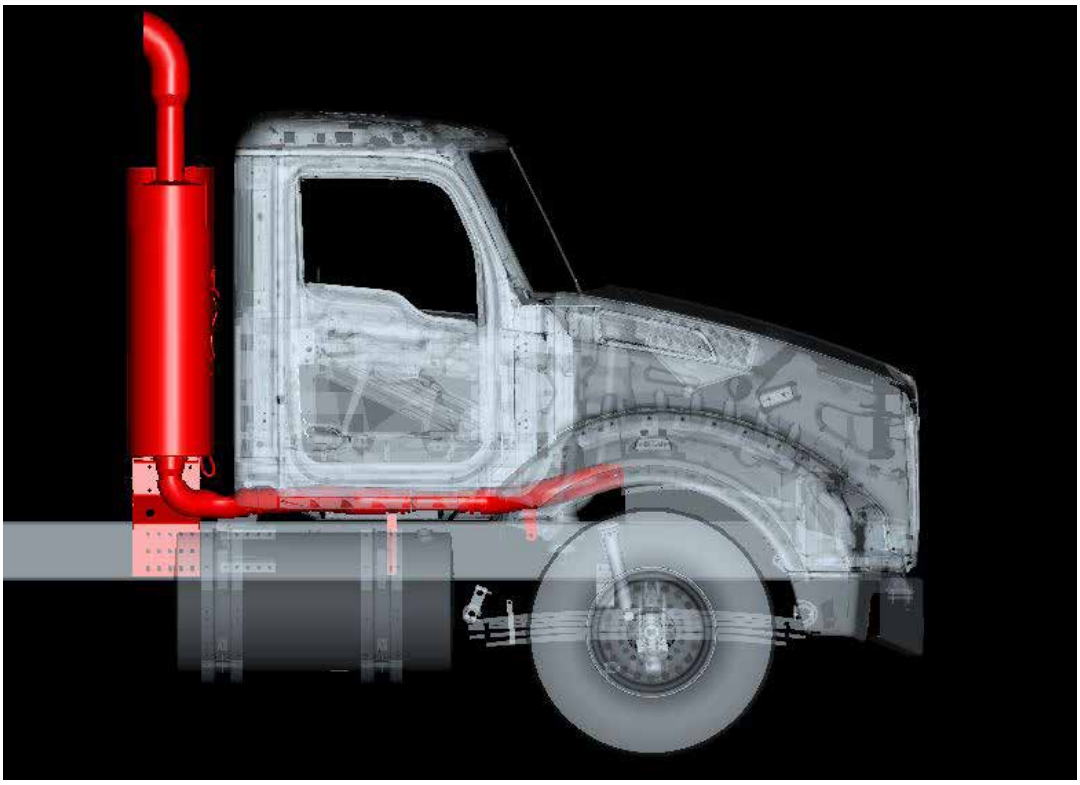


FIGURE 5-27: Right View of Independent Back of Cab DPF/SCR with Back of Cab Tailpipe

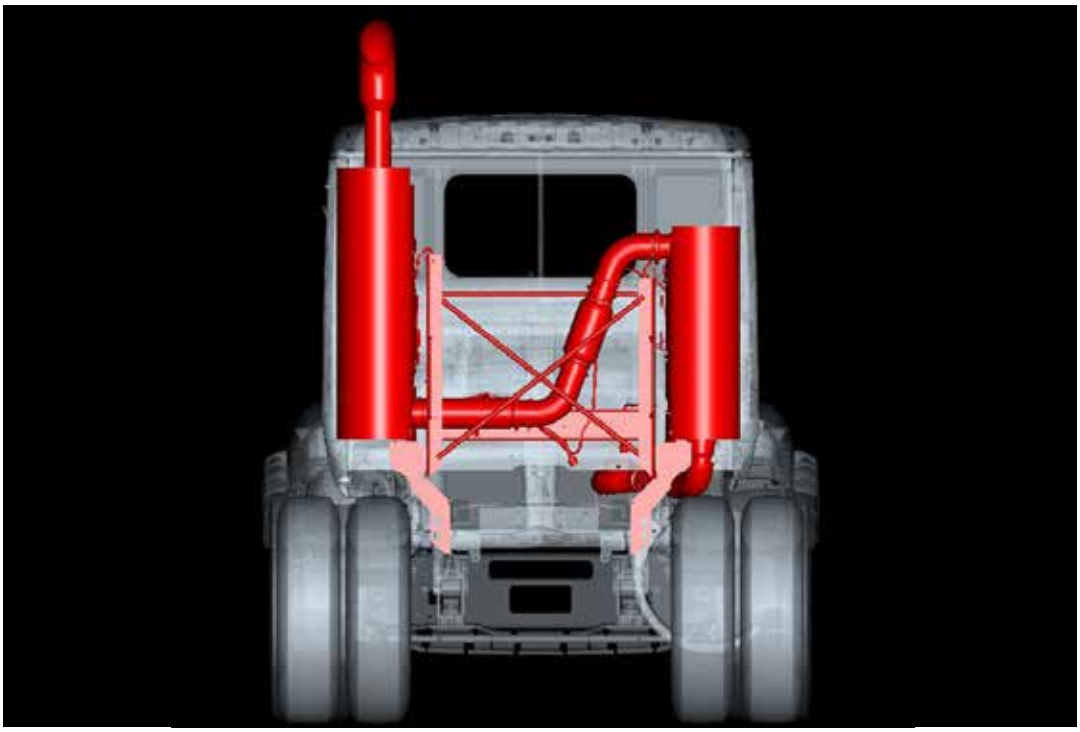


FIGURE 5-28: Back View of Independent Back of Cab DPF/SCR with Back of Cab Tailpipe

https://truckmanualshub.com/

Horizontal Crossover DPF/SCR on DayCab with Ground-Dump Tailpipe

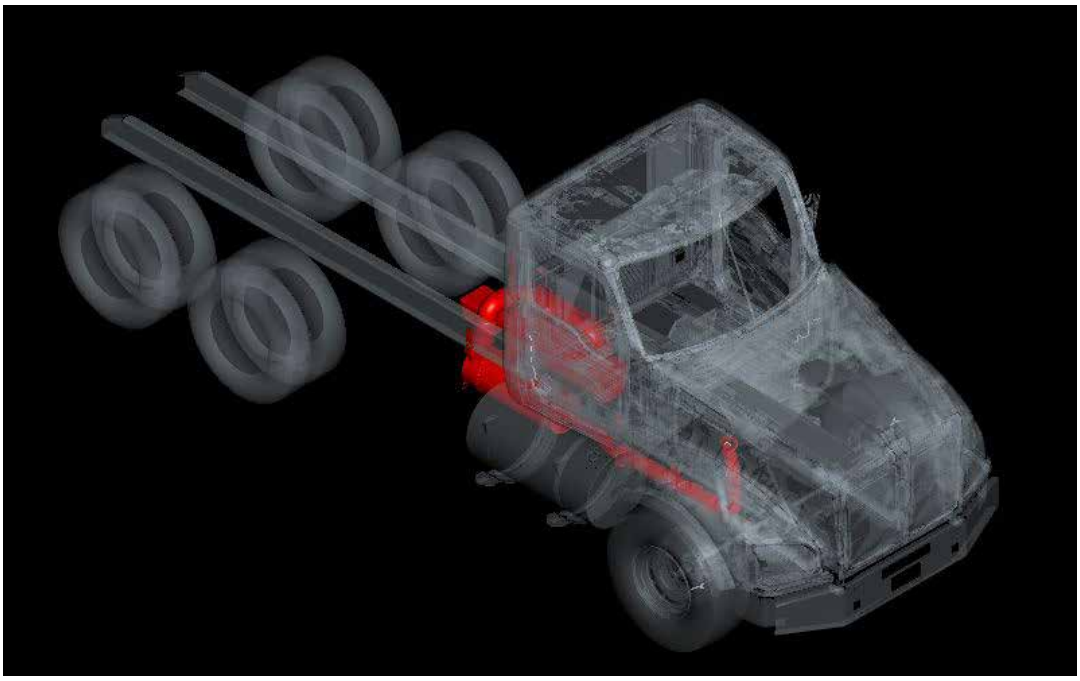


FIGURE 5-29: Isometric View of Horizontal Crossover DPF/SCR with Ground-Dump Tailpipe

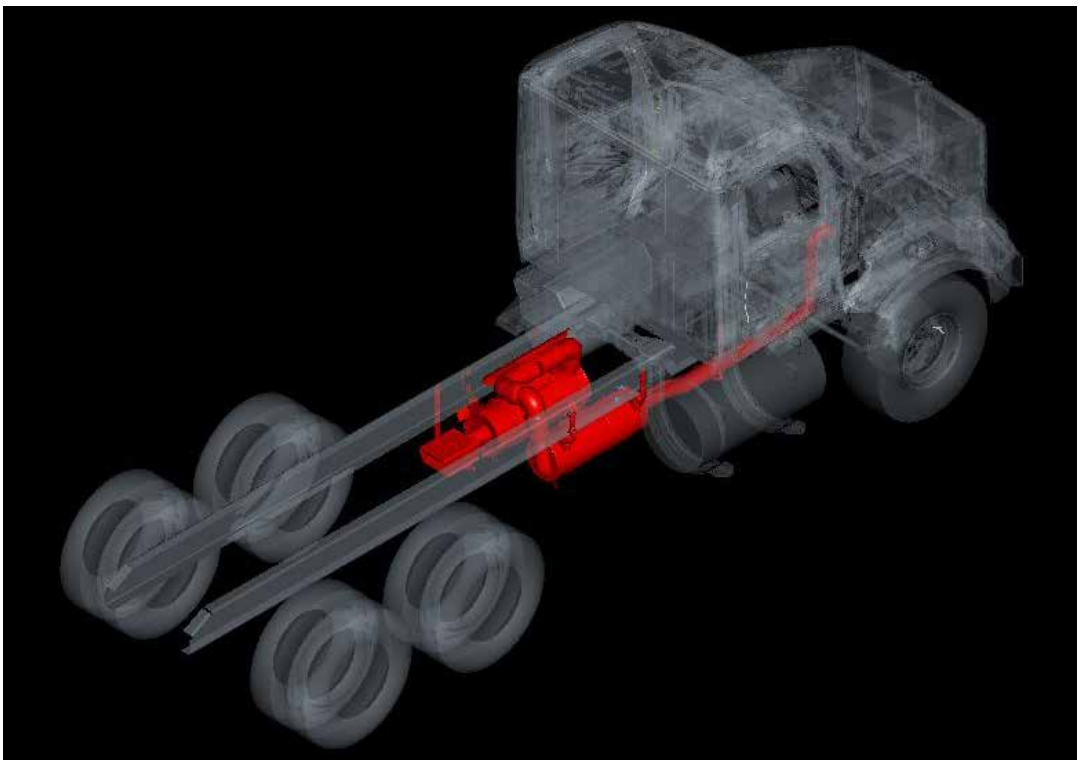


FIGURE 5-30: Isometric View of Horizontal Crossover DPF/SCR with Ground-Dump Tailpipe

https://truckmanualshub.com/

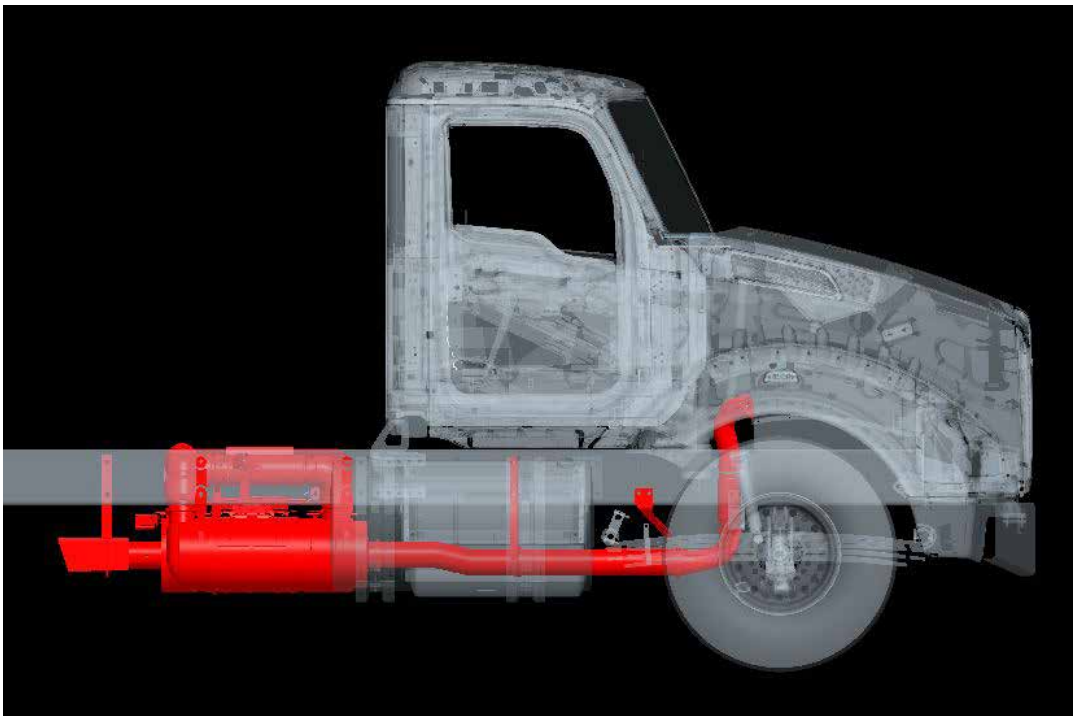


FIGURE 5-31: Right View of Horizontal Crossover DPF/SCR with Ground-Dump Tailpipe

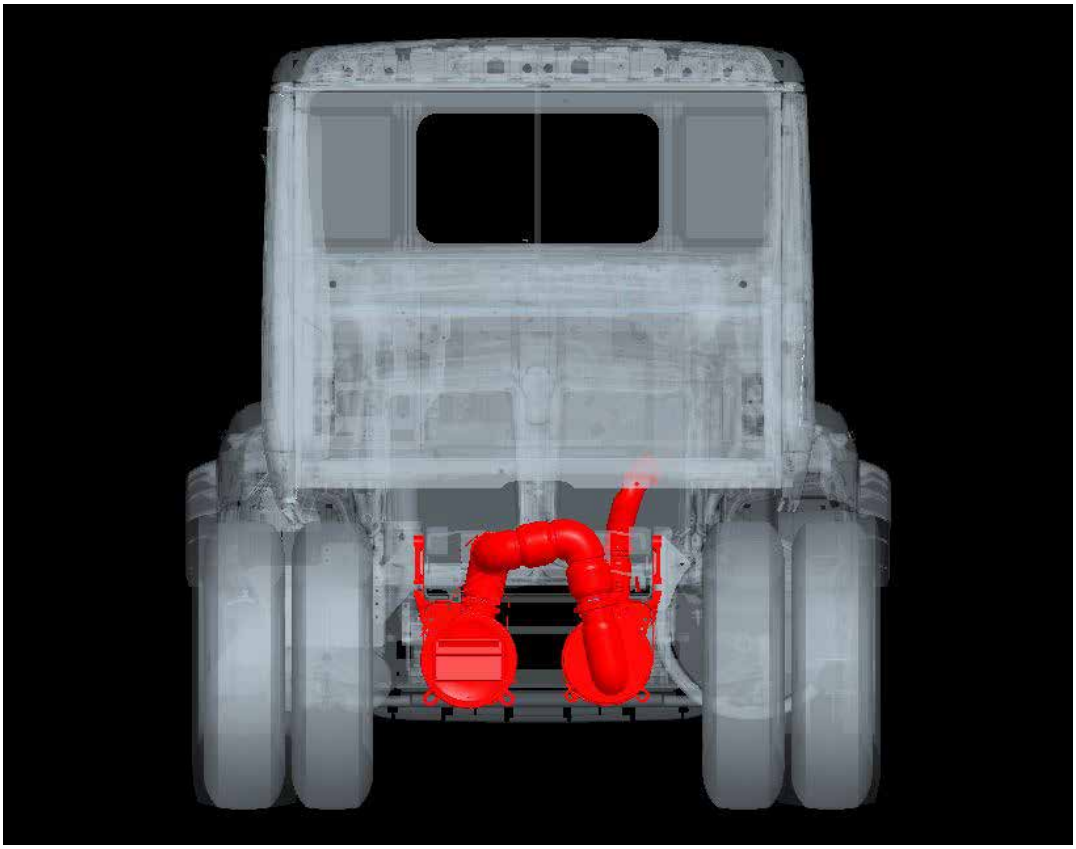


FIGURE 5-32: Back View of Horizontal Crossover DPF/SCR with Ground-Dump Tailpipe

https://truckmanualshub.com/

Right Hand Under DPF/SCR on 40 or 52" Sleeper with Single Side of Cab Tailpipe

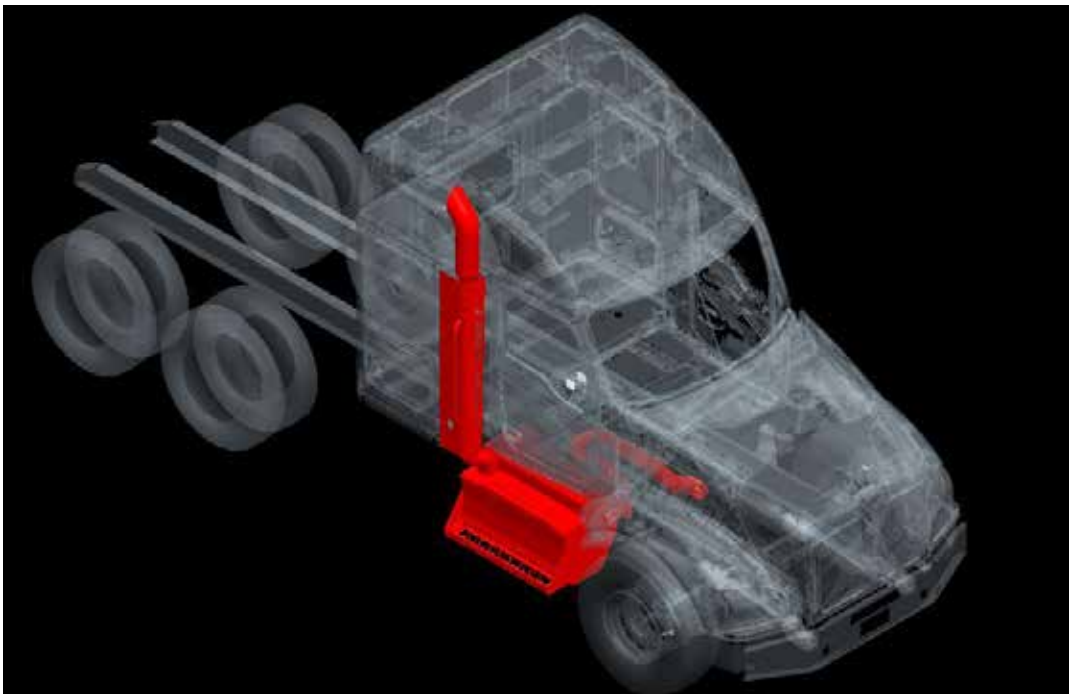


FIGURE 5-33: Isometric View of Right Hand Under DPF/SCR with Single Side of Cab Tailpipe (52" Sleeper)

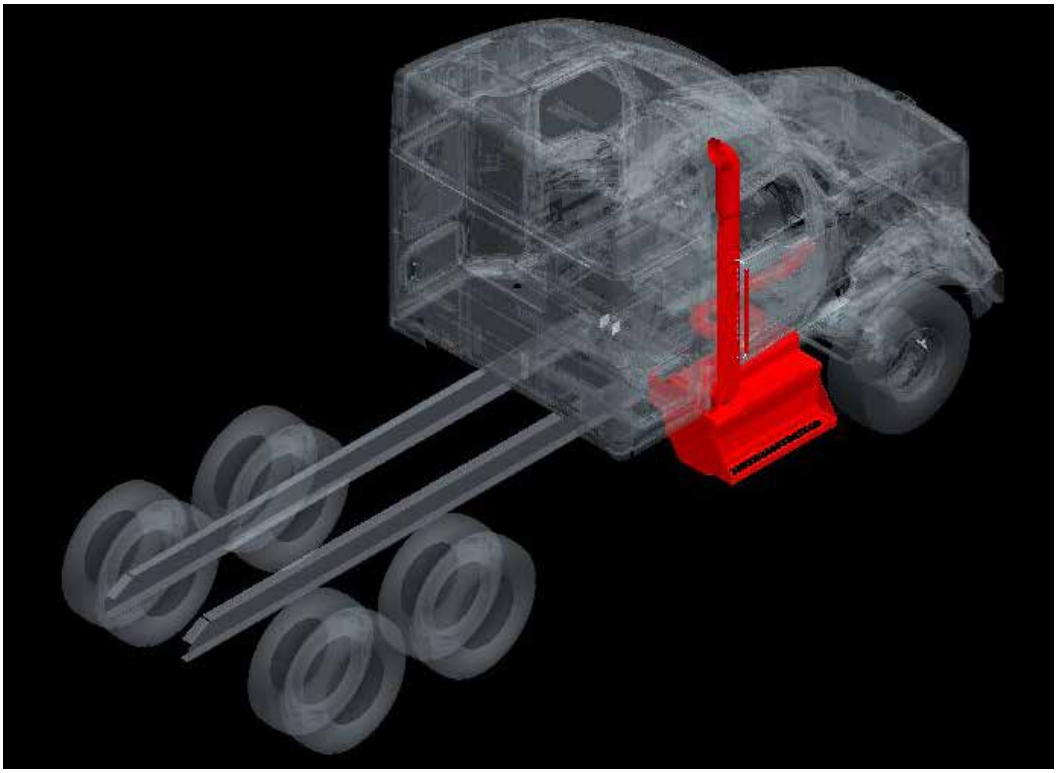


FIGURE 5-34: Isometric View of Right Hand Under DPF/SCR with Single Side of Cab Tailpipe (52" Sleeper)

https://truckmanualshub.com/

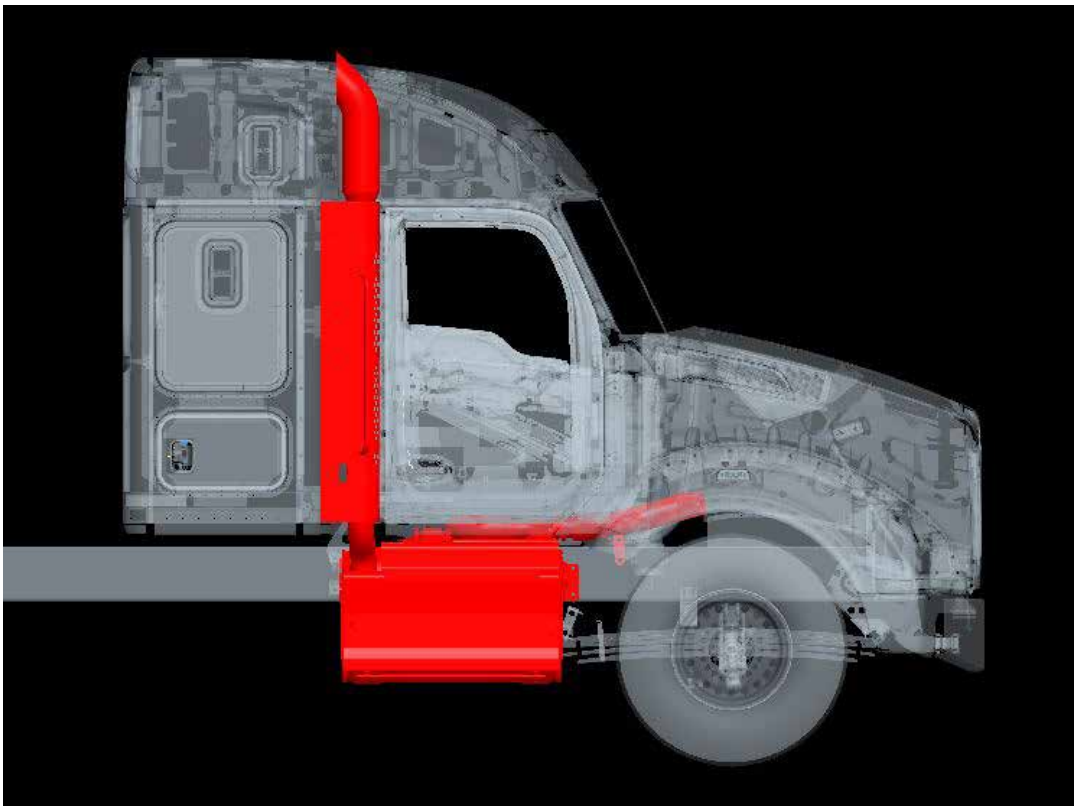


FIGURE 5-35: Right View of Right Hand Under DPF/SCR with Single Side of Cab Tailpipe (52" Sleeper)

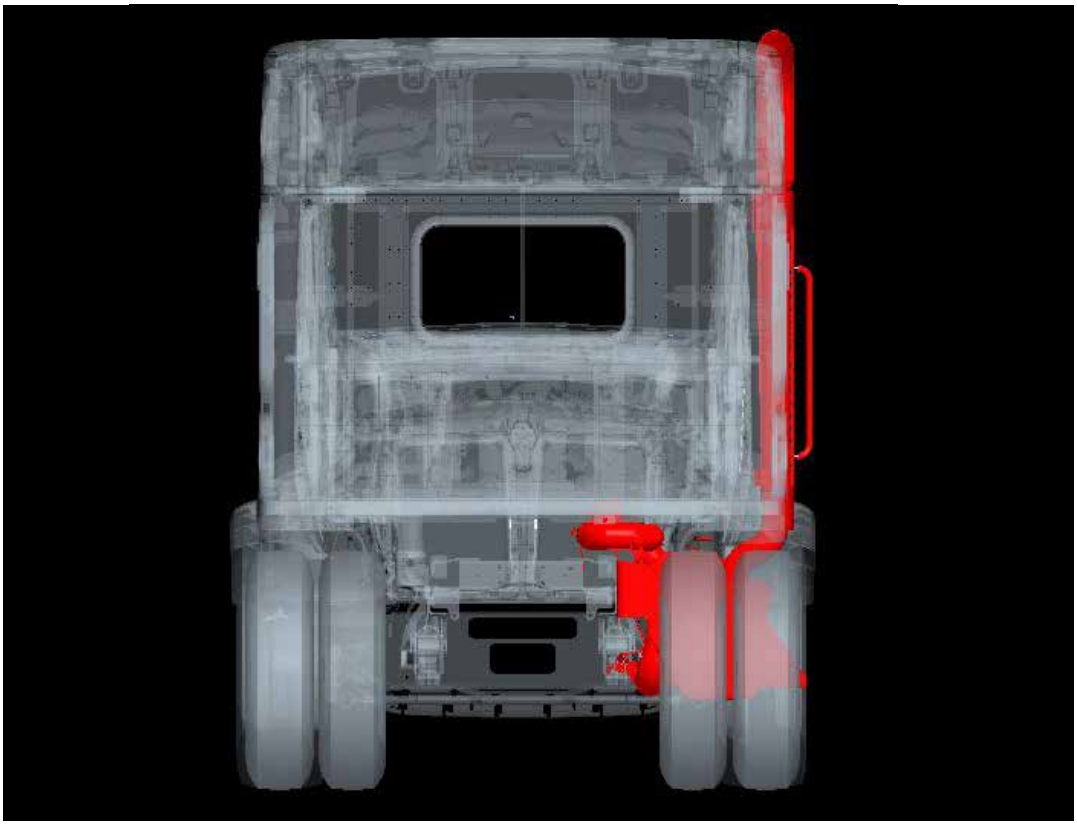


FIGURE 5-36: Rear View of Right Hand Under DPF/SCR with Single Side of Cab Tailpipe (52" Sleeper)

https://truckmanualshub.com/

Right Hand Under DPF/SCR on 40" or 52" Sleeper with Dual Side of Cab Tailpipe

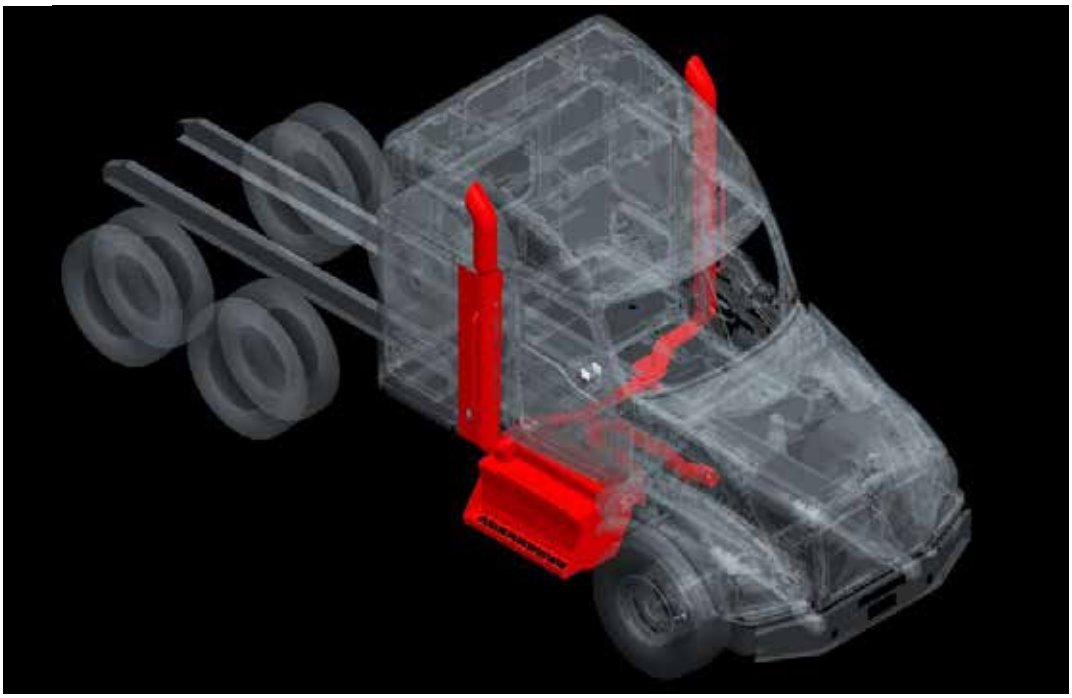


FIGURE 5-37: Isometric View of Right Hand Under DPF/SCR with Dual Side of Cab Tailpipe (52" Sleeper)

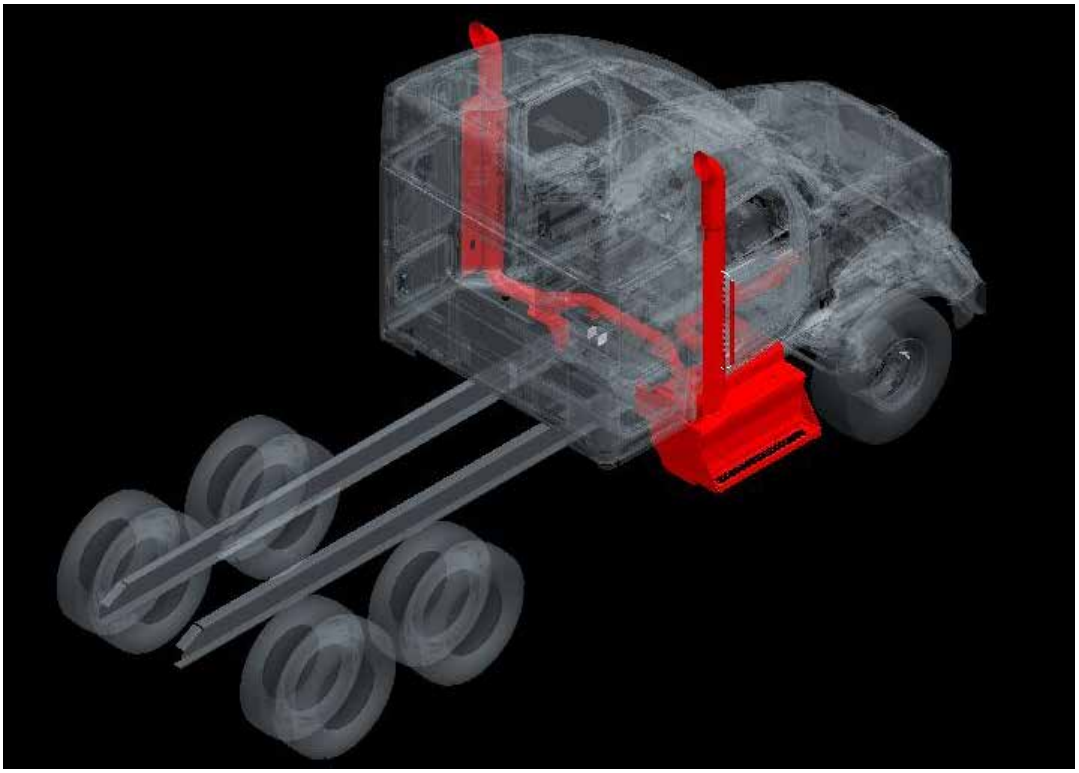


FIGURE 5-38: Isometric View of Right Hand Under DPF/SCR with Dual Side of Cab Tailpipe (52" Sleeper)

https://truckmanualshub.com/

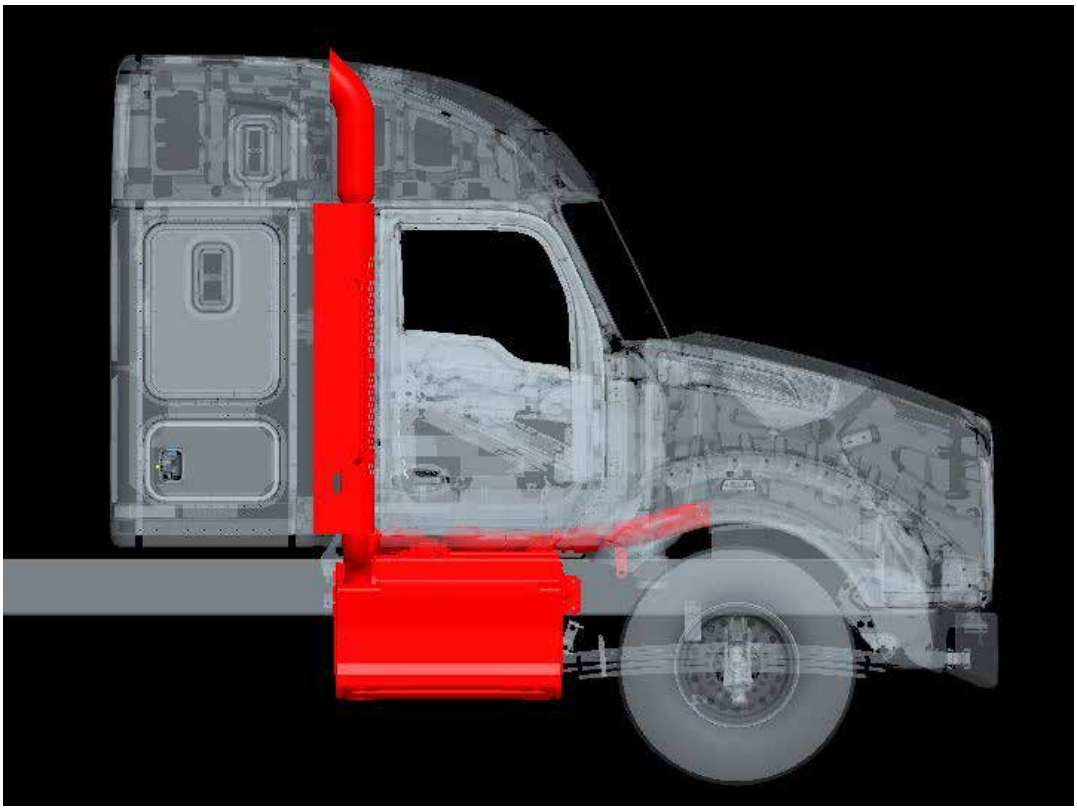


FIGURE 5-39: Right View of Right Hand Under DPF/SCR with Dual Side of Cab Tailpipe (52" Sleeper)

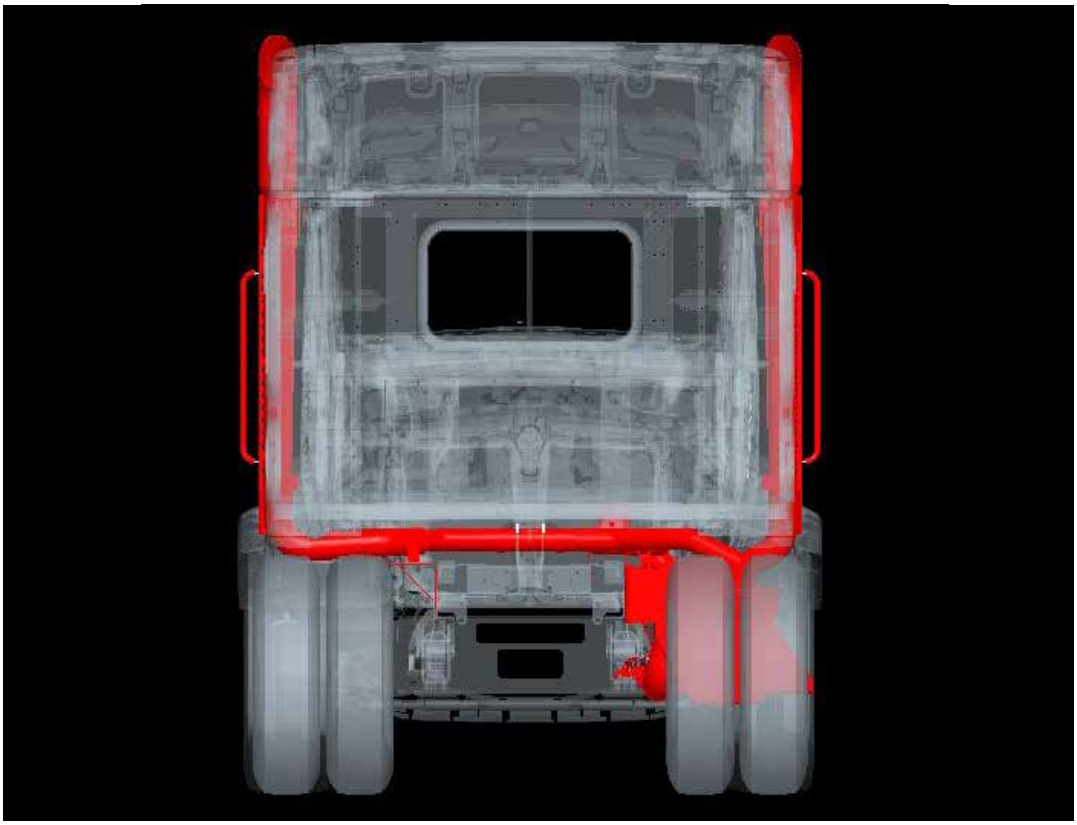


FIGURE 5-40: Rear View of Right Hand Under DPF/SCR with Dual Side of Cab Tailpipe (52" Sleeper)

https://truckmanualshub.com/

Right Hand Under DPF/SCR on 40" or 52" Sleeper with Single Back of Sleeper Tailpipe

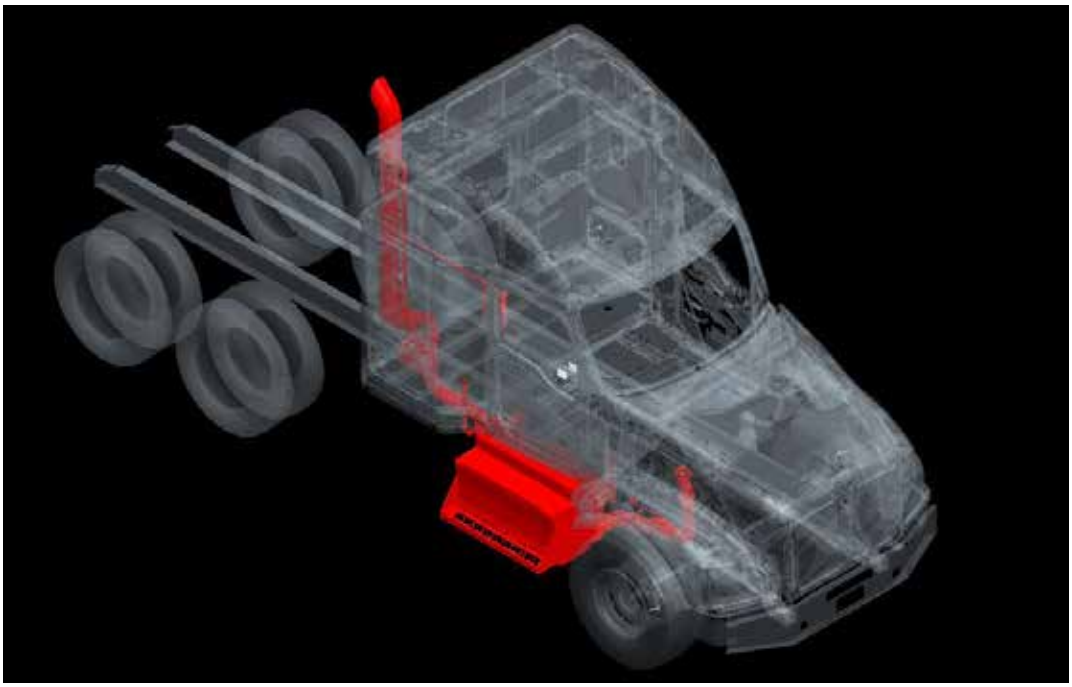


FIGURE 5-41: Isometric View of Right Hand Under DPF/SCR with Single Back of Sleeper Tailpipe (52" Sleeper)

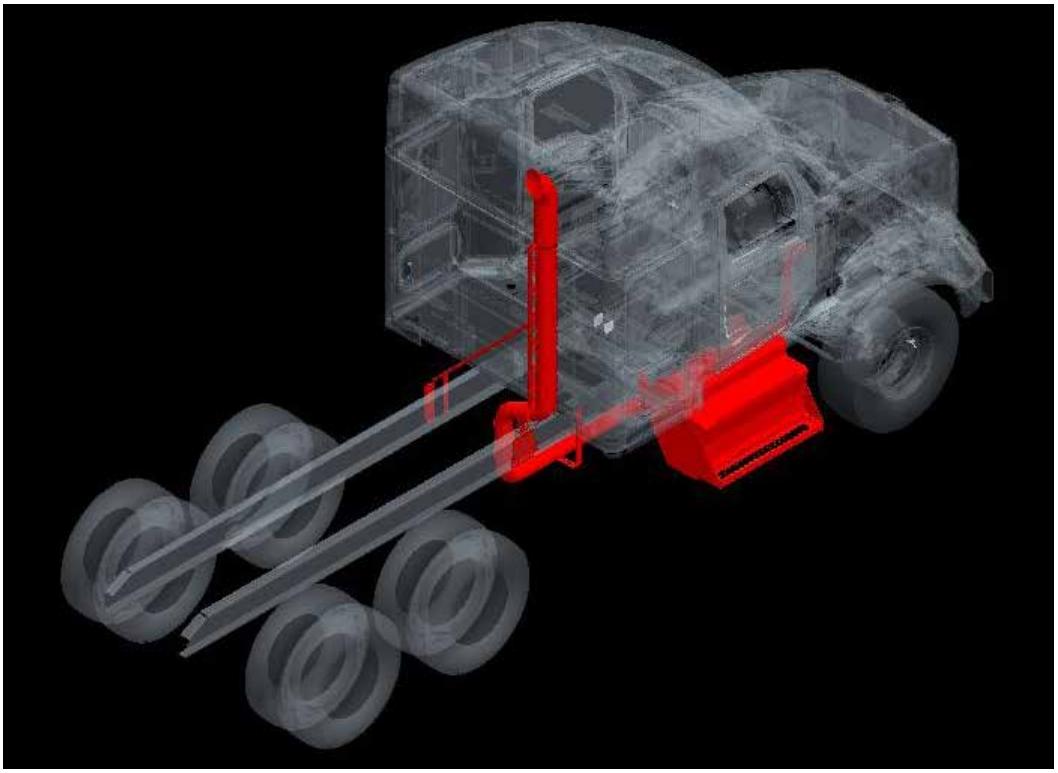


FIGURE 5-42: Isometric View of Right Hand Under DPF/SCR with Single Back of Sleeper Tailpipe (52" Sleeper)

https://truckmanualshub.com/

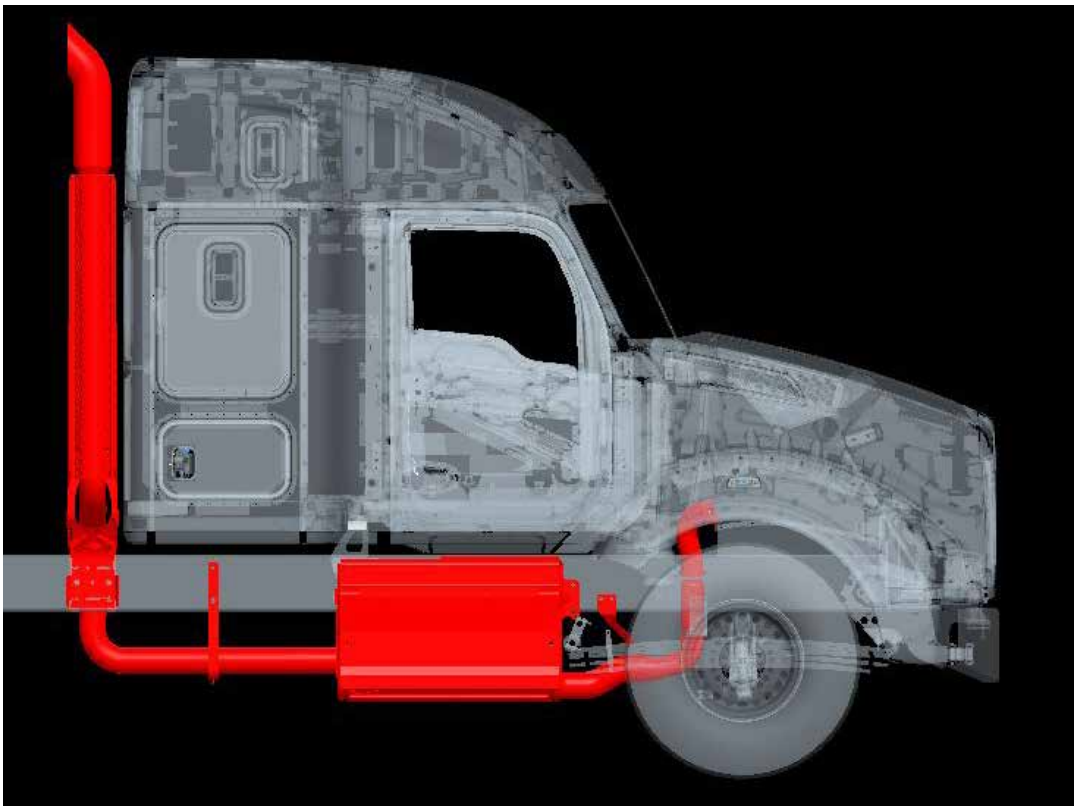


FIGURE 5-43: Right View of Right Hand Under DPF/SCR with Single Back of Sleeper Tailpipe (52" Sleeper)

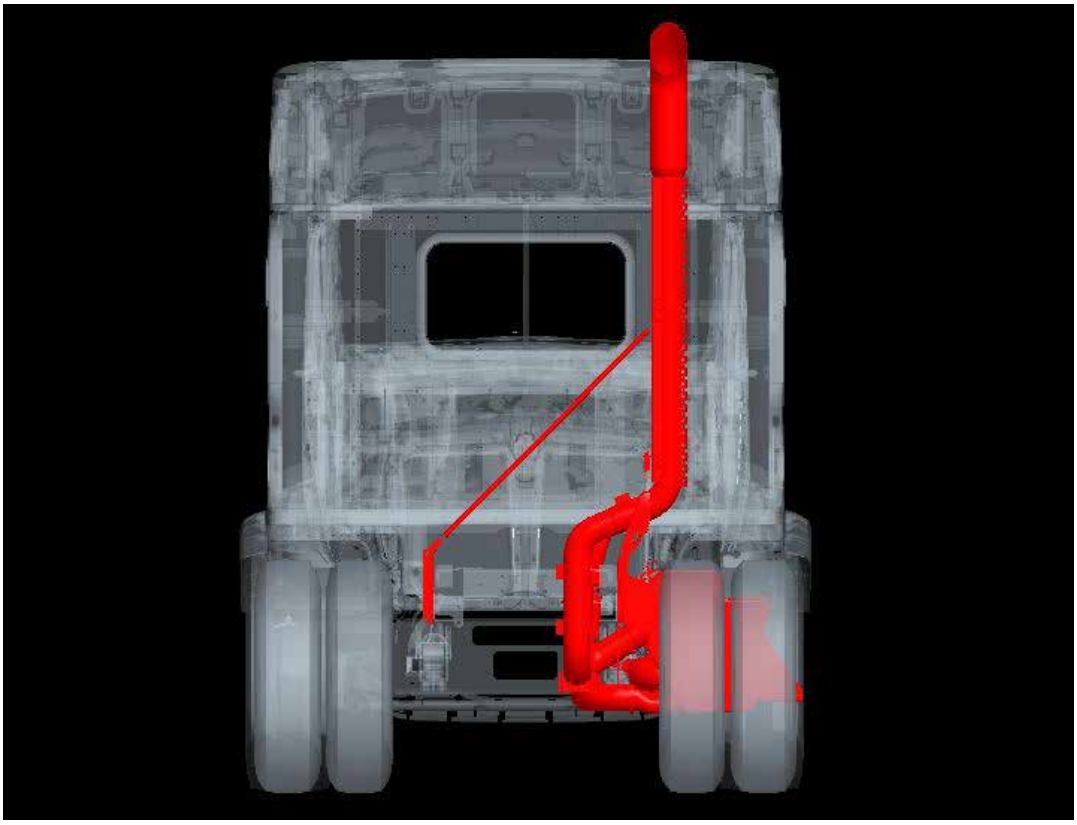


FIGURE 5-44: Rear View of Right Hand Under DPF/SCR with Single Back of Sleeper Tailpipe (52" Sleeper)

https://truckmanualshub.com/

Right Hand Under DPF/SCR on 40" or 52" Sleeper with Dual Back of Sleeper Tailpipes

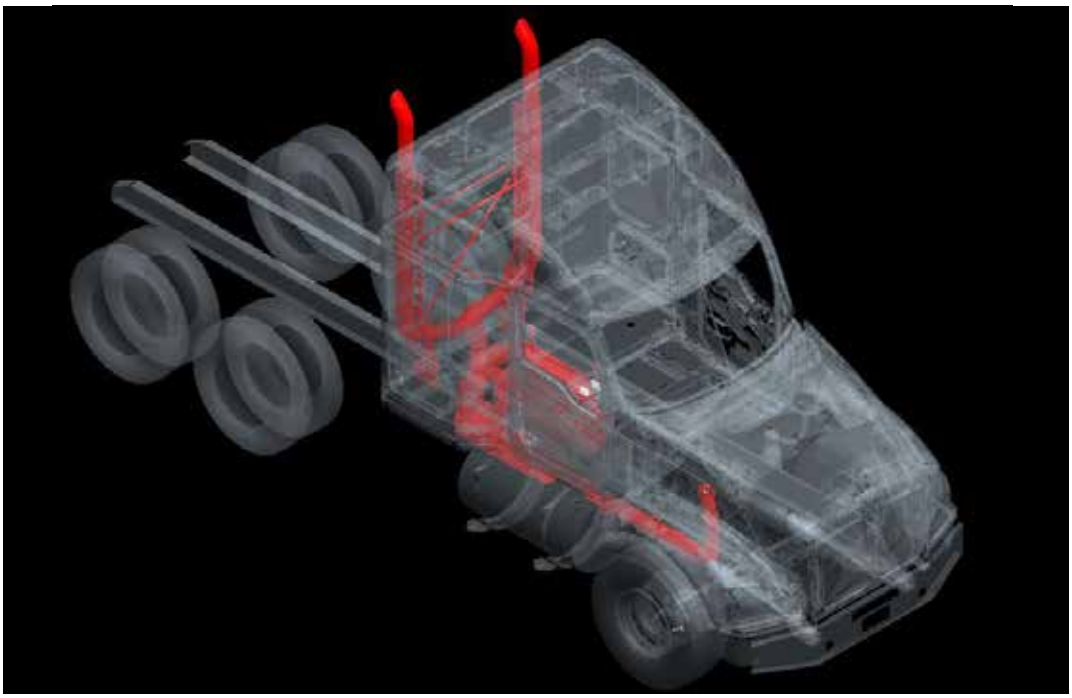


FIGURE 5-45: Isometric View of Right Hand Under DPF/SCR with Dual Back of Sleeper Tailpipes (52" Sleeper)

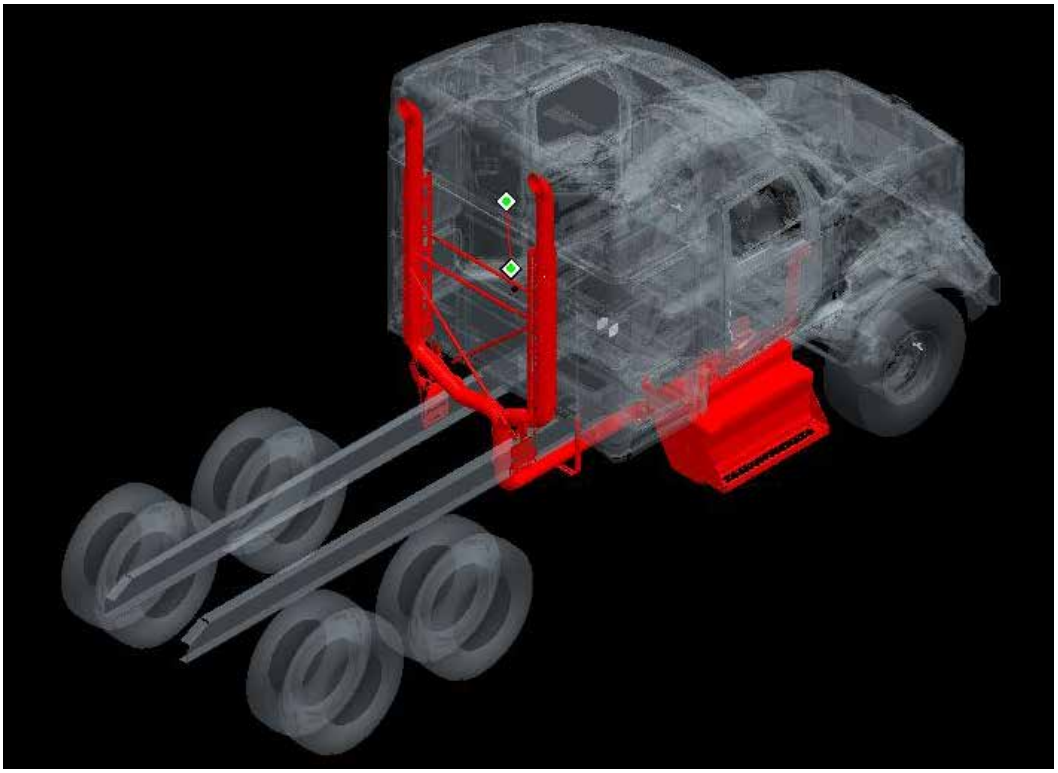


FIGURE 5-46: Isometric View of Right Hand Under DPF/SCR with Dual Back of Sleeper Tailpipes (52" Sleeper)

https://truckmanualshub.com/

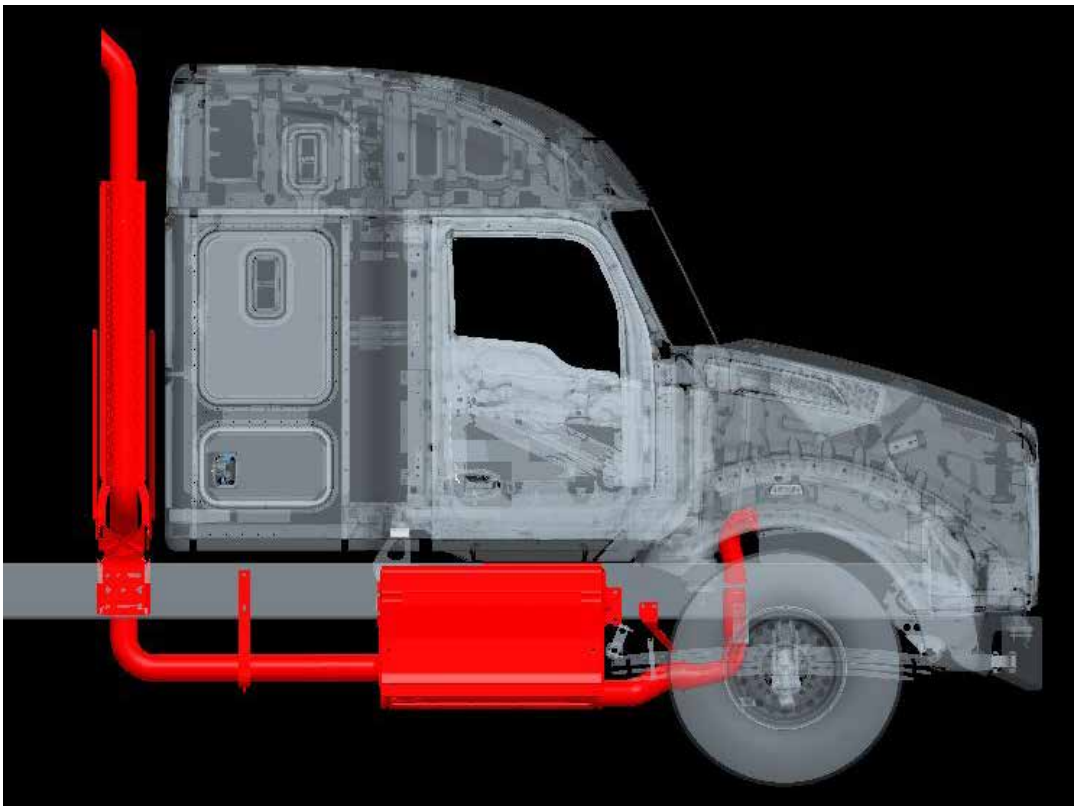


FIGURE 5-47: Right View of Right Hand Under DPF/SCR with Dual Back of Sleeper Tailpipes (52" Sleeper)

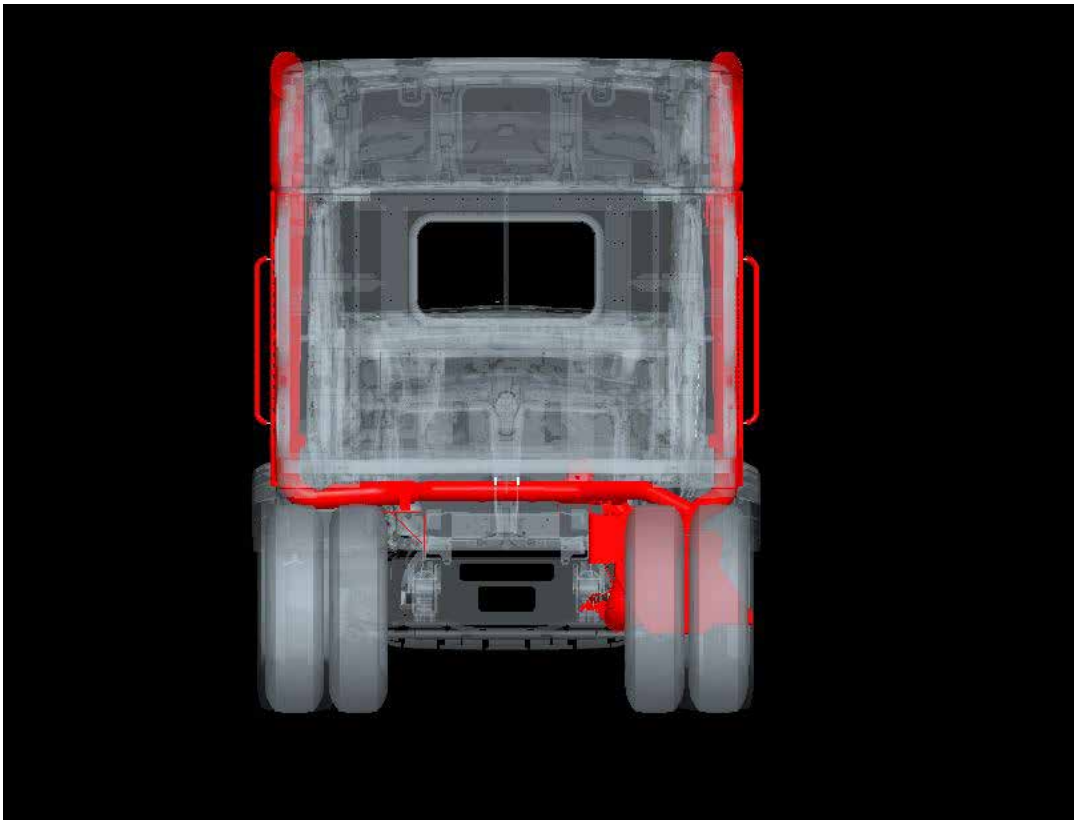


FIGURE 5-48: Rear View of Right Hand Under DPF/SCR with Dual Back of Sleeper Tailpipes (52" Sleeper)

https://truckmanualshub.com/

Horizontal Crossover DPF/SCR on 40" or 52" Sleeper with Single Back of Sleeper Tailpipe

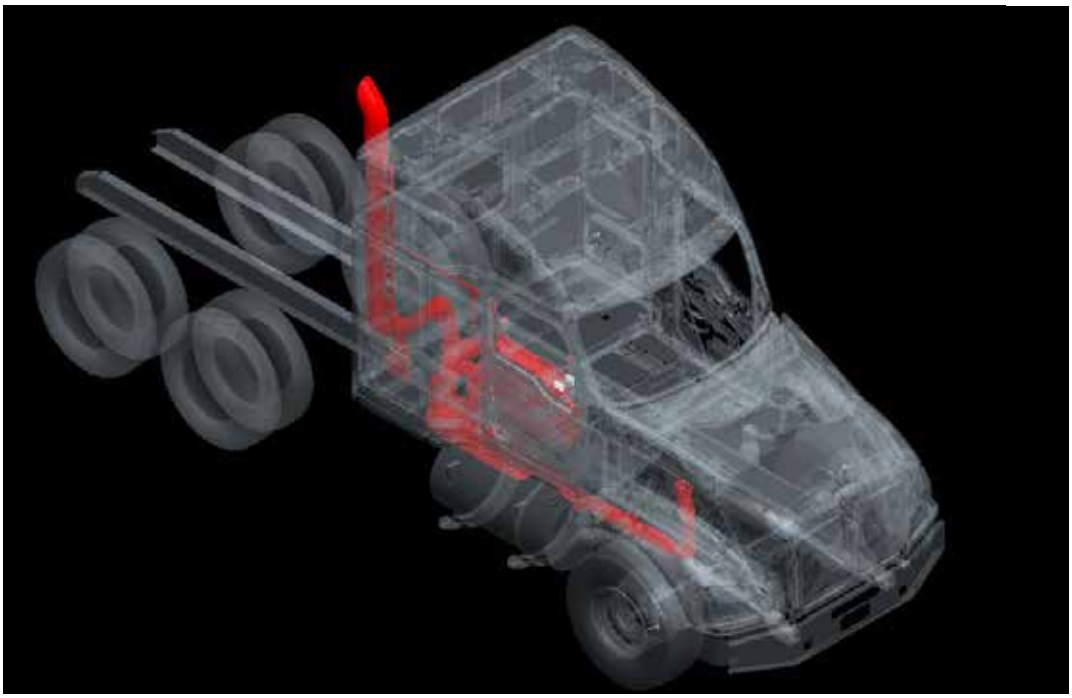


FIGURE 5-49: Isometric View of Horizontal Crossover DPF/SCR with Single Back of Sleeper Tailpipe (52" Sleeper)

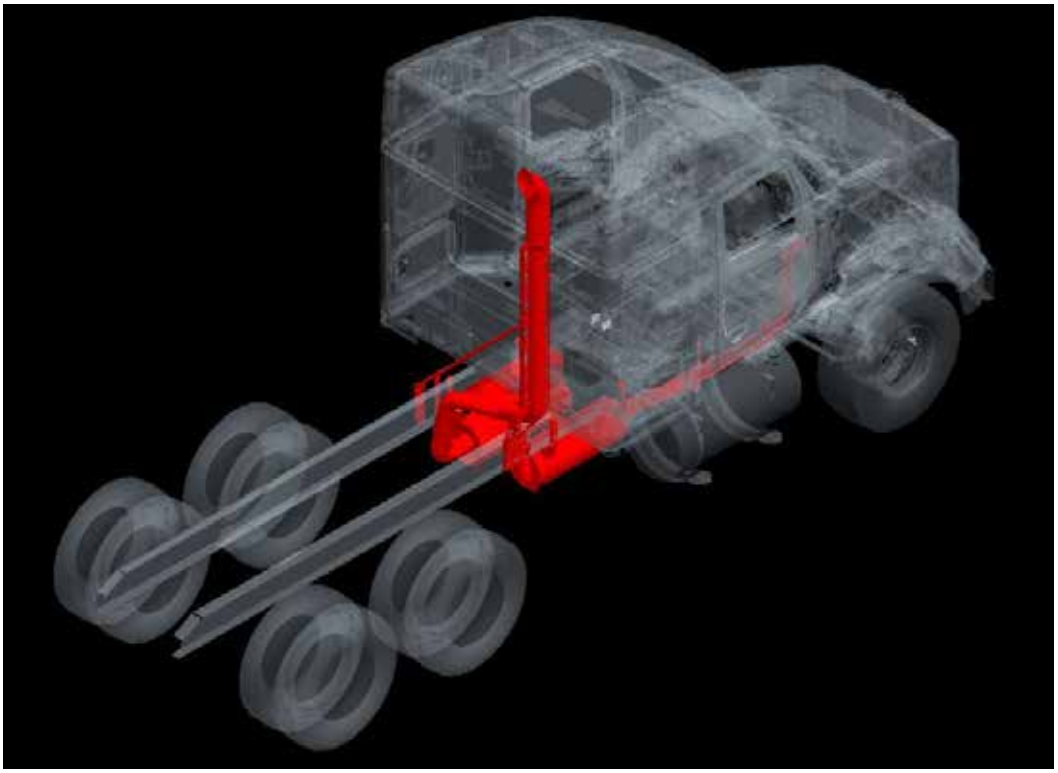


FIGURE 5-50: Isometric View of Horizontal Crossover DPF/SCR with Single Back of Sleeper Tailpipe (52" Sleeper)

https://truckmanualshub.com/



FIGURE 5-51: Right View of Horizontal Crossover DPF/SCR with Single Back of Sleeper Tailpipe (52" Sleeper)

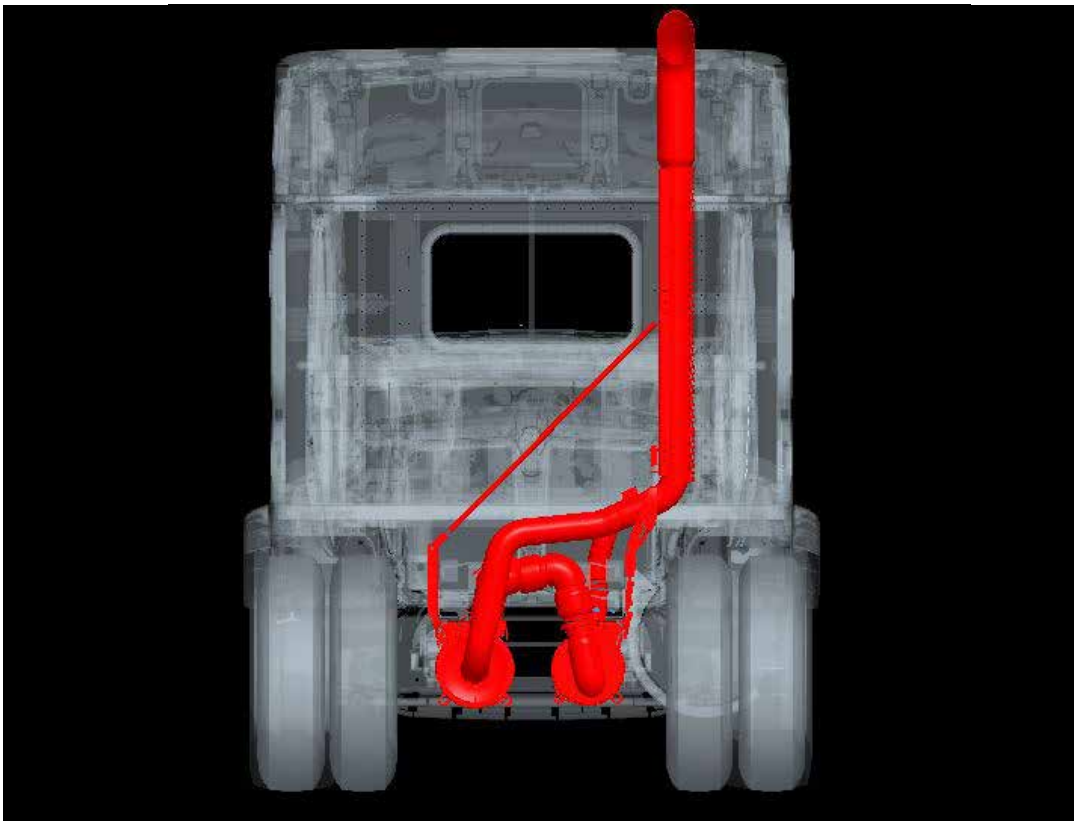


FIGURE 5-52: Rear View of Horizontal Crossover DPF/SCR with Single Back of Sleeper Tailpipe (52" Sleeper)

https://truckmanualshub.com/

Horizontal Crossover DPF/SCR on 40" or 52" Sleeper with Dual Back of Sleeper Tailpipes

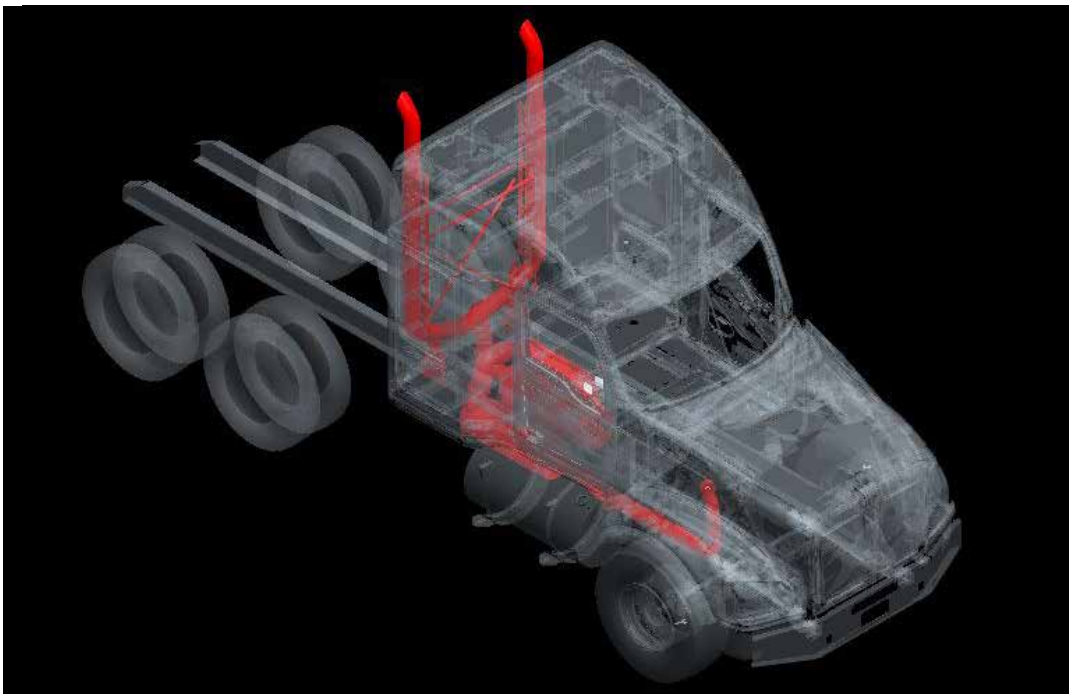


FIGURE 5-53: Isometric View of Horizontal Crossover DPF/SCR with Dual Back of Sleeper Tailpipes (52" Sleeper)

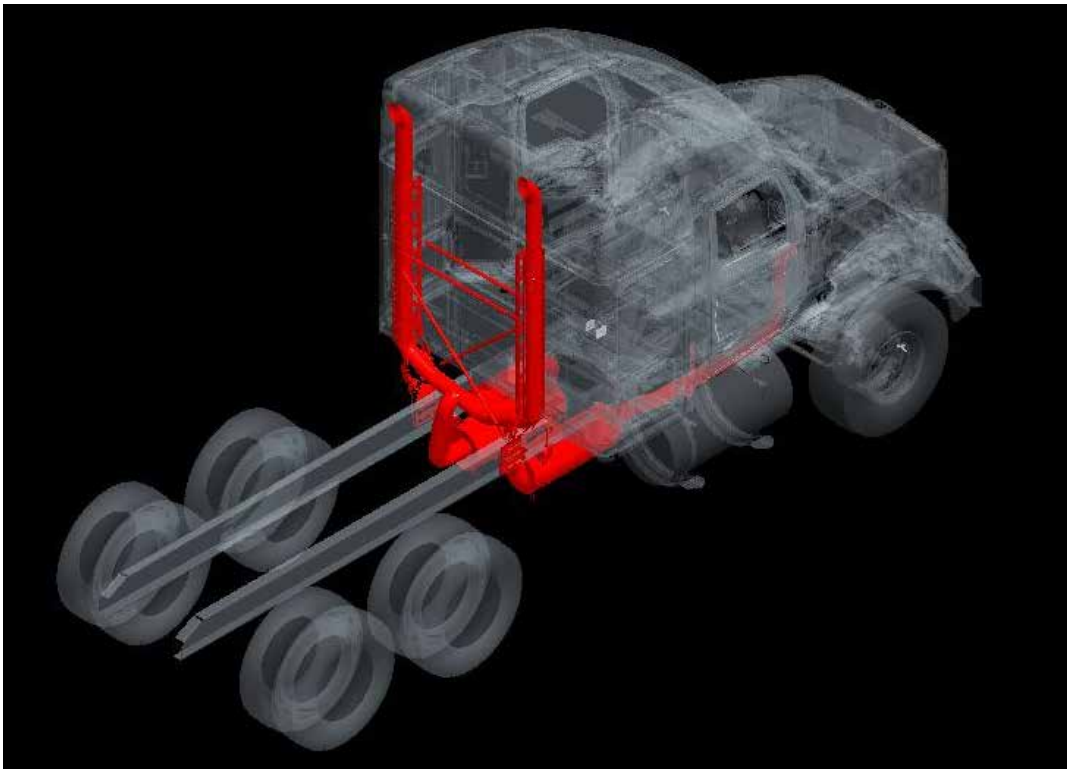


FIGURE 5-54: Isometric View of Horizontal Crossover DPF/SCR with Dual Back of Sleeper Tailpipes (52" Sleeper)

https://truckmanualshub.com/

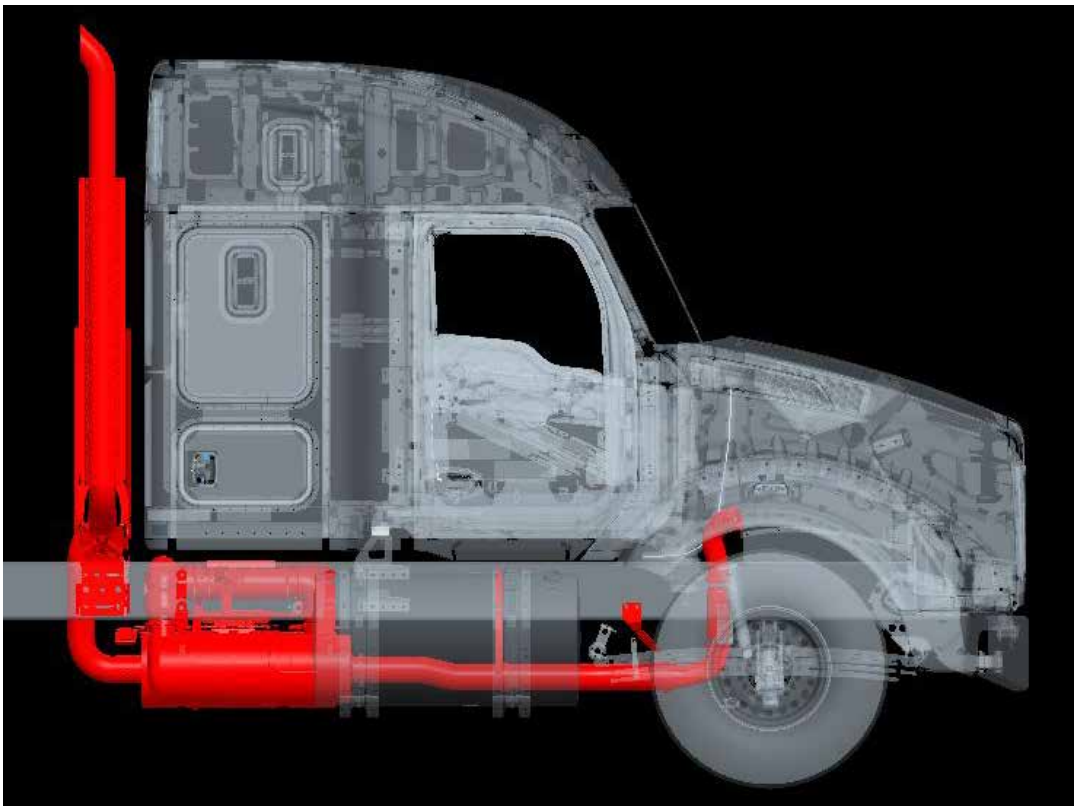


FIGURE 5-55: Right View of Horizontal Crossover DPF/SCR with Dual Back of Sleeper Tailpipes (52" Sleeper)

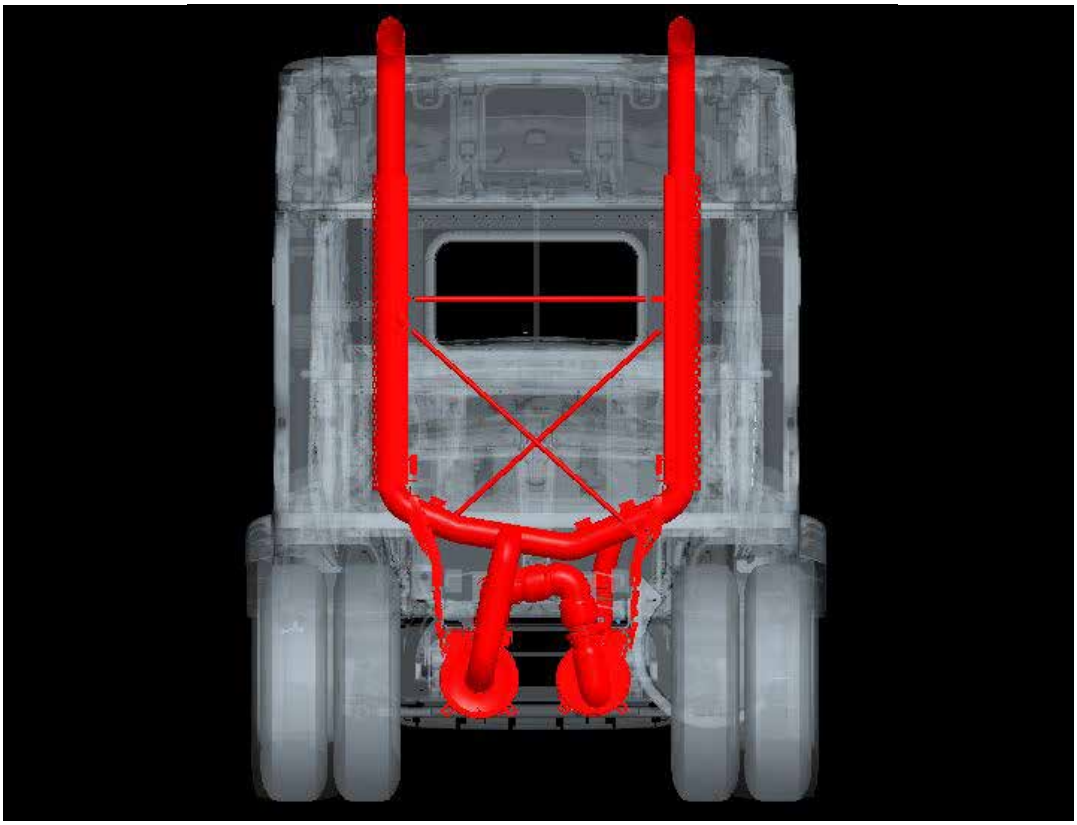


FIGURE 5-56: Rear View of Horizontal Crossover DPF/SCR with Dual Back of Sleeper Tailpipes (52" Sleeper)

https://truckmanualshub.com/

EXHAUST INFORMATION

This section includes information on how to calculate tailpipe heights.

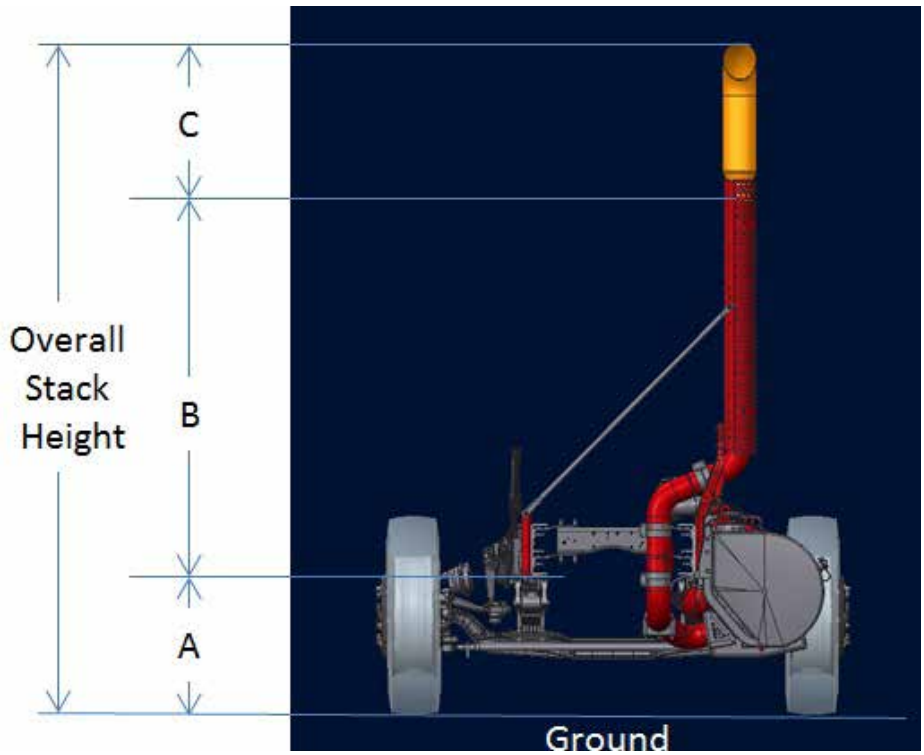


FIGURE 5-57.

	Dimension B		Min. Tailpipe Length Dimension "A" (DayCab)	Min. Tailpipe Length Dimension "A" (40" Sleeper)	Min. Tailpipe Length Dimension "A" (52" Sleeper)
Diesel	Tailpipes Side of Cab RHUC DPF/SCR)	69.2"	24"	N/A	N/A
	Tailpipes Side of Sleeper (RHUC DPF/SCR)	69.2"	N/A	36"	42"
	Tailpipes Back of Cab (RHUC DPF/SCR)	70.3"	24"	N/A	N/A
	Tailpipes Back of Sleeper (RHUC DPF/SCR or Horizontal Crossover DPF/SCR)	86"	N/A	24"	36"
	Tailpipes Back of Cab (Independent DPF/SCR Back of Cab)	77.5"	24"	24"	N/A
Natural Gas	Tailpipes Side of Cab (RHUC Catalyst)	69.2"	24"	36"	N/A
	Tailpipe Back of Cab (Independent Catalyst Back of Cab)	74"	24"	N/A	N/A

TABLE 5-2.

https://truckmanualshub.com/

Utilize Prospector frame heights (or calculated knowing tire size and suspension height) to accurately calculate Dimension “A” from ground to bottom of frame rail.

When utilizing Prospector, remember that heights shown are calculated to top of frame rail, and frame section height needs to be subtracted from Prospector height to get overall frame height from ground to bottom of frame flange Dimension A).

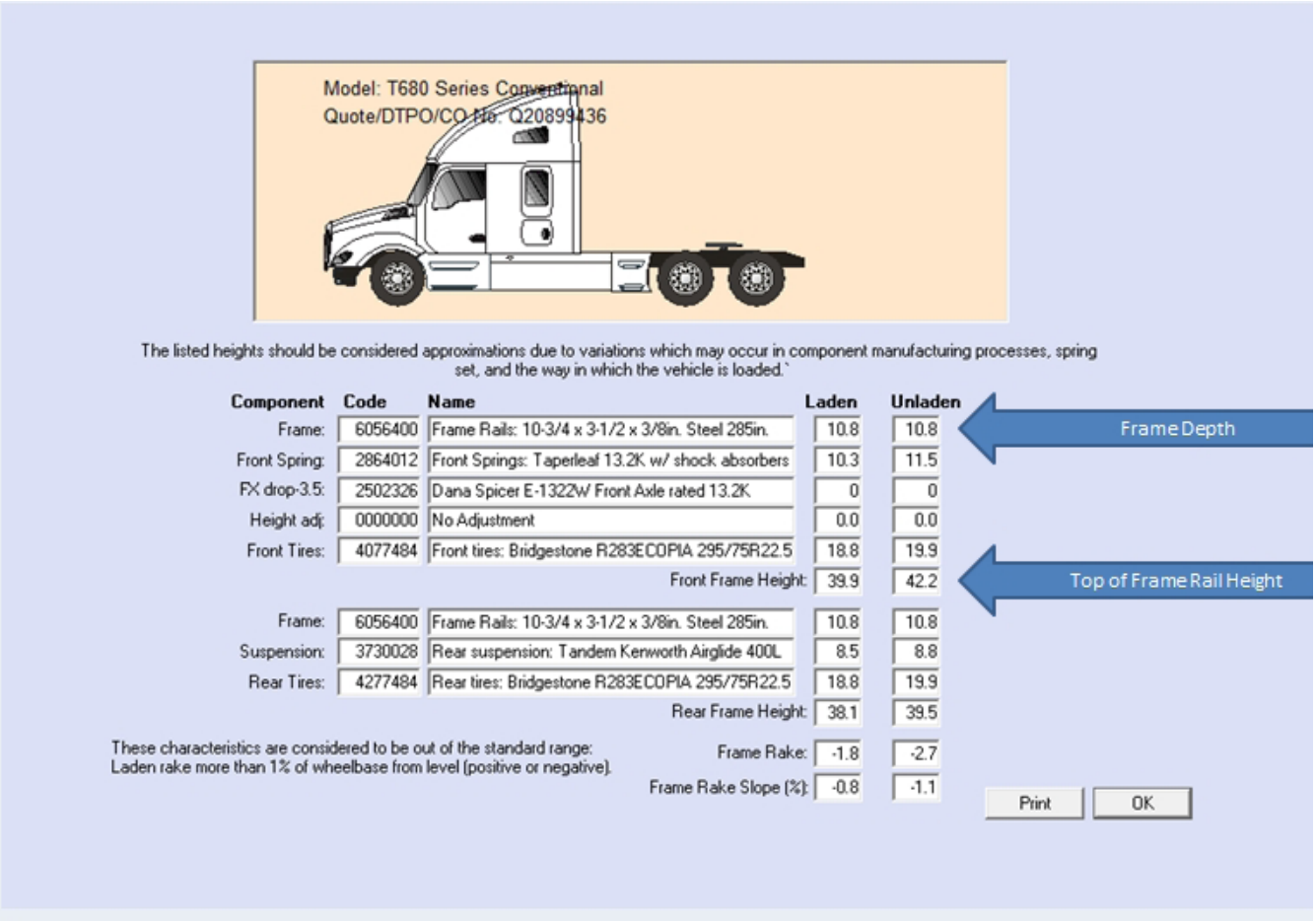


FIGURE 5-58. Dimension A = Top of Rail Frame Height from Prospector – Frame Depth.

For approximate unladen stack height (12,000 pound springs) use the following frame heights:

Tire Size	Top of Rail
11R24.5	43.5"
11R22.5	42.5"
285/75R24.5	42"
295/75R22.5	41.5"

*Use Prospector frame heights for more accurate results.

Sample: Tailpipe height 13’6"	=	Desired overall stack height	=	162.0"
	(–)	Prospector frame height	(–)	43.5"
	(+)	Frame rail depth	(+)	10.6"
	(–)	Dimension ‘A’ from chart	(–)	68.6"
	=	Tail pipe length	=	60.5"

https://truckmanualshub.com/

This page intentionally left blank.

https://truckmanualshub.com/

FRAME LAYOUTS

The dimensions in the frame layout section are intended to aid in layout of the chassis, and to help determine the best possible combination of fuel tanks, battery boxes, the diesel particulate filter (DPF), SCR canister, and Diesel Exhaust Fluid (DEF) tank. For your application, the layouts focus on the under cab area, with appropriate dimensional information included for pertinent back of cab components. Not all optional equipment is included in this section. Additional components may be placed on the rail behind components shown. The Back of Cab components are shown primarily for reference. For more specific requirements please work with your local Kenworth Dealer. Please read the instructions carefully.

The following dimensions are consistent across the entire section to aid in the comparison of one layout option versus another.

TABLE 6-1.

B = Battery box
D = DEF tank
E = Exhaust
F1 = Fuel Tank RHS
F2 = Fuel Tank LHS
T = Tool Box

The layouts are organized by type, specifically the arrangement of under cab components. The visual index that follows will give you a quick overview of the layouts that are included. Using the index locate the layout that you are interested in, then turn to the specified pages. The charts that follow are then model specific. It is important that the correct chart is used for accurate dimensional information.

Visual Index

Symbol	Description
	RHUC DPF/SCR
	Horizontal DPF/SCR
	Parallel Battery Box, Standard Length
	In Cab Battery Box

Symbol	Description
	Cantilever Battery Box
	Tool Box
	DEF Tank
	Fuel Tank

https://truckmanualshub.com/

COMMON OPTIONAL COMPONENTS

The frame layouts that follow contain the minimum frame requirements to be operational (fuel tanks, battery box, and after-treatment components). All layouts are shown with standard length battery boxes unless otherwise noted. Dimensions for these components have been provided below to help complete the frame layout for chassis with more fuel tanks, additional tool boxes, etc.

TABLE 6-2. Fuel Tank Overall Length (in)

Fuel Tank Overall Length (in)			
	Fuel Tank Diameter		
Gallons	**22”**	**24.5”**	**28.5”**
45	N/A	23.0	N/A
56	35.6	N/A	N/A
60	38.0	30.6	N/A
75	47.3	38.5	28.7
90	N/A	45.5	34.3
100	62.2	50.0	N/A
105	N/A	N/A	38.8
110	N/A	55.0	N/A
120	74.3	60.6	45.8
135	N/A	67.2	50.9
150	N/A	74.5	56.2
177	N/A	N/A	66.1

TABLE 6-3. Battery Box Centerframe Lengths (in)

Battery Box Centerframe Lengths (in)		
	T680	**T880**
Parallel Short	34.8	34.8
Parallel Extended	42.0	42.0
Parallel BOC	34.8	34.8
Cantilever (Standard)	17.8	17.8
Cantilever (Vocational)	15.2	15.2

https://truckmanualshub.com/

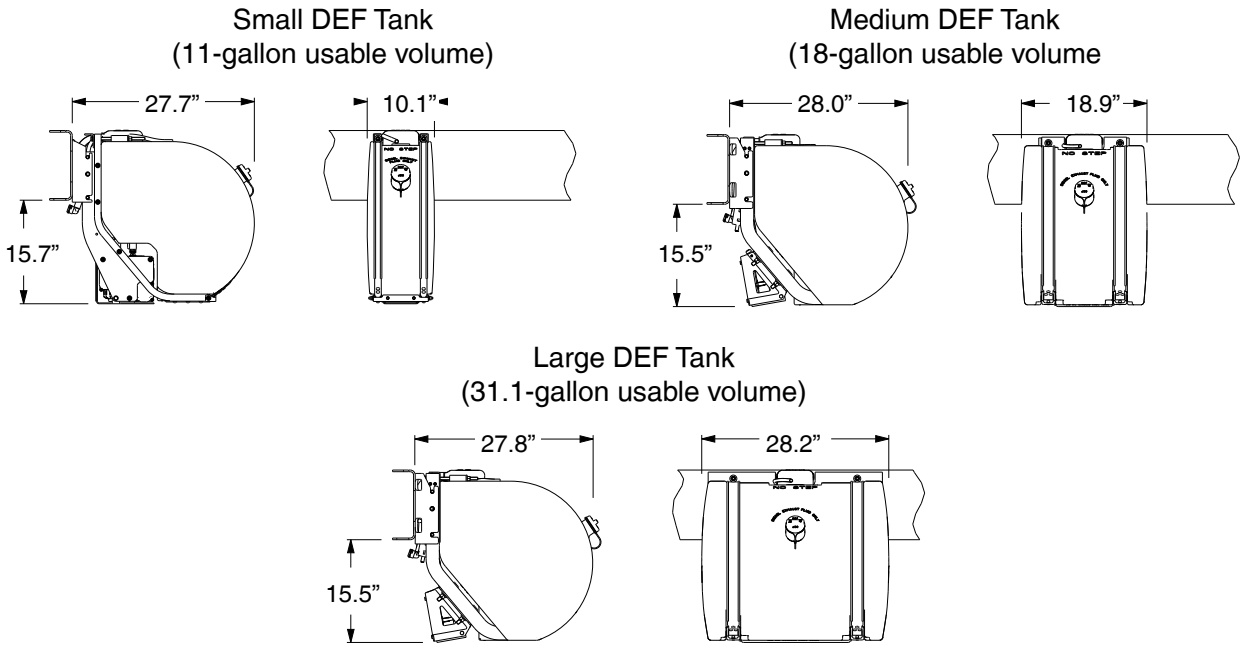


FIGURE 6-1. DEF Tank Dimensions.

Acronyms Index

Throughout the Frame Layout section you will see these acronyms. They are defined here to help you decode the layouts.

BOC	Back Of Cab
BOS	Back Of Sleeper
CBOC	Clear Back Of Cab
DEF	Diesel Exhaust Fluid
DSOAC	Dual Side Of AeroCab

DSOC	Dual Side Of Cab
LHUC	Left Hand Under Cab
RHUC	Right Hand Under Cab
SOAC	Side Of AeroCab
SOC	Side Of Cab

https://truckmanualshub.com/

FRAME LAYOUT INDEX

Day Cab Chassis Layout Options



D1 is used with RHUC DPF/SCR, LHUC fuel tank, RH BOC DEF tank, and LH BOC cantilever battery box. Charts located on pages 6-8 through 6-9.



D2 is used with RHUC DPF/SCR, LHUC fuel tank, RH BOC cantilever battery box, and LH BOC DEF tank. Charts located on pages 6-10 through 6-11.



D3 is used with RHUC DPF/SCR, LHUC battery box, RH BOC DEF tank, and LH BOC fuel tank. Charts located on pages 6-12 through 6-13.



D4 is used with RHUC DPF/SCR, LHUC battery box, LH BOC DEF tank, and RH BOC fuel tank. Charts located on pages 6-14 through 6-15.

https://truckmanualshub.com/



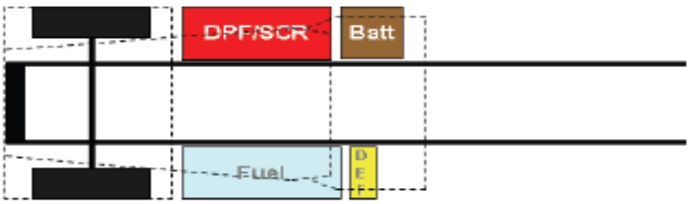
D5 is used with RHUC DPF/SCR, LHUC fuel tank, RH BOC DEF tank, and in cab battery box. Charts located on pages 6-16 through 6-17.

https://truckmanualshub.com/

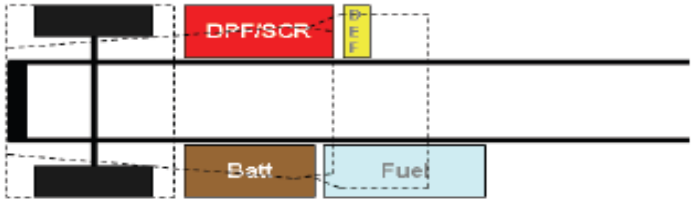
Sleeper Chassis Layout Options



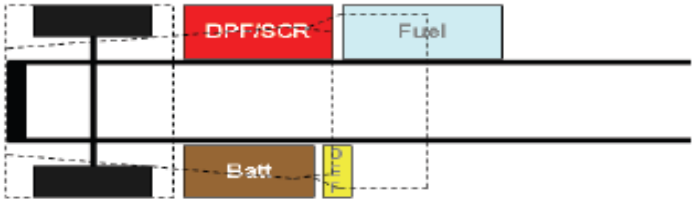
S1 is used with 52” Integral sleeper with RHUC DPF/SCR, LHUC fuel tank, RH BOC DEF tank, and LH BOC cantilever battery box. Charts located on pages 6-18 through 6-19.



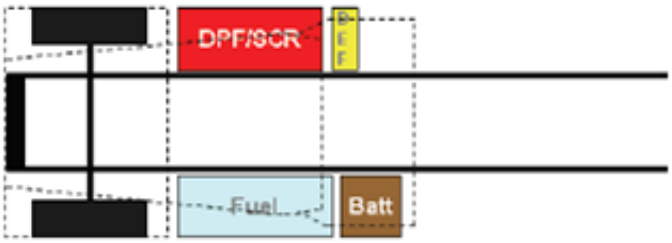
S2 is used with 52” Integral sleeper with RHUC DPF/SCR, LHUC fuel tank, LH BOC DEF tank, and RH BOC cantilever batter box. Charts located on pages 6-20 through 6-21.



S3 is used with 52” Integral sleeper with RHUC DPF/SCR, LHUC battery box, RH BOC DEF tank, and LH BOC fuel tank. Charts located on pages 6-22 through 6-23.

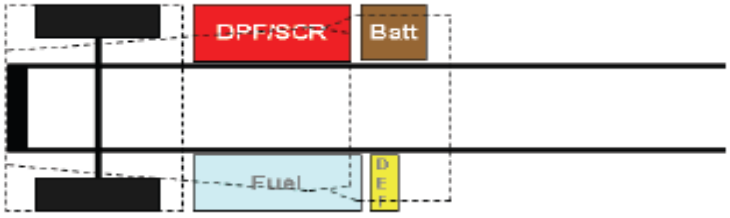


S4 is used with 52” Integral sleeper with RHUC DPF/SCR, LHUC battery box, LH BOC DEF tank, and RH BOC fuel tank. Charts located on pages 6-24 through 6-25.

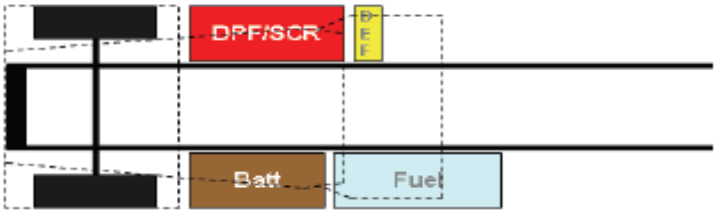


S5 is used with 40” Integral sleeper with RHUC DPF/SCR, LHUC battery box, LH BOC DEF tank, and RH BOC fuel tank. Charts located on pages 6-26 through 6-27.

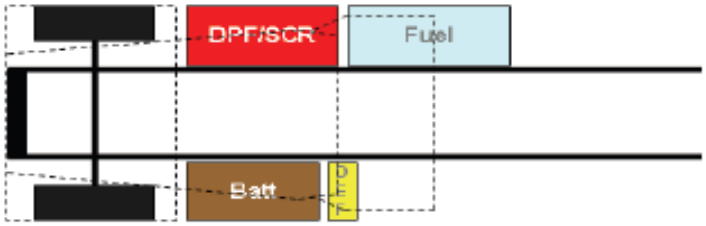
https://truckmanualshub.com/



S6 is used with 40” Integral sleeper with RHUC DPF/SCR, LHUC battery box, LH BOC DEF tank, and RH BOC fuel tank. Charts located on pages 6-28 through 6-29.



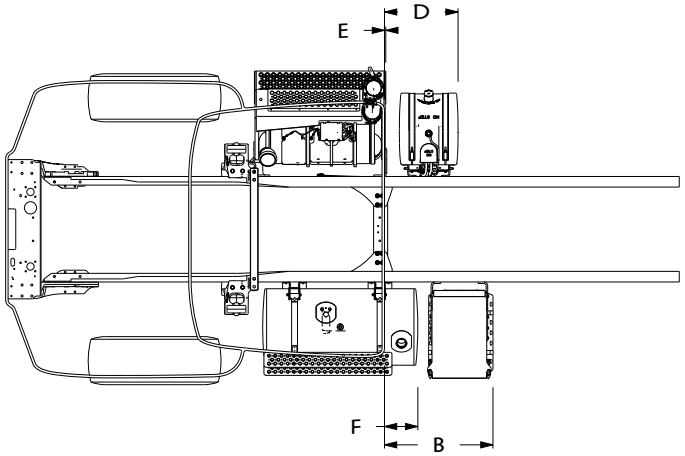
S7 is used with 40” Integral sleeper with RHUC DPF/SCR, LHUC battery box, LH BOC DEF tank, and RH BOC fuel tank. Charts located on pages 6-30 through 6-31.



S8 is used with 40” Integral sleeper with RHUC DPF/SCR, LHUC battery box, LH BOC DEF tank, and RH BOC fuel tank. Charts located on pages 6-32 through 6-33.

https://truckmanualshub.com/

D1—Use with the following models: T680/T880 (Medium Hood)



Dimension E (BOC to DPF/SCR) = 0.8in

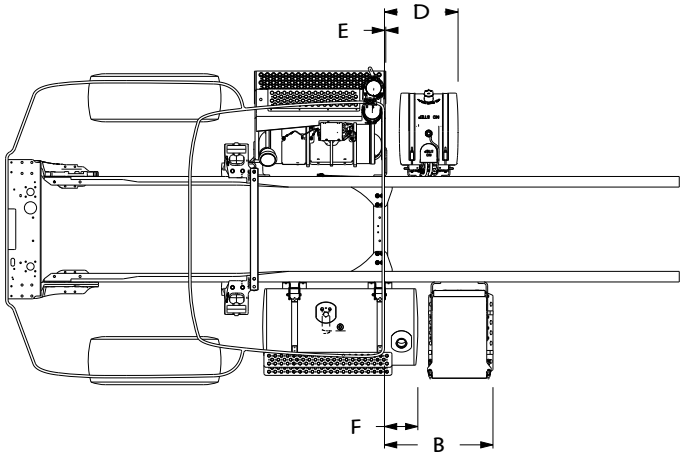
TABLE 6-5.

T680/T880 Daycab with Medium Hood							
Fuel Tank Size			Dimension F BOC to Fuel Tank Daycab (in)	Dimension B BOC to Battery Box* (in)	Dimension D (in)		
					DEF Tank Size		
Diameter	Gallons	Length (in)			Small	Medium	Large
22" Diameter Tank	56	35.6	-1.8	18.0	14**	23.8**	32.4**
	60	38.0	0.7	20.4			
	75	47.3	9.6	29.4			
	100	62.2	24.5	44.3			
	120	74.3	36.6	56.3			
24.5" Diameter Tank	60	30.6	-7.1	12.6			
	75	38.5	0.8	20.6			
	90	45.5	7.8	27.6			
	100	50.0	12.3	32.1			
	110	55.0	17.3	37.0			
	120	60.6	22.9	42.6			
	135	67.2	29.6	49.3			
	150	74.5	36.8	56.6			
28.5" Diameter Tank	75	28.7	-8.9*	10.8			
	90	34.3	-3.4*	16.3			
	105	38.8	-1.1*	20.8			
	110	42.4	4.8*	24.5			
	120	45.8	8.1*	27.8			
	135	50.9	13.2*	32.9			
	150	56.2	18.5*	38.2			
	177	66.1	28.5*	48.2			

NOTE: DIMENSION “B” IS CALCULATED USING A CANTILEVER SIZED BATTERY BOX. OPTIONAL BOXES WILL AFFECT THIS DIMENSION.
* N/A w/ Dual Side of Cab or Back of Cab Exhaust
** Add 5.9 inches for Back of Cab Exhaust.
*** ADD 3.9 INCHES FOR BACK OF CAB EXHAUST

https://truckmanualshub.com/

D1—Use with the following models: T680/T880 (Short Hood)



Dimension E (BOC to DPF/SCR) = 3.5in

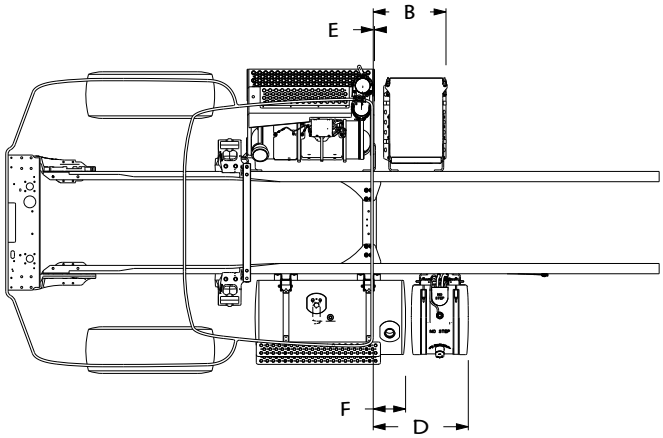
TABLE 6-6.

T680/T880 Daycab with Short Hood							
Fuel Tank Size			Dimension F BOC to Fuel Tank Daycab (in)	Dimension B BOC to Battery Box* (in)	Dimension D (in)		
					DEF Tank Size		
Diameter	Gallons	Length (in)			Small	Medium	Large
22” Diameter Tank	56	35.6	-2.0	19.2	16**	25.7***	34.4**
	60	38.0	0.4	21.7			
	75	47.3	8.7	30.0			
	100	62.2	23.6	44.9			
	120	74.3	35.7	56.9			
24.5” Diameter Tank	60	30.6	-6.7	14.6			
	75	38.5	-0.3	21.0			
	90	45.5	6.8	28.0			
	100	50.0	11.2	32.5			
	110	55.0	16.2	37.4			
	120	60.6	21.8	43.0			
	135	67.2	28.5	49.7			
	150	74.5	35.8	57.0			
28.5” Diameter Tank	75	28.7	-	-			
	90	34.3	-2.8*	18.4			
	105	38.8	1*	22.2			
	110	42.4	3.8*	24.5			
	120	45.8	7.2*	28.4			
	135	50.9	12.3*	33.5			
	150	56.2	17.6*	38.8			
	177	66.1	27.5*	48.7			

NOTE: DIMENSION “B” IS CALCULATED USING A CANTILEVER SIZED BATTERY BOX. OPTIONAL BOXES WILL AFFECT THIS DIMENSION.
* N/A W/ DUAL SIDE OF CAB EXHAUST
** ADD 1.9 INCHES FOR BACK OF CAB EXHAUST
*** ADD 2.0 INCHES FOR BACK OF CAB EXHAUST
**** ADD 3.9 INCHES FOR BACK OF CAB EXHAUST

https://truckmanualshub.com/

D2—Use with the following models: T680/T880 (Medium Hood)



Dimension B (BOC Catilever Battery Box)* = 23.5in
Dimension E (BOC to DPF/SCR) = 0.8in

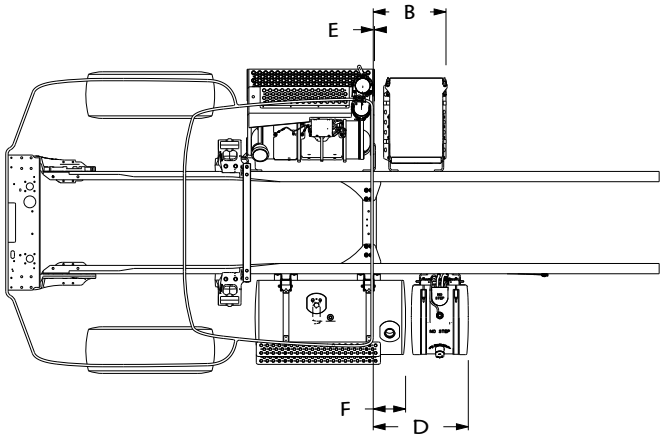
TABLE 6-7.

T680/T880 Daycab with Medium Hood						
Fuel Tank Size			Dimension F BOC to DEF Tank Daycab (in)	Dimension D (in)		
				DEF Tank Size		
Diameter	Gallons	Length (in)		Small	Medium	Large
22” Diameter Tank	56	35.6	-1.8	12.4	19.8	28.4
	60	38.0	0.7	12.4	21.8	30.4
	75	47.3	9.6	22.3	31.6	71.7
	100	62.2	24.5	36.1	45.4	71.7
	120	74.3	36.6	49.8	57.2	71.7
24.5” Diameter Tank	60	30.6	-7.1	6.5**	13.9**	24.4
	75	38.5	0.8	12.4	21.8	32.3
	90	45.5	7.8	22.3	29.6	38.2
	100	50.0	12.3	24.3	33.6	42.2
	110	55.0	17.3	30.2	39.5	48.1
	120	60.6	22.9	36.1	43.4	54.0
	135	67.2	29.6	42.0	51.3	59.9
	150	74.5	36.8	49.8	59.2	67.8
28.5” Diameter Tank	90	34.3	-3.4*	8.5	19.8	28.4
	105	38.8	-1.1*	14.4	21.8	32.3
	120	45.8	8.1*	20.3	29.6	38.2
	135	50.9	13.2*	26.2	33.6	44.1
	150	56.2	18.5*	30.2	39.5	50.0
	177	66.1	28.5*	42.0	49.3	59.9

NOTE: DIMENSION “B” IS CALCULATED USING A CANTILEVER SIZED BATTERY BOX. OPTIONAL BOXES WILL AFFECT THIS DIMENSION.
* N/A w/ Back of Cab or Dual Side of Cab Exhaust
** Add 2 inches for Dual Side of Cab Exhaust
*** Add 3.9 inches for Dual Side of Cab Exhaust
**** Add 5.9 inches for Dual Side of Cab Exhaust

https://truckmanualshub.com/

D2—Use with the following models: T680/T880 (Short Hood)



Dimension B (BOC to Cantilever Battery Box) = 25.4in
Dimension E (BOC to DPF/SCR) = 3.5in

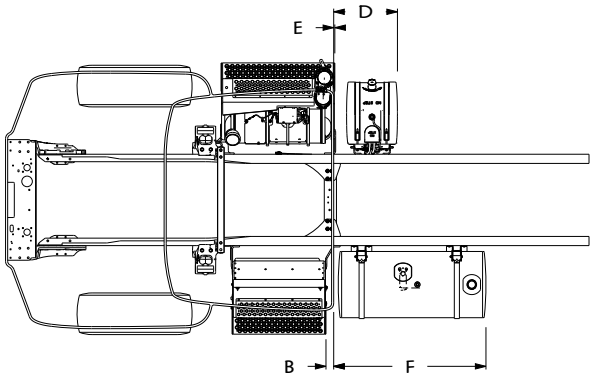
TABLE 6-8.

T680/T880 Daycab with Short Hood						
Fuel Tank Size			Dimension F BOC to DEF Tank Daycab (in)	Dimension D (in)		
				DEF Tank Size		
Diameter	Gallons	Length (in)		Small	Medium	Large
22” Diameter Tank	56	35.6	-2.0	16.4	23.7	34.3
	60	38.0	0.4	18.3	25.7	36.3
	75	47.3	8.7	26.2	35.6	44.1
	100	62.2	23.6	42.0	51.3	59.9
	120	74.3	35.7	53.8	63.1	71.7
24.5” Diameter Tank	60	30.6	-6.7	12.4	19.8	28.4
	75	38.5	-0.3	12.4	21.8	36.3
	90	45.5	6.8	18.3	27.7	42.2
	100	50.0	11.2	24.3	31.6	48.1
	110	55.0	16.2	28.2	37.5	52.0
	120	60.6	21.8	34.1	43.4	57.9
	135	67.2	28.5	42.0	49.3	63.8
	150	74.5	35.8	47.9	57.2	71.7
28.5” Diameter Tank	75	28.7	-8.4*	12.4	19.8	28.4
	90	34.3	-2.8*	14.4	21.8	32.3
	105	38.8	1*	18.3	27.7	36.3
	110	42.4	3.8*	22.3	31.6	40.2
	120	45.8	7.2*	26.2	33.6	44.1
	135	50.9	12.3*	30.2	39.5	48.1
	150	56.2	17.6*	36.1	45.4	54.0
	177	66.1	27.5*	45.9	55.2	63.8

NOTE: DIMENSION “B” IS CALCULATED USING A CANTILEVER SIZED BATTERY BOX. OPTIONAL BOXES WILL AFFECT THIS DIMENSION.
* N/A with Dual Side of Cab Exhaust

https://truckmanualshub.com/

D3—Use with the following models: T680/T880 (Medium Hood)



Dimension B (BOC to Battery Box) = -2.5in
Dimension E (BOC to DPF/SCR) = 0.8in

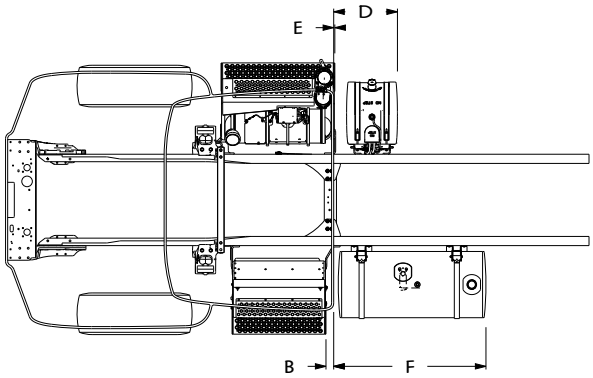
TABLE 6-9.

T680/T880 Daycab with Medium Hood						
Fuel Tank Size			Dimension F BOC to DEF Tank Daycab (in)	Dimension D (in)		
				DEF Tank Size		
Diameter	Gallons	Length (in)		Small	Medium	Large
22” Diameter Tank	56	35.6	35.1	14*	23.8*	32.4*
	60	38.0	37.5			
	75	47.3	46.8			
	100	62.2	61.7			
	120	74.3	73.8			
24.5” Diameter Tank	60	30.6	30.1			
	75	38.5	38.0			
	90	45.5	45.0			
	100	50.0	49.5			
	110	55.0	54.5			
	120	60.6	60.1			
	135	67.2	66.8			
	150	74.5	74.0			
28.5” Diameter Tank	75	28.7	28.2			
	90	34.3	33.8			
	105	38.8	38.3			
	110	42.4	41.9			
	120	45.8	45.3			
	135	50.9	50.4			
	150	56.2	55.7			
	177	66.1	65.6			

NOTE: DIMENSIONS “B” AND “F” ARE CALCULATED USING A 34 INCH VOCATIONAL BATTERY BOX. OPTIONAL BOXES WILL AFFECT THESE DIMENSIONS.
* Add 5.9 inches for Back of Cab Exhaust
** Add 3.9 inches for Back of Cab Exhaust

https://truckmanualshub.com/

D3—Use with the following models: T680/T880 (Short Hood)



Dimension B (BOC to Battery Box) = -2.5in
Dimension E (BOC to DPF/SCR) = 3.5in

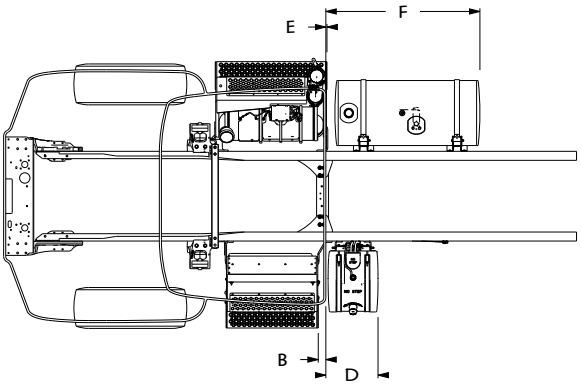
TABLE 6-10.

T680/T880 Daycab with Short Hood						
Fuel Tank Size			Dimension F BOC to DEF Tank Daycab (in)	Dimension D (in)		
				DEF Tank Size		
Diameter	Gallons	Length (in)		Small	Medium	Large
22” Diameter Tank	56	35.6	35.1	16*	25.7**	34.4*
	60	38.0	37.5			
	75	47.3	46.8			
	85	53.2	52.7			
	100	62.2	61.7			
	120	74.3	73.8			
24.5” Diameter Tank	60	30.6	30.1			
	75	38.5	38.0			
	90	45.5	45.0			
	100	50.0	49.5			
	110	55.0	54.5			
	120	60.6	60.1			
	135	67.2	66.8			
	150	74.5	74.0			
28.5” Diameter Tank	75	28.7	28.2			
	90	34.3	33.8			
	105	38.8	38.3			
	110	42.4	41.9			
	120	45.8	45.3			
	135	50.9	50.4			
	150	56.2	55.7			
	177	66.1	65.6			

NOTE: DIMENSIONS “B” AND “F” ARE CALCULATED USING A 34 INCH VOCATIONAL BATTERY BOX. OPTIONAL BOXES WILL AFFECT THESE DIMENSIONS.
* Add 1.9 inches for Back of Cab Exhaust
** Add 2.0 inches for Back of Cab Exhaust
** Add 3.9 inches for Back of Cab Exhaust

https://truckmanualshub.com/

D4—Use with the following models: T680/T880 (Medium Hood)



Dimension B (BOC to Battery Box) = -2.5in
Dimension E (BOC to DPF/SCR) = 0.8in

TABLE 6-11.

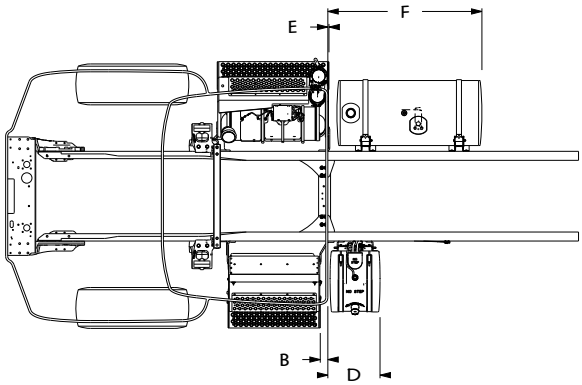
T680/T880 Daycab with Medium Hood						
Fuel Tank Size			Dimension F BOC to DEF Tank Daycab (in)	Dimension D (in)		
				DEF Tank Size		
Diameter	Gallons	Length (in)		Small	Medium	Large
22” Diameter Tank	56	35.6	38.4	12.0	19.8*	28.5*
	60	38.0	40.8			
	75	47.3	50.1			
	100	62.2	65.0			
	120	74.3	77.1			
24.5” Diameter Tank	60	30.6	33.4			
	75	38.5	41.3			
	90	45.5	48.3			
	100	50.0	52.8			
	110	55.0	57.8			
	120	60.6	63.4			
	135	67.2	70.1			
	150	74.5	77.3			
28.5” Diameter Tank	75	28.7	31.6			
	90	34.3	37.1			
	105	38.8	41.6			
	110	42.4	45.3			
	120	45.8	48.6			
	135	50.9	53.7			
	150	56.2	59.0			
	177	66.1	69.0			

NOTE: DIMENSIONS “B” AND “D” ARE CALCULATED USING A 34 INCH VOCATIONAL BATTERY BOX. OPTIONAL BOXES WILL AFFECT THESE DIMENSIONS.

* Add 1.9 inches for Back of Cab Exhaust
** Add 2.0 inches for Back of Cab Exhaust

https://truckmanualshub.com/

D4—Use with the following models: T680/T880 (Short Hood)



Dimension B (BOC to Battery Box) = -2.5in
Dimension E (BOC to DPF/SCR) = 3.5in

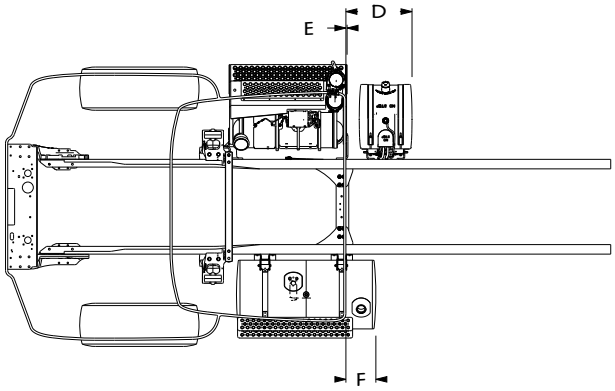
TABLE 6-12.

T680/T880 Daycab with Short Hood						
Fuel Tank Size			Dimension F BOC to DEF Tank Daycab (in)	Dimension D (in)		
				DEF Tank Size		
Diameter	Gallons	Length (in)		Small	Medium	Large
22” Diameter Tank	56	35.6	41.1	12.0	19.8**	28.5*
	60	38.0	43.5			
	75	47.3	52.8			
	85	53.2	58.7			
	100	62.2	67.7			
	120	74.3	79.7			
24.5” Diameter Tank	60	30.6	36.0			
	75	38.5	44.0			
	90	45.5	51.0			
	100	50.0	55.5			
	110	55.0	60.4			
	120	60.6	66.0			
	135	67.2	72.7			
	150	74.5	80.0			
28.5” Diameter Tank	75	28.7	34.2			
	90	34.3	39.7			
	105	38.8	44.3			
	110	42.4	47.9			
	120	45.8	51.3			
	135	50.9	56.3			
	150	56.2	61.7			
	177	66.1	71.6			

NOTE: DIMENSIONS “B” AND “D” ARE CALCULATED USING A 34 INCH VOCATIONAL BATTERY BOX. OPTIONAL BOXES WILL AFFECT THESE DIMENSIONS.
* Add 1.9 inches for Back of Cab Exhaust
** Add 2.0 inches for Back of Cab Exhaust

https://truckmanualshub.com/

D5—Use with the following models: T680/T880 (Medium Hood)



Dimension E (BOC to DPF/SCR) = 0.8in

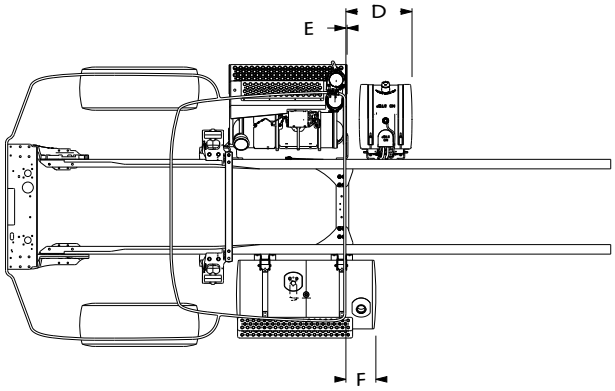
TABLE 6-13.

T680/T880 Daycab with Medium Hood						
Fuel Tank Size			Dimension F BOC to DEF Tank Daycab (in)	Dimension D (in)		
				DEF Tank Size		
Diameter	Gallons	Length (in)		Small	Medium	Large
22” Diameter Tank	56	35.6	-1.8	14**	23.8**	32.4**
	60	38.0	0.7			
	75	47.3	9.6			
	100	62.2	24.5			
	120	74.3	36.6			
24.5” Diameter Tank	60	30.6	-7.1			
	75	38.5	0.8			
	90	45.5	7.8			
	100	50.0	12.3			
	110	55.0	17.3			
	120	60.6	22.9			
	135	67.2	29.6			
	150	74.5	36.8			
28.5” Diameter Tank	75	28.7	-8.9*			
	90	34.3	-3.4*			
	105	38.8	-1.1*			
	110	42.4	4.8*			
	120	45.8	8.1*			
	135	50.9	13.2*			
	150	56.2	18.5*			
	177	66.1	28.5*			

NOTE: DIMENSIONS “B” AND “D” ARE CALCULATED USING A 34 INCH VOCATIONAL BATTERY BOX. OPTIONAL BOXES WILL AFFECT THESE *
N/A W/ BACK OF CAB EXHAUST
** Add 5.9 inches for Back of Cab Exhaust
*** Add 3.9 inches for Back of Cab Exhaust

https://truckmanualshub.com/

D5—Use with the following models: T680/T880 (Short Hood)



Dimension E (BOC to DPF/SCR) = 3.5in

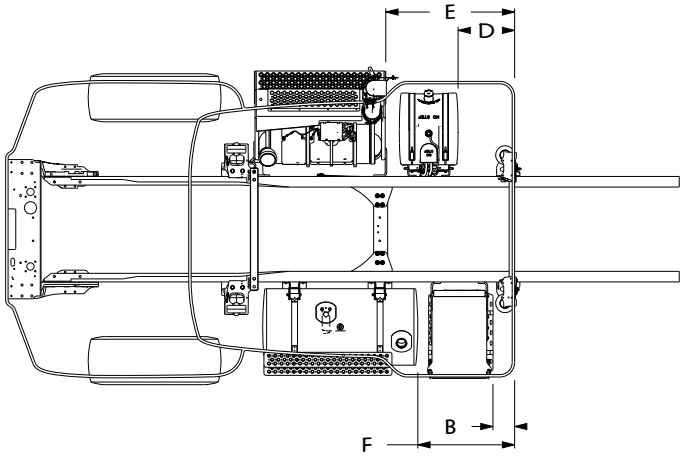
TABLE 6-14.

T680/T880 Daycab with Short Hood						
Fuel Tank Size			Dimension F BOC to DEF Tank Daycab (in)	Dimension D (in)		
				DEF Tank Size		
Diameter	Gallons	Length (in)		Small	Medium	Large
22” Diameter Tank	56	35.6	-2.0	16**	25.7***	34.4**
	60	38.0	0.4			
	75	47.3	8.7			
	100	62.2	23.6			
	120	74.3	35.7			
24.5” Diameter Tank	60	30.6	-6.7			
	75	38.5	-0.3			
	90	45.5	6.8			
	100	50.0	11.2			
	110	55.0	16.2			
	120	60.6	21.8			
	135	67.2	28.5			
	150	74.5	35.8			
28.5” Diameter Tank	75	28.7	-			
	90	34.3	-2.8*			
	105	38.8	1*			
	110	42.4	-			
	120	45.8	7.2*			
	135	50.9	12.3*			
	150	56.2	17.6*			
	177	66.1	27.5*			

* N/A W/ DUAL SIDE OF CAB EXHAUST
** Add 1.9 inches for Back of Cab Exhaust
*** Add 2.0 inches for Back of Cab Exhaust
**** Add 3.9 inches for Back of Cab Exhaust

https://truckmanualshub.com/

S1—Use with the following models: T680/T880 (Medium Hood)



Dimension B (BOC to Cantilever Battery Box) = -5in
Dimension E (BOC to DPF/SCR) = -41.2in

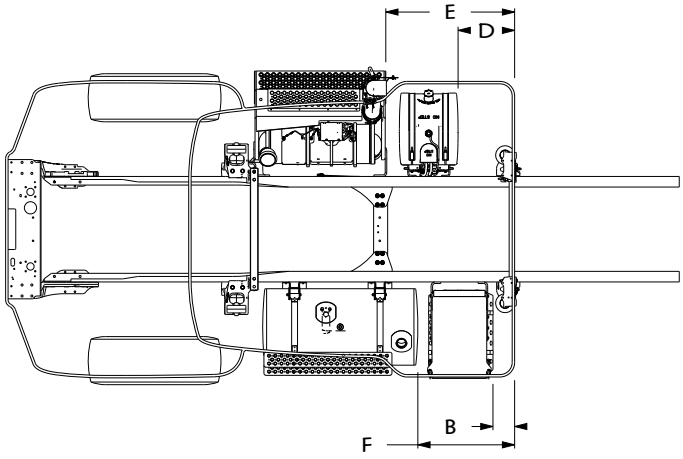
TABLE 6-15.

T680/T880 52" Sleeper with Medium Hood							
Fuel Tank Size			Dimension F BOS to Fuel Tank (in)	Dimension B BOC to Battery Box* (in)	Dimension D (in)		
					DEF Tank Size		
Diameter	Gallons	Length (in)			Small	Medium	Large
22" Diameter Tank	56	35.6	-45.3	-24.1	-28.0	-18.2	-9.6
	60	38.0	-42.8	-21.6			
	75	47.3	-33.9	-12.7			
	100	62.2	-19.0	2.2			
	120	74.3	-6.9	14.3			
24.5" Diameter Tank	60	30.6	-50.6	-29.4			
	75	38.5	-42.7	-21.5			
	90	45.5	-35.7	-14.5			
	100	50.0	-31.2	-10.0			
	110	55.0	-26.2	-5.0			
	120	60.6	-20.6	0.6			
	135	67.2	-13.9	7.3			
	150	74.5	-6.7	14.5			
28.5" Diameter Tank	75	28.7	-52.4*	-31.2			
	90	34.3	-46.9*	-25.7			
	105	38.8	-42.4*	-21.2			
	110	42.4	-38.7*	-17.5			
	120	45.8	-35.4*	-14.2			
	135	50.9	-30.3*	-9.1			
	150	56.2	-25*	-3.8			
	177	66.1	-15*	6.2			

NOTE: DIMENSION “B” IS CALCULATED USING A CANTILEVER SIZED BATTERY BOX. OPTIONAL BOXES WILL AFFECT THIS DIMENSION.
* N/A w/ Dual Side of Cab or Back of Cab Sleeper

https://truckmanualshub.com/

S1—Use with the following models: T680/T880 (Short Hood)



Dimension B (BOC to Cantilever Battery Box) = 6.8inz
Dimension E (BOC to DPF/SCR) = -38.5in

TABLE 6-16.

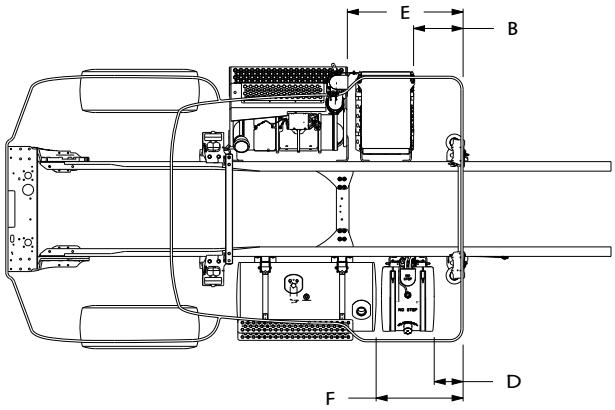
T680/T880 52" Sleeper with Short Hood							
Fuel Tank Size			Dimension F BOS to Fuel Tank (in)	Dimension B BOC to Battery Box* (in)	Dimension D (in)		
					DEF Tank Size		
Diameter	Gallons	Length (in)			Small	Medium	Large
22" Diameter Tank	56	35.6	-44.0	-24.1	-26.0	-16.2	-7.6
	60	38.0	-41.6	-21.6			
	75	47.3	-33.3	-12.7			
	100	62.2	-18.4	2.2			
	120	74.3	-6.3	14.3			
24.5" Diameter Tank	60	30.6	-48.7	-29.4			
	75	38.5	-42.2	-21.5			
	90	45.5	-35.2	-14.5			
	100	50.0	-30.7	-10.0			
	110	55.0	-25.8	-5.0			
	120	60.6	-20.2	0.6			
	135	67.2	-13.5	7.3			
	150	74.5	-6.2	14.5			
28.5" Diameter Tank	75	28.7	-	-			
	90	34.3	-44.8*	-25.7			
	105	38.8	-41*	-21.2			
	110	42.4	-	-			
	120	45.8	-34.8*	-14.2			
	135	50.9	-29.7*	-9.1			
	150	56.2	-24.4*	-3.8			
	177	66.1	-14.4*	6.2			

NOTE: DIMENSION "B" IS CALCULATED USING A CANTILEVER SIZED BATTERY BOX. OPTIONAL BOXES WILL AFFECT THIS DIMENSION.

* N/A w/ Dual Side of Cab Exhaust

https://truckmanualshub.com/

S2—Use with the following models: T680/T880 (Medium Hood)



Dimension B (BOS Catilever Battery Box) = -18.5in
Dimension E (BOS to DPF/SCR) = -41.2in

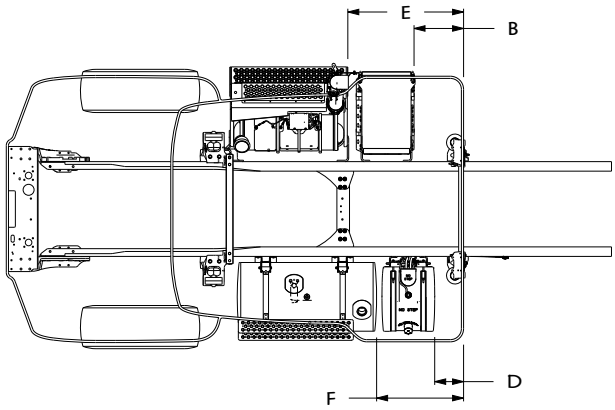
TABLE 6-17.

T680/T880 52" Sleeper with Medium Hood						
Fuel Tank Size			Dimension F BOS to Fuel Tank (in)	Dimension D (in) BOS to DEF Tank* (in)		
				DEF Tank Size		
Diameter	Gallons	Length (in)		Small	Medium	Large
22" Diameter Tank	56	35.6	-45.3	-29.6	-22.2	-13.6
	60	38.0	-42.8	-29.6	-20.2	-11.6
	75	47.3	-33.9	-19.7	-10.4	29.7*****
	100	62.2	-19.0	-5.9	21.1****	29.7*****
	120	74.3	-6.9	11.8*****	21.1****	29.7*****
24.5" Diameter Tank	60	30.6	-50.6	-35.5**	-28.1**	-17.6**
	75	38.5	-42.7	-29.6	-20.2	-9.7
	90	45.5	-35.7	-19.7	-12.4	29.7*****
	100	50.0	-31.2	-17.7	-8.4	29.7*****
	110	55.0	-26.2	-11.8	21.1****	29.7*****
	120	60.6	-20.6	-5.9	21.1****	29.7*****
	135	67.2	-13.9	11.8*****	21.1****	29.7*****
	150	74.5	-6.7	11.8*****	21.1****	29.7*****
28.5" Diameter Tank	90	34.3	-46.9*	-33.5	-22.2	-13.6
	105	38.8	-42.4*	-27.6	-20.2	-9.7
	120	45.8	-35.4*	-21.7	-12.4	29.7*****
	135	50.9	-30.3*	-15.8	-8.4	29.7*****
	150	56.2	-25*	-11.8	21.1****	29.7*****
	177	66.1	-15*	11.8*****	21.1****	29.7*****

NOTE: DIMENSION "B" IS CALCULATED USING A CANTILEVER SIZED BATTERY BOX. OPTIONAL BOXES WILL AFFECT THIS DIMENSION.
* N/A W/ DUAL SIDE OF CAB EXHAUST
** ADD 3.9 INCHES FOR DUAL SIDE OF CAB EXHAUST
*** ADD 5.9 INCHES FOR DUAL SIDE OF CAB EXHAUST
**** ADD 9.8 INCHES FOR DUAL BACK OF SLEEPER EXHAUST
***** ADD 11.8 INCHES FOR DUAL BACK OF SLEEPER EXHAUST

https://truckmanualshub.com/

S2—Use with the following models: T680/T880 (Short Hood)



Dimension B (BOS to Cantilever Battery Box) = 16.6in
Dimension E (BOS to DPF/SCR) = -38.5in

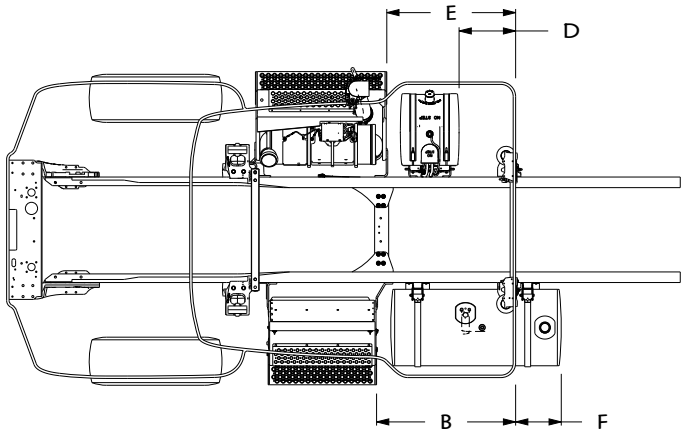
TABLE 6-18.

T680/T880 52" Sleeper with Short Hood						
Fuel Tank Size			Dimension F BOS to Fuel Tank (in)	Dimension D (in) BOS to DEF Tank* (in)		
				DEF Tank Size		
Diameter	Gallons	Length (in)		Small	Medium	Large
22" Diameter Tank	56	35.6	-44.0	-25.6	-18.3	-7.7
	60	38.0	-41.6	-23.7	-16.3	-5.7
	75	47.3	-33.3	-15.8	-6.4	29.7*****
	100	62.2	-18.4	11.8*****	21.1****	29.7*****
	120	74.3	-6.3	11.8*****	21.1****	29.7*****
24.5" Diameter Tank	60	30.6	-48.7	-29.6	-22.2	-13.6
	75	38.5	-42.2	-29.6	-20.2	-5.7
	90	45.5	-35.2	-23.7	-14.3	29.7*****
	100	50.0	-30.7	-17.7	-10.4	29.7*****
	110	55.0	-25.8	-13.8	21.1****	29.7*****
	120	60.6	-20.2	11.8*****	21.1****	29.7*****
	135	67.2	-13.5	11.8*****	21.1****	29.7*****
	150	74.5	-6.2	11.8*****	21.1****	29.7*****
28.5" Diameter Tank	90	34.3	-44.8*	-27.6	-20.2	-9.7
	105	38.8	-41*	-23.7	-14.3	29.7*****
	120	45.8	-34.8*	-15.8	-8.4	29.7*****
	135	50.9	-29.7*	-11.8	21.1	29.7*****
	150	56.2	-24.4*	-5.9	21.1	29.7*****
	177	66.1	-14.4*	11.8*****	21.1****	29.7*****

NOTE: DIMENSION "B" IS CALCULATED USING A CANTILEVER SIZED BATTERY BOX. OPTIONAL BOXES WILL AFFECT THIS DIMENSION.
* N/A WITH DUAL SIDE OF CAB EXHAUST
** ADD 3.9 INCHES FOR DUAL SIDE OF CAB EXHAUST
*** ADD 5.9 INCHES FOR DUAL SIDE OF CAB EXHAUST
**** ADD 9.8 INCHES FOR DUAL BACK OF SLEEPER EXHAUST
***** ADD 11.8 INCHES FOR DUAL BACK OF SLEEPER EXHAUST

https://truckmanualshub.com/

S3—Use with the following models: T680/T880 (Medium Hood)



Dimension B (BOC to Battery Box) = -44.5in
Dimension E (BOC to DPF/SCR) = -41.2in

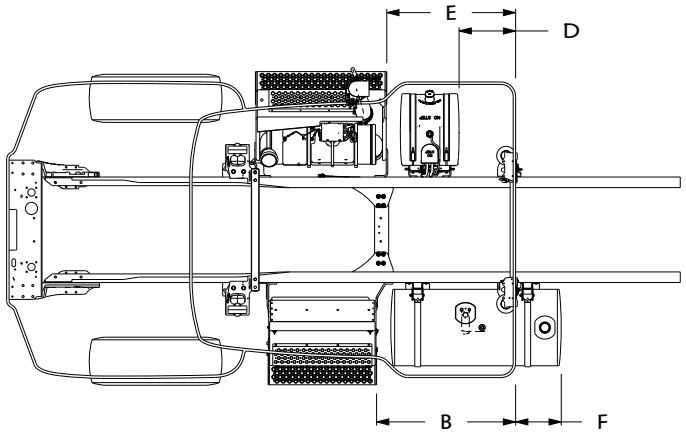
TABLE 6-19.

T680/T880 52" Sleeper with Medium Hood						
Fuel Tank Size			Dimension F BOS to DEF Tank (in)	Dimension D (in)		
				DEF Tank Size		
Diameter	Gallons	Length (in)		Small	Medium	Large
22" Diameter Tank	56	35.6	-6.9	-28.0	-18.2	-9.6
	60	38.0	-4.5			
	75	47.3	4.8			
	100	62.2	19.7			
	120	74.3	31.8			
24.5" Diameter Tank	60	30.6	-11.9			
	75	38.5	-4.0			
	90	45.5	3.0			
	100	50.0	7.5			
	110	55.0	12.5			
	120	60.6	18.1			
	135	67.2	24.8			
	150	74.5	32.0			
28.5" Diameter Tank	75	28.7	-13.7			
	90	34.3	-8.2			
	105	38.8	-3.7			
	110	42.4	0.0			
	120	45.8	3.3			
	135	50.9	8.4			
	150	56.2	13.7			
	177	66.1	23.7			

NOTE: DIMENSIONS "B" AND "F" ARE CALCULATED USING A 34 INCH VOCATIONAL BATTERY BOX. OPTIONAL BOXES WILL AFFECT THESE DIMENSIONS.

https://truckmanualshub.com/

S3—Use with the following models: T680/T880 (Short Hood)



Dimension B (BOC to Battery Box) = -44.5in
Dimension E (BOC to DPF/SCR) = -38.5in

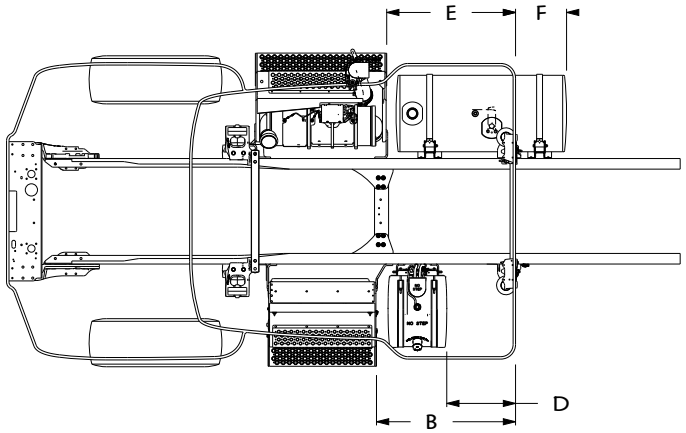
TABLE 6-20.

T680/T880 52” Sleeper with Short Hood						
Fuel Tank Size			Dimension F BOS to DEF Tank (in)	Dimension D (in)		
				DEF Tank Size		
Diameter	Gallons	Length (in)		Small	Medium	Large
22” Diameter Tank	56	35.6	-6.9	-26.0	-16.2	-7.6
	60	38.0	-4.5			
	75	47.3	4.8			
	100	62.2	19.7			
	120	74.3	31.8			
24.5” Diameter Tank	60	30.6	-11.9			
	75	38.5	-4.0			
	90	45.5	3.0			
	100	50.0	7.5			
	110	55.0	12.5			
	120	60.6	18.1			
	135	67.2	24.8			
	150	74.5	32.0			
28.5” Diameter Tank	75	28.7	-13.7			
	90	34.3	-8.2			
	105	38.8	-3.7			
	110	42.4	0.0			
	120	45.8	3.3			
	135	50.9	8.4			
	150	56.2	13.7			
	177	66.1	23.7			

NOTE: DIMENSIONS “B” AND “F” ARE CALCULATED USING A 34 INCH VOCATIONAL BATTERY BOX. OPTIONAL BOXES WILL AFFECT THESE DIMENSIONS..

https://truckmanualshub.com/

S4—Use with the following models: T680/T880 (Medium Hood)



Dimension B (BOC to Battery Box) = -44.5in
Dimension E (BOC to DPF/SCR) = -41.2in

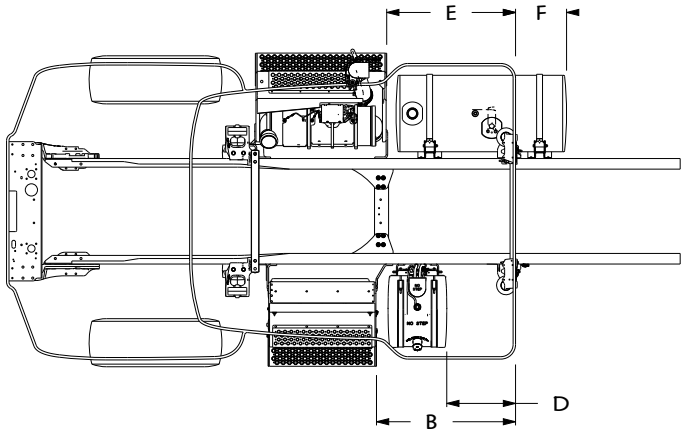
TABLE 6-21.

T680/T880 52" Sleeper with Medium Hood						
Fuel Tank Size			Dimension F BOS to DEF Tank (in)	Dimension D (in)		
				DEF Tank Size		
Diameter	Gallons	Length (in)		Small	Medium	Large
22" Diameter Tank	56	35.6	-3.6	-30	-22.1*	-13.5*
	60	38.0	-1.1			
	75	47.3	8.1			
	100	62.2	23.0			
	120	74.3	35.1			
24.5" Diameter Tank	60	30.6	-8.6			
	75	38.5	-0.7			
	90	45.5	6.3			
	100	50.0	10.8			
	110	55.0	15.8			
	120	60.6	21.4			
	135	67.2	28.1			
	150	74.5	35.3			
28.5" Diameter Tank	75	28.7	-10.4			
	90	34.3	-4.9			
	105	38.8	-0.4			
	110	42.4	3.3			
	120	45.8	6.6			
	135	50.9	11.7			
	150	56.2	17.0			
	177	66.1	27.0			

NOTE: DIMENSIONS "B" AND "F" ARE CALCULATED USING A 34 INCH VOCATIONAL BATTERY BOX. OPTIONAL BOXES WILL AFFECT THESE DIMENSIONS.
* Add 1.9 inches for Dual Side of Cab Exhaust
** Add 2 inches for Dual Side of Cab Exhaust

https://truckmanualshub.com/

S4—Use with the following models: T680/T880 (Short Hood)



Dimension B (BOC to Battery Box) = -44.5in
Dimension E (BOC to DPF/SCR) = -38.5in

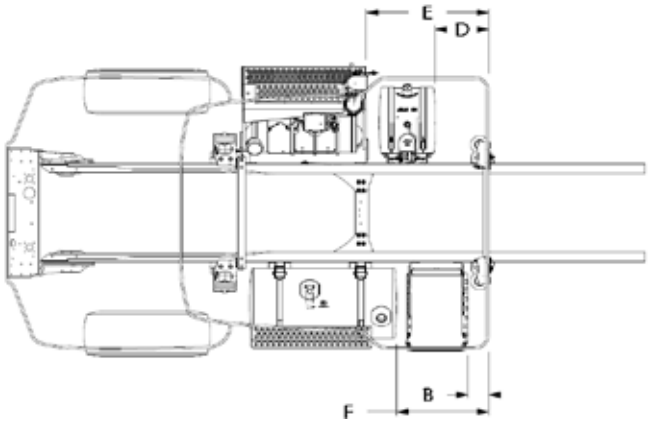
TABLE 6-22.

T680/T880 52" Sleeper with Short Hood						
Fuel Tank Size			Dimension F BOS to DEF Tank (in)	Dimension D (in)		
				DEF Tank Size		
Diameter	Gallons	Length (in)		Small	Medium	Large
22" Diameter Tank	56	35.6	-0.9	-30	-22.1*	-13.5*
	60	38.0	1.5			
	75	47.3	10.8			
	100	62.2	25.7			
	120	74.3	37.7			
24.5" Diameter Tank	60	30.6	-6.0			
	75	38.5	2.0			
	90	45.5	9.0			
	100	50.0	13.5			
	110	55.0	18.4			
	120	60.6	24.0			
	135	67.2	30.7			
	150	74.5	38.0			
28.5" Diameter Tank	75	28.7	-7.8			
	90	34.3	-2.3			
	105	38.8	2.3			
	110	42.4	5.9			
	120	45.8	9.3			
	135	50.9	14.3			
	150	56.2	19.7			
	177	66.1	29.6			

NOTE: DIMENSIONS "B" AND "F" ARE CALCULATED USING A 34 INCH VOCATIONAL BATTERY BOX. OPTIONAL BOXES WILL AFFECT THESE DIMENSIONS.
* Add 1.9 inches for Dual Side of Cab Exhaust
** Add 2 inches for Dual Side of Cab Exhaust

https://truckmanualshub.com/

S5—Use with the following models: T880 (Medium Hood)



Dimension E (BOS to DPF/SCR) = -29.9in

TABLE 6-23.

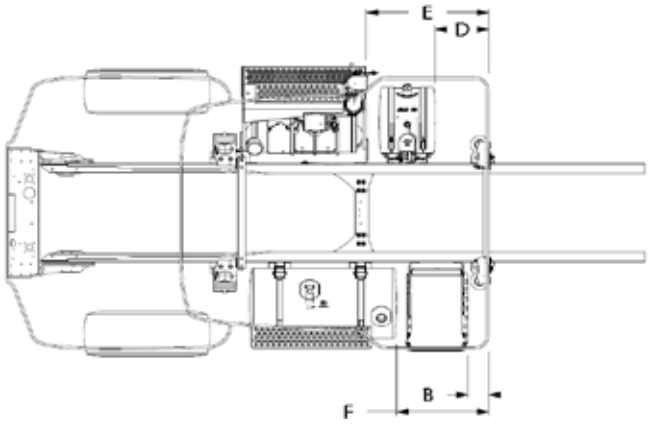
T880 40" Sleeper with Medium Hood							
Fuel Tank Size			Dimension F BOS to Fuel Tank (in)	Dimension B BOS to Battery Box (in)	Dimension D (in)		
					DEF Tank Size		
Diameter	Gallons	Length (in)			Small	Medium	Large
22" Diameter Tank	56	35.6	-32.2	-10.1	-13.8	-6.5	32.7
	60	38.0	-29.8	-8.1			
	75	47.3	-20.5	23.4			
	100	62.2	-5.6	23.4			
	120	74.3	6.5	29.3			
24.5" Diameter Tank	60	30.6	-37.1	-14.0			
	75	38.5	-29.3	-6.2			
	90	45.5	-22.3	23.4			
	100	50.0	-17.8	23.4			
	110	55.0	-12.8	23.4			
	120	60.6	-7.2	23.4			
	135	67.2	-0.6	23.4			
	150	74.5	6.7	29.3			
28.5" Diameter Tank	90	34.3	-33.5	-10.1			
	105	38.8	-29.0	-6.2			
	120	45.8	-18.4	23.4			
	135	50.9	-13.3	23.4			
	150	56.2	-8.0	23.4			
	177	66.1	1.9	23.4			

NOTE: DIMENSION "B" IS CALCULATED USING A CANTILEVER SIZED BATTERY BOX. OPTIONAL BOXES WILL AFFECT THIS DIMENSION.

* N/A w/ Dual Side of Cab Exhaust

https://truckmanualshub.com/

S5—Use with the following models: T880 (Short Hood)



Dimension E (BOS to DPF/SCR) = -27.2in

TABLE 6-24.

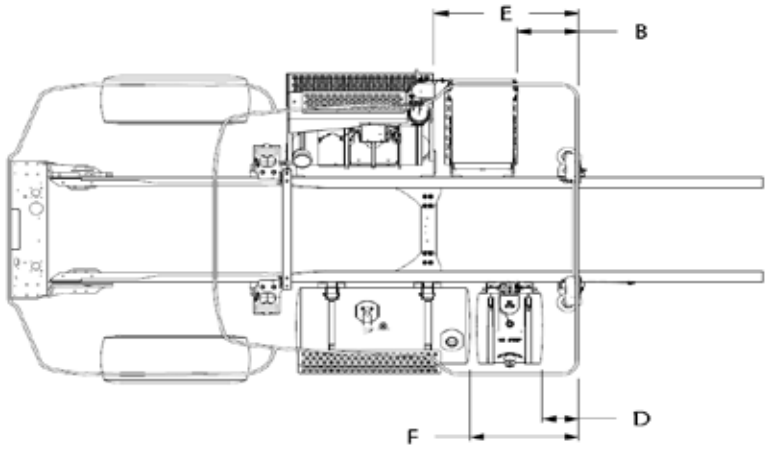
T880 40" Sleeper with Short Hood							
Fuel Tank Size			Dimension F BOS to Fuel Tank (in)	Dimension B BOS to Battery Box (in)	Dimension D (in)		
					DEF Tank Size		
Diameter	Gallons	Length (in)			Small	Medium	Large
22" Diameter Tank	56	35.6	-32.2	-10.1	-11.8	-4.5	33.7
	60	38.0	-29.8	-6.2			
	75	47.3	-21.5	23.4			
	100	62.2	-6.6	23.4			
	120	74.3	5.5	27.3			
24.5" Diameter Tank	60	30.6	-36.8	*-14			
	75	38.5	-29.9	-6.2			
	90	45.5	-22.9	23.4			
	100	50.0	-18.4	23.4			
	110	55.0	-13.4	23.4			
	120	60.6	-7.9	23.4			
	135	67.2	-1.2	23.4			
	150	74.5	6.5	29.3			
28.5" Diameter Tank	90	34.3	-32.3	-10.1			
	105	38.8	-29.2	-6.2			
	120	45.8	-23.0	23.4			
	135	50.9	-18.0	23.4			
	150	56.2	-12.6	23.4			
	177	66.1	-2.7	23.4			

NOTE: DIMENSION "B" IS CALCULATED USING A CANTILEVER SIZED BATTERY BOX. OPTIONAL BOXES WILL AFFECT THIS DIMENSION.

* N/A w/ Dual Side of Cab Exhaust

https://truckmanualshub.com/

S6—Use with the following models: T880 (Medium Hood)



Dimension B (BOS Catilever Battery Box) = -6.4in
Dimension E (BOS to DPF/SCR) = -29.9in

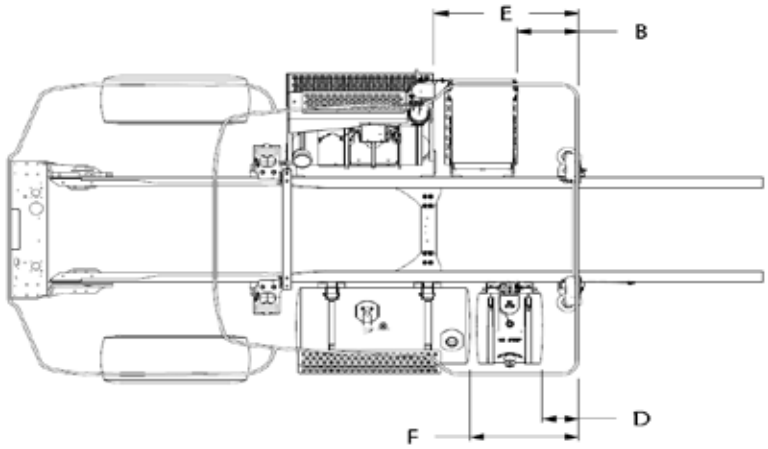
TABLE 6-25.

T880 40" Sleeper with Medium Hood						
Fuel Tank Size			Dimension F BOS to DEF Tank (in)	Dimension D BOS to DEF Tank (in)		
				DEF Tank Size		
Diameter	Gallons	Length (in)		Small	Medium	Large
22" Diameter Tank	56	35.6	-32.2	-17.7	-8.3	33.6
	60	38.0	-29.8	-15.7	-6.4	33.6
	75	47.3	-20.5	-5.9	23.1	33.6
	100	62.2	-5.6	13.7	23.1	33.6
	120	74.3	6.5	21.6	29.0	39
24.5" Diameter Tank	60	30.6	-37.1	-21.7**	-14.25**	-3.7***
	75	38.5	-29.3	-13.8	-6.4	33.6
	90	45.5	-22.3	-10.8	23.1	33.6
	100	50.0	-17.8	-3.9	23.1	33.6
	110	55.0	-12.8	13.7	23.1	33.6
	120	60.6	-7.3	13.7	23.1	33.6
	135	67.2	-0.6	13.7	23.1	33.6
	150	74.5	6.7	21.6	29.0	39
28.5" Diameter Tank	90	34.3	-33.5	-20.2	-10.8	33.6
	105	38.8	-28.9	-14.3	-4.9	33.6
	120	45.8	-21.9	-8.4	23.1	33.6
	135	50.9	-16.9	13.7	23.1	33.6
	150	56.2	-11.5	13.7	23.1	33.6
	177	66.1	-1.6	13.7	23.1	33.6

NOTE: DIMENSION "B" IS CALCULATED USING A CANTILEVER SIZED BATTERY BOX. OPTIONAL BOXES WILL AFFECT THIS DIMENSION.
* N/A w/ Dual Side of Cab Exhaust
** Add 3.9 inches for Dual Side of Cab Exhaust
*** Move beyond rear of sleeper w/ Dual Side of Cab Exhaust

https://truckmanualshub.com/

S6—Use with the following models: T880 (Short Hood)



Dimension B (BOC to Battery Box) = -44.5in
Dimension E (BOC to DPF/SCR) = -38.5in

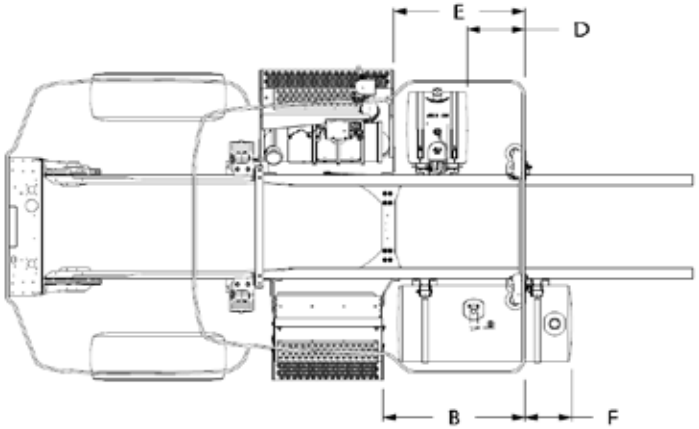
TABLE 6-26.

T880 40" Sleeper with Short Hood						
Fuel Tank Size			Dimension F BOS to DEF Tank (in)	Dimension D BOS to DEF Tank (in)		
				DEF Tank Size		
Diameter	Gallons	Length (in)		Small	Medium	Large
22" Diameter Tank	56	35.6	-32.2	-17.7	-8.3	33.7
	60	38.0	-29.8	-15.8	-6.4	33.7
	75	47.3	-21.5	-5.9	23.1	33.7
	100	62.2	-6.6	13.2	23.1	33.7
	120	74.3	5.5	19.7	29	37.6
24.5" Diameter Tank	60	30.6	-36.8	-19.7**	-12.3**	-3.7
	75	38.5	-29.9	-15.7	-6.4	33.7
	90	45.5	-22.9	-7.9	23.1	33.7
	100	50.0	-18.4	-3.9	23.1	33.7
	110	55.0	-13.4	13.2	23.1	33.7
	120	60.6	-7.9	13.2	23.1	33.7
	135	67.2	-1.2	13.2	23.1	33.7
	150	74.5	6.5	19.7	29	37.6
28.5" Diameter Tank	90	34.3	-32.3	-17.7	-8.3	33.7
	105	38.8	-29.2	-13.8	-4.4	33.7
	120	45.8	-23.0	-7.9	23.1	33.7
	135	50.9	-18.0	-3.9	23.1	33.7
	150	56.2	-12.6	13.2	23.1	33.7
	177	66.1	-2.7	13.2	23.1	33.7

NOTE: DIMENSIONS "B" AND "F" ARE CALCULATED USING A 34 INCH VOCATIONAL BATTERY BOX. OPTIONAL BOXES WILL AFFECT THESE DIMENSIONS.
* Add 1.9 inches for Dual Side of Cab Exhaust
** Add 2 inches for Dual Side of Cab Exhaust

https://truckmanualshub.com/

S7—Use with the following models: T880 (Medium Hood)



Dimension B (BOS to Battery Box) = -33.2in
Dimension E (BOS to DPF/SCR) = -29.9in

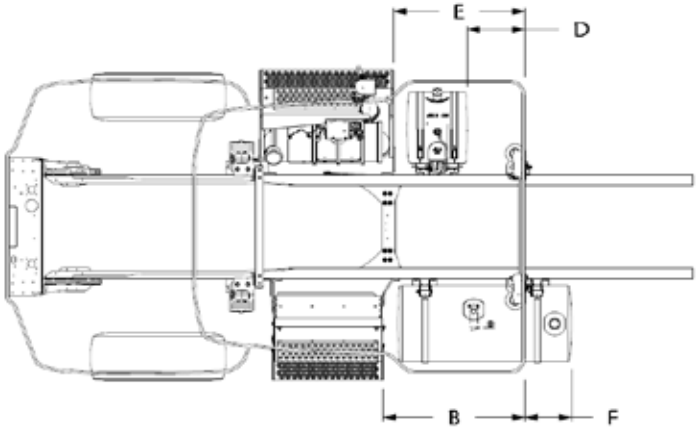
TABLE 6-27.

T880 40" Sleeper with Medium Hood						
Fuel Tank Size			Dimension F BOS to Fuel Tank (in)	Dimension D (in)		
				DEF Tank Size		
Diameter	Gallons	Length (in)		Small	Medium	Large
22" Diameter Tank	56	35.6	9.6	-13.8	-6.5	32.7
	60	38.0	9.6			
	75	47.3	17.0			
	100	62.2	31.9			
	120	74.3	43.9			
24.5" Diameter Tank	60	30.6	2.0			
	75	38.5	8.0			
	90	45.5	15.0			
	100	50.0	19.5			
	110	55.0	24.5			
	120	60.6	30.0			
	135	67.2	36.7			
	150	74.5	44.0			
28.5" Diameter Tank	75	28.7	-1.0			
	90	34.3	1.3			
	105	38.8	9.6			
	110	42.4	10.3			
	120	45.8	13.7			
	135	50.9	18.7			
	150	56.2	24.1			
	177	66.1	34.0			

NOTE: DIMENSIONS "B" AND "F" ARE CALCULATED USING A 34 INCH VOCATIONAL BATTERY BOX. OPTIONAL BOXES WILL AFFECT THESE DIMENSIONS.

https://truckmanualshub.com/

S7—Use with the following models: T880 (Short Hood)



Dimension B (BOS to Battery Box) = -33.2in
Dimension E (BOS to DPF/SCR) = -27.2in

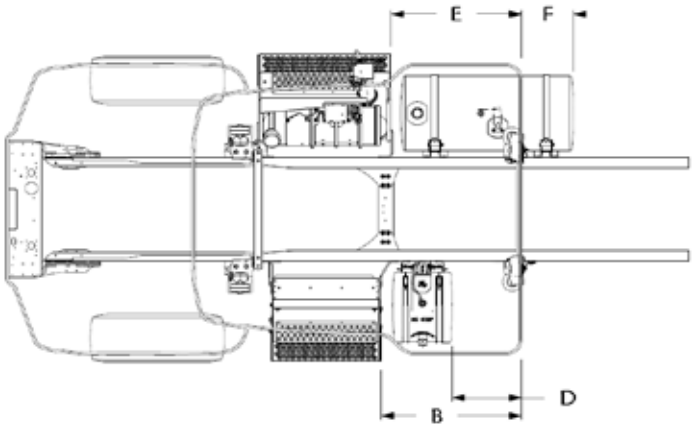
TABLE 6-28.

T880 40" Sleeper with Short Hood						
Fuel Tank Size			Dimension F BOS to Fuel Tan (in)	Dimension D (in)		
				DEF Tank Size		
Diameter	Gallons	Length (in)		Small	Medium	Large
22" Diameter Tank	56	35.6	10.6	-11.8	-4.5	33.7
	60	38.0	10.6			
	75	47.3	18.0			
	100	62.2	32.9			
	120	74.3	44.9			
24.5" Diameter Tank	60	30.6	3.0			
	75	38.5	9.0			
	90	45.5	16.0			
	100	50.0	20.5			
	110	55.0	25.5			
	120	60.6	31.0			
	135	67.2	37.7			
	150	74.5	45.0			
28.5" Diameter Tank	75	28.7	0.0			
	90	34.3	2.3			
	105	38.8	10.6			
	110	42.4	11.3			
	120	45.8	14.7			
	135	50.9	19.7			
	150	56.2	25.1			
	177	66.1	35.0			

NOTE: DIMENSIONS "B" AND "F" ARE CALCULATED USING A 34 INCH VOCATIONAL BATTERY BOX. OPTIONAL BOXES WILL AFFECT THESE DIMENSIONS.

https://truckmanualshub.com/

S8—Use with the following models: T880 (Medium Hood)



Dimension B (BOS to Battery Box) = -33.2in
Dimension E (BOS to DPF/SCR) = -29.9in

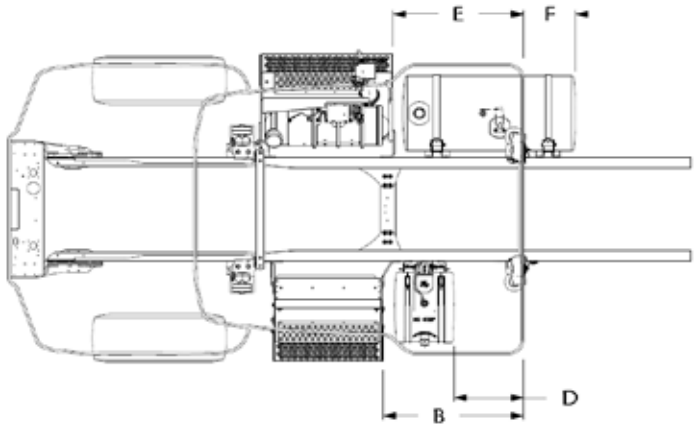
TABLE 6-29.

T880 40" Sleeper with Medium Hood						
Fuel Tank Size			Dimension F BOS to Fuel Tank (in)	Dimension D (in)		
				DEF Tank Size		
Diameter	Gallons	Length (in)		Small	Medium	Large
22" Diameter Tank	56	35.6	10.6	-17.6*	-10.2*	33.6
	60	38.0	10.6			
	75	47.3	19.9			
	100	62.2	34.8			
	120	74.3	46.8			
24.5" Diameter Tank	60	30.6	3.2			
	75	38.5	11.2			
	90	45.5	18.2			
	100	50.0	22.6			
	110	55.0	27.6			
	120	60.6	33.2			
	135	67.2	39.9			
	150	74.5	47.2			
28.5" Diameter Tank	75	28.7	1.4			
	90	34.3	10.6			
	105	38.8	11.4			
	110	42.4	15.0			
	120	45.8	18.4			
	135	50.9	23.4			
	150	56.2	28.8			
	177	66.1	38.7			

NOTE: DIMENSIONS "B" AND "F" ARE CALCULATED USING A 34 INCH VOCATIONAL BATTERY BOX. OPTIONAL BOXES WILL AFFECT THESE DIMENSIONS.
* Add 1.9 inches for Dual Side of Cab Exhaust

https://truckmanualshub.com/

S8—Use with the following models: T880 (Short Hood)



Dimension B (BOS to Battery Box) = -33.2in
Dimension E (BOS to DPF/SCR) = -27.2in

TABLE 6-30.

T880 40” Sleeper with Short Hood						
Fuel Tank Size			Dimension F BOS to Fuel Tank (in)	Dimension D (in)		
				DEF Tank Size		
Diameter	Gallons	Length (in)		Small	Medium	Large
22” Diameter Tank	56	35.6	10.6	-17.6*	-10.2*	33.6
	60	38.0	13.3			
	75	47.3	22.6			
	100	62.2	37.5			
	120	74.3	49.5			
24.5” Diameter Tank	60	30.6	5.9			
	75	38.5	13.9			
	90	45.5	20.9			
	100	50.0	25.3			
	110	55.0	30.3			
	120	60.6	35.9			
	135	67.2	42.6			
	150	74.5	49.9			
28.5” Diameter Tank	75	28.7	10.6			
	90	34.3	10.6			
	105	38.8	14.1			
	110	42.4	17.7			
	120	45.8	21.1			
	135	50.9	26.1			
	150	56.2	31.5			
	177	66.1	41.4			

NOTE: DIMENSIONS “B” AND “F” ARE CALCULATED USING A 34 INCH VOCATIONAL BATTERY BOX. OPTIONAL BOXES WILL AFFECT THESE DIMENSIONS.
* Add 1.9 inches for Dual Side of Cab Exhaust

https://truckmanualshub.com/

This page intentionally left blank.

https://truckmanualshub.com/

FRAME INFORMATION

Frame information provided is per rail, some specifications are written for RBM requirements per pair of rails. Make sure to know the requirement before deciding on the frame rail.

TABLE 7-1. Single Steel Rails

Rail Height		Flange Width		Web Thickness	Section Modulus (in^3)	RBM (in lbs)	Weight (lbs/in)
H		W		T	S	R	W
10 - 5/8”	x	3 -1/2”	x	5/16”	14.80	1,776,000	2.90
10 - 3/4”	x	3 -1/2”	x	3/8”	17.80	2,132,000	3.46
10 -11/16”	x	3 -1/2”	x	1/2”	22.35	2,683,000	4.53
11- 5/8”	x	3 -7/8”	x	3/8”	21.43	2,572,000	3.80

TABLE 7-2. Inserted Steel Rails

Rail Height	Insert Material	Section Modulus	RBM (in lbs)	Weight (lbs/in)
10 - 5/8”	Single 9-7/8”x 2-7/8” x 1/4”	24.37	2,925,000	4.96
10 - 3/4”	Single 9-7/8”x 2-7/8” x 1/4”	27.33	3,280,000	5.53
11- 5/8”	Single 10-3/4” x 3-1/2” x 1/4”	39.20	4,704,000	7.28
11- 5/8”	Double (one 10-3/4” x 3-1/2” x 1/4” and one 9-7/8”x 2-7/8” x 1/4”)	48.77	5,853,000	9.33

https://truckmanualshub.com/

CRITICAL CLEARANCES

Rear Wheels and Cab

CAUTION:

Insufficient clearance between rear tires and body structure could cause damage to the body during suspension movement. Allow at least 8 inches clearance (See Figure 6–5.)

Normal suspension movement could cause contact between the tires and the body. To prevent this, mount the body so that the minimum clearance between the top of the tire and the bottom of the body is 8 inches (203 mm). This should be measured with the body empty. See Figure 6–1.

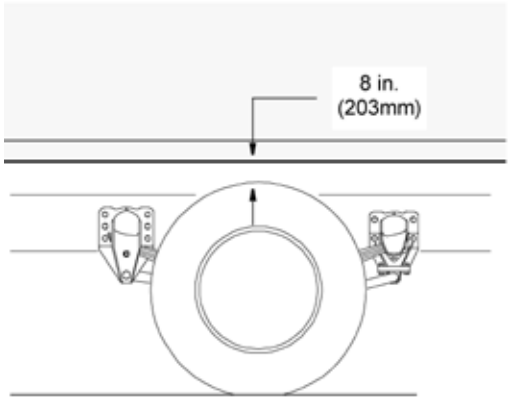


FIGURE 7-1. Minimum Clearance Between Top Of Rear Tires And Body Structure Overhang.

CAUTION:

Maintain adequate clearance between back of cab and the front (leading edge) of mounted body. See Figure 6–2.

Note:

Be sure to provide maintenance access to battery box and fuel tank fill neck.

https://truckmanualshub.com/

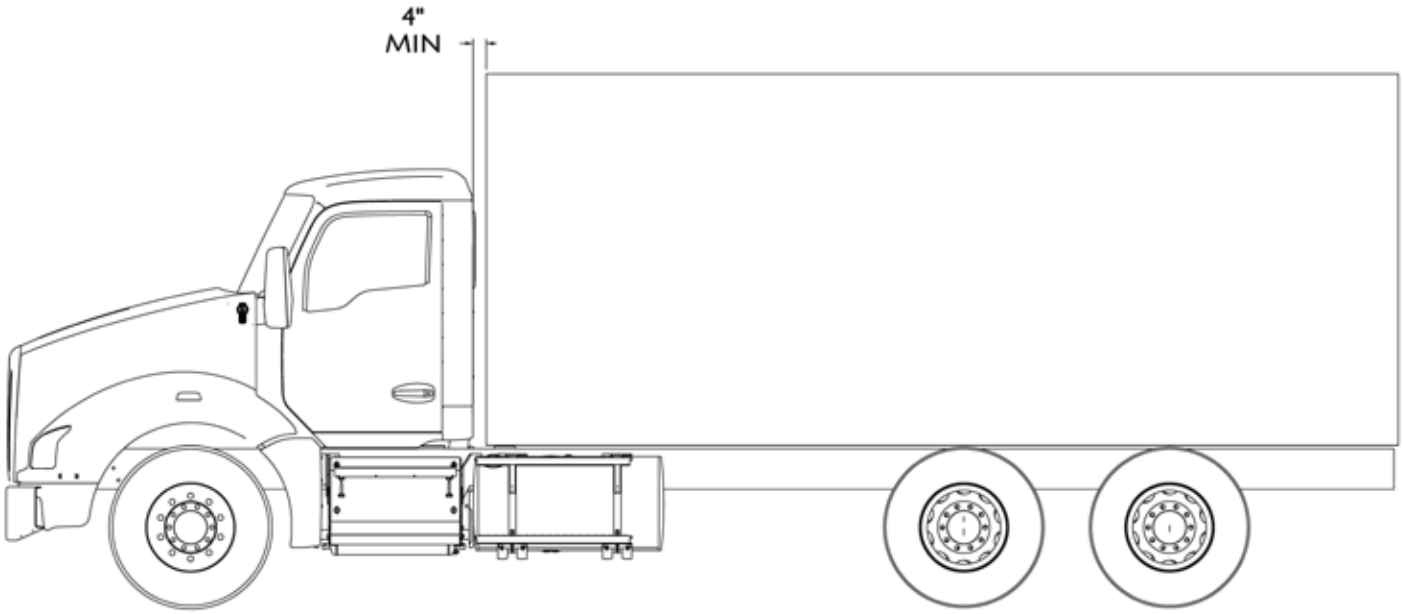


FIGURE 7-2. Minimum Back of Cab Clearance

WARNING:

If the frame rail flanges are modified or damaged, the rail could fail prematurely and cause an accident. When mounting a body to the chassis, DO NOT drill holes in the upper or lower flange of the frame rail. Mount the body using body mounting brackets or U–bolts.

BODY MOUNTING USING BRACKETS

CAUTION:

Always install a spacer between the body subframe and the top flange of the frame rail. Failure to do so could result in corrosion due to dissimilar materials.

Installation of a spacer between the body subframe and the top flange of the frame rail will help prevent premature wear of the components due to chafing or corrosion.

https://truckmanualshub.com/

Frame Sill

If the body is mounted to the frame with brackets, we recommend that the frame sill spacer be made from a strip of rubber or plastic (delrin or nylon). These materials will not undergo large dimensional changes during periods of high or low humidity. The strip will be less likely to fall out during extreme relative motion between body and chassis. See Figure 6–3.

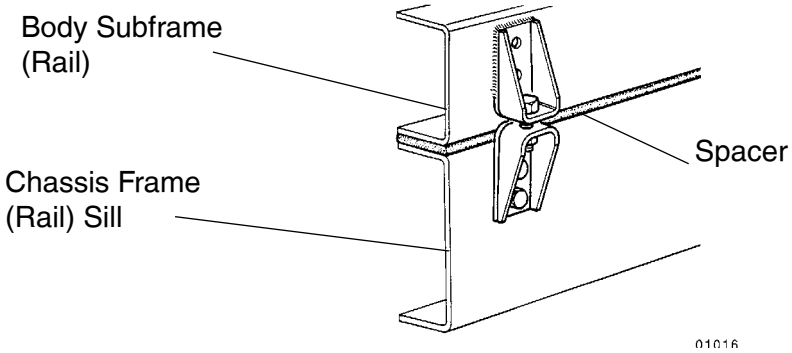


FIGURE 7-3. Spacer Between Frame Sill and Body Rail - Rubber or Plastic

Brackets

When mounting a body to the chassis with brackets, we recommend designs that offer limited amount of relative movement, bolted securely but not too rigid. Brackets should allow for slight movement between the body and the chassis. For instance, Figure 6–4 shows a high compression spring between the bolt and the bracket.

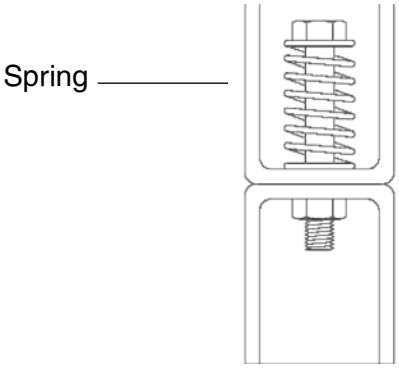


FIGURE 7-4. High Compression Spring Between the Mounting Bolt and Upper Bracket

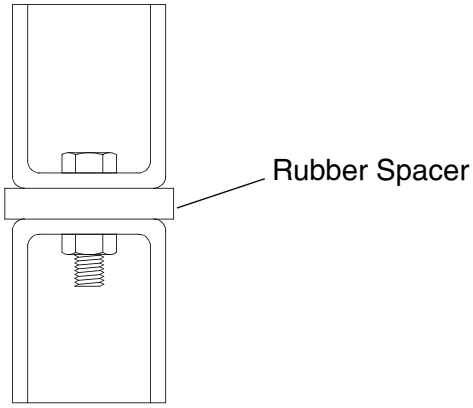


FIGURE 7-5. Rubber Spacer Between Brackets

Another possibility is mounting a rubber spacer between the brackets. See Figure 6–5.

These designs will allow relative movement between the body and the chassis during extreme frame racking situations. Extreme frame racking, and mountings that are too rigid, could cause damage to the body. This is particularly true with tanker installations.

https://truckmanualshub.com/

MOUNTING HOLES

When installing the lower bracket on frame rails the mounting holes in the chassis frame bracket and frame rail must comply with the general spacing and location guidelines illustrated in Figure 6–6. The hole diameter should not exceed the bolt diameter by more than .060 inches (1.5 mm).

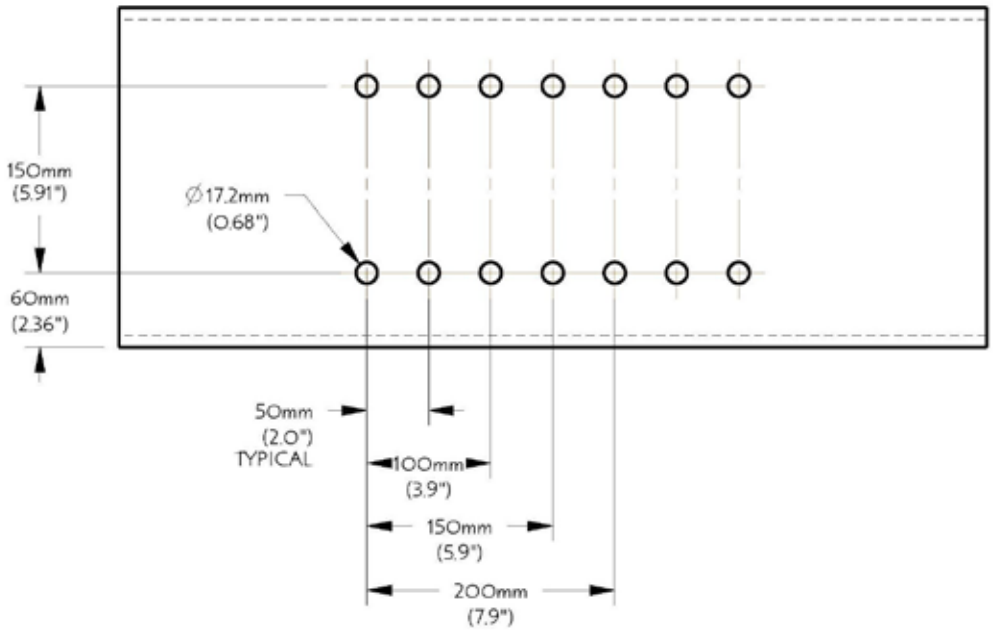


FIGURE 7-6. Crossmember-Gusset Hole Pattern Requirements. [inch (mm)]

Frame Drilling



WARNING:

When mounting a body to the chassis, DO NOT drill holes in the upper or lower flange of the frame rail. If the frame rail flanges are modified or damaged, the rail could fail prematurely and cause an accident. Mount the body using body mounting brackets or U–bolts.

CAUTION:

Use care when drilling the frame web so the wires and air lines routed inside the rail are not damaged, Failure to do so could cause an inoperable electrical or air system circuit.

WARNING:

Do not drill closely spaced holes in the frame rail. Hole centers of two adjacent holes should be spaced no less than twice the diameter of the largest hole. Closer spacing could induce a failure between the holes.

https://truckmanualshub.com/

BODY MOUNTING USING U–BOLTS

Spacers

If the body is mounted to the frame with U–bolts, use a hardwood sill (minimum 1/2 inch (12 mm) thick) between the frame rail and body frame to protect the top surface of the rail flange.

WARNING:

Do not allow the frame rails or flanges to deform when tightening the U–bolts. It will weaken the frame and could cause an accident. Use suitable spacers made of steel or hardwood on the inside of the frame rail to prevent collapse of the frame flanges.

Use a hardwood spacer between the bottom flange and the U–bolt to prevent the U–bolt from notching the frame flange. See Figure 6–7.

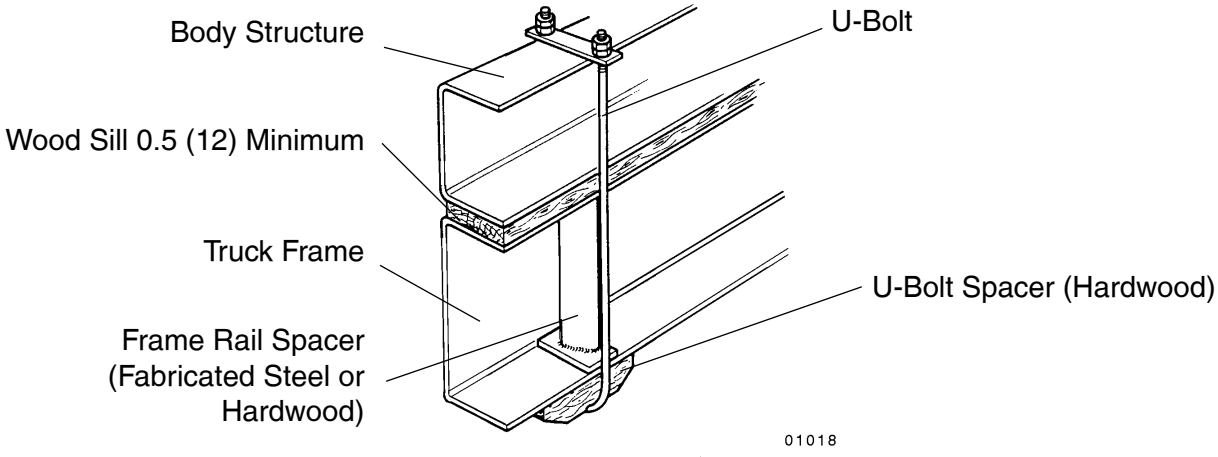


FIGURE 7-7. Acceptable U-Bolt Mounting with Wood and Fabricated Spacers [inch (mm)]

WARNING:

Do not allow spacers and other body mounting parts to interfere with brake lines, fuel lines, or wiring harnesses routed inside the frame rail. Crimped or damaged brake lines, fuel lines, or wiring could result in loss of braking, fuel leaks, electrical overload or a fire. Carefully inspect the installation to ensure adequate clearances for air brake lines, fuel lines, and wiring. See Figure 6–8.

CAUTION:

Mount U–bolts so they do not chafe on frame rail. Failure to do so could result in premature wear of the U-bolt or frame rail.

https://truckmanualshub.com/

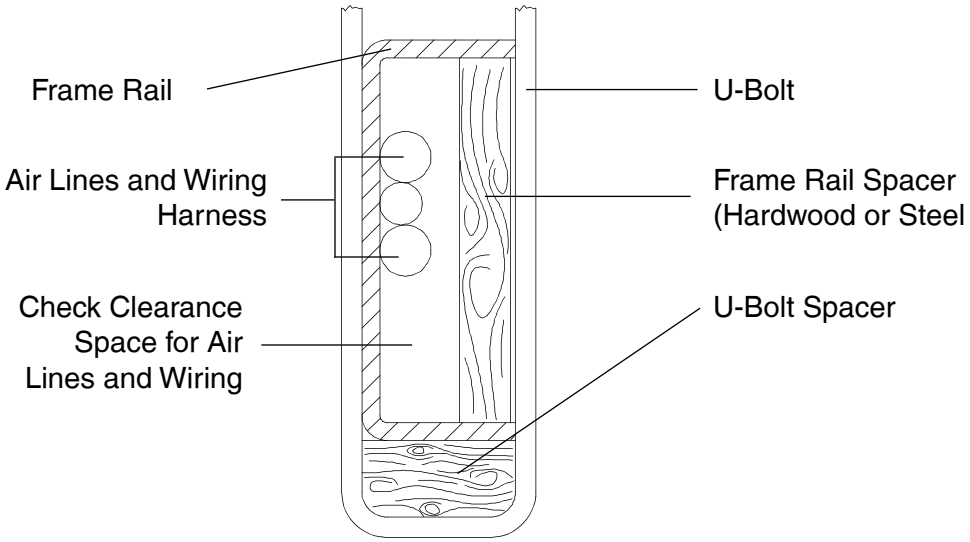
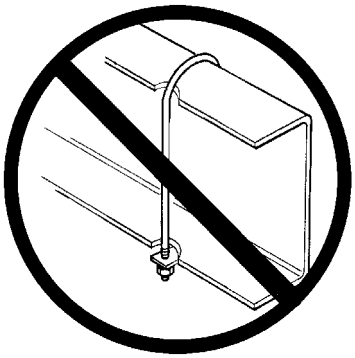


FIGURE 7-8. Clearance Space for Air Lines and Cables

WARNING:

Do not notch frame rail flanges to force a U–bolt fit. Notched or damaged frame flanges could result in premature frame failure. Use a larger size U–bolt. Use a hardwood spacer as shown in Figure 7-7.



https://truckmanualshub.com/

Rear Body Mount

When U–bolts are used to mount a body we recommend that the last body attachment be made with a “fishplate” bracket. See Figure 6–9. This provides a firm attaching point and helps prevent any relative fore or aft movement between the body and frame.

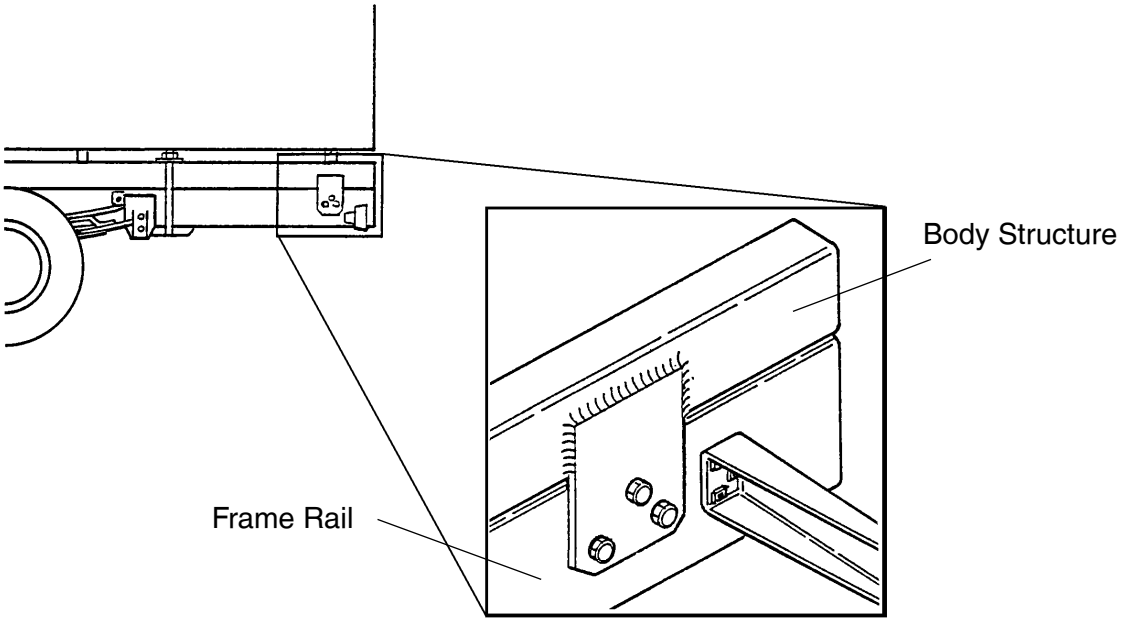


FIGURE 7-9. Example of Fishplate Bracket at Rear End of Body, used with U-Bolts

https://truckmanualshub.com/

FRAME MODIFICATIONS

Introduction

Kenworth offers customer specified wheelbases. So, in most cases frame modifications to produce a certain wheelbase should not be necessary.

However, some installations may require slight modifications, while other installations will require extensive modifications. Sometimes an existing dealer stock chassis may need to have the wheelbase changed to better fit a customer's application. The modifications may be as simple as shortening or lengthening the frame cutoff, or they may be as complex as changing the wheelbase.

DRILLING RAILS

Location and Hole Pattern

If holes need to be drilled to attach anything to the rail, see SECTION 6 "BODY MOUNTING" for more information. Follow the general spacing and hole location guidelines on Page 6–5, Figure 6–6.

WARNING!

When mounting a body to the chassis, DO NOT drill holes in the upper or lower flange of the frame rail. If the frame rail flanges are modified or damaged, the rail could fail prematurely and cause an accident. Mount the body using body mounting brackets or U–bolts.



WARNING!

Do not drill closely spare holes in the web of the frame. Hole centers of two adjacent holes should be spaced no less than twice the diameter of the largest hole. Closer spacing could induce a failure between the holes.

CAUTION:

An appropriately sized bolt and nut must be installed and torqued properly in all unused frame holes. Failure to do so could result in frame crack initiation around the hole.

CAUTION:

Use care when drilling the frame web so the wires and air lines routed inside the rail are not damaged, Failure to do so could cause an inoperable electrical or air system circuit.

CAUTION:

Never use a torch to make holes in the rail. Use the appropriate diameter drill bit. Heat from a torch will affect the material properties of the frame rail and could result in frame rail cracks.

CAUTION:

Hole diameter should not exceed the bolt diameter by more than .060 inches (1.5 mm). Oversized holes could result in excessive frame wear around the hole.

https://truckmanualshub.com/

MODIFYING FRAME LENGTH

The frame cutoff after the rear axle can be shortened to match a particular body length. Using a torch is acceptable; however, heat from a torch will affect the material characteristics of the frame rail. The affected material will normally be confined to within 1 to 2 inches (25 to 50 mm) of the flame cut and may not adversely affect the strength of the chassis or body installation.

The frame cutoff can be lengthened by adding frame extenders.

When extending 10.5” frame rails, the additional sections can be welded to the existing rails. The joint should be welded and reinforced as illustrated in Figure 7–1.

Note:

See page 8-6 for more information on welding frames.

Frame Insert

A frame insert must be added after welding a frame rail extension to compensate for lost strength. The insert should be of the same material as the frame member, or of steel, and at least equal to the frame rail in thickness. Attachment of the insert to the frame should be made with Ream-Fit heat-treated bolts, 5/8 in. (16 mm) dia. or the next larger size. Both the reinforcement and frame holes should be reamed to provide a fit of from .001 in. to .003 in. (.025 to .076 mm) clearance. Do not weld reinforcing members. The insert should span a distance of at least 24 in. (610 mm) on either side of the joint to insure an even distribution of stresses. Cut the ends of the insert at 45° as shown in Figure 7–2 unless the insert extends to the end of the frame.

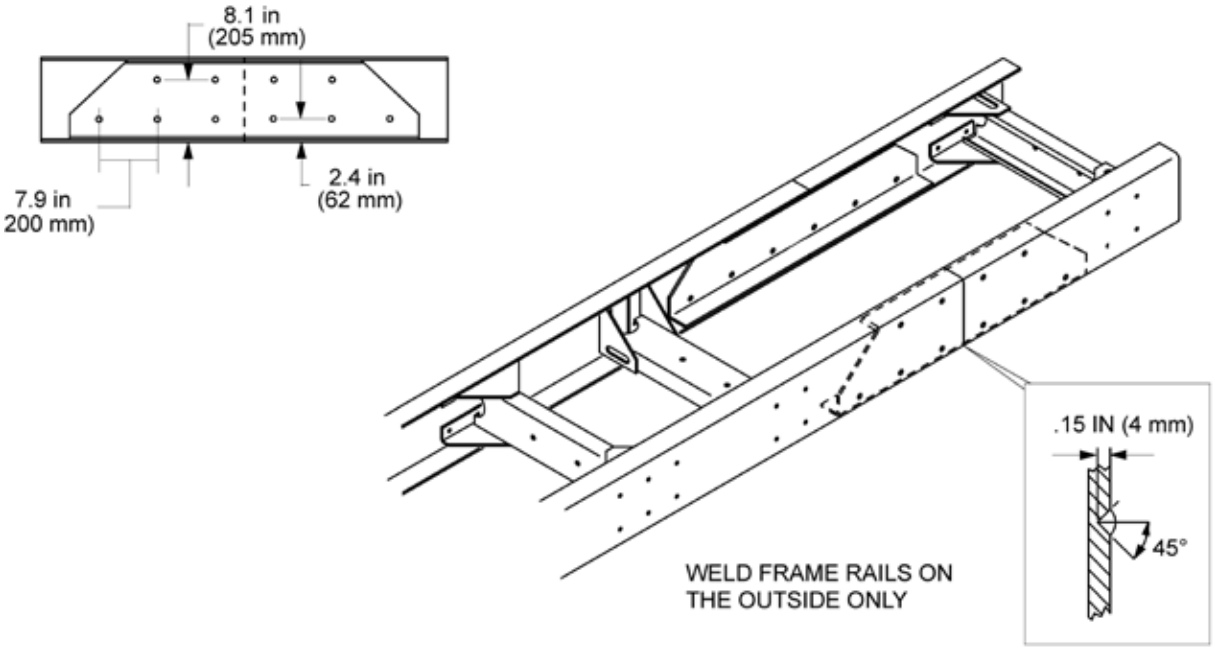


FIGURE 8-1. Detail of Frame Extension and Joint Welding

https://truckmanualshub.com/

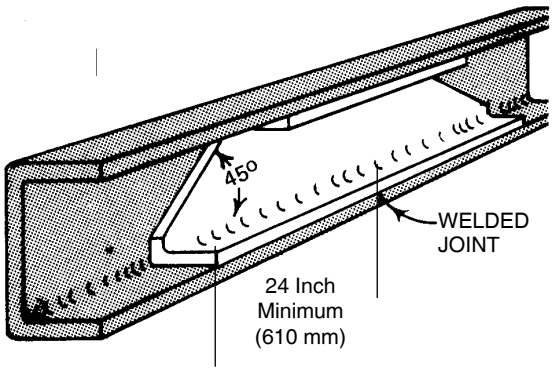


FIGURE 8-2. Frame Insert

Where possible, use existing bolt holes to attach the insert to the frame. Bolt holes must not be located closer to the frame flanges than the present bolt pattern.

If the insert is placed in a section of the main frame where few bolts are located, additional bolts are required. Use the following guideline for locating additional bolt holes.

CHANGING WHEELBASE

We do not recommend modifying the wheelbase. Occasionally, however, a chassis wheelbase will need to be reduced or lengthened. When this needs to be done there are a few guidelines that should to be considered.

WARNING!

When changing the wheelbase, be sure to follow the driveline manufacturer's recommendations for driveline length or angle changes. Incorrectly modified drivelines can fail prematurely due to excessive vibration.

Before changing the wheelbase the driveline angles of the proposed wheelbase need to be examined to ensure that no harmful vibrations are created. Consult the driveline manufacturer for appropriate recommendations.

WARNING!

When changing the wheelbase, a continuous blank frame insert/outsert must be added in the area of the new rear suspension mounting bolts. All new mounting holes must pass through the original rail and the insert/outsert. Failure to do so could cause excessive stress in the original rail due to additional holes.

Before the rear suspension is relocated, check the new location of the spring hanger brackets. The new holes for the spring hanger brackets must not overlap existing holes and should not come any closer than 2 inches (50 mm) to existing holes in the frame.

WARNING!

When relocating a suspension bracket, do not mount it on the extended (added) section of a frame rail. The suspension loading could result in premature failure of the added section splice. This could cause an accident. Use care when planning the wheelbase so that the rear suspension bracket is always mounted on the original rail section. See Figure 7–3.

https://truckmanualshub.com/

When reducing the wheelbase, we recommend that the suspension be moved forward and relocated on the original rail. The rail behind the suspension can then be cut to achieve the desired frame cutoff. See Figure 7–3.

WARNING! **Do not drill new holes any closer than 2 inches (50 mm) to existing holes. Frame drilling affects the strength of the rails.**

Before the rear suspension is relocated, check the new location of the spring hanger brackets. The new holes for the spring hanger brackets must not overlap existing holes and should not come any closer than 2 inches (50 mm) to existing holes.

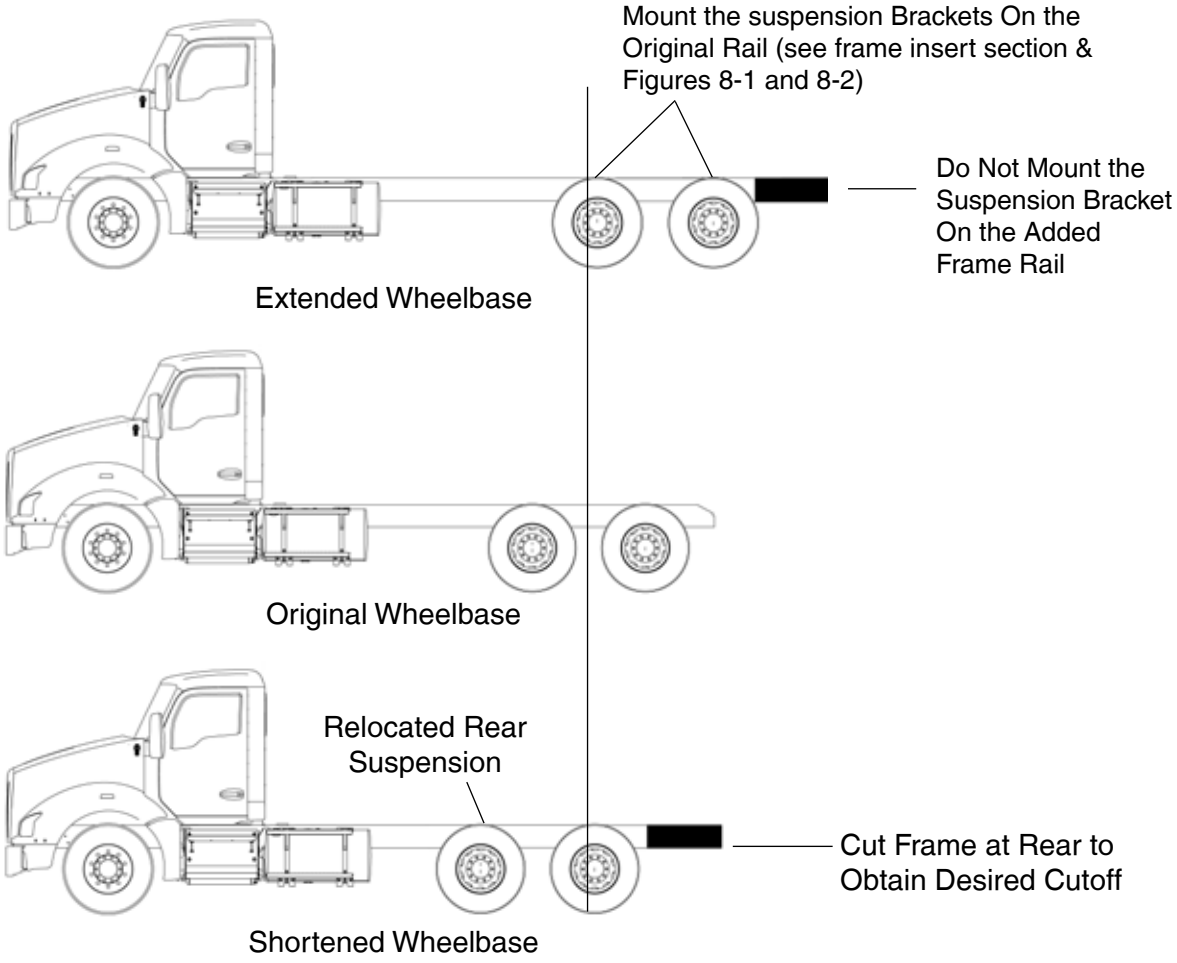
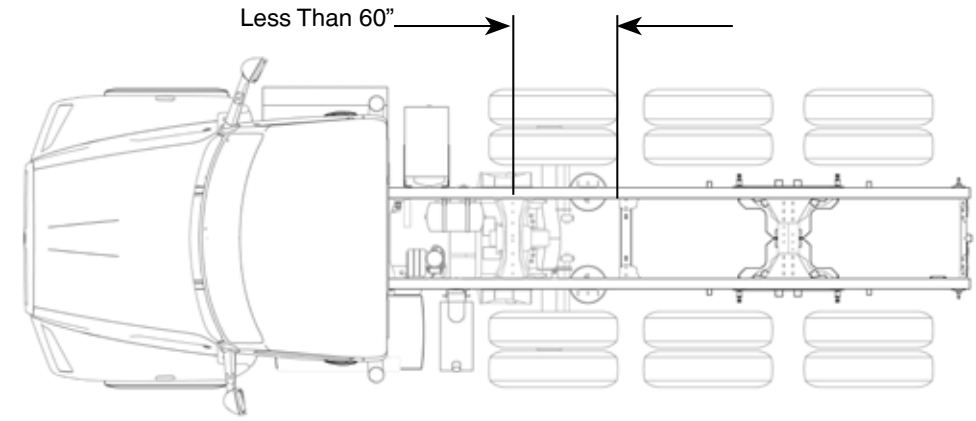


FIGURE 8-3. Comparison of Original, Shortened, and Extended Wheelbases.

https://truckmanualshub.com/

CROSSMEMBERS

After changing a wheelbase, an additional crossmember may be required to maintain the original frame strength. The maximum allowable distance between adjacent crossmembers is 60 inches (1524 mm). If the distance between adjacent crossmembers exceeds this dimension, add a crossmember between them. See Figure 7–4.



Before Wheelbase is Lengthened

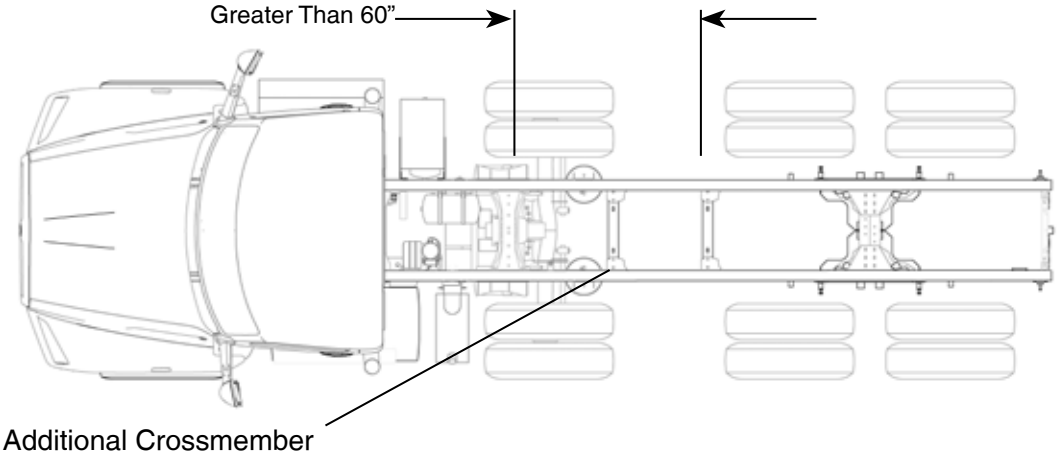


FIGURE 8-4. Crossmember Added When Distance Exceeds 60 Inches (1524 mm)

https://truckmanualshub.com/

WELDING

Kenworth DOES NOT recommend frame welding. The high heat of welding nullifies the special heat treatment of the rails, greatly reducing the tensile strength of the frame rail. If a frame member becomes cracked from overloading, fatigue, surface damage or a collision, the only permanent repair is to replace the damaged frame member with a new part.

The following information is provided (for temporary emergency repair). Prior to welding a cracked frame rail, the area should be beveled (V'd out) to allow for a better weld. To prevent spreading of the crack, a 7 to 9 mm (1/4 in. to 3/8 in.) dia. hole should be drilled at the end of the crack. Widen the crack along its full length by using two hack saw blades together. When welding steel frames use the shielded arc method. When welding aluminum frames use either the tungsten inert gas (TIG) or consumable electrode method. Be sure to obtain full weld penetration along the entire length of the crack.

Precautions

CAUTION:

Before welding, disconnect the negative terminal battery cable.

CAUTION:

Before welding, disconnect the alternator terminals. Failure to do so could result in damage to the voltage regulator and/or alternator.

CAUTION:

To prevent damage to electrical equipment, disconnect battery cables before arc-welding on a truck, and be sure that the welding ground lead is connected to the frame. Bearings and other parts will be damaged if current must pass through them in order to complete the circuit.

Welding Precautions: All Electronic Engines

Before welding on vehicles with electronic engines, the following precautions should be observed.

1. Disconnect all electrical connections to the vehicle batteries.
2. Disconnect all ECM connectors.
3. Do no use the ECM or engine ground stud for the ground of the welding probe.
4. Ensure that the ground connection for the welder is as close to the weld point as possible. This ensures maximum weld current and minimum risk to damage electrical components on the vehicle.
5. Turn off key.

Note:

Bosch ABS and Wabco ABS: Disconnect ECU.

https://truckmanualshub.com/

TORQUE REQUIREMENTS

TABLE 8-1. Customary Grade 8 UNF or UNC.

Fastener	Torque	
Size	Nm	Lb.-Ft
5/16	22–30	16–22
3/8	41–54	30–40
7/16	75–88	55–65
1/2	109–122	80–90
9/16	156–190	115-140
5/8	224–265	165–195
3/4	394–462	290–340
7/8	517–626	380–460
1	952–1129	800–830
1-1/8	1346–1591	990–1170
1-1/4	1877–2217	1380–1630

Torque values apply to fasteners with clean threads, lightly libricated, with hardened steel washers, and nylon-insert nuts.

TABLE 8-2. U.S. Customary – Grade 8. Metric Class 10.9

	Torque	
Fastener	Nm	Lb-Ft
M6	9–15	7–11
M8	23–31	17–23
M10	33–43	24–32
M12	75–101	55–75
M14	134–164	99–121
M16	163–217	120–160
M20	352–460	260–340

https://truckmanualshub.com/

This page intentionally left blank.

https://truckmanualshub.com/

ELECTRICAL

This section is written to provide information to the body builder when installing equipment into vehicles built with Multiplexed instrumentation. The new technology presented by NAMUX 4 level instrumentation integrates J-1939 CAN data communications to various equipment on the vehicle. This book is intended to address how to work in aftermarket equipment while still maintaining full functionality of the OEM vehicle.

The most important advancement of NAMUX 4 instrumentation is the implementation of the Cab ECU controlling air operated aftermarket devices. While it is still possible to wire completely outside of the Cab ECU system, utilizing the CECU functions will make a cleaner installation and will maintain OEM functionality. NAMUX 4 expands controls to air operated devices by receiving input from dash switches, remote (aftermarket) switches, sensors mounted to the aftermarket equipment and other vehicle parameters (engine speed, transmission status etc.) With the proper programming, the CECU will then process the inputs and will create a J-1939 Data instruction which is communicated to another controller outside the cab called the Chassis Node. This chassis node receives the instruction and connects 12V power to an air solenoid. 12V power will open the solenoid and supply air pressure to that air circuit.

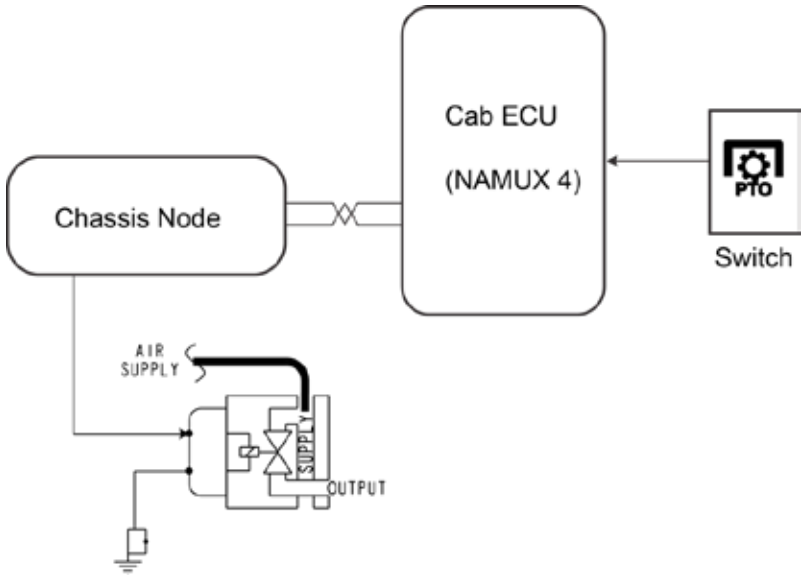


FIGURE 9-1. NAMUX 4 System Diagram

In addition to NAMUX 4 technology, the vehicle electrical harness has been redesigned to minimize weight and reduce various connectors (which have been proven to increase the opportunity for electrical malfunctions which also increase the amount of time to troubleshoot). What this means for the aftermarket installer is that there is a limitation to modifying a vehicle with aftermarket equipment if the vehicle was not originally specified for those options from the factory. To the aftermarket installer, more time will be spent installing pins and routing wires instead of simply installing jumper harnesses if the vehicle was not specified with 'customer installed' equipment from the factory. For example, vehicles ordered with a 'customer installed' PTO will have connectors on the vehicle for aftermarket connectors. A vehicle specified with standard radio will not have a pigtail for premium sound speakers.

https://truckmanualshub.com/

For Model Year 2017 (Calendar Year 2016) engines, Kenworth utilizes a faster connection for diagnostics. Before this timeframe, a 250 kbps baudrate was utilized with a black Type 1 diagnostics connector. After this timeframe, U.S. and Canadian market chassis (not export engines or natural gas engines) will utilize a new green Type 2 connector at 500 kbps baudrate. This new connection will utilize the faster connection specifically for OBD CAN diagnostics on the C and D terminals, while still broadcasting the Vehicle CAN on the F and G terminals (see figure below for comparison). In order to connect properly, a "Y" adapter cable is required to connect various service tools (DAVIE, ESA, Eaton ServiceRanger, Allison DOC, Wabco Toolbox). On the "Y" adapter, both green (new) and black (old) connections are provided to allow compatibility with 2016 and later as well as pre-2016 chassis without the need to remove the adapter.

2016+



Pin	Circuit Assignment
A	Ground
B	+12V
C	J1939 @ 500 kbps (OBD CAN)
D	
E	Not Connected
F	J1939 @ 250 kbps (Vehicle CAN)
G	
H	CAN_H @ 250 kbps or Spare
J	CAN_L @ 250 kbps or ISO9141 K-Line

Before 2016



- Export Trucks
- Natural Gas

Pin	Circuit Assignment
A	Ground
B	+12V
C	J1939 @ 250 kbps (Vehicle CAN)
D	
E	Not Connected
F	Not Used (J1708/J1587)
G	
H	CAN_H @ 250 kbps or Spare
J	CAN_L @ 250 kbps or ISO9141 K-Line

FIGURE 9-2. Diagnostic Connector Comparison

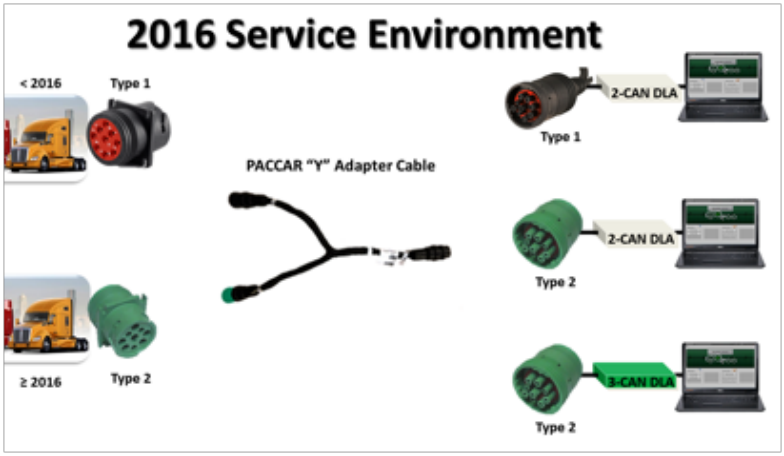


FIGURE 9-3. 2016+ Service Environment

https://truckmanualshub.com/

BODY BUILDER CONNECTION POINTS

Becoming familiar with the various connectors available to the aftermarket installer is important. This section contains reference information for the connectors that are used to add equipment.

Harness Design

The T680 and T880 are designed and manufactured with a cab harness that is chassis specific. The new design minimizes the number of connectors which improves routing, reduces electrical problems and reduces diagnostic time when servicing. The new design, however, changes the way electrical components are added to the vehicle for final use customers. The after-market installer will have several options available:

1. Ensure that the vehicle is ordered and specified with the equipment installed or at least have 'furnish by owner' provision.
2. Install electronic accessories outside of the CECU network, direct power from the power distribution center and no splicing into the cab harness.
3. Route new wires and install pins to the designated pin location on all connectors.

It is imperative that the installer never splice into a cab harness for signal or power purposes.

Remote Throttle and Remote PTO Control

The body builder will need to find the 12-pin remote throttle connector, located in the engine compartment on the engine harness. See the PTO Section for additional information

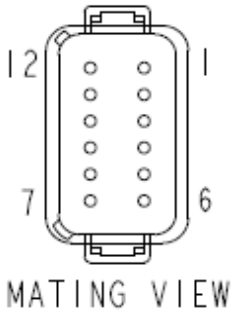


FIGURE 9-4. 12 Pin Connector

Spare Power

Spare power is located at the fuse panel (area P096 below) or connector P001.

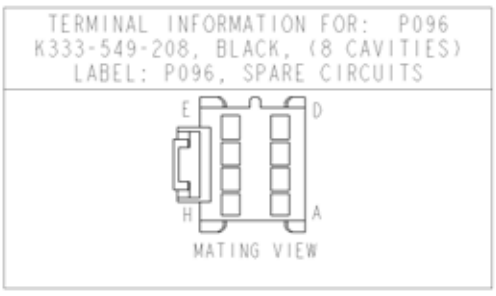


FIGURE 9-5. Spare circuit connector detail

https://truckmanualshub.com/

Grounding

Grounding any post-OEM component/device/apparatus/etc. to the metal cab structure or frame is not acceptable. Failure to properly ground add-on components can result in vehicle damage and possibly bodily injury.

Ground all post-OEM component/device/apparatus/etc. with combined current draw of less than 30A to the firewall ground buss bar with appropriately sized wire/cable for the load required.

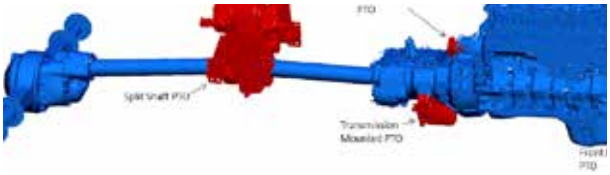


FIGURE 9-6. Grounding Buss Bar Design



FIGURE 9-7. Grounding Point - Cab Interior Behind Driver's Side Kick Panel

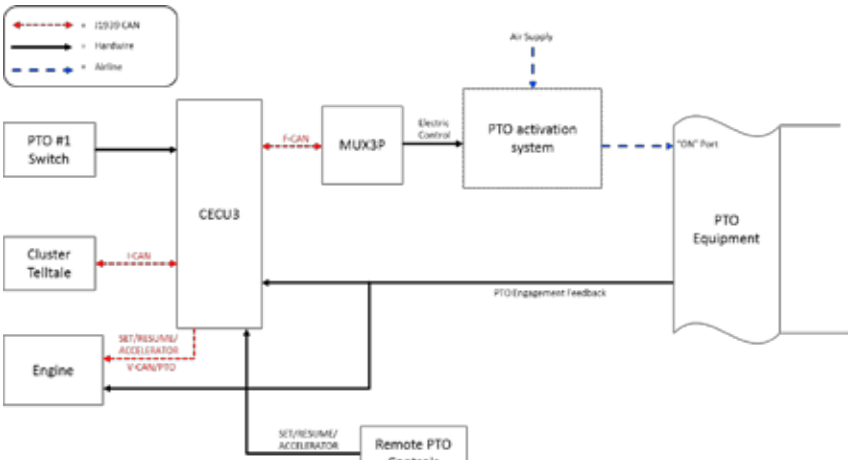


FIGURE 9-8. Grounding Point - Cab Exterior LH Side of Firewall

https://truckmanualshub.com/

Post OEM components/devices/apparatus/etc. with combined current draw in excess of 30A, ground must be attained from vehicle batteries directly with appropriately sized wire/cable for the load required.

Electrical Wire Number and Color

Kenworth will continue to use the wiring scheme that was employed on legacy trucks. The wire system uses 10 different colors and only on striped wire color. Each wire has a minimum of seven characters, with the first three characters as the wire color. The remaining four characters are related to the wire services. The colors determine the circuits function as follows:

TABLE 9-1. Wire Number General Categories

R/W	Direct Battery Power
RED	Protected Battery Power
ORG	IGN/ACC/Start Power
YEL	Activated Power
BRN	Indicator Illumination, Backlighting
BLK	Load Return
GRY	Control
VIO	Reference Voltage
BLU	Sensor Signal
GRN	Sensor common not connected to GND
WHT	Ground

https://truckmanualshub.com/

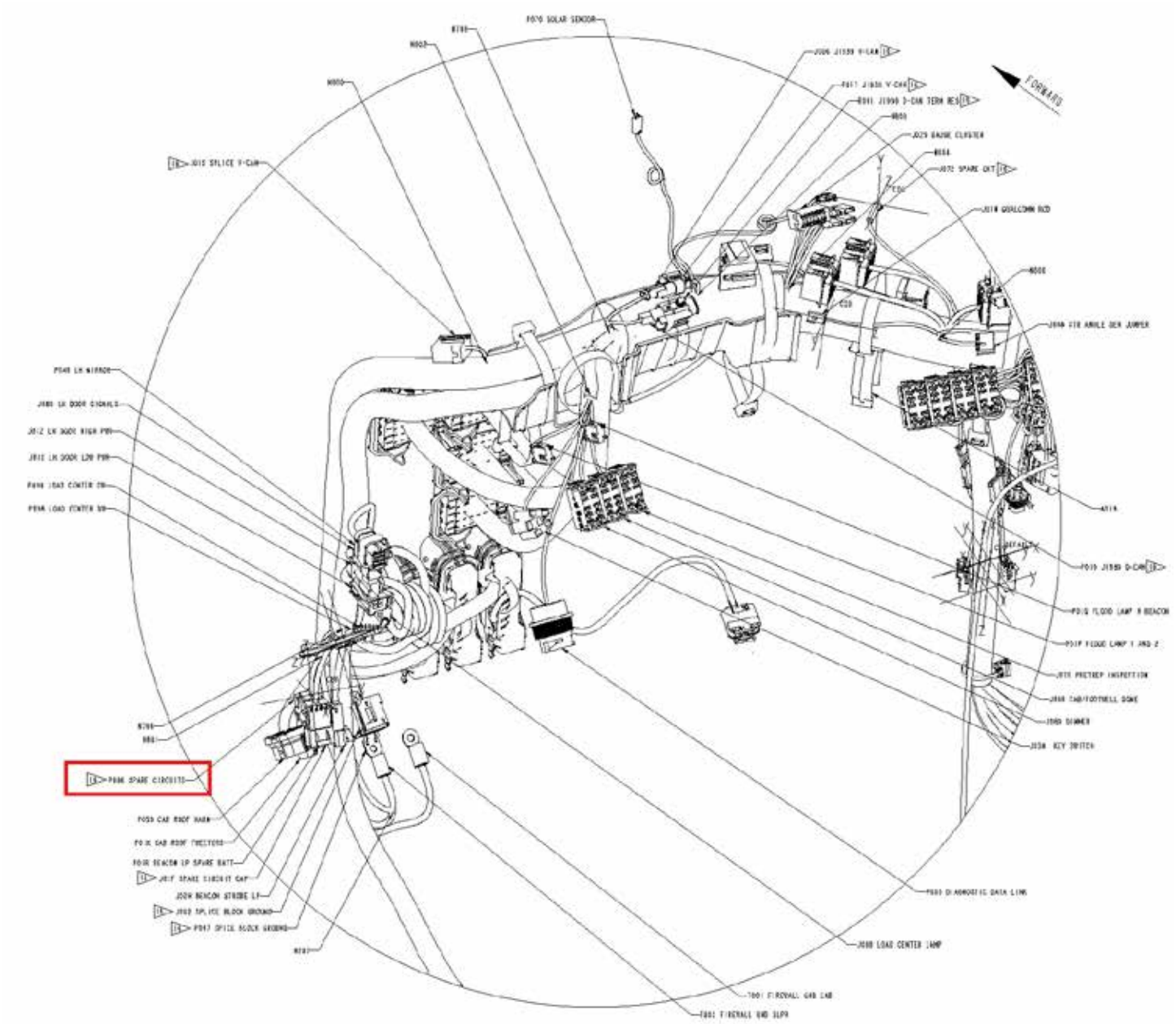


FIGURE 9-9. Spare circuit location under-dash (P096)

https://truckmanualshub.com/

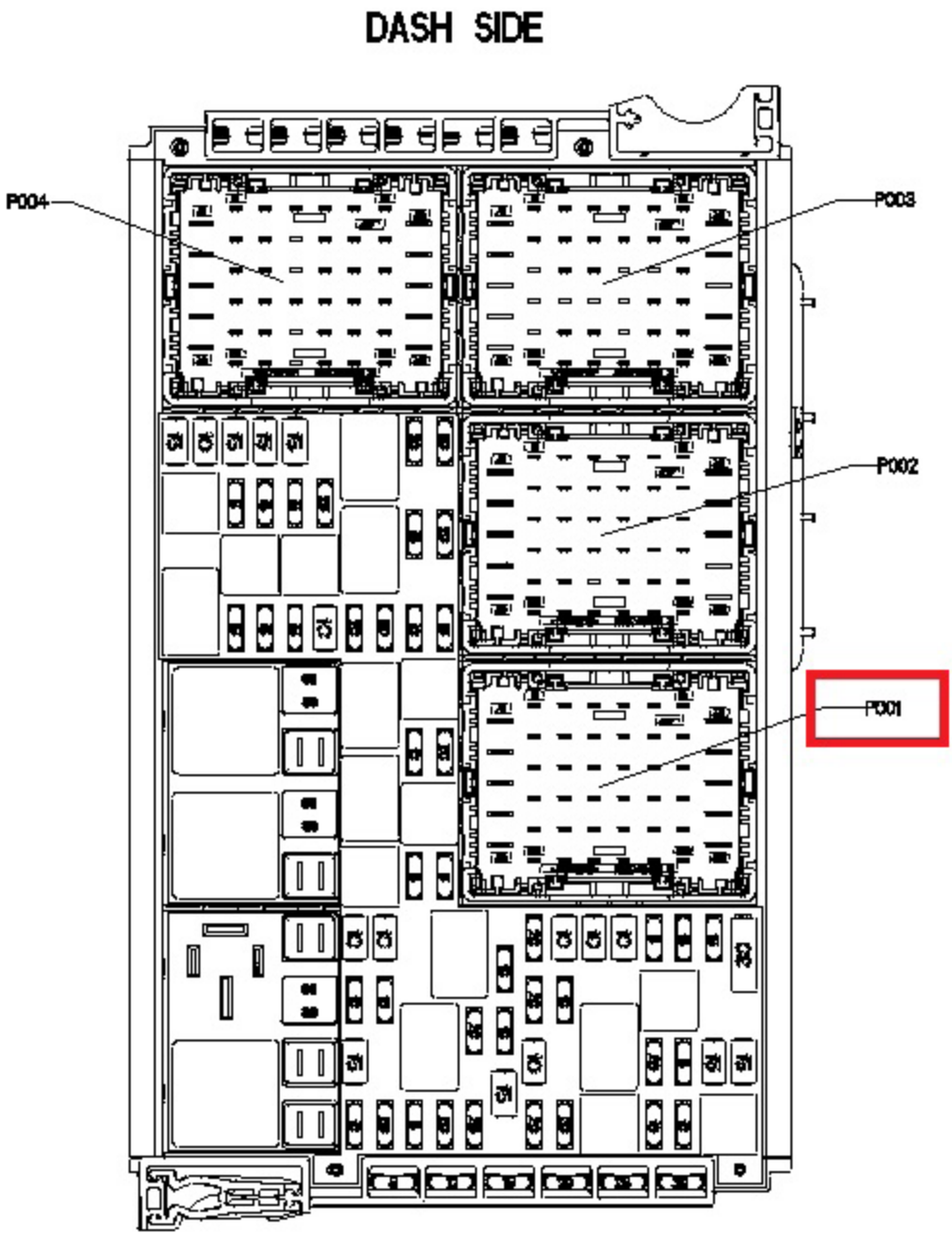


FIGURE 9-10. Spare circuit location on Power Distribution Center (Dash-Side, P001)

https://truckmanualshub.com/

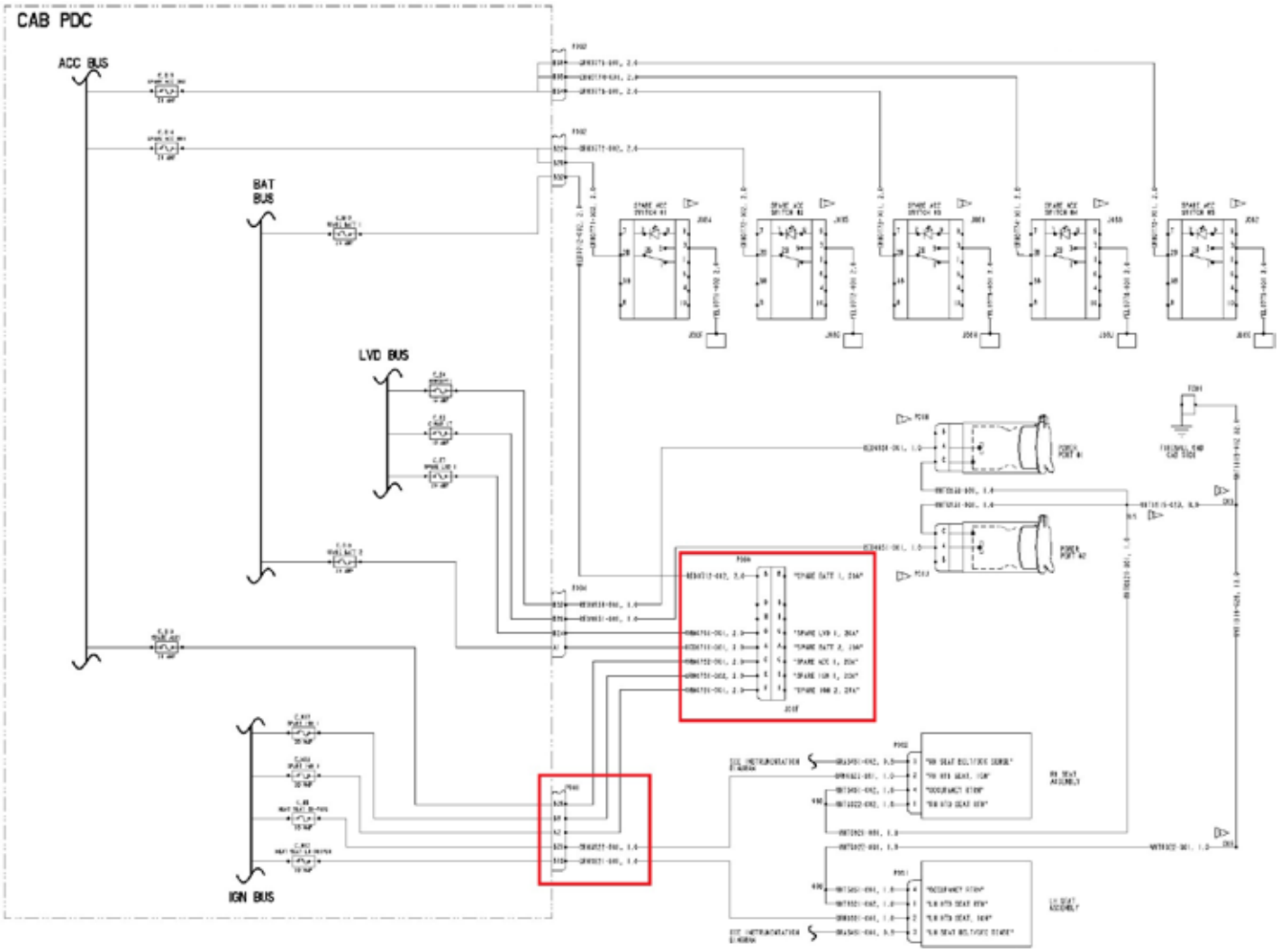


FIGURE 9-11. Spare circuit diagram (P001 and P096)

https://truckmanualshub.com/

Air Solenoid Ground

Air solenoids are grounded to connectors P157 and P185 which are located behind the overbell between the air manifold and the chassis node.

Cab Switch Backlighting

Splice blocks P010 and P011 provide power and ground for switch lighting. These are located behind the panel to the right of the steering column. In some instances, you may need to remove the instrument cluster.

Electric Engaged Equipment (Opposed to Air Operated)

At the left hand forward cab mount, P198 is available for PTO controls that are electrically engaged via 12V DC power. Located under cab.

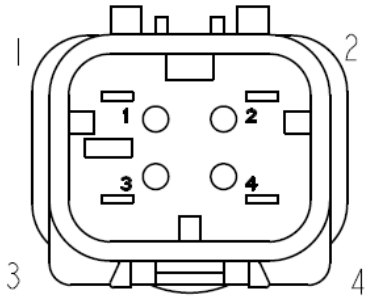


FIGURE 9-12. Electric Engaged Equipment Connector

Air Solenoid Bank and Chassis Node

The installer needs to identify where these two components are located.

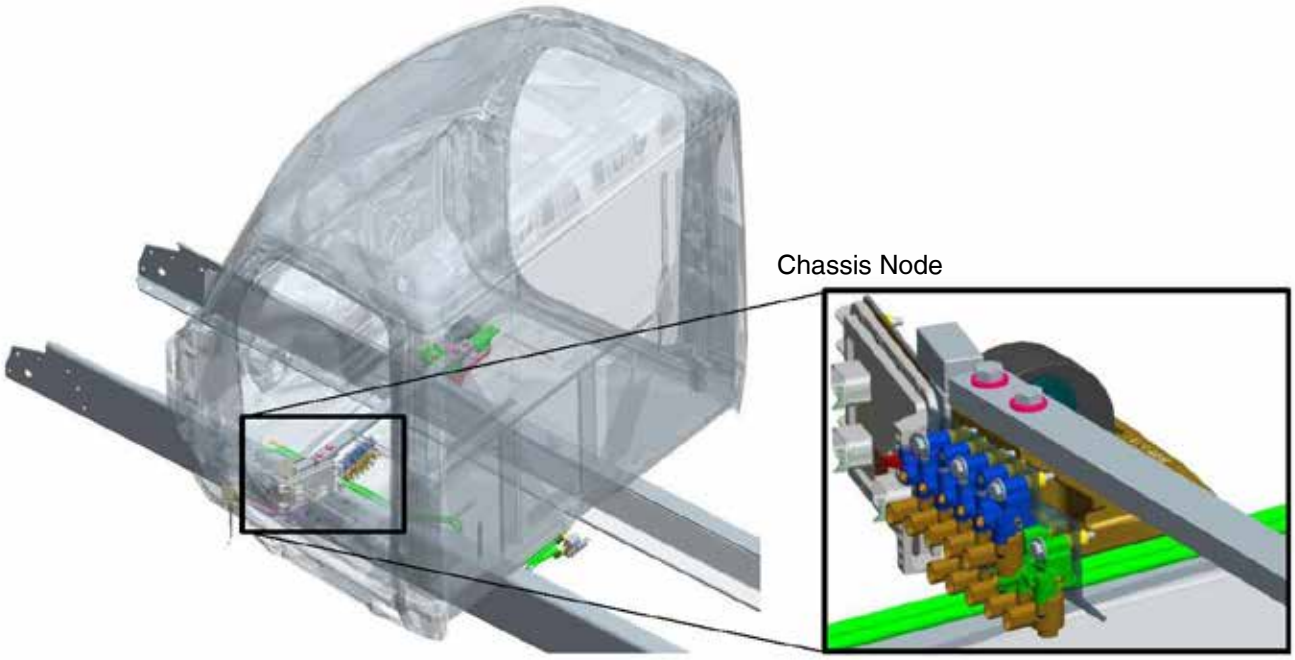


FIGURE 9-13. Air Solenoid Bank and Chassis Node

https://truckmanualshub.com/

Rear Axle Controls and Sensors

Two connectors are located on the left hand frame rail forward of the forward rear drive axle. P046 is to install axle temperature sensors and P047 is to connect differential lock mechanisms.

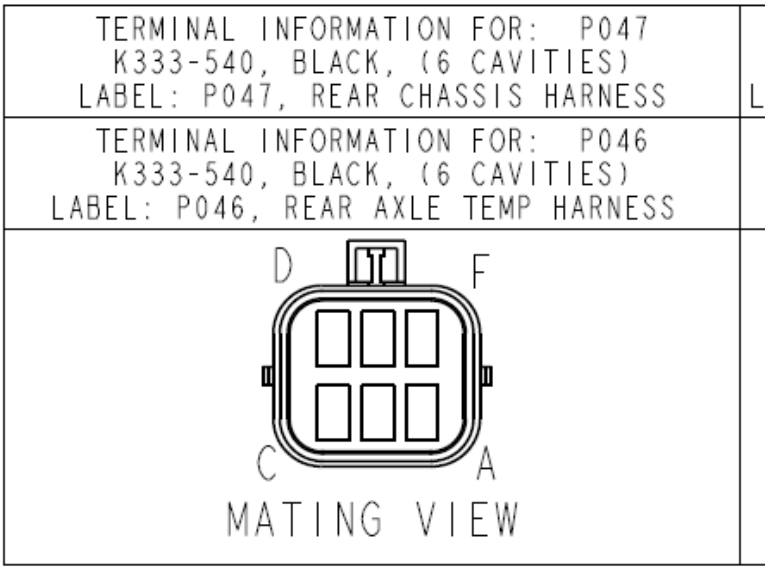


FIGURE 9-14. Rear Axle Controls and Sensors Connector

B-CAN Interface

One connector is located at the EOF for the BCAN interface.

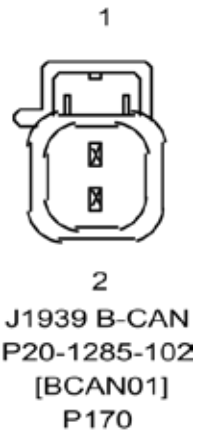


FIGURE 9-15. B-CAN Connector

https://truckmanualshub.com/

Location Diagrams for Various Connectors on the Frame

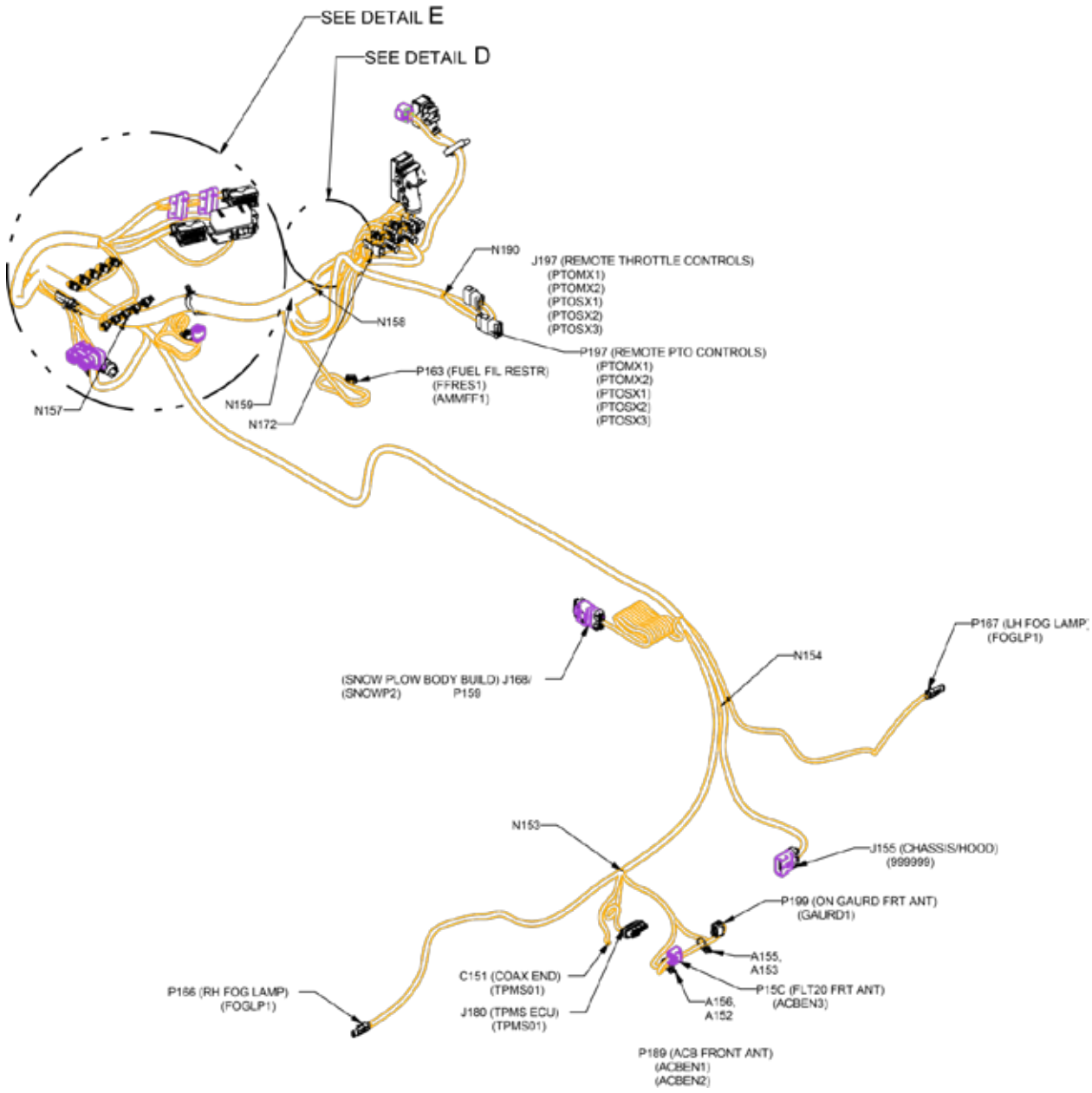


FIGURE 9-16. Chassis Harness From Cab Mount to Front of Frame

https://truckmanualshub.com/

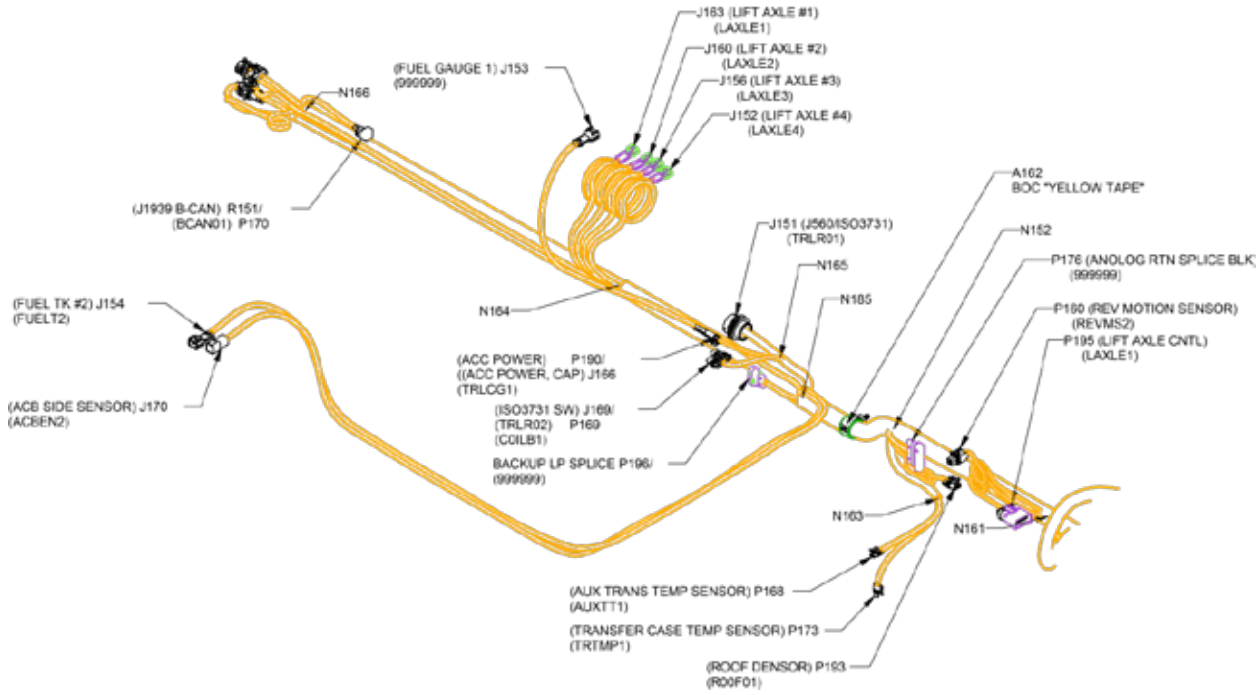


FIGURE 9-17. Chassis Harness From Cab Mount to BOC

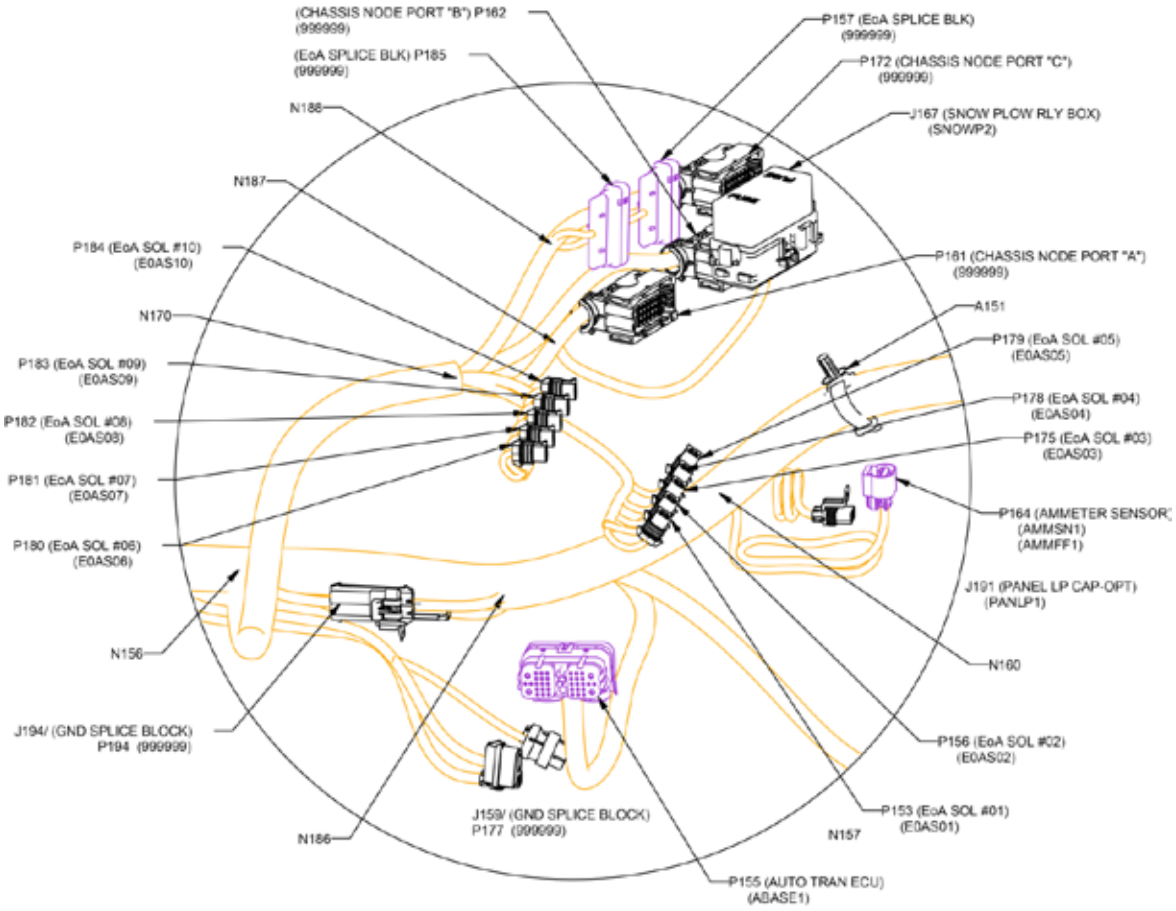


FIGURE 9-18. Connectors Near Front Cab Mount

https://truckmanualshub.com/

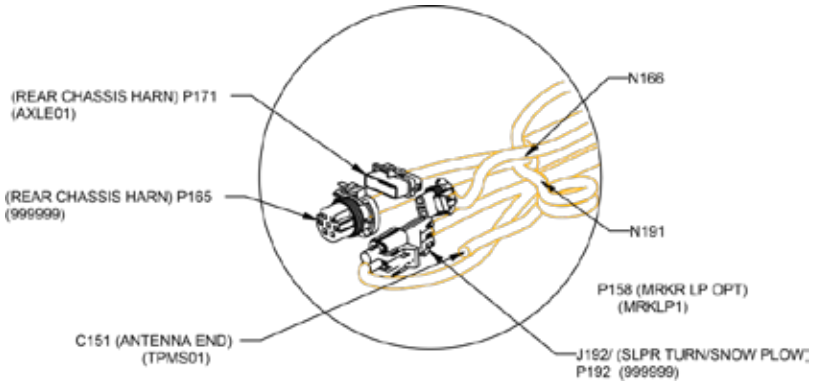


FIGURE 9-19. Connector Near BOC

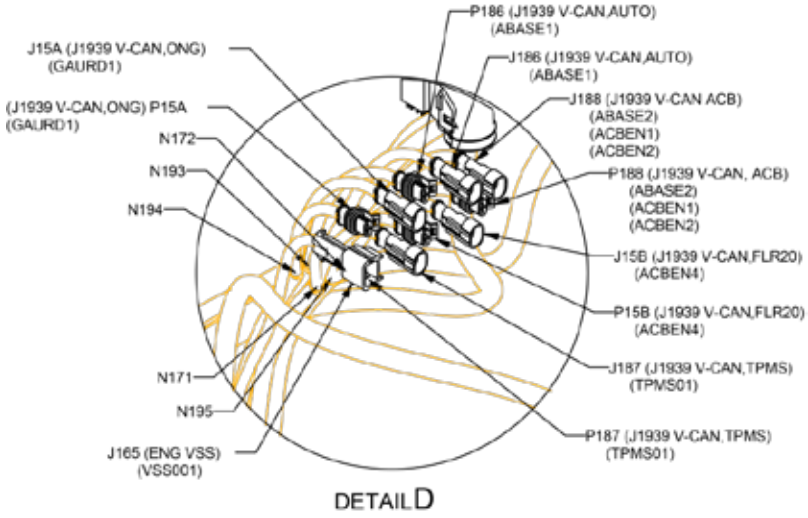


FIGURE 9-20. VCAN Connectors

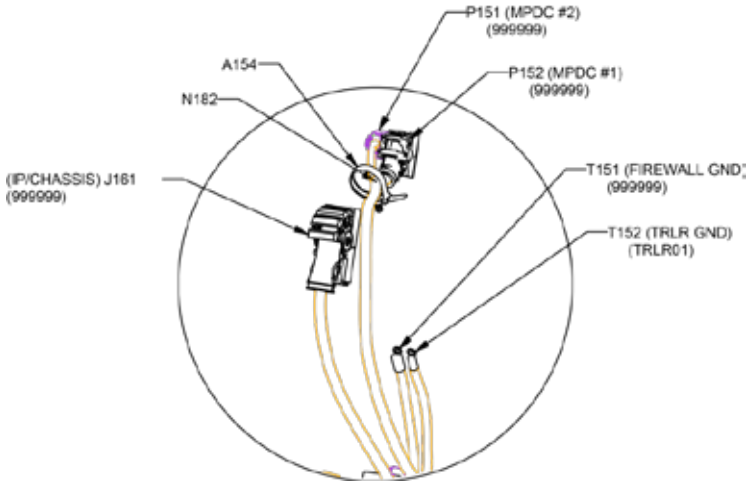


FIGURE 9-21. Firewall Connectors

https://truckmanualshub.com/

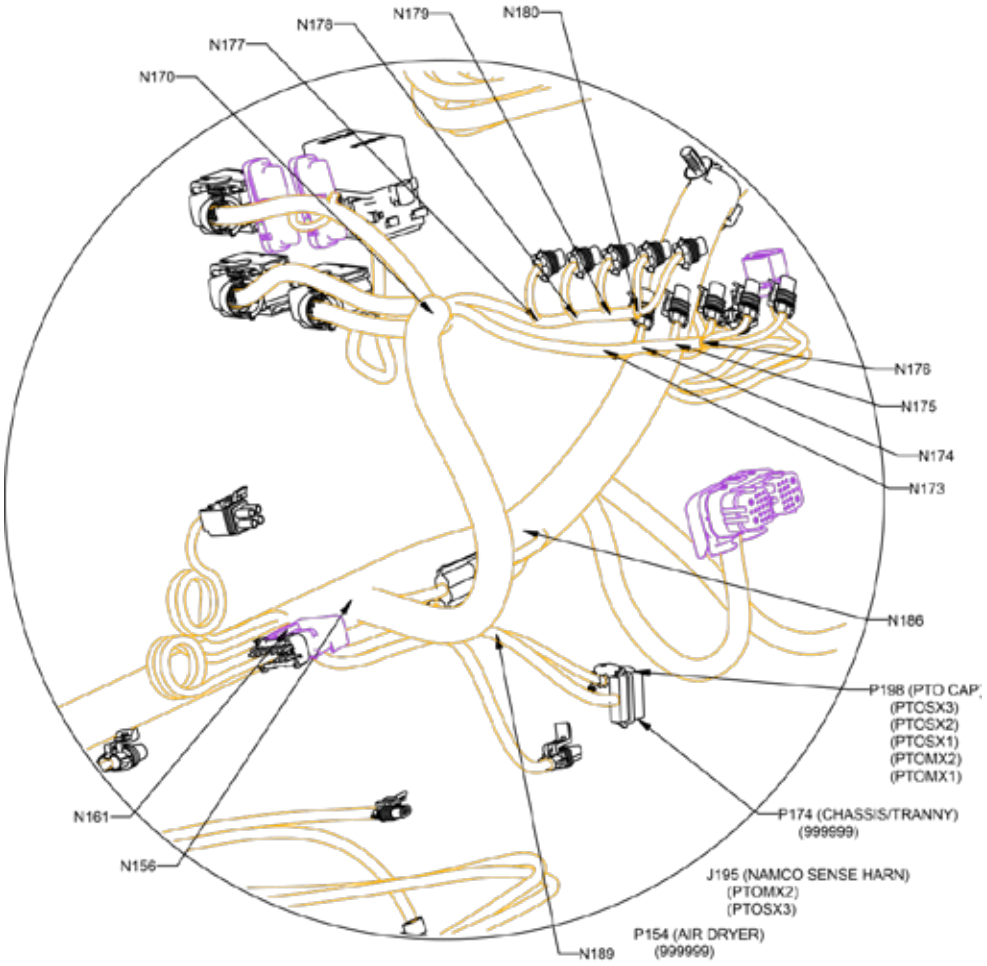


FIGURE 9-22. Chassis Node and Electric Over Air Solenoid Bank

https://truckmanualshub.com/

Installing Additional Switches onto the Chassis

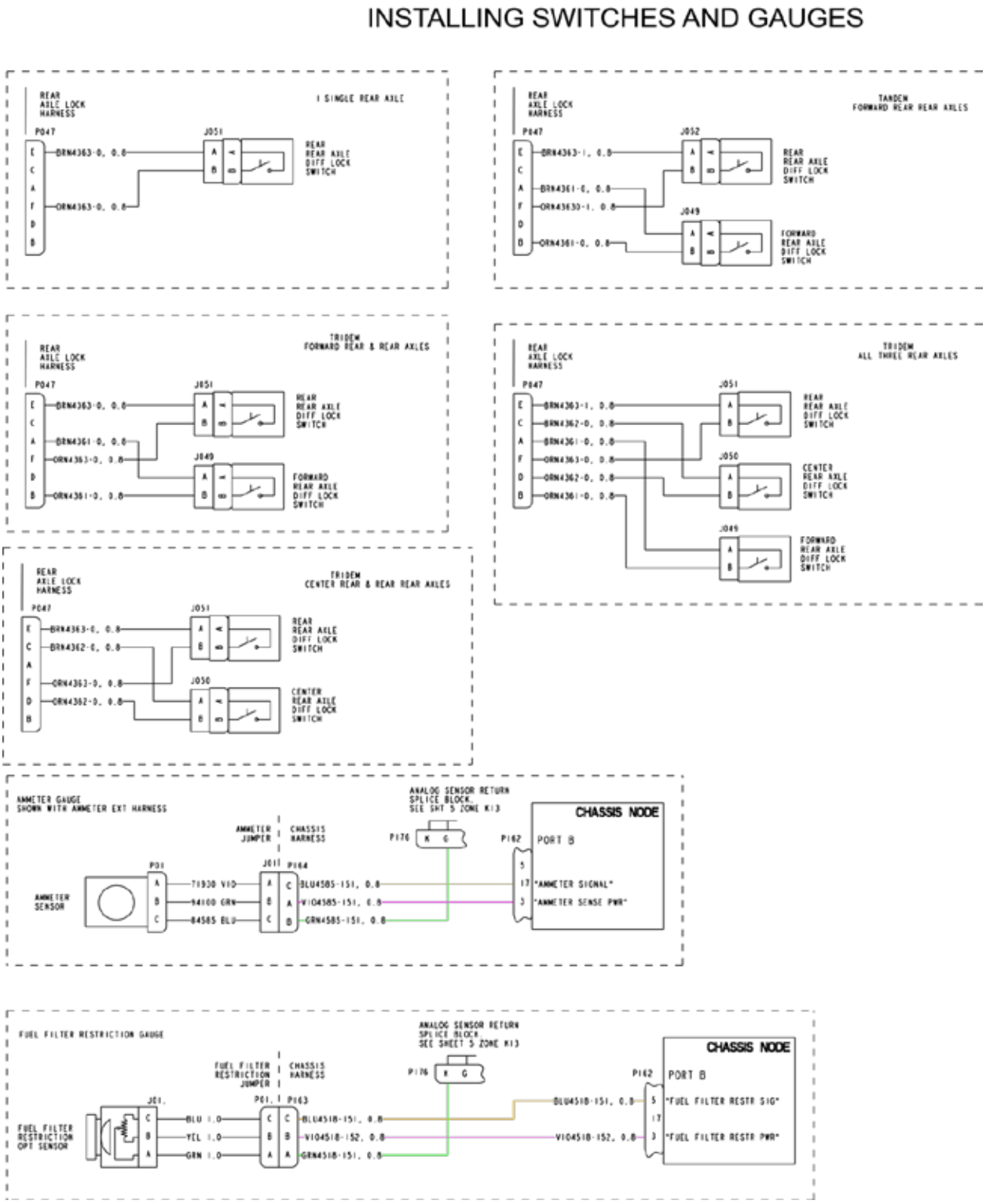


FIGURE 9-23. Installing Additional Switches onto the Chassis Side

https://truckmanualshub.com/

Installing Additional Gauges on the Dash

Optional gauges may be installed and connected to the CECU via a jumper harness. See the Dash section below for additional information.

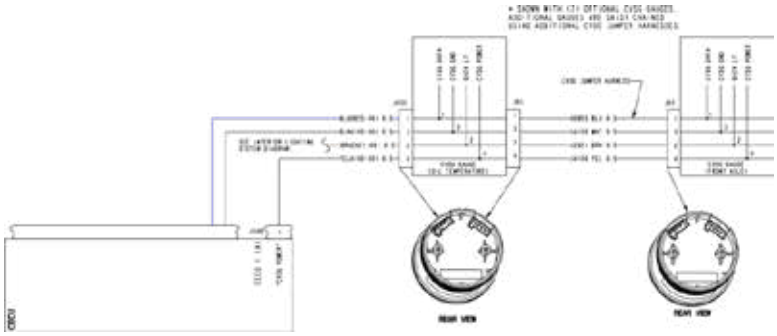


FIGURE 9-24. Installing Additional Gauges on the Dash

https://truckmanualshub.com/

Installing Sensors on the Chassis for Gauges

Typical installation of additional sensors for gauges.

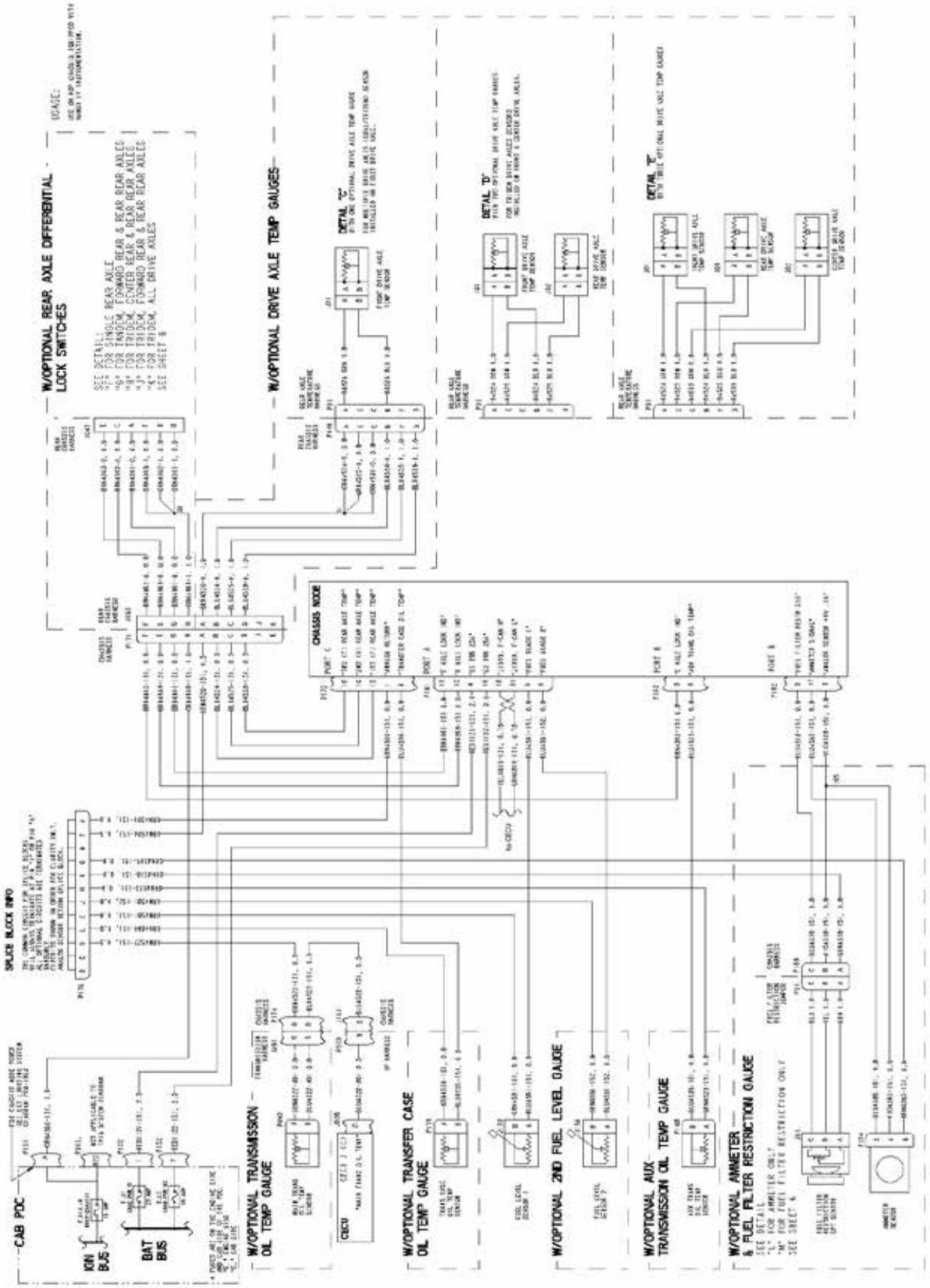


FIGURE 9-25. Installing Sensors on the Chassis Side for Gauges

https://truckmanualshub.com/

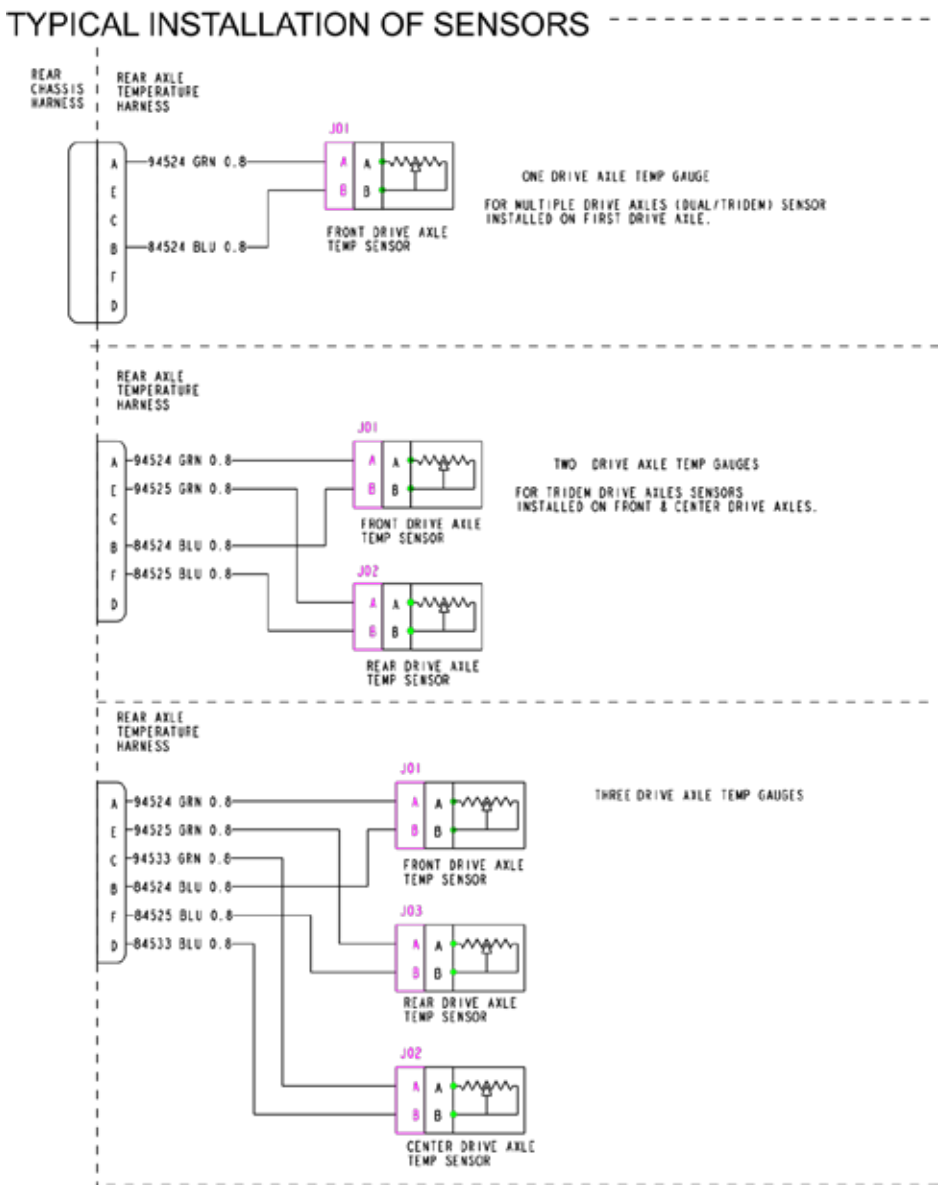


FIGURE 9-26. Typical Installation of Sensors Diagram

Spare power is found via a connector behind the fuse panel cover (left hand side of the dash, below the ignition switch). This connector is labeled P096.

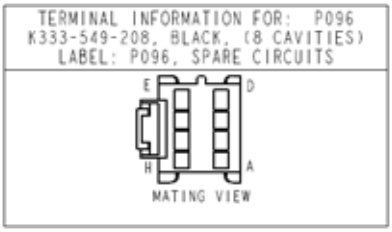


FIGURE 9-27. Spare Power Connector

https://truckmanualshub.com/

LIFT AXLES (PUSHERS & TAG)

Truck Lift Axles

All truck lift axles (pushers and tag), are direct wire Electric-Only from the switch to the axle mounted solenoid. This is not from the EoA Solenoid Bank. There are a total of four lift axle controls available; 3 pushers and 1 tag axle. These are controlled with separate switches by default.

The customer can order the following configurations; steerable, non-steerable, with auto-reverse, and with park brake interlock. A lift axle comes with a control switch (single or separate), a gauge, and a regulator valve.

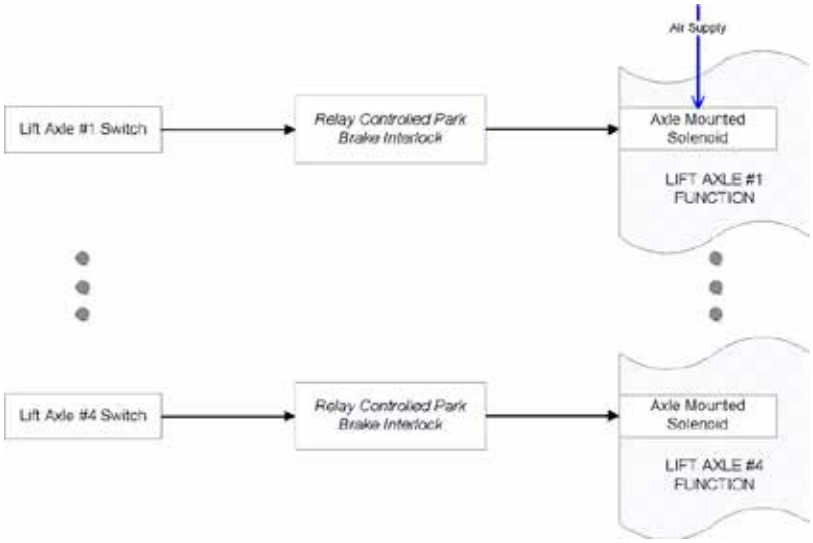


FIGURE 9-28. Truck Lift Axles (Separate Switches)

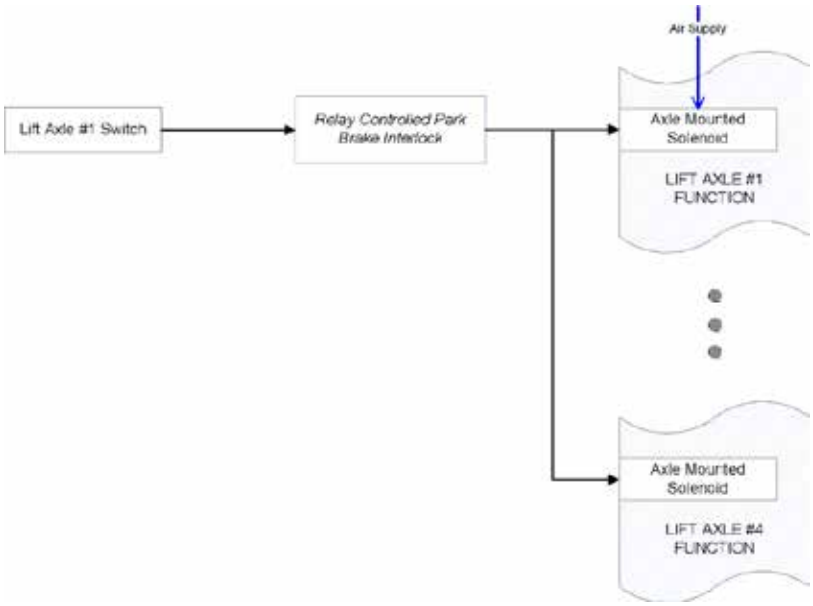


FIGURE 9-29. Truck Lift Axles (Single Switch)

https://truckmanualshub.com/

Table 9-2. Truck Lift Axle Logic

Lift Axle Type	Raise Condition Logic	Lower Condition Logic
Steerable Lift Axle w/o Auto-Reverse	- Lift Switch is Inactive OR - Park Brake Active OR - Trans in Reverse	- Lift Switch is Active AND - Park Brake Inactive AND - Trans Not is Reverse
Steerable Lift Axle with Auto-Reverse OR Non-Steerable Lift Axle w/o Park Brake	- Lift Switch is Inactive OR - Park Brake Active	- Lift Switch is Active AND - Park Brake Inactive AND
Non-Steerable Lift Axle with Park Brake	- Lift Switch is Inactive AND - Park Brake Inactive	- Lift Switch is Active OR - Park Brake Active

Trailer Lift Axles

Trailer lift axles can be either EoA or Electric-Only type. There are a total of two available EoA trailer lift axle controls using latching solenoids. If one axle is ordered, the customer will receive a switch labeled “Trailer Lift Axle”. If two axles are ordered the customer can have a single switch that controls both axles or two switches. If two switches are present they are labeled “Forward Trailer Lift Axle” and “Rear Trailer Lift Axle”.

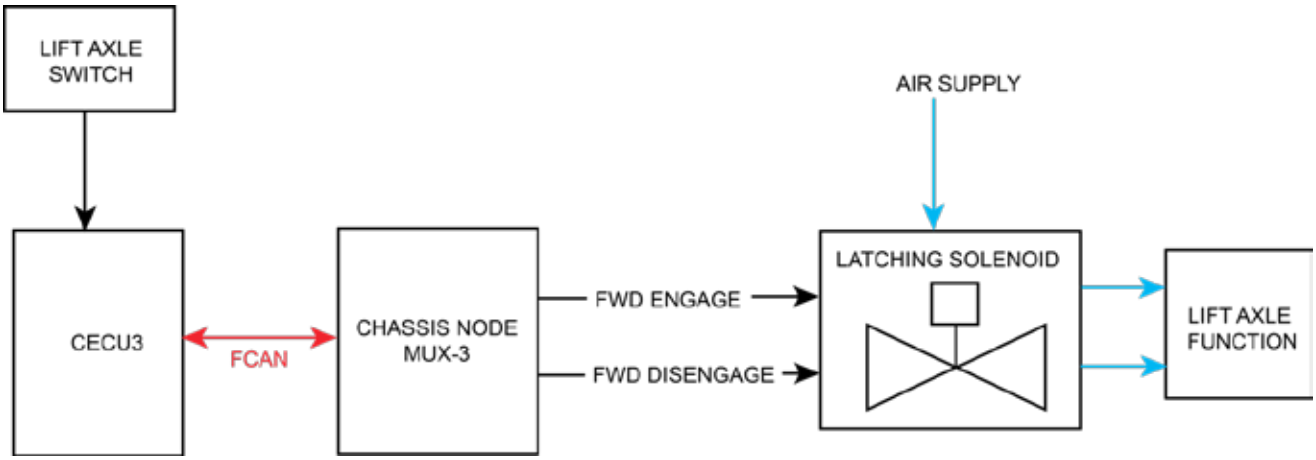


FIGURE 9-30. EoA Trailer Lift Axles

Air Solenoids

Air solenoids are the devices that translate the electrical signal into physical change that controls the air pressure in various circuits. The air solenoids are mounted to a bracket outside the cab. The solenoids are designed to stack on each other so that they share a common air supply rail which reduces the amount of air lines on the vehicle.

Air solenoids used on the vehicle are both of Latching and Non Latching types.

Table 9-3. Air Solenoid Types

Latching	Requires a signal voltage to close or open a solenoid. Will remain in position if power is disconnected. Physically, these require 2 spots on the bank compared to a non-latching valve.
Non-latching	Requires 12v to change a valve from its normal position. Will revert back to its normal position if power is disconnected.

https://truckmanualshub.com/

For safety reasons, certain circuits are designed with latching type solenoid valves. These circuits include but are not limited to:

1. Air suspension dump (tractor and trailer)
2. 2 speed rear axle control
3. Liftable axle controls (both on the vehicle and on the trailer)
4. Workbrakes for winches

The aftermarket installer/final vehicle manufacturer needs to decide what type of valve to install and ensure that the documentation to the operator provides them with enough understanding of how the customized switches work.

Note:

General air accessory, when ordered from the factory, is wired to a non-latching solenoid. Therefore, general air accessory options will reset when the ignition is turned off. If a latching solenoid is installed on a “furnish by owner” air accessory, the installer will need to document how the system operates.

Remote Throttle

Remote control of the PTO is performed through the 12-pin remote throttle connector on the engine harness. These are pins 1, 2, and possibly 6 (depending on engine) on J111_.

The 2013 MX engine controller port (J2 pin 21) will report a PTO active when driven high (+12V DC). Since PTO and pump mode signals are low when active a relay is needed to convert the low signal to a high signal. When a PTO is specified on a chassis the MX engine harness will contain the optional remote throttle/PTO 12-way connector and cap (P111C/J111C).

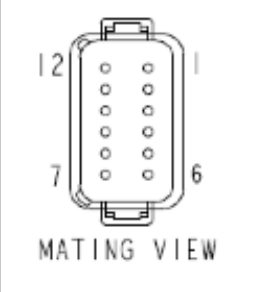


Table 9-4. MX engine (P111C/J111C)

Pin	Function
1	REMOTE PTO RESUME SWITCH
2	REMOTE PTO SET SWITCH
3	COMMON RETURN (TWISTED TRIPLE)
4	REMOTE THROTTLE SENSOR CIRCUIT (TWISTED TRIPLE)
5	PTO ENGAGED SIGNAL (HIGH=ENGAGED)
6	NOT USED
7	+12V 10A BODY IGN FUSE E_E9
8	VEHICLE GROUND
9	NOT USED
10	SENSOR POWER SUPPLY +5V (TWISTED TRIPLE)
11	+12V 10A BODY IGN FUSE E_E9
12	NOT USED

https://truckmanualshub.com/

The 2013 ISX engine controller port (J2 pin 94) will report a PTO active when driven low (Ground). When a PTO is specified on a chassis the ISX engine harness will contain the optional remote throttle/PTO 12-way connector and cap (P111A/J111A).

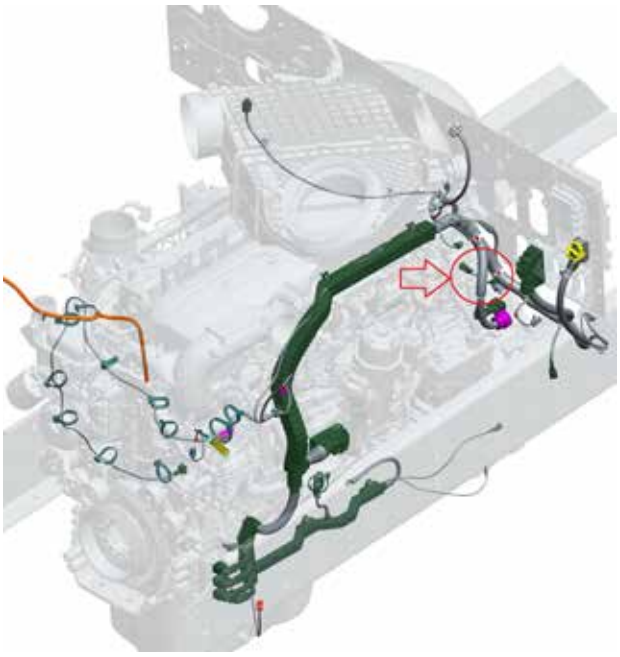


FIGURE 9-31. MX-13 Connection location.

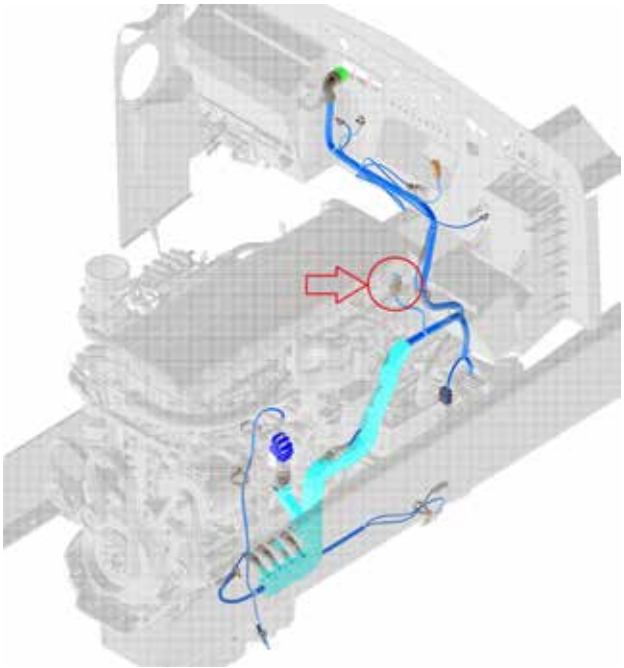


FIGURE 9-32. MX-11 Connection location.

https://truckmanualshub.com/

Table 9-5. ISX Remote Throttle/PTO Connector P111A/J111A:

Pin	Function
1	CC/REMOTE PTO RESUME SWITCH
2	CC/REMOTE PTO SET SWITCH
3	COMMON RTN #1 (SW)
4	REMOTE THROTTLE SENSOR CIRCUIT (TWISTED TRIPLE)
10	SENSOR SUPPLY +5V (TWISTED TRIPLE)
11	COMMON RTN #3 (SENSOR) (TWISTED TRIPLE)
5	PTO ENGAGED SIGNAL (LOW = ENGAGED)
6	CC/PTO ON/OFF SWITCH
7	+12V 10A BODY IGN FUSE E_E9
8	VEHICLE GROUND
9	TORQUE LIMIT SWITCH
12	REMOTE THROTTLE ON/OFF

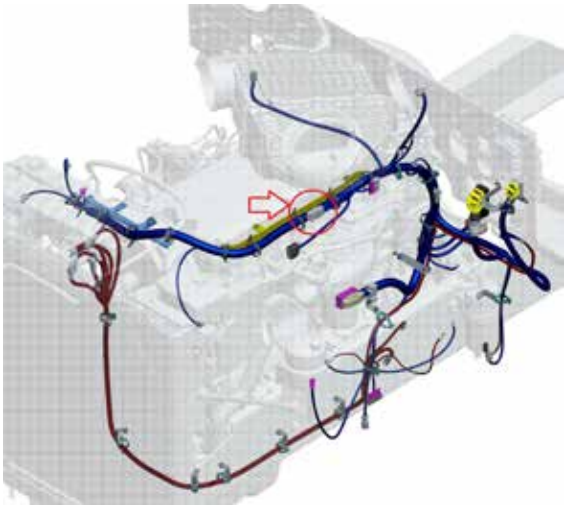


FIGURE 9-33. ISX15 Connection location

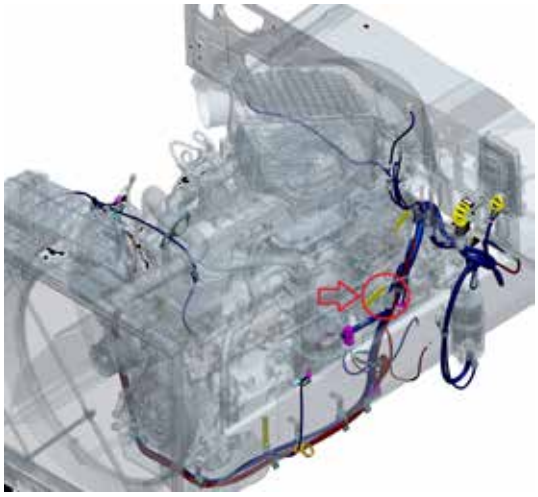


FIGURE 9-34. ISX12 Connection location.

https://truckmanualshub.com/

Focusing on the PACCAR MX-13, the electrical design requires an additional relay to turn the normally LOW PTO engage signal into a 12V HIGH signal to the engine ECU.

Chassis node connector pin reference (Port C).

The label ‘C’ will be in raised lettering on the chassis node.

Table 9-6. EoA Chassis Node Guide

EOA switch number	Port C Pin location
1	2
2	3
3	5
4	6
5	8
6	9
7	11
8	12

CECU input locations for EOA Switches from the dash.

This connector is the center most connector and has 52 pins.

Table 9-7. EoA CECU Guide

EOA switch number	CECU (connector C) Pin location
1	3
2	26
3	17
4	18
5	19
6	20
7	22
8	24

https://truckmanualshub.com/

Cab ECU Parameter Reference Table

Cab ECU parameters are used to define whether a function is turned on in the system. Control hardware may be installed, however it will not function until the software is programmed to use it.

Table 9-8. CECU Parameters

Q30-1024-005	Cruise Control Set Switch Accel or Decel	0	1	Parameter is used to define the cruise control set/resume switch functionality. Value 0/Disabled means set switch is used for accelerate, and resume switch is used for decelerate. Value 1/Enabled means set switch is used for decelerate, and resume switch is used for accelerate.
Q30-1024-006	Cruise Control Present	0	1	Parameter is used to determine if cruise control is installed and controls the cruise control messages to the engine. Value 0/Disabled means cruise control switches are not installed. Value 1/Enabled means cruise control switches are installed.
Q30-1024-039	PTO Oil Temperature Gauge Installed	0	1	Valve 0/Disabled means gauge is not installed. Valve 1/Enable means gauge is installed.
Q30-1024-042	Transfer Case Oil Temperature Gauge Installed	0	1	Parameter controls the functionality (output on CVSG bus and DTC's) of the transfer case oil temperature gauge. Value 0/Disabled means Transfer Case Oil Temperature Gauge is not installed. Value 1/Enabled means Transfer Case Oil Temperature Gauge is installed.
Q30-1024-047	Engine Fan Override Present	0	1	Parameter is used to determine if the fan override switch is installed. Value 0/Disabled means engine fan override switch is not installed. Value 1/Enabled means engine fan override switch is installed.
Q30-1024-058	Transfer Case Temperature Sensor Type	0	1	Parameter is used to determine which type of transfer case temperature sensor is installed for the transfer case temperature gauge. This determines the input range. Value 0 means Transfer Case Temperature Sensor Type = Delphi. Value 1 means Transfer Case Temperature Sensor Type = Siemens (or Continental).
Q30-1024-060	PTO Control Present	0	1	Parameter is used to determine the presence of PTO controls. (For CUMMINS engine, default value is 1 -Cruise Control PTO idle bump). Value 0/Disabled means PTO Control functionality is disabled. Value 1/Enabled means PTO Control functionality is enabled.
Q30-1024-063	Remote PTO Present	0	1	Parameter is used to determine if the remote PTO switches are installed (PACCAR engines only). Value 0/Disabled means Remote PTO switches are not installed. Value 1/Enabled means Remote PTO switches are wired to CECU and functionality is enabled.
Q30-1024-075	Engine Fan With Park Brake Installed	0	1	Parameter is used to determine if an engine fan override is available to the operator. This override will allow the operator to turn the engine fan on when the park brakes are set and the engine ECU permits the fan to turn on. Value 0/ Disable means that this function is not enabled and the operator cannot control when the engine fan turns on. Value 1/Enabled means that the operator may turn the engine fan on when the park brakes are on and the engine ECU permits the fan to be on.

https://truckmanualshub.com/

Q30-1024-132	Engine Fan on with AC and Park Brake	0	1	Parameter is used to determine if an engine fan override is available to the operator. This override will allow the operator to turn the engine fan on when the park brakes are set, A/C is ON and the engine ECU permits the fan to turn on. Value 0/ Disable means that this function is not enabled and the operator cannot control when the engine fan turns on. Value 1/Enabled means that the operator may turn the engine fan on when the park brakes are on, A/C is ON and the engine ECU permits the fan to be on.
Q30-1024-156	PTO Total Fuel Fault Enabled	0	1	Parameter is used to determine if the PTO total fuel fault message is enabled. Value 0/Disabled means the PTO total fuel fault message is disabled. Value 1/Enabled means the PTO total fuel fault message is enabled.
Q30-1024-160	Electric Over Air Function 1			Parameter is used to set the function that is installed to this EOA switch-output pair
Q30-1024-161	Electric Over Air Function 2			Parameter is used to set the function that is installed to this EOA switch-output pair
Q30-1024-162	Electric Over Air Function 3			Parameter is used to set the function that is installed to this EOA switch-output pair
Q30-1024-163	Electric Over Air Function 4			Parameter is used to set the function that is installed to this EOA switch-output pair
Q30-1024-164	Electric Over Air Function 5			Parameter is used to set the function that is installed to this EOA switch-output pair
Q30-1024-165	Electric Over Air Function 6			Parameter is used to set the function that is installed to this EOA switch-output pair
Q30-1024-166	Electric Over Air Function 7			Parameter is used to set the function that is installed to this EOA switch-output pair
Q30-1024-167	Electric Over Air Function 8			Parameter is used to set the function that is installed to this EOA switch-output pair
Q30-1024-168	Electric Over Air Function 1 Speed Cutoff			Parameter is used to set the interlock speed cutoff for the corresponding EOA switch-output pair
Q30-1024-169	Electric Over Air Function 2 Speed Cutoff			Parameter is used to set the interlock speed cutoff for the corresponding EOA switch-output pair
Q30-1024-170	Electric Over Air Function 3 Speed Cutoff			Parameter is used to set the interlock speed cutoff for the corresponding EOA switch-output pair
Q30-1024-171	Electric Over Air Function 4 Speed Cutoff			Parameter is used to set the interlock speed cutoff for the corresponding EOA switch-output pair
Q30-1024-172	Electric Over Air Function 5 Speed Cutoff			Parameter is used to set the interlock speed cutoff for the corresponding EOA switch-output pair
Q30-1024-173	Electric Over Air Function 6 Speed Cutoff			Parameter is used to set the interlock speed cutoff for the corresponding EOA switch-output pair
Q30-1024-174	Electric Over Air Function 7 Speed Cutoff			Parameter is used to set the interlock speed cutoff for the corresponding EOA switch-output pair
Q30-1024-175	Electric Over Air Function 8 Speed Cutoff			Parameter is used to set the interlock speed cutoff for the corresponding EOA switch-output pair

https://truckmanualshub.com/

Interlock Programming Details

* = Latching Type Solenoid, requires two MUX3P outputs to control on/off.
[1] = Dual Single Type Solenoid, function is called twice to achieve two inputs and two outputs.
[2] = Dual Single Type Solenoid, function must called as a pair with the Main and Opposite direction to achieve two input and two outputs.
[3] = Momentary switch input.

Table 9-9. Interlocks

#	Function	Interlock	Default	Range	Options for Interlock
1 *	Air Suspension Dump w/ Park Brake Interlock	Under Speed Threshold & Park Brakes Set	7	0-10	Optional Add
2 *	Air Suspension Dump	Under Speed Threshold & Park Brakes Set	7	0-10	Standard
3 *	Trailer Suspension Dump	Under Speed Threshold & Park Brakes Set	7	0-10	Standard
4 *	Trailer Suspension Dump w/ Park Brake Interlock	Under Speed Threshold & Park Brakes Set	7	0-10	Optional Add
5	Trailer Lift Axle (single)	None			Standard
6	Trailer Lift Axle (Forward	None			Standard
7	Trailer Lift Axle (Rear)	None			Standard
8	Air Suspension Over-Inflation	Under Speed Threshold	25	0-40	Standard Non-Configurable
9	Two-Speed Rear Axle w/ Park Brake Interlock	Inter-Axle Diff. Lock Switch Off & Park Brakes Set			Optional Add
10	Two-Speed Rear Axle	Inter-Axle Diff. Lock Switch Off			Standard
11	Fifth Wheel Slide	Under Speed Threshold	7	0-10	Standard
12	Front-Axle Declutch	Under Speed Threshold	25	0-70	Standard
13	Inter-Axle Differential Lock	Under Speed Threshold	25	0-70	Standard Non-Configurable
14 3	Kingpin Release (Momentary)	Park Brakes Set			Standard
15	Rear Axle Declutch (aka. Transfer Case Engage)	Under Speed Threshold & Transmission In Neutral	7	0-10	Standard Non-Configurable
16	Transfer Case Hi/Low	Under Speed Threshold & Transmission In Neutral	7	0-10	Standard Non-Configurable
17 1	Aux Trans 3-Position Control (AT1202) w/ Park Brake Interlock	Park Brakes Set			Optional Add
18	Front Axle Declutch (not currently used)	Under Speed Threshold	25	0-70	Standard
19 1	PTO 2-Position (Fwd/Rev) w/ Park Brake Interlock	Park Brakes Set			Optional Add
20	PTO #1 w/ Park Brake Interlock	Park Brakes Set			Optional Add

https://truckmanualshub.com/

#	Function	Interlock	Default	Range	Options for Interlock
21	PTO #2 w/ Park Brake Interlock	Park Brakes Set			Optional Add
22	Trailer Dump Gate (single) w/ Speed Interlock (EoA version - KW ONLY)	Under Speed Threshold	25	0-40	Optional Add
23	Trailer Belly Dump (Center) w/ Speed Interlock (not currently used)	Under Speed Threshold	25	0-40	Optional Add
24	Trailer Belly Dump (Forward) w/ Speed Interlock (EoA version - KW ONLY)	Under Speed Threshold	25	0-40	Optional Add
25	Trailer Belly Dump (Rear) w/ Speed Interlock (EoA version - KW ONLY)	Under Speed Threshold	25	0-40	Optional Add
26	Truck Dump Gate w/ Speed Interlock (EoA version - KW only)	Under Speed Threshold	25	0-40	Optional Add
27	Wheel Diff. Lock Axle (Single Rear) w/ Speed Interlock	Under Speed Threshold	25	0-40	Optional Non-Configurable
28	Wheel Diff. Lock Axle (Forward Rear) w/ Speed Interlock	Under Speed Threshold	25	0-40	Optional Non-Configurable
29	Wheel Diff. Lock Axle (Center Rear) w/ Speed Interlock	Under Speed Threshold	25	0-40	Optional Non-Configurable
30	Wheel Diff. Lock Axle (Rear Rear) w/ Speed Interlock	Under Speed Threshold	25	0-40	Optional Non-Configurable
31	Wheel Diff. Lock Axle (Dual Rear) w/ Speed Interlock	Under Speed Threshold	25	0-40	Optional Non-Configurable
32	Wheel Diff. Lock Axle (Front Drive) w/ Speed Interlock	Under Speed Threshold	25	0-40	Optional Non-Configurable
33	Air Accessory (Non-Latching) w/ Park Brake Interlock	Park Brakes Set			Optional Add
34	Air Accessory (Non-Latching)	None			Standard
35 1	Aux Trans 3-Position Control (AT1202)	None			Standard
36 1	PTO 2-Position (Fwd/Rev)	None			Standard
37	PTO #1	None			Standard
38	PTO #2	None			Standard
39	Trailer Dump Gate (single)	None			Standard
40	Trailer Belly Dump (Center) (not currently used)	None			Standard
41	Trailer Belly Dump (Forward)	None			Standard
42	Trailer Belly Dump (Rear)	None			Standard
43	Trailer Tow / Pintle Hook	None			Standard
44	Truck Dump Gate	None			Standard

https://truckmanualshub.com/

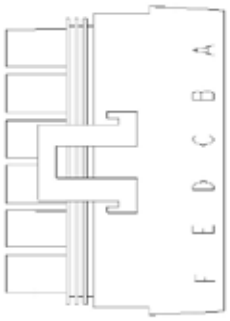
#	Function	Interlock	Default	Range	Options for Interlock
45	Wheel Diff. Lock Axle (Single Rear)	None			Standard
46	Wheel Diff. Lock Axle (Forward Rear)	None			Standard
47	Wheel Diff. Lock Axle (Center Rear)	None			Standard
48	Wheel Diff. Lock Axle (Rear Rear)	None			Standard
49	Wheel Diff. Lock Axle (Dual Rear)	None			Standard
50	Wheel Diff. Lock Axle (Front Drive)	None			Standard
51	Winch Clutch	None			Standard
52 *	All Brakes/ Work Brakes w/ Speed Interlock (a.k.a Winching Brake)	Under Speed Threshold	7	0-10	Standard
53 *	All Brakes/ Work Brakes (a.k.a Winching Brake)	None			Standard
54 *	Double Acting PTO (not currently used)	None			Standard
55 *	Double Acting PTO (not currently used)	Park Brake			Optional Add
56 2	Reversible PTO – Main Direction Switch Input (not currently used)	None			Standard
57 2	Reversible PTO – Opposite Direction Switch Input (not currently used)	None			Standard
58 2	Reversible PTO – Main Direction Switch Input (not currently used)	Park Brake			Optional Add
59 2	Reversible PTO – Opposite Direction Switch Input (not currently used)	Park Brake			Optional Add
60	Interlock Only – Park Brake	Park Brake			Standard
61	Interlock Only - Speed	Under Speed Threshold	25	0-70	Standard

https://truckmanualshub.com/

Transmission Back Up Signals

The back-up signal can be accessed from pin D of the 6-way tail light connector located at the end of frame.

The tail light connector is a 6-way connector located in the chassis harness at the end of frame. It will either be connected to a tail light, a jumper harness, or tied up in the rail if no tail lights are provided.



PIN	CIRCUIT DESCRIPTION
A	Park Lamp
B	Left Turn/Stop Lamp
C	Right Turn/Stop Lamp
D	Backup Lamp
E	Aux Chassis
F	Ground

FIGURE 9-35. Mating Connector: Packard PN 12020786

Junction Box

The junction box easy access to various signals as outlined in Figure 9-26.



Connection diagram

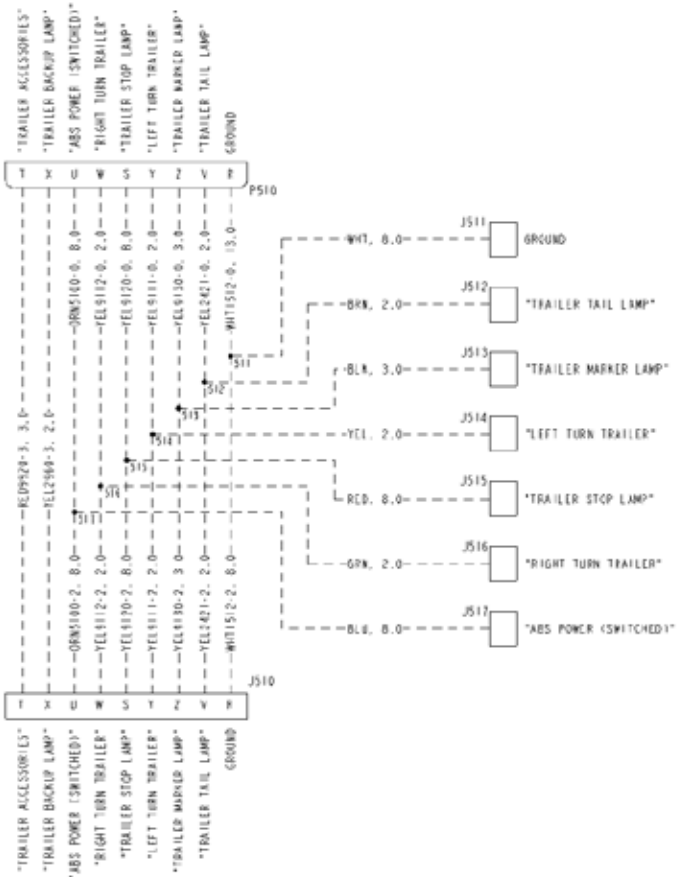


FIGURE 9-36. Junction Box BOC or EOF

https://truckmanualshub.com/

J1939

WARNING!

The J1939 databus is the communication link between the engine and the Anti-Lock Braking System (ABS). Only J1939 compatible devices should be added to the databus. Some J1939 compatible aftermarket devices may disrupt the ability of the databus to communicate. If the databus is disrupted by an aftermarket device, it must be removed from the databus.

Guidelines - J1939 Circuit Requirements

- Circuits added must be a twisted pair consisting of a minimum of 1 twist per inch.
- Individual breakout length of circuits added cannot exceed 118 inches.
- Do not splice into existing J1939 circuits. Use the connection points provided.
- J1939 circuits are for data transmission only and are not to be used for power or ground circuits.
- Any modifications must conform to SAE J1939.

J1939 Access

All Kenworth vehicles include J1939 circuitry. The J1939 circuit can be accessed in two locations. The first access is located inside the dash behind the tachometer. The second access is at the driver side toward the rear of the engine.

1. Dash Access - Connector located in dash behind the tachometer



FIGURE 9-37. Dash Access

2. Engine Access - Connector located on OEM engine harness on driver's side of engine toward the rear of engine



FIGURE 9-38. Engine Access

https://truckmanualshub.com/

J1939 Access Procedures

1. Identify J1939 Access Connector (note long blue shell)
2. Disconnect connection (note terminating resistor from inside blue connector)

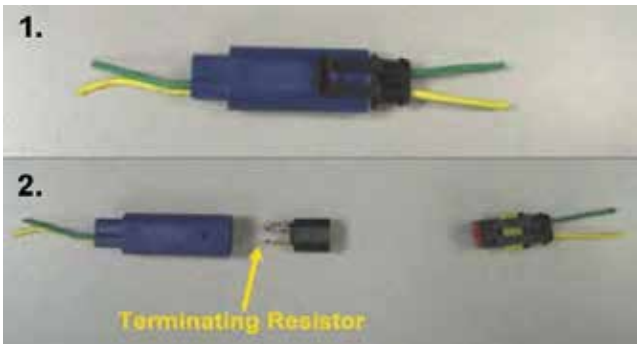


FIGURE 9-39. J1939 Access

1. Make connection in between original connection (tin).
2. Ensure terminating resistor is inserted in blue connector shell (arrow).



FIGURE 9-40. J1939 Access

https://truckmanualshub.com/

How Do I...

This section is created to provide specific instructions to completing the installation. Please refer to the section for dash board to access dash panels for switches and gauges.

Install a Multiplexed Instrument

Generally, installing gauges and switches into the dash board will require installing pins in a connector of the CECU if a connector is not present. The CECU will then need to be re-programmed to accept the new instruments.

Install and Air Operated External Device

After installing the instruments in the cab, and before re-programming the CECU, the electric over air solenoid will need to be installed onto the solenoid bank. These instructions do not apply to vehicles that have all spaces on the solenoid bank already in use by some device.

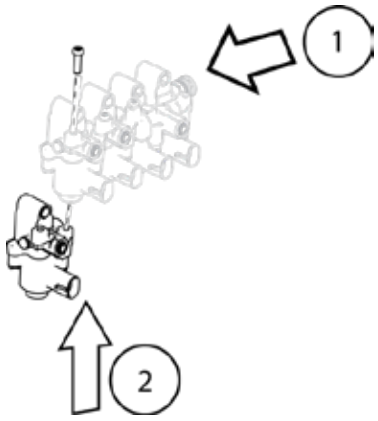


FIGURE 9-41. J1939 Access

Once the solenoid is installed, wiring must be installed between the chassis node and the solenoid. Then the ground wire should be installed between the solenoid and the ground splice. Air supply to the solenoid bank is already in place, but air lines from the output of the solenoid to the air operated device will need to be installed.

Re-program the CECU

The CECU may be programmed by using the software Electronic Service Application (ESA). The engine will need to be programmed using the engine specific software.

Install New Telltale Icons into the Instrument Cluster

To install new telltales into the instrument cluster, the cluster will need to be removed from the dash. The instrument panel trim is removed after removing the panel immediately to the right of the instrument cluster. Then 4 fasteners hold the instrument cluster to the dash structure. Refer to the Dash removal chapter to identify the location of the telltale icon tray.

Access the Solenoid Bank and Chassis Node

Accessing these two items will require opening the hood and removing the fairings. After the fairings are removed, the battery box/batteries will need to be removed from the frame rail. This process will provide open access to the chassis node, solenoid bank and all electrical connectors.

The solenoid bank and chassis node may be removed without removing the battery box, however this will not provide access to the splice block needed for ground connection.

Get the Suspension Air Bags to Deflate When the PTO is on

Dump body applications will be able to utilize a function such that when the PTO is active (and the dump body is being lifted), the body is sitting on the suspension bump stops. This provides a more stable platform than the airbag.

EE_PAR_EOA_bool_SuspensionDumpWithPTOActivation enables this functionality. If any switch is configured to be a PTO switch and any switch is configured to be Suspension Dump, the Suspension Dump switch shall be considered as active. All existing Suspension Dump interlocks must still pass for the suspension to be dumped.

https://truckmanualshub.com/

Dash

The following section identifies ways to access the dash to install or modify the vehicle for aftermarket devices.

Gauge and Switch Installation

The first step to accessing the dash instruments is to remove the trim. The panel immediately to the right is the first panel to come off. These panels are held in by snap fasteners. Be sure that the metal retaining clips are not lost otherwise the panel will not install snug.

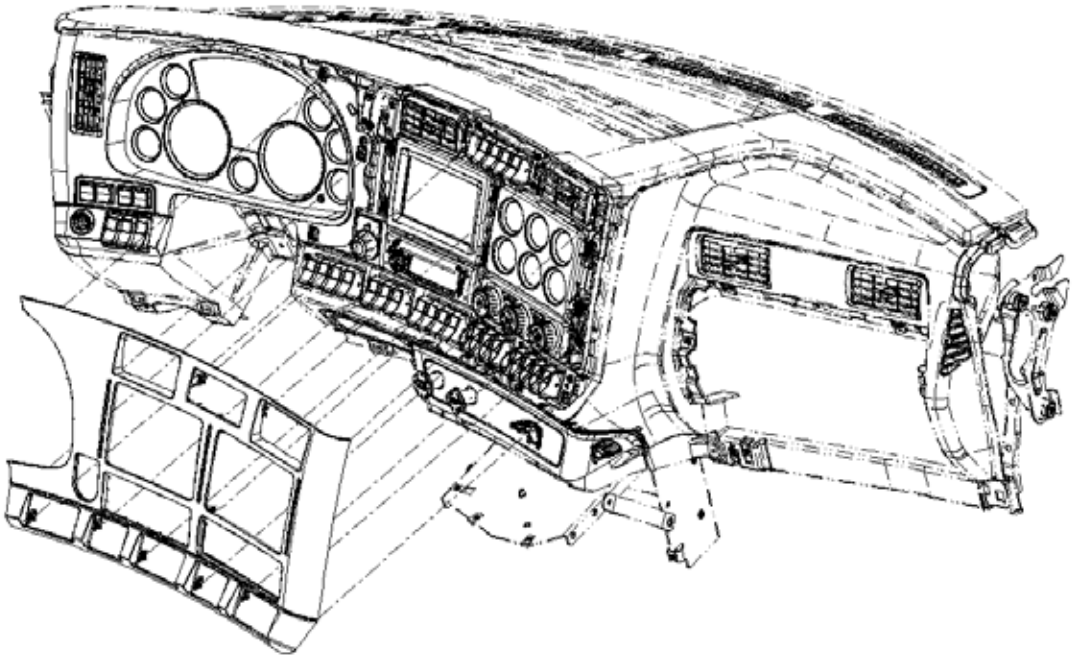


FIGURE 9-42. Trim Panel Removal

Gauges and switches are fastened directly to the panel. Once the panel is free, the gauge or switch can be installed. Gauges are held by a screwed on collar while switches have a plastic tab.

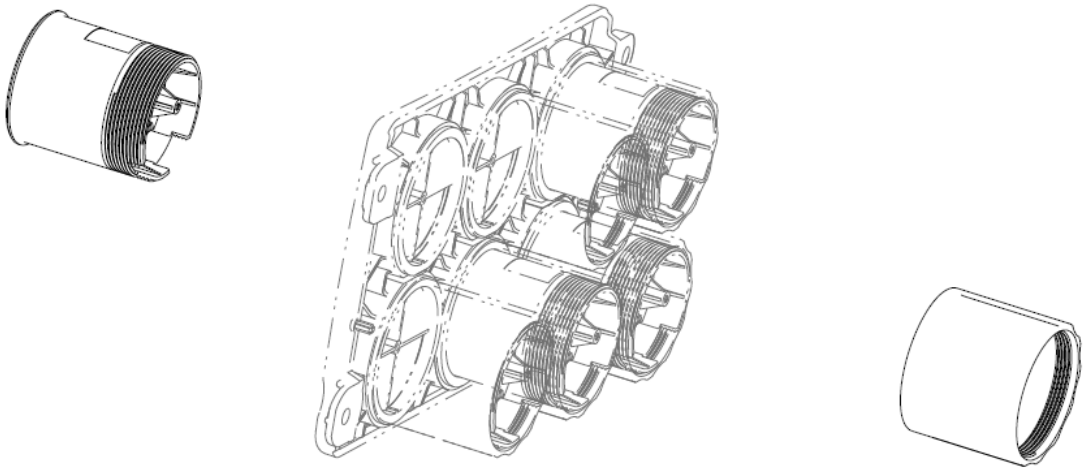


FIGURE 9-43. Gauge Installation

https://truckmanualshub.com/

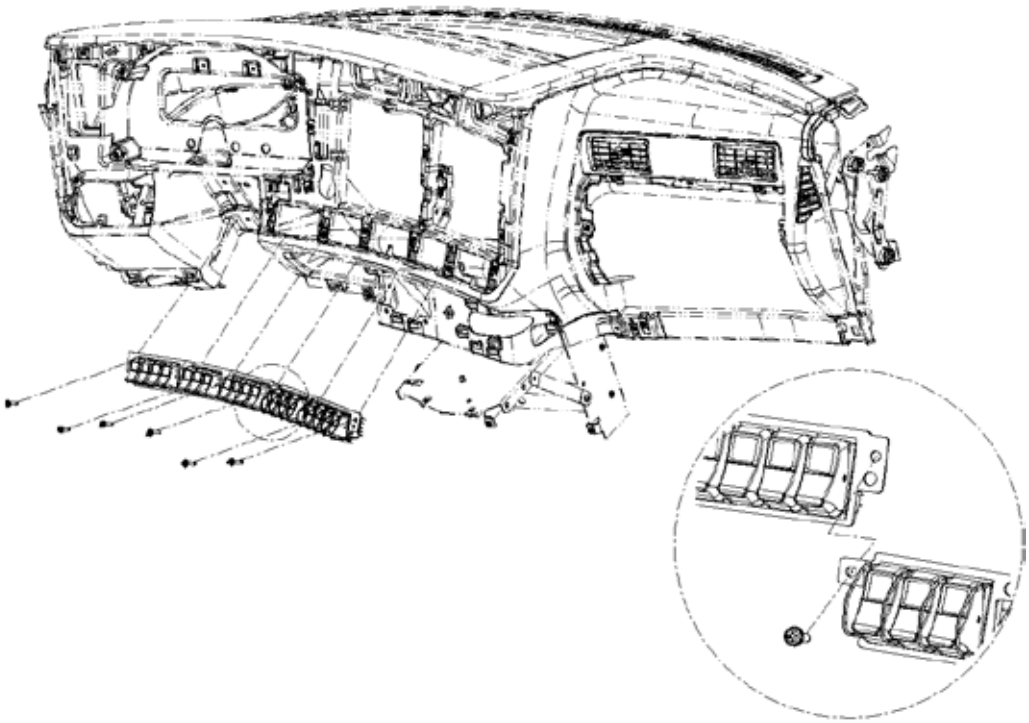


FIGURE 9-44. Switch Installation

Telltale Icons Installation

Removing the first panel will allow the panel covering the instrument cluster to be removed. Removing the cluster is necessary to install telltale symbols or access other connectors to complete the installation.

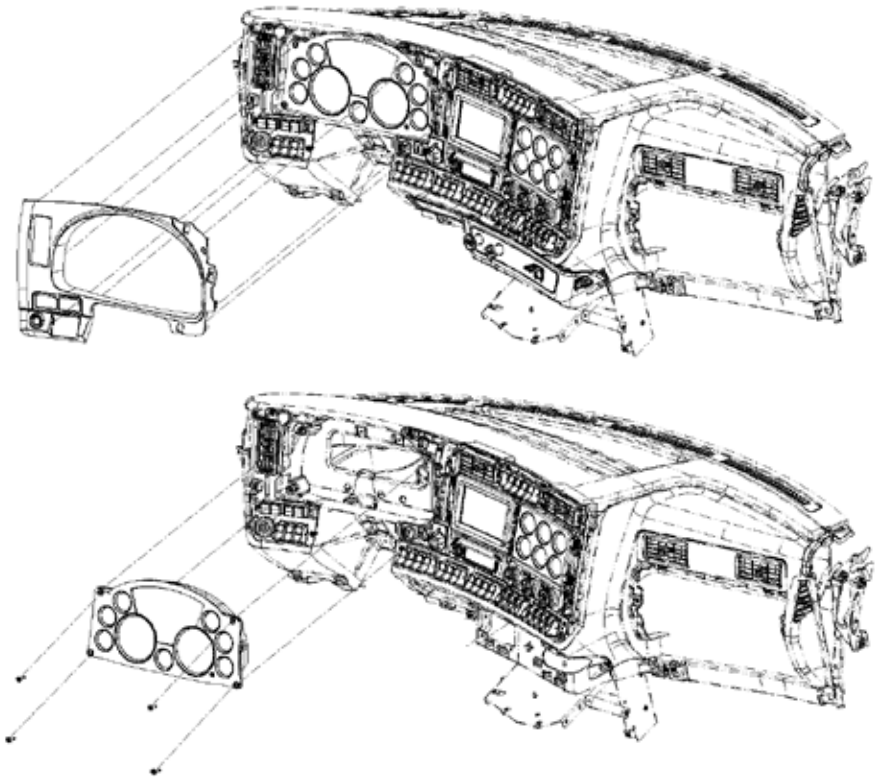


FIGURE 9-45. Cluster Removal

https://truckmanualshub.com/

To install new telltales into the instrument cluster, the cluster will need to be removed from the dash. The instrument panel trim is removed after removing the panel immediately to the right of the instrument cluster. Then 4 fasteners hold the instrument cluster to the dash structure.

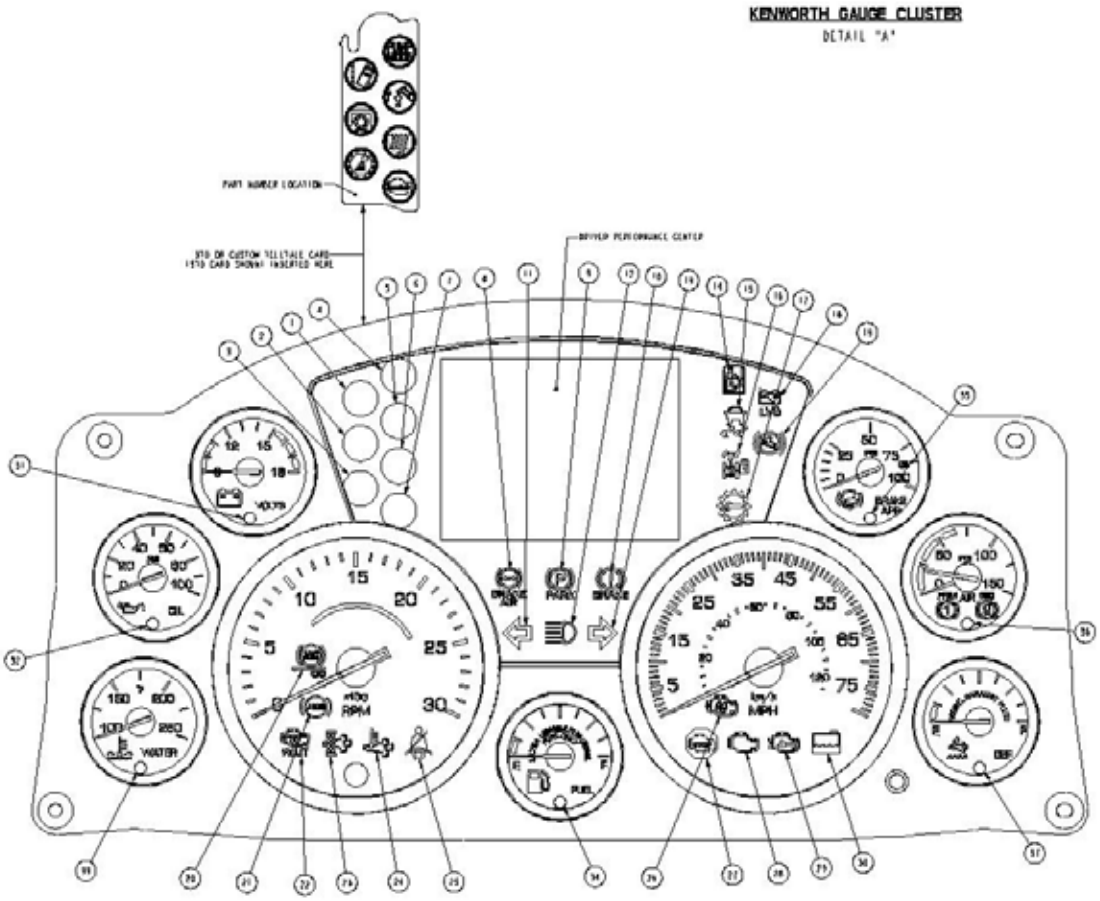


FIGURE 9-46. Telltale Installation Diagnostics & Service Tool Connection

https://truckmanualshub.com/

ROUTING

Introduction

This section specifies the general requirements for securing hoses and electrical wires to present an orderly appearance, facilitate inspection and maintenance, and prevent potential damage to these lines.

Definitions

Bundle: Two or more air, electrical, fuel, or other lines tied together to form a unitized assembly.

Clamp: A cushioned rigid or semi-rigid, anti-chafing device for containing the bundle and securing it to the frame or other structural support. Standard clamps have a black elastomer lining. High temperature clamps (e.g., those used with compressor discharge hose) have a white or red elastomer lining (most applications for these are called out in the bills of material). An assembly of two clamps fastened together to separate components is referred to as a “butterfly” clamp. Note: the metal portion of clamps shall be stainless steel or otherwise made capable, through plating or other means, of passing a 200 hour salt spray test per ASTM B117 without rusting.

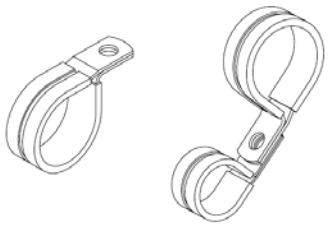


FIGURE 10-1. Clamp and Butterfly Clamp

Butterfly Tie: A tough plastic (nylon or equivalent) locking dual clamp tie strap used to separate bundles or single lines, hoses, etc. These straps must be UV stable. (Tyton DCT11)



FIGURE 10-2. Butterfly Tie

Tie Strap: A tough plastic (nylon, or equivalent) locking strap used to tie the lines in a bundle together between clamps or to otherwise secure hoses and wires as noted below. These straps must be UV stable.



FIGURE 10-3. Tie Strap

Heavy Duty (HD) Mount: A black rigid device used for securing a tie strap to the frame or other structural support. Mounts are made of impact modified, heat stabilized UV resistant nylon capable of continuous operation between temperatures 220°F (150°) and -40°F (-40°).

https://truckmanualshub.com/

Note: **Heavy duty tie straps 0.50in (12.7mm) wide (Tyton T255ROHIR or similar) shall be used whenever HD mounts are specified, although 0.25in (6.4mm) tie straps may be used in some specified applications.**

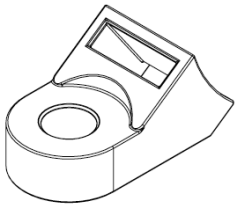


FIGURE 10-4. Heavy Duty (HD) Mount.

Excess of material: More than 3 inches of slack for every 14 inch section of hose routing, except for air conditioner hoses. See section 4.1.3 for air conditioner hose requirements.

Shortness of material: Less than 1 inch of slack on a 14 inch section of hose routing.

ROUTING REQUIREMENTS

Wiring

Electrical ground wire terminals must be securely attached and the complete terminal surface must contact a clean bare metal surface. See R414-558 for grounding wire connection practice. Apply electrical contact corrosion inhibitor Nyogel 759G grease (made by William F. Nye, Inc., New Bedford, MA) per R414-558.

Don't bend wires or use tie straps within 3 inches (75 mm) of (connected) wire connectors or plugs.

Wires in Bundles

Electrical wires (other than the exceptions covered below) running parallel with air or coolant hose bundles, may be included in the bundle if they are isolated from the hoses with a covering of convoluted plastic tubing.

EXCEPTIONS:

Battery cables (including jump start cables) may be bundled with or tied to the charging wire harness. They shall **not** be bundled with or tied directly to any other components, including hoses, wires, or bundles. They shall be separated from other routed components using butterfly ties at intervals not exceeding 14 inches (356 mm). Battery strap (W84-1000) tie down shall be used without exception to secure battery cables to frame mounted or other major component (e.g. engine, tmsn, etc.) mounted standoffs at intervals not exceeding 14 inches (356 mm). The (positive) battery cable shall be covered with convoluted plastic tubing from terminal to terminal.

110/220 volt wires for engine heaters, oil pan heaters, transmission oil heaters and battery pad warmers, shall **not** be included in any hose/wire bundle with a fuel hose. Individual heater wires not in a bundle shall be separated from other components by using butterfly clamps or butterfly ties at intervals not exceeding 14 inches (356 mm). Heater wires with a secondary covering shall be covered with convoluted tubing whether they are in bundles or not.

https://truckmanualshub.com/

Wires Crossing other Components

Electrical wires crossing over other components, such as lines, bolt heads, fittings, engine components lifting eyes, engine block, cylinder head, etc., close enough to rub shall be isolated with a covering of convoluted tubing **and** separated from the component by using butterfly clamps, butterfly ties, or plastic sheathing. 110/220 volt engine heater wiring shall be installed with butterfly ties or butterfly clamps

Piping

Use no street elbows in air brake, water, fuel, or hydraulic systems unless specified on the piping diagram and the build instructions.

Use no elbows in the air brake system unless specified on the air piping diagram and the build instructions.

Hoses Crossing Components

Hoses crossing over other components close enough to rub shall be protected with a secured covering of convoluted plastic tubing (KW part number K344-813), another section of hose, or plastic sheathing (KW part number K213-1312). The usage of butterfly ties, or butterfly clamps are also recommended.

Air Compressor Discharge Hoses

Wires or hoses shall not be tied to the high temperature air compressor discharge hose. Hoses and wires may be routed across the air compressor discharge hose at a distance of 18 inches (457 mm) or greater from the compressor discharge port. In this case the crossing hoses and wires shall be “butterfly” clamped to the air compressor discharge hose and covered with convoluted tubing at the clamp point (use high temperature clamps on the compressor hose).

Bundles

HD mount and tie strap, or clamp shall be located at intervals not to exceed 14 inches (356 mm) along the bundle.

Regular tie straps shall be located at intervals not to exceed 7 inches (178 mm) between HD mount or clamps. Extra tie straps may be used as needed to contain the hoses and wires in the bundle.

Routing of Wires and Hoses near Moving Components

Wires and Hoses shall be routed away from moving components, such as fans, shackle links, drivelines, steering linkages, etc. so that there is at least 0.5 inches (12.7 mm) clearance when the component is operating at its **maximum** travel limits.

A minimum clearance of 1.0 inchs (25.4) shall be maintained between steering axle tires (and associated rotating parts) in all positions and routed components, such as hoses, oil lines, wires, pipes, etc.

https://truckmanualshub.com/

Routing of Wires and Hoses near Exhaust System

TABLE 10-1. Exhaust – System Clearance

Description	Shielded	Unshielded
Coolant hoses, HVAC hoses and tubing, and electrical wires within 15” of the turbo and/or over 15” from the turbo	2” minimum	3” minimum
Fuel hoses		
within 15” of the turbo	n/a	4” minimum
over 15” from the turbo	2” minimum	3” minimum
Fuel tanks and hydraulic tanks		
crossing tank	n/a	2” minimum
parallel to tank	n/a	2” minimum
end of tank	n/a	1” minimum
aluminum/ceramic-coated exhaust pipe crossing tank	n/a	1.5” minimum
Air hose		
nylon	3” minimum	8” minimum
wire braid	2” minimum	3” minimum

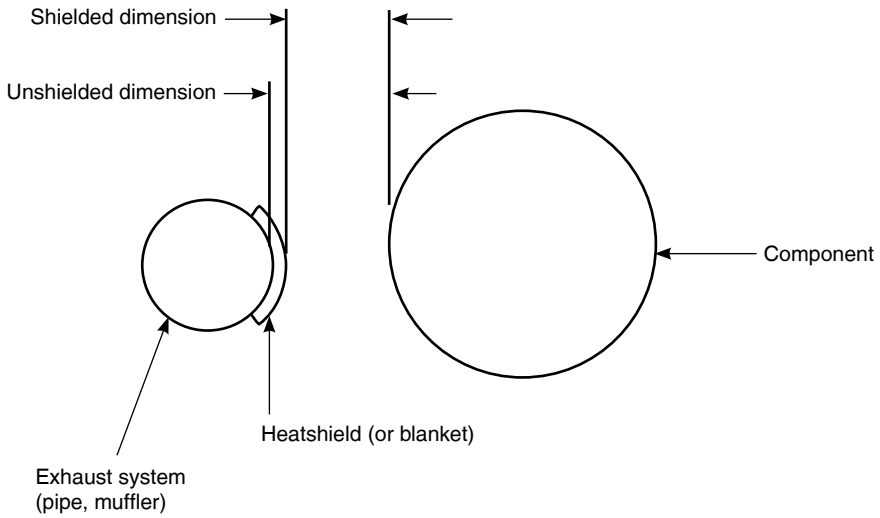


FIGURE 10-5. Definition of measurements.

https://truckmanualshub.com/

Appendix A
Vehicle Identification

VEHICLE IDENTIFICATION NUMBER

A 17–character number (numeral and letter combination) forms the Vehicle Identification Number (VIN) which includes the Chassis Number. It contains among other information, the model year (4), assembly plant (5), and vehicle serial number (6). See Figure A–1.

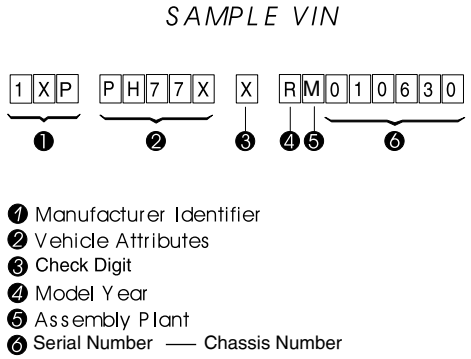


FIGURE A-1. Vehicle Identification Number (VIN).

The model year (4) is designated by an alphanumeric code in the tenth character position in the VIN. See Table A-1 and Figure A–1.

Code	Year
5	2005
6	2006
7	2007
8	2008
9	2009

Code	Year
A	2010
B	2011
C	2012
D	2013
E	2014
F	2015

TABLE A-1. Model Year (Code) Designations.

VIN Location

The VIN is marked on the Incomplete Vehicle Certification Label (on trucks). It is located either on the driver's door edge or door frame. See Figure A–2.

Chassis Number Locations

The Chassis Number comprises the last six characters of the VIN, and is shown in multiple locations on the vehicle.

- Left side of cab, back wall of cab: stmped plate. (DayCab)
- Left side of cab, back wall of sleeper: stamped plate. (Sleeper)
- Tire, Rim, and Weight Rating Data label.
- Major Components and Weights label.
- Noise Emission label.
- Paint Identification label.

https://truckmanualshub.com/

VEHICLE IDENTIFICATION LABELS

Vehicle Identification Labels are located on the driver's side door edge or on either the driver's or passenger's side door frames. See Figure A-2. Labels include Vehicle Certification, Components and Weights, Tire/Rim and Weight Rating Data, Noise Emissions, and Paint Identification. Quantity and location of labels may differ based on Complete/Incomplete vehicle, and Single/Dual certification.

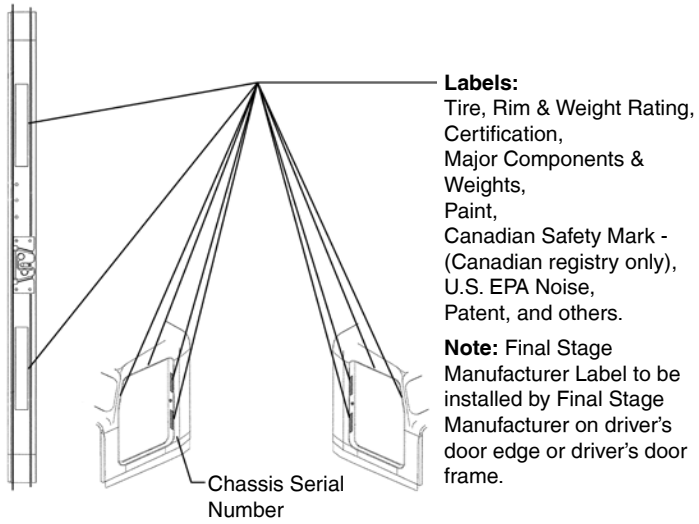


FIGURE A-2. Drivers Door and Door Frame Labels

Tire/Rim and Weight Rating Data Label

The Tire/Rim and Weight Rating Data Label is used in conjunction with the Incomplete Vehicle Certification Label on Incomplete Vehicles. It contains chassis serial number and the following information:

- GVWR — Gross Vehicle Weight Rating
- GAWR FRONT and REAR — Gross Axle Weight Ratings for Front and Rear Axle
- TIRE/RIM SIZES AND INFLATION PRESSURES — Tire/Rim Sizes and Cold Pressure Minimums

Note: **GVWR is the TOTAL WEIGHT the vehicle is designed to carry. This includes the weight of the empty vehicle, loading platform, occupants, fuel, and any load.**

Incomplete Vehicle Certification Label

The Incomplete Vehicle Certification Label contains the chassis VIN, date of manufacture, and listing of applicable motor vehicle safety standards.

Components and Weights Label

The Major Components and Weights Label includes chassis weight and gross weight information, as well as model and serial numbers for the vehicle, engine, transmission, and axles.

https://truckmanualshub.com/

Noise Emission Label

The Noise Emission Label contains the chassis serial number, date of manufacture, and information regarding US noise emission regulations. This label is not provided on Canadian registered vehicles.

Paint Identification Label

The Paint Identification Label contains the paint colors used by the factory to paint the truck. It lists frame, wheels, cab interior and exterior colors. This label is located either underneath the dash to the left of the steering column support, inside the glovebox, or on the passenger's door frame.

COMPONENT IDENTIFICATION

Each of the following components has their own identification label.

Engine Identification

The engine serial number is stamped on a plate located on the left front of the engine. For further information, please refer to the Engine Operation and Maintenance Manual (included in the glove compartment of each vehicle).

Transmission Identification

The transmission identification number is stamped on a tag affixed to the right forward side of the transmission case. It includes among other specifications the transmission model, serial, and part number.

Front Axle Identification

The front axle has a identification tag located on the front axle beam. It includes the axle model, part number and serial number.

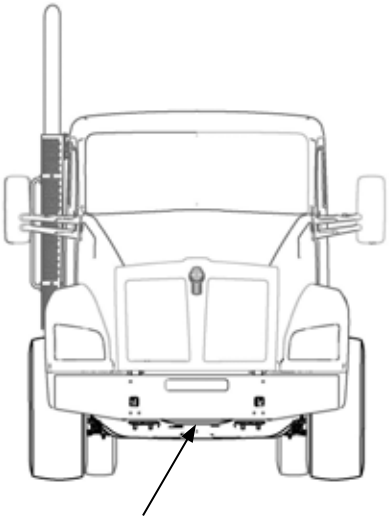


FIGURE A-3. Front Axle Identification

https://truckmanualshub.com/

Rear Axle Identification

The rear axle identification numbering system includes two labels or stamps.

1. Axle Housing Number Tag, located on the left forward side of the housing arm. This tag identifies the axle housing.

2. Axle Differential Carrier Identification, located on the top side of the differential carrier. The following information is either stamped, or marked with a metal tag: Model No., Carrier Production Assembly No., Carrier Assembly Serial No., Gear Ratio, Axle Specifications Number and OEM part number and country of origin.

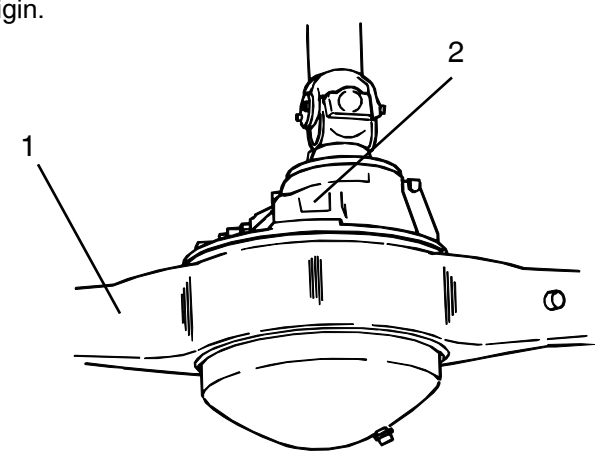


FIGURE A-4. Rear Axle Identification

Note:

Illustrated identification tag locations are typical. Actual locations may vary by axle manufacturer and with single versus tandem axles.

https://truckmanualshub.com/

This page intentionally left blank.



A PACCAR COMPANY

Kenworth Truck Company
P.O. Box 1000
Kirkland, WA 98083
(425) 828-5000