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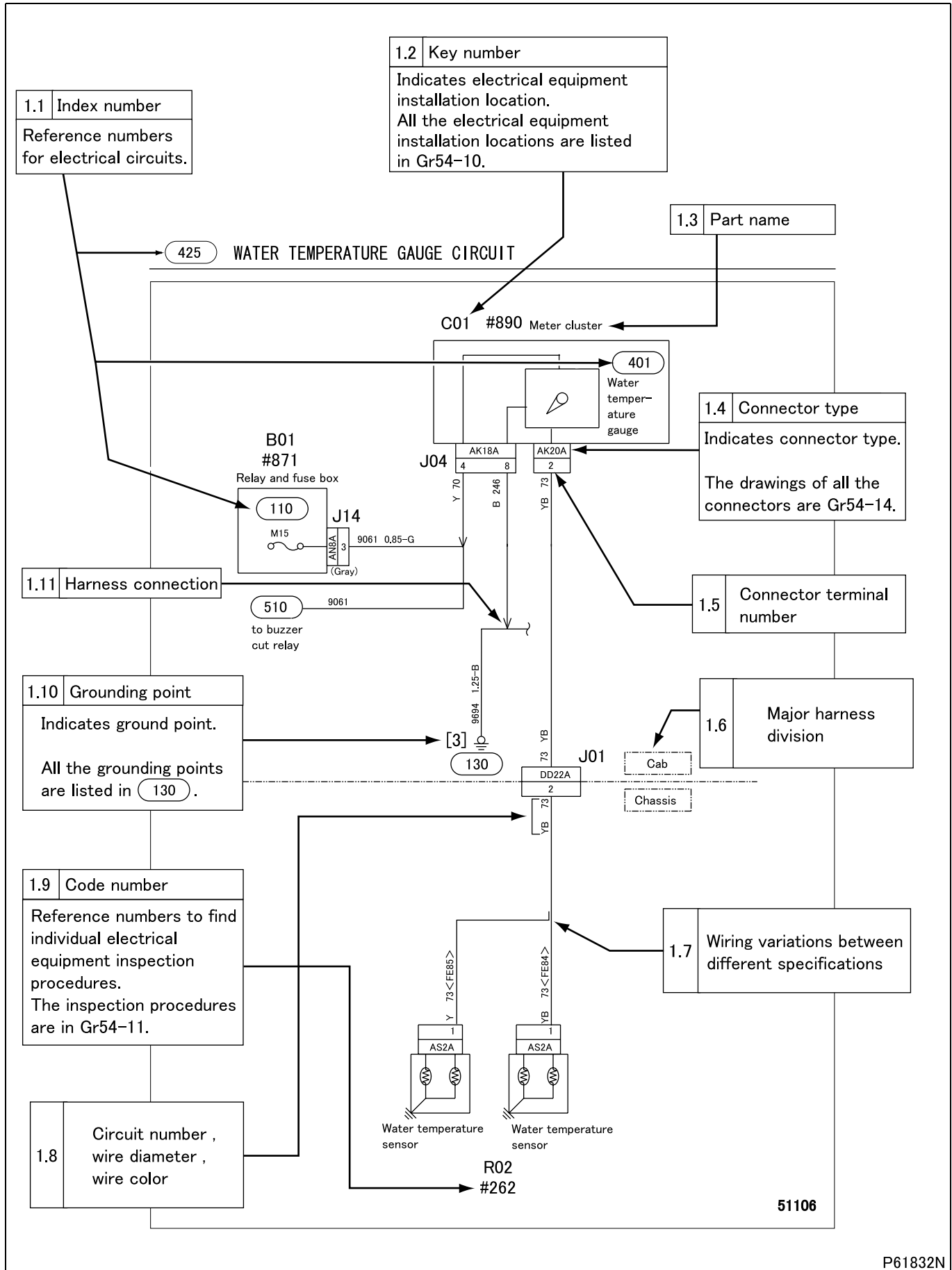
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HOW TO READ THIS GROUP

HOW TO READ THIS GROUP

HOW TO READ CIRCUITS (ELECTRICAL)



1.1 Index number: (100) to (999)

- Index numbers are used as reference numbers for electrical circuits. Each electrical circuit has been assigned its own index number.

1.2 Key number: A01 to Z99

- Key numbers indicate parts installation locations. The installation location of a part can be easily found using its key number shown in a circuit diagram.

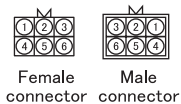
All of the electrical equipment installation locations are listed in Gr54-10.

1.3 Part name

1.4 Connector type (type indication)

- A list of the connectors used is included in Gr54-14.

1.5 Connector terminal number



Connector terminal numbering starts with the upper left corner for female connectors and with the upper right corner for male connectors.

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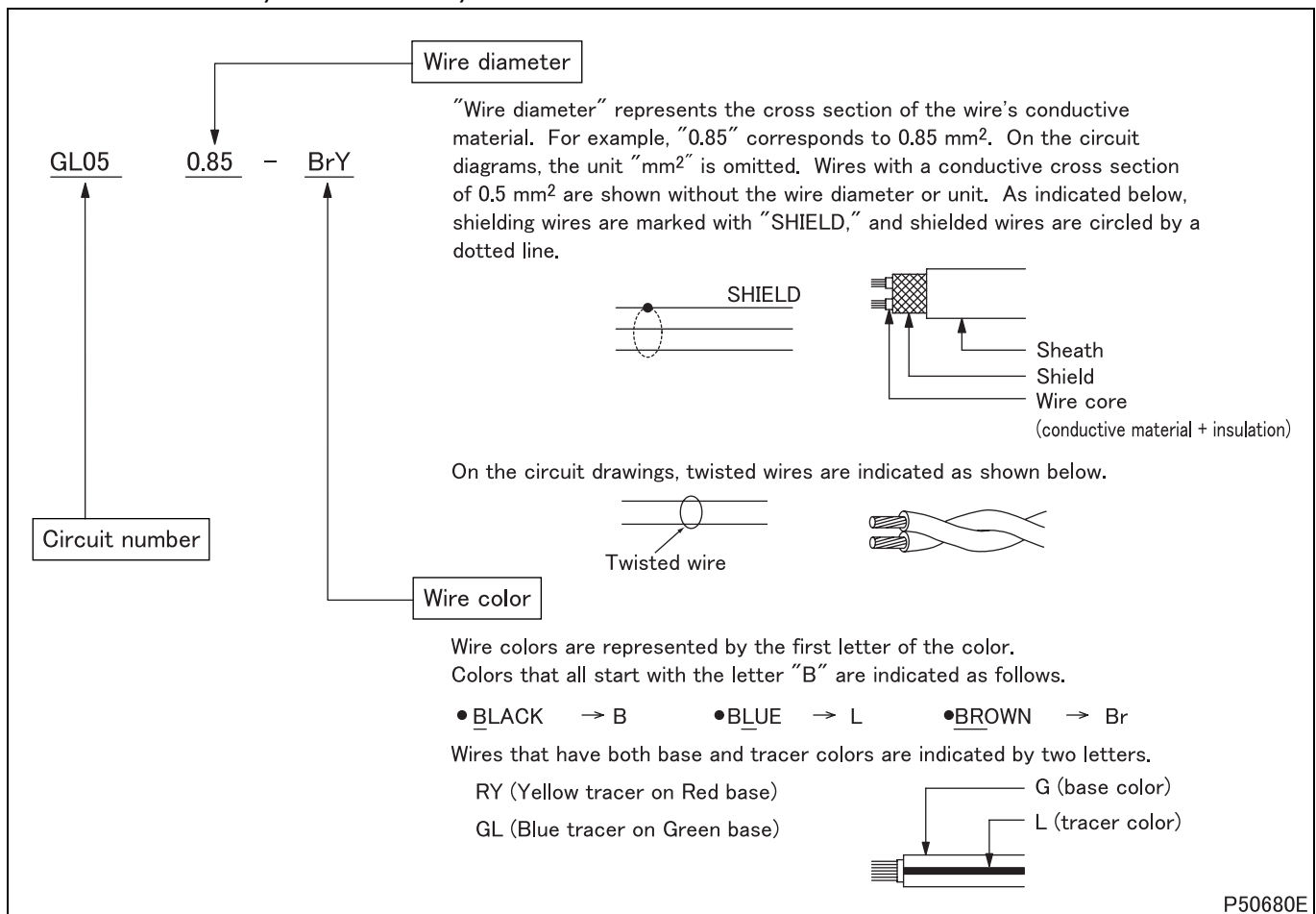
1.6 Major harness division

- Major harness divisions are shown.

1.7 Wiring variations between different specifications

- Variations in wiring/circuit between different vehicle specifications are clearly indicated as shown.

1.8 Circuit number, wire diameter, wire color



1.9 Code number: #001 to #999

- Code numbers are reference numbers to find individual electrical equipment inspection procedures. The inspection procedure for a electrical equipment can be found using its code number shown in a circuit diagram.

HOW TO READ THIS GROUP

1.10 Grounding point: [1] to [99]

- Locations where wires are grounded to the vehicle. All of the grounding points are listed in (130).

1.11 Harness connection

- The arrow in the wiring diagram indicates where harnesses are connected, and NOT the flow of electricity.

Wire color

Wire color		Base color + tracer											
B	Black	BW	Black/ white	BY	Black/ yellow	BR	Black/red	BG	Black/ green	BL	Black/ blue		
Br	Brown	BrW	Brown/ white	BrB	Brown/ black	BrY	Brown/ yellow	BrR	Brown/ red	BrG	Brown/ green		
G	Green	GW	Green/ white	GR	Green/ red	GY	Green/ yellow	GB	Green/ black	GL	Green/ blue	GO	Green/ orange
Gr Gy	Gray	GrL GyL	Gray/ blue	GrR GyR	Gray/ red								
L	Blue	LW	Blue/ white	LR	Blue/red	LY	Blue/ yellow	LB	Blue/ black	LO	Blue/ orange	LG	Blue/ green
Lg	Light green	LgR	Light green/ red	LgY	Light green/ yellow	LgB	Light green/ black	LgW	Light green/ white				
O	Orange	OL	Orange/ blue	OB	Orange/ black	OG	Orange/ green						
P	Pink	PB	Pink/ black	PG	Pink/ green	PL	Pink/ blue	PN	Pink/ white				
Pu	Purple												
R	Red	RW	Red/ white	RB	Red/ black	RY	Red/ yellow	RG	Red/ green	RL	Red/blue	RO	Red/ orange
Sb	Sky blue												
V	Violet	VY	Violet/ yellow	VW	Violet/ white	VR	Violet/red	VG	Violet/ green				
W	White	WR	White/ red	WB	White/ black	WL	White/ blue	WG	White/ green	WO	White/ orange		
Y	Yellow	YR	Yellow/ red	YB	Yellow/ black	YG	Yellow/ green	YL	Yellow/ blue	YW	Yellow/ white	YO	Yellow/ orange
		YP	Yellow/ pink	YV	Yellow/ violet								

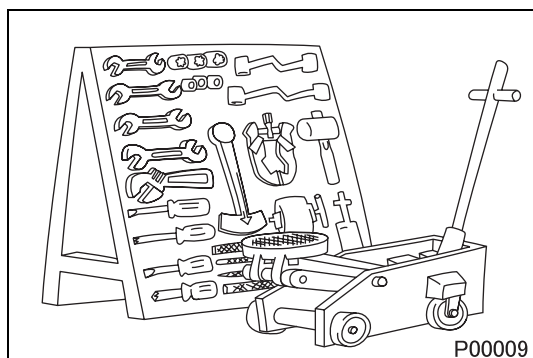
54-00A GENERAL

PRECAUTIONS FOR MAINTENANCE OPERATION

- Before performing service operations, inquire into the customer's complaints and ascertain the condition by checking the total distance travelled, the conditions under which the vehicle is operated, and other relevant factors about the vehicle. And note the necessary information. This information will help you to service the vehicle efficiently.
- Check the location of the fault, and identify its cause. Based on your findings, determine whether parts must be removed or disassembled. Then, follow the service procedure given in this manual.



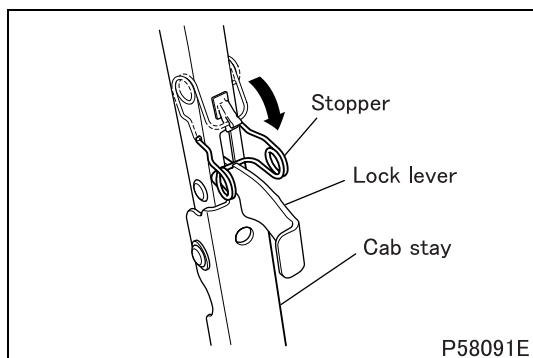
- Perform service operations on a level surface. Before starting, take the following preparatory steps:
 - To prevent soiling and damage, place covers over the seats, trim and floor in the cab and over the paintwork of the body.



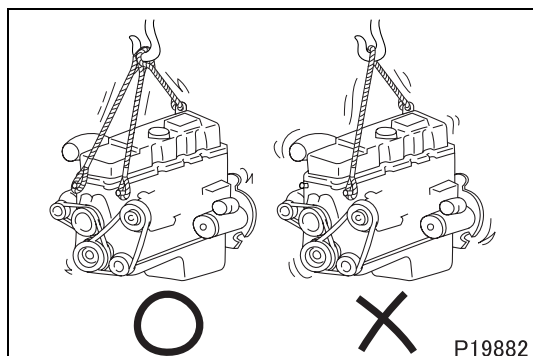
- Prepare all the general and special tools necessary for the job.

WARNING ⚠

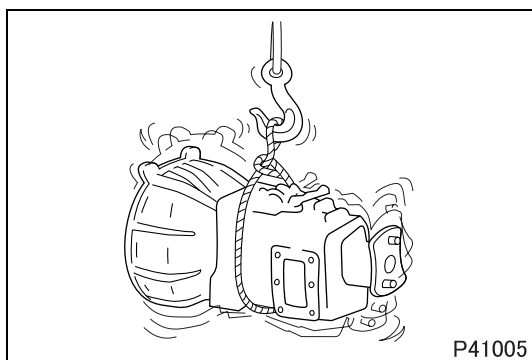
- **Special tools must be used wherever specified in this manual. Do not attempt to use other tools since they could cause injuries and/or vehicle damage.**



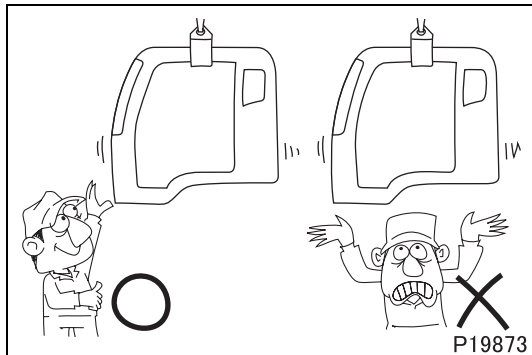
- After tilting the manual tilt type cab, be sure to engage the stopper with the lock lever to lock the cab stay securely.



- Take extreme care when removing/installing heavy items such as engine, transmission and axle. When lifting heavy items using a cable etc., observe the following precautions.
 - Identify the mass of the item being lifted. Use the cable that is strong enough to support the mass.



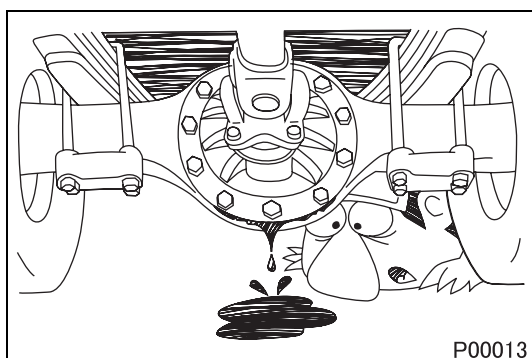
- If lifting eyes are not provided on the item being lifted, tie a cable around the item taking into account the item's center of gravity.



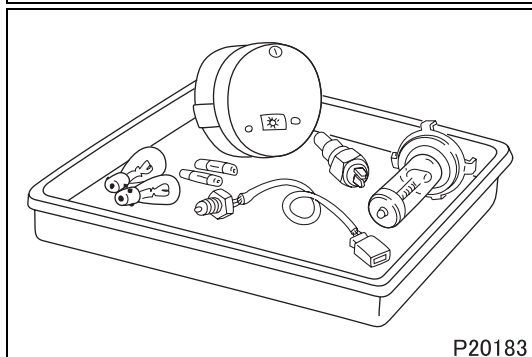
- Do not allow anyone to pass or stay under a lifted item which may possibly fall.



- Never work in shoes that have oily soles.
When working with a partner or in a group, use pre-arranged signals and pay constant attention to safety. Be careful not to touch switches and levers unintentionally.



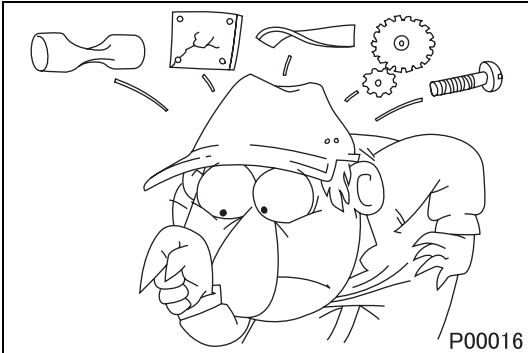
- Inspect for oil leakage etc. before washing the vehicle. If the order is reversed, any oil leakage or fault that may exist could go unnoticed during inspection.



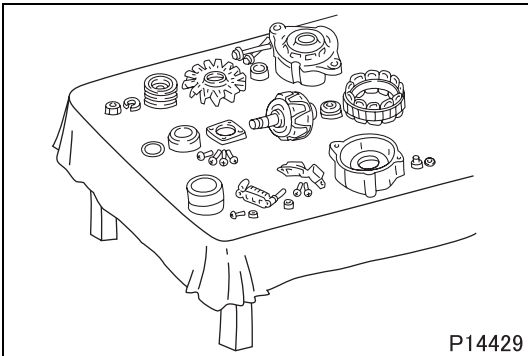
- Prepare replacement parts ready for installation.

PRECAUTIONS FOR MAINTENANCE OPERATION

- Oil seals, packings, O-rings and other rubber parts, gaskets, and split pins must be replaced with new ones after removal. Use only approved replacement parts.



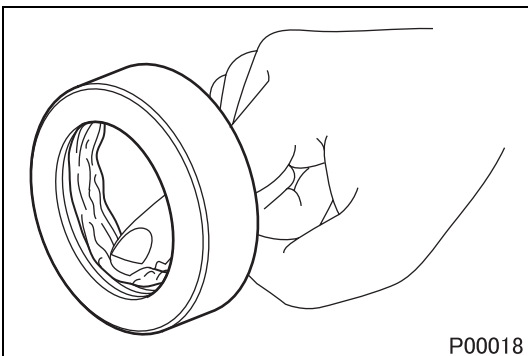
- When disassembling parts, visually check them for wear, cracks, damage, deformation, deterioration, rust, corrosion, defective rotation, fatigue, clogging and any other possible defect.



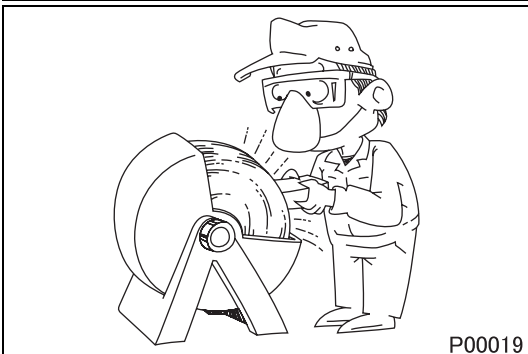
- To facilitate correct reassembly of parts, make alignment marks on them before disassembly and arrange disassembled parts neatly. Make punch marks and other alignment marks where they will not detract from parts' functionality and appearance.
- After removing parts from the vehicle, cover the area to keep it free of dust.

CAUTION

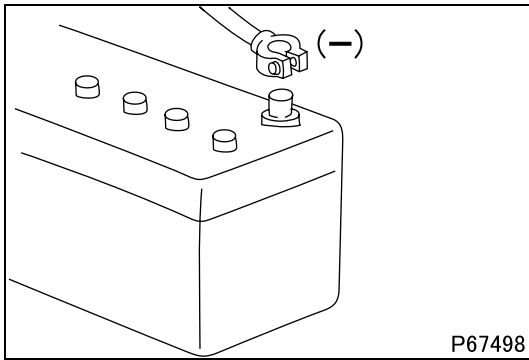
- **Be careful not to mix up identical parts, similar parts and parts that have left/right alignments.**
- **Keep new replacement parts and original (removed) parts separately.**



- Apply the specified oil or grease to U-seals, oil seals, dust seals and bearings before reassembly.
- Always use the specified oils and greases when performing inspection or replacement. Immediately wipe away any excess oil or grease with a rag.



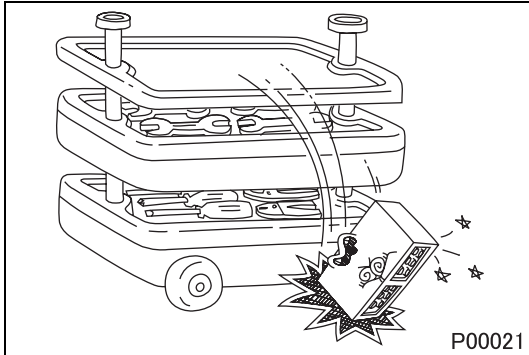
- Wear safety goggles when using a grinder or welder. Wear gloves when necessary, and watch out for sharp edges and other items that might wound your hands.



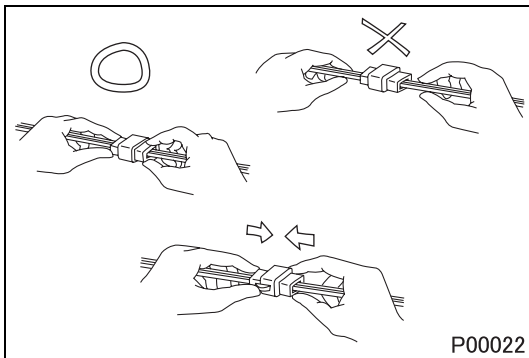
- Before working on the electrical system, disconnect the (-) battery cable to prevent short circuits.

CAUTION

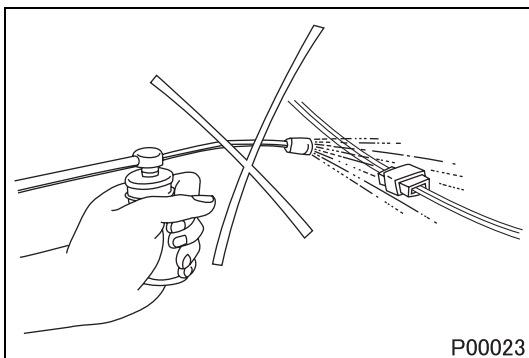
- **Make sure the starter switch and lighting switches are OFF before disconnecting or connecting battery cable. Semiconductor components may otherwise be damaged.**



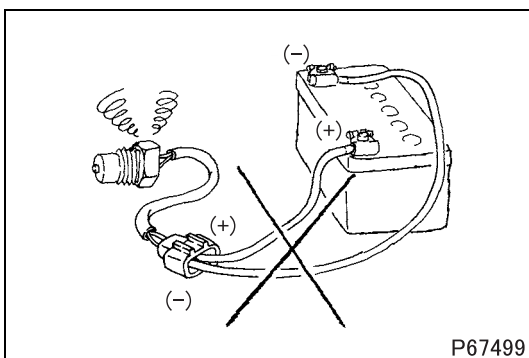
- Carefully handle sensors relays, and other items that are sensitive to shock and heat. Do not remove or paint the cover of any control unit.



- When separating connectors, grasp the connectors themselves rather than the harnesses.
- To separate locking connectors, first push them in the direction of the arrows. To reconnect locking connectors, push them together until they click.



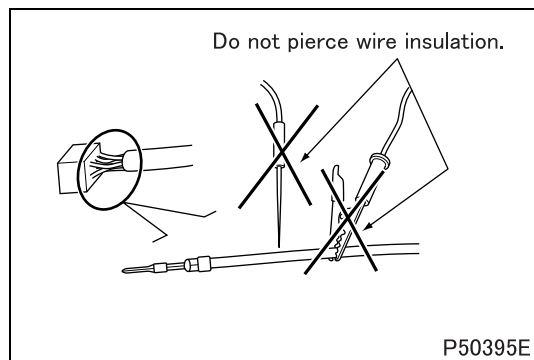
- Before washing the vehicle, cover electrical parts to keep them dry. (Use plastic sheets or the like.) Keep water away from harness connectors and sensors and immediately wipe off any water that gets on them.



- When applying a voltage to a part for inspection purposes, check that the (+) and (-) cables are connected properly then gradually increase the voltage from zero. Do not exceed the specified voltage.
Remember that control units and sensors do not necessarily operate on the battery voltage.

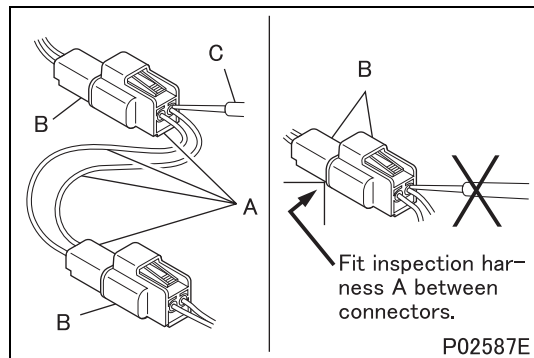
PRECAUTIONS FOR MAINTENANCE OPERATION

1. Handling Precautions for Electric Circuits



CAUTION

- Do not pierce wire insulation with test probes or alligator clips when performing electrical inspections. Doing so can, particularly with the chassis harness, hasten corrosion.

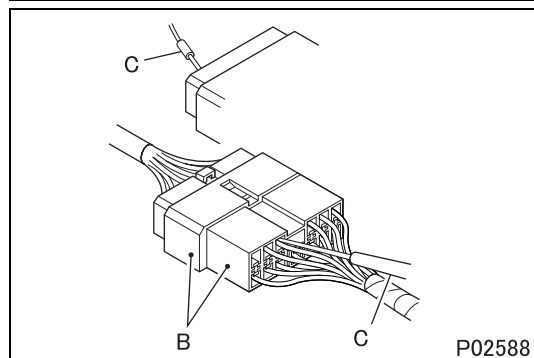


1.1 Inspection of harnesses

(1) Inspections with connectors fitted together

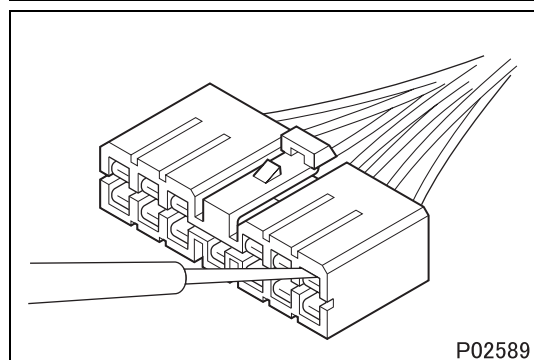
(1.1) Waterproof connectors

- Connect an inspection harness and connector **A** between the connectors **B** of the circuit to be inspected. Perform the inspection by applying a test probe **C** to the connectors of the inspection harness. Do not insert the test probe **C** into the wire-entry sides of the waterproof connectors since this would damage their waterproof seals and lead to rust.



(1.2) Non-waterproof connectors

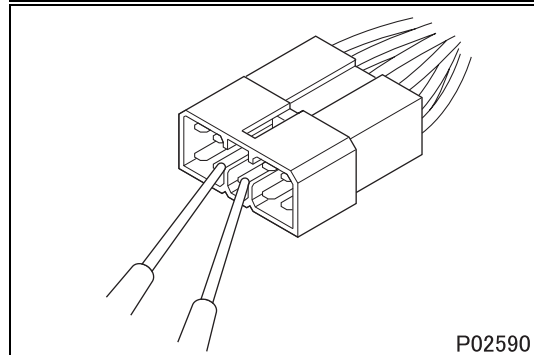
- Perform the inspection by inserting a test probe **C** into the wire-entry sides of the connectors. An extra-narrow probe is required for control unit connectors, which are smaller than other types of connector. Do not force a regular-size probe into control unit connectors since this would cause damage.



(2) Inspections with connectors separated

(2.1) Inspections on female terminals

- Perform the inspection by carefully inserting a test probe into the terminals. Do not force the test probe into the terminals since this could deform them and cause poor connections.

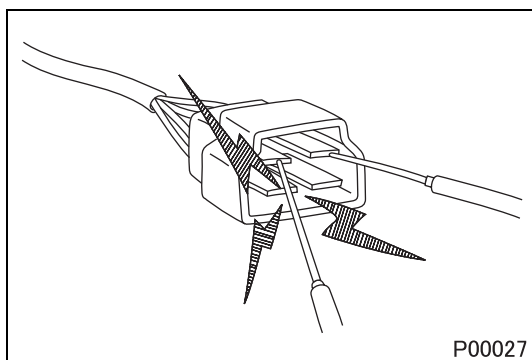


(2.2) Inspections on male terminals

- Perform the inspection by applying test probes directly to the pins.

CAUTION

- Be careful not to short-circuit pins together with the test probes. With control unit connectors, short-circuiting of pins can cause damage to the control unit's internal circuitry.

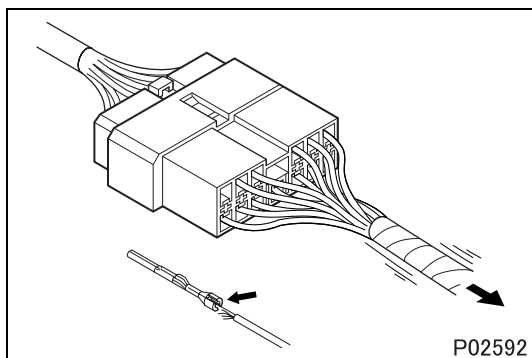
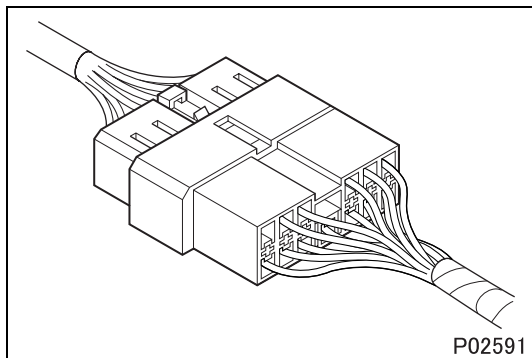


- When using a multimeter to check continuity, do not allow the test probes to touch the wrong terminals.

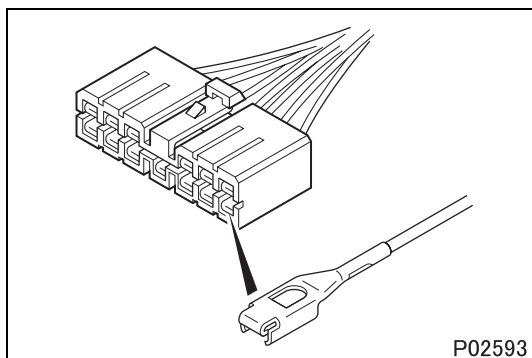
1.2 Inspection of connectors

(1) Visual inspection

- Check that the connectors are fitted together securely.



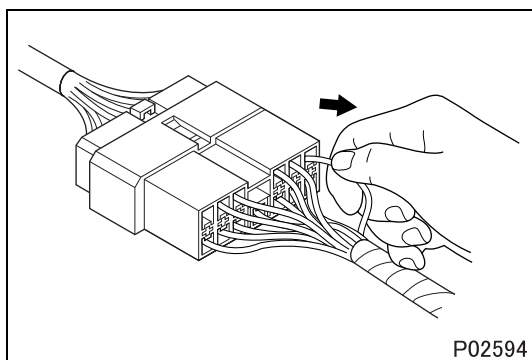
- Check whether wires have been separated from their terminals due to pulling of the harness.



- Check that male and female terminals fit together tightly.

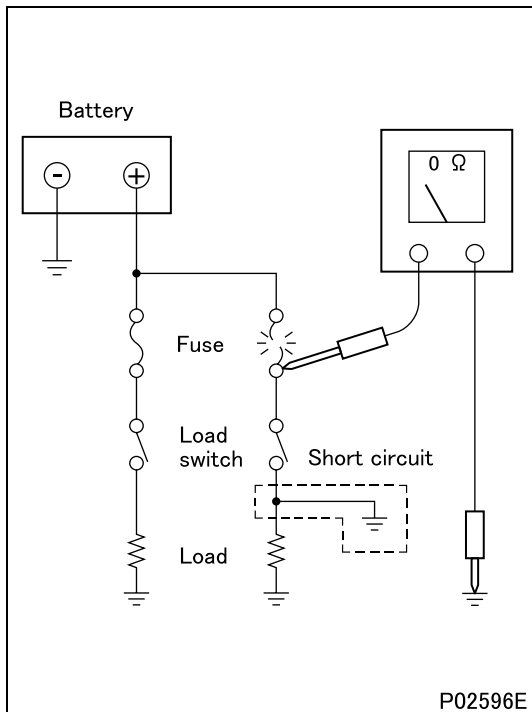
- Check for defective connections caused by loose terminals, by rust on terminals, or by contamination of terminals by foreign substances.

PRECAUTIONS FOR MAINTENANCE OPERATION



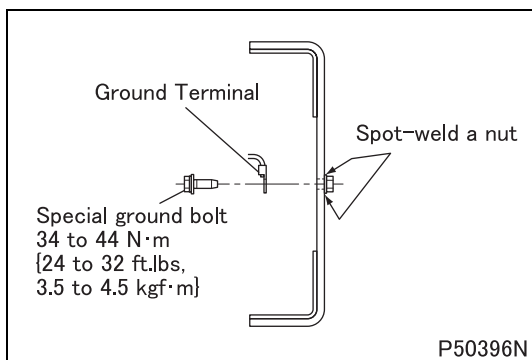
(2) Checking for loose terminals

- If connector terminal retainers become damaged, male and female terminals may not mate with each other when the connector bodies are fitted together. To check for such terminals, gently pull each wire and see whether any terminals slip out of their connector housings.



1.3 Inspections when a fuse blows

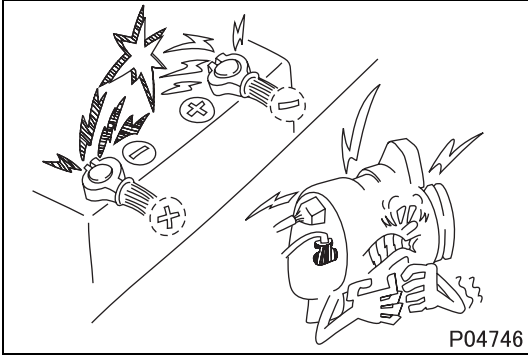
- Remove the fuse, then measure the resistance between ground and the fuse's load side.
Next, close the switch of each circuit connected to the fuse. If the resistance measurement between any switch and ground is zero, there is a short circuit between the switch and the load. If the resistance measurement is not zero, the circuit is not currently short-circuited; the fuse probably blew due to a momentary short circuit.
- The main causes of short circuits are as follows:
 - Harnesses trapped between chassis parts
 - Harness insulation damage due to friction or heat
 - Moisture in connectors or circuitry
 - Human error (accidental short-circuiting of components)



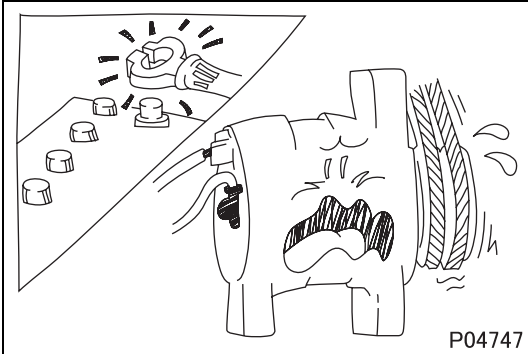
1.4 Inspection of chassis ground

- A special ground bolt is used to tighten a ground terminal. When servicing the ground point, be sure to follow the procedures described below:
 - When reinstalling the ground bolt
Tighten the ground bolt to the specified torque.
 - When relocating the ground point
A special ground bolt must be used. Spot-weld a nut to a frame and tighten the ground bolt to the specified torque. Be sure to apply touch-up paint to the welded point.

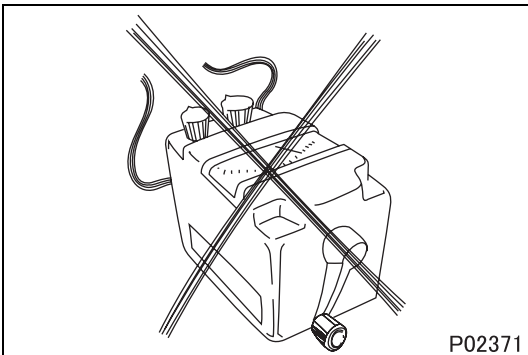
2. Service Precautions for Alternators



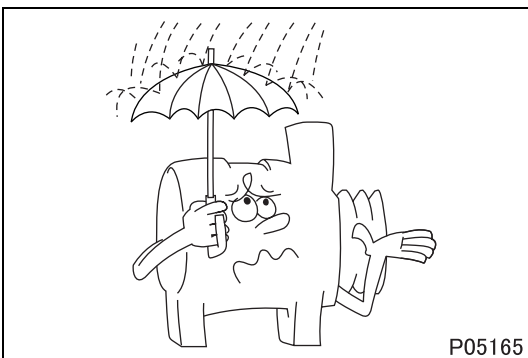
- When servicing alternators, observe the following precautions:
 - Never reverse the polarity of battery connections. If the polarity of the battery connections were to be reversed, a large current would flow from the battery to the alternator, damaging the diodes and regulator.



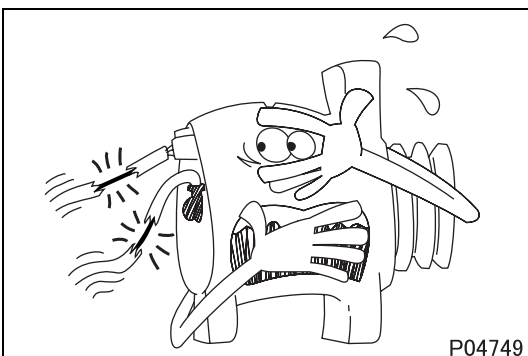
- Never disconnect the battery cables with the engine running. Disconnection of the battery cables during engine operation would cause a surge voltage, leading to deterioration of the diodes and regulator.



- Never perform inspections using a high-voltage multimeter. The use of a high-voltage multimeter could damage the diodes and regulator.

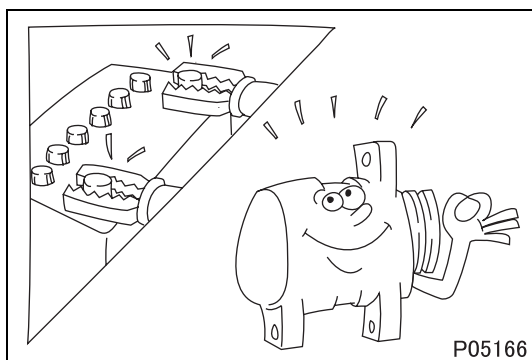


- Keep alternators dry. Water on alternators can cause internal short circuits and damage.



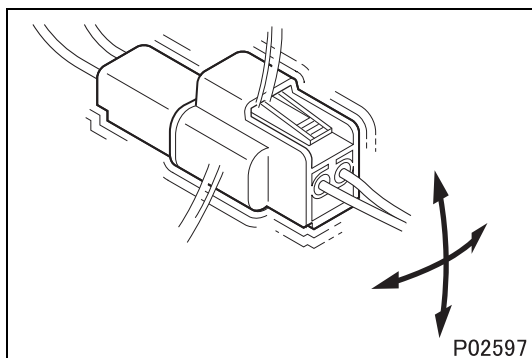
- Never operate an alternator with the B and L terminals short-circuited. Operation with the B and L terminals connected together would damage the diode trio.

PRECAUTIONS FOR MAINTENANCE OPERATION



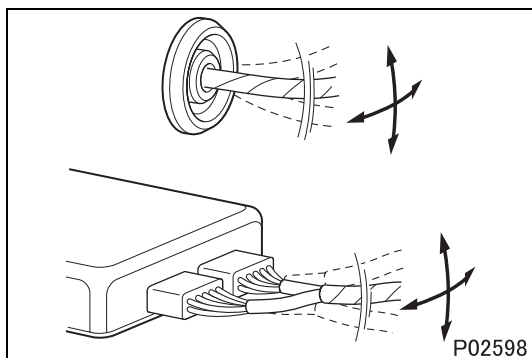
- Disconnect the battery cables (+) and (–) before quick-charging the battery with a quick charger. Unless the battery cables are disconnected, quick-charging can damage the diodes and regulator.

3. Intermittent Faults

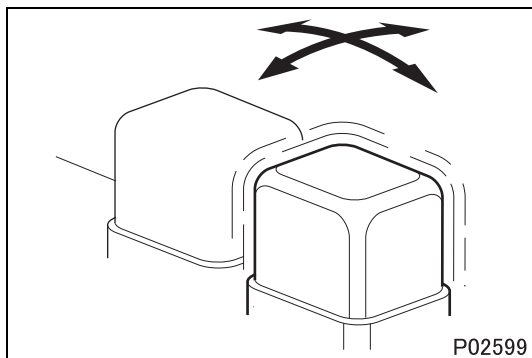


- An intermittent fault typically occurs only under certain operating conditions. Once these conditions have been identified, the cause of the intermittent fault can be ascertained easily. First, ask the customer about the vehicle operating conditions and weather conditions under which the fault occurs. Also ask about the frequency with which the fault occurs and about the fault symptoms. Then, reproduce the fault based on this information. In accordance with the conditions under which the fault occurs, determine whether the fault is caused by vibration, heat or other factors. If vibration is a possible factor, see if the fault can be reproduced by performing the following checks on individual connectors and other parts:

- Gently move connectors up and down and to left and right.
- Gently move wiring harnesses up and down and to left and right.
- Gently wiggle sensors and other devices by hand.
- Gently wiggle wiring harnesses on suspension systems and other moving parts.

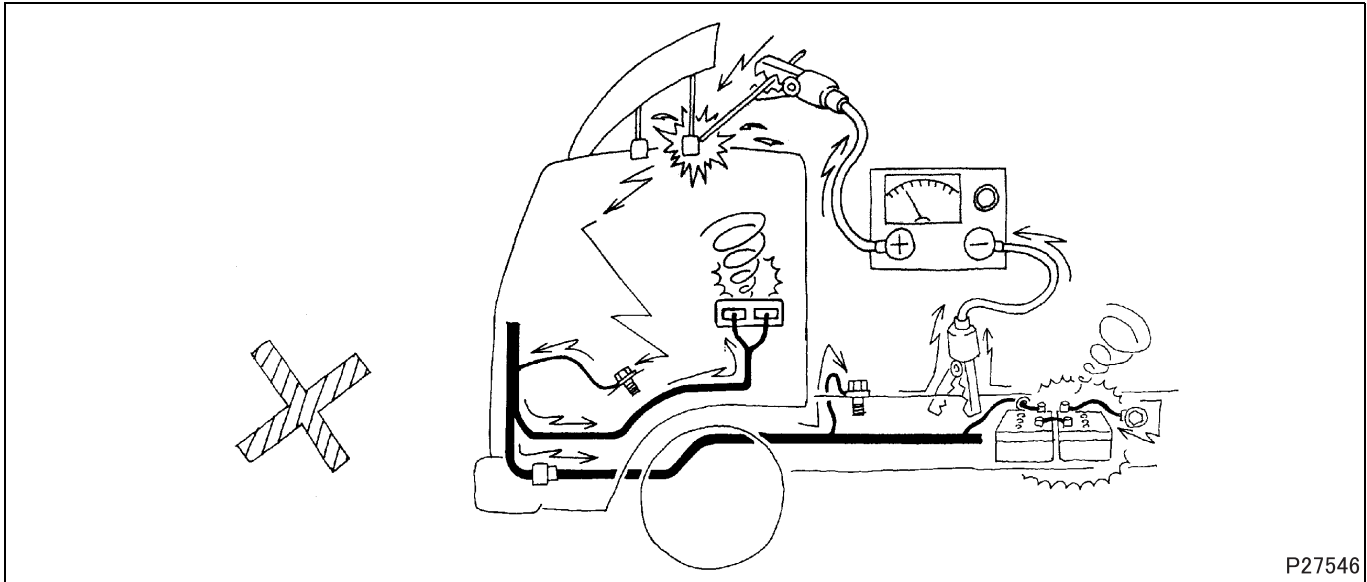


- Connectors and other parts to be checked are those included or given as likely fault locations in inspection procedures corresponding to diagnosis codes and/or fault symptoms.



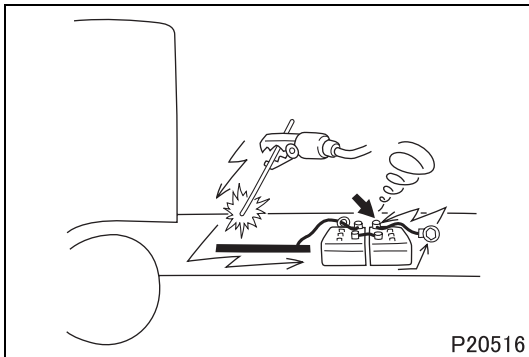
4. Precautions for Arc Welding

- When arc welding is performed, current from the welder flows to ground via the vehicle's metal parts. Unless appropriate steps are taken, this current can damage control units, other electrical devices and wiring harnesses. And any electrical device near the point on the vehicle to which the (–) cable of the welder is connected, might be largely damaged.



P27546

- Current flows backward as shown below.



P20516

4.1 From battery (–) cable

To prevent damage to the battery and to electrical devices that are connected directly to the battery, it is essential to disconnect the battery's (–) cable.

4.2 Procedure

- Turn the starter switch to the LOCK position.
- ↓
- Disconnect the battery's (–) cable.
- ↓
- Cover all parts of the vehicle that may be damaged by welding sparks.
- ↓
- Connect the welder's (–) cable to the vehicle as close as possible to the area being welded. Do not connect the welder's (–) cable to the cab if the frame is being welded, and vice versa.
- ↓
- Set the welding current in accordance with the part being welded.

54-00B SPECIFICATIONS

Battery

Item		Specifications
Model		130E41L
Voltage × Quantity	V	12 × 2
Capacity (5-hour rating)	Ah	92

Alternator

Item		Specifications
Manufacturer		MITSUBISHI ELECTRIC
Type		Alternator with built-in regulator (without brush, external fan)
Model		A4TU1593
Output	V-A	12–100

Starter

Item		Specifications
Starter	Manufacturer	MITSUBISHI ELECTRIC
	Model	M8T55371
	Output V-kW	12–3.0
	Reduction gear mechanism	Planetary gears
	Magnetic switch operating voltage V	8 or less
Starter relay	Model	U1X11672
	Excitation current V-A	12–4
	Closing voltage V	8 or less
	Opening voltage V	3.5 or less
	Allowable cutoff current A	200
Glow relay	Model	U1T11872
	Excitation current V-A	12–4
	Closing voltage V	8 or less
	Opening voltage V	3.5 or less
	Allowable cutoff current A	60
	Temperature fuse capacity A	127
Glow plug	Model	Sheathed type
	Excitation current V-A	11–5

Lighting

Item		Specifications
Headlamp	Model	Unconventional, rectangular, 2-lamp-system, semi-sealed beam
	Type	Parabola reflector type
	Upper beam (HIGH) W	HB2 halogen 60/55 (HIGH/LOW)
	Lower beam (LOW) W	
	Parking lamp W	5
Front side turn signal lamp (serving also as hazard warning lamp) W		21
Clearance and side marker lamp W		7.5
Rear combination lamp	Stop and tail lamp (stop/tail) W	21/5 (double filament type)
	Rear turn signal lamp (serving also as hazard warning lamp) W	21
	Backup lamp W	21
License plate lamp W		7.5
Identification lamp W		7.5
Cab lamp W		10

Meter

Item			Specifications	
Meter cluster	Manufacturer		DENSO	
	Voltage V		12	
	Speedometer indicating range km/h {MPH}		Meter reading $\begin{smallmatrix} +2 \\ 0 \end{smallmatrix}$ to $\begin{smallmatrix} +6.5 \\ 0 \end{smallmatrix}$ { $\begin{smallmatrix} +2 \\ 0 \end{smallmatrix}$ to $\begin{smallmatrix} +3 \\ 0 \end{smallmatrix}$ }	
	Tachometer indicating range rpm		Meter reading ± 150	
	Water temperature gauge indicating range		<M/T> 103°C {217°F} 70 to 96°C {158 to 205°F} 50°C {122°F} <A/T> 103°C {217°F} 70 to 96°C {158 to 205°F} 50°C {122°F} P58273N P57939N	
	Meter warning buzzer	Rated current mA	50 or less	
		Sound pressure dB	$60 \begin{smallmatrix} +6 \\ 0 \end{smallmatrix}$ (at 1 m {3.3 ft.})	

A/T: Automatic transmission

M/T: Manual transmission

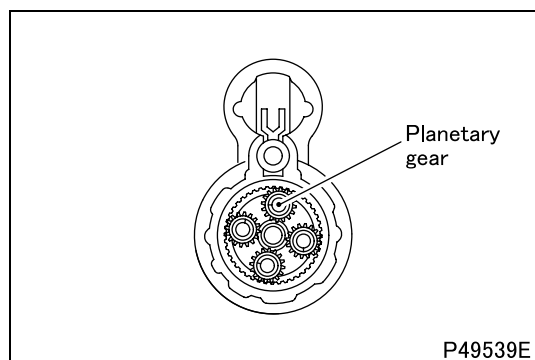
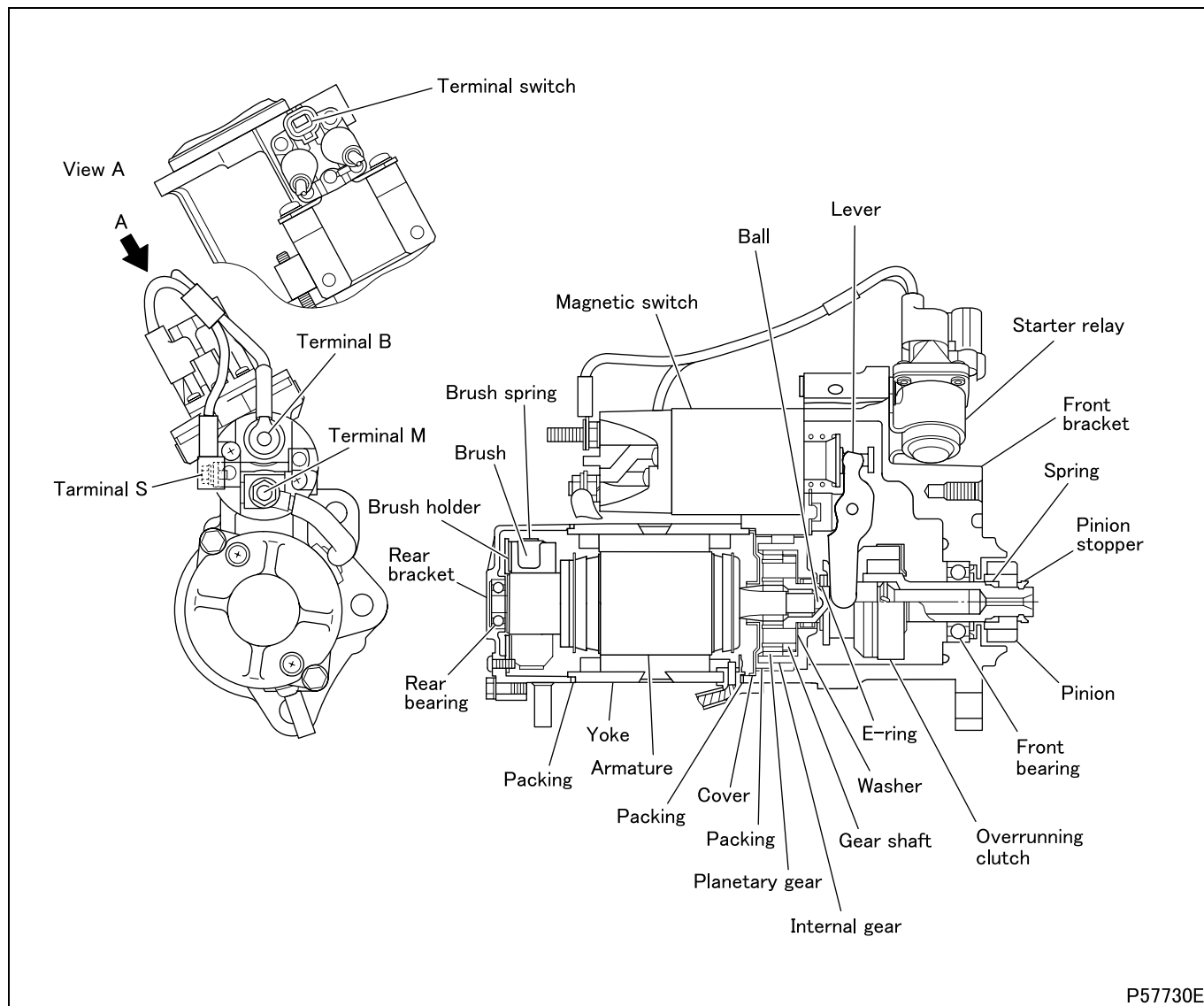
Relay, Radio, Motor, Horn, Buzzer

Item		Specifications
Minimum operating voltage of relay		V
		8 or less
Loudspeaker	Rated input	W
		15
	Maximum input	W
		25
	Impedance	Ω
		4 ± 0.6
Wiper motor	Rated voltage	V
		12
	No-load current	A
		4 or less
	Bound current	A
		30 or less
Washer motor	Rated voltage	V
		12
	Rated current	A
		3.8 or less
Power window motor	Rated voltage	V
		12
	Rated current	A
		5 or less
Electric horn	Rated voltage	V
		12
	Current consumption	A
		3 or less
	Sound pressure	dB
		110 ± 5 (at 2 m {6.6 ft.})
Back buzzer	Rated voltage	V
		12
	Rated current	mA
		50 or less
	Sound pressure	dB
		85 ± 10 (at 1 m {3.3 ft.})
Cab tilt buzzer	Rated voltage	V
		12
	Rated current	mA
		66 or less
	Sound pressure	dB
		73 ± 10 (at 1 m {3.3 ft.})
Hydraulic warning buzzer (only attached hydraulic brake)	Rated voltage	V
		12
	Rated current	mA
		100 or less
	Sound pressure	dB
		90 to 105 (at 1 m {3.3 ft.})

54-00C STRUCTURE AND OPERATION

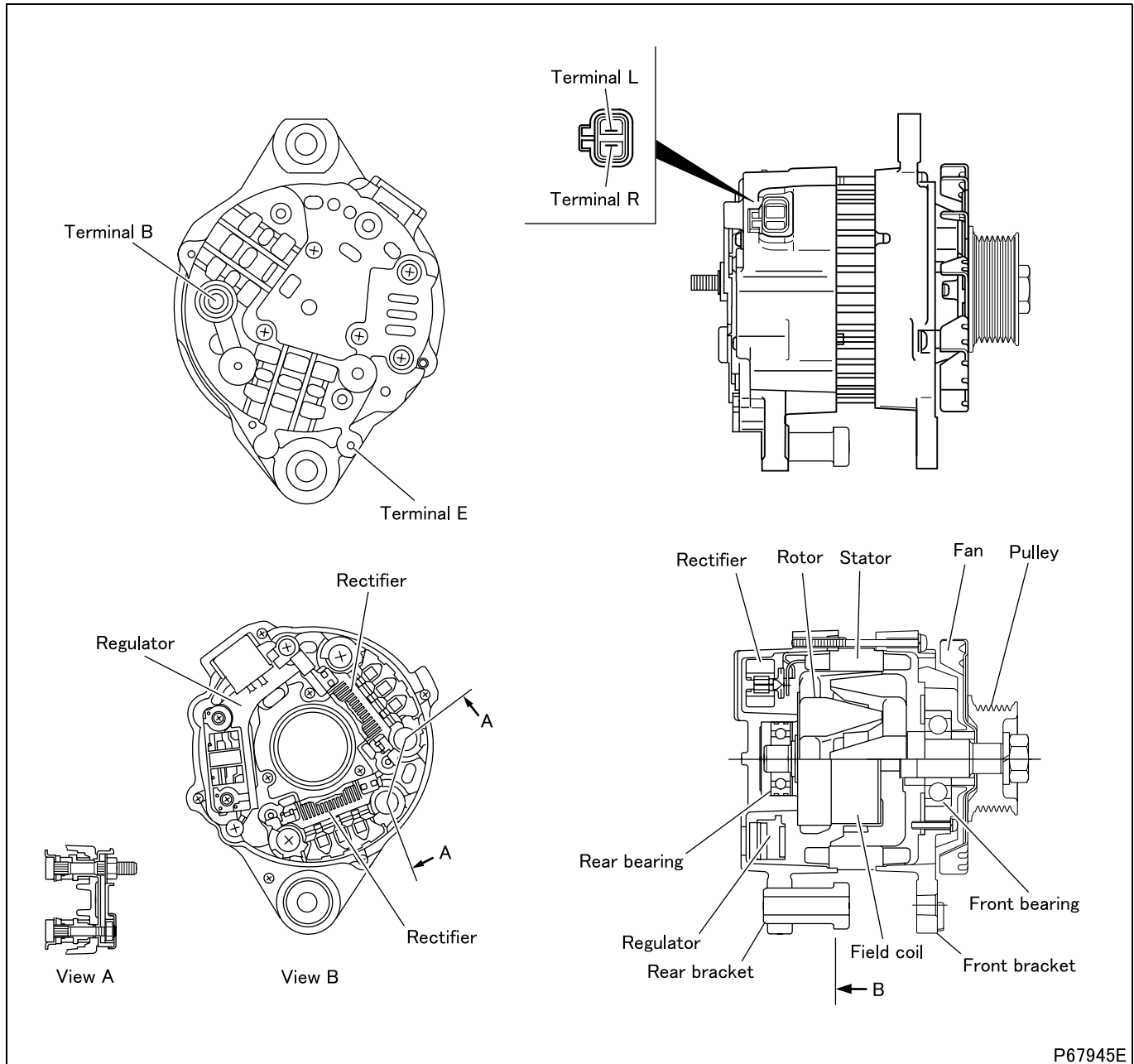
STRUCTURE AND OPERATION

1. Starter

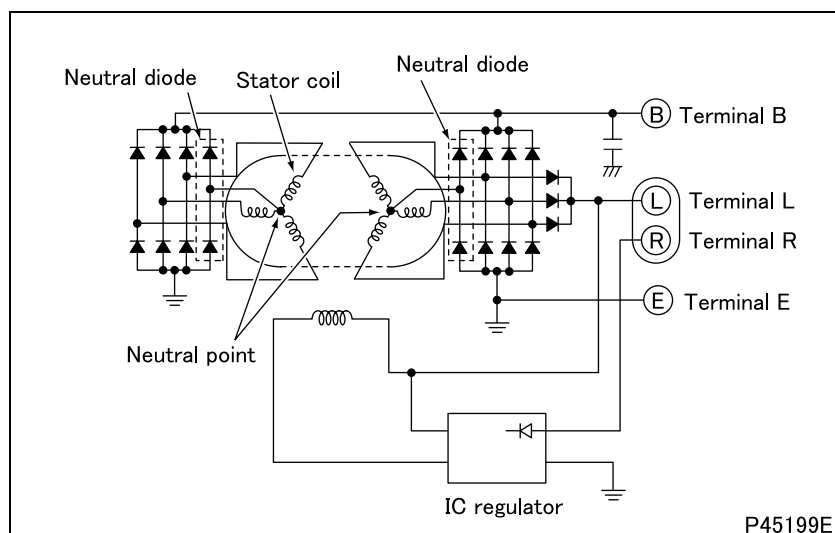


- This starter uses planetary gears as its reduction gearing mechanism.

2. Alternator

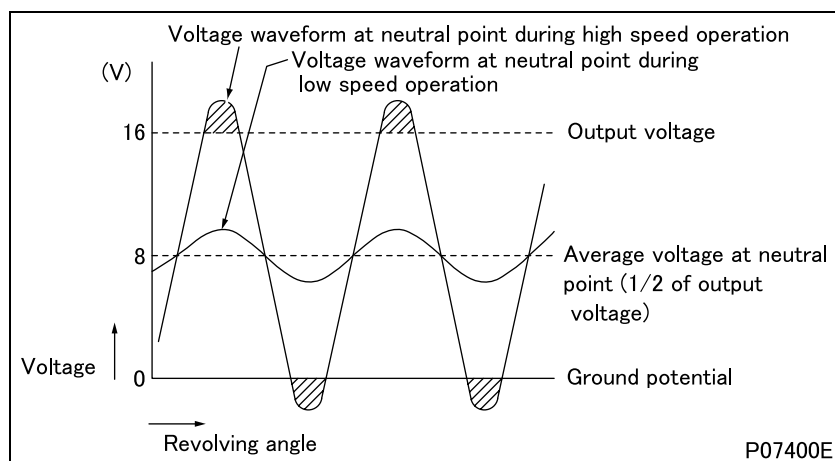


STRUCTURE AND OPERATION



2.1 Features of alternator with neutral diodes

- The alternator is the same as the current alternator except that neutral diodes have been added.
- These neutral diodes enable this alternator to provide higher DC output during operation at high speeds than the alternator without neutral diodes.

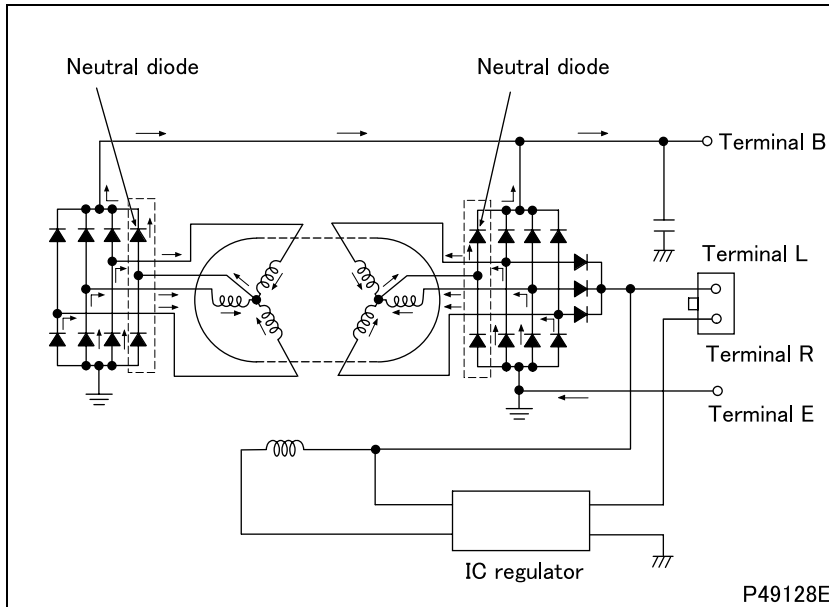


2.2 Variations of voltage at neutral point and operation of neutral diodes

- The potential at the neutral point varies up and down with the neutral point DC voltage ($1/2$ of output voltage) as a center as shown.
- When the alternator is operated at high speeds, the voltage at the neutral point can increase to exceed the output voltage (16V) and decrease to become lower than the ground voltage (0V). To adjust these over-voltage and under-voltage (shaded portions of diagram) the current from the excess voltages is taken by neutral diodes and added to the DC output.

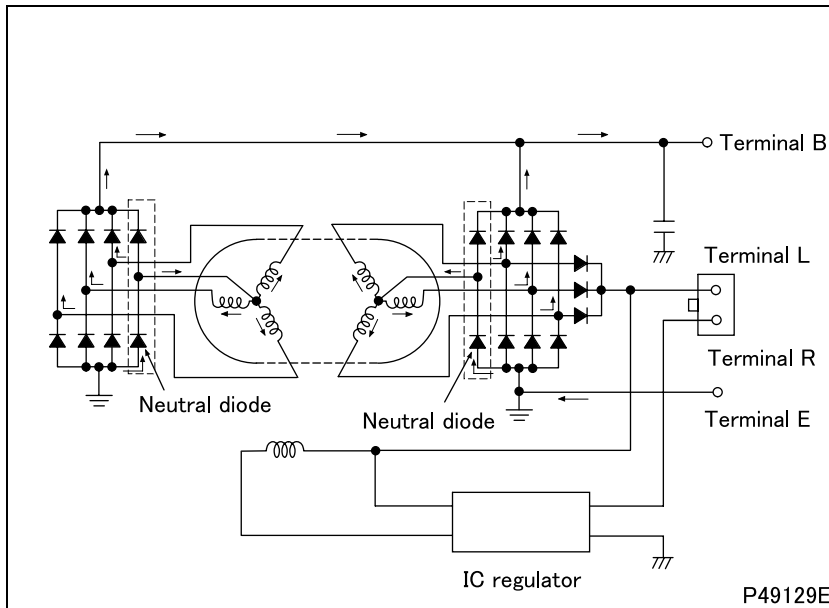
The operation of neutral diodes for each voltage and potential is as follows.

- When the voltage at neutral point is in the range from 0 to 16V, the other six diodes are operated. Neutral diodes are not operated.



2.3 When the voltage at neutral point exceeds 16V

- The positive neutral diode adds extra output to the DC output for supply to each electric equipment.



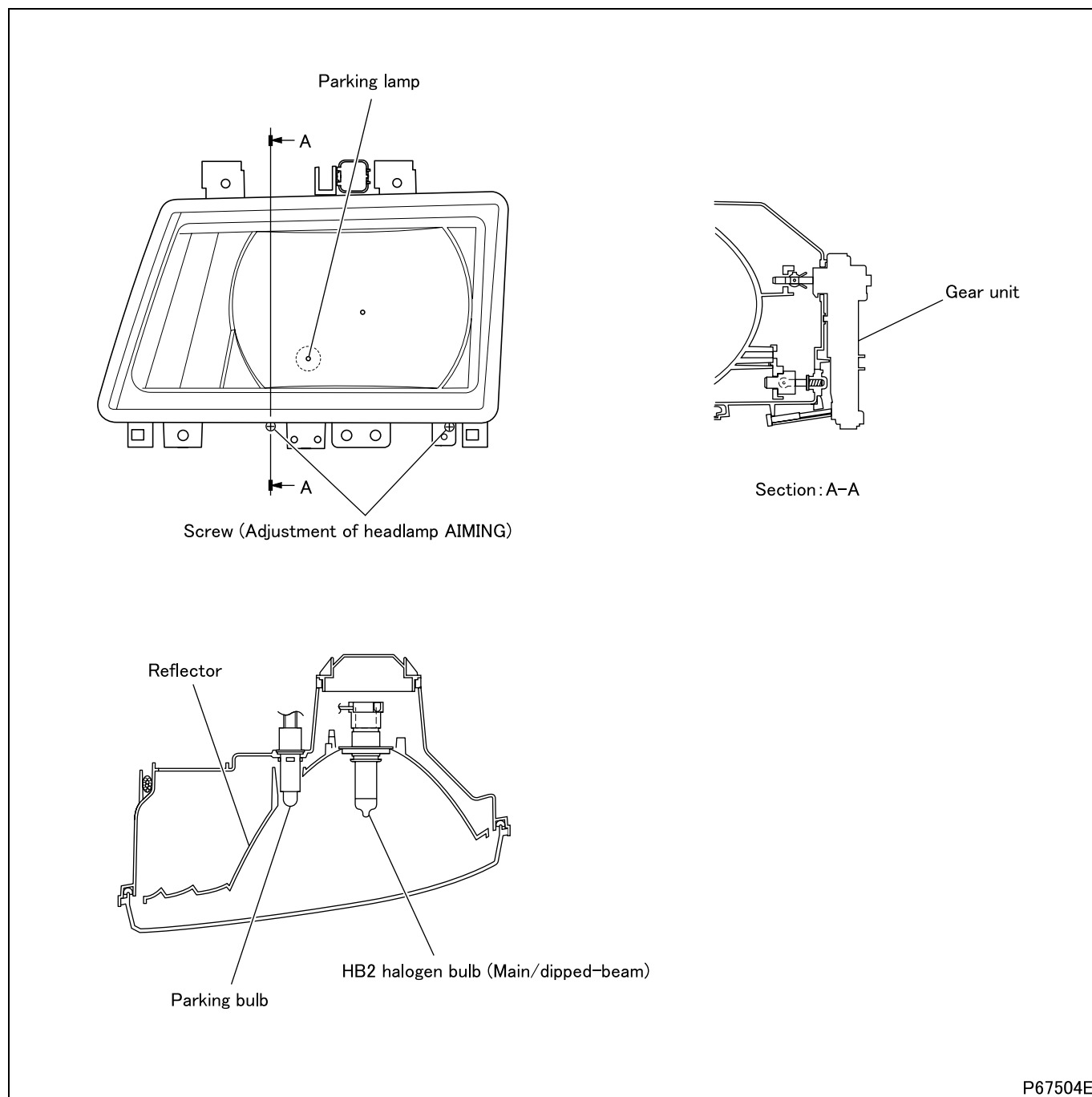
2.4 When the voltage at neutral point drops below 0V

- The negative neutral diode supplies the output from neutral point through other three diodes.

STRUCTURE AND OPERATION

3. Headlamps

<Unconventional, rectangular 2-lamp halogen headlamp>

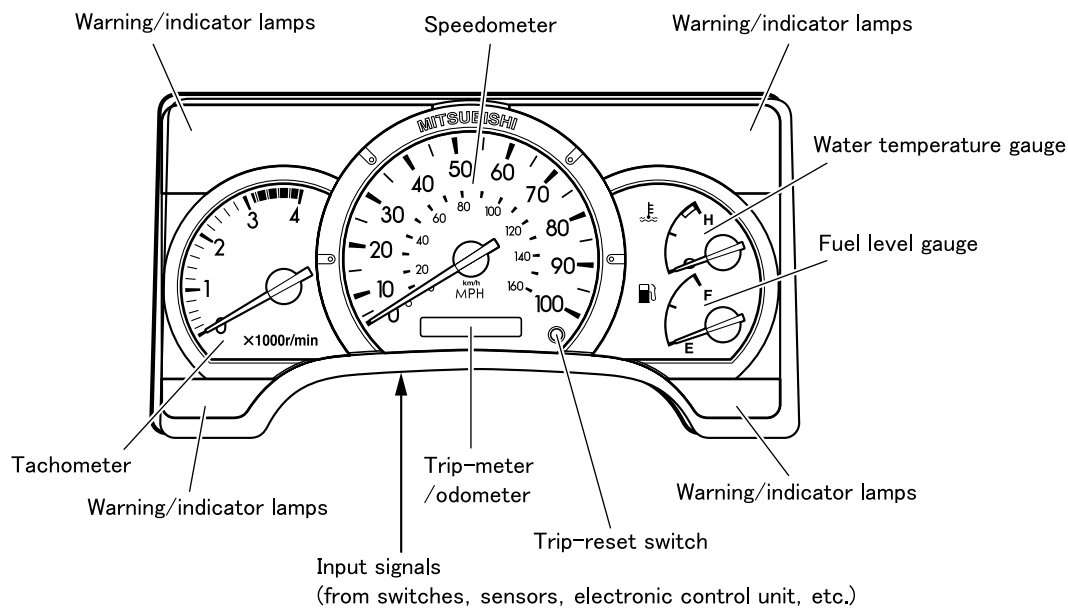


P67504E

(Left headlamps are shown in this illustration)

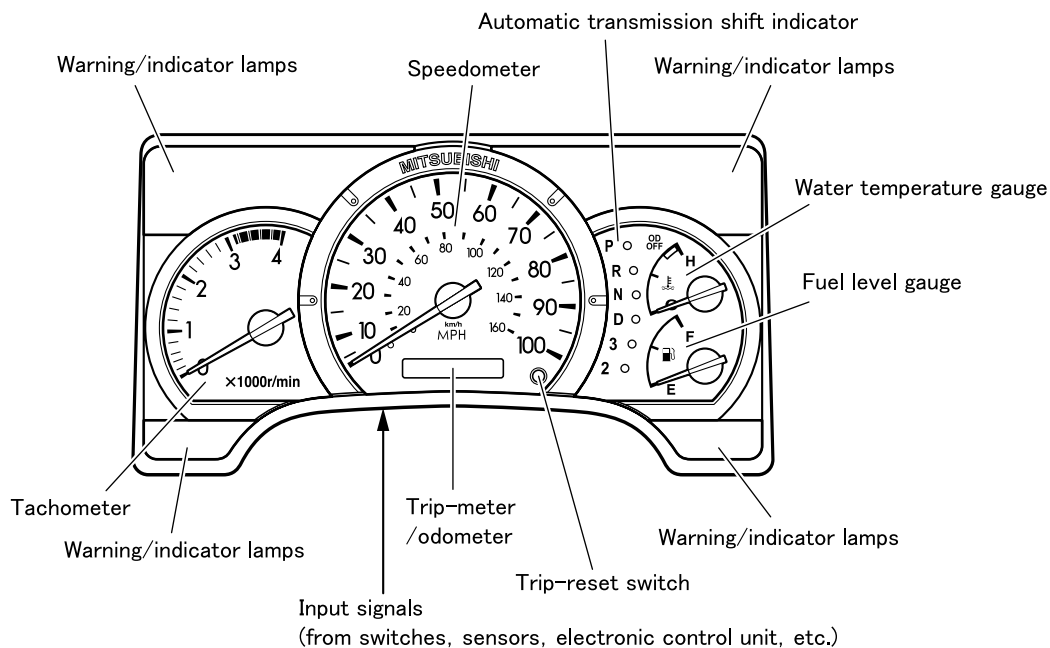
4. Meter Cluster

<Manual transmission>



P64157E

<Automatic transmission>

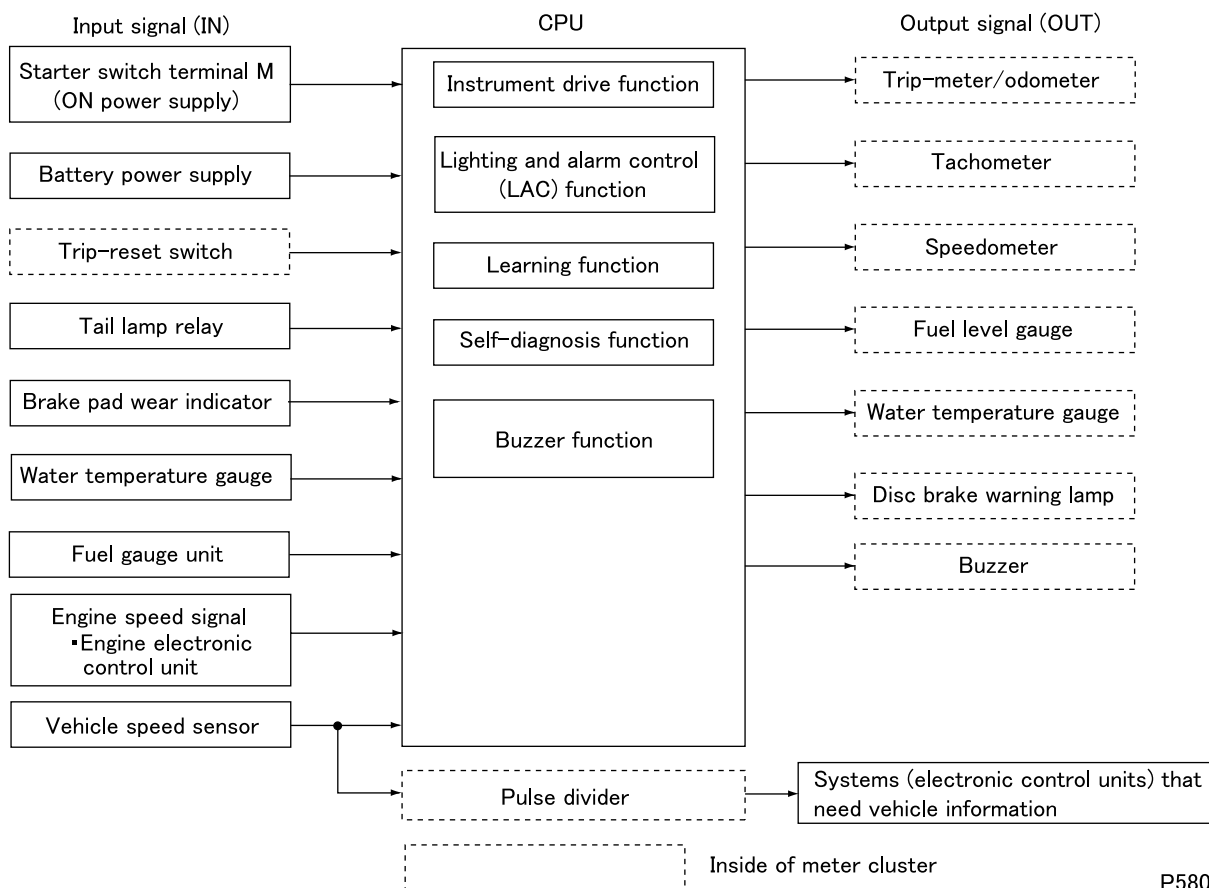


P64158E

- The meter cluster incorporates a CPU, which contains the lighting and alarm control (LAC) function, learning function, and self-diagnosis function.

STRUCTURE AND OPERATION

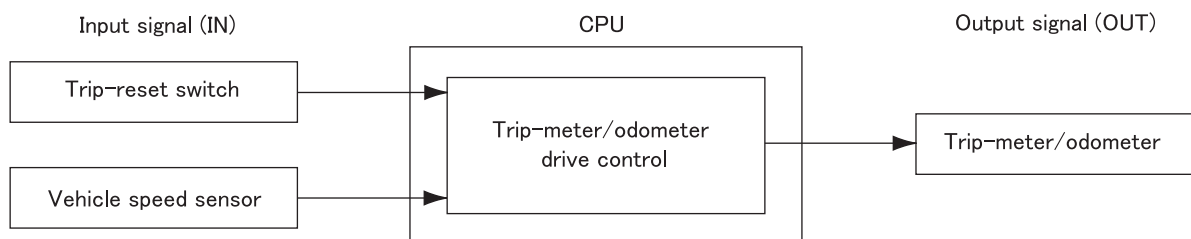
4.1 Electronic control unit in the meter cluster system block diagram



P58089E

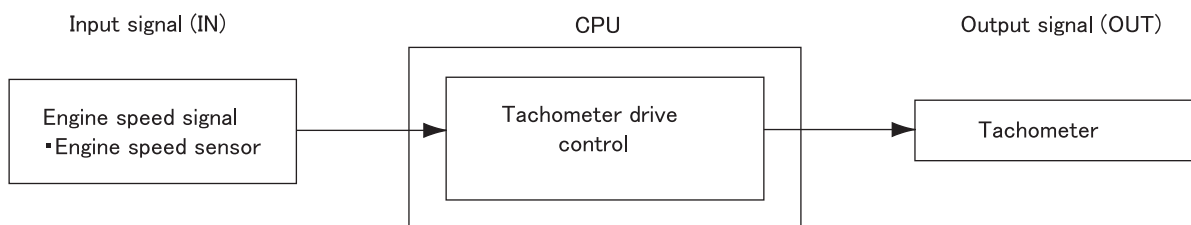
4.2 Instrument drive function

(1) Trip-meter/odometer



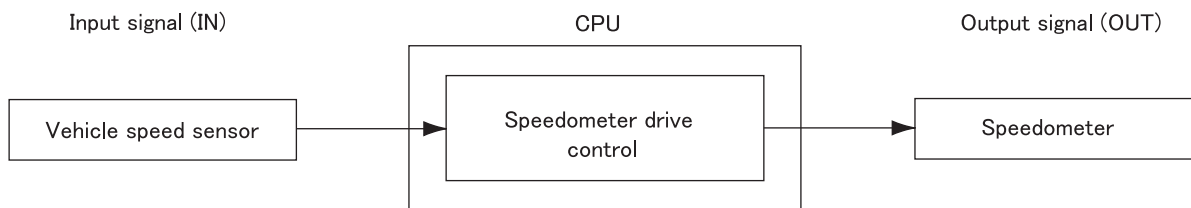
P57489E

(2) Tachometer



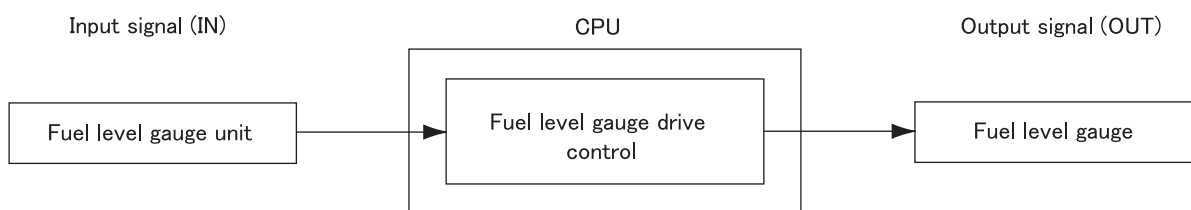
P57490E

(3) Speedometer



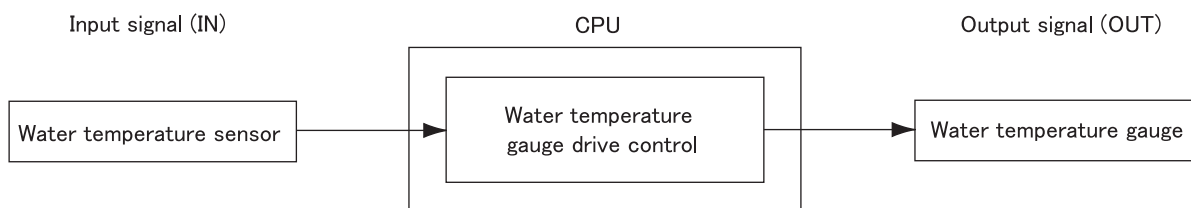
P57491E

(4) Fuel level gauge



P57492E

(5) Water temperature gauge

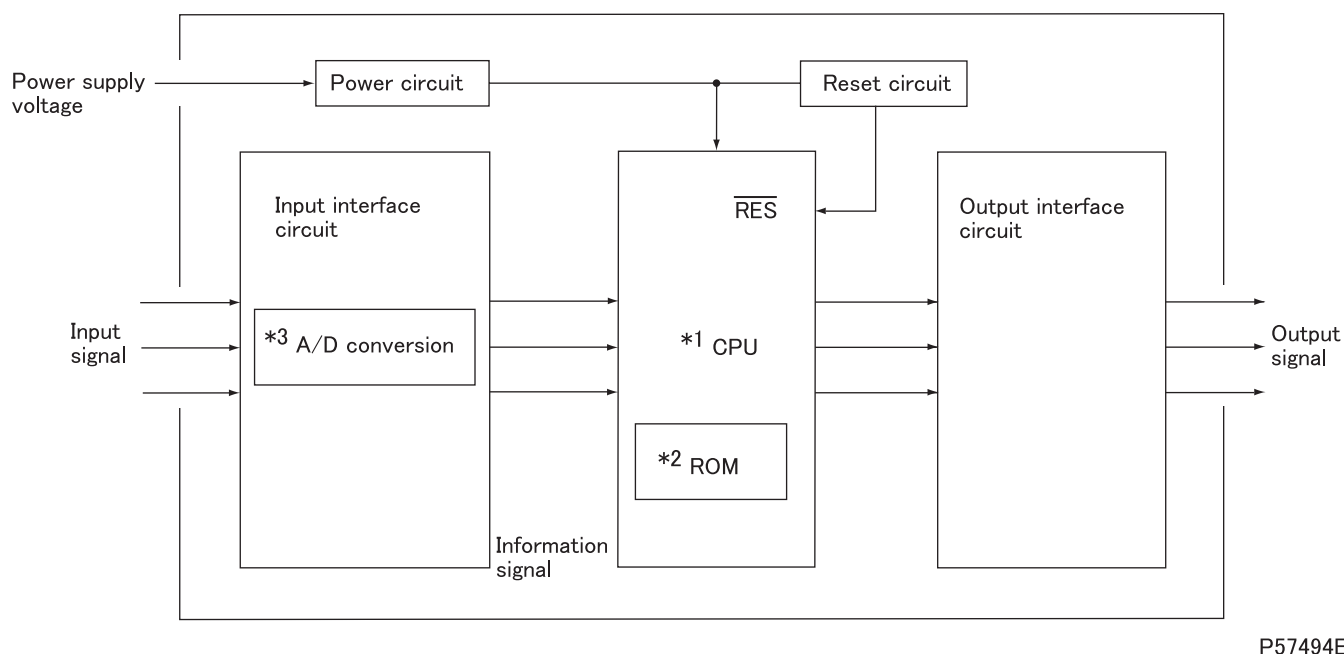


P57493E

STRUCTURE AND OPERATION

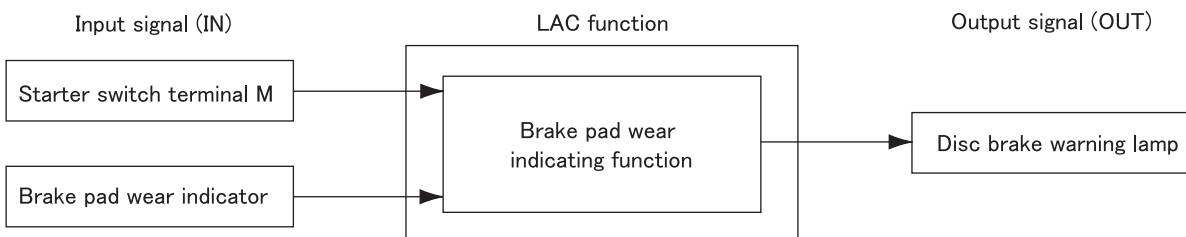
4.3 Lighting and alarm control (LAC) function

(1) Internal structure of LAC



- Internally, the LAC is essentially made up of the input interface circuit, *¹CPU, *²ROM, and output interface circuit.
 - *¹CPU:
An abbreviation for Central Processing Unit. It compares the input information and the information stored in the ROM, makes a decision and sends commands to the outputs.
 - *²ROM:
An abbreviation for Read-Only Memory. Its contents are only for reading. It stores fixed data and programs, and such retained information is not deleted even after power is cut off.
- Information sources such as the sensor and switch send input signals to the input interface circuit.
- The input interface circuit performs *³A/D conversion of the input signals, and the converted signals are transmitted to the CPU as information signals.
 - *³A/D conversion:
An abbreviation for Analog/Digital conversion. It converts analog signals to digital signals. This conversion enables calculation to be made in the CPU.
- The CPU compares the received signals with the data in the ROM, makes a decision, and sends the results to the output interface circuit.
- The output interface circuit transmits these results to each system as output signals to instruct operations.
- Performing these series of operations continuously enables optimum control of each function.

(2) LAC function system block diagram



(3) Brake pad wear indicating function

- The LAC function determines ON or OFF state of the brake pad wear indicator, and causes the disc brake warning lamp to turn on if necessary.

4.4 Learning function

- The learning function makes the electronic control unit in the meter cluster recognize the specifications of the vehicle, without which the meter cluster cannot provide proper indications.
- There are the following two learning items:
 - “With” or “without” brake pad wear indicator.
 - “With” or “without” clutch disc wear indicator.

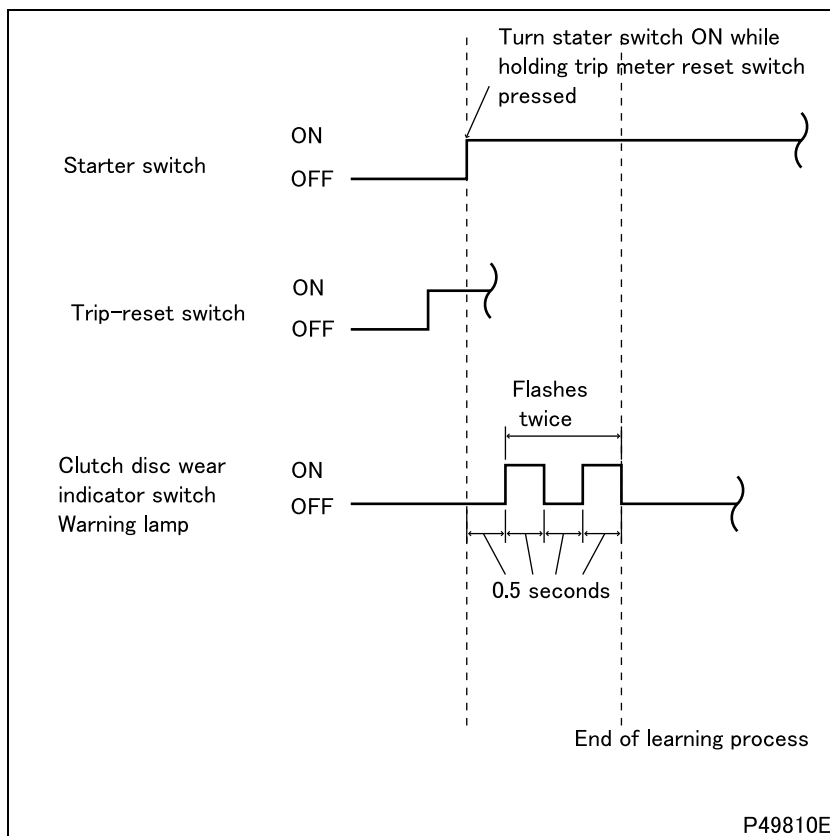
CAUTION

- When making the electronic control unit recognize “with” for the clutch disc wear indicator, make sure that there is no open circuit in any of the relevant switch circuits. (If any circuit is found open, replace the corresponding switch.)

(1) Learning operation

- The learning operation method differs depending on the odometer reading as follows:
 - Less than 3 km/h {1.86 mph} (for when the meter cluster is replaced with a new one).
 - 3 km/h {1.86 mph} or more (for when re-learning is required due to such a reason as wrong initial learning).

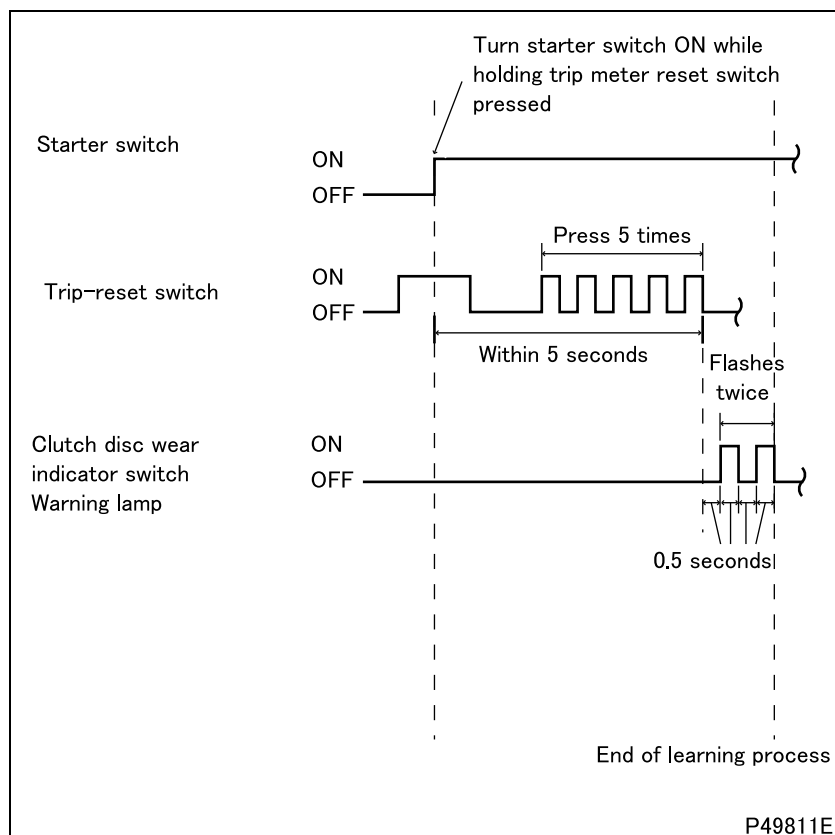
(2) Learning operation for odometer reading of less than 3 km/h {1.86 mph}



- Turn the starter switch to ON while holding the trip meter reset switch pressed, then release the reset switch.
- A 0.5 seconds later, the clutch disc wear indicator lamp will flash twice, indicating completion of the learning process.
- If “without” is learned for the clutch disc wear indicator, the indicator lamp neither flashes nor illuminates.

STRUCTURE AND OPERATION

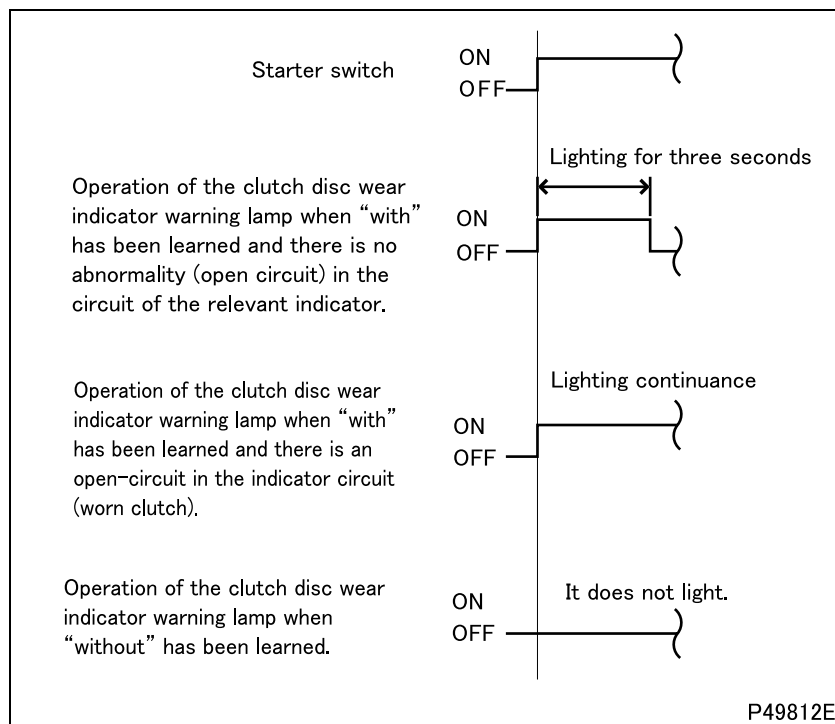
(3) Learning operation for odometer reading of 3 km/h {1.86 mph} or more



- Turn the starter switch to ON while holding the trip-reset switch pressed, then release the reset switch.
- Within 0.5 seconds after turning the starter switch to ON, press again the trip-reset switch 5 times.
- If "without" is learned for the clutch disc wear indicator, the indicator lamp neither flashes nor illuminates.

(4) Learning result confirmation and open-circuit checking

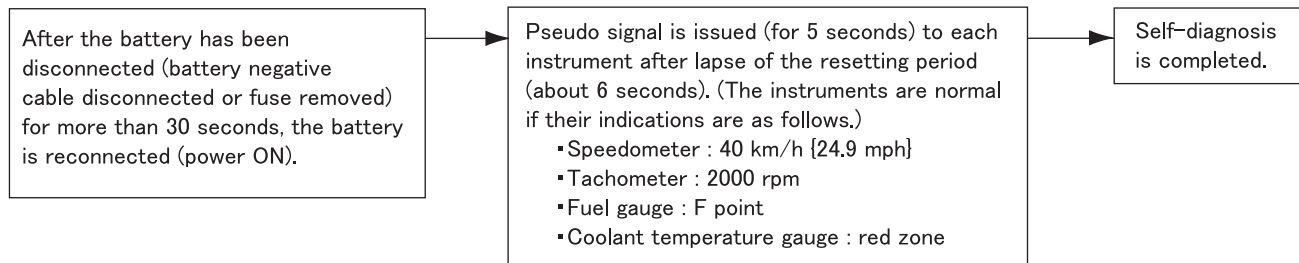
- After every learning operation, turn the starter switch to OFF and then to ON again to make sure that the indicator lamp for which "equipment" has been learnt illuminates.



- The open-circuit checking function checks that the indicator lamp(s) for which "equipment" has been learned illuminates normally when the starter switch is turned to ON.

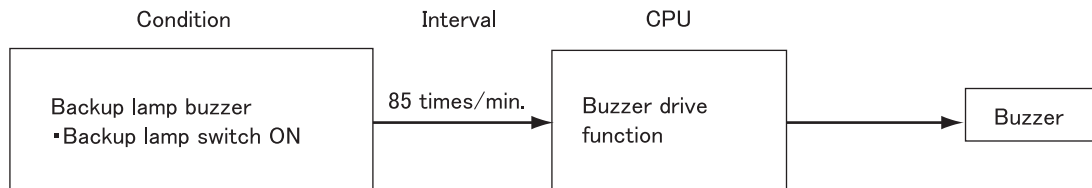
4.5 Self-diagnosis function

- The CPU performs the self-diagnosis function by sending a pseudo signal to each instrument, determining whether the instrument responds normally to the signal.



P57496N

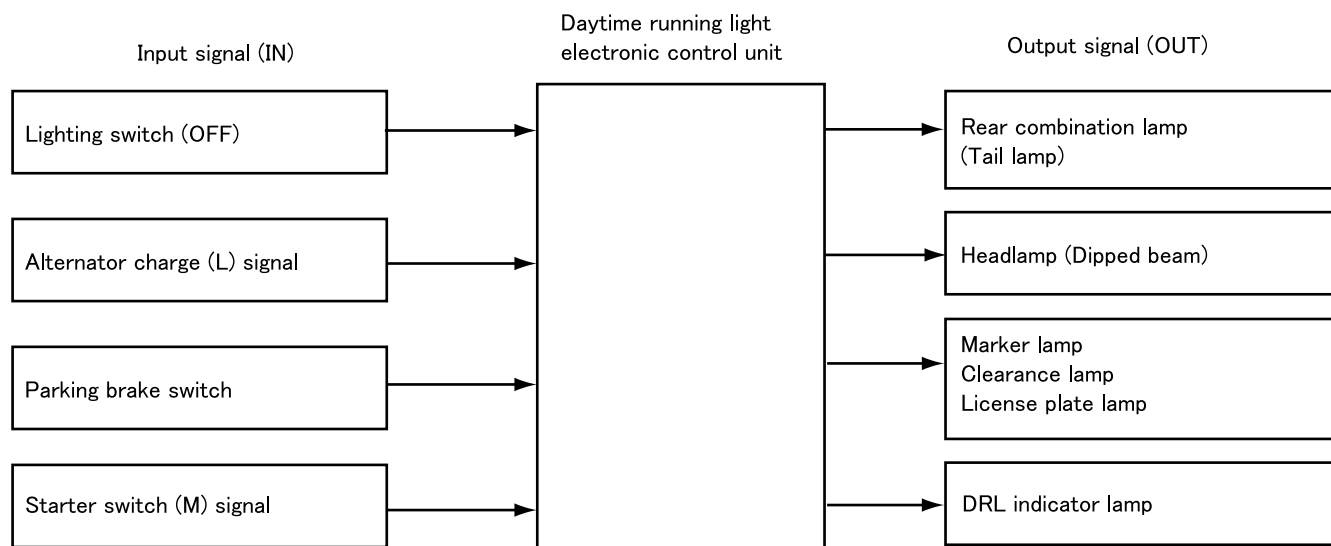
4.6 Buzzer sounding function



P62494E

STRUCTURE AND OPERATION

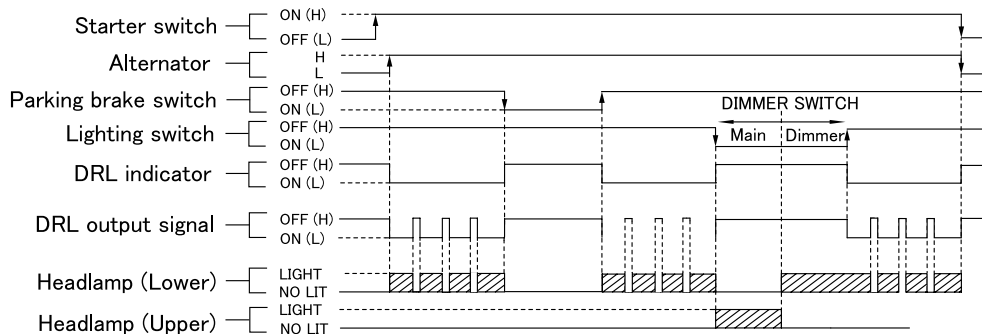
5. Daytime Running Light System



P58722E

- In a daytime running light system, regardless the position of lighting switch while engine is running, the dipped beam of the headlamp and the tail lamp of the rear combinations, position lamp, license plate lamp will light on.
- Except for that the lighting switch is OFF or when the passing switch is ON, the same lamps as usual switch operation will light.

5.1 Timing chart



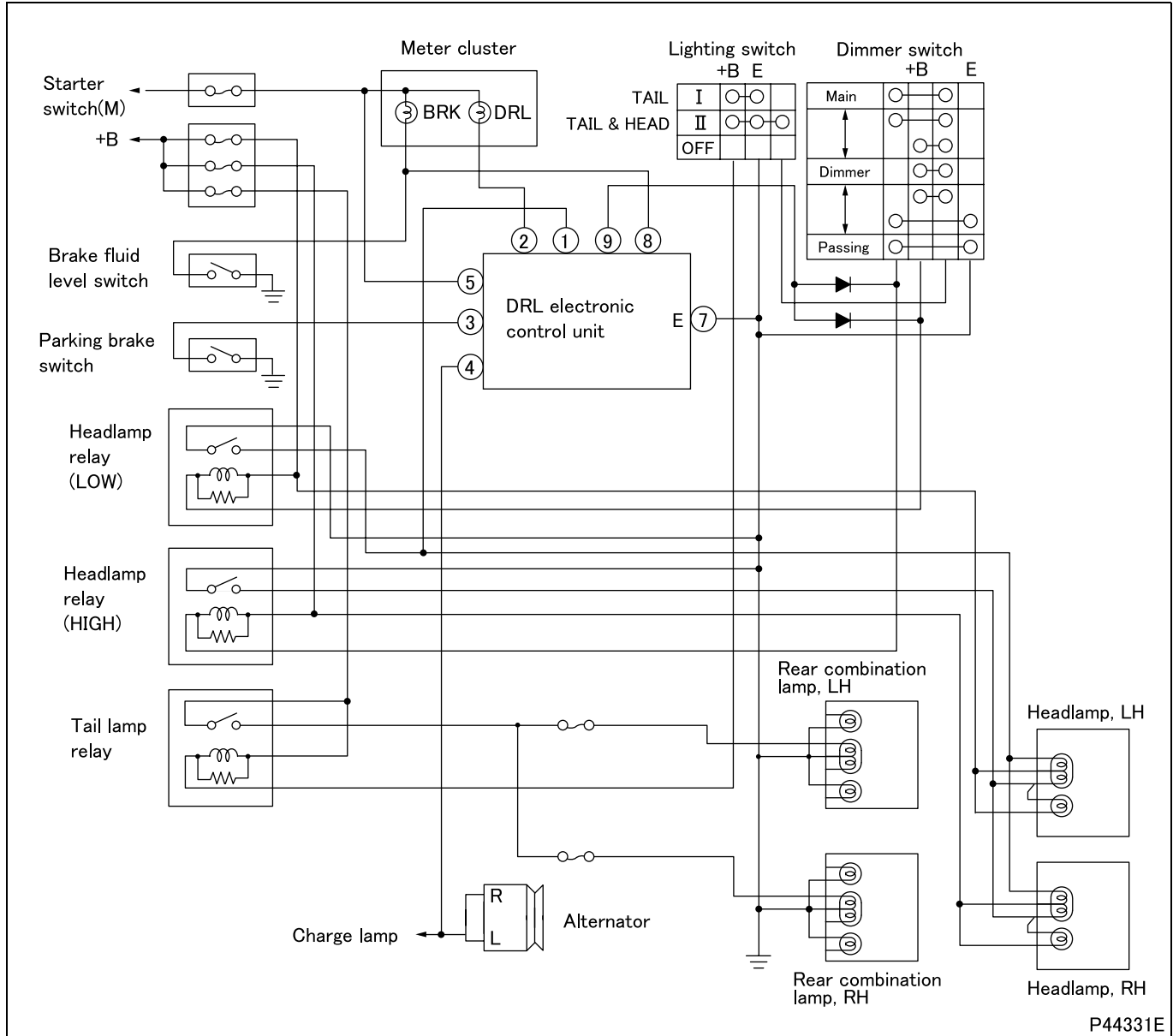
P36413E

Headlamps repeat ON/OFF operations at 120 Hz according to the above timing chart. Because of the cyclic ON/OFF operations, the headlamps are dimmer than when the headlamp switch is ON.

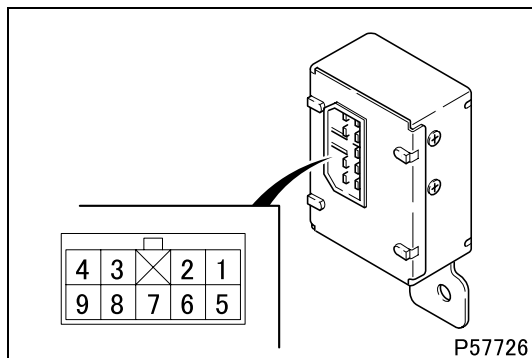
Explanation of timing chart

- After the engine starts, when alternator begins generating electricity with starter switch in the ON position, headlamps light.
- When parking brake switch is ON, the DRL turns off to switch off the headlamps.

5.2 Daytime running light electronic control unit circuit diagram



5.3 DRL electronic control unit



Terminal No.	Connecting destinations	Terminal No.	Connecting destinations
1	Head lamp (Dipped)	6	—
2	DRL indicator lamp	7	Ground
3	Parking brake switch	8	Parking brake indicator lamp
4	Alternator L terminal	9	Lighting switch
5	Starter switch M terminal	—	—

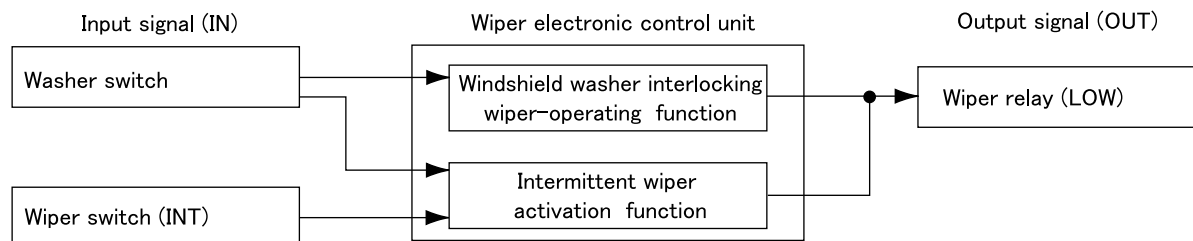
STRUCTURE AND OPERATION

6. Wiper Control

6.1 Outline

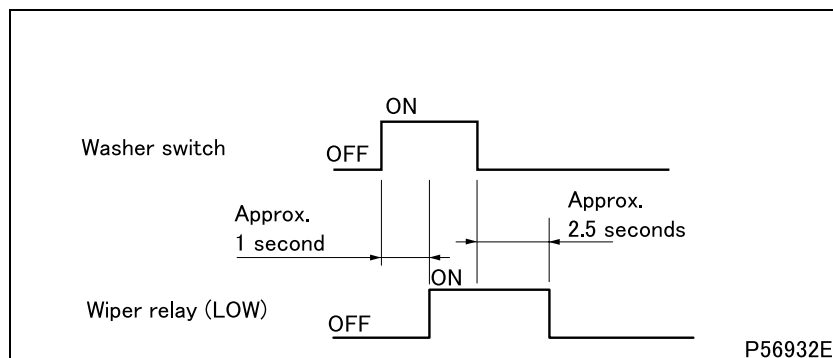
- This wiper electronic control unit is an integrated control unit controlling the following functions.
 - Windshield washer interlocking wiper-operating function.
 - Intermittent wiper activation function.

(1) System function schematic



P58030E

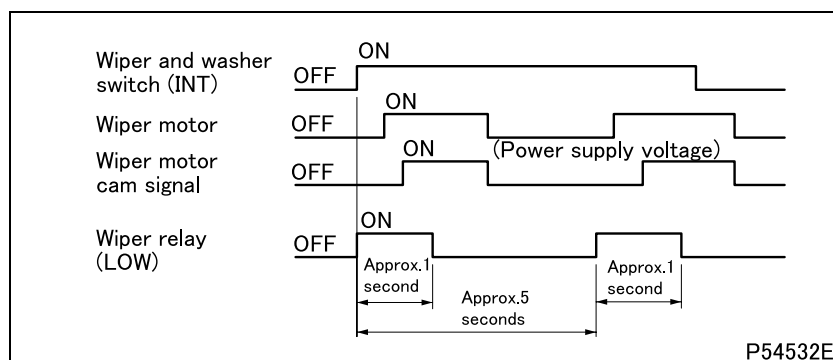
6.2 Windshield washer interlocking wiper-operating function



P56932E

- This function causes the windshield wipers to operate a few times at low speed when the windshield washer switch is turned ON.
- As shown in the drawing, the wiper electronic control unit introduces a short delay between detecting the ON condition of the wiper and washer switch (washer switch) and activating the wiper relay.

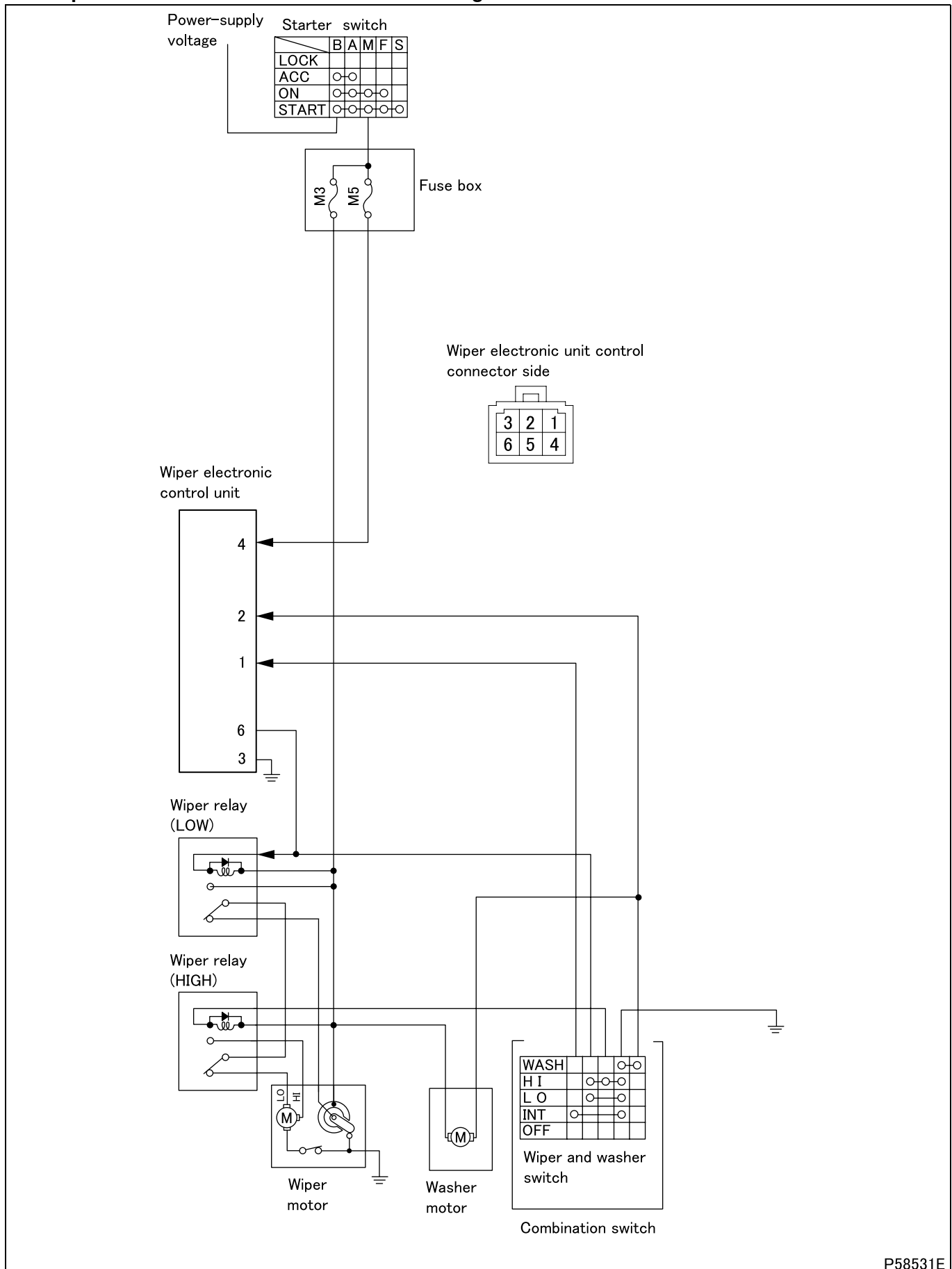
6.3 Intermittent wiper activation function



P54532E

- Wiper electronic control unit causes intermittent wiper operation to take place as shown in the drawing.

6.4 Wiper electronic control unit connection diagram



P58531E

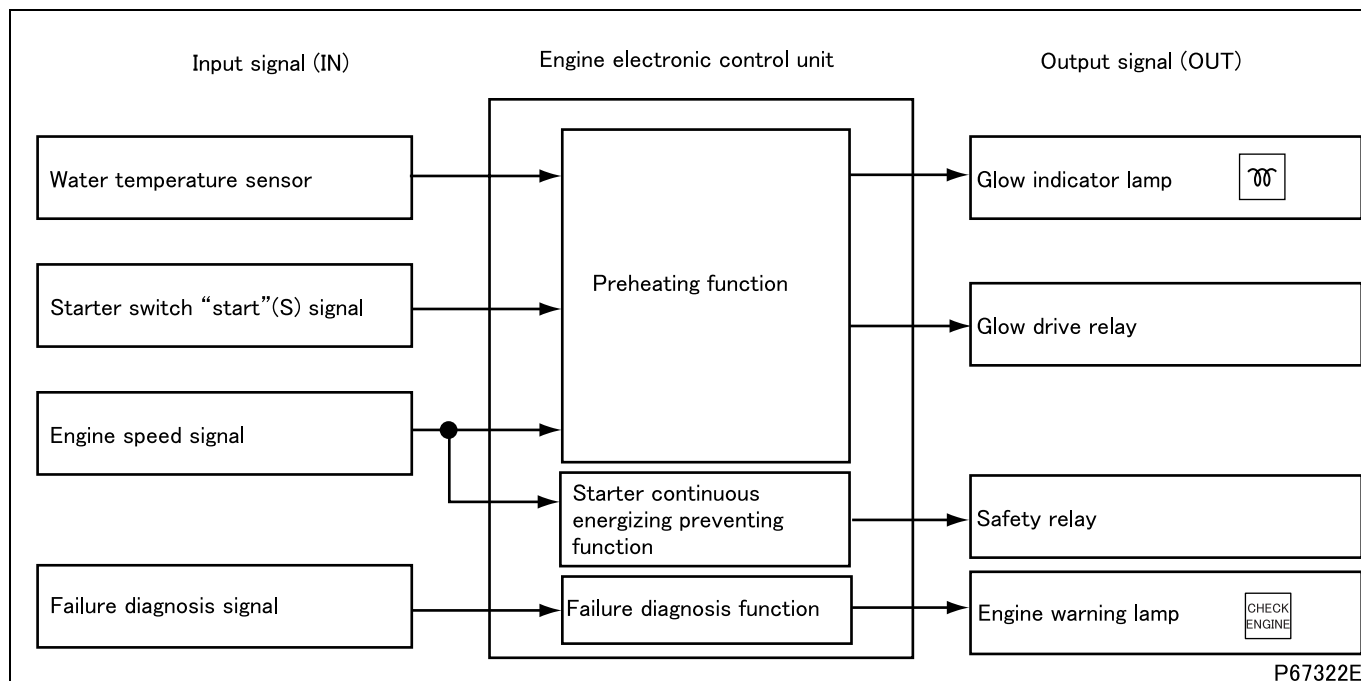
STRUCTURE AND OPERATION

7. Starter Continuous Energizing Preventing Function and Preheating Function

7.1 Outline

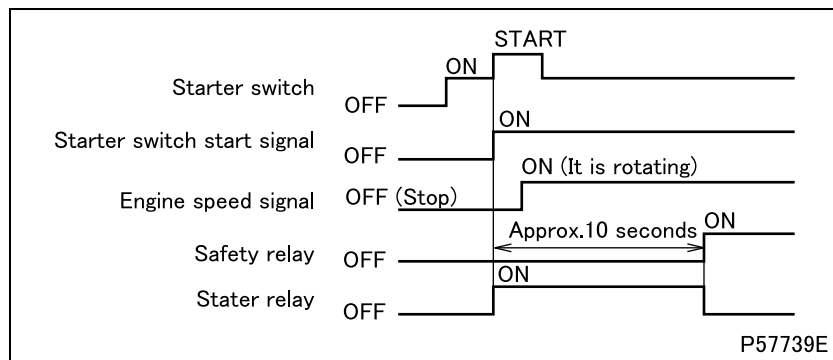
- These functions are controlled by the engine electronic control unit.

(1) System function schematic



Information signal	Parts name	Major function and operation
Engine water temperature signal	Water temperature sensor	Engine water temperature detection
Starter switch "start" (S) signal	Starter switch	Start position detection
Engine speed signal	Engine speed sensor	Engine speed detection
Failure diagnosis signal	Diagnosis switch	Output of diagnosis code
	Memory clear switch	Erasure of diagnosis code Transmission of past diagnostic code
Engine warning signal	Engine warning lamp	Abnormality of each function
Safety relay activation signal	Safety relay	Release of starter continuous energizing

7.2 Starter continuous energizing preventing function



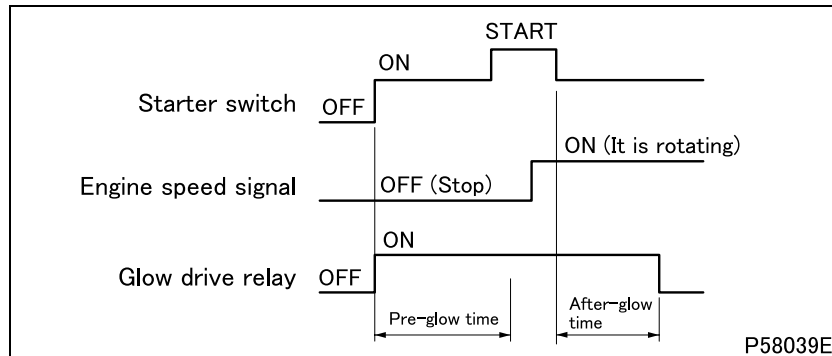
- This function is provided to prevent starter over-run.
- If the starter operates for longer than a predetermined period following engine startup, the Engine electronic control unit deems that it has been energized continuously for too long. The Engine electronic control unit then stops the flow of current to the starter and starter relay, thereby preventing the starter from seizing.

- If the engine electronic control unit determines, based on the engine speed signal it receives, that the engine has run at or above the specified speed for longer than the specified time period after start-up, the unit trips the safety relay open.

7.3 Preheating function

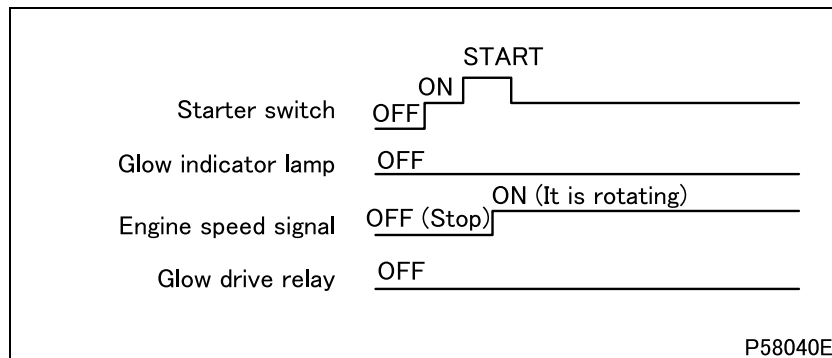
- This preheating function aims to enhance the engine start up when the engine coolant is low in cold weather or temperature.

Engine electronic control unit the entire function as follows:



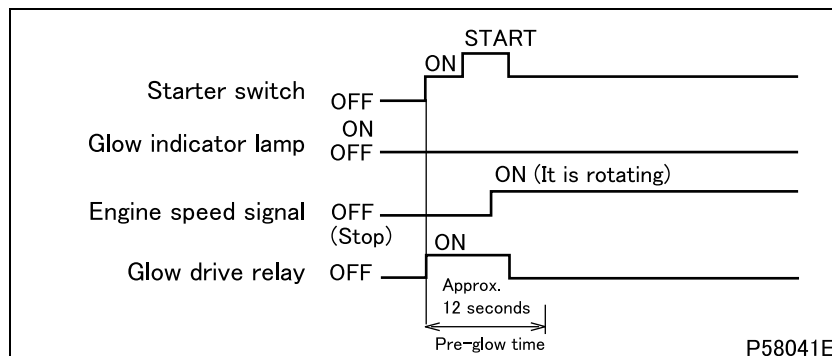
(1) Pre-glow and After-glow

The preheating is operated with a pre-glow before the engine starts and an after-glow after the engine starts. They are controlled by the starter switch (S terminal) signal, engine water temperature signal and the engine speed signal.



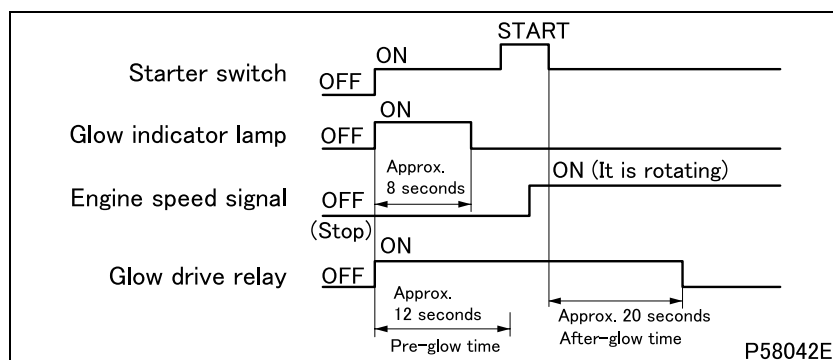
(2) Operation mode

- When the engine coolant temperature is 60°C {140°F} or more.



- When the engine coolant temperature is 0 to 60°C {32 to 140°F}.

STRUCTURE AND OPERATION



- When the engine coolant temperature is 0°C {32°F} or less.

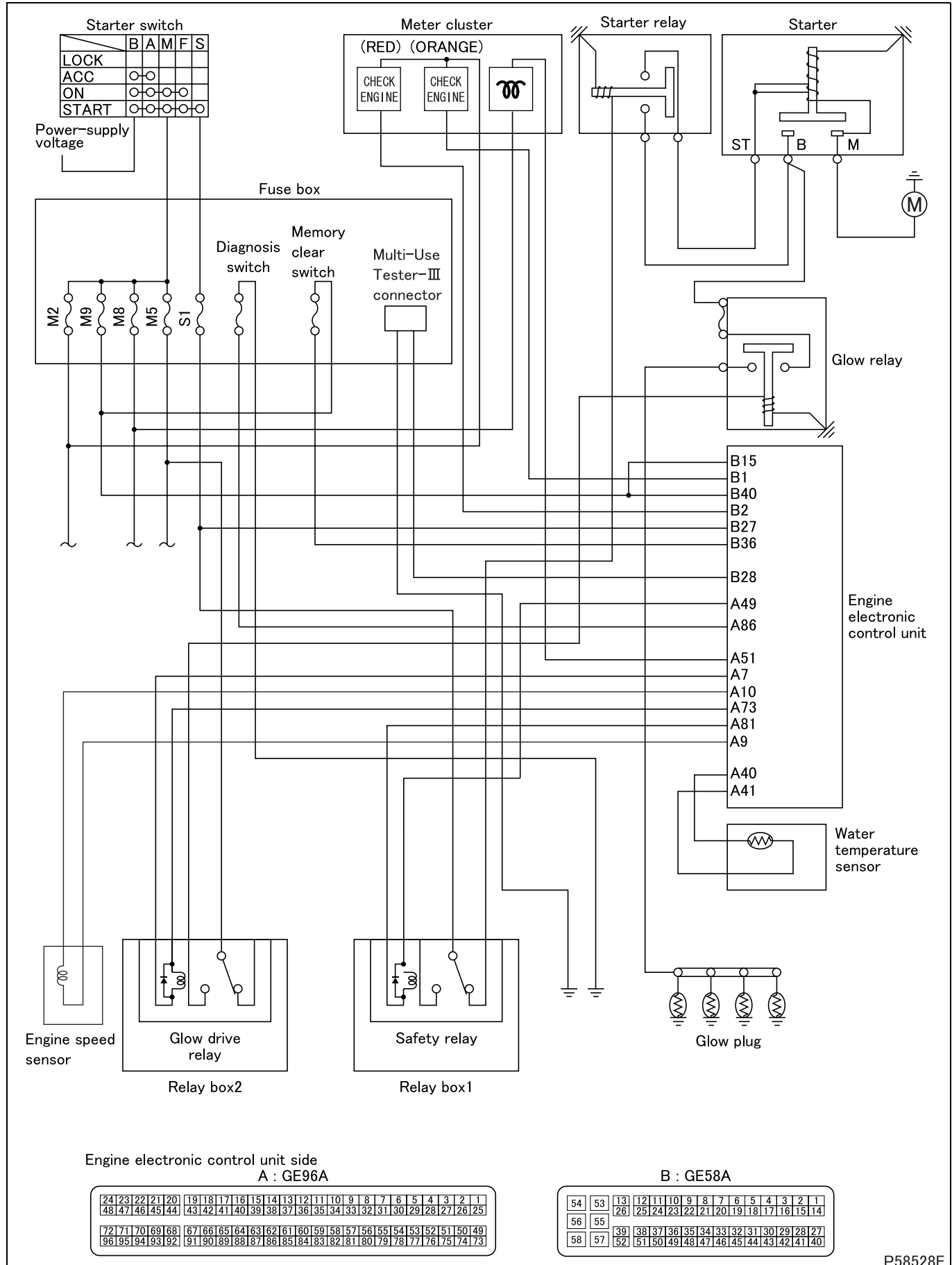
7.4 Fault diagnosis function

- While the starter switch is in the ON position, the sensors and other components are continuously monitored for faults. In the event that a component is found faulty, an indication is made in the meter cluster to alert the driver, the fault location is memorized in the form of a diagnosis code, and backup control necessitated by the fault is initiated.
- While the backup control is taking place, the system's functionality is limited to ensure vehicle and driver safety. It is possible to read the memorized diagnosis code using a Multi-Use Tester or from flashing of the warning lamp.

NOTE

- Diagnosis codes shown by the Multi-Use Tester and those indicated by flashing of the warning lamp are different.
- The Multi-Use Tester is capable of showing more detailed diagnosis codes.

7.5 Engine electronic control unit connection diagram



54-00D TROUBLESHOOTING

1. Power and Charging

Symptoms		Battery electrolyte decreases too early.	Battery overheating.	Battery is normal but over-discharged.	Charge warning lamp does not light when starter switch is turned ON, with engine stopped.	Alternator is normal but battery over-discharged.	Reference Gr
Possible causes							
Connector connection faulty, harness broken, grounding faulty				O		O	
Fuse blown				O	O	O	
V-belts loose				O		O	Gr14
V-belts damaged				O		O	Gr14
Battery faulty		O				O	
Alternator	Stator coil broken			O			
	Stator coil short-circuited with core			O			
	Field coil broken			O			
	Rectifier faulty			O			
	Regulator faulty		O	O	O		
	Wiring faulty			O			
Meter cluster faulty					O		

2. Engine Starting

Symptoms		Starter does not operate.	Starter operates but engine does not start			Engine does not stop.	Engine cannot be preheated.	Engine is hard to start.	Engine warm-up function does not operate.	Reference Gr
			Pinion does not engage with ring gear.	Pinion engages with ring gear but does not rotate.	Flywheel rotates but engine does not start.					
Possible causes										
Connector connection faulty, harness broken, grounding faulty		O			O	O	O		O	
High-current fuse blown		O								
Fuse blown		O				O	O		O	
Battery insufficiently charged		O		O						
Starter	Magnetic switch contacts stuck or fused together	O								
	Open circuit in magnetic switch coil	O								
	Overrunning clutch malfunctioning			O						
	Pinion worn or damaged		O							
Starter relay defective		O								
Starter switch defective		O				O				
Flywheel ring gear worn or damaged			O							Gr11
Glow plugs defective							O	O		
Glow relay defective							O	O		
Safety relay defective		O								
Water temperature sensor defective							O	O	O	
Engine electronic control unit defective		O					O	O	O	Gr13E
Exhaust brake system defective								O	O	Gr35
Faulty connection of connecting plate							O	O		
Transmission neutral switch defective									O	
Neutral start relay defective <A/T>		O								
Inhibitor switch defective <A/T>		O								
Warm-up switch defective									O	

A/T: Automatic transmission

3. Lighting

[illegible]

Symptoms		Turn signal lamp (serving also as hazard warning lamp)					Cab lamp does not light.	Interior illumination lamps for meters, radio system, etc. do not light.	Reference Gr
		Does not blink.	Stay ON.	Blinks too slowly.	Blinks too quickly.	Blinks irregularly.			
Possible causes									
Connector connection faulty, harness broken, grounding faulty		O					O	O	
Fuse blown		O					O		
Battery capacity insufficient			O						
Alternator output insufficient			O						
Bulb burnt-out		O			O		O	O	
Power (wattage) of bulb is lower than specified value					O				
Power (wattage) of bulb is higher than specified value				O					
Combination switch	Lighting switch faulty							O	
	Turn signal lamp switch faulty								
	Dimmer switch faulty								
Relay box	Headlamp relay (HIGH, LOW) faulty								
	Tail lamp relay faulty							O	
	Stop lamp relay faulty								
	Turn signal lamp relay faulty	O							
Stop lamp switch faulty									
Flasher unit faulty		O	O	O	O	O			
Backup lamp switch faulty									
Back buzzer faulty									
Cab lamp switch faulty							O		
Cab lamp faulty							O		
Door switch faulty							O		
Hazard warning lamp switch faulty		O	O						
Rheostat switch faulty								O	

Symptoms		Van body dome light does not light.	Daytime running light system does not operate after engine starts, and headlamps do not light.	Reference Gr
Possible causes				
Connector connection faulty, harness broken, grounding faulty		O	O	
Fuse blown		O		
Battery capacity insufficient				
Alternator output insufficient				
Bulb burnt-out		O		
Power (wattage) of bulb is lower than specified value				
Power (wattage) of bulb is higher than specified value				
Combination switch	Lighting switch faulty	O		
	Turn signal lamp switch faulty			
	Dimmer switch faulty			
Relay box	Headlamp relay (HIGH, LOW) faulty		O	
	Tail lamp relay faulty		O	
	Stop lamp relay faulty			
	Turn signal lamp relay faulty			
	Daytime running light relay		O	
Stop lamp switch faulty				
Flasher unit faulty				
Backup lamp switch faulty				
Back buzzer faulty				
Cab lamp switch faulty				
Cab lamp faulty				
Door switch faulty				
Hazard warning lamp switch faulty				
Rheostat switch faulty				
Van body dome light relay faulty		O		
Van body dome light switch faulty		O		
Daytime running light electronic control unit faulty			O	

4. Meter

Symptoms		Pointer does not move.	Pointer movement unstable.	Indication error large.	Abnormal noise from meter.	Reference Gr
Possible causes						
Connector connection faulty, harness broken, grounding faulty		O	O			
Fuse blown		O				
Internal circuits of meter cluster faulty		O	O	O		
Printed wiring board of meter cluster faulty		O				
Tachometer	Engine speed sensor coil open-circuited	O				
	Engine speed sensor improperly mounted	O	O			
	Tachometer faulty	O	O	O	O	
Speedometer or tachograph	Vehicle speed sensor faulty	O				
	Vehicle speed sensor improperly mounted		O			
	Specified tires not used			O		Gr31
	Tires worn or inflation pressure incorrect			O		Gr31
	Specified L-joint of transmission not used (difference in gear ratio)			O		Gr22
	Specified speedometer gear of transmission not used (difference in gear ratio)			O		Gr22
	Installation angle of speedometer gear bushing on transmission incorrect (not set at correct gear ratio position)			O		Gr22
	Speedometer or tachograph faulty	O	O	O	O	
Water temperature gauge	Water temperature sensor faulty	O		O		
	Water temperature gauge faulty	O		O		
	Thermostat does not close	O				Gr14
Fuel gauge	Fuel level sensor faulty	O		O		
	Fuel gauge faulty	O		O		

5. Cigarette Lighter and Audio

Symtoms	Cigarette lighter			Au- dio	Reference Gr
	Does not glow.	Does not return.	Night lamp does not light up.	Radio does not work.	
Possible causes					
Connector connection faulty, harness disconnection, grounding faulty	☐		☐	☐	
Fuse blown	☐		☐	☐	
Cigarette lighter faulty	☐	☐			
Tail lamp relay faulty			☐		
Antenna and antenna cable connection faulty				☐	
Radio amplifier faulty				☐	
Radio tuner faulty				☐	
Cassette deck head and pinch roller faulty					
Speaker faulty				☐	
Left and right speaker impedance different					

6. Accessory Noise Generation Source

Accessory	Noise	Symptoms
Alternator	Whistling	High pitch sound when accelerator pedal suddenly pressed (Stops soon after engine stopped)
Water temperature gauge	Scratching	Occurs when engine running (Continues for a while after engine stops)
Engine oil pressure switch	Rattling	Depends on engine speed (Does not occur during idling)
Fuel level sensor	Scratching	Occurs when engine suddenly revved, while running on rough roads, or starter switch turned ON
Flasher unit	Banging	When turn signal blinks
Horn	Hissing	Occurs when horn button pressed or released
Wiper motor	Whining	Depends on windshield wiper speed
Washer motor	Whining	When windshield washer operates

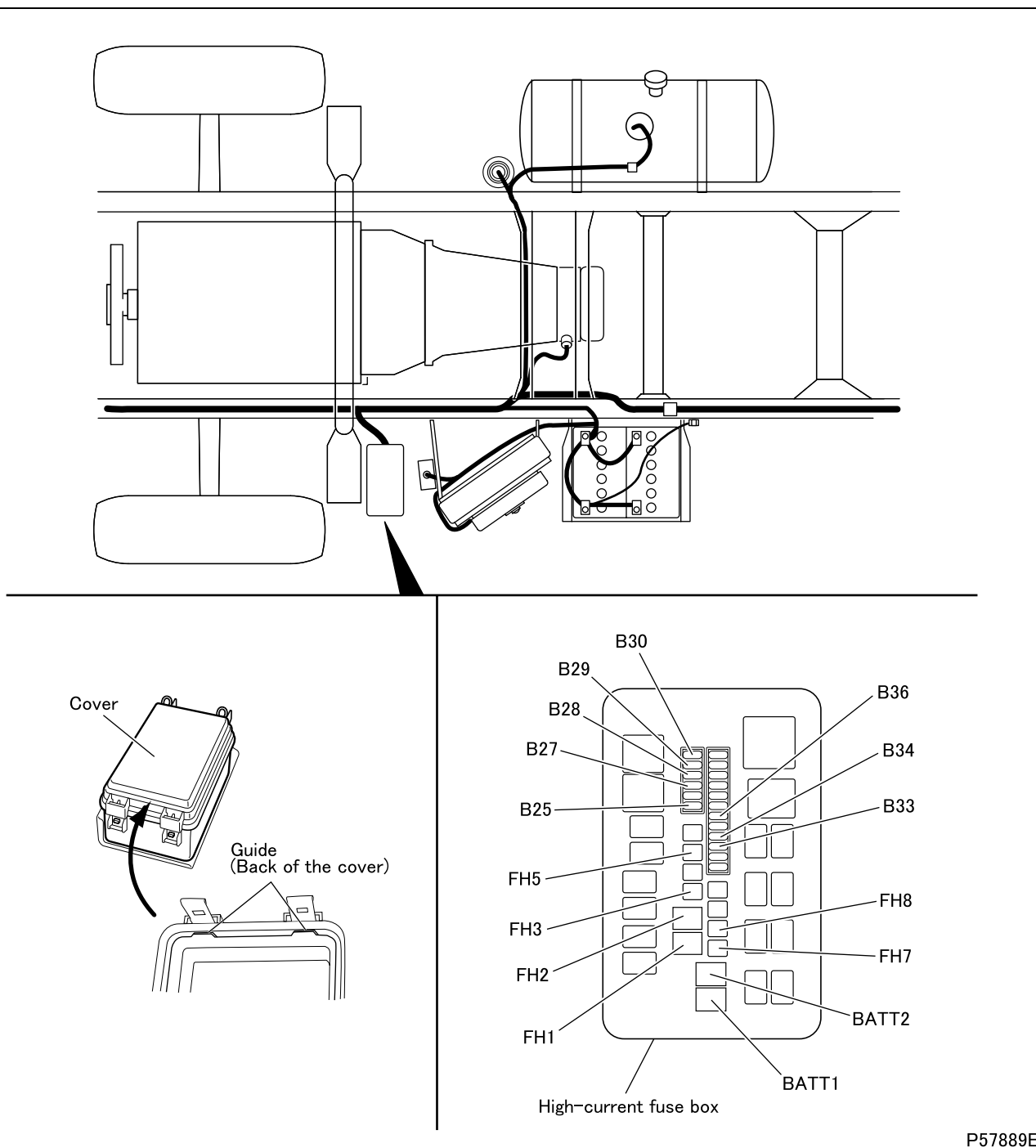
7. Horn

Symptoms	Horn				Reference Gr
	No sound	Continuous sound	Small sound	Sound quality poor	
Possible causes					
Connector connection faulty, harness disconnection, grounding faulty	O				
Fuse blown	O				
Horn switch faulty	O	O			
Horn faulty	O		O	O	
Horn stay warped			O	O	
Battery voltage insufficient	O		O		

8. PREHEATING SYSTEM (See #955)**9. STARTER CONTINUOUS ENERGIZING PREVENTING FUNCTION (See #956)**

54-01 POWER, CHARGE AND GROUND CIRCUIT

HIGH-CURRENT FUSE BOX



P57889E

WARNING

- To prevent possible injury, be sure to disconnect the negative (–) cable of the battery and insulate it with tape before removing high-current fuses. (See #860.)
- With the negative (–) cable of the battery connected, battery voltage is always applied to each fuse. The battery voltage is applied to the fuses under the following conditions: Always (directly connected to the battery)

CAUTION

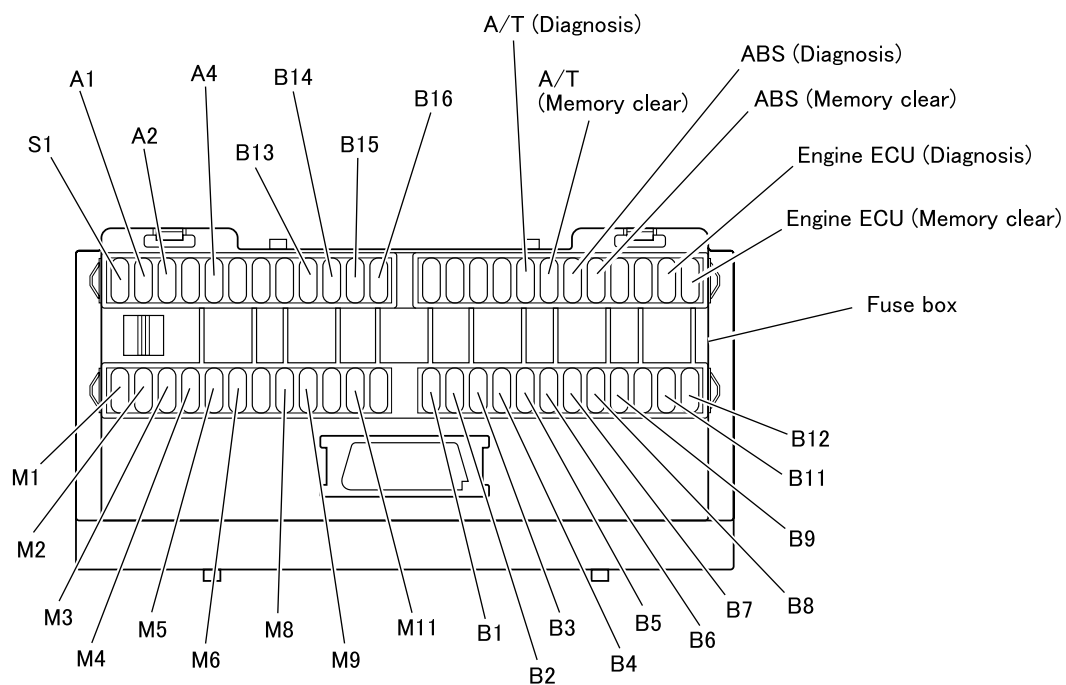
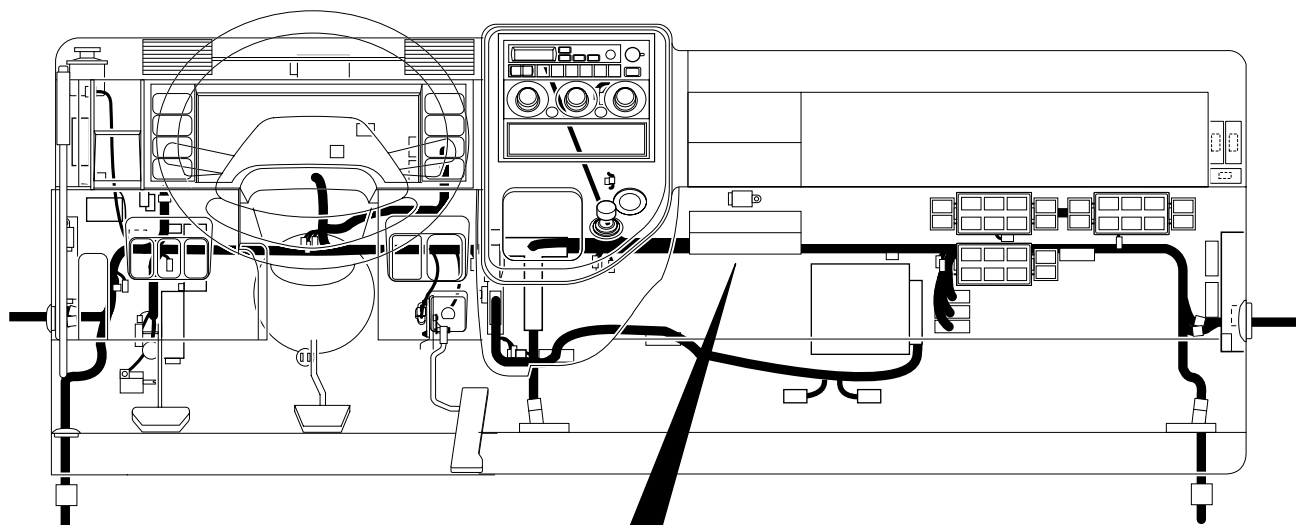
- If a fuse blows out, identify and remedy the cause, then replace the fuse.
- Be sure to use the fuse with the specified ampere.
- When installing the cover on the high-current fuse box, lightly press the cover directly down until the guide on the cover securely fits in the guide on the fuse box. Do not push the cover inward with excessive force, as doing so could easily damage the guides.

High-current fuse box

Fuse No.	Main load	Capacity
FH1	Fuse box (S1, A1 to A5, M1 to M12)	60A
FH2	Fuse box (B1 to B12)	60A
FH3	Fuse box (B13 to B16)	40A
FH5	Hydraulic booster	60A
FH7	ABS motor	40A
FH8	ABS solenoid	40A
B25	Tail lamp	15A
B27	Horn	10A
B28	Air-conditioner	10A
B29	Condenser fan	25A
B30	Blower fan	30A
B33	Van body dome light	10A
B34	ATF cooler fan	20A
B36	Engine electronic drive unit	20A
BATT1	Alternator	120A
BATT2	Alternator	120A

ABS: Anti-lock brake system

ATF: Automatic transmission fluid



ECU : Electronic control unit
A/T : Automatic transmission

P57900E

CAUTION

- If a fuse blows out, identify and remedy the cause, then replace the fuse.
- Be sure to use the fuse with the specified ampere.

Fuse box

Fuse No.	Main load	Capacity
A1	Cigarette lighter	15A
A2	Audio	10A
A4	Opt (ACC)	10A
B1	Stop lamp	15A
B2	Meter	10A
B3	Turn signal lamp	15A
B4	Opt (B)	10A
B5	Audio	10A
B6	Cab lamp	10A
B7	Power window (driver)	30A
B8	Power window (assistant)	30A
B9	Engine electronic control unit	20A
B11	Mirror heater	20A
B12	Automatic transmission	10A
B13	Tester	15A
B14	Headlamp (HI)	20A
B15	Headlamp (LH/LO)	20A
B16	Headlamp (RH/LO)	20A
M1	Backup lamp	10A
M2	Meter	10A
M3	Wiper	15A
M4	Opt (M)	10A
M5	Relay control	10A
M6	Automatic transmission	10A
M8	Exhaust brake	10A
M9	Engine electronic control unit	5A
M11	ABS	10A
S1	Starter	10A

Diagnosis fuse

Fuse No.	Main load	Capacity
A/T	Diagnosis	5A
A/T	Memory clear	10A
ABS	Diagnosis	5A
ABS	Memory clear	10A
Engine ECU	Diagnosis	5A
Engine ECU	Memory clear	10A

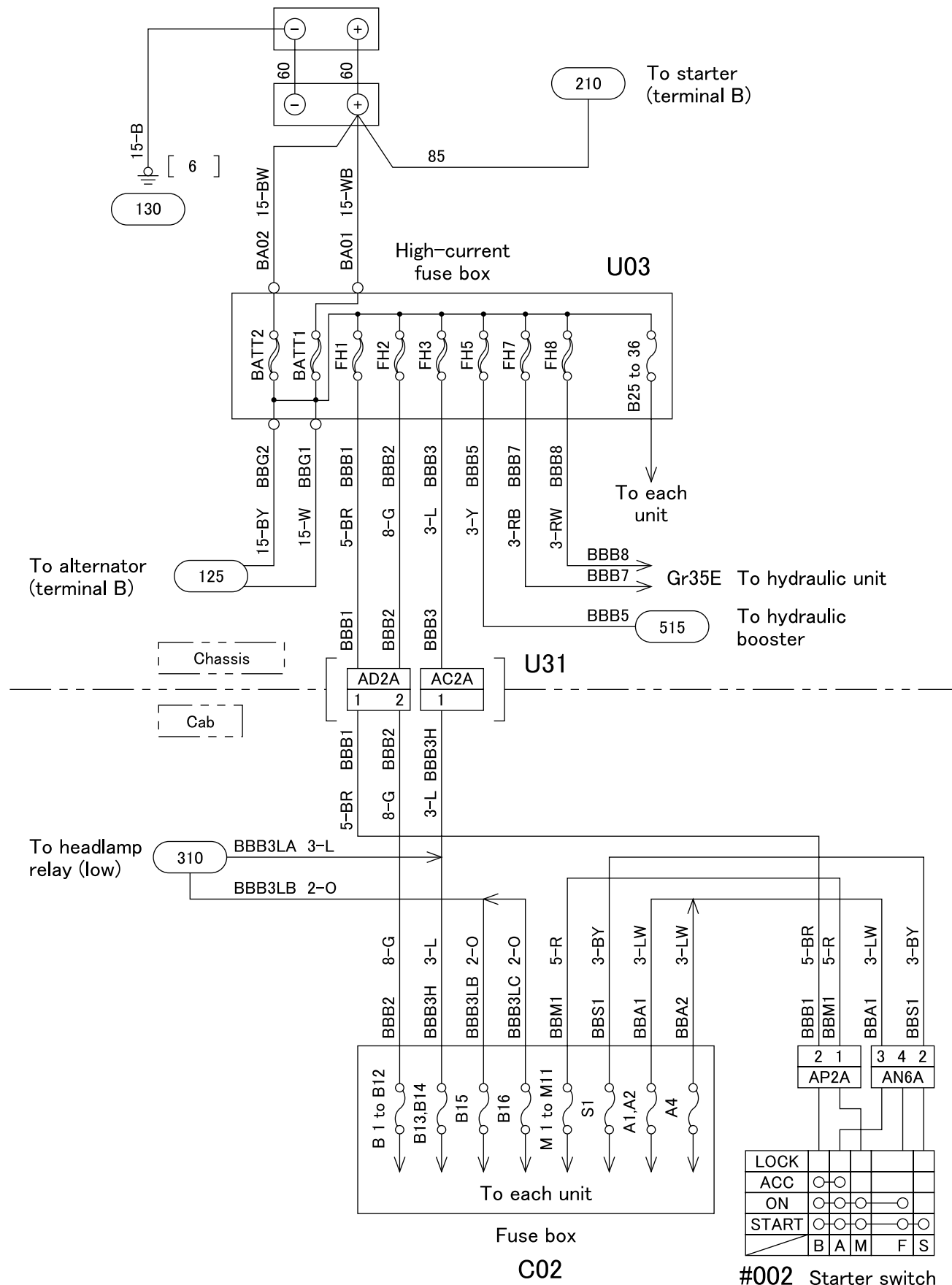
ABS: Anti-lock brake system

A/T: Automatic transmission

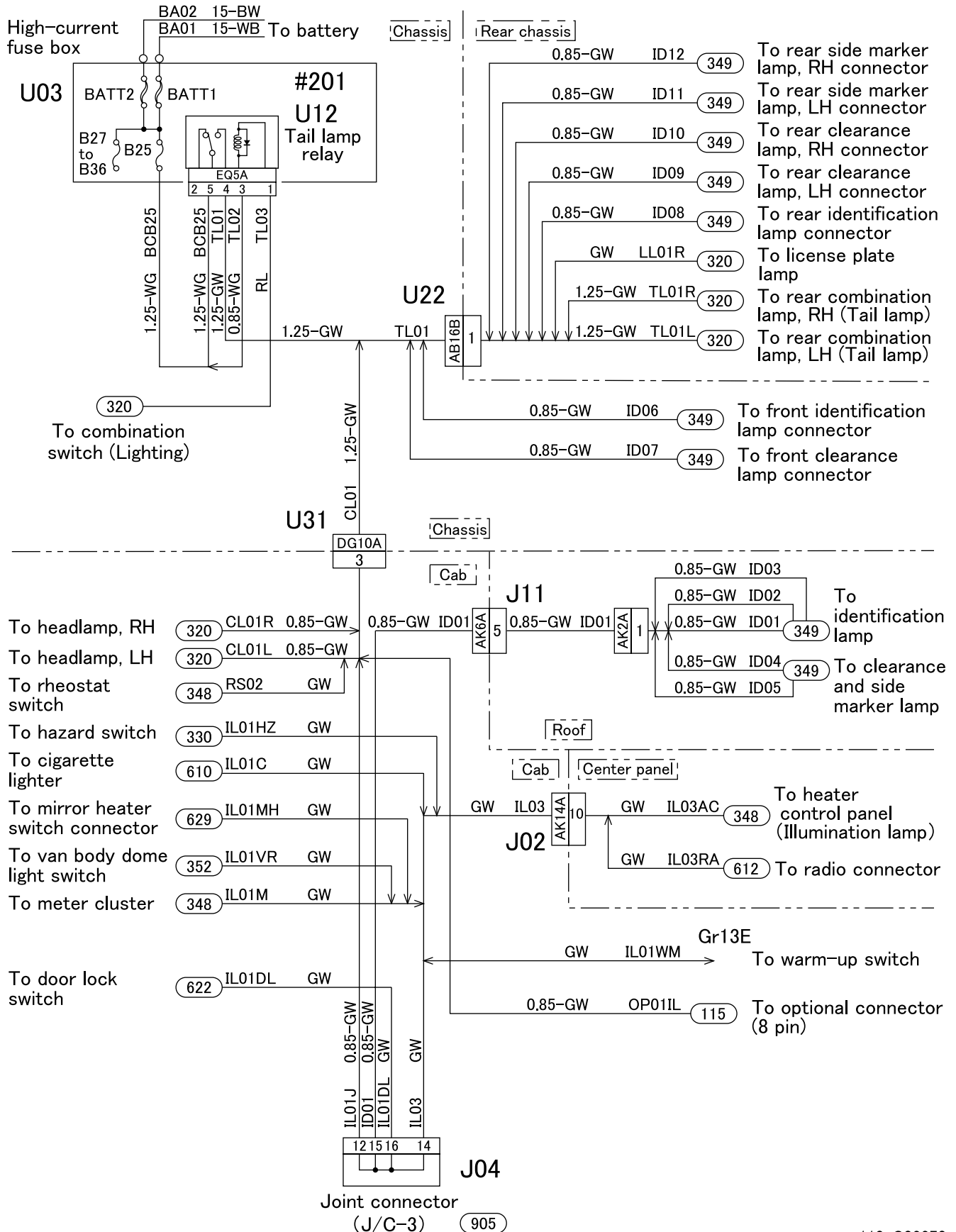
ECU: Electronic control unit

Battery to fuse

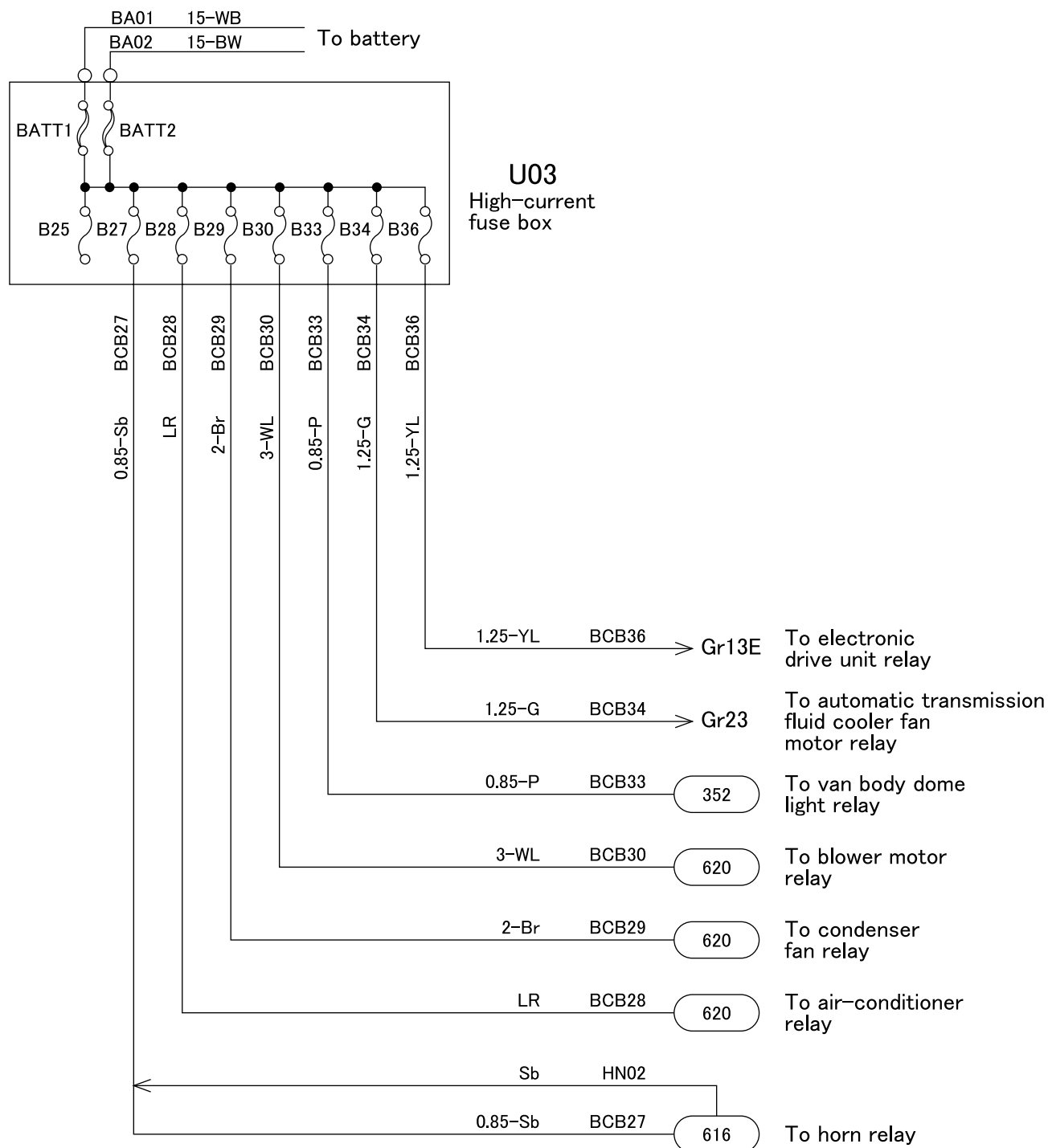
#860 Battery



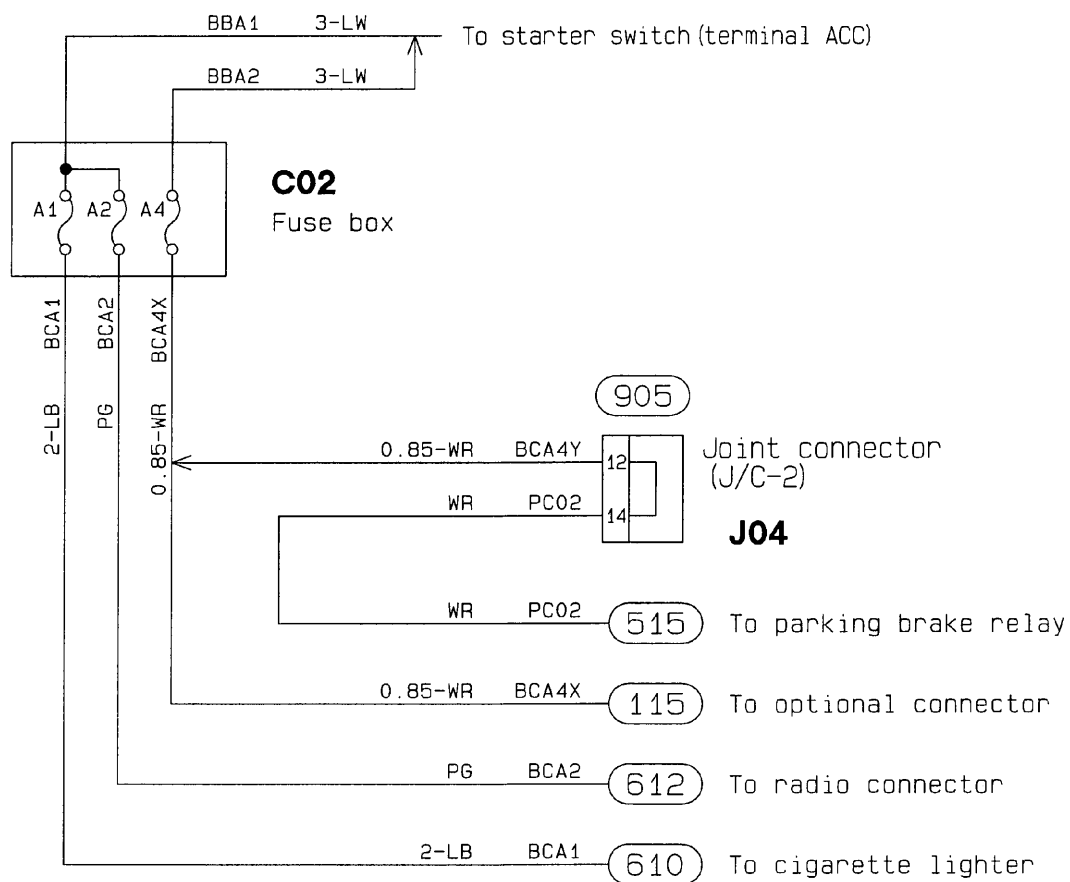
High-current fuse box (Fuse B25)



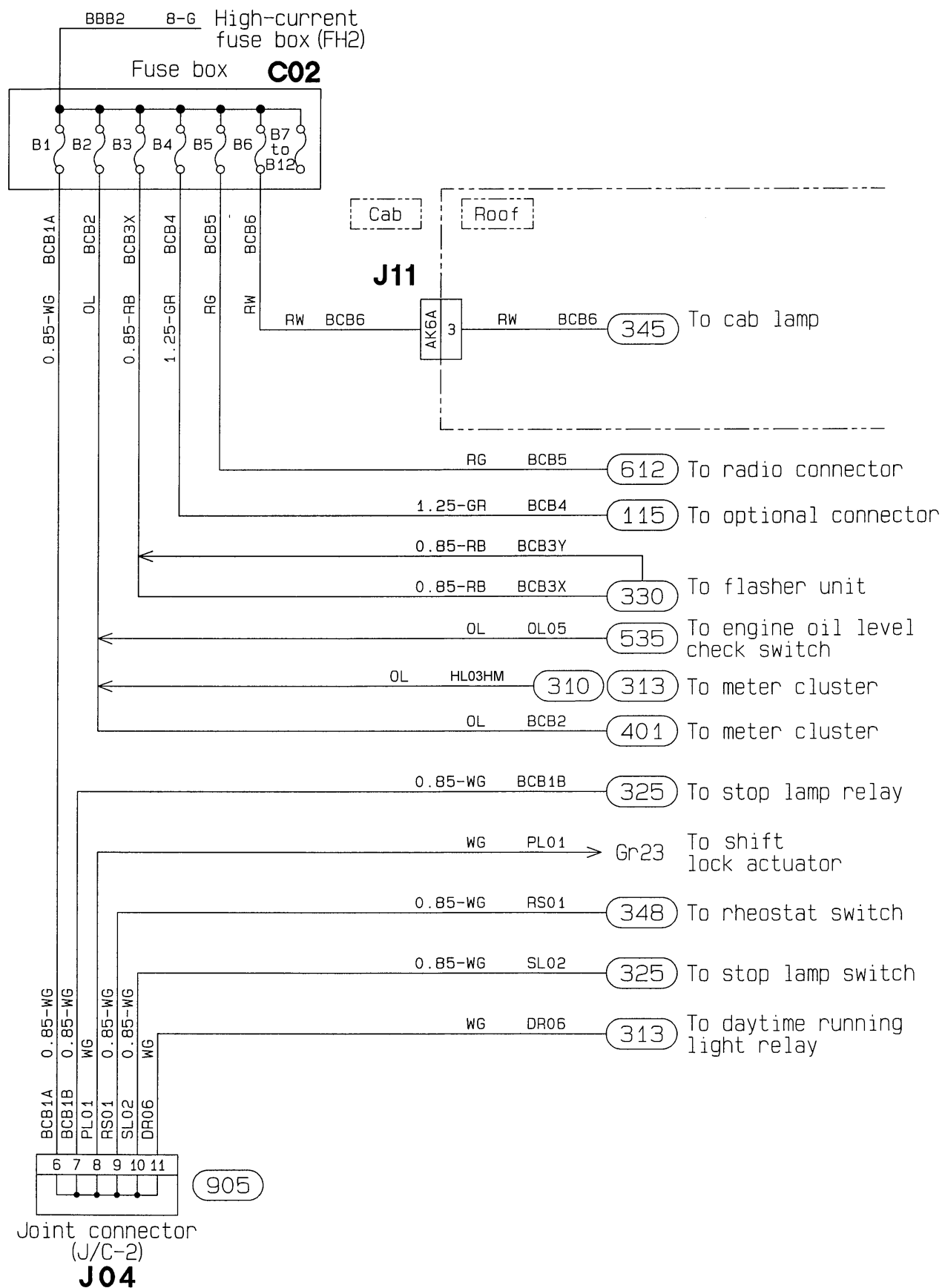
High-current fuse box
(Fuse B27 to B36)



Fuse box
(Fuse A1 to A4)

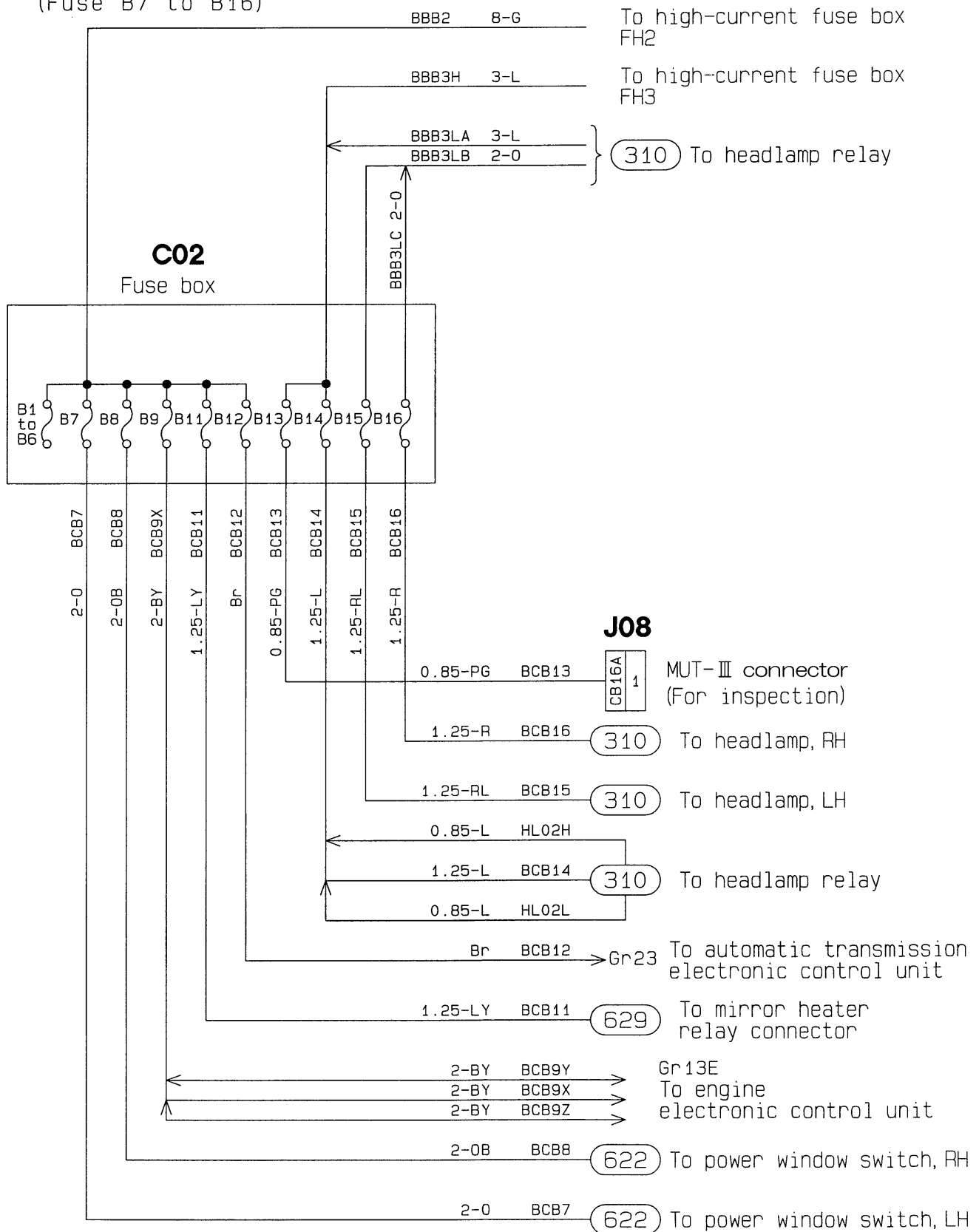


Fuse box
(Fuse B1 to B6)



C02271

Fuse box
(Fuse B7 to B16)

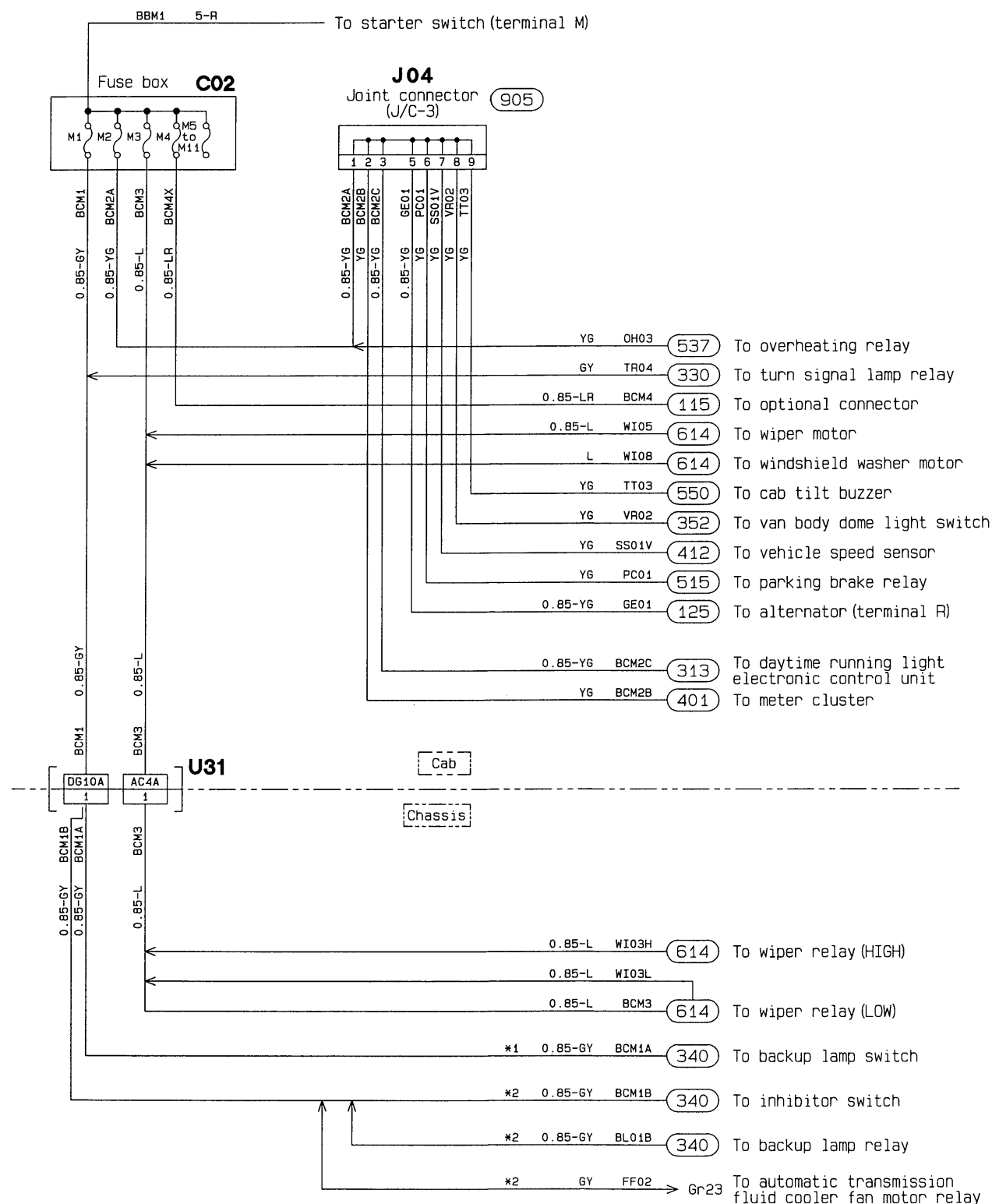


MUT : Multi-Use Tester

C00471

54-01-11

Fuse box
(Fuse M1 to M4)



*1 : Manual transmission
*2 : Automatic transmission

Fuse box C02

J03
Joint connector (J/C-1) (905)

J06a
MUT-III connector (for recorder)

J04
Joint connector (J/C-2) (905)

U31
Chassis

J02
Center panel

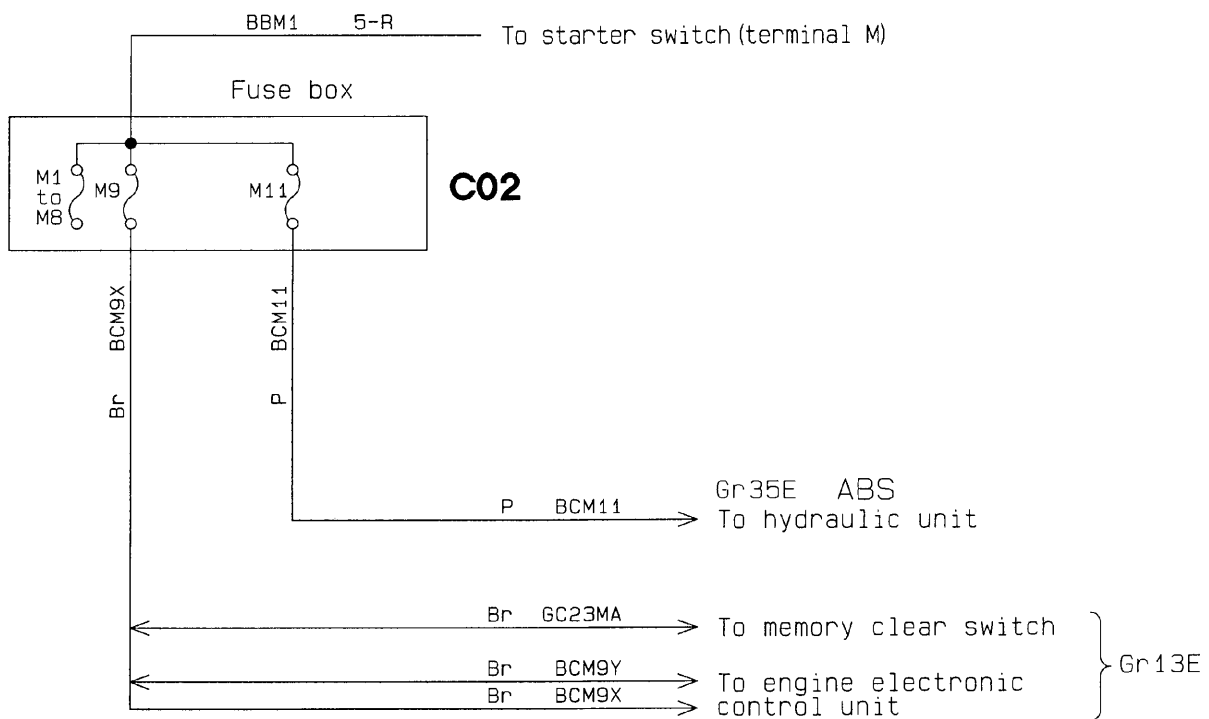
Legend:

- *1: Manual transmission
- *2: Automatic transmission
- ABS: Anti-lock brake system
- MUT: Multi-Use Tester

Wiring Connections:

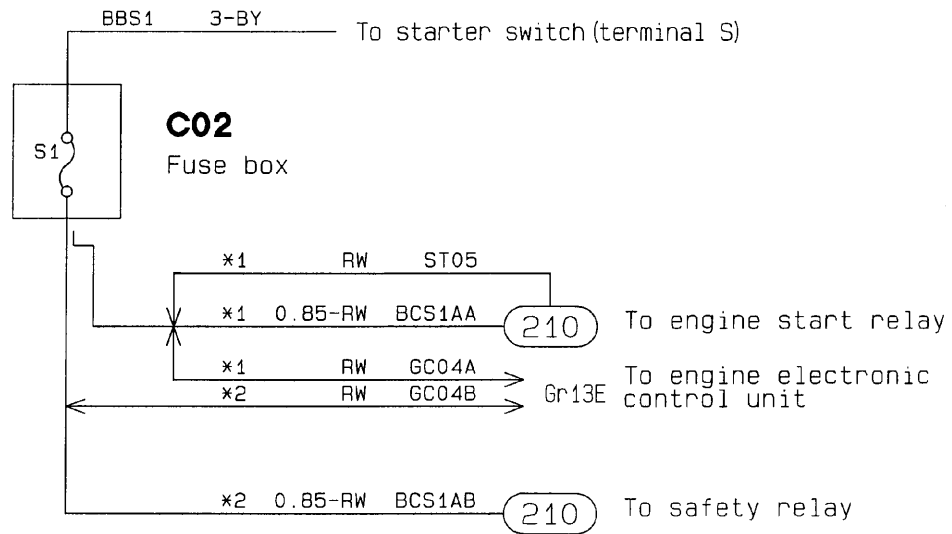
- BCM5X** (0.85-YB) → **614** → To wiper control unit
- GL01** (YB) → **220** → To glow drive relay
- MH02** (YB) → **629** → To mirror heater relay connector
- PW01** (YB) → **622** → To power window switch
- BW01** (YB) → **620** → To blower motor relay
- AC06** (YB) → **620** → To condenser fan relay
- AC03** (YB) → **620** → To air-conditioner relay
- AM01** (YB) → **620** → To heater control panel
- AM06** (YB) → **620** → To heater control panel
- AM05V** (YB) → **620** → To fresh/recirculation changeover switch
- EX08** (Lg) → **710** → To meter cluster
- WM01** (Lg) → **Gr13E** → To warm-up switch
- GL05** (Lg) → **220** → To meter cluster
- CS09** (Lg) → **Gr13E** → To torque limit switch
- PT03** (Lg) → **850** → To power take-off relay connector
- PT01** (Lg) → **850** → To power take-off relay connector
- EX04A** (*1 Lg) → **710** → To transmission neutral relay
- EX10** (*1 Lg) → **710** → To transmission neutral relay
- EX02** (Lg) → **710** → To clutch switch
- AS05** (Lg) → **710** → To ABS exhaust brake cut relay
- BCM8B** (Lg) → **710** → To ABS exhaust brake cut relay
- EX04B** (*2 Lg) → **710** → To exhaust brake cut relay
- AN38** (Lg) → **710** → To exhaust brake cut relay
- KL01** (YR) → **Gr23** → To key interlock electronic control unit
- PL02** (YR) → **Gr23** → To shift lock actuator
- BCM6Y** (YR) → **Gr23** → To automatic transmission electronic control unit
- BCM6X** (YR) → **Gr23** → To automatic transmission electronic control unit

Fuse box
(Fuse M9 to M11)



ABS: Anti-lock brake system

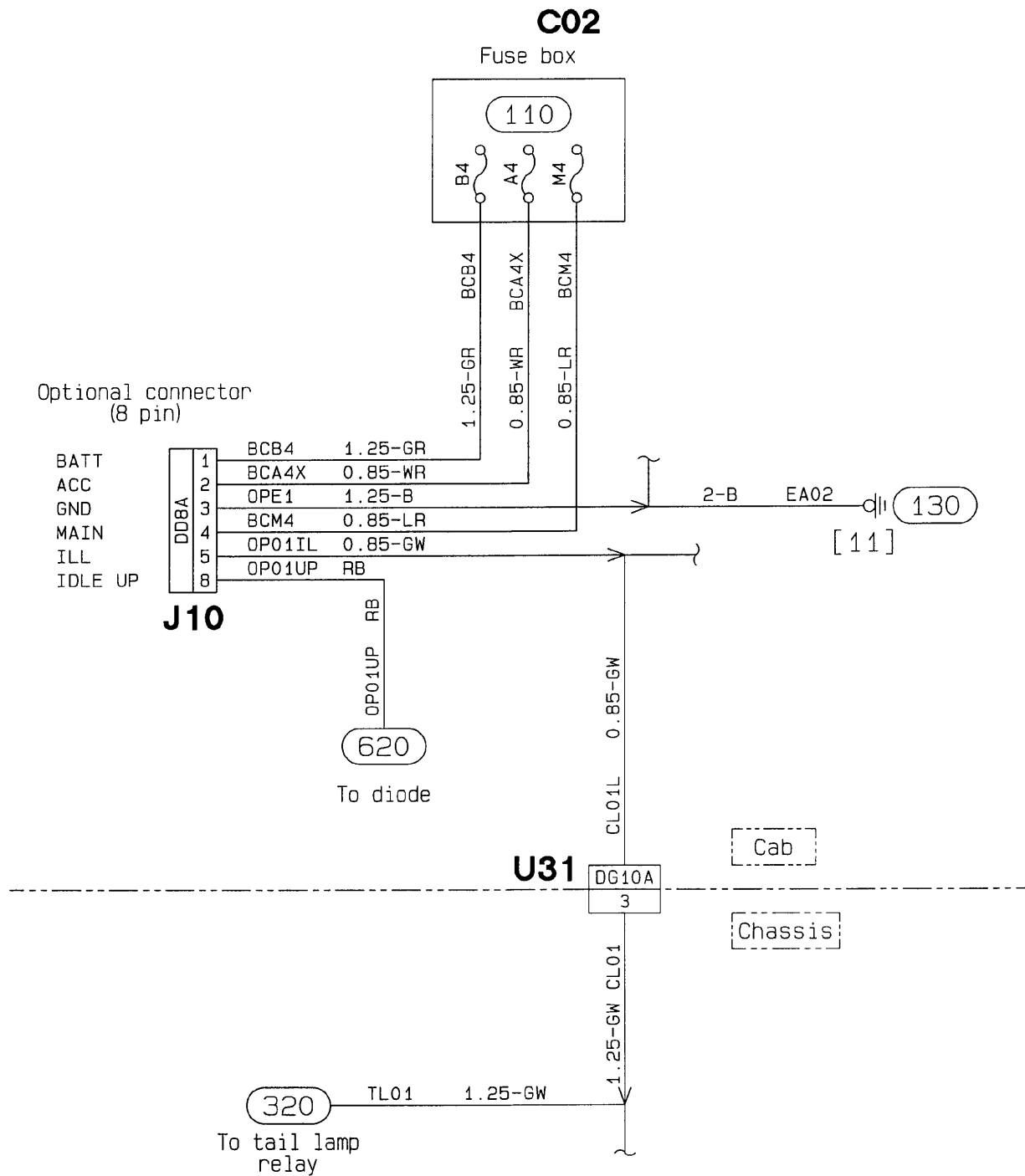
Fuse box (Fuses S1)



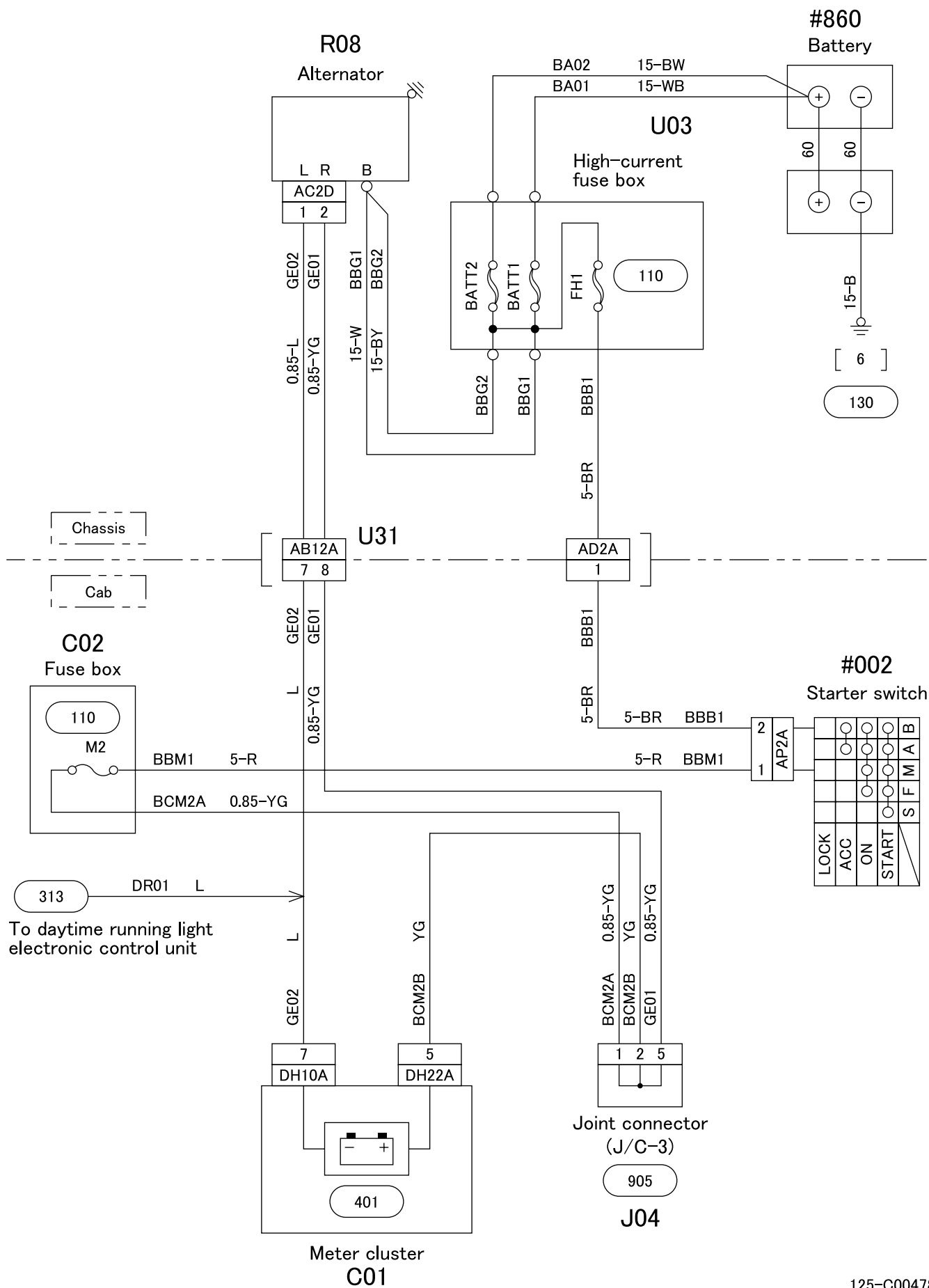
*1 : Manual transmission

*2 : Automatic transmission

115 RESERVE POWER CIRCUIT

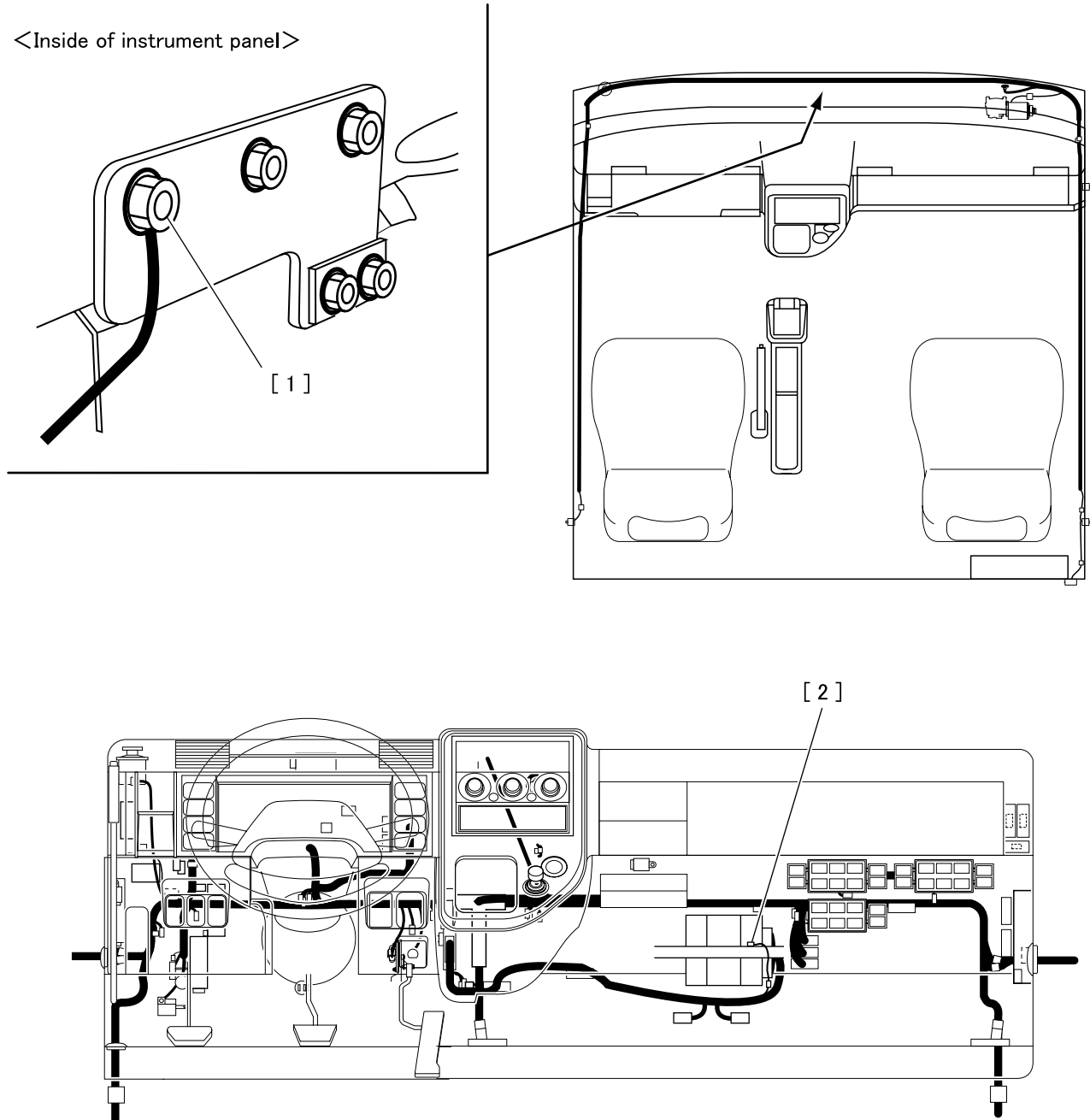


C00477



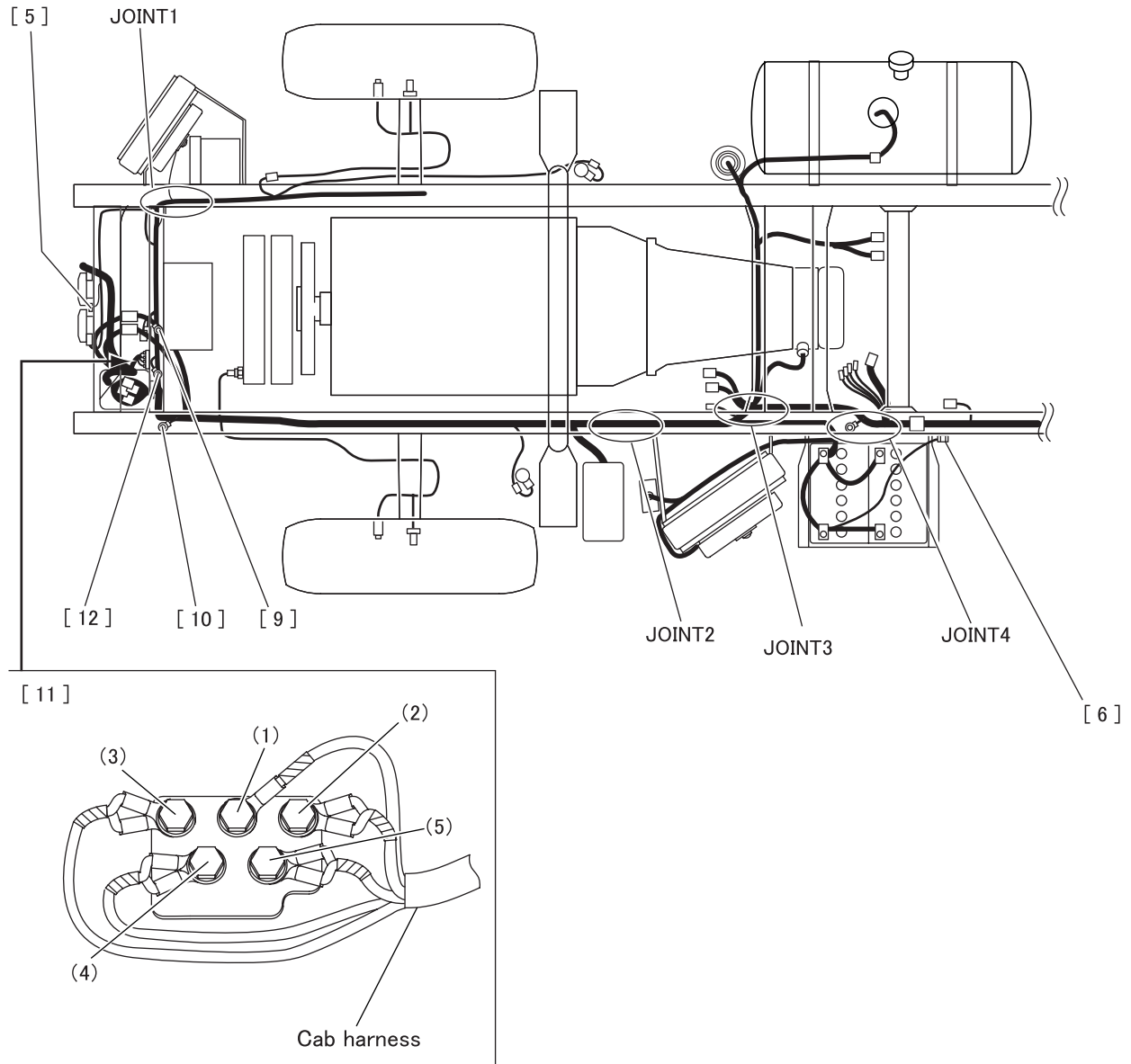
[1] to [2] Cab ground

<Inside of instrument panel>



Location	Circuit No.	Wire diameter-wire color	Destination	Remarks
[1]	EA09	2-B	Joint connector (J/C-3)	—
	EA10	5-B	Frame ground	—
[2]	GCE5	1.25-B	Joint connector (J/C-3)	Engine electronic control unit case ground

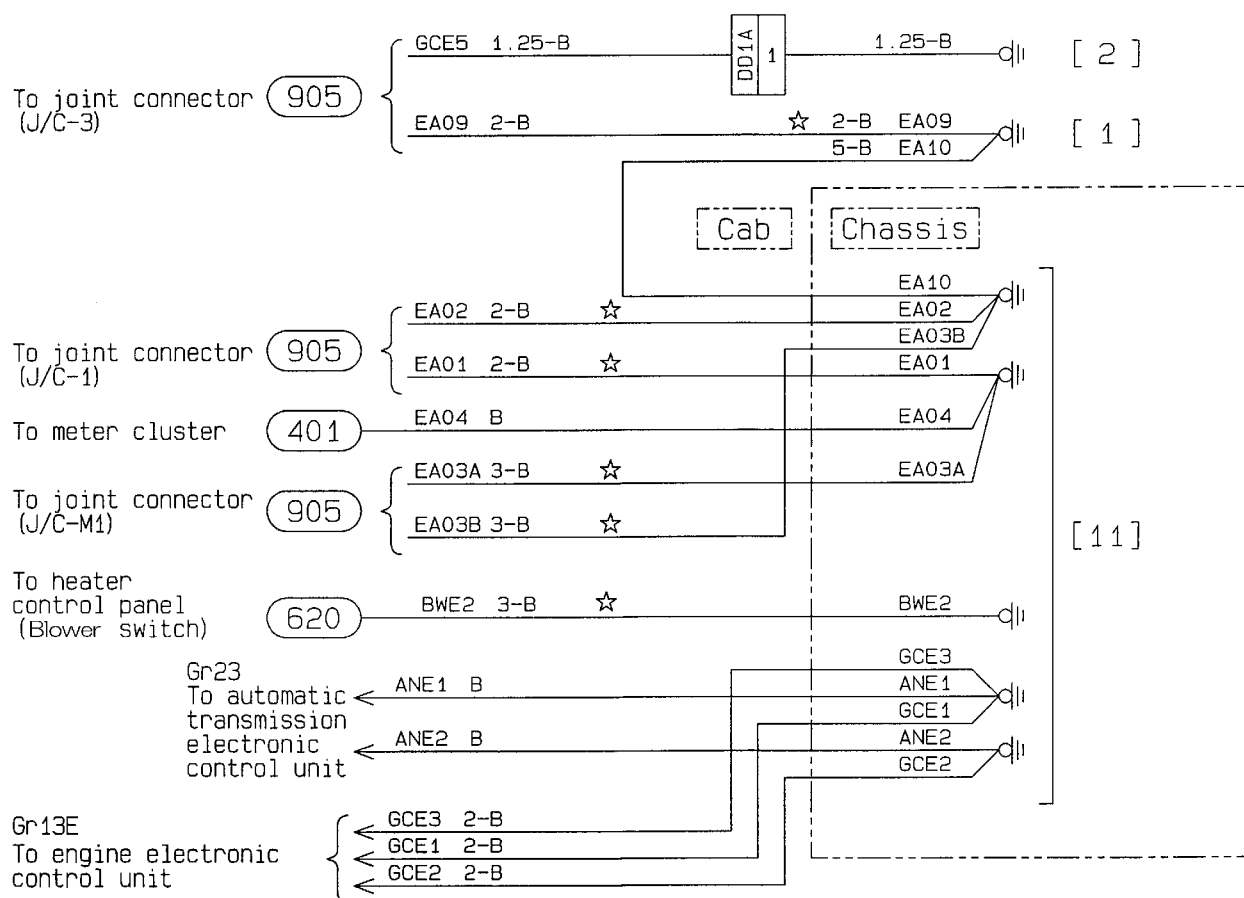
[5] to [12] Chassis ground



Location	Circuit No.	Wire diameter-wire color	Destination	Remarks
[5]	HNE1	2-B	Horn bracket	—
[6]	—	15-B	Battery	Battery ground (Frame ground)
[9]	EA11	2-B	Joint1	Frame ground
	EA12	1.25-B	Joint2	Frame ground
[10]	ASE1	3-B	Hydraulic unit	—
	ASE2	3-B	Hydraulic unit	—
[11](5)	ANE1	B	Automatic transmission electronic control unit	Automatic transmission
[11](4)	ANE2	B	Automatic transmission electronic control unit	Automatic transmission
[11](1)	BWE2	3-B	Center panel harness	—
[11](2)	EA01	2-B	Joint connector (J/C-1)	(Cab)
[11](3)	EA02	2-B	Joint connector (J/C-1)	(Cab)
[11](2)	EA03A	3-B	Joint connector (J/C-M1)	(Cab)
[11](3)	EA03B	3-B	Joint connector (J/C-M1)	(Cab)
[11](2)	EA04	B	Combination meter	(Cab)
[11](3)	EA10	5-B	Cab ground	—
[11](5)	GCE1	2-B	Engine electronic control unit	—
[11](4)	GCE2	2-B	Engine electronic control unit	—
[11](5)	GCE3	2-B	Engine electronic control unit	—
[12]	EA13	1.25-B	Joint3	Frame ground
	EA14	2-B	Rear chassis harness	Frame ground

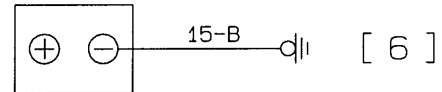
Entire ground

- This diagram indicates grounding points.
- See the following pages for branching of grounding (wiring for ☆).
(in circuit No.order)



#860

Battery



To horn circuit (616) HNE1 2-B HNE1 [5]

To hydraulic unit { ASE1 3-B ASE1 [10]
 ABS Gr35E { ASE2 3-B ASE2

To JOINT 1 EA11 2-B ☆ EA11 [9]

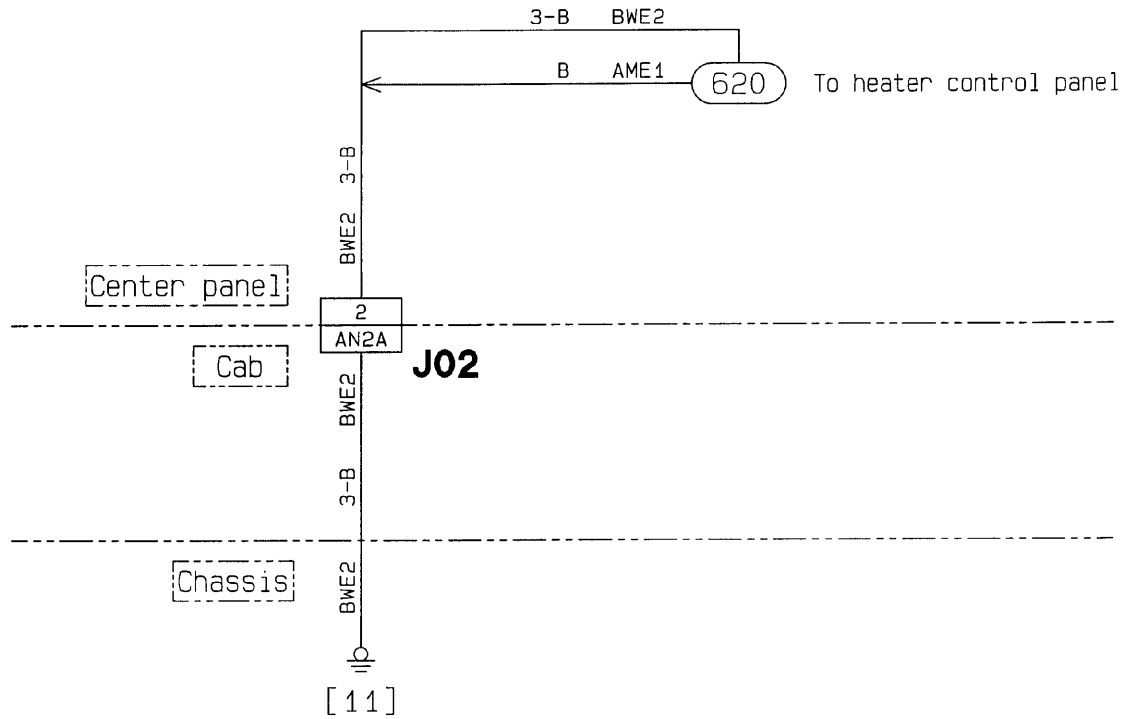
To JOINT 2 EA12 1.25-B ☆ EA12

To JOINT 3 EA13 1.25-B ☆ EA13 [12]

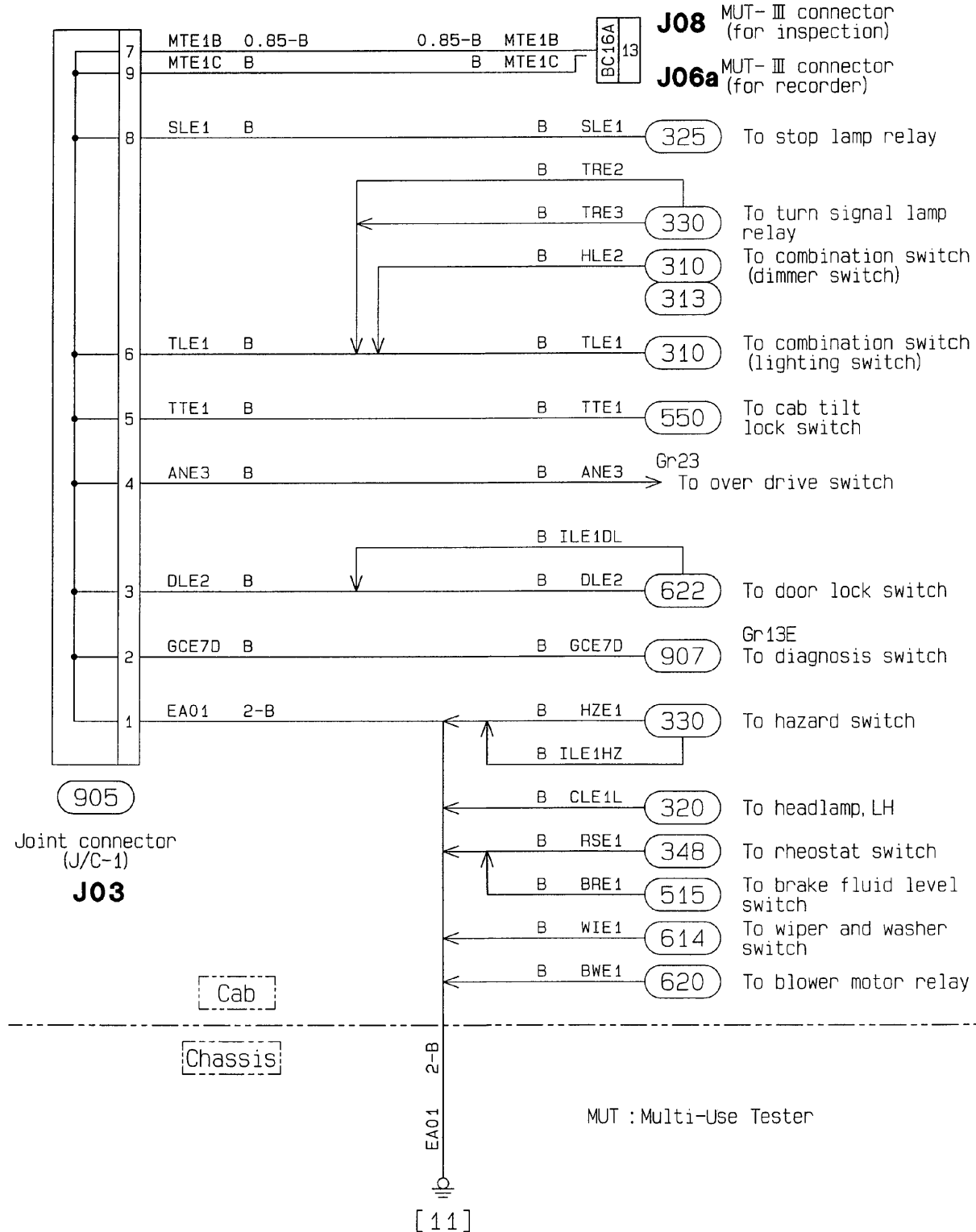
To rear combination (320) EA14 2-B ☆ EA14
 lamp, LH

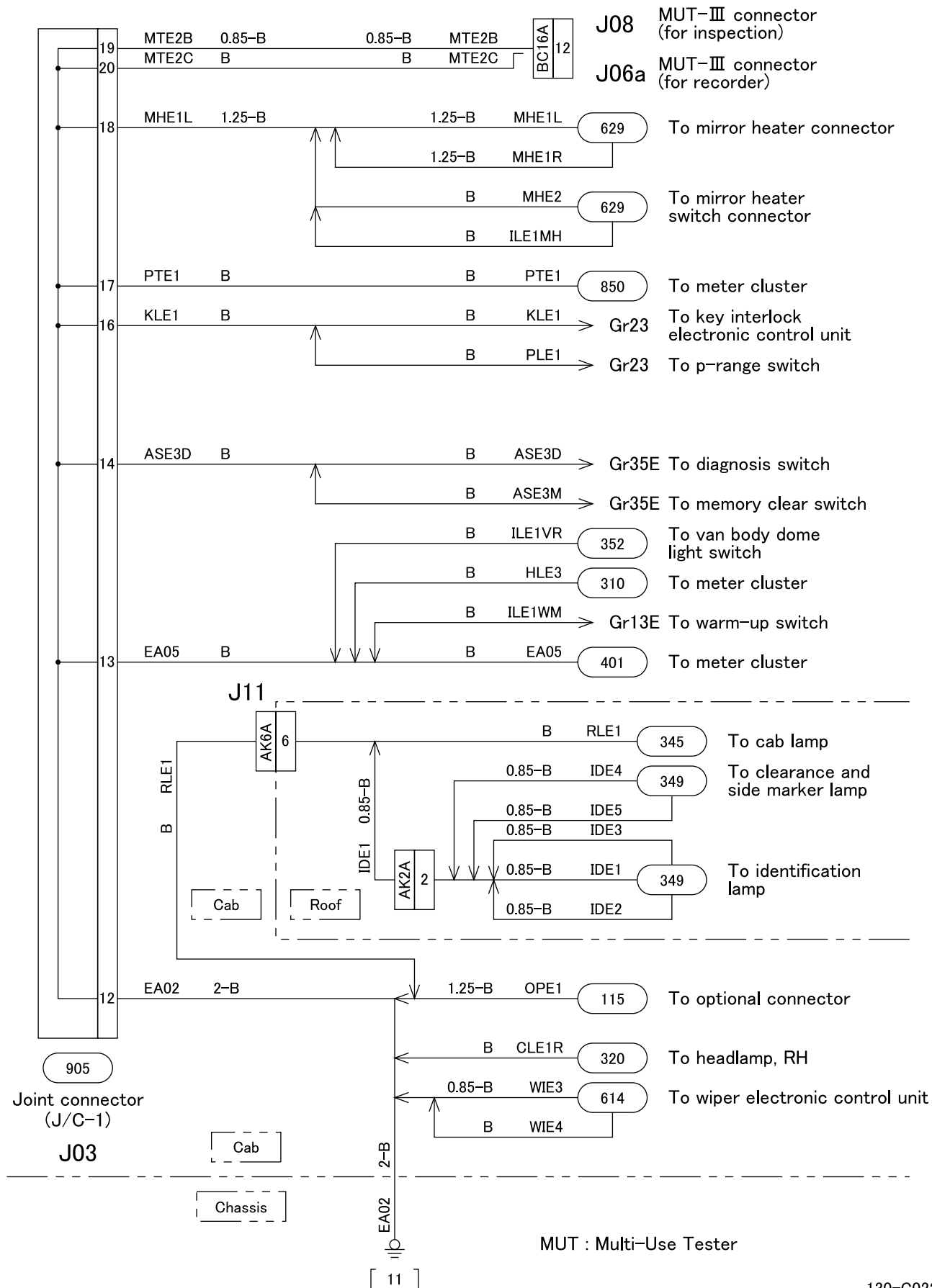
ABS : Anti-lock brake system

Circuit No.BWE2 chassis ground

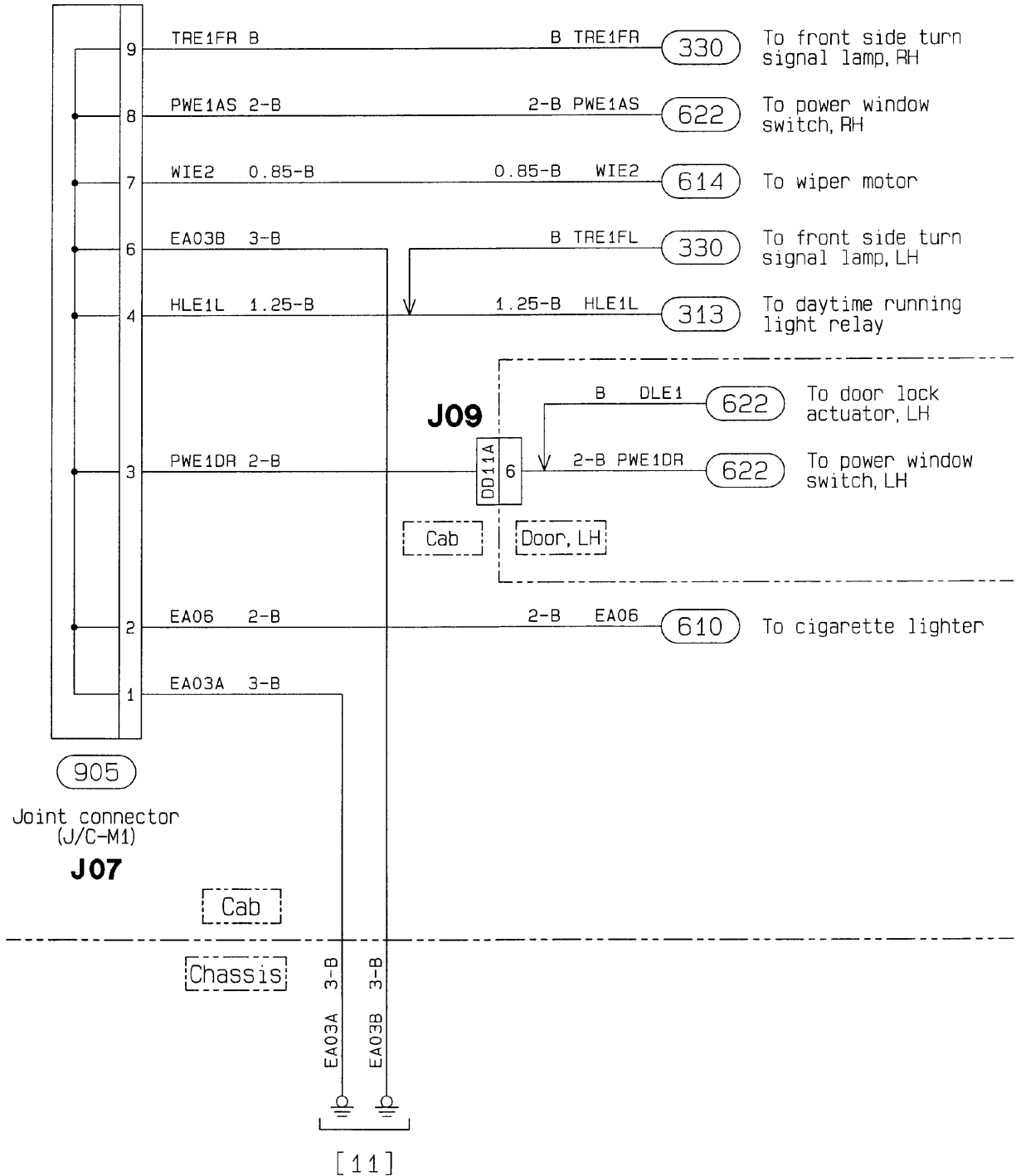


Circuit No.EA01 chassis ground

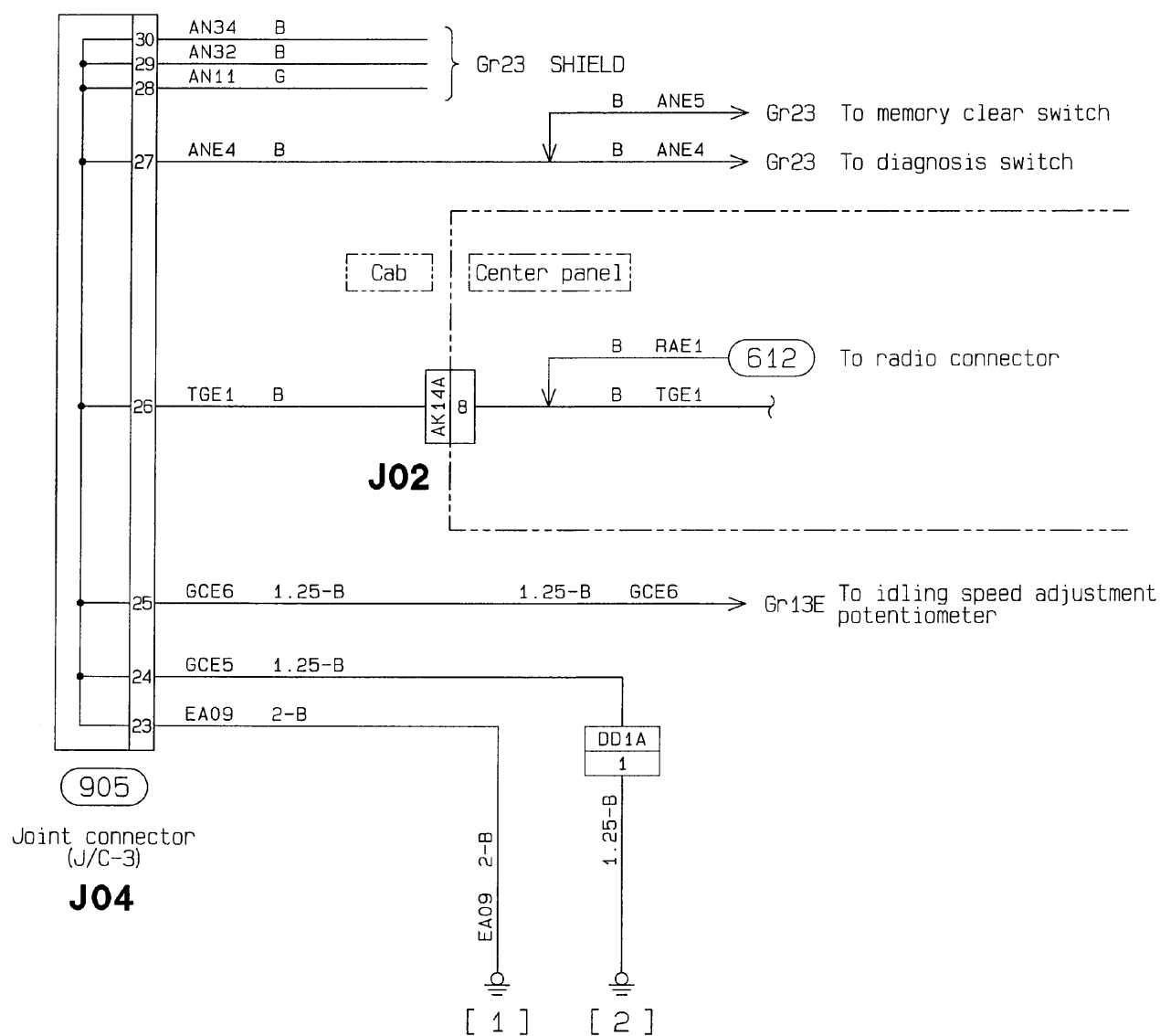




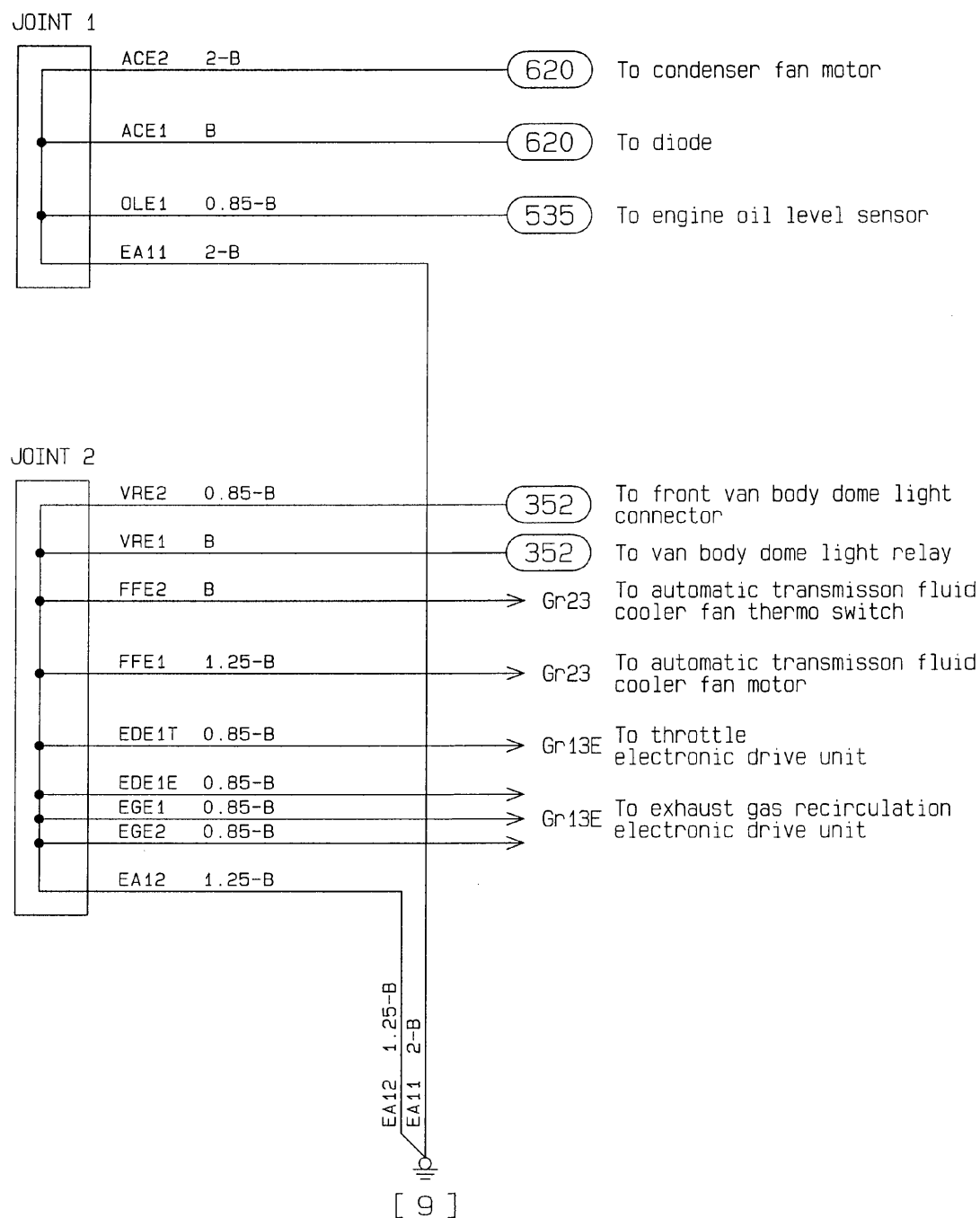
Circuit No.EA03A,EA03B chassis ground



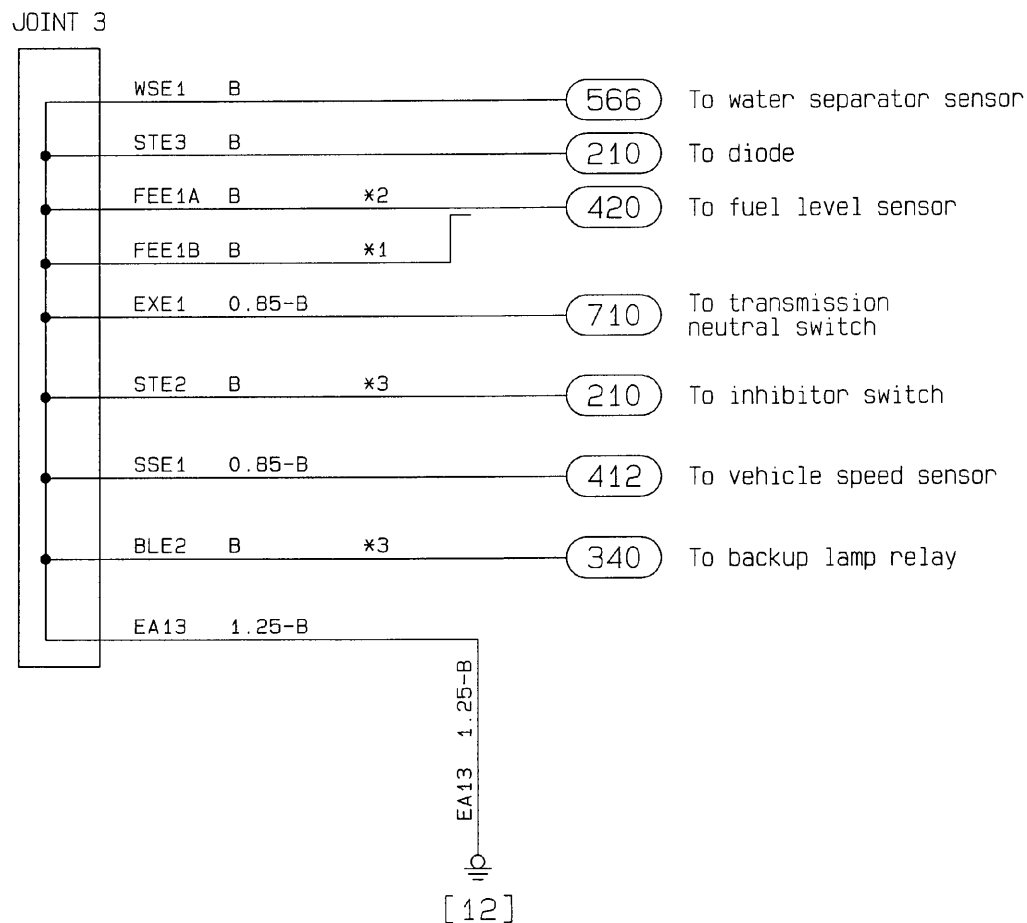
Circuit No.EA09 cab ground



Circuit No.EA11,EA12 chassis ground



Circuit No.EA13 chassis ground

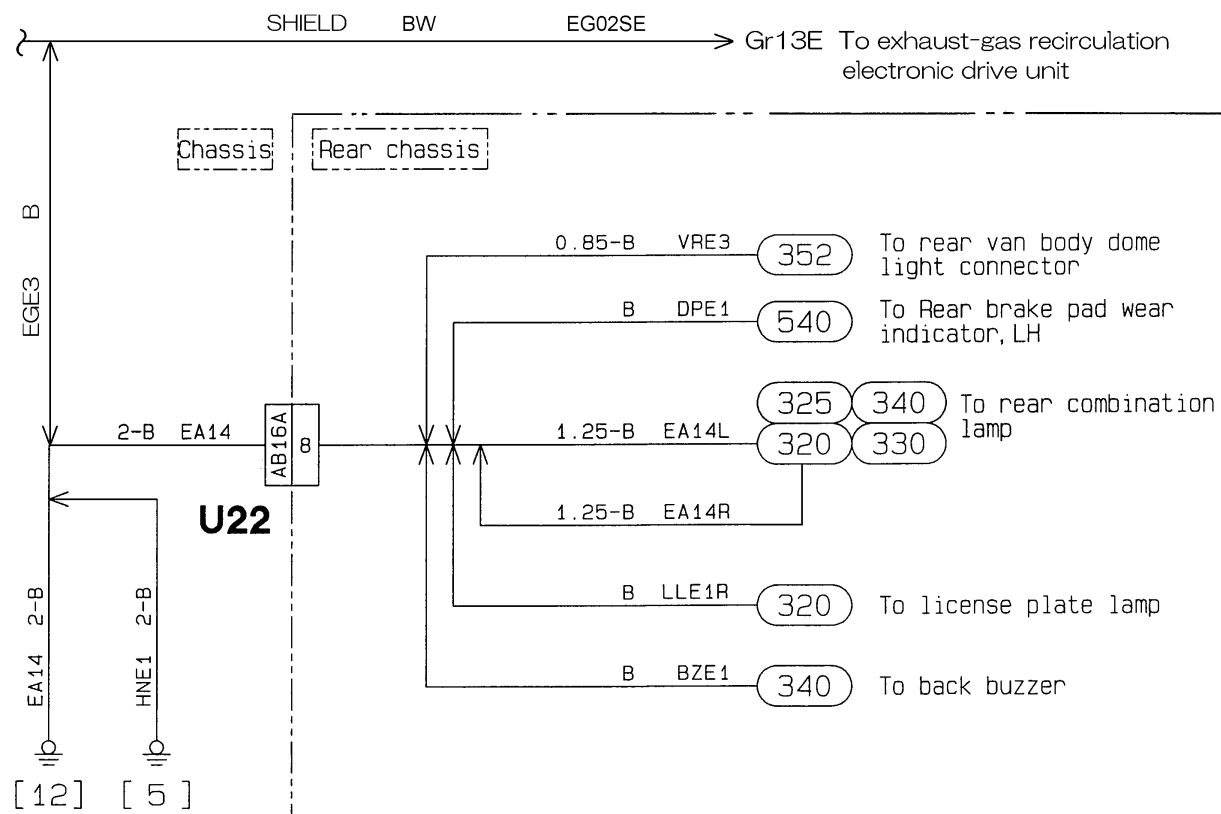


*1 : Fuel tank equipped rear overhang

*2 : Except *1

*3 : Automatic transmission

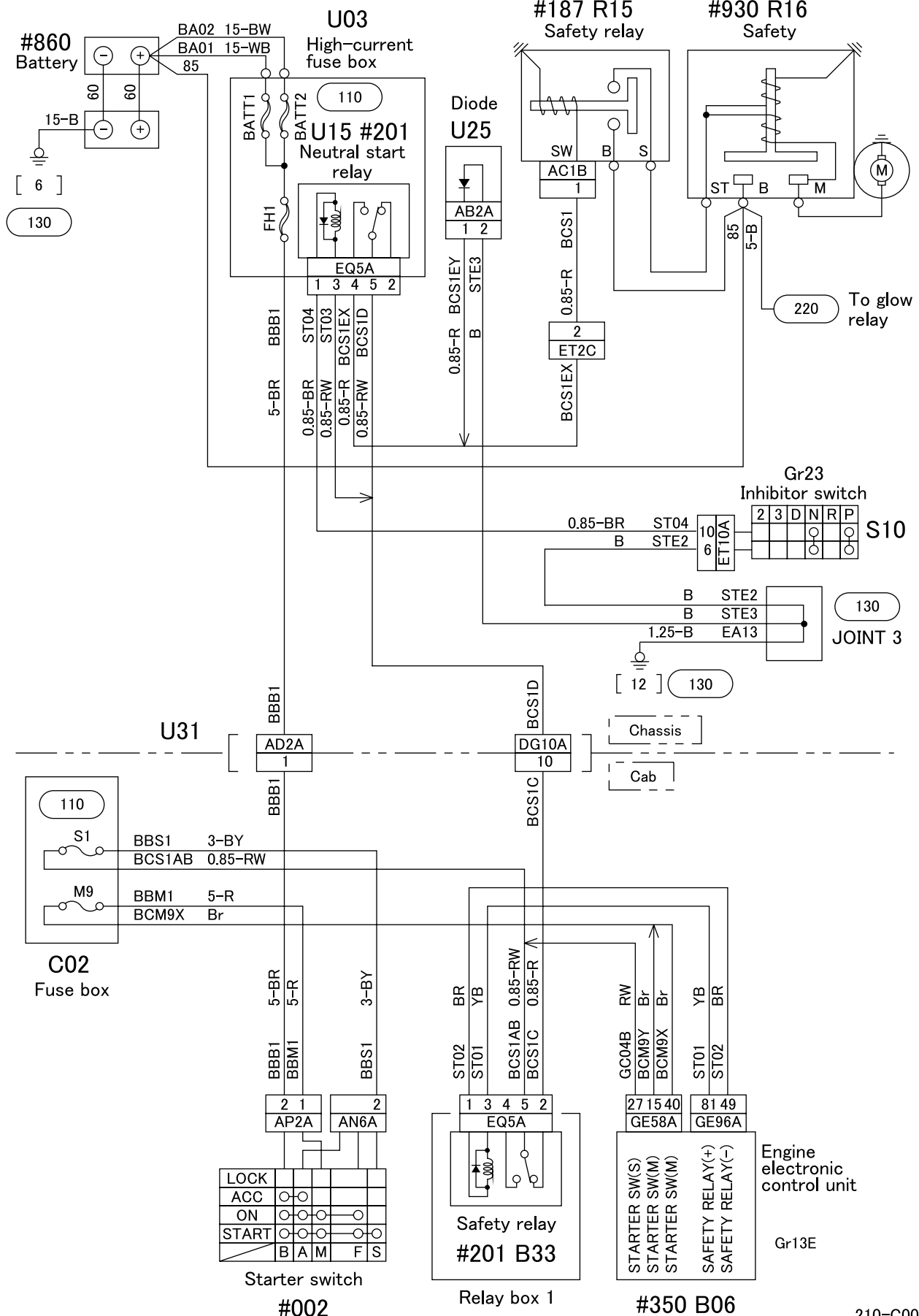
Circuit No.EA14 chassis ground

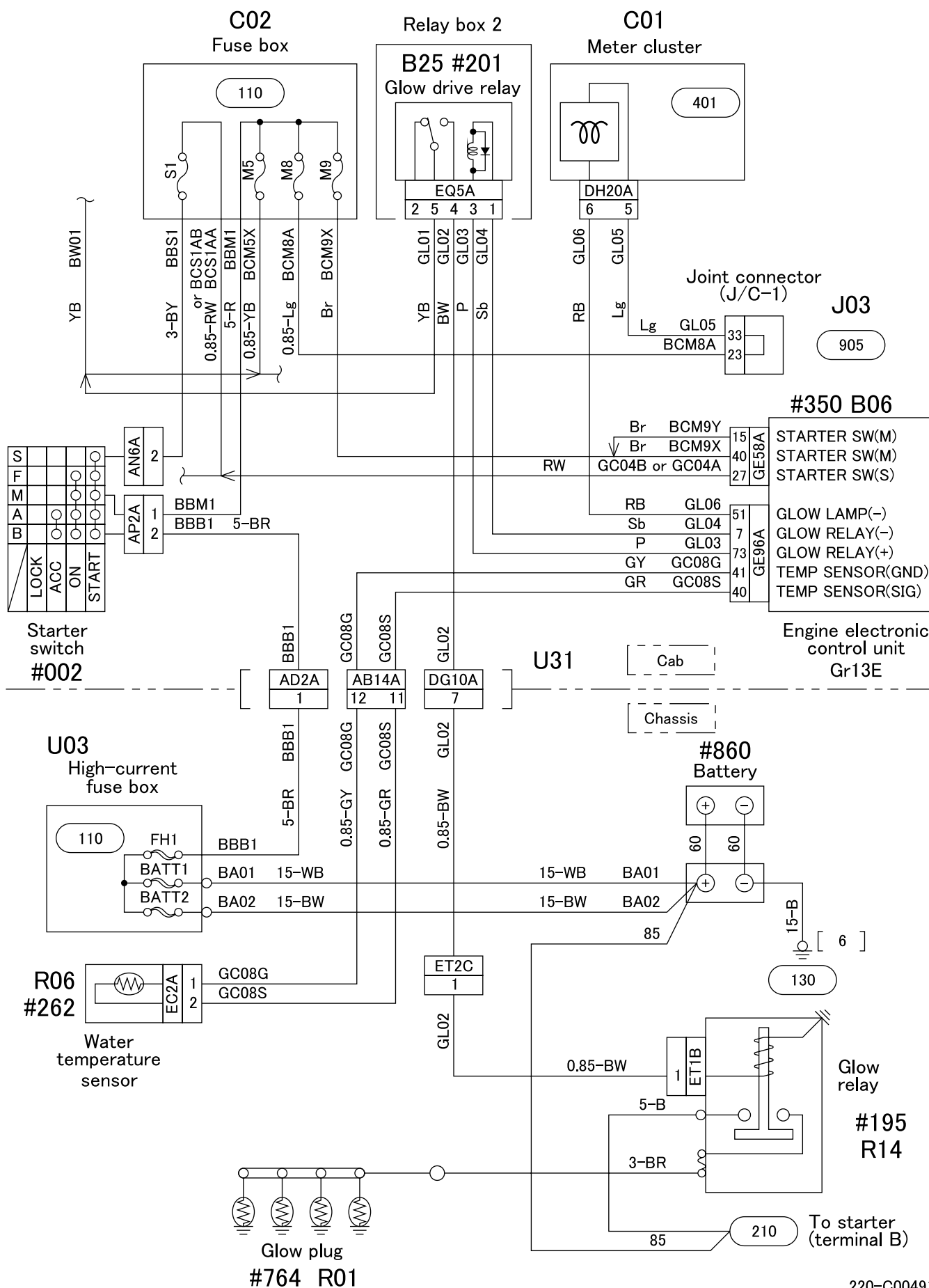


54-02 STARTING CIRCUIT

210 ENGINE STARTING CIRCUIT

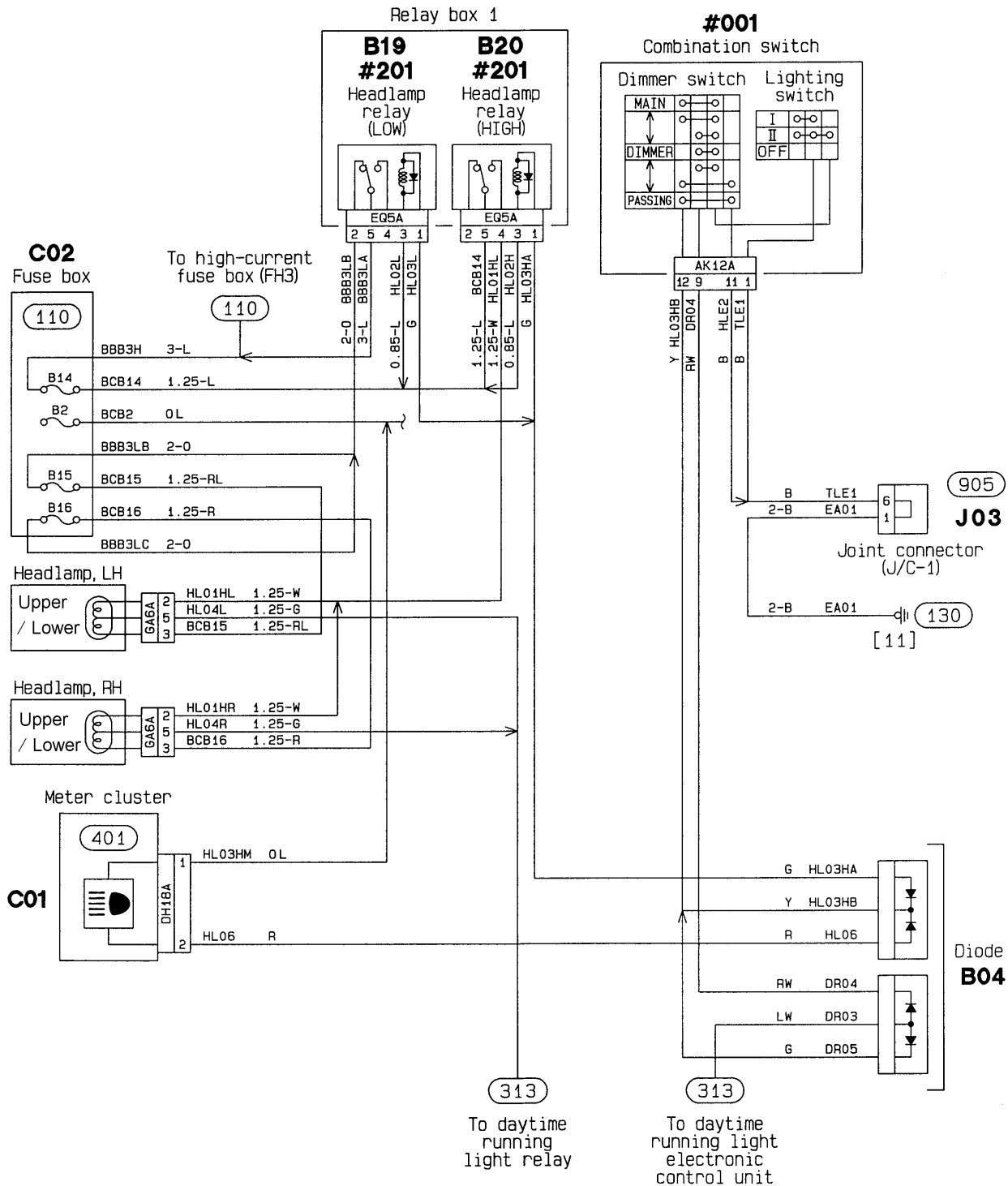
<Automatic transmission>





54-03 LIGHTING CIRCUIT

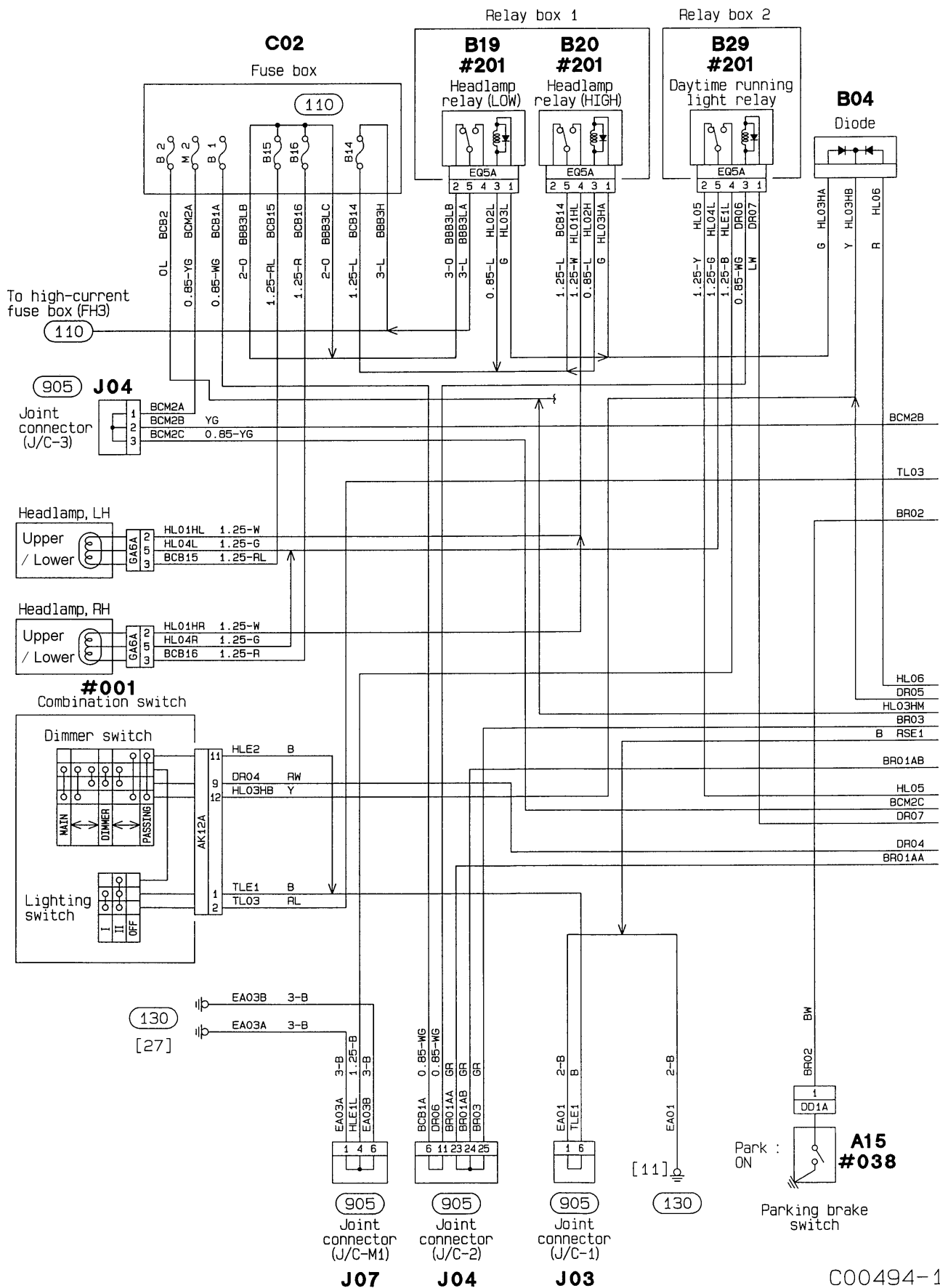
310 HEADLAMP CIRCUIT



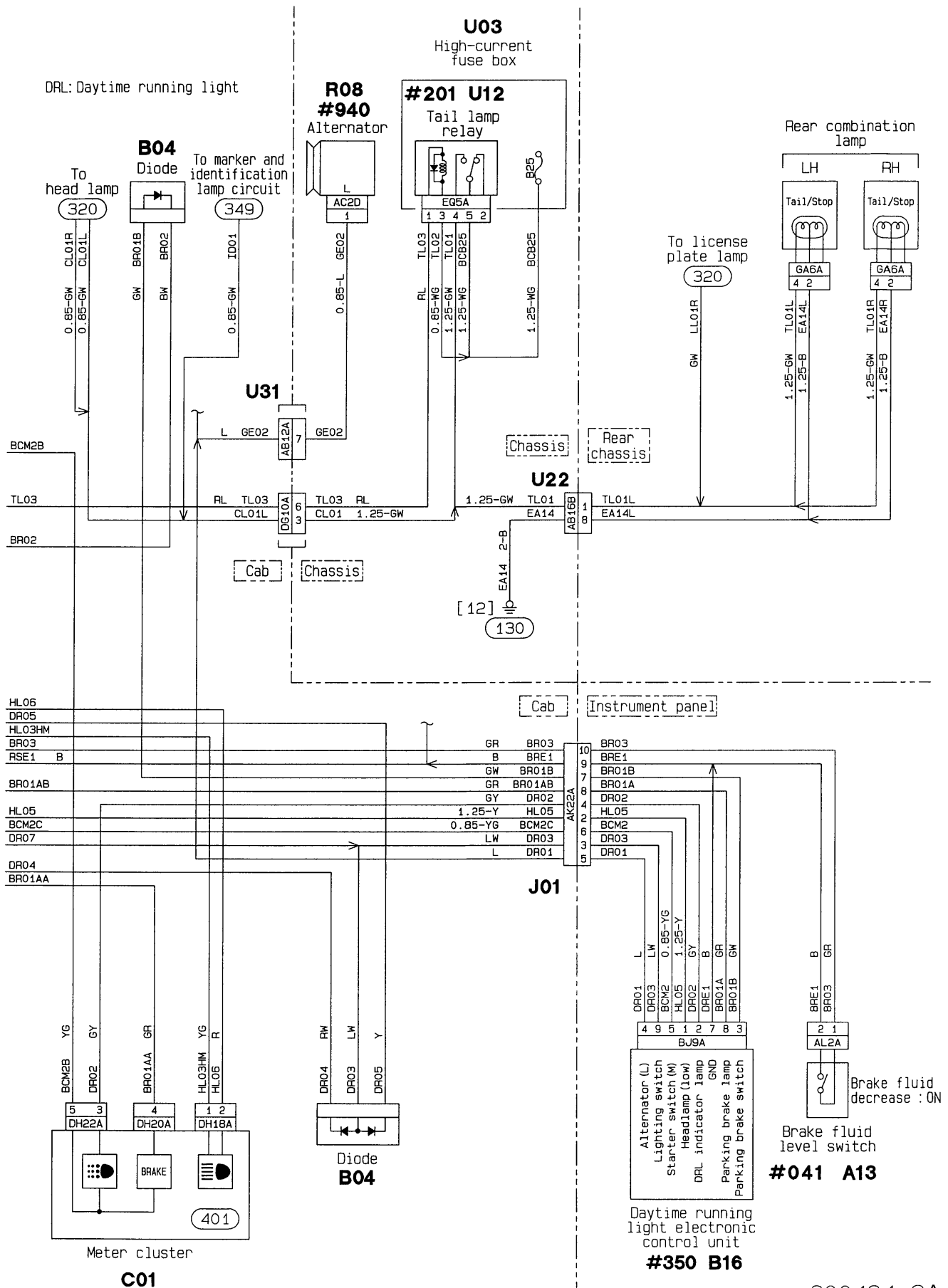
C00493

M E M O

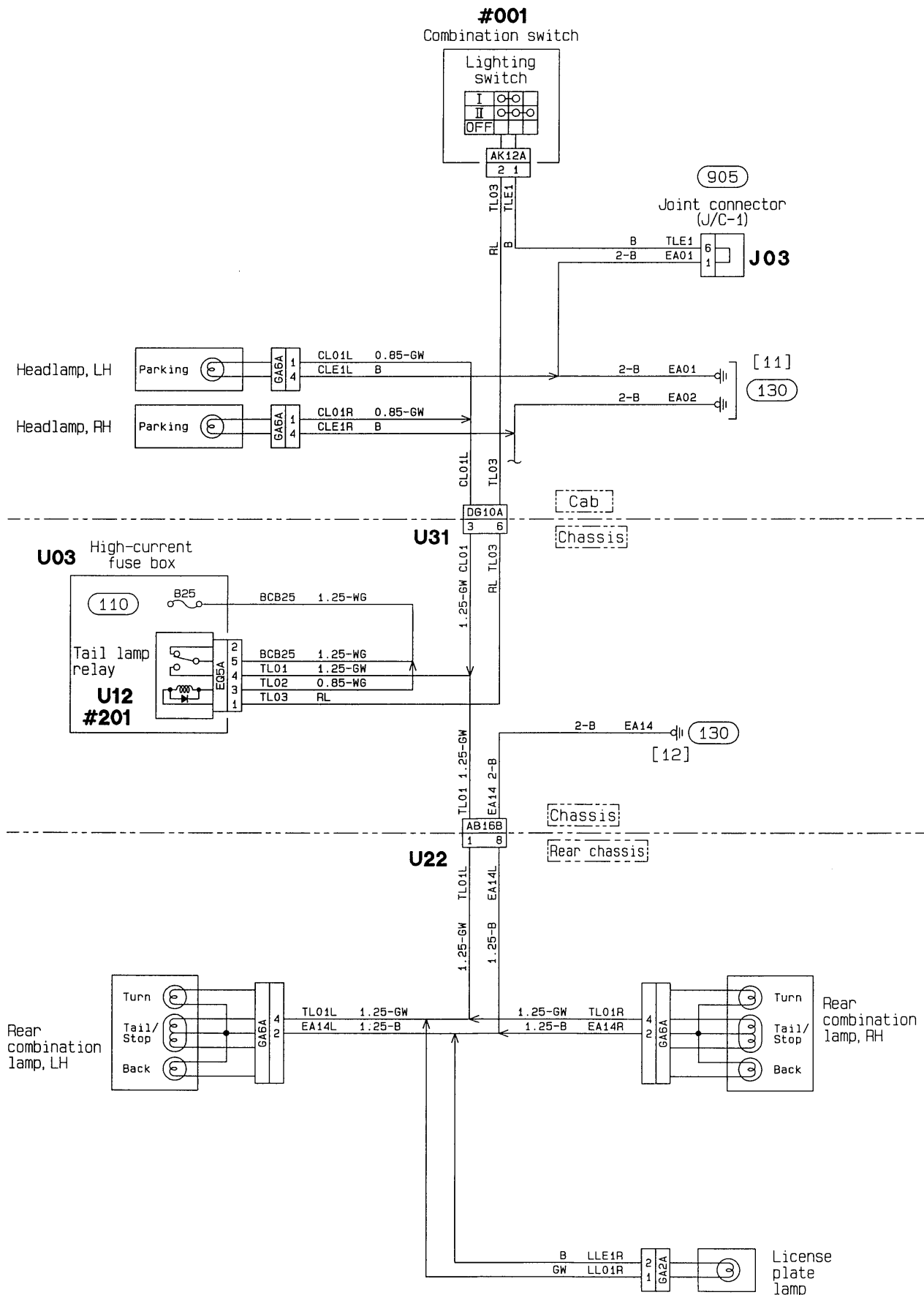
313 DAYTIME RUNNING LIGHT CIRCUIT

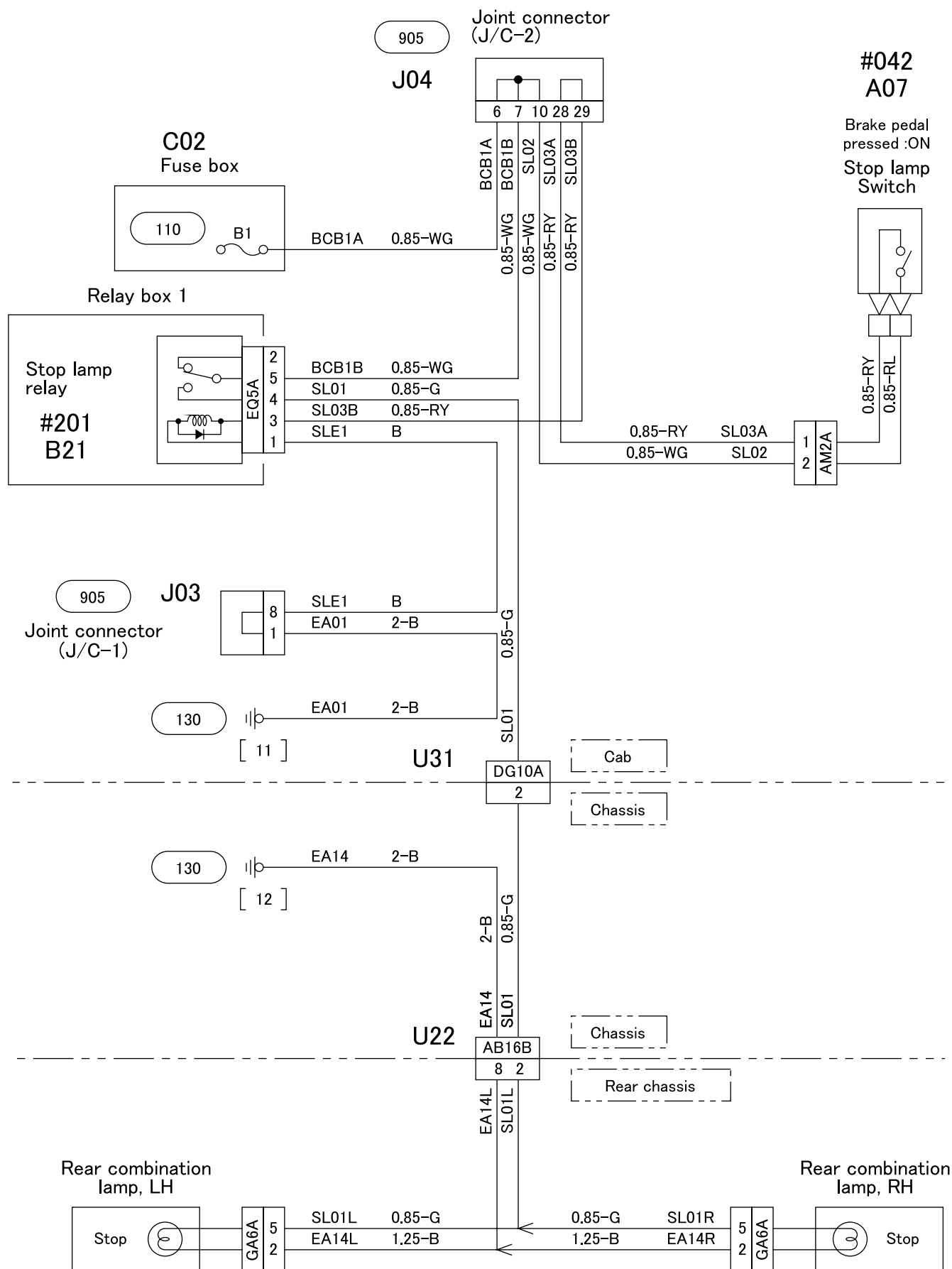


C00494-1

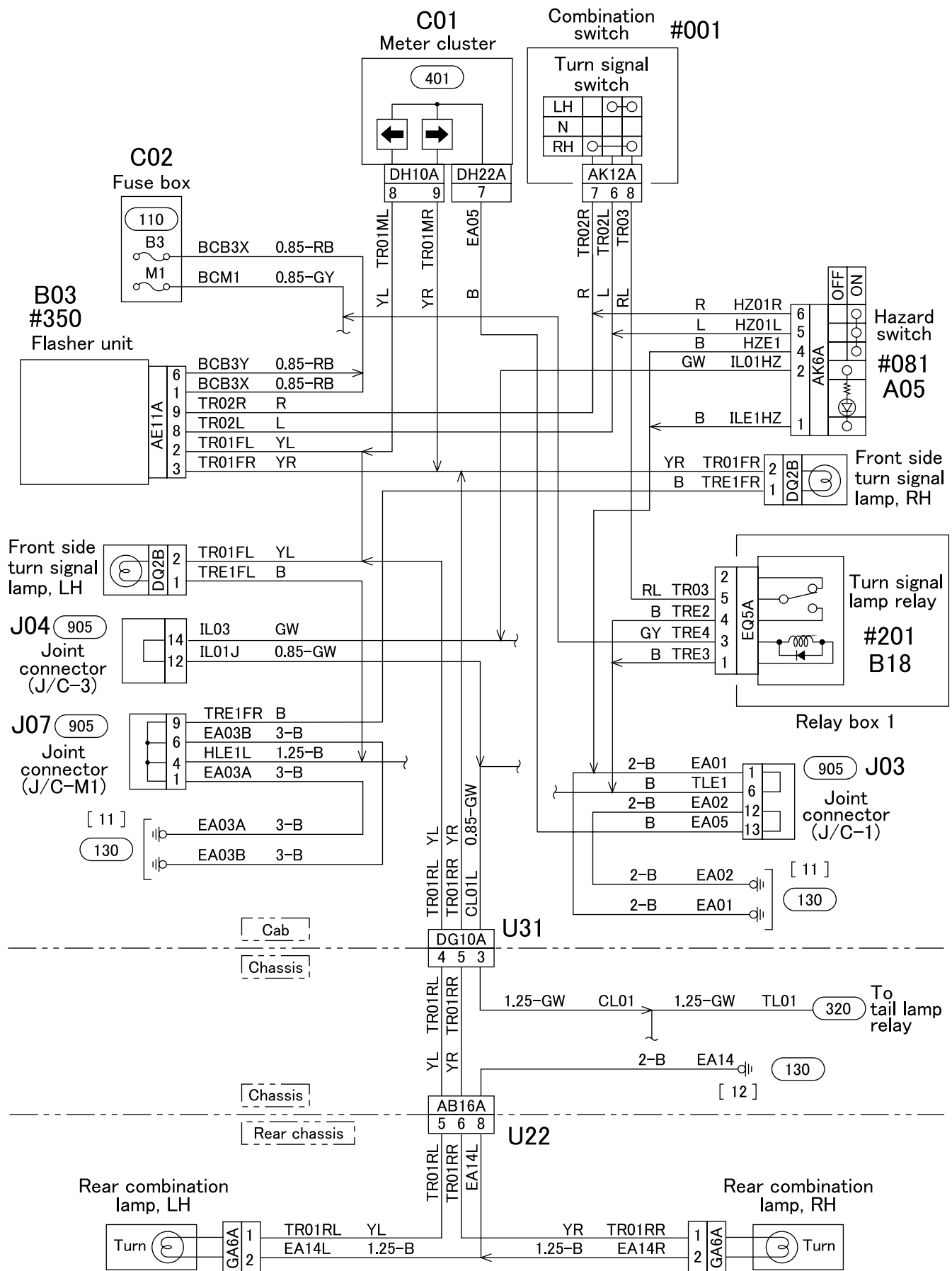


320 TAIL, CLEARANCE AND LICENSE PLATE LAMPS CIRCUIT



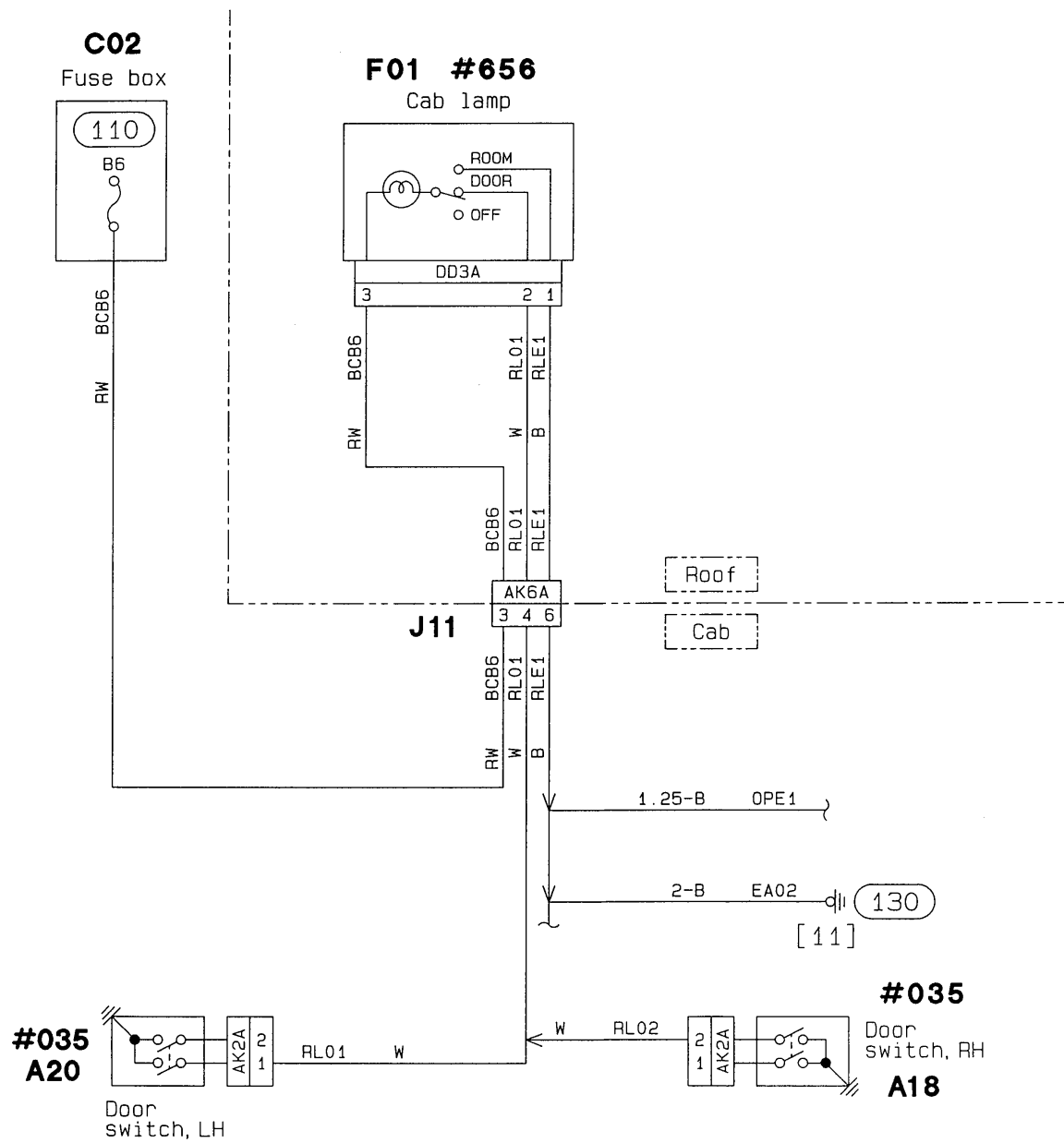


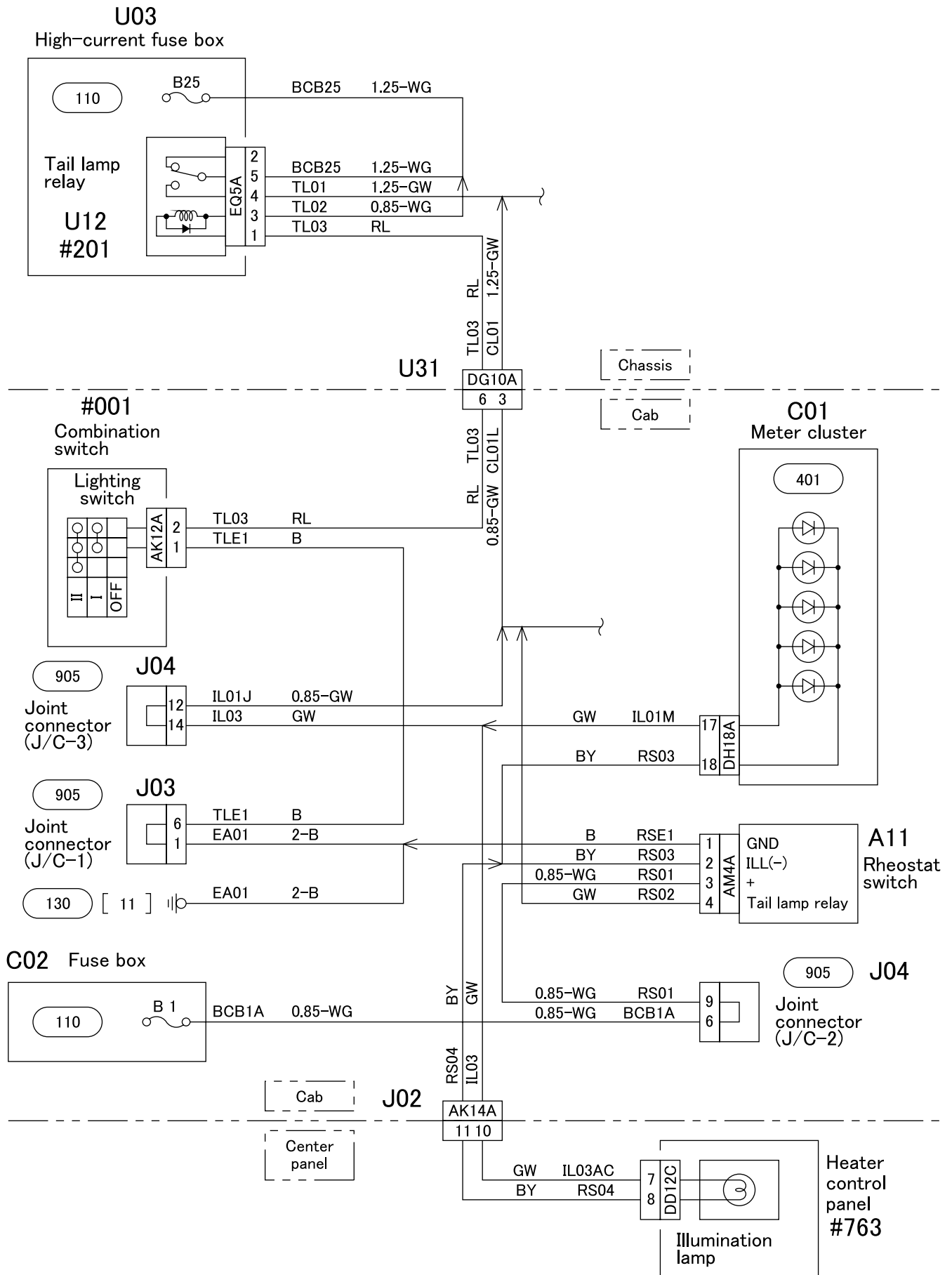
330 TURN SIGNAL AND HAZARD LAMP CIRCUIT

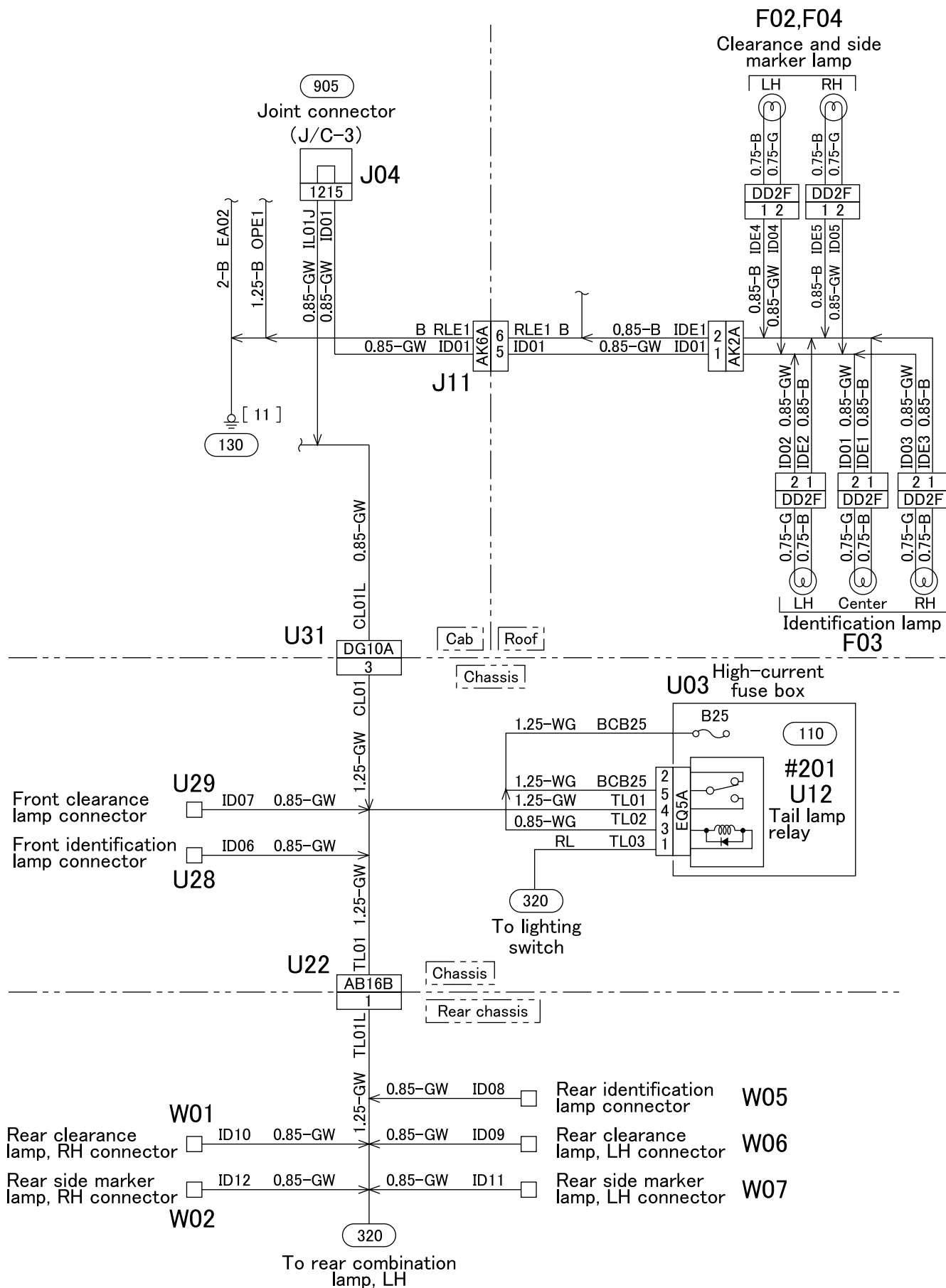


M E M O

[illegible]

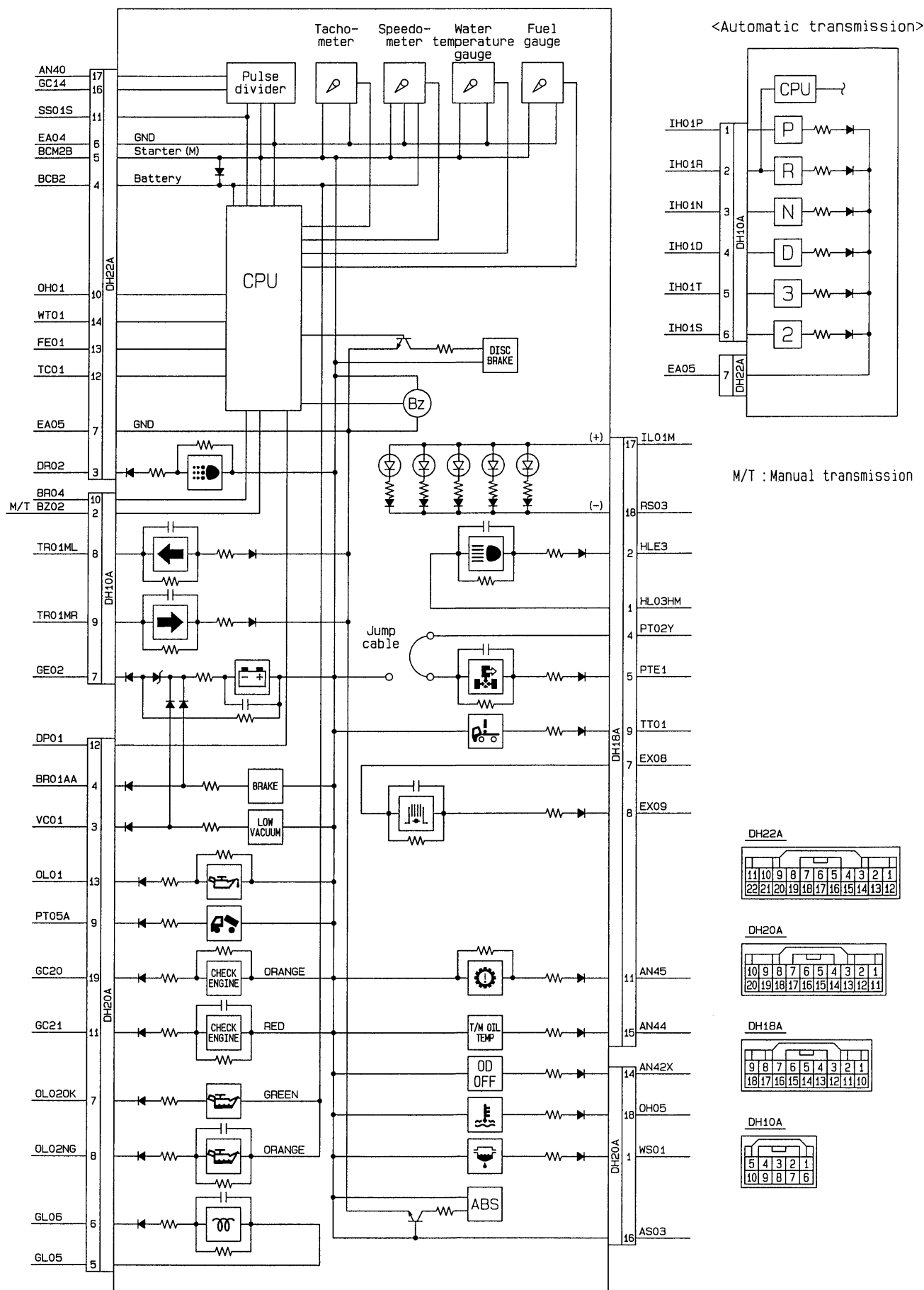




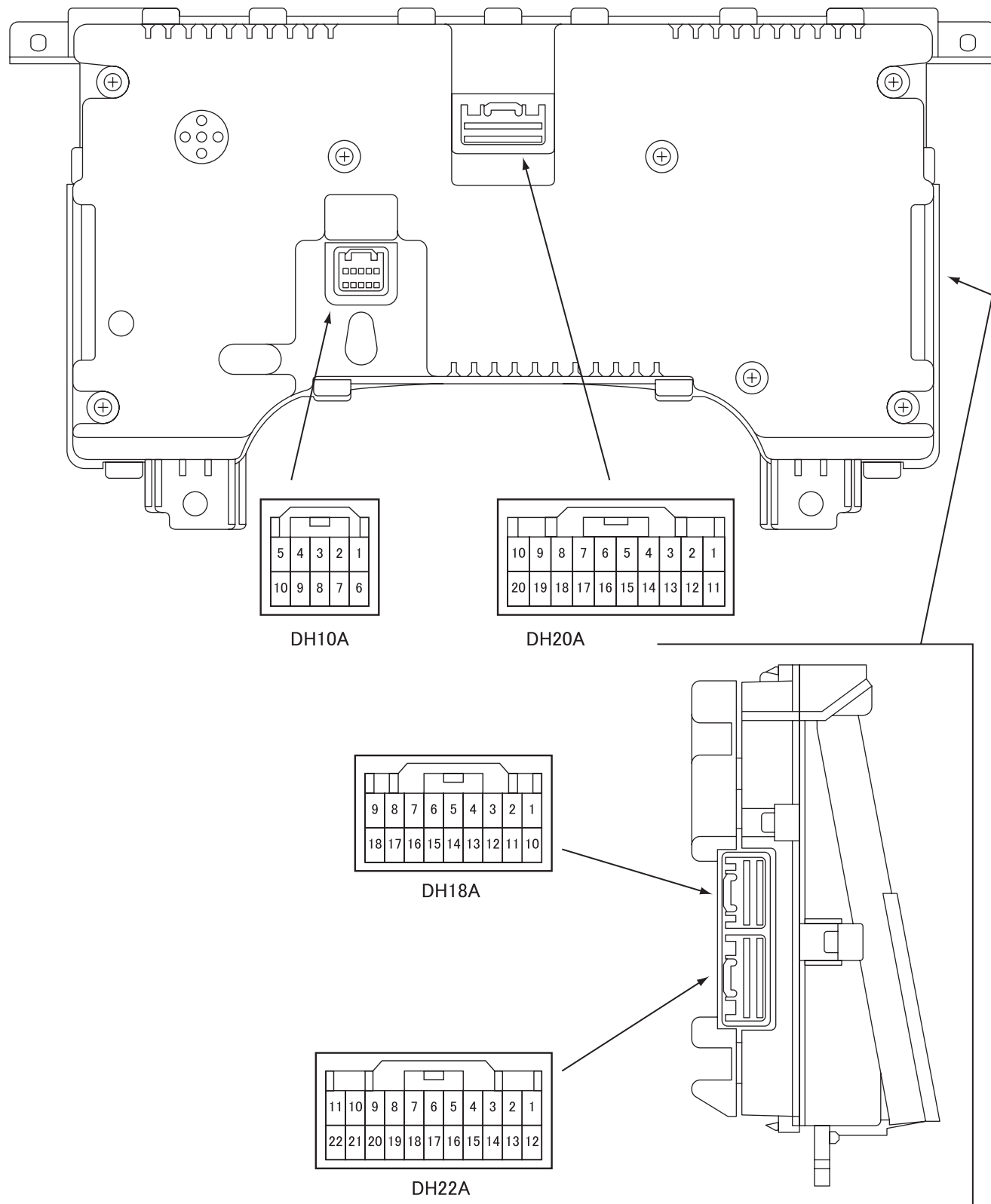




54-04 METER CIRCUIT

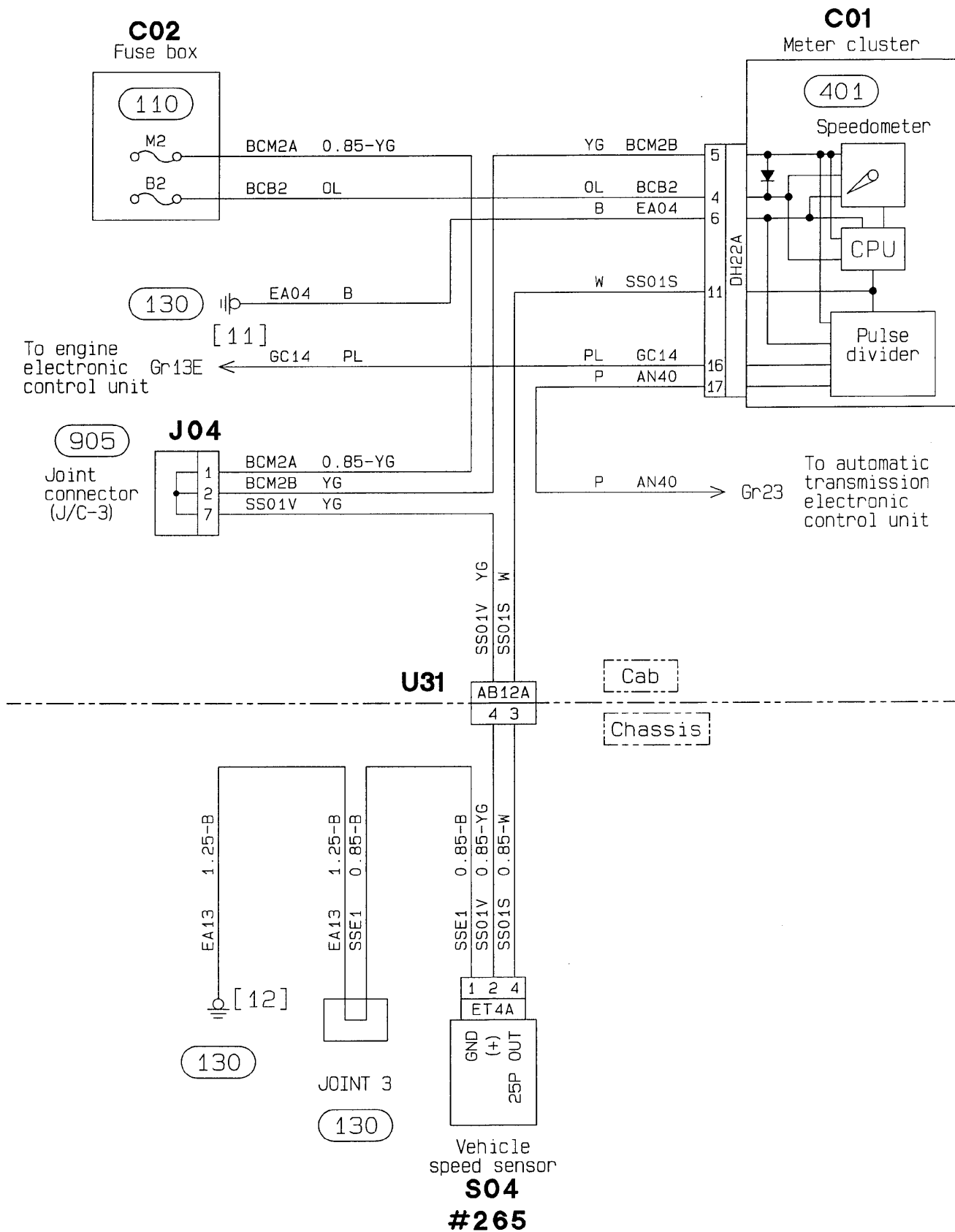


Meter cluster backward view

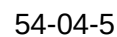


Because a CPU is built into the meter, the inner part of the meter body cannot be disassembled.

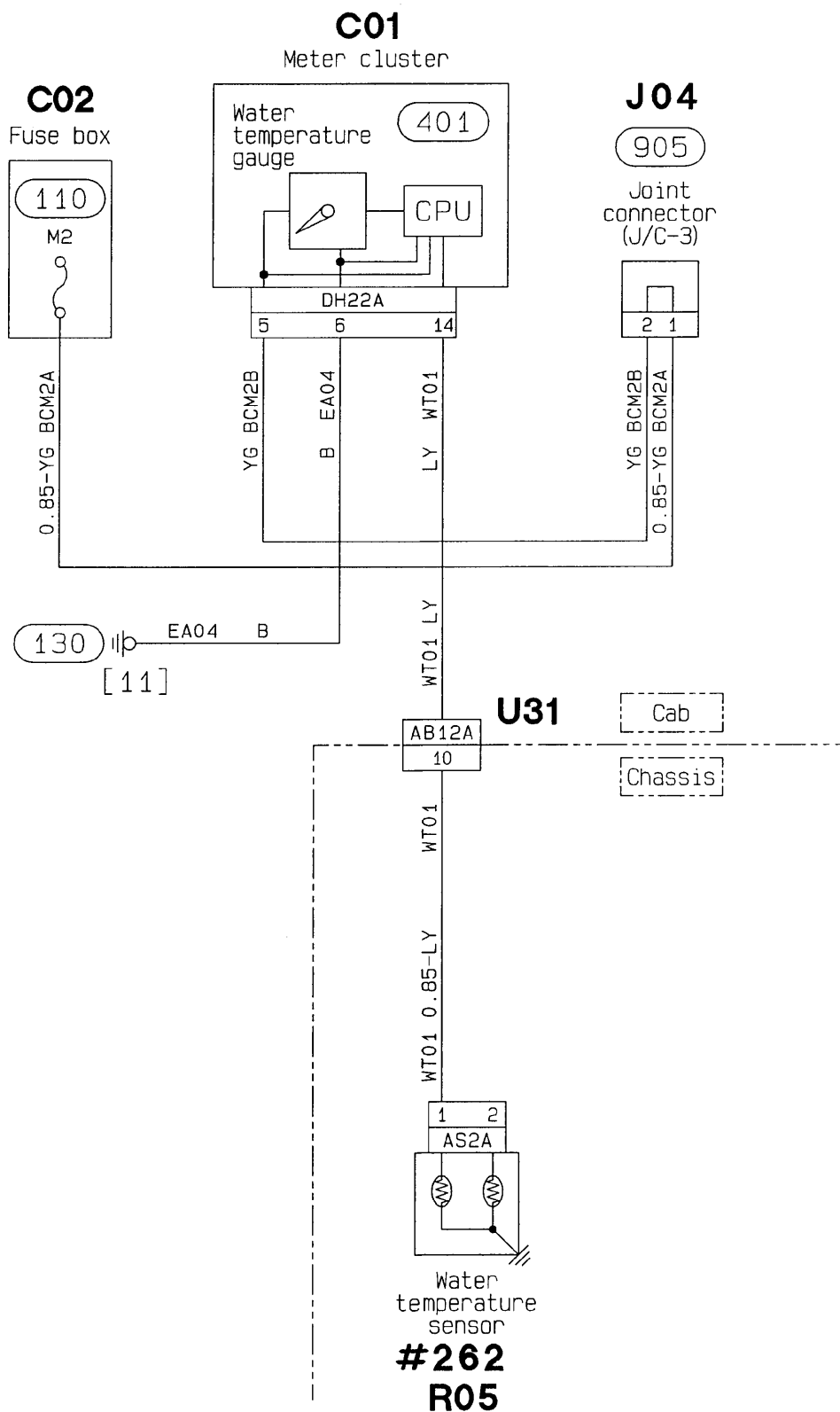
412 SPEEDOMETER CIRCUIT



C00506

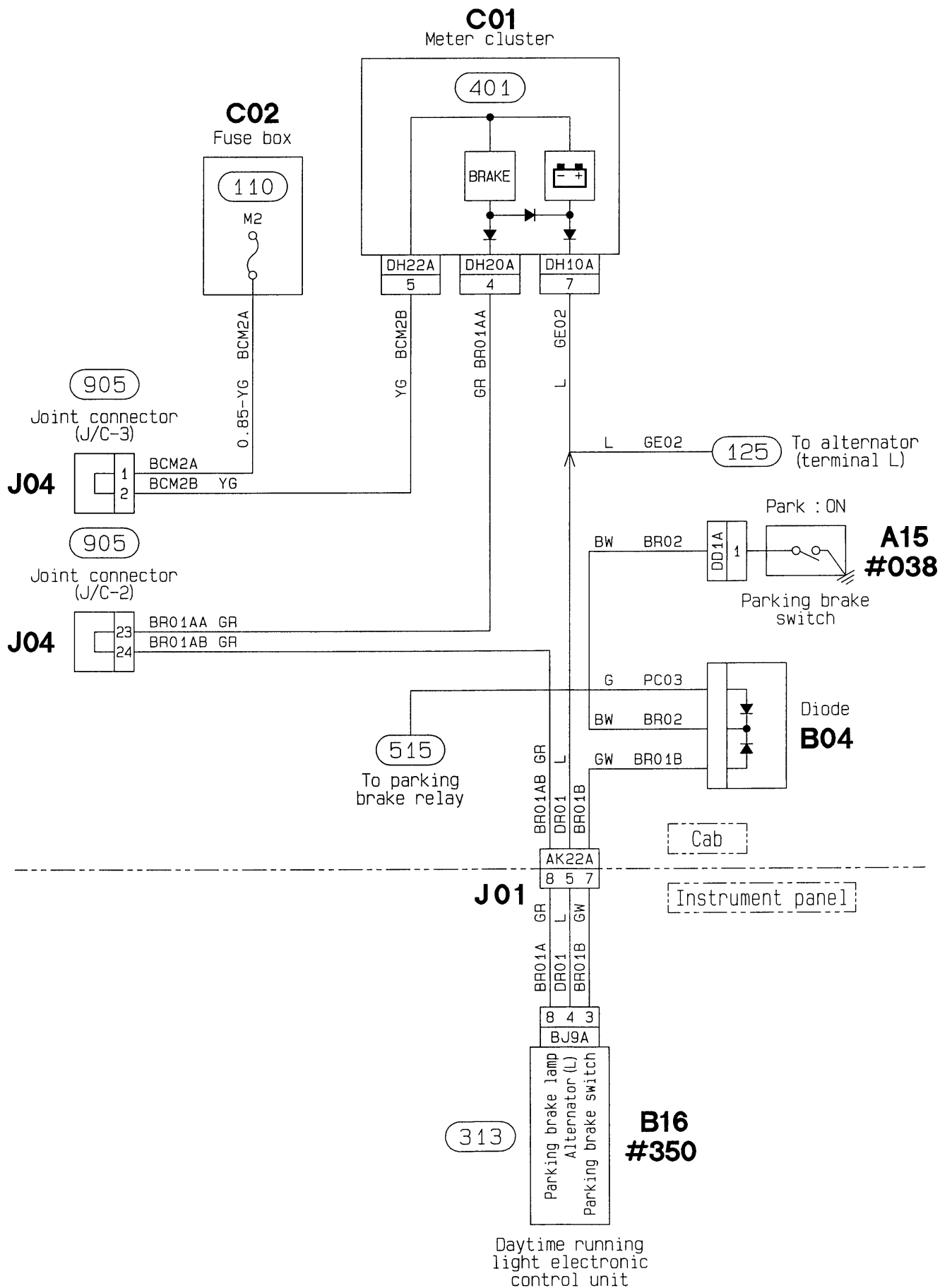


425 WATER TEMPERATURE GAUGE CIRCUIT



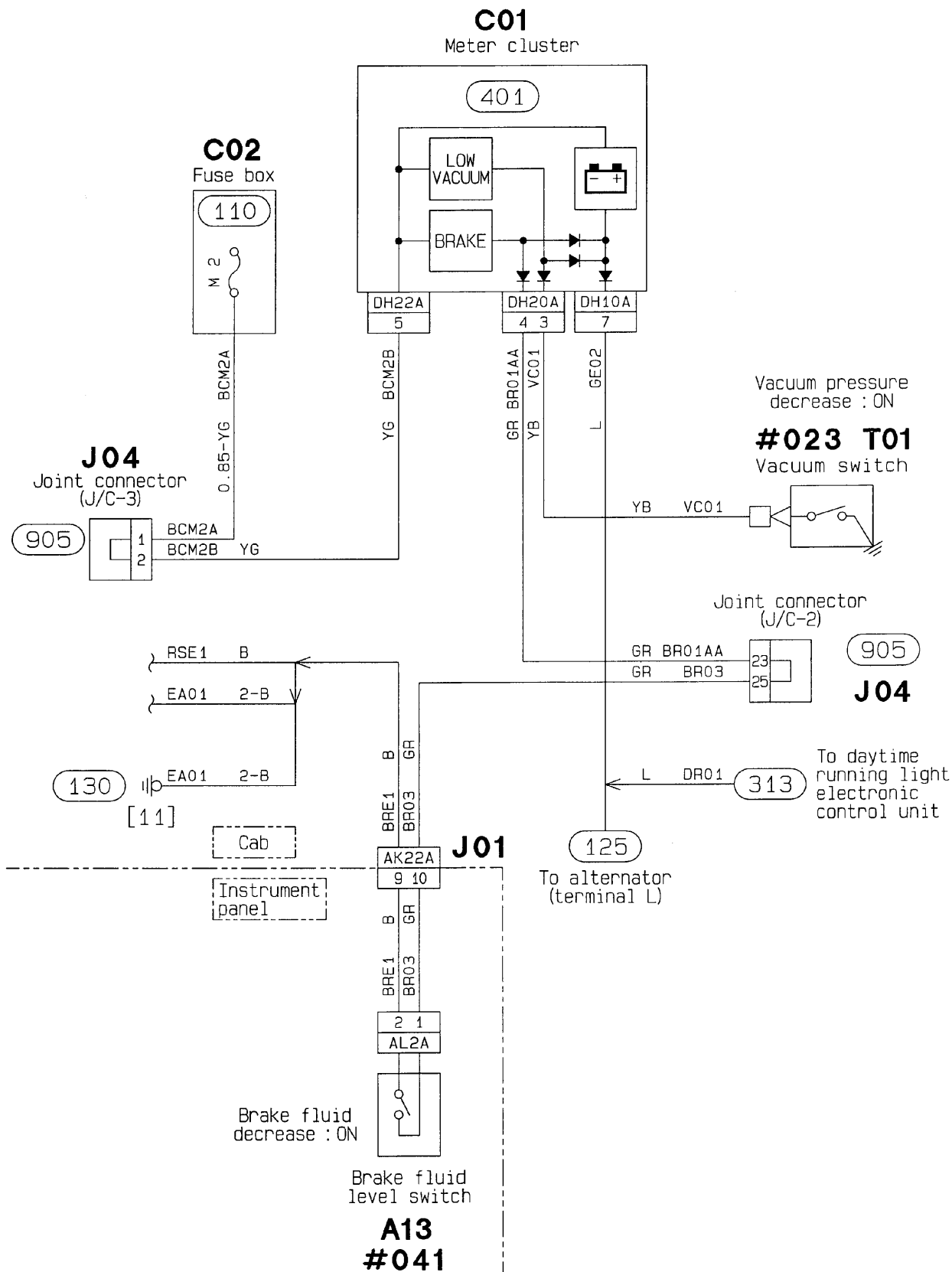
54-05 INDICATOR AND WARNING LAMP CIRCUIT

510 PARKING BRAKE INDICATOR CIRCUIT



M E M O

<Except hydraulic booster>



C02 Fuse box

- A4 → BCA4X 0.85-WR
- M2 → BCM2A 0.85-YG
- B1 → BCB1A 0.85-WG

To optional connector

To daytime running light electronic control unit

#042 A07

- 0.85-RY SL03A
- 0.85-WG SL02
- 0.85-WG BCB1A
- 0.85-WG SL02
- 0.85-WR BCA4Y
- WR PC02
- GR BR01AA
- GR BR03
- GR BR05
- 0.85-RY SL03A
- RY HB01
- GR BR05
- BY BR06
- YG WB01
- Y WB02

Brake pedal pressed : ON

Stop lamp switch

J04 Joint connector (J/C-2)

B02 Diode

#038 A15

Parking brake switch

Relay box 1

Parking brake relay

B32 #201

Daytime running light electronic control unit

B02 Diode

To alternator (terminal L)

Meter cluster C01

High-current fuse box U03

FH5

U31

Chassis Cab

Cab Instrument panel J01

BRE1

BR03

WB03

WB02

Y BY

DD2A

Bz Warning buzzer #611 C07

Emergency pump motor relay B35

Motor C04a

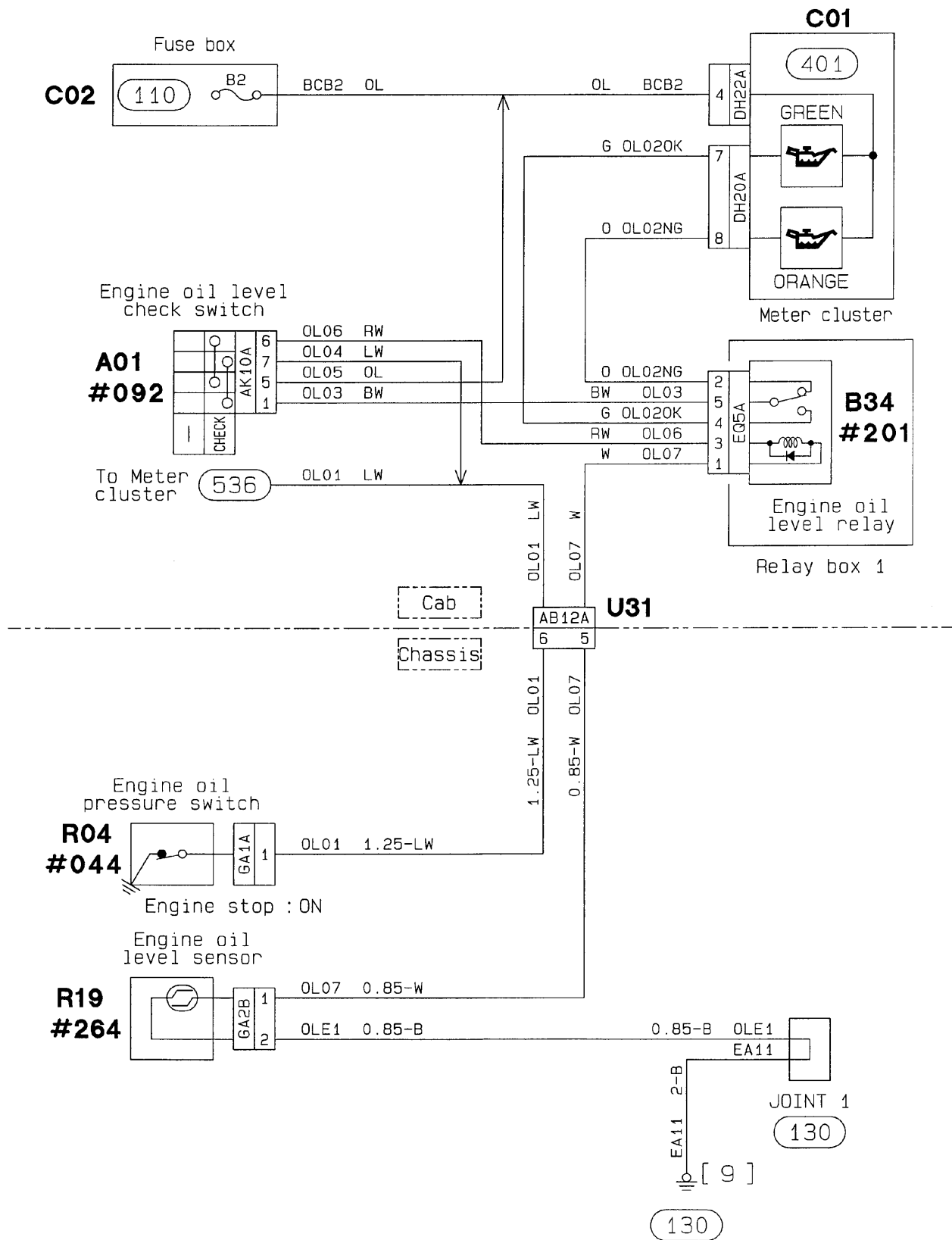
Flow switch A14

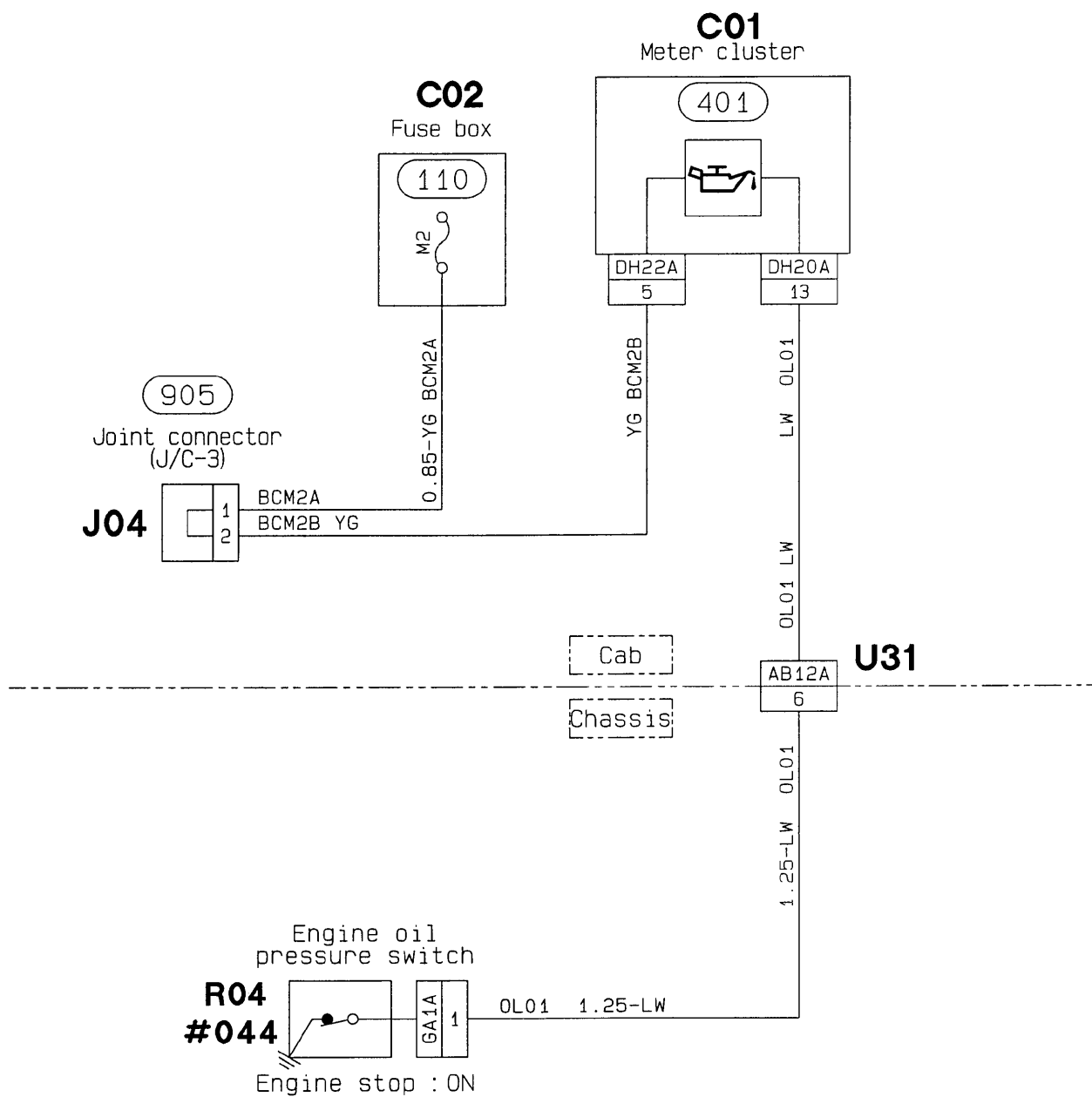
Hydraulic booster

Brake fluid level switch A13 #041

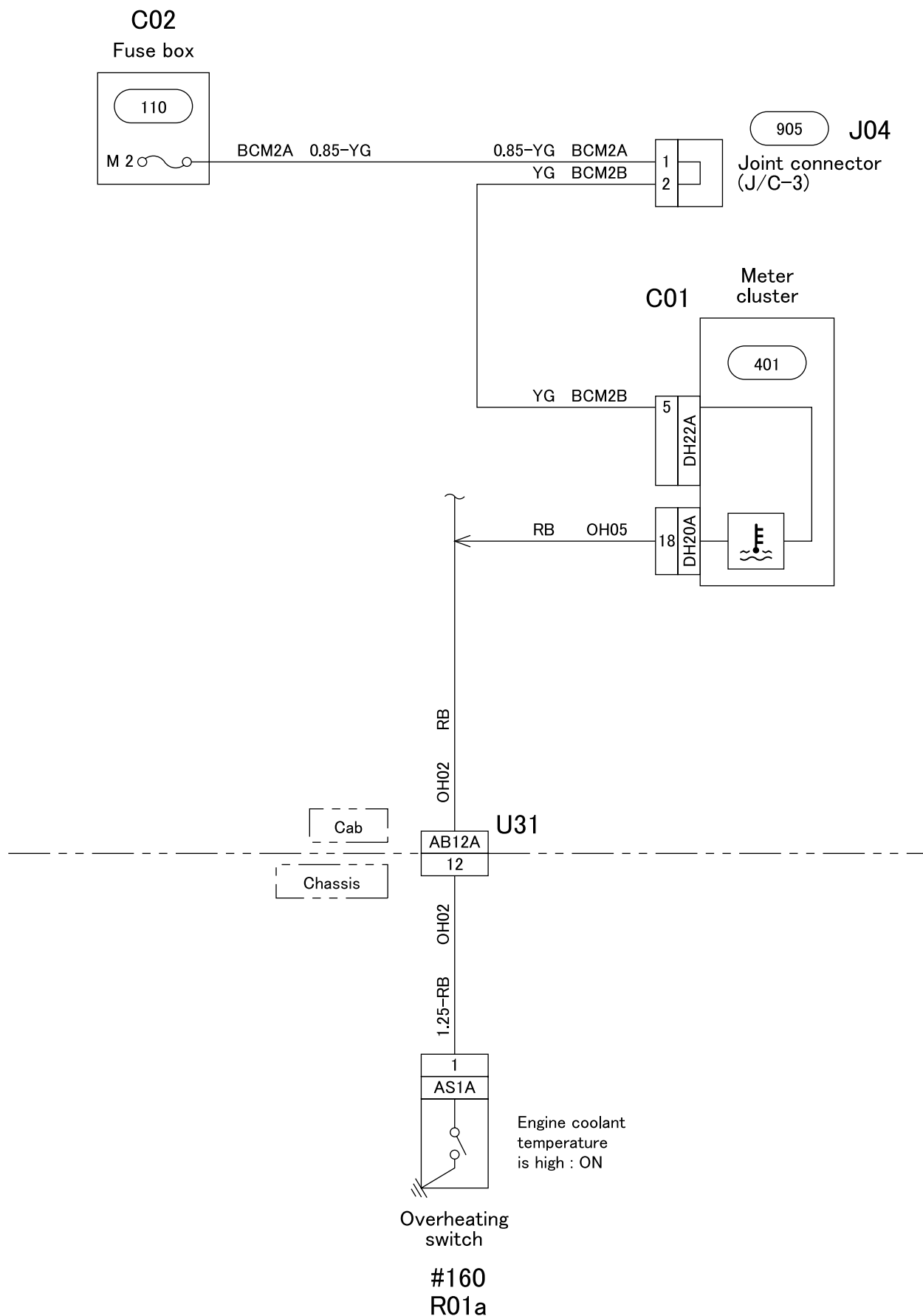
Brake fluid decrease : ON

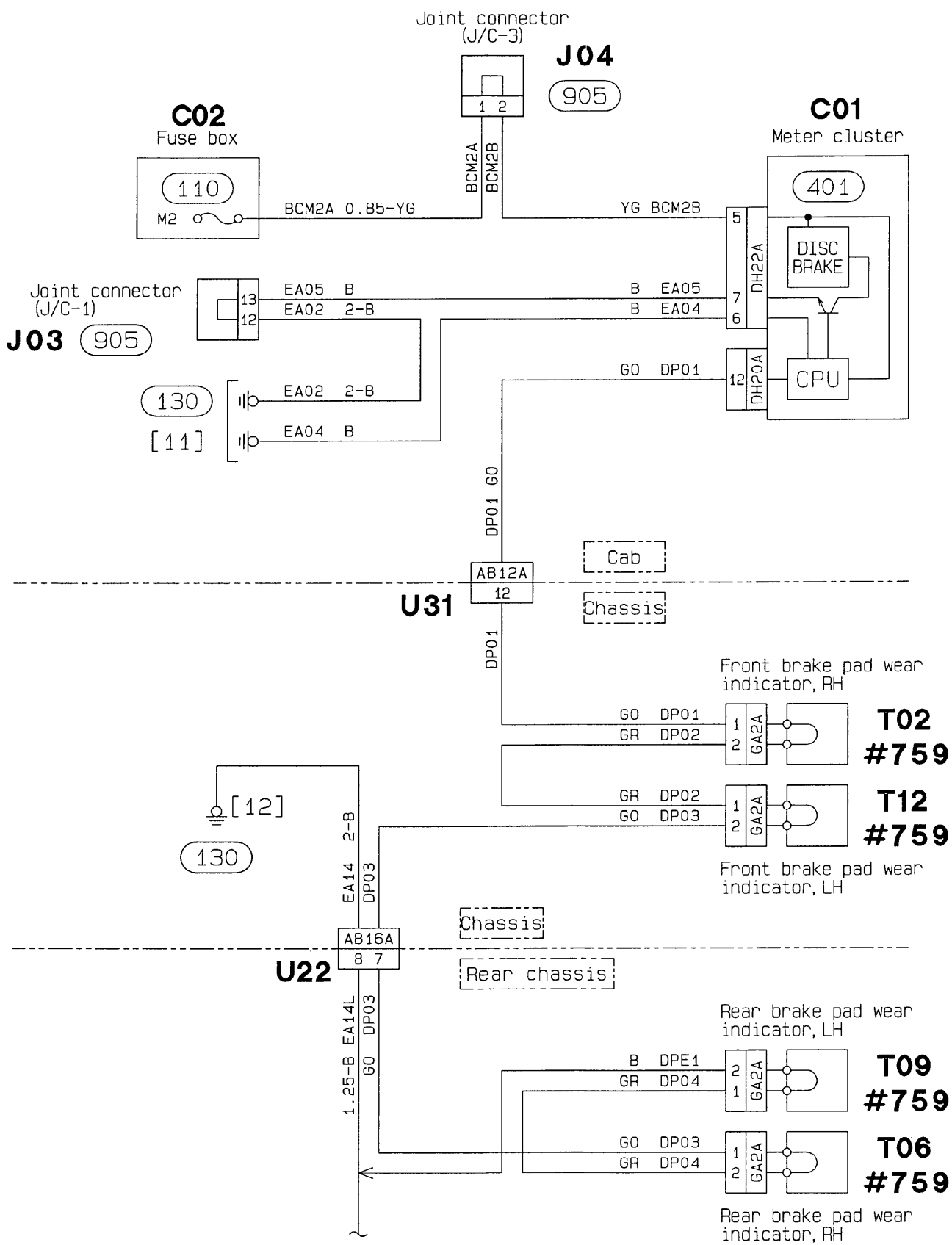
535 ENGINE OIL LEVEL WARNING CIRCUIT



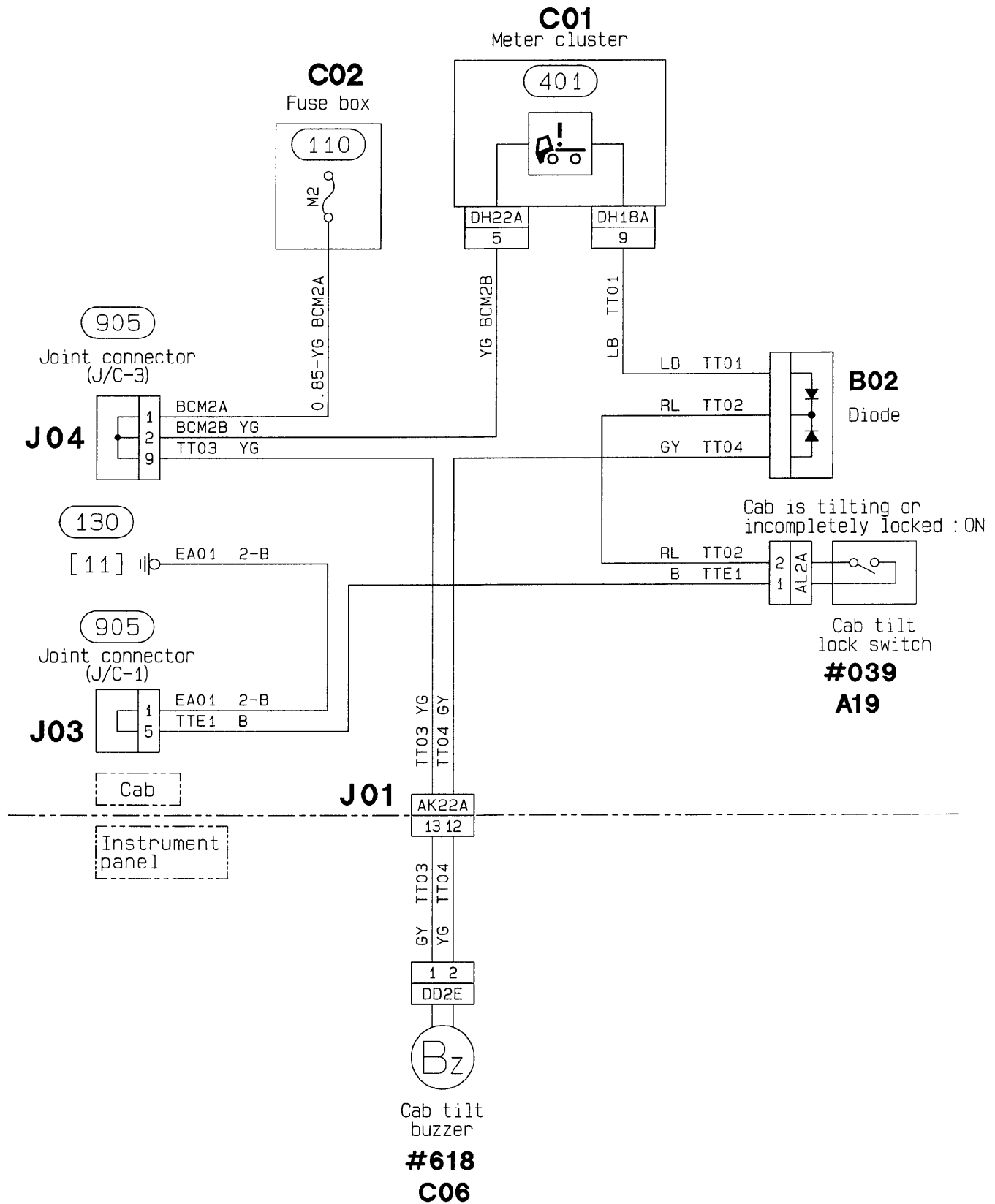


537 OVERHEATING WARNING CIRCUIT

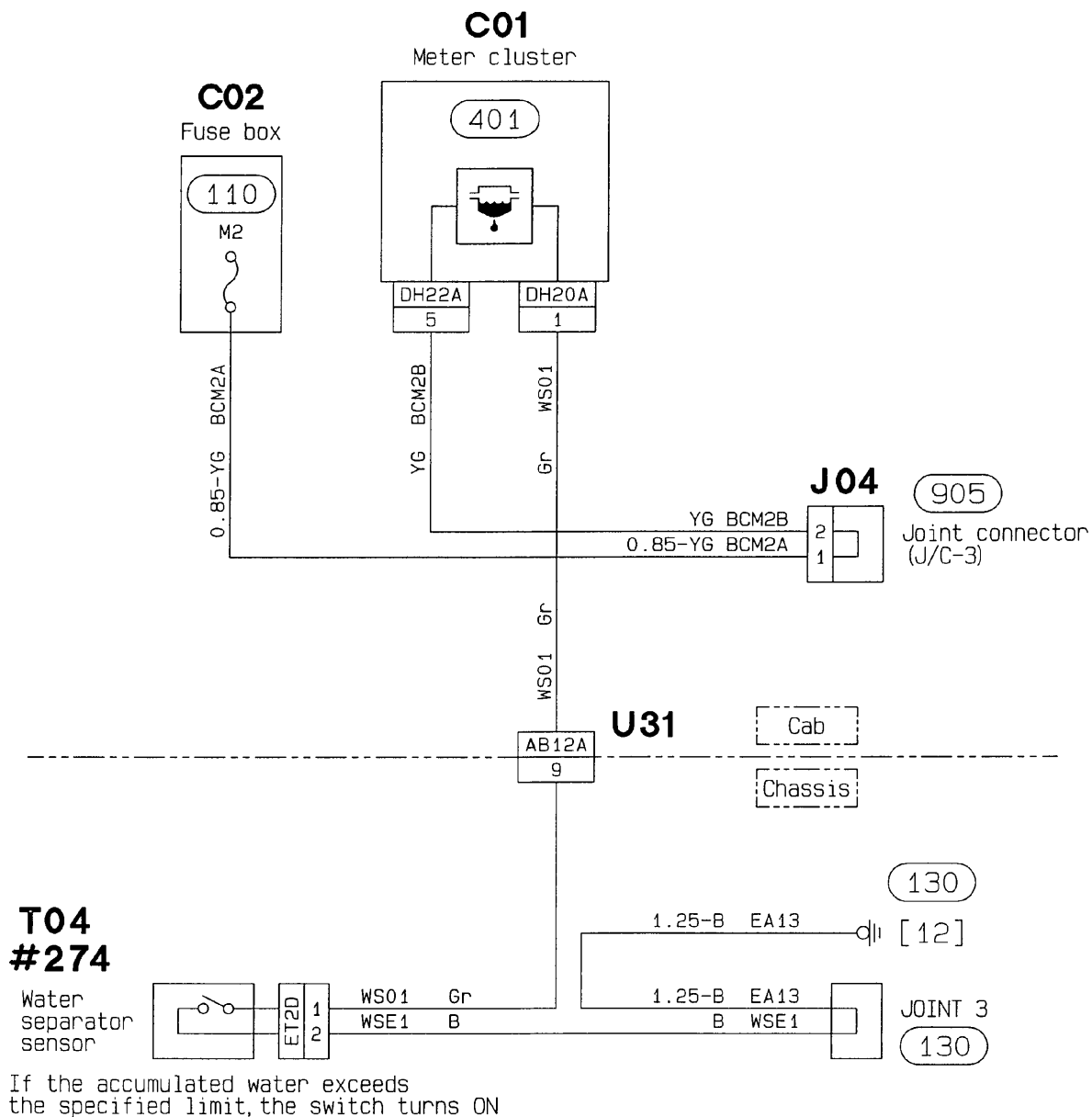




550 CAB TILT WARNING CIRCUIT

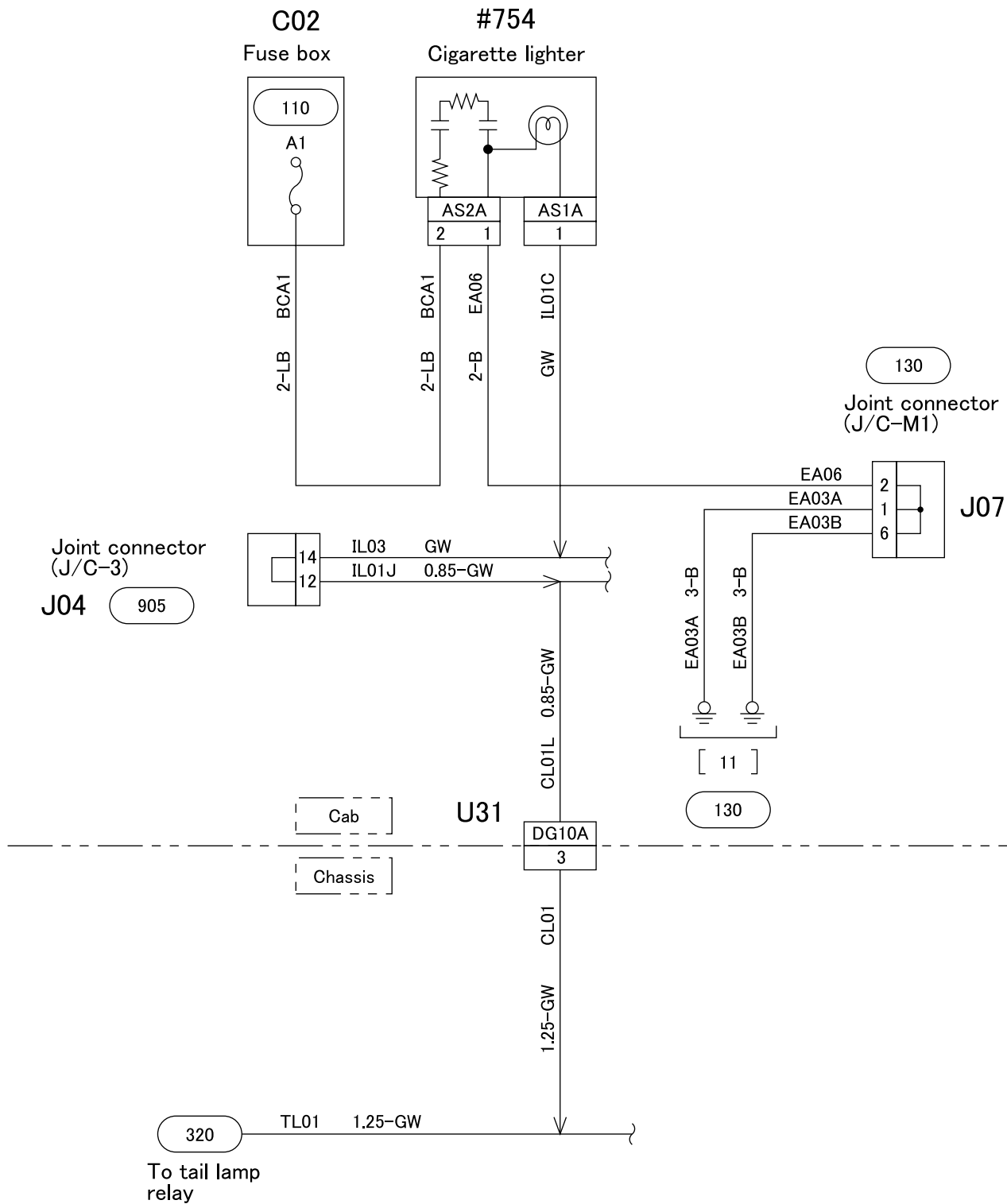


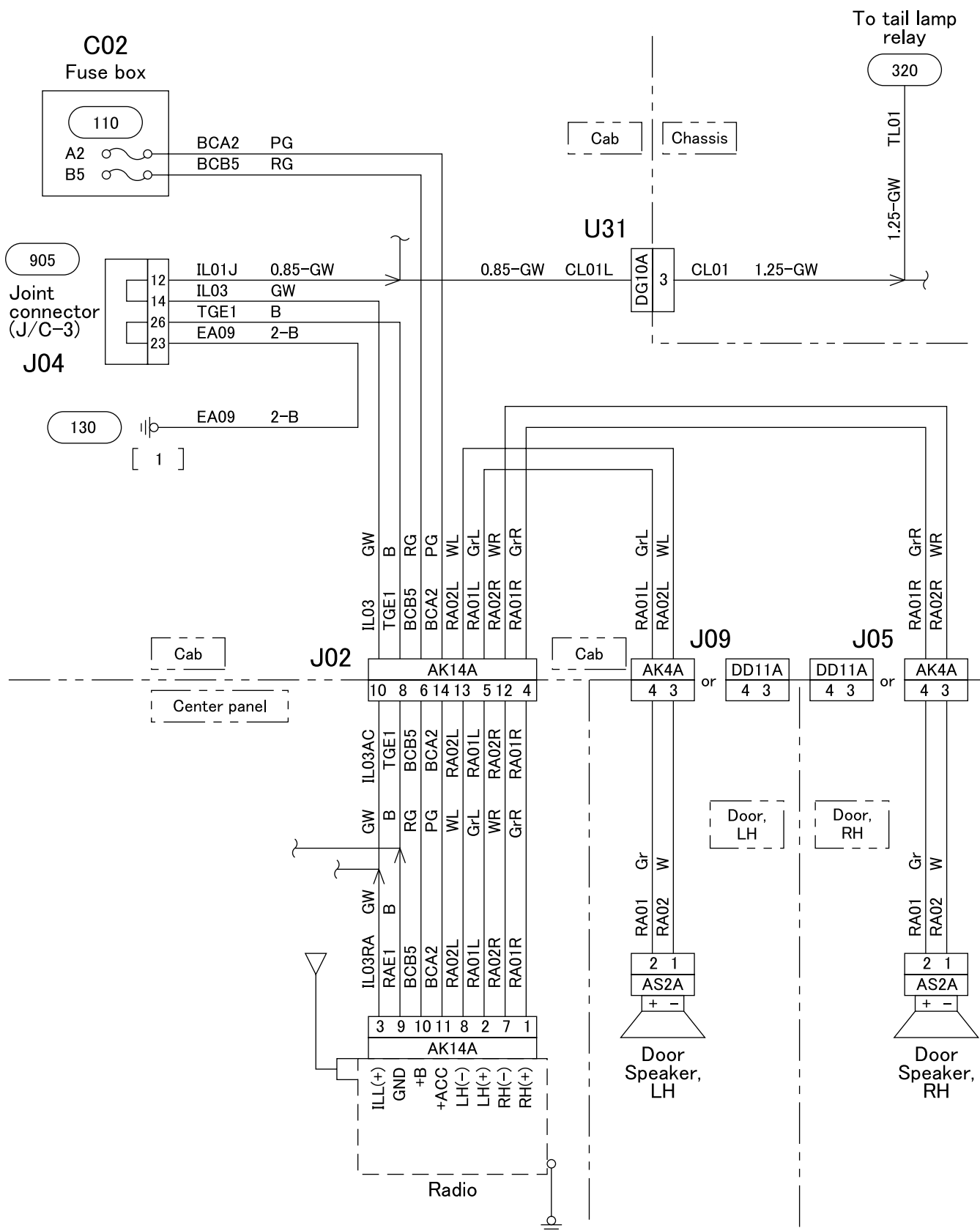
C00517



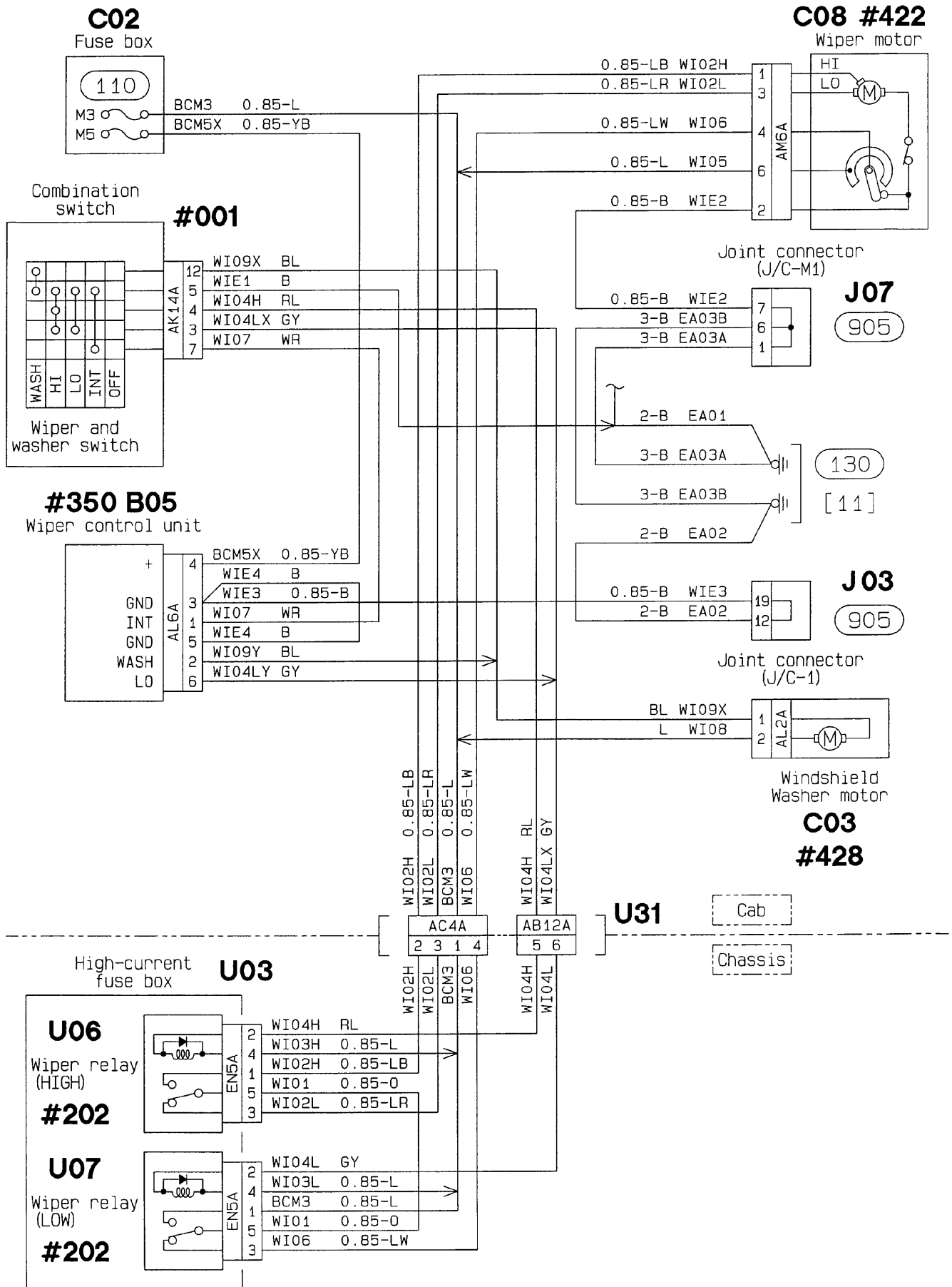
54-06 CAB SIDE ELECTRICAL CIRCUIT

610 CIGARETTE LIGHTER CIRCUIT

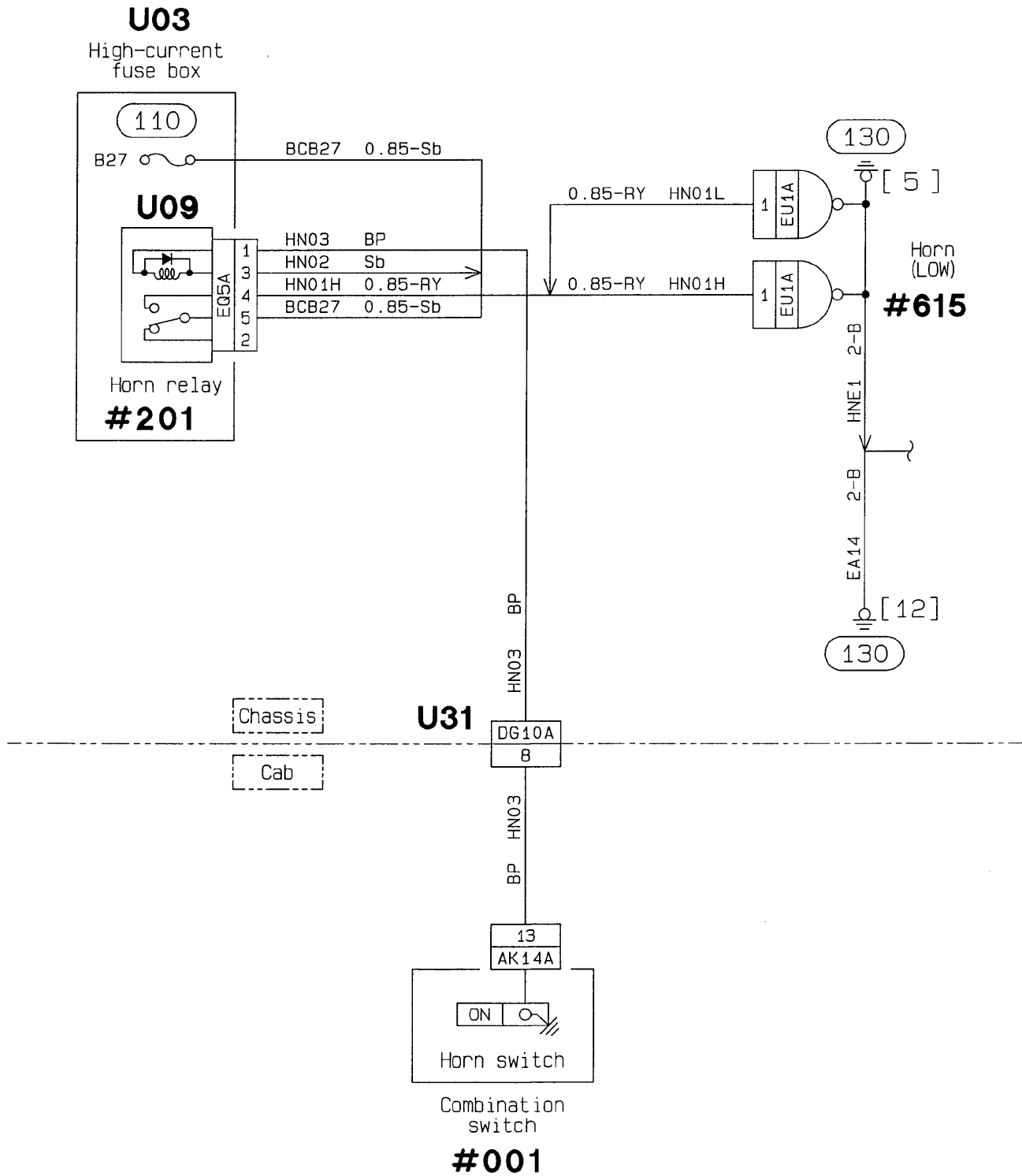




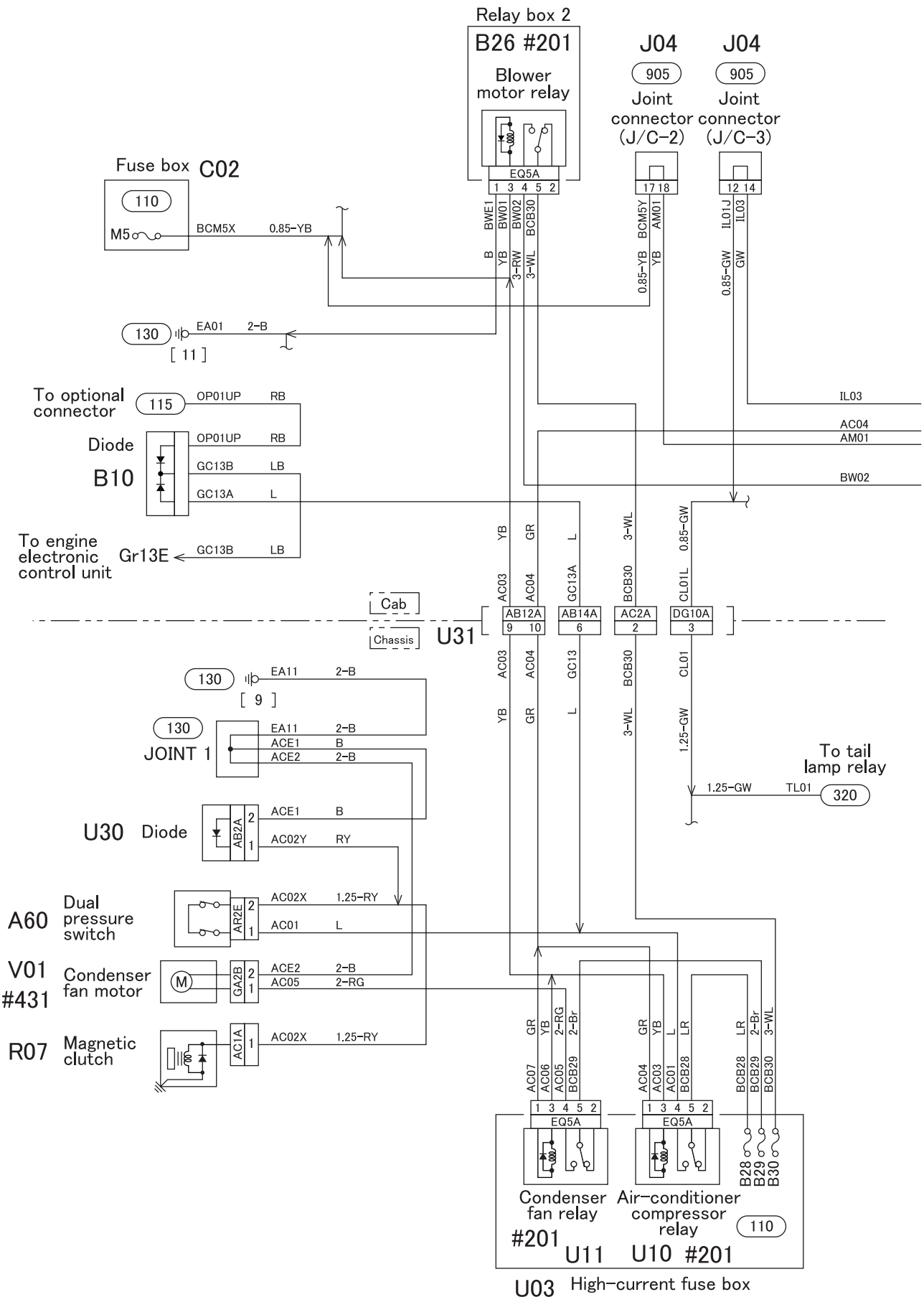
614 WIPER AND WASHER CIRCUIT

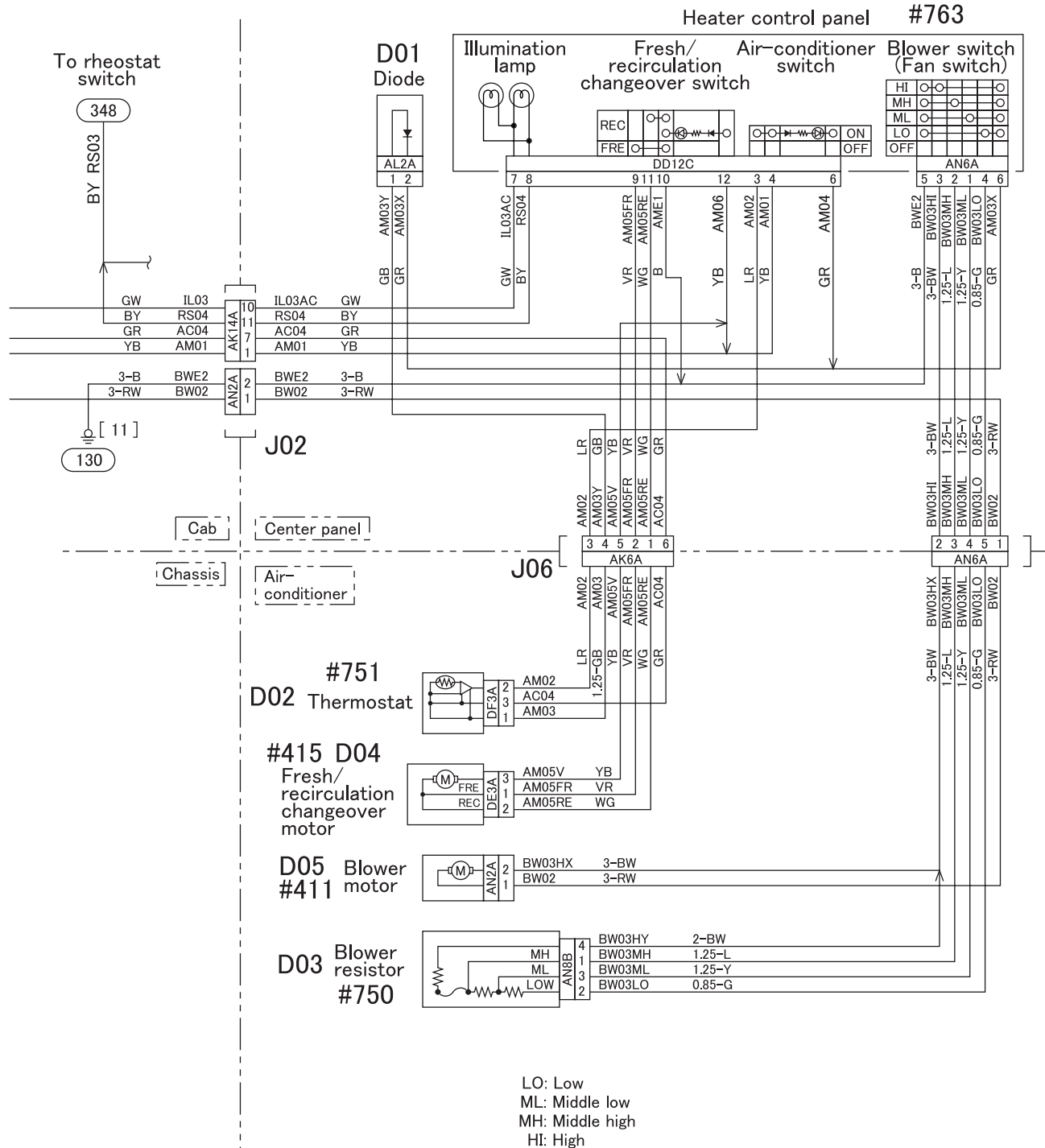


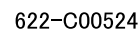
C00521

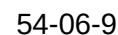


620 AIR-CONDITIONER CIRCUIT





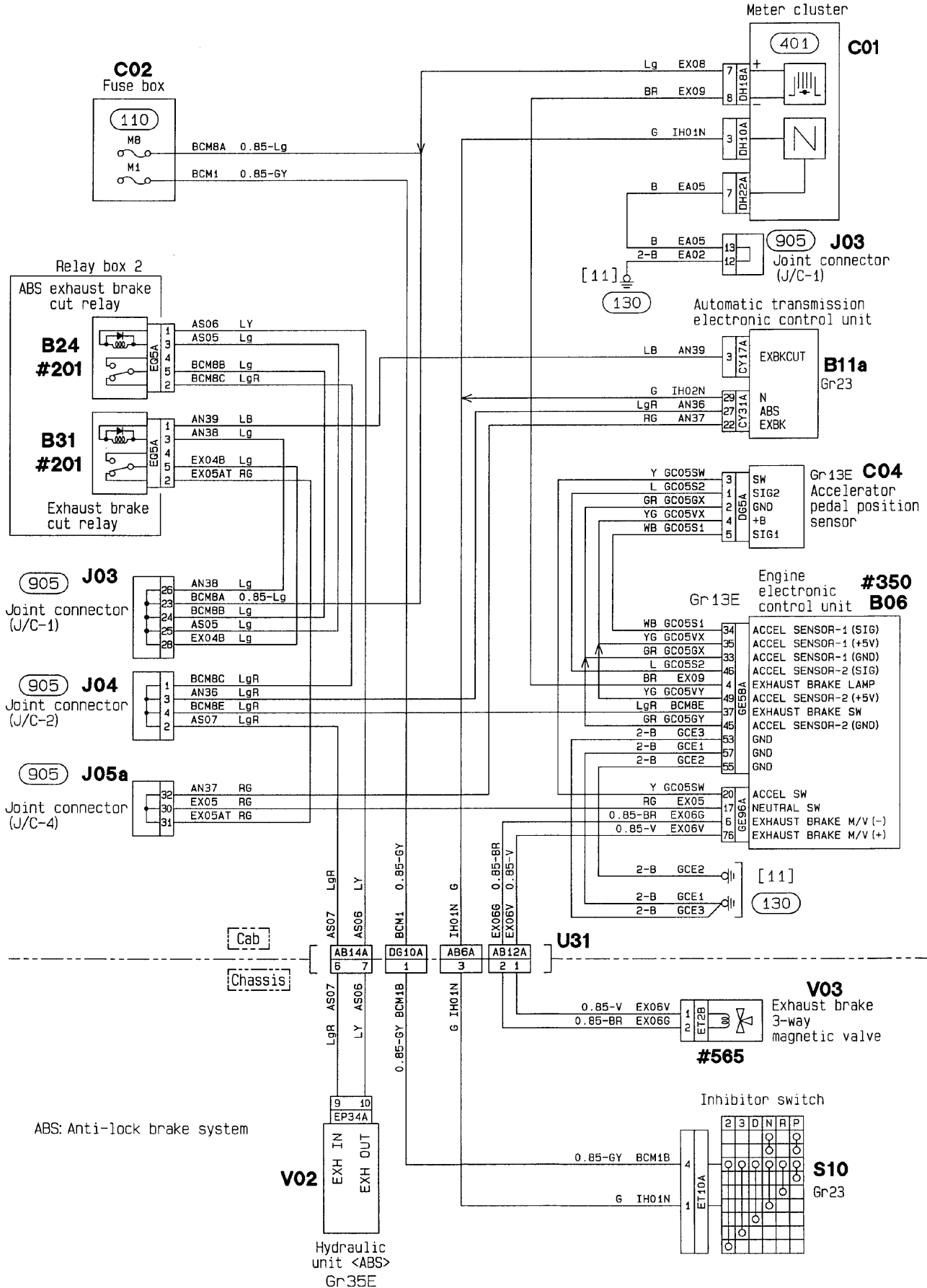




54-07 CHASSIS SIDE ELECTRICAL CIRCUIT

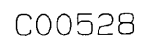
710 EXHAUST BRAKE CIRCUIT

<Automatic transmission>



C00545

54-08 ENGINE AND TRANSMISSION SIDE ELECTRICAL CIRCUIT

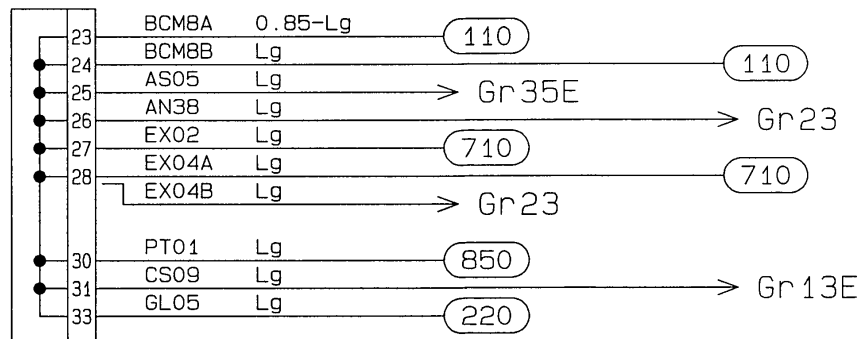
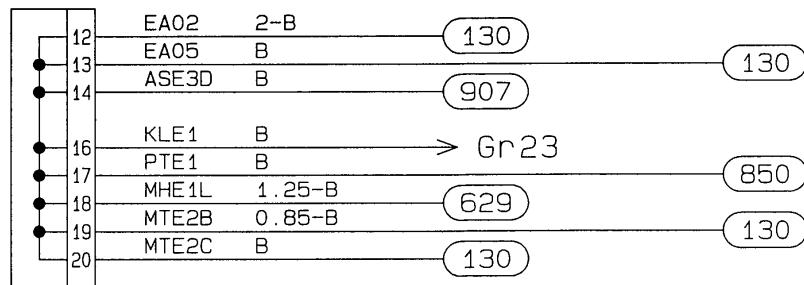
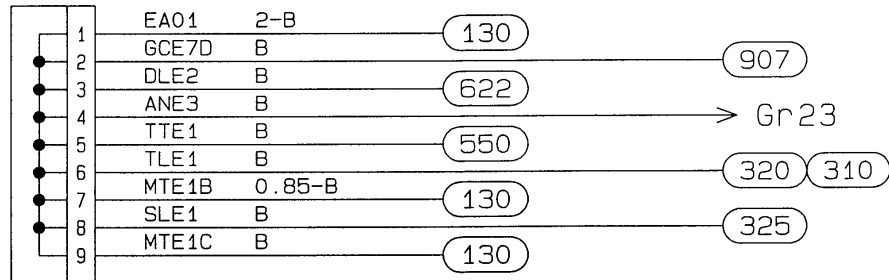


54-09 OTHER CIRCUIT

905 JOINT CONNECTOR (J/C)

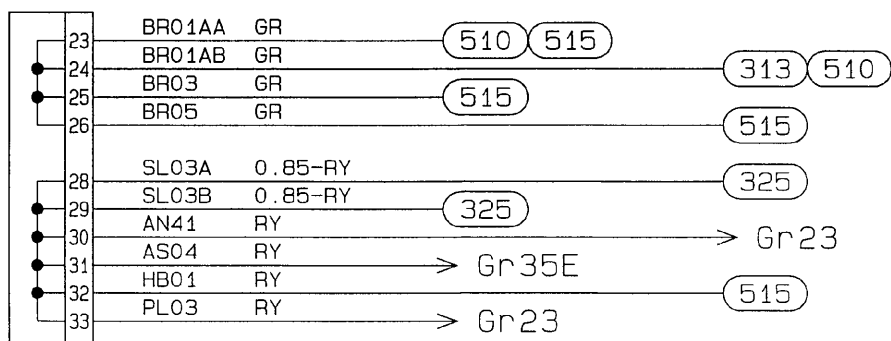
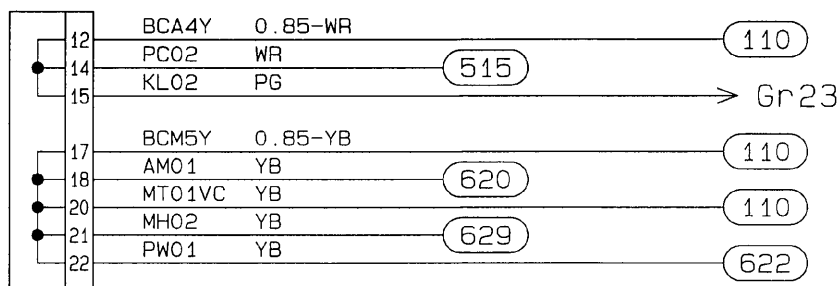
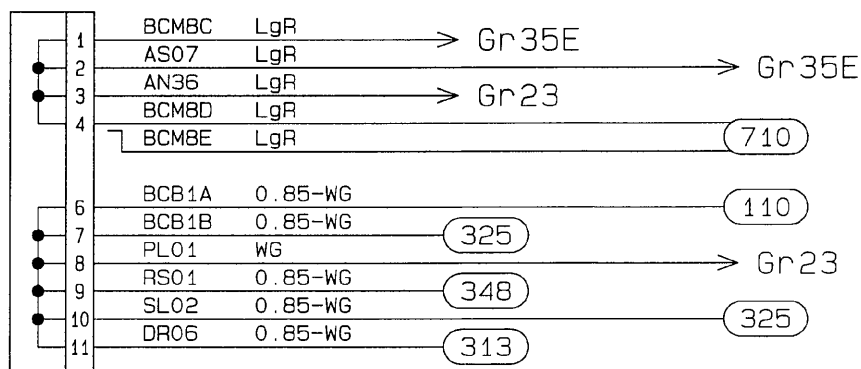
(J/C-1)

1	2	3	4	5	6	7	8	9	10	11
EA01	GCE7D	DLE2	ANE3	TTE1	TLE1	MTE1B	SLE1	MTE1C		—
12	13	14	15	16	17	18	19	20	21	22
EA02	EA05	ASE3D	—	KLE1	PTE1	MHE1L	MTE2B	MTE2C		—
23	24	25	26	27	28	29	30	31	32	33
BCM8A	BCM8B	AS05	AN38	EX02	EX04A EX04B	—	PT01	CS09		GL05



(J/C-2)

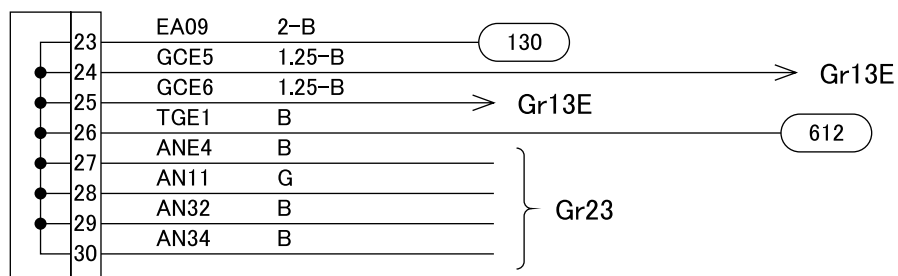
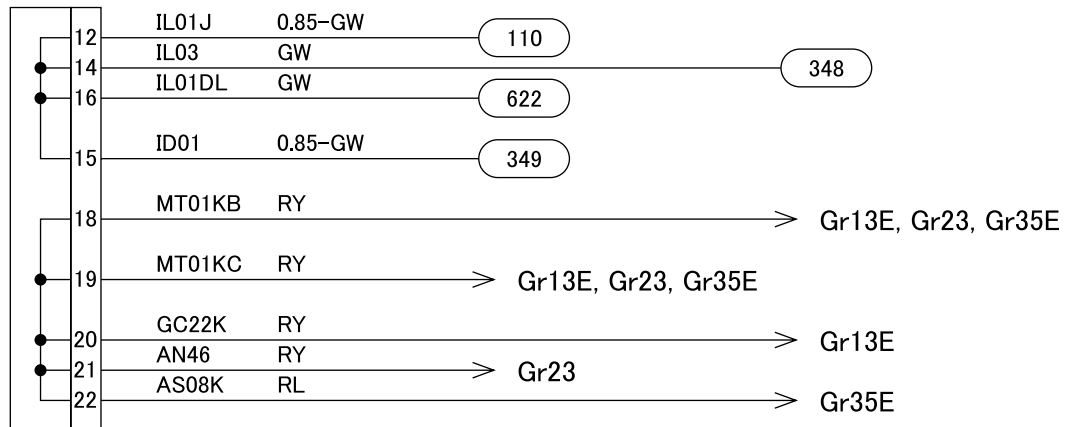
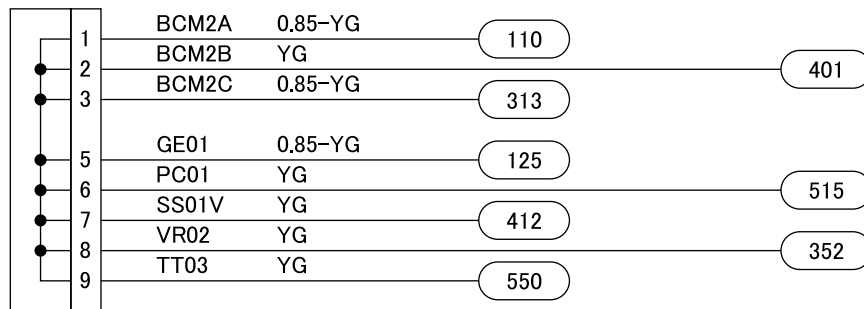
1	2	3	4	5	6	7	8	9	10	11
BCMBC	AS07	AN36	BCM8D BCM8E		BCB1A	BCB1B	PL01	RS01	SL02	DR06
12	13	14	15	16	17	18	19	20	21	22
BCA4Y	—	PC02	KL02		BCM5Y	AM01	—	MT01VC	MH02	PW01
23	24	25	26	27	28	29	30	31	32	33
BR01AA	BR01AB	BR03	BR05		SL03A	SL03B	AN41	AS04	HB01	PL03



905 JOINT CONNECTOR (J/C)

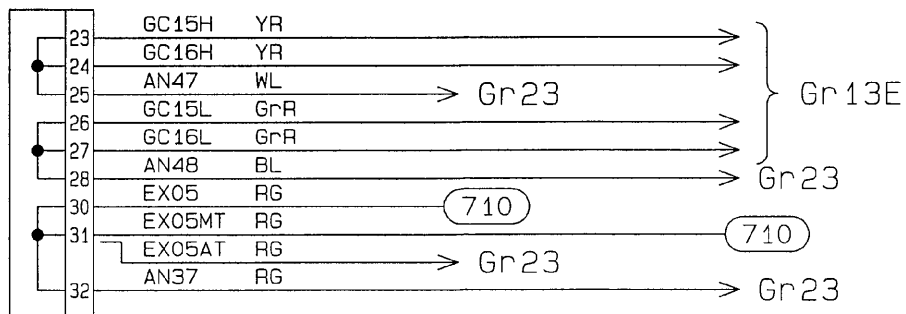
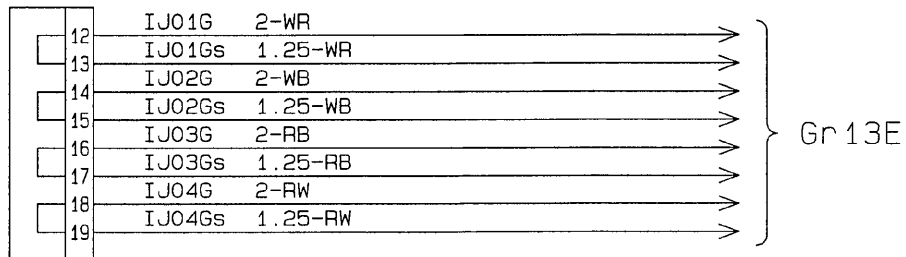
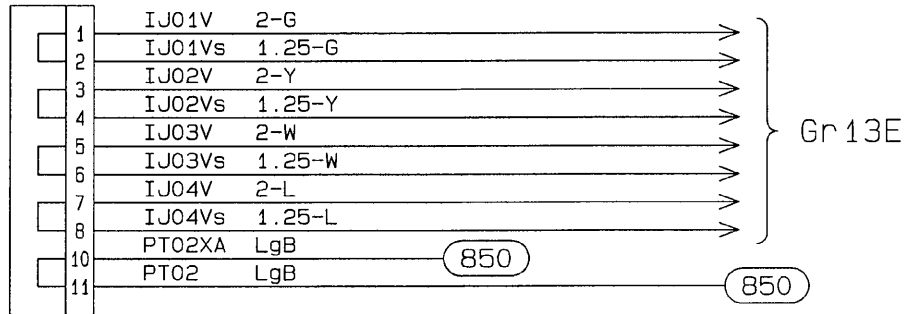
(J/C-3)

1	2	3	4	5	6	7	8	9	10	11
BCM2A	BCM2B	BCM2C	—	GE01	PC01	SS01V	VR02	TT03		—
12	13	14	15	16	17	18	19	20	21	22
IL01J		IL03	ID01	IL01DL	—	MT01KB	MT01KC	GC22K	AN46	AS08K
23	24	25	26	27	28	29	30	31	32	33
EA09	GCE5	GCE6	TGE1	ANE4	AN11	AN32	AN34	—		—



(J/C-4)

1	2	3	4	5	6	7	8	9	10	11
IJ01V	IJ01Vs	IJ02V	IJ02Vs	IJ03V	IJ03Vs	IJ04V	IJ04Vs		PT02XA	PT02
12	13	14	15	16	17	18	19	20	21	22
IJ01G	IJ01Gs	IJ02G	IJ02Gs	IJ03G	IJ03Gs	IJ04G	IJ04Gs		—	—
23	24	25	26	27	28	29	30	31	32	33
GC15H	GC16H	AN47	GC15L	GC16L	AN48		EX05	EX05AT EX05MT	AN37	—

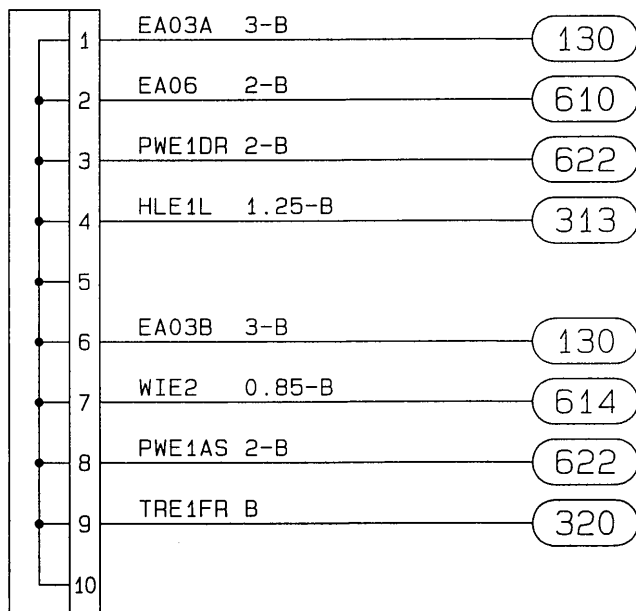


905 JOINT CONNECTOR (J/C)

(J/C-M1)

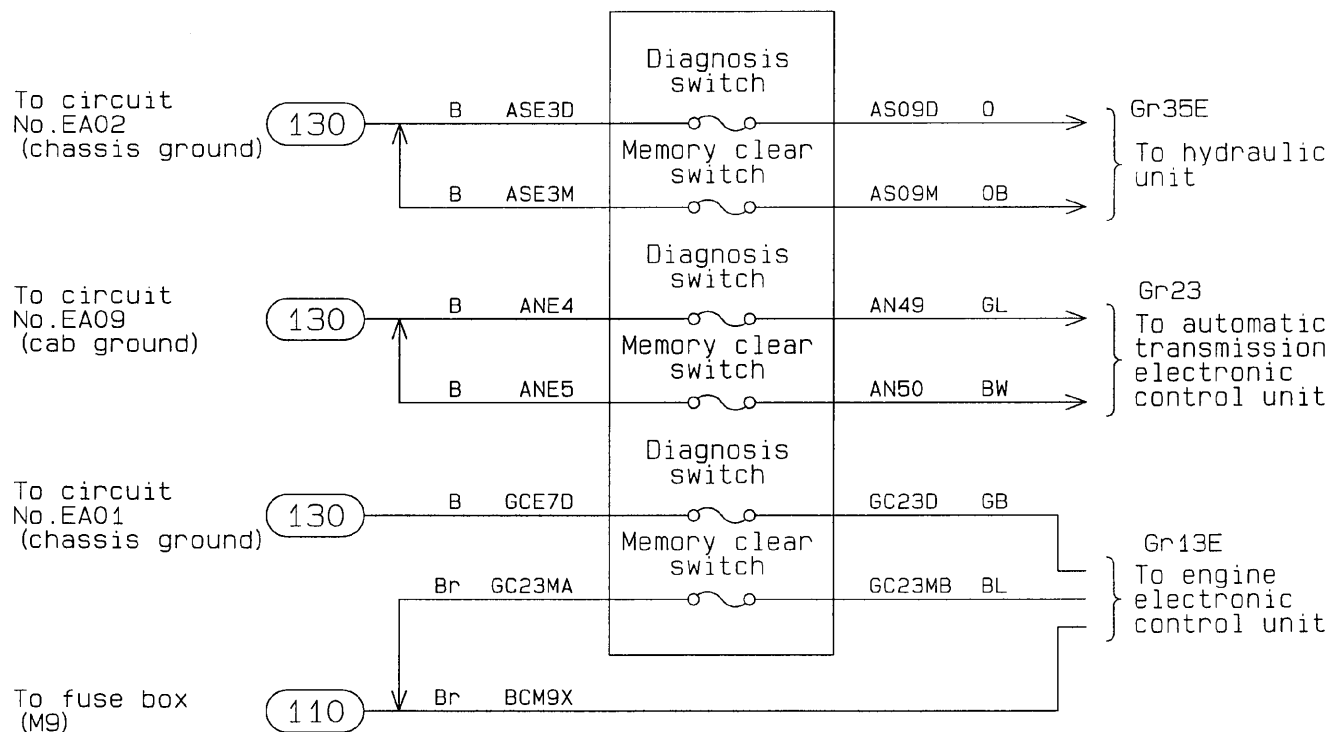


EA03A	EA06	PWE1DR	HLE1L	—
1	2	3	4	5
6	7	8	9	10
EA03B	WIE2	PWE1AS	TRE1FR	—



C00533

C02 Fuse box

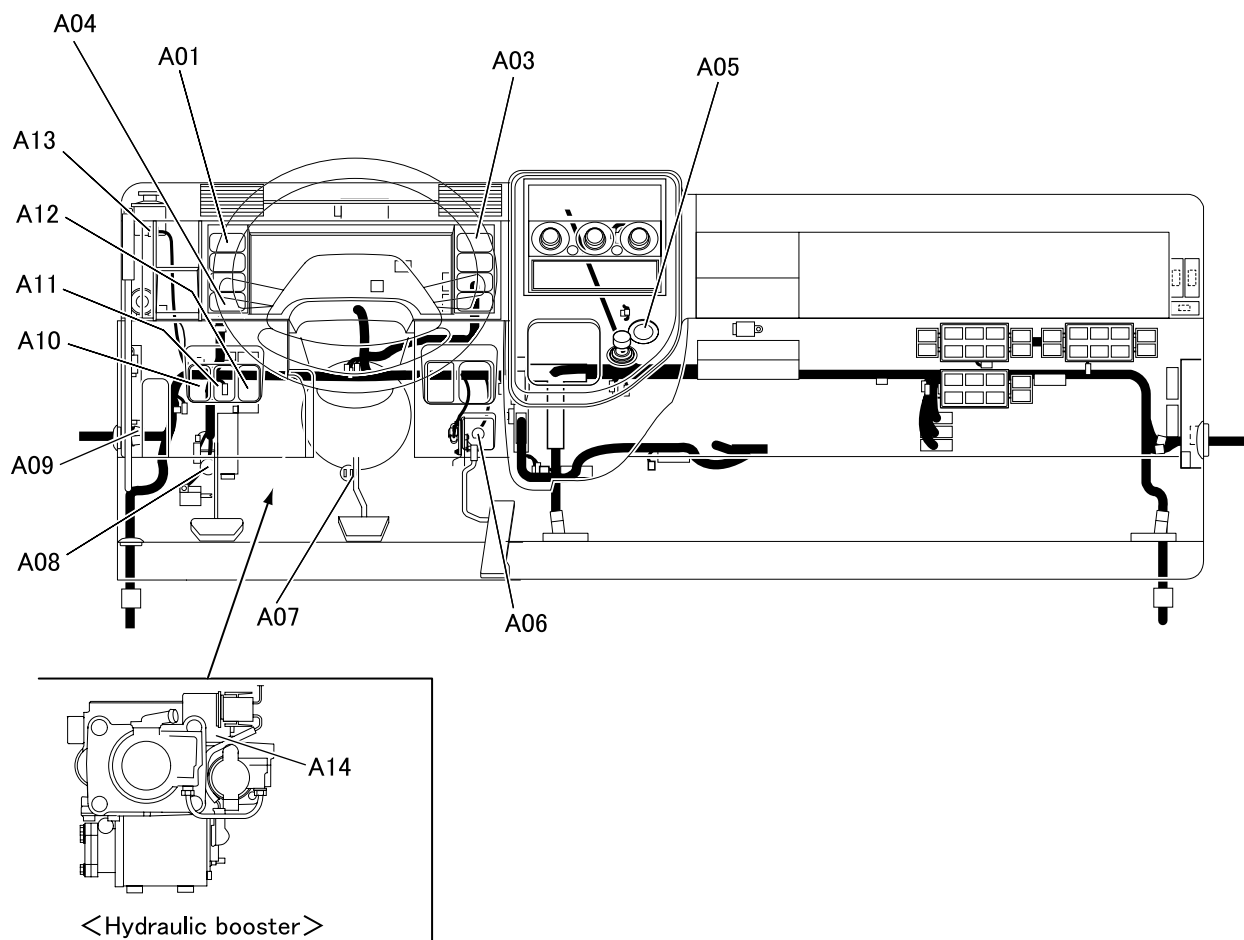


The fuse is substituted for
diagnosis switch and the memory clear switch.

C00534

54-10 ELECTRICAL EQUIPMENT INSTALLATION POSITIONS

A01 to 14



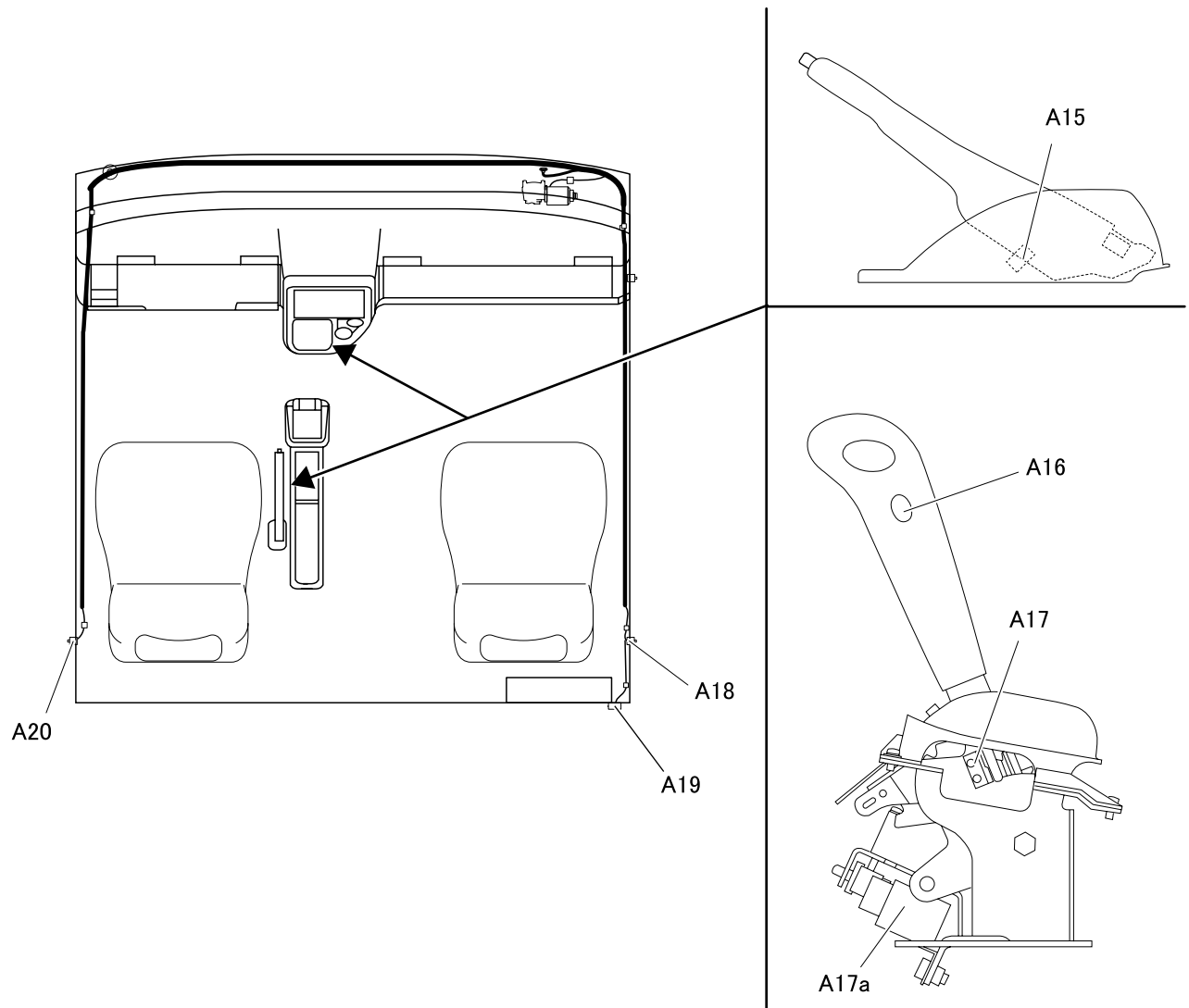
No relevant parts in a missing number

- | | |
|---|--|
| A01 Engine oil level check switch | A09 T/M PTO indicator lamp switch |
| A03 Warming switch | A10 Van body dome light switch |
| A04 Door lock switch | A11 Rheostat switch |
| A05 Hazard switch | A12 Mirror heater switch |
| A06 Idling speed adjustment potentiometer | A13 Brake fluid level switch |
| A07 Stop lamp switch | A14 Flow switch <With hydraulic booster> |
| A08 Clutch switch | |

PTO : Power take-off

T/M : Transmission

A15 to 22

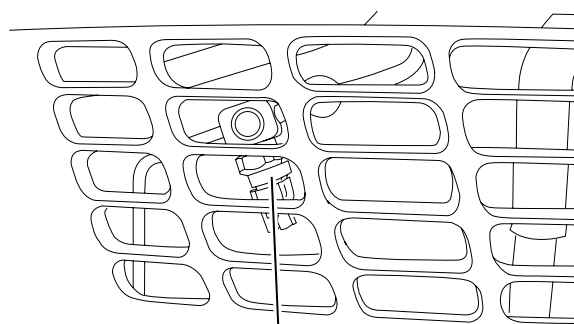
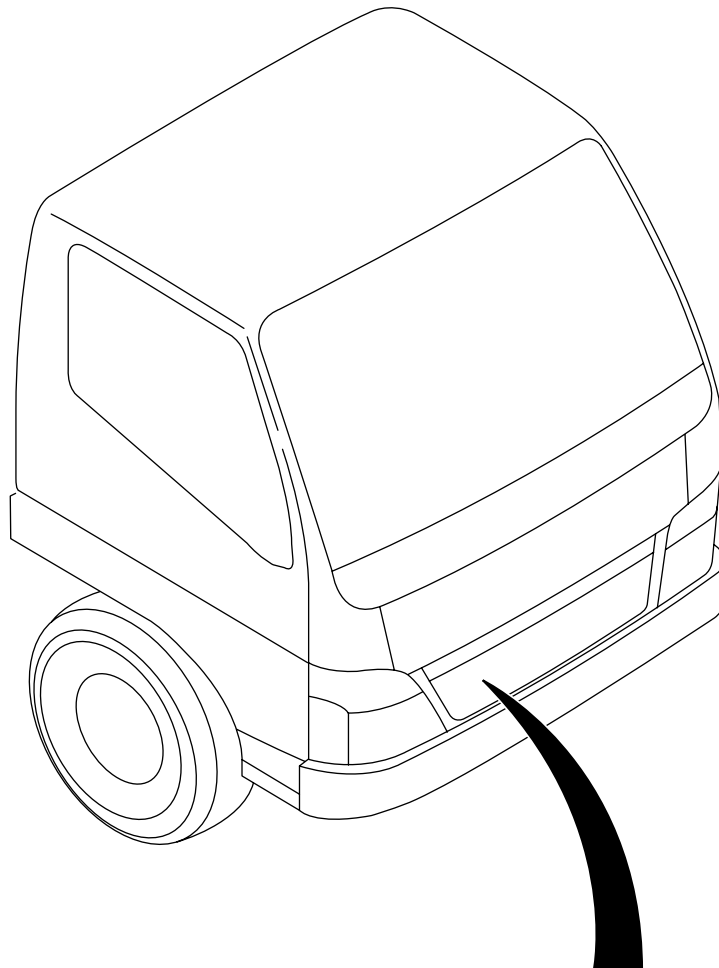


No relevant parts in a missing number

- A15 Parking brake switch
- A16 O/D switch <A/T>
- A17 P range switch <A/T>
- A17a Shift lock actuator <A/T>
- A18 Front door switch, RH
- A19 Cab tilt lock switch
- A20 Front door switch, LH

A/T : Automatic transmission
O/D : Over drive

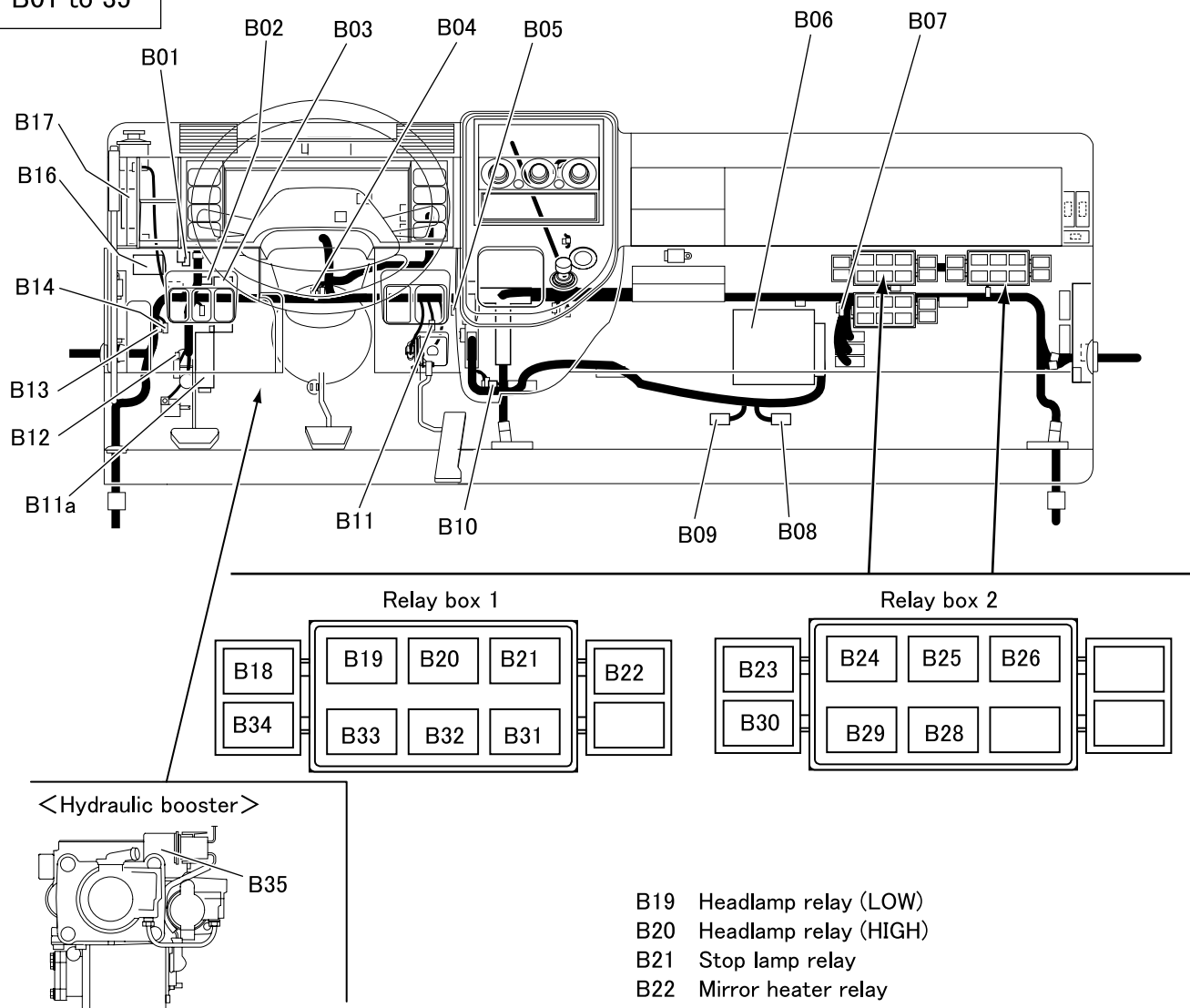
A60



A60

A60 Dual pressure switch <With air-conditioner>

B01 to 35



<Hydraulic booster>

No relevant parts in a missing number

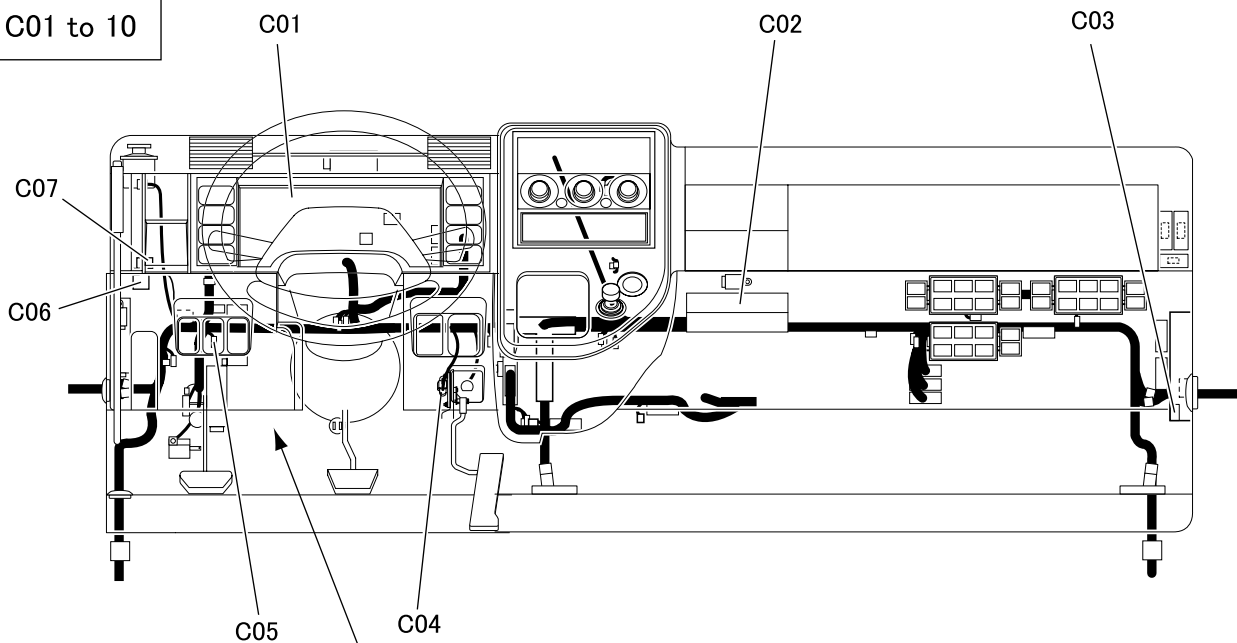
- B01 Diode
- B02 Diode
- B03 Flasher unit
- B04 Diode
- B05 Wiper electronic control unit
- B06 Engine ECU
- B07 Diode
- B08 Resistor unit
- B09 Resistor unit
- B10 Diode
- B11 PTO resistor
- B11a A/T ECU
- B12 Diode
- B13 Fuel injection rate adjustment unit
- B14 Diode
- B16 Daytime running light ECU
- B17 Key interlock control unit
- B18 Turn signal lamp relay

- B19 Headlamp relay (LOW)
- B20 Headlamp relay (HIGH)
- B21 Stop lamp relay
- B22 Mirror heater relay
- B23 Engine start relay <M/T>
- B24 ABS exhaust brake cut relay
- B25 Glow drive relay
- B26 Blower motor relay
- B28 Overheating relay
- B29 Daytime running light relay
- B30 T/M neutral relay <M/T>
- B31 Exhaust brake cut relay <A/T>
- PTO relay <M/T>
- B32 Parking brake relay <With hydraulic booster>
- B33 Safety relay
- B34 Engine oil level relay
- B35 Emergency pump motor relay
- <With hydraulic booster>

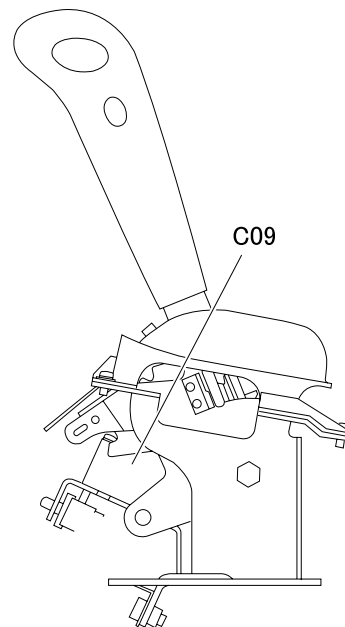
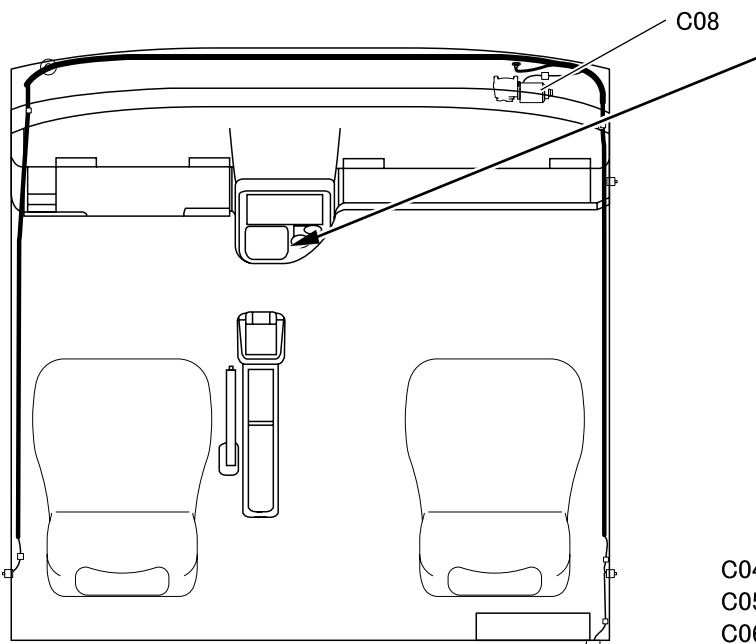
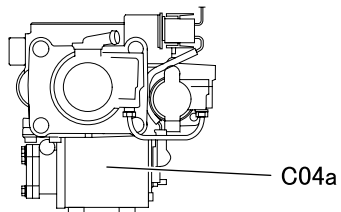
- A/T : Automatic transmission
- ABS : Anti-lock brake system
- ECU : Electronic control unit
- M/T : Manual transmission
- PTO : Power take-off
- T/M : Transmission

C FUSE, METER, SENSOR, BUZZER, MOTOR AND ACTUATOR

C01 to 10



<Hydraulic booster>



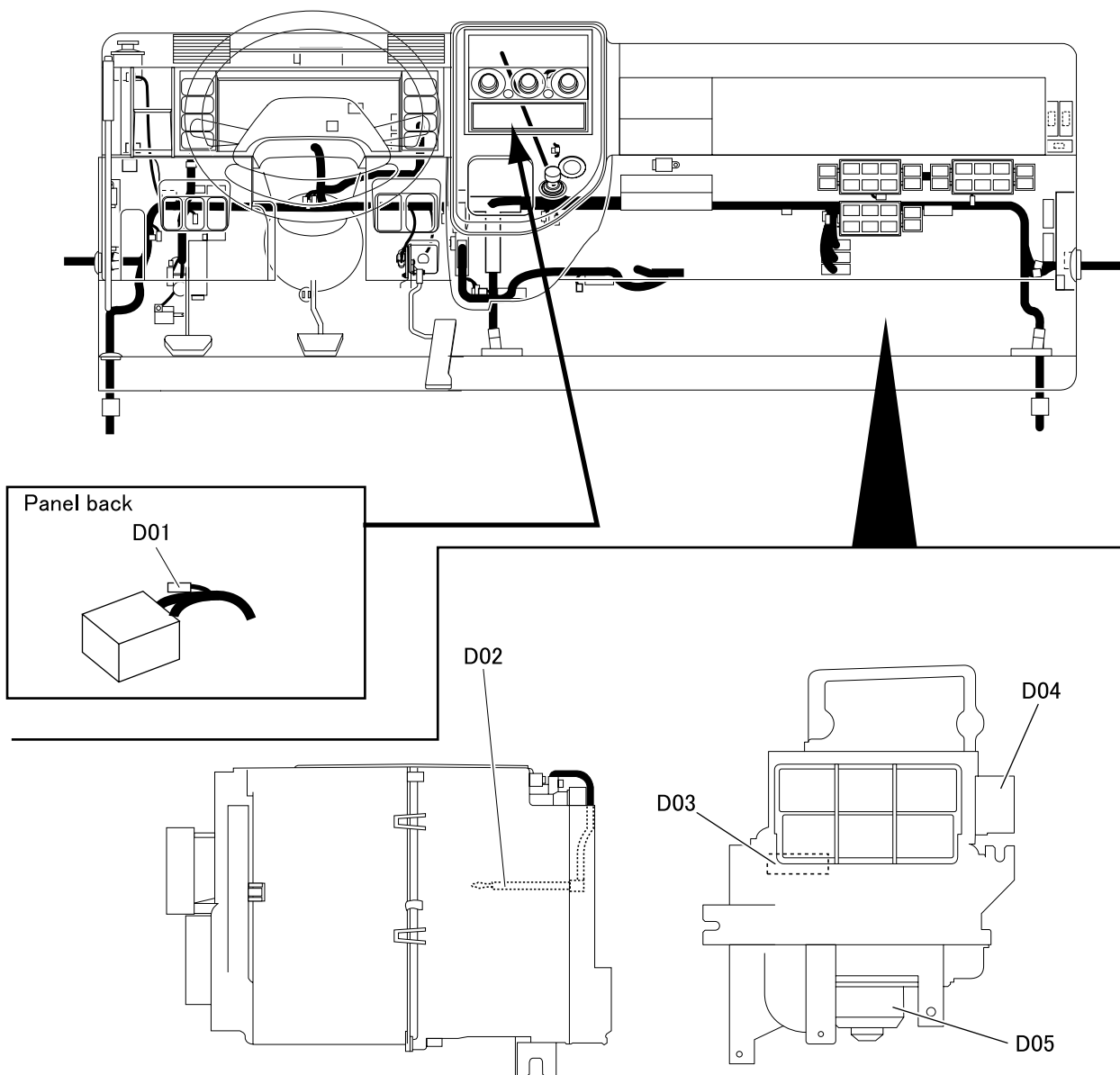
No relevant parts in a missing number

- C01 Meter cluster
- C02 Fuse box
- C03 Windshield washer motor
- C04 Accelerator pedal position sensor

- C04a Motor <With hydraulic booster>
- C05 G sensor <ABS>
- C06 Cab tilt buzzer
- C07 Warning buzzer
- C08 Wiper motor
- C09 Shift lock actuator <A/T>

ABS: Anti-lock brake system
A/T: Automatic transmission

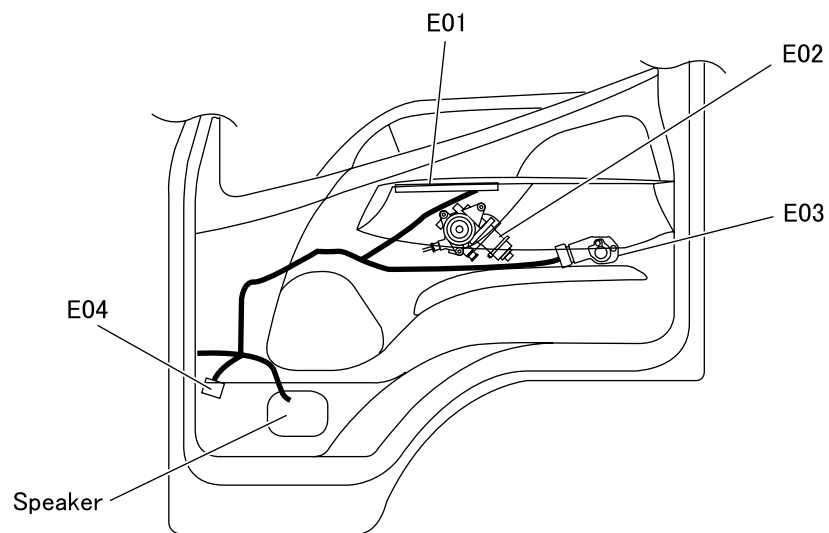
D01 to 05



No relevant parts in a missing number

- D01 Diode
- D02 Thermostat
- D03 Blower resistor
- D04 Fresh/recirculation changeover motor
- D05 Blower motor

E01 to 04

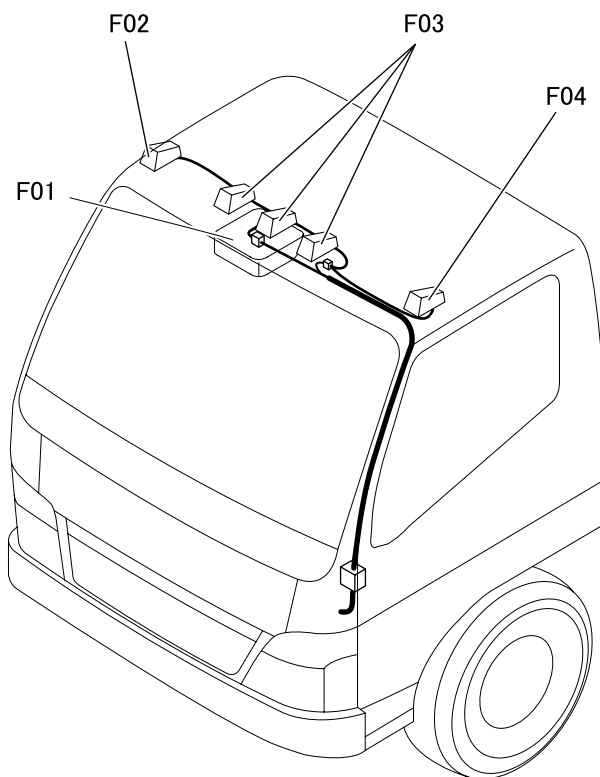


This illustrations show the right side door, the left side door is symmetrical.

No relevant parts in a missing number

- E01 Power window switch
- E02 Power window motor
- E03 Door lock actuator
- E04 Mirror heater connector

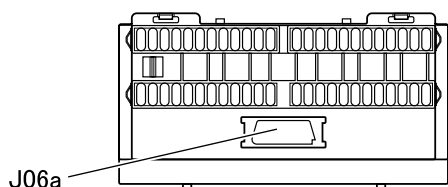
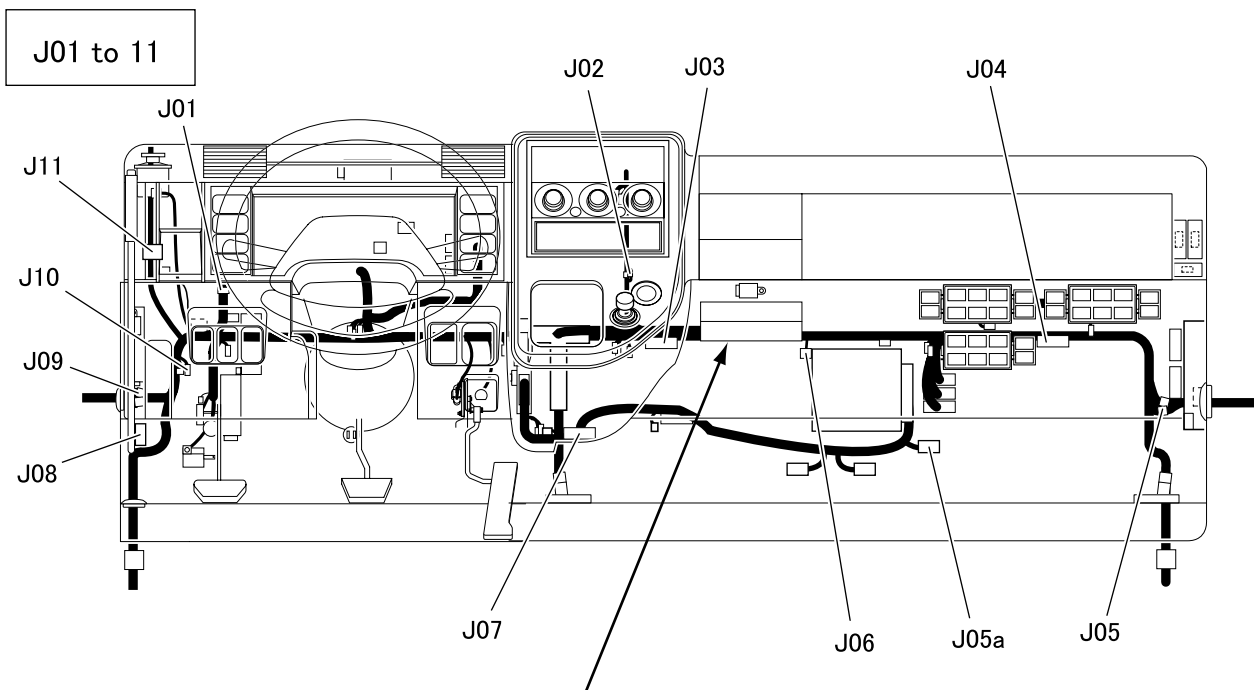
F01 to 05



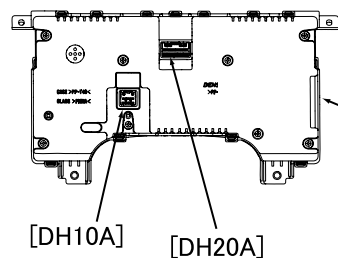
No relevant parts in a missing number

- F01 Cab lamp
- F02 Clearance and side marker lamp, RH
- F03 Identification lamp
- F04 Clearance and side marker lamp, LH

J JOINTS OF MAIN HARNESS CONNECTORS



Meter cluster backward view



[DH18A]

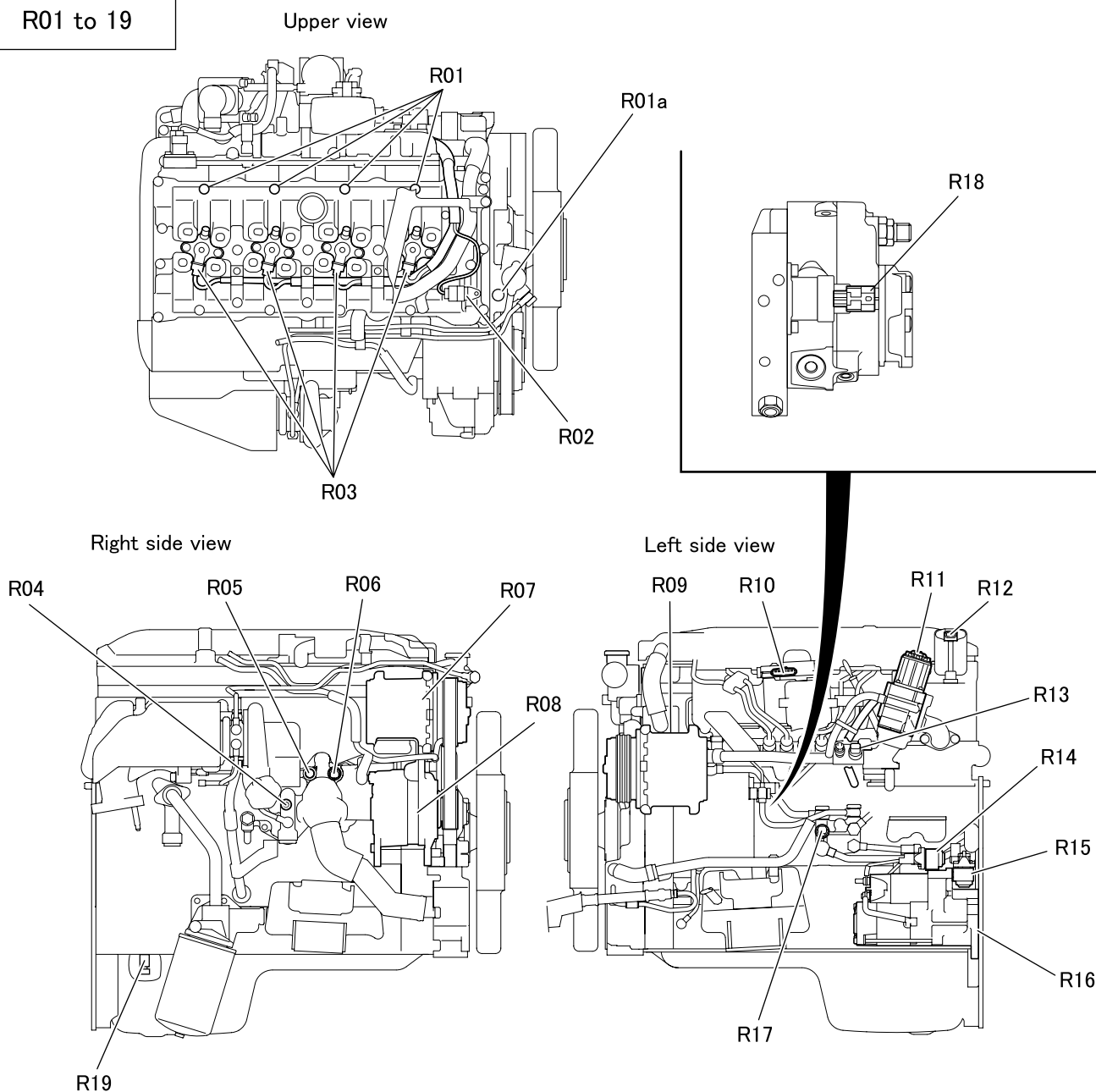
[DH22A]

No relevant parts in a missing number

- J01 Connection of cab harness and instrument panel harness
- J02 Connection of cab harness and center panel harness
- J03 Joint connector (J/C-1)
- J04 Joint connector (J/C-2, 3)
- J05 Connection of cab harness and door harness, RH
- J05a Joint connector (J/C-4)
- J06 Connection of center panel harness and air-conditioner harness
- J06a Multi-Use Tester-III connector (for recorder)
- J07 Joint connector (J/C-M1)
- J08 Multi-Use Tester-III connector (for inspection)
- J09 Connection of cab harness and door harness, LH
- J10 Optional connector
- J11 Connection of cab harness and roof harness

Indicate by connector type []. [connector type]

R01 to 19



No relevant parts in a missing number

- R01 Glow plug
- R01a Overheating switch
- R02 Cylinder recognition sensor
- R03 Injectors
- R04 Engine oil pressure switch
- R05 Water temperature sensor
(connects to water temperature gauge)
- R06 Water temperature sensor
(connects to engine ECU)
- R07 Magnetic clutch
- R08 Alternator
- R09 Magnetic clutch <Freezer>
- R10 Intake throttle
(building into motor, position sensor)

- R11 EGR valve
(building into motor, position sensor)
- R12 Boost pressure sensor
- R13 Common rail pressure sensor
- R14 Glow relay
- R15 Starter relay
- R16 Starter
- R17 Fuel temperature sensor
- R18 MPROP (rail pressure control valve)
- R19 Engine oil level sensor

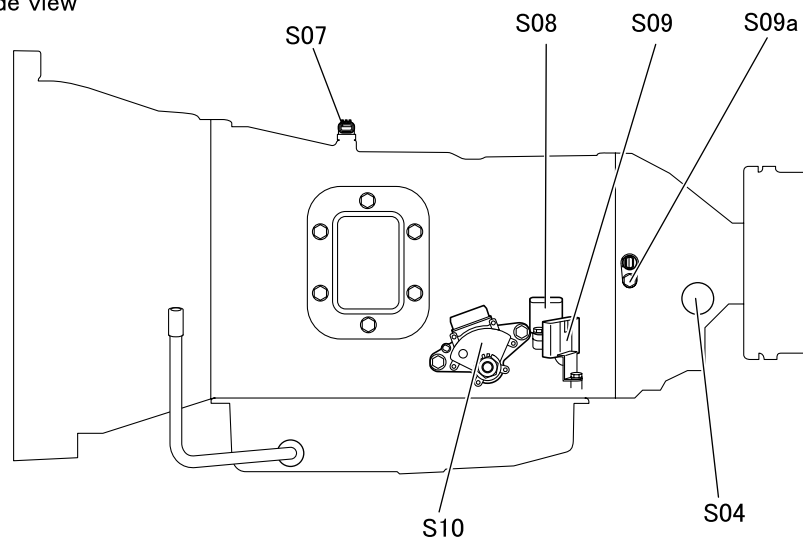
ECU : Electronic control unit

EGR : Exhaust gas recirculation

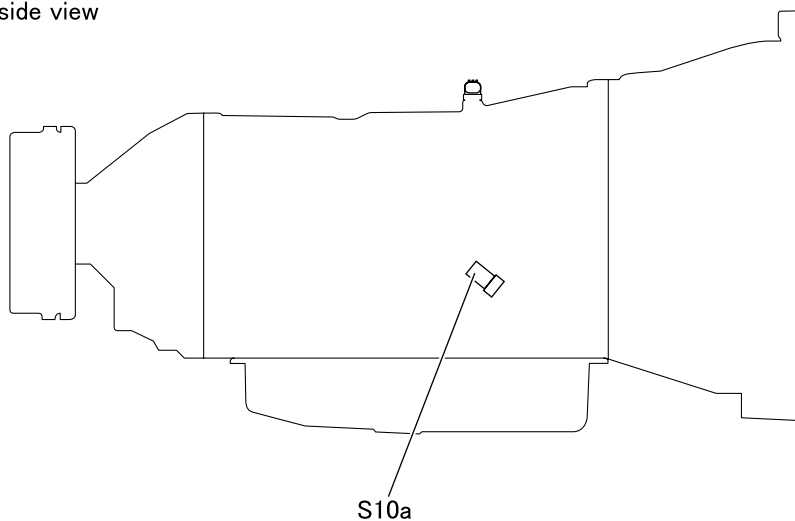
S01 to 12

<Automatic transmission>

Left side view



Right side view

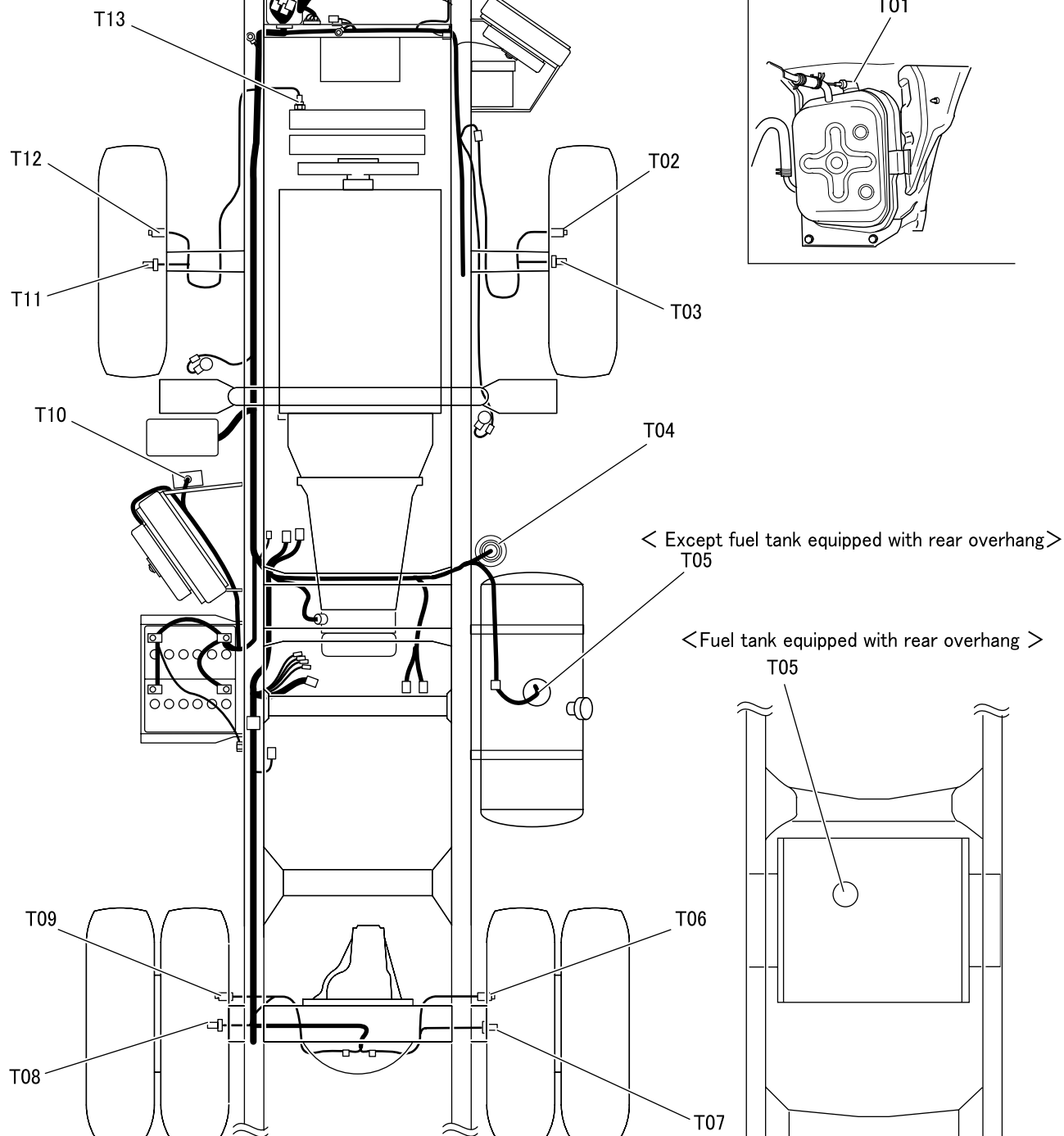


No relevant parts in a missing number

- S04 Vehicle speed sensor
- S07 Turbine revolution sensor
- S08 A/T solenoid connector
- S09 A/T solenoid connector
- S09a Output speed sensor
- S10 Inhibitor switch
- S10a A/T fluid temperature sensor

A/T : Automatic transmission

T01 to 13

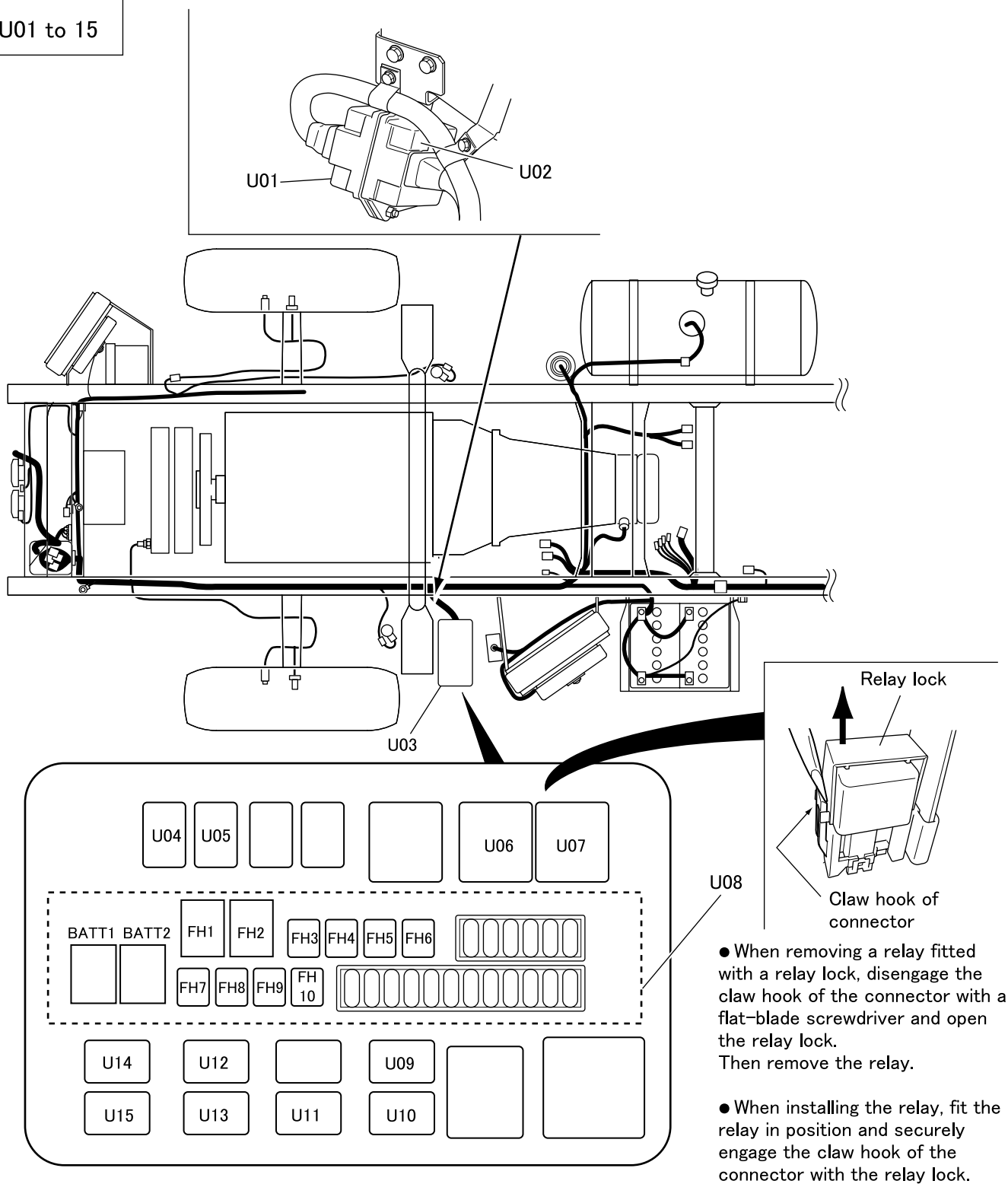


No relevant parts in a missing number

T01	Vacuum switch	T08	Rear wheel speed sensor, LH
T02	Front brake pad wear indicator, RH	T09	Rear brake pad wear indicator, LH
T03	Front wheel speed sensor, RH	T10	Automatic transmission fluid cooler fan thermo switch
T04	Water separator sensor	T11	Front wheel speed sensor, LH
T05	Fuel level sensor	T12	Front brake pad wear indicator, LH
T06	Rear brake pad wear indicator, RH	T13	Boost air temperature sensor
T07	Rear wheel speed sensor, RH		

U FUSE, RELAY AND CONNECTORS

U01 to 15

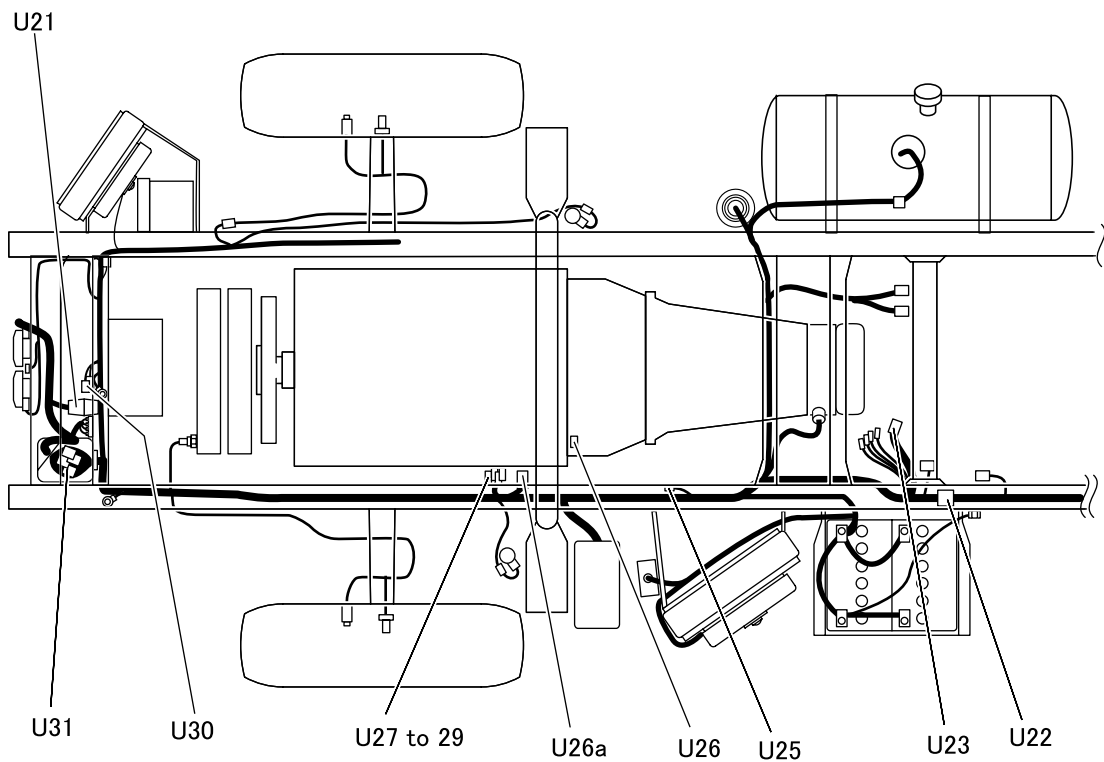


U01 Throttle EDU
 U02 EGR EDU
 U03 High-current fuse box
 U04 ATF cooler fan motor relay
 U05 Backup lamp relay <A/T>
 U06 Wiper relay (HIGH)
 U07 Wiper relay (LOW)
 U08 High-current fuse

U09 Horn relay
 U10 Air-conditioner compressor relay
 U11 Condenser fan relay
 U12 Tail lamp relay
 U13 EDU relay
 U14 Van body dome light relay
 U15 Neutral start relay <A/T>

ATF : Automatic transmission fluid
 A/T : Automatic transmission
 EDU : Electronic drive unit
 EGR : Exhaust gas recirculation

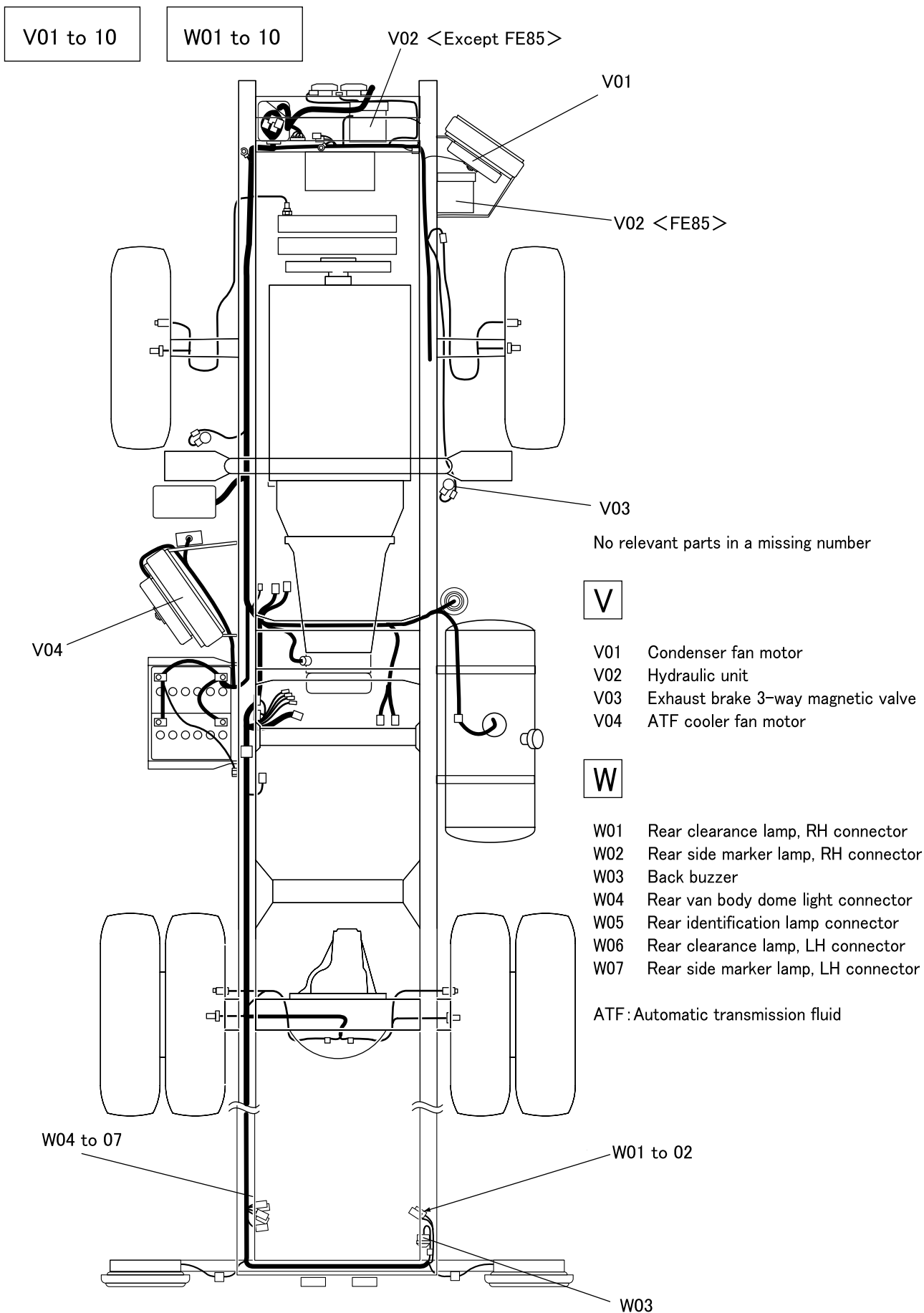
U21 to 31



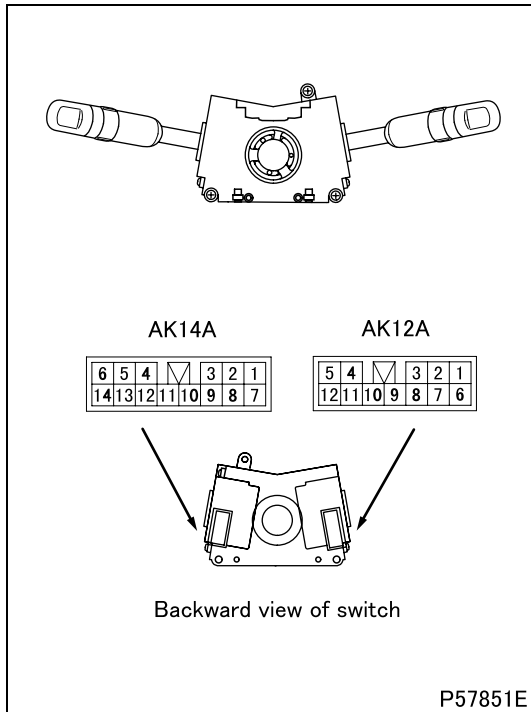
No relevant parts in a missing number

- U21 Connection of cab harness and engine harness
- U22 Connection of chassis harness and rear chassis harness
- U23 Connection of chassis harness and transfer control harness
- U25 Diode
- U26 Connection of chassis harness and starter harness
- U26a Joint connector
- U27 Front van body dome light connector
- U28 Front identification lamp connector
- U29 Front clearance lamp connector
- U30 Diode
- U31 Connection of chassis harness and cab harness or engine harness

V MAGNETIC VALVE AND MOTOR W BUZZER AND CONNECTORS



54-11 INSPECTION OF ELECTRICAL EQUIPMENT



#001 Inspection of combination switch

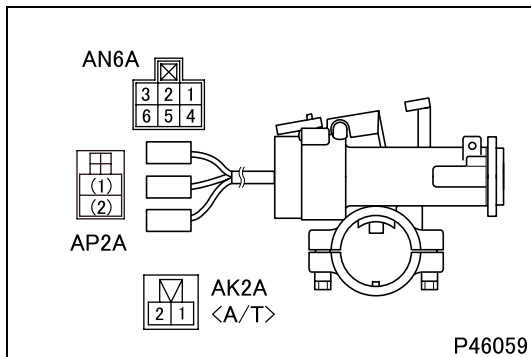
AK12A connector connection table

Switch position			Continuity terminal
Lighting switch	OFF		—
	I		1–2
	II	Dimmer	1–9
		Main	1–9–12
Dimmer switch	Passing		11–12
Turn signal lamp switch	LH		6–8
	N (neutral)		—
	RH		7–8

AK14A connector connection table

Switch position		Continuity terminal
Wiper and washer switch	OFF	—
	INT (interval)	5–7
	LO (low)	3–5
	HI (high)	3–4–5
	WASH (washer)	5–12
Horn switch	OFF	—
	ON	13–body ground
Exhaust brake switch	ON	8–9
	OFF	—

- If any fault is found, replace the switch. (See Gr37.)



#002 Inspection of starter switch

AP2A, AN6A connector connection table

Switch position	Continuity terminal
LOCK	—
ACC	(2)–3
ON	(1)–(2)–3–4
START	(1)–(2)–2–3–4

- Terminal numbers within parentheses () show terminals of AP2A.

AK2A connector connection table

<Key interlock solenoid (A/T)>

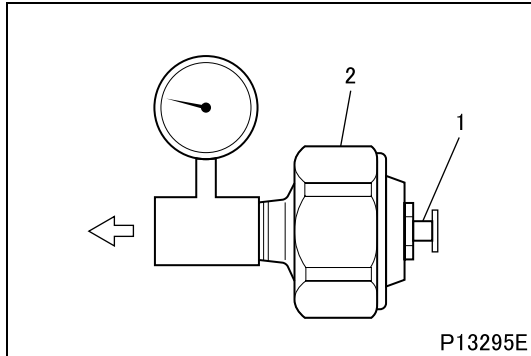
Shift position	Continuity terminal	Remarks
P range: OFF	—	The key must be turned to the lock direction
Without P range: ON	(+) 2–1 (–)	The key must not be turned to the lock direction

A/T: Automatic transmission

- If any fault is found, replace the switch. (See Gr37.)

#011 Inspection of rheostat switch

- The rheostat switch contains a control circuit, because of this it is difficult to inspect the rheostat switch independently, therefore you should inspect the rheostat switch indirectly by inspecting the system harness and the related parts.
- If no fault is found in the related parts but the system is faulty, replace the switch.

**#023 Inspection of vacuum switch**

- Perform the following checks, and if any fault is found, replace the switch. (See Gr35A.)

(1) Inspection without applying negative pressure

- Make sure that there is no continuity between terminals 1 and 2 (body).

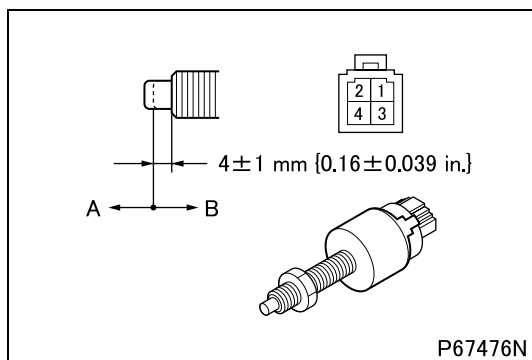
(2) Inspection by applying negative pressure

- Gradually apply negative pressure to the switch starting from 0 kPa {0 psi, 0 kgf/cm²}.
- Measure the degree of air pressure at the moment when continuity is detected between terminals 1 and 2 (body), and make sure to confirm if the value meets the standard.

Standard value	$-(47^{+3.3}_{-4.0})$ kPa $\{-(13.8^{+0.98}_{-1.18})$ in.Hg, $-(350^{+25}_{-30})$ mmHg}
----------------	---

#026, #027 Inspection of power window switch

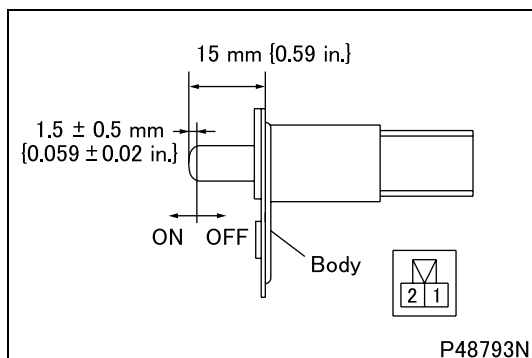
- Because it is not easy to check these switches individually, determine quality of the switches indirectly by checking related parts, such as harnesses, power window motor, etc. in the system.
- If there is nothing abnormal in related parts, but still something wrong with the system, then replace the switches. (See Gr43.)



#031 Inspection of clutch switch

Switch position	Continuity terminal
A	1-4
B	2-3

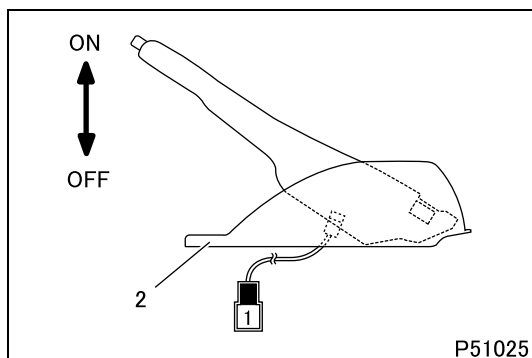
- If any fault is found, replace the switch. (See Gr21.)



#035 Inspection of door switch

Switch position	Continuity terminal
OFF	—
ON	1-body, 2-body

- If any fault is found, replace the switch. (See Gr43.)

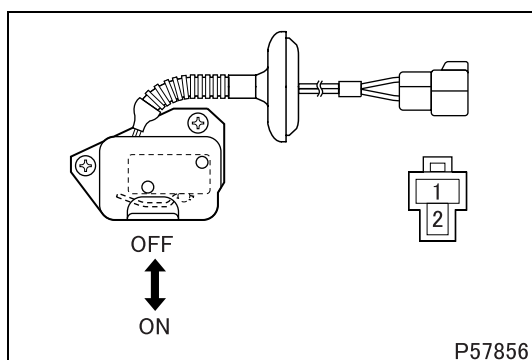


#038 Inspection of parking brake switch

- Measure continuity between terminals 1 and 2 (body) ground.

Pull the parking brake lever	Continuity exists
Release the parking brake lever	Continuity does not exist

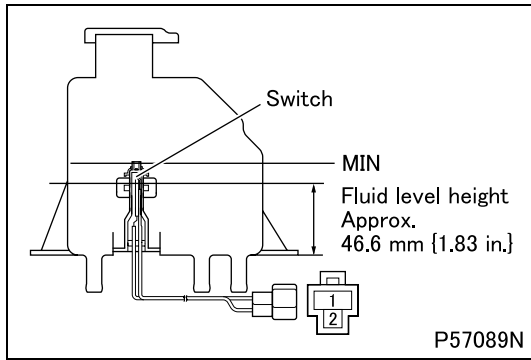
- If any fault is found, replace the switch. (See Gr36.)



#039 Inspection of cab tilt lock switch

Switch position	Continuity terminal
OFF	—
ON	1-2

- If any fault is found, replace the switch. (See Gr42.)

**#041 Inspection of brake fluid level switch**

- Gradually drain brake fluid from the brake fluid tank.

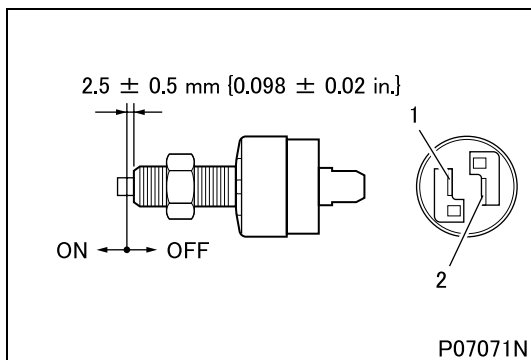
CAUTION

- Brake fluid contains ingredients that dissolve paint on the bodywork of a vehicle. Quickly wipe off brake fluid when it is spilled.**

- Measure height of the switch when continuity is detected between terminals 1 and 2.

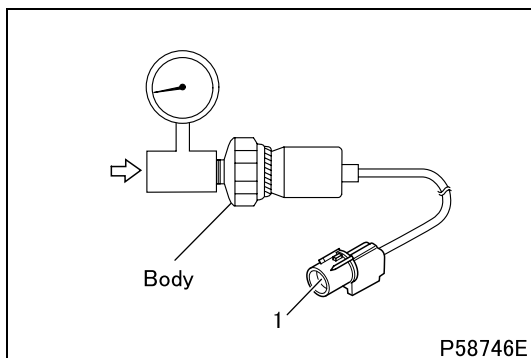
Standard value	46.6 mm {1.83 in.}
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- If the measured value deviates from the standard value, replace the brake fluid tank. (See Gr52.)

**#042 Inspection of stop lamp switch**

Switch position	Continuity terminal
OFF	—
ON	1-2

- If any fault is found, replace the switch. (See Gr35A.)

**#044 Inspection of engine oil pressure switch**

- Perform the following checks, and if any fault is found, replace the switch. (See Gr12.)

(1) Inspection without applying air pressure

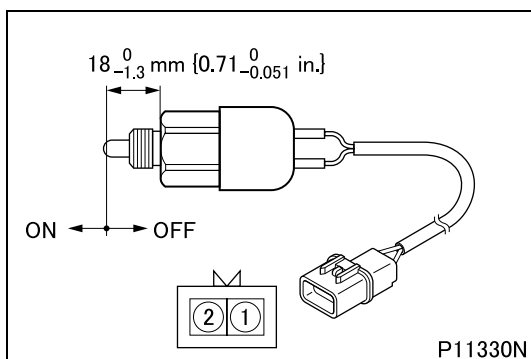
- Make sure that there is continuity between terminals 1 and body.

(2) Inspection by applying air pressure

- Gradually apply air pressure to the switch starting from 0 kPa {0 psi, 0 kgf/cm²}.

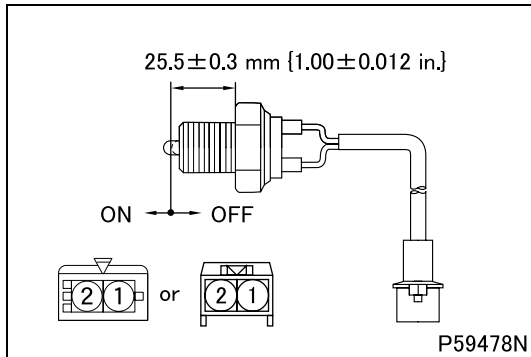
- Measure the degree of air pressure at the moment when continuity is not detected between terminals 1 and body, and make sure to confirm if the value meets the standard.

Standard value (operating pressure)	50 ± 10 kPa {7.1 ± 1.4 psi, 0.5 ± 0.1 kgf/cm ² }
--	---

**#054 Inspection of switch**

Switch position	Continuity terminal
OFF	—
ON	1-2

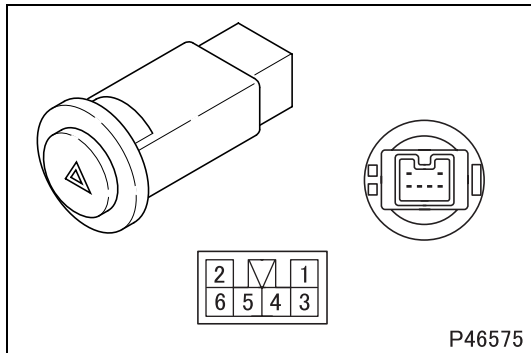
- If any fault is found, replace the switch.
 - Backup lamp switch. (See Gr22.)



#056 Inspection of transmission neutral switch

Switch position	Continuity terminal
OFF	—
ON	1-2

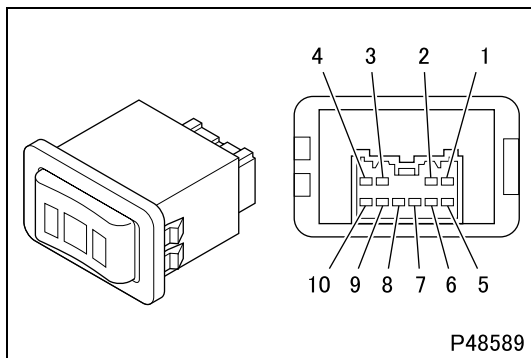
- If any fault is found, replace the switch. (See Gr22.)



#081 Inspection of hazard switch

Switch position	Continuity terminal	Night illumination
OFF	—	(+) 2-1 (-)
ON	4-5-6	

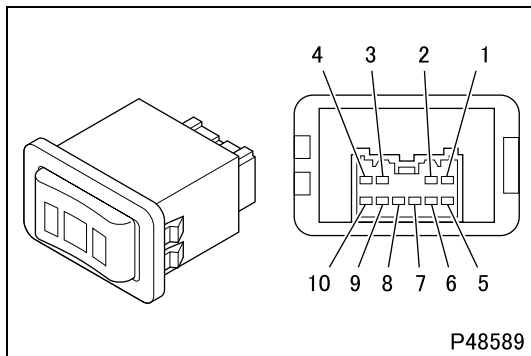
- If any fault is found, replace the switch. (See Gr52.)



#087 Inspection of van body dome light switch

Switch position	Continuity terminal	Operation illumination	Night illumination
OFF	1-8	—	(+) 2-3 (-)
ON	1-7	(-) 3-9 (+)	

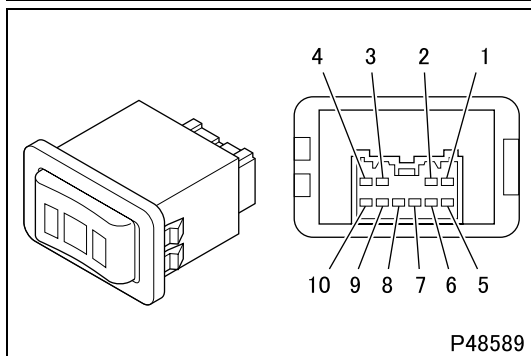
- If any fault is found, replace the switch.



#089 Inspection of switch

Switch position	Continuity terminal	Night illumination
OFF	1-8	(+) 2-3 (-)
ON	1-7	

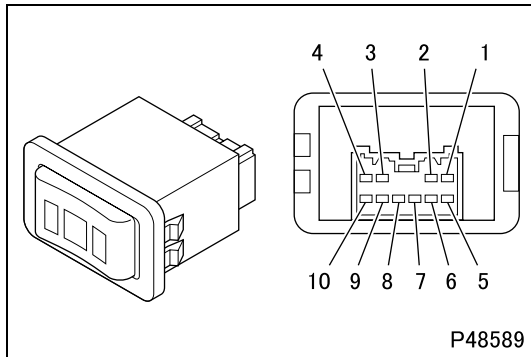
- If any fault is found, replace the switch. (See Gr52.)
- Warm-up switch



#092 Inspection of engine oil level check switch

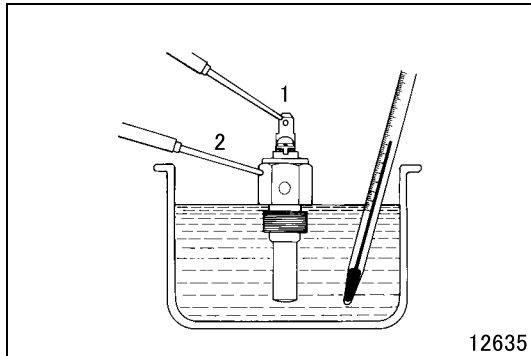
Switch position	Continuity terminal
—	—
CHK	1-7, 5-6

- If any fault is found, replace the switch. (See Gr52.)

**#094 Inspection of door lock switch**

Switch position	Continuity terminal	Night illumination
LOCK	1-7	(+) 2-3 (-)
Neutral	-	
UNLK	1-8	

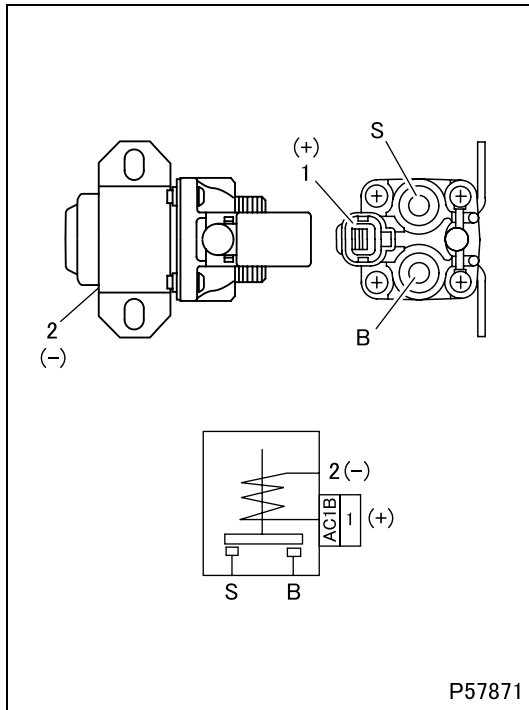
- If any fault is found, replace the switch. (See Gr43.)

**#160 Inspection of overheating switch**

- Place the switch in engine oil in a container.
- Raise the oil temperature to the specified values and stir the oil.
- Measure the operating temperature between terminals 1 and 2 (body) respectively.

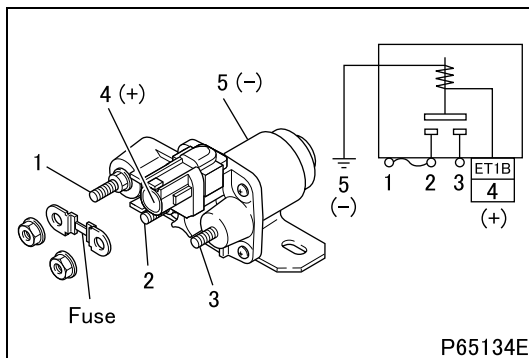
Standard Value	When temperature increase (OFF→ON)	$110 \pm 2^{\circ}\text{C}$ { $230 \pm 36^{\circ}\text{F}$ }
	When temperature decrease (ON→OFF)	$110 \pm 4^{\circ}\text{C}$ { $230 \pm 39^{\circ}\text{F}$ }

- If the measured value deviates from the standard value, replace the switch. (See Gr14.)



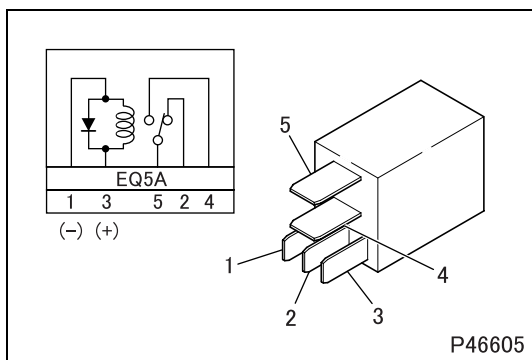
#187 Inspection of starter relay

- Perform continuity check and operation check, and if any fault is found, replace the relay.



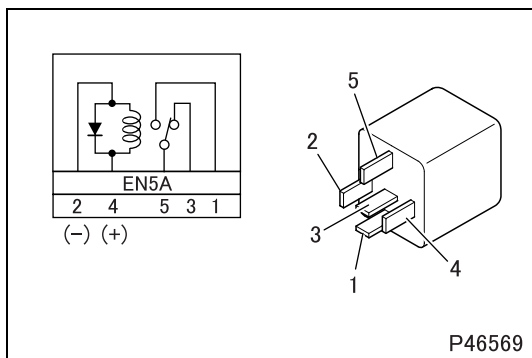
#195 Inspection of glow relay

- Perform continuity check and operation check, and if any fault is found, replace the relay.



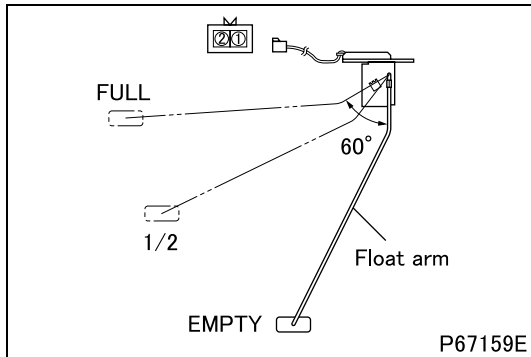
#201 Inspection of relay (normally open type 5 pin)

- Perform continuity check and operation check, and if any fault is found, replace the relay.



#202 Inspection of relay (normally open type 5 pin)

- Perform continuity check and operation check, and if any fault is found, replace the relay.

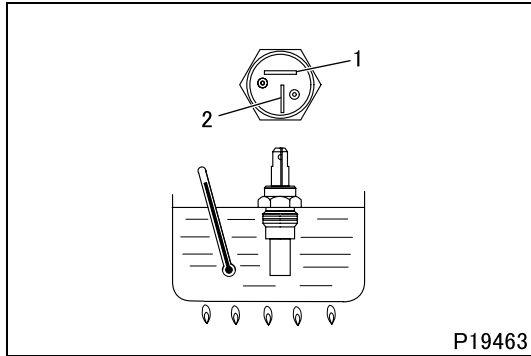


#258 Inspection of fuel level sensor

- Measure resistance values between terminals 1 and 2 when bringing the float arm into contact with stoppers (at EMPTY and FULL positions) and placing it at the midpoint position.

Standard value	at FULL position	$0^{+2}_0 \Omega$
	at 1/2 position	$50 \pm 3 \Omega$
	at EMPTY position	$150 \pm 10 \Omega$

- If the measured value deviates from the standard value, replace the sensor. (See Gr13A.)



#262 Inspection of water temperature sensor

<For water temperature gauge>

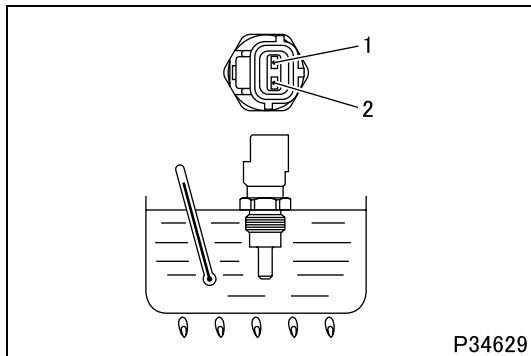
- Dip the sensor in a container filled with engine oil.
- Raise the oil temperature to the specified one while stirring oil.
- Measure resistance values between terminals 1 and 2 and body.

Terminal 1: water temperature gauge connected side

Terminal 2: Is not use

Standard value	1 and body (water temperature gauge connected side)	50°C {122°F}	153.9 Ω (reference value)
		80°C {176°F}	$51.9^{+4.9}_{-4.4} \Omega$
		100°C {212°F}	$27.4^{+1.9}_{-1.2} \Omega$

- If the measured value deviates from the standard value, replace the sensor. (See Gr14.)

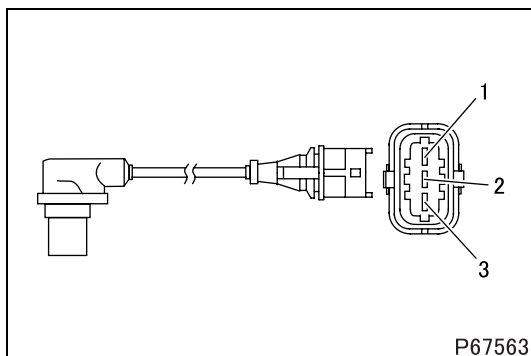


<For engine control>

- Place the sensor in engine oil in a container.
- Raise the oil temperature to the specified values and stir the oil.
- Measure the resistance between terminals 1 and 2.

Standard value	20°C {68°F}	$2.45 \pm 0.14 \text{ k}\Omega$
	80°C {176°F}	322.2 Ω (reference value)
	110°C {230°F}	$147.1 \pm 2 \Omega$

- If the measured value deviates from the standard value, replace the sensor. (See Gr14.)

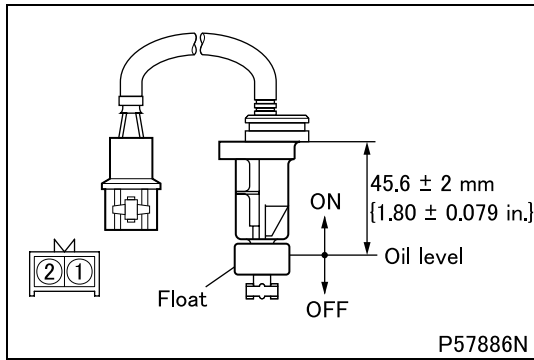


#263 Inspection of engine speed sensor

- Measure the resistance between terminals 1 and 2.

Standard value (at 20°C {68°F})	$860 \pm 86 \Omega$
---------------------------------	---------------------

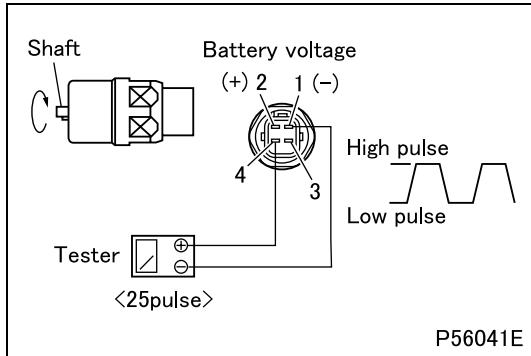
- If the measured value deviates from the standard value, replace the sensor. (See Gr13E.)



#264 Inspection of engine oil level sensor

Switch position	Continuity terminal
OFF	—
ON	1-2

- If any fault is found, replace the sensor. (See Gr12.)

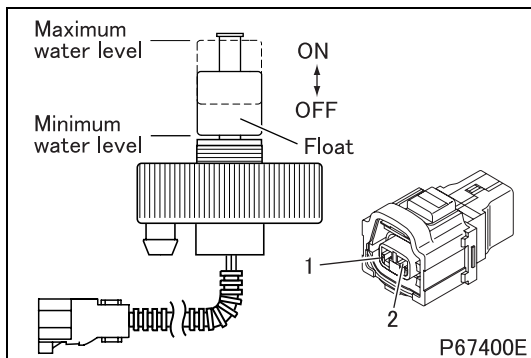


#265 Inspection of vehicle speed sensor

- Rotate the sensor shaft with the battery voltage applied between terminals 1 and 2.
- Measure the maximum value (high pulse voltage) and the minimum value (low pulse voltage) of the voltage generated at each terminal.

Standard value	Between 25 pulse output terminals 1 and 4	Low pulse voltage	0.5 V or less
		High pulse voltage	8 ± 1 V

- If the measurement is not within the range of the standard value, replace the sensor. (See Gr22.)



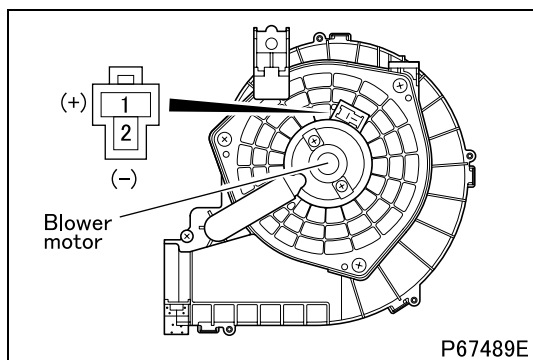
#274 Inspection of water separator sensor

Condition	Continuity terminal
ON (when coolant quantity is approx. 100 cm ³ {6.10 cu.in.})	1-2
OFF	—

- If any fault is found, replace the sensor (See Gr13A.)

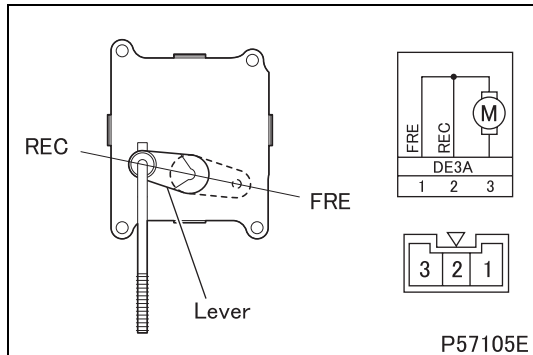
#350 Inspection of control unit and other units

- Since the units alone cannot be readily checked in the off-vehicle state, check the harness, switch and other related parts in each system.
- If any fault is not found in the related parts, and the problem still remains in the system, replace the control units or other units.



#411 Inspection of blower motor

- Make sure that the motor operates when battery voltage is applied between terminals 1 and 2.
- If any fault is found, replace the motor. (See Gr55.)



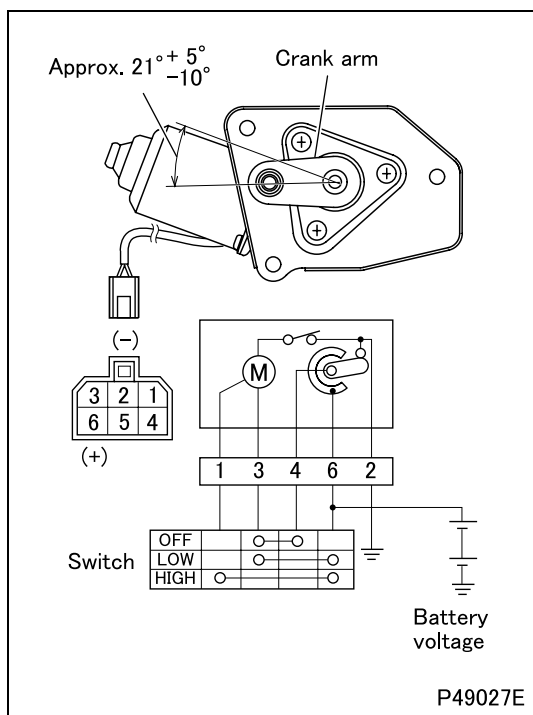
#415 Inspection of fresh/recirculation changeover motor

- Perform the following checks, and if any fault is found, replace the motor. (See Gr55.)
- Make sure that the motor operates when battery voltage is applied between each terminal.

Lever position	Terminal
REC (inside air)	(+) 3-2 (-)
FRE (outside air)	(+) 3-1 (-)

CAUTION

- Stop applying battery voltage if the lever stops spontaneously at the REC or FRE position.



#422 Inspection of wiper motor

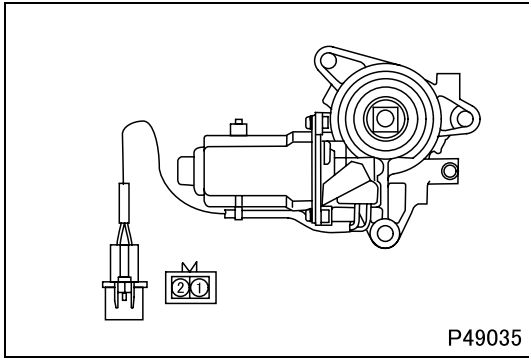
- Connect a switch to wiper motor as shown.
- Check the motor for correct operation as follows. If any fault is found, replace the motor. (See Gr51.)

(1) Inspection of motor operation

- Set switch to HIGH position to check that the motor rotates at high speed.
- Set switch to LOW position to check that the motor rotates at low speed.

(2) Inspection of automatic stop position

- Set switch to LOW position to let the motor rotate at low speed.
- When the crank arm is in a position other than automatic stop position (outside the angles shown), set switch to OFF position.
- Check to see that the crank arm stops at the automatic stop position (within the angles range shown).

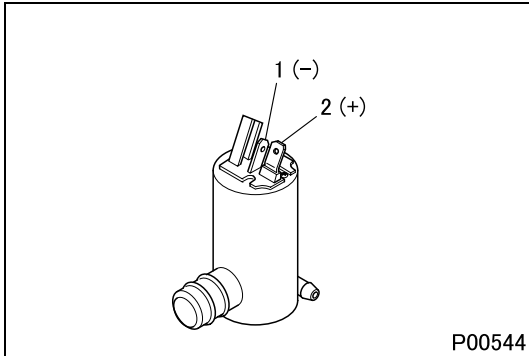


#423 Inspection of power window motor

- Make sure that the motor operates when battery voltage is applied between terminals 1 and 2.

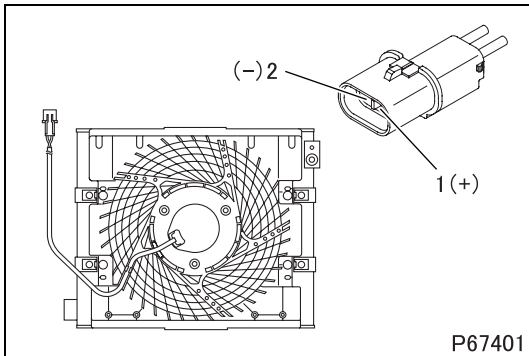
Rotation direction	Terminal
Left	(+) 2-1 (-)
Right	(+) 1-2 (-)

- If any fault is found, replace the motor and the regulator as a set. (See Gr43.)



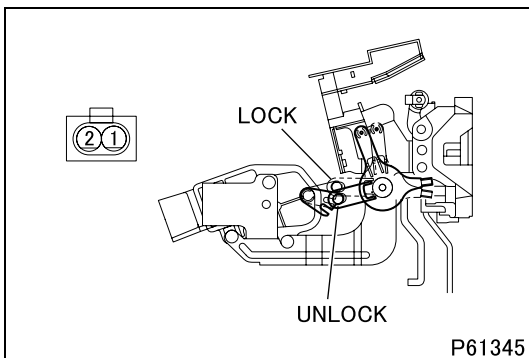
#428 Inspection of windshield washer motor

- Make sure that the motor operates when battery voltage is applied between terminals 1 and 2.
- If any fault is found, replace the motor. (See Gr51.)



#431 Inspection of condenser fan motor

- Make sure that the motor operates when battery voltage is applied between terminals 1 and 2.
- If any fault is found, replace the motor. (See Gr55.)



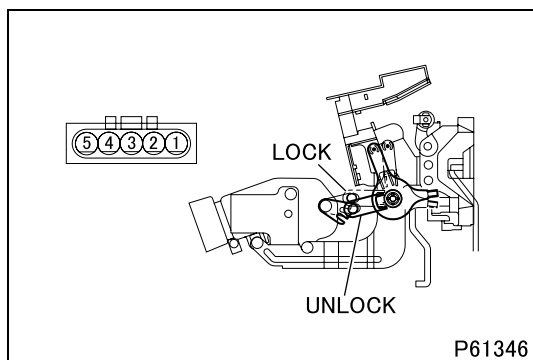
#510 Inspection of door lock actuator (on assistant driver's side)

- Apply battery voltage between each terminals confirm that the actuator operates.

Switch position	Terminal
LOCK	(+) 1-2 (-)
UNLOCK	(+) 2-1 (-)

- If any fault is found, replace the actuator. (See Gr43.)

#560 to #609 MAGNETIC VALVE

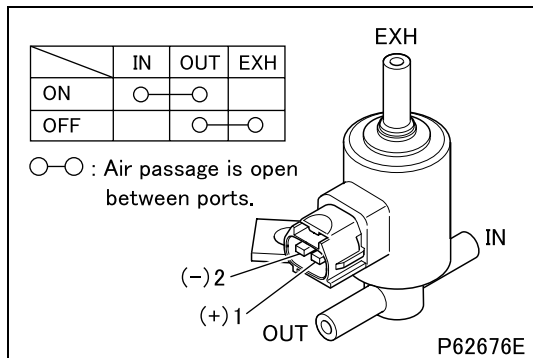


#511 Inspection of door lock actuator (on driver's side)

- Apply battery voltage between each terminals confirm that the actuator operates.

Switch position	Continuity terminal	Terminal
LOCK	1-2	(+) 3-4 (-)
UNLOCK	1-5	(+) 4-3 (-)

- If any fault is found, replace the actuator. (See Gr43.)



#565 Inspection of 3-way magnetic valve

- Perform the following checks, and if any fault is found, replace the 3-way magnetic valve.

(1) Operation check

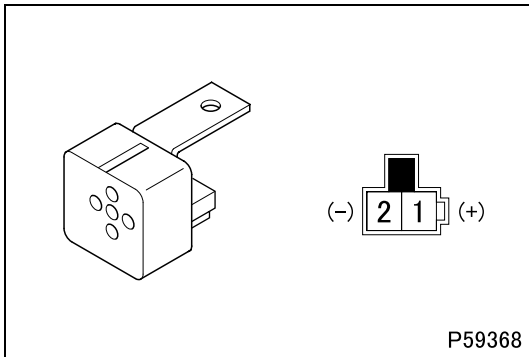
- Gradually apply DC current between terminals 1 and 2 starting from 0 V.

Measure the voltage at which the 3-way magnetic valve operates. (Determine ON/OFF of the magnetic valve by operating noises.)

Standard value (minimum operating voltage)	11 V or less
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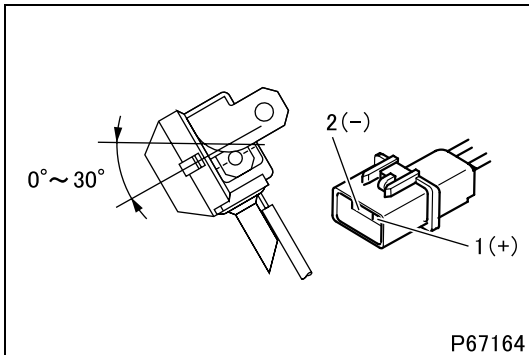
(2) Inspection of continuity and air tightness

- Negative pressure when inspected: -100 kPa {-29.5 in.Hg, -750 mmHg}



#611 Inspection of warning buzzer

- Make sure that the buzzer sounds when battery voltage is applied between terminals 1 and 2.
- If any fault is found, replace the buzzer.



#614 Inspection of back buzzer

[Inspection]

- Make sure to confirm if the buzzer intermittently sounds by applying the battery voltage between terminals 1 and 2.
- If any fault is found, replace the buzzer.

[Installation]

- Install the back buzzer to the frame in the range of angles as illustrated.

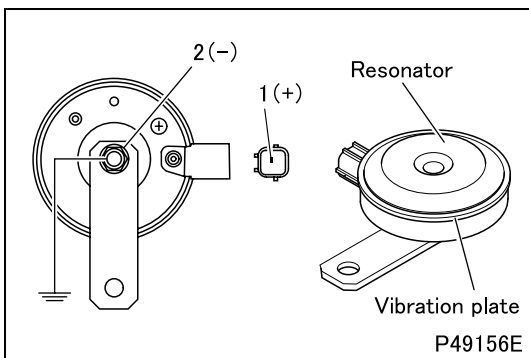
CAUTION ⚠

- Beware that if the installed angle of the buzzer is out of the range as illustrated, water in the buzzer will not be drained normally.

#615 Inspection of electric horn

CAUTION ⚠

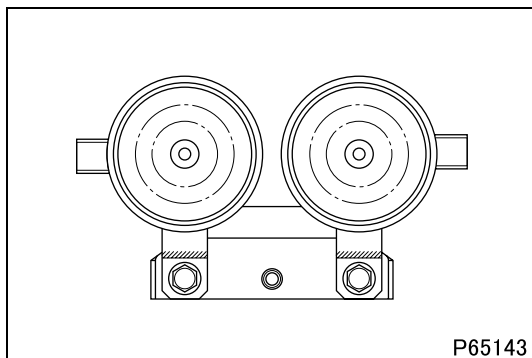
- Bending the stay changes the sound quality of the horn, degrading the horn performance.
- Never bend or damage the stay.



[Inspection]

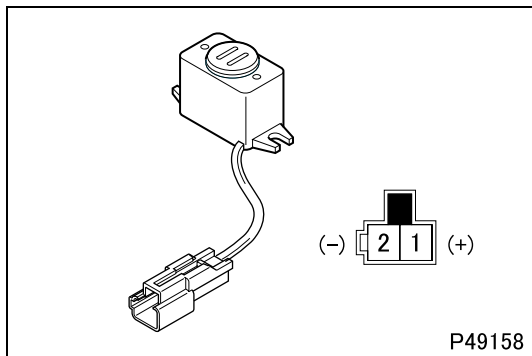
- Make sure to confirm whether the horn sounds by applying the battery voltage between terminals 1 and 2 (body).
- Remove foreign substances adhered to the resonator and diaphragm.
- If any fault is found, replace the horn.

#610 to #649 BUZZER, HORN



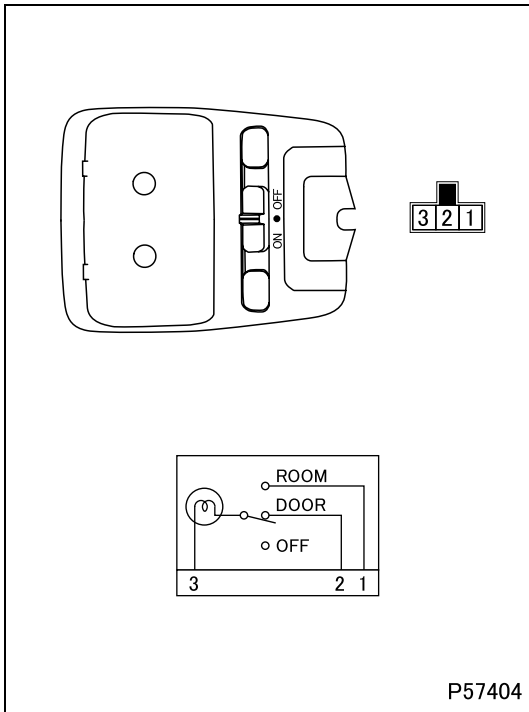
[Installation]

- Install in the direction as illustrated.



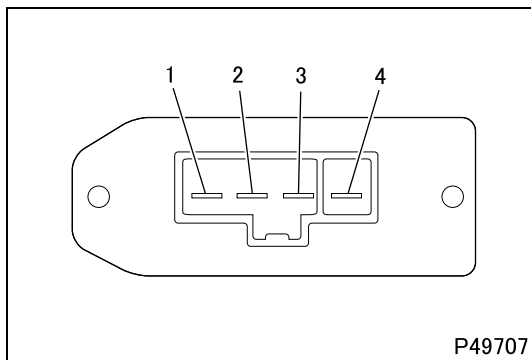
#618 Inspection of cab tilt buzzer

- Make sure that the buzzer sounds when battery voltage is applied between terminals 1 and 2.
- If any fault is found, replace the buzzer.



#656 Inspection of cab lamp

- If any fault is found, replace the lamp.

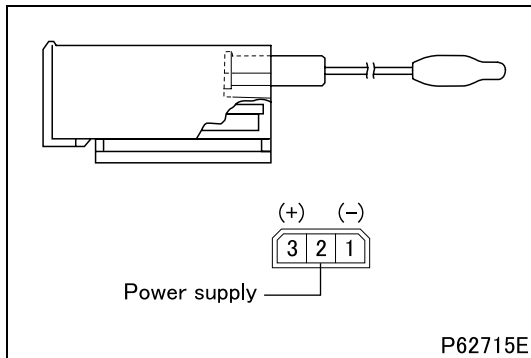


#750 Inspection of blower resistor

- Measure resistance values between each terminals.

Position	Terminal	Standard value
MEDIUM HIGH	1-4	0.24 Ω
MEDIUM LOW	3-4	0.93 Ω
LOW	2-4	1.5 Ω

- If the measured value deviates from the standard value, replace the blower resistor. (See Gr55.)

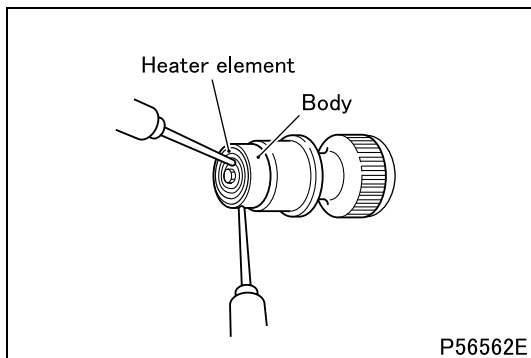


#751 Inspection of thermostat

- Measure resistance values between each terminals 1 and 3 at the specified temperature.

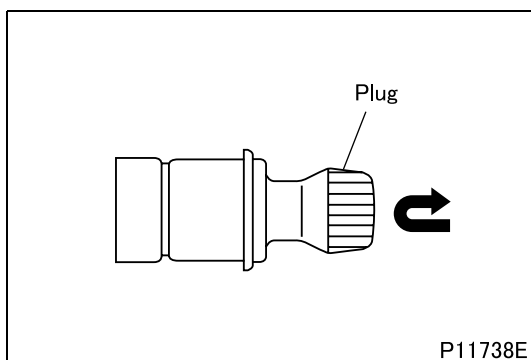
Switch position	Continuity terminal
OFF (4.2°C)	—
ON (5.2°C)	1-3

- If any fault is found, replace the thermostat. (See Gr55.)



#754 Inspection of cigarette lighter

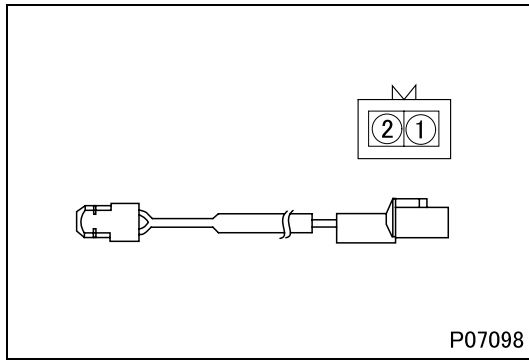
- Perform the following checks, and if any fault is found, replace the cigarette lighter. (See Gr52.)
- Make sure that there is continuity between heater element and body.



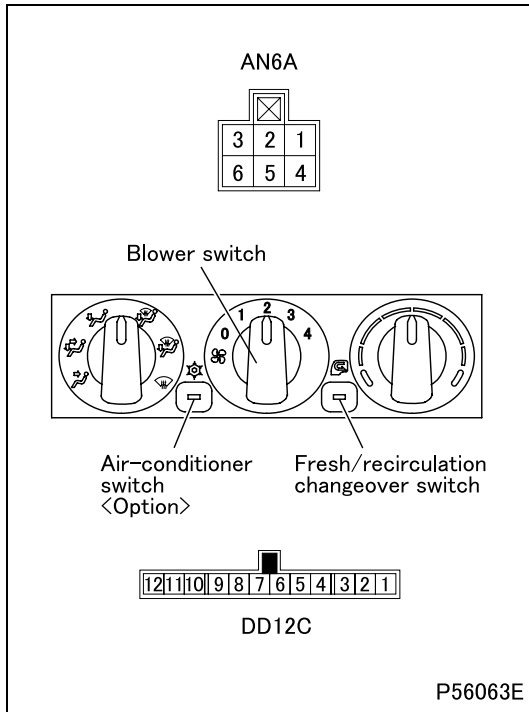
- Make sure that when plug is pushed in by hand, it immediately returns to its original position.
- Place the starter switch at ACC or ON position.
- Push plug into the socket in the cab.
- Measure the time required for plug to automatically return.

Standard value	15 $\pm$ 5 seconds
----------------	--------------------

- Check to see that heater element is red-hot.

**#759 Inspection of brake pad wear indicator**

- Make sure that there is continuity between terminals 1 and 2.
- If any fault is found, replace the brake pad wear indicator. (See Gr35A.)

**#763 Inspection of heater control panel**

- Perform the following checks, and if any fault is found, replace the heater control panel. (See Gr52.)

(1) Blower switch <AN6A connector>

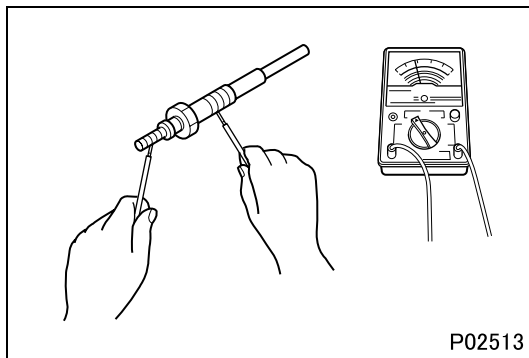
Switch position	Continuity terminal
0 : OFF	—
1 : LO (LOW)	4-5-6
2 : ML (MEDIUM LOW)	1-5-6
3 : MH (MEDIUM HIGH)	2-5-6
4 : HI (HIGH)	3-5-6

(2) Fresh/recirculation changeover switch <DD12C connector>

Switch position	Continuity terminal	Operation illumination	Night illumination
OFF : Fresh air	9-10	—	(+) 7-8 (-)
ON : recirculation air	10-11	(+) 12-10 (-)	

(3) Air-conditioner switch <DD12C connector>

Switch position	Continuity terminal	Operation illumination	Night illumination
OFF	—	—	(+) 7-8 (-)
ON	3-4-6	(+) 3-6 (-) (+) 4-6 (-)	

**#764 Inspection of glow plug**

- Measure resistance value of glow plug as shown.

Standard value (cold resistance of glow plug)	Approx. 1.0 Ω
---	---------------

- If the measured value deviates from the standard value, replace the glow plug. (See Gr11.)

DANGER ⚠

- Since flammable hydrogen gas is generated by the battery be sure to obey the following warnings:
 - Do not short-circuit the (+) and (-) terminals on the battery.
 - Keep sparks and lit cigarettes away from the battery.
 - Do not wear metal objects on your arms and lean over battery.
- Because the battery electrolyte is made of diluted sulfuric acid and is corrosive, when handling battery wear safety glasses and rubber gloves to protect the eyes and hands.

WARNING ⚠

- Make sure that you disconnect battery cable (-) first when you disconnect battery cables.

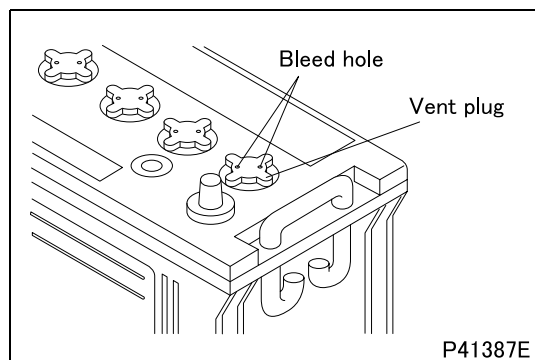
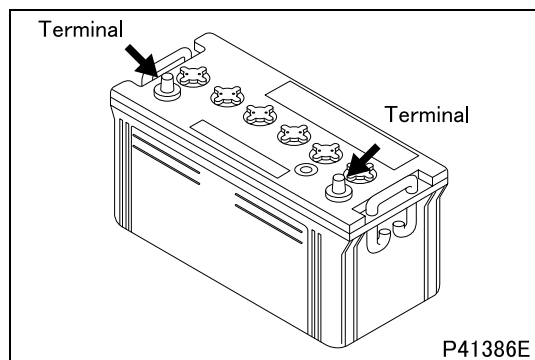
CAUTION ⚠

- Make sure that all electrical switches of the vehicle are OFF before connecting battery cables.
- Make sure that you connect battery cable (+) before you connect battery cable (-).
- To prevent a short-circuit be sure that disconnected battery cables do not accidentally touch the battery terminals.

Service standards

Location	Maintenance item	Standard value	Limit	Remedy
-	Specific gravity of battery electrolyte (20°C {68°F})	1.280	1.220	Charge or replace

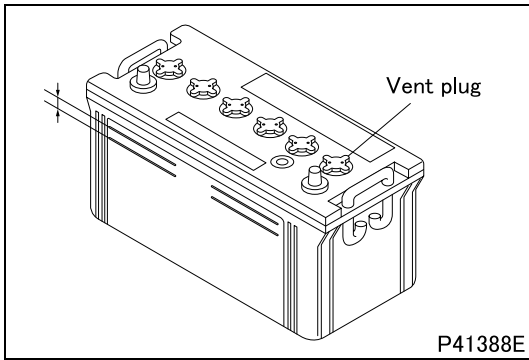
◆ Service procedure ◆



Inspection of battery

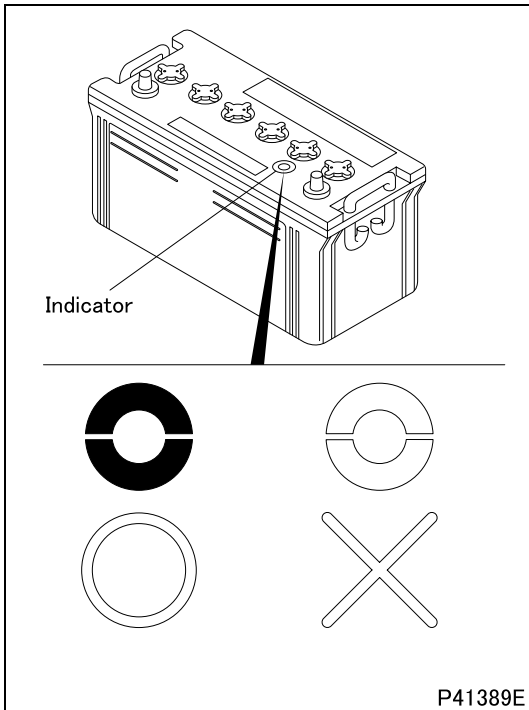
(1) Visual inspection

- If terminal is corroded, scrub off the corrosion from it using a wire brush.
 - If cracks or defects are found on battery, replace it since the cracks or defects can cause liquid spills.
-
- If bleed hole of vent plug is clogged, clean the hole.



(2) Inspection of fluid level

- Make sure that the battery electrolyte level is between UPPER and LOWER.
- If the level is below LOWER, remove vent plug and fill the battery with distilled water or battery replenisher to UPPER.



(3) Measurement of specific gravity

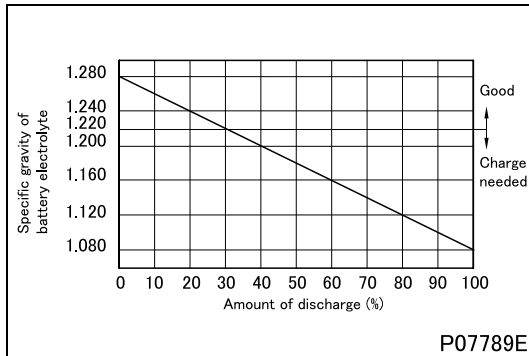
You can tell the specific gravity of the battery electrolyte by the color shown in indicator.

Blue : Good

White : Charge or replace

(4) Charging

- Although, as a rule, battery charging should be done with the battery removed from the vehicle, if you have to charge the battery while it is on the vehicle, make sure that you stop the engine and disconnect battery cable (–).
- Remove vent plug before charging the battery.
- For the recommended charge time and current, see the following table to avoid overcharging.



	Charge current (A)	Charge time (H)	Upper limit of fluid temperature (°C {°F})
Normal charge	Value of 5-hour rating capacity 10	$\frac{\text{*Amount of discharge (Ah)}}{\text{Charge current (A)}} \times 1.2$ (to 1.5)	45 {113}
Quick charge	Value of 5-hour rating capacity 1.5	0.5	55 {131}

$$\text{* Amount of discharge (Ah)} = \frac{\text{5-hour rating capacity (Ah)} \times \frac{\text{Amount of discharge (\%)}}{100}}{100}$$

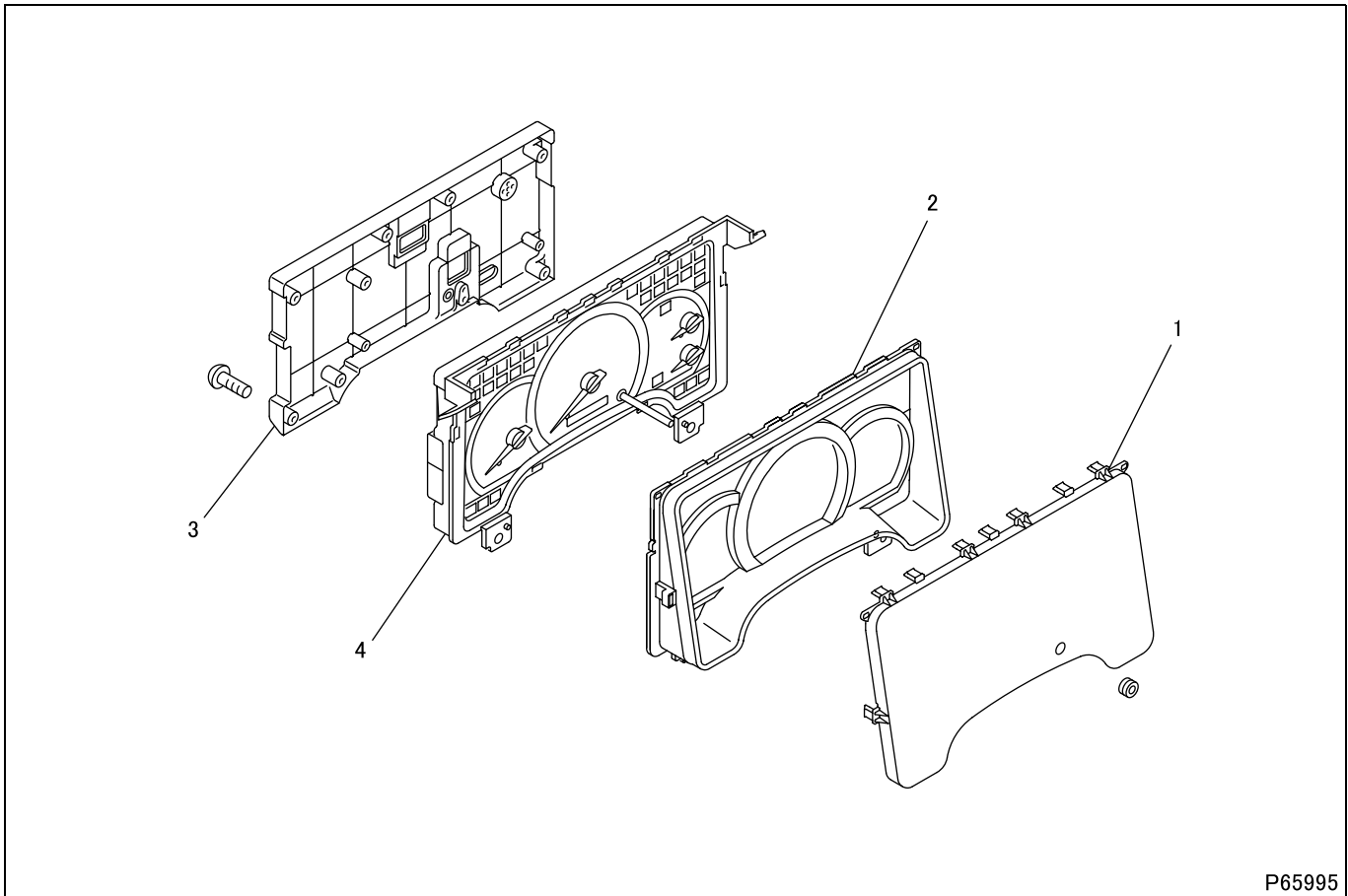
- Use the graph shown on the left to calculate the amount of discharge (%).
- Use diluted sulfuric acid, made up of sulfuric acid and refined or distilled water, as the battery electrolyte.

DANGER ⚠

- Keep naked light away from the battery while charging to prevent explosion.
- It is dangerous to generate sparks while charging the battery.
- Do not charge battery if the electrolyte level is below LOWER LEVEL, since it can cause early deterioration, heating, or explosion. Make sure to add the fluid to the specified level before charging.

WARNING ⚠

- Do not let the battery electrolyte level rise and overflow while charging the battery.
- After charging the battery, tighten vent plug, wash away sulfuric acid from the battery using water, and dry the surface.



● Disassembly sequence

- 1 Meter glass
- 2 Plate
- 3 Cover
- 4 Body

● Assembly sequence

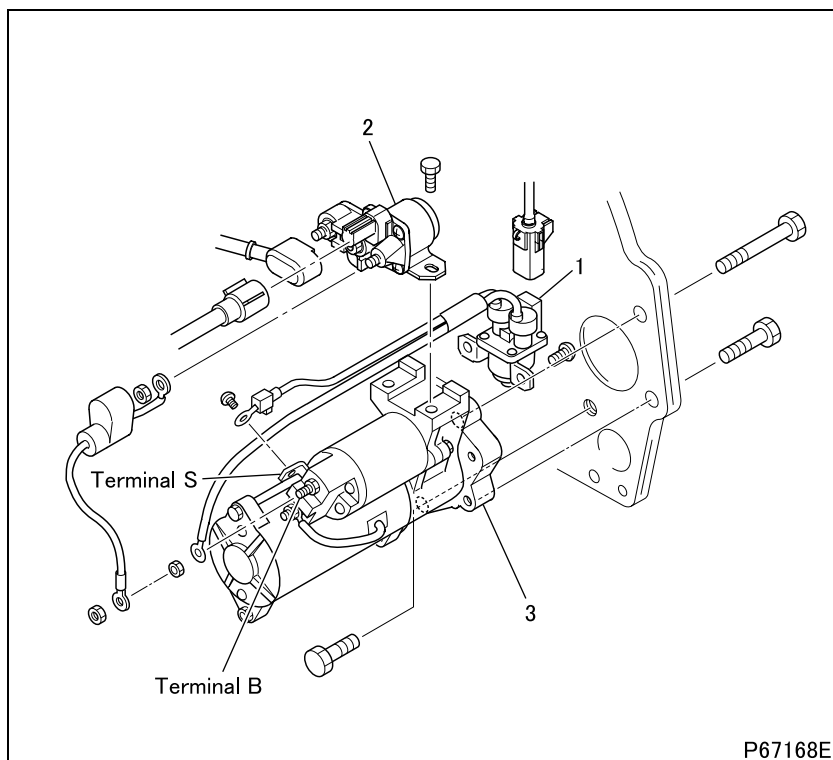
Follow the disassembly sequence in reverse.

◆ Inspection procedure ◆

■ Inspection: Meters

- Each sensor signal is converted into digital signal in the meter cluster and then the value is indicated by the corresponding meter on the cluster. Therefore, a single meter inspection cannot be performed. Each meter should be checked indirectly by checking its related harnesses and parts.
- If the related harnesses and parts are normal but the meter indication is faulty, replace the meter cluster.

54-12 STARTER AND ALTERNATOR



● Removal sequence

- 1 Starter relay
- 2 Glow relay
- 3 Starter

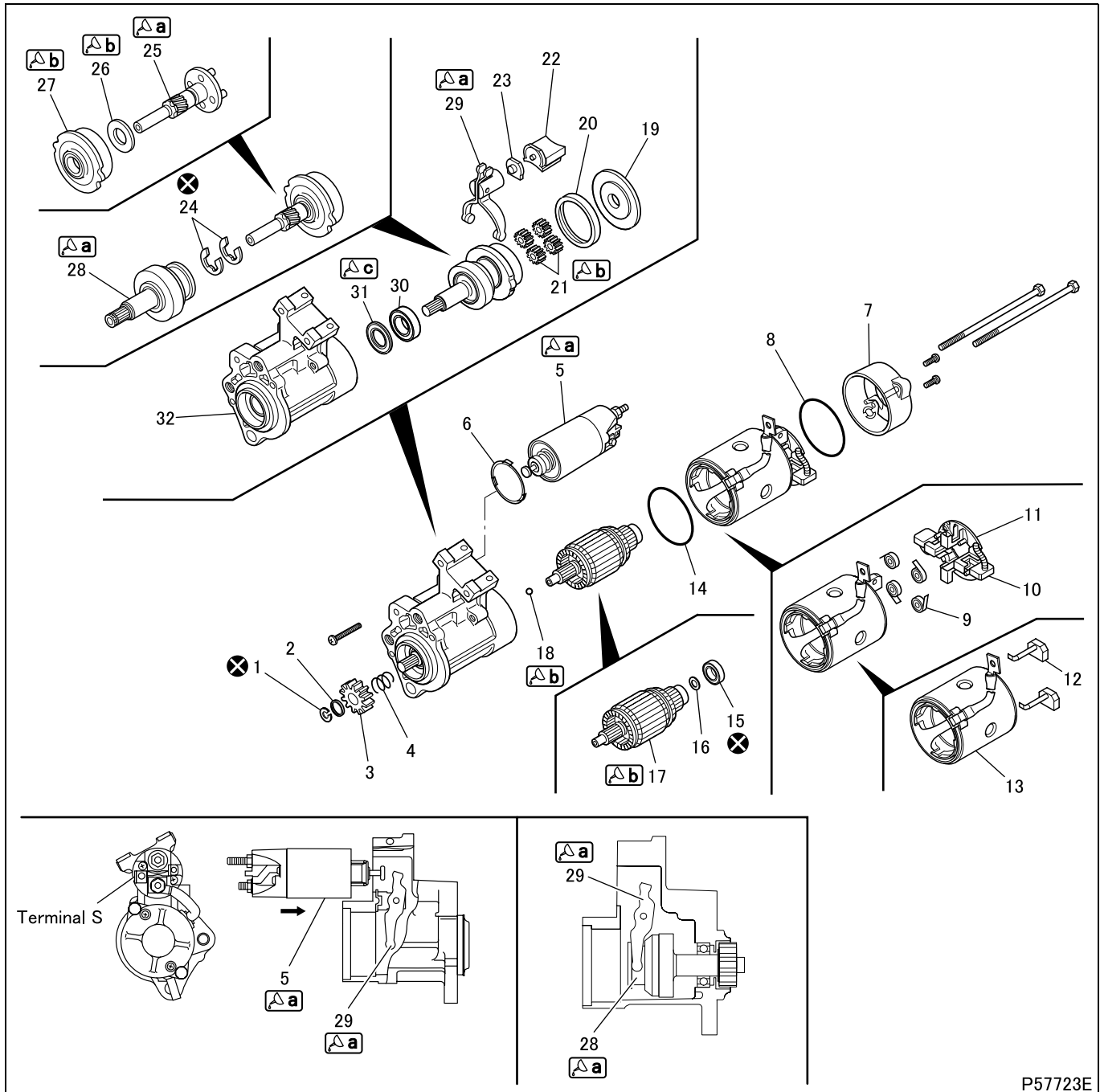
WARNING ⚠

- Before removing the starter, disconnect the (-) battery cable and insulate the cable and the (-) battery terminal with tape.
- It is dangerous to leave the (-) battery cable connected since the battery cable voltage is always present at terminal B.

● Installation sequence

Follow the removal sequence in reverse.

M E M O



P57723E

● Disassembly sequence

- | | | |
|-------------------|-------------------|-----------------------|
| 1 Stopper ring | 13 Yoke | 25 Gear shaft |
| 2 Pinion stopper | 14 Packing | 26 Washer |
| 3 Pinion | 15 Rear bearing | 27 Internal gear |
| 4 Spring | 16 Washer | 28 Overrunning clutch |
| 5 Magnetic switch | 17 Armature | 29 Lever |
| 6 Shim | 18 Ball | 30 Front bearing |
| 7 Rear bracket | 19 Cover | 31 Oil seal |
| 8 Packing | 20 Rubber packing | 32 Front bracket |
| 9 Brush spring | 21 Planetary gear | |
| 10 Brush (-) | 22 Rubber packing | |
| 11 Brush holder | 23 Plate | |
| 12 Brush (+) | 24 E-ring | |

⊗: Non-reusable parts

CAUTION ⚠

- Do not remove the rear bearing unless defects are evident.
- When the armature is removed, the ball may come out with it. Take care not to lose the ball.
- It is not necessary to remove the pinion when only the motor section needs to be disassembled for inspection, like when inspecting brushes and related parts.
- Be sure to remove the pinion before disassembling any other parts.

● Assembly sequence

Follow the disassembly sequence in reverse.

CAUTION ⚠

- Whenever the magnetic switch is replaced, the pinion gap must be adjusted.

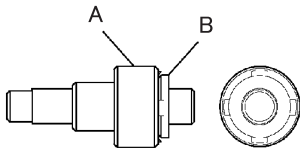
Service standards (Unit: mm {in.})

Location	Maintenance item			Standard value	Limit	Remedy
–	Pinion gap			0.5 to 2.0 {0.02 to 0.079}	–	Adjust
–	No-load characteristics	With 11 V applied	Current	180 A or less	–	Inspect
			Rotation speed	3800 rpm or higher	–	
9	Brush spring pressure			29.2 to 39.4 N {6.6 to 8.9 lbs, 3 to 4 kgf}	13.7 N {3.1 lbs, 1.4 kgf}	Replace
10, 12	Brush length			18 {0.71}	11 {0.43}	Replace
17	Commutator outside diameter			32 {1.26}	31.4 {1.24}	Replace
	Runout of commutator periphery			–	0.1 {0.0039} or higher	
	Mold depth between segments			–	0.2 {0.0079} or less	Correct or replace

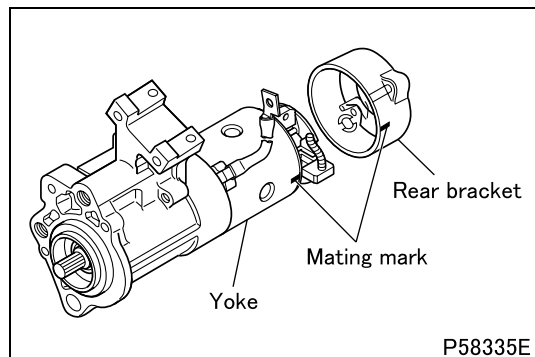
Lubricant and/or sealant

Mark	Points of application	Specified lubricant and/or sealant	Quantity
	Lever contact surface of magnetic switch	Multipurpose grease [NLGI No. 2 (Li soap)]	As required
	Sliding surfaces of gear shaft and overrunning clutch		
	Splines of overrunning clutch		
	Sliding surfaces of lever and overrunning clutch		
	Sliding surfaces of armature and gear shaft	Molykote AG650	As required
	Ball		
	Teeth of planetary gear and internal gear		
	Washer		
	Oil seal	Multipurpose grease [NLGI No.2 (Li soap)] or grease attached to oil seal	As required

Special tools

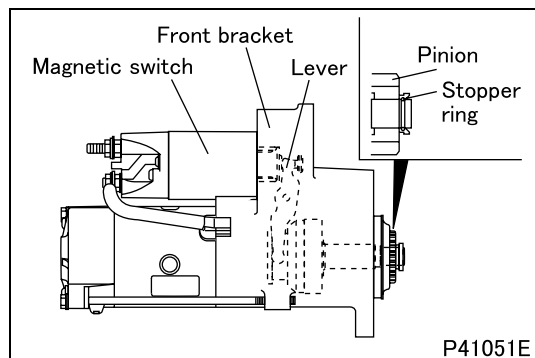
Mark	Tool name and shape	Part No.	Application
	Bearing remover and installer  A: Bearing remover and installer B: Bearing installer P50804	MH063596 A: MH063614 B: MH063618	Removal and installation of front bearing

◆ Work before disassembly ◆



■ Mating mark: Rear bracket and yoke

◆ Disassembly procedure ◆



■ Disassembly: Pinion

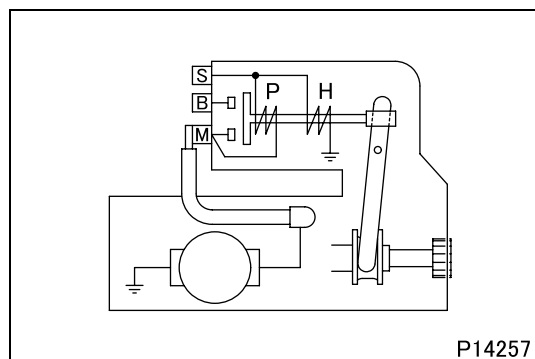
- For removal of the pinion, current must be supplied to the starter such that the pinion springs out.

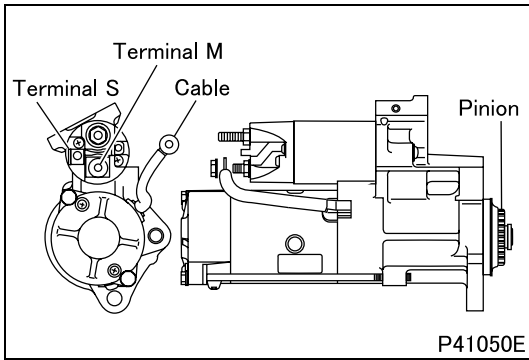
WARNING ⚠

- When the starter is energized, the pinion will spring out and rotate. Be careful not to touch it with your hands.
- The magnetic switch may become very hot during inspections. Be careful when touching it.

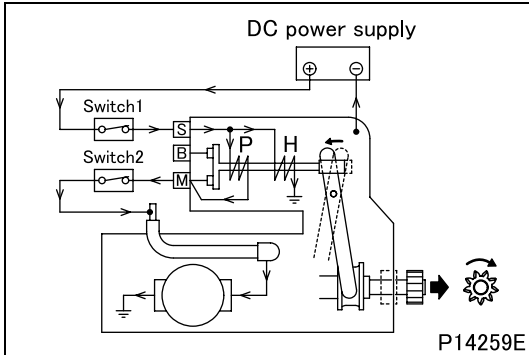
CAUTION ⚠

- Do not energize the pull-in coil P for longer than 10 seconds, and do not energize the holding coil H for longer than 30 seconds. If these periods are exceeded, the coils may overheat and burn out.
- To make the pinion spring out, be sure to energize the starter such that its parts are positioned correctly. If the starter is not energized and the lever is pulled to make the pinion come out, the front bracket and/or lever may be damaged by the shock inflicted upon them when the stopper ring is removed.
- When current is supplied to the starter, a large current (100 A or higher) will flow. For inspection purposes, use booster cables or similarly thick cables. It is also important to ensure that all connections are secure.

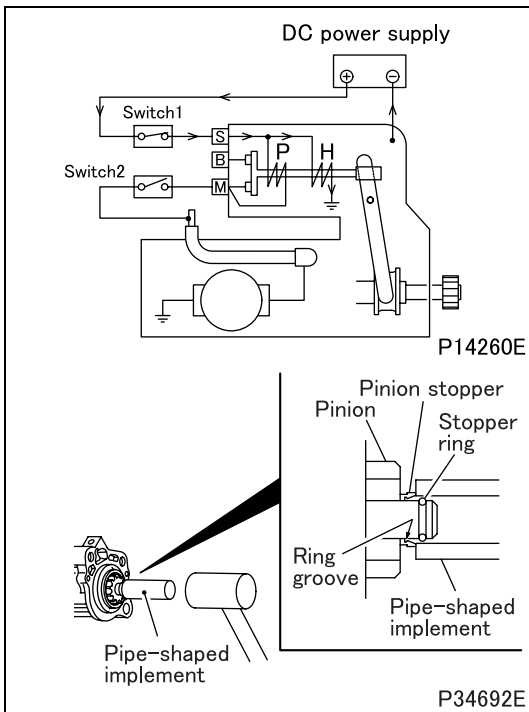




- Connect the starter as illustrated.



- The following operations are performed with current supplied to the starter. Thus, the entire procedure for removal of the pinion must be completed within 30 seconds.
- Turn ON switches 1 and 2 to supply current to the starter. The pinion will spring out and rotate.



- After the pinion starts to rotate, quickly (within five seconds) turn OFF switch 2 to stop the pinion's rotation.

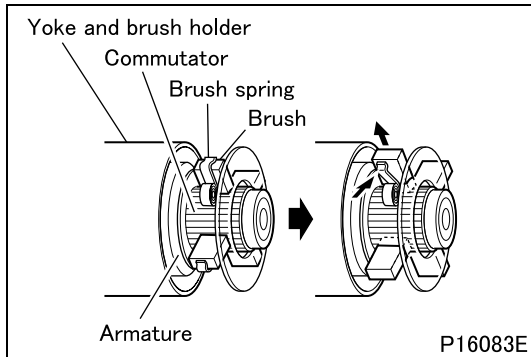
CAUTION

- When switches 1 and 2 are turned ON, the pull-in coil P and holding coil H are both energized. The circuit is connected such that no voltage is applied to starter terminal B, so current flows to the pull-in coil while the pinion rotates. To prevent the pull-in coil from burning out, it is essential to turn OFF switch 2 quickly (within five seconds) after the pinion starts to rotate.

- Apply a pipe-shaped implement to the pinion stopper.
- Using a hammer, lightly tap the pipe-shaped implement to remove the stopper ring from the ring groove of the pinion stopper.
- Remove the stopper ring and pinion.
- Turn OFF switch 1 to de-energize the starter.

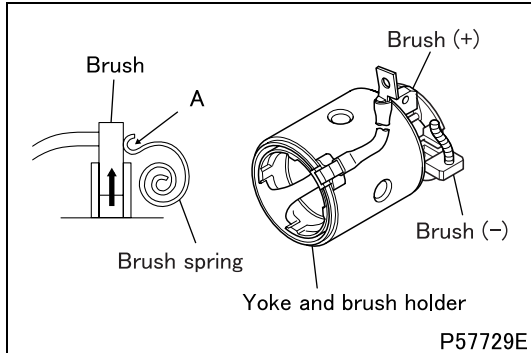
CAUTION

- When the starter is de-energized, the mechanism will attempt to pull in the pinion. Thus, the stopper ring may slip back into the ring groove of the pinion stopper. If this happens, energize the starter and go through the pinion removal procedure again.

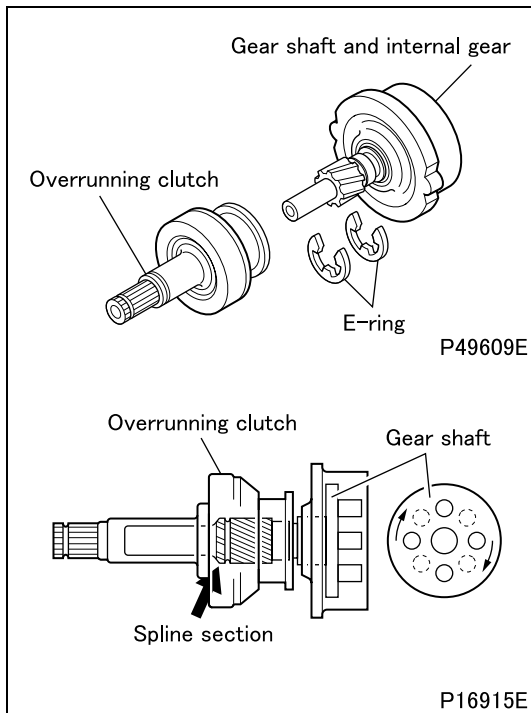


■ Disassembly: Yoke and brush holder

- Use the following method to remove the yoke and brush holder in order to prevent the commutator of the armature from being damaged by the brushes.
- Lift the brushes away from the commutator and hold them lifted by applying the brush springs against the sides of the brush springs.

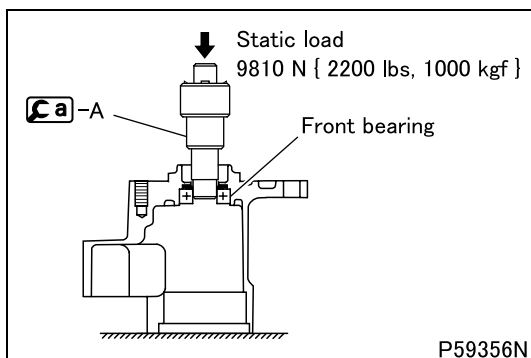


- Pull part A of each brush spring and pull up the brushes.
- Hold the brushes in position with the brush springs as illustrated.
- Remove the yoke and brush holder.



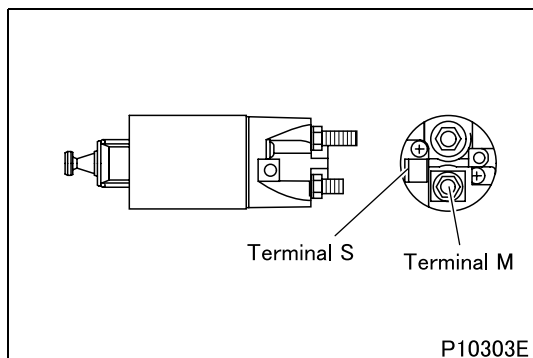
■ Disassembly: Gear shaft and internal gear

- Remove the E-rings and then the gear shaft and internal gear from the overrunning clutch. Proceed as follows if the gear shaft cannot be removed due to interference of the splined section of gear shaft with internal parts of the overrunning clutch.
- Press the gear shaft against the overrunning clutch.
- Turn the gear shaft approx. 1/8 of a turn to change the position of splined section.



■ Disassembly: Front bearing

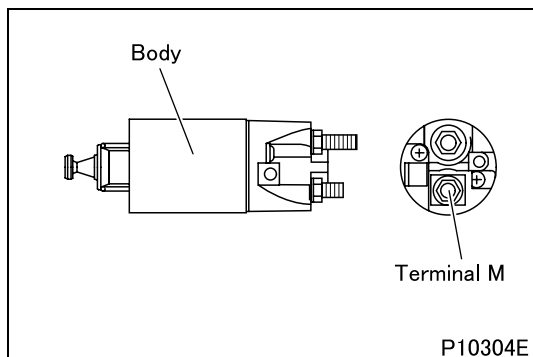
◆ Inspection procedure ◆



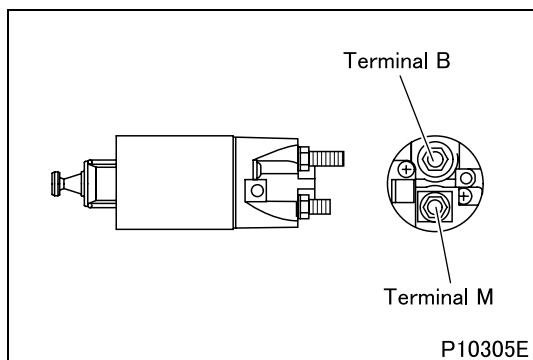
■ Inspection: Magnetic switch

(1) Test for coil open circuit

- Check that continuity exists between terminals S and M.

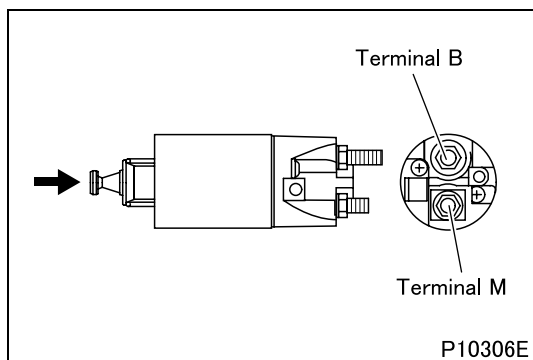


- Check that continuity exists between terminal M and the body.



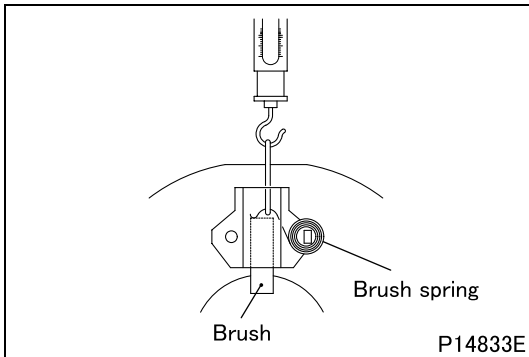
(2) Test for fused-together contacts

- Check that continuity does not exist between terminals B and M.



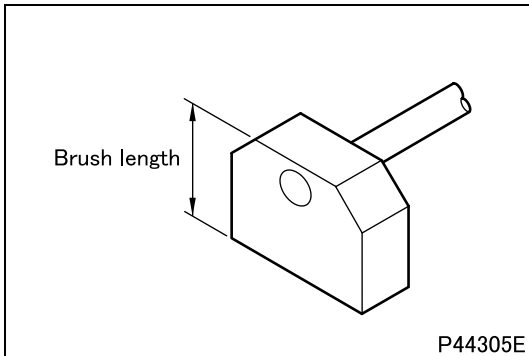
(3) Test for contact-to-contact continuity

- Push in the end of the magnetic switch to close the internal contacts. Then, check that continuity exists between terminals B and M.



■ Inspection: Brush spring

- Using new brushes, measure the load required to separate each brush spring from its brush.
- If either measurement is lower than the specified limit, replace the brush springs.



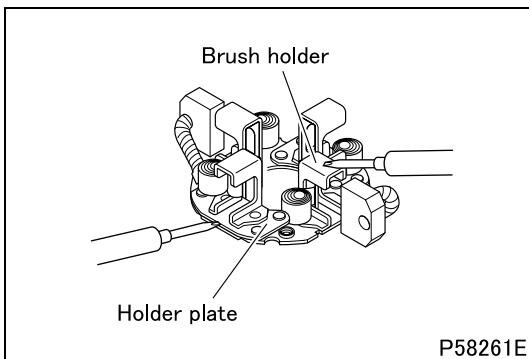
■ Inspection: Brush (-)

(1) Brush length

- If either brush (-) is shorter than the limit, it must be replaced.

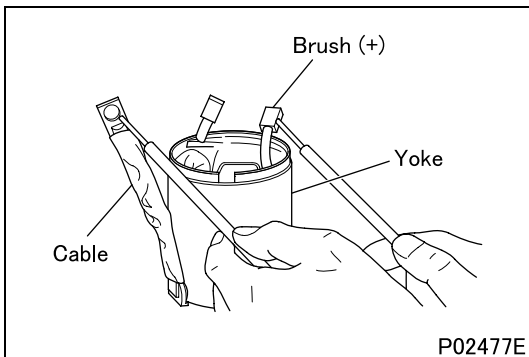
(2) Commutator contact surface of brush

- If the commutator contact surface of either brush is rough or unevenly worn, rectify it with emery paper (#300 to 500).



■ Inspection: Brush holder

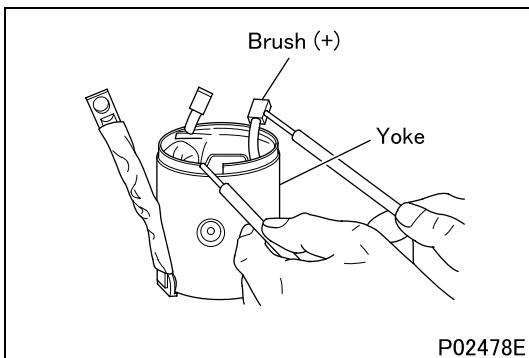
- Thoroughly clean the (+) brush holder and the (-) holder plate, then, check that continuity does not exist between them.
- If continuity exists, there is a short circuit and the brush holder must be replaced.



■ Inspection: Yoke

(1) Test for coil open circuit

- Check that continuity exists between the cable and the (+) brush.
- If there is no continuity, there is an open circuit and the yoke or (+) brush must be replaced.

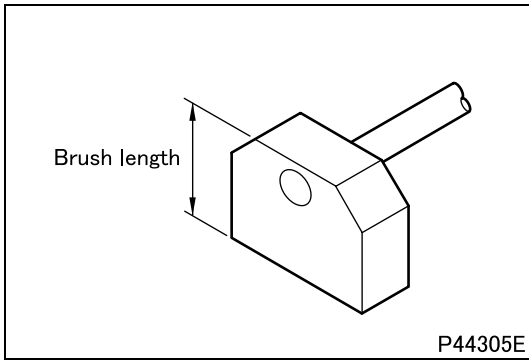


(2) Test for coil grounding

- Check that continuity does not exist between the yoke and the (+) brush.
- If continuity exists, the coil is grounded. Inspect the insulation, and replace the yoke and the (+) brush if the insulation cannot be rectified.

CAUTION ⚠

- The coil may be grounded to the yoke due to the accumulation of worn-off metal particles from the brushes and/or armature.



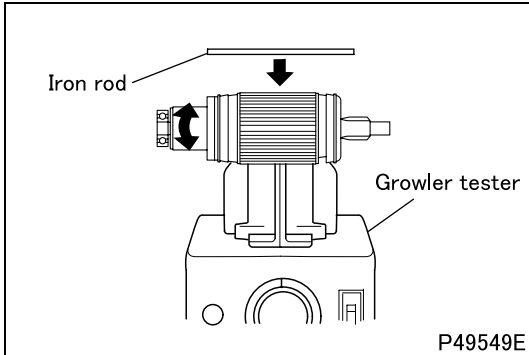
■ Inspection: Brush (+)

(1) Brush length

- If either brush (+) is shorter than the limit, it must be replaced.

(2) Commutator contact surface of brush

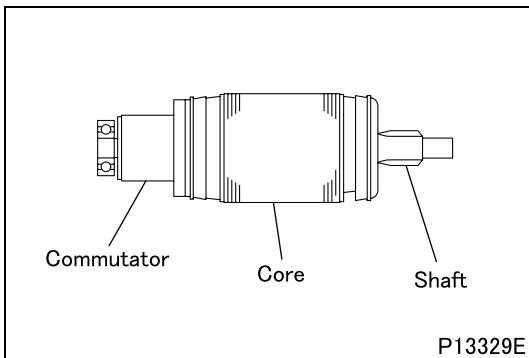
- If the commutator contact surface of either brush is rough or unevenly worn, rectify it with emery paper (#300 to 500).



■ Inspection: Armature

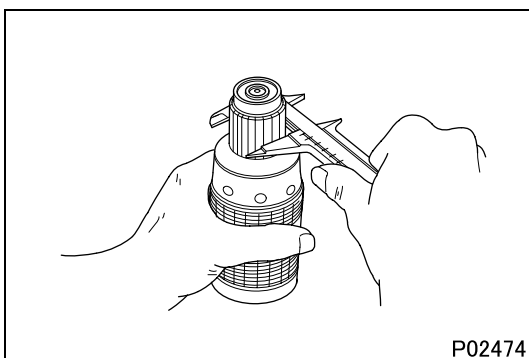
(1) Test for coil short circuit

- Hold an iron rod parallel with the armature.
- Slowly rotate the armature by hand.
- If the iron rod vibrates or is pulled toward the armature, the coil is short-circuited and the armature must be replaced.



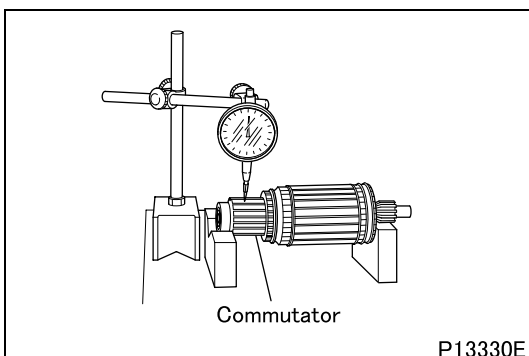
(2) Test for coil grounding

- Check that continuity does not exist between the commutator and the core (or shaft).
- If continuity exists, the coil is grounded and the armature must be replaced.



(3) Commutator outside diameter

- If the measurement is out of specification, replace the armature.

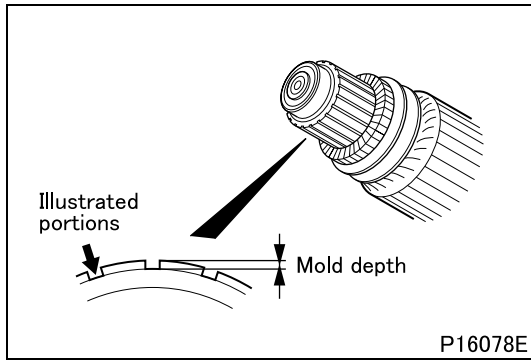


(4) Runout of commutator periphery

- If the reading exceeds the specified limit, rectify the commutator of the armature, making sure the outside diameter stays within specification.

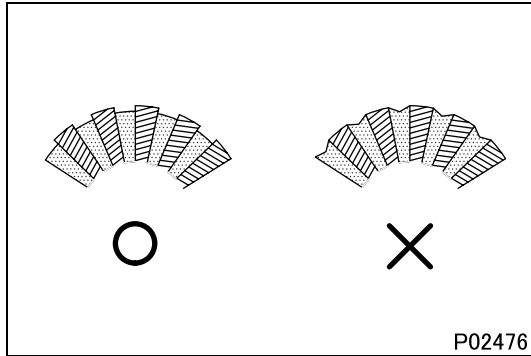
(5) Condition of commutator surface

- If the surface is rough or has stepped wear, rectify it with emery paper (#300 to 500).
- After rectifying the surface, check the extent of commutator runout.



(6) Mold depth between segments

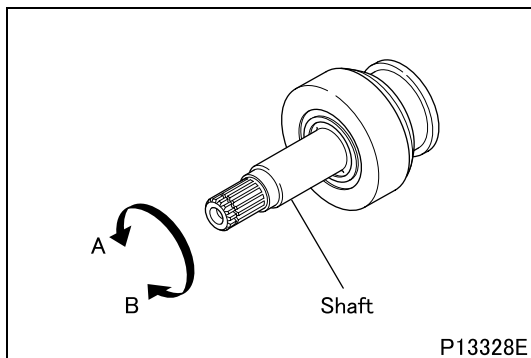
- If the measurement is lower than the specified limit, rectify or replace the armature.
- To rectify the armature, grind the illustrated portions.



- If the mold is worn as illustrated, rectify or replace the armature.

O : Acceptable

× : Unacceptable

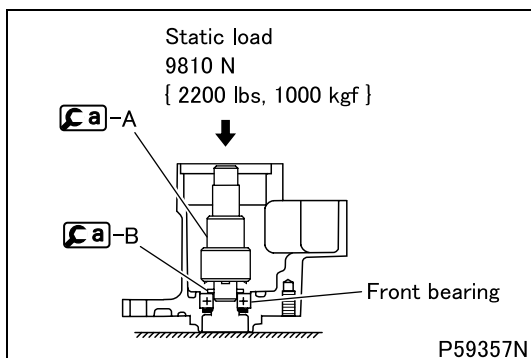


■ Inspection: Overrunning clutch

If the following inspections reveal any abnormality, replace the overrunning clutch.

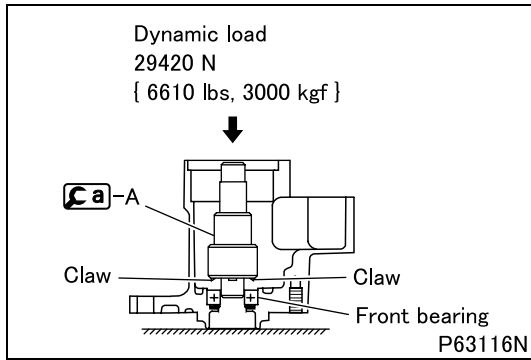
- Turn the shaft in direction B and check that it rotates smoothly.
- Turn the shaft in direction A and check that it locks.

◆ Assembly procedure ◆



■ Assembly: Front bearing

- Press-fit the front bearing using -A and -B.



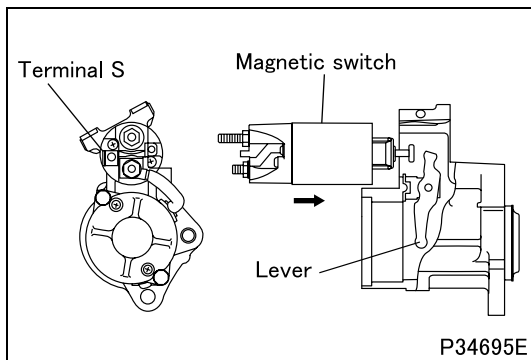
- After the press fitting, caulk the front bearing using the claw on **Ca**-A.

CAUTION

- Avoid re-caulking previously caulked points.

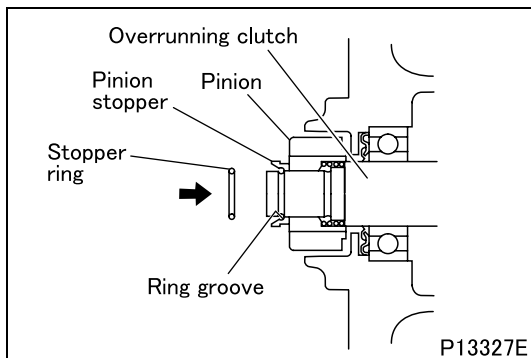
■ Assembly: Yoke and brush holder

- To install the yoke and brush holder, follow the removal sequence in reverse.
(See “■ Disassembly: Yoke and brush holder”.)



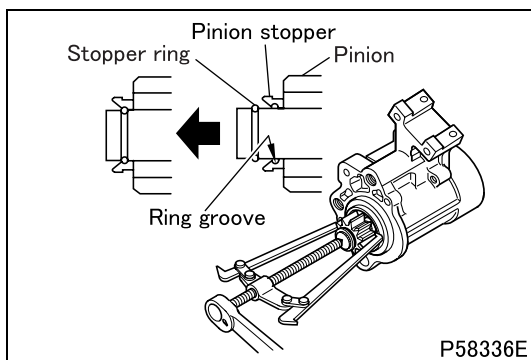
■ Assembly: Magnetic switch

- Fit the magnetic switch onto the lever with terminal S aligned as illustrated.



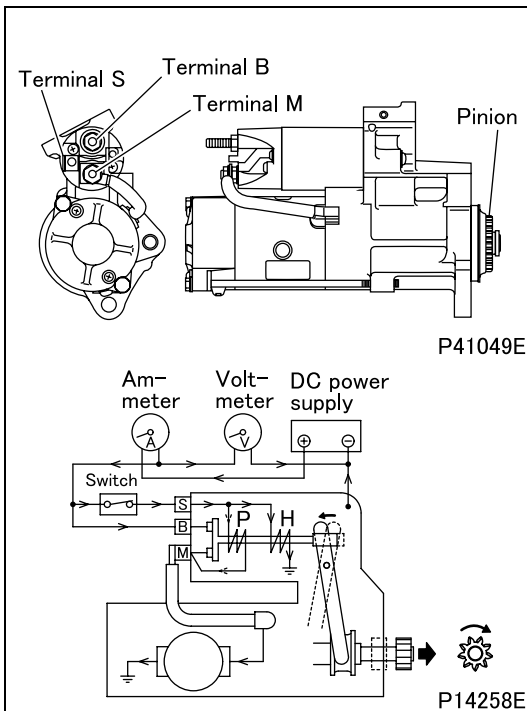
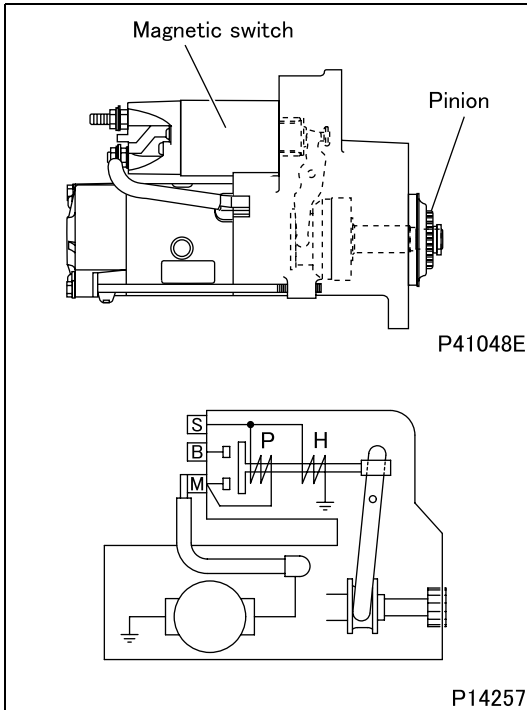
■ Assembly: Pinion

- For installation of the pinion, it is not necessary to supply current to the starter.
 - Fit the pinion stopper and pinion onto the overrunning clutch, making sure they are oriented as illustrated.
 - Fit the stopper ring into the ring groove of the overrunning clutch.



- Pull the pinion hard and securely fit the stopper ring into the ring groove of the pinion stopper.

◆ Inspection after assembly ◆



■ Inspection: Performance and pinion gap

- After assembling the starter, perform inspections with current supplied to it.

WARNING ⚠

- When the starter is energized, the pinion will spring out and rotate. Be careful not to touch it with your hands.
- The magnetic switch may become very hot during inspections. Be careful when touching it.

CAUTION ⚠

- Do not energize the pull-in coil P for longer than 10 seconds, and do not energize the holding coil H for longer than 30 seconds. If these periods are exceeded, the coils may overheat and burn out.
- When current is supplied to the starter, a large current (100 A or higher) will flow. For inspection purposes, booster cables or similarly thick cables must therefore be used. It is also important to ensure that all connections are secure.

(1) Performance test

- Connect the starter as illustrated.
- Set the voltage to 11 volts DC.

CAUTION ⚠

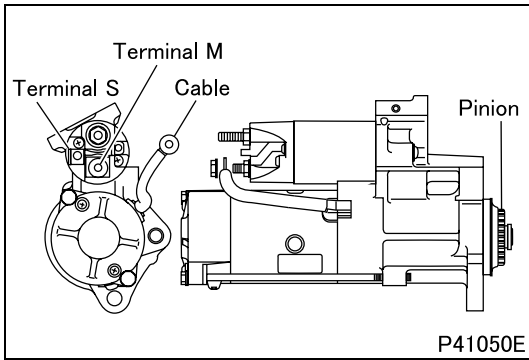
- The voltage applied must not exceed 12 V.

- The following operations are performed with current supplied to the starter. Thus, the entire test (consisting of measurement of the current flowing through the starter and measurement of the starter's rotational speed) must be completed within 30 seconds.
 - Turn ON the switch to supply current to the starter. The pinion will spring out and rotate.

CAUTION ⚠

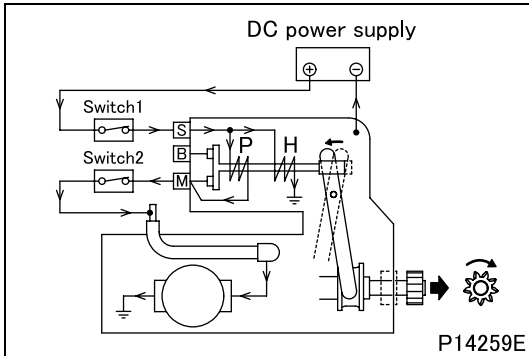
- When the switch is turned ON, the pull-in coil P and holding coil H are both energized. When the large current from the DC power supply flows from terminal B to terminal M, the supply of current to the pull-in coil P is cut; only the holding coil H remains energized. To prevent the holding coil from burning out, it is essential to complete all operations within 30 seconds.

- Measure the current and the starter's rotational speed. To measure the rotational speed, shine a stroboscope on the pinion.
- Turn OFF the switch to de-energize the starter.
- If either measurement is out of specification, disassemble and inspect the starter again.

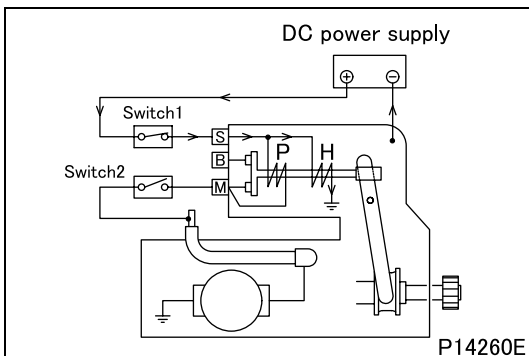


(2) Pinion gap

- Connect the starter as illustrated.



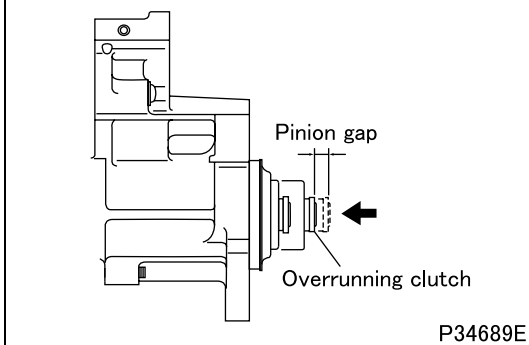
- The following operations are performed with current supplied to the starter. Thus, the entire procedure for measurement of the pinion gap must be completed within 30 seconds.
- Turn ON switches 1 and 2 to supply current to the starter. The pinion will spring out and rotate.



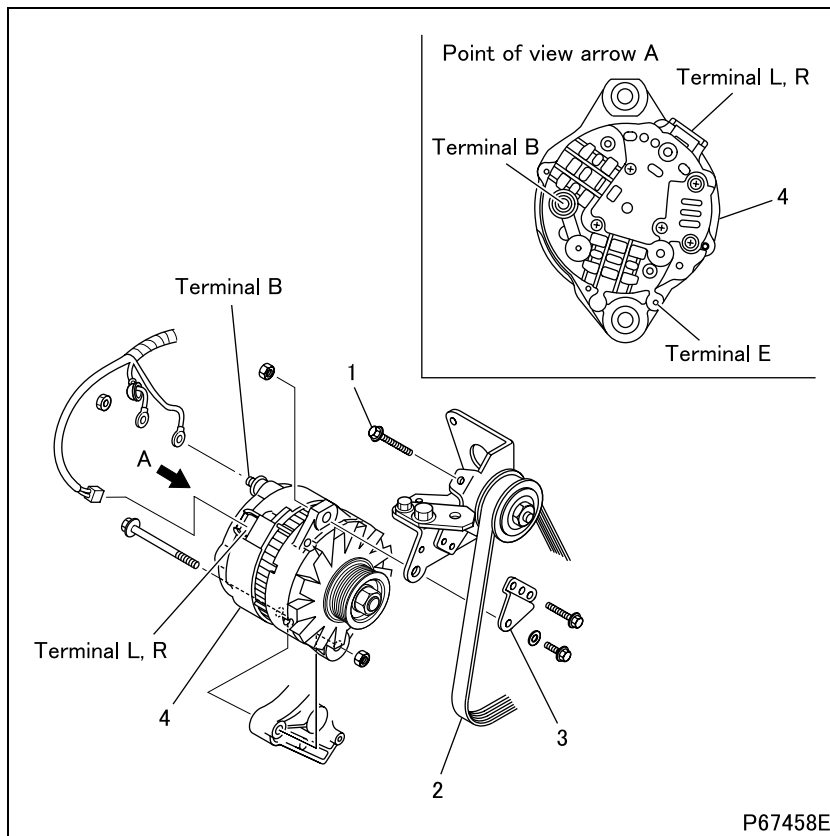
- After the pinion starts to rotate, quickly (within five seconds) turn OFF switch 2 to stop the pinion's rotation.

CAUTION ⚠

- When switches 1 and 2 are turned ON, the pull-in coil P and holding coil H are both energized. The circuit is connected such that no voltage is applied to starter terminal B, so current flows to the pull-in coil while the pinion rotates. To prevent the pull-in coil from burning out, it is essential to turn OFF switch 2 quickly (within five seconds) after the pinion starts to rotate.



- Pull out the end of the overrunning clutch and then lightly push in the end of the overrunning clutch and measure the amount of movement in the axial direction, i.e., the pinion gap.
- Turn OFF switch 1 to de-energize the starter.
- If the measurement is out of specification, replace the lever.



● Removal sequence

- 1 Adjusting bolt
- 2 V-belt
- 3 Alternator stay
- 4 Alternator

WARNING ⚠

- Before removing the alternator, disconnect the (–) battery cable and insulate the cable and the (–) battery terminal with tape.
- It is dangerous to leave the (–) battery cable connected since the battery cable voltage is always present at terminal B.

● Installation sequence

Follow the removal sequence in reverse.

CAUTION ⚠

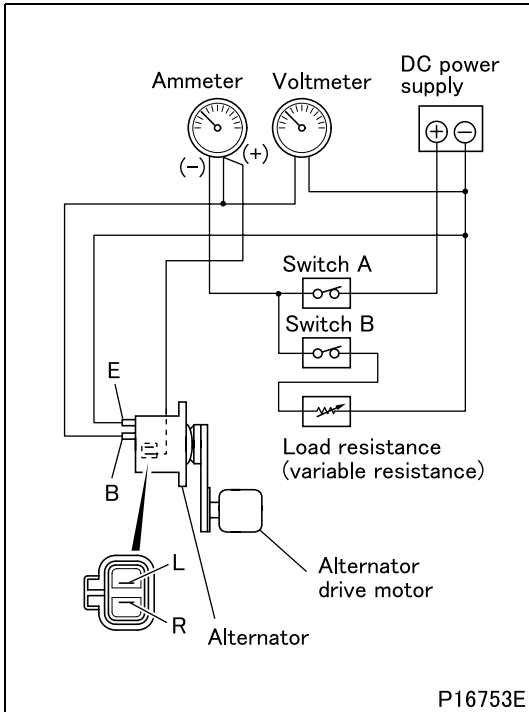
- Be sure to adjust the V-belt tension. (See Gr14)

Service standards

Location	Maintenance item		Standard value	Limit	Remedy
4	Alternator output current (*when alternator is hot and producing 13.5 V)	At 1500 rpm	51.5 A or more	–	Inspect
		At 2500 rpm	82.5 A or more	–	
		At 5000 rpm	104 A or more	–	
	Adjustment voltage of regulator (at 5000 rpm, 5A is loaded)		14.7 ± 0.3 V	–	Replace

- * The hot condition is that which occurs after the alternator has been running at normal ambient temperature with 5000 rpm and maximum output for 30 minutes.

◆ Inspection procedure ◆



■ Inspection: Alternator

(1) Alternator output current (Bench test)

- Connect the alternator as illustrated.

CAUTION ⚠

- Wires with sufficient thickness should be used for wiring and each connection should be securely fastened.

B: Terminal B

E: Terminal E

L: Terminal L

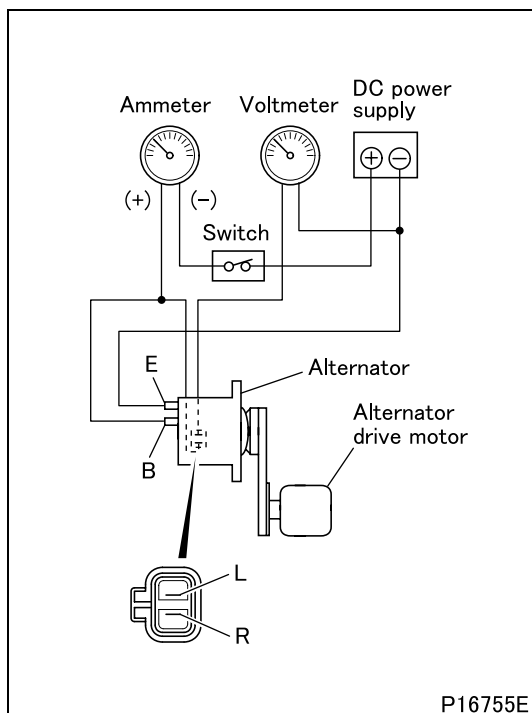
R: Terminal R

- Increase load resistance to the maximum (condition under which the load current hardly flows).
- Turn switch A and B ON.
- Run alternator at 5000 rpm for 30 minutes by adjusting load resistance so that electric current can conform to the specified standard.

Alternator nominal current

Current
104 A or more

- Measure the current at each specified revolution of alternator.
- If the measured value is lower than the standard value, disassemble and check alternator.



(2) Adjustment voltage of regulator (Bench test)

- Connect the alternator as illustrated.

B: Terminal B

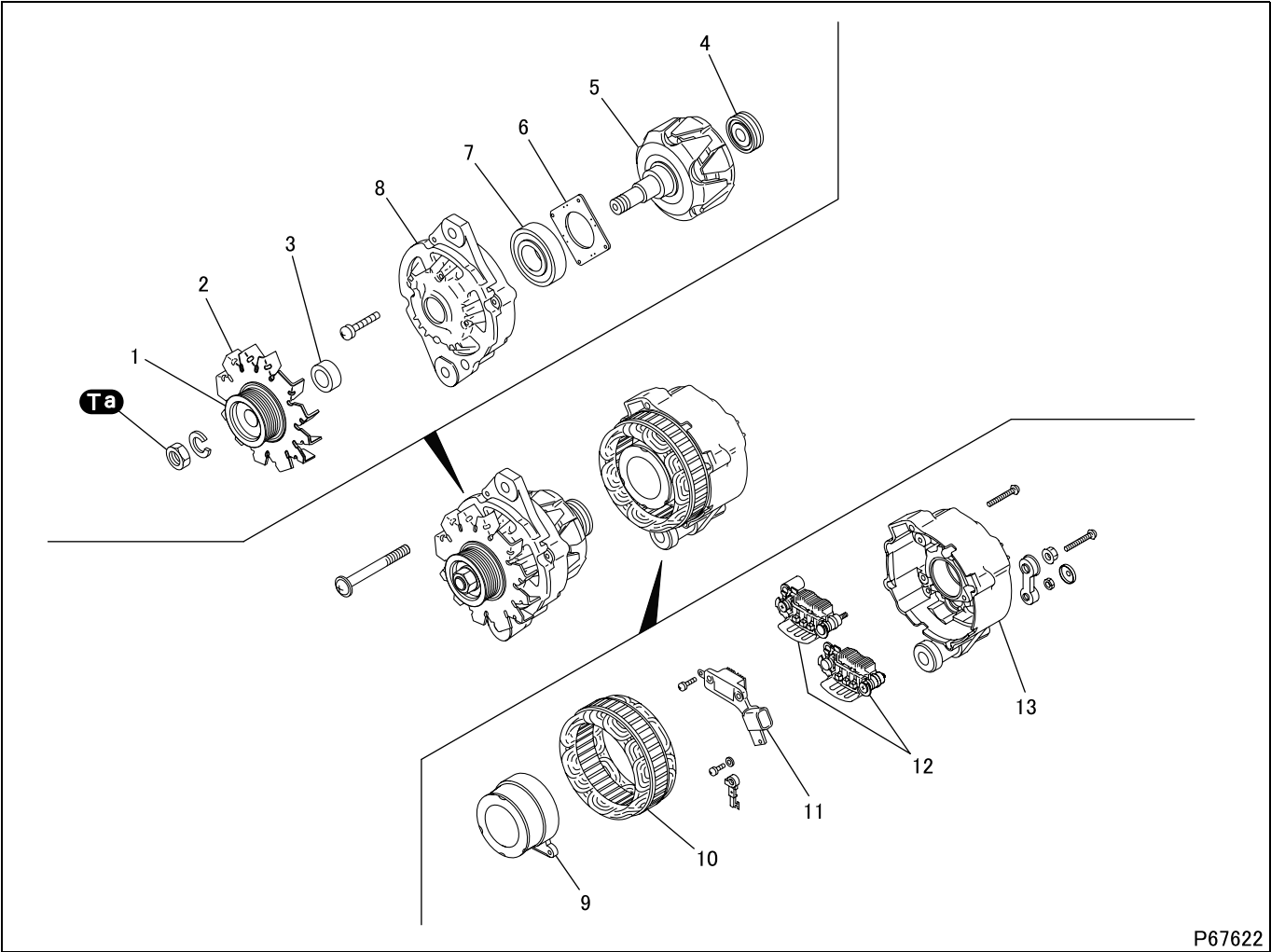
E: Terminal E

L: Terminal L

R: Terminal R

- Turn switch ON.
- Run alternator at low speeds.
- Increase the speed of alternator to 5000 rpm and measure the voltage (adjustment voltage) at this speed. At the same time, make sure that the current is 10 amperes or less at 5000 rpm.
- If the measured value deviates from the standard value, do as follows:
 - If higher than the standard value: Replace the regulator.
 - If lower than the standard value: Inspect the alternator related parts before replacing the regulator.

M E M O



P67622

● Disassembly sequence

- | | |
|-----------------|-----------------|
| 1 Pulley | 8 Front bracket |
| 2 Fan | 9 Field coil |
| 3 Spacer | 10 Stator |
| 4 Rear bearing | 11 Regulator |
| 5 Rotor | 12 Rectifier |
| 6 Cover | 13 Rear bracket |
| 7 Front bearing | |

NOTE

- Do not remove the rear and front bearing, stator unless faulty.

● Assembly sequence

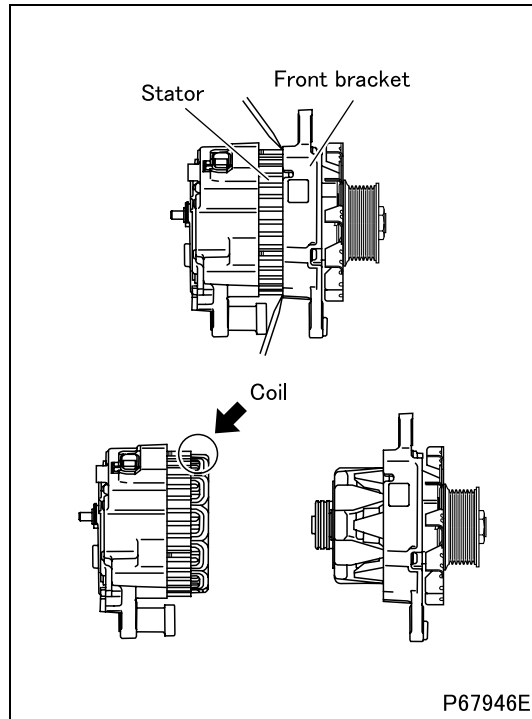
Follow the disassembly sequence in reverse.

Tightening torque (Unit: N·m {ft. lbs, kgf·m})

Mark	Parts to be tightened	Tightening torque	Remarks
Ta	Nut (Pulley mounting)	132 to 162 {97 to 120, 13 to 17}	—

Service standards

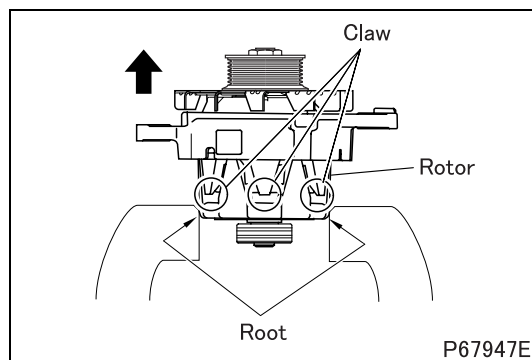
Location	Maintenance item	Standard value	Limit	Remedy
9	Field coil resistance (at 20°C {68°F})	1.9 to 2.3 Ω	–	Replace

◆ Disassembly procedure ◆**■ Disassembly: Rotor and front bracket**

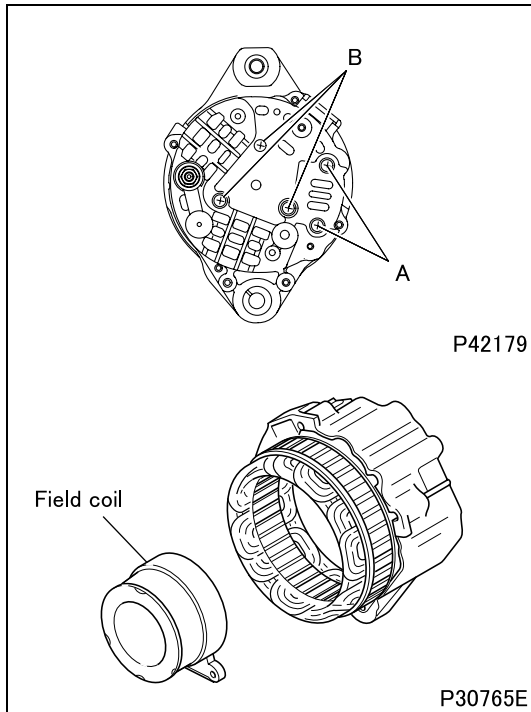
- Insert a screwdriver between front bracket and stator.
- Use the screwdriver to pry rotor and front bracket away from stator and rear bracket.

CAUTION ⚠

- Be careful not to insert the screwdriver too deep or it will damage coil of stator and might cause a short-circuit.

**■ Disassembly: Pulley****CAUTION** ⚠

- Make sure to grip the root of the core claws when you hold the rotor in a vice. Gripping claws can damage them.



■ Disassembly: Field coil

- Remove screw **A** (2 places).

CAUTION ⚠

- If screw **B** are removed first, the weight of field coil may be placed on the joining portion with regulator which is fixed with screw **A**, causing break of the joining portion. To avoid this, remove screw **A** first.

- Remove screw **B** (3 places).

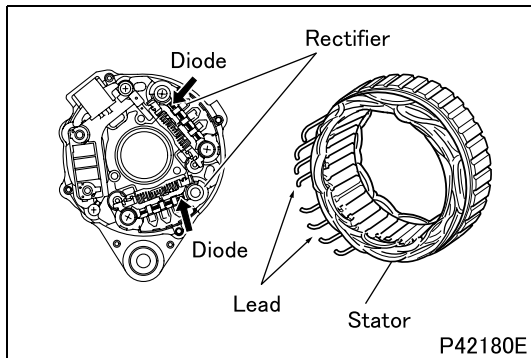
CAUTION ⚠

- If screw **B** are removed, the field coil will fall under its own weight. Keep the field coil supported by your hand.

- Remove field coil.

CAUTION ⚠

- Do not remove the field coil forcibly. Otherwise the portion that joins with the regulator may be caught by the stator coil.



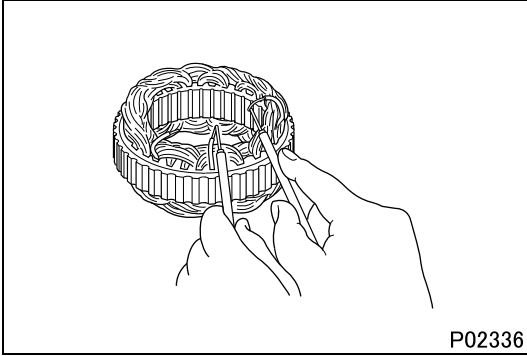
■ Disassembly: Stator

- Disconnect lead of stator from rectifier. The lead is soldered to diode of the rectifier at 8 places. (Each of the 2 rectifiers has 4 soldered sections.)

CAUTION ⚠

- Unsolder within as short a time period as possible (within 5 seconds), otherwise diode can be easily damaged by heat.

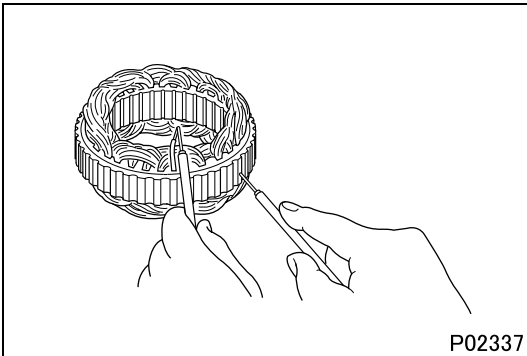
◆ Inspection procedure ◆



■ Inspection: Stator

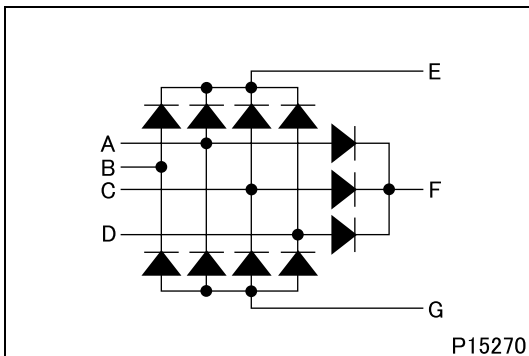
(1) Continuity between each lead wire

- Check that there is continuity between each stator lead.
- If there is no continuity, the lead has broken.



(2) Continuity between each lead wires and the core

- Check that there is no continuity between lead wires and the core.
- If there is continuity, the lead wire has short-circuited.



■ Inspection: Rectifier

- Check the function of diodes within rectifier properly. If any fault is found, replace the rectifier.

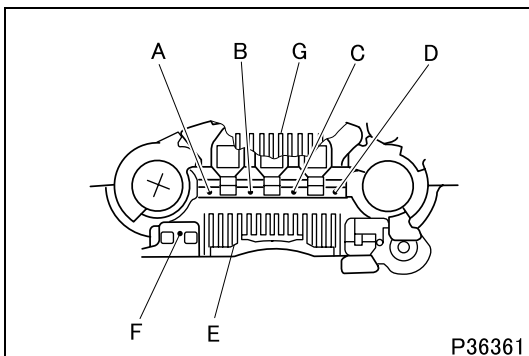
If resistance is infinite in both cases, the diode is open.

If resistance is close to 0 Ω in both cases, the diode has shorted.

A, B, C, D: Lead connecting area of stator coil

E, G: Heat sink area

F: Regulator connecting area



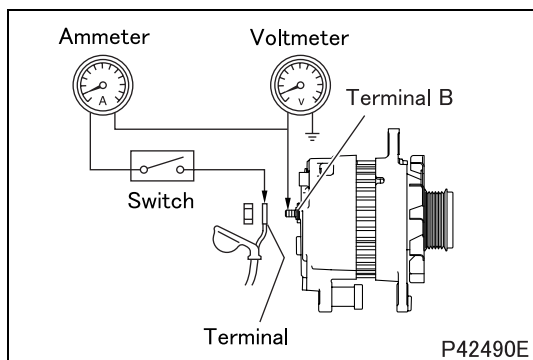
- Inspection should be conducted twice, changing over the positive probe and the negative probe of the tester.

CAUTION ⚠

- When inspecting using a tester, the current flowing through the rectifier is smaller than usual. Therefore, an incorrect resistance value may be indicated on the tester. Additionally, incorrect indications become larger as the range of the tester gets smaller. Set the tester to a largest possible scale.

54-13 ON-VEHICLE INSPECTION AND ADJUSTMENT

#950 INSPECTION OF ALTERNATOR



Performance test

- Connect the meters to the alternator as shown.

WARNING

- To prevent possible injury, be sure to disconnect the negative battery cable and insulate the cable and the negative battery terminal with tape before working on the wiring. With the negative (-) battery cable connected, battery voltage is always applied to terminal B.
- To connect to switch, use a lead wire with the same or larger diameter than that of the chassis harness connected to terminal B.

- Turn on switch and make sure that voltmeter indicates battery voltage.
- Start the engine.
- Immediately turn on the switches for all lamps on the vehicle.
- Immediately accelerate the engine to the speed indicated below and measure the alternator's output current.
Approx. 2400 rpm
- The alternator is considered to be good if the measured value is 70% or more of the nominal output current.

Alternator nominal output

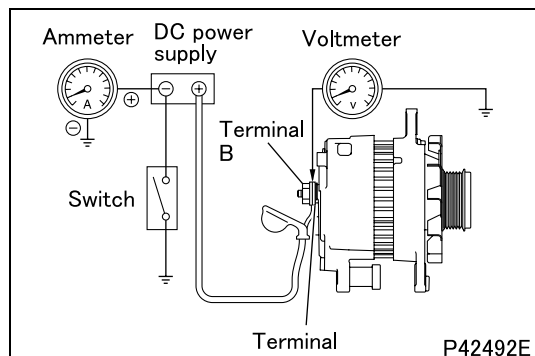
Voltage	Output current
12 V	100 A

NOTE

- The on-vehicle inspection is only a simplified check. Use a test bench for accurate checking.

Service standards

Location	Maintenance item	Standard value	Limit	Remedy
–	Adjusting voltage	14.7 ± 0.3 V	–	Replace



- Connect the meters to the alternator as shown.

WARNING ⚠

- To prevent possible injury, be sure to disconnect the negative battery cable and insulate the cable and the negative battery terminal with tape before working on the wiring. With the negative (–) battery cable connected, battery voltage is always applied to terminal B.
- To connect to switch, use a lead wire with the same or larger diameter than that of the chassis harness connected to terminal B.

- Turn off the switches for lamps, heater, etc. so that electric loads may not be applied during the inspection.
- Turn on switch and then start the engine.
- If the output current is 5 amperes or less when the engine speed is raised to the appropriate speed indicated below, then measure the voltage at terminal B.
Approx. 2400 rpm

CAUTION ⚠

- If the output current is in the range from 5 to 10 amperes, the measured value (regulated voltage) will be slightly lower.
14.4 V ± 0.3 V

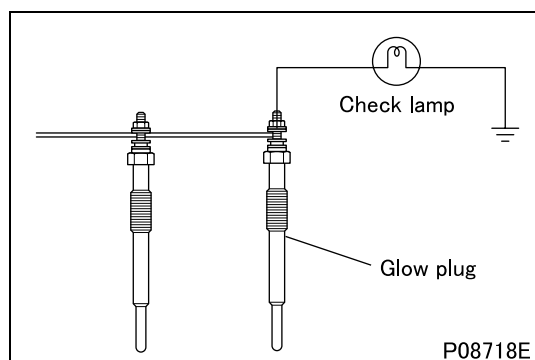
- If the output current is 5 amperes or more, do one of the following:
 - Run the engine for a while to charge the battery.
 - Replace the battery with a fully-charged one.
- If the measured value deviates from the standard value, conduct checking again on the test bench.

#955 INSPECTION OF PREHEATING SYSTEM

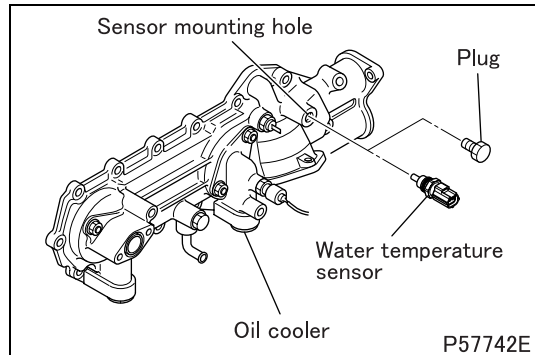
1. Preparation for inspection

Service standards

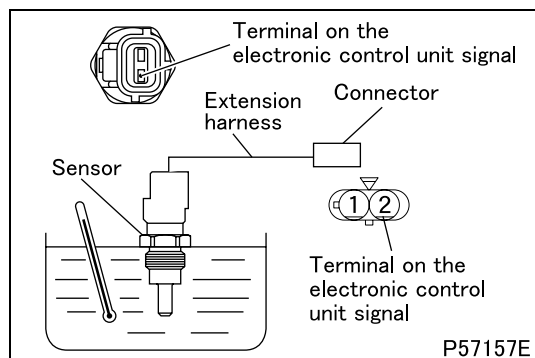
Location	Maintenance item			Standard value	Limit	Remedy
-	Coolant temperature	Pre-glow time	60°C {140°F} or higher	No pre-glow operation	-	Inspect
			0 to 60°C {32 to 140°F}	About 12 seconds	-	
			0°C {32°F} or below	About 12 seconds	-	
		After-glow time	60°C {140°F} or higher	No after-glow operation	-	
			0 to 60°C {32 to 140°F}	No after-glow operation	-	
			0°C {32°F} or below	About 20 seconds	-	
		Indicator lamp ON time	60°C {140°F} or higher	No illumination	-	
			0 to 60°C {32 to 140°F}	No illumination	-	
			0°C {32°F} or below	About 8 seconds	-	



- Turn the starter switch to OFF.
- Connect a check lamp to the glow plug.



- Remove the water temperature sensor from the engine, and close the sensor mounting hole with the plug (M16 × 1.5 mm).



- Connect the extension harness between the water temperature sensor and connector.
- Place the water temperature sensor in a container of water.
- Conduct the following test while changing the temperature of water in the container. If anything abnormal is found, check relevant components.

(1) Pre-glow time and indicator lamp ON time checking

- Turn the starter switch to ON (without starting the engine), and confirm that the pre-glow time and indicator lamp ON time at each water temperature conform with standard values.
- Measure the illuminating time of the check lamp to measure the pre-glow time.
- Measure the meter cluster glow lamp illuminating time to measure the indicator lamp ON time.

(2) After-glow time checking

- Start the engine, and measure how long the illumination of check lamp lasts after the glow lamp on the meter cluster goes out to ensure that the after-glow time conforms with the standard value.

2. Inspection Based on Diagnosis Codes**2.1 Diagnosis code list****NOTE**

- **Diagnosis codes shown by the Multi-Use Tester and those indicated by flashing of the warning lamp are different.**
- **The Multi-Use Tester is capable of showing more detailed diagnosis codes.**

Code	Message	Flashes
P0380	Relay for Glow Relay	26
P0381	Glow Lamp	89

2.2 Diagnosis code generation conditions and inspection items**P0380 : Relay for Glow Relay (Warning lamp flashes : 26)**

Generation conditions		Glow drive relay short or open circuit, or overload
Recoverability		System recovers if signal becomes with starter switch ON position.
Control effected by electronic control unit		• Suspend glow control
Inspection	Service data	8D : Glow Relay
	Actuator test	AF : Relay for Glow Relay
	Electronic control unit connector	01 : Glow drive relay
	Electrical equipment	#201 : Glow drive relay #350 : Engine electronic control unit
	Electronic circuit diagram	Glow drive relay system (See (220))

P0381 : Glow Lamp (Warning lamp flashes : 89)

Generation conditions		Glow indicator lamp short or open circuit, or overload
Recoverability		System recovers if signal becomes with starter switch ON position.
Control effected by electronic control unit		• Normal control
Inspection	Service data	8E : Glow Relay Indicator Lamp
	Actuator test	B0 : Glow Indicator Lamp
	Electronic control unit connector	02 : Glow indicator lamp
	Electrical equipment	Meter cluster #350 : Engine electronic control unit
	Electronic circuit diagram	Glow drive relay system (See (220))

#955 INSPECTION OF PREHEATING SYSTEM

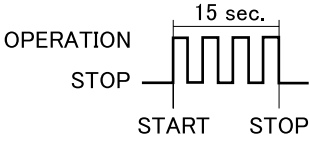
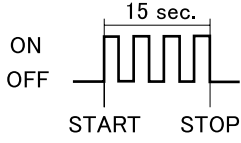
3. Multi-Use Tester Service Data

CAUTION

- It is possible to see service data and actuator tests simultaneously.

No.	Item	Data	Inspection condition	Requirement
8D	Glow Relay	ON/OFF	With engine coolant temperature at or below 60°C {140 °F}, turn starter switch OFF and ON. Inspect immediately after turning ON starter switch.	ON
			With engine coolant temperature at or above 60°C {140 °F} or water temperature at or below 60°C {140 °F}, turn starter switch OFF and ON. Inspect 40 seconds after turning starter switch ON.	OFF
			[Actuator test] AF: Relay for glow relay	
8E	Glow Relay Indicator Lamp	ON/OFF	With engine coolant temperature at or below 60°C {140 °F}, turn starter switch OFF and ON. Inspect immediately after turning ON starter switch.	ON
			With engine coolant temperature at or above 60°C {140 °F} or water temperature at or below 60°C {140 °F}, turn starter switch OFF and ON. Inspect 40 seconds after turning starter switch ON.	OFF
			[Actuator test] B0: Glow indicator lamp	

4. Actuator Tests Performed Using Multi-Use Tester

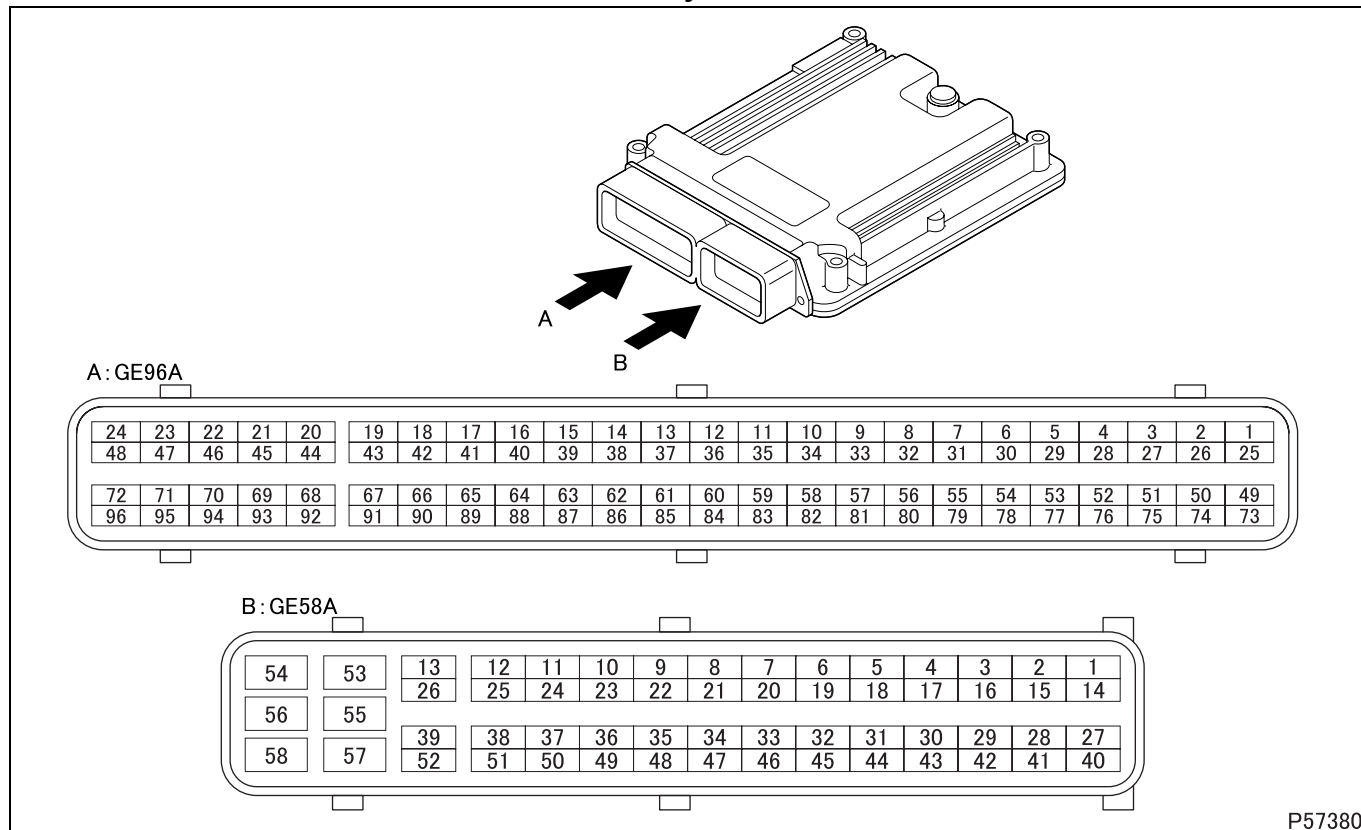
No.	Item	Explanation	Confirmation method
AF	Relay for Glow Relay	Glow drive relay drive signal  P57740E	Actuation noise should be heard. [Service data] 8D: Glow relay
B0	Glow Indicator Lamp	Glow indicator lamp illumination signal  P57725E	Actuation noise should be heard. [Service data] 8E: Glow indicator lamp

5. Inspection Performed at Electronic Control Unit Connectors

- The following inspection should assist troubleshooting by enabling you to verify whether or not electronic control unit signals are correctly transmitted via the vehicle harnesses and connectors.

The numbers in the table **01**, **02**, etc. cross-refers you to the corresponding numbers in the table in “2. Inspection Based on Diagnosis Codes”.

5.1 Electronic control unit connector terminal layout



5.2 Inspection instructions

CAUTION

- Some inspections are performed with the connectors removed. Others are performed with the connectors fitted. Observe the following caution:
- Do not touch any terminal other than those specified for the inspection. Be particularly careful not to cause short circuits between terminals using the tester probes.

Check item	Measurement method
01 Glow drive relay voltage	[Conditions] • Keep the vehicle harnesses connected to the electronic control unit connector halves. (Inspection is made at the back of the vehicle connectors.) • Carry out the actuator test “AF - Relay for Glow Relay” using Multi-Use Tester. [Normal status] Terminals (+) - (-) : A73 - A7 • Battery voltage
02 Glow indicator lamp illumination	[Conditions] • Keep the vehicle harnesses connected to the electronic control unit connector halves. (Inspection is made at the back of the vehicle connectors.) • Carry out the actuator test “B0 - Glow Indicator Lamp” using Multi-Use Tester. [Normal status] Short the terminal A51 to ground. • The glow indicator lamp should illuminate.

#956 INSPECTION OF STARTER CONTINUOUS ENERGIZING PREVENTING FUNCTION**1. Inspection Based on Diagnosis Codes****1.1 Diagnosis code list****NOTE**

- Diagnosis codes shown by the Multi-Use Tester and those indicated by flashing of the warning lamp are different.
- The Multi-Use Tester is capable of showing more detailed diagnosis codes.

Code	Message	Flashes
P0615	Starter Safety Relay	48
P0616		
P0617		

1.2 Diagnosis code generation conditions and inspection items**P0615 : Starter Safety Relay (Warning lamp flashes : 48)**

Generation conditions		Safety relay overload
Recoverability		System recovers if signal becomes with starter switch ON position.
Control effected by electronic control unit		• Normal control
Inspection	Service data	8F : Starter safety relay
	Actuator test	B1 : Starter safety relay
	Electronic control unit connector	01 : Safety relay
	Electrical equipment	#201 : Safety relay #350 : Engine electronic control unit
	Electronic circuit diagram	Safety relay system (See (210))

P0616 : Starter Safety Relay (Warning lamp flashes : 48)

Generation conditions		Safety relay ground short or open circuit
Recoverability		System recovers if signal becomes with starter switch ON position.
Control effected by electronic control unit		• Normal control
Inspection	Service data	8F : Starter safety relay
	Actuator test	B1 : Starter safety relay
	Electronic control unit connector	01 : Safety relay
	Electrical equipment	#201 : Safety relay #350 : Engine electronic control unit
	Electronic circuit diagram	Glow drive relay system (See (210))

P0617 : Starter Safety Relay (Warning lamp flashes : 48)

Generation conditions		Safety relay Battery short or open circuit
Recoverability		System recovers if signal becomes with starter switch ON position.
Control effected by electronic control unit		• Normal control
Inspection	Service data	8F : Starter safety relay
	Actuator test	B1 : Starter safety relay
	Electronic control unit connector	01 : Safety relay
	Electrical equipment	#201 : Safety relay #350 : Engine electronic control unit
	Electronic circuit diagram	Glow drive relay system (See (210))

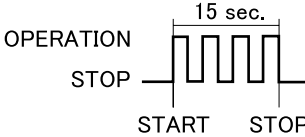
2. Multi-Use Tester Service Data

CAUTION

- It is possible to see service data and actuator tests simultaneously.

No.	Item	Data	Inspection condition	Requirement
8F	Starter Safety Relay	ON/OFF	Carry out the actuator test "B1 - Starter safety relay" using Multi-Use Tester. The relay should be ON.	ON
			When not testing	OFF
			[Actuator test] B1: Starter safety relay	

3. Actuator Tests Performed Using Multi-Use Tester

No.	Item	Explanation	Confirmation method
B1	Starter Safety Relay	Starter safety relay drive signal  P57740E	Actuation noise should be heard. [Service data] 8F: Starter safety relay

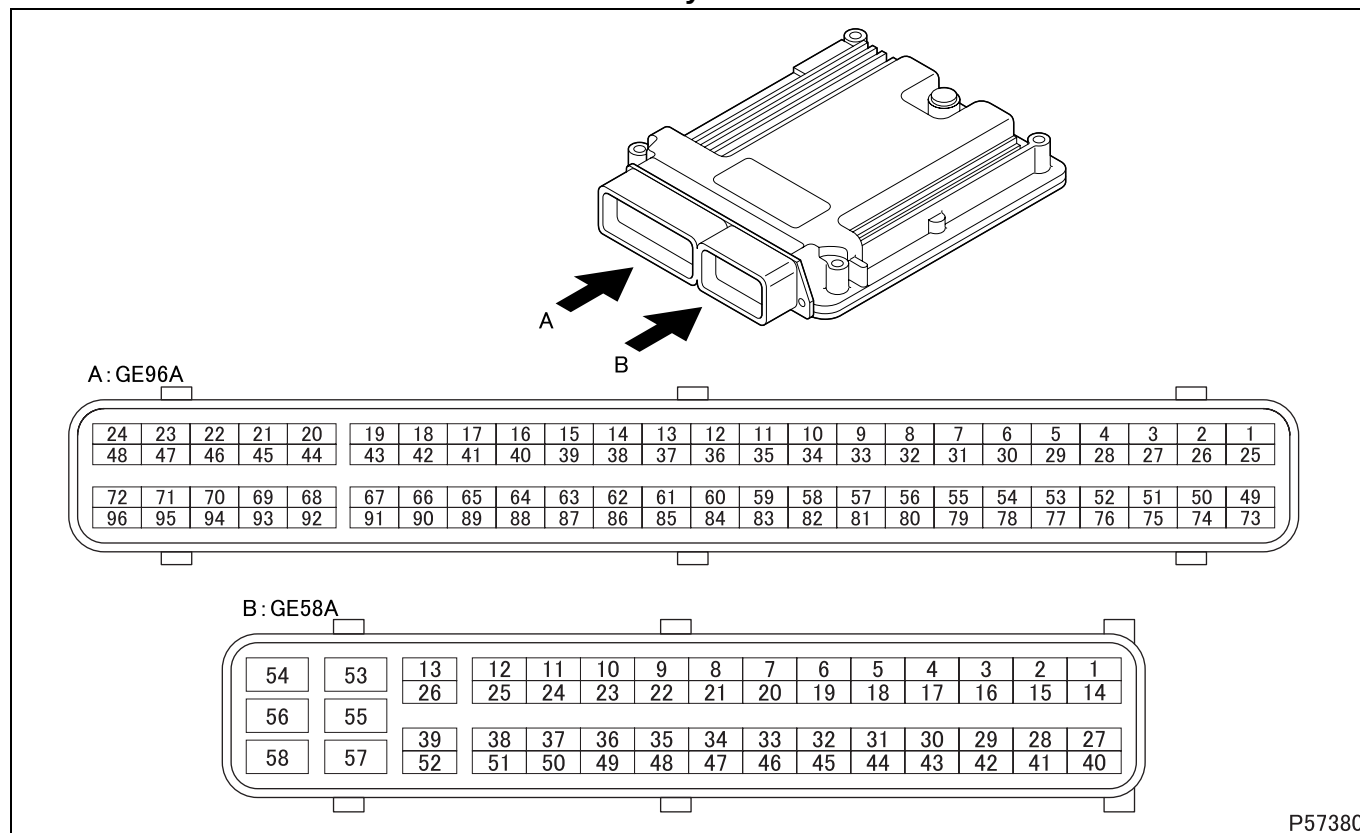
#956 INSPECTION OF STARTER CONTINUOUS ENERGIZING PREVENTING FUNCTION

4. Inspection Performed at Electronic Control Unit Connectors

- The following inspection should assist troubleshooting by enabling you to verify whether or not electronic control unit signals are correctly transmitted via the vehicle harnesses and connectors.

The numbers in the table **01**, **02**, etc. cross-refers you to the corresponding numbers in the table in “1. Inspection Based on Diagnosis Codes”.

4.1 Electronic control unit connector terminal layout



4.2 Inspection instructions

CAUTION

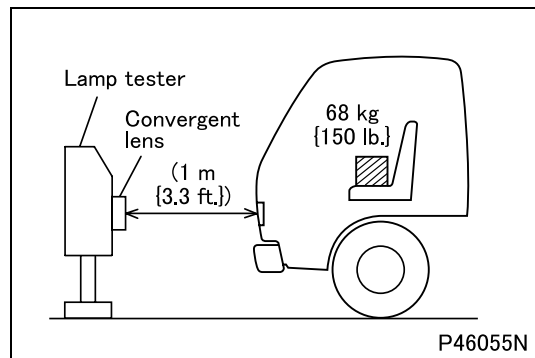
- Some inspections are performed with the connectors removed. Others are performed with the connectors fitted. Observe the following caution:
- Do not touch any terminal other than those specified for the inspection. Be particularly careful not to cause short circuits between terminals using the tester probes.

Inspection item	Procedures
01 Safety relay voltage	[Conditions] • Keep the vehicle harnesses connected to the electronic control unit connector halves. (Inspection is made at the back of the vehicle connectors.) [Normal status] Terminals (+) - (-) : A81 - A49 • Relay ON: 12 V • Relay OFF: 0 V

M E M O

#960 HEADLAMP AIMING

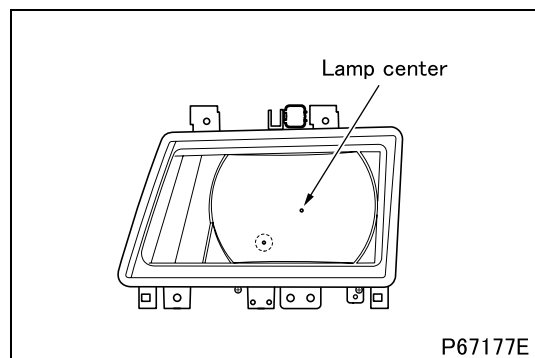
1. Preparation before Adjustment



- Park the vehicle on a level place.

WARNING

- Be sure to put tire chocks securely in place.

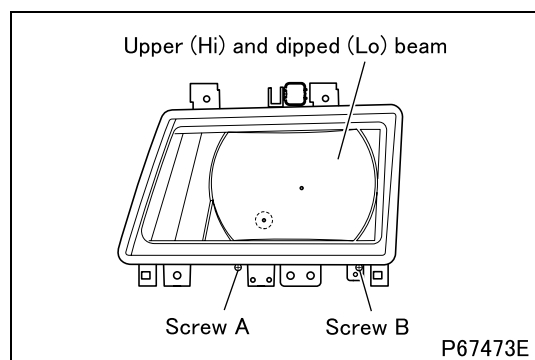


- Unload the vehicle and make sure no one is in it.
- Inflate the tires to the specified pressure. (See Gr31.)
- Seat one person of an equivalent mass (68 kg {150 lb.}) in the vehicle.
- Start the engine and check that the battery is being charged.
- Place convergent lamp tester and the vehicle facing each other as shown in the drawing.
- Align the center of headlamp bulb and the center of convergent lens of convergent lamp tester. (The drawing shows the left-hand headlamp.)

2. Adjustment

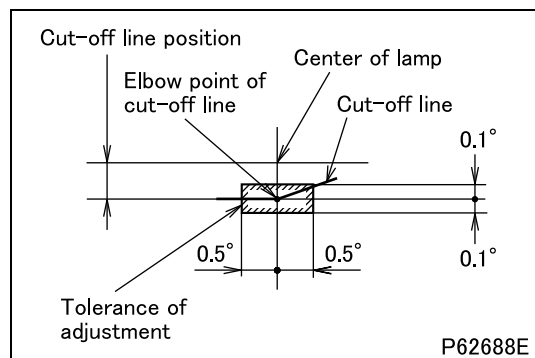
WARNING

- Do not mask a lit headlamp for more than 10 minutes or the heat generated might cause a fire.



2.1 Adjustment of Dipped Beam

- Turn on dipped beam.
- Make adjustment by the following procedure so that the elbow point of dipped beam cut-off line is in the illustrated position.
- Vertical adjustment: Adjust by turning screws A and B in this order by the same amount.



- Horizontal adjustment: Turn screw B. Adjust the optical axes of both the right- and left-hand dipped beams to the illustrated position.

Cut-off line position: 0.7°

Adjusting direction for optical axis

<Left-hand headlamp>

	Upward	Downward	Leftward	Rightward
Screw A	Counter-clockwise	Clockwise	–	–
Screw B	–	–	Clockwise	Counter-clockwise

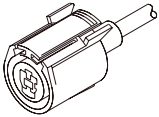
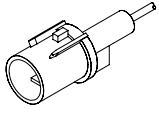
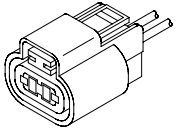
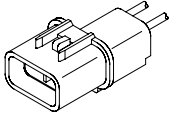
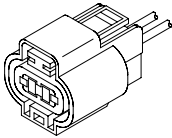
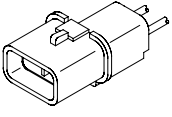
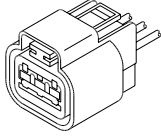
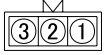
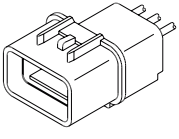
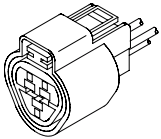
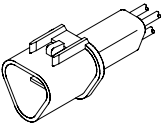
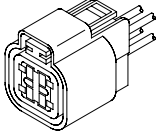
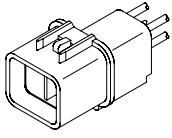
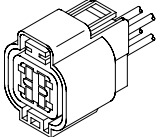
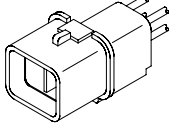
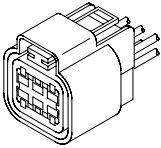
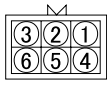
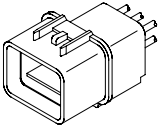
<Right-hand headlamp>

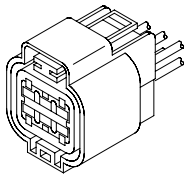
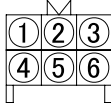
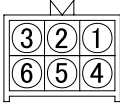
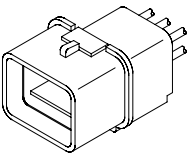
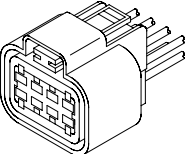
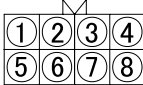
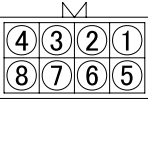
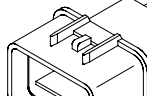
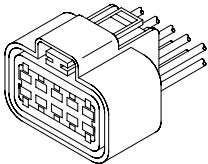
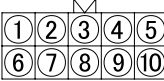
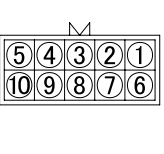
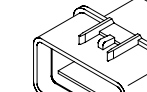
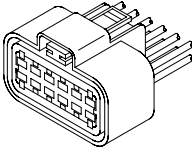
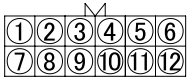
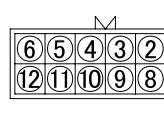
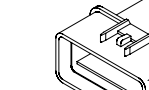
	Upward	Downward	Leftward	Rightward
Screw A	Counter-clockwise	Clockwise	–	–
Screw B	–	–	Counter-clockwise	Clockwise

54-14 CONNECTOR CONFIGURATION CHART

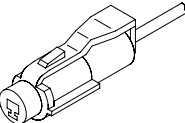
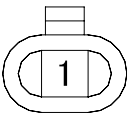
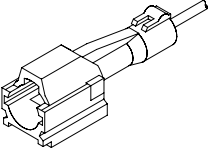
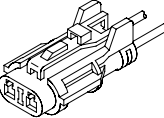
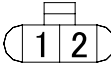
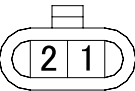
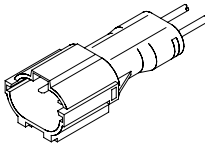
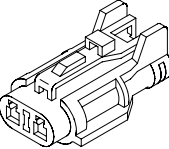
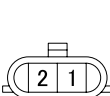
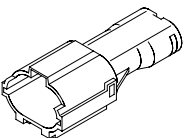
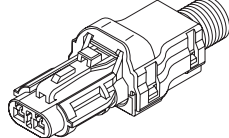
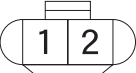
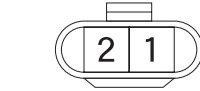
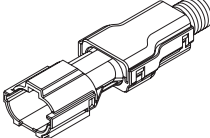
CONNECTOR CONFIGURATION CHART

AA type

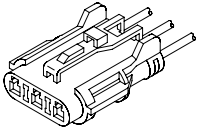
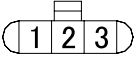
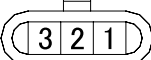
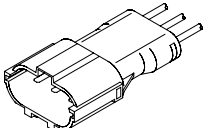
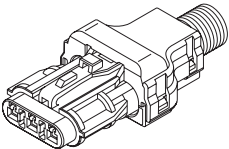
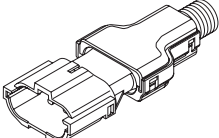
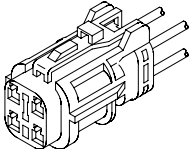
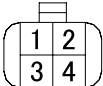
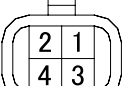
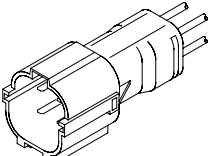
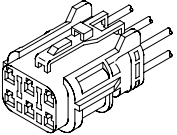
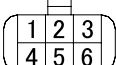
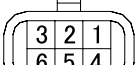
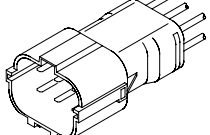
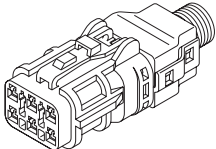
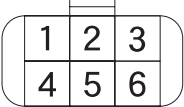
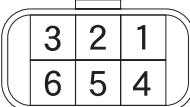
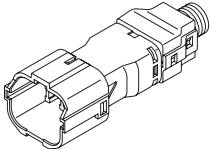
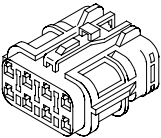
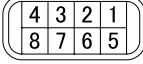
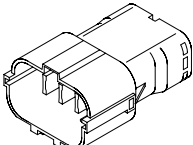
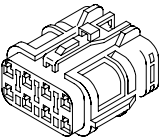
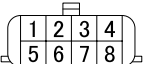
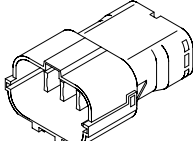
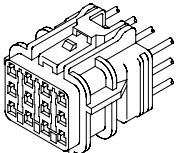
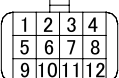
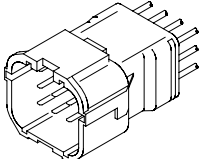
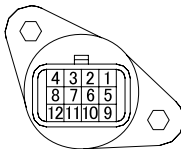
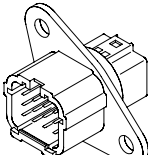
Number shows number of pins	Female connector	Male connector
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AA2A	 	 
AA2B	 	 
AA3A	 	 
AA3B	 	 
AA4A	 	 
AA4B	 	 
AA6A	 	 

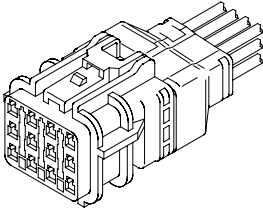
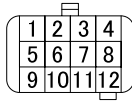
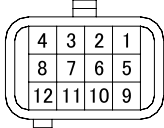
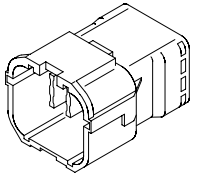
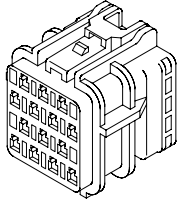
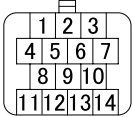
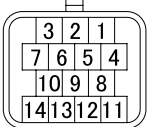
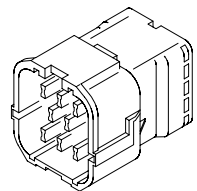
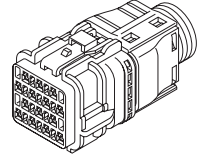
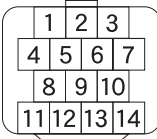
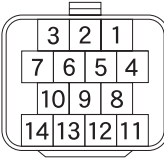
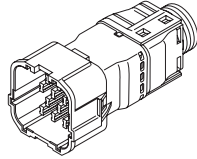
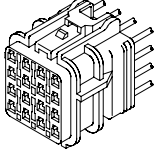
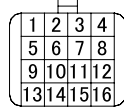
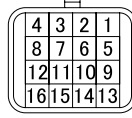
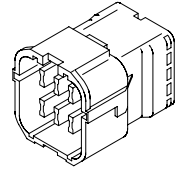
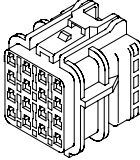
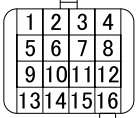
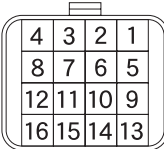
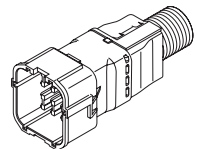
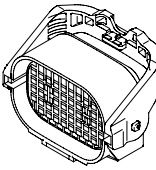
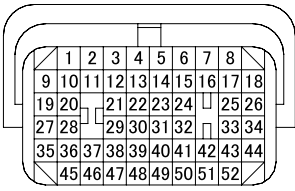
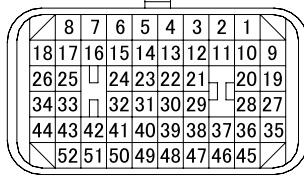
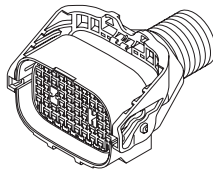
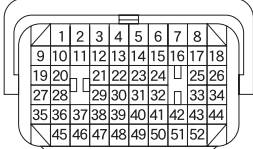
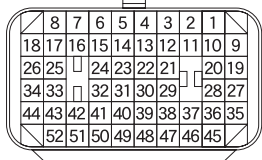
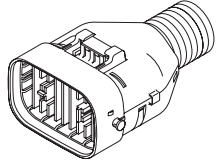
Number shows number of pins	Female connector	Male connector
AA6B	 	 
AA8A	 	 
AA10A	 	 
AA12A	 	 

AB type

Number shows number of pins	Female connector	Male connector
AB1A	 	 
AB2A	 	 
AB2B	 	 
AB2C	 	 

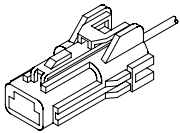
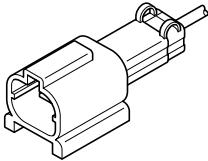
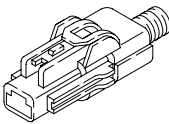
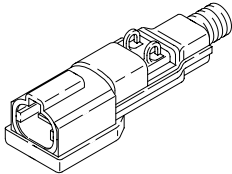
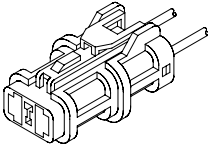
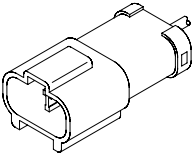
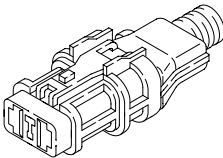
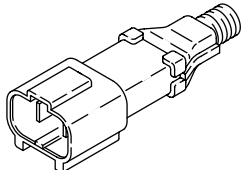
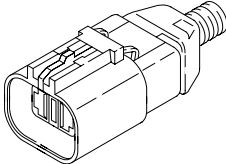
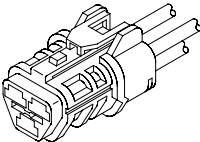
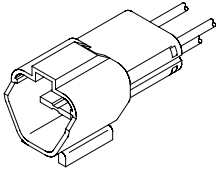
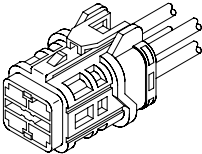
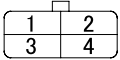
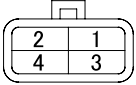
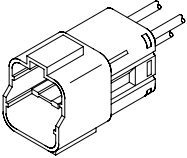
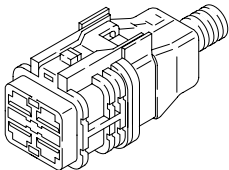
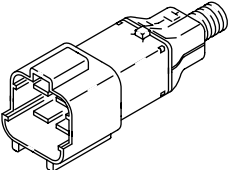
CONNECTOR CONFIGURATION CHART

Number shows number of pins	Female connector	Male connector
AB3A	 	 
AB3B	 	 
AB4A	 	 
AB6A	 	 
AB6B	 	 
AB8A	 	 
AB8B	 	 
AB12A	 	   

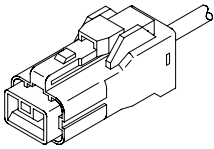
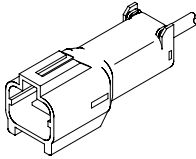
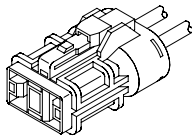
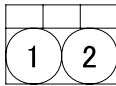
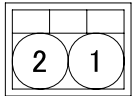
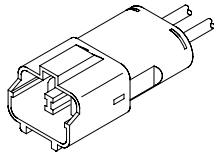
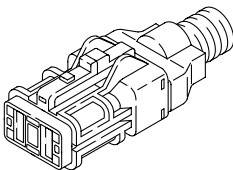
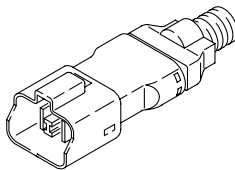
Number shows number of pins	Female connector	Male connector
AB12B	 	 
AB14A	 	 
AB14B	 	 
AB16A	 	 
AB16B	 	 
AB52A	 	
AB52B	 	 

CONNECTOR CONFIGURATION CHART

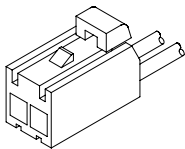
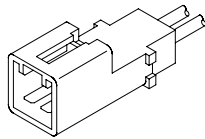
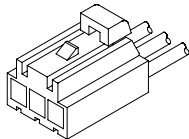
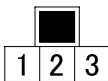
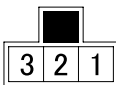
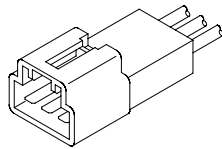
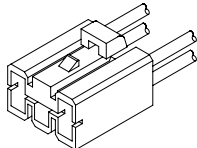
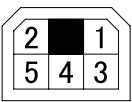
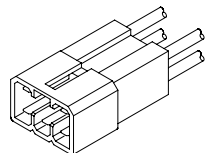
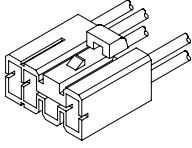
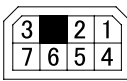
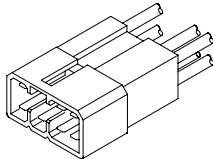
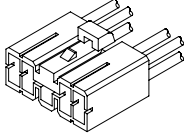
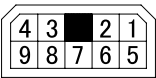
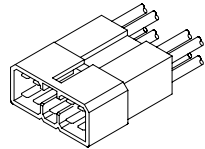
AC type

Number shows number of pins	Female connector		Male connector	
AC1A				
AC1B				
AC2A				
AC2B				
AC2C				
AC3A				
AC4A				
AC4B				

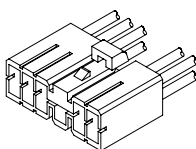
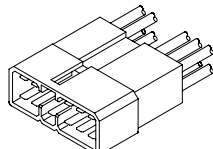
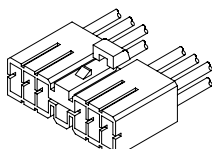
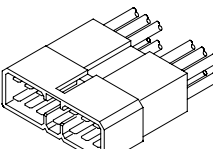
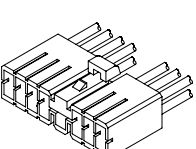
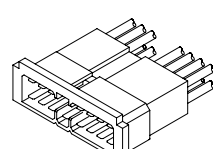
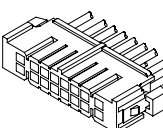
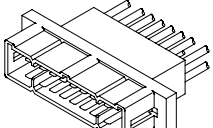
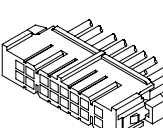
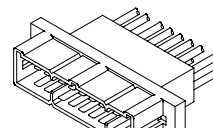
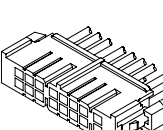
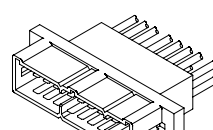
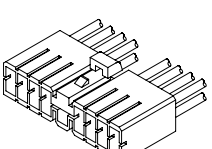
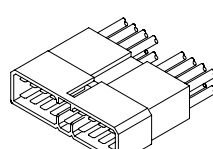
AD type

Number shows number of pins	Female connector	Male connector
AD1A	 	 
AD2A	 	 
AD2B	 	 

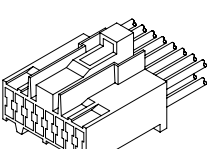
AE type

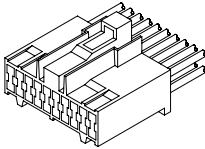
Number shows number of pins	Female connector	Male connector
AE2A	 	 
AE3A	 	 
AE5A	 	 
AE7A	 	 
AE9A	 	 

CONNECTOR CONFIGURATION CHART

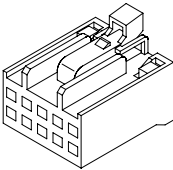
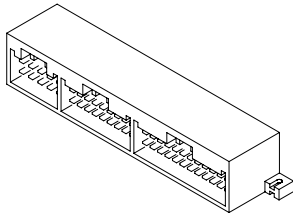
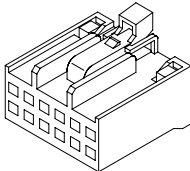
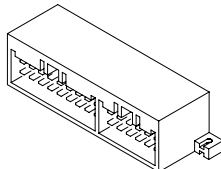
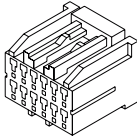
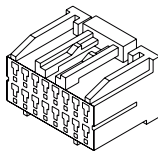
Number shows number of pins	Female connector	Male connector																																				
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6	7	8	9	10	11																																	
5	4		3	2	1																																	
11	10	9	8	7	6																																	
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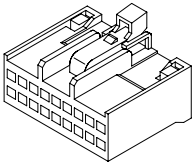
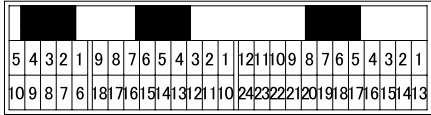
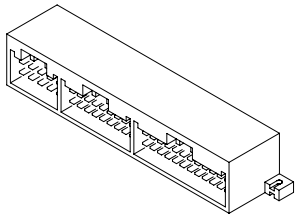
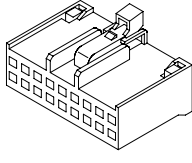
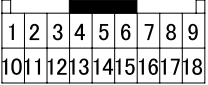
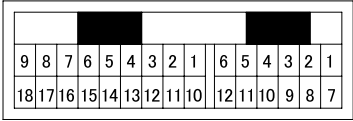
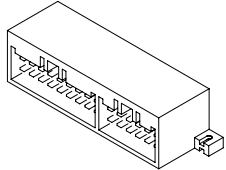
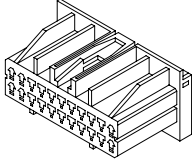
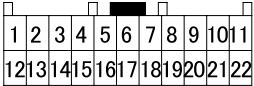
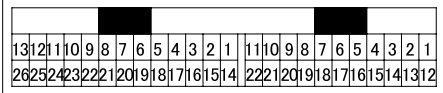
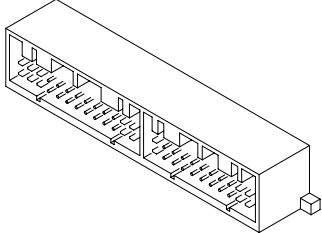
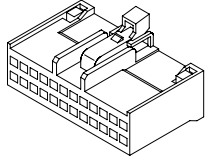
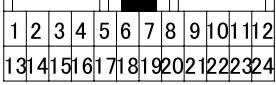
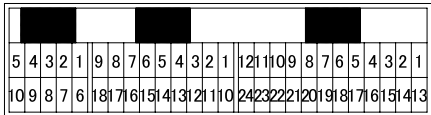
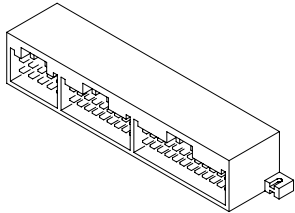
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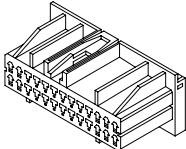
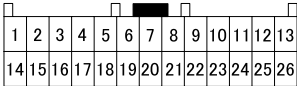
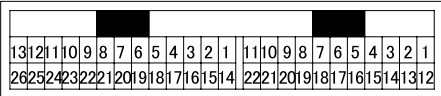
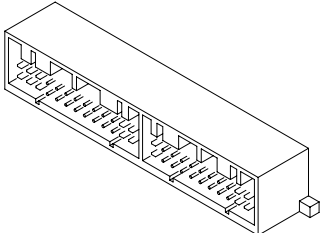
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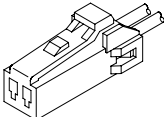
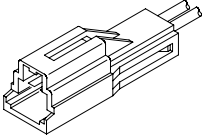
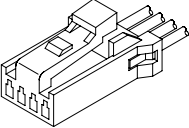
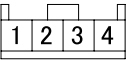
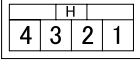
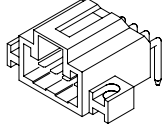
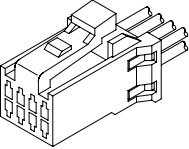
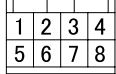
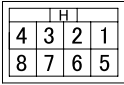
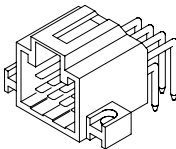
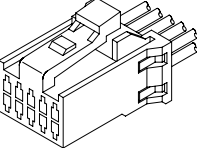
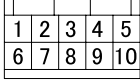
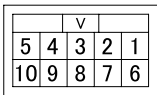
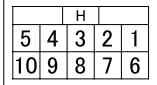
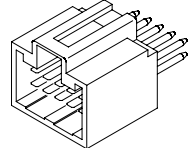
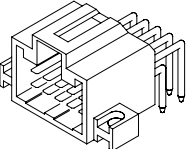
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CONNECTOR CONFIGURATION CHART

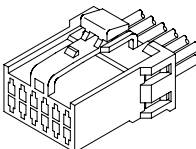
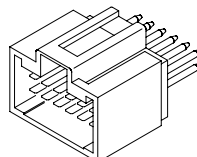
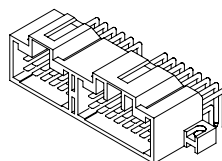
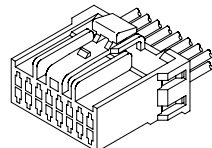
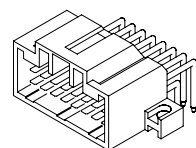
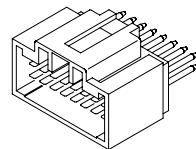
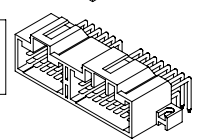
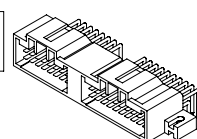
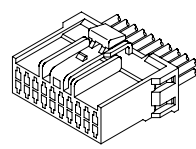
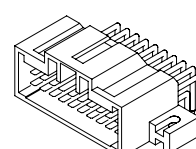
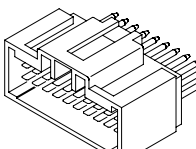
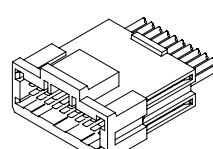
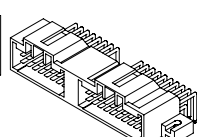
Number shows number of pins	Female connector	Male connector
AH18A	 	 (AH10A) AH18A (AH24A) 
AH18B	 	 AH18B (AH12A) 
AH22A	 	 (AH26A) AH22A 
AH24A	 	 (AH10A) (AH18A) AH24A 

Number shows number of pins	Female connector	Male connector
AH26A	 	 AH26A (AH22A) 

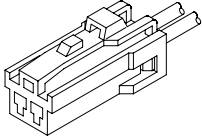
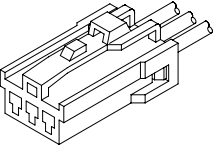
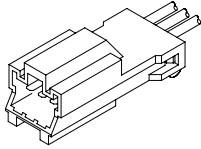
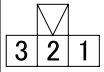
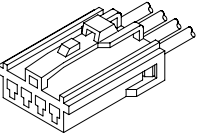
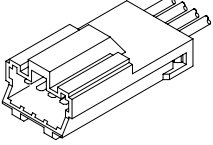
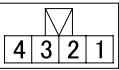
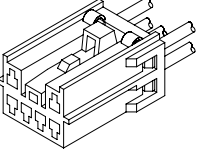
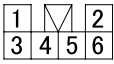
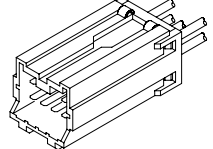
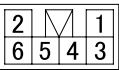
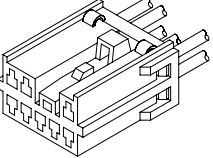
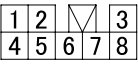
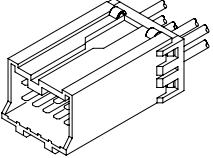
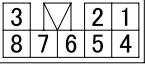
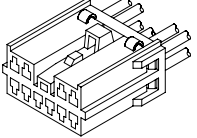
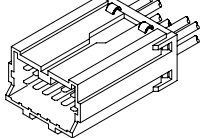
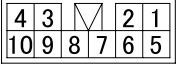
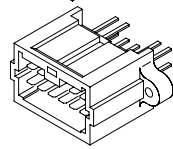
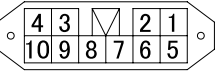
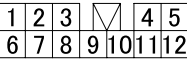
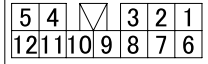
AJ type

Number shows number of pins	Female connector	Male connector
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AJ4A	 	 
AJ8A	 	 
AJ10A	 	   

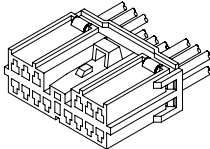
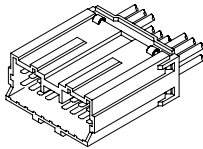
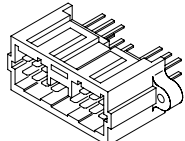
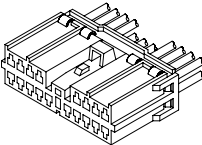
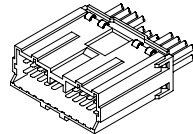
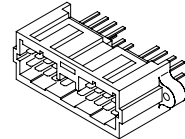
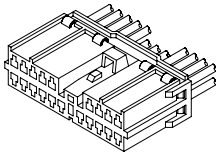
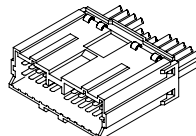
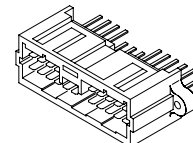
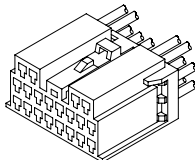
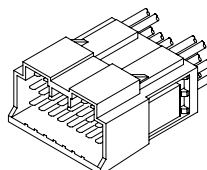
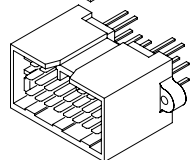
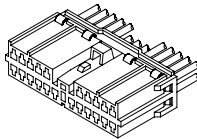
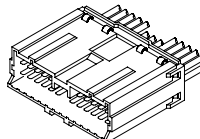
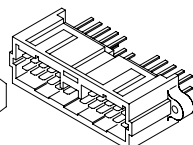
CONNECTOR CONFIGURATION CHART

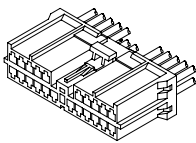
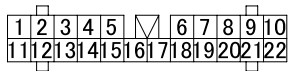
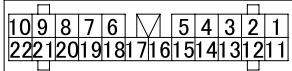
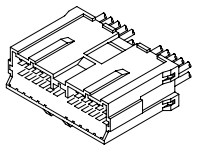
Number shows number of pins	Female connector	Male connector																																																																																																																																																																										
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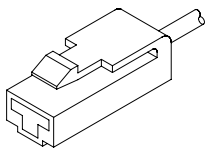
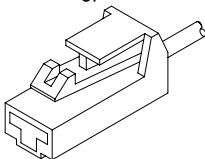
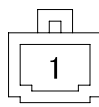
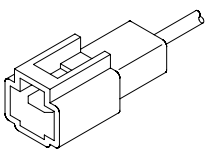
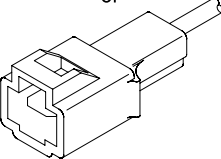
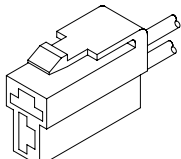
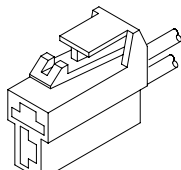
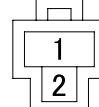
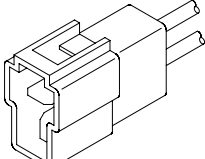
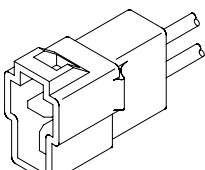
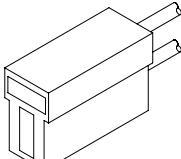
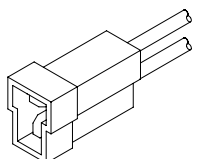
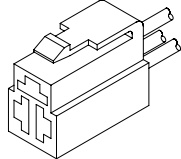
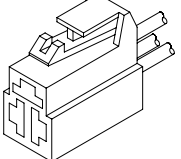
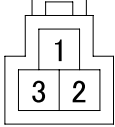
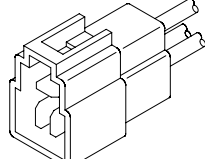
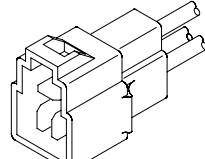
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AK4A	 	 
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CONNECTOR CONFIGURATION CHART

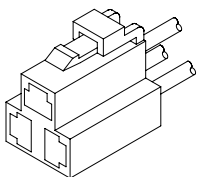
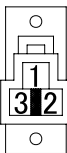
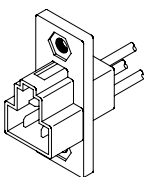
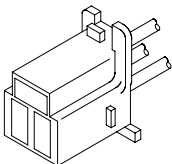
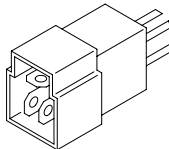
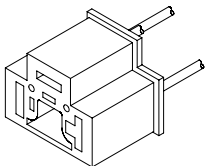
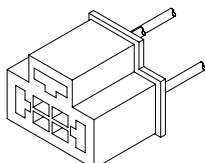
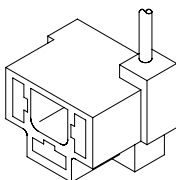
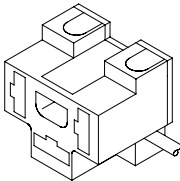
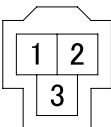
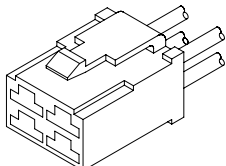
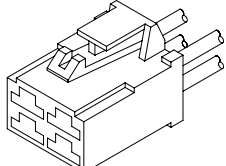
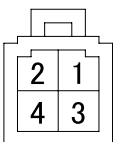
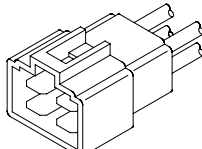
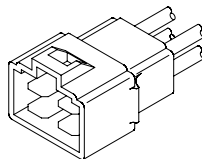
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AK22A	 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>▽</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr><tr><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td><td>21</td><td>22</td></tr></table>	1	2	3	4	5	▽	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	<table><tr><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>▽</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>22</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td><td>16</td><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td></tr></table>  <table><tr><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>▽</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>22</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td><td>16</td><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td></tr></table> 	10	9	8	7	6	▽	5	4	3	2	1	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	▽	5	4	3	2	1	22	21	20	19	18	17	16	15	14	13	12	11
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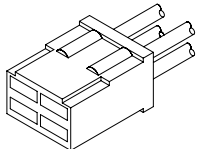
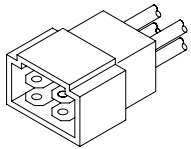
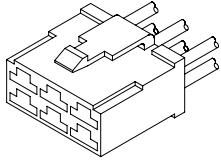
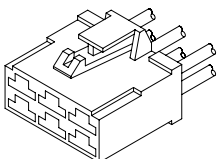
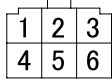
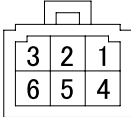
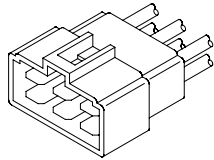
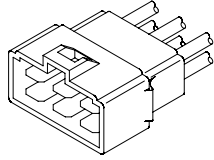
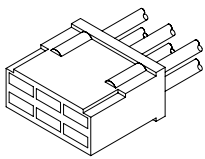
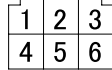
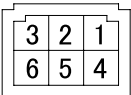
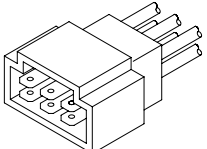
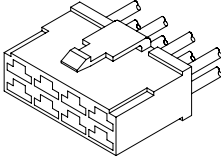
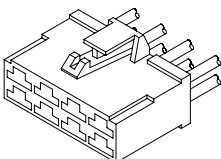
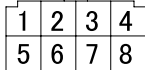
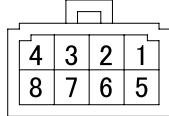
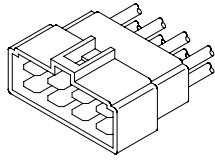
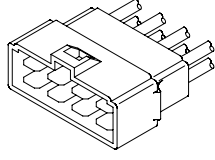
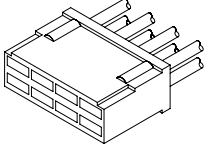
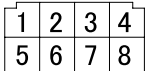
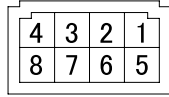
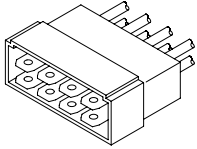
Number shows number of pins	Female connector	Male connector
AK22B	 	 

AL type

Number shows number of pins	Female connector	Male connector
AL1A	  	  
AL2A	  	  
AL2B	 	 
AL3A	  	  

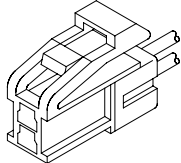
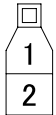
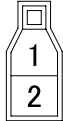
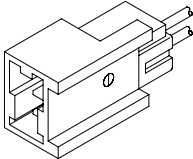
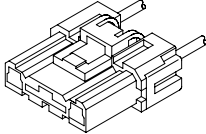
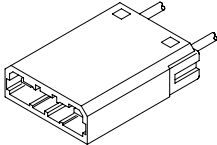
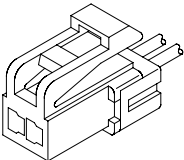
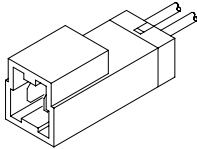
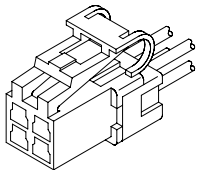
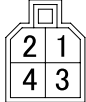
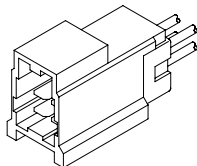
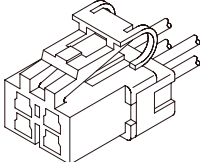
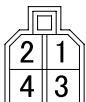
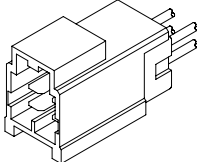
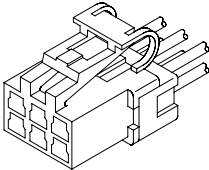
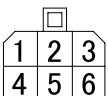
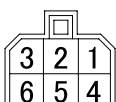
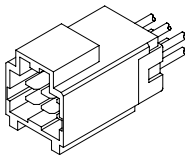
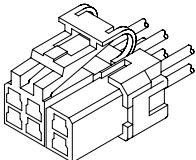
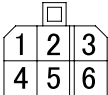
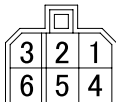
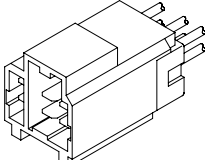
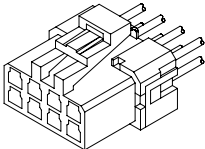
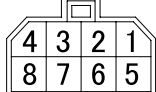
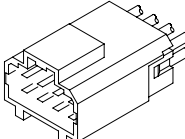
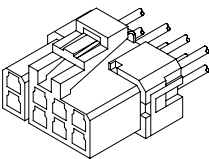
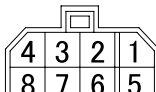
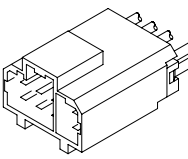
CONNECTOR CONFIGURATION CHART

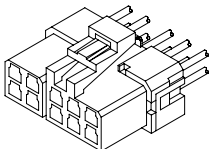
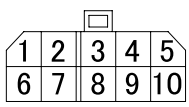
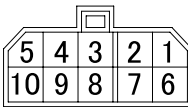
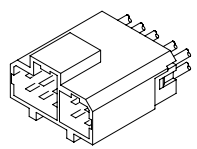
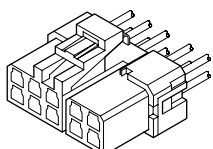
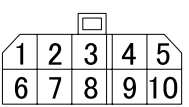
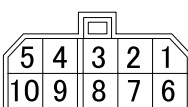
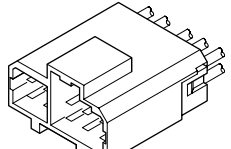
Number shows number of pins	Female connector	Male connector
AL3B	 	 
AL3C	 	 
AL3D	 or  	
AL3E	 or  	
AL4A	 or  	  or 

Number shows number of pins	Female connector	Male connector
AL4B	 	 
AL6A	 or  	 or  
AL6B	 	 
AL8A	 or  	 or  
AL8B	 	 

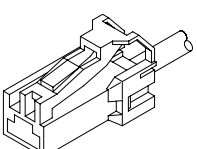
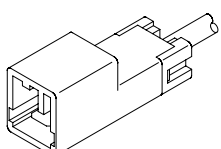
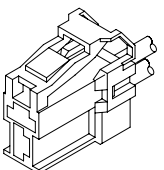
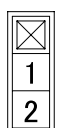
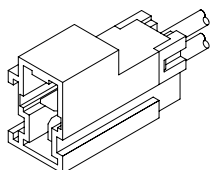
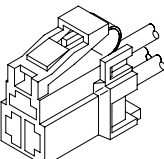
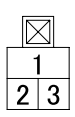
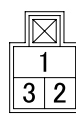
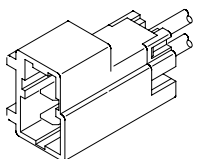
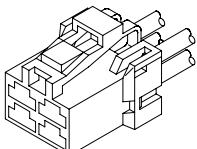
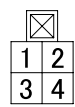
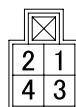
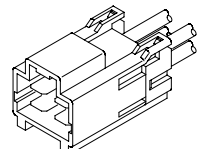
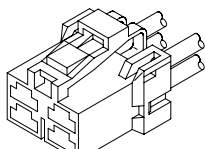
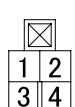
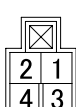
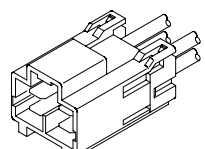
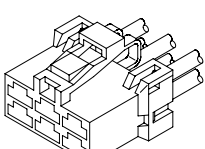
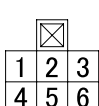
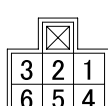
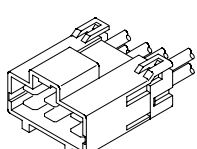
CONNECTOR CONFIGURATION CHART

AM type

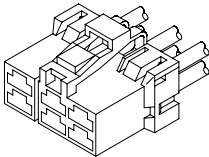
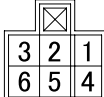
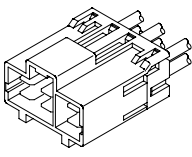
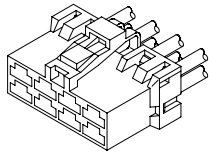
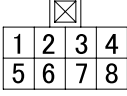
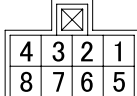
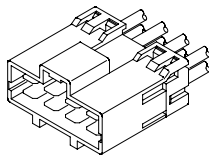
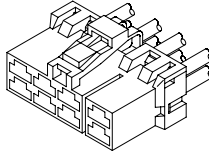
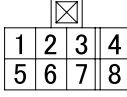
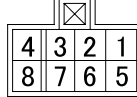
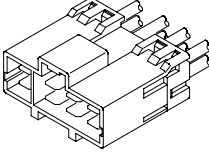
Number shows number of pins	Female connector		Male connector	
AM2A				
AM2B				
AM2C				
AM4A				
AM4B				
AM6A				
AM6B				
AM8A				
AM8B				

Number shows number of pins	Female connector	Male connector
AM10A	 	 
AM10B	 	 

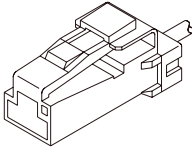
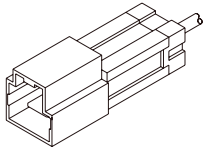
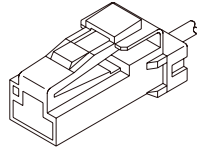
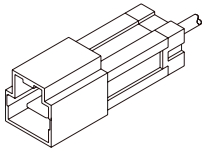
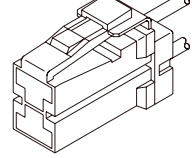
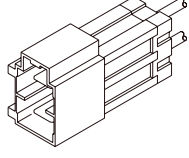
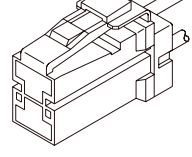
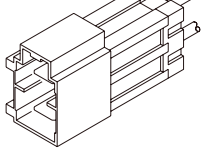
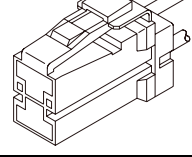
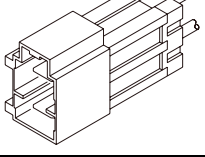
AN type

Number shows number of pins	Female connector	Male connector
AN1A	 	 
AN2A	 	 
AN3A	 	 
AN4A	 	 
AN4B	 	 
AN6A	 	 

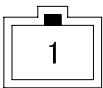
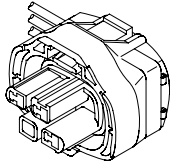
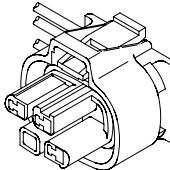
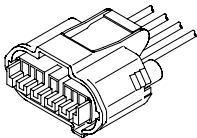
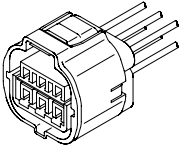
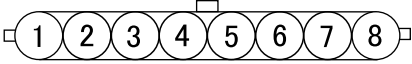
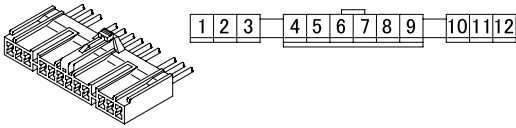
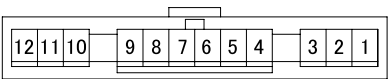
CONNECTOR CONFIGURATION CHART

Number shows number of pins	Female connector	Male connector
AN6B	 	 
AN8A	 	 
AN8B	 	 

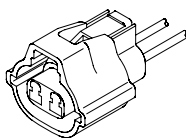
AP type

Number shows number of pins	Female connector	Male connector
AP1A	 	 
AP1B	 	 
AP2A	 	 
AP2B	 	 
AP2C	 	 

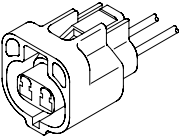
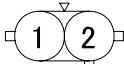
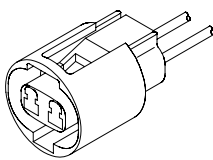
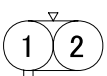
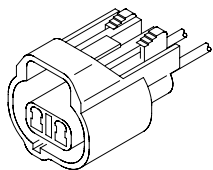
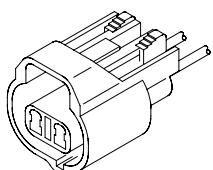
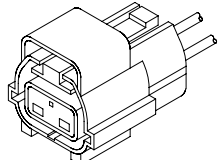
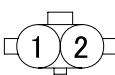
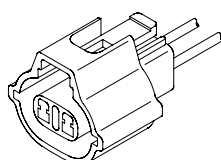
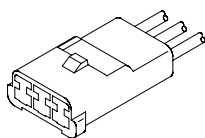
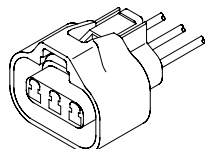
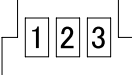
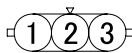
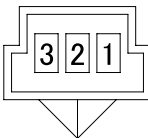
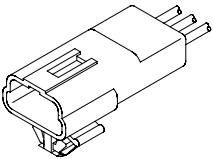
AQ type

Number shows number of pins	Female connector	Male connector
AQ1A		
AQ3A		
AQ3B		
AQ5A		
AQ6A		
AQ8A		
AQ12A		

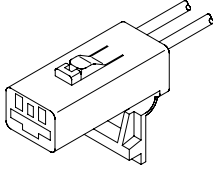
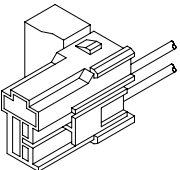
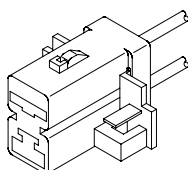
AR type

Number shows number of pins	Female connector	Male connector
AR2A		

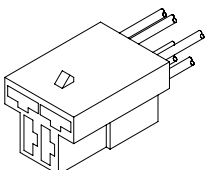
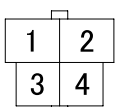
CONNECTOR CONFIGURATION CHART

Number shows number of pins	Female connector	Male connector
AR2B	 	
AR2C	 	
AR2D	 	
AR2E	 	
AR2F		
AR2G	 	
AR2H	 	
AR3A	   	 

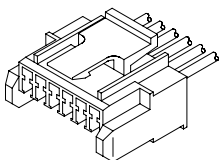
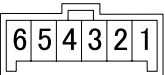
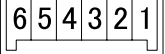
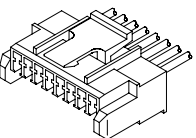
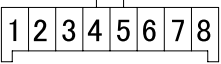
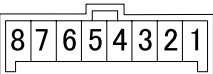
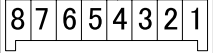
AS type

Number shows number of pins	Female connector	Male connector
AS1A	 	
AS2A	 	
AS2B	 	

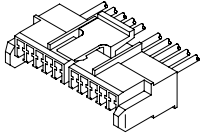
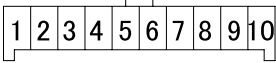
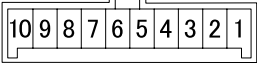
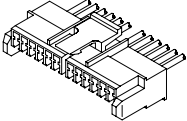
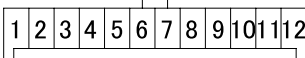
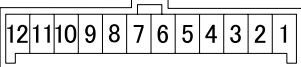
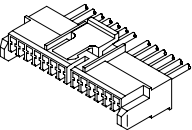
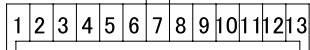
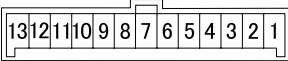
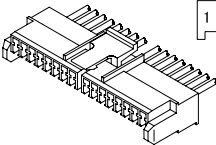
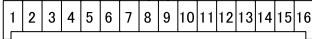
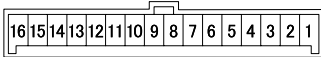
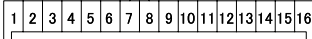
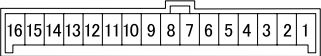
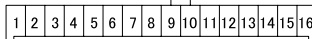
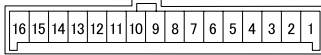
AT type

Number shows number of pins	Female connector	Male connector
AT4A	 	

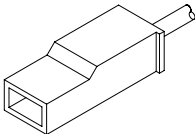
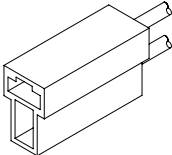
AU type

Number shows number of pins	Female connector	Male connector
AU2A	 	 
AU6A	 	 
AU8A	 	 

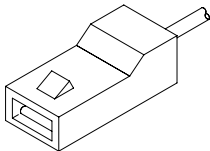
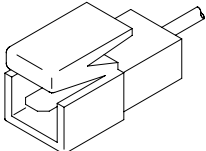
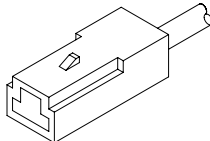
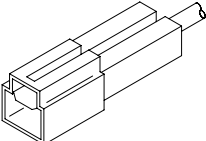
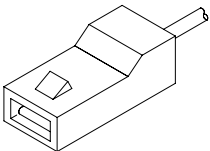
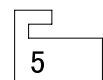
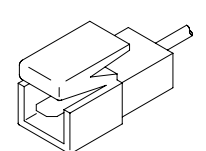
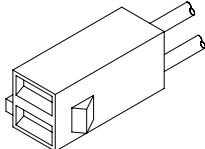
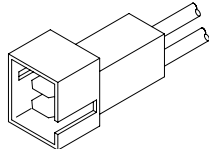
CONNECTOR CONFIGURATION CHART

Number shows number of pins	Female connector	Male connector
AU10A	 	
AU12A	 	
AU13A	 	
AU16A	 	
AU16B		
AU16C		

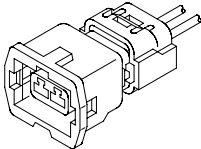
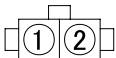
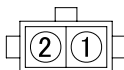
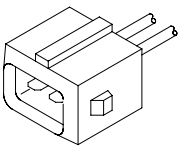
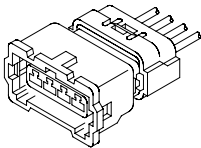
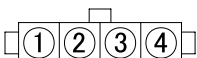
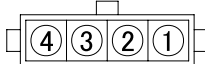
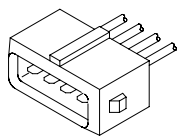
AV type

Number shows number of pins	Female connector	Male connector
AV1A	 	
AV2A	 	

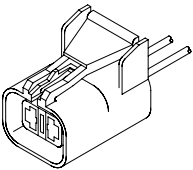
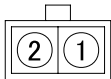
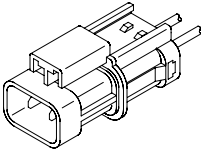
AW type

Number shows number of pins	Female connector	Male connector
AW1A	 	 
AW1B	 	 
AW1C	 	 
AW2A	 	 

AX type

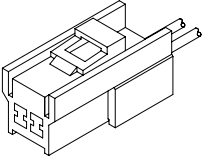
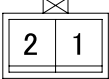
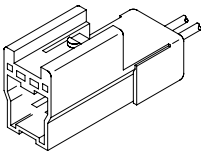
Number shows number of pins	Female connector	Male connector
AX2A	 	 
AX4A	 	 

AY type

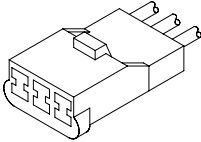
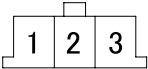
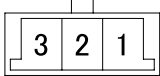
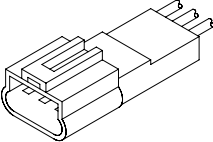
Number shows number of pins	Female connector	Male connector
AY2A	 	 

CONNECTOR CONFIGURATION CHART

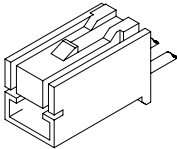
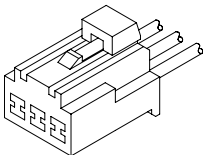
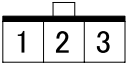
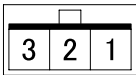
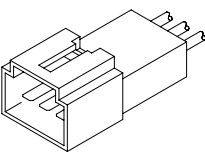
AZ type

Number shows number of pins	Female connector	Male connector
AZ2A	 	 

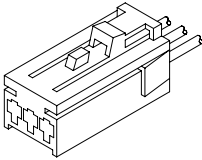
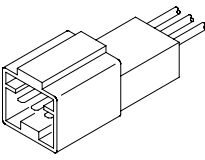
BA type

Number shows number of pins	Female connector	Male connector
BA3A	 	 

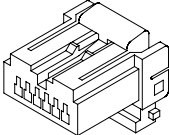
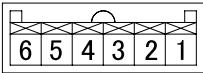
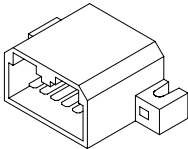
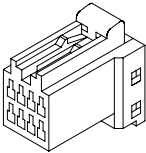
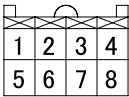
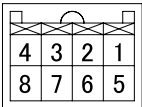
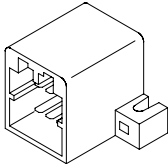
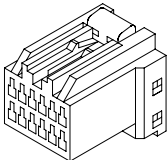
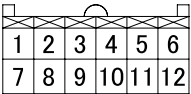
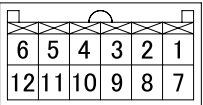
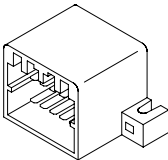
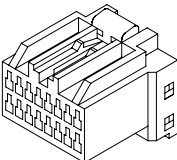
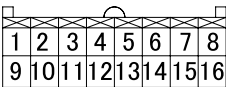
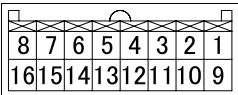
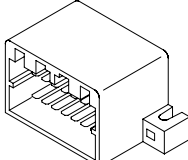
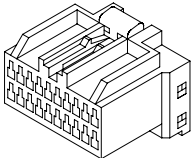
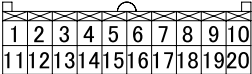
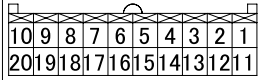
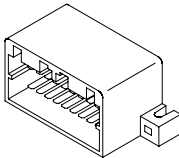
BB type

Number shows number of pins	Female connector	Male connector
BB2A	 	
BB3A	 	 

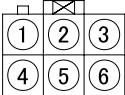
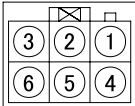
BC type

Number shows number of pins	Female connector	Male connector
BC3A	 	 

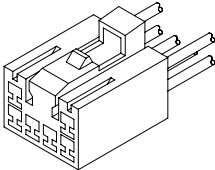
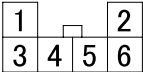
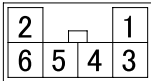
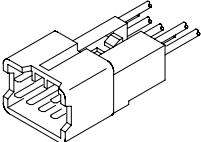
BD type

Number shows number of pins	Female connector	Male connector
BD6A	 	 
BD8A	 	 
BD12A	 	 
BD16A	 	 
BD20A	 	 

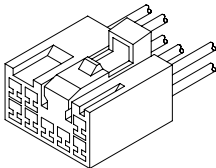
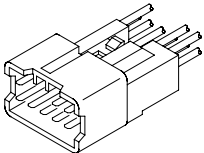
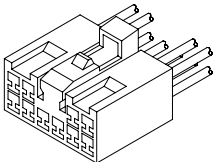
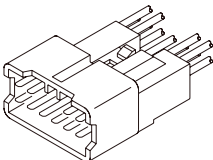
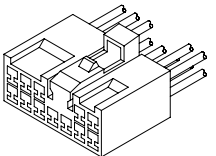
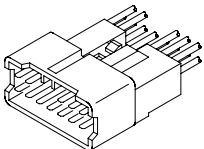
BE type

Number shows number of pins	Female connector	Male connector
BE6A		

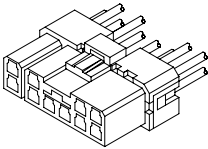
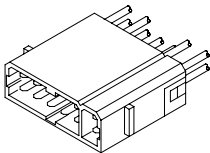
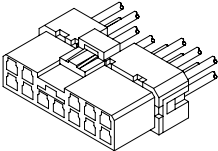
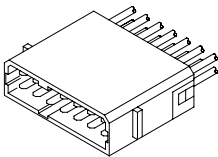
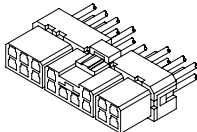
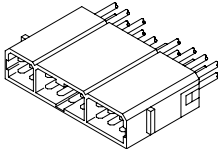
BF type

Number shows number of pins	Female connector	Male connector
BF6A	 	 

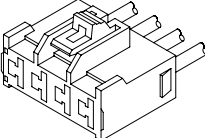
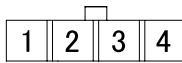
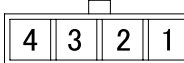
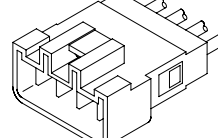
CONNECTOR CONFIGURATION CHART

Number shows number of pins	Female connector	Male connector																																				
BF8A	 <table><tr><td>1</td><td>2</td><td></td><td>3</td></tr><tr><td>4</td><td>5</td><td>6</td><td>7</td></tr><tr><td></td><td></td><td></td><td>8</td></tr></table>	1	2		3	4	5	6	7				8	<table><tr><td>3</td><td></td><td>2</td><td>1</td></tr><tr><td>8</td><td>7</td><td>6</td><td>5</td></tr><tr><td></td><td></td><td></td><td>4</td></tr></table> 	3		2	1	8	7	6	5				4												
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BF10A	 <table><tr><td>1</td><td>2</td><td></td><td>3</td><td>4</td></tr><tr><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td></tr><tr><td></td><td></td><td></td><td></td><td>10</td></tr></table>	1	2		3	4	5	6	7	8	9					10	<table><tr><td>4</td><td>3</td><td></td><td>2</td><td>1</td></tr><tr><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td></tr><tr><td></td><td></td><td></td><td></td><td>5</td></tr></table> 	4	3		2	1	10	9	8	7	6					5						
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BF12A	 <table><tr><td>1</td><td>2</td><td>3</td><td></td><td>4</td><td>5</td></tr><tr><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td>12</td></tr></table>	1	2	3		4	5	6	7	8	9	10	11						12	<table><tr><td>5</td><td>4</td><td></td><td>3</td><td>2</td><td>1</td></tr><tr><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td>6</td></tr></table> 	5	4		3	2	1	12	11	10	9	8	7						6
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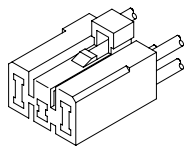
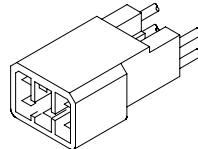
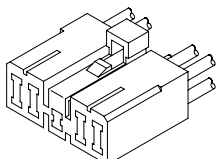
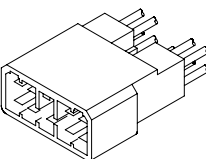
BG type

Number shows number of pins	Female connector	Male connector																																																
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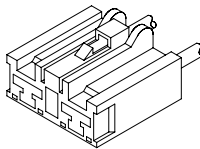
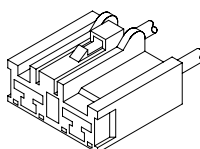
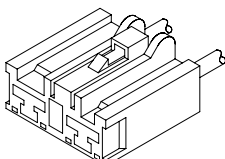
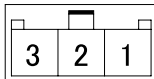
BH type

Number shows number of pins	Female connector	Male connector
BH4A	 	 

BJ type

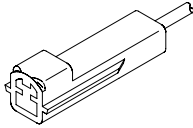
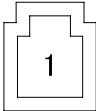
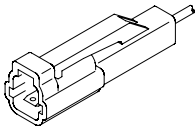
Number shows number of pins	Female connector	Male connector																				
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2	X	1																				
5	4	3																				
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1	2	X	3																			
4	5	6	7																			
3	X	2	1																			
7	6	5	4																			
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1	2	X	3	4																		
5	6	7	8	9																		
4	3	X	2	1																		
9	8	7	6	5																		

BM type

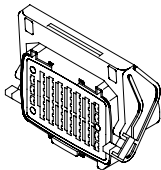
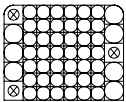
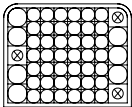
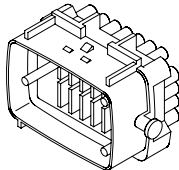
Number shows number of pins	Female connector	Male connector
BM2A	 	
BM2B	 	
BM2C	 	
BM3A		

CONNECTOR CONFIGURATION CHART

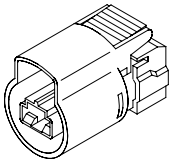
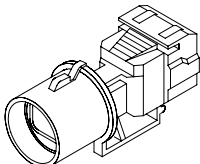
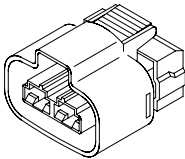
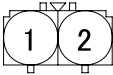
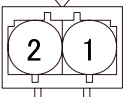
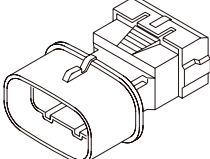
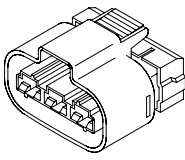
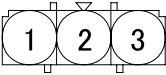
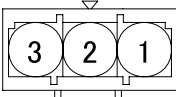
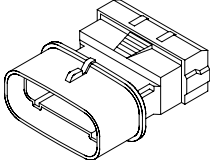
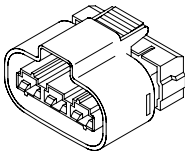
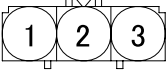
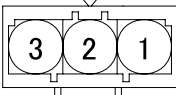
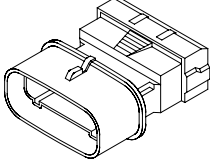
BN type

Number shows number of pins	Female connector	Male connector
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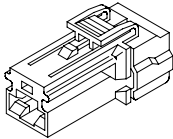
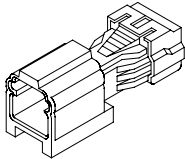
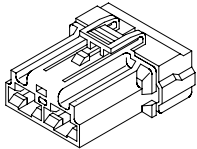
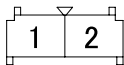
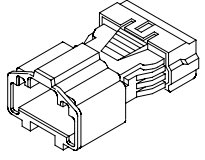
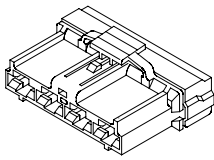
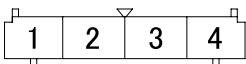
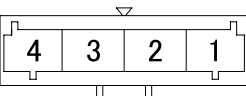
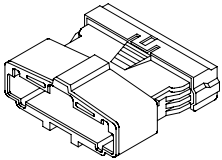
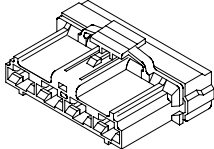
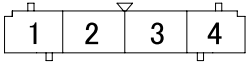
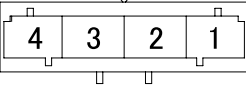
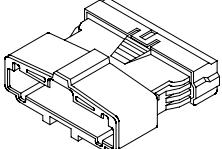
BP type

Number shows number of pins	Female connector	Male connector
BP49A	 	 

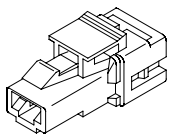
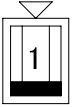
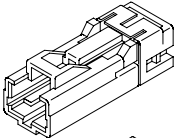
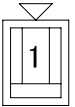
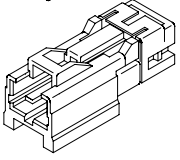
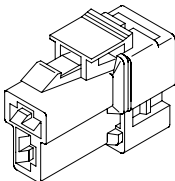
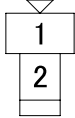
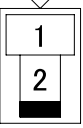
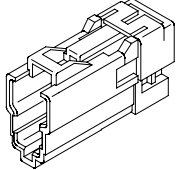
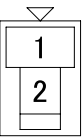
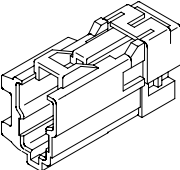
BQ type

Number shows number of pins	Female connector	Male connector
BQ1A	 	 
BQ2A	 	 
BQ3A	 	 
BQ3B	 	 

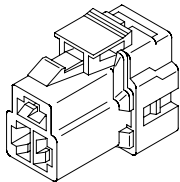
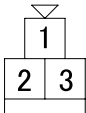
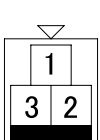
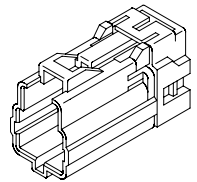
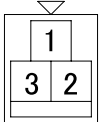
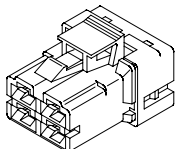
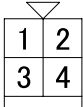
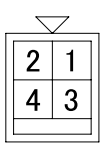
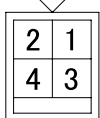
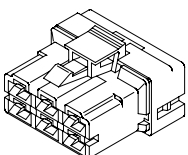
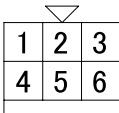
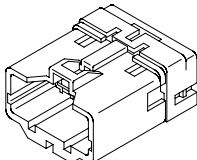
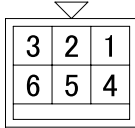
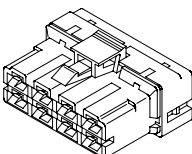
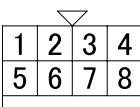
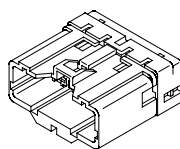
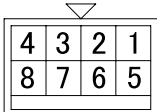
BR type

Number shows number of pins	Female connector	Male connector
BR1A	 	 
BR2A	 	 
BR4A	 	 
BR4B	 	 

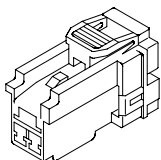
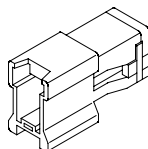
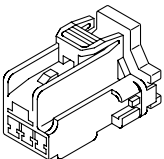
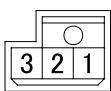
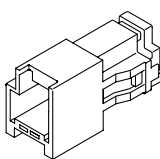
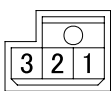
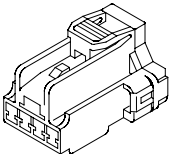
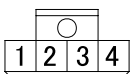
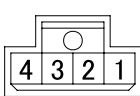
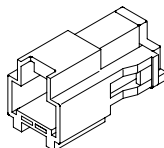
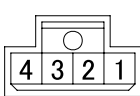
BS type

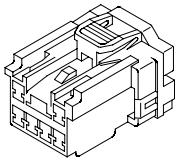
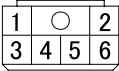
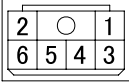
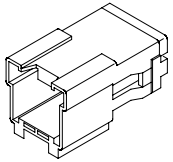
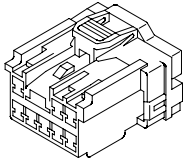
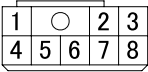
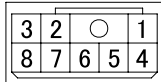
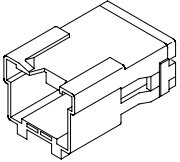
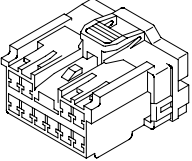
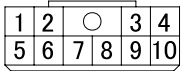
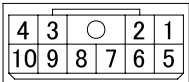
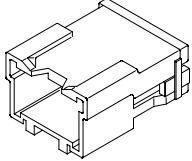
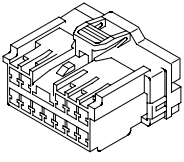
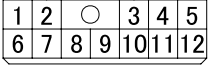
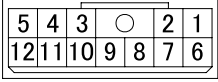
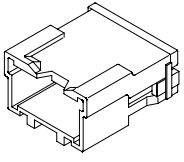
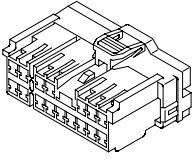
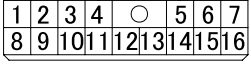
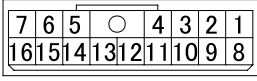
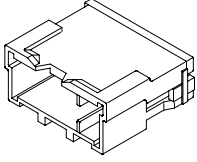
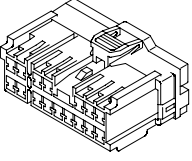
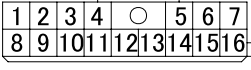
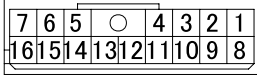
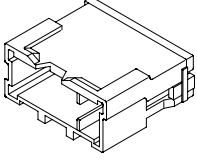
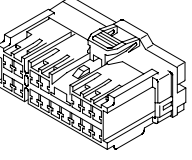
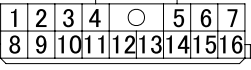
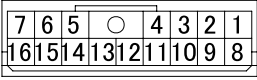
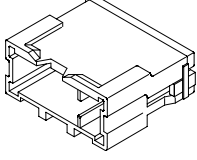
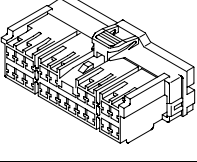
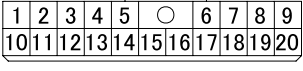
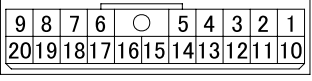
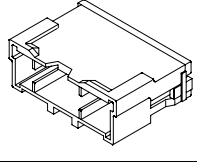
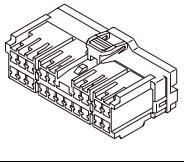
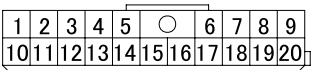
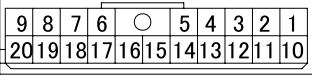
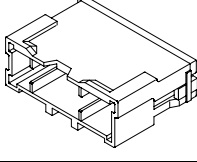
Number shows number of pins	Female connector	Male connector
BS1A	 	   
BS2A	 	   

CONNECTOR CONFIGURATION CHART

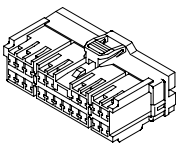
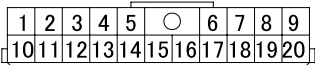
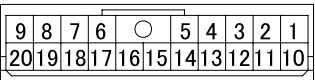
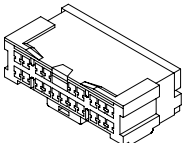
Number shows number of pins	Female connector	Male connector
BS3A	 	  
BS4A	 	 
BS6A	 	 
BS8A	 	 

BT type

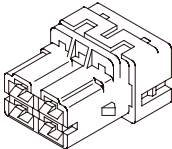
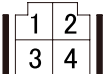
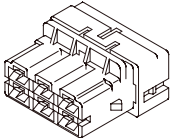
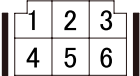
Number shows number of pins	Female connector	Male connector
BT2A	 	  
BT3A	 	  
BT4A	 	  

Number shows number of pins	Female connector	Male connector
BT6A	 	 
BT8A	 	 
BT10A	 	 
BT12A	 	 
BT16A	 	 
BT16B	 	 
BT16C	 	 
BT20A	 	 
BT20B	 	 

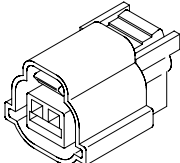
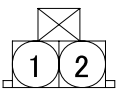
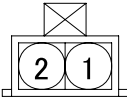
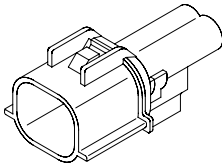
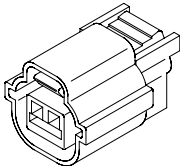
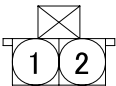
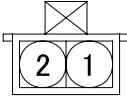
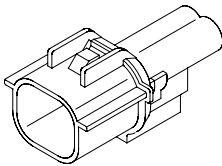
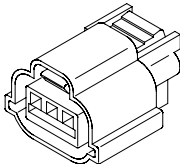
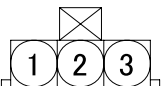
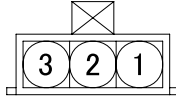
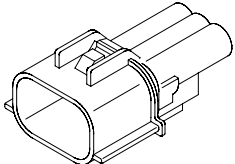
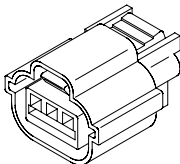
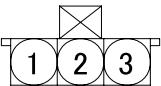
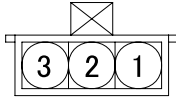
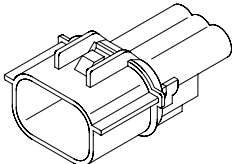
CONNECTOR CONFIGURATION CHART

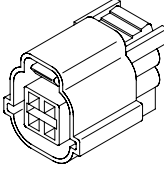
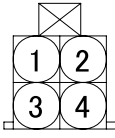
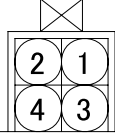
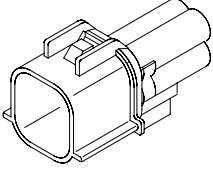
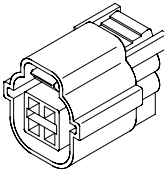
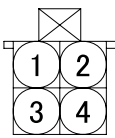
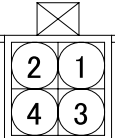
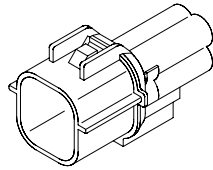
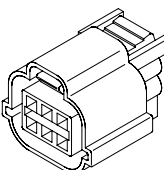
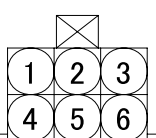
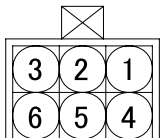
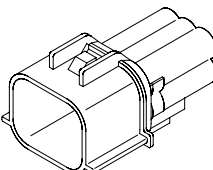
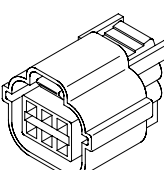
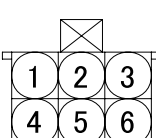
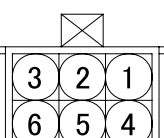
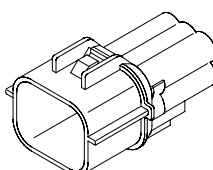
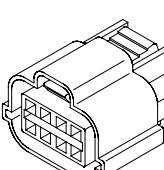
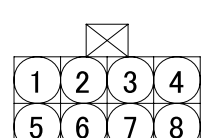
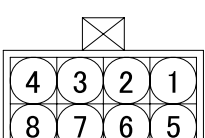
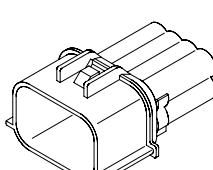
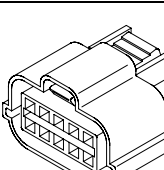
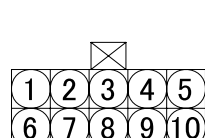
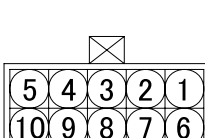
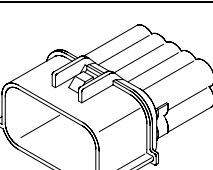
Number shows number of pins	Female connector	Male connector
BT20C	 	 

BU type

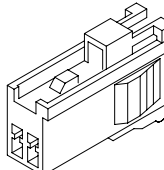
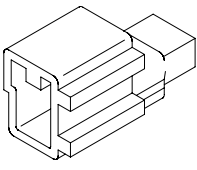
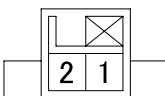
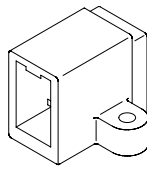
Number shows number of pins	Female connector	Male connector
BU4A	 	
BU6A	 	

BW type

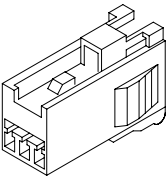
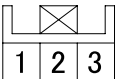
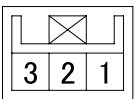
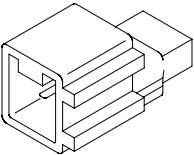
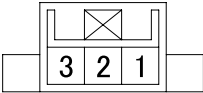
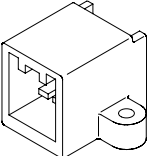
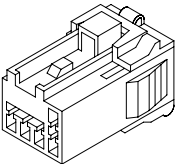
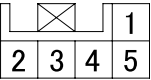
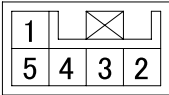
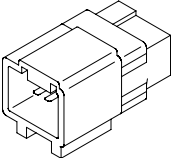
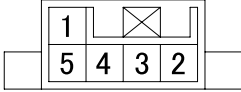
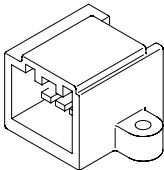
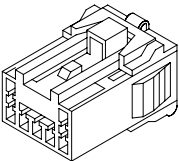
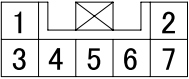
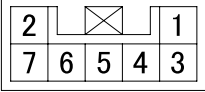
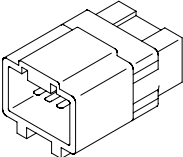
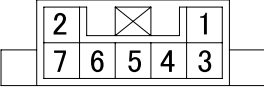
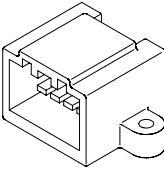
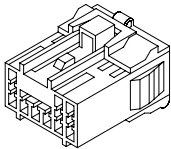
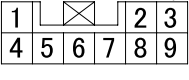
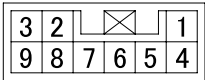
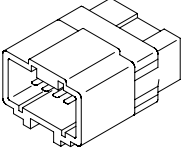
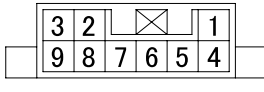
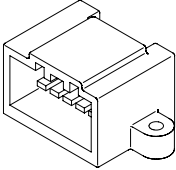
Number shows number of pins	Female connector	Male connector
BW2A	 	 
BW2B	 	 
BW3A	 	 
BW3B	 	 

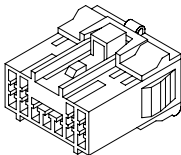
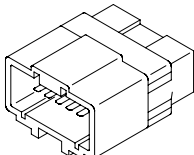
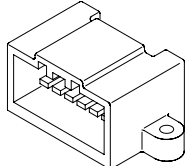
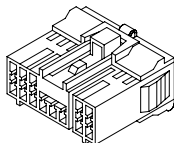
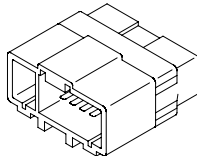
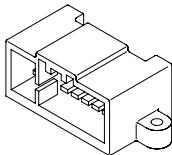
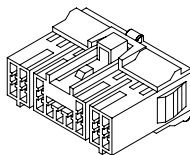
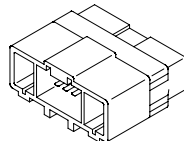
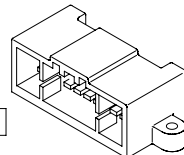
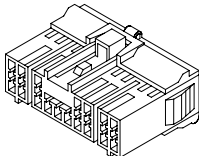
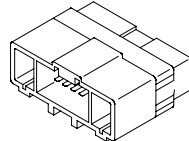
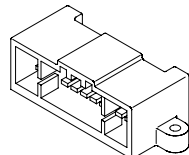
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BW4A	 	 
BW4B	 	 
BW6A	 	 
BW6B	 	 
BW8A	 	 
BW10A	 	 

BX type

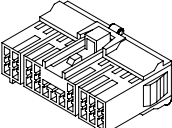
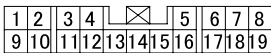
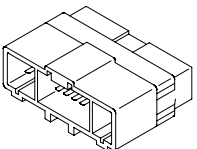
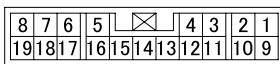
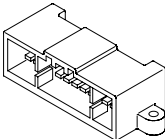
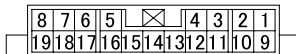
Number shows number of pins	Female connector	Male connector
BX2A	 	   

CONNECTOR CONFIGURATION CHART

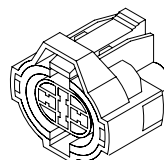
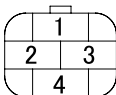
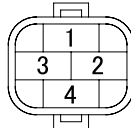
Number shows number of pins	Female connector	Male connector
BX3A	 	   
BX5A	 	   
BX7A	 	   
BX9A	 	   

Number shows number of pins	Female connector	Male connector																																																																																	
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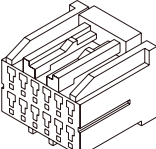
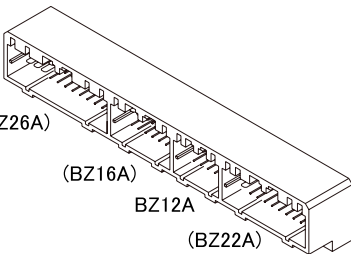
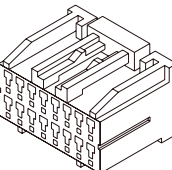
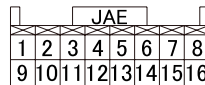
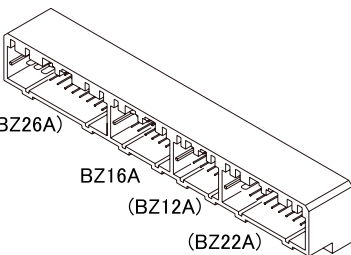
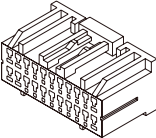
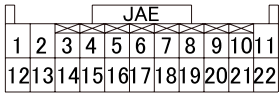
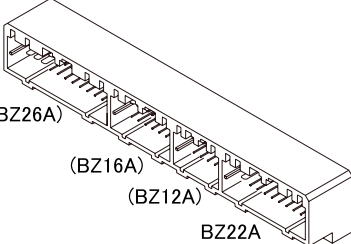
CONNECTOR CONFIGURATION CHART

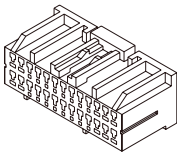
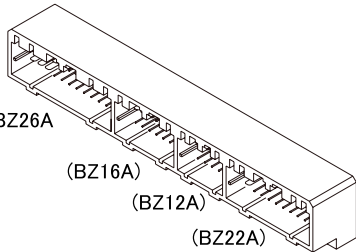
Number shows number of pins	Female connector	Male connector
BX19A	 	   

BY type

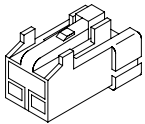
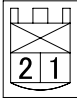
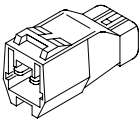
Number shows number of pins	Female connector	Male connector
BY4A	 	

BZ type

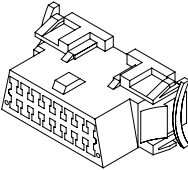
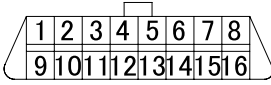
Number shows number of pins	Female connector	Male connector
BZ12A	 	 (BZ26A) (BZ16A) BZ12A (BZ22A)
BZ16A	 	 (BZ26A) BZ16A (BZ12A) (BZ22A)
BZ22A	 	 (BZ26A) (BZ16A) (BZ12A) BZ22A

Number shows number of pins	Female connector	Male connector
BZ26A	 	

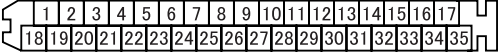
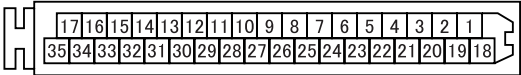
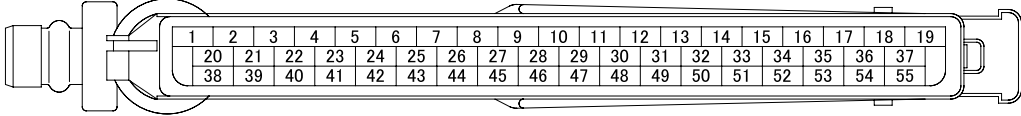
CA type

Number shows number of pins	Female connector	Male connector
CA2A	 	 

CB type

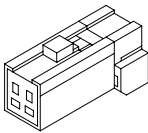
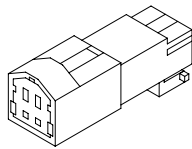
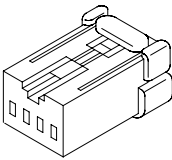
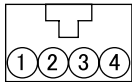
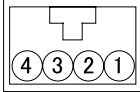
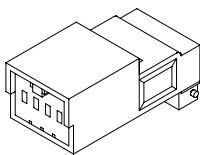
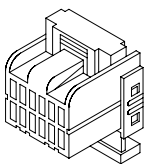
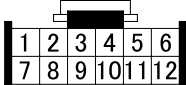
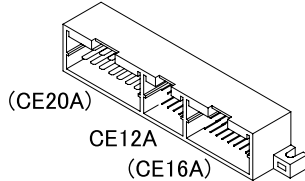
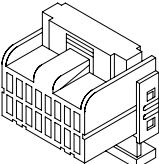
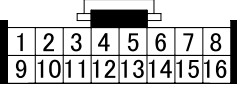
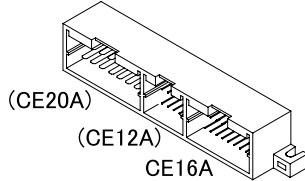
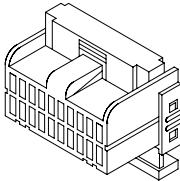
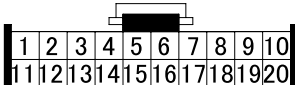
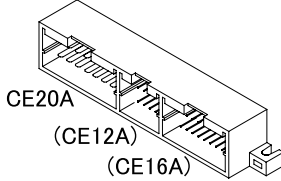
Number shows number of pins	Female connector	Male connector
CB16A	 	

CD type

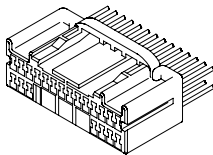
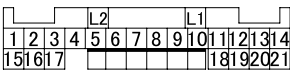
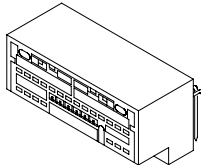
Number shows number of pins	Female connector	Male connector
CD35A		
CD55A		

CONNECTOR CONFIGURATION CHART

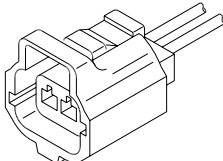
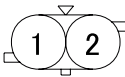
CE type

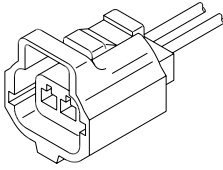
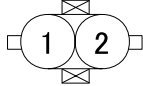
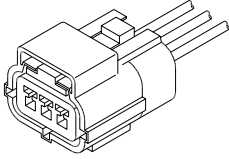
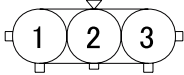
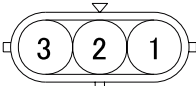
Number shows number of pins	Female connector	Male connector
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CE4A	 	 
CE12A	 	
CE16A	 	
CE20A	 	

CF type

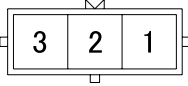
Number shows number of pins	Female connector	Male connector
CF21A	 	

CH type

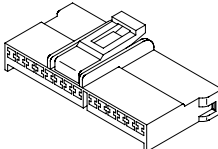
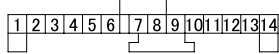
Number shows number of pins	Female connector	Male connector
CH2A	 	

Number shows number of pins	Female connector	Male connector
CH2B	 	
CH3A	 	

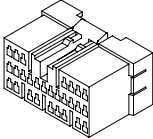
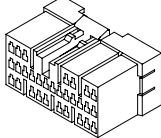
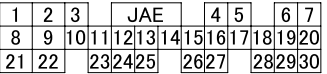
CK type

Number shows number of pins	Female connector	Male connector
CK3A		

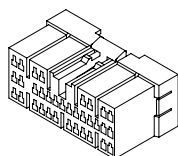
CL type

Number shows number of pins	Female connector	Male connector
CL14A	 	

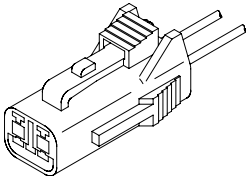
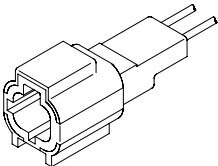
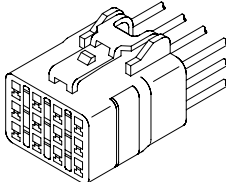
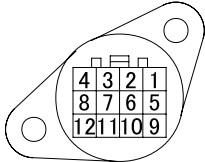
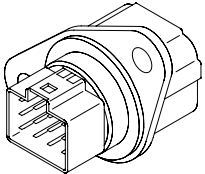
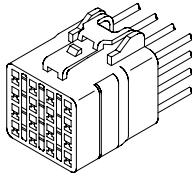
CM type

Number shows number of pins	Female connector	Male connector
CM28A	 	
CM30A	 	

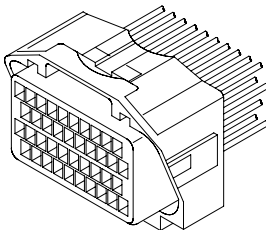
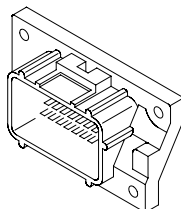
CONNECTOR CONFIGURATION CHART

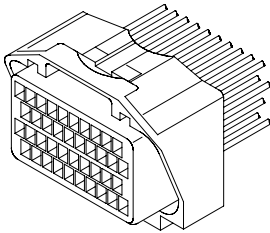
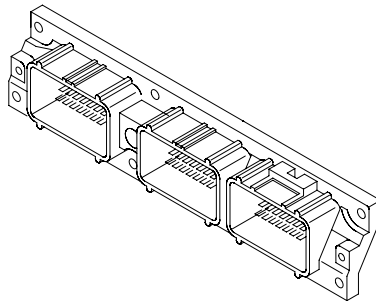
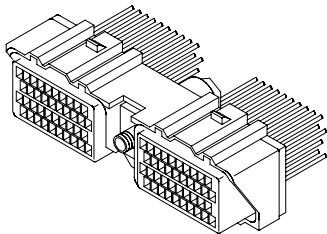
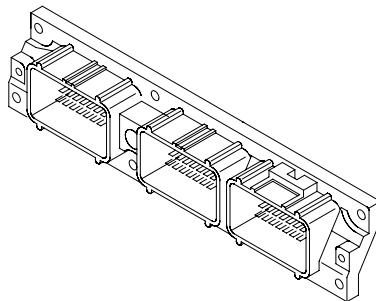
Number shows number of pins	Female connector	Male connector																																										
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CN type

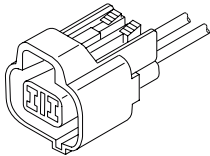
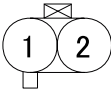
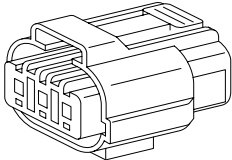
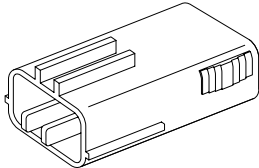
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CN16A	 <table border="1" data-bbox="734 1045 860 1150"><tr><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>5</td><td>6</td><td>7</td><td>8</td></tr><tr><td>9</td><td>10</td><td>11</td><td>12</td></tr><tr><td>13</td><td>14</td><td>15</td><td>16</td></tr></table>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
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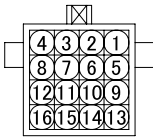
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CQ type

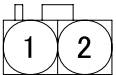
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CQ2B	 	
CQ3A		

CR type

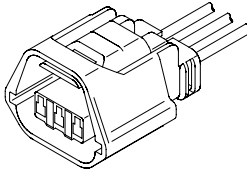
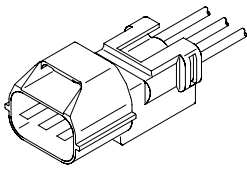
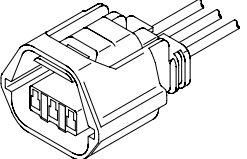
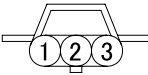
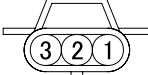
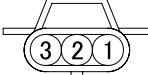
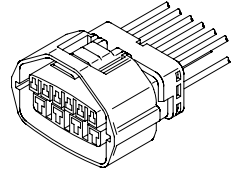
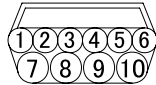
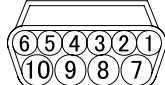
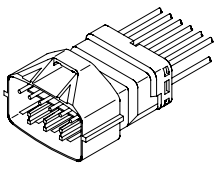
Number shows number of pins	Female connector	Male connector
CR16A		

CONNECTOR CONFIGURATION CHART

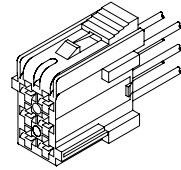
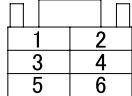
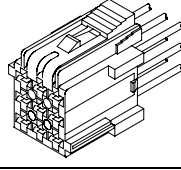
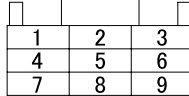
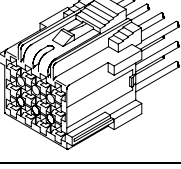
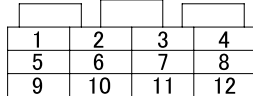
CS type

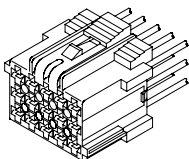
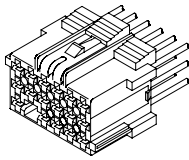
Number shows number of pins	Female connector	Male connector
CS2A		

CT type

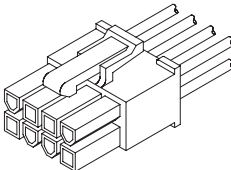
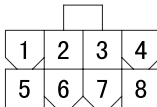
Number shows number of pins	Female connector	Male connector
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CT3B	 	 
CT10A	 	 

CU type

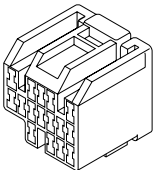
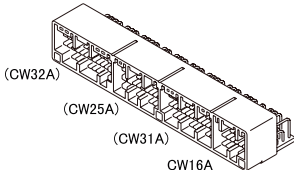
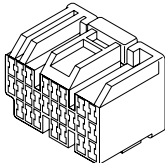
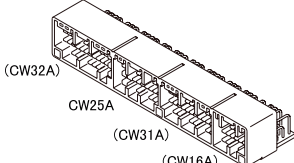
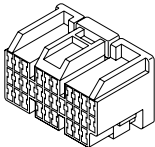
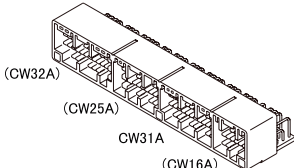
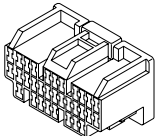
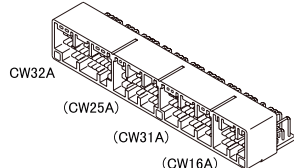
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CU9A	 	
CU12A	 	

Number shows number of pins	Female connector	Male connector																								
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CV type

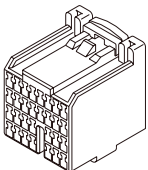
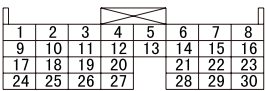
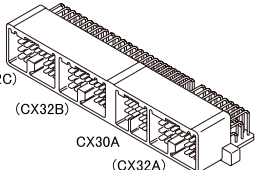
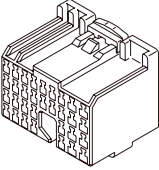
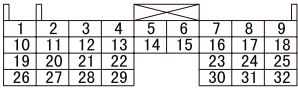
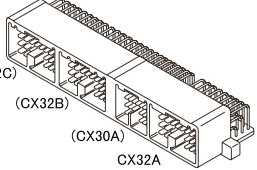
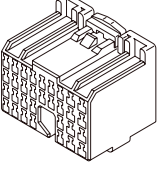
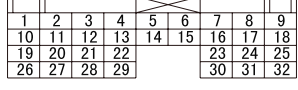
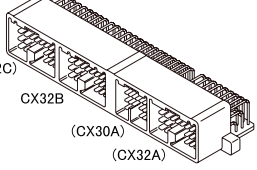
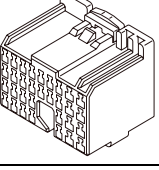
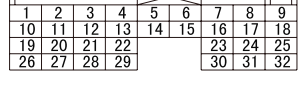
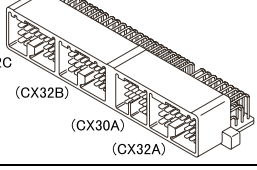
Number shows number of pins	Female connector	Male connector
CV8A	 	

CW type

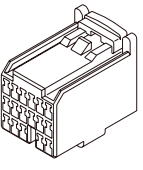
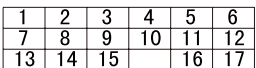
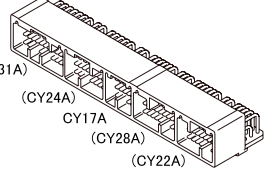
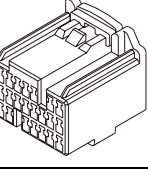
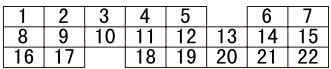
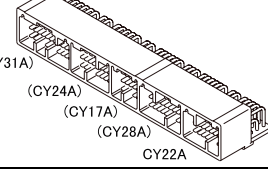
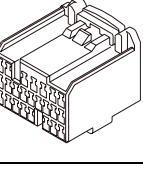
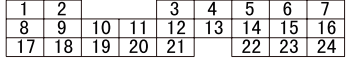
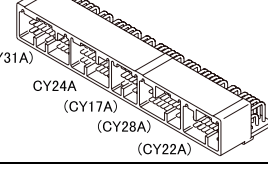
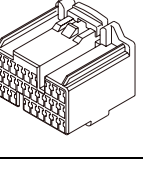
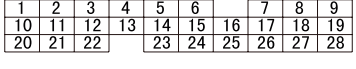
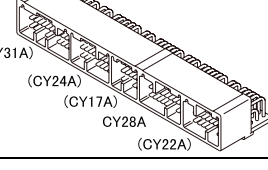
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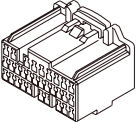
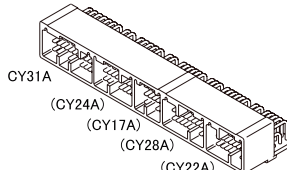
CONNECTOR CONFIGURATION CHART

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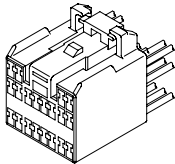
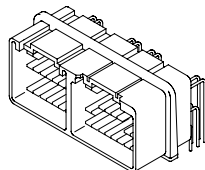
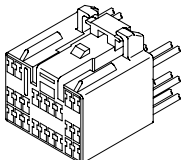
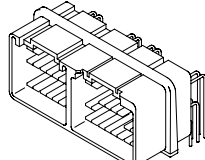
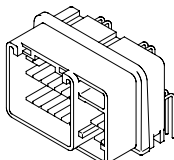
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CY type

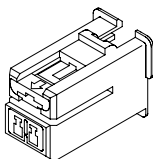
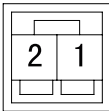
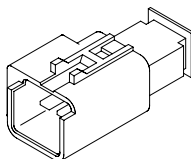
Number shows number of pins	Female connector	Male connector
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CY22A	 	 (CY31A) (CY24A) (CY17A) (CY28A) CY22A
CY24A	 	 (CY31A) CY24A (CY17A) (CY28A) (CY22A)
CY28A	 	 (CY31A) (CY24A) (CY17A) CY28A (CY22A)

Number shows number of pins	Female connector	Male connector																																				
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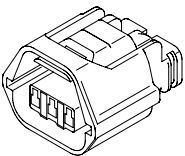
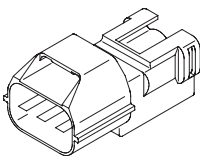
DA type

Number shows number of pins	Female connector	Male connector																																																																																																																					
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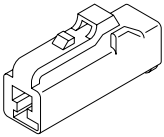
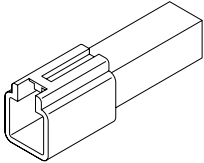
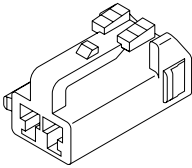
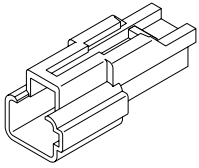
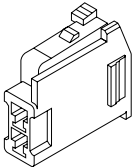
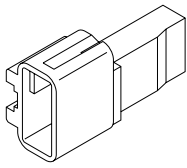
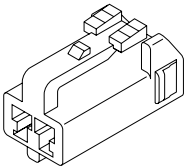
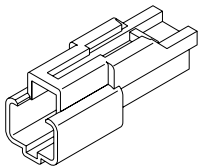
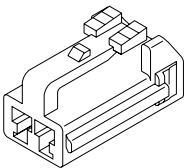
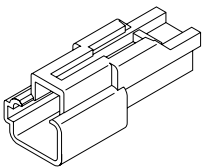
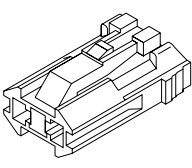
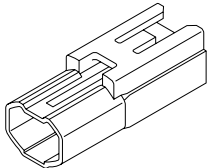
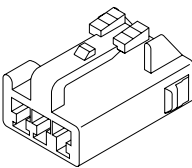
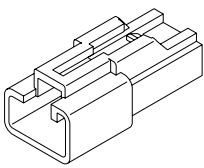
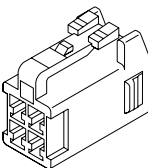
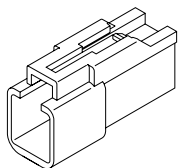
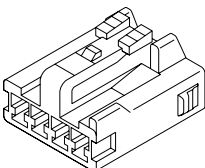
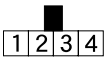
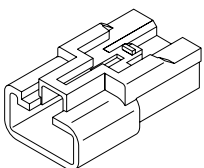
Number shows number of pins	Female connector	Male connector
DB2A	 	 

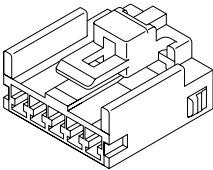
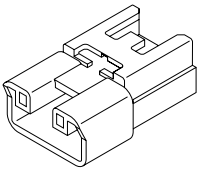
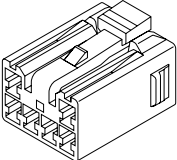
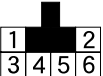
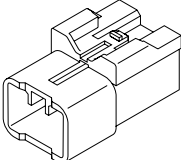
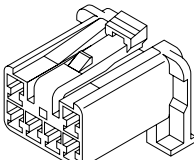
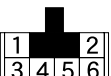
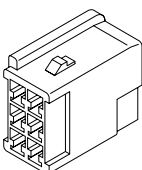
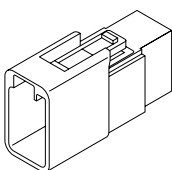
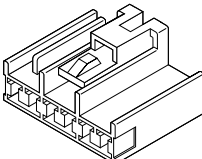
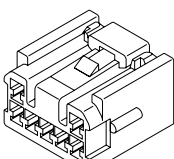
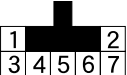
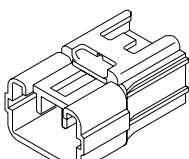
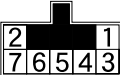
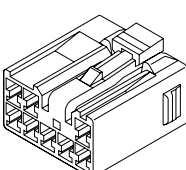
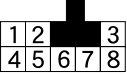
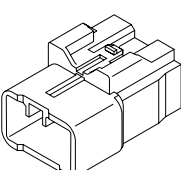
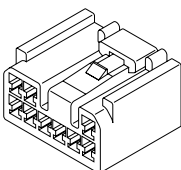
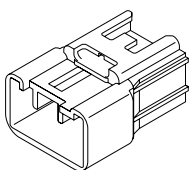
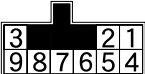
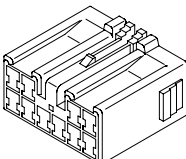
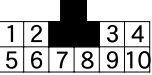
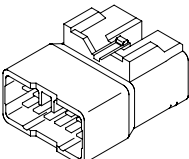
DC type

Number shows number of pins	Female connector	Male connector						
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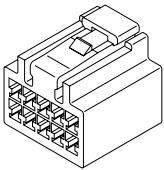
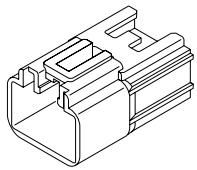
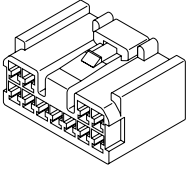
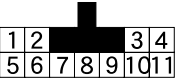
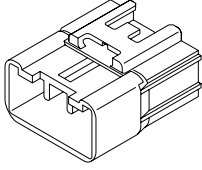
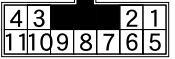
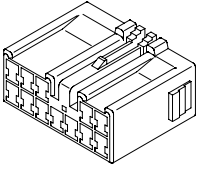
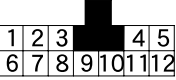
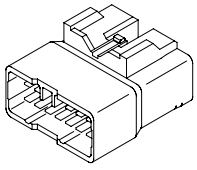
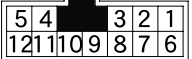
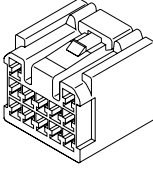
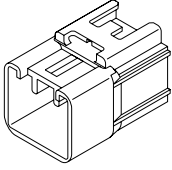
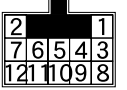
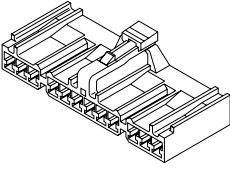
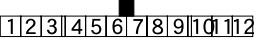
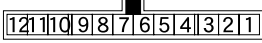
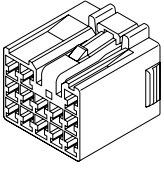
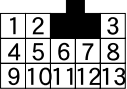
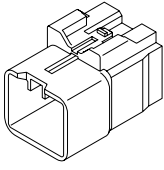
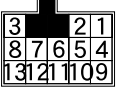
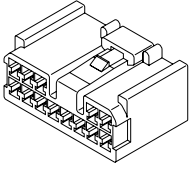
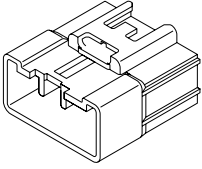
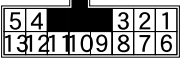
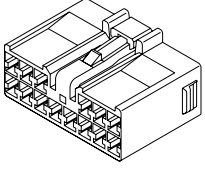
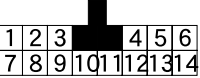
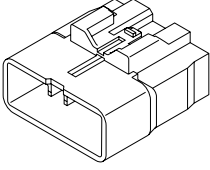
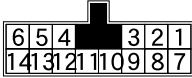
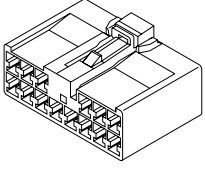
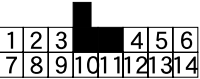
CONNECTOR CONFIGURATION CHART

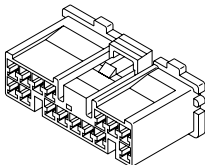
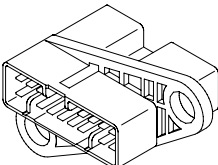
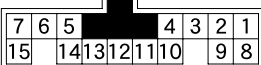
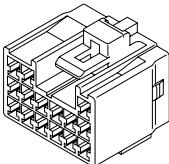
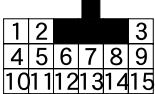
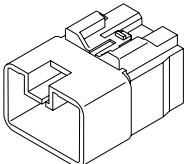
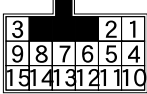
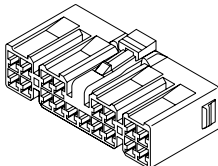
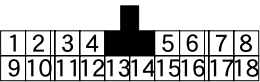
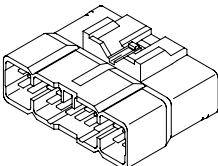
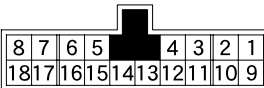
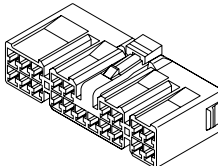
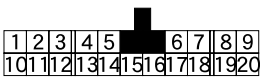
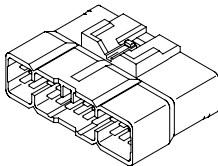
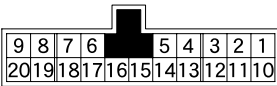
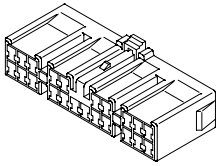
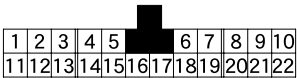
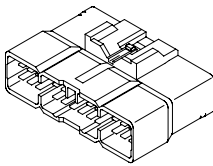
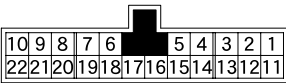
DD type

Number shows number of pins	Female connector	Male connector
DD1A	 	 
DD2A	 	 
DD2B	 	 
DD2C	 	 
DD2E	 	 
DD2F	 	 
DD3A	 	 
DD4A	 	 
DD4C	 	 

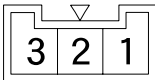
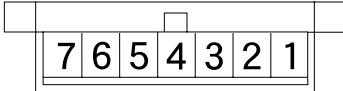
Number shows number of pins	Female connector	Male connector
DD5A	 	 
DD6A	 	 
DD6B	 	
DD6C	 	 
DD6E	 	
DD7A	 	 
DD8A	 	 
DD9A	 	 
DD10A	 	 

CONNECTOR CONFIGURATION CHART

Number shows number of pins	Female connector	Male connector
DD10B	 	 
DD11A	 	 
DD12A	 	 
DD12B	 	 
DD12C	 	 
DD13A	 	 
DD13B	 	 
DD14A	 	 
DD14B	 	

Number shows number of pins	Female connector	Male connector
DD15A	 	 
DD15B	 	 
DD18A	 	 
DD20A	 	 
DD22A	 	 

DE type

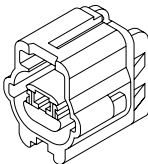
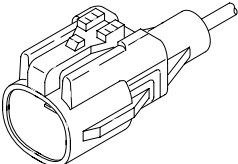
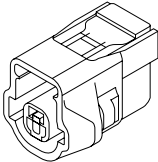
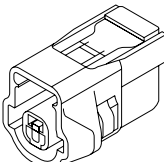
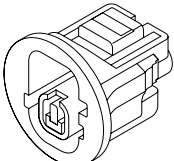
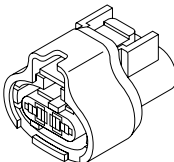
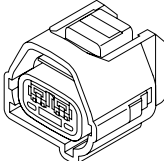
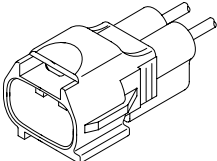
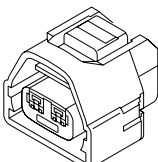
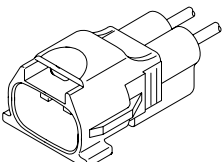
Number shows number of pins	Female connector	Male connector
DE3A		
DE7A		

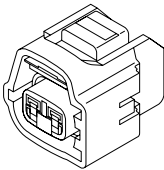
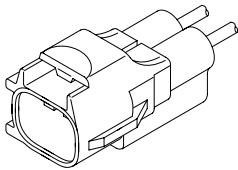
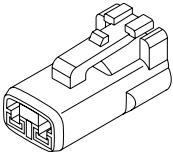
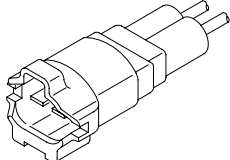
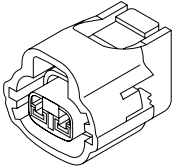
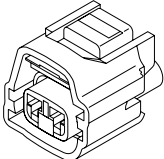
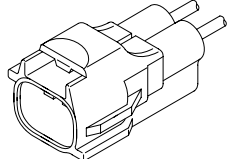
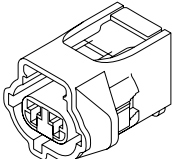
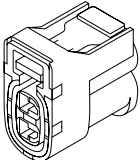
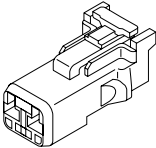
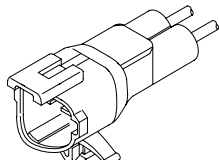
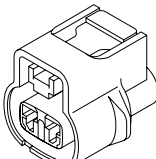
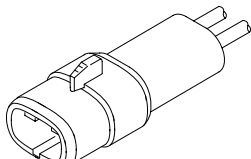
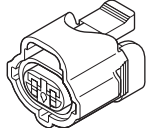
CONNECTOR CONFIGURATION CHART

DF type

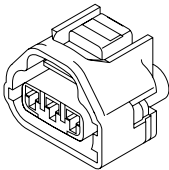
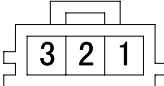
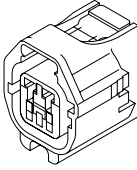
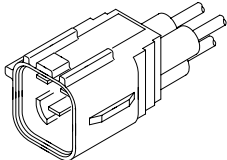
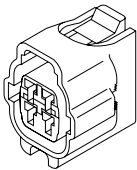
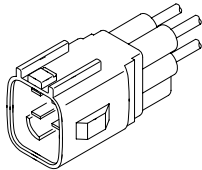
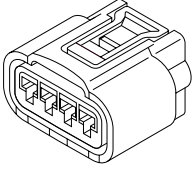
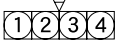
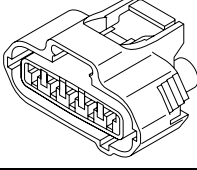
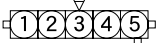
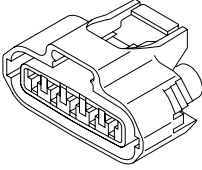
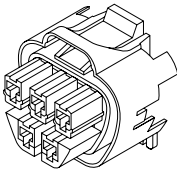
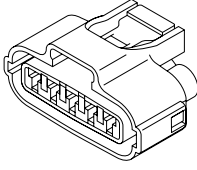
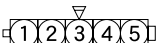
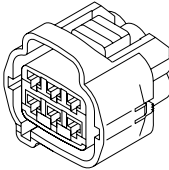
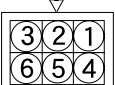
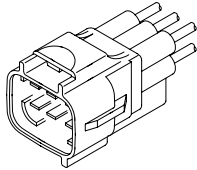
Number shows number of pins	Female connector	Male connector
DF3A		

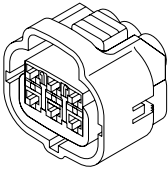
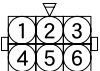
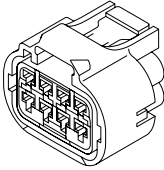
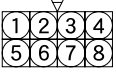
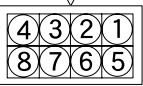
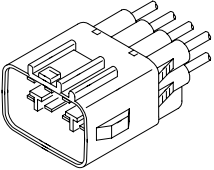
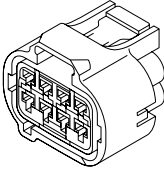
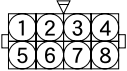
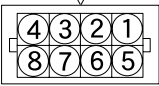
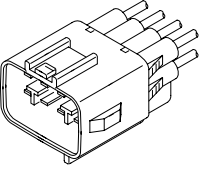
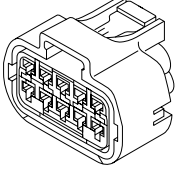
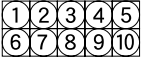
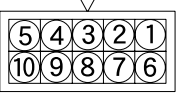
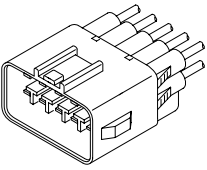
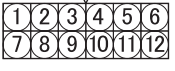
DG type

Number shows number of pins	Female connector	Male connector
DG1A	 	 
DG1B	 	
DG1C	 	
DG1D	 	
DG2A	 	
DG2B	 	 
DG2C	 	 

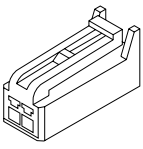
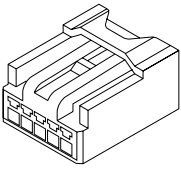
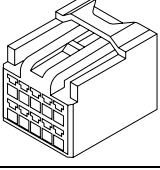
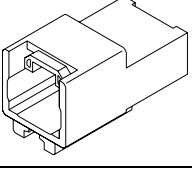
Number shows number of pins	Female connector	Male connector
DG2D	 	 
DG2E	 	 
DG2F	 	
DG2G	 	 
DG2H	 	
DG2J	 	
DG2K	 	 
DG2L	 	 
DG2M	 	

CONNECTOR CONFIGURATION CHART

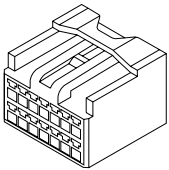
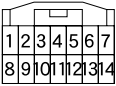
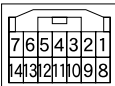
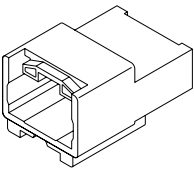
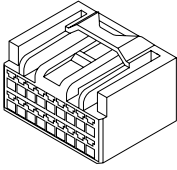
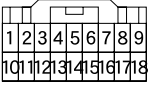
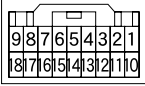
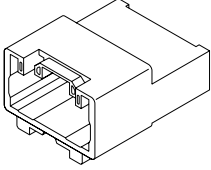
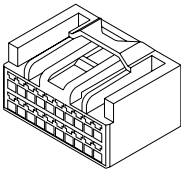
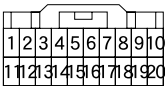
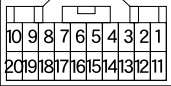
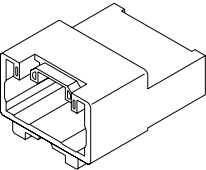
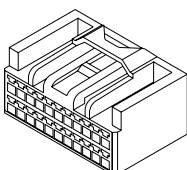
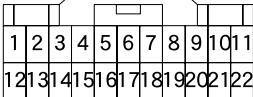
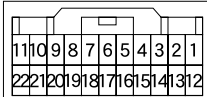
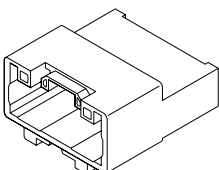
Number shows number of pins	Female connector	Male connector
DG3A	 	
DG3B	 	 
DG4A	 	 
DG4B	 	
DG5A	 	
DG5B	 	
DG5C	 	
DG5D	 	
DG6A	 	 

Number shows number of pins	Female connector	Male connector
DG6B	 	
DG8A	 	 
DG8B	 	 
DG10A	 	 
DG12A	 	

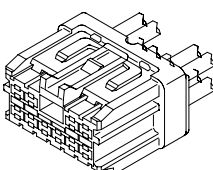
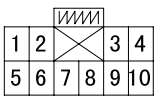
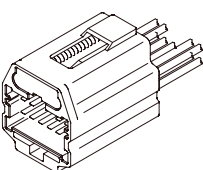
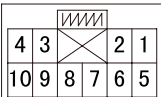
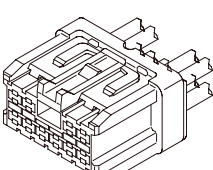
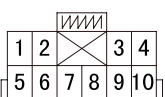
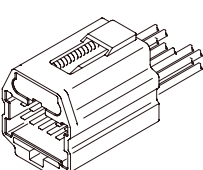
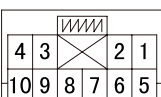
DH type

Number shows number of pins	Female connector	Male connector
DH2A	 	
DH5A	 	
DH10A	 	 

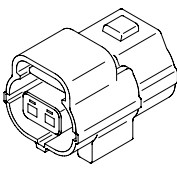
CONNECTOR CONFIGURATION CHART

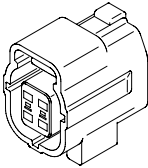
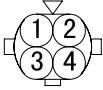
Number shows number of pins	Female connector	Male connector
DH14A	 	 
DH18A	 	 
DH20A	 	 
DH22A	 	 

DJ type

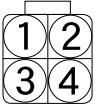
Number shows number of pins	Female connector	Male connector
DJ10A	 	 
DJ10B	 	 

DK type

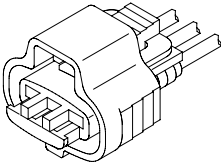
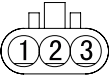
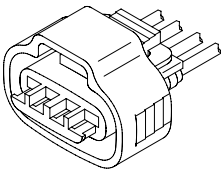
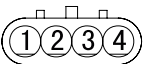
Number shows number of pins	Female connector	Male connector
DK2A	 	

Number shows number of pins	Female connector	Male connector
DK4A	 	

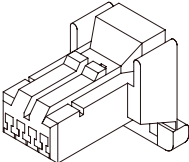
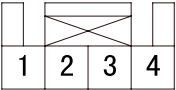
DL type

Number shows number of pins	Female connector	Male connector
DL4A		

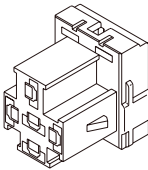
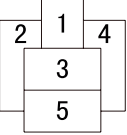
DM type

Number shows number of pins	Female connector	Male connector
DM3A	 	
DM4A	 	

DN type

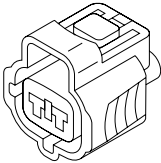
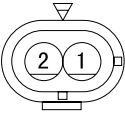
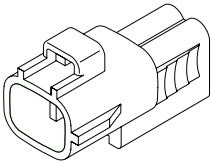
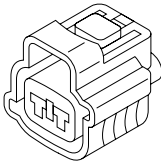
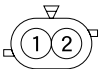
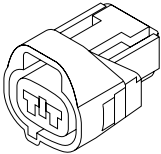
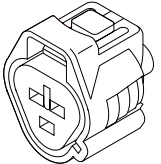
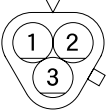
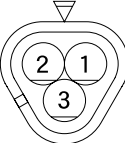
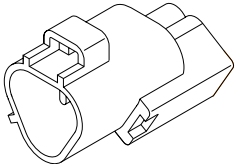
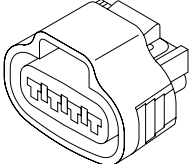
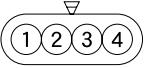
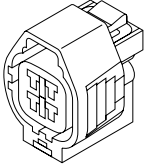
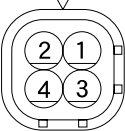
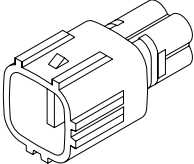
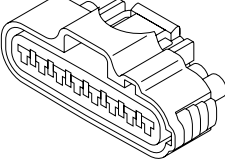
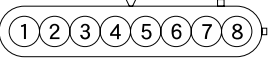
Number shows number of pins	Female connector	Male connector
DN4A	 	

DP type

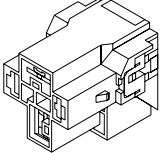
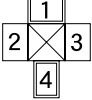
Number shows number of pins	Female connector	Male connector
DP5A	 	

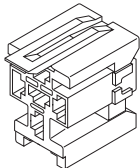
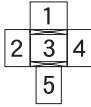
CONNECTOR CONFIGURATION CHART

DQ type

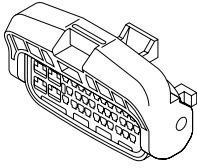
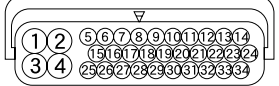
Number shows number of pins	Female connector	Male connector
DQ2A	 	 
DQ2B	 	
DQ2C	 	
DQ3A	 	 
DQ4A	 	
DQ4B	 	 
DQ8A	 	

EN type

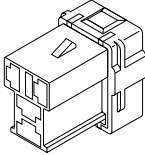
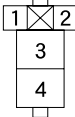
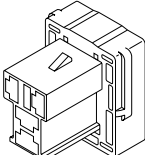
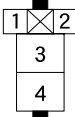
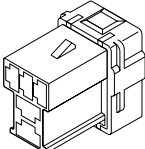
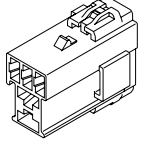
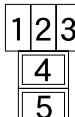
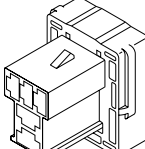
Number shows number of pins	Female connector	Male connector
EN4A	 	

Number shows number of pins	Female connector	Male connector
EN5A	 	

EP type

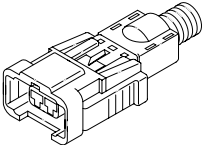
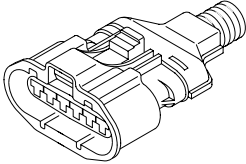
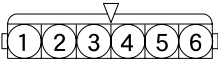
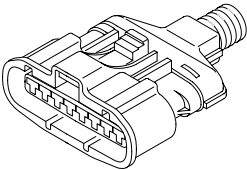
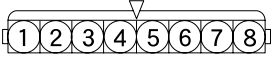
Number shows number of pins	Female connector	Male connector
EP34A	 	

EQ type

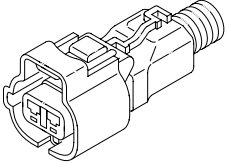
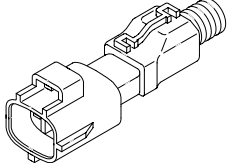
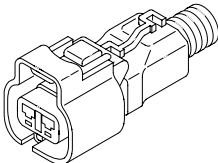
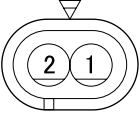
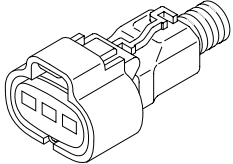
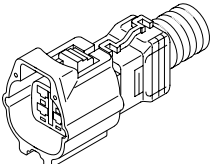
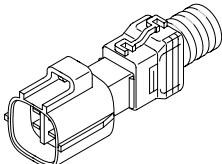
Number shows number of pins	Female connector	Male connector
EQ4A	 	
EQ4B	 	
EQ5A	   	
EQ5B	 	

CONNECTOR CONFIGURATION CHART

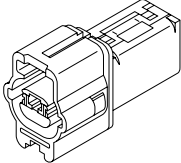
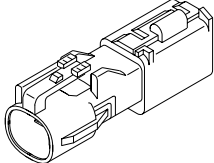
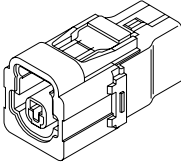
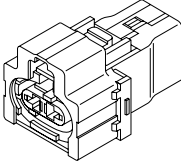
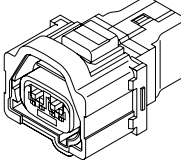
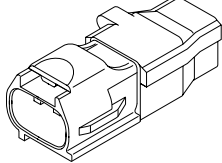
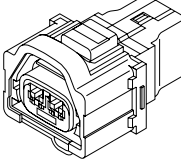
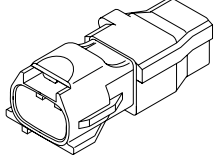
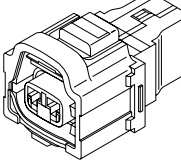
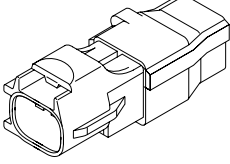
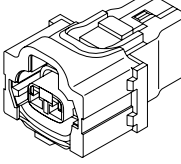
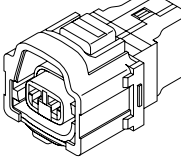
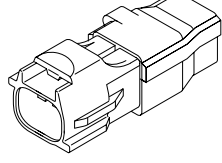
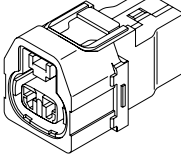
ER type

Number shows number of pins	Female connector	Male connector
ER2A	 	
ER6A	 	
ER8A	 	

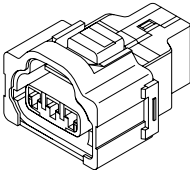
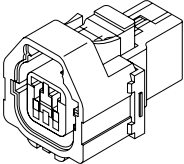
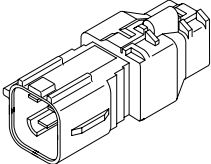
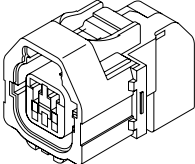
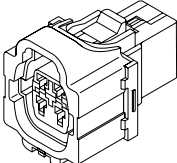
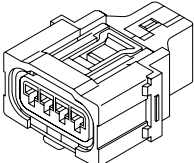
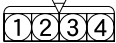
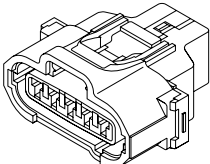
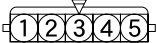
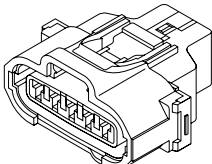
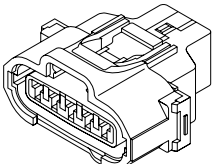
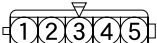
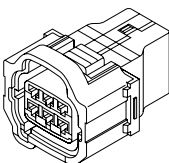
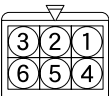
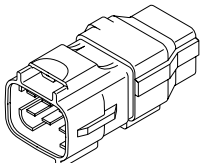
ES type

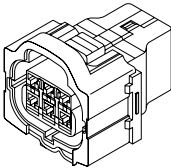
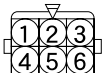
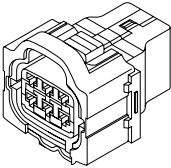
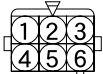
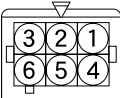
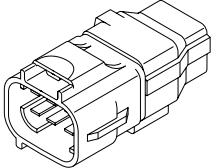
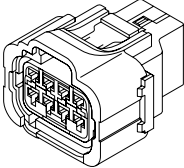
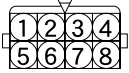
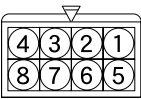
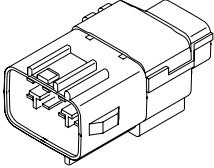
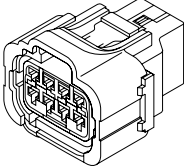
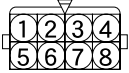
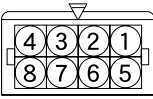
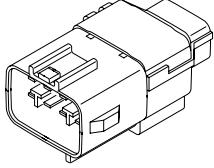
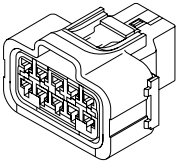
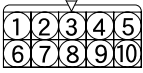
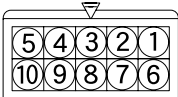
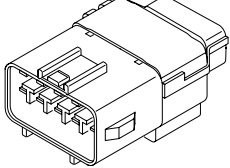
Number shows number of pins	Female connector	Male connector
ES2A	 	 
ES2B	 	
ES2C	 	
ES3A	 	
ES4A	 	 

ET type

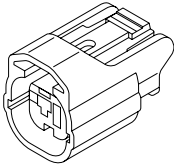
Number shows number of pins	Female connector	Male connector
ET1A	 	 
ET1B	 	
ET2A	 	
ET2B	 	 
ET2C	 	 
ET2D	 	 
ET2F	 	
ET2G	 	 
ET2L	 	

CONNECTOR CONFIGURATION CHART

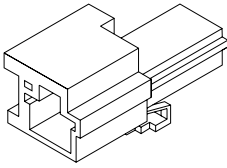
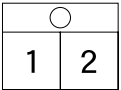
Number shows number of pins	Female connector	Male connector
ET3A	 	
ET3B	 	 
ET3C	 	
ET4A	 	
ET4B	 	
ET5A	 	
ET5B	 	
ET5D	 	
ET6A	 	 

Number shows number of pins	Female connector	Male connector
ET6B	 	
ET6C	 	 
ET8A	 	 
ET8B	 	 
ET10A	 	 

EU type

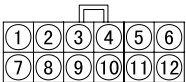
Number shows number of pins	Female connector	Male connector
EU1A	 	

EV type

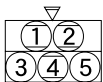
Number shows number of pins	Female connector	Male connector
EV2A	 	

CONNECTOR CONFIGURATION CHART

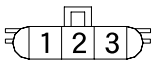
EW type

Number shows number of pins	Female connector	Male connector
EW12A		

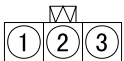
EX type

Number shows number of pins	Female connector	Male connector
EX5A		

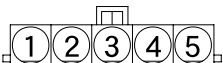
EY type

Number shows number of pins	Female connector	Male connector
EY3A		

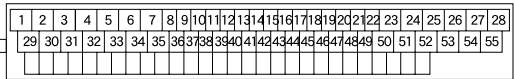
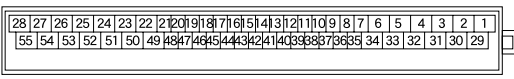
EZ type

Number shows number of pins	Female connector	Male connector
EZ3A		

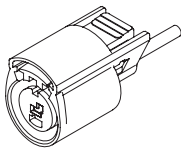
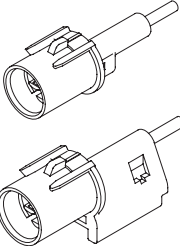
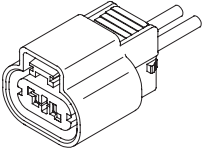
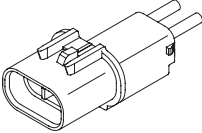
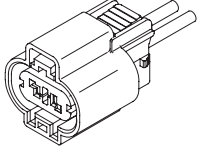
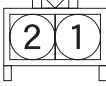
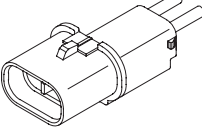
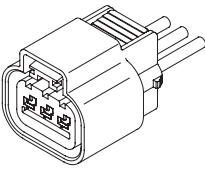
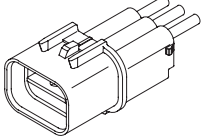
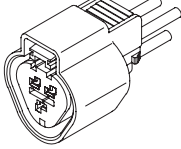
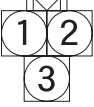
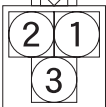
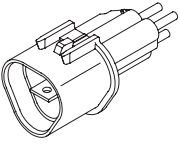
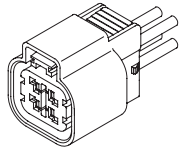
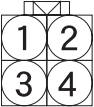
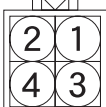
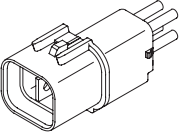
FA type

Number shows number of pins	Female connector	Male connector
FA5A		

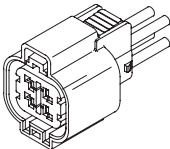
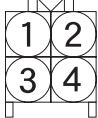
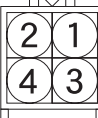
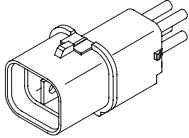
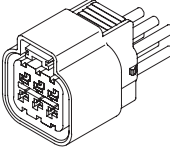
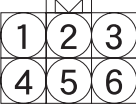
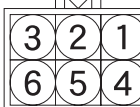
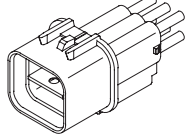
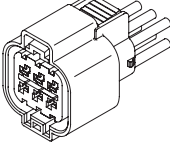
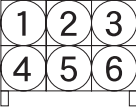
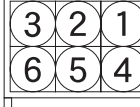
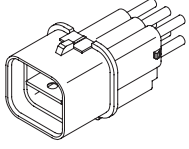
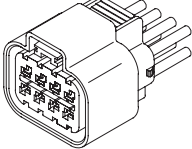
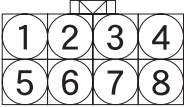
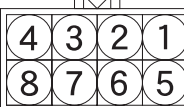
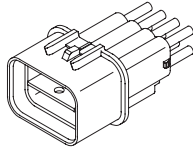
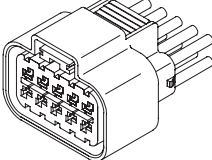
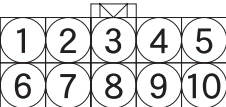
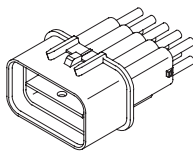
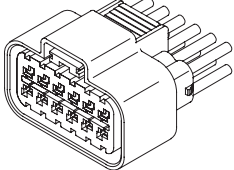
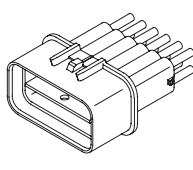
FB type

Number shows number of pins	Female connector	Male connector
FB55A		

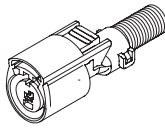
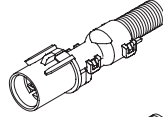
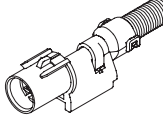
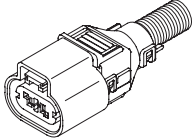
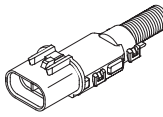
GA type

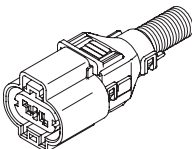
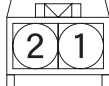
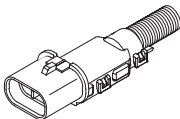
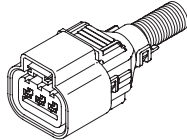
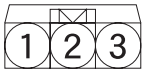
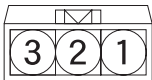
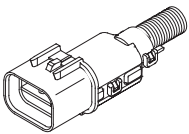
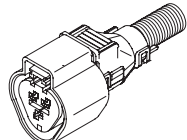
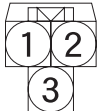
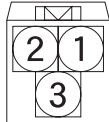
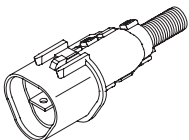
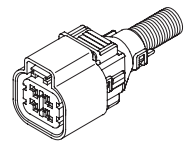
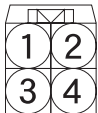
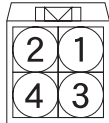
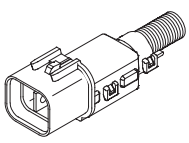
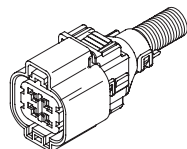
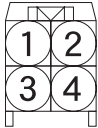
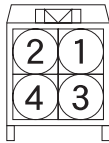
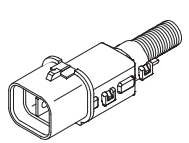
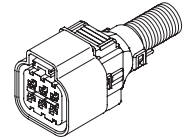
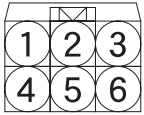
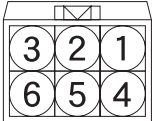
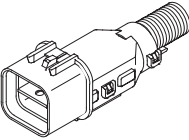
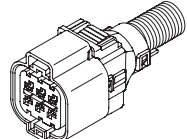
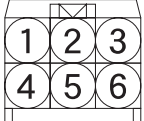
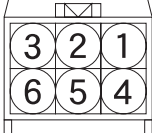
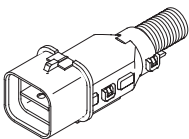
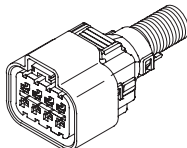
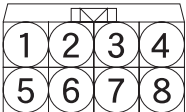
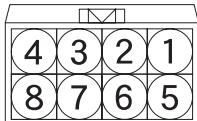
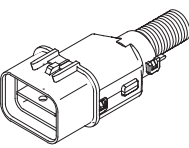
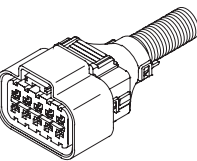
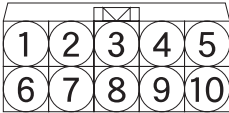
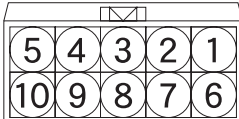
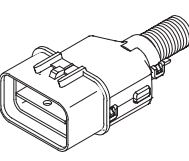
Number shows number of pins	Female connector	Male connector
GA1A	 	 
GA2A	 	 
GA2B	 	 
GA3A	 	 
GA3B	 	 
GA4A	 	 

CONNECTOR CONFIGURATION CHART

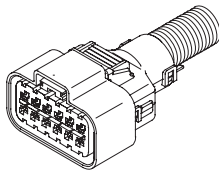
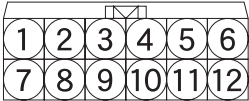
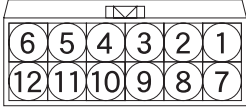
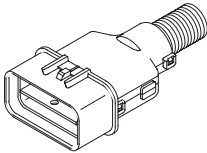
Number shows number of pins	Female connector	Male connector
GA4B	 	 
GA6A	 	 
GA6B	 	 
GA8A	 	 
GA10A	 	 
GA12A	 	 

GB type

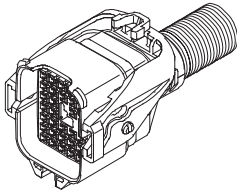
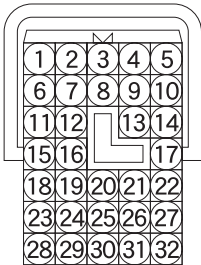
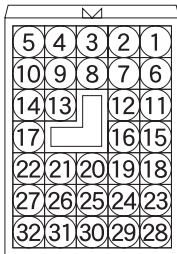
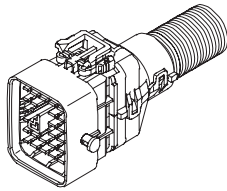
Number shows number of pins	Female connector	Male connector
GB1A	 	   
GB2A	 	 

Number shows number of pins	Female connector		Male connector	
GB2B				
GB3A				
GB3B				
GB4A				
GB4B				
GB6A				
GB6B				
GB8A				
GB10A				

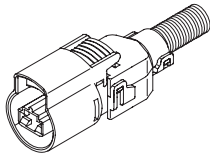
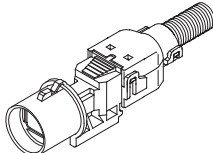
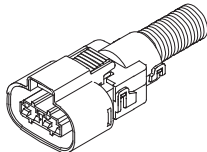
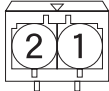
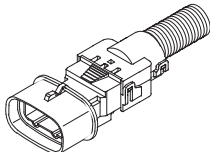
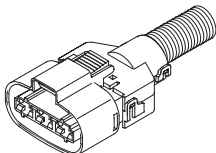
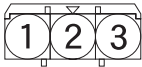
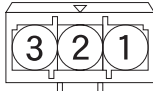
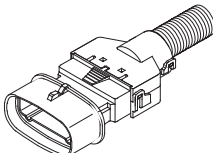
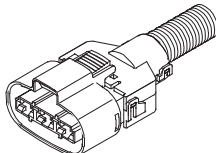
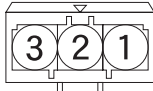
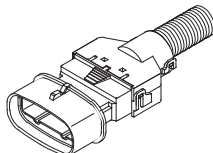
CONNECTOR CONFIGURATION CHART

Number shows number of pins	Female connector	Male connector
GB12A	 	 

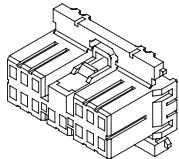
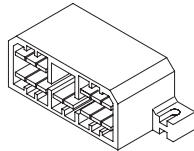
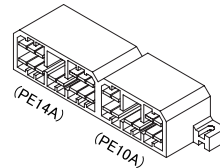
GC type

Number shows number of pins	Female connector	Male connector
GC32A	 	 

GD type

Number shows number of pins	Female connector	Male connector
GD1A	 	 
GD2A	 	 
GD3A	 	 
GD3B	 	 

PE type

Number shows number of pins	Female connector	Male connector																																																								
PE14A	 <table border="1" data-bbox="664 331 854 380"><tr><td>1</td><td>2</td><td>3</td><td>A</td><td>4</td><td>5</td><td>6</td></tr><tr><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td></tr></table>	1	2	3	A	4	5	6	7	8	9	10	11	12	13	14	<table border="1" data-bbox="950 331 1141 388"><tr><td>6</td><td>5</td><td>4</td><td>A</td><td>3</td><td>2</td><td>1</td></tr><tr><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td></tr></table>  <table border="1" data-bbox="937 506 1101 554"><tr><td>6</td><td>5</td><td>4</td><td>A</td><td>3</td><td>2</td><td>1</td></tr><tr><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td></tr></table> (PE14A) <table border="1" data-bbox="1101 506 1237 554"><tr><td>4</td><td>3</td><td>A</td><td>2</td><td>1</td></tr><tr><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td></tr></table> (PE10A)  (PE14A) (PE10A)	6	5	4	A	3	2	1	14	13	12	11	10	9	8	7	6	5	4	A	3	2	1	14	13	12	11	10	9	8	7	4	3	A	2	1	10	9	8	7	6	5
1	2	3	A	4	5	6																																																				
7	8	9	10	11	12	13	14																																																			
6	5	4	A	3	2	1																																																				
14	13	12	11	10	9	8	7																																																			
6	5	4	A	3	2	1																																																				
14	13	12	11	10	9	8	7																																																			
4	3	A	2	1																																																						
10	9	8	7	6	5																																																					

