

DAIHATSU
F70,F75,F77

**Service
manual**

BODY ELECTRICAL SYSTEM

DAIHATSU MOTOR CO., LTD.

NO.9703-FE

BE

DAIHATSU

F70,F75,F77

BODY ELECTRICAL SYSTEM

1. COMBINATION METER	BE- 6
2. WARNING & INDICATOR	BE-15
3. IGNITION KEY SWITCH	BE-21
4. HORN	BE-23
5. MULTI-USE LEVER SWITCH	BE-24
6. LIGHTING	BE-32
7. FRONT WIPER & WASHER	BE-47
8. REAR WIPER & WASHER	BE-52
9. REAR WINDOW DEFOGGER	BE-55
10. HEADLAMP CLEANER	BE-57
11. FRONT HEATER	BE-58
12. REAR HEATER	BE-63
13. REMOTE CONTROL MIRROR	BE-64
14. POWER WINDOW	BE-66
15. POWER FRONT DOOR LOCK	BE-68
16. BACK DOOR OPENER	BE-70
17. THREE-STAGE DAMPER	BE-71
18. DAY-LIGHT RELAY	BE-74
19. DIM-DIP LAMP	BE-76
20. VOLT METER	BE-78
21. INCLINOMETER	BE-79
22. CLOCK	BE-82

WRE91-BE001

INTRODUCTION

1. Handling of Connectors with Lock

(1) Disconnection

While pushing the lock lever as shown in the right figure, disconnect the connector. Do not pull the harness during this operation.

(2) Connection

Connect the male connector to the female connector. Ensure that the lock is engaged completely.

(3) Removal of terminal

Housing lance type

Insert a miniature screwdriver through the opening section of the connector into between the locking lug and the terminal. While prying up the locking lug with the screwdriver, pull the terminal backward.

Metal lance type

While pushing the lance with the screwdriver, pull the terminal backward.

(4) Installation of terminal

Housing lance type

Push the terminal into the protruding section of the connector, until the lock is engaged completely.

Lightly pull the harness to assure that the locking has been made completely.

Metal lance type

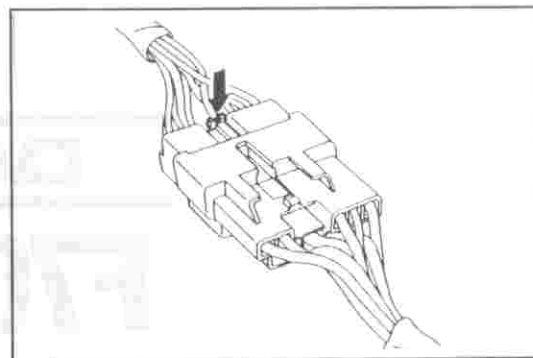
Insert the terminal into the connector, until lance is locked completely.

Lightly pull the harness to assure that the locking has been made completely.

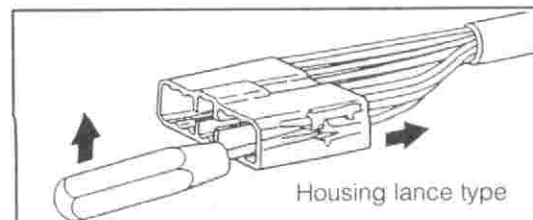
CAUTION:

• HANDLING INSTRUCTIONS ON LOCK TYPE CONNECTOR

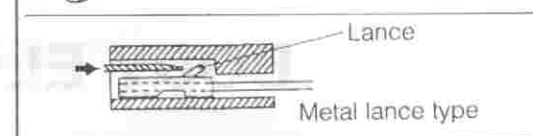
Do not disconnect or connect the lock type connector, unless such operation is absolutely necessary. If the connector should be disconnected or connected, be sure to follow the procedure given below.



WRE91-BE002



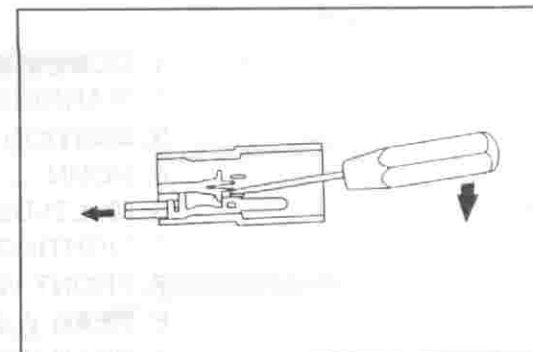
Housing lance type



Lance

Metal lance type

WRE91-BE003



WRE91-BE004

WRE91-BE005

2. Disconnection

The lock type of the connector comes in a push release type, a pull release type, a spring lock type, an one-way lock type and so on.

After confirming the shape of the lock, unlock the lock. Disconnect the connector while holding the connector by hand.

NOTE:

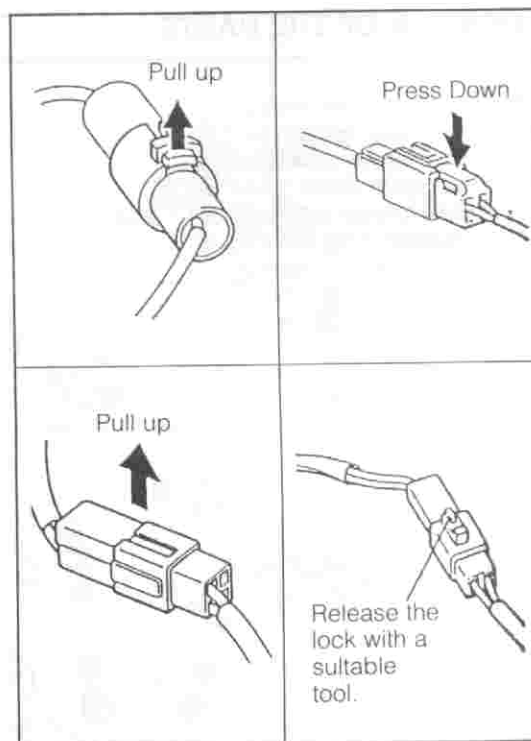
- Never pull the harness during the disconnection.
- Be sure to pull out the connector straight so as not to damage the terminal.

3. Connection

Perform the connection, until the lock is completely engaged.

NOTE:

- To confirm whether the connector has been locked or not, lightly pull the connector. Make sure that the connector will not be disconnected. Be sure to press the connector again before finishing the confirmation.

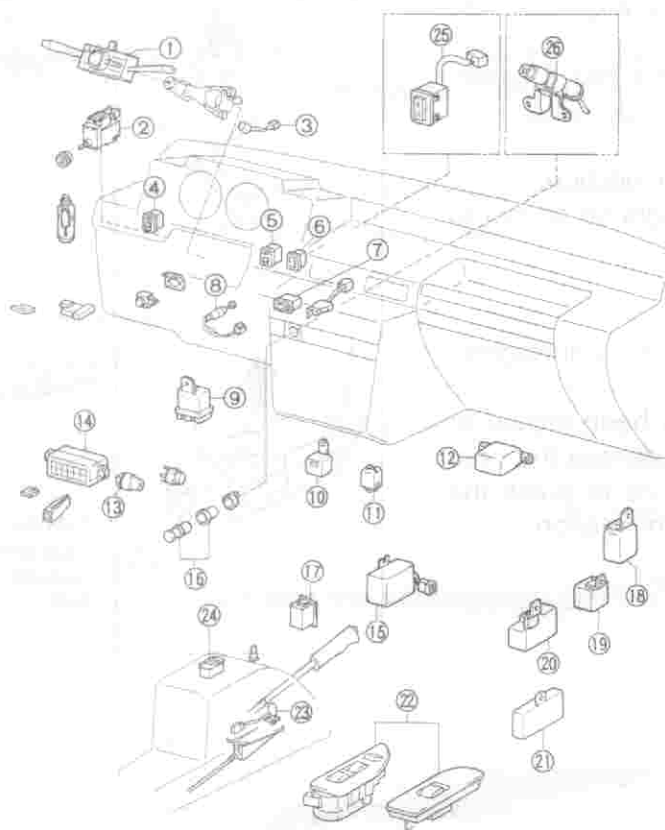


WRE91-BE005

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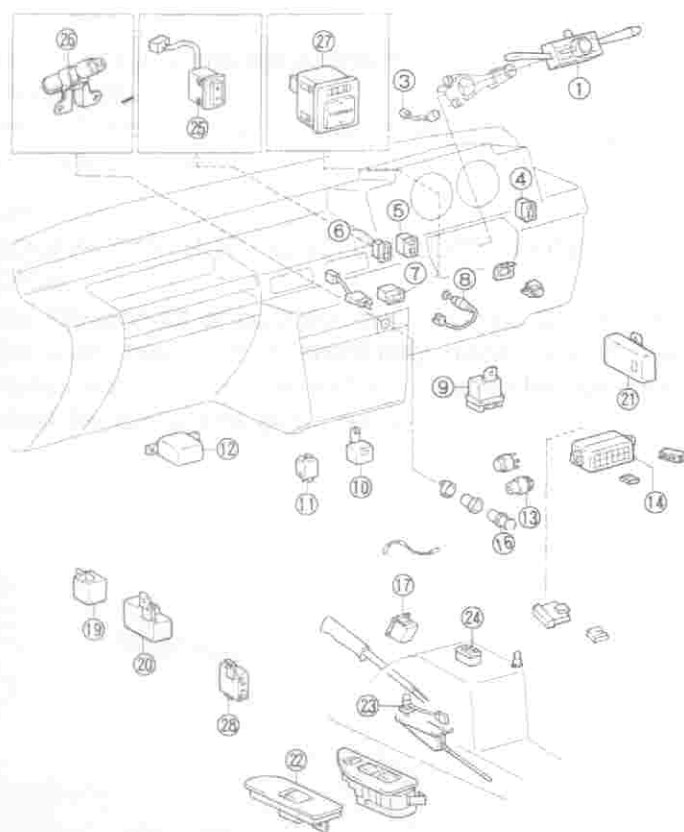
LOCATION OF THE PARTS

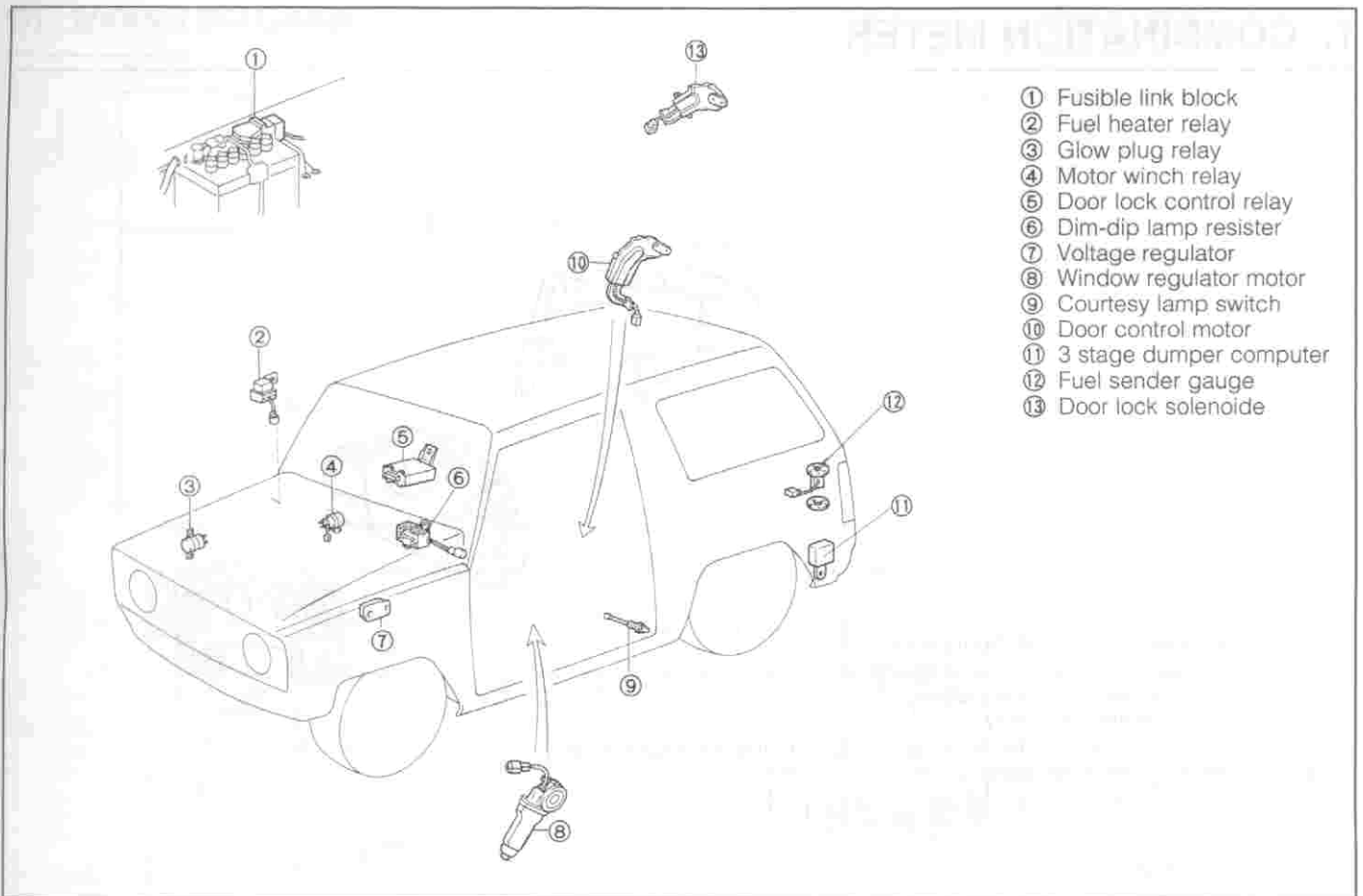
LHD



- ① Turn signal switch
- ② Head light leveling switch
- ③ Ignition switch
- ④ Rear window defogger switch
- ⑤ Fog lamp switch
- ⑥ Rear wiper switch
- ⑦ Heater blower switch
- ⑧ Stop lamp switch
- ⑨ Starter relay
- ⑩ Int. wiper relay
- ⑪ Turn signal flasher
- ⑫ Glow plug relay
- ⑬ Power shift relay
- ⑭ Fuse block
- ⑮ Day light relay
- ⑯ Cigarette lighter
- ⑰ Door control switch
- ⑱ Seat belt warning relay
- ⑲ Fuel control relay
- ⑳ Headlamp cleaner relay
- ㉑ Preheating timer
- ㉒ Power window switch
- ㉓ Parking brake switch
- ㉔ 3 stage dumper switch
- ㉕ 4WD Switch
- ㉖ Rear fog lamp switch
- ㉗ Remote control mirror switch
- ㉘ Dim-dip lamp relay

RHD

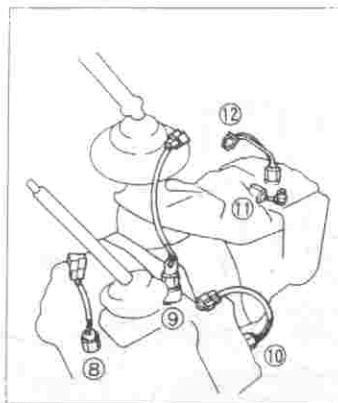




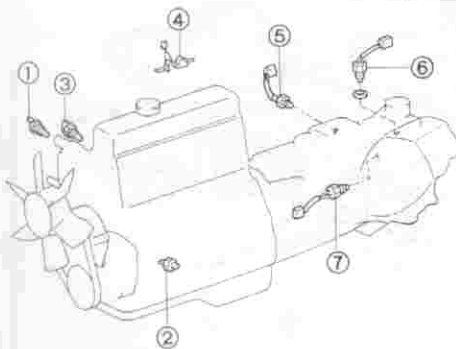
- ① Fusible link block
- ② Fuel heater relay
- ③ Glow plug relay
- ④ Motor winch relay
- ⑤ Door lock control relay
- ⑥ Dim-dip lamp resister
- ⑦ Voltage regulator
- ⑧ Window regulator motor
- ⑨ Courtesy lamp switch
- ⑩ Door control motor
- ⑪ 3 stage dumper computer
- ⑫ Fuel sender gauge
- ⑬ Door lock solenoid

WRE91-BE008

Power shift switch

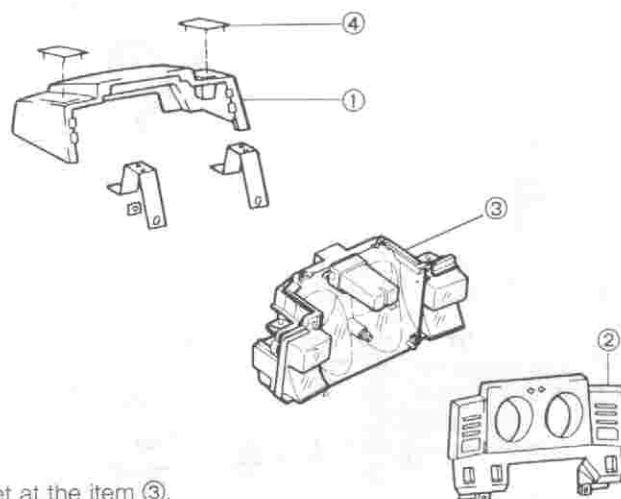


- ① Water temp. sender gauge
- ② Oil pressure switch
- ③ Water temp. sensor
(For preheating timer)
- ④ Glow plug current sensor
- ⑤ Back up lamp switch
- ⑥ Transfer position detect switch
- ⑦ 4WD detect switch
- ⑧ High/Low SW = Push/OFF
- ⑨ Position SW = Push/ON
- ⑩ 4WD Detecting SW = Push/ON
- ⑪ Back up SW = Push/ON
- ⑫ Shift SW = Push/OFF



WRE91-BE009

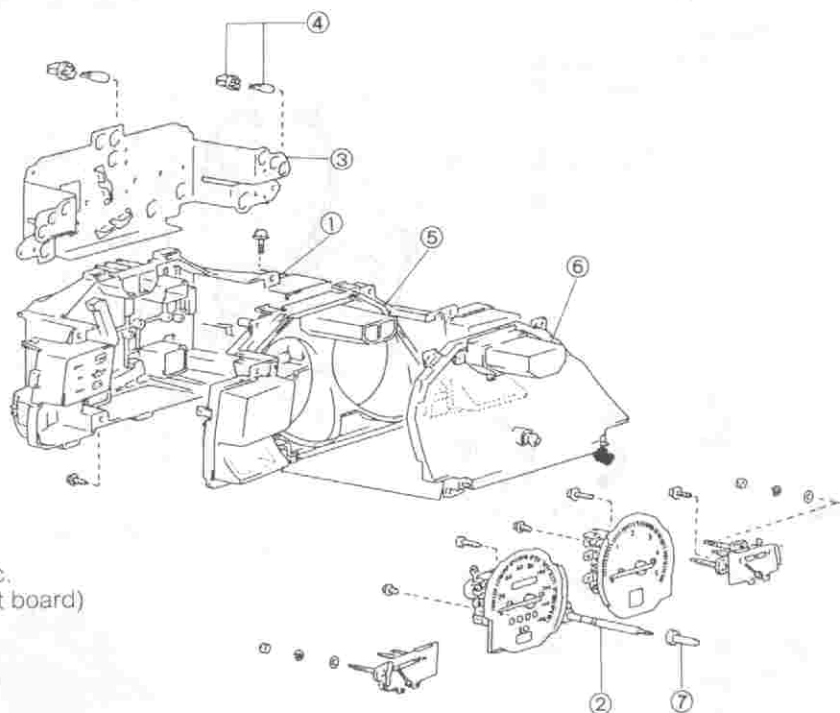
1. COMBINATION METER



- ① Speedometer cluster finish front panel
When installing, the items ① and ② should be set at the item ③.
- ② Instrument cluster finish rear panel
- ③ Combination meter assembly
When installing, remove the items ⑤ and ⑥ from the vehicle as a set.
- ④ Instrument cluster finish panel cover

WRE91-BE010

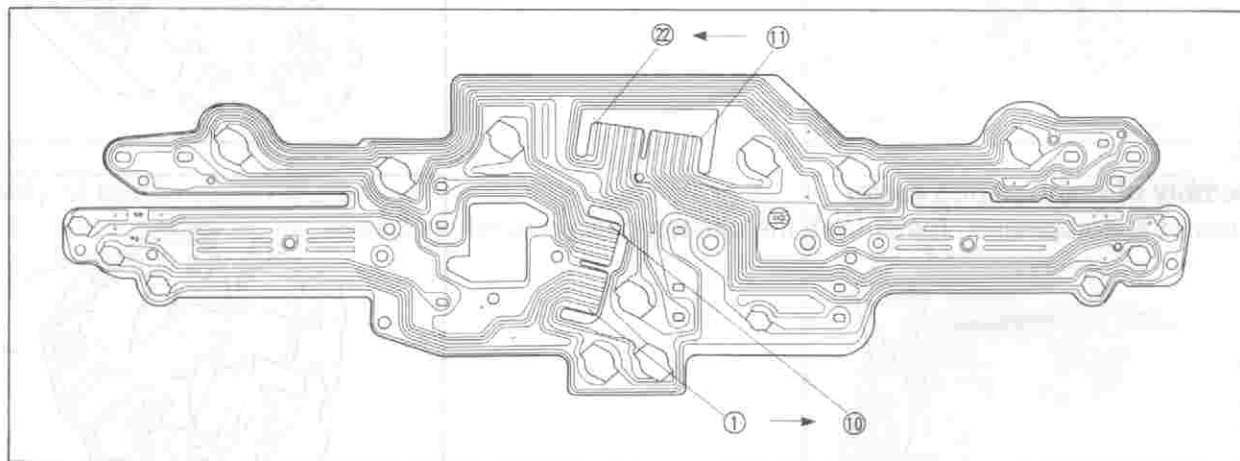
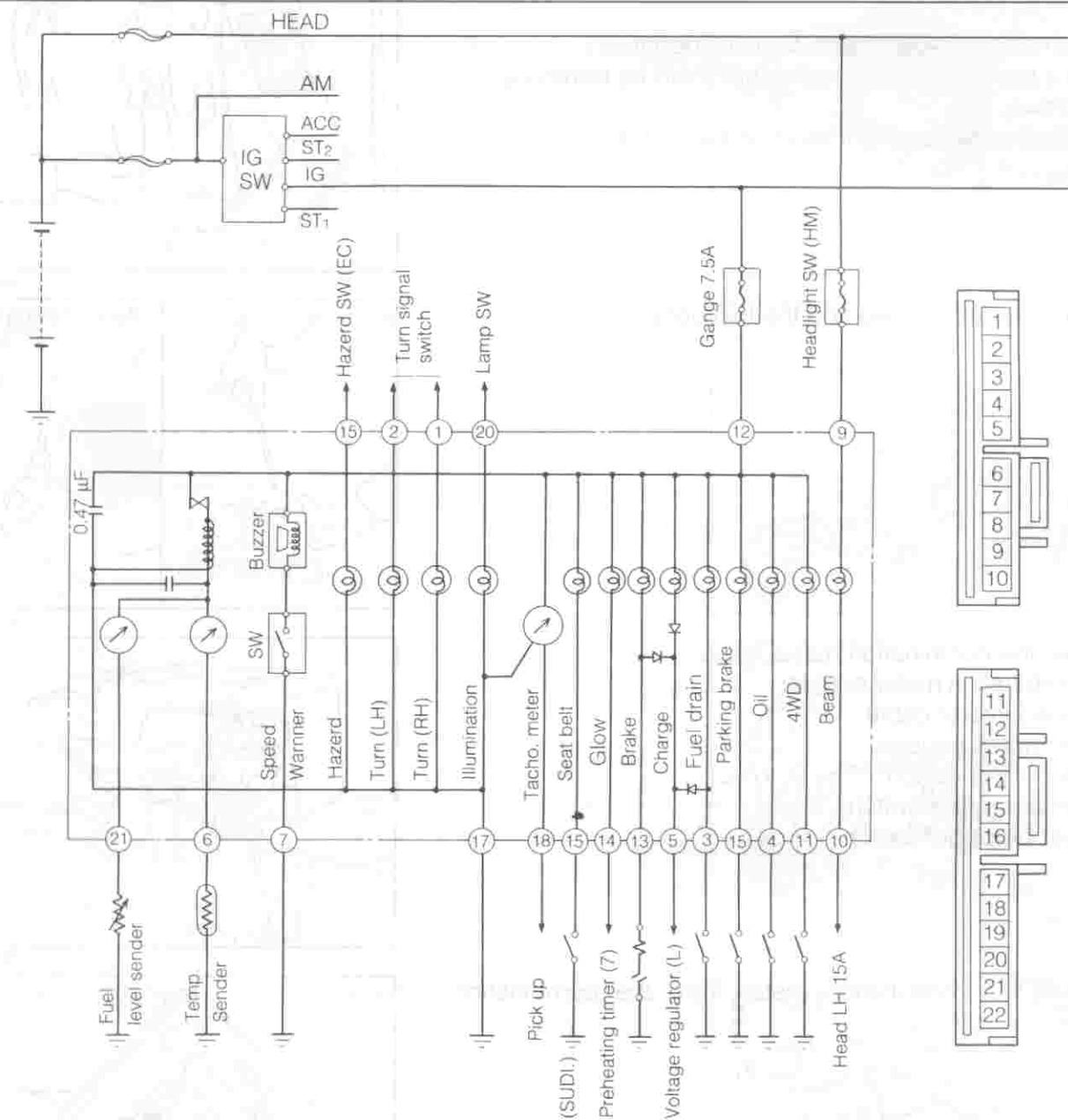
COMPONENTS



- ① Case subassembly
- ② Speedometer and tachometer, etc.
- ③ Plate subassembly (Printed circuit board)
- ④ Bulb, etc.
- ⑤ Wind plate subassembly
- ⑥ Front glass subassembly
- ⑦ Knob

WRE91-BE011

1-1. WIRING DIAGRAM

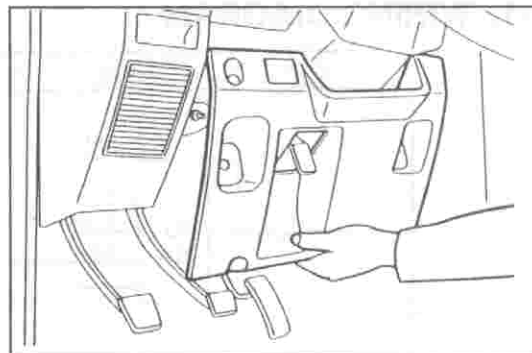


(This is a sample of the circuit panel)

1-2. REMOVAL AND INSTALLATION

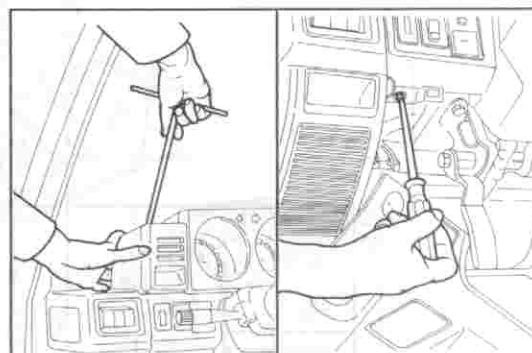
Removal

1. Disconnect the battery cable from the negative (-) terminal.
2. Remove the lower instrument panel finish by removing the two screws.
 - Remove the headlight levering switch knob.



WRE91-BE235

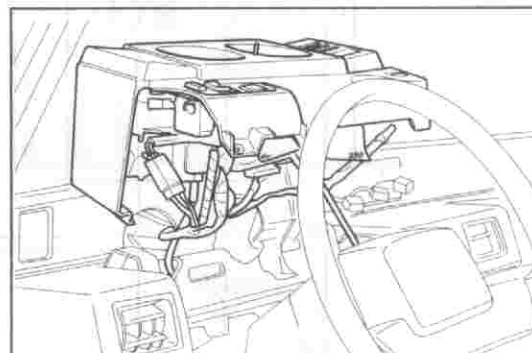
3. Remove the two screws and the two bolts.



WRE91-BE236

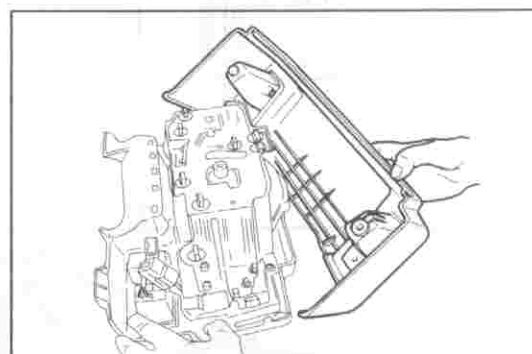
4. Remove the combination meter Assy.

- Combination meter coupler
- Speedometer cable
- 4 H switch coupler
- Rear wiper switch
- Remote mirror switch
- Rear defogger switch



WRE91-BE237

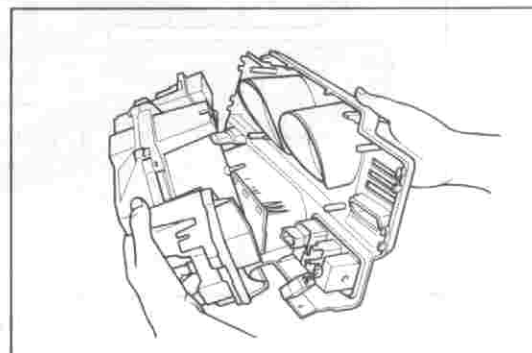
5. Remove the combination meter from the combination cluster.



WRE91-BE238

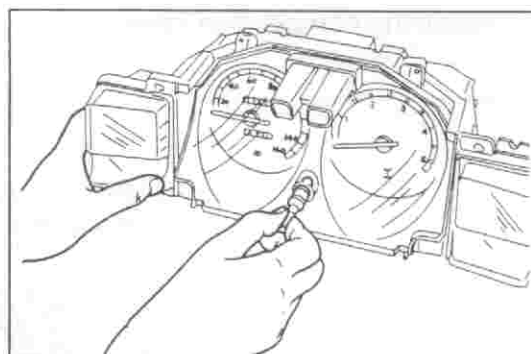
Disassembly of combination meter

1. Remove the combination meter from the cluster.



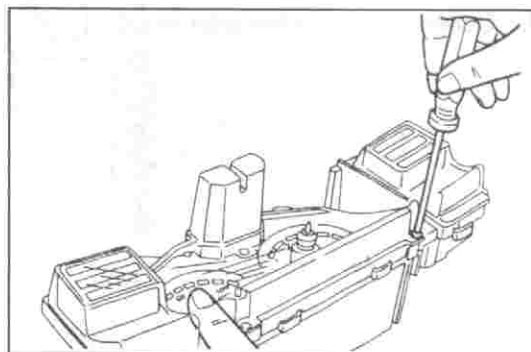
WRE91-BE239

2. Remove the odometer knob by counter-clock-wise.



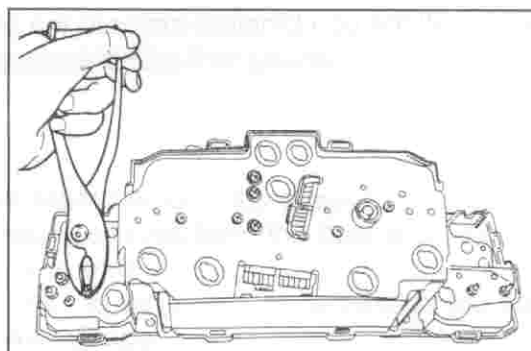
WRE91-BE240

3. Remove the combination meter cover.



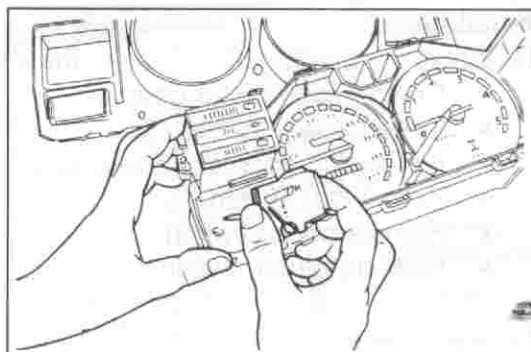
WRE91-BE241

4. Remove the circuit panel.



WRE91-BE242

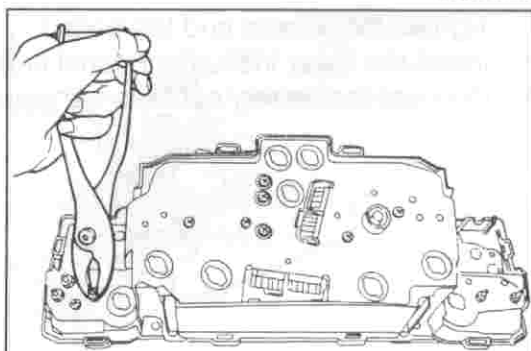
5. Remove the tachometer, the speedometer and the gauges.



WRE91-BE243

Assembly of combination meter

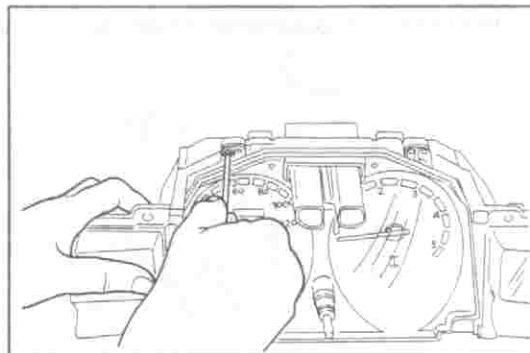
1. Install the tachometer, the speedometer and gauges.
2. Install the circuit panel.



WRE91-BE244

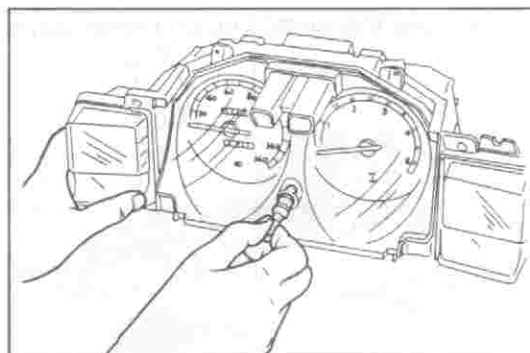
BODY ELECTRICAL SYSTEM

3. Install the combination cover.



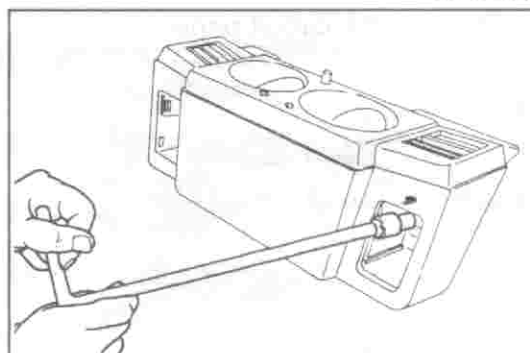
WRE91-BE245

4. Screw on the odometer knob.



WRE91-BE246

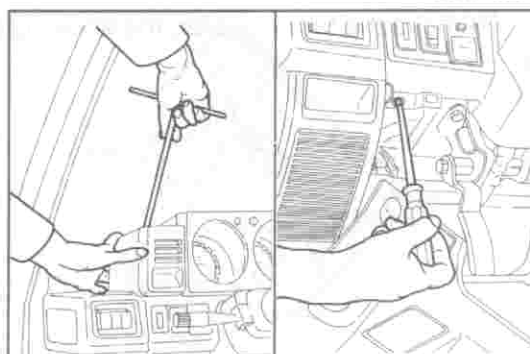
5. Install the combination meter to the cluster.



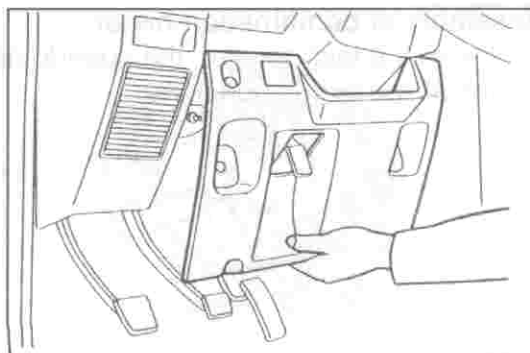
WRE91-BE247

Installation

1. Install the combination Assy to the instrument panel.
 - Combination meter coupler
 - Speedometer cable
 - 4 H switch coupler
 - Rear wiper switch
 - Remote mirror switch
 - Rear defogger switch
2. Tighten the screws and the bolts.
3. Install the lower instrument panel finish.
4. Connect the battery cable to the negative (-) terminal.

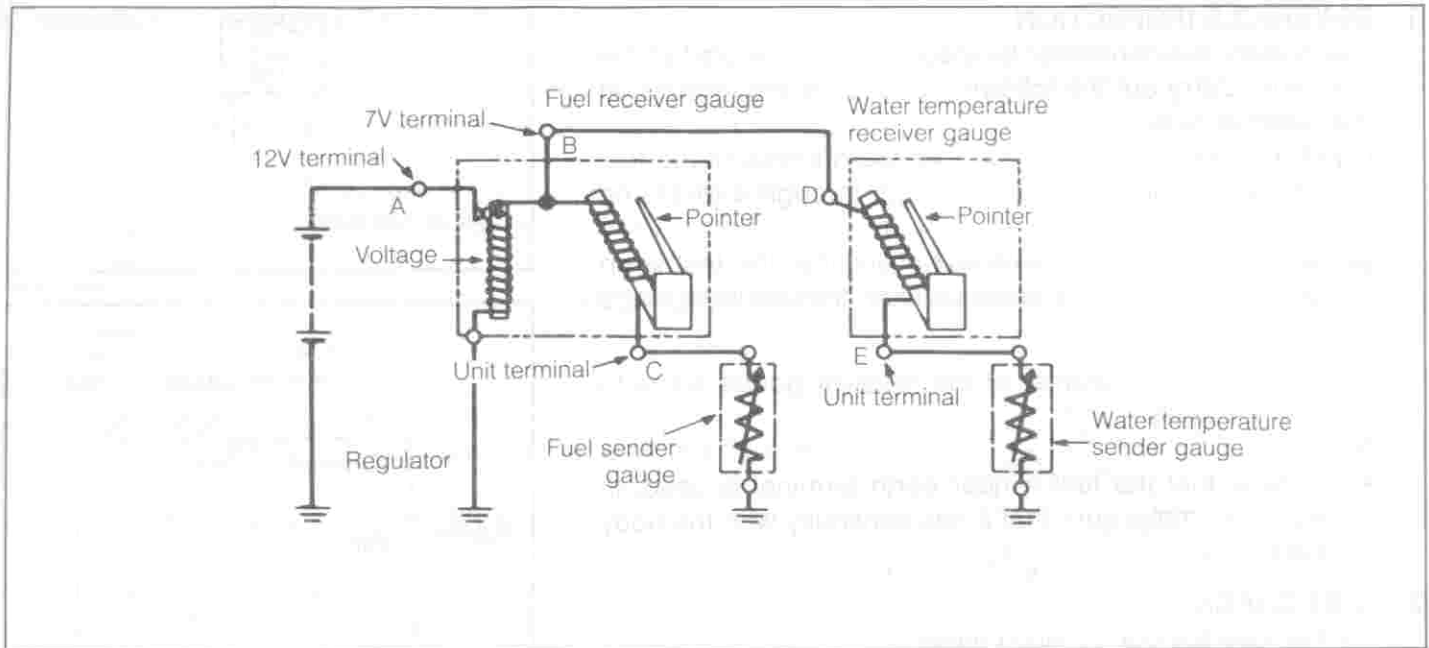


WRE91-BE248



WRE91-BE249

1-3. GAUGE CIRCUIT DIAGRAM



WRE91-BE016

BIMETAL GAUGE

A bimetal type gauge is employed for the water temperature gauge and for the fuel gauge.

This gauge adopts such a combination that a bimetal is employed at the receiver section, whereas a resistor is installed at the sender section.

The following is brief description of the construction. A heat wire is wound around the bimetal. As a result, the bimetal bends in proportion to the heat amount which the bimetal receives from the heat wire. As the bimetal bends, the pointer is interlocked with that deflection of the heat wire.

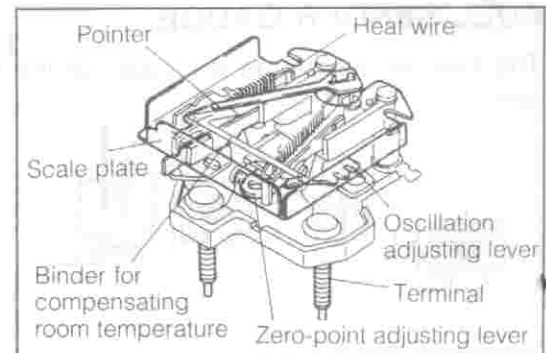
As respects the resistance at the sender section, a sliding type resistor is employed in the case of the fuel gauge, while a thermistor is used in the case of the water temperature gauge.

WRE91-BE017

The right figure indicates the receiver section.

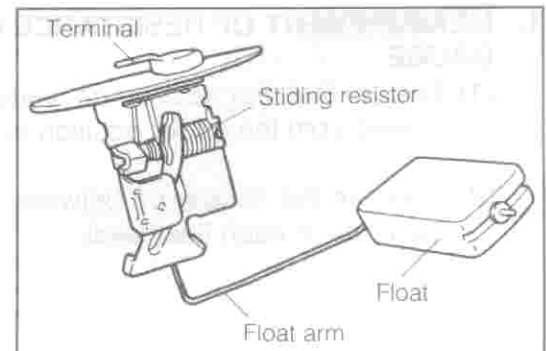
In the case of the bimetal-resistor combination type gauge, heat is generated by current which flows through the circuit.

Therefore, any variation in the power supply voltage will affect the amount of current flowing through the circuit, thereby causing an error in the reading at the receiving section. To prevent this error, the gauge incorporates a voltage regulator.



WRE91-BE018

The right figure represents the sender section which employs a sliding resistor. The gauge of this type is used for the fuel gauge.



WRE91-BE019

FUEL RECEIVER GAUGE

(Bimetal type)

1. IN-VEHICLE INSPECTION

Disconnect the connector located at the upper part of the fuel tank. Carry out the following checks at the terminal at the receiver side.

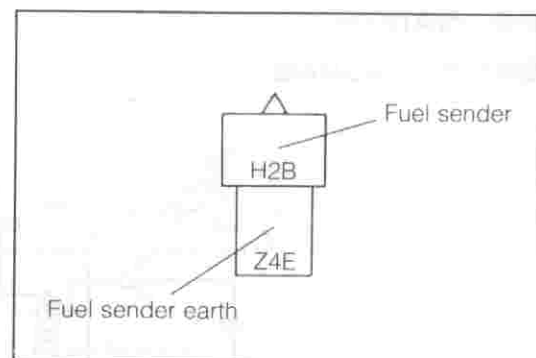
- (1) Disconnect the connector from the harness of the fuel sender gauge. Ground the gauge through a test lamp (12V - 3.4W).
- (2) Turn ON the engine switch. Ensure that the test lamp goes on and, several seconds later, the test lamp starts flashing.
- (3) Ensure that the pointer of the receiver gauge starts to rise gradually.

NOTE:

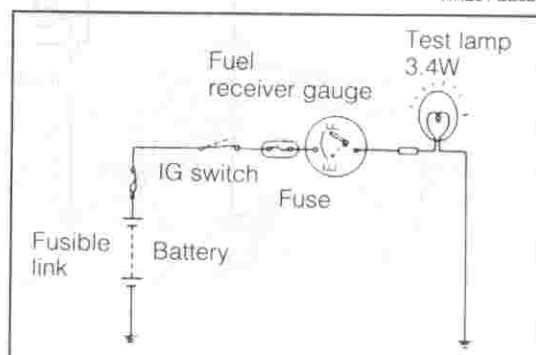
- In case that the fuel sender earth terminal is used, in advance, make sure that it has continuity with the body earth.

2. UNIT CHECK

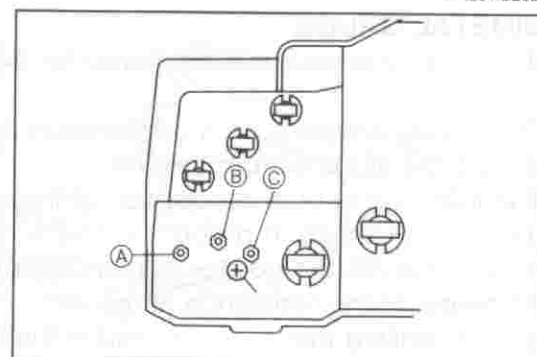
- (1) Remove the combination meter.
- (2) Measure the resistance between the terminals ② and ③.
Specified Value: 55Ω
- (3) Connect the multi-pole connector to the combination meter. Turn ON the engine key. Ensure that the battery voltage is applied between the terminal ① and the body earth.
- (4) Under the conditions in the step (3), ensure that a voltage varying approximately from 2 to 7V is applied between the terminal ② and the body earth.



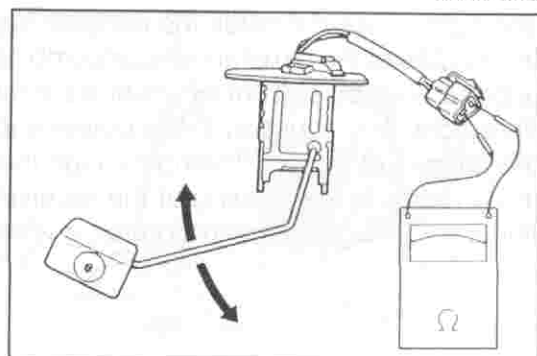
WRE91-BE020



WRE91-BE021



WRE91-BE022



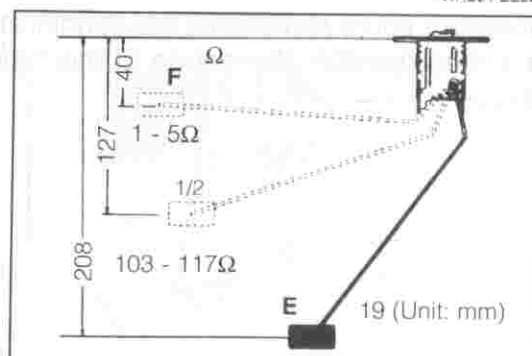
WRE91-BE023

FUEL SENDER GAUGE

The fuel sender gauge is located at the upper part of the fuel tank.

1. MEASUREMENT OF RESISTANCE OF FUEL SENDER GAUGE

- (1) Ensure that the resistance varies when the float is moved from the upper position to the lower position.
- (2) Measure the resistance between the fuel terminal and the body at each float level.



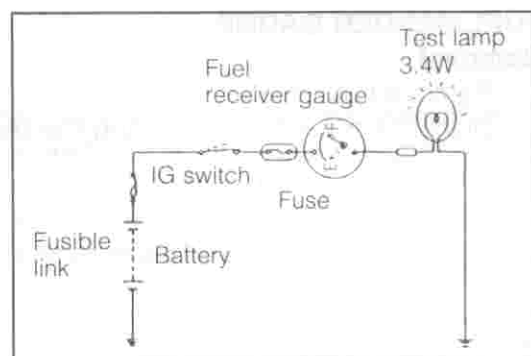
WRE91-BE024

WATER TEMPERATURE RECEIVER GAUGE

(Bimetal type use)

1. IN-VEHICLE INSPECTION

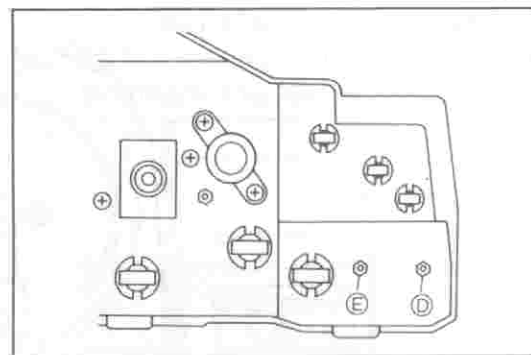
- (1) Disconnect the connector from the harness of the water temperature sender gauge. Ground the gauge to the connector at the harness trough a test lamp (12V - 3.4W).
- (2) Turn ON the engine switch. Ensure that the test lamp goes on and, several seconds later, the test lamp starts flashing.
- (3) Ensure that the pointer of the receiver gauge starts to rise gradually.



WRE-91-BF025

2. UNIT CHECK

- (1) Remove the combination meter.
- (2) Measure the resistance between the terminals ④ and ⑤.
Specified Value: Approx. 55Ω
- (3) Connect the multi-pole connector to the combination meter. Turn ON the engine key. Ensure that the battery voltage is applied between the terminal ① and the body earth.
- (4) Under the conditions in the step (3), ensure that a voltage varying approximately from 2 to 7V is applied between the terminal ④ and the body earth.



WFE91-BE026

WATER TEMPERATURE SENDER GAUGE

The water temperature sensor gauge is located at the rear end of the cylinder head.

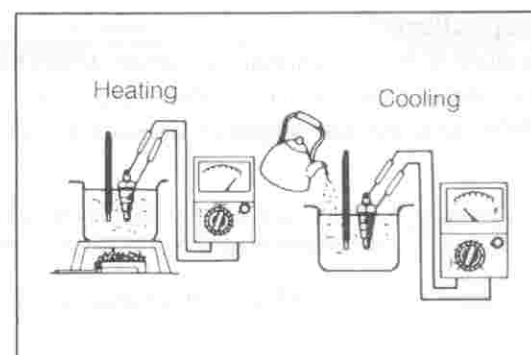
UNIT INSPECTION

Measure the resistance between the terminal and the earth, as indicated in the right figure.

Specified Value (Reference):

50°C: 189 - 259Ω

110°C: 24 - 28Ω



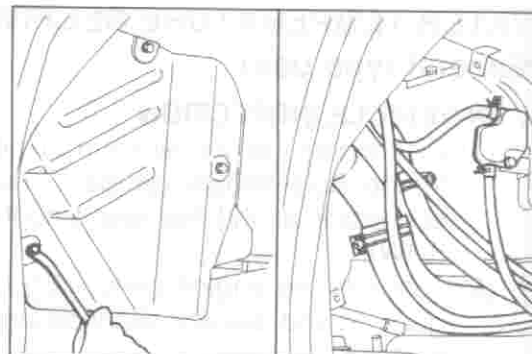
WRE91-BED27

BODY ELECTRICAL SYSTEM

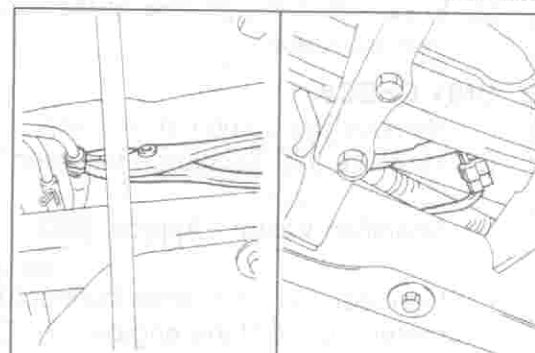
FUEL SENDER GAUGE

Removal

1. Remove the fuel inlet protector.
2. Disconnect the fuel hoses and the breather hoses.
3. Disconnect the fuel pipes.
4. Disconnect the connector of the fuel sender gauge.
5. Remove the fuel tank assembly.

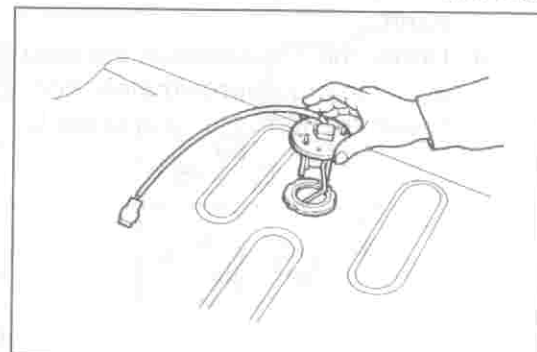


WRE91-BE028



WRE91-BE029

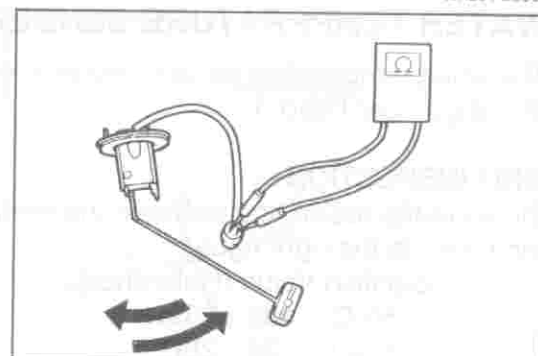
6. Remove the fuel sender gauge from the fuel tank.



WRE91-BE030

Inspection

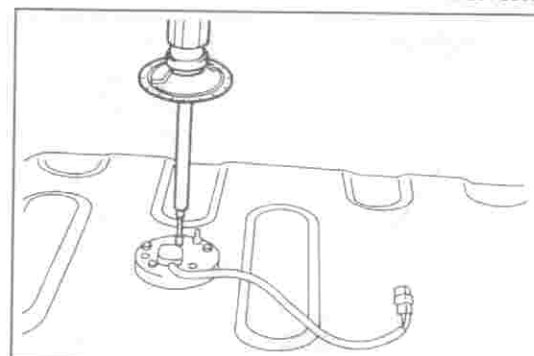
Ensure that the resistance varies when the float is moved from the upper position to the lower position. Refer to previous pages.



WRE91-BE031

Installation

1. Install the fuel sender gauge to the tank.
Tightening Torque: 0.18 - 0.20 N·m (1.8 - 2.0 kgf-m)



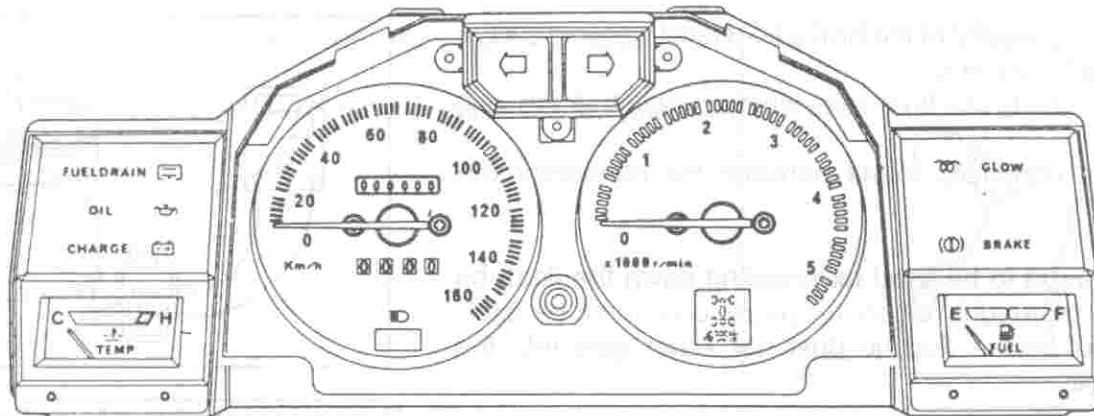
WRE91-BE250

2. WARNING & INDICATOR

CHECK WARNING LAMPS

1. Set the ignition switch to the ON position. Ensure that the warning lamps given below are illuminated.
2. Set the ignition switch to the START position. Start the engine. Ensure that the warning lamps given below are extinguished. (With the parking lever not applied)
3. Stop the engine. Set the ignition switch to the START position again. Start the engine. Ensure that, four to eight seconds later, the seat belt warning buzzer ceases its operation and the seat belt warning lamp goes out.

2-1. WARNING & INDICATOR



WRE91-BE032

	Kind	Indication	Function
Warning lamp	Hazard warning	HAZARD	Flashes when hazard switch is turned ON. Indicating color: Red
	Brake warning	BRAKE	Glow when brake fluid becomes too low or empty, or when parking brake is applied. Indicating color: Red
	Parking brake warning	PARK BRAKE	Glow when parking brake is applied while the engine is running. Indicating color: Red
	Oil pressure warning	OIL	Glow when engine oil pressure system is encountered with abnormality while engine is running. Indicating color: Red
	Charge warning	CHARGE	Glow when engine charging system is encountered with abnormality while engine is running. Indicating color: Red
	Seat belt warning	FASTEN BELTS	Glow for about six seconds when driver fails to buckle up seat belt at driver's seat after ignition switch has been turned ON or engine has started. Indicating color: Red
	Fuel drain warning	FUEL DRAIN	Glow when the water in fuel is accumulated in the fuel filter in excess of the stipulated amount. Indicating color: Red
Indicator lamp	High beam indicator	ID	Glow when upper beams of headlamps are turned ON. Indicating color: Green
	Turn signal indicator	← →	Flashes when turn signal switch or hazard warning switch is turned ON. Indicating color: Green
	4WD Indicator	4WD	Glow when the transfer shift lever is moved to the 4H or 4L position with the engine switch turned ON. Indicating color: Green
	Glow plug indicator	GLOW	Glow when ignition key holds at the G position or ON position Indicating color: Red

WRE91-BE033

2-2. BRAKE WARNING

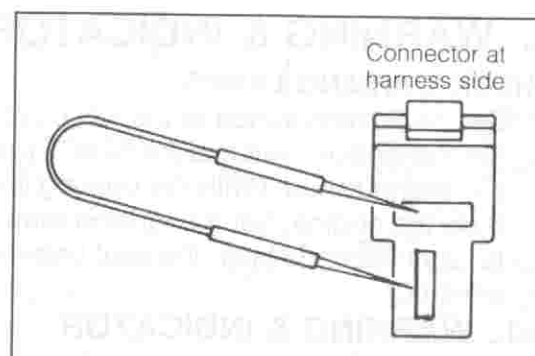
BRAKE FLUID LEVEL SWITCH

In-vehicle inspection

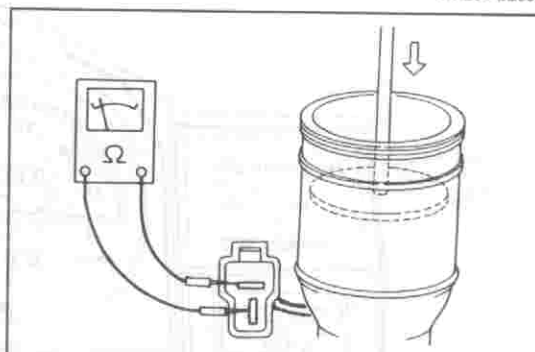
1. Start the engine.
2. Return the parking brake lever to the original position.
3. Disconnect the connector of the brake level warning switch. Short the connector terminals at the wire harness side with each other, as indicated in the right figure. Ensure that the brake warning lamp glows.
4. Pull out the connector of the brake fluid level warning switch and connect a tester.
5. Press down the brake fluid level warning switch (float) with a rod.
6. Ensure that continuity exists between the connector terminals.

NOTE:

- As for a rod to be used for pressing down the float, be sure to thoroughly clean it. Special care must be exercised to ensure that no dust nor water gets into the reservoir.



WRE91-BE034

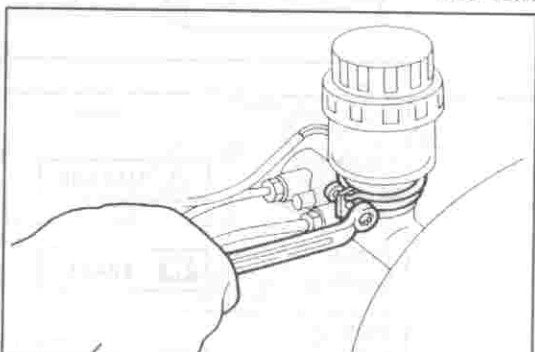


WRE91-BE035

Removal

Replace the brake fluid level switch. If the switch exists malfunction while the above inspection.

1. Detach the reservoir tank cap.
2. Drain the brake fluid from the reservoir tank.
3. Remove the reservoir assembly.



WRE91-BE036

Installation

1. Install the master cylinder reservoir assembly to the master cylinder.

Tightening Torque: 4.9 - 6.9 N·m (0.55 - 0.7 kgf-m)

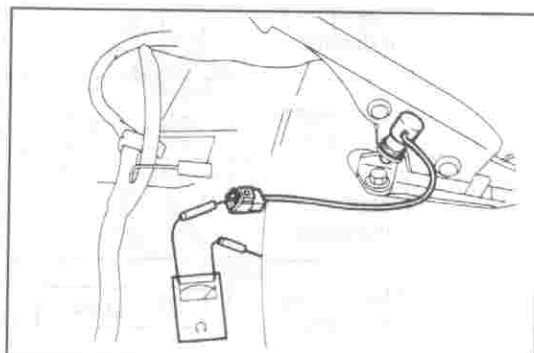
2. Fill the reservoir tank with brake fluid up to the MAX level.
Brake Fluid to be Used: DOT3 or SAE J1703.

WRE91-BE037

PARKING BRAKE SWITCH

In-vehicle inspection

1. Pull out the connector of the parking brake switch and conduct continuity checks between the terminal and the body earth.
 - (1) Ensure that continuity exists between the terminals when the parking brake lever is pulled upward.
 - (2) Ensure that no continuity exists between the terminals when the parking brake lever is returned.

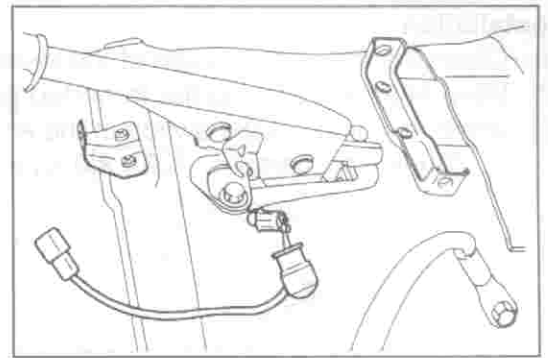


WRE91-BE038

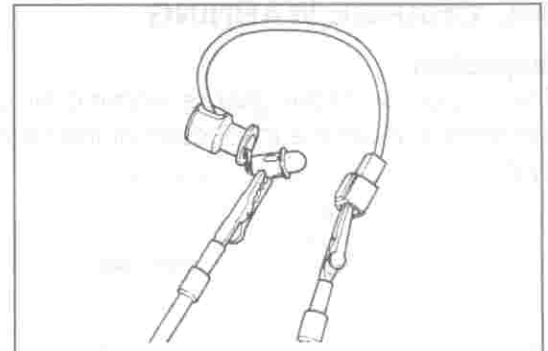
Unit inspection

1. Remove the rear console box.
2. Remove the parking brake switch.

- (1) Ensure that continuity exists between the terminal and the switch body.
- (2) When push the plunger, no continuity exists the terminal and the switch body.



WRE91-BE039

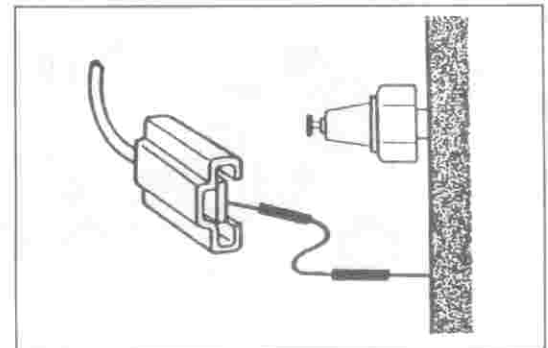


WRE91-BE040

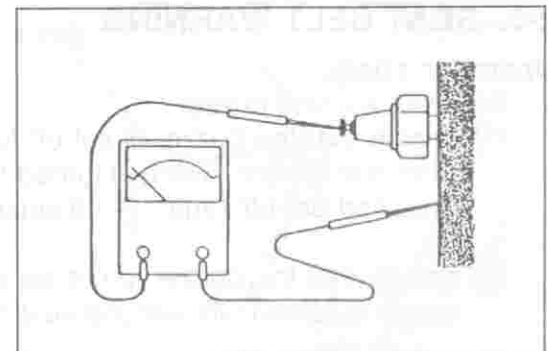
2-3. OIL PRESSURE WARNING

In-vehicle inspection

1. Disconnect the connector of the oil pressure switch at the engine oil cleaner.
2. Ground the connector at the harness side.
3. Turn ON the IG switch.
4. Ensure that the oil pressure warning glows.
5. Connect a tester between the oil pressure switch terminal and the earth.
6. Ensure that continuity exists while the engine is stopped.
7. Ensure that no continuity exists while the engine is running.



WRE91-BE041

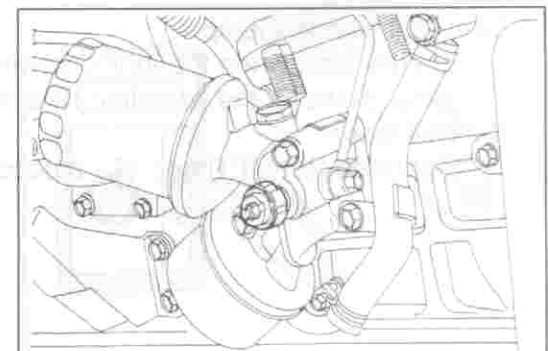


WRE91-BE042

Removal

Replace the oil pressure switch, If the switch exists malfunction while above inspection.

1. Turn OFF the IG switch.
2. Remove the oil pressure switch with 26 mm hexagonal box wrench.



WRE91-BE043

BODY ELECTRICAL SYSTEM

Installation

1. Clean the threaded portion of the switch.
2. Wind seal tape around the threaded portion.
3. Install the oil pressure switch in the engine.

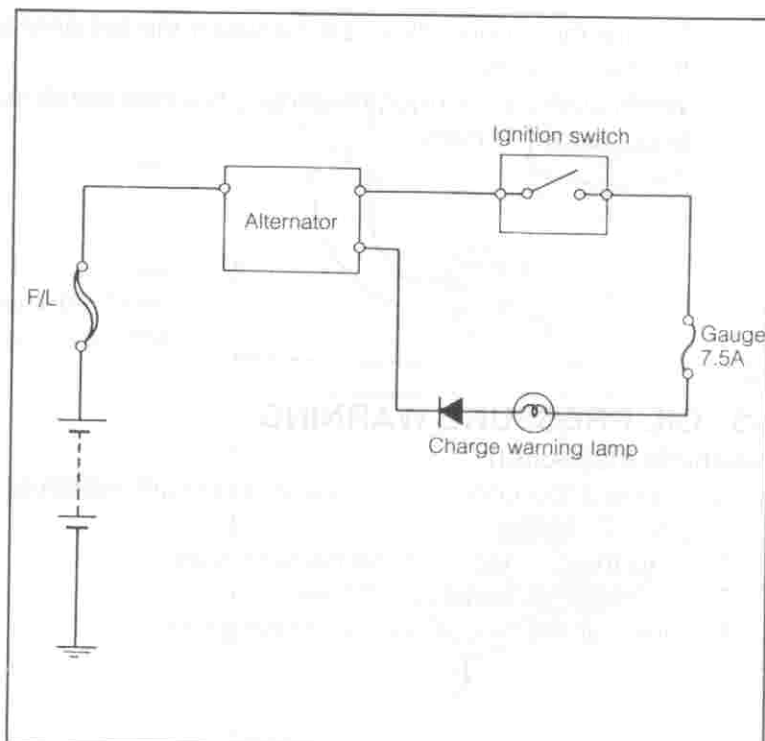
Tightening Torque: 1.2 - 2.0 kg-m (8.7 - 14.5 ft-lb).

WRE91-BE044

2-4. CHARGE WARNING

Inspection

The inspection of the charge warning lamp is performed under the inspection of the charge system.

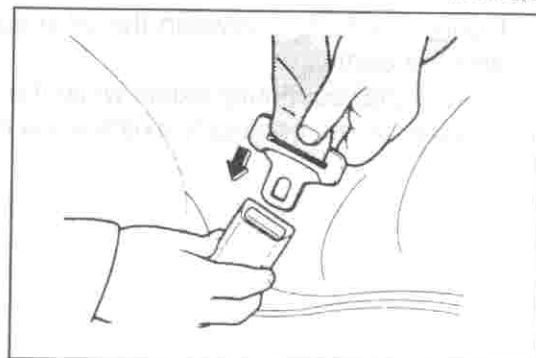


WRE91-BE045

2-5. SEAT BELT WARNING

Operation check

1. Seat belt warning buzzer
 - (1) Ensure that the buzzer is set off for the specified time when the ignition switch is turned ON.
Specified Set-off Time: 4 - 8 seconds
 - (2) Ensure that the buzzer is not set off when the ignition switch is turned ON with the seat belt locked.
2. Seat belt warning lamp
 - (1) Ensure that, when the ignition switch is turned ON, the lamp glows for the specified time regardless of the seat belt lock.
Specified Set-off Time: 4 - 8 seconds



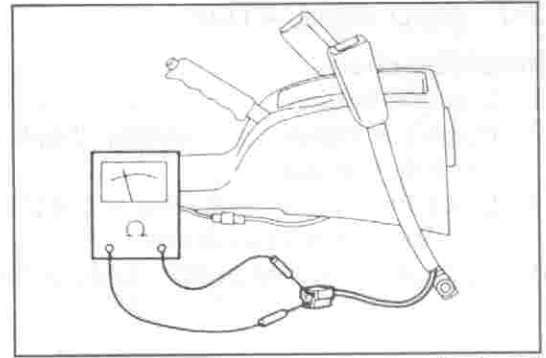
WRE91-BE046



WRE91-BE047

Inspection of seat belt switch

1. Pull out the connector of the seat belt switch and connect a tester.
2. Buckle the seat belt. Ensure that continuity exists between the connector terminals.

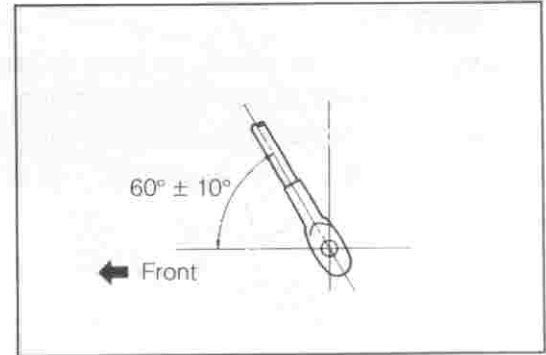


WRE91-BE048

Removal and installation

Install the seat belt so that the installation angle of the front/inner seat belt may become 50 - 70 degrees.

Tightening Torque: 2.9 - 5.4 kg-m
(21.0 - 39.1 ft-lb, 28.4 - 53.0 N-m)



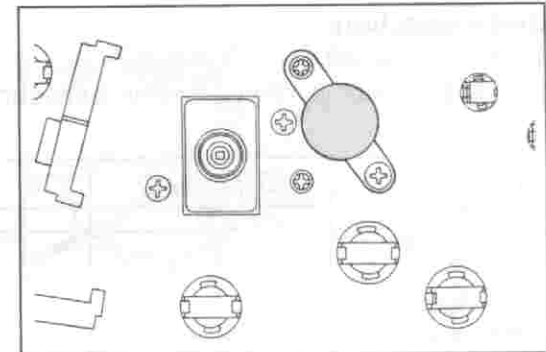
WRE91-BE049

Inspection of buzzer

1. Remove the buzzer.
2. Apply a voltage of 12V between the terminals of the buzzer.
3. Ensure that the buzzer is set off.

NOTE:

- It must be noted that the buzzer will not be set off if the positive $\oplus$ and negative $\ominus$ terminals are connected reversely.

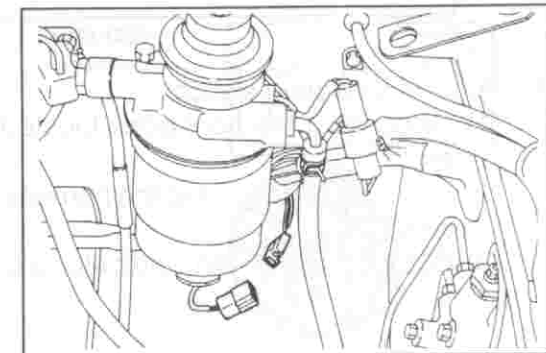


WRE91-BE050

2-6. FUEL DRAIN WARNING

In-vehicle check

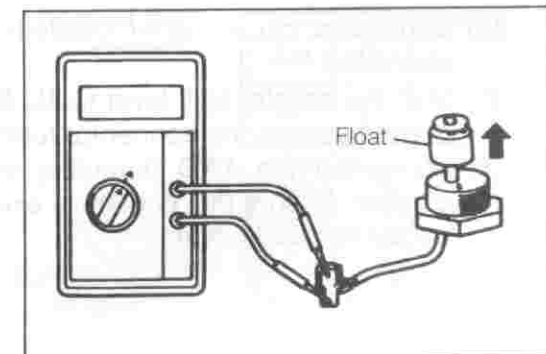
1. Disconnect the connector.
2. Turn ON the IG switch.
3. Short the connector at the harness side.
4. Ensure that the fuel drain warning glows.



WRE91-BE051

Sensor check

1. Drain fuel from the fuel filter.
2. Disconnect the connector.
3. Remove the sensor unit by water pump pliers.
4. Connect a circuit tester.
5. Lift the float
6. Continuity should exist between the connector terminals.



WRE91-BE052

2-7. 4WD INDICATOR

In-vehicle check

1. Start the engine.
2. Place the transfer shift lever in the 4L position. Ensure that the indicator glows.
3. Place the transfer shift lever in the 2H position. Ensure that the indicator is extinguished.
4. Turn-ON the power switch. Ensure that the indicator glows.

WARNING:

- Prior to the check, be sure to place the transmission shift lever in the neutral position.
- Also, make sure to apply the parking brake to the vehicle.

Unit inspection

1. Power switch

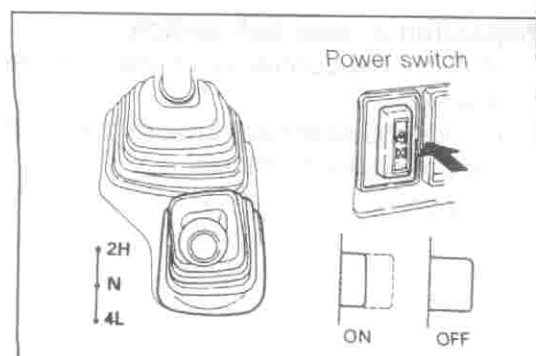
- (1) Connect a circuit tester between the respective terminals.

	①	②	③	④	⑤
OFF	○			○	
		○			○
ON	○			○	
			○		○

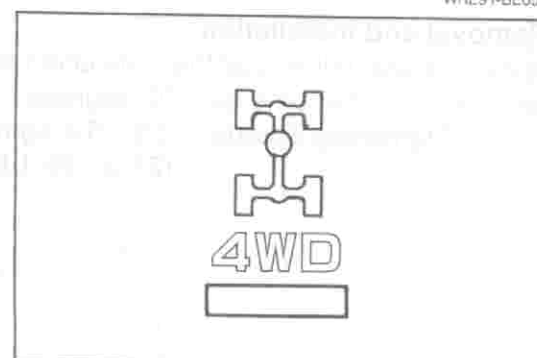
2. Position detecting switch

- (1) Disconnect the connector located at the transfer case end.
- (2) Short the connector at the harness side. (As for connector ②).
- (3) Ensure that the 4WD indicator glows.

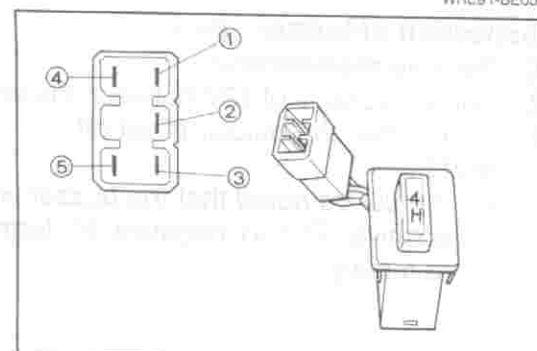
- (4) Connect a circuit tester between the terminal of the connector.
- (5) Shift the transfer shift lever to 4L. Ensure that continuity exists between the connector terminals. (① and ⑤).
- (6) Screw out the 4WD detecting switch and push the plunger. Ensure that continuity exists between the connector terminals. (③).



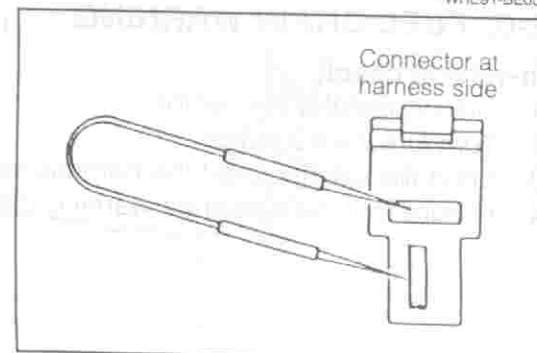
WRE91-BE053



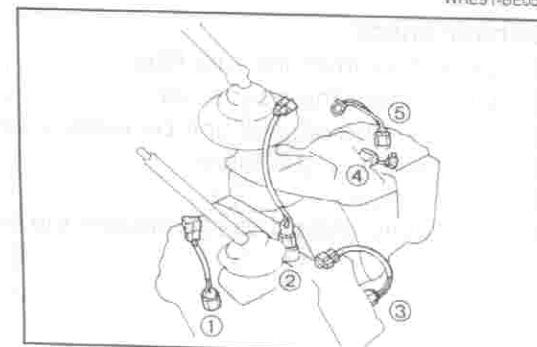
WRE91-BE054



WRE91-BE055



WRE91-BE056

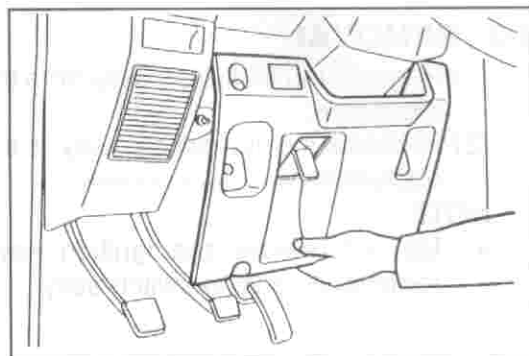


WRE91-BE057

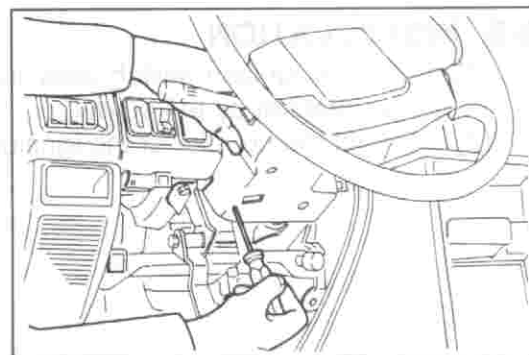
3. IGNITION KEY SWITCH

3-1. INSPECTION

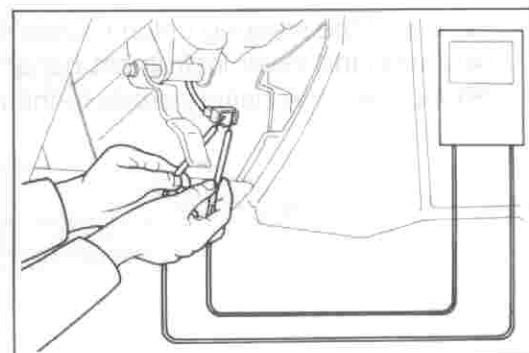
- (1) Disconnect the battery cable from the negative (-) terminal.
- (2) Remove the lower instrument panel finish by removing the two screws.
 - Remove the headlight levering switch knob.



- (3) Remove the steering column lower cover.



- (4) Disconnect the connector of the ignition key switch.
- (5) Connect a circuit tester between the terminal of the connector.



- (6) Ensure that continuity exists between the respective terminals as indicated in the table.

Table of connection

Terminal Position	AM	ACC	IG	ST ₁	ST ₂
LOCK					
ACC	○	○			
ON	○	○	○		
START	○		○	○	○

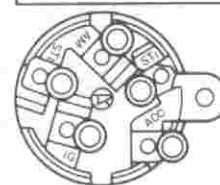
(Diesel engine with QSI system)

Terminal Position	AM	ACC	M	G	ST
LOCK					
ACC	○	○			
ON	○	○	○		
G	○		○	○	
START	○		○		○

(Diesel engine)

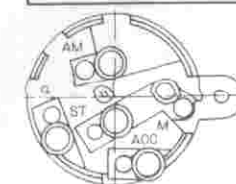
(With QSI system)

AM	ST ₂	ACC
M	ST ₁	



(Without QSI system)

AM	G	ACC
M	ST	



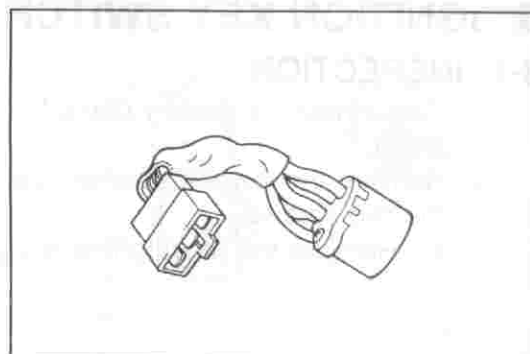
BODY ELECTRICAL SYSTEM

3-2. REMOVAL

- (1) Remove the IG switch assy from the holder by removing the screw.
- (2) Replace the IG switch assy if the switch assy exists malfunction.

NOTE:

- Do not remove the ignition key cylinder during the removal of ignition switch assy.



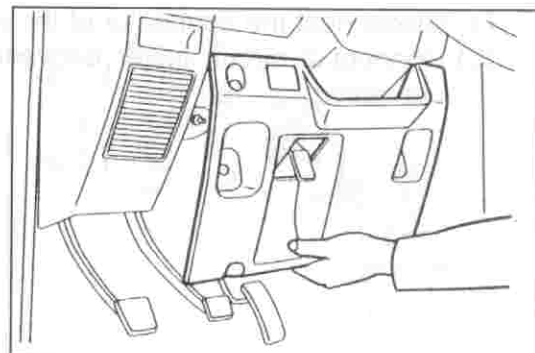
WRE91-BE254

3-3. INSTALLATION

- (1) Install the ignition switch assy to the steering column upper bracket by the screw.
- (2) Connect the coupler of the ignition switch.

WRE91-BE255

- (3) Install the steering column lower cover.
- (4) Install the lower instrument panel finish.
- (5) Connect the battery cable to the negative (-) terminal.

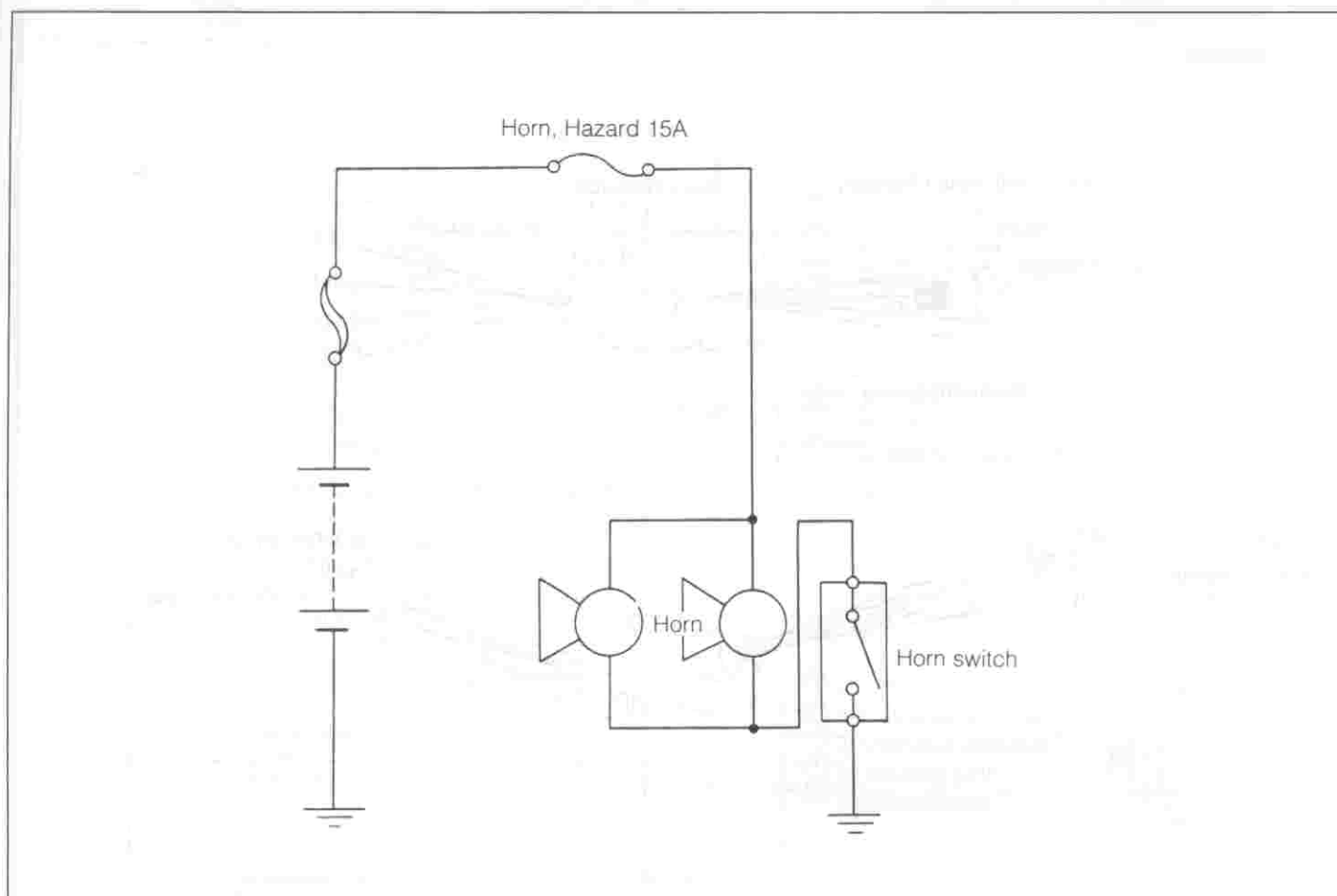


WRE91-BE256

4. HORN

The horn is installed at the front of the radiator support panel.

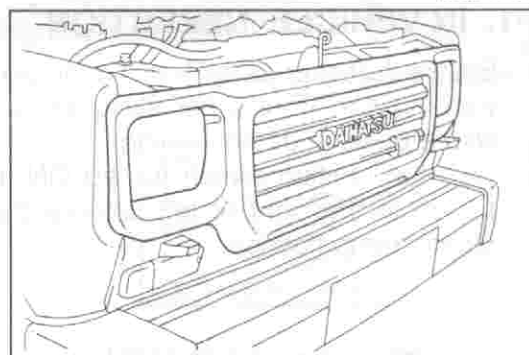
CIRCUIT DIAGRAM



WRE91-BE062

REMOVAL

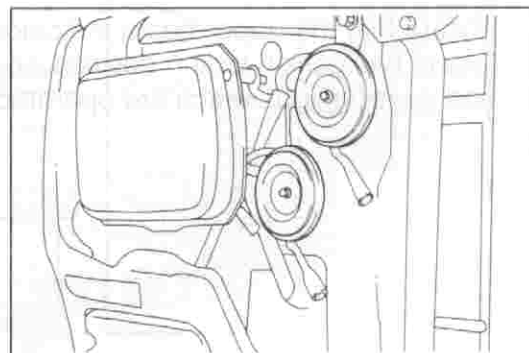
1. Removal of radiator grille
 - (1) Remove the two screws.
 - (2) Detach the two clips, using a screwdriver.
 - (3) Remove the radiator grille from the vehicle body by raising it diagonally toward you.
2. Removal of horn assembly
 - (1) Disconnect the connector.
 - (2) Remove the horn.



WRE91-BE063

INSTALLATION

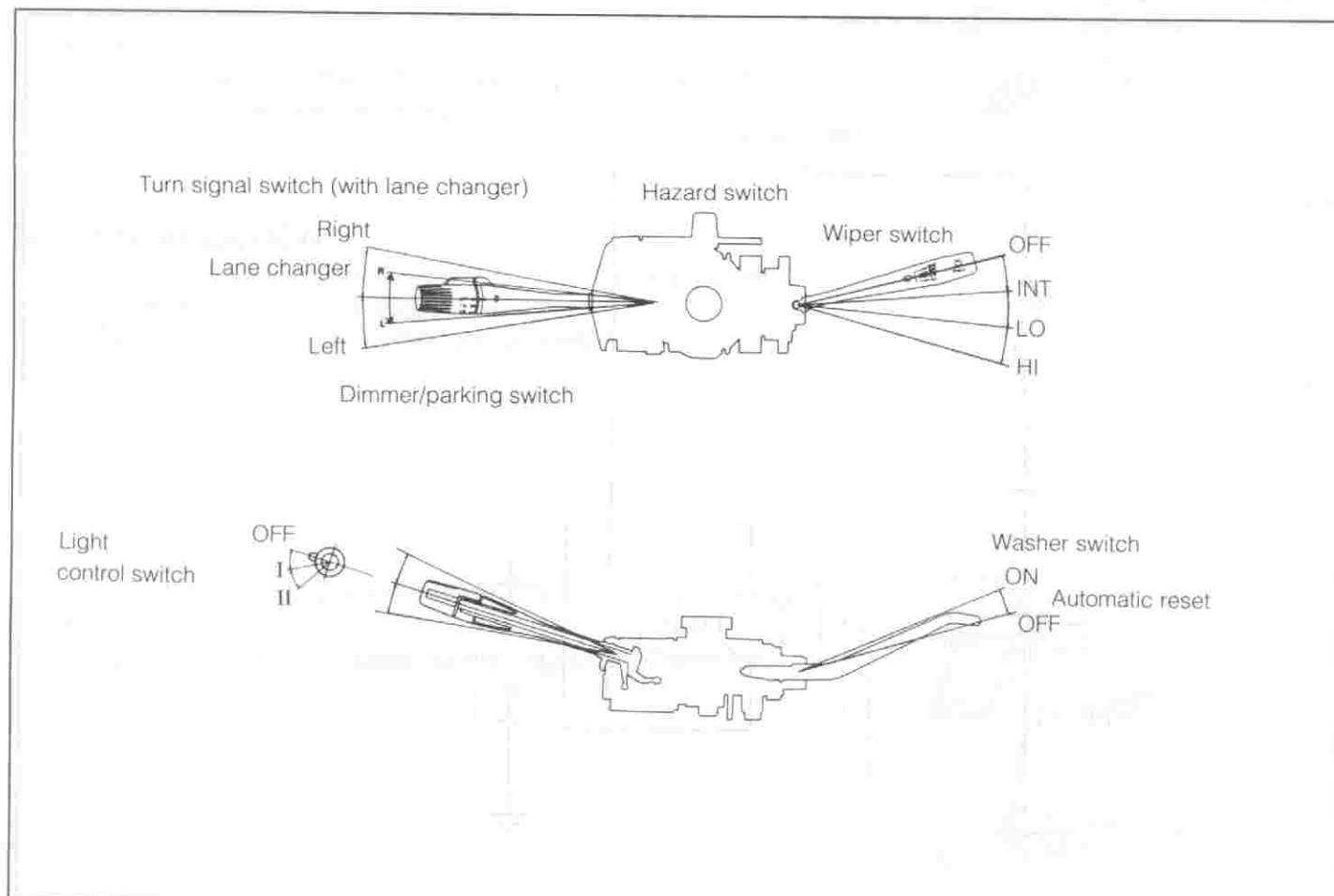
1. Install the horn assembly.
2. Installation of headlamp grille
 - (1) Ensure that three clips are provided at the body side.
 - (2) Set the headlamp grille on the body. Secure the headlamp grille with the two clips at the upper side.
 - (3) Attach the headlamp grille to the body with the two screws.



WRE91-BE064

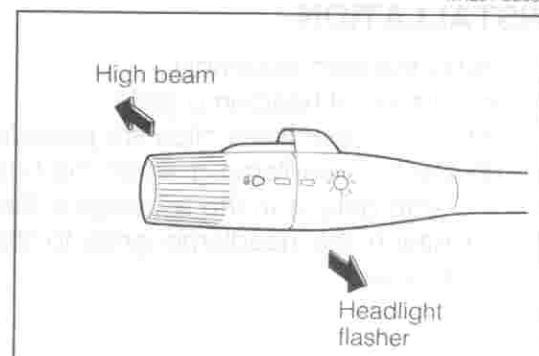
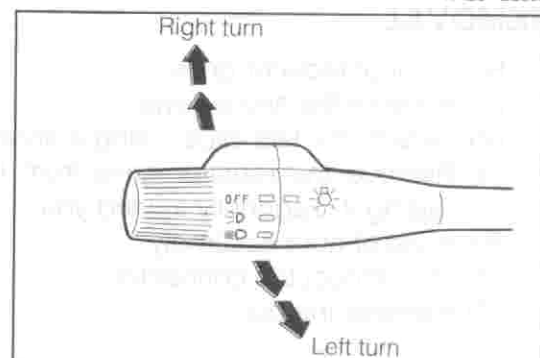
5. MULTI-USE LEVER SWITCH

A multi-use lever type in which all switches to be used most frequently during the driving, such as the lighting switches, turn signal switch and wiper switch, are arranged concentrated around the steering column has been employed.



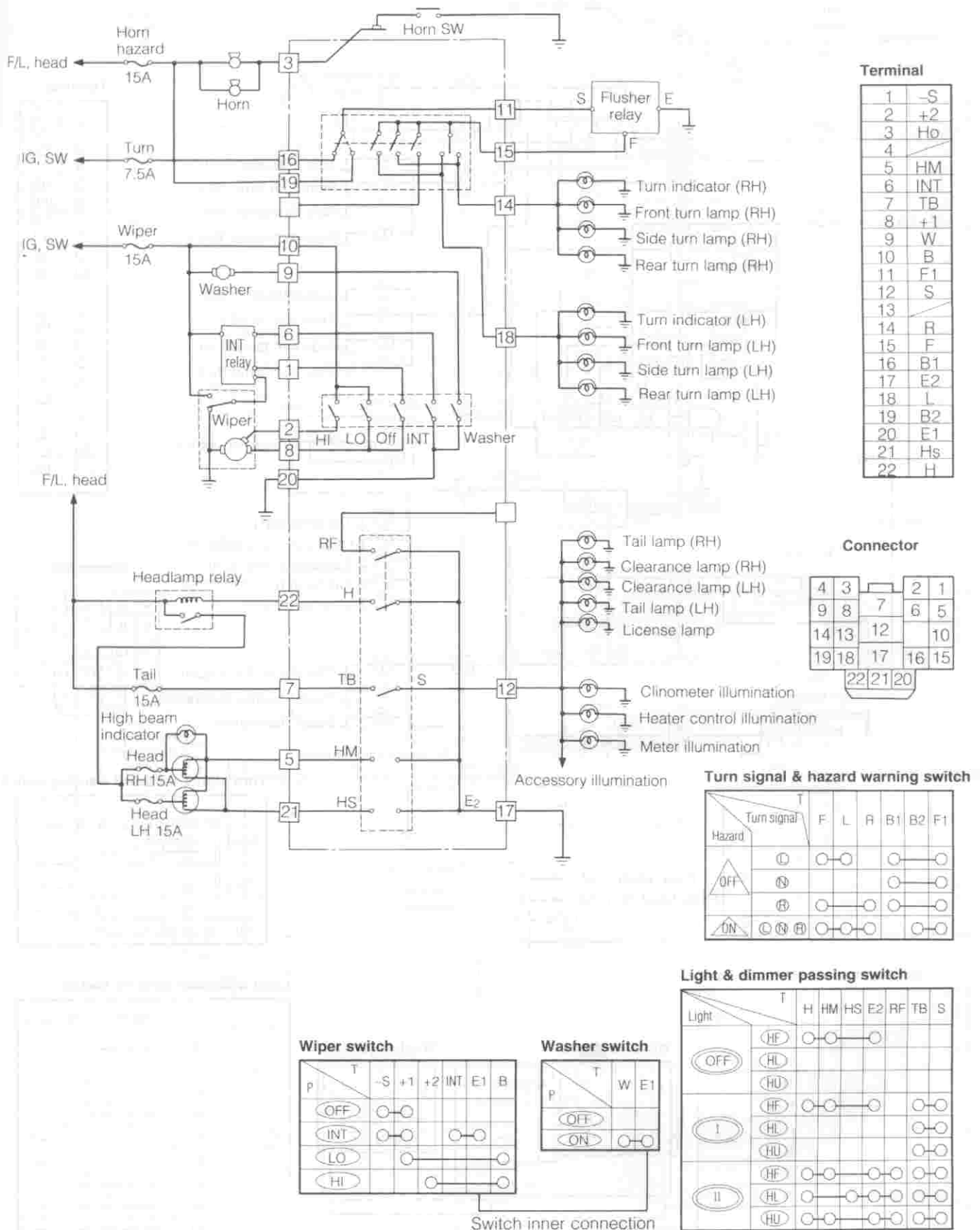
5-1. IN VEHICLE INSPECTION

1. Ensure that each of the turn signal, dimmer, lighting, hazard warning and front wiper switches is functioning smoothly with a positive detent feeling.
2. With the ignition switch turned ON, move the turn signal switch to the right or left. Ensure that the turn signal indicator lamp flashes.
3. Ensure that the upper beam indicator lamp glows regardless of the ignition switch position when the dimmer switch and passing light switch are operated.



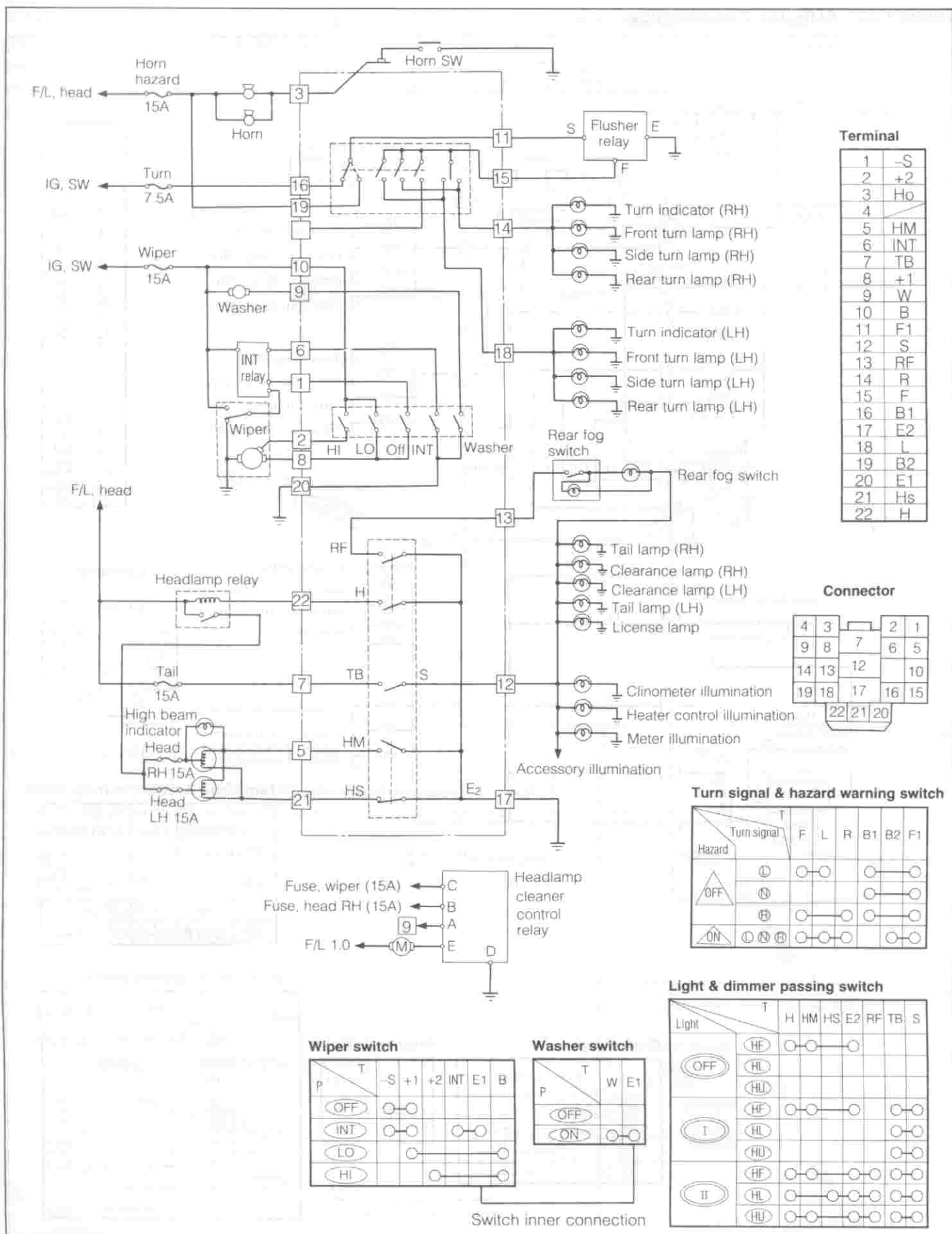
5-2. WIRING DIAGRAM

Version A: AUS, GE Specification

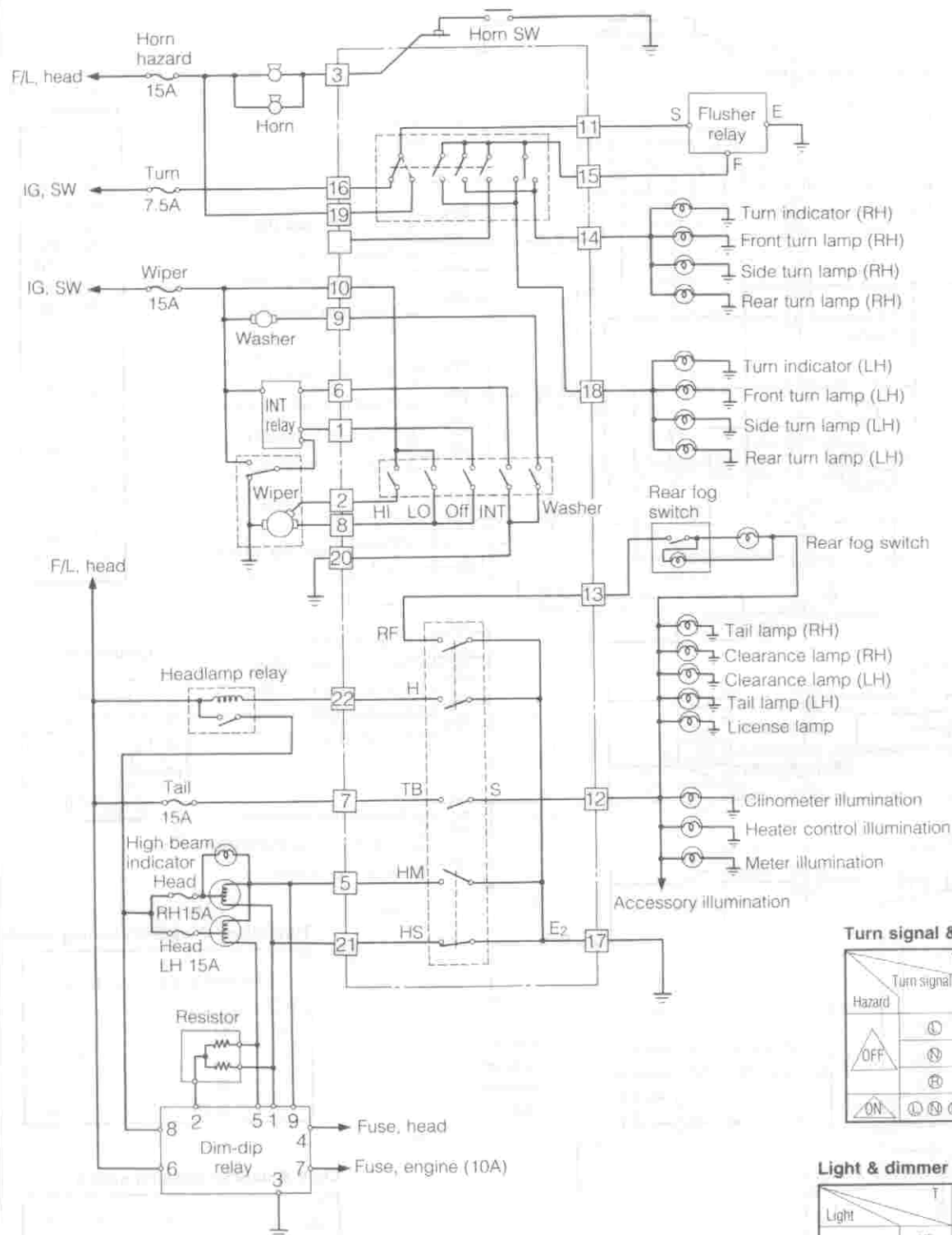


BODY ELECTRICAL SYSTEM

Version B: EC Specification



Version C: EC Specification with Dim-dip System



Terminal

1	-S
2	+2
3	Ho
4	
5	HM
6	INT
7	TB
8	+1
9	W
10	B
11	F1
12	S
13	RF
14	R
15	F
16	B1
17	E2
18	L
19	B2
20	E1
21	Hs
22	H

Connector

4	3	7	2	1
9	8		6	5
14	13	12		10
19	18	17	16	15
22 21 20				

Turn signal & hazard warning switch

	Turn signal	T	F	L	R	B1	B2	F1
Hazard								
OFF								
ON								

Light & dimmer passing switch

	T	H	HM	HS	E2	RF	TB	S
Light								
OFF	HF							
HL								
HU								
I	HF							
HL								
HU								
II	HF							
HL								
HU								

Wiper switch

	T	-S	+1	+2	INT	E1	B
P							
OFF							
INT							
LO							
HI							

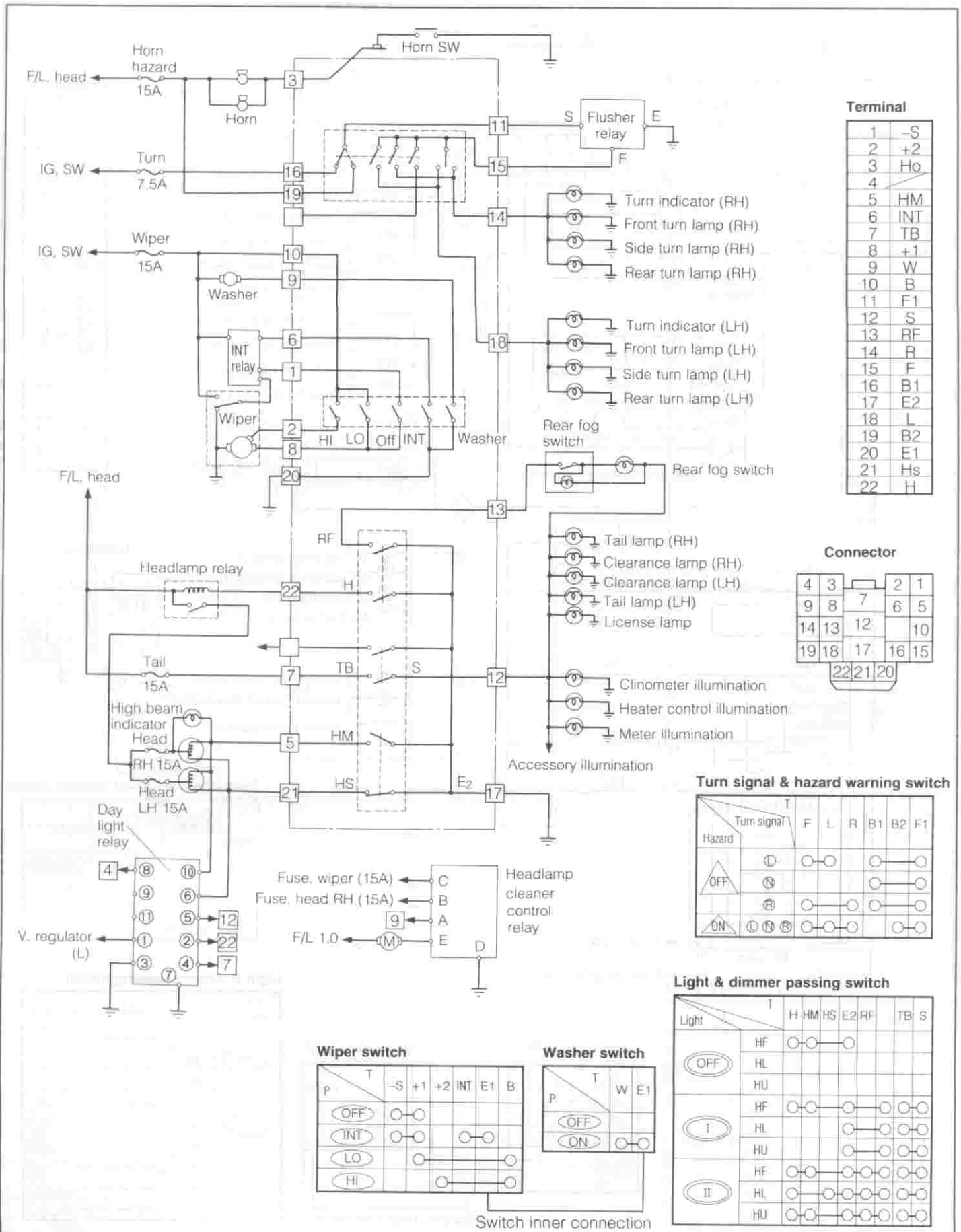
Washer switch

	T	W	E1
P			
OFF			
ON			

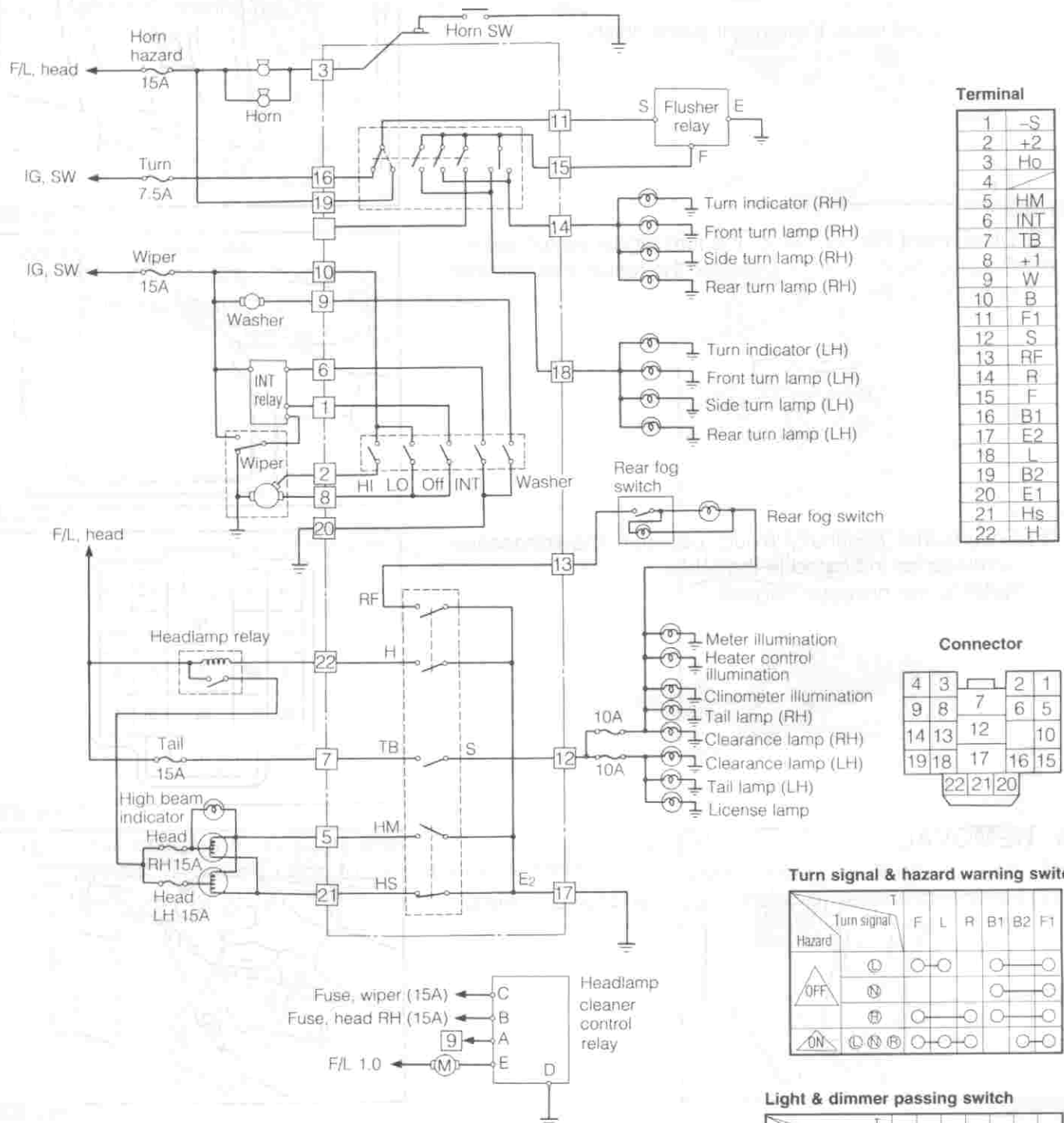
Switch inner connection

BODY ELECTRICAL SYSTEM

Version D: EC Specification with Day-light System



Version E: German Specification



Wiper switch

P	T	-S	+1	+2	INT	E1	B
OFF							
INT							
LO							
HI							

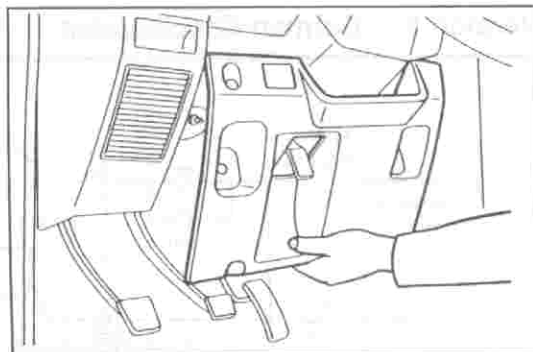
Washer switch

P	T	W	E1
OFF			
ON			

Switch inner connection

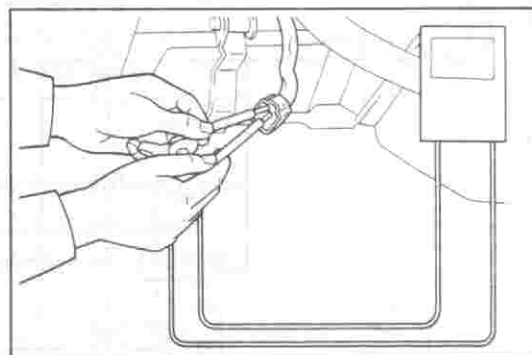
5-3. INSPECTION

- (1) Disconnect the battery cable from the negative (-) terminal.
- (2) Remove the lower instrument panel finish.



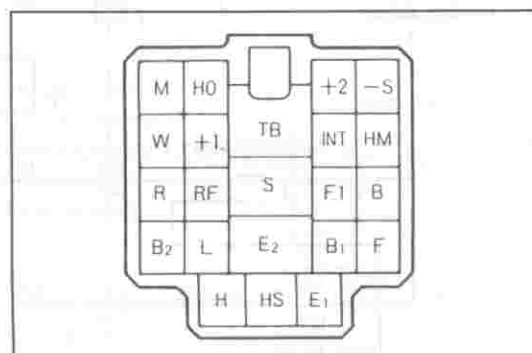
WRE91-BE257

- (3) Disconnect the coupler of the turn signal switch assy.
- (4) Connect a circuit tester between the respective terminal of the connector.



WRE91-BE258

- (5) Ensure that continuity exists between the respective terminals as indicated in the table. Refer to the previous pages.



WRE91-BE259

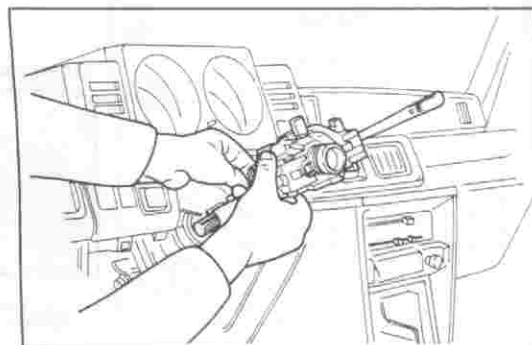
5-4. REMOVAL

- (1) Remove the steering wheel assy.
- (2) Remove the steering column upper and lower covers.



WRE91-BE260

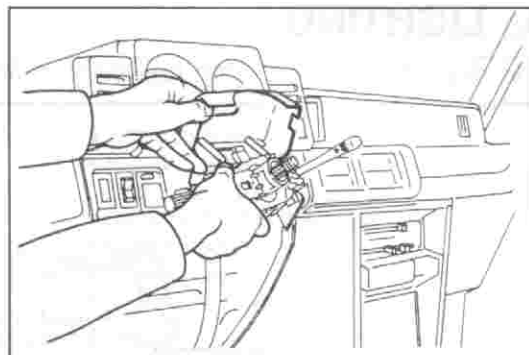
- (3) Remove the turn signal switch assy.



WRE91-BE261

5-5. INSTALLATION

- (1) Install the turn signal switch assy to the steering shaft.
- (2) Install the steering column upper and lower covers.



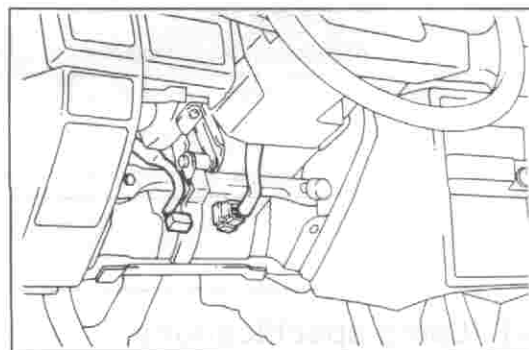
WRE91-BE262

- (3) Tighten the screws.
 - (4) Install the steering wheel assy.
- Tightening Torque: 29.4 - 49.0 N·m (3.0 - 5.0 kgf·m)



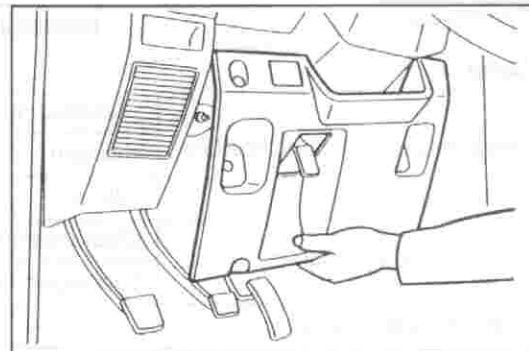
WRE91-BE263

- (4) Connect the coupler of the turn signal switch assy.



WRE91-BE264

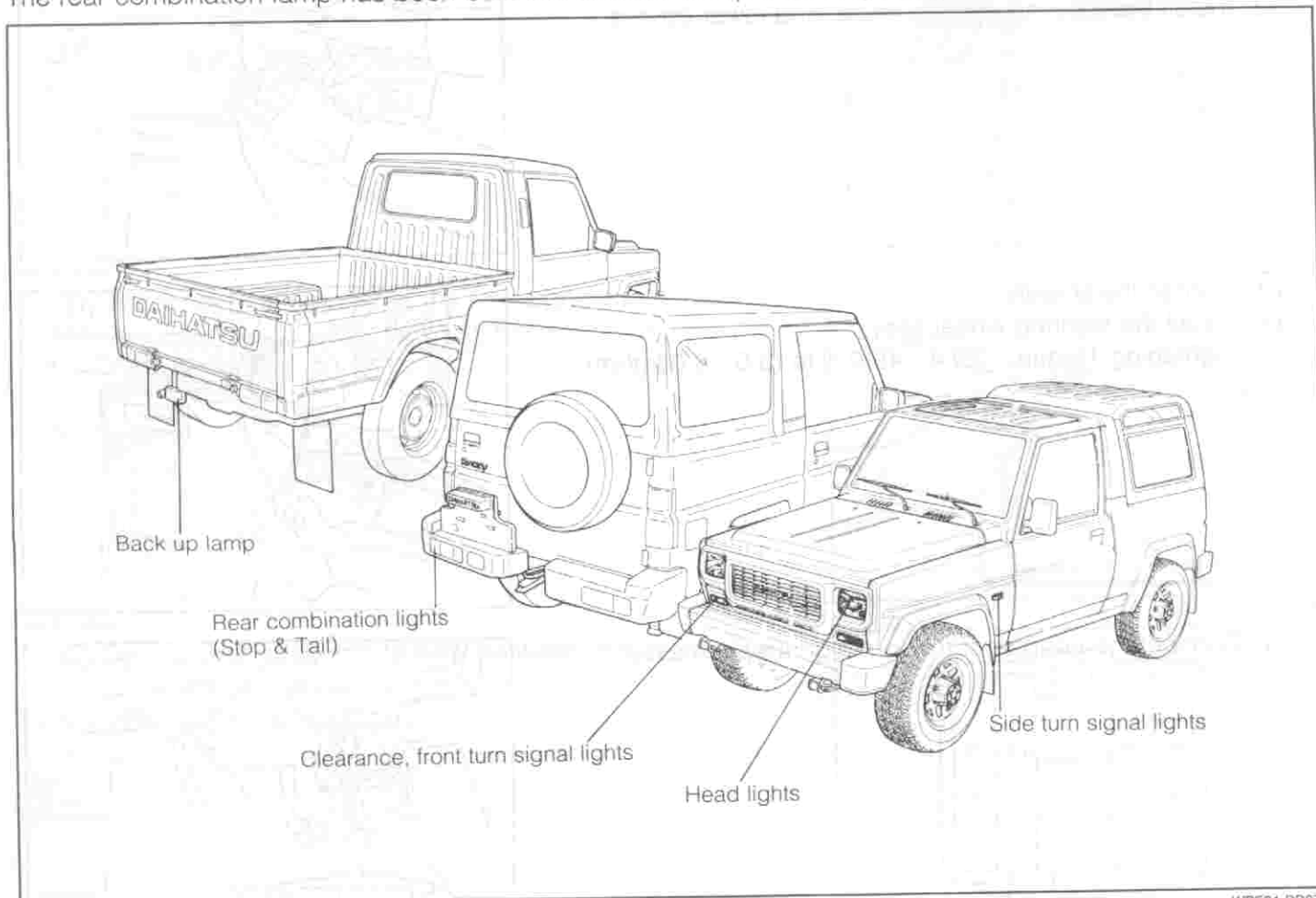
- (5) Install the lower instrument panel finish.
- (6) Connect the battery cable to the negative (-) terminal.



WRE91-BE265

6. LIGHTING

The rear combination lamp has been built into the rear bumper for only European and Australian markets.



WRE91-BR078

6-1. Lamp specifications

Lamp		Specifications	Wattage	Remarks
Headlamp	Bulb specifications	Candescent	45/40	
		Halogen	60/55	
		Yellow	45/40	
Front combination lamp		Clearance lamp	5	
		Turn signal lamp	21	
Side turn signal lamp			5	
Rear combination lamp		Stop/tail lamp	21/5	Figures in () denote European specifications
		Turn signal lamp	23(21)	
		Back up lamp	21	
License plate lamp			5	
Room lamp			10	
Fog lamp		Front	35	• Option on Australian & General specifications
		Rear	21	• Standard on R.H.D. vehicles for European specifications • Option on L.H.D. vehicles for European specifications

WRE91-BR079

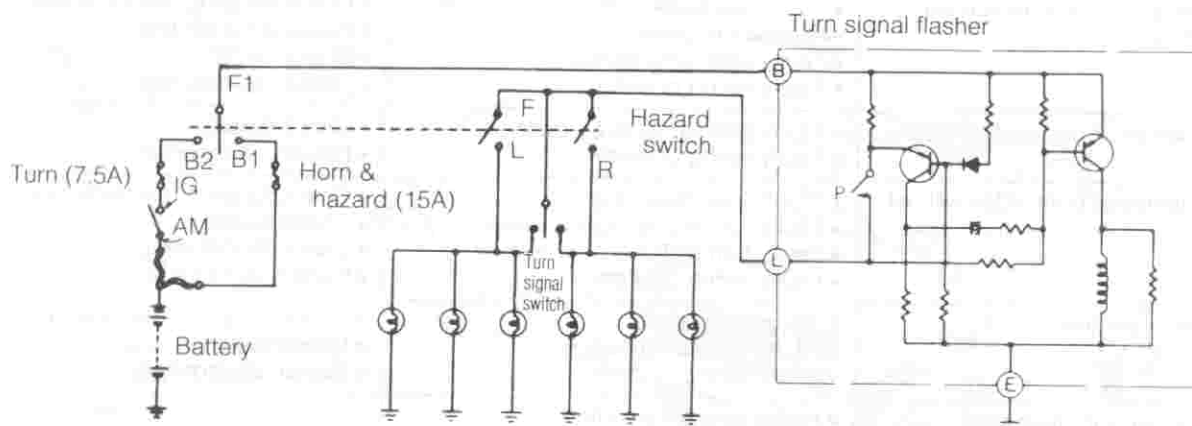
6-2. TROUBLE SHOOTING

Problem	Possible causes	Remedies
One headlamp will not glow.	• Burnt bulb • Faulty socket • Faulty wiring or earth	• Replace bulb. • Repair, as required.
Headlamps will not glow.	• Fusible link and/or fuse blown out • Faulty lighting switch • Faulty headlamp relay • Faulty wiring or earth	• Replace fusible link and/or fuse. • Check switch. • Check relay • Repair, as required.
High beam or low beam will not glow.	• Faulty lighting switch or dimmer switch • Faulty wiring	• Check switch. • Repair, as required.
Clearance lamp, tail lamp or license lamp will not glow.	• "Tail" fuse blown out • Fusible link blown out • Faulty side lamp switch • Faulty wiring or earth	• Check for short. Replace fuse. • Replace fusible link. • Check switch. • Repair, as required.
Turn signal lamps at one side will not glow.	• Faulty turn signal lamp switch • Faulty wiring or earth	• Check switch. • Repair, as required.
Turn signal lamps at both sides will not glow.	• "Turn" fuse blown out • Faulty turn signal/hazard switch • Faulty turn signal flasher relay • Faulty wiring or earth	• Check for short. Replace fuse. • Check switch. • Check flasher relay • Repair, as required.
Stop lamp will not glow.	• "Stop" fuse blown out • Faulty stop lamp switch • Faulty wiring or earth	• Check for short. Replace fuse. • Check switch. • Repair, as required.
Stop lamp remains in glow state.	• Faulty stop lamp switch.	• Adjust or replace switch.
Hazard warning lamp will not glow.	• "Horn" fuse blown out • Faulty flasher relay • Faulty hazard switch • Faulty wiring or earth	• Check for short. Replace fuse. • Check flasher. • Check switch. • Repair, as required.

WR91-8E080

6-3. TURN SIGNAL FLASHER

The turn signal flasher controls turn signal and hazard warning. The flasher is located above the accelerator pedal for L.H.D vehicle and above the clutch pedal for R.H.D vehicle.



WRE91-BE081

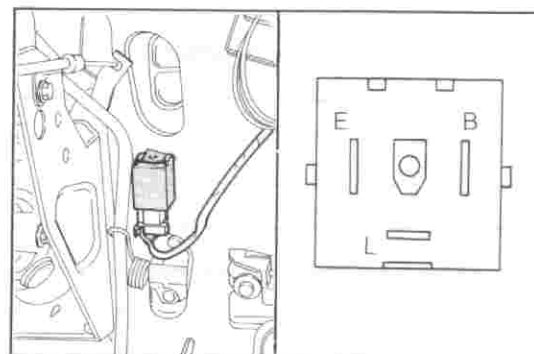
Inspection

Check each lamp for the state of glowing, flashing and not glowing.

Specified Flashing Speed: 85 ± 10 times/min.

NOTE:

- If any of the front or rear turn signal lamps has open wire, the flashing speed will exceed 120 times/min.
- If any abnormality is found in the inspection, check for burnt bulb and check each switch. When no abnormality is found in these checks, replace the turn signal flasher.

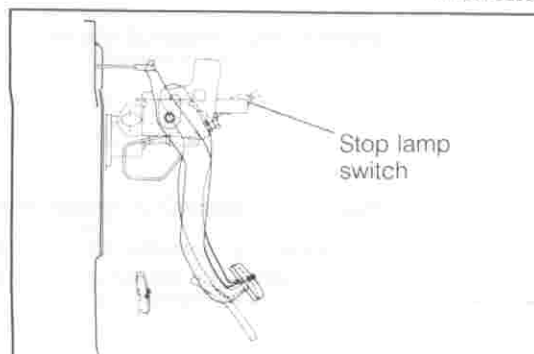


WRE91-BE082

6-4. STOP LAMP SWITCH

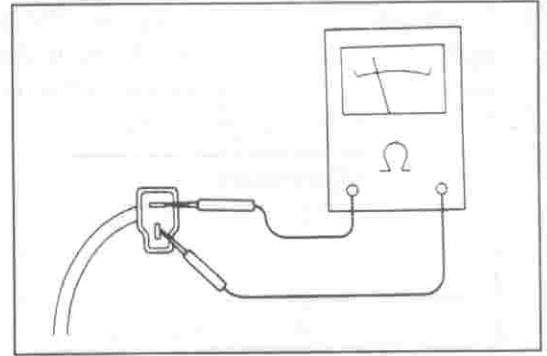
Inspection

1. Disconnect the connector of the stop lamp switch.
2. Ensure that continuity exists between the terminals when the brake pedal is depressed.



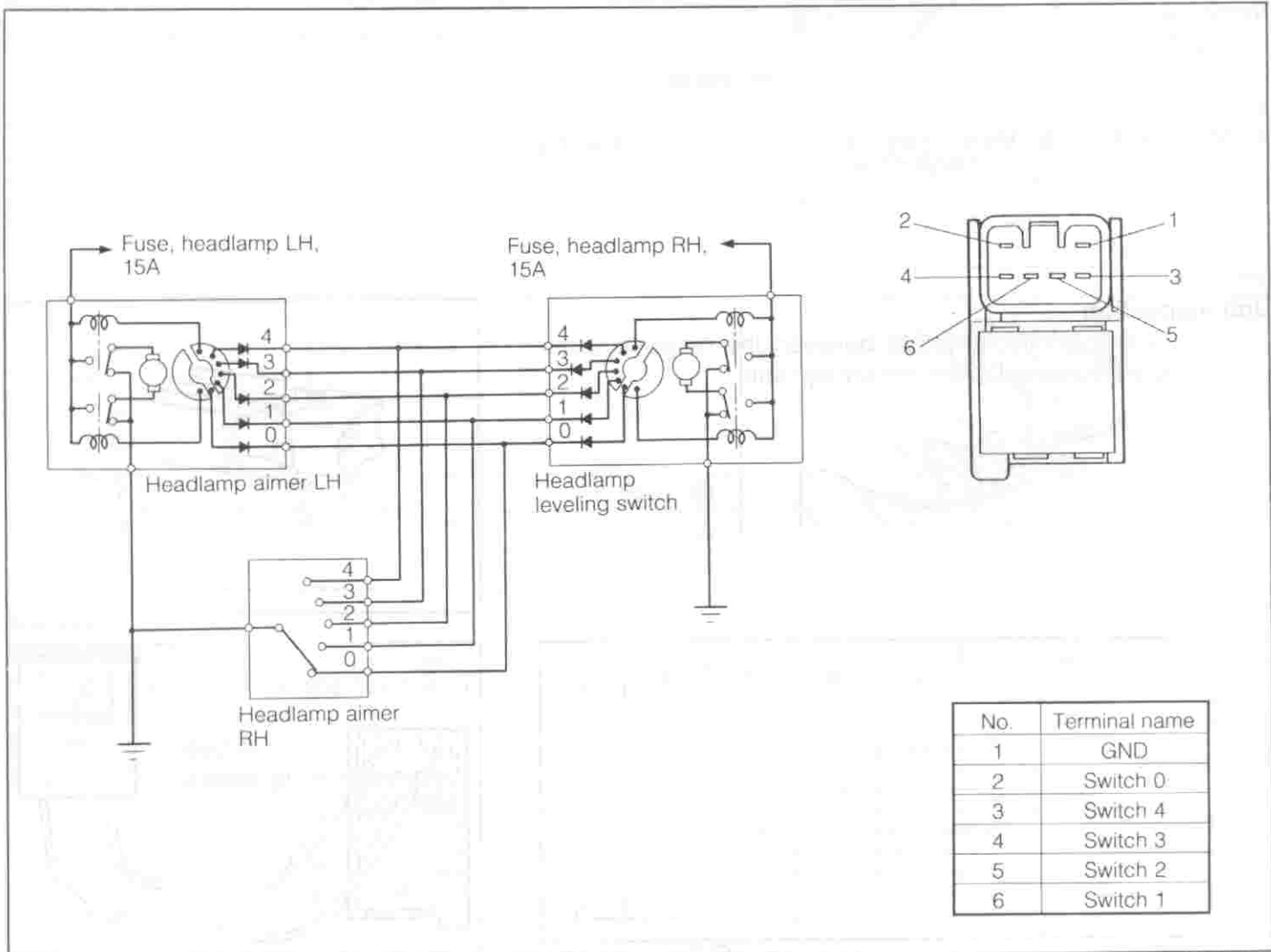
WRE91-BE083

3. Ensure that no continuity exists between the terminals when the brake pedal is not depressed.



WRE91-BE084

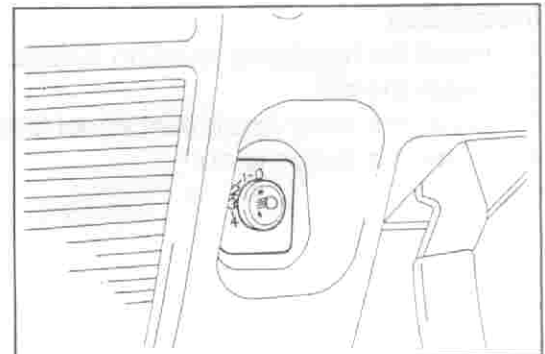
6-5. HEADLAMP LEVELING SWITCH



WRE91-BE085

In vehicle inspection

1. Set the headlamp leveling switch to the position "O". The height of the photometric axis projected on a screen placed 3 meters in front of the headlamps becomes the reference line.
2. Set the switch to the position "1". Ensure that the photometric axis moves 21 mm (0.83 inch) down below the reference line.

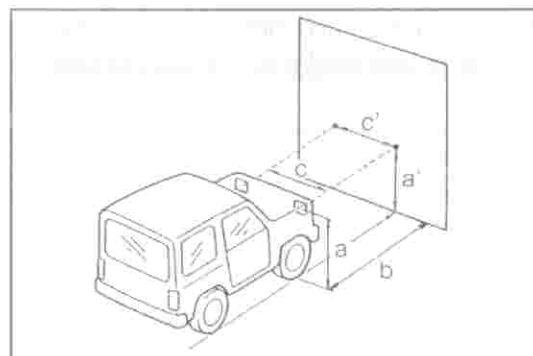


WRE91-BE086

BODY ELECTRICAL SYSTEM

3. In the same way as above, set the switch to each of the positions "2" through "4". Ensure that each distance between the photometric axis and the reference line conforms to the table.

Switch position	Stroke mm.(inch)
1	21 (0.83)
2	42 (1.65)
3	63 (2.48)
4	84 (3.31)



WRE91-BE087

Removal

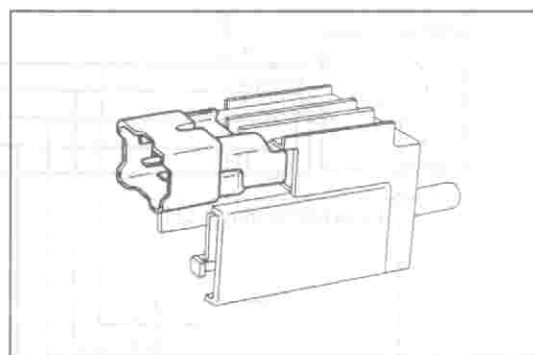
1. Remove the switch knob.
2. Remove the lower instrument panel finish panel.
3. Remove the nut.
4. Remove the connector. Remove the headlamp levelling switch.

Unit inspection

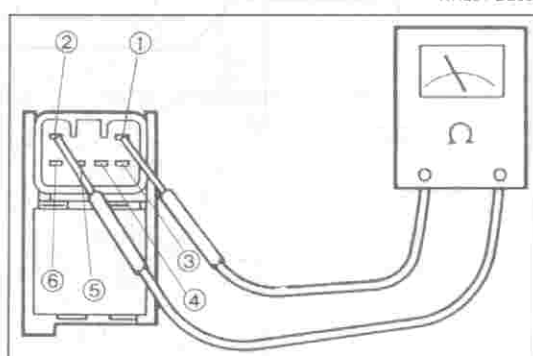
1. Ensure that continuity exists between the respective terminals as indicated in the continuity table.

Terminal	1	2	3	4	5	6
Switch						
0	○	○				
4	○		○			
3	○			○		
2	○				○	
1	○					○

○—○ Continuity exists.



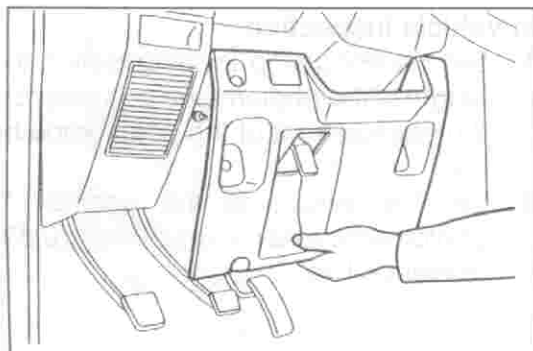
WRE91-BE088



WRE91-BE089

Installation

1. Install the headlamp levelling switch. Install the connector.
2. Install the nut.
3. Install the lower instrument panel finish panel.
4. Install the switch knob.

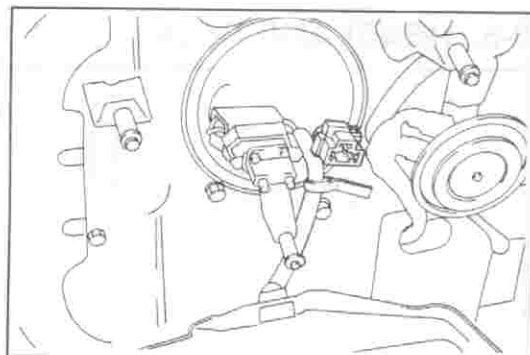


WRE91-BE090

ACTUATOR

Removal

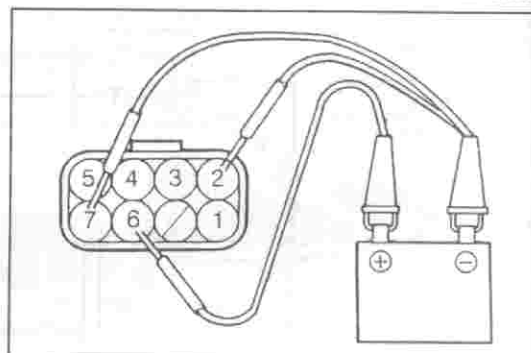
1. Remove the radiator grille assembly.
2. Remove the headlamp.
3. Remove the actuator from the headlamp.
4. Remove the connector.



WRE91-BE091

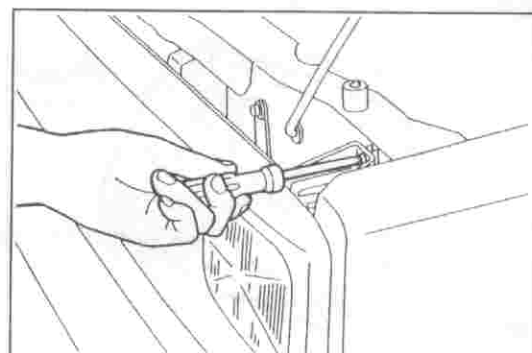
Inspection

Apply a voltage of 12 V in accordance with the table below. Ensure that the motor operates properly.



WRE91-BE092

Terminal Switch position	1	2	3	4	5	6	7
0	⊖					⊕	⊖
1		⊖				⊕	⊖
2			⊖			⊕	⊖
3				⊖		⊕	⊖
4					⊖	⊕	⊖



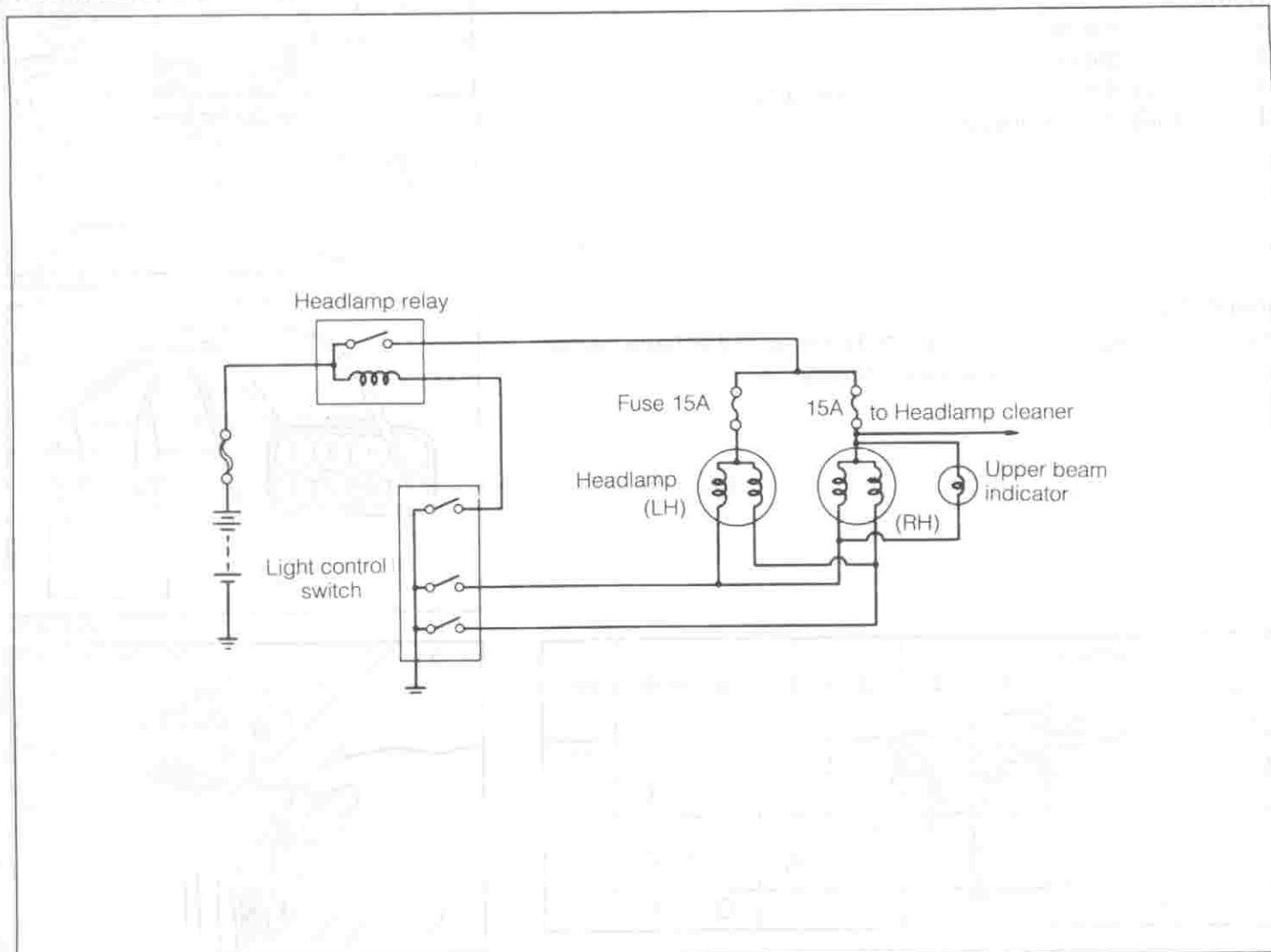
WRE91-BE093

Installation

1. Install the actuator to the headlamp.
2. Install the connector.
3. Install the headlamp.
4. Install the radiator grille assembly.

WRE91-BE094

6-6. HEADLAMP RELAY

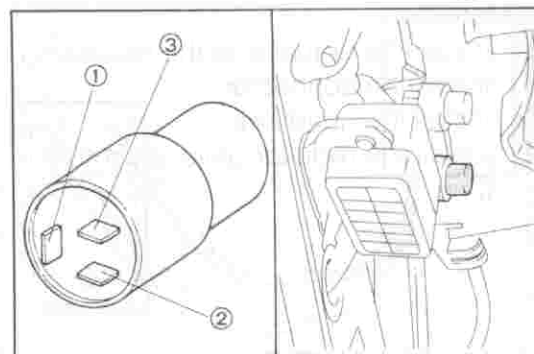


WRE91-BE095

Unit inspection

Ensure that continuity exists between the respective terminal.

- ① — ②
- ② — ③
- ③ — ①



WRE91-BE096

6-7. HEADLAMP

NOTE:

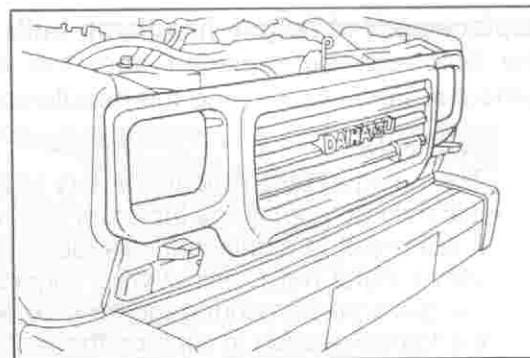
- If should be noted that the bulb replacement can be performed only after socket cover has been detached.

Removal

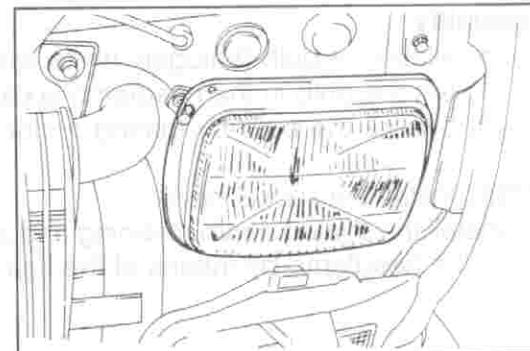
1. Removal of radiator grille
 - (1) Remove the two screws.
 - (2) Detach the two clips, using a screwdriver.
 - (3) Remove the radiator grille from the vehicle body by raising it diagonally toward you.
2. Removal of headlamp assembly
 - (1) Turn the headlamp counterclockwise while pushing it.
 - (2) Remove the headlamp from the vehicle body. Disconnect the connector.

Disassembly

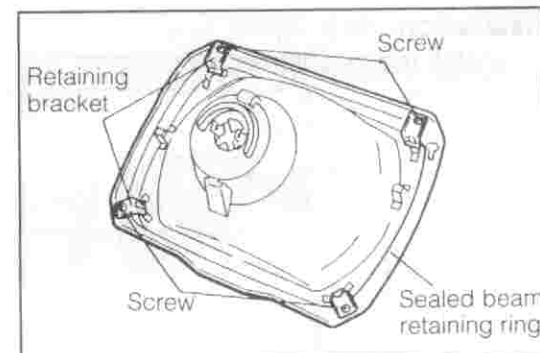
1. Remove the retaining bracket and sealed beam retaining ring by removing the four screws located at the back side of the headlamp.
2. Removal of bulb (halogen, white and yellow bulb)
 - (1) Remove the socket cover.
 - (2) Remove the spring set by turning it counterclockwise while pushing it.
 - (3) Remove the bulb.



WRE91-BE097

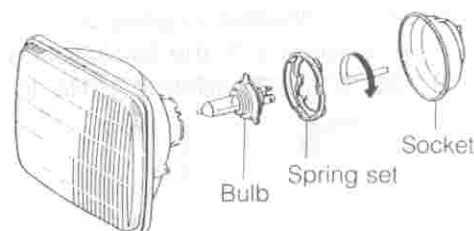


WRE91-BE098

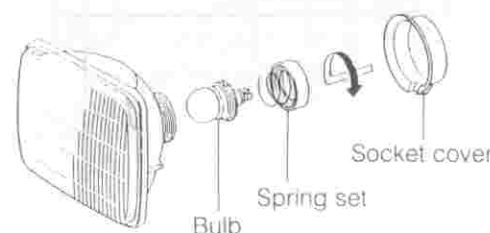


WRE91-BE099

Halogen



White and yellow bulb



WRE91-BE100

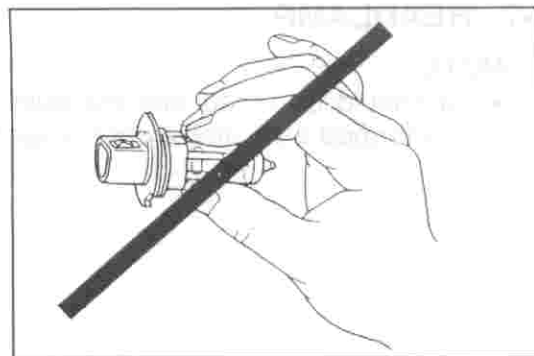
BODY ELECTRICAL SYSTEM

Replacement of halgen headlamp bulb

The bulb can be replaced from the engine compartment without a need of removing the headlamp proper.

WARNING:

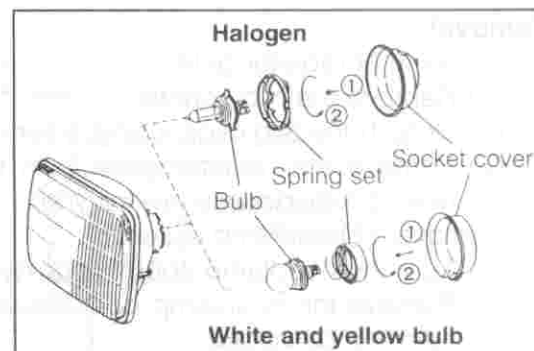
The halogen bulb reaches a very high temperature while it is put into use. If any lubricant gets on the bulb surface, it will result in significantly reduced lamp life. Hence, be very careful not to allow your fingers, etc. to touch with the glass portion during the replacement. Be sure to hold the flange section to replace the bulb.



WRE91-BE101

Assembly

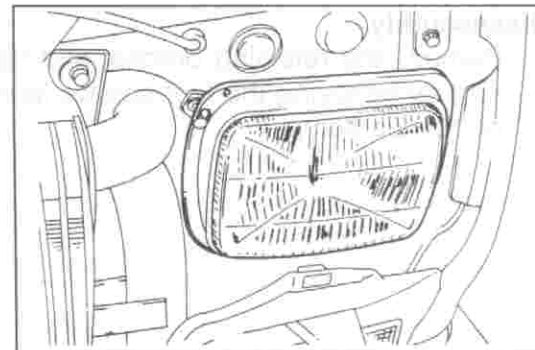
1. Installation of bulb (halogen, white and yellow bulb)
 - (1) Set the bulb in the headlamp socket.
 - (2) Secure the bulb by turning it clockwise while pushing it.
 - (3) Install the socket cover.
2. Install the sealed beam retaining ring and retaining bracket to the headlamp by means of the four screws.



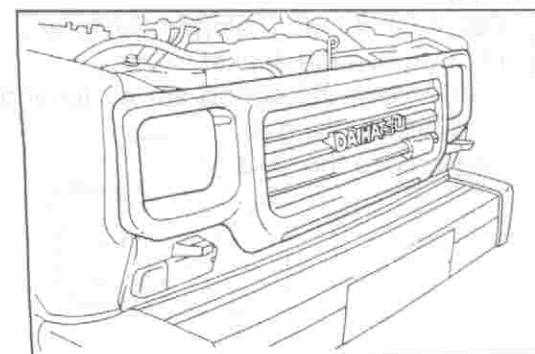
WRE91-BE102

Installation

1. Install the headlamp.
 - (1) Ensure that three clips are provided at the body side.
 - (2) Set the headlamp grille on the body. Secure the headlamp grille with the two clips at the upper side.
 - (3) Attach the headlamp grille to the body with the two screws.



WRE91-BE103



WRE91-BE104

HEADLAMP AIMING ADJUSTMENT PROCEDURE

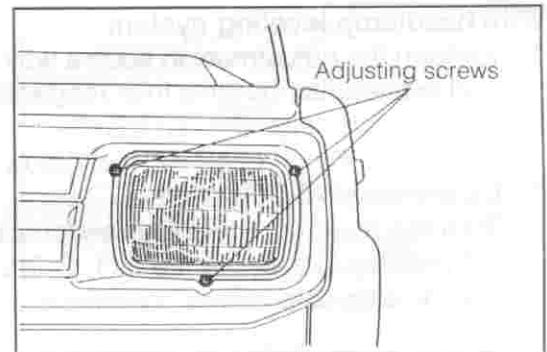
NOTE:

- Vehicle conditions during headlamp aiming adjustment
- (1) Ensure that the tire air inflation pressure is the specified value.
- (2) Ensure that a driver is seated at the driver's seat.
- (3) Ensure that the gasoline, oil and water are filled to their full level.
- (4) Ensure that the spare tire, tools and jack are mounted on their specified positions.
- (5) Rock the vehicle in the up-&-down direction as well as in the right-&-left direction so that the suspensions may be settled to the specified conditions.
- (6) The engine revolution speed should be 1500 rpm or more.

WRE91-BE105

Preparation of procedure

1. Set the headlamps to the low beam position.
2. Set the headlamp levelling switch to the position "0".
3. Place the screen 3 meters in front of the headlamps.
4. Adjust the adjusting screws in such a way that the photometric axis may comply with the requirements indicated in the figure.



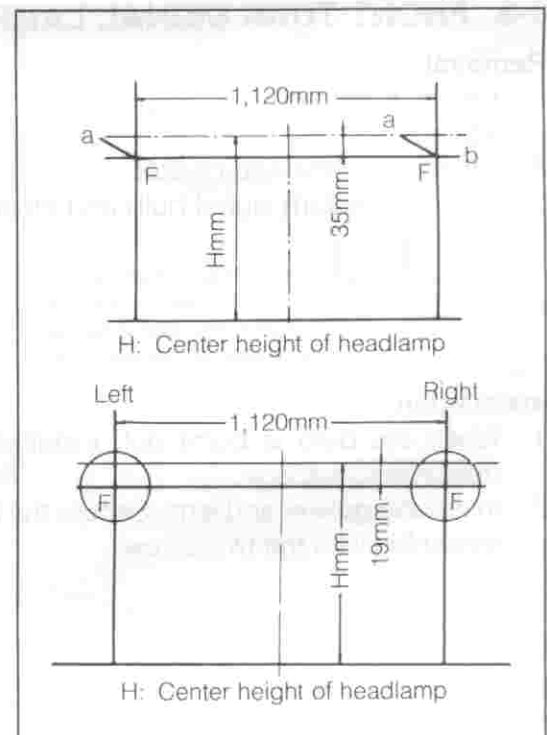
WRE91-BE106

Incandescent bulb

1. On the screen, set the reference points for the headlamp aiming adjustment as follows:
 - (1) Measure the headlamp center height [H]. Draw a reference line on the screen at a height 19 mm below the above measured height.
 - (2) Draw vertical center lines of the right and left headlamps on the screen. Thus, obtain each intersection point [F] made by the vertical center lines and the horizontal reference line.
2. Turn ON the upper beam of the headlamp. Adjust the adjusting screws so that the beam may come to the intersection [F] on the screen.

NOTE:

- Make sure that photometric axis of the right headlamp will not deflect toward the outside.
3. Upon completion of the aiming adjustment, turn ON the lower beam of the headlamp. Ensure that the beam aims the lower left direction.



WRE91-BE107

BODY ELECTRICAL SYSTEM

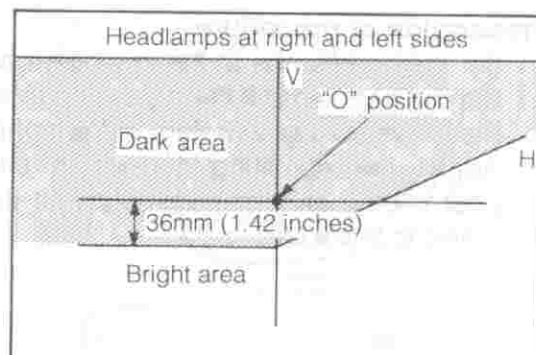
Halogen bulb

1. On the screen, set the reference points for the headlamp aiming adjustment as follows:
 - (1) Measure the headlamp center height [H]. Draw a reference line on the screen at a height 35 mm below the above measured height.
 - (2) Draw vertical center lines of the right and left headlamps on the screen. Thus, obtain each intersection point [F] made by the vertical center lines and the horizontal reference line.
2. Turn ON the lower beam of the headlamp. Adjust the adjusting screws so that the intersection of the cut-off lines come to the intersection [F] on the screen.

WRE91-BE108

With headlamp leveling system

1. Perform the adjustment in such a way that each of the right and left headlamps aims their respective "0" position. Then, adjust each headlamp so that its photometric axis comes at a point 36 mm (1.42 inches) below the "0" position.
2. Confirmation of Operation
Turn the headlamp levelling switch progressively from the "0" position in a sequence of 1, 2, 3 and 4. Ensure that the photometric axis moves downward.

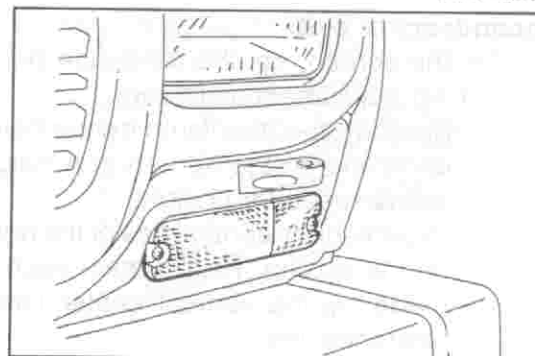


WRE91-BE109

6-8. FRONT TURN SIGNAL LAMP

Removal

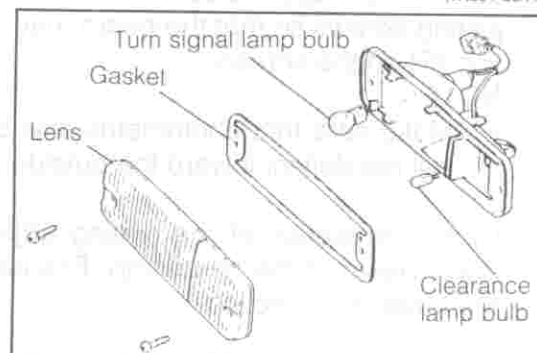
1. Remove the front turn signal lamp by removing the two screws.
2. Detach the lens and gasket.
3. Remove the turn signal bulb and clearance bulb.



WRE91-BE110

Installation

1. When the bulb is burnt out, install a new bulb with the designated wattage.
2. Install the gasket and lens. Secure the front turn signal lamp assembly with the two screw.

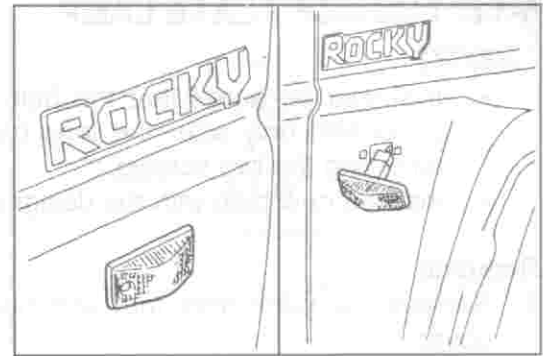


WRE91-BE111

6-9. SIDE TURN SIGNAL LAMP

Removal

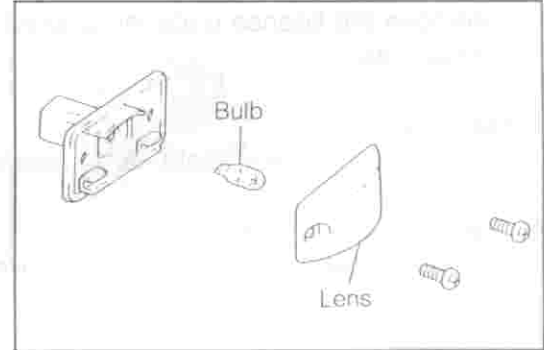
1. Remove the side turn signal lamp by removing the two screws.
2. Detach the lens.
3. Remove the bulb.



WRE91-BE112

Installation

1. When the bulb is burnt out, install a new bulb with the designated wattage.
2. Install the lens. Secure the side turn signal lamp assembly with the screw.

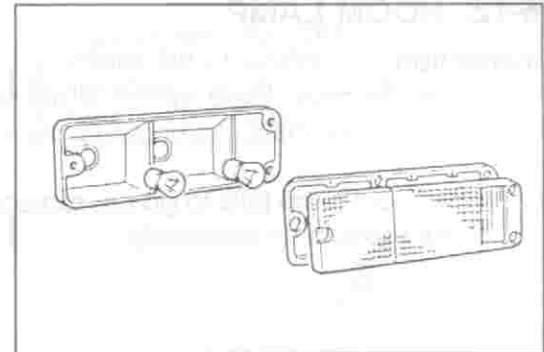


WRE91-BE113

6-10. REAR COMBINATION LAMP

Removal

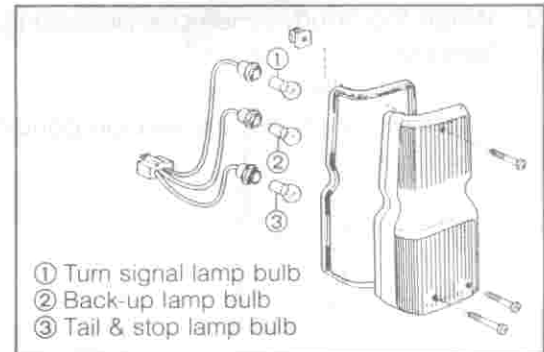
1. Remove the rear combination lamp assembly by removing the three screws.
2. Detach the socket and bulb.



WRE91-BE114

Installation

1. When the bulb is burnt out, install a new bulb with the designated wattage.
2. Install the bulb and socket in the rear combination lamp assembly.
3. Install the rear combination lamp assembly with the three screws.



WRE91-BE115

6-11. LICENSE PLATE LAMP

NOTE:

- It should be noted that the bulb replacement can be performed only after the lens has been detached by removing the two screws.
- Install a new bulb with the designated wattage.

Removal

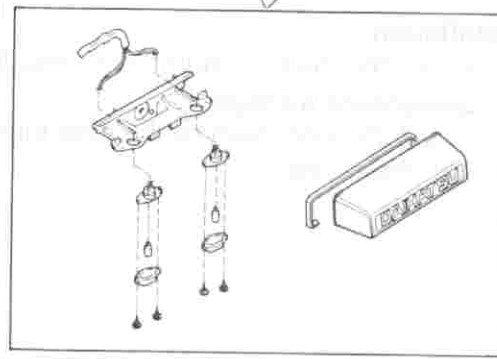
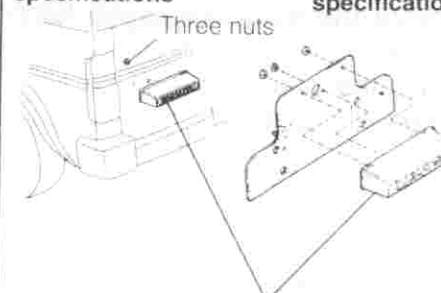
1. Remove the back door trim and back door service hole cover.
2. Disconnect the connector.
3. Remove the license plate lamp assembly by removing the three nuts.

Installation

1. Install the license plate lamp assembly with the three screws.
2. Connect the connector.
3. Install the back door service hole cover and back door trim.

Australian and General specifications

European specifications



WRE91-BE116

6-12. ROOM LAMP

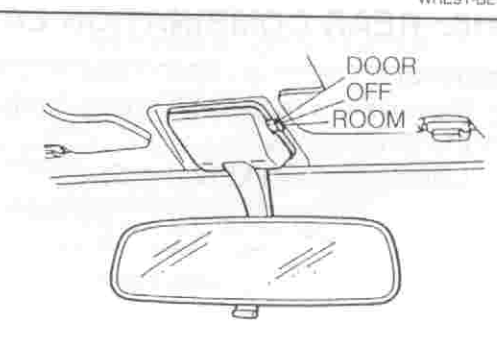
Inspection

1. When the room lamp switch is set to the ROOM position with the door in its closed state, the room lamp goes on.

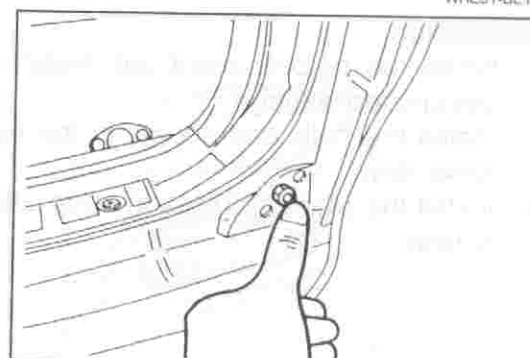
If the room lamp fails to go on, replace the room lamp bulb or the room lamp assembly.

2. When the courtesy lamp is pushed in repeatedly, the room lamp should go on and off.

If the room lamp fails to go on, replace the courtesy lamp or check for proper installation conditions.



WRE91-BE117



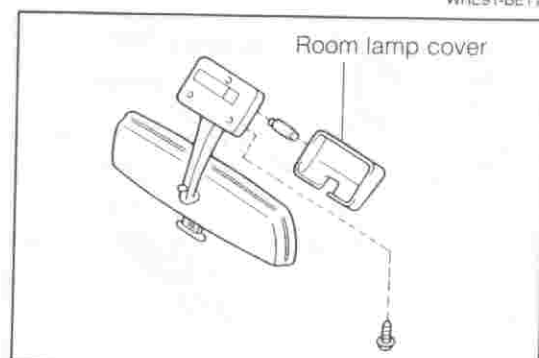
WRE91-BE118

NOTE:

- It should be noted that the bulb replacement can be performed only after the room lamp cover has been detached.

Removal

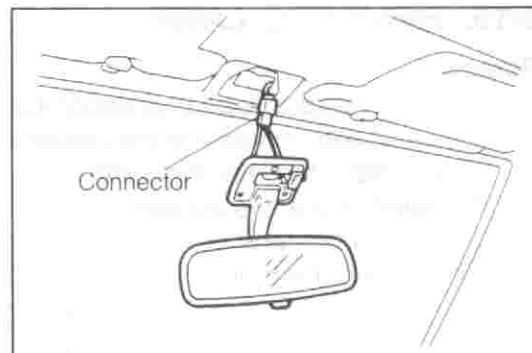
1. Detach the room lamp cover.
2. Remove the room lamp assembly by removing the three screws and disconnect the connector.



WRE91-BE119

Installation

1. Connect the connector.
2. Install the room lamp assembly with the three screws.
3. Attach the room lamp cover.



WRE91-BE120

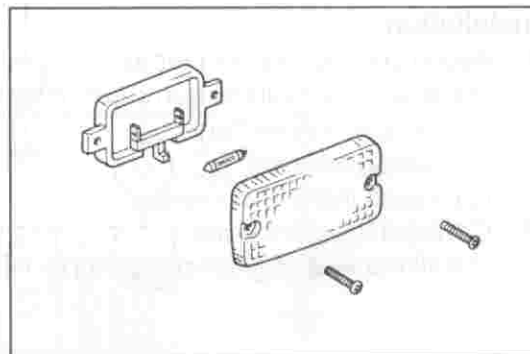
6-13. LUGGAGE ROOM

Removal

1. Remove the two screws to detach the lamp assembly.
2. Pull the bulb straight out.

Installation

Reverse the removal procedure to install the lamp assembly.



WRE91-BE121

6-14. BACKUP LAMP

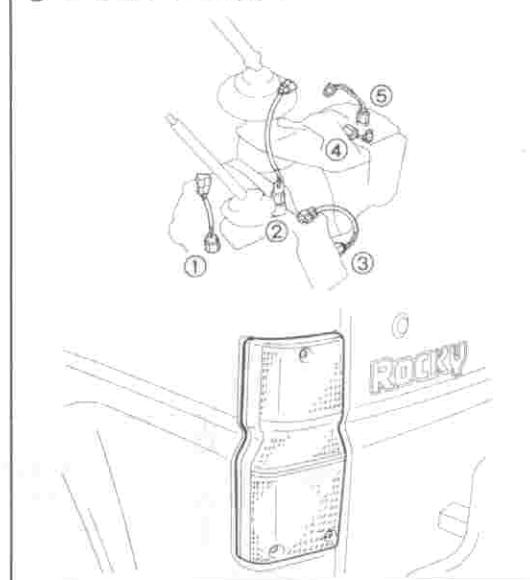
The backup lamp switch is mounted on the transmission case cover.

Inspection

1. Draw out the coupler which is connected to the backup lamp switch. This disconnection should be made at the vehicle side. Then, short the coupler.
2. Ensure that the backup lamp goes on.
3. Connect the backup lamp switch coupler again. Place the transmission in the reverse gear.
4. If the backup lamp fails to go on, replace the backup lamp switch.

Tightening Torque: 2.9 - 4.9 N·m (0.3 - 0.5 kg·m)

- ① High/Low SW = Push/OFF
- ② Position SW = Push/ON
- ③ 4WD Delecting SW = Push/ON
- ④ Back up SW = Push/ON
- ⑤ Shift SW = Push/OFF

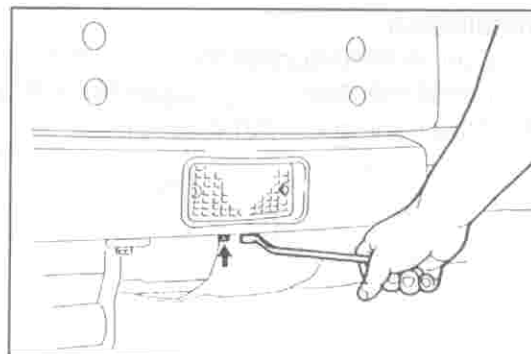


WRE91-BE122

6-15. REAR FOG LAMP

Removal

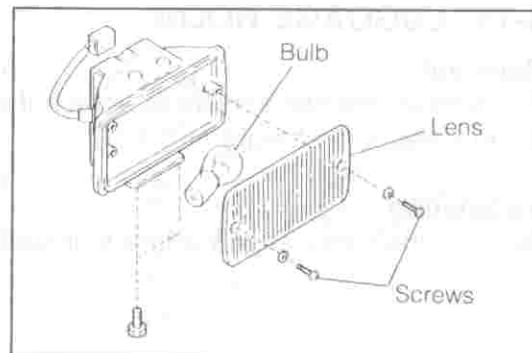
1. Remove the rear fog lamp assembly by removing the two bolts and disconnect the connector.
2. Disassembly the rear fog lamp.
 - (1) Remove the two screws.
 - (2) Detach the lens.
 - (3) Remove the bulb.



WRE91-BE123

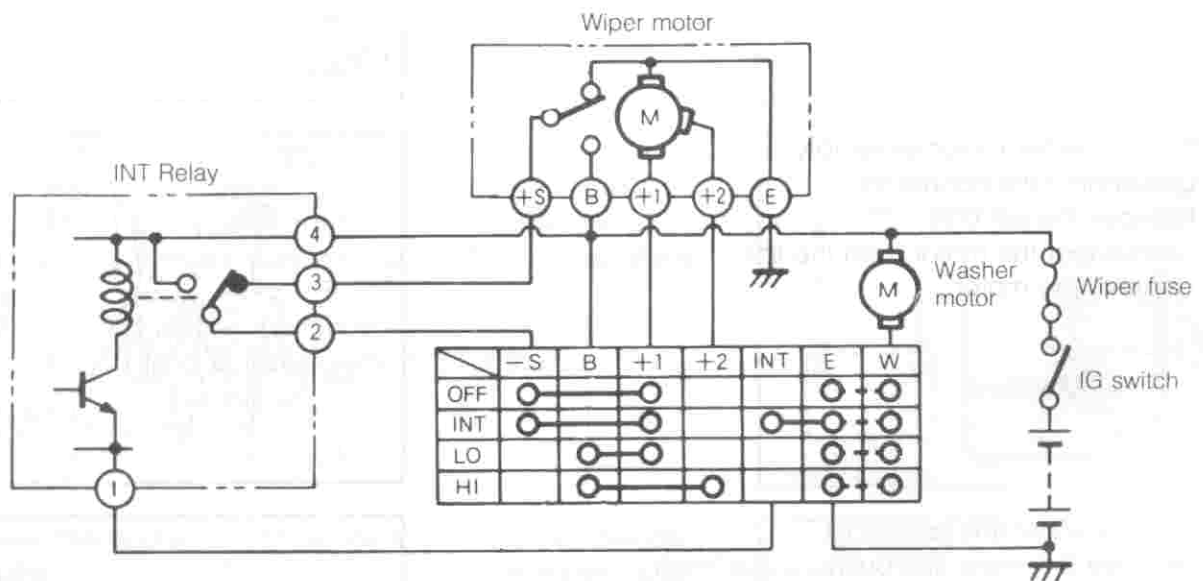
Installation

1. Assembly the rear fog lamp.
 - (1) When the bulb is burnt out, install a new bulb with the designated wattage.
 - (2) Attach the lens.
 - (3) Install the two screws.
2. Connect the connector.
3. Install the rear fog lamp assembly with the two bolts.

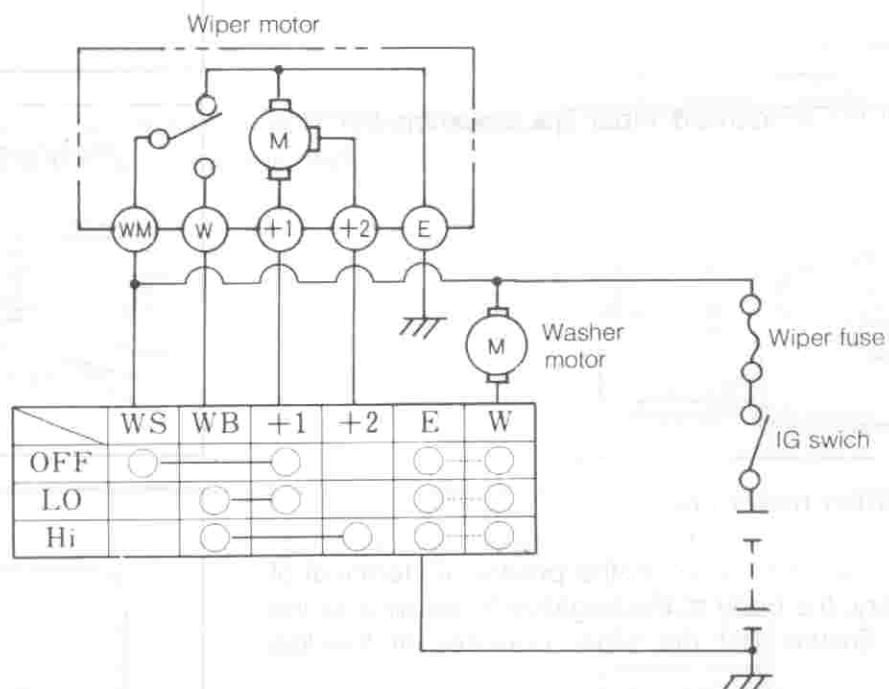


WRE91-BE124

7. FRONT WIPER & WASHER WIRING DIAGRAM



(WITH INT)

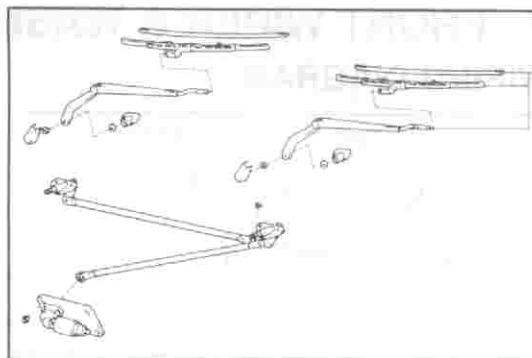


(WITHOUT INT)

7-1. WIPER MOTOR & BLADE

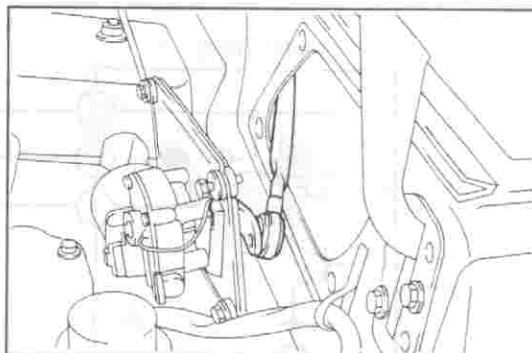
Removal

1. Removal of wiper arm and blades.
 - (1) Remove the windshield wiper arm cover.
 - (2) Remove the nut.
 - (3) Remove the wiper arm and blades.



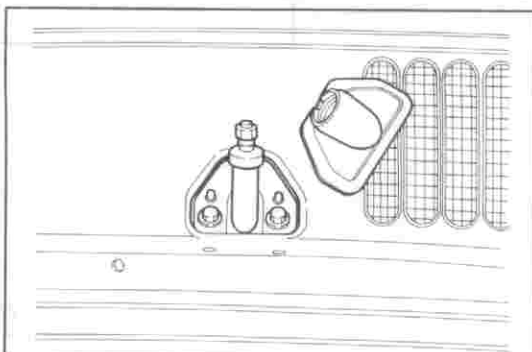
WRE91-BE126

2. Removal of wiper motor assembly.
 - (1) Disconnect the connector.
 - (2) Remove the set bolt.
 - (3) Disconnect the motor from the link.
 - (4) Remove the motor.



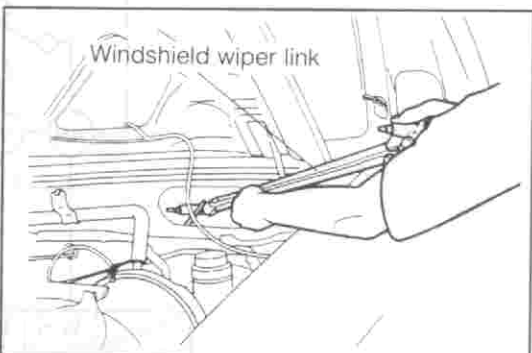
WRE91-BE127

3. Removal of wiper link assembly.
 - (1) Remove the wiper link bush.
 - (2) Remove the set bolt.



WRE91-BE128

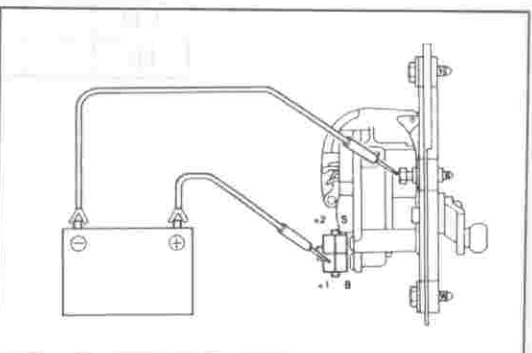
- (3) Take out the windshield wiper link assembly from the cowl louver hole.



WRE91-BE129

Inspection of wiper motor unit

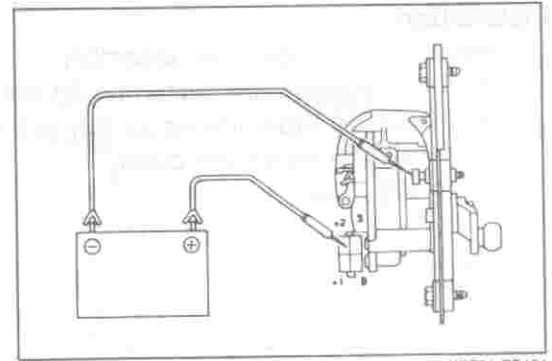
1. Low speed operation check
 - (1) Connect the terminal +1 to the positive $\oplus$ terminal of the battery; the body to the negative $\ominus$ terminal of the battery. Ensure that the wiper operates at the low speed.



WRE91-BE130

2. High speed operation check

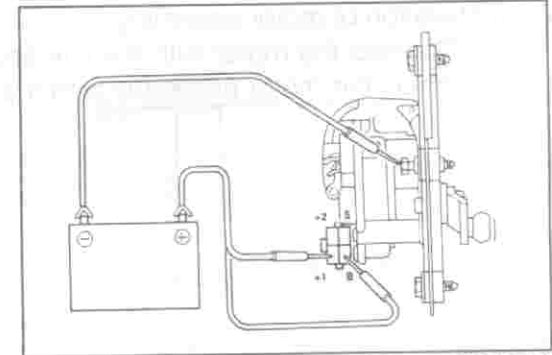
- (1) Connect the terminal +2 to the positive $\oplus$ terminal of the battery; the body to the negative $\ominus$ terminal of the battery. Ensure that the wiper operates at the high speed.



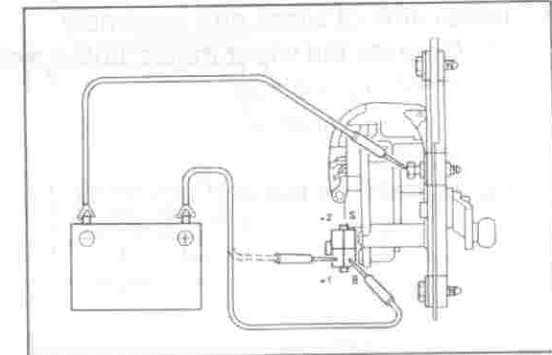
3. OFF operation check

With the wiper motor body connected to the negative $\ominus$ terminal of the battery, perform the following checks.

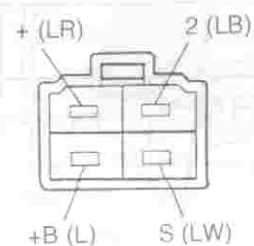
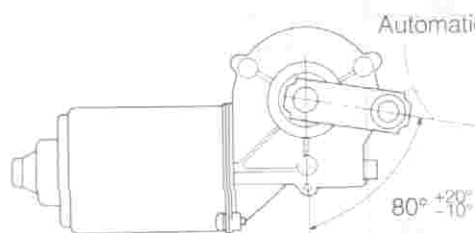
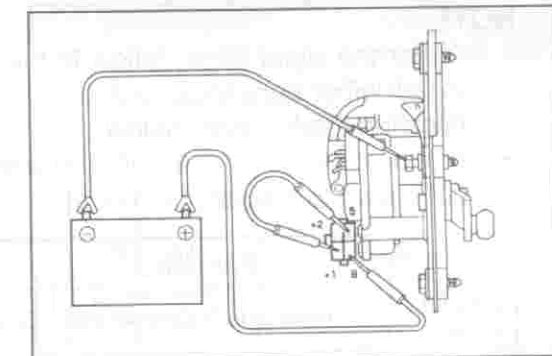
- (1) Connect the terminal B to the positive $\oplus$ terminal of the battery.
- (2) Operate the wiper at the low speed by connecting the terminal +1 to the positive $\oplus$ terminal of the battery.



- (3) Under the operating conditions in the step (2), disconnect the terminal +1 so as to interrupt the wiper motor operation.



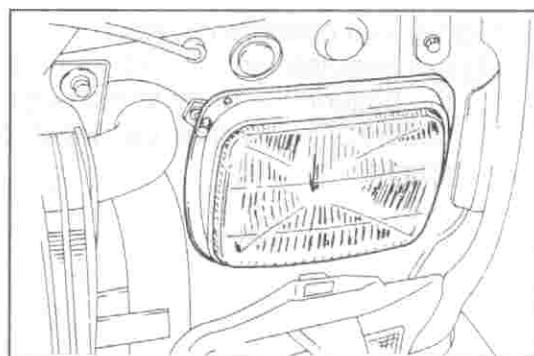
- (4) Connect the terminal +1 to the terminal S. Ensure that the wiper operates and stops at the automatic stopping position.



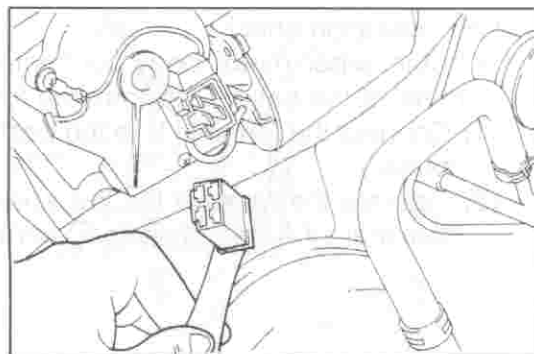
BODY ELECTRICAL SYSTEM

Installation

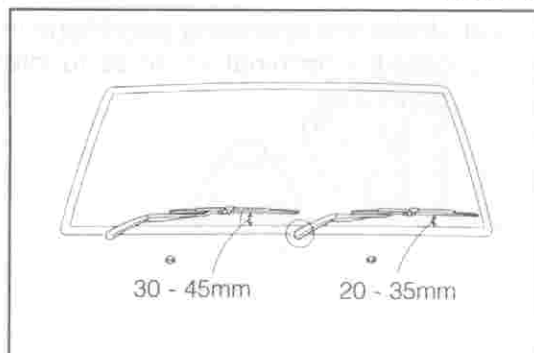
1. Installation of wiper link assembly.
 - (1) Into the wiper link assembly to the cowl louver hole.
 - (2) Install the wiper link assembly to the body using a bolts.
 - (3) Install the wiper link bush.
2. Installation of motor assembly.
 - (1) Connect the motor with the link securely.
 - (2) Install the motor assembly with the bolts.
3. Installation of wiper arm assembly.
 - (1) Operate the wiper motor, until it assumes the automatic stopping position.
 - (2) Set the wiper arms at the positions indicated in the illustration.
 - (3) Tighten the nut and attach the front wiper arm cover.



WRE91-BE136



WRE91-BE137

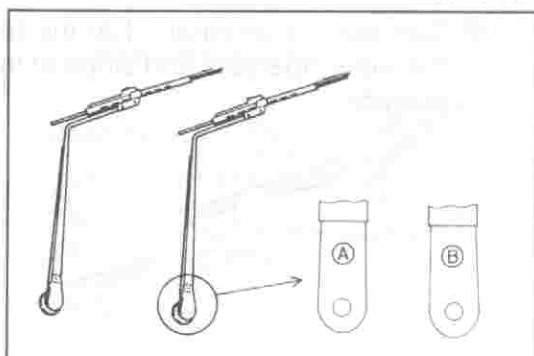


WRE91-BE138

NOTE:

- As for the wiper arms, follow to the marks given below. Install wiper arms in accordance with the following identification marks given below.
- It should be noted that the arm and blade length differ according to the vehicle model.

Vehicle model \ Item	R.H. Unit		L.H. Unit	
	Driver side	Co-driver side	Driver side	Co-driver side
F70V, F75V	(A)	(B)	(E)	(F)
F70	(C)	(D)	(G)	(H)



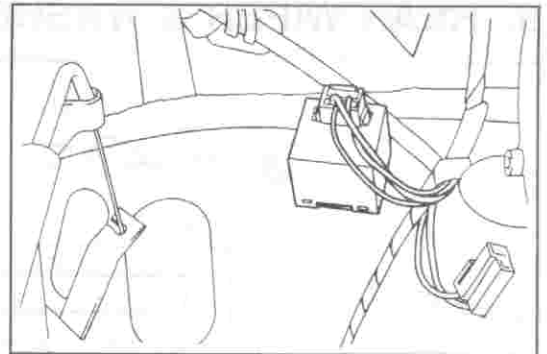
WRE91-BE139

Vehicle model		F70V, F75V	F70
Item			
	(mm)		
Arm length		380	Right 376 Left 400
Blade length		400	Right 400 Left 350

7-2. INTERMITTENT WIPER RELAY

Removal

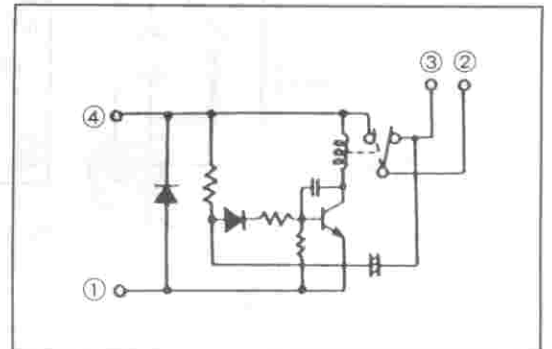
- (1) Remove the lower instrument panel finish.
- (2) Remove the relay from the dash panel.



WRE91-BE140

Unit inspection

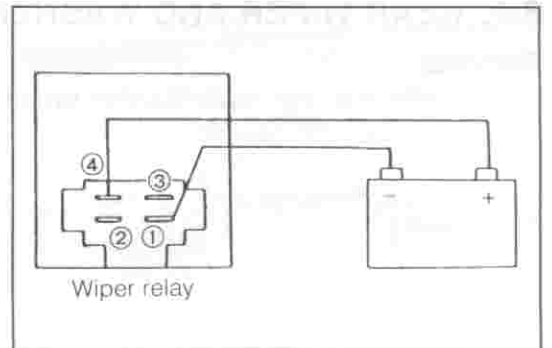
1. Perform continuity checks between terminals given below.
 - (1) Between terminals ② and ③ ... Continuity exists.
 - (2) Between terminals ② and ④ ... No continuity exists.



WRE91-BE141

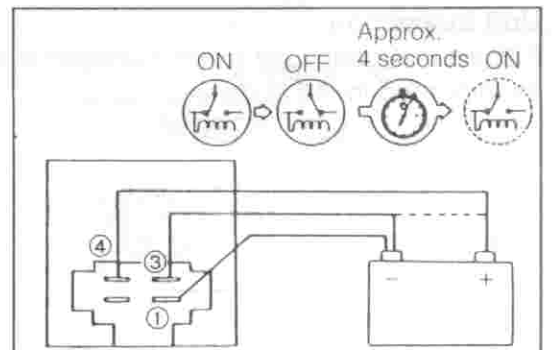
2. Intermittent operation check

- (1) Connect the terminal ④ to the positive $\oplus$ terminal of the battery; terminal ① to the negative $\ominus$ terminal of the battery.
(At this time, the relay emits an operating sound.): The relay is turned ON.



WRE91-BE142

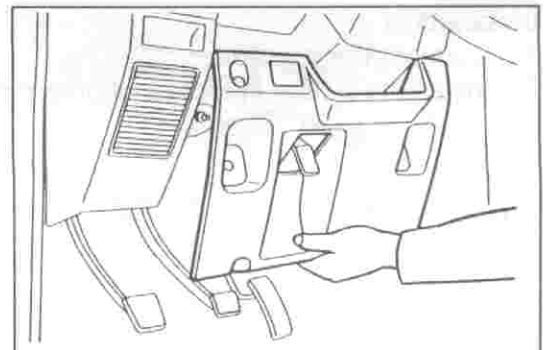
- (2) Connect the terminal ③ to the positive $\oplus$ terminal of the battery for about one second. Then, ground the terminal ③.
(The relay emits an operating sound.): The relay is turned OFF.
- (3) Ensure that, about four seconds later, the relay emits an operating sound (intermittent operation.)



WRE91-BE143

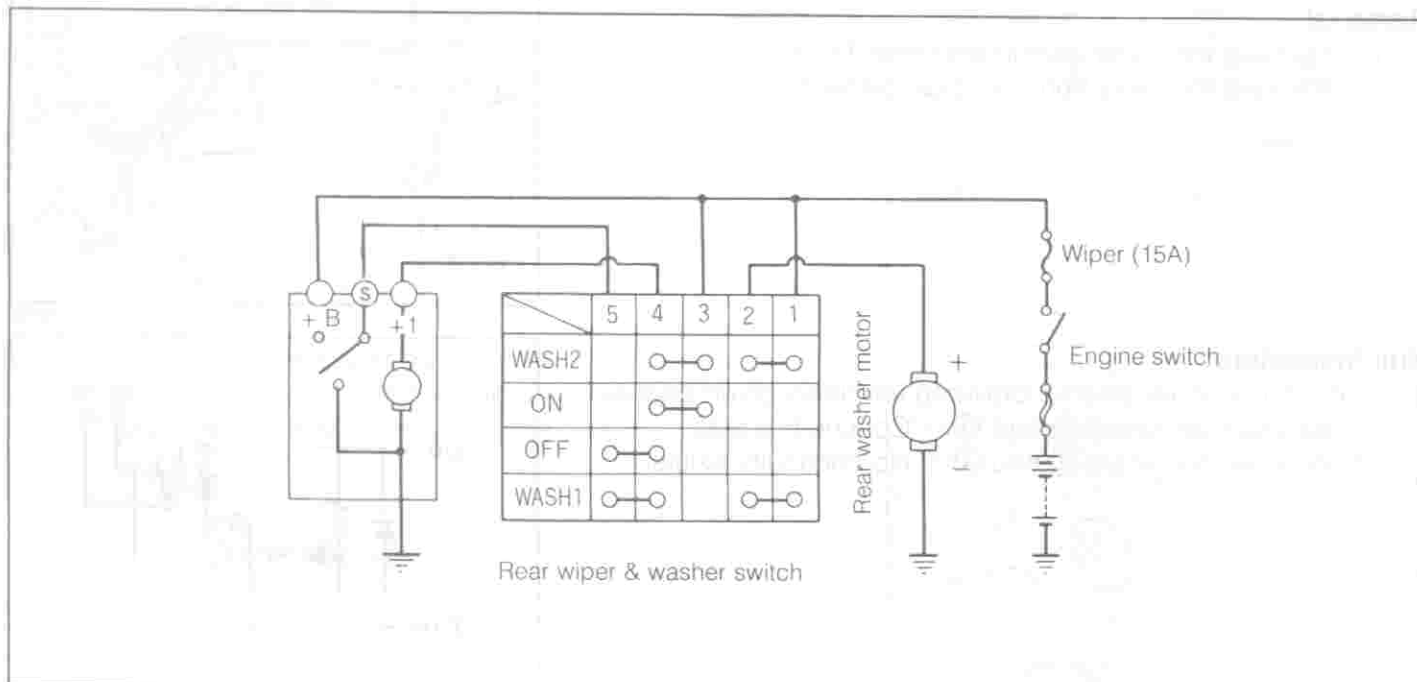
Installation

- (1) Install the intermittent wiper relay to the dash panel.
- (2) Install the lower instrument panel finish.



WRE91-BE266

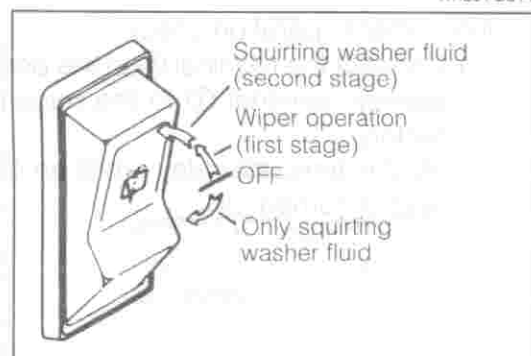
8. REAR WIPER & WASHER



8-1. REAR WIPER AND WASHER SWITCH

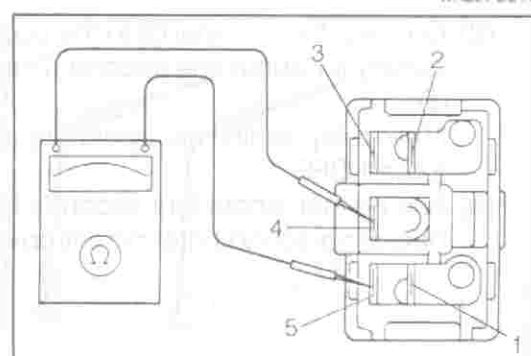
Removal

1. Remove the rear wiper/washer switch with a screwdriver.
2. Disconnect the coupler.



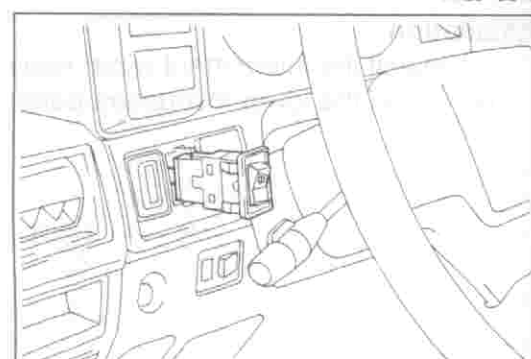
Unit inspection

Ensure that continuity exists between the respective terminals as indicated in the continuity table.



Installation

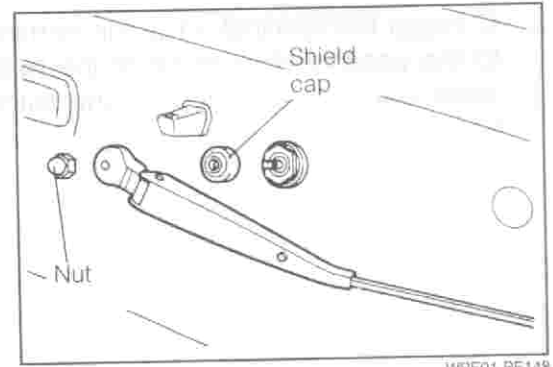
1. Connect the coupler.
2. Install the switch into the instrument panel.



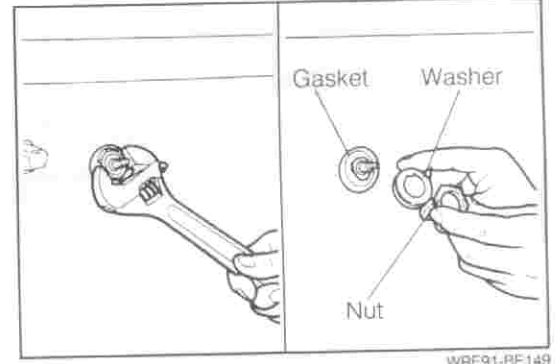
8-2. REAR WIPER MOTOR AND BLADE

Removal

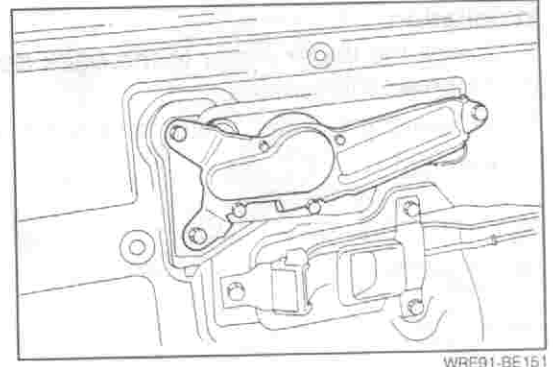
1. Remove the wiper arm and blade by removing the nut.
2. Remove the shield cap.



3. Remove the washer and gasket by removing the nut.

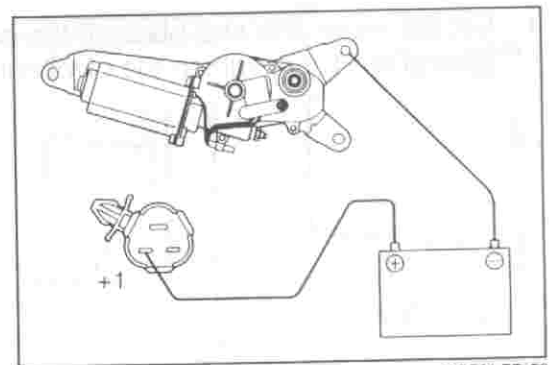


4. Remove the door trim.
5. Turn over the service hole cover (vinyl) at the right upper section of the rear wiper motor.
6. Disconnect the terminal.
7. Remove the wiper motor installation bolts.
8. Remove the wiper motor assembly.

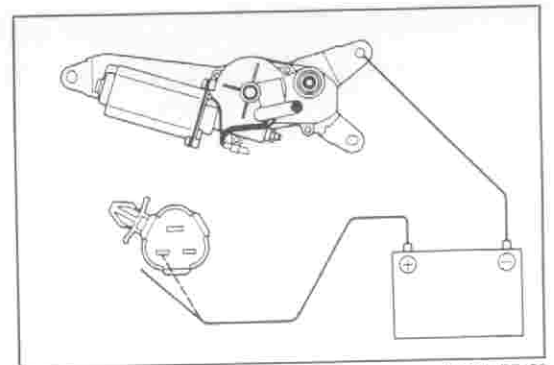


Inspection of wiper motor unit

1. Connect the terminal +1 to the positive $\oplus$ terminal of the battery; the body to the negative $\ominus$ terminal of the battery. Ensure that the wiper operates.

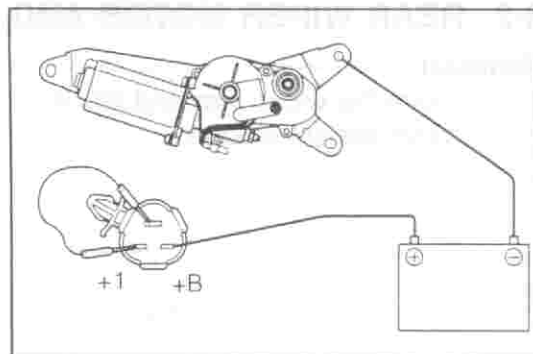


2. Under the operating conditions in the step 1, disconnect the terminal +1 so as to interrupt the wiper motor operation.

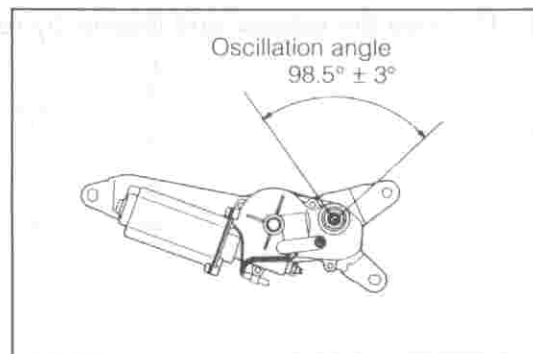


BODY ELECTRICAL SYSTEM

3. Connect the terminal +1 to the terminal S; the terminal +B to the positive $\oplus$ terminal of the battery. Ensure that the wiper operates and stops at the automatic stopping position.



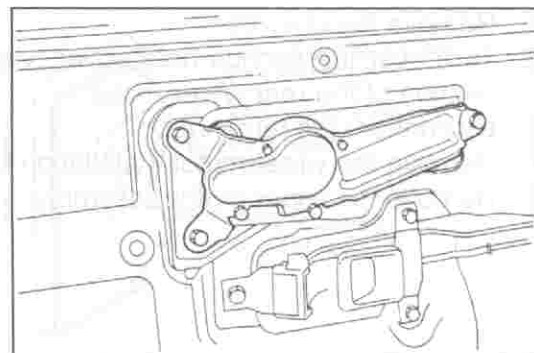
WRE91-BE154



WRE91-BE155

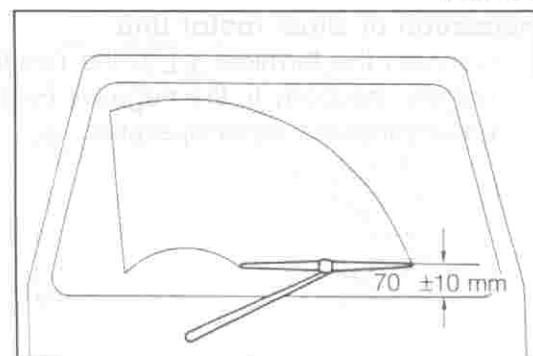
Installation

1. Install the wiper motor to the back door.
2. Connect the terminal.
3. Operate the wiper motor and set it at the automatic stop position.



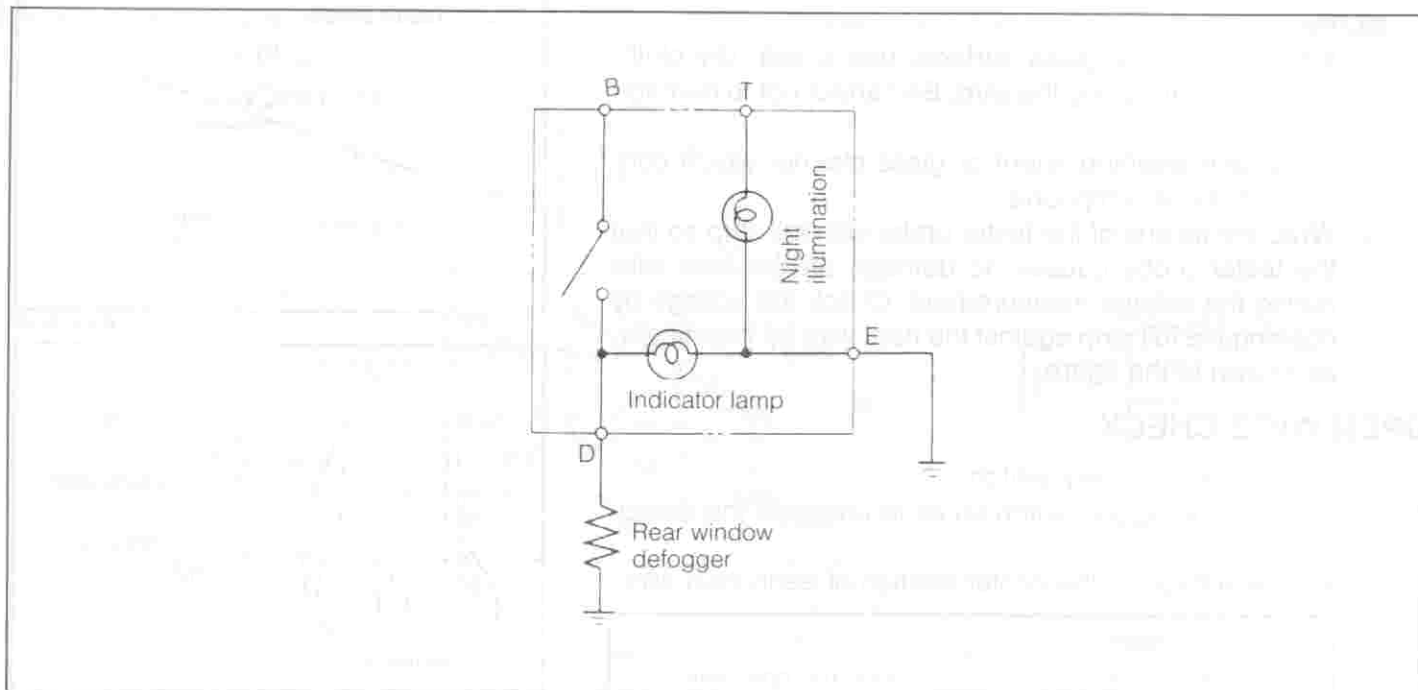
WRE91-BE156

4. Set the wiper arm and blade in the positions shown in the illustration. Then, tighten the pivot nut.



WRE91-BE157

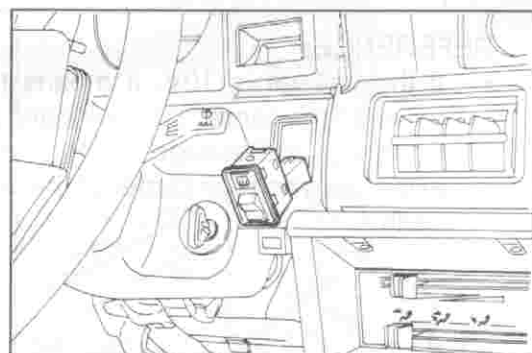
9. REAR WINDOW DEFOGGER



9-1. DEFOGGER SWITCH

Removal

- (1) Remove the rear defogger switch with a screwdriver.
- (2) Disconnect the coupler.



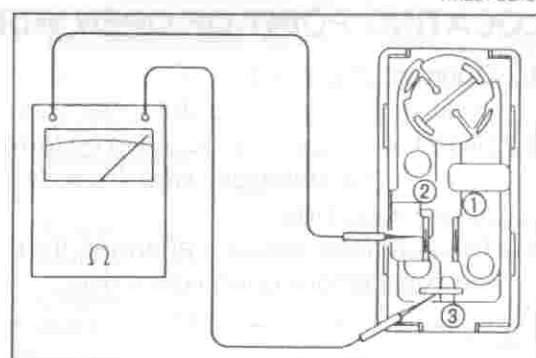
Unit inspection

Ensure that continuity exists between the respective terminals as indicated in the continuity table below.

Continuity table

- — ○ Continuity exists.
○ — ○ Bulb in installed state

Switch \ Terminal	B	D	E	T
OFF	○	○ — ○	○ — ○	○ — ○
ON	○	○ — ○	○ — ○	○ — ○



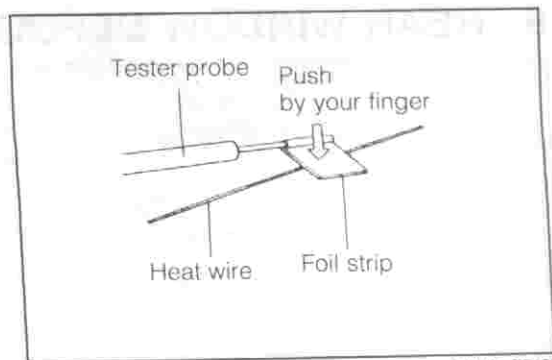
Installation

- (1) Connect the coupler.
- (2) Install the defogger switch.

9-2. DEFOGGER WIRE

NOTE:

- (1) When wiping the glass surface, use a soft, dry cloth. Move the cloth along the wire. Be careful not to damage the wire.
- (2) Never use washing agent or glass cleaner which contains abrasive compound.
- (3) Wrap the tip end of the tester probe with foil strip so that the tester probe causes no damage on the heat wire during the voltage measurement. Check the voltage by pushing the foil strip against the heat wire by your finger, as shown in the figure.

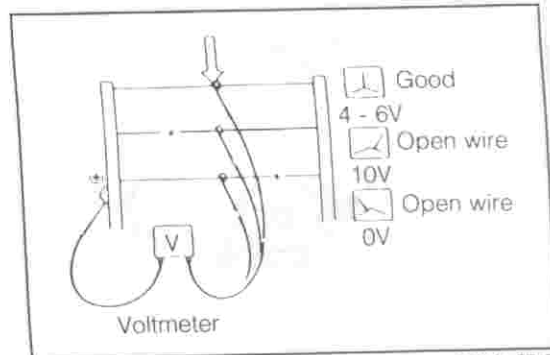


WRE91-BE162

OPEN WIRE CHECK

1. Turn ON the ignition key switch.
2. Turn ON the defogger switch so as to energize the defogger wire.
3. Check the voltage at the center section of each heat wire.

Voltage	Judgement criteria
Approx. 5V	Good (No open wire)
Approx. 10V or 0V	Open wire



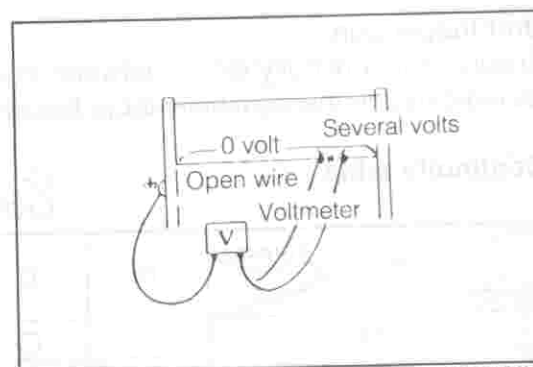
WRE91-BE163

REFERENCE:

- If the voltage is 10V, it means that open wire exists between the center of the wire and the end of the positive $\oplus$ side. If the voltage is 0V, it means that open wire exists between the center of the wire and the end of the earth side.

LOCATING POINT OF OPEN WIRE

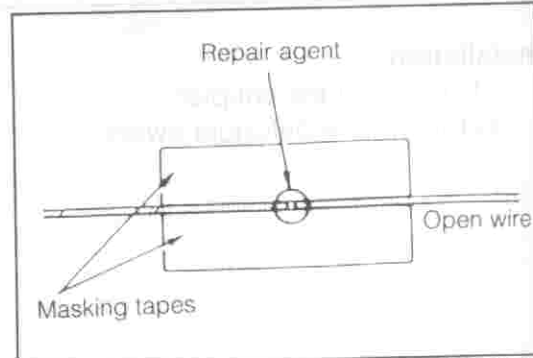
1. Connect the positive $\oplus$ terminal of the voltmeter to the positive $\oplus$ side of the defogger wire.
2. Slide the voltmeter's negative $\ominus$ terminal wrapped with foil strip on the defogger wire from its positive $\oplus$ side to its negative $\ominus$ side.
3. The voltmeter reading changes from 0V to several volts at the point where open wire exists.



WRE91-BE164

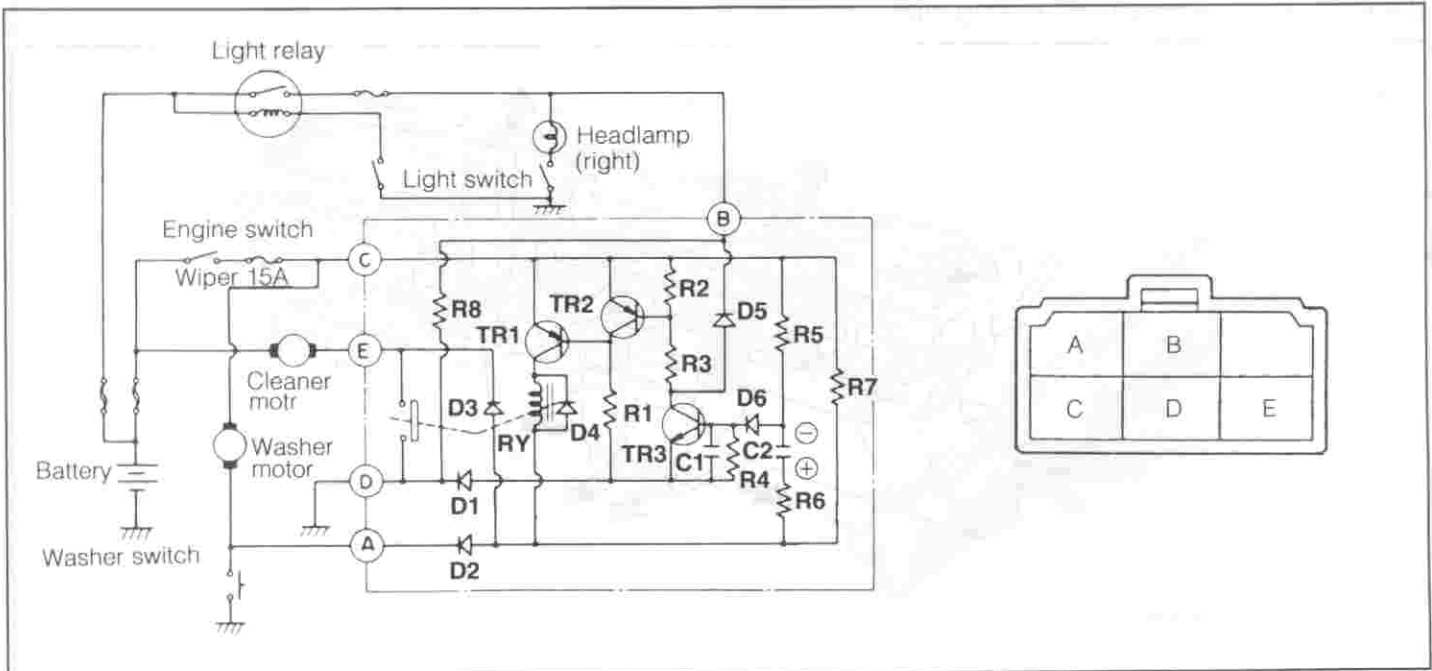
REPAIRING POINT OF OPEN WIRE

1. Clean the point of open wire with white gasoline.
2. Affix masking tapes to both upper and lower portions of the point to be repaired.
3. Stir repair agent (Du Pont Paste No. 4817) thoroughly. Apply a small amount of the repair agent to the repairing point, using a fine brush.
4. Two to three minutes later, peel off the masking tapes.
5. Do not energize the defogger wire within 24 hours after the repair.



WRE91-BE165

10. HEADLAMP CLEANER

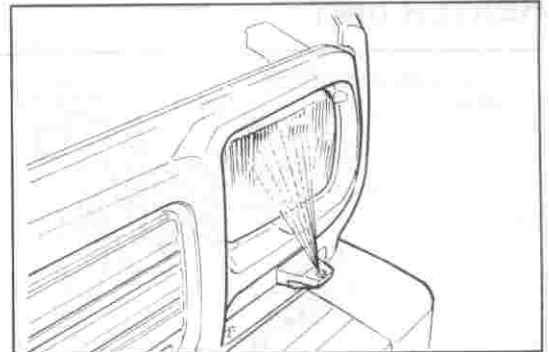


WRE91-BE166

Invehicle inspection

While the ignition switch is turned ON, carry out the following check.

1. Operate the washer switch one time. Within about 0.8 second, operate the washer switch again.
2. Ensure has the cleaner motor operates for about 0.5 second.



WRE91-BE167

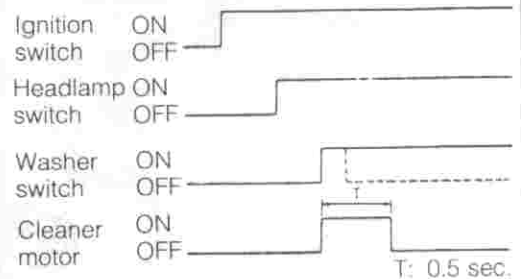
10-1. CONTROL RELAY

Inspection

If the headlamp cleaner is malfunctioning persistently when the following unit inspection reveals no malfunction, replace the headlamp cleaner relay.

- (1) Wiper fuse 15A
- (2) Headlamp cleaner motor
- (3) Washer switch
- (4) Front windshield washer motor

Headlamp cleaner operation chart

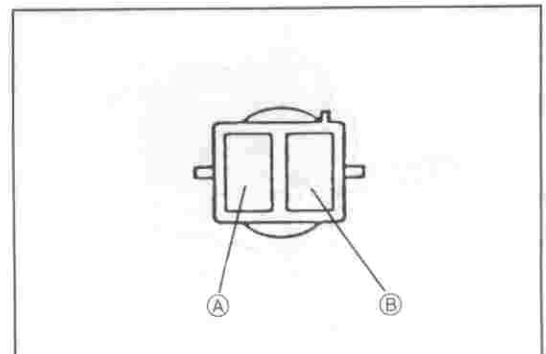


WRE91-BE168

10-2. CLEANER MOTOR

Inspection

When the positive $\oplus$ terminal of the battery is connected to the terminal $\textcircled{A}$, and the negative $\ominus$ terminal of the battery to the terminal $\textcircled{B}$, the motor should operate, thereby discharging pressurized water.

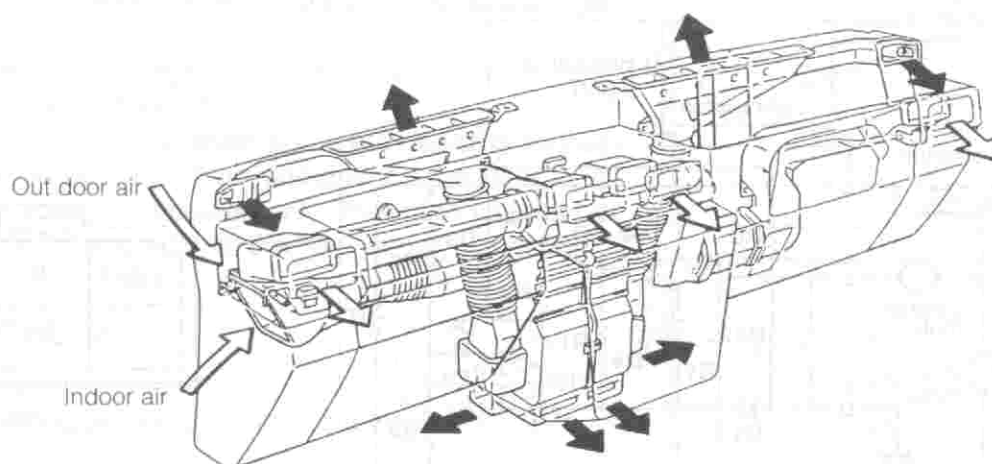


WRE91-BE169

11. FRONT HEATER

The front heater is a semi-air-mixing type.

R.H.D

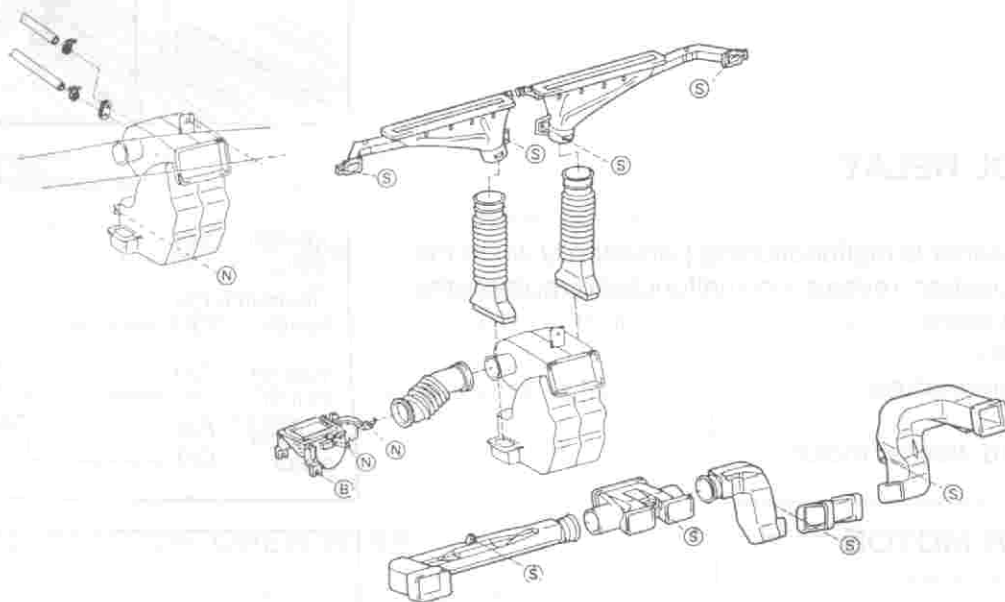


This picture shows a R.H.D vehicle.

WRE91-BE170

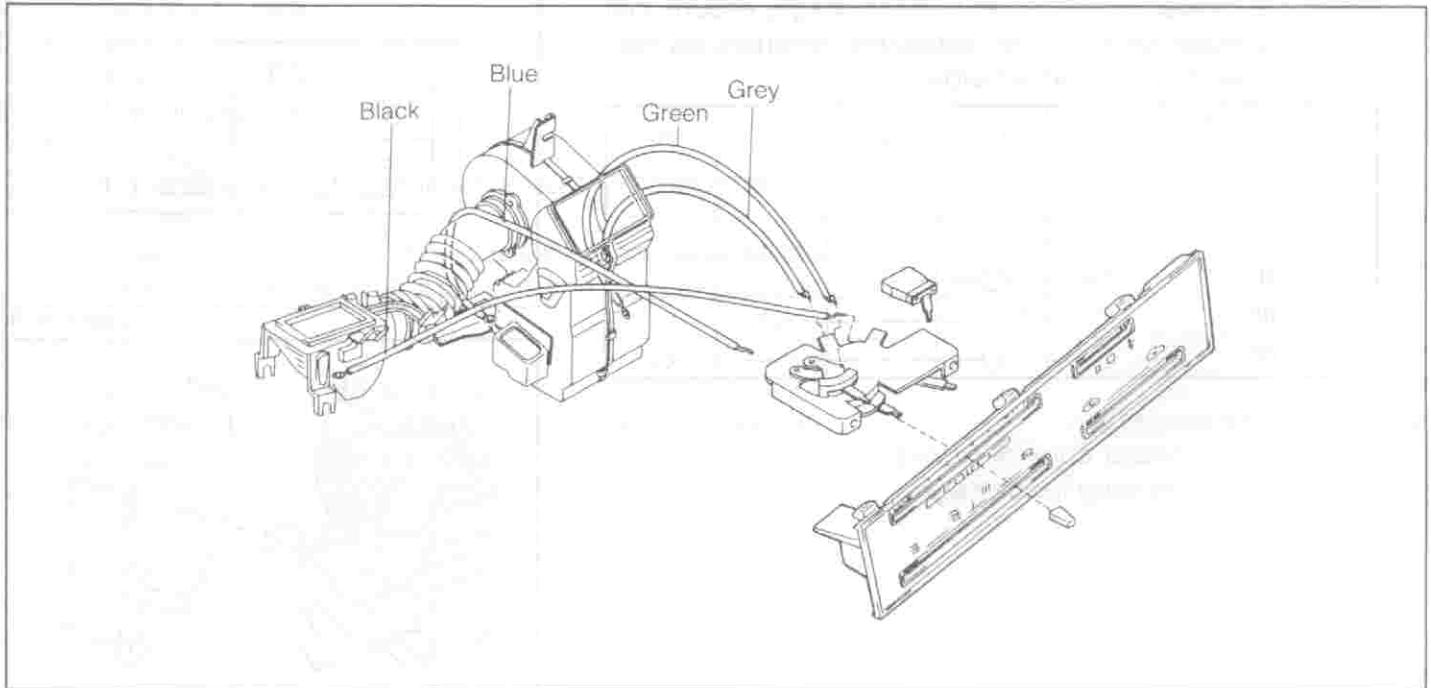
HEATER UNIT

R.H.D



WRE91-BE171

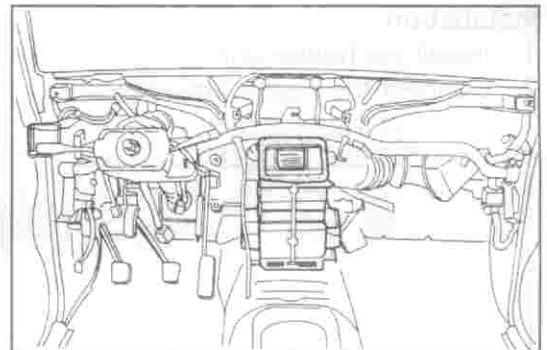
HEATER CONTROL ASSEMBLY



WRE91-BE172

Removal

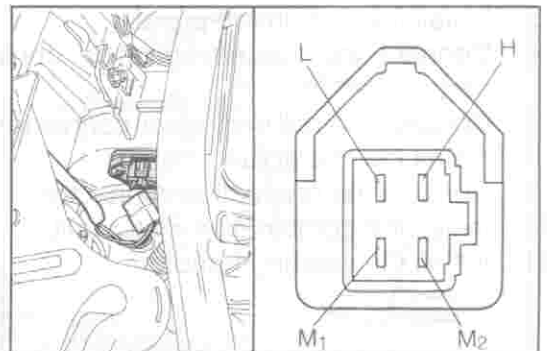
1. Remove the negative $\ominus$ terminal of the battery.
2. Drain the cooling water.
3. Remove the steering wheel.
4. Remove the instrument panel.
5. Disconnect each heater control cable



WRE91-BE173

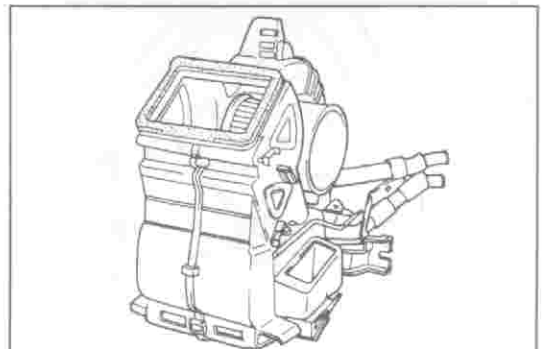
Unit inspection

1. Blower resistor
Ensure that the resistance between the respective terminals conforms to the specifications blow.
Specified Values:
Hi and Me: About 0.6Ω
Lo and Me: About 1.5Ω



WRE91-BE174

2. Blower motor & case
 - (1) Turn the blades of the blower by hand. Ensure that the blades rotate lightly.
 - (2) Ensure that the screws retaining the blades to the motor axle are not loose.
 - (3) Ensure that the blades are not turning eccentrically.
 - (4) Check the flow route switching plate and packing for damage. Also, ensure that they can be switched smoothly.



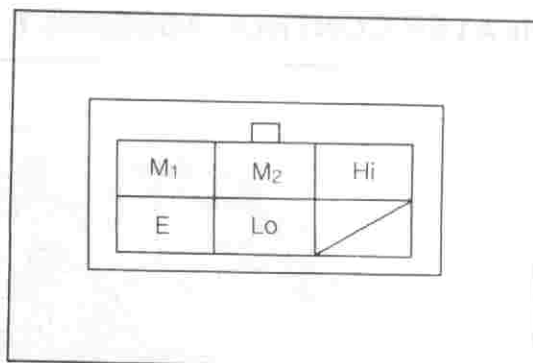
WRE91-BE175

BODY ELECTRICAL SYSTEM

3. Blower switch

When the blower switch is set to each stage, ensure that continuity exists between the respective terminals, as indicated in the continuity table below.

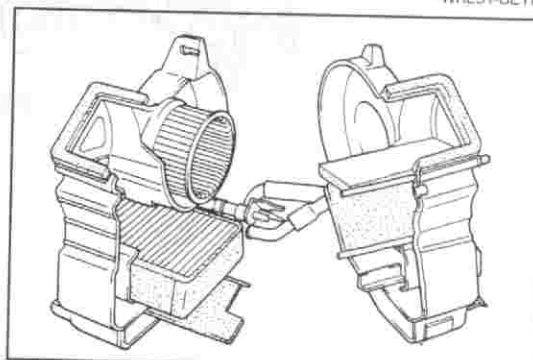
Terminal Switch	E	Lo	M ₁	M ₂	H ₂
OFF					
I	○	○			
II	○	○	○		
III	○	○		○	
IV	○	○			○



WRE91-BE176

4. Heater core assembly

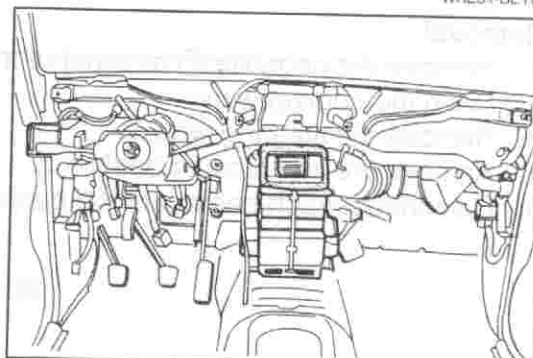
- (1) Check the heater core for cracks.
- (2) Check the packing for damage



WRE91-BE177

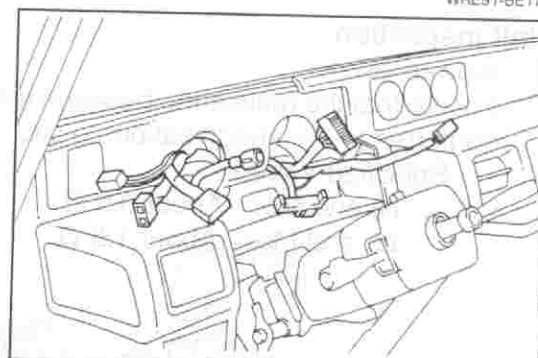
Installation

1. Install the heater unit
2. Connect the heater hoses (water).
3. Connect the couplers.
4. Connect the air duct.



WRE91-BE178

5. Install the instrument panel.
6. Connect the heater/ventilation control wire as following page.
7. Connect the radio/speaker connector.
8. Install the idle adjust knob.
9. Connect the respective connector.
10. Install the combination meter unit.
11. Install the steering handle.



WRE91-BE179

Operation after installation

1. Connect the battery.
2. Ensure that each switch of the instrument panel functions properly.
3. Start the engine.

NOTE:

- (1) Replenish cooling water in advance if the cooling water has been drained out.
 - (2) When starting the engine, place the shift lever of the transmission in the neutral position and apply the parking brake.
4. Ensure that all of the electrical system functions properly.
 5. Ensure that the corresponding outlet is delivering proper air flow in accordance with the position of the heater control level.

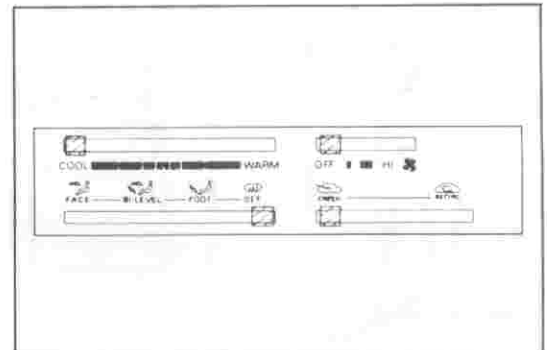
WRE91-BE180

Main points of installation

1. Heater control assembly

(1) Heater control assembly

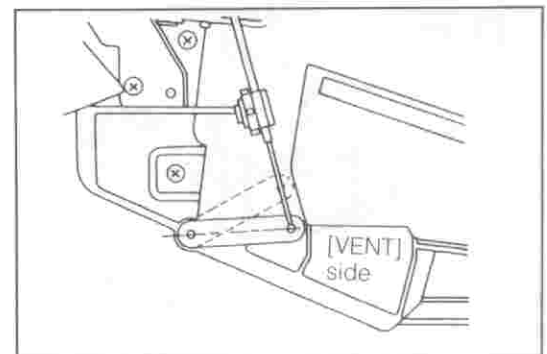
Prior to the installation, set the heater control levers at the respective positions specified in the right figure.



WRE91-BE181

(2) Cable for mode selection (blue)

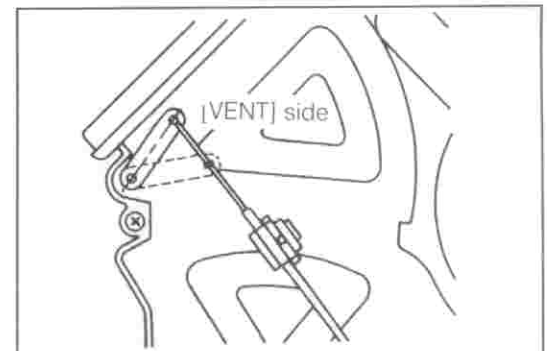
Set the selection lever of the heater unit at the [VENT] side. Then, insert the heater control cable into position



WRE91-BE182

(3) Cable for vent damper selection (grey)

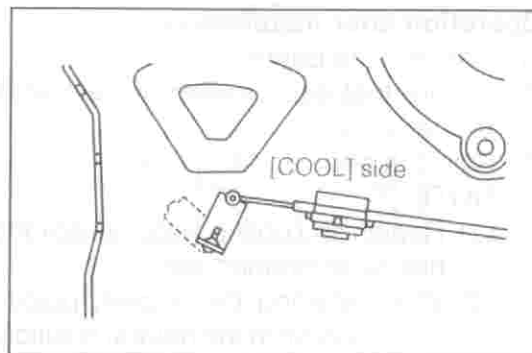
Set the selection lever of the heater unit at the [VENT] side. Then, insert the heater control cable into position.



WRE91-BE183

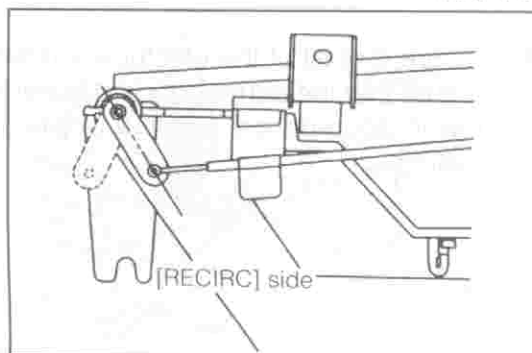
BODY ELECTRICAL SYSTEM

- (4) Cable for water valve selection (green)
Set the selection lever of the heater unit at the [COOL] side. Then, insert the heater control cable into position.



WRE91-BE184

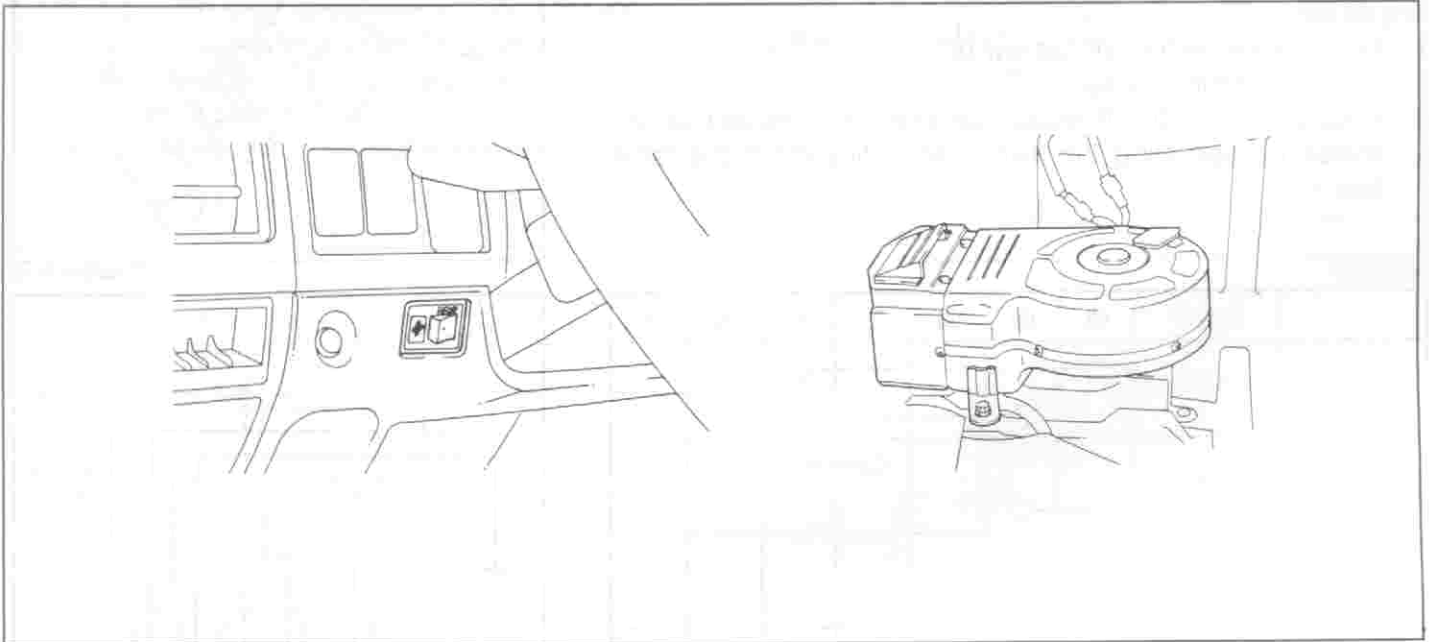
- (5) Cable for inside/outside air selection (black)
Set the selection lever of the heater unit at the [RECIRC] side. Then, insert the heater control cable into position.



WRE91-BE185

12. REAR HEATER

HEATER UNIT



WRE91-BE186

UNIT INSPECTION

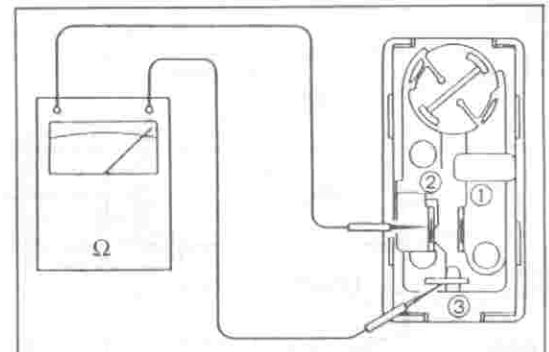
(1) REAR HEATER SWITCH

Ensure that continuity exists between the respective terminals as indicated in the continuity table below.

Continuity table

○—○ Continuity exists.
○●○ Bulb in installed state

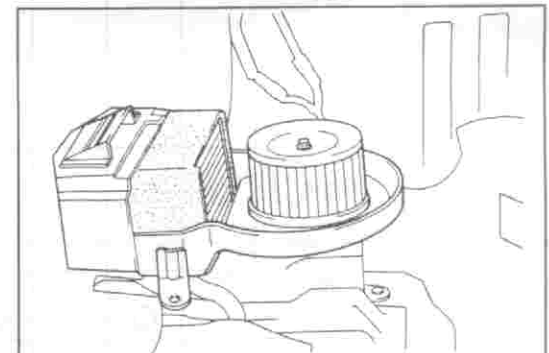
Switch \ Terminal	3	1	2
OFF		○—○	○●○
ON	○—○	○—○	○●○



WRE91-BE187

(2) HEATER CORE

- Check the heater core for cracks.
- Check the packing for damage.



WRE91-BE188

(3) BLOWER

- Check the blades for damage.
- Turn the blades of the blower by hand. Ensure that the blades rotate lightly.

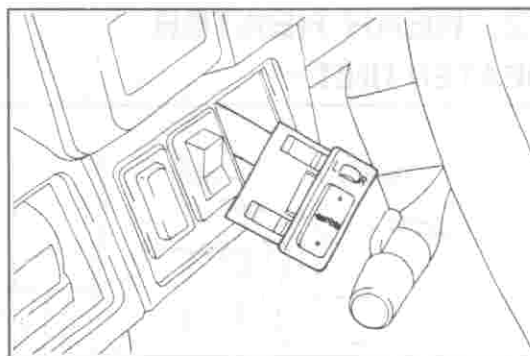
WRE91-BE189

13. REMOTE CONTROL MIRROR

13-1. REMOTE CONTROL SWITCH

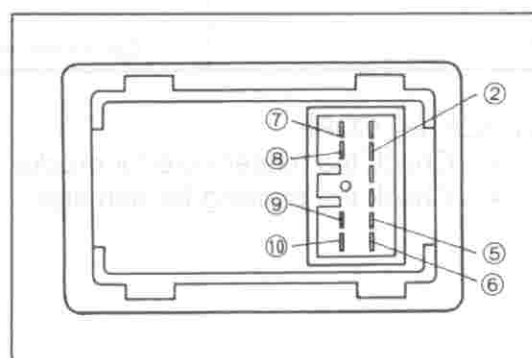
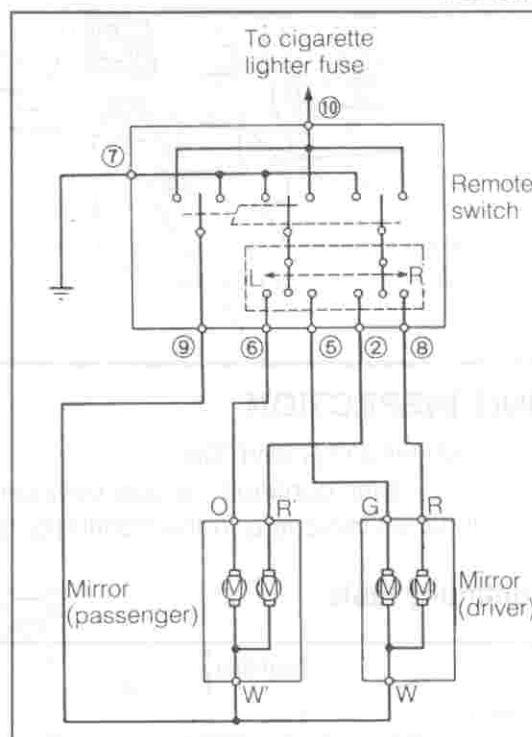
Inspection

1. Remove the switch with screw driver.
2. Disconnect the coupler.
3. Ensure that continuity exists between the respective terminals by operating the switch as indicated in the table below.



WRE91-BE190

	Switch	⑩	⑨	⑧	⑦	⑥	⑤	②
Left	Up	○				○		
	Down		○		○			
	OFF	○	○					
	Left	○					○	
	Right		○		○			○
OFF	Up		○		○			
	Down	○	○					
	OFF							
	Left		○		○			
	Right	○	○					
Right	Up	○						○
	Down		○		○			○
	OFF	○	○					
	Left	○		○				
	Right		○		○			



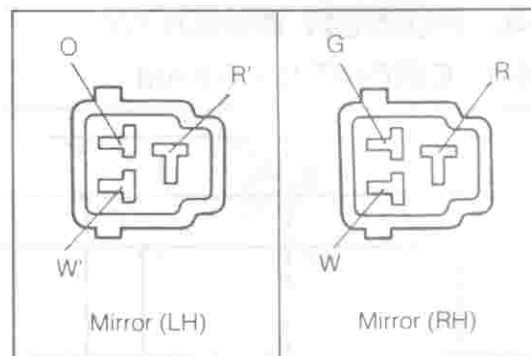
13-2. REMOTE CONTROL MOTOR

Inspection

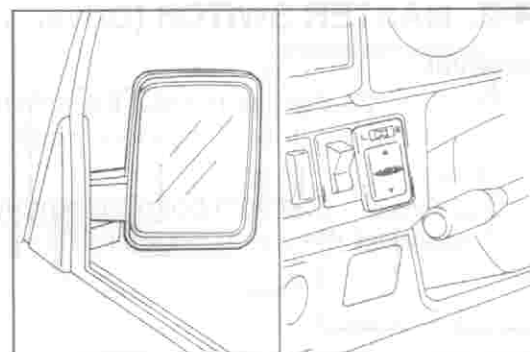
1. Remove the door trim. Take out the coupler.
2. Ensure that the motor operates properly by applying the battery voltage across the respective terminals as indicated in the table below.

(RH)	W	G	R
Up	—	+	
Down	+	—	
Left	—		+
Right	+		—

(LH)	W'	O	R'
Up	—	+	
Down	+	—	
Left	—		+
Right	+		—



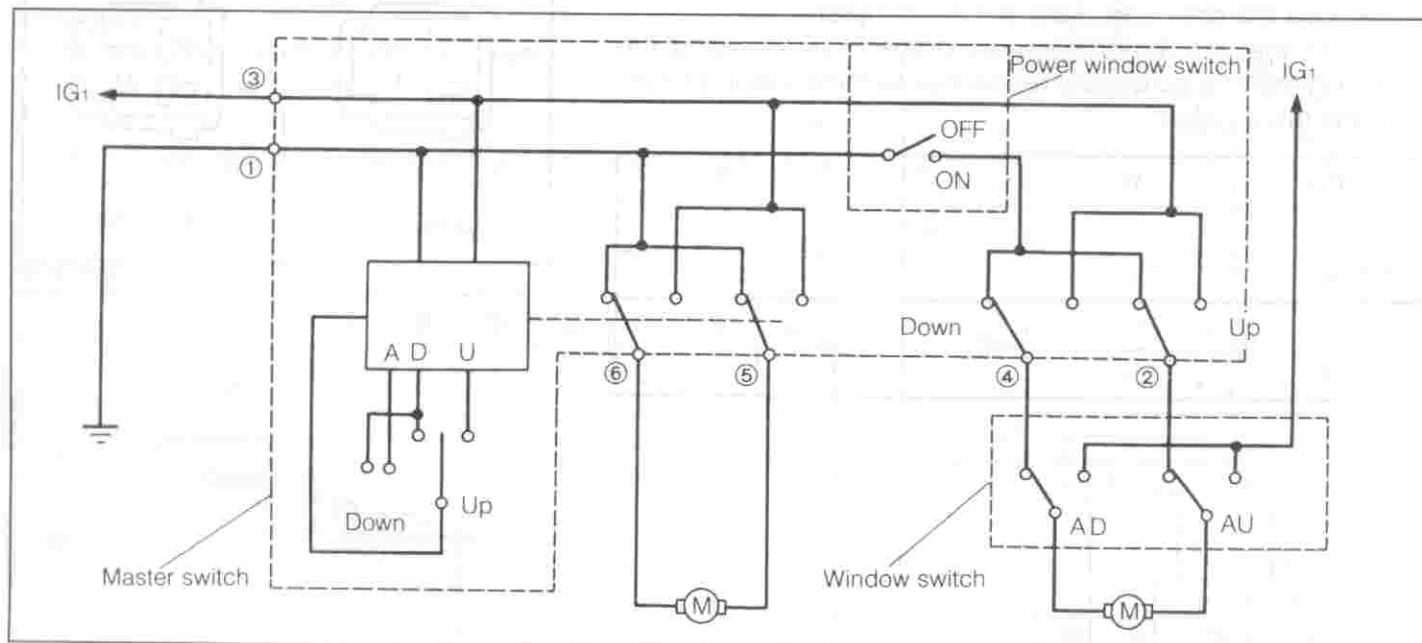
WRE91-BE191



WRE91-BE192

14. POWER WINDOW

14-1. CIRCUIT DIAGRAM

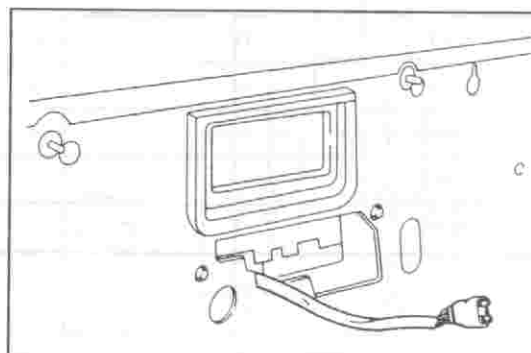


WRE91-BE193

14-2. MASTER SWITCH (Driver's switch)

Removal

1. Remove the three screws of the arm rest.
2. Remove the screw of the door inside handle. Remove the bezel.
3. Remove the door trim board assembly.
4. Disconnect the wiring coupler.



WRE91-BE194

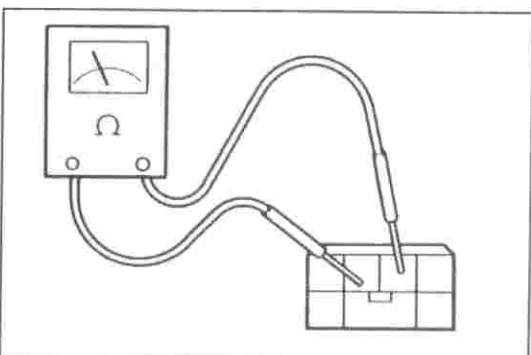
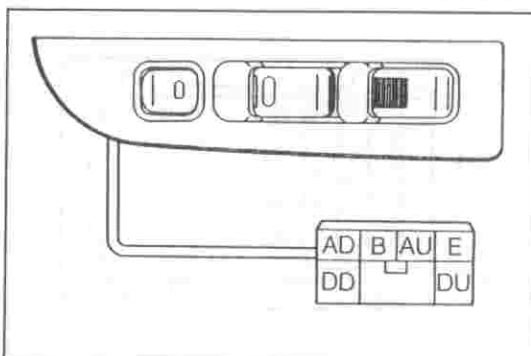
Inspection

Ensure that continuity exists between the respective terminals as indicated in the continuity table below.

Continuity table

○—○ Continuity exists.

Window lock switch		Switch at driver's seat side				Switch at front passenger seat side			
		B	DU	DD	E	B	AU	AD	E
ON	UP	○—○	○—○	○—○	○—○	○—○	○—○	○—○	○—○
	OFF		○—○	○—○	○—○		○—○	○—○	○—○
	DOWN	○—○		○—○		○—○		○—○	
OFF	UP	○—○	○—○	○—○	○—○	○—○	○—○	○—○	○—○
	OFF		○—○	○—○	○—○		○—○	○—○	○—○
	DOWN	○—○		○—○		○—○		○—○	



WRE91-BE195

14-3. WINDOW SWITCH (Passenger's switch)

Removal

1. Remove the three screws of the arm rest.
2. Remove the screw of the door inside handle. Remove the bezel.
3. Remove the door trim board assembly.
4. Disconnect the wiring coupler.

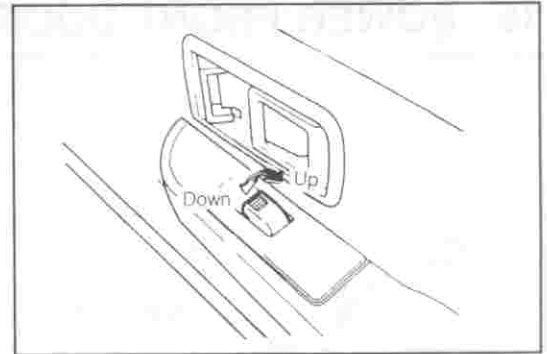
Inspection

Ensure that continuity exists between the respective terminals as indicated in the continuity table below.

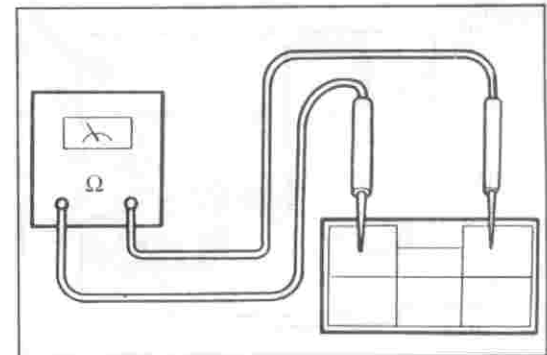
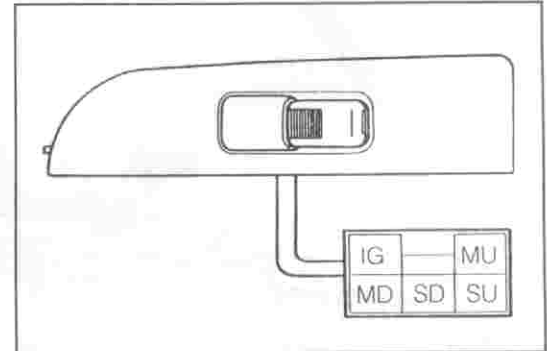
Continuity table

○—○ Continuity exists.

Switch \ Terminal	MU	SU	SD	IG	MD
UP	○—			○—	
OFF	○—	○—	○—		○—
DOWN	○—	○—		○—	○—

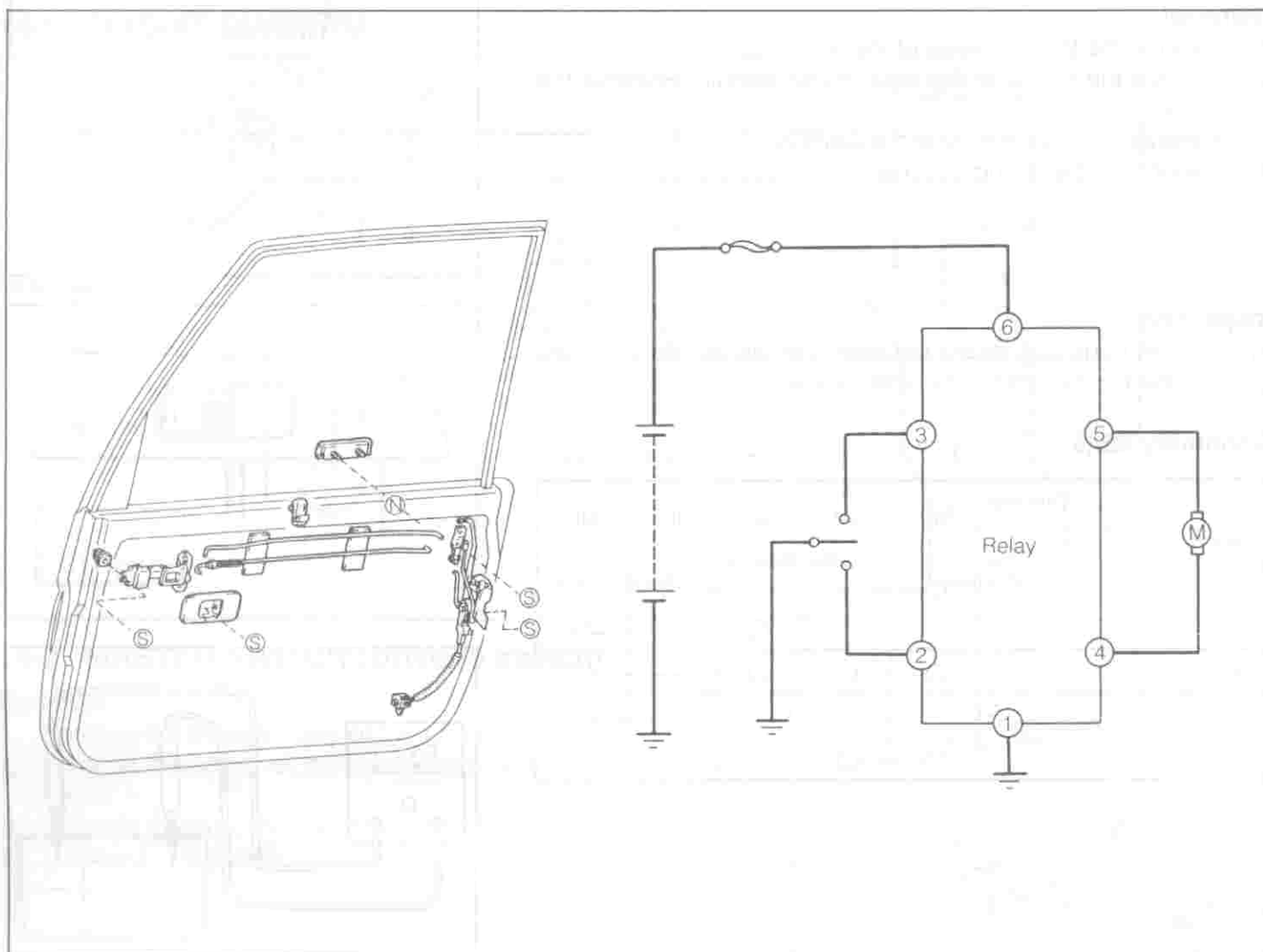


WRE91-BE196



WRE91-BE197

15. POWER FRONT DOOR LOCK



WRE91-BE196

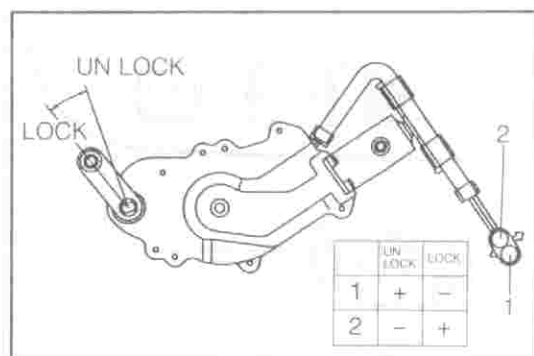
15-1. DOOR LOCK CONTROL MOTOR (Passenger side door)

Removal

1. Remove the three screws of the arm rest.
2. Remove the screw of the door inside handle. Remove the bezel.
3. Remove the door trim board assembly. Disconnect the wiring coupler.
4. Remove the water seal.

Inspection

When the positive $\oplus$ and negative $\ominus$ polarities of a 12V battery are connected to the terminals of the coupler, the lever of the motor should move to the LOCK or UNLOCK direction.



WRE91-BE199

WRE91-BE200

15-2. DOOR LOCK CONTROL SWITCH (Driver side door)

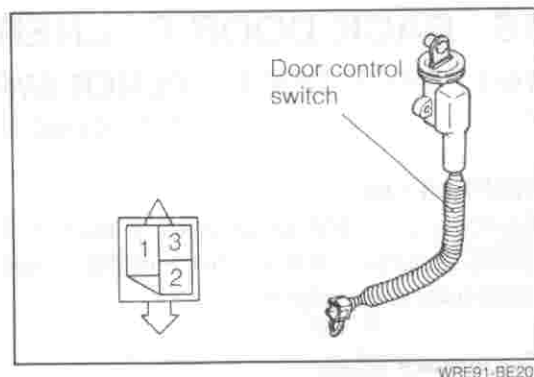
Removal

1. Remove the three screws of the arm rest.
2. Remove the screw of the door inside handle. Remove the bezel.
3. Remove the door trim board assembly. Disconnect the wiring coupler.
4. Remove the water seal.

Inspection

Ensure that continuity exists between the respective terminals as indicated in the table below.

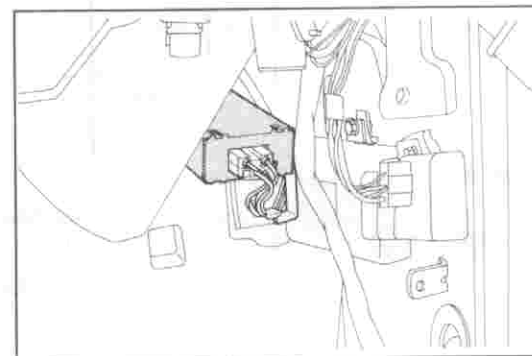
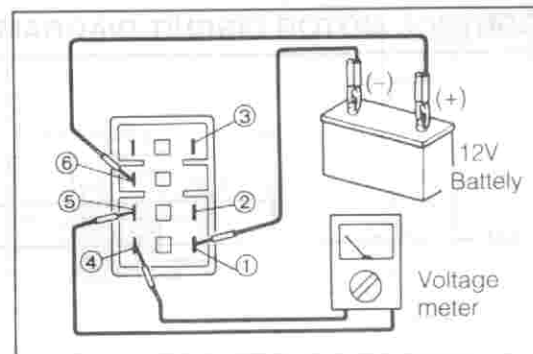
	1	2	3
Lock	○	○	
Unlock	○		○



15-3. DOOR LOCK CONTROL RELAY

Inspection

1. Fabricate a test circuit as indicated in the right figure.
2. Set the circuit tester to the voltmeter range.
3. When the terminal ② is connected to the negative (-) terminal of the battery, ensure that the battery voltage is momentarily applied across the terminals ④ and ⑤.
4. When the terminal ③ is connected to the negative (-) terminal of the battery, ensure that the battery voltage is momentarily applied across the terminals ④ and ⑤. However, the polarity of the voltage at this time should be opposite to that under the step ③ above. page 80



BODY ELECTRICAL SYSTEM

16. BACK DOOR OPENER

16-1. BACK DOOR OPENER SWITCH

The back door opener switch is located at the rear console box.

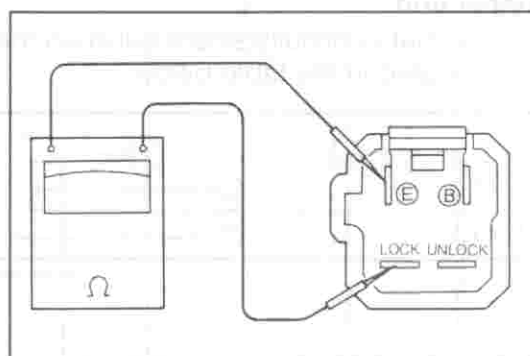
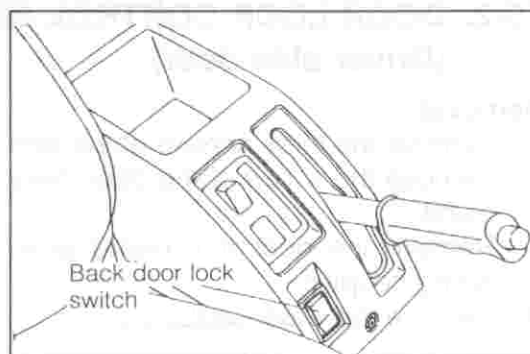
INSPECTION

Remove the back door opener switch. Ensure that continuity exists between the respective terminals as indicated in the continuity table below.

Continuity table

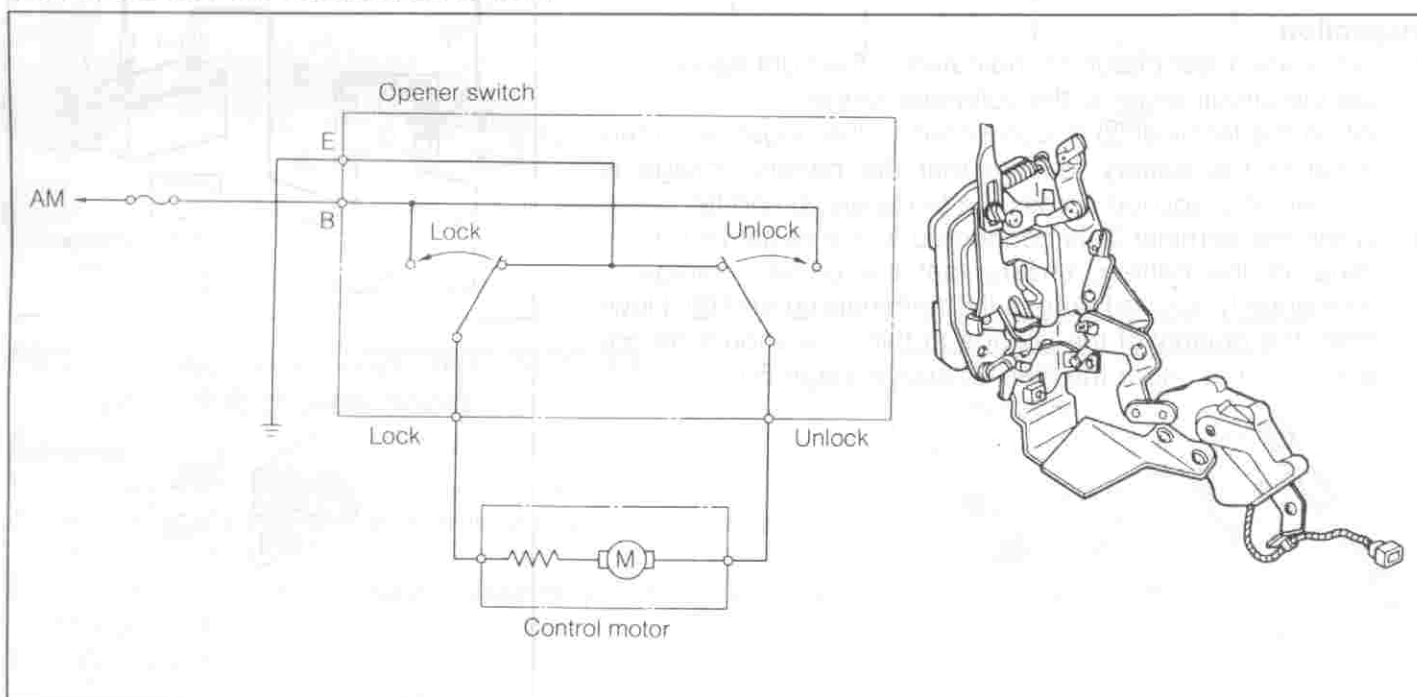
○—○ Continuity exists.

Switch \ Terminal	B	E	LOCK	UNLOCK
LOCK	○—	○—	○—	○—
OFF		○—	○—	○—
UNLOCK	○—	○—	○—	○—



WRE91-BE203

CONTROL MOTOR CIRCUIT DIAGRAM



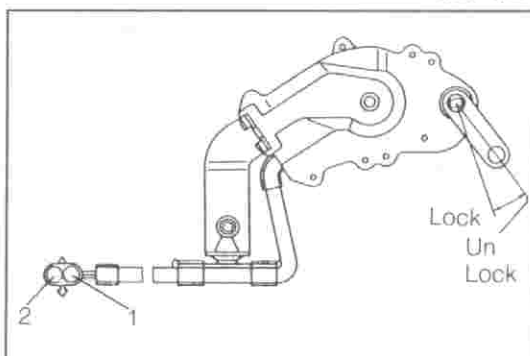
WRE91-BE204

INSPECTION

Solenoid assembly

Apply a voltage of 12V across the following two terminals. Ensure that the motor operates in accordance with the table below.

Operation direction \ Terminal	①	②
UNLOCK	⊕	⊖
LOCK	⊖	⊕



WRE91-BE205

17. THREE-STAGE DAMPER THREE-STAGE DAMPER SWITCH

Removal

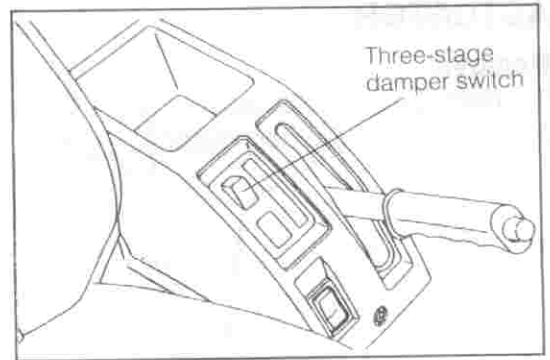
1. Remove the console box.
2. Remove the three-stage damper switch.
3. Disconnect the connector.

Inspection

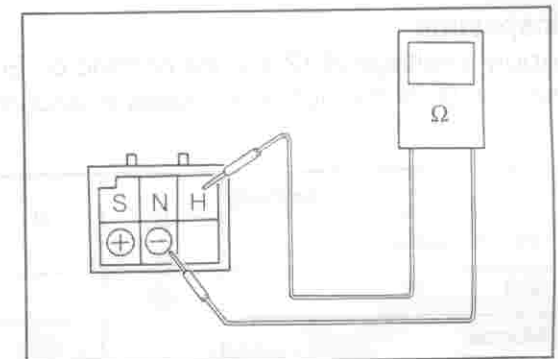
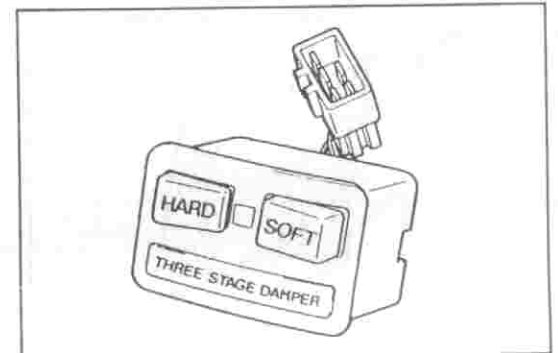
Ensure that continuity exists between the respective terminals as indicated in the continuity table below, using a tester.

○—○ Continuity exists.

Terminal Switch position	⊖	S	N	H	⊕
SOFT	○—○				
NORMAL	○		○		
HARD	○			○	



WRE91-BE206



WRE91-BE207

Installation

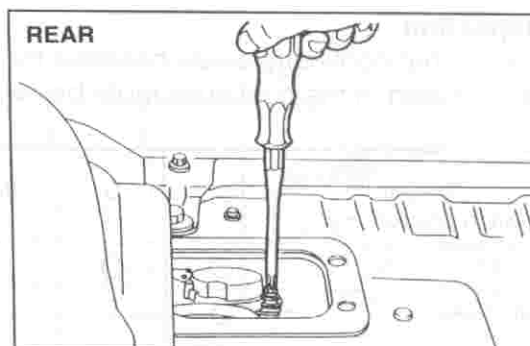
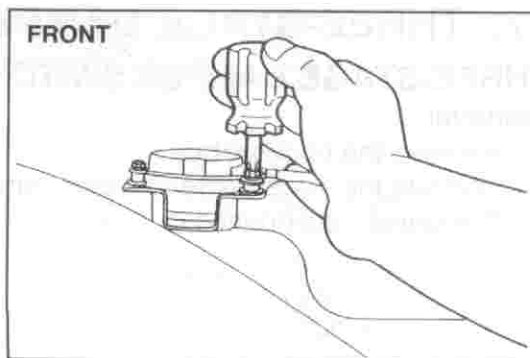
1. Install the three-stage damper switch.
2. Connect the connector.
3. Install the console box.

WRE91-BE208

ACTUATOR

Removal

1. Remove the actuator.
2. Disconnect the connector.

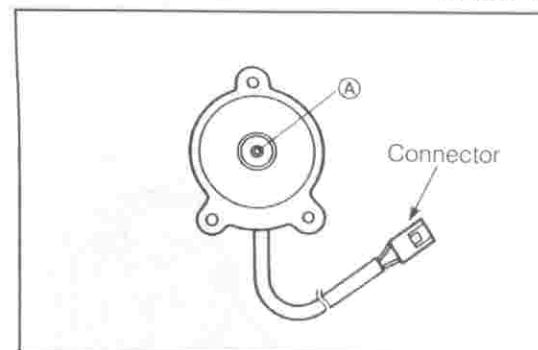


WRE91-BE209

Inspection

Apply a voltage of 12 V to the connector. Ensure that the center section ① of the actuator rotates in accordance with the table below.

Terminal \ Switch position	S	N	H	V.
Soft	⊖			⊕
Normal		⊖		⊕
Hard			⊖	⊕

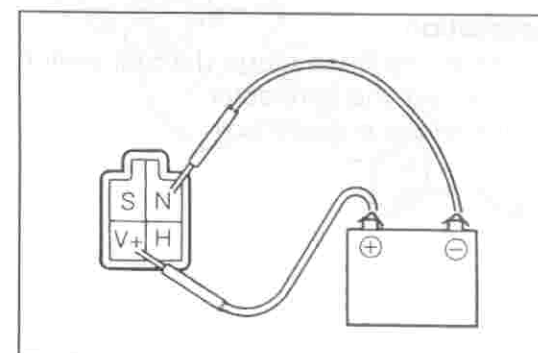


Position of ① at each switch position

Soft	Hard	Normal

Installation

1. Install the actuator.
2. Connect the connector.



WRE91-BE210

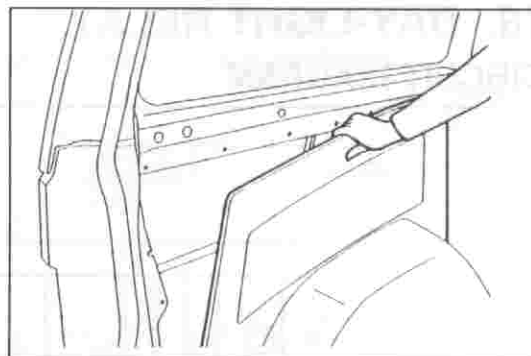
WRE91-BE211

ECU

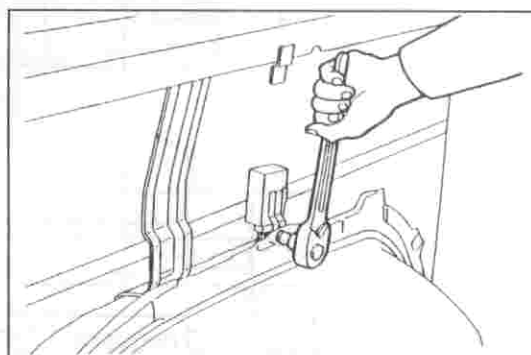
Replace the ECU if the three-stage damper switch and actuator exhibit no abnormality.

Removal

1. Remove the left quarter inside trim board.



2. Remove the ECU.
3. Remove the connector.



WRE91-BE212

Installation

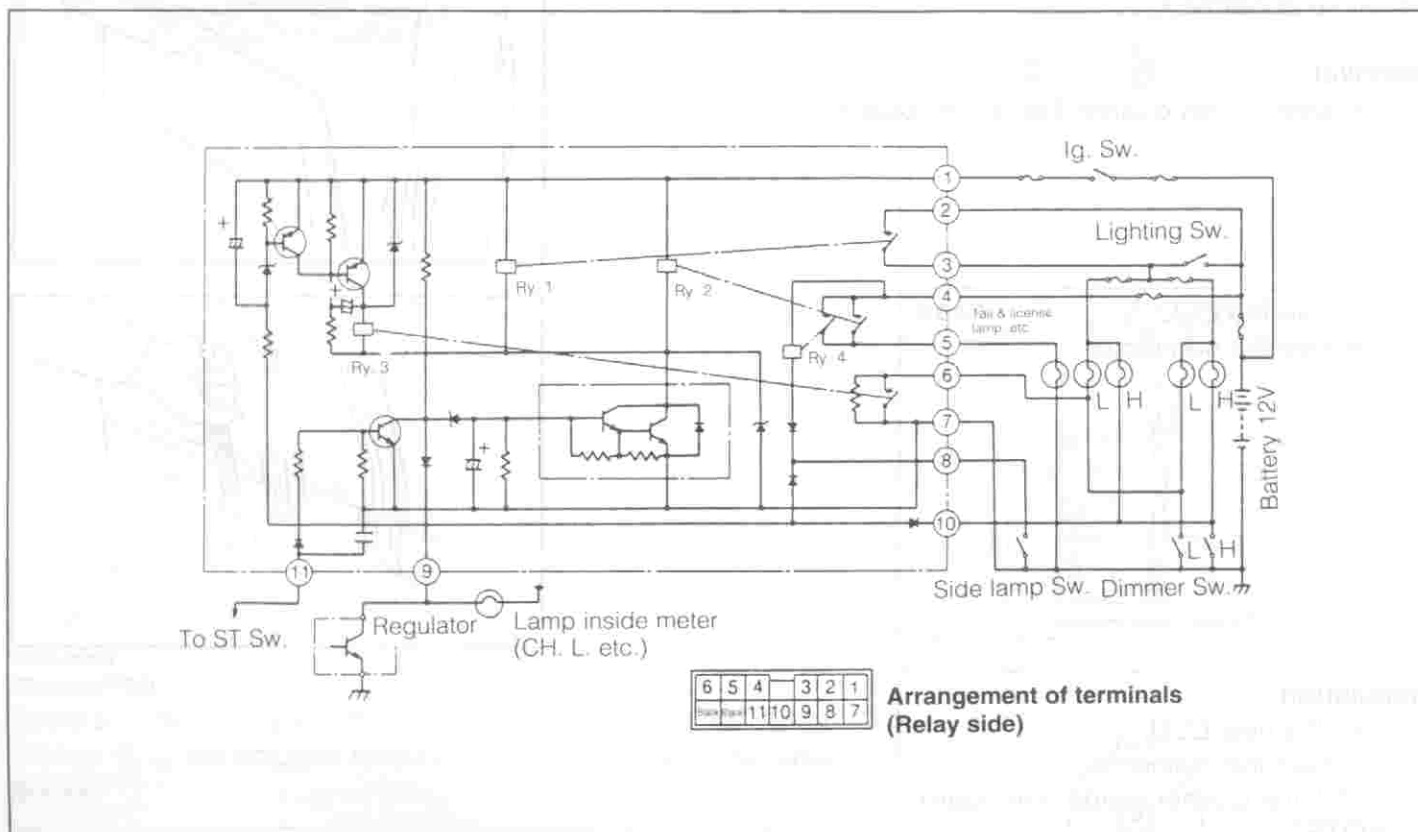
1. Install a new ECU.
2. Connect the connector.
3. Install the quarter inside trim board.

NOTE:

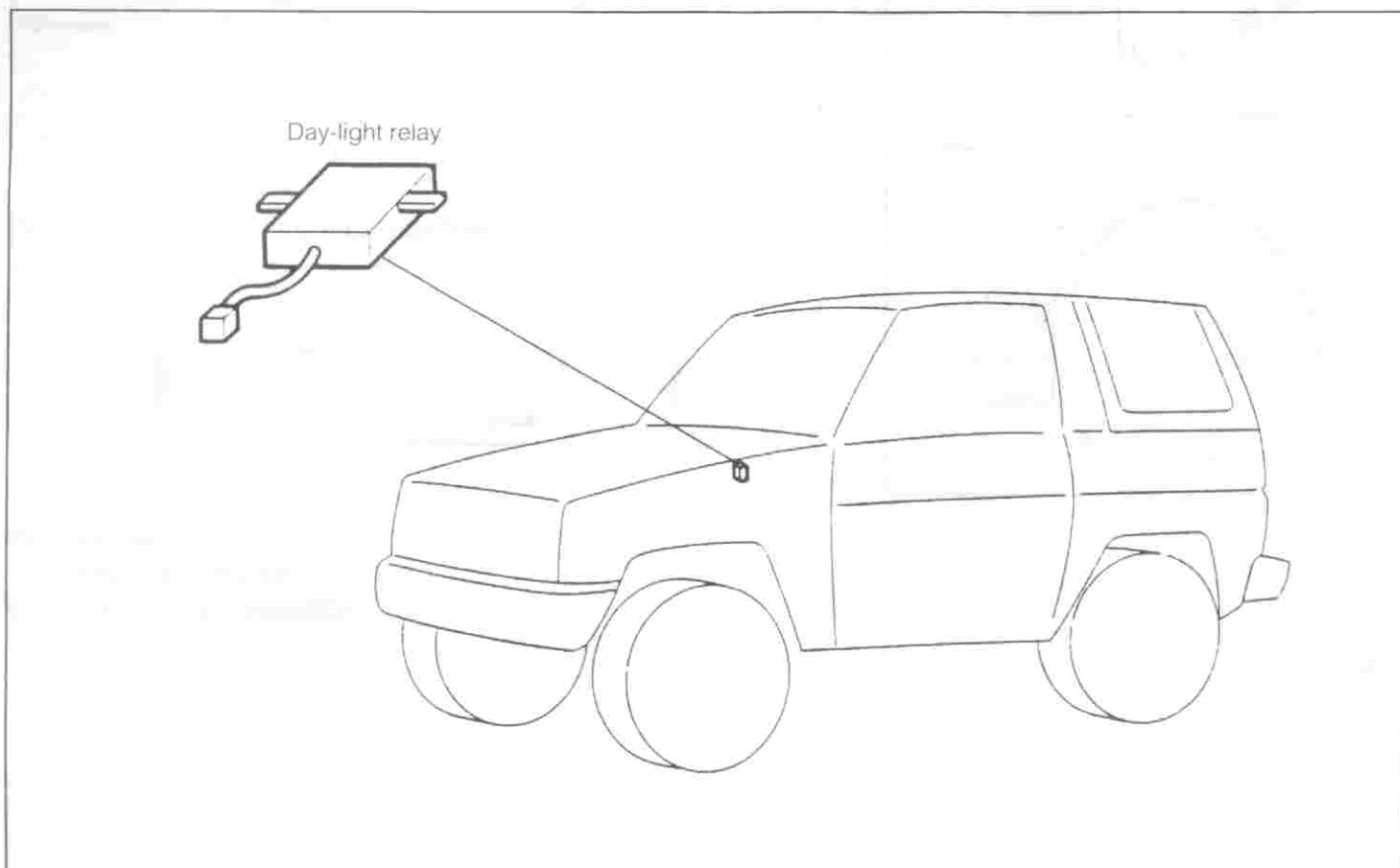
- Ensure that the connector has been installed properly.

WRE91-BE213

18. DAY-LIGHT RELAY CIRCUIT DIAGRAM



LOCATION OF DAY-LIGHT RELAY



OPERATION CHECK

While the engine is rotating, ensure that the day-light goes on under the conditions given below.

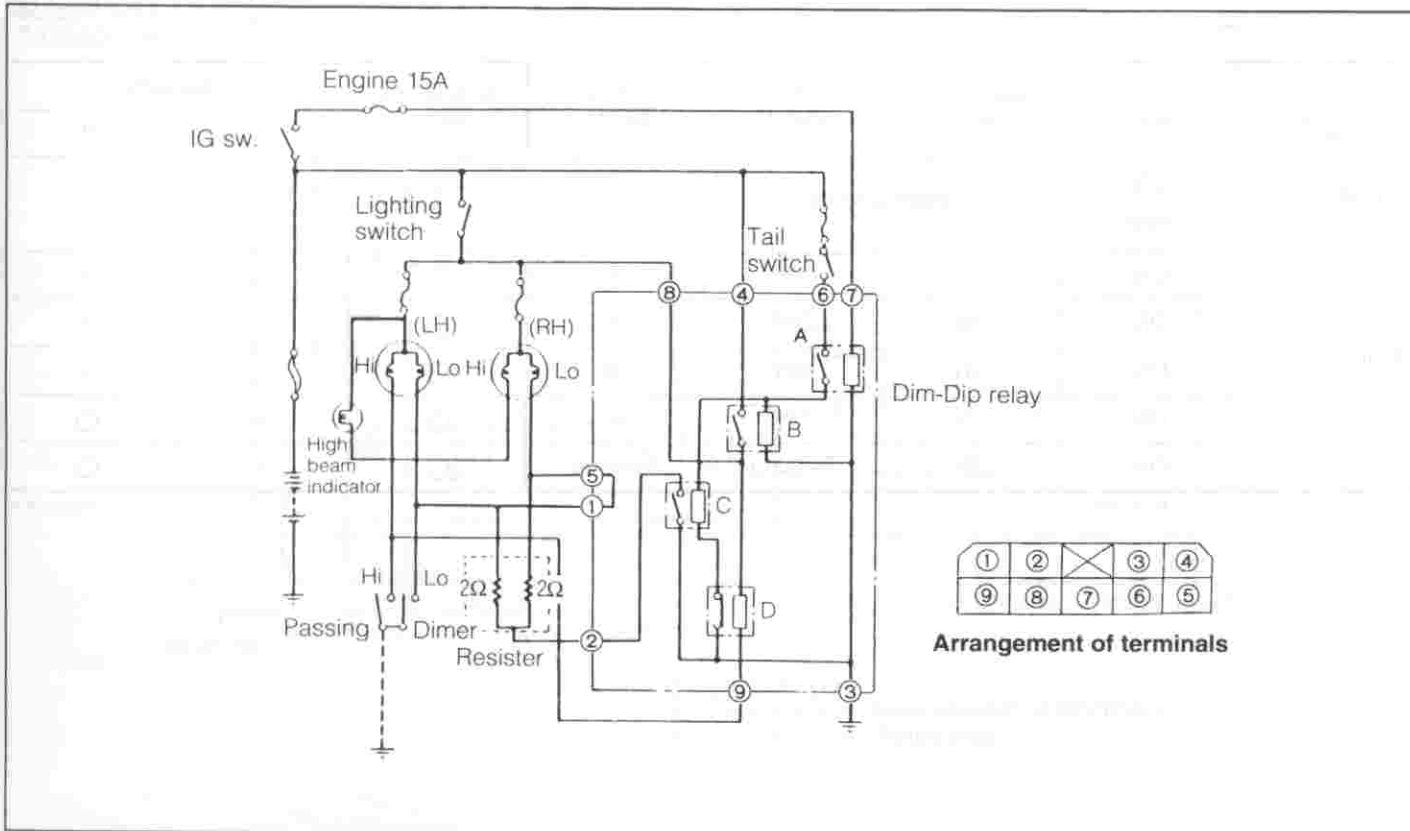
○ ... Goes on
x ... Goes off.

Engine	Ignition switch	Side lamp switch	Lighting switch	Dimmer switch	Tail & license lamp	Headlamp	
						Lo	Hi
STOP	ON	Normal glowing mode					
	OFF						
RUN	ON	OFF	OFF	OFF	○	○	×
	ON	ON	OFF	OFF	○	×	×
	ON	ON	ON	Lo	○	○	×
	ON	ON	ON	Hi	○	×	○
	ON	ON	Passing	Passing	○	×	○

WRE91-BE216

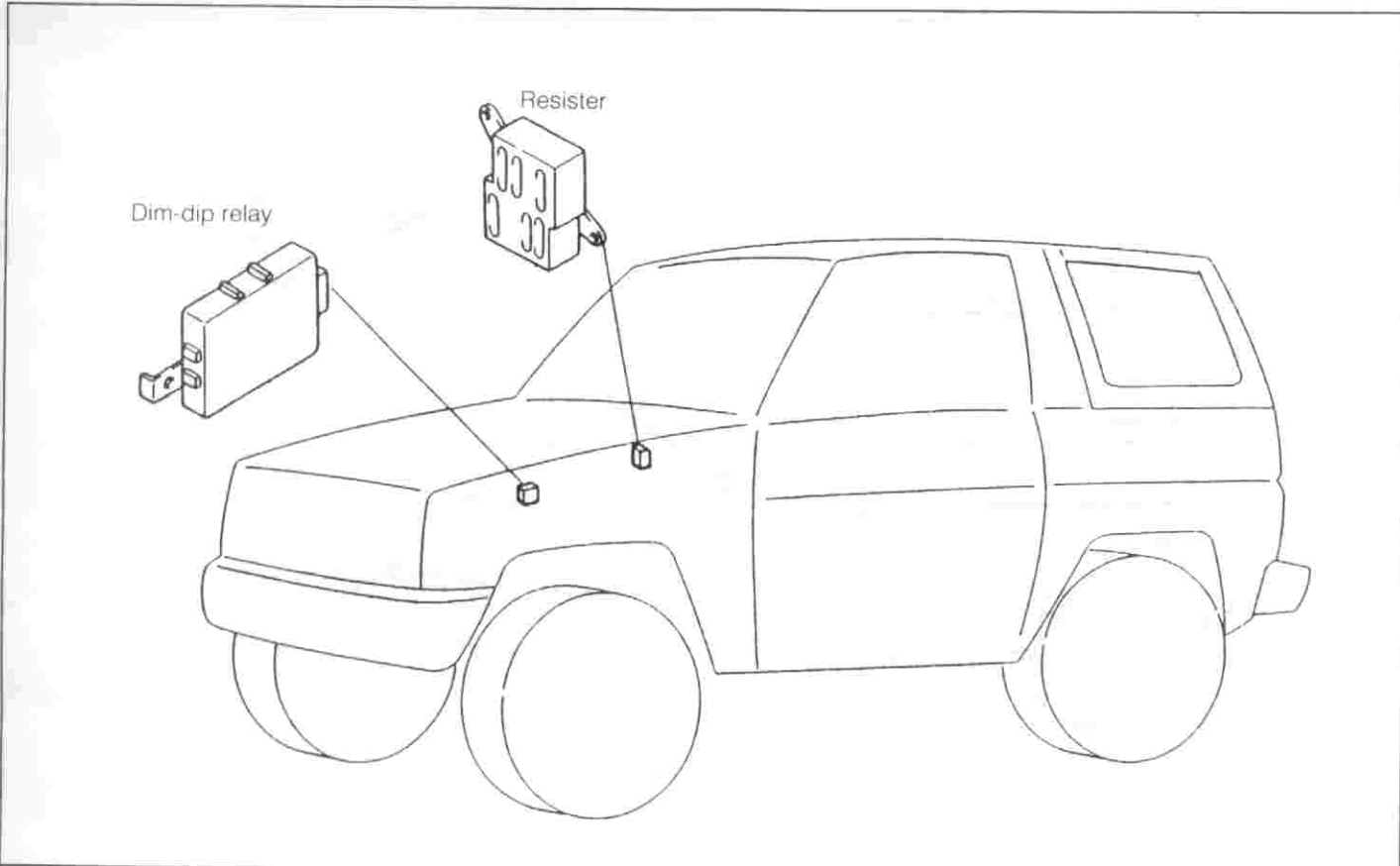
19. DIM-DIP LAMP

CIRCUIT DIAGRAM



WRE91-BE217

LOCATION OF DIM-DIP RELAY AND RESISTER



WRE91-BE218

OPERATION CHECK

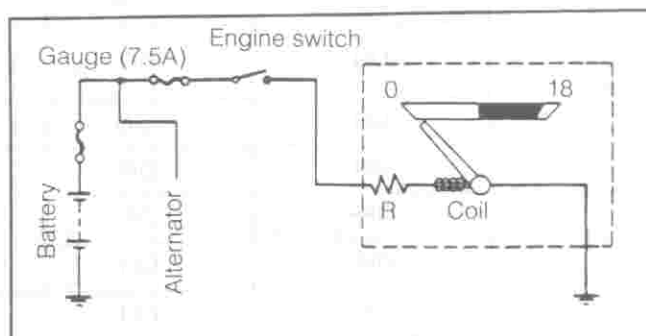
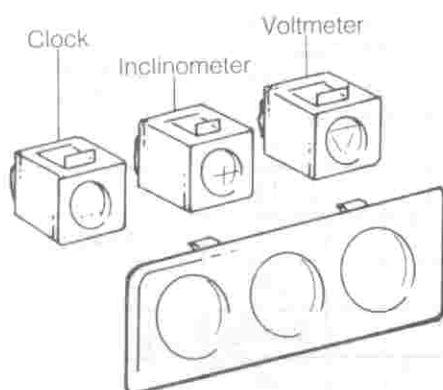
Under the conditions given below, ensure that the luminous intensity of the dim-dip lamp is reduced 10% compared with the normal operation.

Switch condition				Headlamp condition	Remarks
Ignition switch	Tail switch	Lighting switch L	Lighting switch H		
OFF	OFF	OFF	OFF	OFF	
	ON	OFF	OFF	OFF	Tail lamp only goes on.
	ON	ON	OFF	Lo	
	ON	OFF	ON	Hi	
	OFF	OFF	ON	Hi	Passing
ON	OFF	OFF	OFF	OFF	
	ON	OFF	OFF	Dim-dip	
	ON	ON	OFF	Lo	
	ON	OFF	ON	Hi	
	OFF	OFF	ON	Hi	Passing

WRE91-BE219

20. VOLT METER

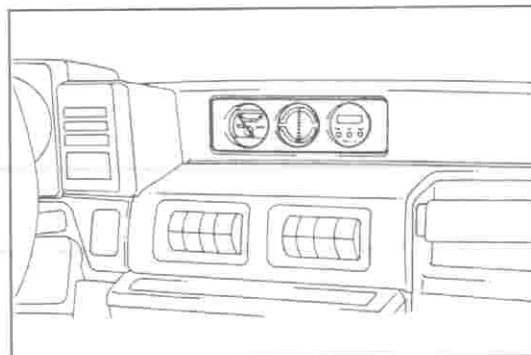
While the engine is running, the voltmeter indicates the charging voltage. When the engine is stopped (with the engine switch turned ON), this voltmeter indicates the battery voltage.



WRE91-BE220

REMOVAL

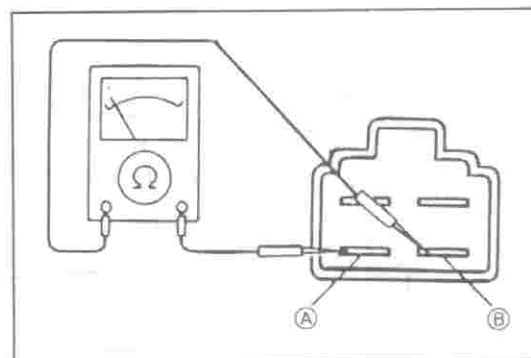
- (1) Remove the panel instrument finish with a screwdriver.
- (2) Insert a screwdriver into the upper and lower notches and pry the screwdriver so as to remove the voltmeter.
- (3) Disconnect the connector.



WRE91-BE221

UNIT INSPECTION

- (1) Connect a circuit tester to the terminals (A) and (B).
Specified Value: about 530 Ω



WRE91-BE222

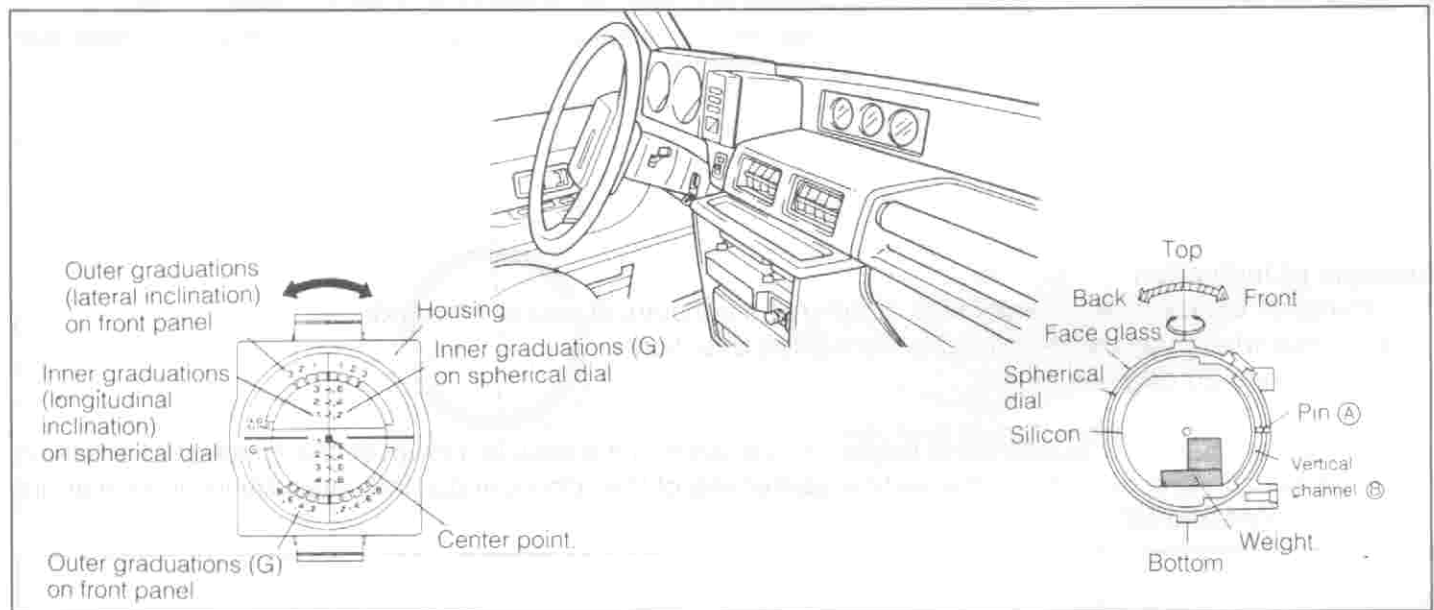
INSTALLATION

- (1) Connect the connector.
- (2) Install the voltmeter to the instrument panel.
- (3) Install the panel instrument finish.

WRE91-BE223

21. INCLINOMETER

The inclinometer indicates any inclination angle of the vehicle in a fore-and aft direction or in a right-and left direction as well as an acceleration being applied to the vehicle.



WRE91-BE224

Specifications

Item		Specification
Operative method		Gravity method by weight
Indications	Front-back	40 degrees max
	Right-left	30 degrees max
Illumination		12V, 1.4W bulb

WRE91-BE225

Construction

The inclinometer consists of an outer casing which inclines in the same way as with the vehicle inclination, a front panel scale plate, a front glass (fixed to the outer casing) and a spherical dial which maintains the horizontal state at all times.

The inclinometer has a pin (A) which protrudes at the rear/inner part of the front glass. Also, a vertical groove (B) is provided at the back side of the spherical dial.

The provision of this pin (A) and vertical groove (B) prevents any rotation of the inclinometer (↺↻) around an axis in an up-and-down direction. However, this construction makes it possible for the inclinometer to turn in a fore-and-aft direction (↔) as well as in a right-and left direction (↻↺).

A weight is fixed at the inside of the spherical dial. This weight indicates always the direction of gravity (lower side).

Furthermore, silicon oil is filled between the spherical dial and the front glass in order that the spherical dial may slide smoothly.

WRE91-BE226

BODY ELECTRICAL SYSTEM

Operation

This weight indicates always the direction of gravity regardless of the vehicle posture. Thus, the inclinometer indicates the vehicle posture in a unit of degree. While the vehicle is running, the meter indicates the acceleration (G).

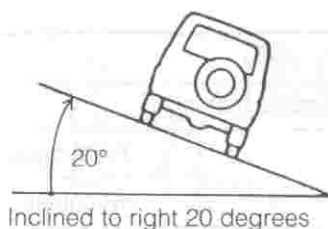
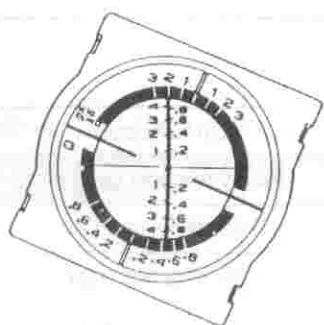
WRE91-BE227

Example of indication

1. Inclination condition when vehicle is running at a constant speed or stopped:

- Case where vehicle is inclined in right-&-left direction (inclined 20 degrees to left):

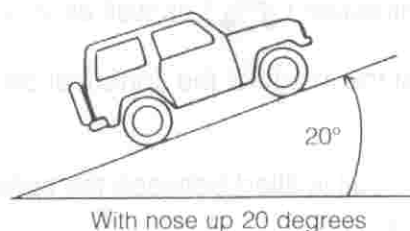
The front panel dial is inclined in the same inclination of the vehicle. However, the spherical dial retains its horizontal state. Hence, the vertical center line of the spherical dial indicates the inclination angle in a right-and-left direction.



WRE91-BE228

- Case where vehicle is inclined in fore-&-aft direction (with nose upward 20 degrees):

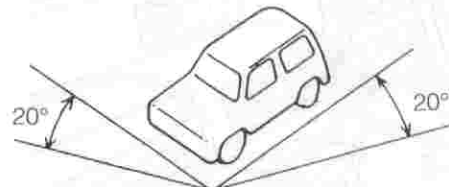
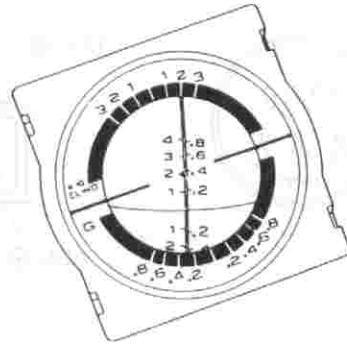
The front glass is inclined in the same inclination of the vehicle. However, the spherical dial retains its horizontal state. Hence, the the intersection of the center point of the front glass with the spherical dial indicates the inclination angle in a fore-and-aft direction.



WRE91-BE229

- Case where vehicle is inclined in fore&-aft direction as well as in right-&-left direction (with nose down 20 degrees and inclined to left 20 degrees):

The inclination angle in a fore-and-aft direction as well as in a right-and-left direction is indicated by means of the spherical dial, front glass and front panel dial.



With nose down 20 degrees and inclined to left 20 degrees

WRE91-BE230

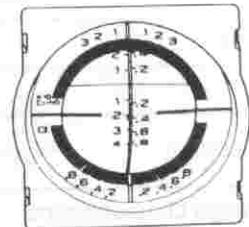
2. When vehicle is under accelerating or decelerating condition:

When an acceleration is applied to the vehicle, the indication of the clinometer changes even while the vehicle is running on a level road.

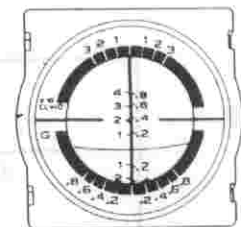
The greater this rate of change, the greater the acceleration.

- Case where vehicle is under acceleration:
A dipping force is applied to front glass in the same dipping direction of the vehicle. However, the spherical dial tends to turn upward. As a result, the intersection of the center point of the front glass with the spherical dial indicates the acceleration.
- Case where vehicle is under deceleration:
A floating force is applied to front glass in the same floating direction of the vehicle. However, the spherical dial tends to turn downward. As a result, the intersection of the center point of the front glass with the spherical dial indicates the deceleration.
- Case where vehicle is cornering:
A centrifugal is applied to the vehicle, thereby changing the indication. The greater this rate of change, the quicker the vehicle is making a turn.

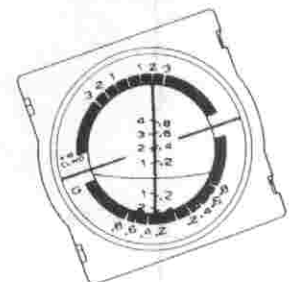
Indication of acceleration



Indication of deceleration



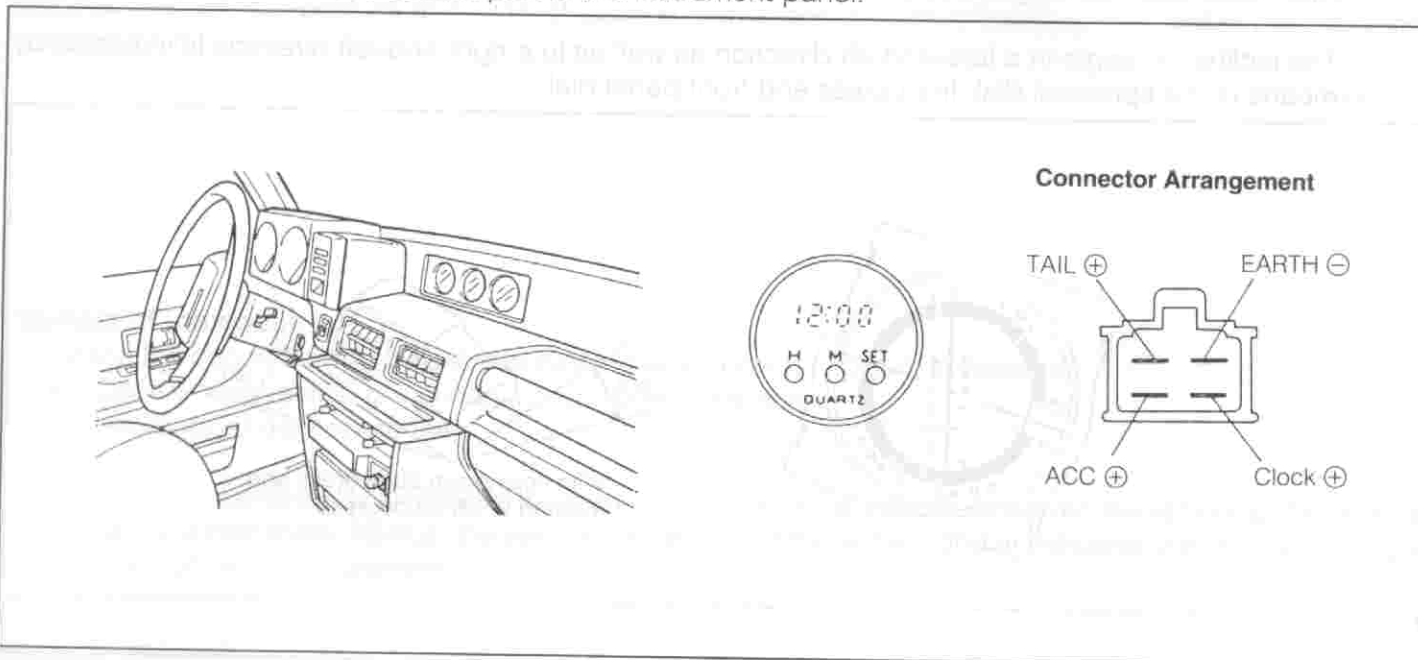
Indication during running while cornering



WRE91-BE231

22. CLOCK

The clock is provided at the central part of the instrument panel.



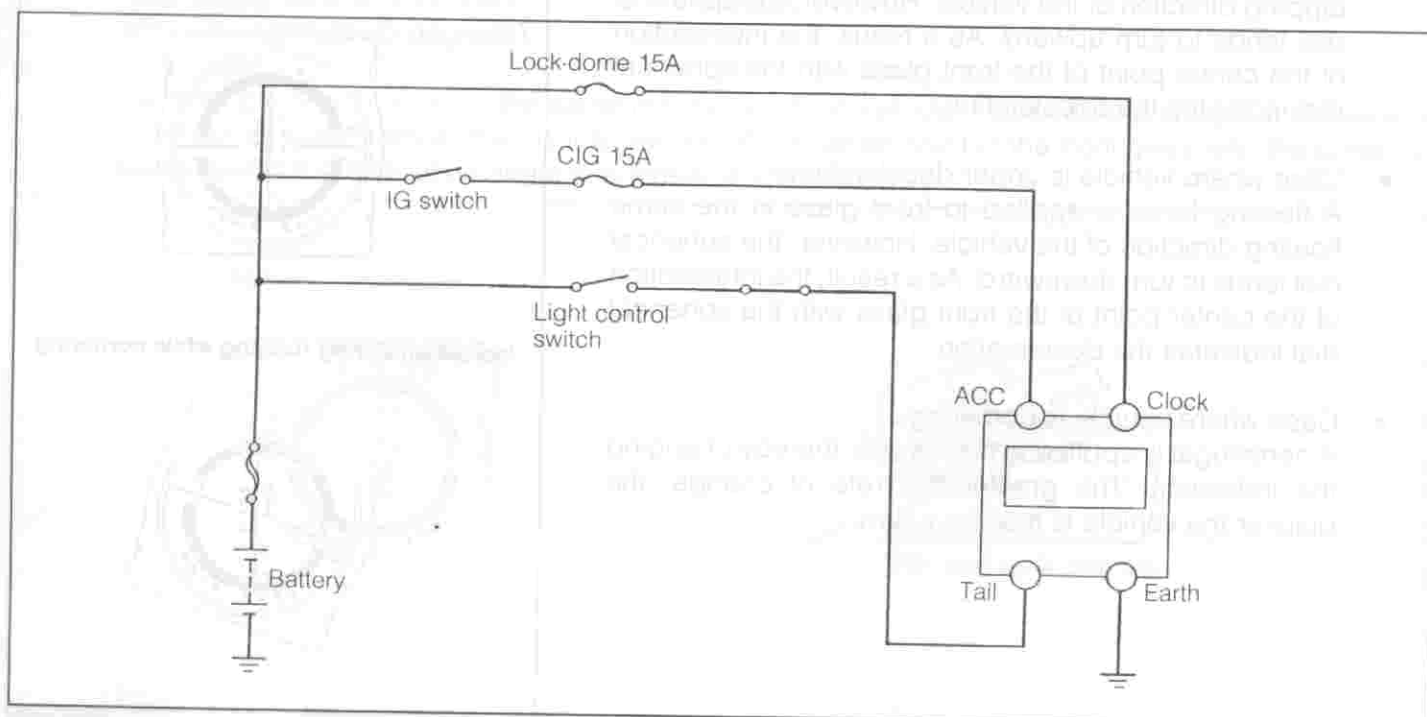
WRE91-BE232

Clock specification

		Specifications
Rating voltage	(V)	12
Accuracy	(second/day)	± 1.5
Consuming current	(mA)	160 (During indication period with glowing) 5 (During indications period without glowing)
Operating range characteristics	(V)	10 - 12

WRE91-BE233

CIRCUIT DIAGRAM



WRE91-BE234