

# CHASSIS ELECTRICAL

## CONTENTS

E54AA---

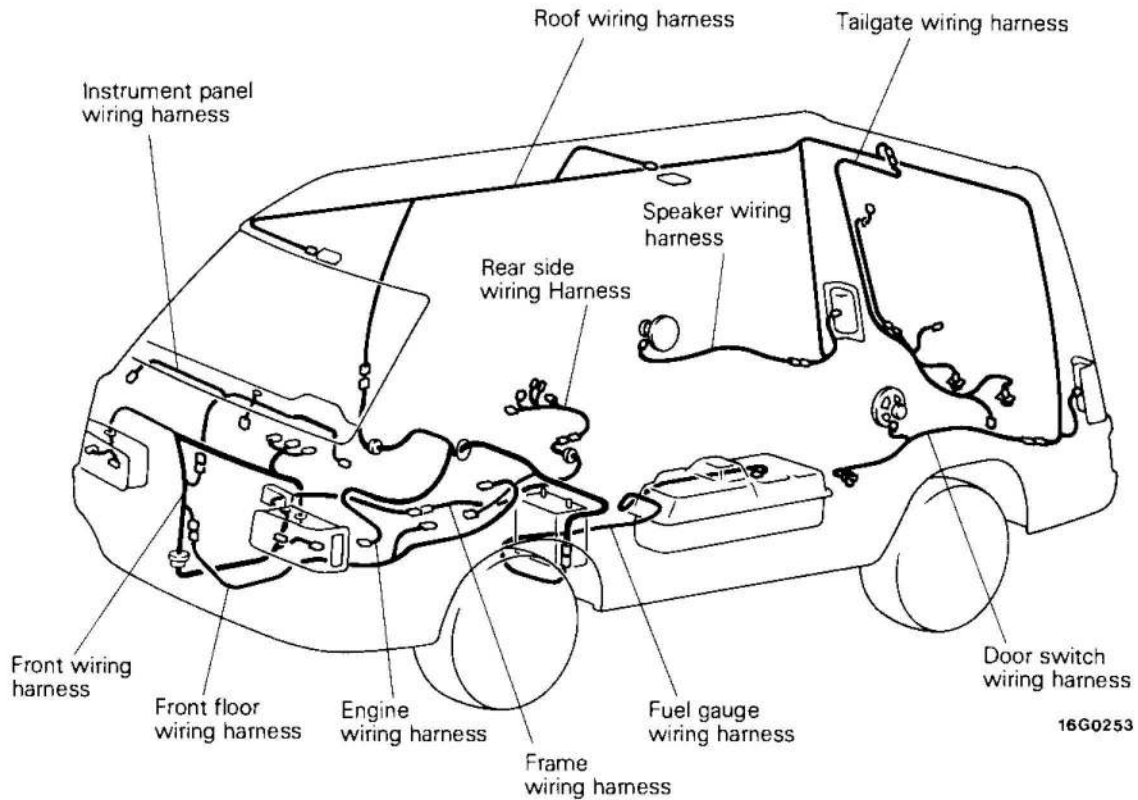
<b>WIRING HARNESS</b> .....	<b>2</b>	<b>COLUMN SWITCH</b> .....	<b>39</b>
General View .....	2	<b>HORN SYSTEM</b> .....	<b>42</b>
Centralized Earth Points .....	3	<b>CIGARETTE LIGHTER</b> .....	<b>46</b>
Relay Mounting Locations .....	6	<b>CLOCK</b> .....	<b>48</b>
Inspection Terminals (M.P.I. type) .....	12	<b>AUDIO SYSTEM</b> .....	<b>49</b>
Mounting Position of Diodes and Condenser .....	13	<b>REAR WINDOW DEFOGGER</b> .....	<b>59</b>
Fusible Links .....	14	<b>AUTOMATIC FREE-WHEELING HUB INDICATOR SYSTEM</b> .....	<b>62</b>
Fuses .....	15	<b>LIGHTING BUZZER SYSTEM</b> .....	<b>64</b>
<b>BATTERY</b> .....	<b>17</b>	<b>SEAT BELT BUZZER, SEAT BELT WARNING TIMER AND KEY REMINDER BUZZER SYSTEM</b> .....	<b>65</b>
<b>IGNITION SWITCH</b> .....	<b>18</b>		
<b>METERS AND GAUGES</b> .....	<b>20</b>		
<b>3-METER UNIT</b> .....	<b>27-1</b>		
<b>INDICATOR AND WARNING LAMP</b> .....	<b>28</b>		
<b>LIGHTING SYSTEM</b> .....	<b>29</b>		

# WIRING HARNESS

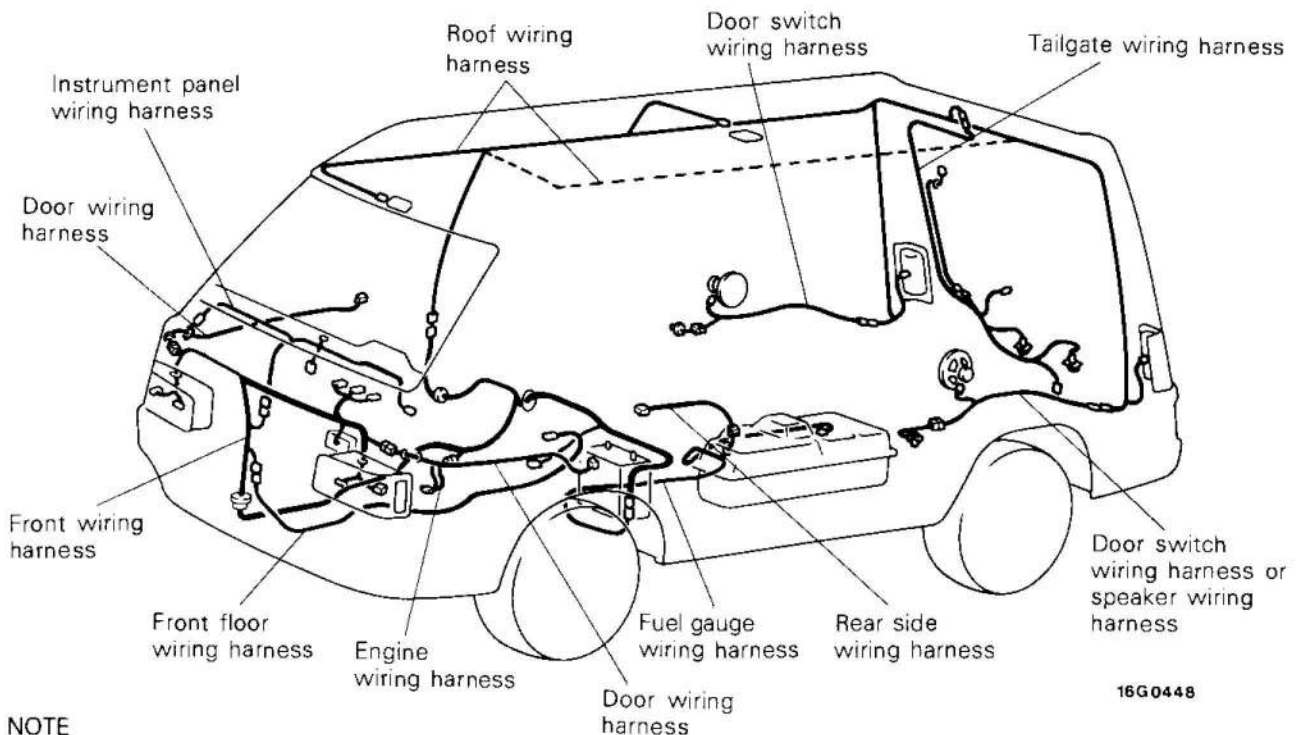
## GENERAL VIEW

E548A--

L.H. drive vehicles <Vehicles built up to October 1989>

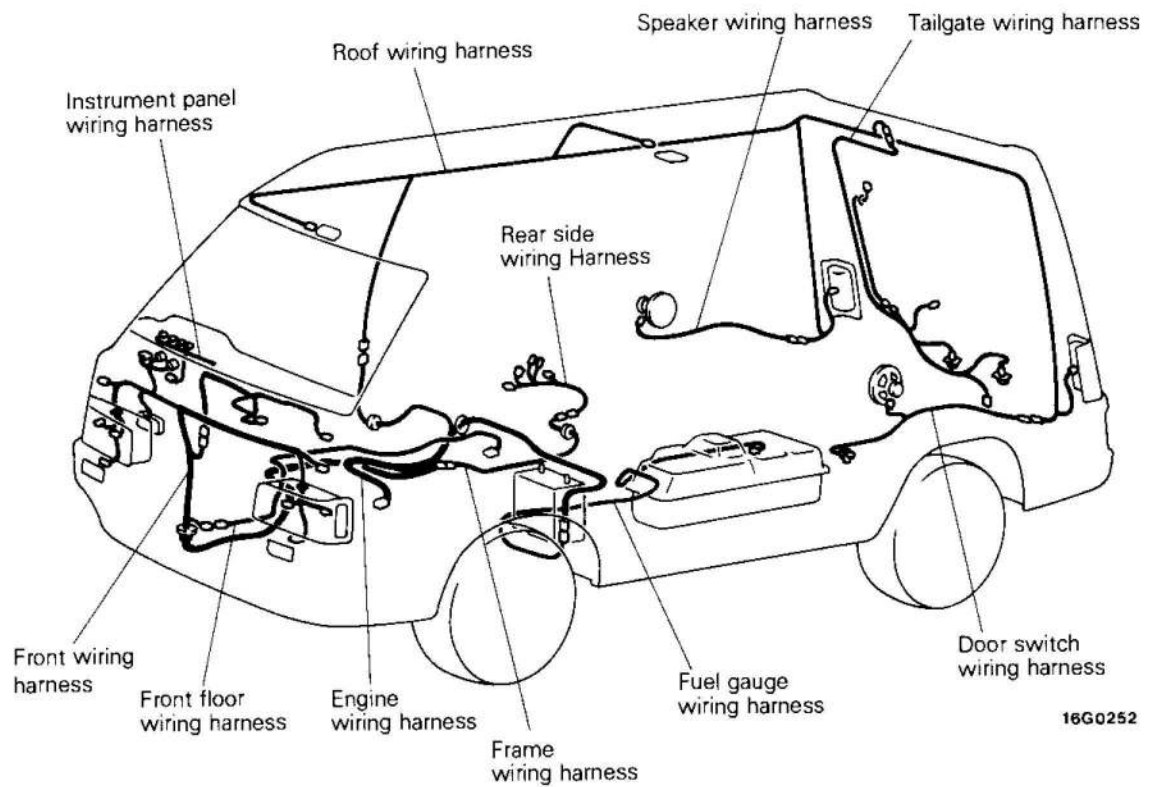


L.H. drive vehicles <Vehicles built from November 1989>

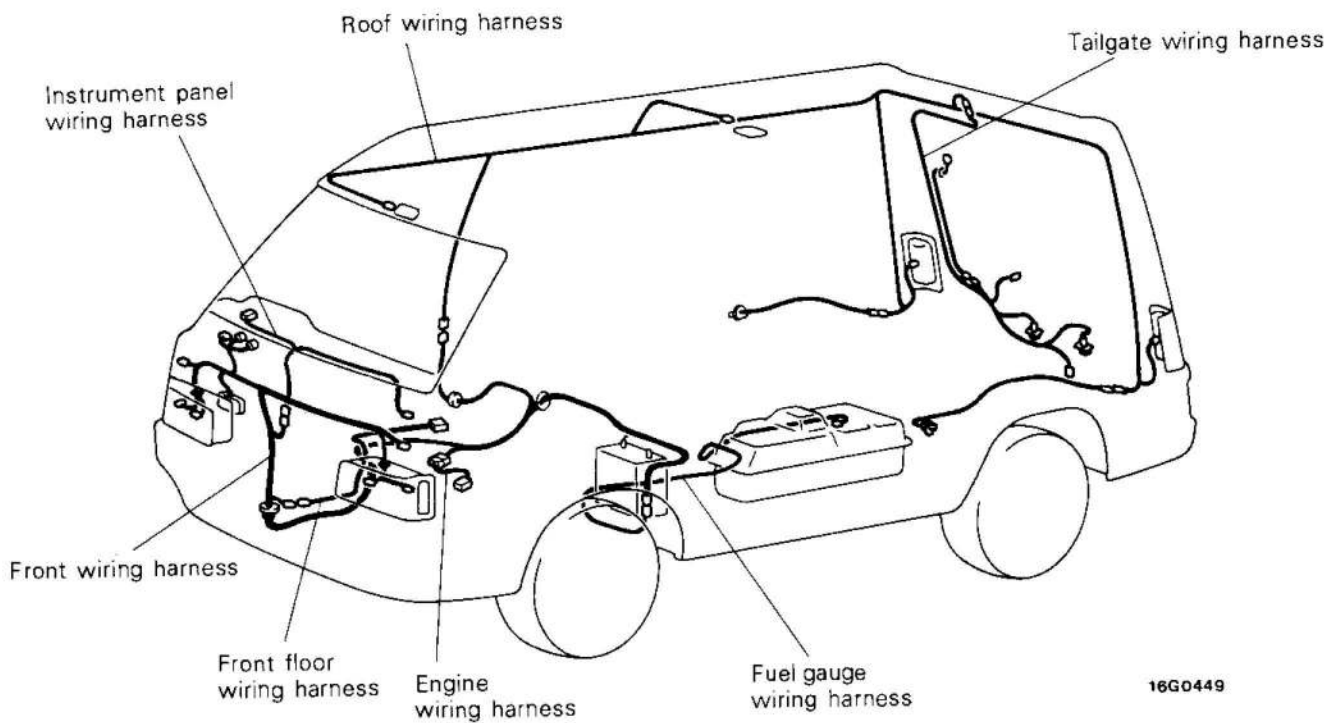


NOTE  
This figure shows only the major wiring harness.

R.H. drive vehicles <Vehicles built up to October 1989>



R.H. drive vehicles <Vehicles built from November 1989>



NOTE  
This figure shows only the major wiring harness.

54-2-2

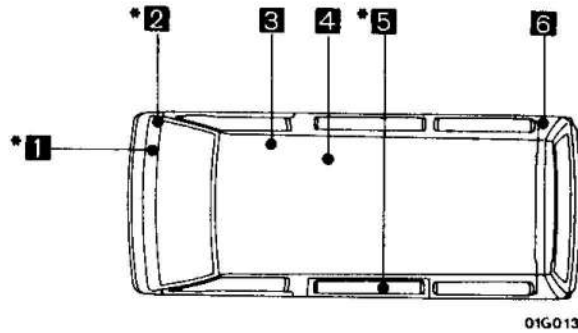
WIRING HARNESS - General View

---

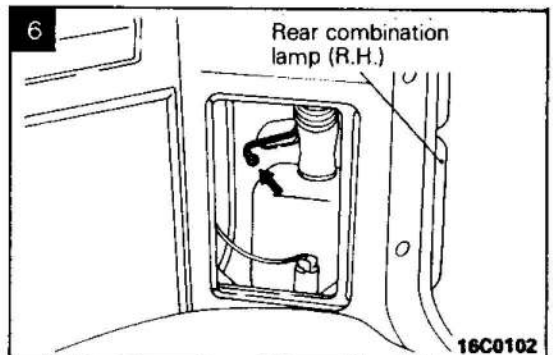
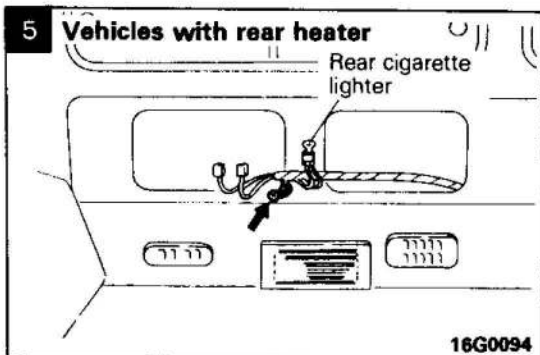
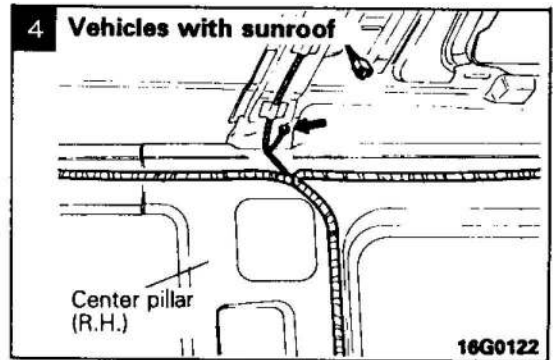
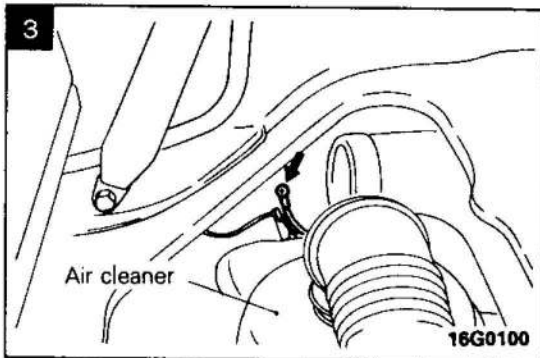
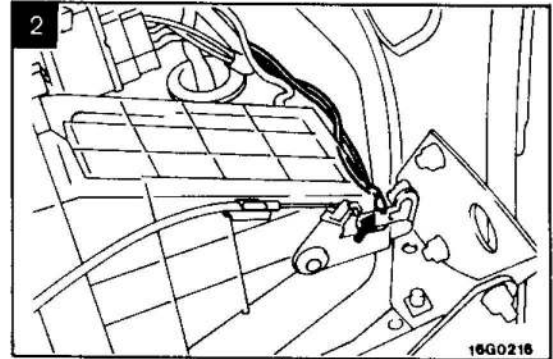
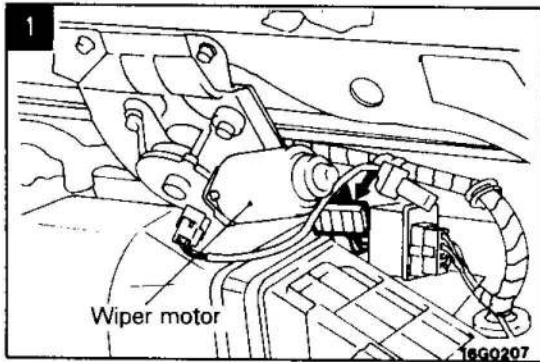
NOTES

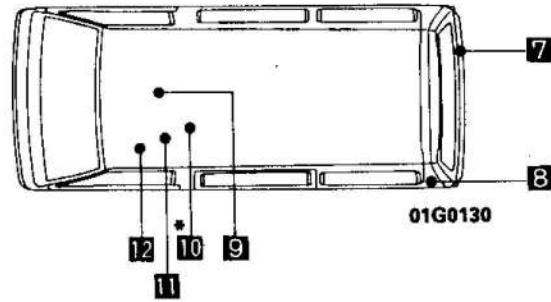
CENTRALIZED EARTH POINTS

ES488--

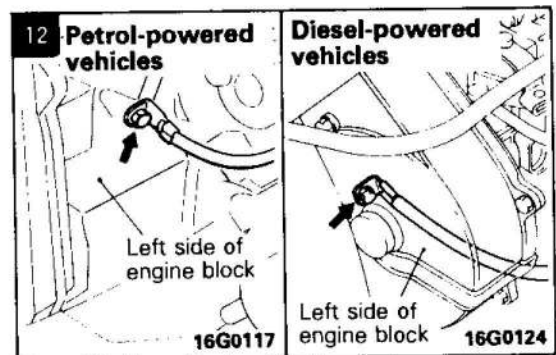
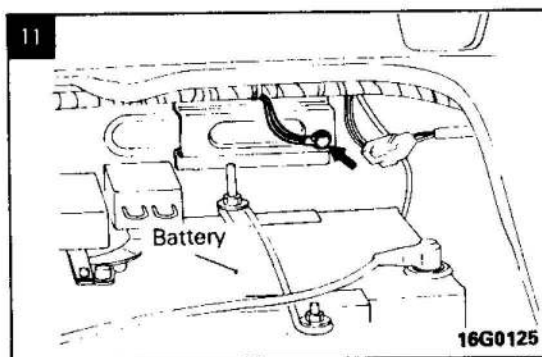
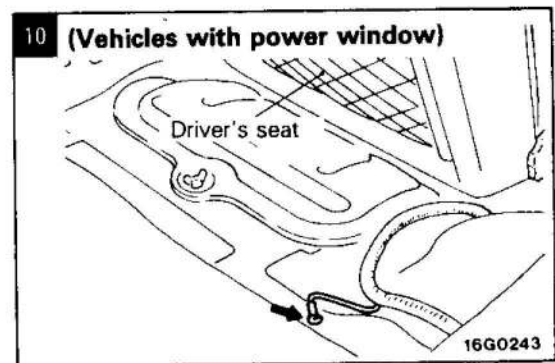
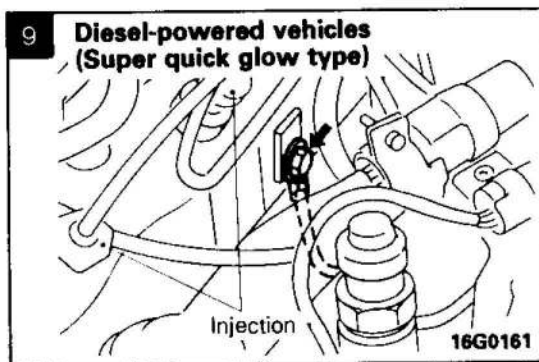
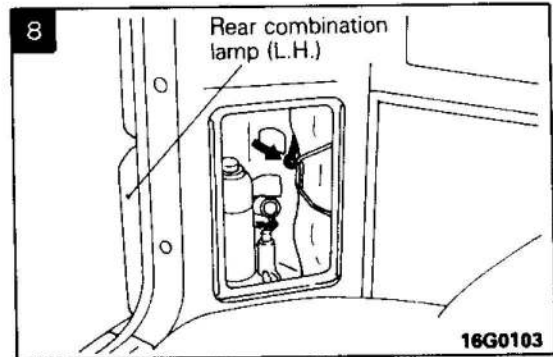
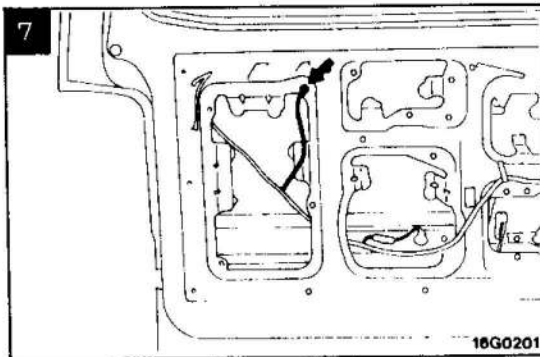


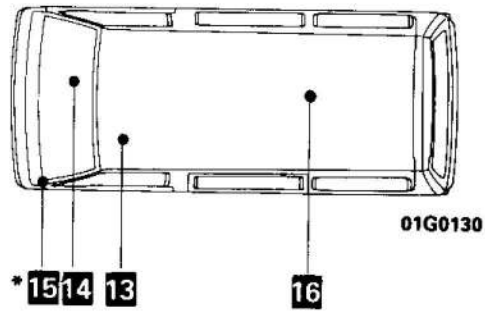
NOTE  
For R.H. drive vehicles, only the positions indicated by the \* are symmetrical.



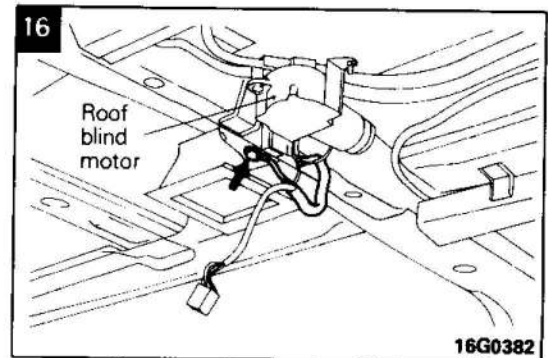
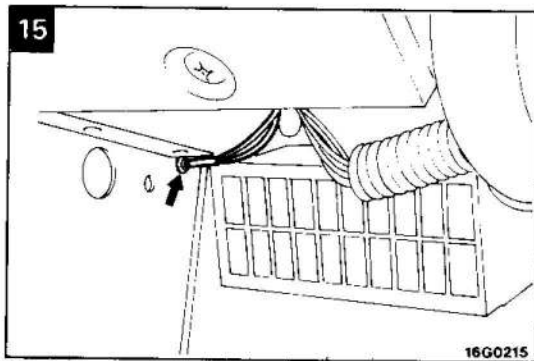
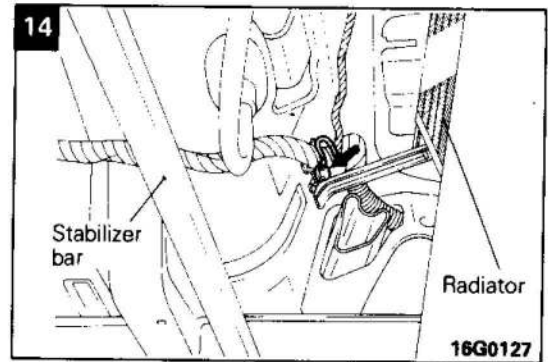
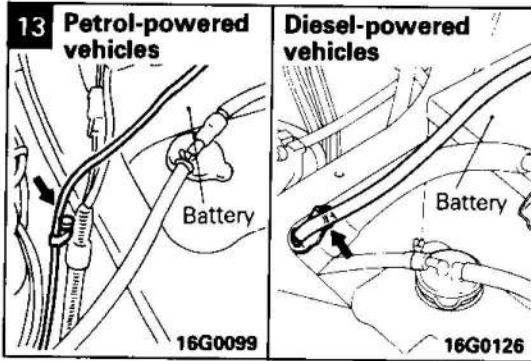


NOTE  
For R.H. drive vehicles, only the positions indicated by the \* are symmetrical.





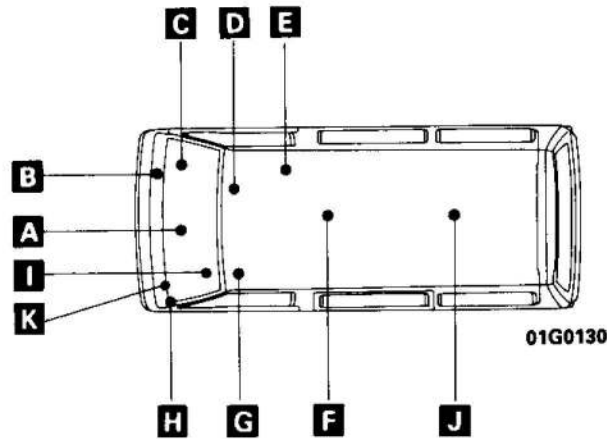
NOTE  
For R.H. drive vehicles, only the positions indicated by the \* are symmetrical.



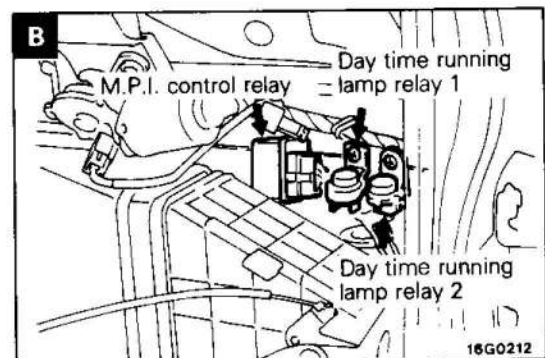
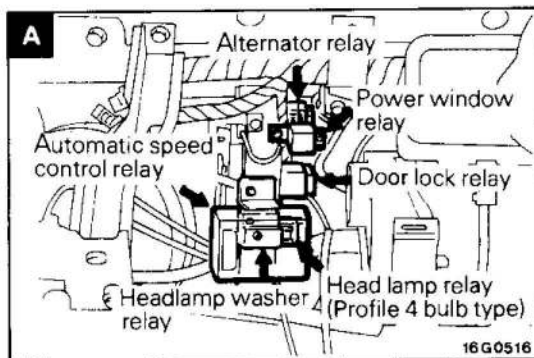
RELAY MOUNTING LOCATIONS

E548C--

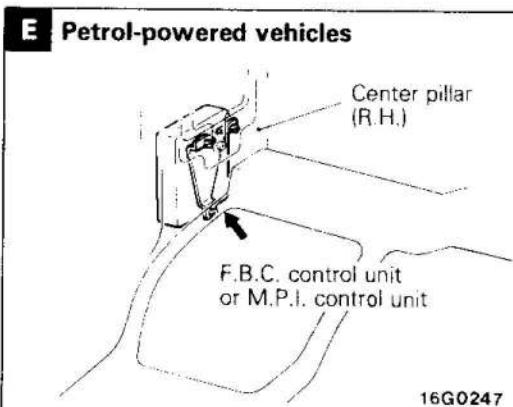
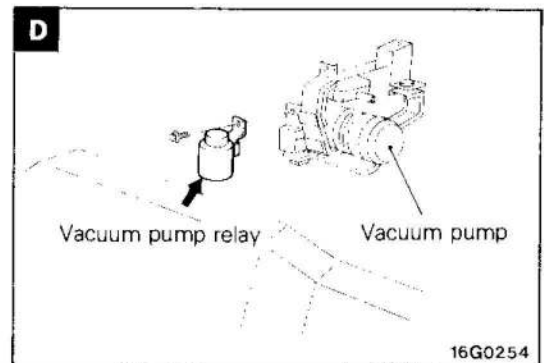
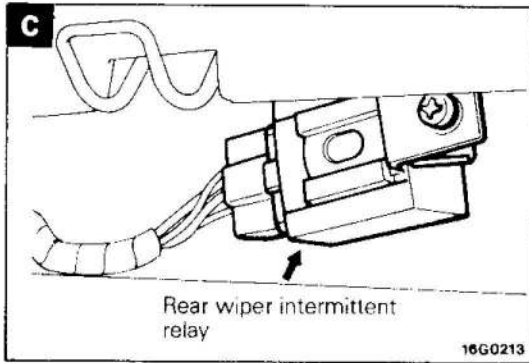
L.H. drive vehicles



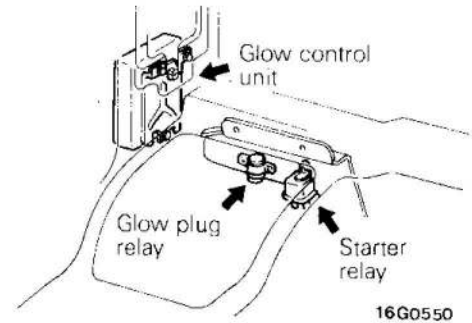
Name	Symbol	Name	Symbol
Alternator relay	A	Cold mixture heater relay	G
Automatic speed control unit	A	Day time running lamp relay 1	B
Day time running lamp relay 2	B	Defogger relay	H
F.B.C. control unit	E	Flasher unit	H
Glow control unit	E	Glow plug relay	E
Glow plug relay (No. 1)	E	Glow plug relay (No. 2)	E
Headlamp relay	H	Headlamp washer relay	A
M.P.I. control relay	B	M.P.I. control relay	E
Overdrive relay	I	Rear heater relay	H
Power window relay	A	Starter relay (Diesel-powered vehicles)	E
Rear fog lamp relay	H	Starter relay (Vehicles with an automatic transmission)	I
Rear wiper intermittent relay	C	Sunroof No. 2 relay	F
Roof blind relay	J	Engine oil level relay	K
Sunroof No. 1 relay	F	Door lock relay	A
Vacuum pump relay	D	Headlamp relay (Vehicles with profile 4 bulb type)	A
Belt warning timer	H		



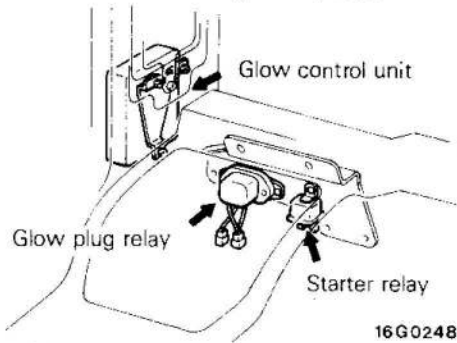




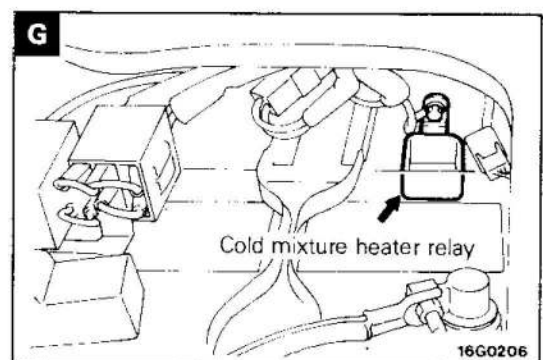
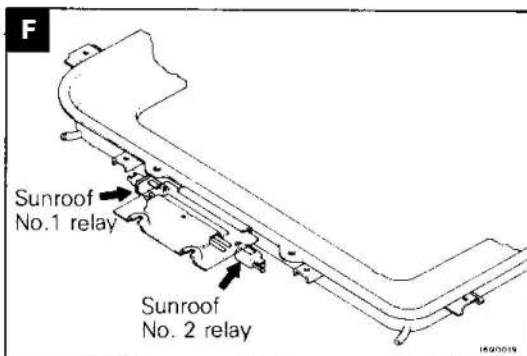
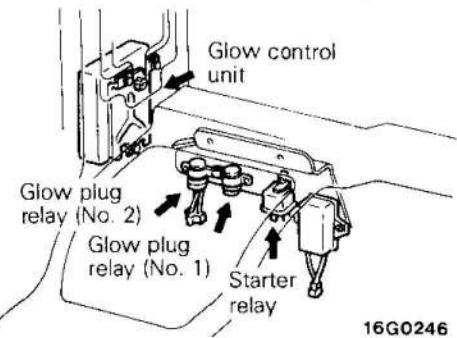
Vehicles with self-regulating glow system

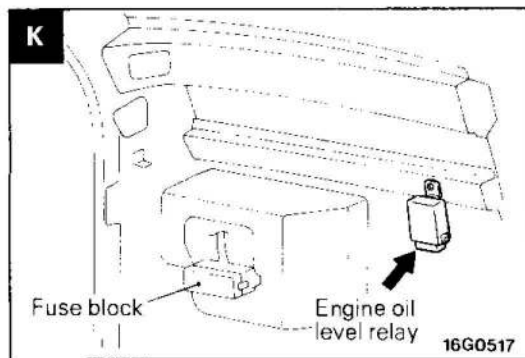
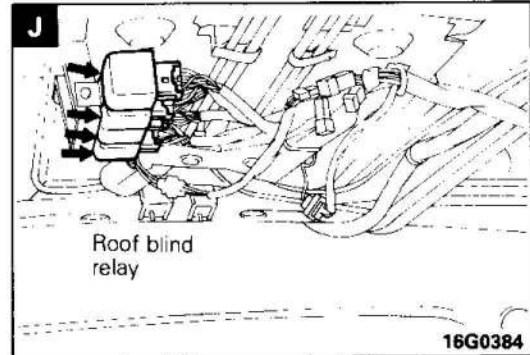
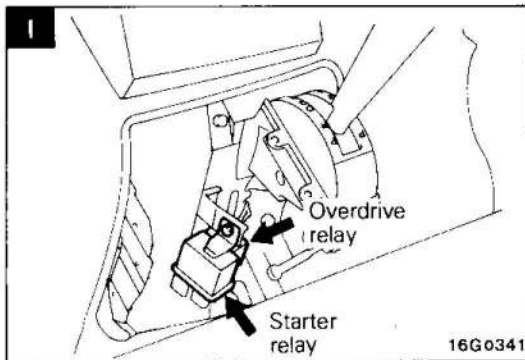
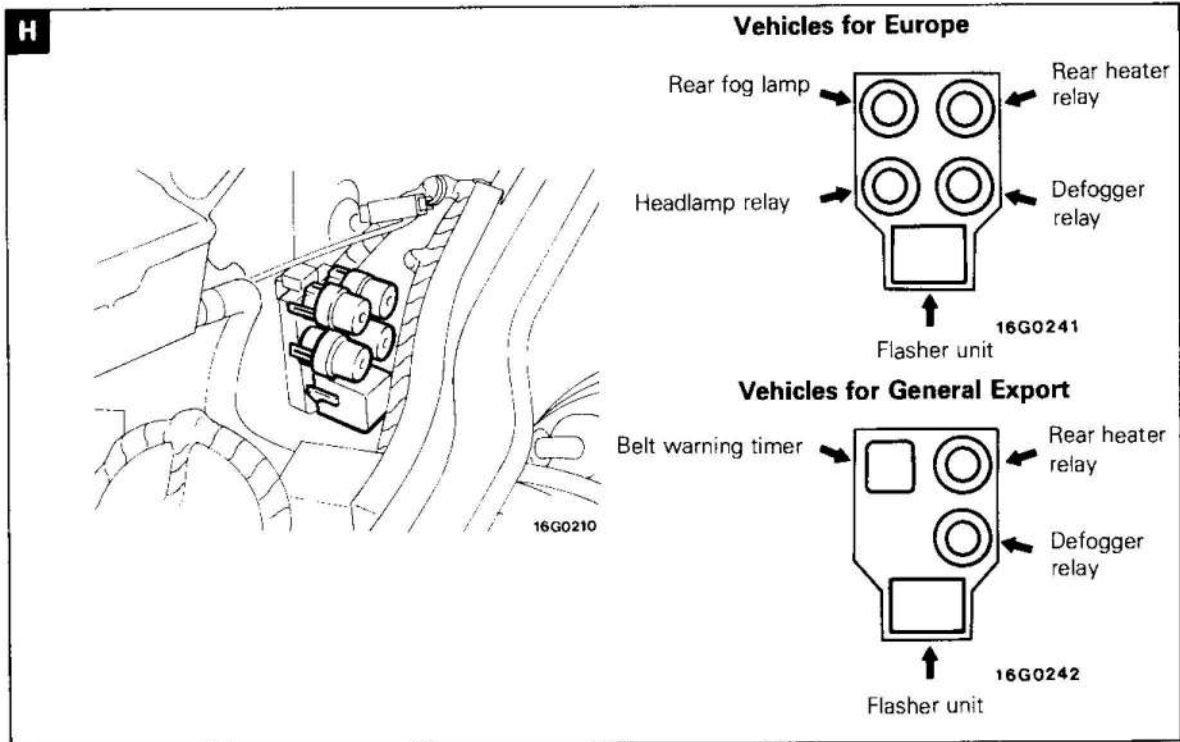


Vehicles with auto glow system

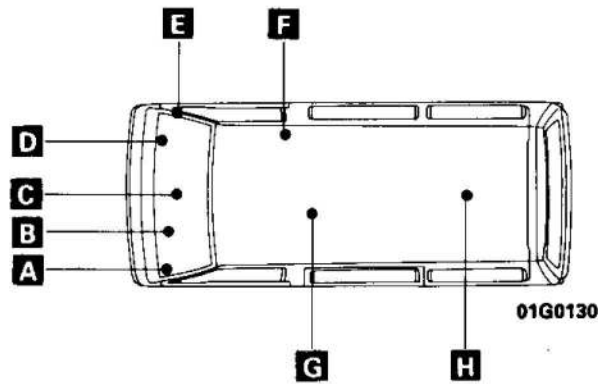


Vehicles with super quick glow system





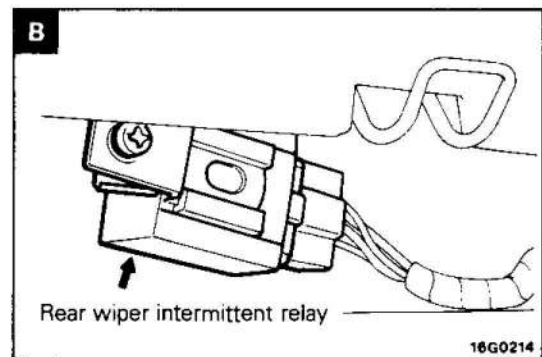
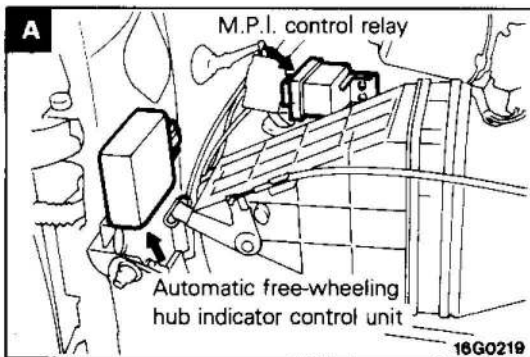
R.H. drive vehicles

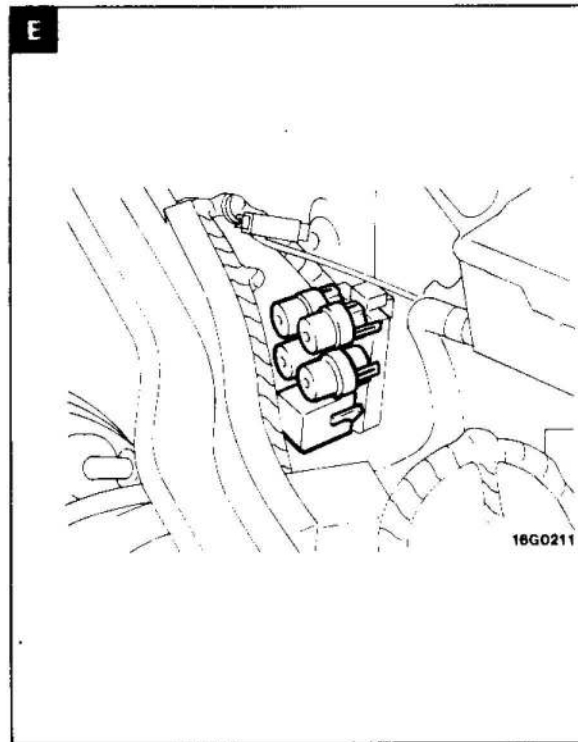
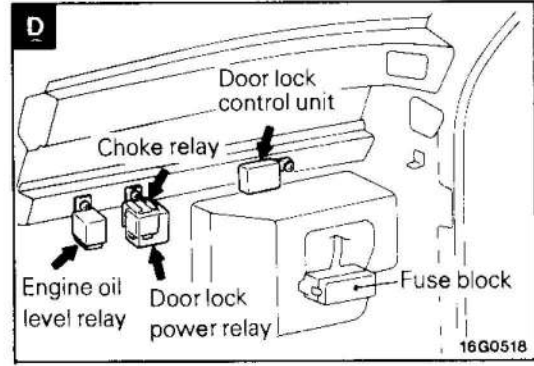
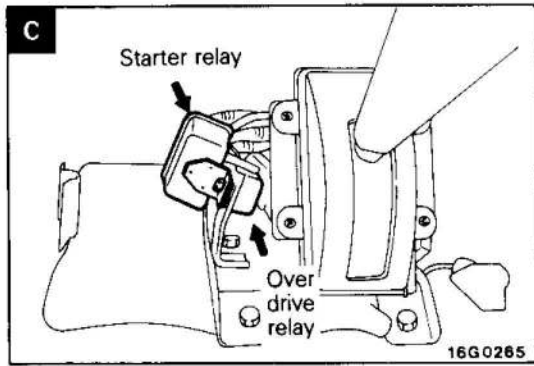


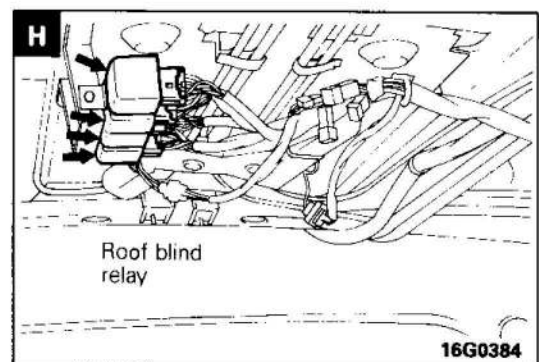
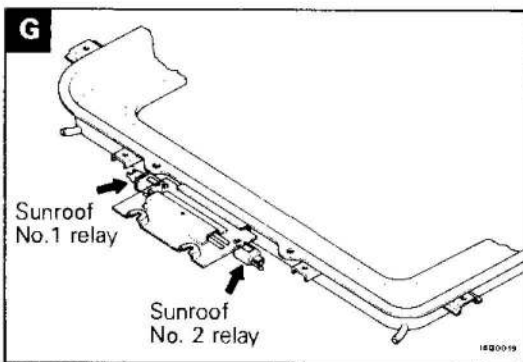
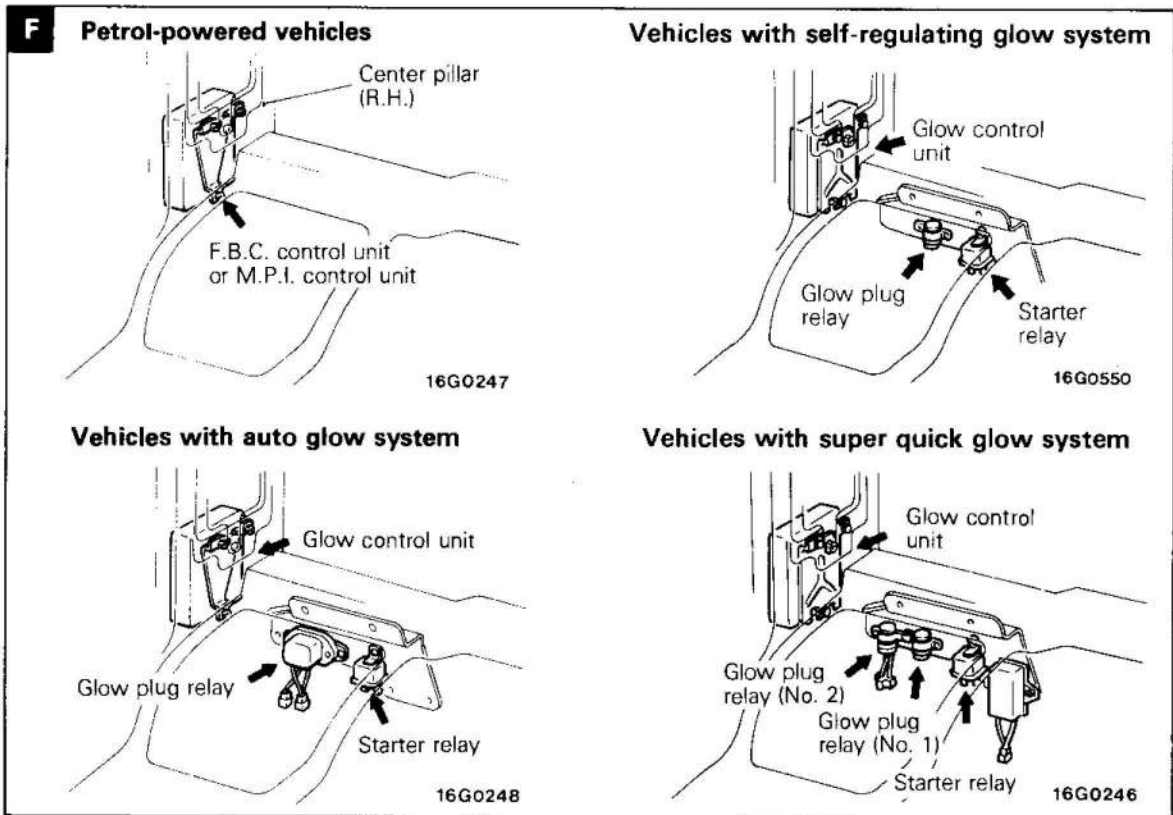
Name	Symbol	Name	Symbol
*Automatic free-wheeling hub indicator control unit	A	Choke relay	D
Defogger relay	E	Dim-dip lamp relay	E
*Door lock control unit	D	*Door lock power relay	D
F.B.C. control unit	F	Flasher unit	E
Glow control unit	F	Glow plug relay	F
Glow plug relay (No. 1)	F	Glow plug relay (No. 2)	F
Headlamp relay	E	*M.P.I. control relay	A
*M.P.I. control unit	F	*Over drive relay	C
Power window relay	E	Rear heater relay	E
Rear wiper intermittent relay	B	Roof blind relay	H
Starter relay (Diesel-powered vehicles)	F	*Starter relay (Petrol-powered vehicles)	C
Sunroof No. 1 relay	G	Sunroof No. 2 relay	G
		Engine oil level relay	D

NOTE

\* indicates vehicles for Australia.

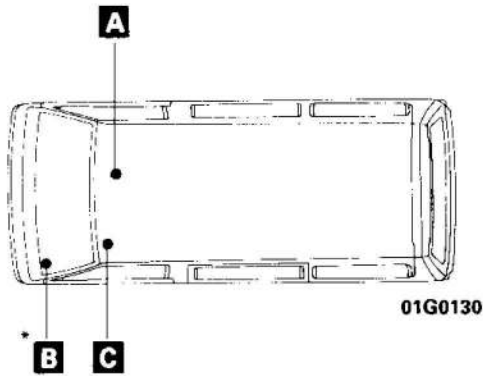






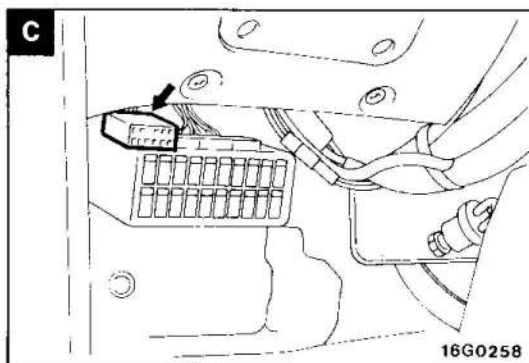
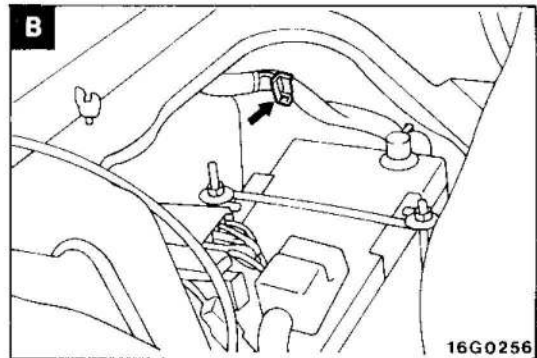
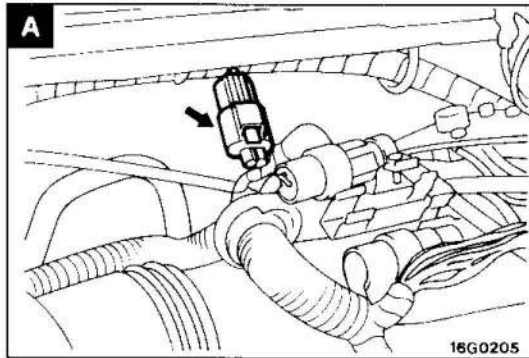
INSPECTION TERMINALS (M.P.I. TYPE)

E54BD—



Name	Symbol
Ignition stabilizing terminal	A
Fuel pump inspection terminal	B
Self-diagnosis terminal	C

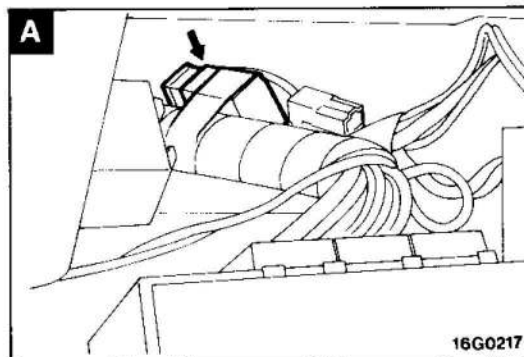
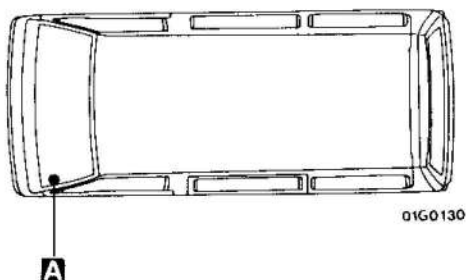
NOTE  
For R.H. drive vehicles, only the positions indicated by the \* are symmetrical.



MOUNTING POSITION OF DIODES AND CONDENSER

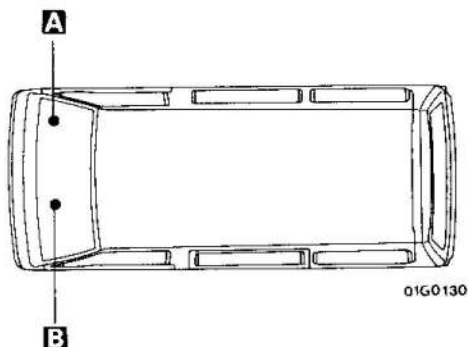
E54BF--

L.H. drive vehicles

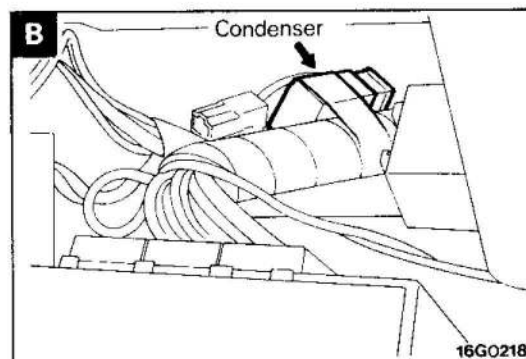
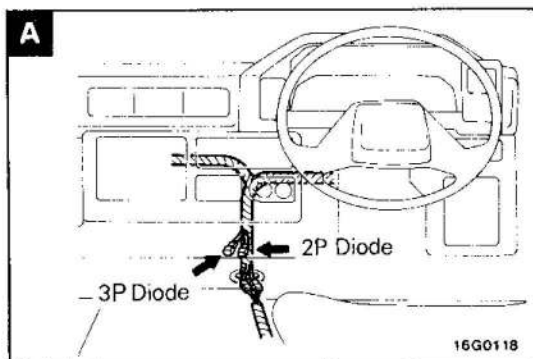


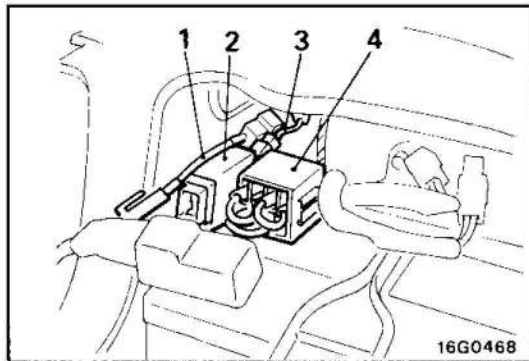
Name	Symbol
Condenser	A

R.H. drive vehicles



Name	Symbol
Condenser	A
2P Diode (for tailgate unlock)	B
3P Diode (for step lamp)	B





## FUSIBLE LINKS

E54BG--

## SPECIFICATIONS

## GENERAL SPECIFICATIONS

## 1. Engine control circuit

Items	Wire colour	Fusible link size mm <sup>2</sup> (in <sup>2</sup> .)
Cold mixture heater circuit	Green	0.5 (0.0008)
M.P.I. circuit	Green	0.5 (0.0008)
Glow circuit	– (Silicon rubber glass tube)	1.0 (0.0015)

## 2. Main circuit

Items	Vehicles built up to May 1989		Vehicles built from June 1989		
	Housing colour	Rated capacity A	Housing colour	Rated capacity A	
Van	Petrol powered vehicles, Diesel powered vehicles without air conditioner	Yellow	60	Black	80
	Diesel powered vehicles with air conditioner	Black	80	Blue	100
Mini-bus	Black	80	Blue	100	

## 3. Air conditioner circuit

Items	Wire colour	Fusible link size mm <sup>2</sup> (in <sup>2</sup> .)	
Van	Vehicles with single air conditioner	Green	0.5 (0.0008)
	Vehicles with dual air conditioner	Brown	0.3 (0.0005)
Green		0.5 (0.0008)	
Mini-bus	Brown	0.3 (0.0005)	
	Green	0.5 (0.0008)	

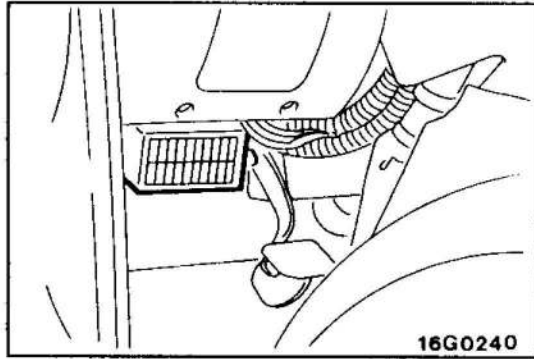
## 4. Fusible link box

Items	Wire colour	Fusible link size mm <sup>2</sup> (in <sup>2</sup> .)	<p>37G0073</p>
1 Ignition switch	Red	0.85 (0.0013)	
2 Defogger	Green	0.5 (0.0008)	
3 Headlamp	Green	0.5 (0.0008)	
	Red*	0.85 (0.0013)*	
4 Door lock	Green	0.5 (0.0008)	

## NOTE

\* indicates Mini-bus for Australia.





**FUSES**

E54BH--

**SPECIFICATIONS**

**GENERAL SPECIFICATIONS**

**Vehicles for Europe**

Power supply circuit	Rated capacity A	Major load circuit
Battery (B <sub>1</sub> )	10	Room lamp circuit
	10	Hazard circuit
	10	Stop lamp circuit
Battery (HU)	15	Headlamp (upper) circuit
Battery (HL)	15	Headlamp (lower) circuit
Battery (B <sub>3</sub> )	15	Defogger circuit
	20	Rear heater circuit
Battery (B <sub>2</sub> )	20	Door lock circuit
Battery (FOG)	10	Rear fog lamp circuit
Ignition switch (ACC)	15	Horn circuit
	15	Wiper circuit
	15	Cigarette lighter circuit
Ignition switch (ACC)	15, 20*	Sunroof circuit
Ignition switch (IG1)	15	Turn signal lamp circuit
Ignition switch (IG2)	20	Heater circuit
	15	Heated seat circuit
Battery (TAIL)	10	Tail lamp (L.H. ) circuit
	10	Tail lamp (R.H.) circuit

**NOTE**

1. Rated fuse capacity and major circuit are described on the fuse block cover.
2. \* indicates vehicles built from December 1988.

## Vehicles for General Export and Australia

Power supply circuit	Rated capacity A	Major load circuit
Battery (B1)	10* <sup>1</sup>	Room lamp circuit
	10	Hazard circuit
	15	Horn circuit
	10	Stop lamp circuit
Battery (HU)* <sup>1</sup>	15	Headlamp (U1) circuit
Battery (HU)	15	Headlamp (U2) circuit
Battery (HL)	15	Headlamp (lower) circuit
Battery (B <sub>3</sub> )	15	Defogger circuit
	20	Rear heater circuit
Battery (B <sub>2</sub> )	20	Door lock circuit
Ignition switch (ACC)	15	Wiper circuit
	15	Cigarette lighter circuit
	15	Rear cigarette lighter circuit
	15, 20* <sup>2</sup>	Sunroof circuit
Ignition switch (IG1)	15	Turn signal lamp circuit
Ignition switch (IG2)	20	Heater circuit
	15	Heated seat circuit

## NOTE

1. Rated fuse capacity and major circuit are described on the fuse block cover.
2. \*<sup>1</sup> indicates Mini-bus for Australia.
3. \*<sup>2</sup> indicates vehicles built from November 1988.

# BATTERY

## SPECIFICATIONS

### GENERAL SPECIFICATIONS

E54CA--

#### Vehicles for Europe

Items	Standard		Option
	Petrol-powered vehicle	Diesel-powered vehicle	Diesel-powered vehicle
Type	65D23R-MF	95D31R-MF	80D26R-MF*
Capacity (5HR) Ah	52	64	55
Reserve capacity min.	111	159	133
Cold cranking current A	420	622	582

#### Vehicles for General Export

Items	Standard		Option	
	Petrol-powered vehicle	Diesel-powered vehicle	Petrol-powered vehicle	Diesel-powered vehicle
Type	34B19R (S)-MF	95D31R--MF	55D23R-MF	80D26R-MF*
Capacity (5HR) Ah	27	64	48	55
Reserve capacity min.	49	159	99	133
Cold cranking current A	272	622	356	582

#### Vehicles for Australia

Items	Standard		Option
	Petrol-powered vehicle	Diesel-powered vehicle	P03VGSNR8·P24VGSNR8
Type	34B19R (S)-MF	95D31R-MF	34B19R (S)
Capacity (5HR) Ah	27	64	27
Reserve capacity min.	49	159	49
Cold cranking current A	272	622	272

**NOTE**

\* indicates 2-battery equipped.

## BATTERY

### INSPECTION

E54CJAA

Refer to GROUP 11-Adjustment of Engine for Battery Check.

# IGNITION SWITCH

## SPECIFICATIONS

### GENERAL SPECIFICATIONS

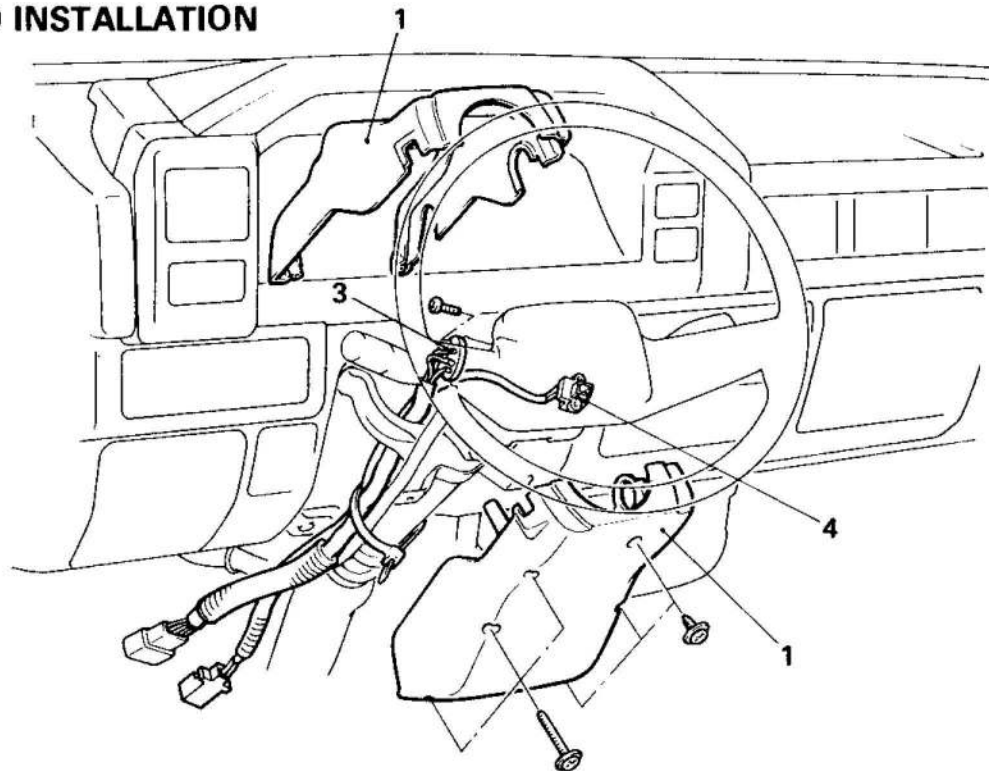
E54DA--

Items	Specifications
Load capacity A	
AM-ACC	15
AM-IG <sub>1</sub>	12
AM-IG <sub>2</sub>	15
AM-ST	15
AM-R	20

## IGNITION SWITCH

### REMOVAL AND INSTALLATION

E54DH--



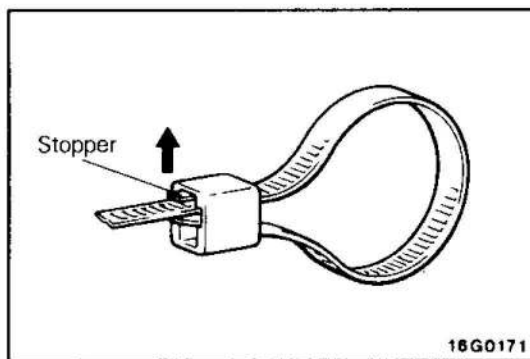
#### Removal steps

- ◆◆ 1. Column cover
- 2. Cable band
- 3. Ignition switch
- 4. Light monitor switch

#### NOTE

- (1) Reverse the removal procedures to reinstall.
- (2) ◆◆ : Refer to "Service Points of Removal".

16G0343



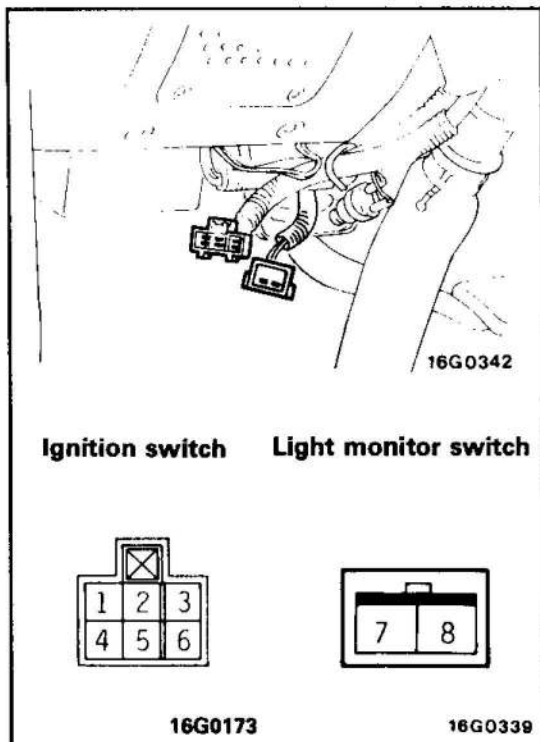
### SERVICE POINTS OF REMOVAL

E54DIAA

#### 2. REMOVAL OF CABLE BAND

Push up stopper and remove cable band.

E54DJAA



**INSPECTION**

- (1) Disconnect the wiring connector from the ignition switch, and connect an ohmmeter to the switch side connector.
- (2) Operate the switch, and check the continuity between the terminals.

**Ignition Switch**

Key position \ Terminal	6	3	4	2	1	5
LOCK						
ACC	○—○					
ON	○—○	○—○	○—○	○—○		
START	○—○		○—○		○—○	○—○

**Light Monitor Switch**

Key position \ Terminal	7	8
When the key is removed	○—○	○—○
When the key is inserted		

**NOTE**

○—○ indicates that there is continuity between the terminals.

# METERS AND GAUGES

## SPECIFICATIONS

### GENERAL SPECIFICATIONS

E54EA---

Items	Specifications
Speedometer Type	Rotary magnet type
Tachometer Type	Pulse type
Fuel gauge Type	Bimetal type (constant-voltage relay incorporated for 7 V)
Fuel gauge unit Type	Variable resistance type
Water temperature gauge Type	Bimetal type (7 V operation)
Water temperature gauge unit Type	Thermistor type
Altimeter Type	Aneroid type
Inclinometer Type	Gravity type

### SERVICE SPECIFICATIONS

E54EB---

Items	Specifications
Standard value	
Tachometer indication error r/min.	
1,000	±100
3,000	±150
5,000	±250
Operation range of fuel gauge unit mm (in.)	
2WD	
Point F	7.2±2 (0.28±0.08)
Point E	172.8±2 (6.80±0.08)
4WD	
Point F	102.7±2 (4.04±0.08)
Point E	157.3±2 (6.19±0.08)
Fuel gauge unit resistance Ω	
Position F	3±2
Position E	110±7
Water temperature gauge unit resistance Ω [at 70°C (158°F)]	104±13.5
Fuel gauge resistance Ω	
Vehicles without tachometer	
Between A-B (constant-voltage type)	99-121
Between B-C (fuel gauge)	50-60
Between A-C	149-181
Vehicles with tachometer	
Between A-B (constant-voltage type)	63-77
Between B-C (fuel gauge)	50-60
Between A-C	113-137
Water temperature gauge resistance Ω	50-60

**TORQUE SPECIFICATIONS**

E54EC--

Items	Nm	kgm	ft.lbs.
Engine coolant temperature gauge unit	8 - 10	0.8 - 1.0	6 - 7

**SEALANTS AND ADHESIVES**


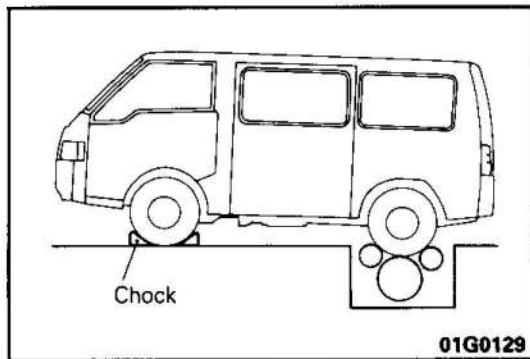
E54EE--

Items	Specified sealant and Adhesive	Remarks
Engine coolant temperature gauge unit	3M Nut Locking Part No. 4171 or equivalent	Drying sealant

**SPECIAL TOOLS**

E54EF--

Tool (Number and name)	Use
MB990784 Ornament remover	Removal of trims

**SERVICE ADJUSTMENT PROCEDURES**

E54EGAA

**1. INSPECTION OF SPEEDOMETER**

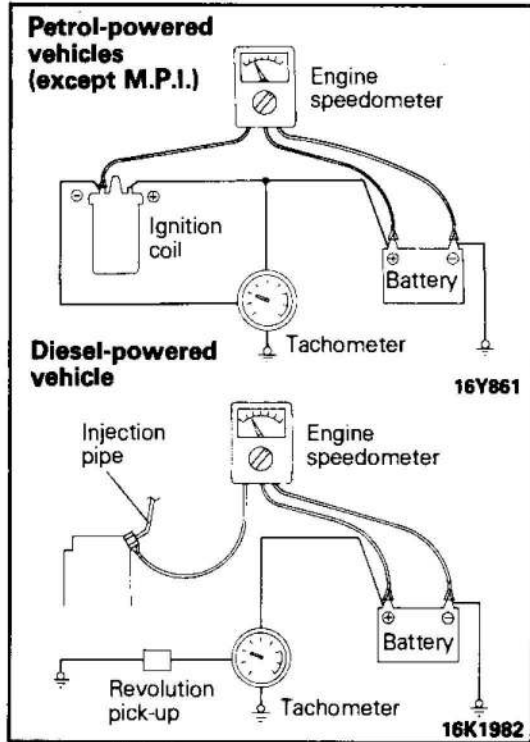
**NOTE**

If there is a special regulation for speedometer indicator difference in the area where the vehicle is operated, be sure to meet the requirement of the regulation.

- (1) Assure tire pressure at standard value.
- (2) Use speedometer tester to check indicator difference.

**Caution**

When checking with speedometer tester, block non-operating wheels to prevent vehicle moving. Set transfer shift lever at 2H for 4WD vehicles.



**2. INSPECTION OF TACHOMETER**

Connect engine speedometer and compare the engine speedometer and tachometer readings. Replace tachometer if difference is excessive.

<b>Standard value:</b> 1,000 rpm	±100 rpm
3,000 rpm	±150 rpm
5,000 rpm	±250 rpm

**Caution**

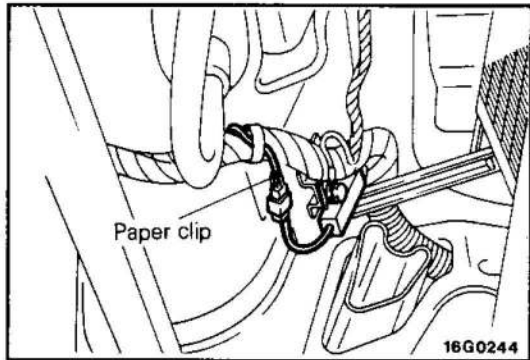
**As the tachometer is negative grounded, do not connect battery conversely to prevent damaging transistor and diode.**

**Petrol-powered Vehicles (excluding MPI) and Diesel-powered Vehicles**

Connect engine speedometer as illustrated.

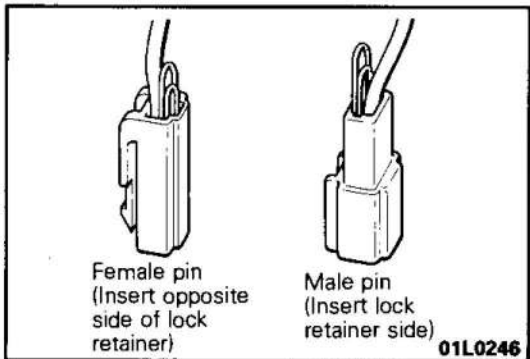
**M.P.I. Vehicles**

- (1) Insert paper clip on 2 pin connector (from harness side) located between the ignition coil (primary side) and noise filter.



**Caution**

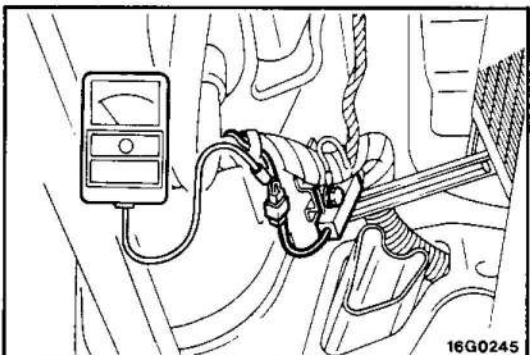
**Insert paper clip along terminal wall as illustrated.**



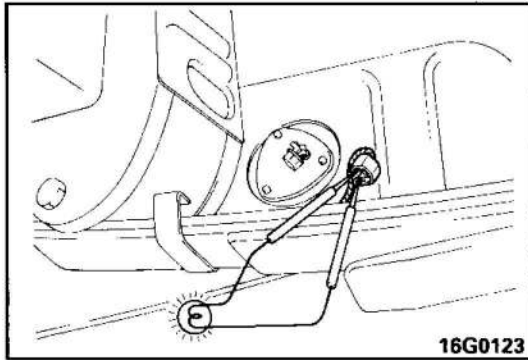
- (2) Connect engine speedometer to paper clip.

**NOTE**

We recommend flux detection type engine speedometer as it can be simply clamped to the high tension cable.

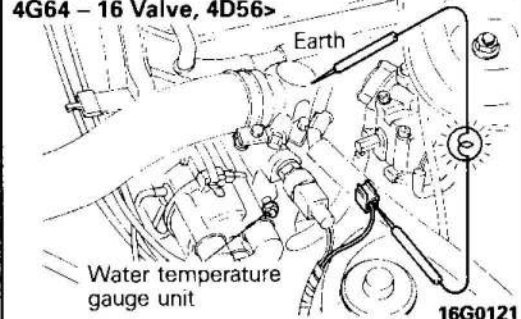






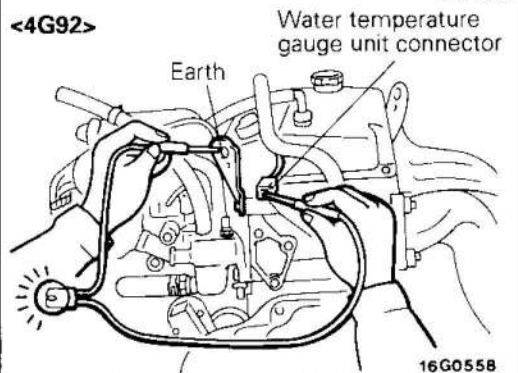
16G0123

<Except 4G92, 4G63 - 16 Valve,  
4G64 - 16 Valve, 4D56>



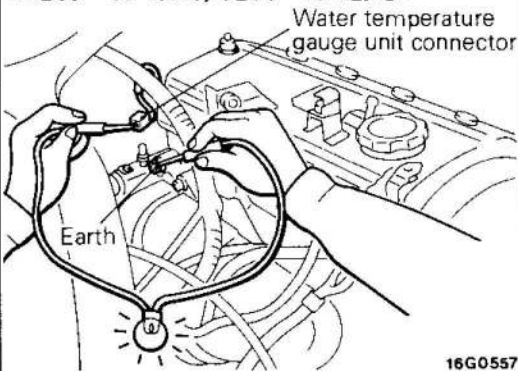
16G0121

<4G92>



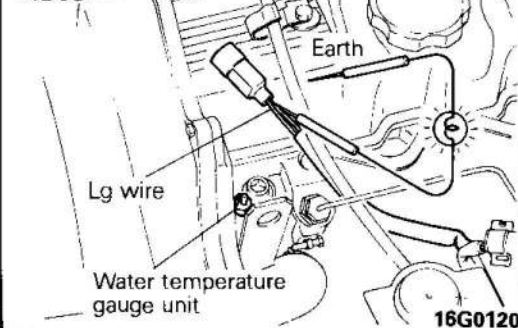
16G0558

<4G63 - 16 Valve, 4G64 - 16 Valve>



16G0557

<4D56>



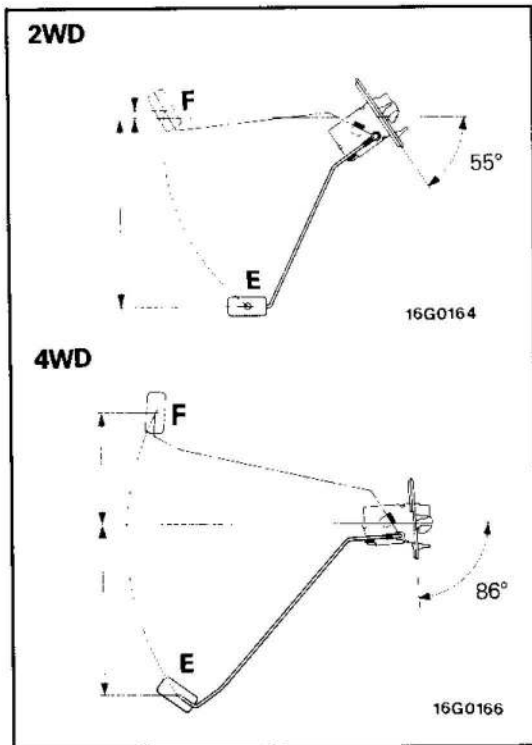
16G0120

### 3. SIMPLE INSPECTION OF FUEL GAUGE

- (1) Remove connector from fuel gauge unit in fuel tank.
- (2) Connect test lamp (12 V-3.4 W) between YL and B wires on harness side connector.
- (3) Turn ON ignition key.
- (4) Assure test lamp flashes and gauge needle moves.
- (5) If test lamp flashes but gauge needle does not move, replace fuel gauge.  
If test lamp does not flash (and gauge needle does not move), check fuse for broken wire, or resistance between gauge terminals (see pages 54-26.), or break in harness. Replace or repair defective parts.

### 4. SIMPLE INSPECTION OF WATER TEMPERATURE GAUGE

- (1) Remove connector from water temperature gauge unit in engine compartment.
- (2) Ground harness side connector via test lamp (12 V-3.4 W).
- (3) Turn ON ignition key.
- (4) Check that test lamp flashes and gauge needle moves.
- (5) If test lamp flashes but the gauge needle does not move, replace water temperature gauge.  
If test lamp does not flash (and gauge needle does not move), check fuse for broken wire, or resistance between gauge terminals (see pages 54-26.), or break in harness. Replace or repair defective part.



## 5. INSPECTION OF FUEL GAUGE UNIT

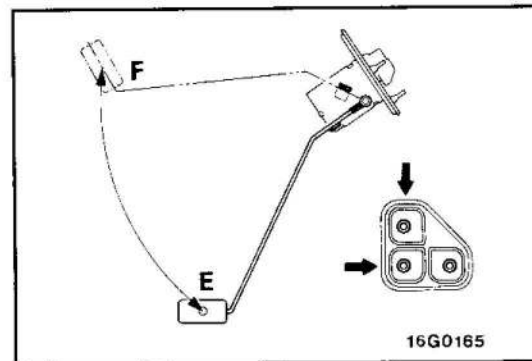
To check, remove fuel gauge unit from fuel tank.  
(See Group 13 FUEL—Fuel Tank.)

### Float Height of Fuel Gauge Unit

Moving float and measure the height at F (highest) and E (lowest) with float arm touching stopper.

#### Standard value:

<b>2WD:</b>	<b>7.2±2 mm (0.28±0.08 in.)</b>	<b>(F)</b>
	<b>172.8±2 mm (6.80±0.08 in.)</b>	<b>(E)</b>
<b>4WD:</b>	<b>102.7±2 mm (4.04±0.08 in.)</b>	<b>(F)</b>
	<b>157.3±2 mm (6.19±0.08 in.)</b>	<b>(E)</b>



### Standard Resistance of Fuel Gauge Unit

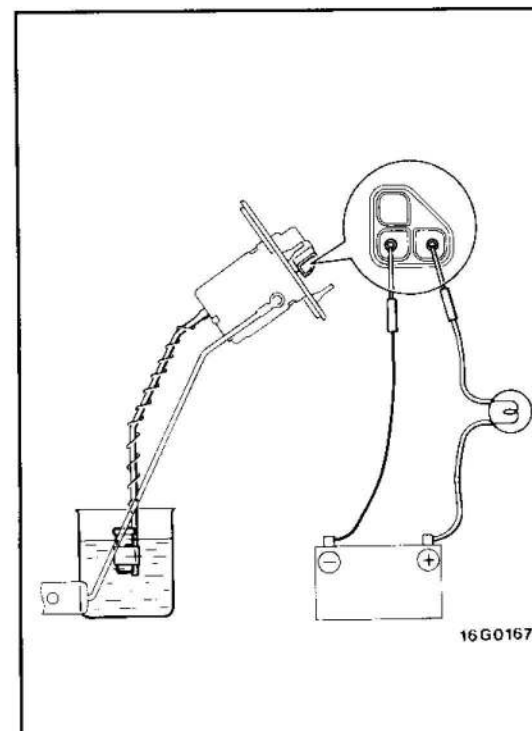
- (1) Check that resistance between the fuel gauge terminal and ground terminal is at standard value when fuel gauge unit float is at F (highest) and E (lowest).

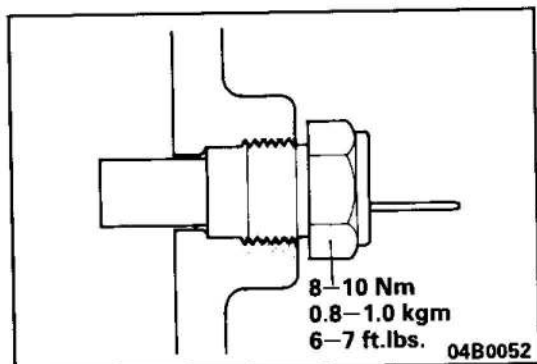
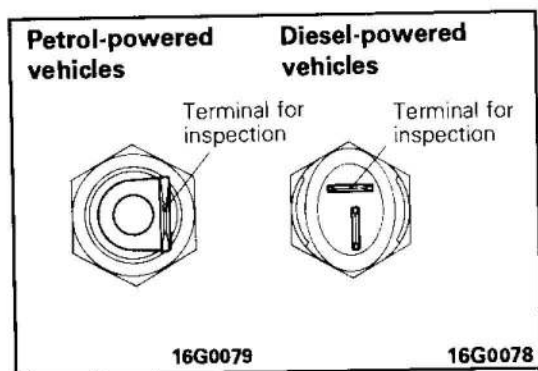
**Standard value:** **3 ± 2 Ω (F)**  
**110 ± 7 Ω (E)**

- (2) Check that resistance changes smoothly when float moves slowly between F (highest) and E (lowest).

## 6. FUEL SENSOR

Connect fuel gauge unit to battery via test lamp (12 V–3.4 W). Immerse in water. Condition good if lamp goes off when unit thermistor is in water and lights when unit is removed from water.





### 7. INSPECTION OF ENGINE COOLANT TEMPERATURE GAUGE UNIT

To check, remove engine coolant temperature gauge unit from intake manifold.

- (1) Immerse unit in 70°C (158 F) water to measure resistance.

**Standard value: 104±13.5Ω**

- (2) After checking, apply the specified adhesive around the thread of engine coolant temperature gauge unit and install on the intake manifold.

**Specified adhesive: 3M Nut Locking Part No. 4171 or equivalent**

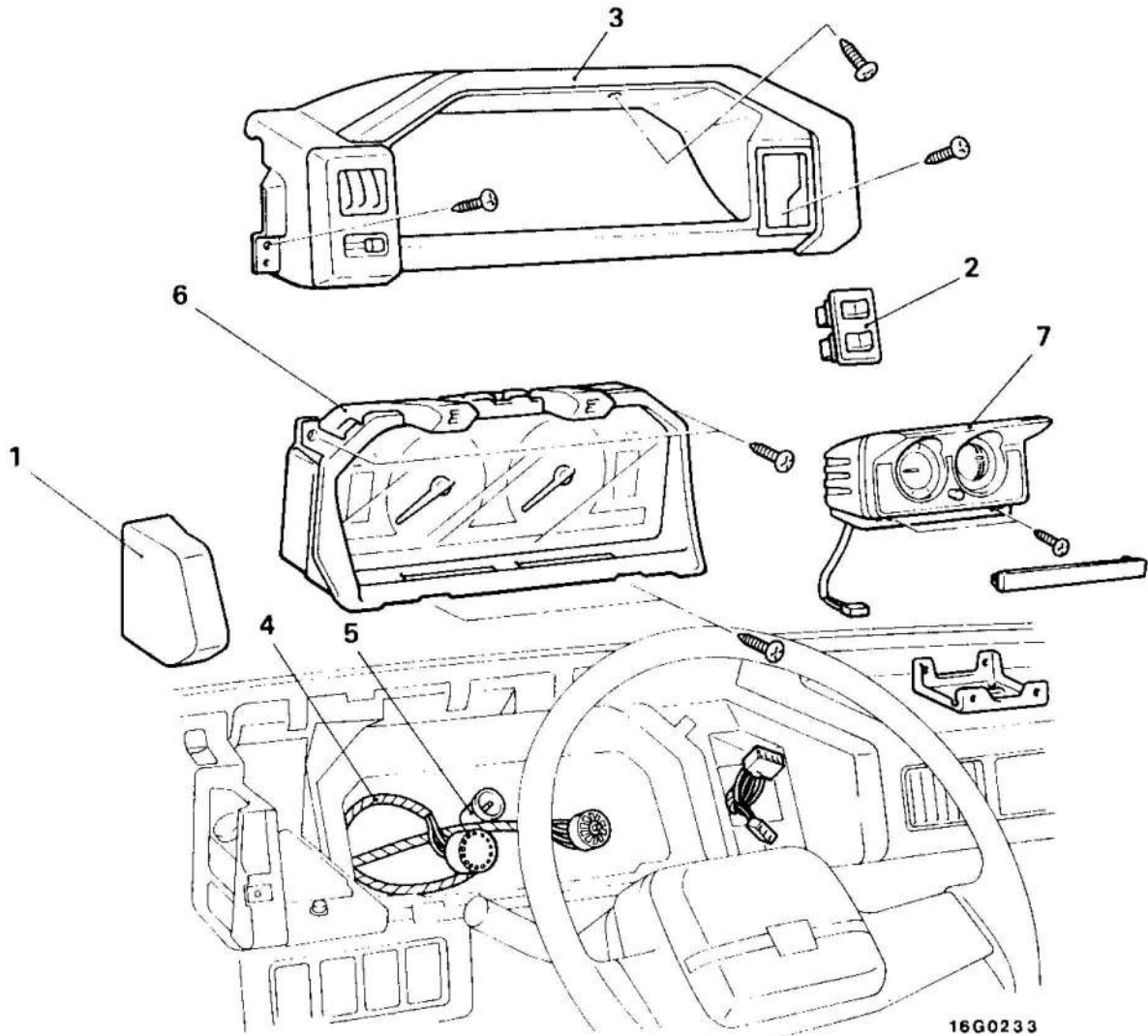
54-24-2

---

NOTES

**METERS AND GAUGES**  
**REMOVAL AND INSTALLATION**

E54EH--



**Combination meter removal steps**

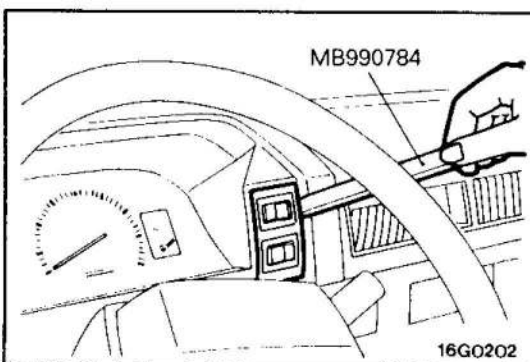
- ◆◆ 1. Inspection lid
- ◆◆ 2. Switch panel
- ◆◆ 3. Meter hood
- ◆◆ 4. Front harness connection
- ◆◆ 5. Speedometer cable connection
- ◆◆ 6. Combination meter

**Altimeter and inclinometer removal**

- ◆◆ 7. Altimeter and inclinometer

**NOTE**

- (1) Reverse the removal procedures to reinstall.
- (2) ◆◆ : Refer to "Service Points of Removal".

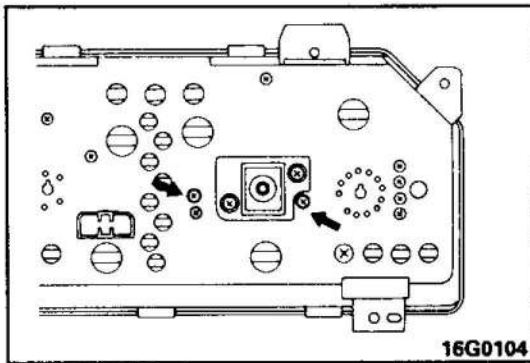


**SERVICE POINTS OF REMOVAL**

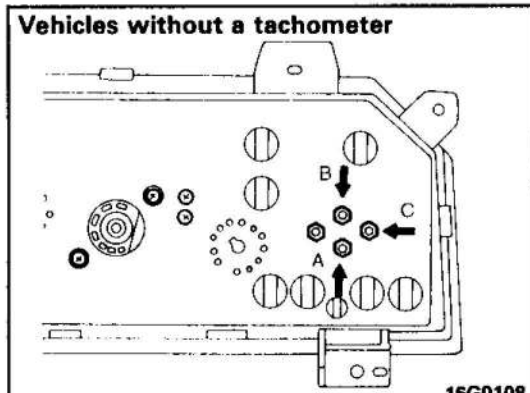
E54E1AA

**2. REMOVAL OF SWITCH PANEL**

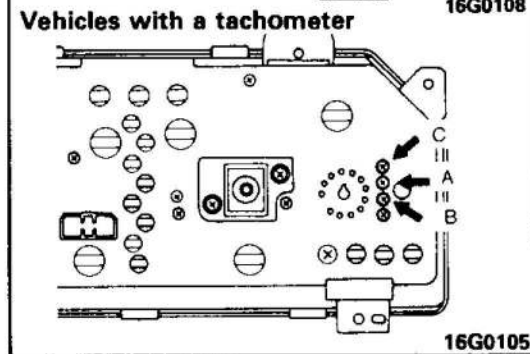
Remove switch panel from meter hood with special tool.



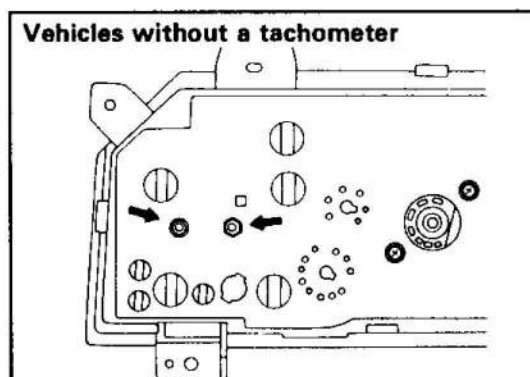
16G0104



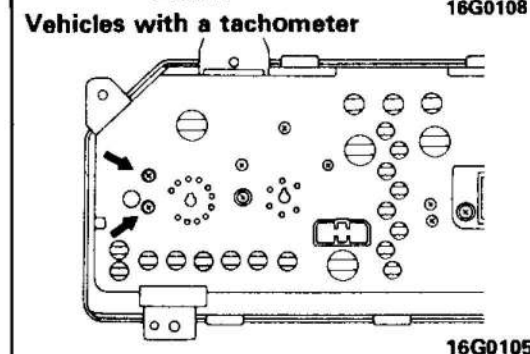
16G0108



16G0105



16G0108



16G0105

## INSPECTION

### 1. INSPECTION OF REED SWITCH

Use circuit tester to check circuit repeats off/on between terminals when speedometer shaft turned several times.

### 2. INSPECTION OF FUEL GAUGE CIRCUIT

Measure resistance between terminals with circuit tester.

#### Standard value:

##### Vehicles without tachometer

Between A-B (Constant-voltage relay) 99-121  $\Omega$

B-C (Fuel gauge) 50-60  $\Omega$

A-C 149-181  $\Omega$

##### Vehicles with tachometer

Between A-B (Constant-voltage relay) 63-77  $\Omega$

B-C (Fuel gauge) 50-60  $\Omega$

A-C 113-137  $\Omega$

### 3. INSPECTION OF WATER TEMPERATURE GAUGE CIRCUIT

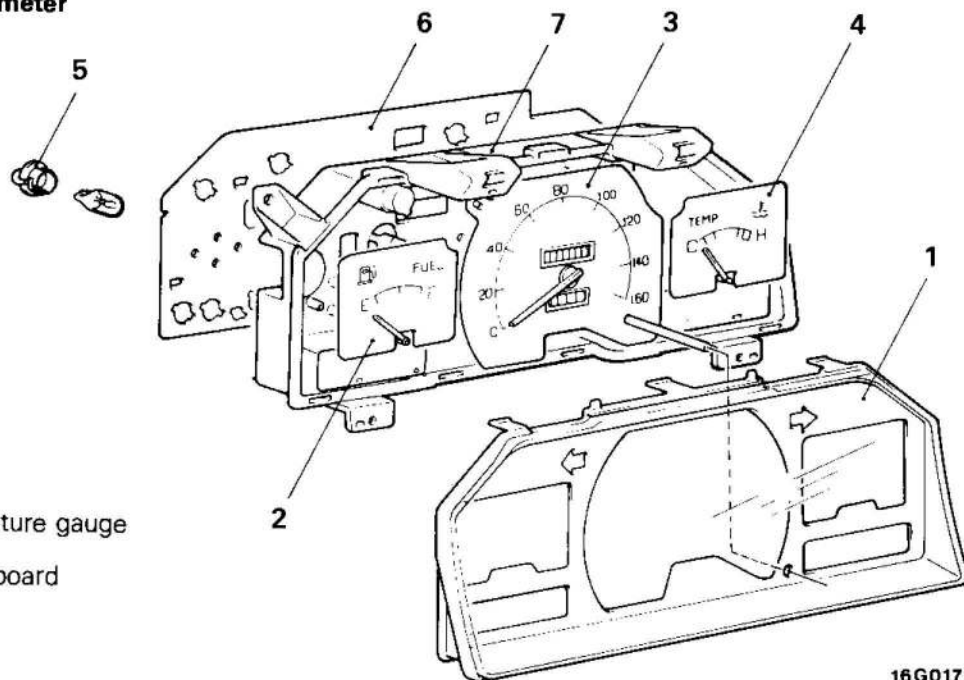
Measure resistance between terminals with circuit tester.

**Standard value: 50-60  $\Omega$**

DISASSEMBLY AND REASSEMBLY

E54EL--

Vehicles without tachometer

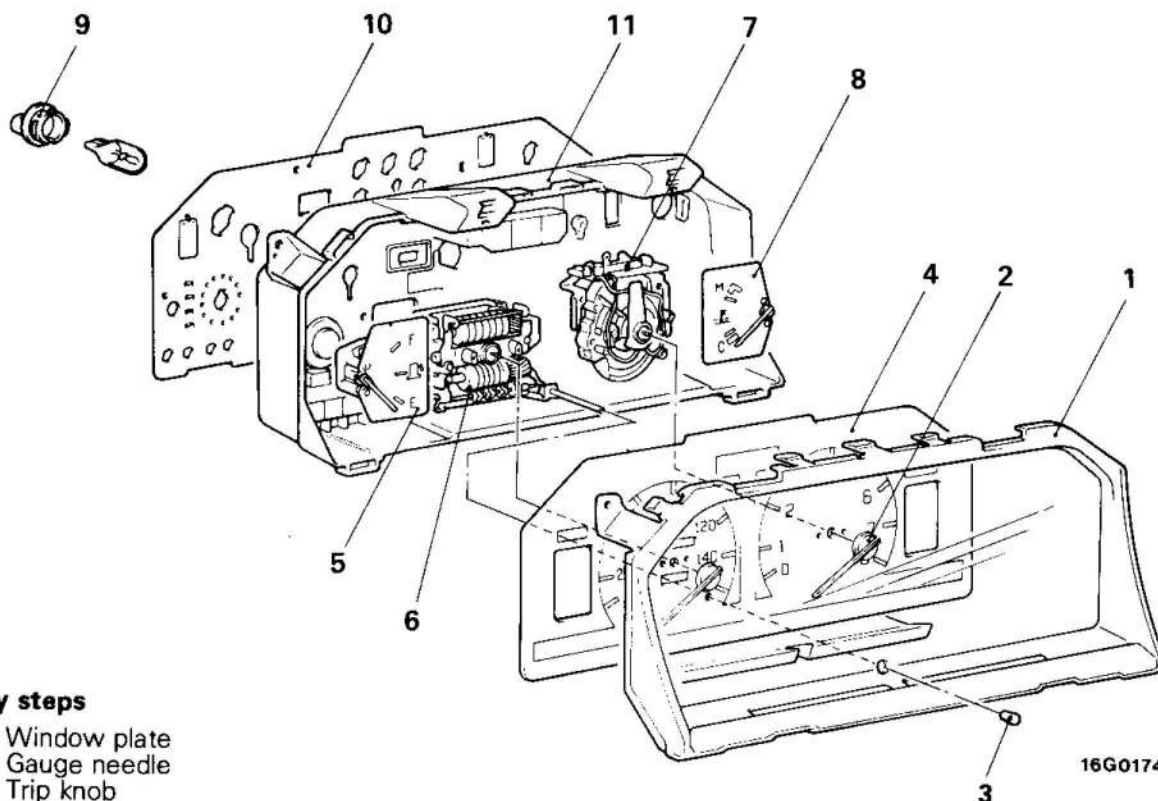


Disassembly steps

1. Window plate
2. Fuel gauge
3. Speedometer
4. Water temperature gauge
5. Socket
6. Printed circuit board
7. Meter case

16G0175

Vehicles with tachometer



Disassembly steps

1. Window plate
2. Gauge needle
3. Trip knob
4. Dial plate
5. Fuel gauge
6. Speedometer
7. Tachometer
8. Water temperature gauge
9. Socket
10. Printed circuit board
11. Meter case

16G0174

NOTE

Reverse the disassembly procedures to reassemble.

**3-METER UNIT****SPECIFICATIONS****GENERAL SPECIFICATIONS**

E54ZAA-

**3-METER UNIT**

Items	Specifications
Inclinometer	
Type	Gravity type
Damping system	Oil-filled system
Altimeter	
Type	Aneroid type
Thermometer	
Type	Fluorescent digital display type

**SERVICE SPECIFICATIONS**

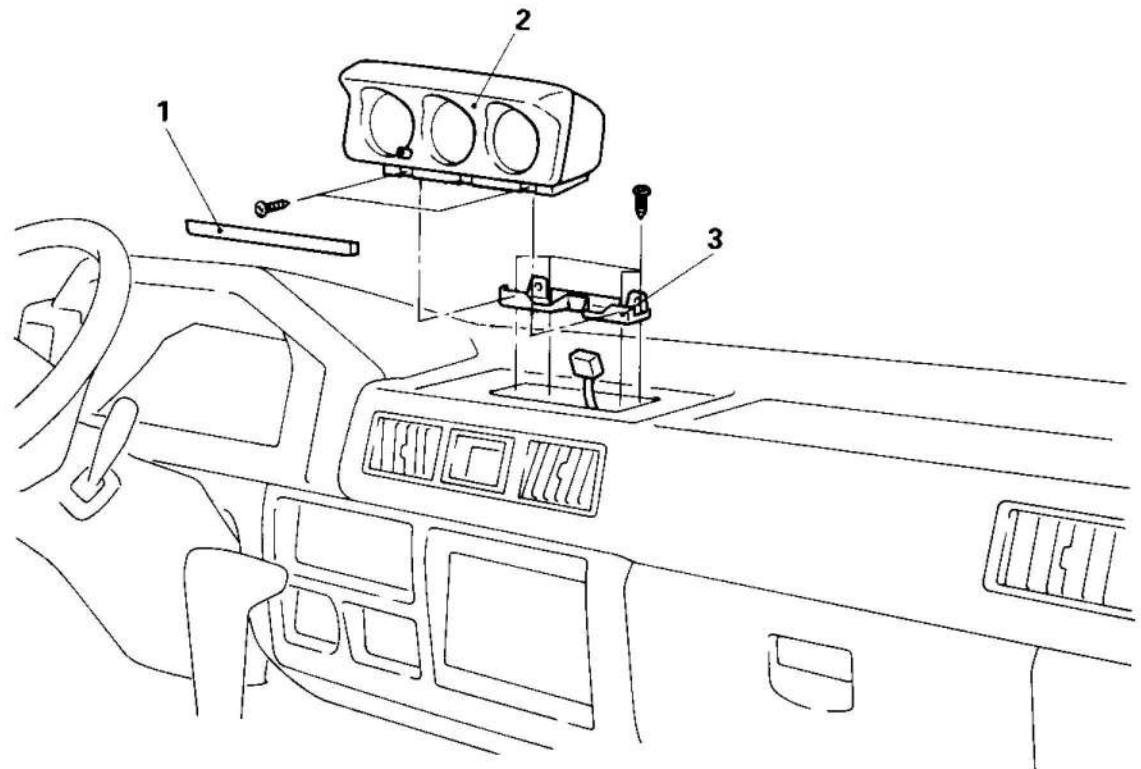
E54ZBA-

Items	Specifications
Standard value	
Thermometer indication error	°C (°F) ±3 (±5.4)
Inside air temperature sensor and outside air temperature sensor resistance value	kΩ Approx. 1.2 at 20°C (68°F) Approx. 1.5 at 40°C (104°F)



## 3-METER UNIT REMOVAL AND INSTALLATION

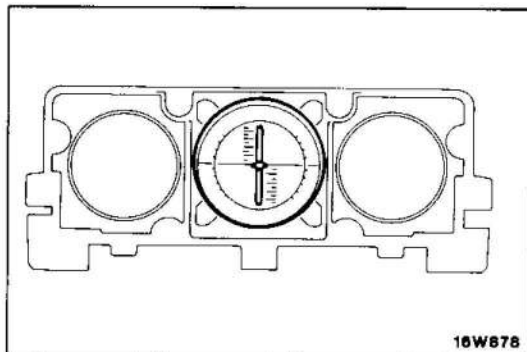
E54ZCA-



16G0538

### Removal steps

1. Cover
2. 3-meter unit
3. Meter assembly bracket



16W878

### INSPECTION INCLINOMETER

E54ZDAA

- (1) Check to be sure that operation is smooth when the inclinometer is tilted up/down and to the left and right.
- (2) The inclinometer can be considered to be in good condition if the pointer indicates the spherical dial horizontal centre line when the meter case is placed on a level surface.

### THERMOMETER

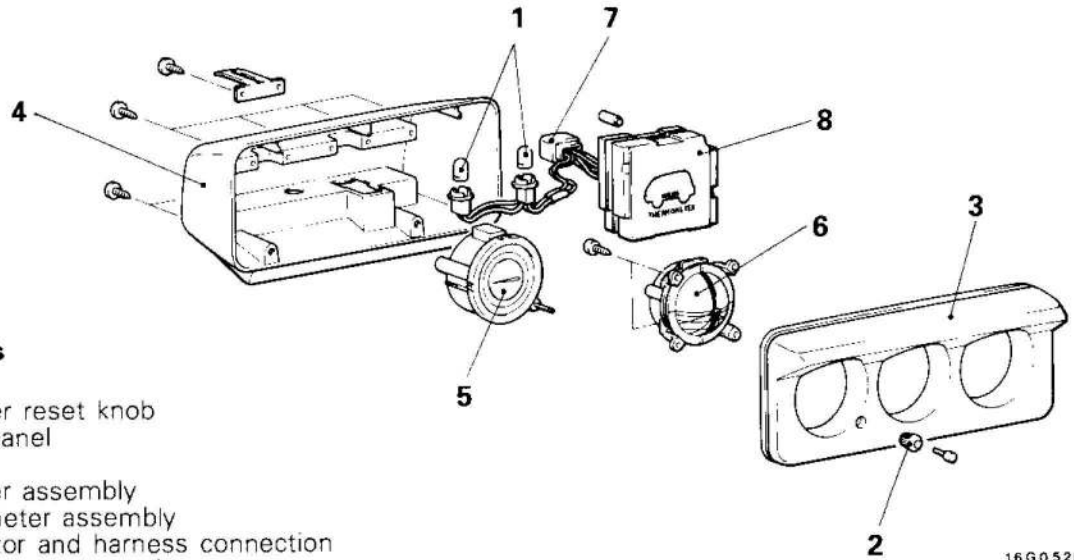
Connect the harness connector of the gauge assembly. Then measure the temperature within the vehicle and outside, and check the difference between those measurements and the measurements provided by the thermometer (used to measure near the inside air temperature sensor and outside air temperature sensor).

**Standard value: within  $\pm 3^{\circ}\text{C}$  ( $\pm 5.4^{\circ}\text{F}$ )**

### NOTE

If the difference is greater than the standard value, check the inside air temperature sensor and outside air temperature sensor as well as the wiring harness, etc.; if they are found to be normal, replace the thermometer. (Refer to P.54-27-3)

**DISASSEMBLY AND REASSEMBLY**

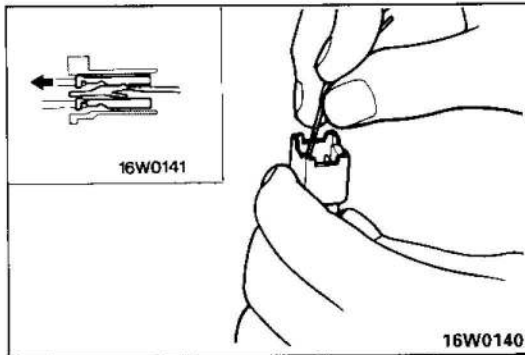


**Disassembly steps**

1. Bulb
2. Altimeter reset knob
3. Meter panel
4. Case
5. Altimeter assembly
6. Inclinator assembly
7. Connector and harness connection
8. Thermometer assembly



16 G 0 5 2 0



**SERVICE POINT OF REMOVAL**

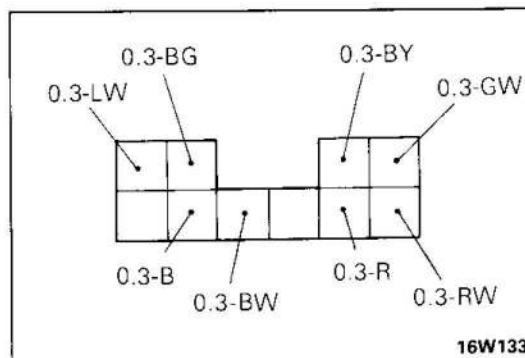
E54ZEAA

**7. DISCONNECTION OF CONNECTOR FROM HARNESS CONNECTION**

- (1) Use a flat-tipped screwdriver or similar tool to remove the connectors from the harnesses.

**NOTE**

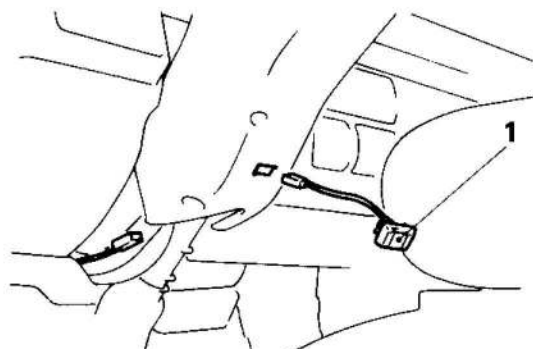
- The harness positions should be marked with the harness colours for reference when installing.



## INSIDE AIR TEMPERATURE SENSOR AND OUTSIDE AIR TEMPERATURE SENSOR

### REMOVAL AND INSTALLATION

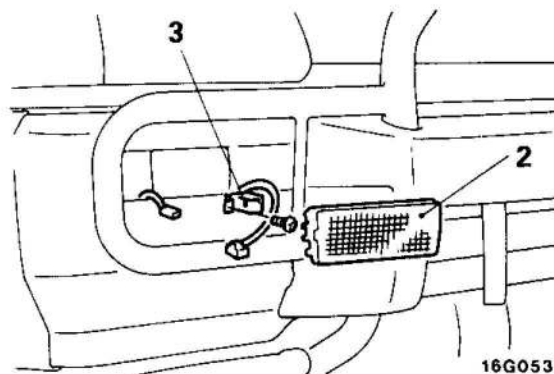
E54RA--



16G0539

#### Inside air temperature sensor removal step

- ◆◆ 1. Inside air temperature sensor



16G0531

#### Outside air temperature sensor removal step

- ◆◆ 2. Front combination lamp assembly  
3. Outside air temperature sensor

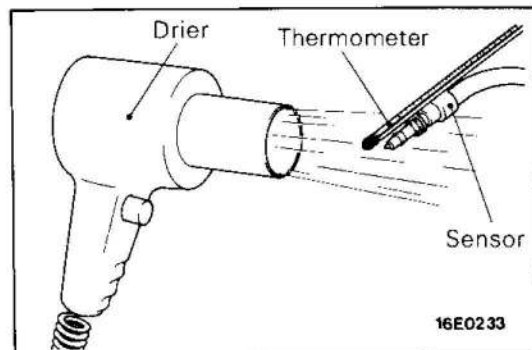
### SERVICE POINTS OF REMOVAL

E54RBAA

1. REMOVAL OF INSIDE AIR TEMPERATURE SENSOR/
3. OUTSIDE AIR TEMPERATURE SENSOR

#### Caution

- (1) When removing the inside air temperature sensor and the outside air temperature sensor, handle them with care, because their tips (the temperature sensing parts) can be easily damaged.
- (2) If the tip of the inside air temperature sensor is dirty, wipe with a dampened soft cloth or similar material.
- (3) If the tip of the outside air temperature sensor is dirty, soak the tip in plenty of water and then wipe the dirt away with a soft cloth or similar material.



16E0233

### INSPECTION

E54RCAC

#### INSPECTION OF INSIDE AIR TEMPERATURE SENSOR AND OUTSIDE AIR TEMPERATURE SENSOR

Check that the internal resistances are at the standard values with each sensor warmed up to 20°C (68°F) and 40°C (104°F).

**Standard value:**      **Approx. 1.2 kΩ at 20°C (68°F)**  
                                 **Approx. 0.5 kΩ at 40°C (104°F)**

# INDICATOR AND WARNING LAMP

## SPECIFICATIONS

### GENERAL SPECIFICATIONS

E54FA --

Unit:W

Item	Without tachometer	With tachometer
Turn-signal indicator lamp	3.4	3
Upper beam indicator lamp	3.4	3
A/T shift indicator lamp* <sup>1</sup>		
Park	—	1.4
Reverse	—	1.4
Neutral	—	1.4
Drive	—	1.4
Second	—	1.4
Low	—	1.4
Overdrive OFF	—	1.4
Door warning lamp	3.4	1.4
Oil pressure warning lamp	3.4	1.4
Charging warning lamp	3.4	1.4
Fuel (remaining) warning lamp	3.4	3.4
Wheel lock indicator lamp* <sup>1</sup>	—	1.4
4WD indicator lamp	1.4	1.4
Tailgate unlock indicator lamp	—	1.4
Brake warning lamp	3.4	1.4
Fuel filter warning lamp* <sup>2</sup>	1.4	1.4
Glow and start indicator lamp* <sup>2</sup>	1.4	1.4
Parking brake indicator lamp* <sup>1</sup>	3.4	1.4
Seat belt warning lamp* <sup>3</sup>	3.4	—
Overheat warning lamp* <sup>4</sup>	3.4	1.4
Headlamp washer indicator lamp	1.4	1.4
Engine oil level warning lamp* <sup>5</sup>	1.4	1.4

## NOTE

\*<sup>1</sup> Vehicles for Australia\*<sup>2</sup> Diesel-powered vehicles\*<sup>3</sup> Vehicles for GCC\*<sup>4</sup> Vehicles for Europe (P25V, P25W – Vehicles built from December 1988)\*<sup>5</sup> Vehicles for Europe (Vehicles built from November 1990)

# LIGHTING SYSTEM

## SPECIFICATIONS

### GENERAL SPECIFICATIONS

E54GA..

Items		Vehicles for Europe	Vehicles for General Export	Vehicles for Australia	
				Van	Mini-bus
<b>Exterior lamps</b>					
Headlamp	W				
2 bulb type					
Incandescent bulb		45/40	65/55	–	–
Halogen bulb		60/55	–	60/55	–
4 bulb type					
Type 1		–	55*2	–	55
Type 2		–	60/55*2	–	60/55
Profile 4 bulb type					
Type 1 (H3)		55	55	–	55
Type 2 (H1)		55	55	–	55
Front combination lamp	W				
Front and side turn signal lamp		21	21	21	–
Front turn signal lamp		–	–	–	21
Position lamp		5	5	5	5
Side turn signal lamp	W	–	–	–	5
Rear combination lamp	W				
Rear turn signal lamp		21	21	21	21
Back up lamp		21	21	21	21
Stop and tail lamp		21/5	21/5	21/5	21/5
Licence plate lamp	W	10	10	10	10
Rear fog lamp	W	21	–	–	–
High-mounted stop lamp	cp	21*3	–	21	21
<b>Interior lamps</b>					
Front room lamp	W	10	10	10	10
Room and map lamp*4					
Room lamp		8	8	–	8
Map lamp		8	8	–	8
Rear room lamp		10	10	10	10
Rear cargo bay lamp*6		10	10	–	10
Room and map lamp*1					
Room lamp		8	8	–	8
Map lamp		8	8	–	8
Door lamp*1		5	5	–	5
Step lamp					
Without switch*1		5	5	–	5
With switch*5		8	8	–	8
Illumination lamp*1		1.4	1.4	–	1.4

**NOTE**

- \*1 indicates Mini-bus.
- \*2 indicates P03WHSRPLW and P03WHSRPRR.
- \*3 indicates P03WHSNPAL6.
- \*4 indicates P03WHSRPR, F03WHSRPLW, P04WHSRPERDA, P05WHSRPR, P04WSNPR8, P04WSRPR8 and P04WHSNPAL6.
- \*5 indicates XL, EXCEED and GLS.
- \*6 indicates XL, GLX, GLS and EXCEED.

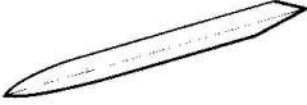
## SERVICE SPECIFICATIONS

E54GB --

Items	Specifications
Limit	
Head lamp intensity	cd
Vehicles for Europe	
Incandescent lamp	20,000
Halogen lamp	30,000
Vehicles for General Export and Van for Australia	20,000
Mini-bus for Australia	
Type 1	18,000
Type 2	7,000

**SPECIAL TOOLS**

E54GF--

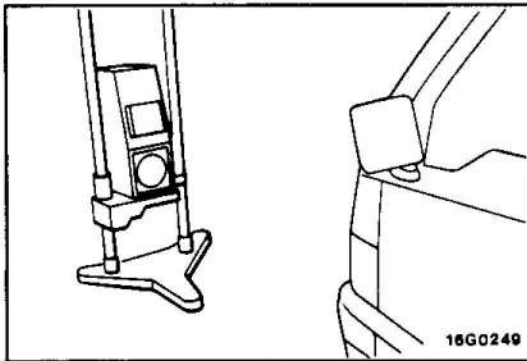
Tool (Number and name)	Use
MB990784 Ornament remover 	Removal of trims

## SERVICE ADJUSTMENT PROCEDURES

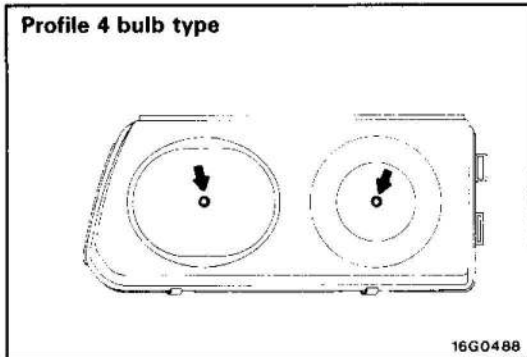
E54GGAA

### AIMING

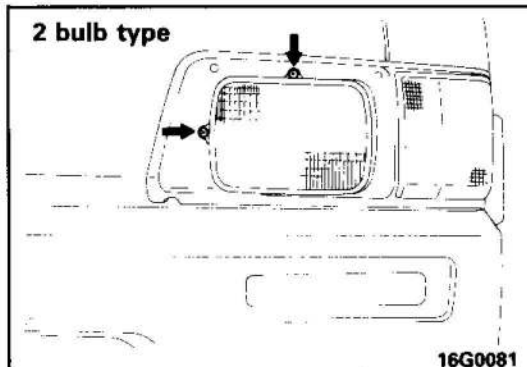
1. The headlamps should be aimed with the proper beam-setting equipment, and in accordance with the equipment manufacturer's instruction.



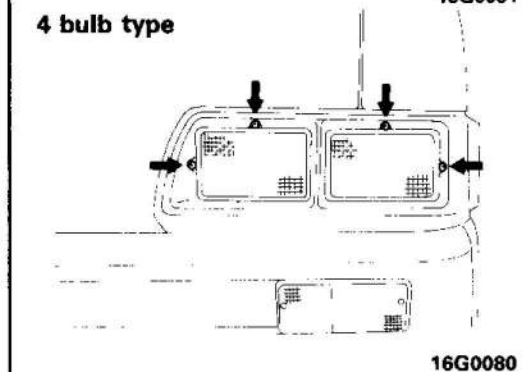
Profile 4 bulb type



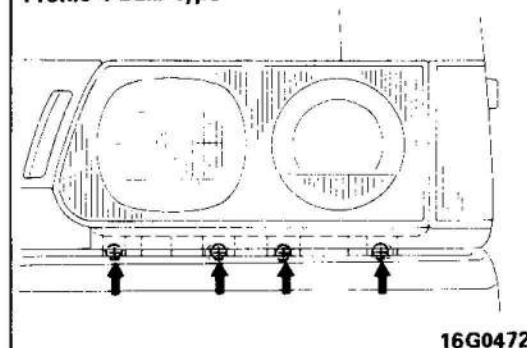
2 bulb type



4 bulb type



Profile 4 bulb type



### Central position of lamp valve

2. If beam-setting equipment is not available, proceed as follows:
  - (1) Inflate the tires to the specified pressures and remove the load from the vehicle (except a driver).
  - (2) Draw vertical lines (vertical lines passing through respective headlamps centres) and a horizontal line (horizontal line passing through centre of headlamps on the screen).
  - (3) With the engine running at 2,000 r/min, aim the headlamps.
  - (4) If there are any regulations pertinent to the aiming of headlamps in the area where the vehicles is to be used, adjust so as to meet those requirements.
3. Make the vertical and horizontal adjustment of the beam by using the adjusting screws.

### NOTE

Alternately turn the adjusting screws to adjust the headlamp aiming.



**INTENSITY MEASUREMENT**

Using a photometer, and following its manufacturer's instruction manual, measure the headlamp intensity and check to be sure that the limit value is satisfied.

**Limit:****Vehicles for Europe**

**Incandescent lamp** 20,000 cd or more

**Halogen lamp** 30,000 cd or more

**Vehicles for General Export and Van for Australia**

20,000 cd or more

**Mini-bus for Australia**

**Type 1** 18,000 cd or more

**Type 2** 7,000 cd or more

**NOTE**

1. When measuring the intensity, maintain an engine speed of 2,000 r/min., with the battery in the charging condition.
2. There may be special local regulations pertaining to headlamp intensity; be sure to make any adjustments necessary to satisfy such regulations.
3. If an illuminometer is used to make the measurements, convert its values photometer values by using the following formula.

$$I = Er^2$$

Where:

I=intensity (cd)

E=illumination (lux)

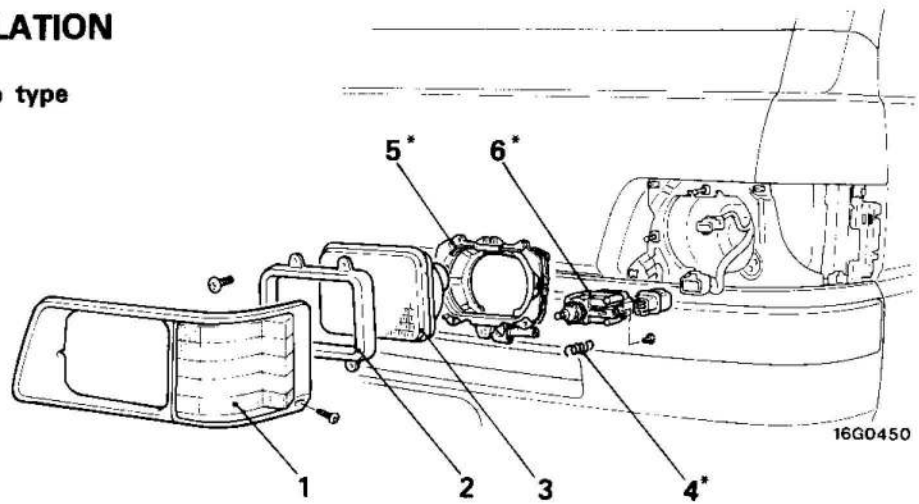
r=distance (m) from headlamps to illuminometer

HEADLAMPS

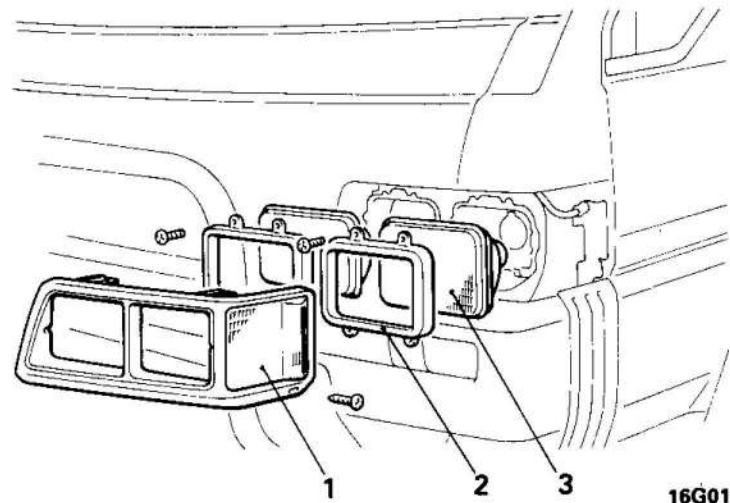
E54GHAA

REMOVAL AND INSTALLATION

2 bulb type



4 bulb type



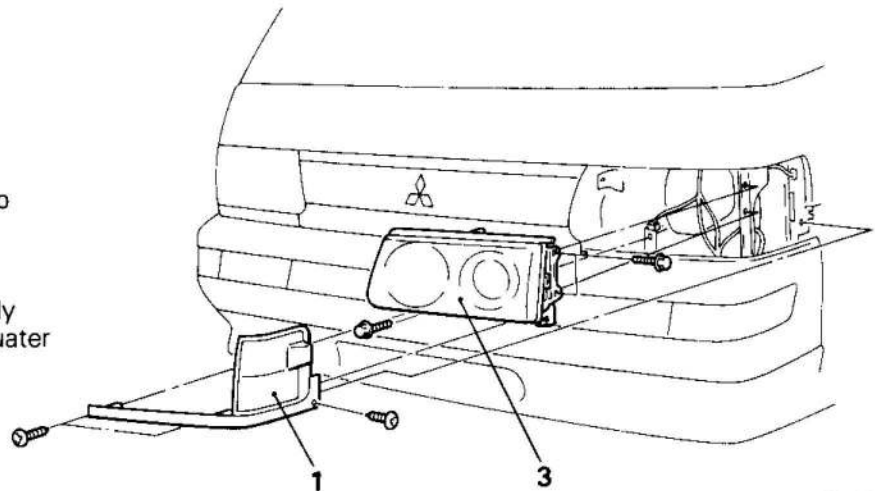
Post-installation Operation

- Aiming Adjustment  
(Refer to P.54-31-1.)

Profile 4 bulb type

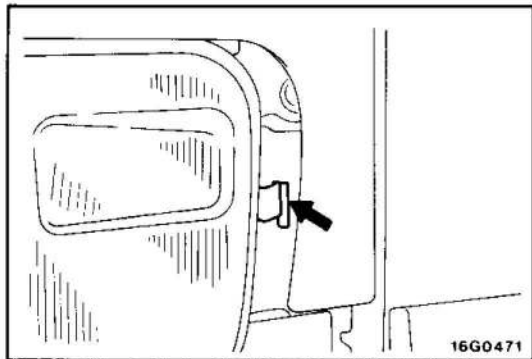
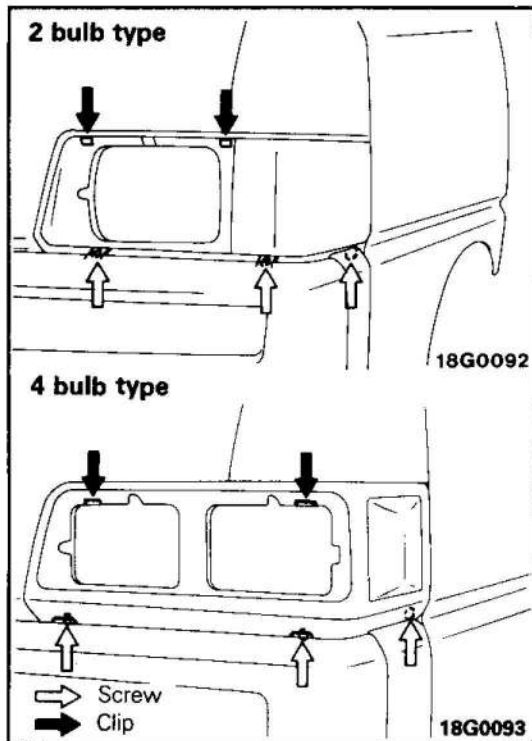
Removal steps

- ◆◆◆◆ 1. Front combination lamp
- 2. Retaining ring
- 3. Headlamp
- 4. Extension spring
- 5. Mounting ring assembly
- 6. Headlamp leveling actuator



NOTE

- (1) Reverse the removal procedures to reinstall.
- (2) ◆◆ : Refer to "Service Points of Removal".
- (3) ◆◆◆ : Refer to "Service Points of Installation".
- (4) \* : Vehicles with headlamp leveling.



**SERVICE POINTS OF REMOVAL**

**1. REMOVAL OF FRONT COMBINATION LAMP**

**2 Bulb Type and 4 Bulb Type**

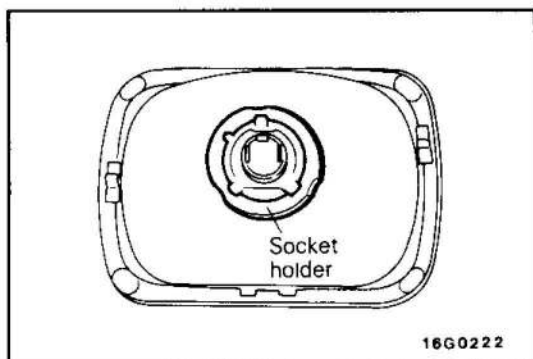
Unscrew lower front combination lamp. Lower lamp and remove clip notch. Remove front combination lamp.

**SERVICE POINTS OF INSTALLATION**

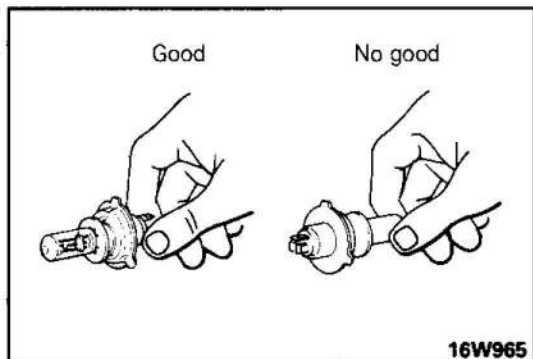
**1. INSTALLATION OF FRONT COMBINATION LAMP**

**Profile 4 Bulb Type**

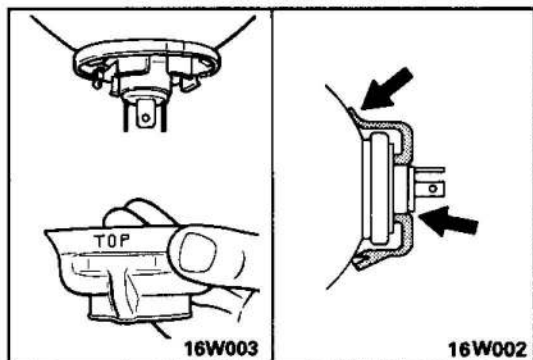
Mount it by surely inserting the insertion fitting into the body side hole of front combination lamp.

**REPLACEMENT OF REPLACEABLE BULB**

- (1) Remove headlamp unit.
- (2) Remove rubber socket cover on lamp body rear.
- (3) Remove socket holder. Remove valve and socket assembly.

**Caution**

1. **Never hold the halogen lamp bulb with a bare hand, dirty glove, etc. If the glass surface is dirty, be sure to clean it with alcohol, paint thinner, etc., and install it after drying it thoroughly.**

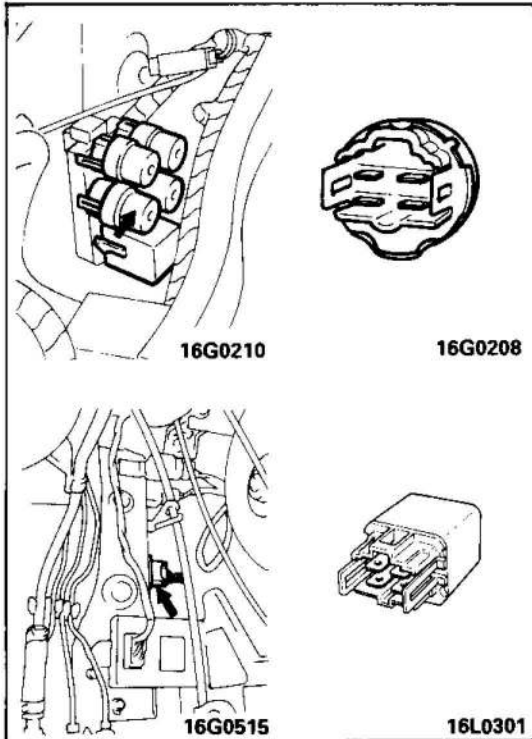


2. **When installing socket cover, install with its top mark upwards. Socket cover should snug fit lamp body rear and valve socket.**

E54GIAL

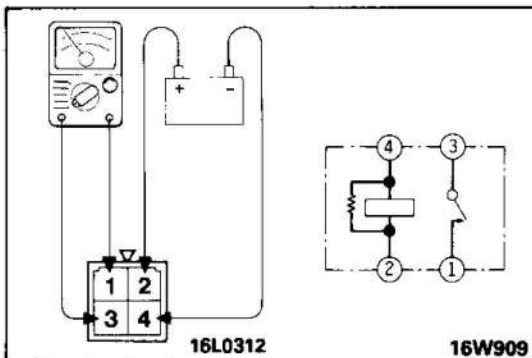
## HEADLAMP RELAY INSPECTION

(1) Remove headlamp relay from interior relay box.



(2) Remove headlamp relay from relay bracket.  
 <Vehicles with profile 4 bulb type>

(3) Connect battery to terminal 2 and check continuity between terminals with terminal 4 earthed.



Power is supplied	1-3 terminals	Continuity
Power is not supplied	1-3 terminals	No continuity
	2-4 terminals	Continuity

## DAYTIME RUNNING LAMP (VEHICLES FOR NORWAY AND SWEDEN)

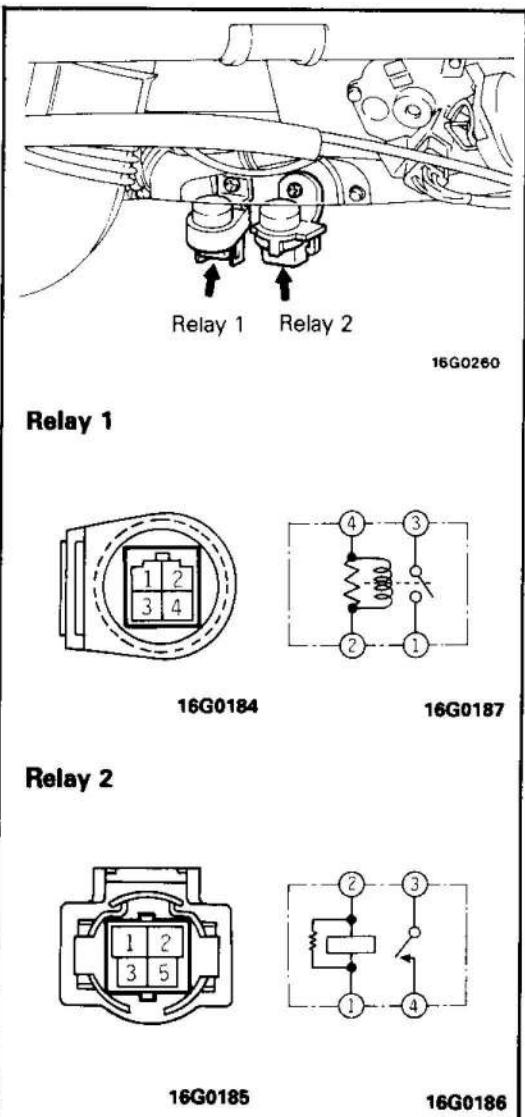
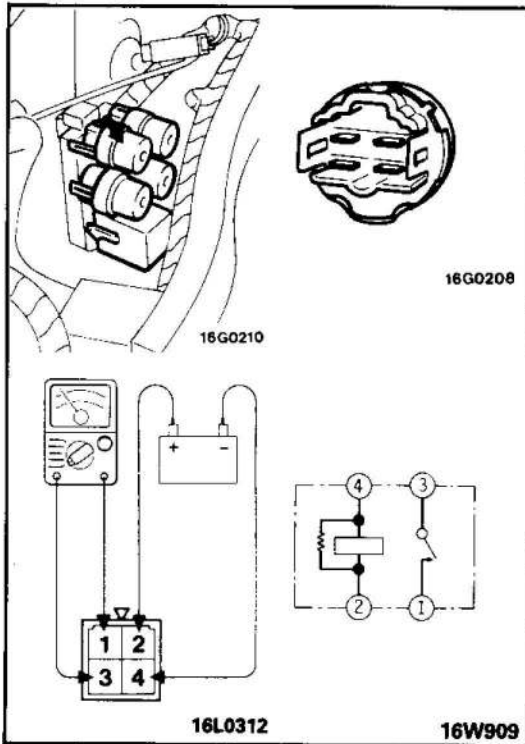
E54GJAA

### INSPECTION

#### POWER RELAY

- (1) Remove power relay from interior relay box.
- (2) Connect battery to terminal 2 and check continuity between terminals with terminal 4 grounded.

Power is supplied	1 – 3 terminals	Continuity
Power is not supplied	1 – 3 terminals	No continuity
	2 – 4 terminals	Continuity



#### RELAY 1, RELAY 2

- (1) Remove glove box, and remove relays.

- (2) Connect battery to terminal 2 and check continuity between terminals with terminal 4 grounded.

Power is supplied	1 – 3 terminals	Continuity
Power is not supplied	1 – 3 terminals	No continuity
	2 – 4 terminals	Continuity

## DIM-DIP LAMP (R.H. DRIVE VEHICLES FOR EUROPE)

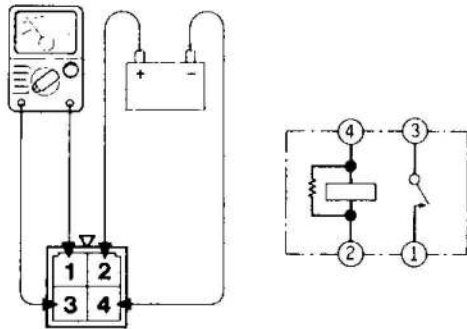
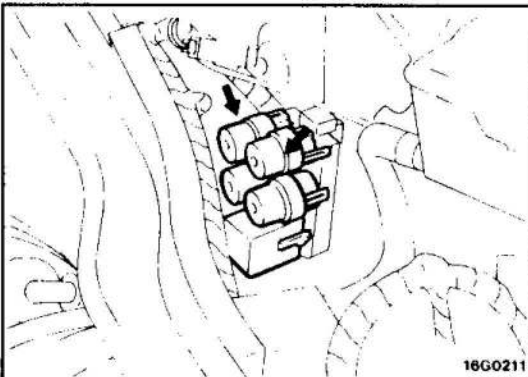
E54GKAA

### INSPECTION

#### DIM-DIP LAMP RELAY

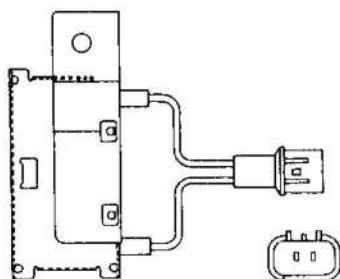
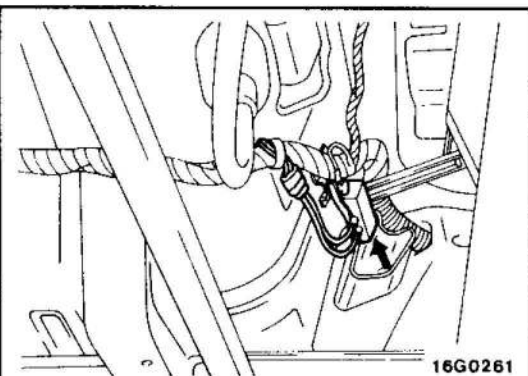
- (1) Remove dim-dip lamp relay from interior relay box.
- (2) Connect battery to terminal 2 and check continuity between terminals with terminal 4 grounded.

Power is supplied	1 – 3 terminals	Continuity
Power is not supplied	1 – 3 terminals	No continuity
	2 – 4 terminals	Continuity



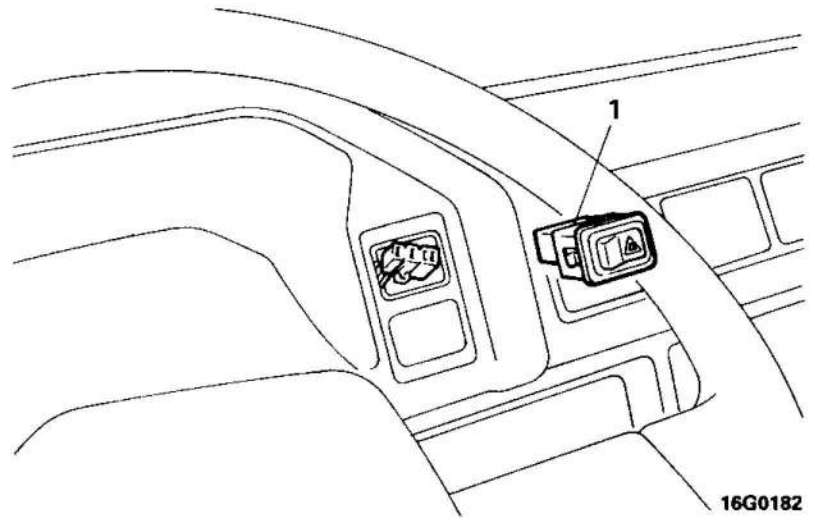
### RESISTOR

Check resistance between resistor terminals is 1  $\Omega$ .



# HAZARD SWITCH

## REMOVAL AND INSTALLATION

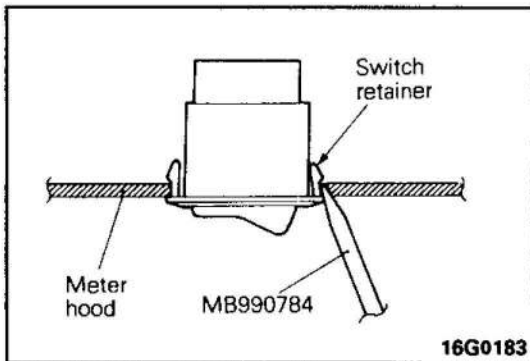


16G0182

◆◆ 1. Hazard switch

**NOTE**

◆◆: Refer to "Service Points of Removal".

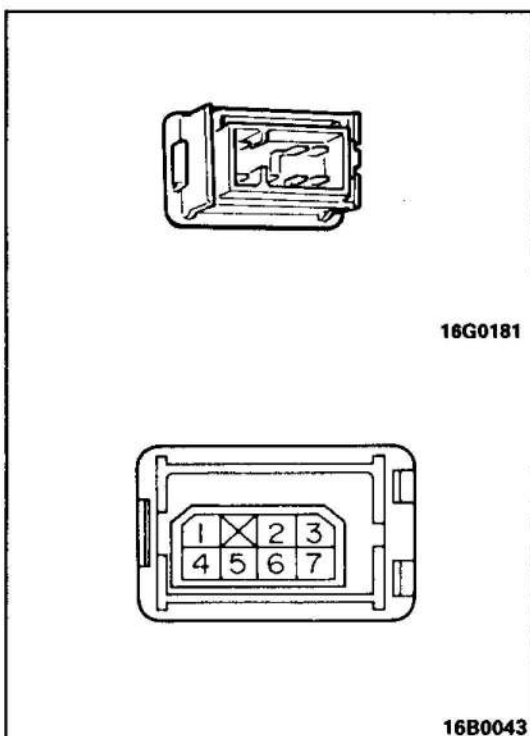


16G0183

## SERVICE POINTS OF REMOVAL

### 1. REMOVAL OF HAZARD SWITCH

Use special tool to disconnect meter hood switch hole and switch retainer on its side. Remove hazard switch.



16G0181

16B0043

## INSPECTION

Operate the switch and check the continuity between the terminals.

Terminal	1	5	4	2	6	7	3
Switch position							
OFF		○—○					
ON	○—○		○—○	○—○	○—○	○—○	○—○

**NOTE**

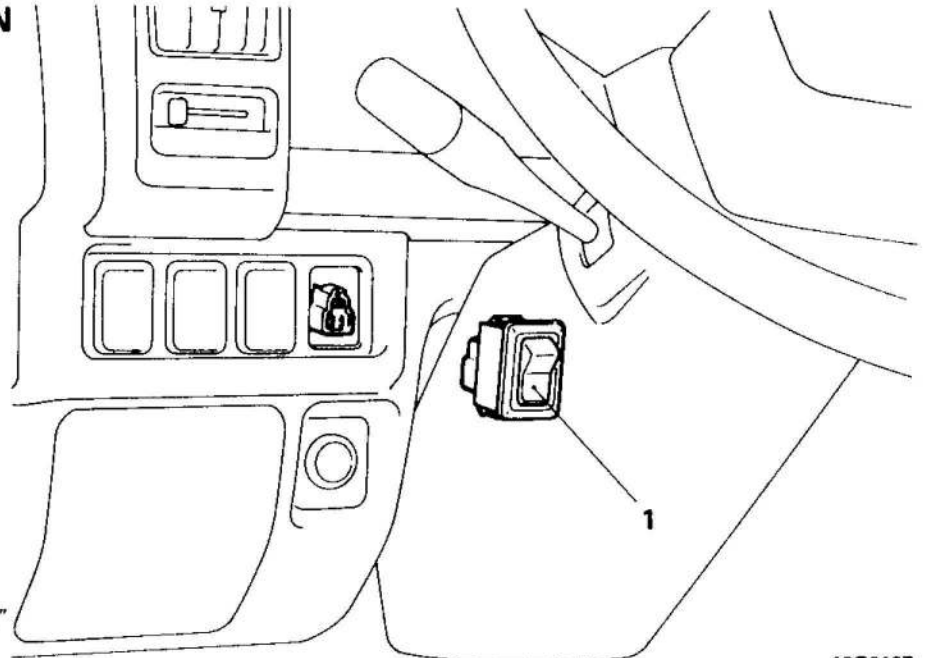
○—○ indicates that there is continuity between the terminals.



**REAR FOG LAMP SWITCH (VEHICLES FOR EUROPE)**

E54GMAA

**REMOVAL AND INSTALLATION**

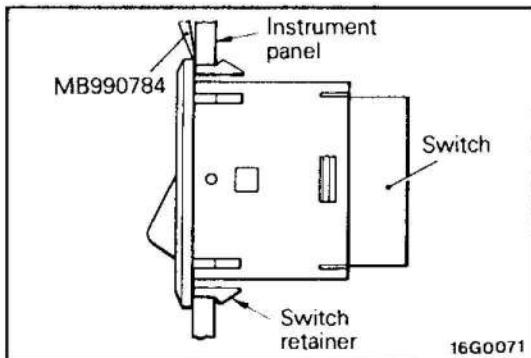


- ◆◆ 1. Rear fog lamp switch

**NOTE**

◆◆ : Refer to "Service Points of Removal"

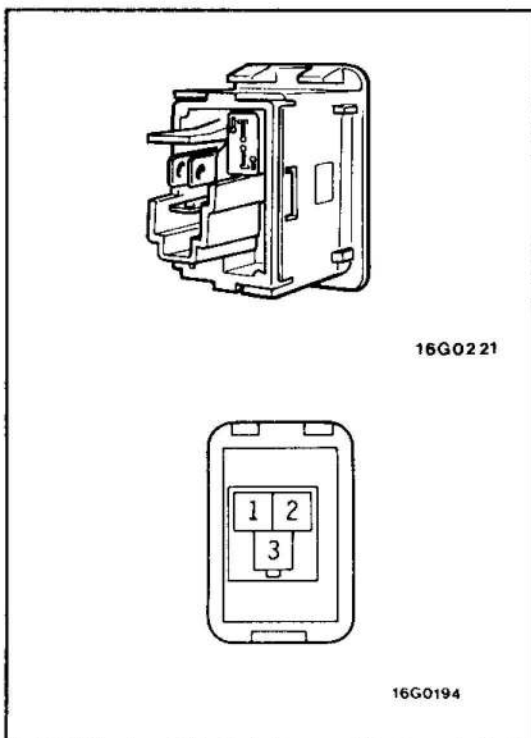
16G0197



**SERVICE POINTS OF REMOVAL**

**1. REMOVAL OF REAR FOG LAMP SWITCH**

Use special tool to disconnect instrument panel switch hole and switch retainer on its side. Remove rear fog lamp switch.



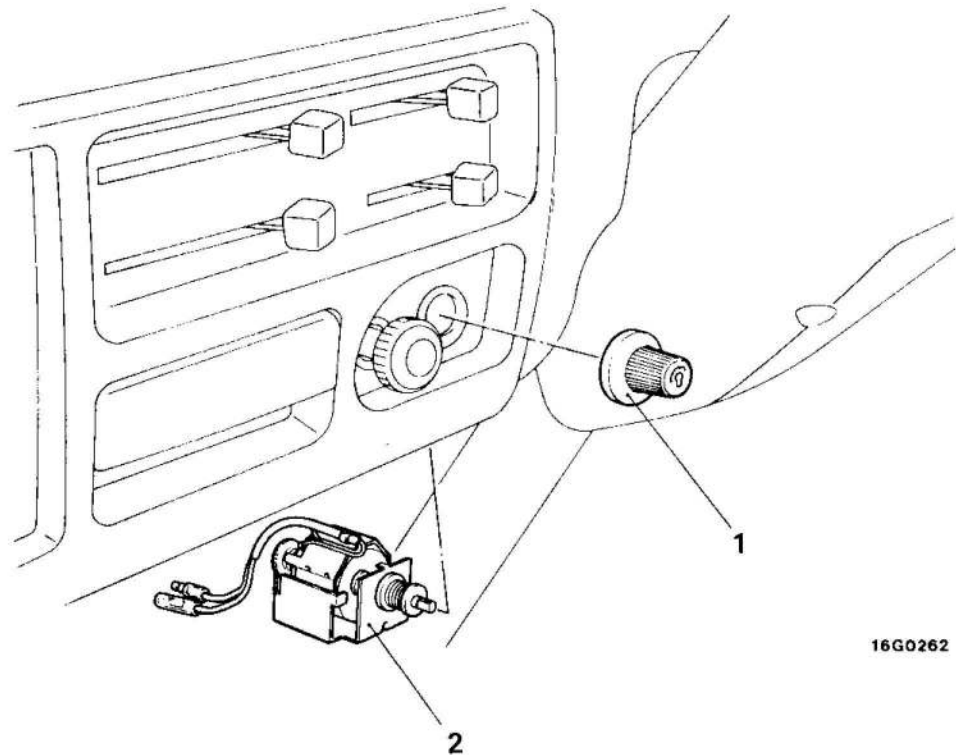
**INSPECTION**

Operate the switch and check the continuity between the terminals.

Switch position \ Terminal	1	3	Indicator lamp	2
OFF		○	⊕	○
ON	○	○	⊕	○

**NOTE**

○—○ indicates that there is continuity between the terminals.

**RHEOSTAT (VEHICLES FOR AUSTRALIA)****REMOVAL AND INSTALLATION**

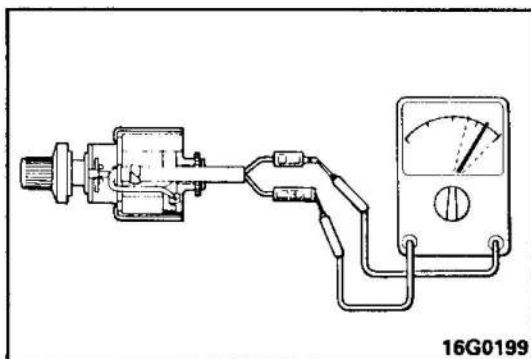
16G0262

**Removal steps**

1. Knob
2. Rheostat

**NOTE**

Reverse the removal procedures to reinstall.

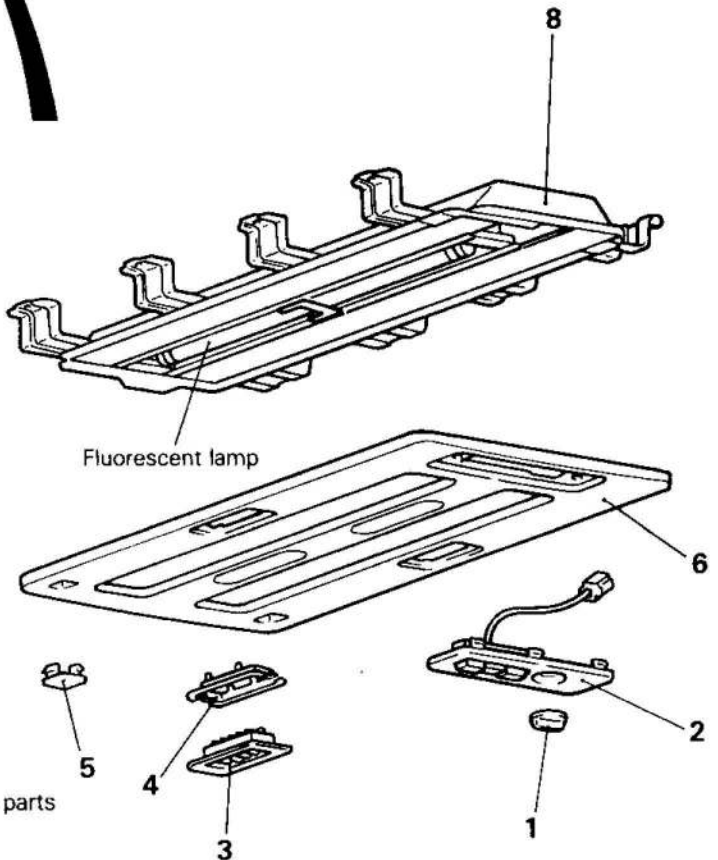
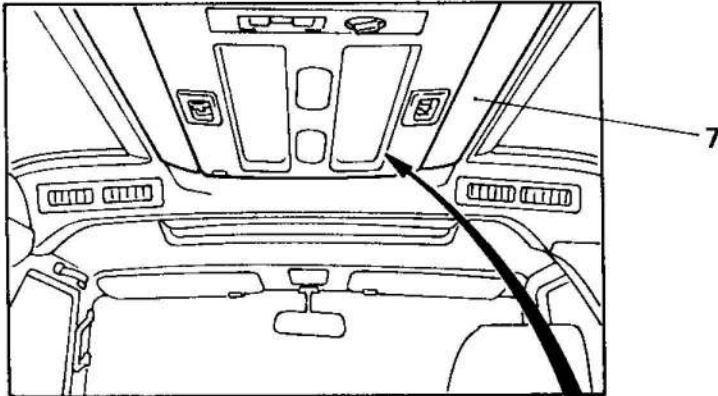


16G0199

**INSPECTION**

- (1) With the connector disconnected, measure the continuity between the rheostat terminals with an ohmmeter.
- (2) If the resistance value varies smoothly between 0 and 10 ohms throughout the entire operation range, the rheostat is functioning properly.

**OVERHEAD CONSOLE LAMP  
REMOVAL AND INSTALLATION**



**Removal steps**

1. Lighting control switch knob
2. Switch panel
3. Air outlet panel
4. Retainer
5. Plug
6. Overhead console lamp cover
7. Headlining
8. Overhead console lamp



**NOTE**

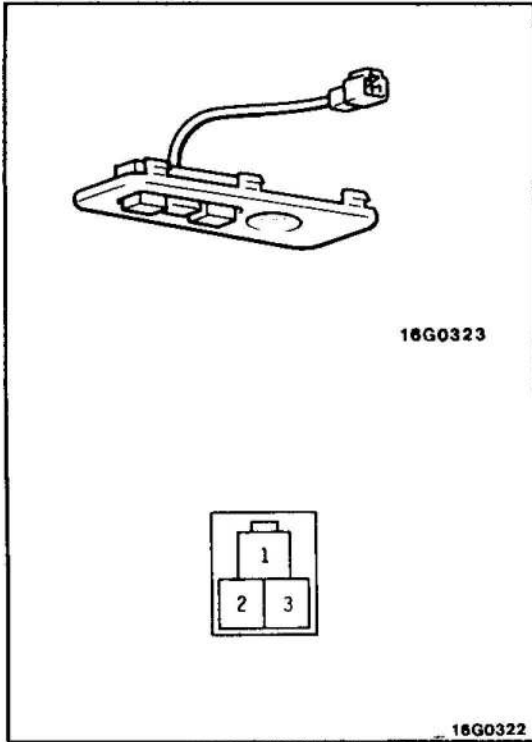
- (1) Reverse the removal procedures to reinstall.
- (2) : Refer to "Service Points of Removal".
- (3) When replacing the fluorescent lamp, remove the parts numbered up to 6 in the diagram.

16G0137

**SERVICE POINTS OF REMOVAL**

**7. REMOVAL OF HEADLINING**

Refer to GROUP 52 INTERIOR—Headlining.



**INSPECTION**

Operate the switch and check the continuity between the terminals.

Switch position \ Terminal	1	2	3
OFF			
O (Door)		○—○	○—○
ON	○—○	○—○	○—○

**NOTE**

○—○ indicates that there is continuity between the terminals.

# COLUMN SWITCH

## SPECIFICATIONS

### TORQUE SPECIFICATIONS

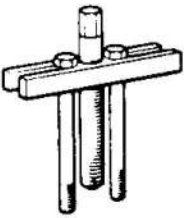
E54HC--

Items	Nm	kgm	ft.lbs.
Steering wheel installing nut	34-50	3.4-5.0	25-36

## SPECIAL TOOLS

E54HF--

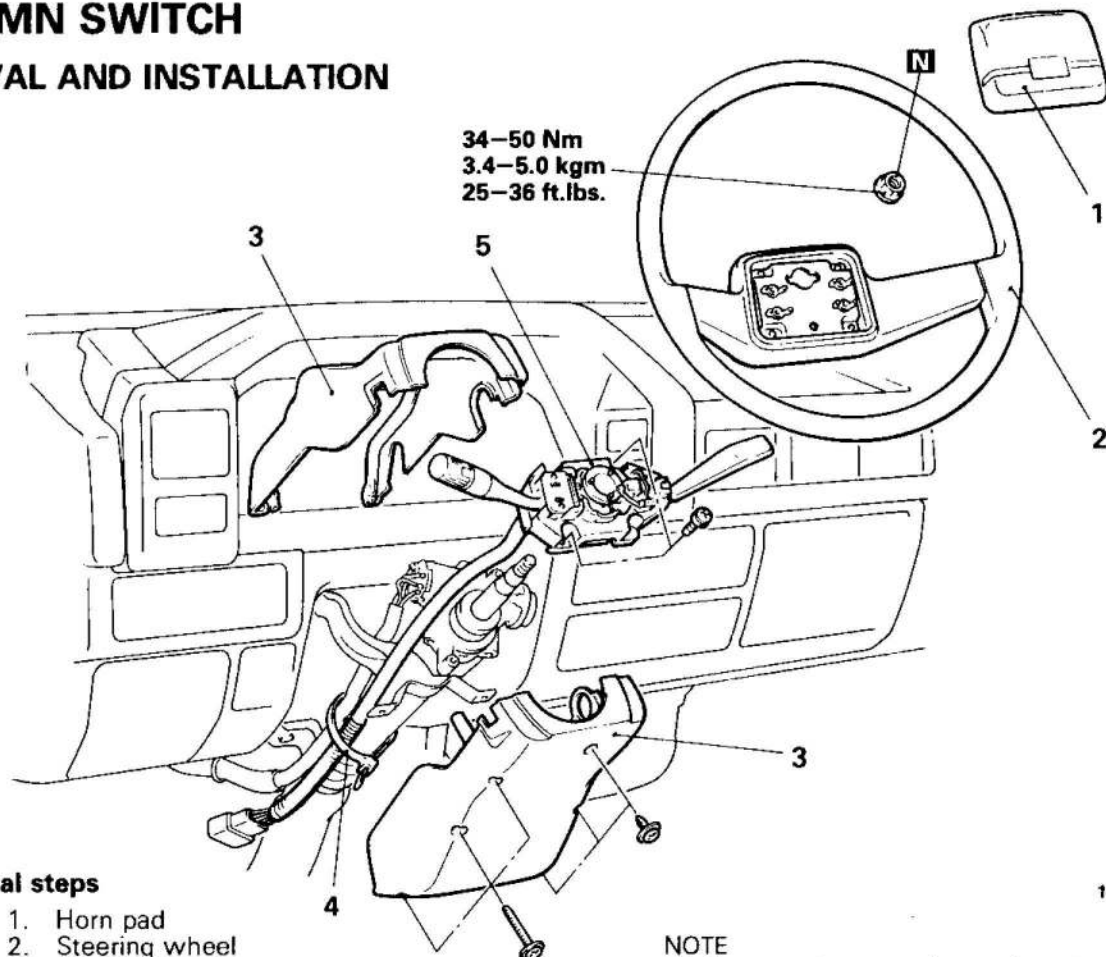
Tool (Number and name)	Use
MB990803 Steering wheel puller	Removal of the steering wheel



## COLUMN SWITCH

### REMOVAL AND INSTALLATION

E54HH--



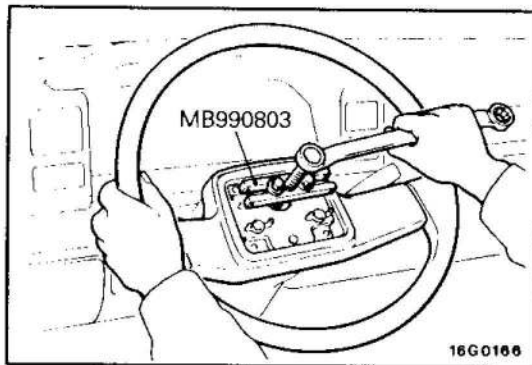
#### Removal steps

- ◆◆ 1. Horn pad
- ◆◆ 2. Steering wheel
- ◆◆ 3. Column cover
- ◆◆ 4. Cable band
- ◆◆ 5. Column switch

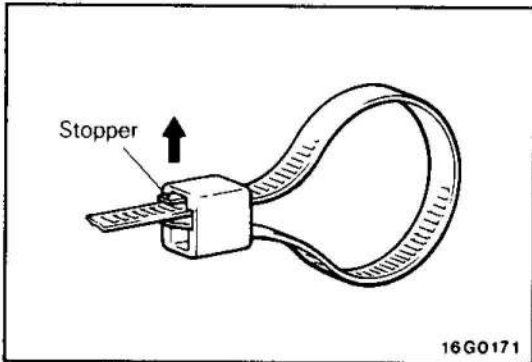
#### NOTE

- (1) Reverse the removal procedures to reinstall.
- (2) ◆◆ : Refer to "Service Points of Removal".
- (3) **N** : Non-reusable parts

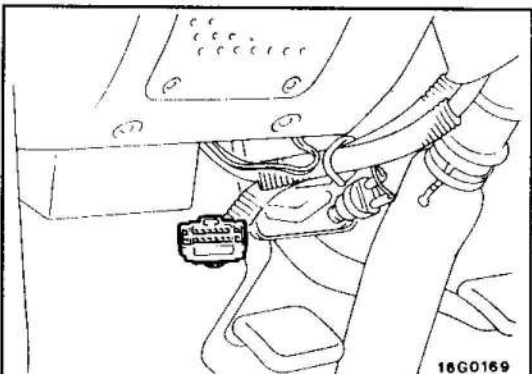
16G0176



16G0166



16G0171



16G0169

**Vehicles for Europe**

**Type 1**

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20

**Type 2**

1	2	3	4	5	21	22	23	6	7	8	9	10
11	12	13	24	14	25	15	26	16	17	18	19	20

**Vehicles for General Export and Australia**

27	3	5	6	7	8	28	16
11	12	13	29	30	17	19	20

16G0172

**SERVICE POINTS OF REMOVAL**

**1. REMOVAL OF HORN PAD**

Refer to P. 54-45.

**2. REMOVAL OF STEERING WHEEL**

Remove the steering wheel by using the special tool.

**4. REMOVAL OF CABLE BAND**

Push up stopper and remove cable band.

**INSPECTION**

- (1) Disconnect the wiring connector from the column switch and connect an ohmmeter to the switch side connector.
- (2) Operate the switch and check the continuity between the terminals.

**LIGHTING SWITCH**

**Vehicles for Europe**

Switch positions		Terminal							
		14	9	2	1B	1	20	11	17
Lighting switch	OFF								
		○	○						
Dimmer, passing switch		○	○	○	○				
	D <sub>1</sub>					○	○		
	D <sub>2</sub>					○		○	
	P							○	○

**Vehicles for General Export and Australia**

Switch positions		Terminal					
		29	28	27	Internal connection	20	11
Lighting switch	OFF						
		○	○				
Dimmer, passing switch		○	○	○	○		
	D <sub>1</sub>				○		○
	D <sub>2</sub>				○		○
	P			○			○

66C003

**NOTE**

○—○ indicates that there is continuity between the terminals.

**TURN-SIGNAL SWITCH**

Switch position \ Terminal	12	3	13
Left	○—○		
Neutral			
Right	○—○		○

**WIPER-WASHER SWITCH**

Switch position \ Terminal	8	17	7	19	12
Wiper switch	OFF	○—○			
	INT	○—○		○	
		○—○		○	
	1	○—○		○	
2		○—○	○		
Washer switch	OFF				
	ON			○—○	

**HEADLAMP WASHER SWITCH**

Switch position \ Terminal	15	16
OFF		
ON	○—○	○

**AUTO SPEED CONTROL SWITCH**

Switch position \ Terminal	16	25	21	26	23
SET	OFF				
	ON	○—○		○	
OFF					
ON				○—○	○
RESUME	○—○			○—○	○

**NOTE**

○—○ indicates that there is continuity between the terminals.

# HORN SYSTEM

## SPECIFICATIONS

### GENERAL SPECIFICATIONS

E54IA--

Items		Dual horn	Single horn	
Horn	Type	Flat	Flat	
	Horn effective voltage V	10-15	11-14.5	
	Consumption Current A	2.5-3.5	Max. 3.5	
	Sound pressure [12 V, 2 m (6.56 ft.)] dB	105-115	100-110	
	Fundamental frequency Hz	Low tone	330-370	340-380
		High tone	395-435	-
	Identification color	Low tone	Black	Black
High tone		White	-	

### TORQUE SPECIFICATIONS

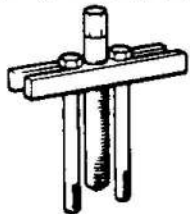
E54IC--

Items	Nm	kgm	ft.lbs.
Steering wheel installation nut	34-50	3.4-5.0	25-36

### SPECIAL TOOLS

E54IF--

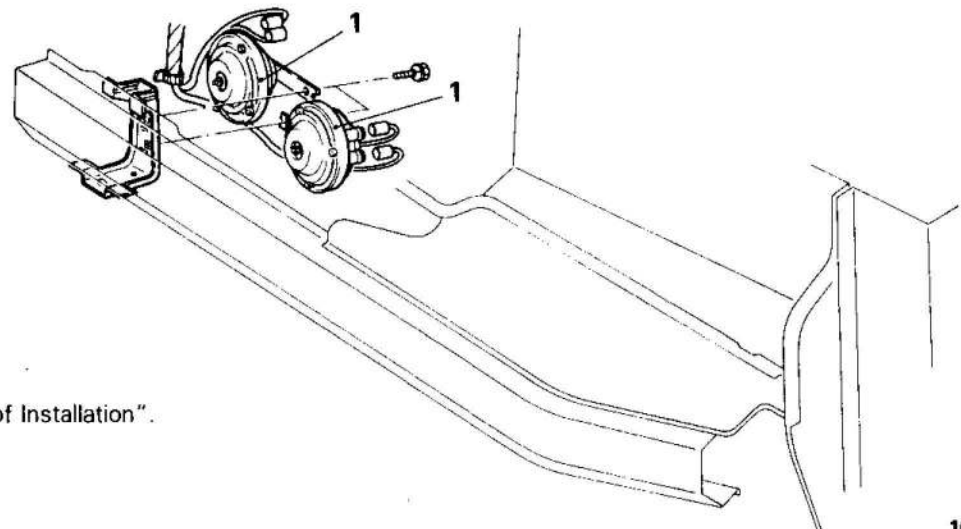
Tool (Number and name)	Use
MB990803 Steering wheel puller	Removal of the steering wheel



## HORN

E54IPAD

### REMOVAL AND INSTALLATION



◆◆1. Horn

**NOTE**

◆◆: Refer to "Service Points of Installation".

16G0083

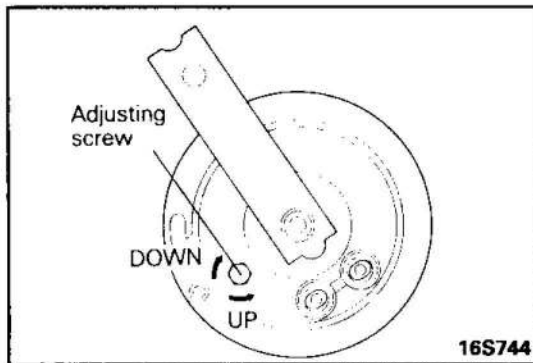
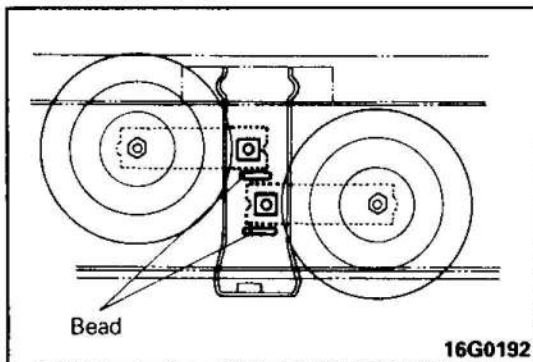


**INSPECTION**

- Check horn adjustment screw for looseness.
- Check the inside of the horn for lodged water, dirt or other foreign matter.

**SERVICE POINTS OF INSTALLATION****1. INSTALLATION OF HORN**

Install horn along horn bracket bead.

**ADJUSTMENT OF HORN**

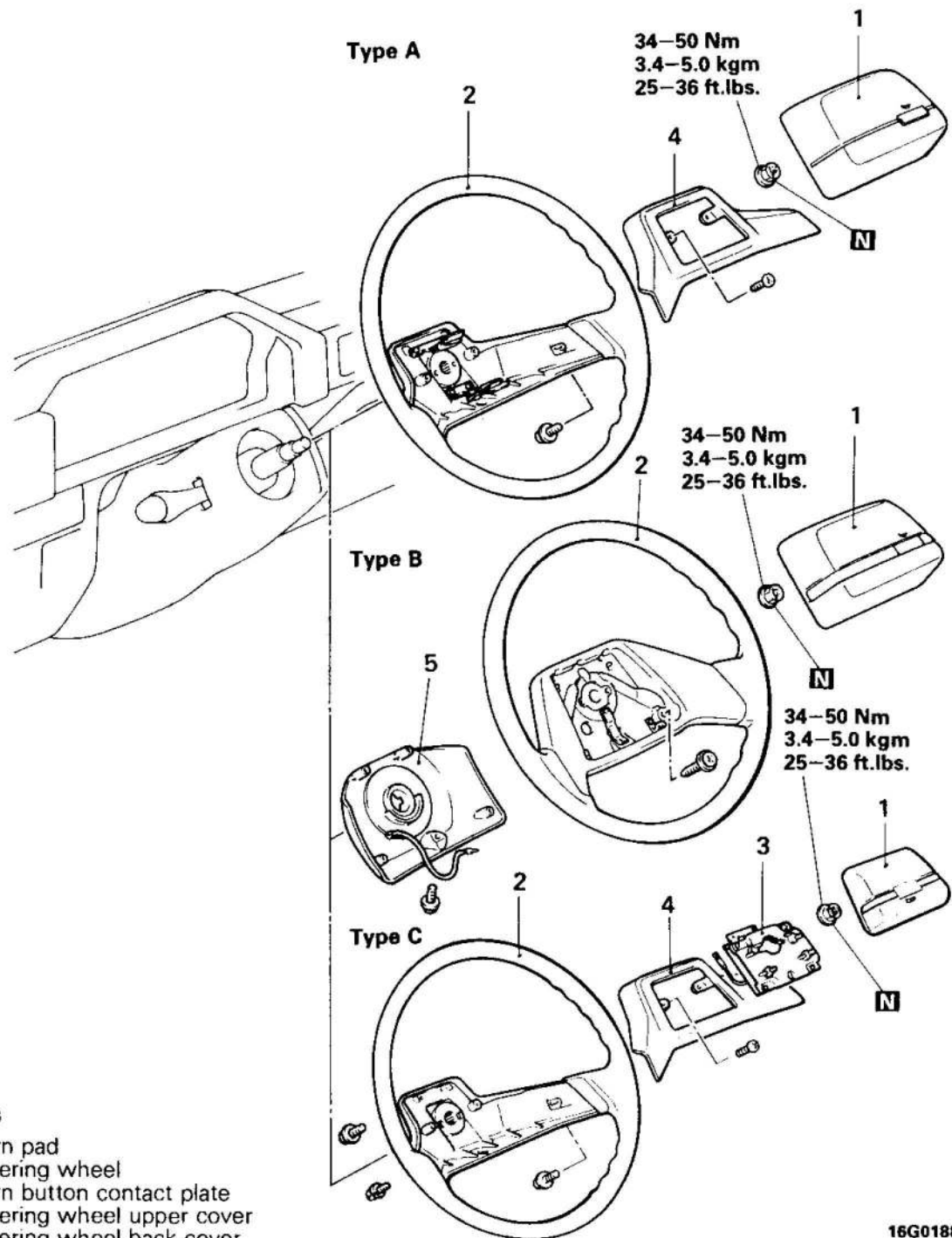
1. Secure the horn bracket in a vice, and then connect a battery of the 12 volts.
2. Sound the horn, and adjust it by truning the adjusting screw.
  - (1) The sound volume is too low:  
Turn the adjusting screw in the "UP" dirction within a range of about 180°, and then set it in position when a satisfactory sound volume has been obtained.
  - (2) The sound volume is too loud:  
Turn the adjusting screw 20° to 30° in the "DOWN" direc-tion, and then set it in position when a satisfactory sound volume has been obtained.
  - (3) Horn will not sound:  
Turn the adjusting screw slightly in the "UP" direction until the horn sounds, find a satisfactory sound volume by con-tinuing to turn the screw within a range of 180°, and then set the screw in place. If a satisfactory volume cannot be obtained, replace the horn.

**Caution**

**After the adjustment apply lacquer to prevent the ad-justing screw from becoming loose.**

## HORN SWITCH

## REMOVAL AND INSTALLATION



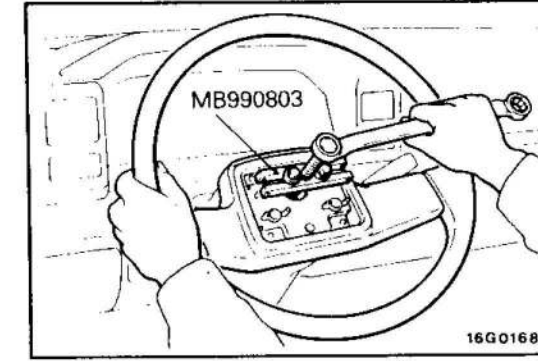
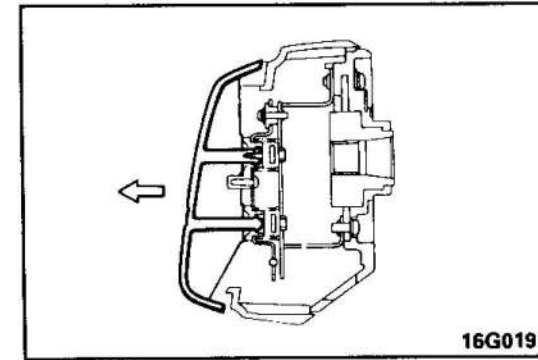
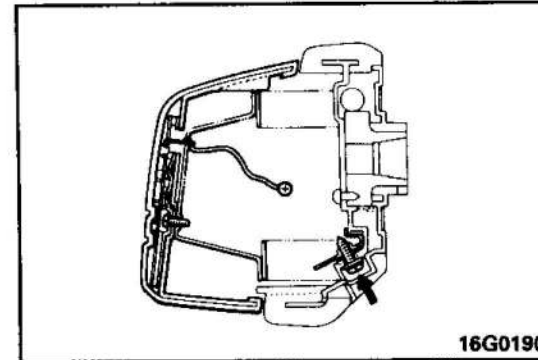
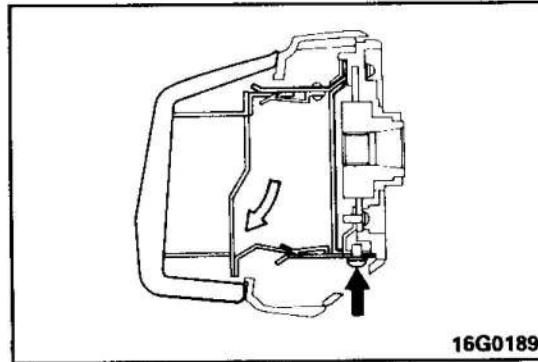
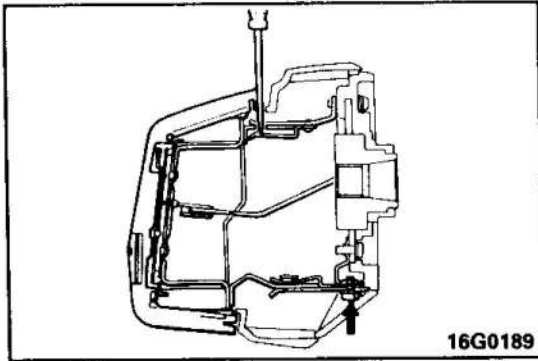
## Removal steps

- ◆◆ 1. Horn pad
- ◆◆ 2. Steering wheel
- 3. Horn button contact plate
- 4. Steering wheel upper cover
- 5. Steering wheel back cover

## NOTE

- (1) Reverse the removal procedures to reinstall.
- (2) ◆◆ : Refer to "Service Points of Removal".
- (3) **N** : Non-reusable parts

16G0188



**SERVICE POINTS OF REMOVAL**

**1. REMOVAL OF HORN PAD**

**TYPE A**

[Applicable until May, 1987]

- (1) While using a screwdriver to press in the upper spring which leads from the central part of the horn pad (the notched part in the upper cover) remove the horn pad.
- (2) Remove the screw fitted to the lower spring.

[Applicable from June, 1987]

Remove the installation screw, move the horn pad in the direction of the arrows and remove the horn pad.

**TYPE B**

Remove the screw fitted to the horn pad and pull the lower part of horn pad towards you to remove.

**TYPE C**

Remove horn pad from horn button contact plate.

**2. REMOVAL OF STEERING WHEEL**

Remove the steering wheel by using the special tool.

**INSPECTION**

- A burned out or short-circuited horn switch contact.
- A damaged horn switch harness.

# CIGARETTE LIGHTER

## SPECIFICATIONS

### GENERAL SPECIFICATIONS

E54JA---

Items	Specifications
Max. input W	120
Reset time second	Within 18
Thermal fuse fusion temperature °C (°F)	180-250 (356-482)

## CIGARETTE LIGHTER

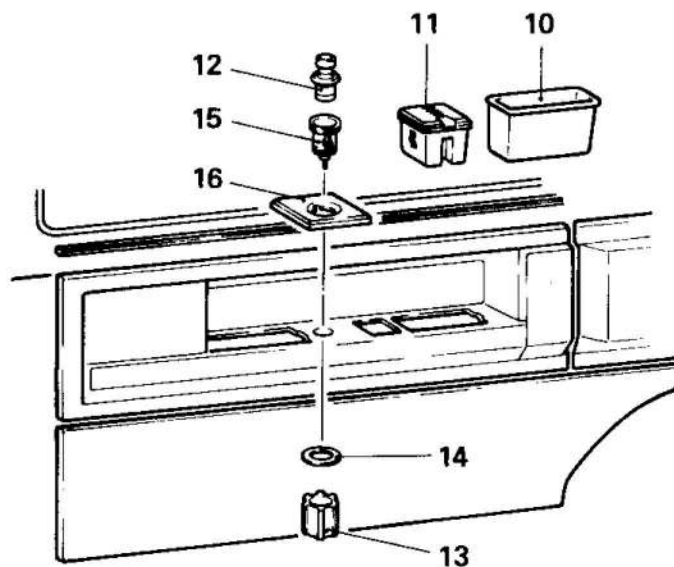
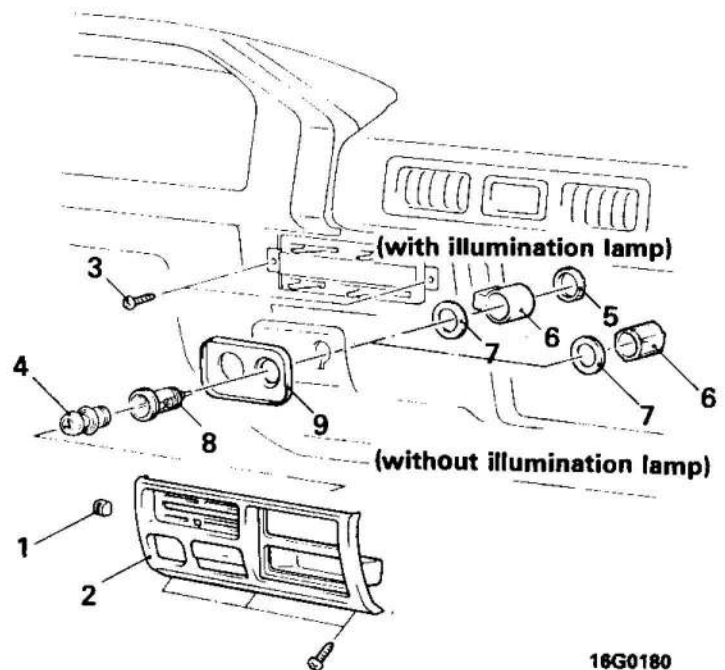
### REMOVAL AND INSTALLATION

E54JH---

#### INSTRUMENT PANEL CIGARETTE LIGHTER

##### Removal steps

1. Heater control lever knob
2. Center panel
3. Heater control installation nut
4. Plug
5. Nut
6. Outer case
7. Washer
8. Socket
9. Protector



#### REAR SIDE TRIM CIGARETTE LIGHTER

##### Removal steps

10. Pocket
11. Ashtray
12. Plug
13. Outer case
14. Washer
15. Socket
16. Protector

##### NOTE

Reverse the removal procedures to reinstall.

**INSPECTION**

E54J1AA

- Take out the plug, and check for a worn edge on the element spot connection, and for shreds of tobacco or other material on the element.
- Using an ohmmeter, check the continuity of the element.

**CAUTIONS FOR USE OF THE CIGARETTE LIGHTER SOCKET AS AUXILIARY POWER SOURCE**

E54JPAA

1. When using a "plug-in" type of accessory, do not use anything with a load of more than 120W.
2. It is recommended that only the lighter be inserted in the receptacle.

**Use of "plug-in" type accessories may damage the receptacle and result in poor retention of the lighter.**

**NOTE**

The specified load should be strictly observed, because overloaded cord burns the ignition switch and harness.

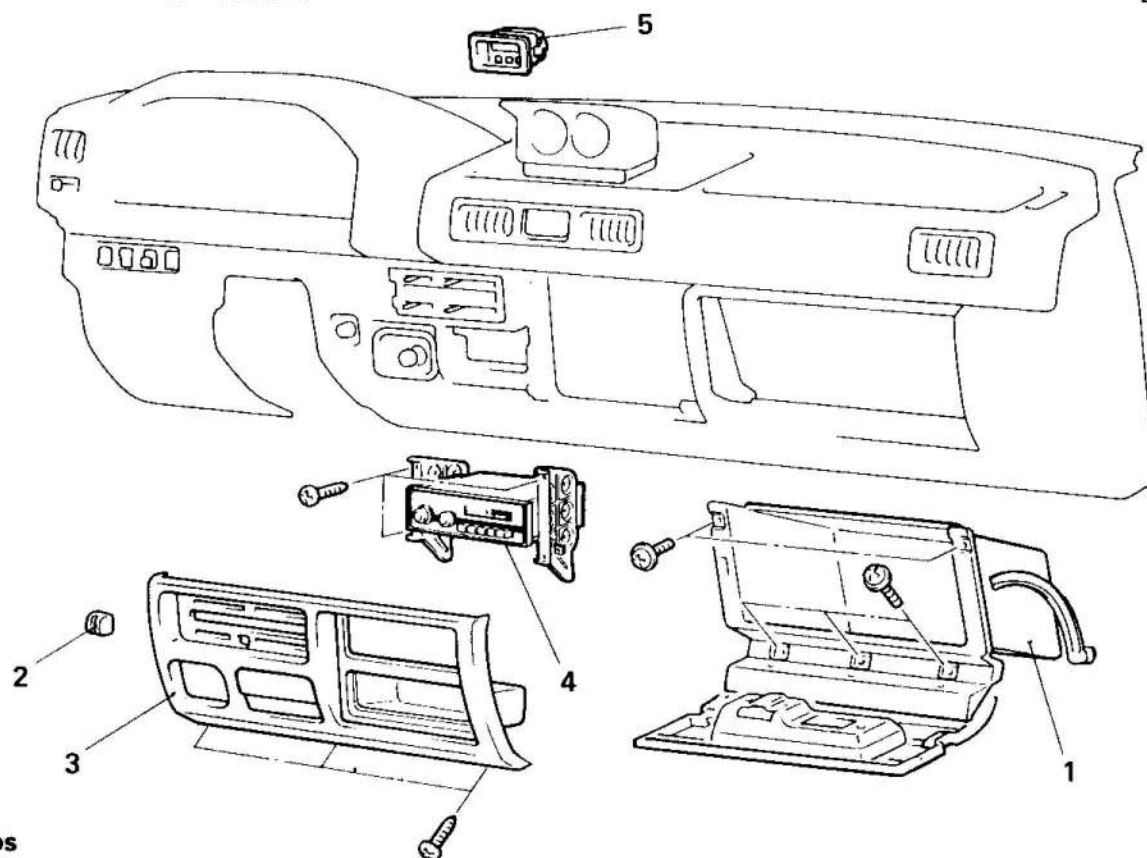
**CLOCK****SPECIFICATIONS****GENERAL SPECIFICATIONS**

E54KA---

Items	Specifications
Type	Crystal oscillating type
Display type	Fluorescent digital display

**CLOCK****REMOVAL AND INSTALLATION**

E54KH---

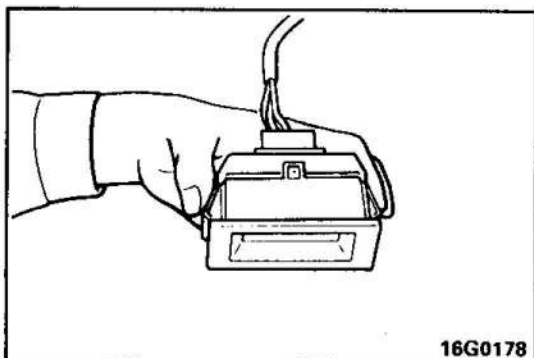
**Removal steps**

1. Glove compartment
2. Heater control lever knob
3. Center panel
4. Radio
- ◆◆ 5. Clock

16G179

**NOTE**

- (1) Reverse the removal procedures to reinstall.  
 (2) ◆◆ : Refer to "Service Points of Removal".



16G0178

**SERVICE POINTS OF REMOVAL**

E54KIAA

**5. REMOVAL OF CLOCK**

Hold spring on clock side and press instrument panel forward.

**AUDIO SYSTEM****SPECIFICATIONS**

E54LA---

**GENERAL SPECIFICATIONS****Vehicles for Europe****[Applicable through November production, 1987]**

Items	Specifications				
Radio					
Model	AR-7125A	AR-7135A	AR-7175A	AR-7185A	—
Receiving band	AM/FM	AM/FM	AM/FM	AM/FM	—
Tape player					
Model	CX-25CA	—	—	—	GX-21A
Speaker					
Front					
Driver's side					
Model	SR-10Z4-DK				SR-10Z4-DK
Allowable input	W				
Rated input		5			5
Max. input		7			7
Assist side					
Model	SR-10Z4-UJ				SR-10Z4-UJ
Allowable input	W				
Rated input		5			5
Max. input		7			7
*Rear					
Model	CJ-FB562A				—
Allowable input	W				
Rated input		7			—
Max. input		10			—
Antenna					
Model	CA-4SJ-P-5				—

**NOTE**

\* indicates equipment for mini-bus.

[Vehicles built from December 1987 up to November 1988]

Items	Van		
Radio			
Model	AR-7125A	AR-7135A	—
Receiving band	AM/FM	AM/FM	—
Tape player			
Model	—	CX-25CA	—
Speaker			
Front			
Driver's side			
Model	SR-10Z4-DK		
Allowable input W			
Rated input	5		
Max. input	7		
Assist side			
Model	SR-10Z4-UJ		
Allowable input W			
Rated input	5		
Max. input	7		
Antenna			
Model	CA-4SJ-P-5		

Items	Mini-bus		
Radio			
Model	AR-7175A	AR-7185A	—
Receiving band	AM/FM	AM/FM	—
Tape player			
Model	—	CX-25CA	—
Speaker			
Front			
Driver's side			
Model	SR-10Z4-DK		
Allowable input W			
Rated input	5		
Max. input	7		
Assist side			
Model	SR-10Z4-UJ		
Allowable input W			
Rated input	5		
Max. input	7		
Rear			
Model	CJ-FB562A		
Allowable input W			
Rated input	7		
Max. input	10		
Antenna			
Model	CA-4SJ-P-5		



[Vehicles built from December 1988]

Items	Van		
Radio			
Model	AR-7125B		–
Receiving band	AM/FM		–
Tape player			
Model	–	CX-25CB	–
Speaker			
Front			
Driver's side			
Model	SR-10Z4-DK		
Allowable input W			
Rated input	5		
Max. input	7		
Assist side			
Model	SR-10Z4-UJ		
Allowable input W			
Rated input	5		
Max. input	7		
Antenna			
Model	CA-4SJ-P-5		

Items	Mini-bus				
Radio					
Model	AR-7128	–	AR-7175B	AR-7185B	–
Receiving band	AM/FM	–	AM/FM	AM/FM	–
Tape player					
Model	–	CX-25CB	–	–	CX-25CB
Speaker					
Front					
Driver's side					
Model	SR-10Z4-DK		SR-10Z4-DK		
Allowable input W					
Rated input	5		5		
Max. input	7		7		
Assist side					
Model	SR-10Z4-UJ		SR-10Z4-UJ		
Allowable input W					
Rated input	5		5		
Max. input	7		7		
Rear					
Model	–		CJ-FB562A		
Allowable input W					
Rated input	–		7		
Max. input	–		10		
Antenna					
Model	CA-4SJ-P-5				

**Vehicles for General Export**  
**[Applicable through June production, 1987]**

Items	Specifications			
Radio				
Model	AR-7150Q	AR-7140A	AR-7174A	—
Receiving band	AM	SW/MW	AM/FM	—
Tape player				
Model	GX-21A			GX-21A
Speaker				
*Driver's side				
Model	SR-10Z4-DK			SR-10Z4-DK
Allowable input	W			
Rated input		5		15
Max. input		7		20
Assist side				
Model	SR-10Z4-UJ			SR-10Z4-UJ
Allowable input	W			
Rated input		5		15
Max. input		7		20
Antenna				
Model	CA-85K-P-2			—

## NOTE

\* indicate equipment not for MONO.

**[Applicable from July production, 1987]**

Items	Specifications				
Radio					
Model	AR-7174A	AR-7179A	AR-7140B	AR-7140A	AR-7279
Receiving band	AM/FM	AM/FM	SW/MW	SW/MW	AM/FM
Tape player					
Model	—	CX-25CA	—	—	CX-25CB
Speaker					
Front					
Driver's side					
Model	—	CJ-FB561A	—	—	SR-10Z4-DK
Allowable input	W				
Rated input	—	7	—	—	5
Max. input	—	10	—	—	7
Assist side					
Model	SR-10Z4-UJ	CJ-FB565A	SR-10Z4-UJ		SR-10Z4-UJ
Allowable input	W				
Rated input	5	7	5	5	5
Max. input	7	10	7	7	7
Rear					
Model	—	CJ-FB562A	—	—	CJ-FB562A
Allowable input	W				
Rated input	—	7	—	—	7
Max. input	—	10	—	—	10
Antenna					
Model	CA-85K-P-2				

**Vehicles for Australia**  
**[Applicable through September production, 1987]**

Items	Specifications	
Radio		
Model	AR-7129A	*CQ-LB563A
Receiving band	AM/FM	AM/FM
Tape player		
Model	CX-25P	—
Speaker		
Front		
Driver's side		
Model	SR-10Z4-DK	SR-10Z4-DK
Allowable input	W	
Rated input	5	5
Max. input	7	7
Assist side		
Model	SR-10Z4-UJ	SR-10Z4-UJ
Allowable input	W	
Rated input	5	5
Max. input	7	7
Rear		
Model	—	CJ-FB562A
Allowable input	W	
Rated input	—	7
Max. input	—	10
Antenna		
Model	CA-85K-P-2	

NOTE

\* indicates electronic turning radio with tape player.

[Vehicles built from October 1987 up to September 1988]

Items	Specifications	
Radio Model Receiving band	AR-7129A AM/FM CQ-LB563A* AM/FM	
Tape player Model	—	CX-25CA —
Speaker Front Driver's side Model Allowable input W Rated input Max. input Assist side Model Allowable input W Rated input Max. input Rear Model Allowable input W Rated input Max. input	SR-10Z4-DK CJ-FB561A 5 7 7 SR-10Z4-UJ CJ-FB565A 5 7 7 — CJ-FB562A — 7 10 — — 10	
Antenna Model	CA-8SK-P-2	

## NOTE

\* indicates electronic turning radio with tape player.

[Vehicles built from October 1988]

Items	Van	Mini-bus		
Radio				
Model		AR-7229	AR-7129A	CQ-LB563A*
Receiving band		AM/FM	AM/FM	AM/FM
Tape player				
Model	–	CX-25CB	CX-25CA	–
Speaker				
Front				
Driver's side				
Model		SR-10Z4-DK		CJ-FB561A
Allowable input	W			
Rated input		5		7
Max. input		7		10
Assist side				
Model		SR-10Z4-UJ		CJ-FB565A
Allowable input	W			
Rated input		5		7
Max. input		7		10
Rear				
Model		–		CJ-FB562A
Allowable input	W			
Rated input		–		7
Max. input		–		10
Antenna				
Model		CA-8SK-P-2		

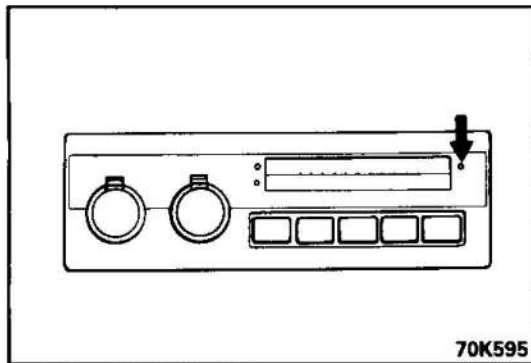
NOTE

\* indicates electronic turning radio with tape player.

TORQUE SPECIFICATIONS

E54LC--

Items	Nm	kgm	ft.lbs.
Antenna mounting screw	1–2	0.1–0.2	0.7–1.4



## SERVICE ADJUSTMENT PROCEDURES

E54LGAA

### ANTENNA TRIMMER (Vehicles with AM radio)

The antenna trimmer is essential for matching the antenna with the radio in order to obtain the maximum sensitivity of the radio. It must be adjusted with the antenna actually mounted on the vehicles. If the trimmer is not adjusted properly, the radio suffers from not only low sensitivity but also noises, such as external noise and noise from passing vehicles. In the following cases, therefore, adjust it as described below.

- (1) When radio is installed.
- (2) If antenna is replaced.
- (3) If radio has low sensitivity.
- (4) If radio is noisy.

### TRIMMER ADJUSTMENT

Make the following preparations for adjustment.

- (1) Turn the ignition key to the "ACC" position.
- (2) Extend the antenna as far as it will go.
- (3) Tune accurately to a station near 1,400 kHz in order to receive a broadcast in as weak an electric field as can be barely received. If there is no station near 1,400 kHz, tune to any high-frequency station (above 1,000 khz) available. If there are two or more stations near 1,400 kHz, choose the louder one.
- (4) Set the volume control to the proper volume.
- (5) Set the tone control to treble position.
- (6) Be sure that preparations (1) through (5) have been correctly made.
- (7) Insert a screwdriver into the trimmer adjusting hole. Turn the screwdriver clockwise or counterclockwise for maximum sensitivity (maximum broadcast wave sound).
- (8) If the optimum sensitivity point cannot be found, check for an antenna malfunction or a broken wire.

### NOTE

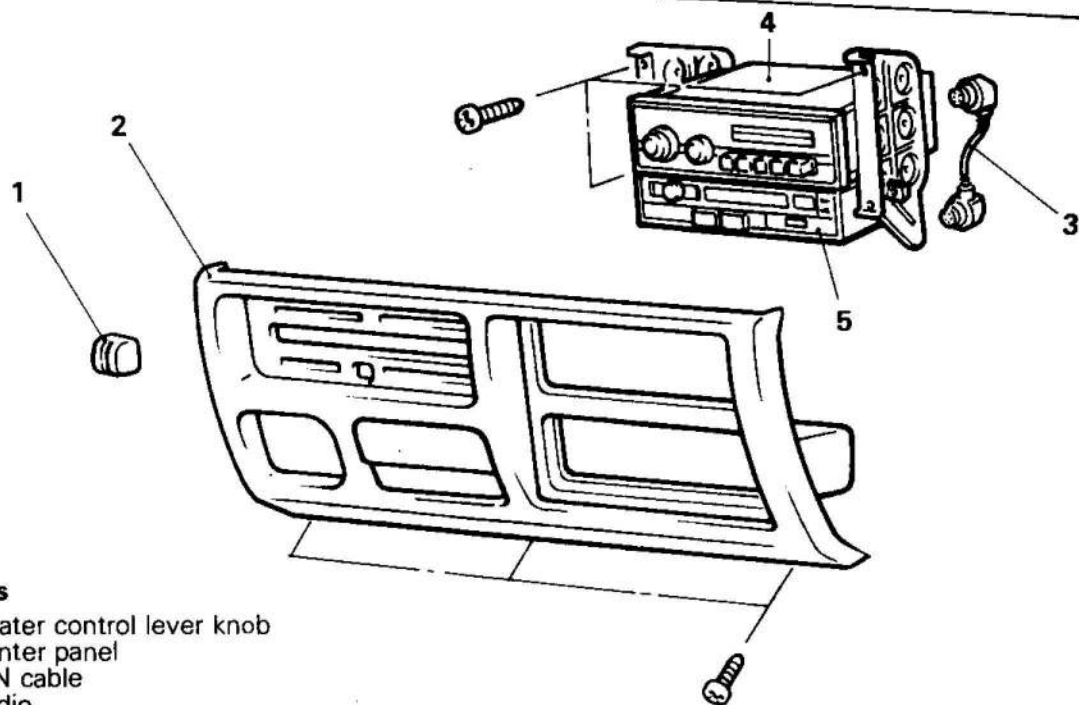
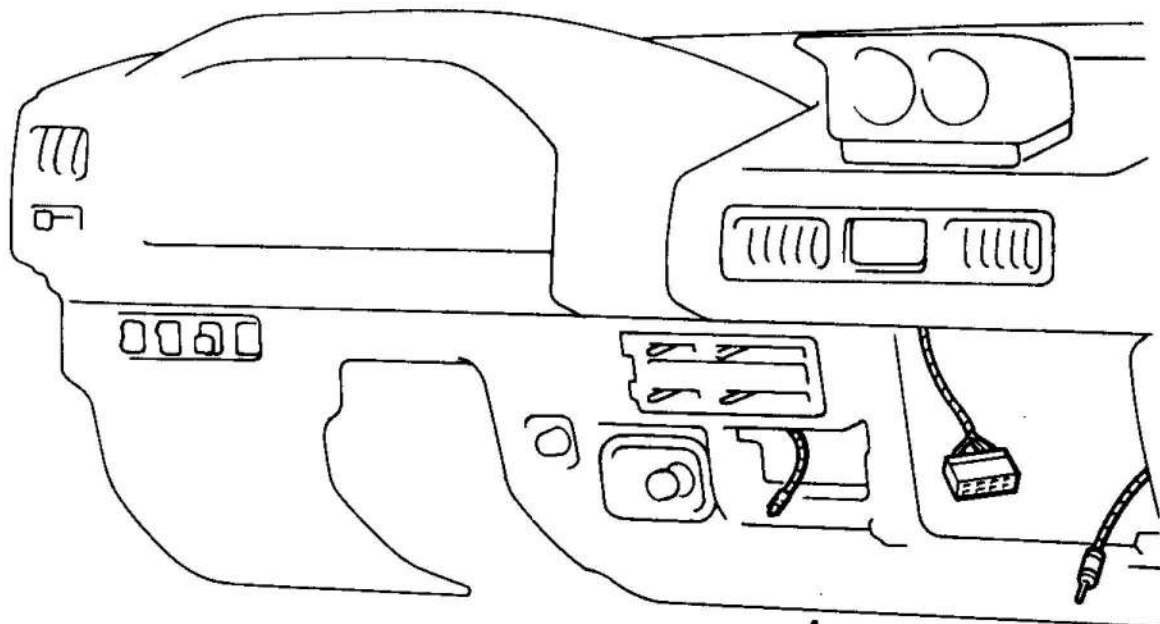
The antenna trimmer of an electronic turning radio does not require adjustment.

# RADIO AND TAPE PLAYER REMOVAL AND INSTALLATION

ES4LHAA

**Post-installation Operation**

- Adjustment of Antenna Trimmer  
(Refer to P.54-52.)



**Removal steps**

1. Heater control lever knob
2. Center panel
3. DIN cable
4. Radio
5. Tape player

**NOTE**

Reverse the removal procedures to reinstall.

16G0234

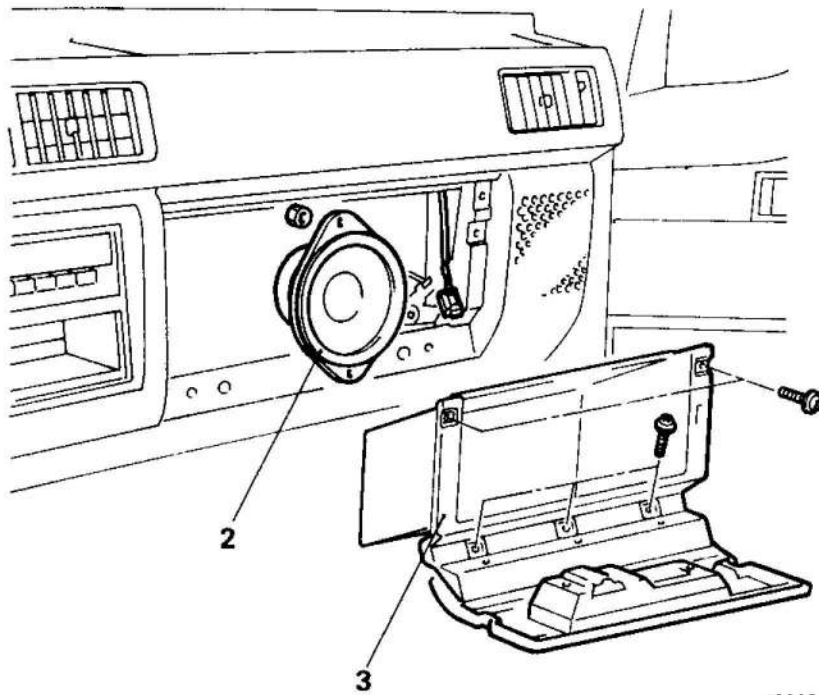
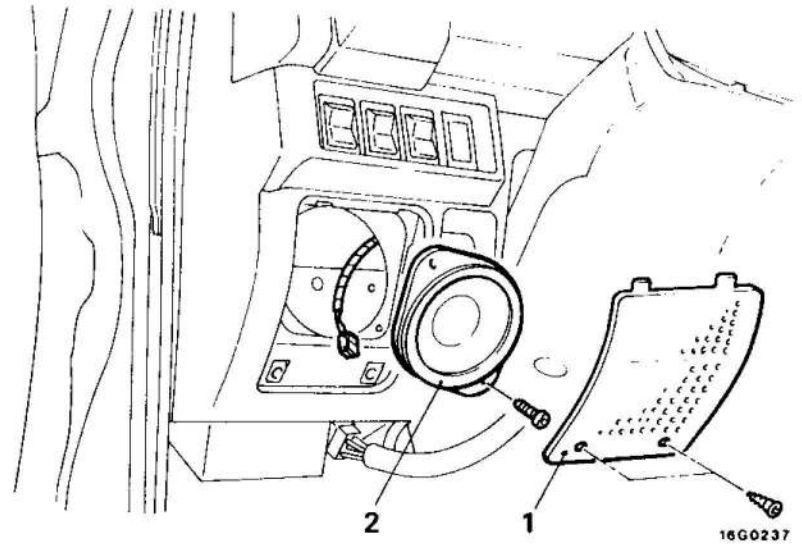
## FRONT SPEAKER REMOVAL AND INSTALLATION

E54CLAA

### DRIVER'S SIDE

#### Removal steps

1. Speaker panel
2. Speaker



### ASSIST SIDE

#### Removal steps

3. Glove compartment
2. Speaker

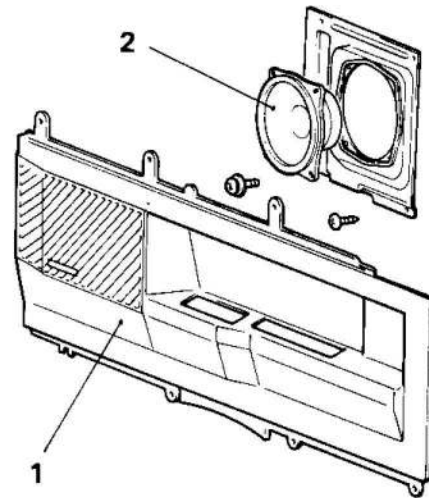
NOTE  
Reverse the removal procedures to reinstall.



## REAR SPEKER

### REMOVAL AND INSTALLATION

ES4LIBA



#### Removal steps

1. Quarter trim
2. Speaker

16G0263

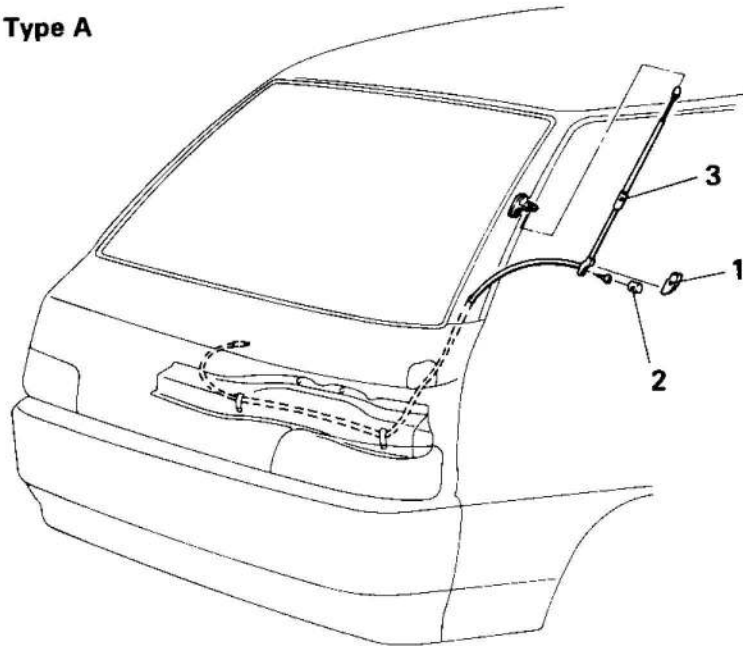
# ANTENNA

## REMOVAL AND INSTALLATION

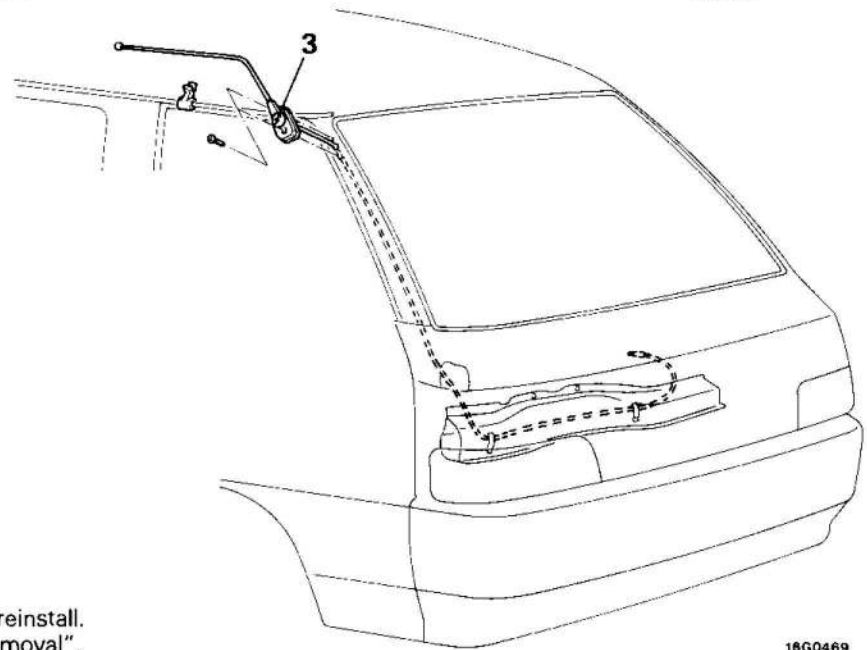
**Post-installation Operation**

- Adjustment of Antenna Trimmer (Refer to P.54-52.)

Type A



Type B



**Removal steps**

1. Cap
2. Waterproofing cap
- ◆◆ 3. Antenna

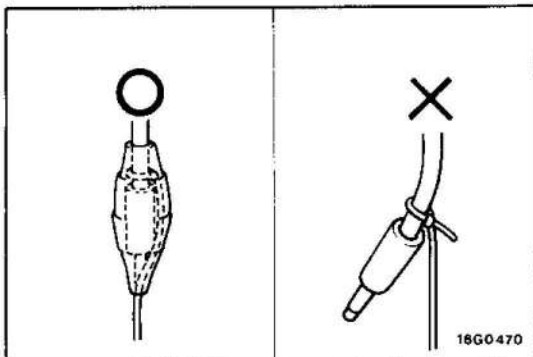
**NOTE**

- (1) Reverse the removal procedures to reinstall.
- (2) ◆◆ : Refer to "Service Points of Removal".

### SERVICE POINTS OF REMOVAL

#### 3. REMOVAL OF ANTENNA

Tie a string [approx. 250 cm (98 in.) ] to the antenna feeder line terminal so that the string application can easily been performed at the time of mounting, wind round a vinyl tape, etc., and remove antenna.



NOTES

## NOISE SUPPRESSION

E54LKAA

Noise interfering with radio reception may be roughly classified as follows:

- (1) Noise produced by the vehicle itself  
Noise from the ignition circuit, alternator circuit, etc.
- (2) Noise generated in the radio itself  
Thermal noise from transistors, IC, resistor, etc.
- (3) Atmospheric noise  
Noise from other vehicles, neon signs, etc.

The radio has devices to suppress noise of the radio itself and atmospheric noise, but it is difficult to eliminate them completely. Noise produced by the vehicle includes whining from the alternator system, and a strong, impulsive, fast popping noise from the ignition system.

Before performing any checking or adjustments, first confirm the following points.

- Adjust the antenna trimmer completely.
- Set the pushbuttons (tuning) properly.
- Extend the antenna all the way.

### PREVENTION OF IGNITION CIRCUIT NOISE

A resistance-equipped cable is used for the high-tension cable in order to prevent noise; however, if any noise from the ignition circuit does occur, check the tightness and earth connection of the positive (+) terminal of the noise filter, and if necessary, check the noise filter.

#### **Caution**

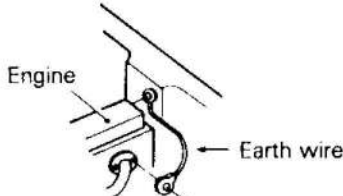
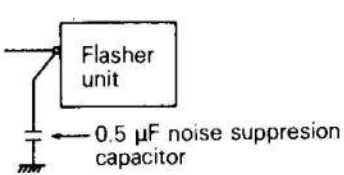
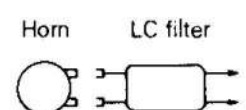
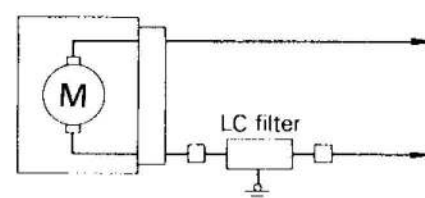
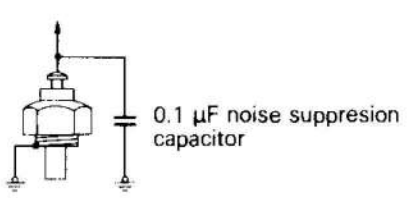
**Be careful not to connect the noise filter to the high-tension cable; doing so could damage the noise filter.**

### PREVENTION OF OTHER CIRCUIT NOISE

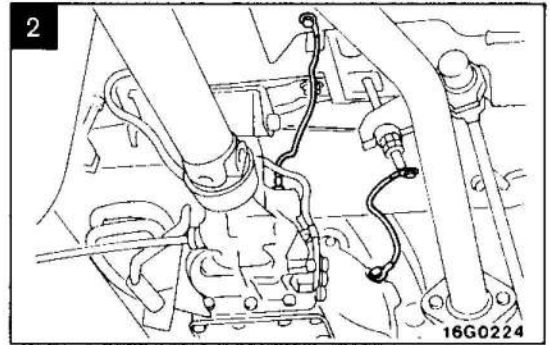
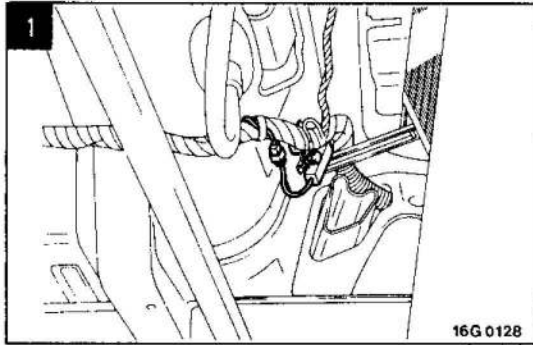
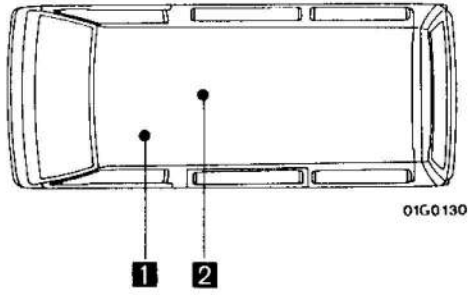
For other noise, take necessary corrective actions in accordance with the following items and the NOISE SUPPRESSION CHART. Polish the earth cable terminal, and connect it properly. Polish the pillar antenna earth terminal, and connect it properly. Earth electric parts completely.

Keep the antenna cable and speaker lead wire away from other electric wiring.

**NOISE SUPPRESSION CHART**

Symptom	Noise source	Remedy
Unusual noise related to engine speed	Engine	Securely earth the engine, frame and/or body and engine hood.  16E710
"Clatter" noise related to the flashing of turn-signal lights	Turn-signals	Connect a 0.5 $\mu$ F noise-suppression capacitor to the B terminal of the flasher unit.  16E712
Abnormal noise when the horn is operated	Horn	1. Connect a 0.5 $\mu$ F noise-suppression capacitor to the +B terminal of the horn. 2. For an FM radio, connect an LC filter to the horn terminals.  16E713
Noise when the windshield washer operates	Washer motor	Connect an LC filter between the terminals of the washer motor and the power source wire.  16F671
Unusual noise when the engine is started	Water temperature gauge unit	Connect a 0.1 $\mu$ F noise-suppression capacitor to the terminal of the water temperature gauge unit.  16F672

LOCATION OF NOISE SUPPRESSOR




# REAR WINDOW DEFOGGER

## SPECIAL TOOLS

E54MF--

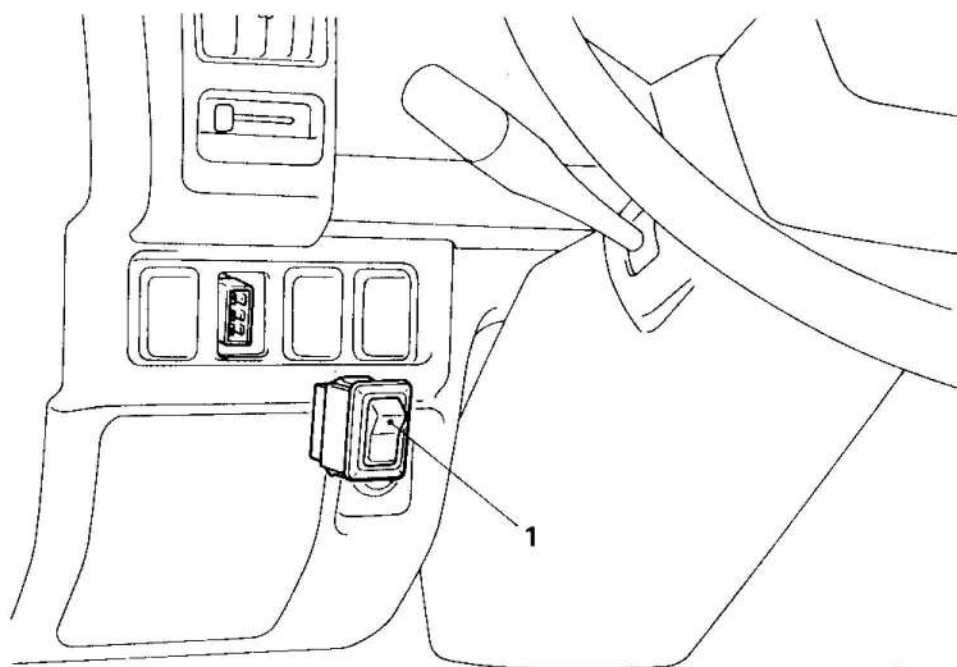
Tool (Number and name)	Use
MB990784 Ornament remover	Removal of switch



## DEFOGGER SWITCH

E54MHAA

### REMOVAL AND INSTALLATION

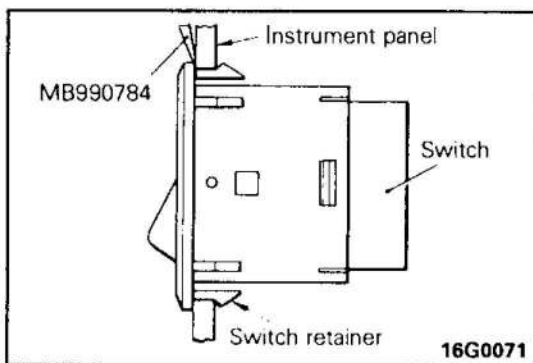


16G0198

◆◆ 1. Defogger switch

**NOTE**

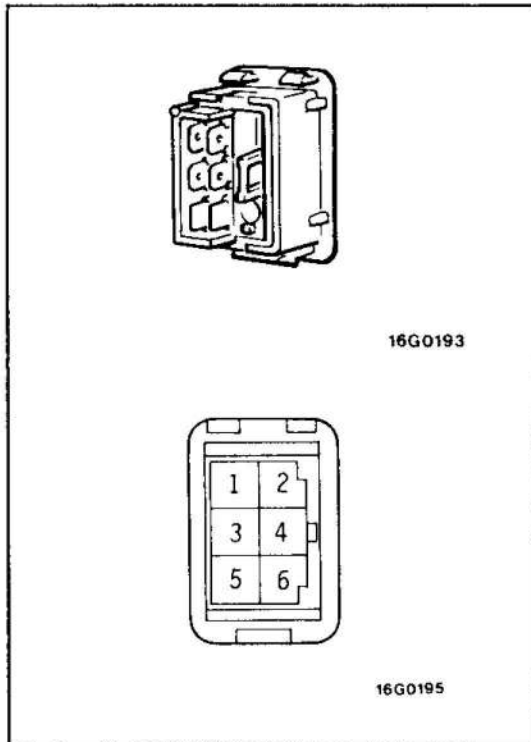
◆◆ : Refer to "Service Points of Removal".



### SERVICE POINTS OF REMOVAL

#### 1. REMOVAL OF DEFOGGER SWITCH

Use special tool to disengage defogger switch retainers from instrument panel, and remove the switch.



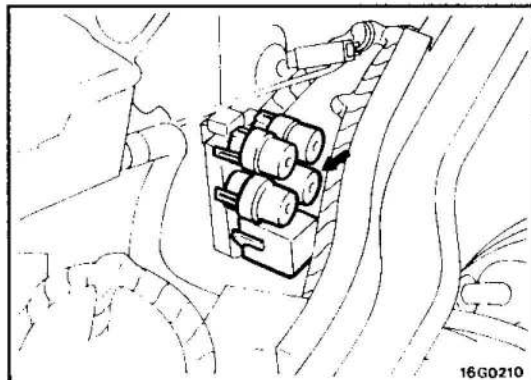
**INSPECTION**

Operate the switch and check the continuity between the terminals.

Switch position \ Terminal	2	5	3	Indicator lamp	6
OFF			○	⊗	○
ON	○	○	○	⊗	○

**NOTE**

○—○ indicates that there is continuity between the terminals.



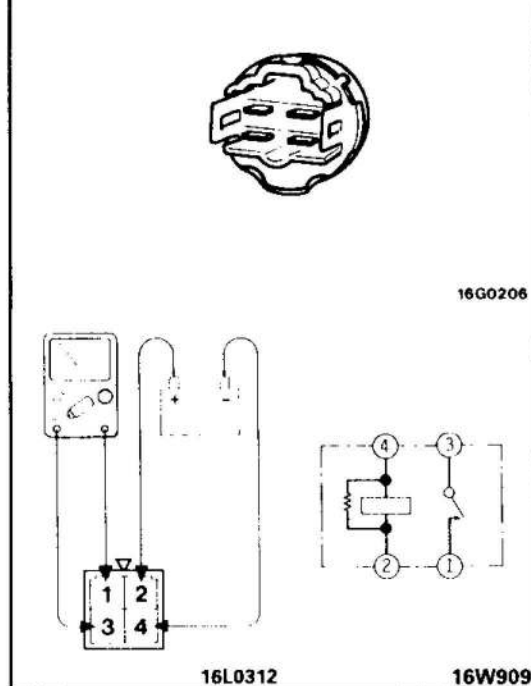
**DEFOGGER RELAY**

E54MIAA

**INSPECTION**

- (1) Remove defogger relay from indoor relay box.
- (2) Connect battery power source to terminal 2. Check circuit between terminals with terminal 4 grounded.

Power is supplied	Between 1–3 terminals	Continuity
Power is not supplied	Between 1–3 terminals	No continuity
	Between 2–4 terminals	Continuity





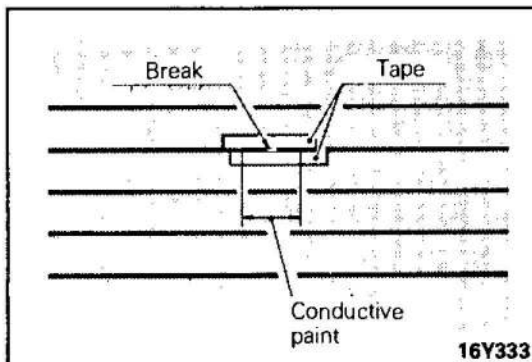
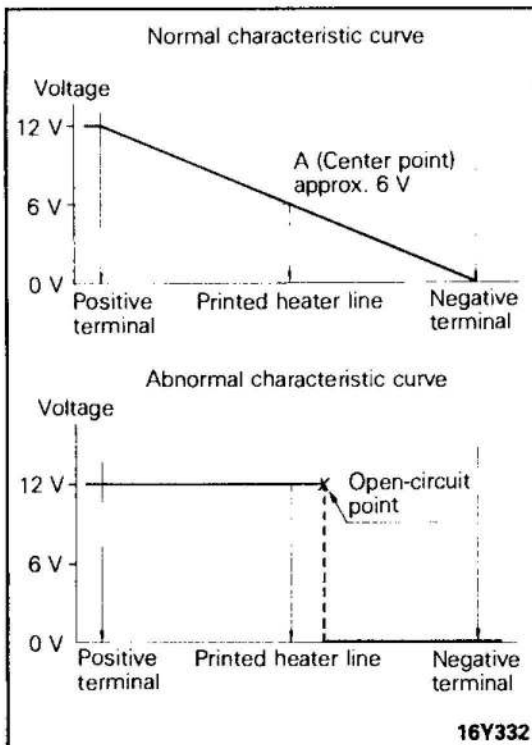
E54MJAA

## PRINTED HEATER LINES

### INSPECTION

#### Printed Heater Lines

- (1) Run engine at 2,000 rpm. Check heater element with battery at full.
- (2) Turn ON rear window defogger switch. Measure heater element voltage with circuit tester at rear window glass center A. Condition good if indicating about 6 V.
- (3) If 12 V is indicated at A, there is a break in the negative terminals from A.  
Move test bar slowly to negative terminal to detect where voltage changes suddenly (0 V).
- (4) If 0 V is indicated at A, there is a break in the positive terminals from A. Detect where the voltage changes suddenly (12 V) with the same method described.



### REPAIR

#### Required Materials

- Thinner
- Tape
- Conductive paint
- Lead-free gasoline
- Fine brush

- (1) Clean disconnected area with lead-free gasoline. Tape along both sides of heater element.
- (2) Mix conductive paint thoroughly. Thin the required amount of paint in a separate container with a small amount of thinner and paint break three times at 15 minute intervals.
- (3) Remove tape and leave for a while before use (circuit complete).
- (4) When completely dry (after 24 hours) finish exterior with a knife.

#### Caution

**Clean glass with a soft cloth (dry or damp) along defogger heater element.**

# AUTOMATIC FREE-WHEELING HUB INDICATOR SYSTEM (Vehicles for Australia-P24WSNXR8)

## SPECIFICATIONS

### SERVICE SPECIFICATIONS

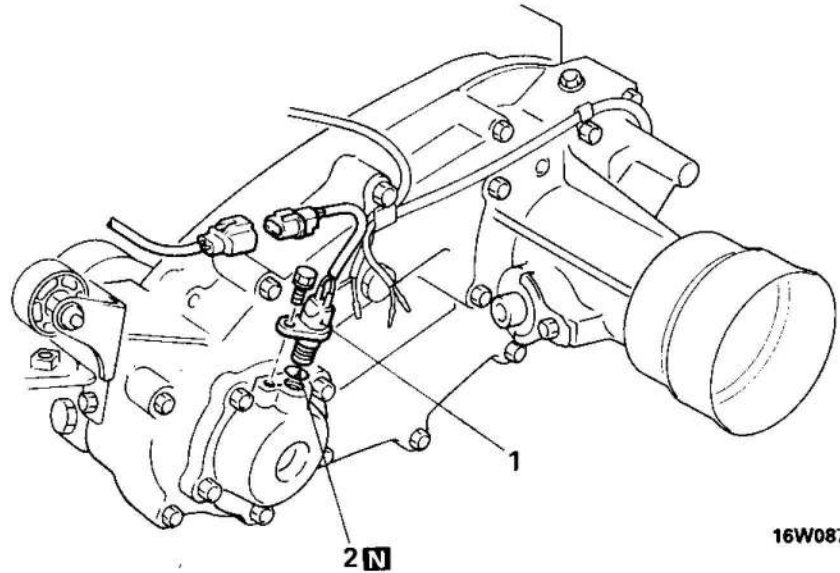
E54NB---

Items	Specifications
Standard values	
Pulse generator resistance [At 20°C (68°F)] $\Omega$	215–275
Vehicles-speed sensor output voltage V	
When OFF	4 or more
When ON	0

## PULSE GENERATOR

E54NHAA

### REMOVAL AND INSTALLATION

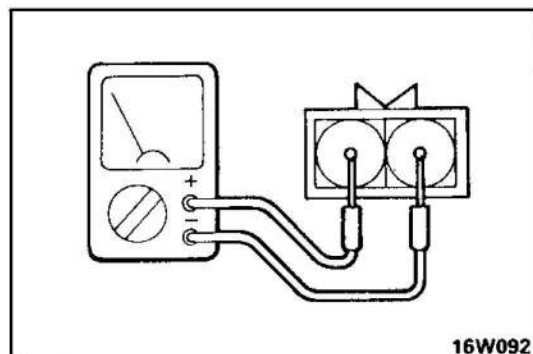


#### Removal steps

1. Pulse generator
2. O-ring

#### NOTE

- (1) Reverse the removal procedures to reinstall.
- (2) **N** : Non-reusable parts



### INSPECTION

- Check whether or not metal particles are adhered to the pole (iron core) of the pulse generator.
- Check whether or not the installation bolts of the pulse generator is loose.

### CHECKING PULSE GENERATOR RESISTANCE

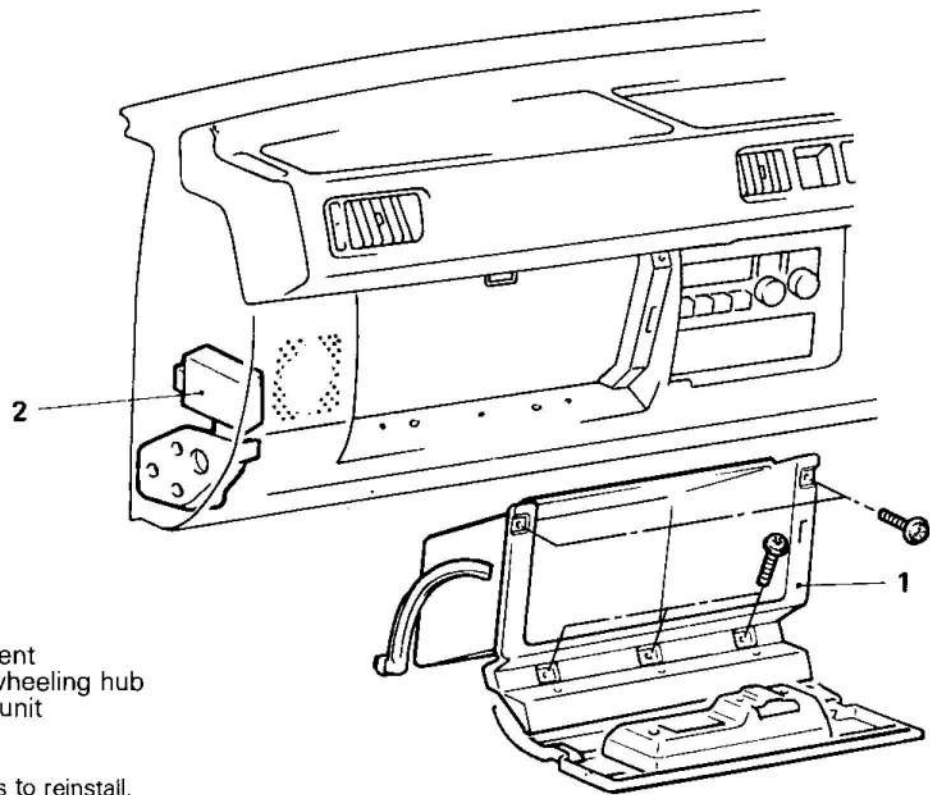
Check whether or not the resistance between the terminals shown in the figure is within the standard value range.

**Standard value: 215–275  $\Omega$  [At 20°C (68°F)]**

# AUTOMATIC FREE-WHEELING HUB INDICATOR CONTROL UNIT

N54N1AA

## REMOVAL AND INSTALLATION



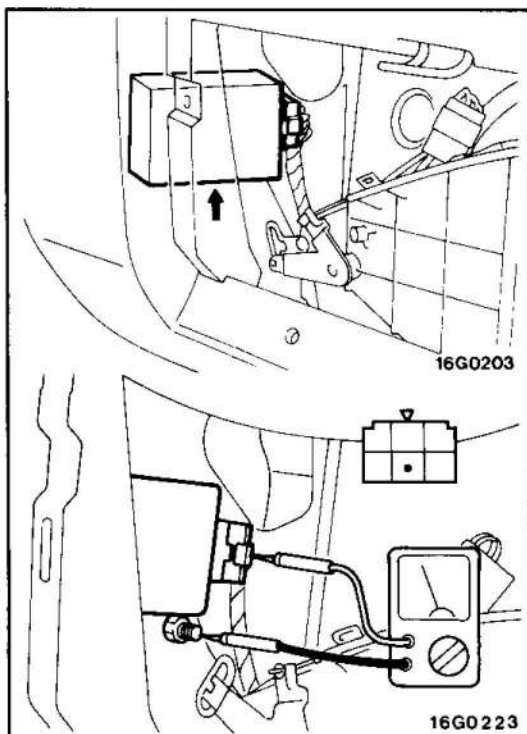
### Removal steps

1. Glove compartment
2. Automatic free-wheeling hub indicator control unit

### NOTE

Reverse the removal procedures to reinstall.

16G0238



## INSPECTION

- (1) Remove glove box. Remove control unit with connector installed.
- (2) Connect voltmeter between control unit terminal (speed sensor connect terminal) as illustrated and body ground.
- (3) With ignition switch ON, move vehicle slightly [0.5 m (1.6 ft.)] to operate speed sensor. Check control unit output voltage satisfies the standard value.

### Standard value:

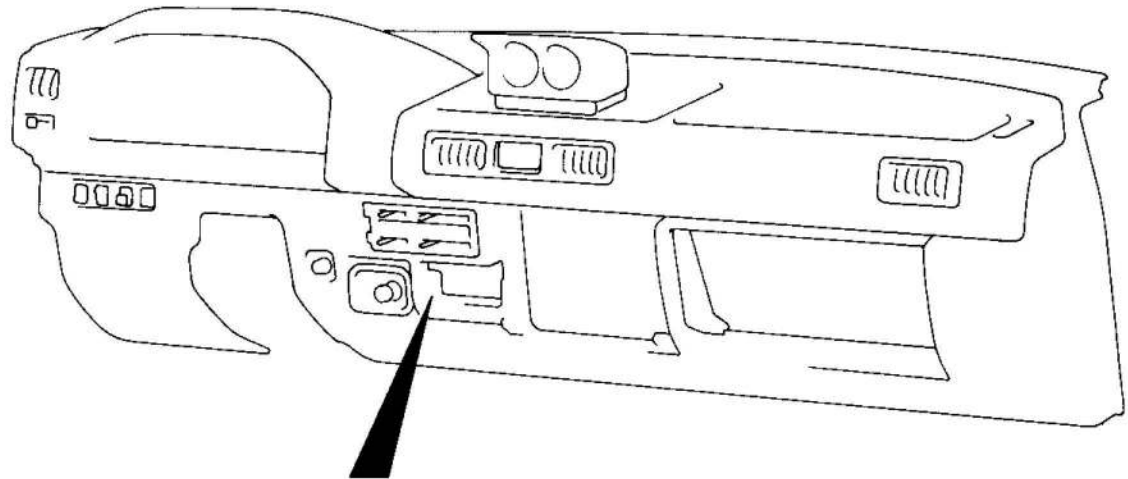
**Vehicle-speed sensor OFF: 4 V or higher**  
**Vehicle-speed sensor ON: 0 V**

# LIGHTING BUZZER SYSTEM

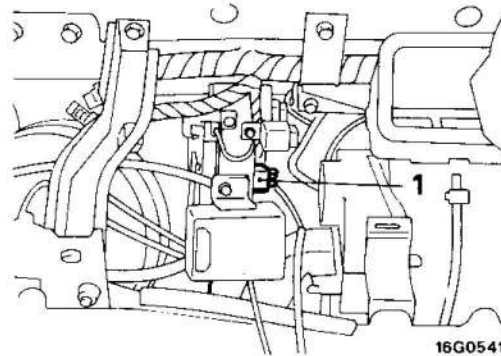
## LIGHTING BUZZER

### REMOVAL AND INSTALLATION

E54TAAA

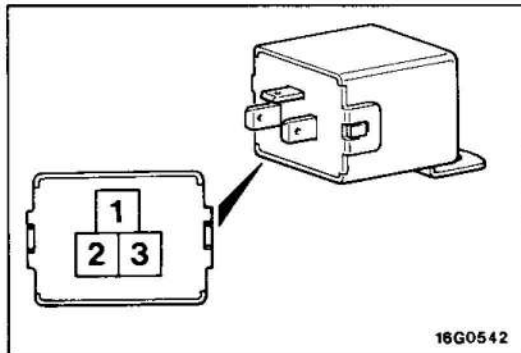


16G0179



16G0541

1. Lighting buzzer



16G0542

### INSPECTION

E54TABA

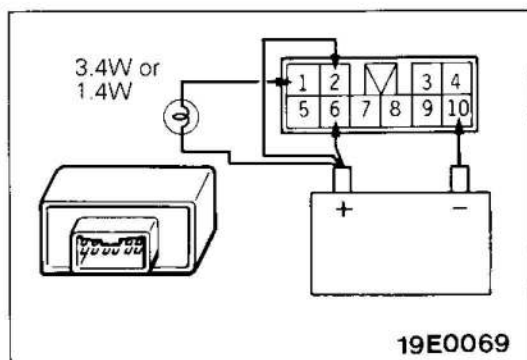
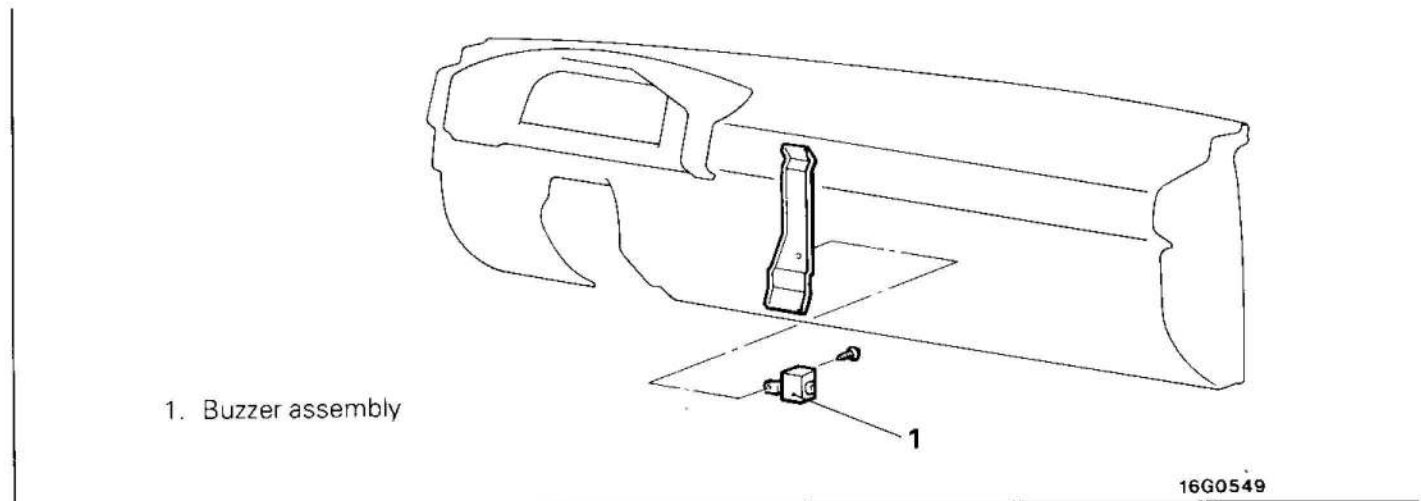
1. Check to be sure that the buzzer sounds when battery voltage is applied to terminal 3 and terminal 1 is earthed.
2. Check to be sure that the buzzer does not sound when battery voltage is applied to terminal 2 and terminal 3 and terminal 1 is earthed.

# SEAT BELT BUZZER, SEAT BELT WARNING TIMER AND KEY REMINDER BUZZER SYSTEM

## BUZZER ASSEMBLY

E54TBAB

### REMOVAL AND INSTALLATION

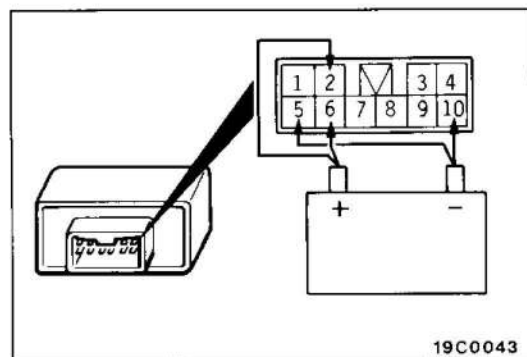


### INSPECTION

#### INSPECTION OF BUZZER ASSEMBLY

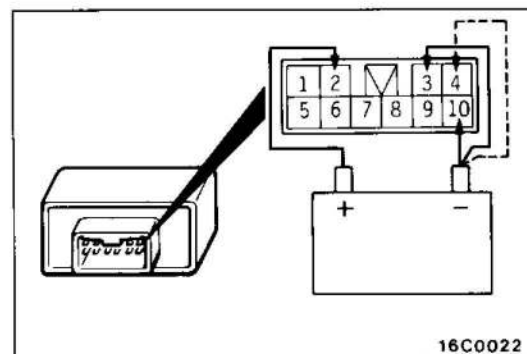
##### 1. INSPECTION OF SEAT BELT WARNING TIMER

- (1) Apply the battery voltage between the terminals (2) and (10).
- (2) Connect a light globe between terminals (1) and the battery (+) terminal, and check to be sure that the globe illuminates for 6 seconds when terminal (6) is connected to the battery.



##### 2. INSPECTION OF SEAT BELT BUZZER

- (1) Apply the battery voltage between the terminals (2), (6) and (10).
- (2) Check to be sure that the buzzer sounds intermittently when the terminal (5) is grounded.



##### 3. INSPECTION OF KEY REMINDER BUZZER

- (1) Apply the battery voltage between the terminals (2) and (10).
- (2) Check to be sure that the buzzer sounds intermittently when the terminal (3) is grounded.
- (3) Check to be sure that the buzzer stops sounding when terminal (4) is grounded.

