

CHASSIS ELECTRICAL

CONTENTS

E54AA--

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SUPPLEMENTAL RESTRAINT SYSTEM (SRS) – AIR BAG

- (1) An SRS air bag for the driver's side seat is optional equipment in this vehicle.
- (2) The SRS includes the following components: impact sensors, SRS diagnosis unit: SRS warning lamp, air bag module, clock spring, interconnecting wiring. Other SRS-related components (that may have to be removed/installed in connection with SRS service or maintenance) are indicated in the table of contents by an asterisk (*).

WARNING!

- (1) Improper service or maintenance of any component of the SRS, or any SRS-related component, can lead to personal injury or death to service personnel (from inadvertent firing of the air bag) or to the driver (from rendering the SRS inoperative).
- (2) Service or maintenance of any SRS component or SRS-related component must be performed only at an authorized MITSUBISHI dealer.
- (3) MITSUBISHI dealer personnel must thoroughly review this manual, and especially its GROUP 52B – Supplemental Restraint System (SRS), before beginning any service or maintenance of any component of the SRS or any SRS-related component.

54-1-1

AUDIO SYSTEM	32	SUNROOF (POWER SUNROOF)	Refer to GROUP 42
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BACK DOOR HANDLE AND LATCH (BACK DOOR LOCKING)	Refer to GROUP 42		

NOTES

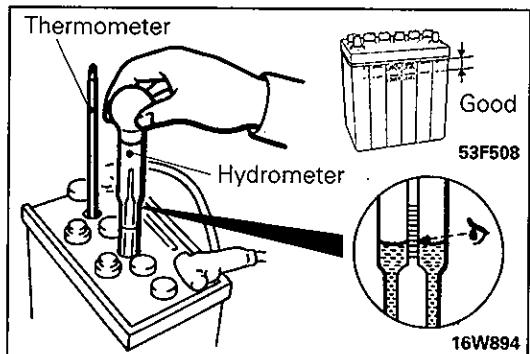
BATTERY

SPECIFICATION

SERVICE SPECIFICATION

E54CB-

Items	Specifications
Standard value Specific gravity of the battery fluid	1,220–1,290 [20°C (68°F)]



SERVICE ADJUSTMENT PROCEDURES

E54CBAD

INSPECTION OF FLUID LEVEL AND SPECIFIC GRAVITY

1. Inspect whether or not the battery fluid is between the UPPER LEVEL and LOWER LEVEL marks.
2. Use a hydrometer and thermometer to check the specific gravity of the battery fluid.

Standard value: 1,220–1,290 [20°C (68°F)]

The specific gravity of the battery fluid varies with the temperature, so use the following formula to calculate the specific gravity for 20°C (68°F). Use the calculated value to determine whether or not the specific gravity is satisfactory.

$$D_{20} = D_t + 0.0007 (t-20)$$

D₂₀: specific gravity of the battery fluid calculated for 20°C (68°F).

D_t: actually measured specific gravity

t: actually measured temperature

VISUAL INSPECTION

Remove the battery from the vehicle.

Caution

If battery fluid has leaked from the battery, use rubber gloves to protect your hands when removing the battery.

- (1) If there is corrosion of the battery stays or battery brackets from the battery fluid, clean by washing in warm or cold water.
- (2) If there is a leak from a crack in the battery case, replace the battery.
- (3) Clean the battery terminals with a wire brush, and replace any parts that are damaged.

CHARGING

1. When charging a battery while still installed in the vehicle, disconnect the battery cables to prevent damage to electrical parts.

2. The current normally used to charge a battery should be approximately 1/10th the battery capacity.

3. When quick charging due to lack of time, etc., the charging current should never exceed the battery capacity as indicated in amperes.

4. Determining if charging is completed.
 - (1) If the specific gravity of the battery fluid reaches 1.250–1.290 and remains constant for at least one hour.
 - (2) If the voltage of each cell reaches 2.5–2.8V and remains constant for at least one hour.

Caution

Take care since the battery fluid level may rise during charging.

Keep all sources of fire away while charging because there is danger of explosion.

Take care not to do anything that could generate sparks while charging.

When charging is completed, replace the battery caps, pour clean water over the battery to remove any sulfuric acid and dry.

BATTERY TEST

TEST STEP		RESULT	ACTION TO TAKE
A0	VISUAL INSPECTION		
	• Remove negative cable, then positive cable. • Check for dirty or corroded connections.	OK ► OK ►	CLEAN terminals and clamps. Go to A1. Go to A1.
A1	LOOSE BATTERY POST		
	• Check for loose battery post.	OK ► OK ►	REPLACE battery. Go to A2.
A2	CRACKED BATTERY COVER		
	• Remove holdowns and shields. • Check for broken/cracked case or cover.	OK ► OK ►	REPLACE battery. Go to A3.
A3	OPEN CIRCUIT VOLTAGE TEST		
	• Turn headlights on for 15 seconds. • Turn headlights off for 2 minutes to allow battery voltage to stabilize. • Disconnect cables. • Read open circuit voltage.	OK ► OPEN CIRCUIT VOLTAGE UNDER 12.4 VOLTS OK ►	CHARGE battery at 5 amps, then go to A3. Go to A4.
A4	LOAD TEST		
	• Connect a load tester to the battery. • Load the battery at the recommended discharge rate (See LOAD TEST RATE CHART) for 15 seconds. • Read voltage after 15 seconds, then remove load.	OK ► VOLTAGE IS LESS THAN MINIMUM LISTED OK ► VOLTAGE IS MORE THAN MINIMUM LISTED	REPLACE battery. Battery OK.

LOAD TEST RATE CHART

Load test (amps)	Cranking rating [–18°C (0°F)]	Reserve capacity	Application
210	420	111	65D23R
240	490	123	75D26R
310	622	159	95D31R

LOAD TEST CHART

Minimum voltage	Temperature	
	°C	°F
9.6	21 and above	70 and above
9.5	16	60
9.4	10	50
9.3	4	40
9.1	–1	30
8.9	–7	20
8.7	–12	10
8.5	–18	0

IGNITION SWITCH

IGNITION SWITCH

REMOVAL AND INSTALLATION

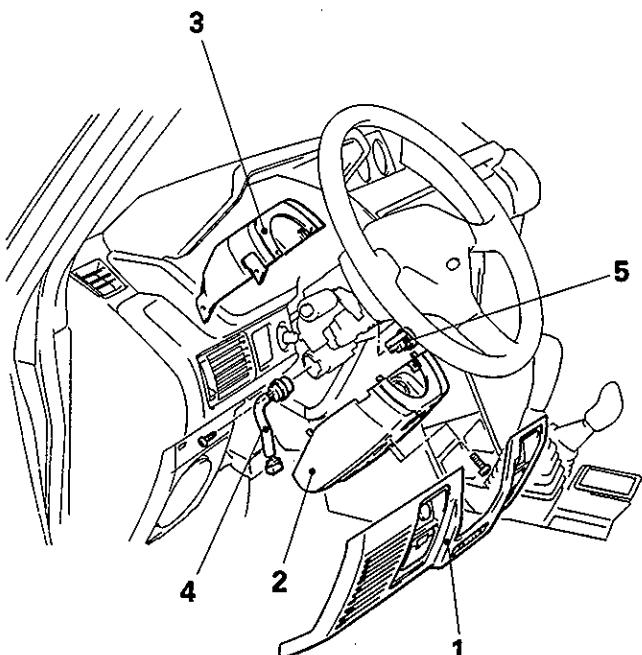
E54DH--

Removal steps of ignition switch

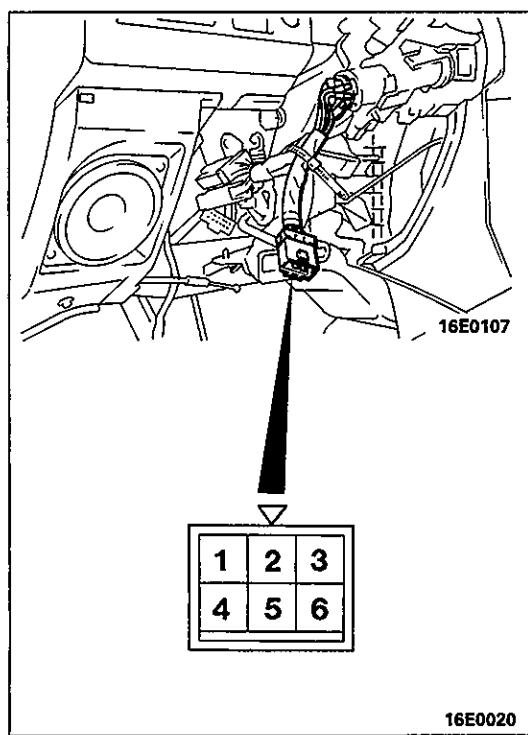
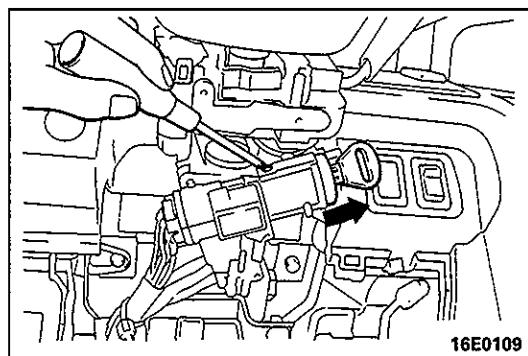
1. Instrument under cover
(Refer to GROUP 52A – Instrument Panel)
2. Column cover lower
3. Column cover upper
4. Ignition switch

Removal steps of steering lock cylinder

2. Column cover lower
5. Steering lock cylinder



16E0110



SERVICE POINT OF REMOVAL

E54DIAF

5. REMOVAL OF STEERING LOCK CYLINDER

- (1) Insert the key in the steering lock cylinder and turn it to the "ACC" position.
- (2) Using a cross-tip (+) screwdriver (small) or a similar tool, push the lock pin of the steering lock cylinder inward and then pull the steering lock cylinder toward you.

INSPECTION

E54DJAN

IGNITION SWITCH

- (1) Remove the instrument under cover. (Refer to GROUP 52A – Instrument Panel.)
- (2) Remove the column cover lower.
- (3) Disconnect the wiring connector from the ignition switch, and connect an ohmmeter to the switch side connector.
- (4) Operate the switch, and check the continuity between the terminals.

<Except L.H. drive vehicles with SRS>

Terminal	1	2	3	4	5	6
Position						
LOCK						
ACC				○		○
ON		○	○	○		○
START	○			○	○	○

NOTE

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

<L.H. drive vehicles with SRS>

Terminal Position	1	2	3	4	5	6
LOCK						
ACC	○					○
ON	○	○		○		○
START	○	○	○		○	

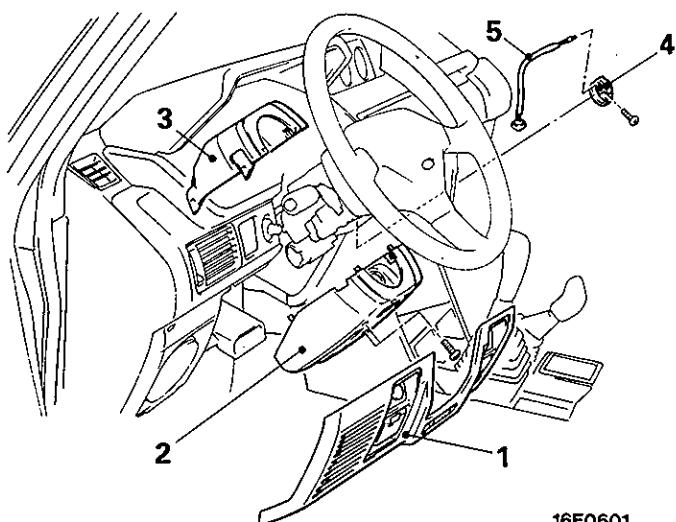
NOTE

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

IGNITION KEY ILLUMINATION SYSTEM

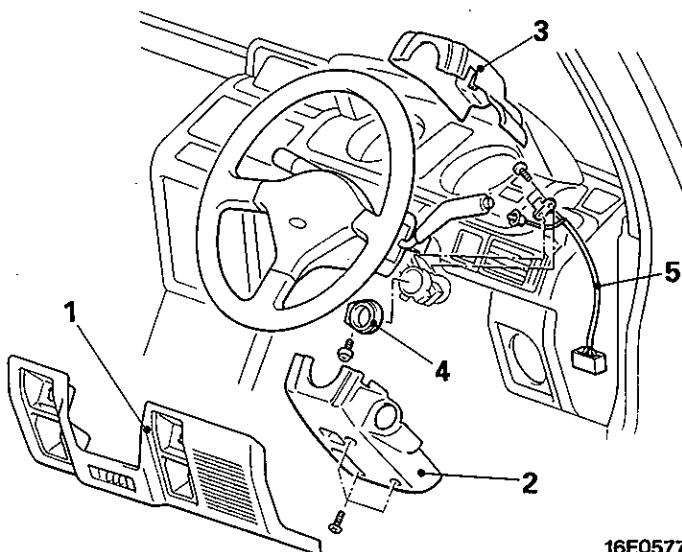
REMOVAL AND INSTALLATION

<L.H. drive vehicles>



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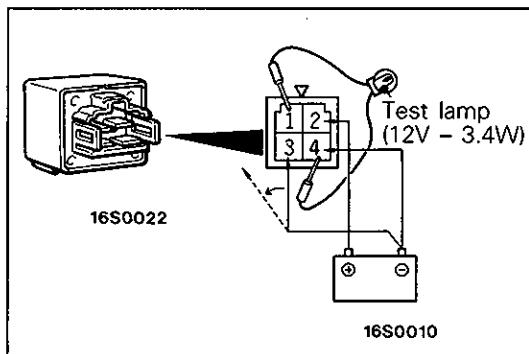
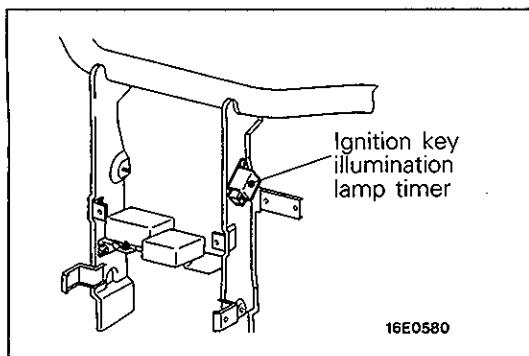
<R.H. drive vehicles>



16E0577

Removal steps

1. Instrument under cover (Refer to GROUP 52A - Instrument Panel)
2. Column cover lower
3. Column cover upper
4. Ignition key illumination ring
5. Key reminder switch or key hole illumination lamp



INSPECTION

IGNITION KEY ILLUMINATION LAMP TIMER

- (1) Remove the instrument panel. (Refer to GROUP 52A – Instrument Panel)
- (2) Remove the ignition key illumination lamp timer.

- (3) Apply the battery voltage between the terminal No. ② and No. ④.
- (4) Connect a test lamp between the terminal No. ① and No. ④.
- (5) Check that the test lamp illuminates for 8 – 16 seconds when terminal ③ is earthed for 3 seconds or more and then disconnected from the earth.

METERS AND GAUGES

SPECIFICATION

SERVICE SPECIFICATIONS

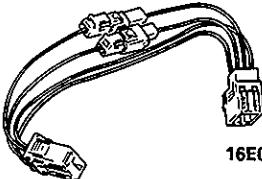
E54EB--

Items	Specifications
Standard value	
Speedometer indication error	km/h (mph)
40 (20)	40-48 (20-25)
80 (40)	80-92 (40-47)
120 (60)	120-136 (60-69)
160 (80)	160-180 (80-91)
- (100)	- (100-114)
Tachometer indication error	r/min
<4G64, 6G72, 4D56>	
1,000	±100
3,000	±150
5,000	±250
6,000 (Petrol-powered vehicles)	±300
<6G74>	
700	±100
3,000	+225 -100
5,000	+325 -125
7,000	+400 -100
<4M40>	
700	±100
3,000	±150
5,000	±250
Fuel gauge unit resistance	Ω
Float point "F"	3±2
Float point "E"	110±7
Fuel gauge unit float height	mm (in.)
Standard wheelbase	
A (Float point "F")	118.1 (4.64)
B (Float point "E")	263.1 (10.35)
Long wheelbase	
A (Float point "F")	119.3 (4.69)
B (Float point "E")	225.0 (10.03)
Fuel gauge resistance	Ω
<Vehicles built up to October, 1993>	
Power supply and earth	233±23.3
Power supply and fuel gauge	86±8.6
Fuel gauge and earth	147±14.7
<Vehicles built from November, 1993>	
Power supply and earth	115±11.5
Power supply and fuel gauge	79±7.9
Fuel gauge and earth	80±8.0

Items	Specifications	
Engine coolant temperature gauge resistance <Vehicles built up to October, 1993>	Ω	147±14.7
Power supply and engine coolant temperature gauge		75±7.5
Power supply and earth		147±14.7
Engine coolant temperature gauge and earth		222±22.2
<Vehicles built from November, 1993>		
Power supply and engine coolant temperature gauge		145±14.5
Power supply and earth		115±11.5
Engine coolant temperature gauge and earth		246±24.6
Inside temperature sensor and outside temperature sensor resistance	Ω	
20°C (68°F)		Approx. 1,200
40°C (104°F)		Approx. 500

SPECIAL TOOL

E54EF--

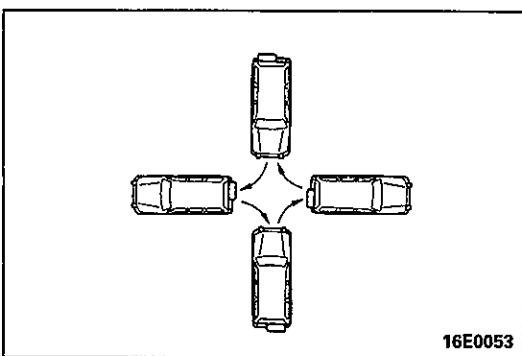
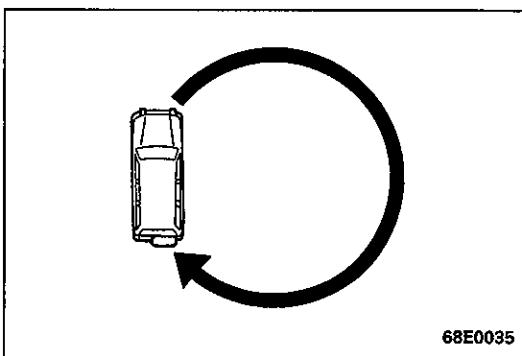
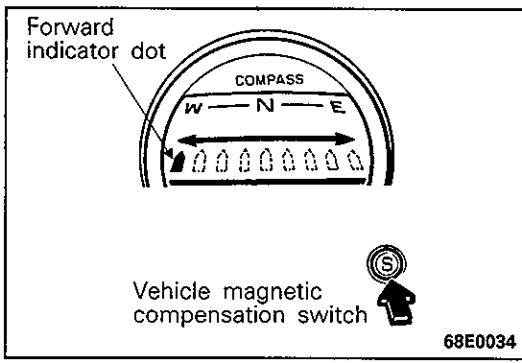
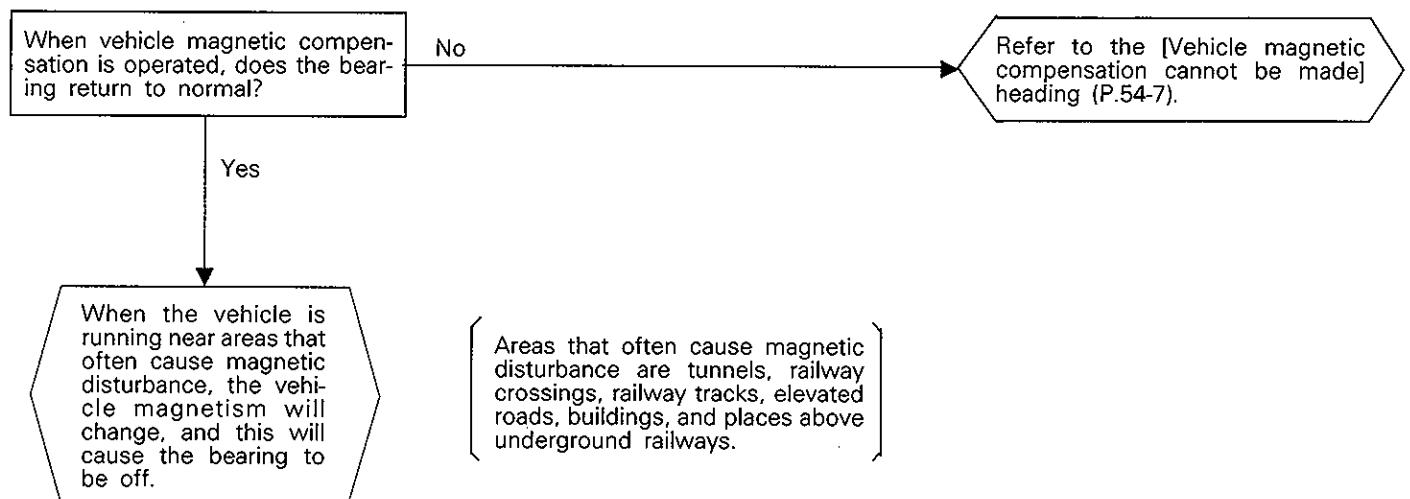
Tool	Number	Name	Use
	MB991416 16E0169	Inspection harness	Measuring the current between N-S terminals and E-W terminals of the electric compass

NOTES

TROUBLESHOOTING

E54E0AA

1. Bearing indicator is off when moving forward



Vehicle magnetic compensation

(1) When the vehicle magnetic compensation (Azimuth adjustment) switch is pressed for 0.5 seconds or more, the direction indicator switches off, and the forward indicator dot will move step by step to the left or right.

(2) If the vehicle turns (slowly) in a 360° circle, compensation is automatically completed.

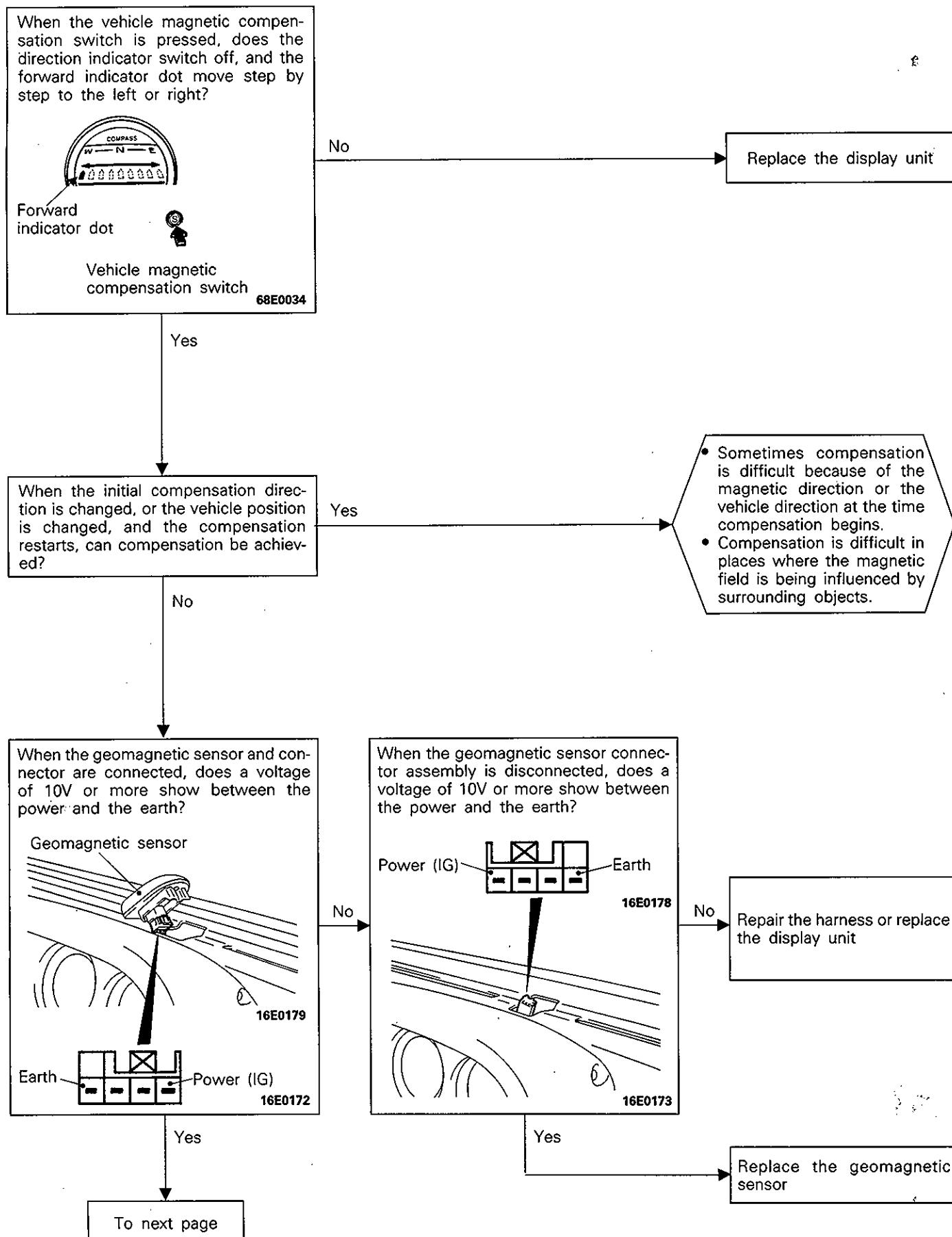
NOTE

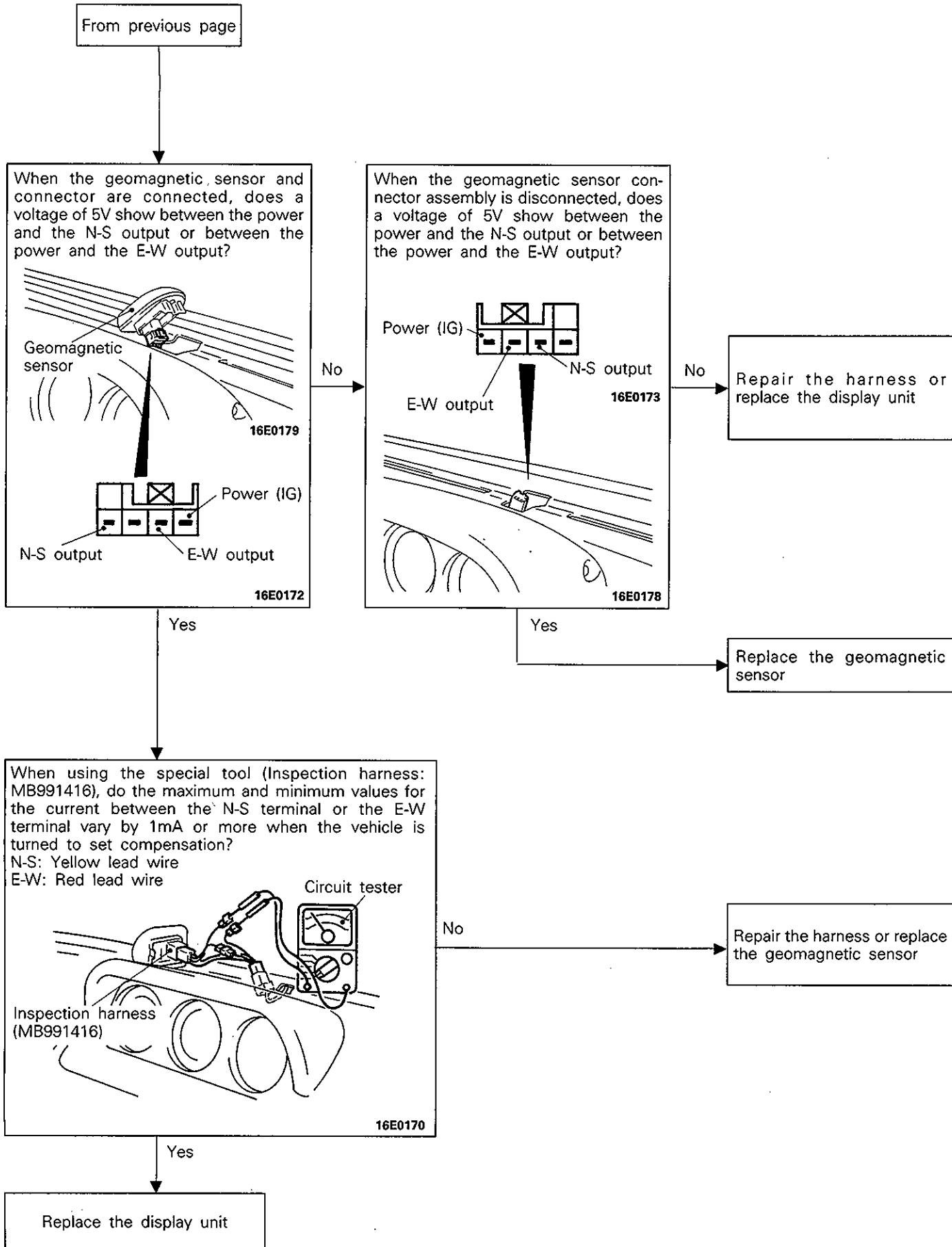
Compensation is possible if the turn is made to either the left or right.

(3) If there is no place to turn the vehicle in a circle, turn the vehicle around by moving it backwards and forwards.

(4) After compensation is completed, a dot showing the current direction of movement will be illuminated.

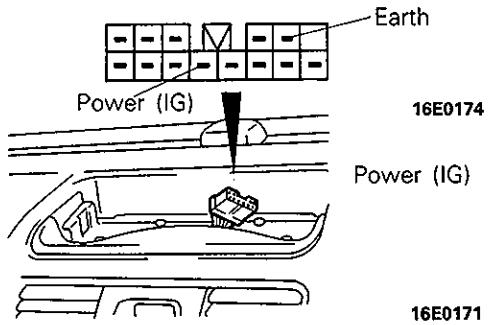
2. Vehicle magnetic compensation cannot be made





3. Display is hard to see or no display appears

When the multi-meter assembly connector is removed, does a voltage of 10V or more show between the power and the earth?

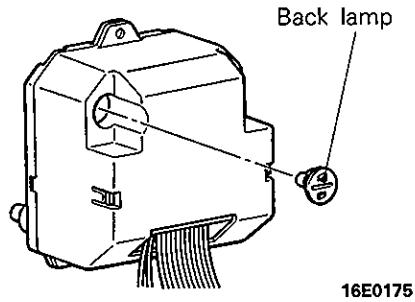


No

Repair the harness

Yes

Is the back lamp illuminated?



No

Replace the back lamp

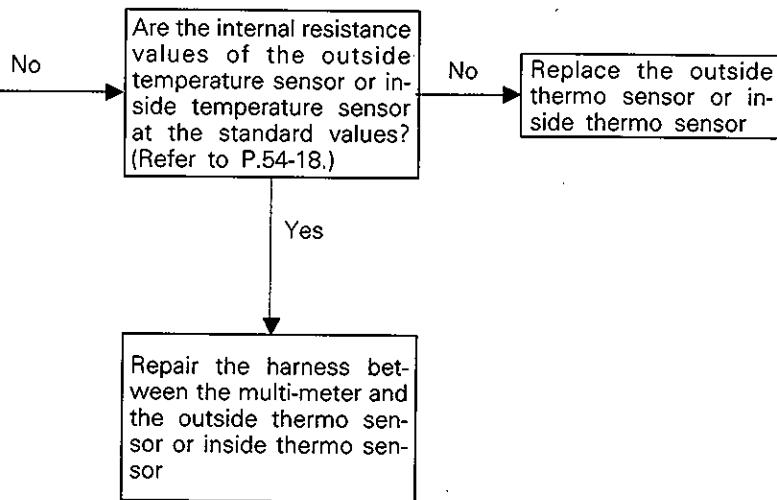
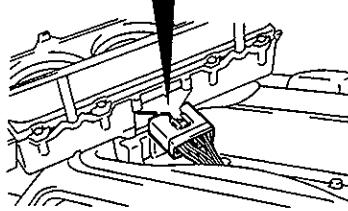
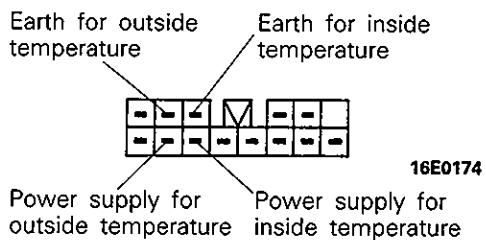
Yes

Replace the display unit

4. Discrepancy between the inside and outside temperatures and the display temperature

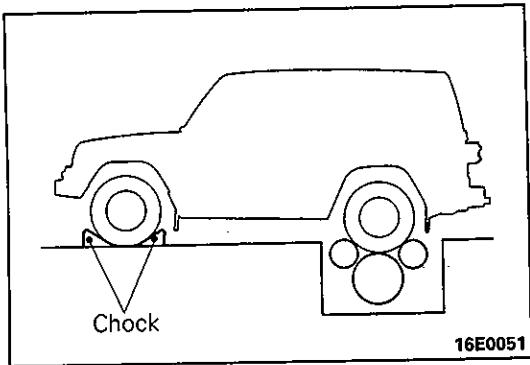
With the multi-meter connected to the connector, when the outside thermo sensor or the inside thermo sensor are showing the temperatures below, are the voltages between the outside temperature power and earth terminals, or between the inside temperature power and earth terminals, as shown in the table below?

Display temperature (°C(F))	Terminal voltage (V)	
	Outside temperature	Inside temperature
0 (0)	3.42	3.42
20 (68)	2.46	2.23
40 (104)	1.61	1.43



Yes

Replace the display unit



SERVICE ADJUSTMENT PROCEDURES

E54EGAT

SPEEDOMETER INSPECTION

- (1) Adjust the pressure of the tyres to the specified level.
(Refer to GROUP 31-General Specifications.)
- (2) Place the vehicle on a speedometer tester and chock the front wheels

Caution
Always inspect with the transfer lever in the "2H" position.

- (3) Check if the speedometer indication range is within the standard values.

Caution

Do not operate the clutch suddenly or decrease speed rapidly while testing.

Standard value: Standard indication Allowable range

km/h (mph)	km/h (mph)
40 (20)	40-48 (20-25)
80 (40)	80-92 (40-47)
120 (60)	120-136 (60-69)
160 (80)	160-180 (80-91)
- (100)	- (100-114)

TACHOMETER INSPECTION

<Petrol-powered vehicles>

- (1) Insert a paper clip in the connector from the harness side, and attach the engine speedometer.

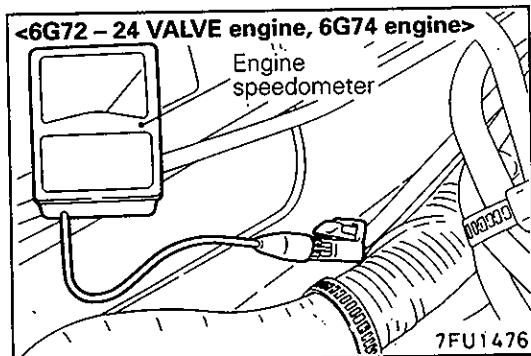
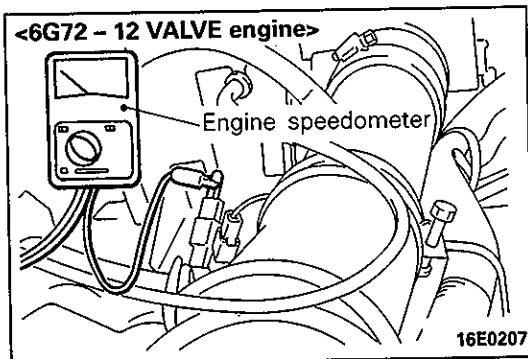
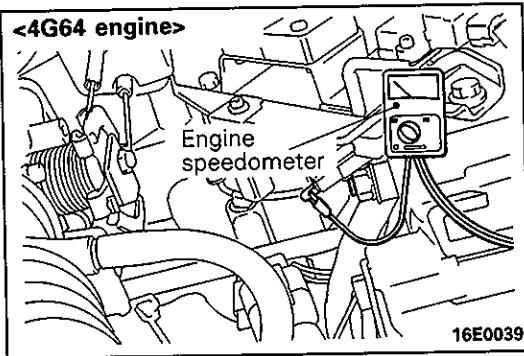
NOTE

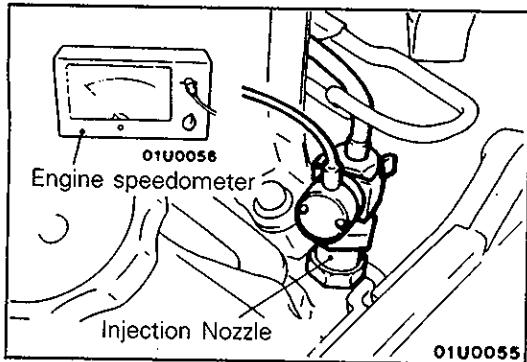
For tachometer inspection, use of a fluxmeter-type engine speedometer is recommended. (Because a fluxmeter only needs to be clipped to the high tension cable.)

- (2) Compare the readings of the engine speedometer and the tachometer at every engine speed, and check if the variations are within the standard values.

Standard value:

	Engine speed r/min	Indicated variation r/min
4G64, 6G72	1000	±100
	3000	±150
	5000	±250
	6000	±300
6G74	700	±100
	3000	+225 -100
	5000	+325 -125
	7000	+400 -100





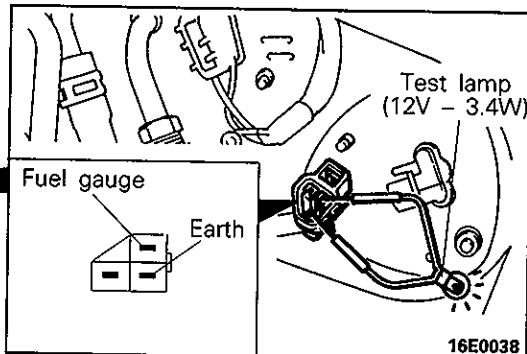
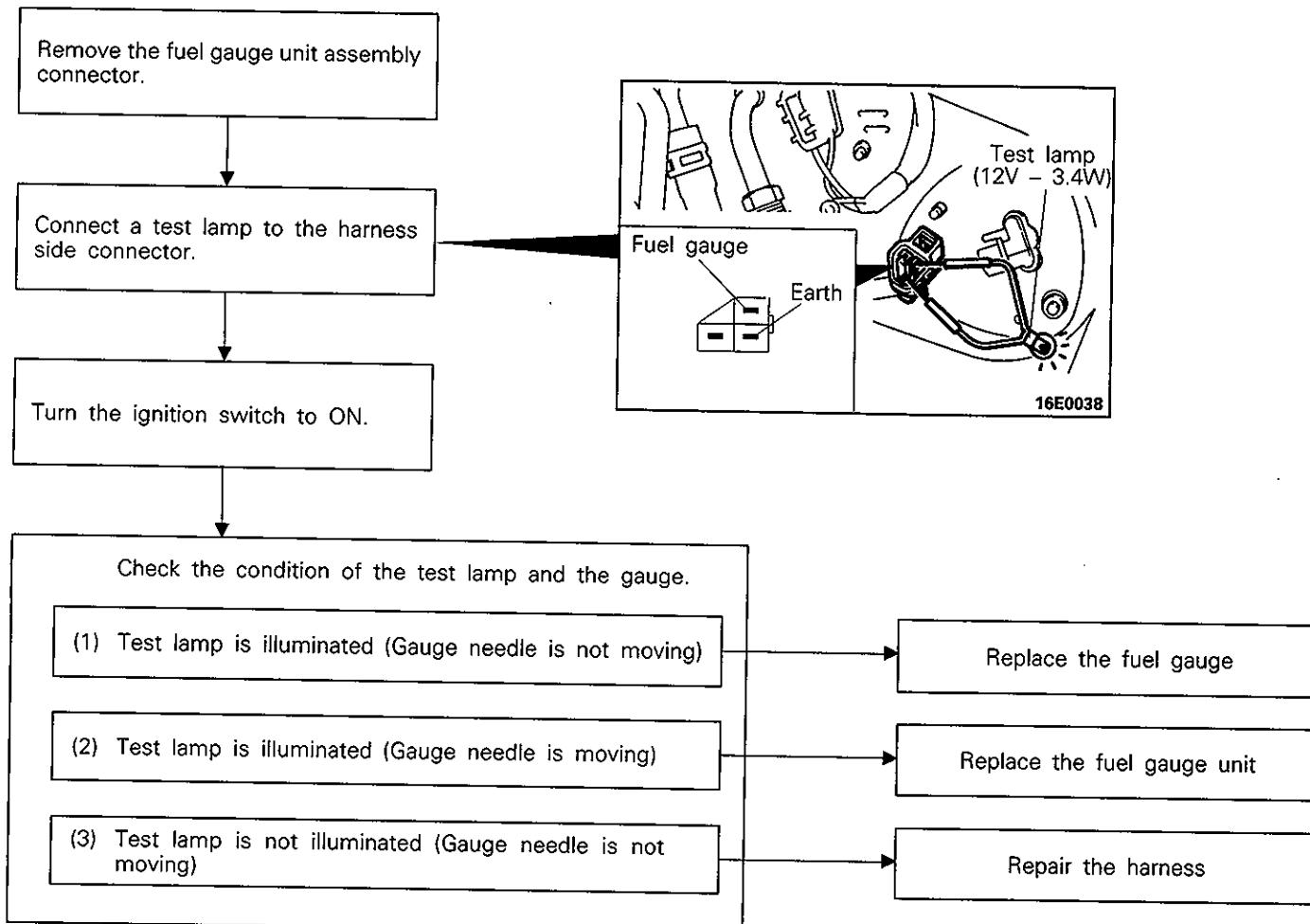
<Diesel-powered vehicles>

- (1) Connect the engine speedometer to the injection pipe or injection nozzle.
- (2) Compare the readings of the engine speedometer and the tachometer at every engine speed, and check if the variations are within the standard values.

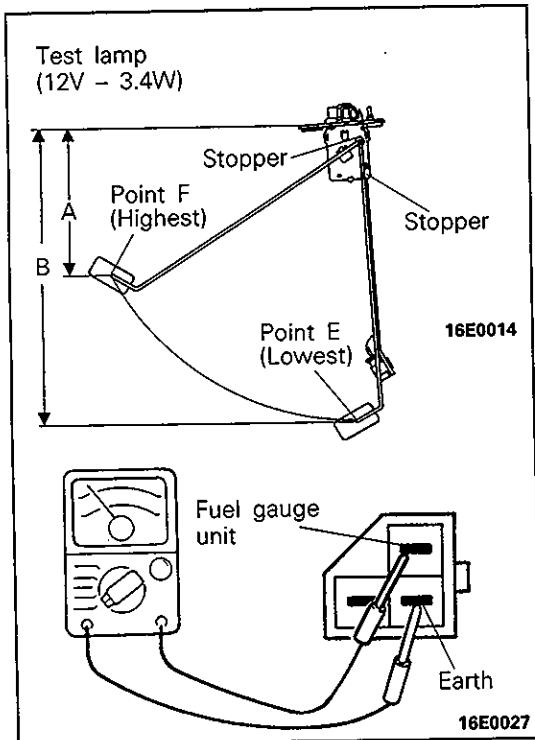
Standard value:

	Engine speed r/min	Indicated variation r/min
4D56	1000	±100
	3000	±150
	5000	±250
4M40	700	±100
	3000	±150
	5000	±250

FUEL GAUGE SIMPLE INSPECTION



16E0038



FUEL GAUGE UNIT INSPECTION

To check, remove fuel gauge unit from fuel tank.
(Refer to GROUP 13 - Fuel Tank.)

Fuel Gauge Unit Resistance

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

Standard value: **Point F** $3 \pm 2 \Omega$
Point E $110 \pm 7 \Omega$

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

Fuel Gauge Unit Float Height

Move float and measure the height A at point F (highest) and B at point E (lowest) with float arm touching stopper.

Standard value:

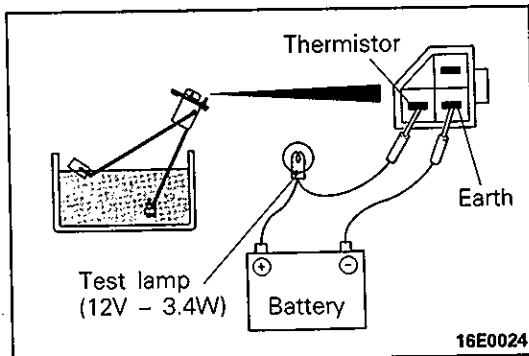
Items	Body type	Standard wheelbase	Long wheelbase
A mm (in.)		118.1 (4.64)	119.3 (4.96)
B mm (in.)		263.1 (10.35)	255.0 (10.03)

FUEL LEVEL SENSOR INSPECTION

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

Caution

After completing this test, wipe the unit dry and install it in the fuel tank.



ENGINE COOLANT TEMPERATURE GAUGE SIMPLE INSPECTION

Remove the engine coolant temperature gauge unit assembly connector.

Earth the harness connector by connecting it to a test lamp.

Turn the ignition switch to ON.

Check the condition of the test lamp and the gauge.

(1) Test lamp is illuminated (Gauge needle is not moving)

Replace the engine coolant temperature gauge

(2) Test lamp is illuminated (Gauge needle is moving)

Replace the engine coolant temperature gauge unit

(3) Test lamp is not illuminated (Gauge needle is not moving)

Repair the harness

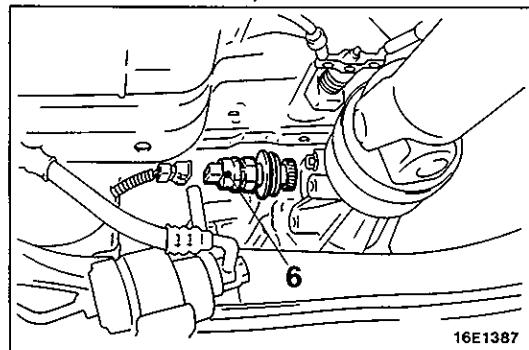
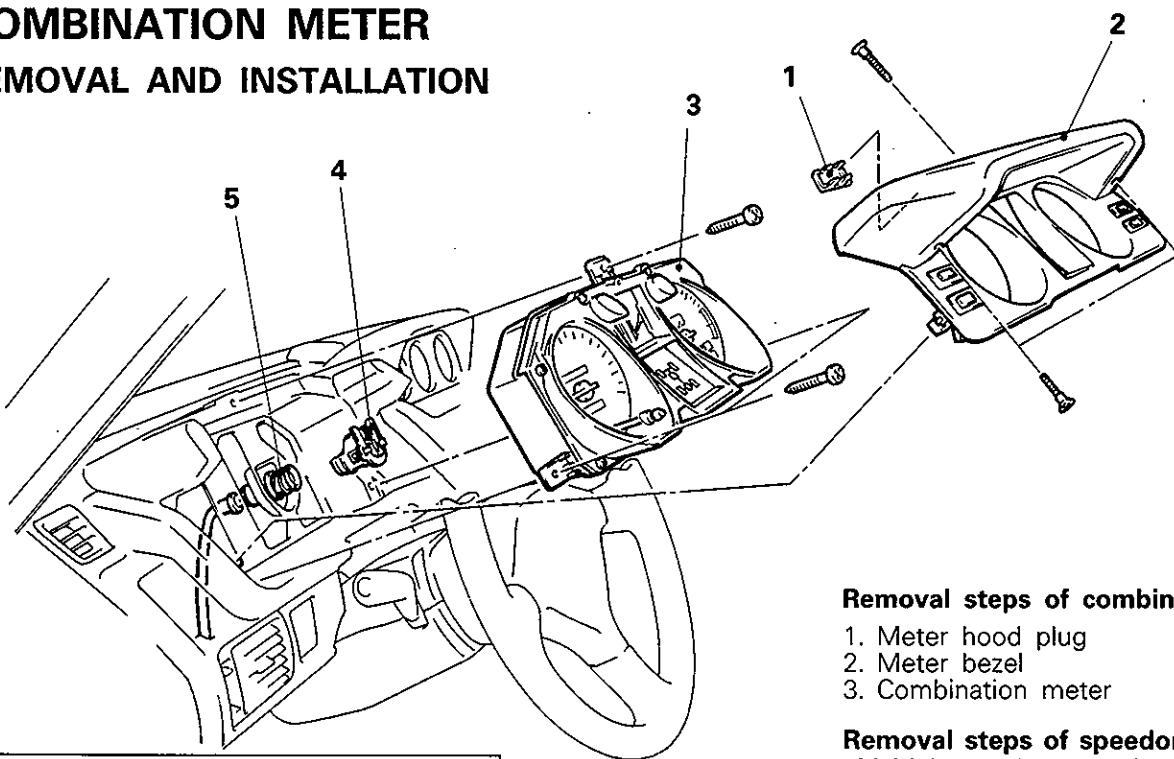
ENGINE COOLANT TEMPERATURE GAUGE UNIT INSPECTION

Refer to GROUP 14 – Engine Coolant Temperature Gauge Unit.

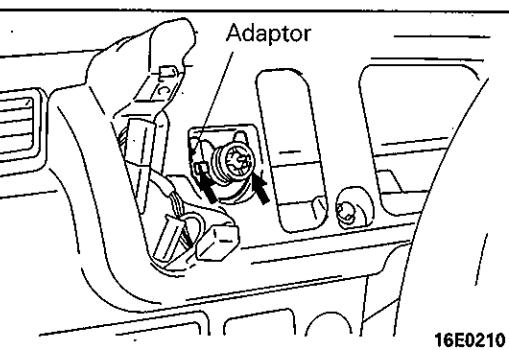
COMBINATION METER

REMOVAL AND INSTALLATION

E54EH--



16E0125



16E0210

Removal steps of combination meter

1. Meter hood plug
2. Meter bezel
3. Combination meter

Removal steps of speedometer cable <Vehicles built up to October, 1993>

1. Meter hood plug
2. Meter bezel
3. Combination meter
4. Adapter
- Instrument panel (Refer to GROUP 52A – Instrument Panel.)
5. Speedometer cable

Removal steps of vehicle speed sensor <Vehicles built from November, 1993>

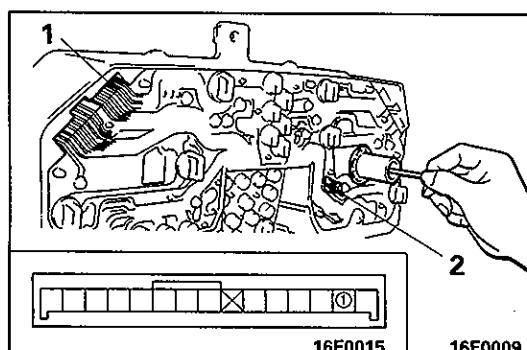
6. Vehicle speed sensor

E54EIAJ

SERVICE POINT OF REMOVAL

4. REMOVAL OF ADAPTER

- (1) Disconnect the speedometer cable at the transmission end of the cable.
- (2) Pull the speedometer cable slightly toward the vehicle's interior, release the lock by turning the adapter to the left or right, and then remove the adapter.

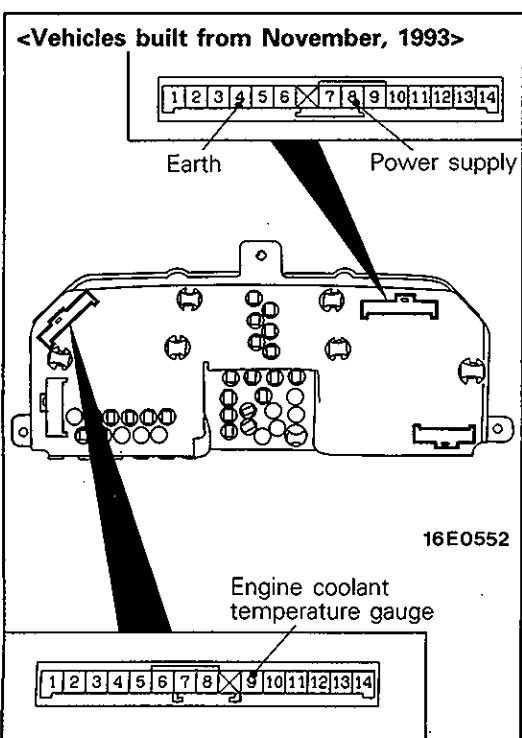
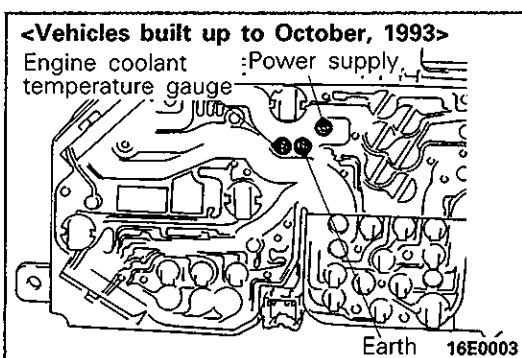
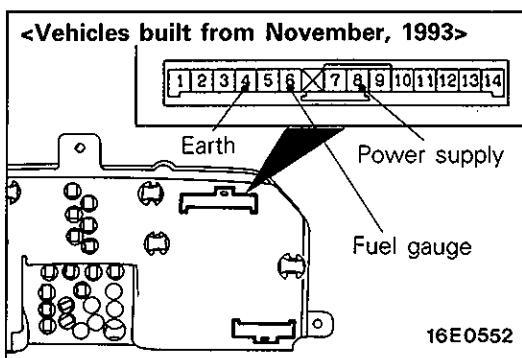
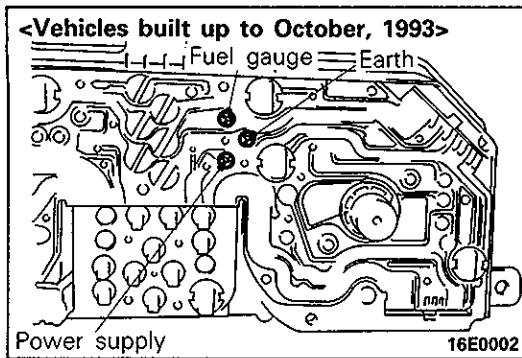


INSPECTION

REED SWITCH

E54EJAQ

Using an ohmmeter, check that continuity and discontinuity alternates between terminals 1 and 2 four times at every rotation of the shaft of the speedometer cable connection.



FUEL GAUGE RESISTANCE

Measure resistance between terminals with circuit tester.

Standard value:

<Vehicles built up to October, 1993>

Power supply and earth $233 \pm 23.3 \Omega$

Power supply and fuel gauge $86 \pm 8.6 \Omega$

Fuel gauge and earth $147 \pm 14.7 \Omega$

<Vehicles built from November, 1993>

Power supply and earth $115 \pm 11.5 \Omega$

Power supply and fuel gauge $79 \pm 7.9 \Omega$

Fuel gauge and earth $80 \pm 8.0 \Omega$

ENGINE COOLANT TEMPERATURE GAUGE RESISTANCE

Measure resistance between terminals with circuit tester.

Caution

For inspection, use a circuit tester which uses a measurement current of 4mA or less.

Standard value:

<Vehicles built up to October, 1993>

Power supply and engine coolant temperature gauge $75 \pm 7.5 \Omega$

Power supply and earth $147 \pm 14.7 \Omega$

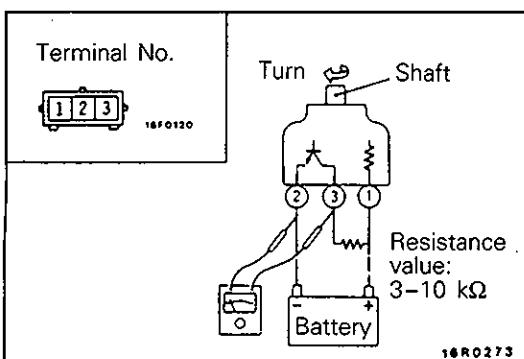
Engine coolant temperature gauge and earth $222 \pm 22.2 \Omega$

<Vehicles built from November, 1993>

Power supply and engine coolant temperature gauge $145 \pm 14.5 \Omega$

Power supply and earth $115 \pm 11.5 \Omega$

Engine coolant temperature gauge and earth $246 \pm 24.6 \Omega$

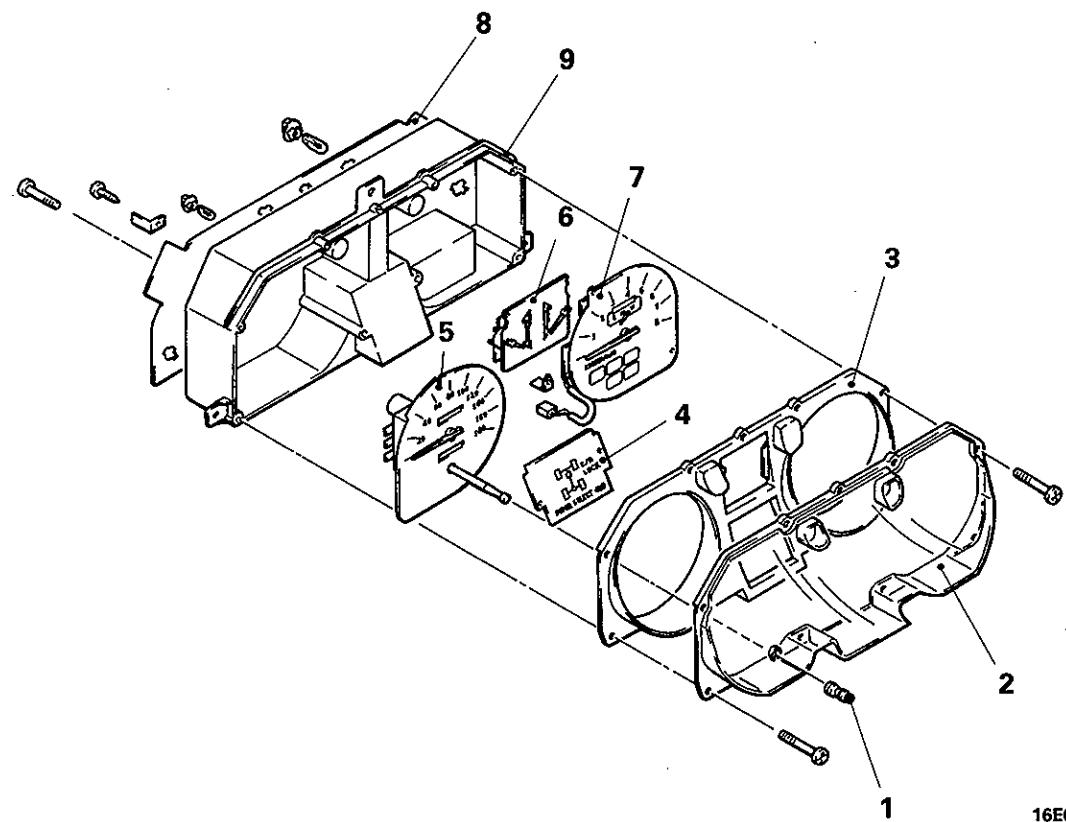


VEHICLE SPEED SENSOR

- (1) Remove the vehicle speed sensor and connect a 3-10 kΩ resistance as shown in the illustration at left.
- (2) Turn the shaft of the vehicle speed sensor and check to be sure that there is voltage between terminals 2 - 3.
(1 turn = 4 pulses)

DISASSEMBLY AND REASSEMBLY

E54EL--

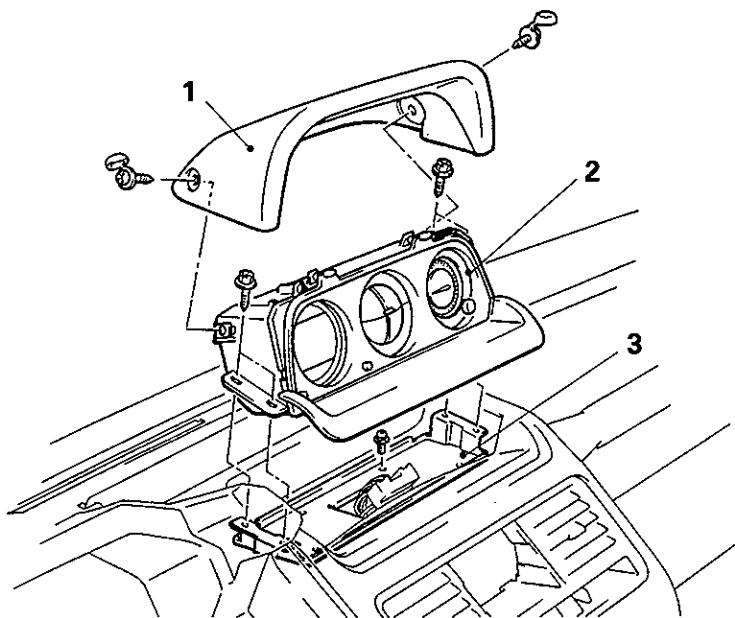


Disassembly steps

1. Boot
2. Meter glass
3. Window plate
4. Prism indicator lens
5. Speedometer
6. Fuel gauge and engine coolant temperature gauge
7. Tachometer
8. Printed-circuit board
9. Meter case

MULTI-METER REMOVAL AND INSTALLATION

E54EP--

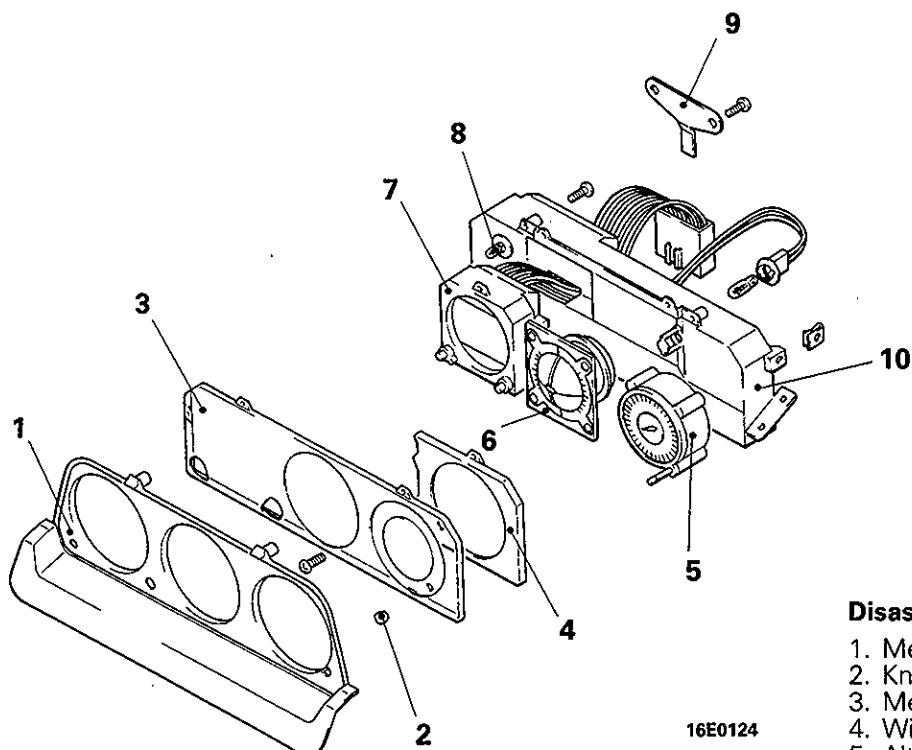
**Removal steps**

1. Meter hood
2. Multi-meter
3. Meter bracket

16E0126

DISASSEMBLY AND REASSEMBLY

E54EQ--



16E0124

Disassembly steps

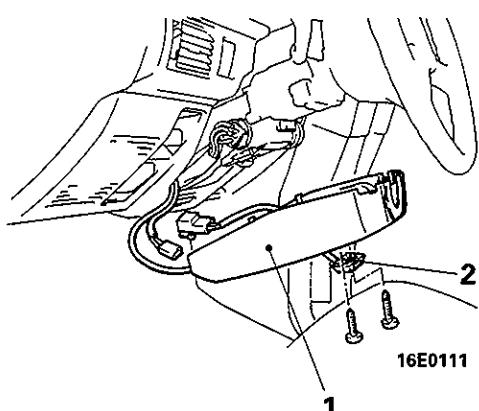
1. Meter garnish
2. Knob
3. Meter glass
4. Window plate
5. Altimeter
6. Inclinometer
7. Electric compass & thermometer or thermometer
8. Back lamp bulb
9. Connector bracket
10. Meter case

GEOMAGNETIC SENSOR, INSIDE TEMPERATURE SENSOR AND OUTSIDE TEMPERATURE SENSOR

E54ER-

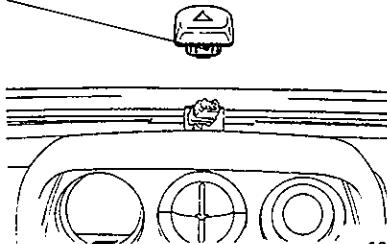
REMOVAL AND INSTALLATION

<Inside temperature sensor>



Geomagnetic sensor
Inside temperature sensor

<Geomagnetic Sensor>



16E0117

Removal steps of inside temperature sensor

1. Column cover lower
2. Inside temperature sensor

Removal steps of outside temperature sensor

1. Radiator grille
2. Outside temperature sensor

16E0168

<Outside temperature sensor>

1

2

16E0004

INSPECTION

E54ESAA

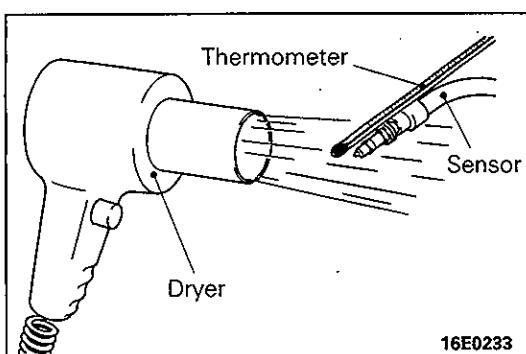
OUTSIDE TEMPERATURE SENSOR AND INSIDE TEMPERATURE SENSOR

Check that the internal resistance values of the outside temperature sensor or inside temperature sensor are at the standard values when each sensor shows temperatures of 20°C (68°F) and 40°C (104°F).

Standard value: **20°C (68°F) Approx. 1200 Ω**
40°C (104°F) Approx. 500 Ω

NOTE

For inspection of the geomagnetic sensor, refer to Troubleshooting (P.54-6).



INDICATORS AND WARNING LAMPS

E54FBAD

Unit:W

Items	Specifications
Turn-signal indiation lamp	3.4
Upper-beam indiation lamp	1.12
Automatic transmission indication lamp	1.12
Variable shock absorber indication lamp	Light emitting diode (LED)
Diesel pre-heat indication lamp	1.12
Overdrive off indication lamp	1.12
4WD indication lamp	1.12
Cruise control indication lamp	1.12
Power/Hold changeover indicator lamp	1.12
Rear fog indication lamp	1.12
Door-ajar warning lamp	1.12
Oil pressure warning lamp	1.12
Charge warning lamp	1.12
Low engine oil warning lamp	1.12
Fuel filter warning lamp	1.12
Automatic transmission oil temperature warning lamp	1.12
Low headlamp washer fluid warning lamp	1.12
Low fuel warning lamp	3.4
Hazard fog indication lamp	1.12
Brake warning lamp	1.12
Check engine warning lamp	1.12
Anti-lock braking system warning lamp	1.12
Supplemental restraint system warning lamp	1.12

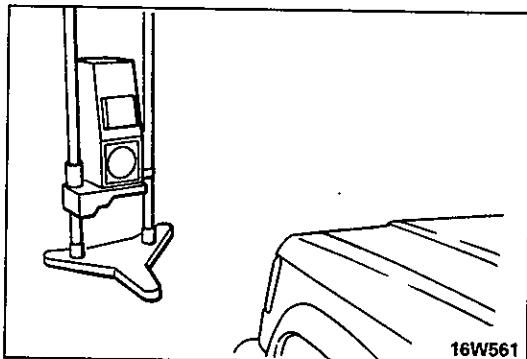
LIGHTING SYSTEM

SPECIFICATION

SERVICE SPECIFICATIONS

E54GB-

Items	Specifications
Standard value	
Headlamp aiming (for lower beam adjustment)	
Vertical direction	60 mm (2.36 in.) below the horizontal line (H)
Horizontal direction	Position where the 15° sloping section intersects the vertical line (V)
Resistance between resistor terminals <Vehicles with dim-dip lamp>	Approx. 1 Ω
Limit	
Headlamp intensity	30,000 cd or more



SERVICE ADJUSTMENT PROCEDURES

HEADLAMP AIMING

E54GGAX

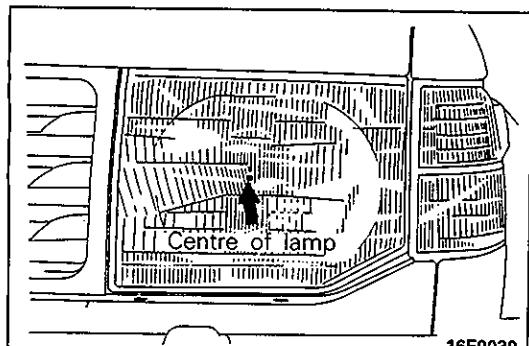
<Adjustment Using Beamsetting Equipment>

- (1) The headlamps should be aimed with the proper beamsetting equipment, and in accordance with the equipment manufacturer's instructions.

NOTE

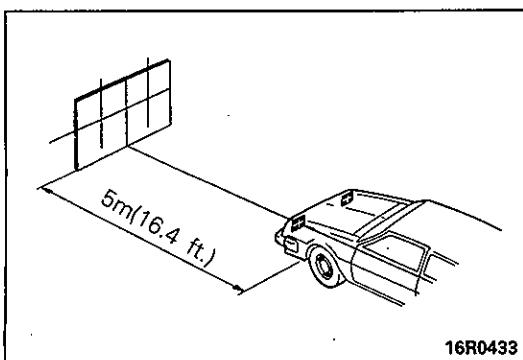
If there are any regulations pertinent to the aiming of headlamps in the area where the vehicle is to be used, adjust so as to meet those requirements.

- (2) Alternately turn the adjusting screw to adjust the headlamp aiming. (Refer to P.54-21)



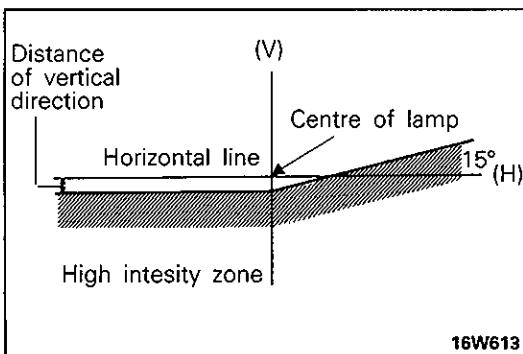
<Adjustment Using Screen>

- (1) Check the centre of the headlamp (□ mark) as shown in the illustration.
- (2) Inflate the tyres to the specified pressures and remove the load from the vehicle (except a driver).
- (3) For vehicles with the headlamp leveling system, set the headlamp leveling switch to "0".



16R0433

- (4) Set the distance between the screen and the centre of the headlamps as shown in the illustration.
- (5) With the engine running at 2,000 r/min. aim the headlamps.



16W613

- (6) Check if the lower beam shining onto the screen is at the standard value.

Standard value:

<Vertical direction>

60 mm (2.36 in.) below the horizontal line (H)

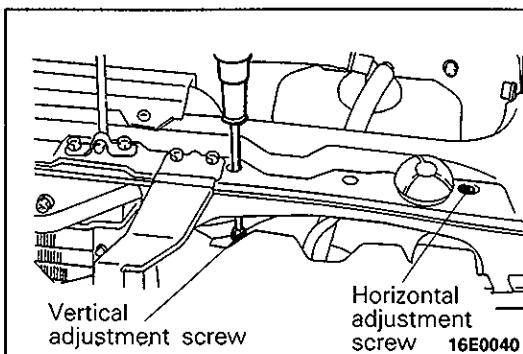
<Horizontal direction>

Position where the 15° sloping section intersects the vertical line (V)

Caution

When making the aiming adjustment, be sure to mask those lamps which are not being adjusted.

When it is difficult, because of outside light, to distinguish the light/dark dividing line, use a curtain, screen or similar material to reduce the effects of the outside light.



- (7) Alternately turn the adjusting screw to adjust the headlamp aiming.

Caution

Be sure to adjust the aiming adjustment screw in the tightening direction.

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: 30,000 cd or more

NOTE

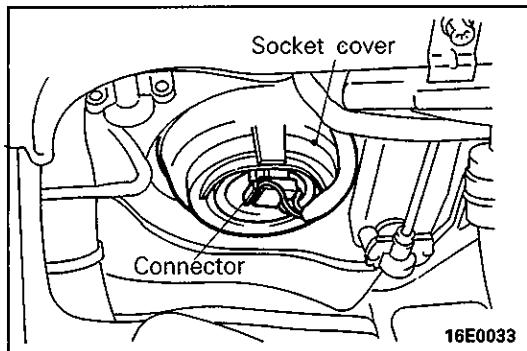
1. When measuring the intensity, maintain an engine speed of 2,000 r/min., with the battery in the charging condition.
2. There may be special local regulations pertaining to headlamp intensity; be sure to make any adjustments necessary to satisfy such regulations.
3. If an illuminometer is used to make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

$$I = Er^2$$

Where: I = intensity (cd)

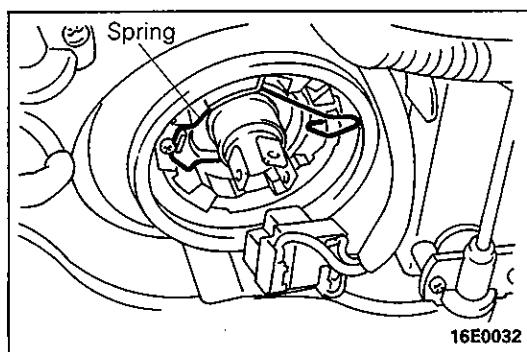
E = illumination (lux)

r = distance (m) from headlamps to illuminometer

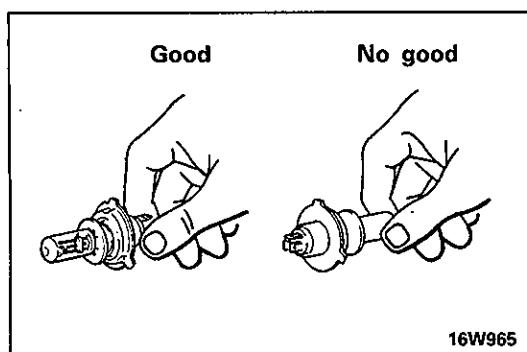


REPLACEMENT OF REPLACEABLE BULB

- (1) Remove the engine coolant reserve tank. (left side only)
- (2) Remove the air cleaner (Diesel-powered vehicles for right side only).
- (3) Disconnect the harness connector, and then pull out the socket cover.



- (4) Remove the bulb attaching spring and withdraw the bulb.



Caution

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.

- (5) Securely tighten the socket cover.

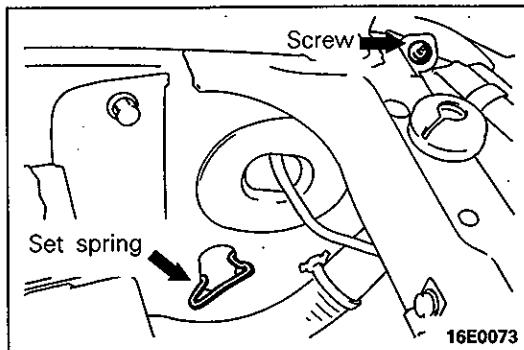
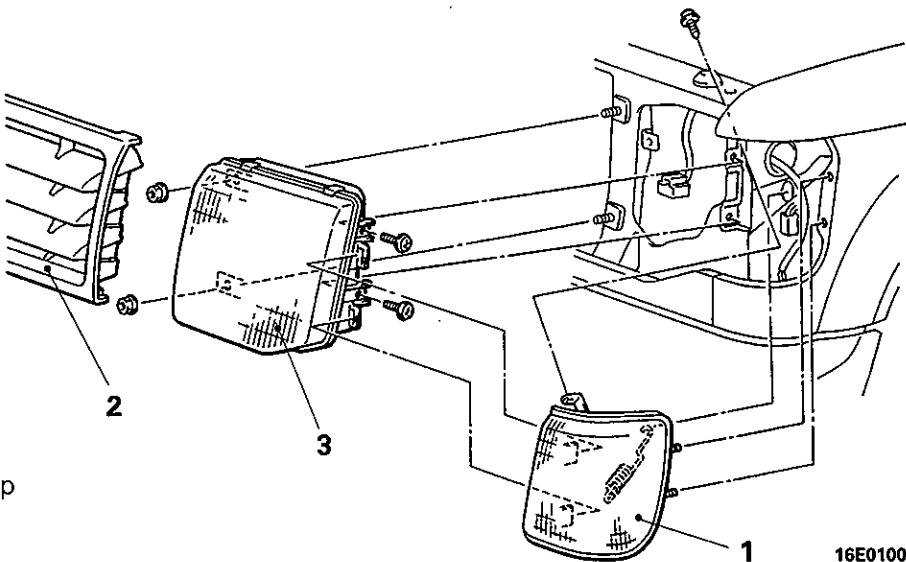
NOTE

If the socket cover is not securely installed, the lens will be out of focus, or water will get inside the lamp unit, so the cover should be securely installed.

HEADLAMP AND FRONT COMBINATION LAMP

E54GHAN

REMOVAL AND INSTALLATION



SERVICE POINT OF REMOVAL

1. REMOVAL OF FRONT COMBINATION LAMP

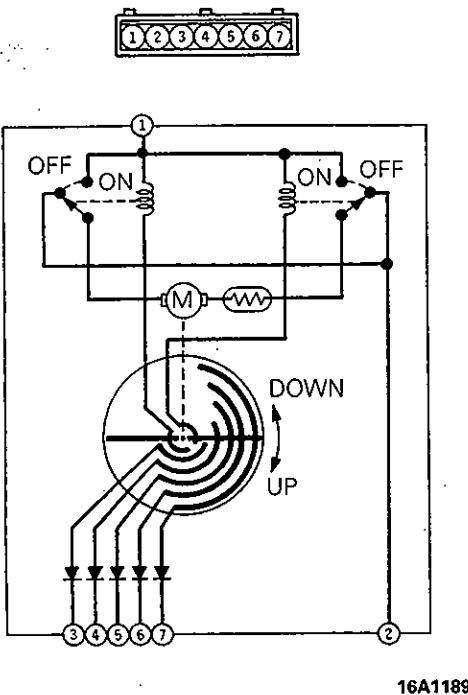
Remove the front combination lamp mounting screws and set spring, and remove the front combination lamp by pulling it towards the front of the vehicle.

NOTE

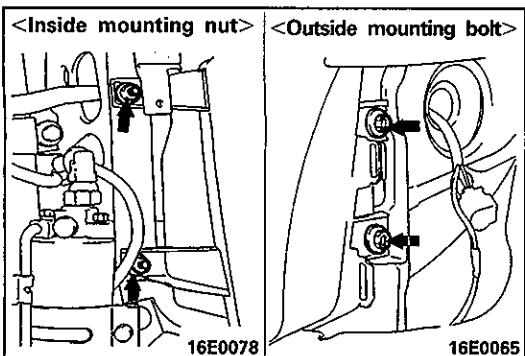
For the left side, before removing the front combination lamp, remove the engine coolant reserve tank in advance.

INSPECTION

HEADLAMP LEVELING UNIT



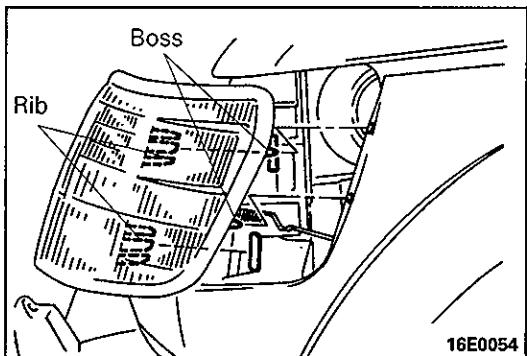
- (1) After setting the headlamp levelling switch to the "0" position, remove the headlamp and inspect.
- (2) Check to be sure there is no continuity between terminals (1) and (2).
- (3) Connect terminal (1) to the battery and connect terminal (2) to earth ground.
- (4) Check to make sure the motor is activated (headlamp reflector operates) for 0.6 to 1.0 second when terminals (4), (5), (6) and (7) are connected to earth in this order.
- (5) Next, check to make sure the motor is activated [headlamp reflector operates in reverse order or (4) above] for 0.6 to 1.0 second when terminals (6), (5), (4) and (3) are connected to earth in this order.
- (6) If the headlamp leveling unit is defective, replace the entire headlamp assembly.



SERVICE POINTS OF INSTALLATION

3. INSTALLATION OF HEADLAMP

After tightening the outside mounting bolt, tighten the inside mounting nut.

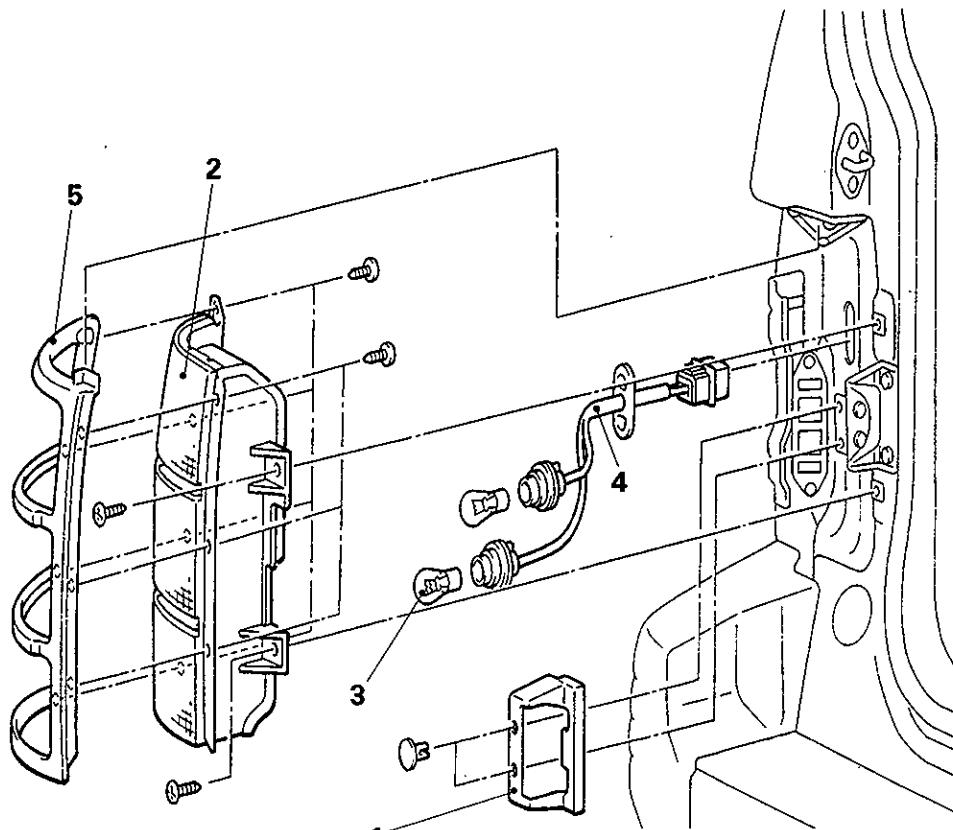


1. INSTALLATION OF FRONT COMBINATION LAMP

- (1) Align the front combination lamp positioning bosses with the insertion holes in the fender, and align the ribs with the headlamp insertion holes.
- (2) While pushing the front combination lamp in towards the rear of the vehicle, pull the set spring into the engine compartment to tighten it to the vehicle body, and then tighten with the screw.

REAR COMBINATION LAMP REMOVAL AND INSTALLATION

ES4GVAF



Removal steps

1. Back door bumper cover
2. Rear combination lamp unit
3. Bulb
 - Quarter trim (Refer to GROUP 52–Trim)
4. Socket assembly
5. Rear combination lamp bezel

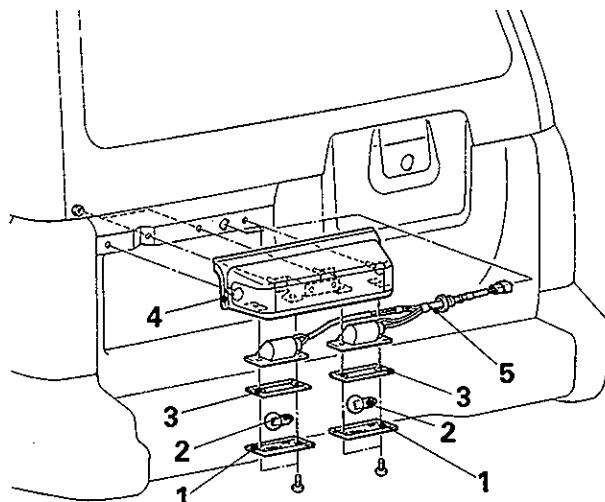
LICENCE PLATE LAMP

REMOVAL AND INSTALLATION

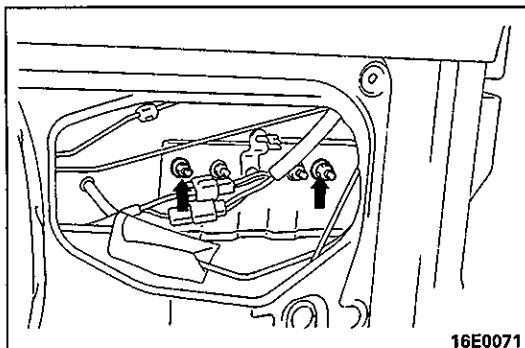
E54GTAE

Removal steps

1. Lens
2. Bulb
3. Lens gasket
- Back door trim (Refer to GROUP 42-Door Trim and Waterproof Film)
4. Licence lamp garnish
5. Socket assembly



16E0101

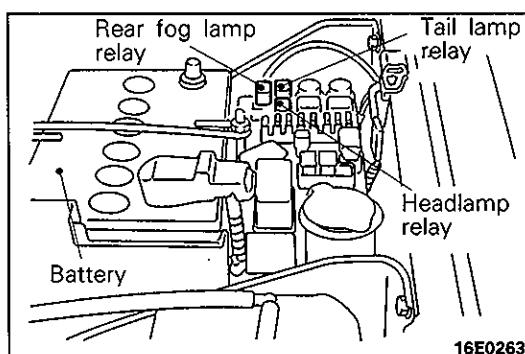


16E0071

SERVICE POINT OF REMOVAL

4. REMOVAL OF LICENCE LAMP GARNISH

- (1) Take off the waterproof film and remove the licence lamp garnish mounting nuts.
- (2) Remove the clips with a (-) screwdriver, and remove the licence lamp garnish together with the socket assembly.



16E0263

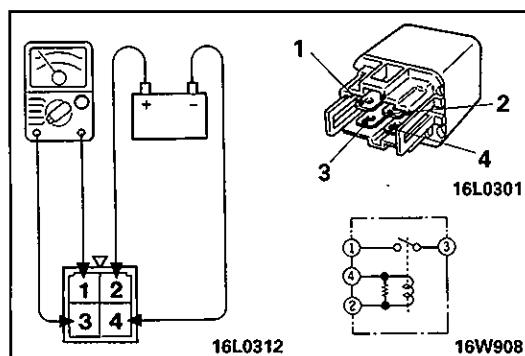
RELAY

E54GIAO

INSPECTION

Headlamp Relay, Tail Lamp Relay, Rear Fog Lamp Relay

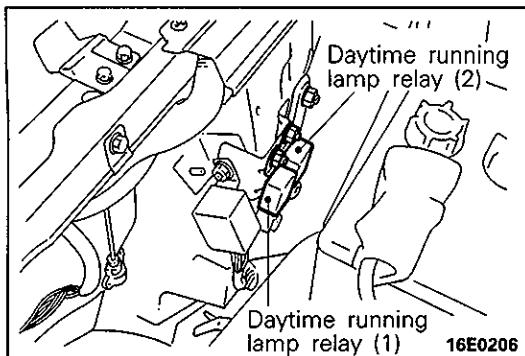
- (1) Remove the headlamp relay, tail lamp relay or rear fog lamp relay from the relay box in the engine compartment.



16W908

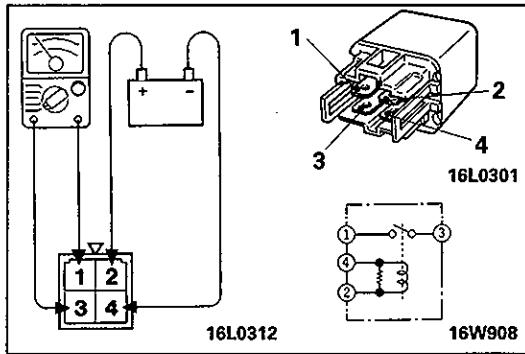
- (2) Apply battery voltage to terminal (2), and check the continuity between the terminals when terminal (4) is earthed.

When power is supplied	Between terminals 1-3	Continuity
When power is not supplied	Between terminals 1-3	No continuity
	Between terminals 2-4	Continuity



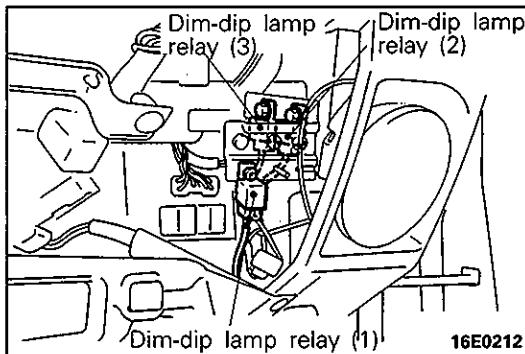
Daytime Running Lamp Relay (1), (2) <Vehicles with daytime running lamp>

(1) Remove the daytime running lamp relay (1) or (2).



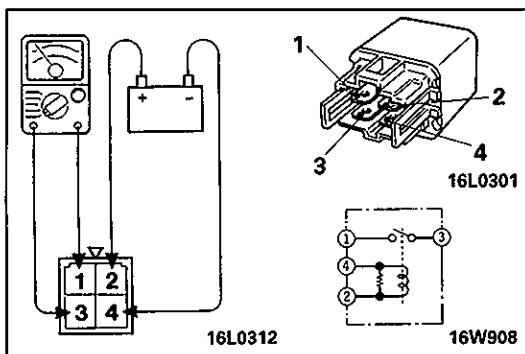
(2) Apply battery voltage to terminal (2), and check the continuity between the terminals when terminal (4) is earthed.

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



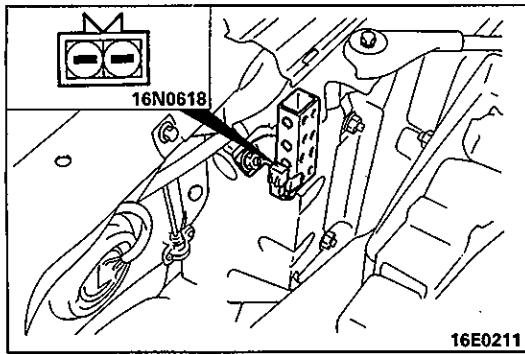
Dim-dip Lamp Relay (1), (2), (3) <Vehicles with dim-dip lamp>

(1) Remove the instrument under cover, (Refer to GROUP 52- Instrument Panel)
(2) Remove the dim-dip lamp relay (1), (2) or (3).



(3) Apply battery voltage to terminal (2), and check the continuity between the terminals when terminal (4) is earthed.

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

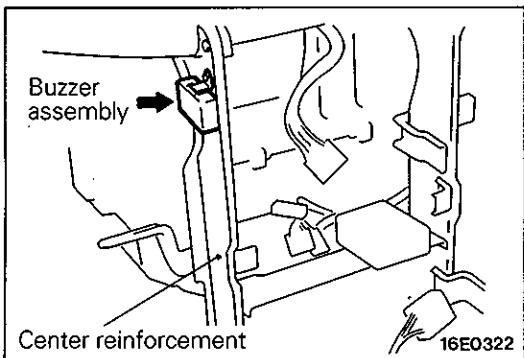


RESISTOR <Vehicles with dim-dip lamp>

INSPECTION

Connect an ohmmeter to the resistor connector terminal and check if the resistance value is within the standard value.

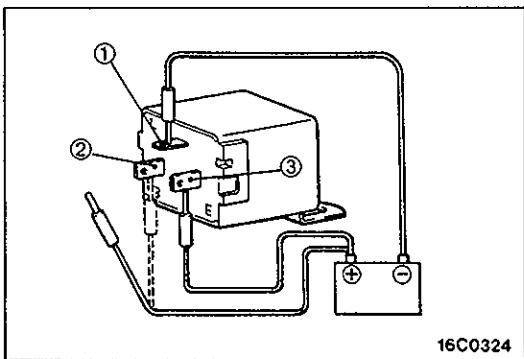
Standard value: Approx. 1 Ω



LIGHTING MONITOR BUZZER

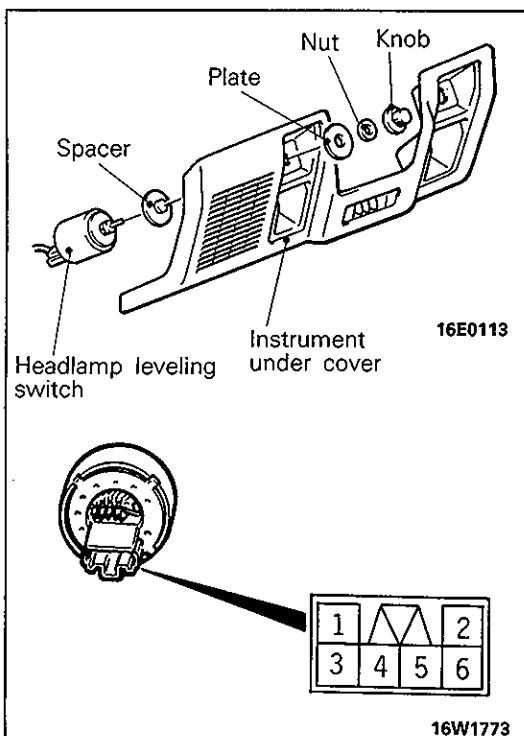
INSPECTION

- (1) Remove the instrument panel (Refer to GROUP 52-Instrument Panel).
- (2) Remove the lighting monitor buzzer.



- (3) Check to be sure that the buzzer sounds when battery voltage is applied to terminal ③ and terminal ① is earthed.
- (4) Check to be sure that the buzzer stops sounding when battery voltage is applied to terminal ②.

NOTES



SWITCH

E54YBCA

INSPECTION

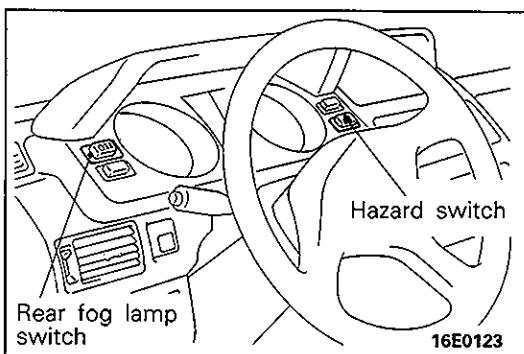
Headlamp levering switch

- (1) Remove the instrument under cover. (Refer to GROUP 52A - Instrument Panel.)
- (2) Operate the switch, and check the continuity between the terminals

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

NOTE

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



Rear Fog Lamp Switch and Hazard Switch

- (1) Remove the rear fog lamp switch or hazard switch from the meter bezel.

- (2) Operate the switch, and check the continuity between the terminals.

<Hazard Switch>

Switch position	Terminal	1	2	3	4	5	6	7	8	9	10
OFF						○	○	○	○	○	
ON		○	○	○	○	○	○				ILL

NOTE

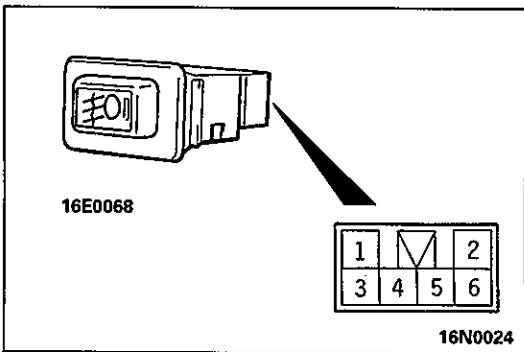
○-○ indicates that there is continuity between the terminals.

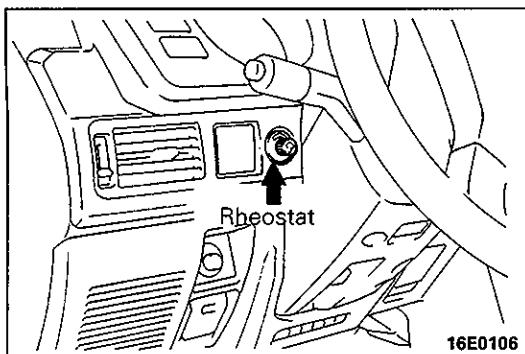
<Rear Fog Lamp Switch>

Switch position	Terminal	1		3	2	6		4
OFF			ILL			○	○	
ON		○		○				IND

NOTE

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



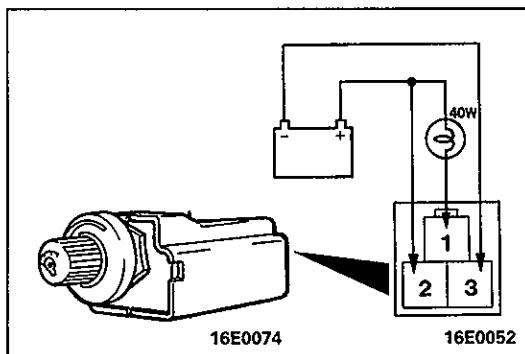


RHEOSTAT

E54GNAH

INSPECTION

- (1) Instrument under cover. (Refer to GROUP 52A - Instrument Panel.)
- (2) Remove the rheostat from the instrument panel.



- (3) Connect the battery and the test lamp (40W) as shown in the illustration.
- (4) Operate the rheostat, and if the brightness changes smoothly without switching off, then the rheostat function is normal.

COLUMN SWITCH SPECIAL TOOL

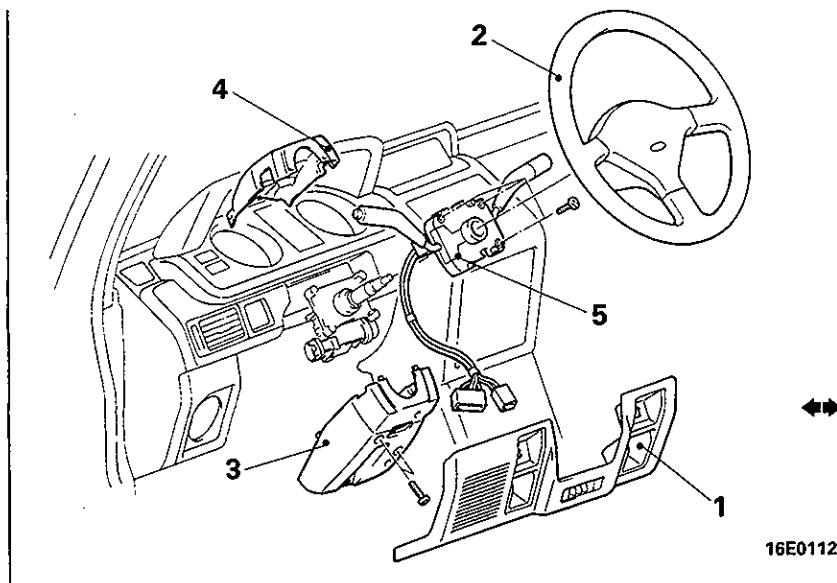
E54HF--

Tool	Number	Name	Use
	MB990803	Steering wheel puller	Removal of the steering wheel

COLUMN SWITCH <Vehicles without SRS>

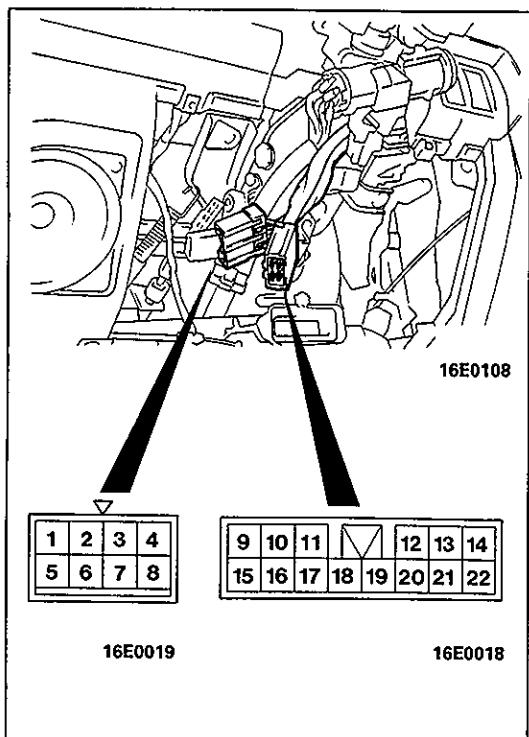
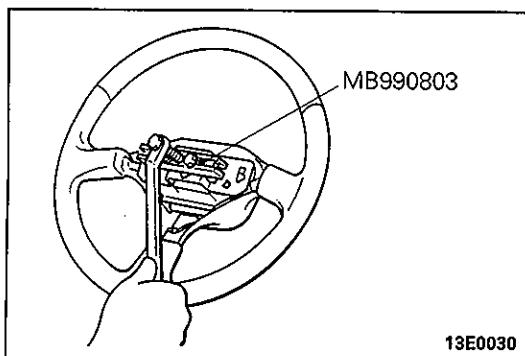
REMOVAL AND INSTALLATION

E54HH--



Removal steps

1. Instrument under cover (Refer to GROUP 52A - Instrument Panel.)
2. Steering wheel (Refer to GROUP 37 - Steering Wheel and Shaft.)
3. Column cover lower
4. Column cover upper
5. Column switch



SERVICE POINT OF REMOVAL

E54H1AG

2. REMOVAL OF STEERING WHEEL

INSPECTION

E54H1AP

- (1) Remove the instrument under cover. (Refer to GROUP 52A – Instrument Panel.)
- (2) Remove the column cover lower.
- (3) Disconnect the connector at the column switch.
- (4) Operate the switch, and check the continuity between the terminals.

Switch position	Terminal	1	5	6	11	14	17	18	19	20	22
Lighting switch	OFF										
	TAIL					○					○
	HEAD				○		○				○
Dimmer/ Passing switch	LOWER	○	○								
	UPPER	○	○								▲
	PASSING	○	○			○					
Turn signal switch	RH							○	○		
	OFF										
	LH							○	○		

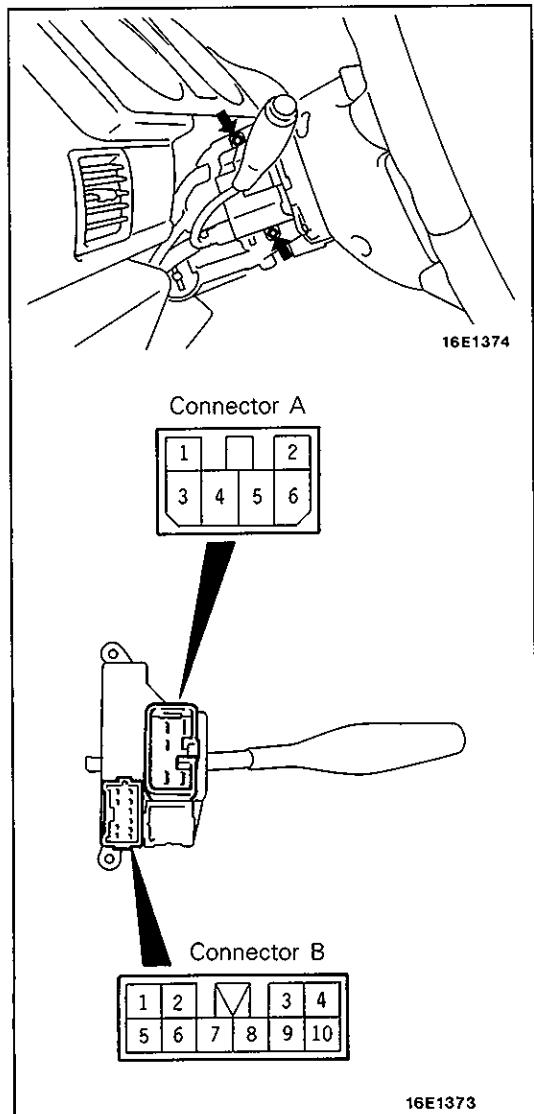
NOTE

- (1) ○-○ indicates that there is continuity between the terminals.
- (2) For inspection of the windshield wiper and washer switch, refer to GROUP 51 – Windshield Wiper and Washer.
- (3) For inspection of the headlamp washer switch, refer to GROUP 51 – Headlamp Washer.

LIGHTING SWITCH, DIMMER/PASSING SWITCH, TURN-SIGNAL LAMP
SWITCH <Vehicles with SRS>

INSPECTION

- (1) Remove the column cover lower.
- (2) Remove the column cover upper.
- (3) Remove the screws indicated by arrows in the illustration, and then remove the switch.
- (4) Operate the switch, and check the continuity between the terminals.



<Lighting switch>

Switch position	Terminal	Connector				
		A	B	5	6	7
OFF						
TAIL				○		○
HEAD		○		○		○
		○		○		○

<Dimmer/Passing switch>

Switch position	Terminal	Connector				
		1	2	3	4	6
LOWER				○	○	
UPPER				○	○	
PASSING	LOWER	○	○		○	○
	UPPER	○	○		○	○

<Turn-signal lamp switch>

Switch position	Terminal	Connector					
		1	3	4	8	9	10
RH					○	○	
OFF							
LH		○			○		

NOTE

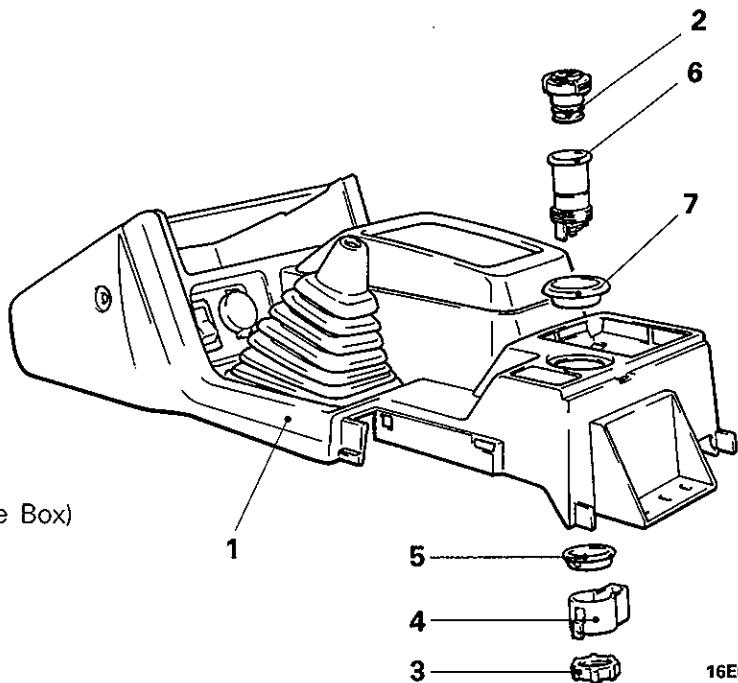
○—○ indicates that there is continuity between the terminals.

NOTES

CIGARETTE LIGHTER

REMOVAL AND INSTALLATION

ES4JH--



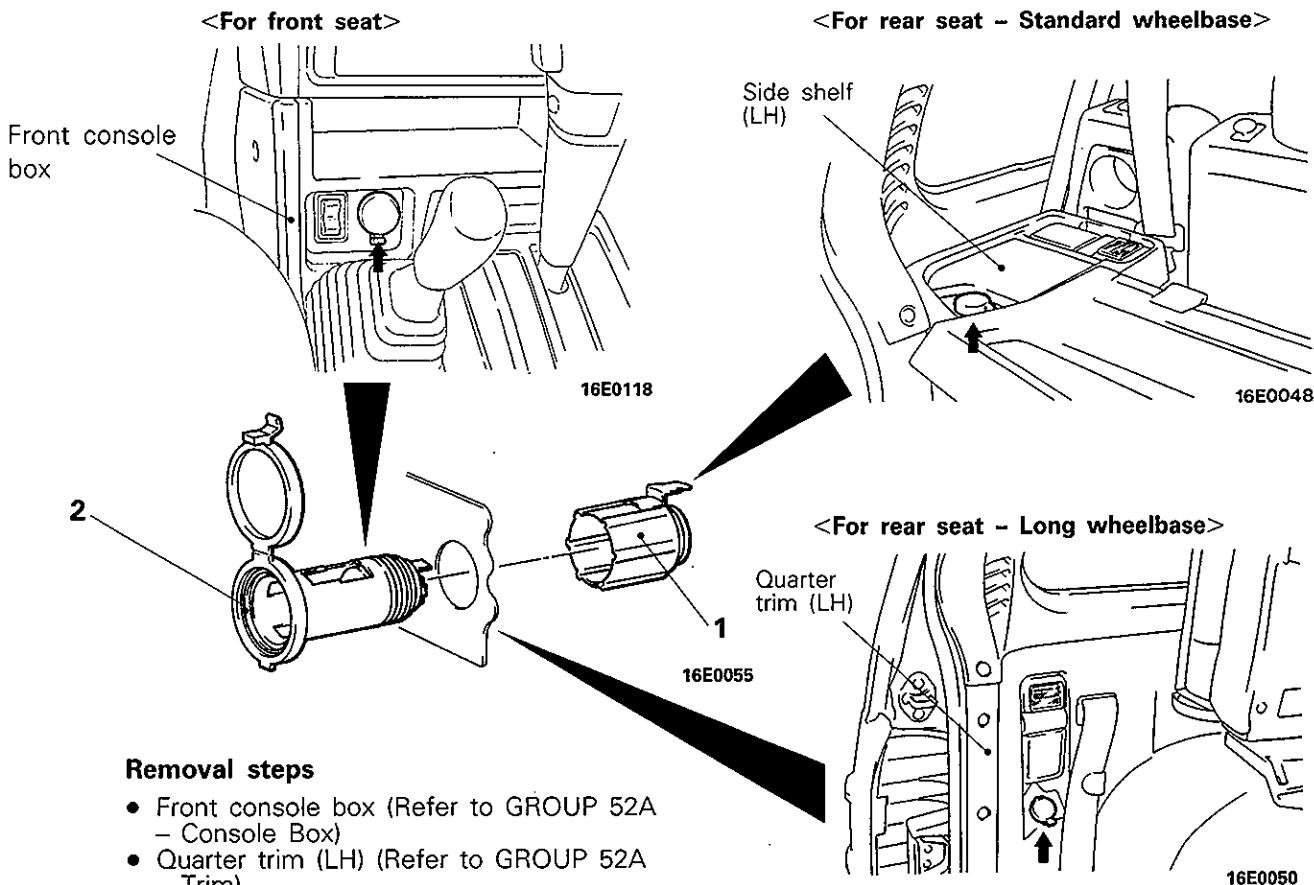
Removal steps

1. Front console box
(Refer to GROUP 52A – Console Box)
2. Plug
3. Nut
4. Outer case
5. Washer
6. Socket
7. Protector

ACCESSORY SOCKET

REMOVAL AND INSTALLATION

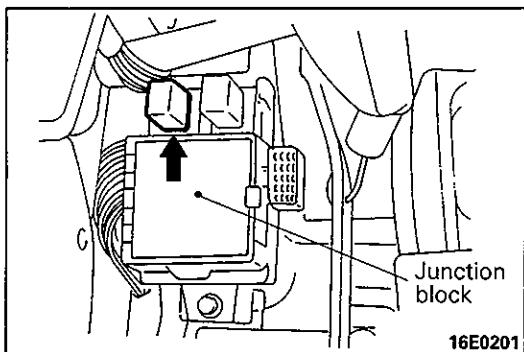
ES4JBAA



Removal steps

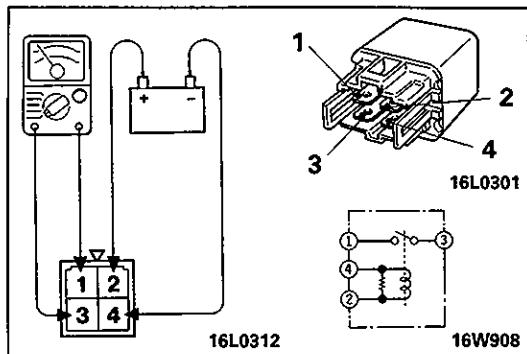
- Front console box (Refer to GROUP 52A – Console Box)
- Quarter trim (LH) (Refer to GROUP 52A – Trim)

1. Socket
2. Outer case



INSPECTION

(1) Remove the accessory socket relay from the junction block.



(2) Apply battery voltage to terminal (2), and check the continuity between the terminals when terminal (4) is earthed.

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

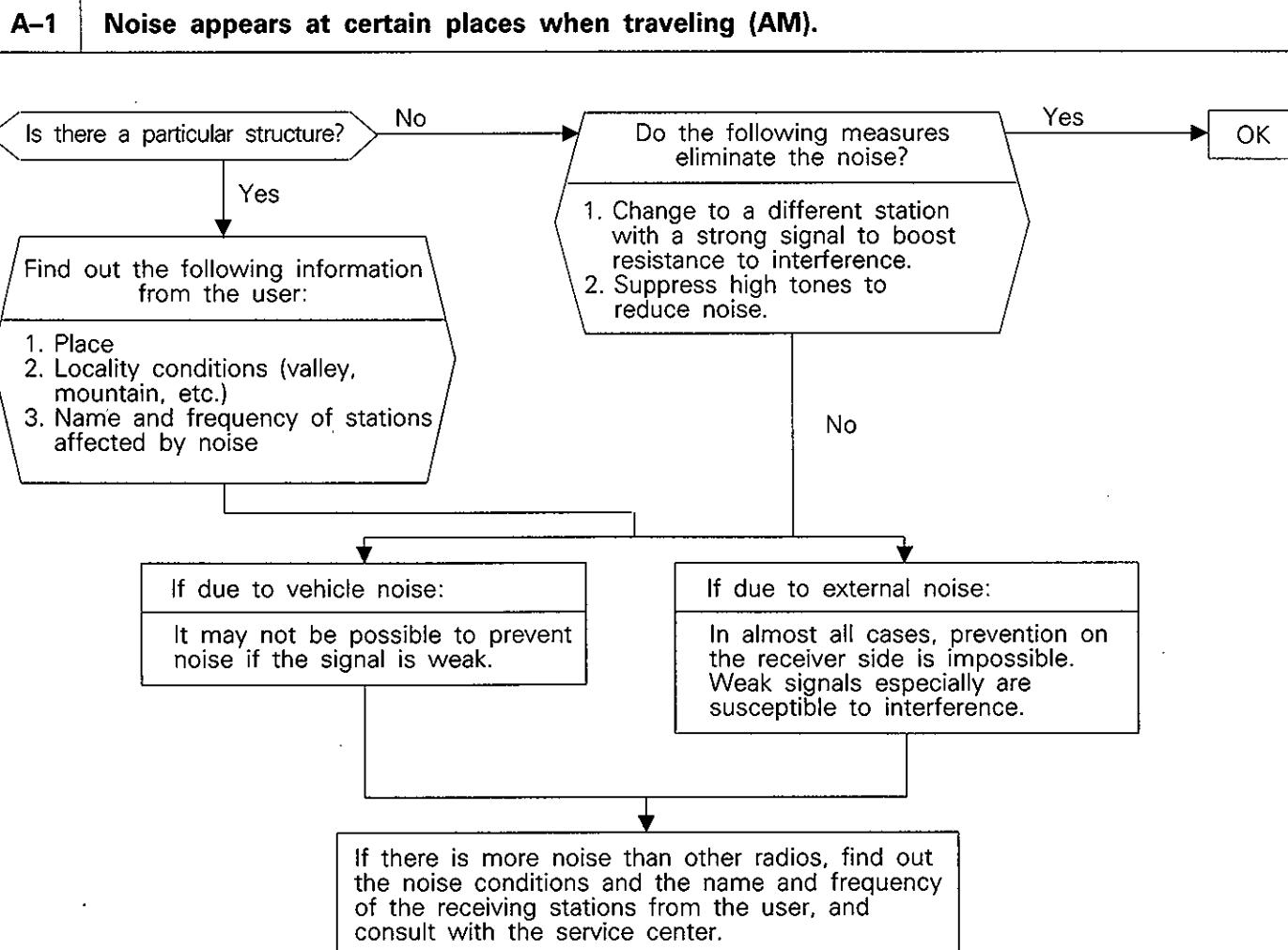
AUDIO SYSTEM**TROUBLESHOOTING****QUICK-REFERENCE TROUBLESHOOTING CHART**

E54LC--

Item	Problem symptom	Relevant chart
Noise	Noise appears at certain places when traveling (AM).	A-1
	Noise appears at certain places when traveling (FM).	A-2
	Mixed with noise, only at night (AM).	A-3
	Broadcasts can be heard but both AM and FM have a lot of noise.	A-4
	There is more noise either on AM or on FM.	A-5
	There is noise when starting the engine.	A-6
	Some noise appears when there is vibration or shocks during traveling.	A-7
	Noise sometimes appears on FM during traveling.	A-8
	Ever-present noise.	A-9
Radio	When switch is set to ON, no power is available.	B-1
	No sound from one speaker.	B-2
	There is noise but no reception for both AM and FM or no sound from AM, or no sound from FM.	B-3
	Insufficient sensitivity.	B-4
	Distortion on AM or on both AM and FM.	B-5
	Distortion on FM only.	B-6
	Too few automatic select stations.	B-7
	Insufficient memory (preset stations are erased).	B-8
Cassette player	Cassette tape will not insert.	C-1
	No sound.	C-2
	No sound from one speaker.	C-3
	Sound quality is poor, or sound is weak.	C-4
	Cassette tape will not eject.	C-5
	Uneven revolution. Tape speed is fast or slow.	C-6
	Automatic search does not work	C-7
	Faulty auto reverse.	C-8
	Tape gets caught in mechanism.	C-9
Motor antenna	Motor antenna won't extend or retract.	D-1
	Motor antenna extends and retracts but does not receive.	D-2

NOTE

Refer to problem symptoms of AM radio for LW and MW radio.

CHART**A. NOISE**

A-2 Noise appears at certain places when traveling (FM).

Do the following measures eliminate the noise?

- Change to a different station with a strong signal to boost resistance to interference.
- Suppress high tones to reduce noise.

Yes

OK

No

If there is more noise than other radios, find out the noise conditions and the name and frequency of the receiving stations from the user, and consult with the service center.

NOTE

About FM waves:

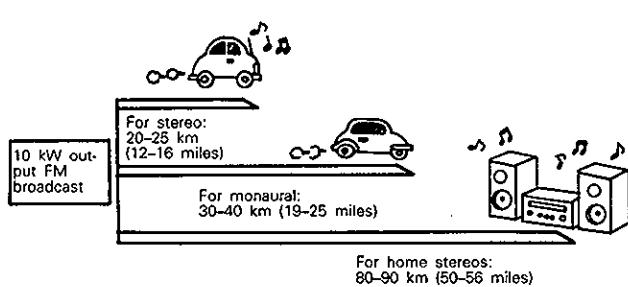
FM waves have the same properties as light, and can be deflected and blocked. Wave reception is not possible in the shadow of obstructions such as buildings or mountains.

1. The signal becomes weak as the distance from the station's transmission antenna increases. Although this may vary according to the signal strength of the transmitting station and intervening geographical formations or buildings, the area of good reception is approx. 20-25 km (12-16 miles) for stereo reception, and 30-40 km (19-25 miles) for monaural reception.
2. The signal becomes weak when an area of shadow from the transmitting antenna (places where there are obstructions such as mountains or buildings between the antenna and the car),

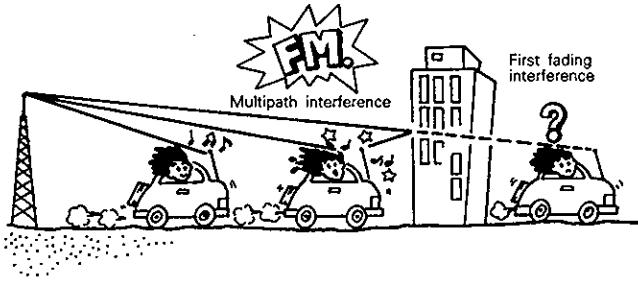
and noise will appear. <This is called first fading, and gives a steady buzzing noise>

3. If a direct signal hits the antenna at the same time as a signal reflected by obstructions such as mountains or buildings, interference of the two signals will generate noise. During traveling, noise will appear each time the vehicle's antenna passes through this kind of obstructed area. The strength and interval of the noise varies according to the signal strength and the conditions of deflection. <This is called multipath noise, and is a repetitious buzzing.>
4. Since FM stereo transmission and reception has a weaker field than monaural, it is often accompanied by a hissing noise.

FM Broadcast Good Reception Areas



FM Signal Characteristics and Signal Interference



A-3 Mixed with noise, only at night (AM).

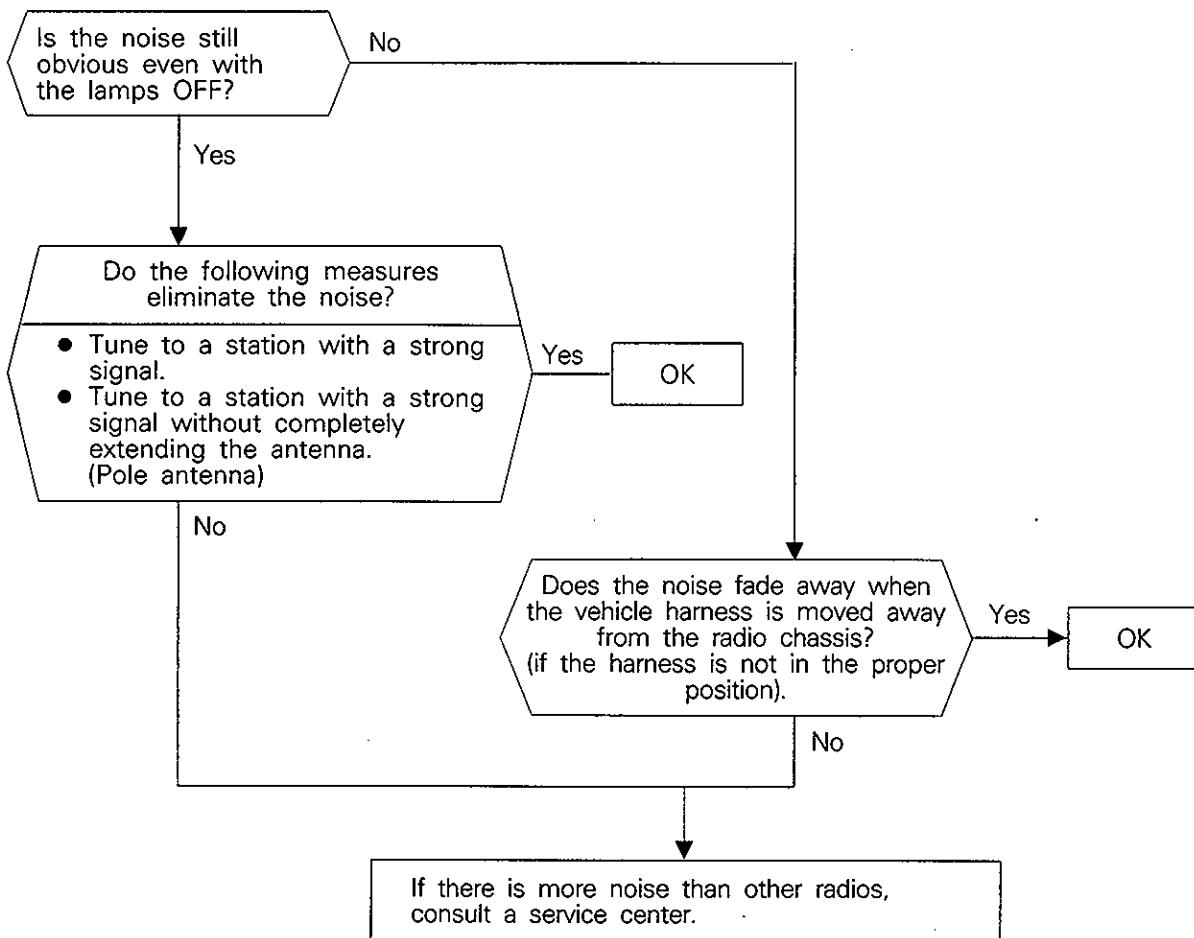
The following factors can be considered as possible causes of noise appearing at night.

1. Factors due to signal conditions: Due to the fact that long-distance signals are more easily received at night, even stations that are received without problem during the day may experience interference in a general worsening of reception conditions. The weaker a station is the more susceptible it is to interference, and a change to a different station or the appearance of a beating

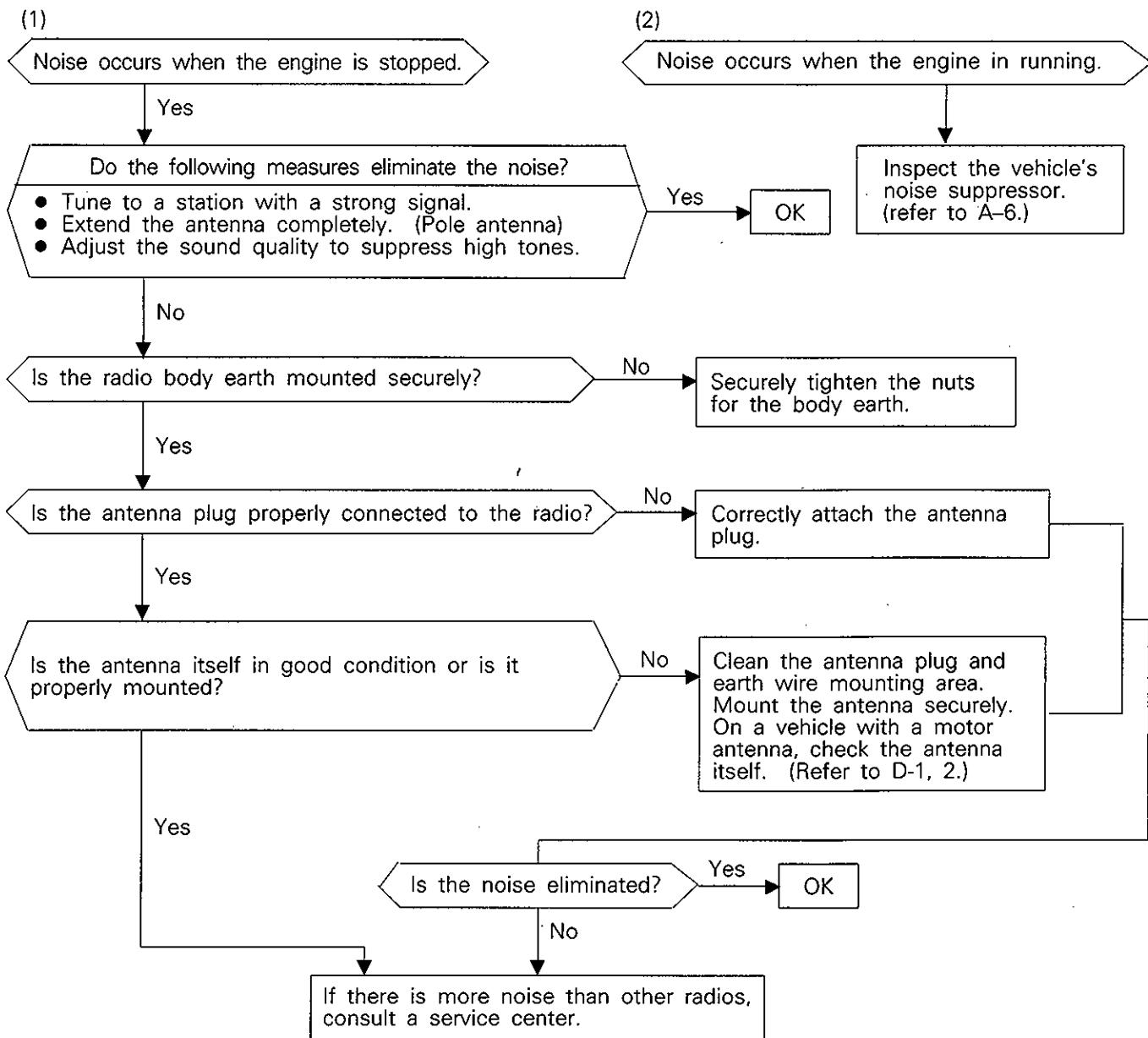
sound* may occur.

Beat sound*: Two signals close in frequency interfere with each other, creating a repetitious high-pitched sound. This sound is generated not only by sound signals but by electrical waves as well.

2. Factors due to vehicle noise: Alternator noise may be a cause.



A-4 Broadcast can be heard but both AM and FM have a lot of noise.



NOTE

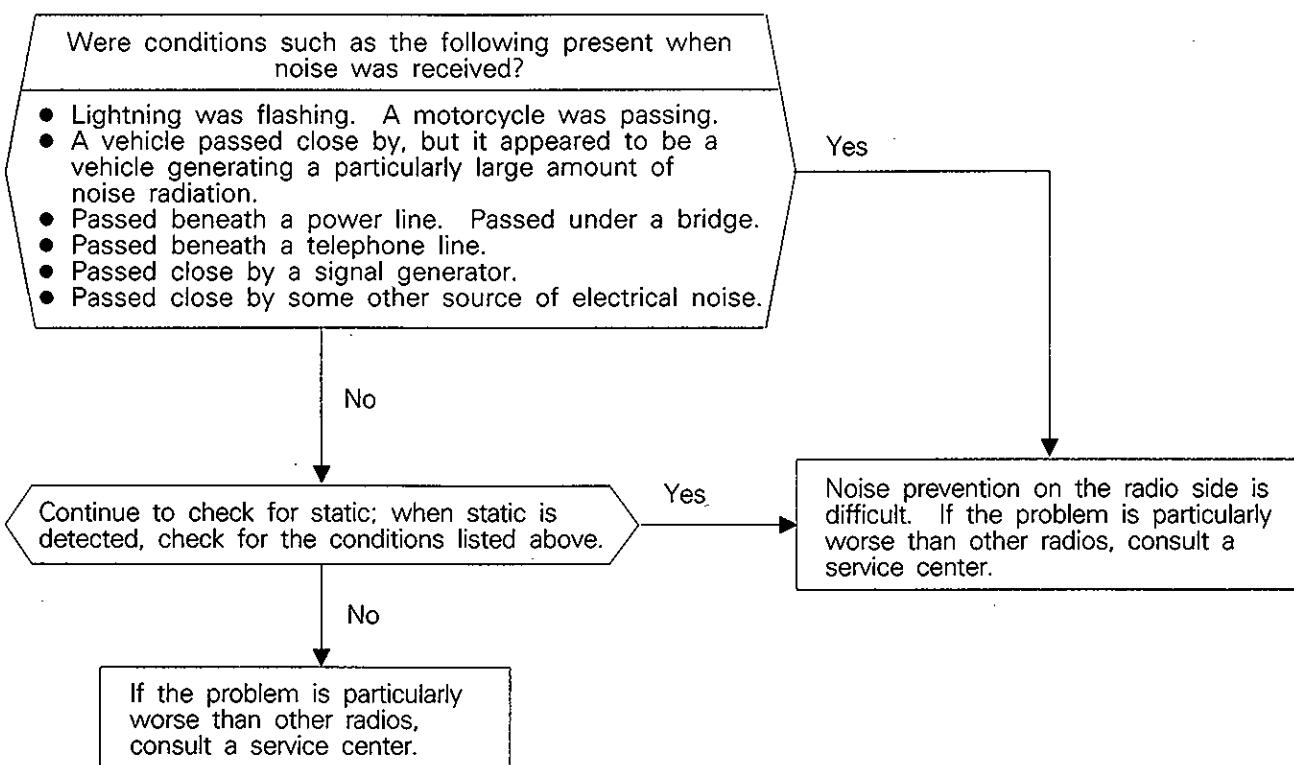
About noise encountered during FM reception only. Due to differences in FM and AM system, FM is not as susceptible as AM to interference from engines, power lines, lightning, etc. On the other hand, there are cases due to the characteristics of FM waves of noise or distortion

generated by typical noise interference (first fading and multipath). (Refer to A-2.)

<Noise (hissing) occurs in weak signal areas such as mountainous regions, but this is not due to a problem with the radio.>

A-5 There is more noise either on AM or on FM.

1. There is much noise only on AM
 Due to differences in AM and FM systems, AM is more susceptible to noise interference.



2. There is much noise only on FM

Due to differences in FM and AM systems, FM is not as susceptible as AM to interference from engines, power lines, lightning, etc. On the other hand, there are cases due to the characteristics of FM waves of noise or distor-

tion generated by typical noise interference (first fading and multipath). (Refer to A-2)
 <Noise (hissing) occurs in weak signal areas such as mountainous regions, but this is not due to a problem with the radio.>

A-6 There is noise when starting the engine.

Noise type Sounds are in parentheses ().	Conditions	Cause	Inspection or replacement	
			Noise- preventive part	Mounting place (next page)
AM, FM: Ignition noise (Popping, Snapping, Cracking, Buzzing)	<ul style="list-style-type: none"> Increasing the engine speed causing the popping sound to speed up, and volume decreases. Disappears when the ignition switch is turned to ACC. 	<ul style="list-style-type: none"> Mainly due to the spark plugs. Due to the engine noise. 	<ul style="list-style-type: none"> Noise filter Earth cable Noise capacitor 	2 1, 3 2
Other electrical components	–	Noise may appear as electrical components become older.	Repair or replace electrical components.	
Static electricity (Cracking, Crinkling)	<ul style="list-style-type: none"> Disappears when the vehicle is completely stopped. Severe when the clutch is engaged. 	Occurs when parts or wiring move for some reason and contact metal parts of the body.	Return parts or wiring to their proper position.	
	<ul style="list-style-type: none"> Various noises are produced depending on the body part of the vehicle. 	Due to detachment from the body of the front hood, bumpers, exhaust pipe and muffler, suspension, etc.	Earth parts by bonding. Cases where the problem is not eliminated by a single response to one area are common, due to several body parts being imperfectly earthed.	

Caution

- Connecting a high tension cable to the noise filter may destroy the noise filter and should never be done.**
- Check that there is no external noise. Since failure due to this may result in misdiagnosis due to inability to identify the noise source, this operation must be performed.**
- Noise prevention should be performed by suppressing strong sources of noise step by step.**

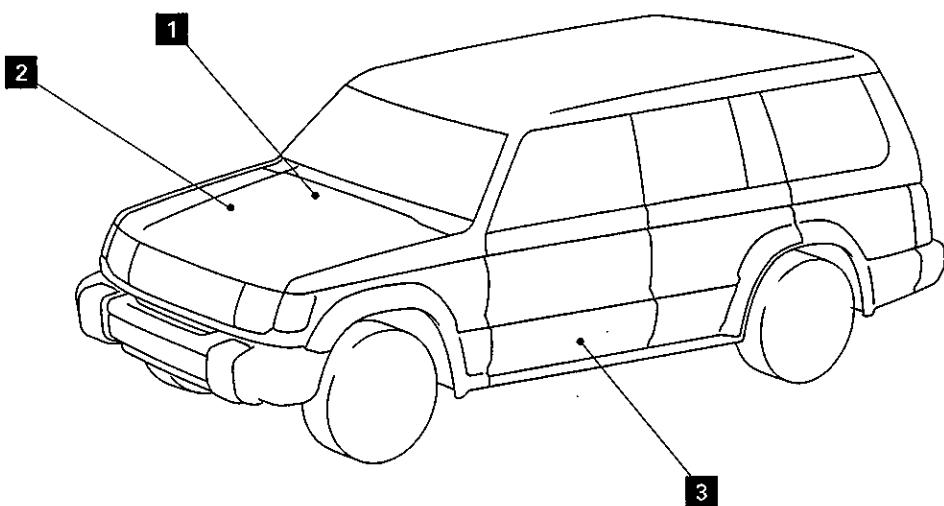
NOTE

- Capacitor**
The capacitor does not pass D.C. current, but as the number of waves increases when it passes A.C. current, impedance (resistance

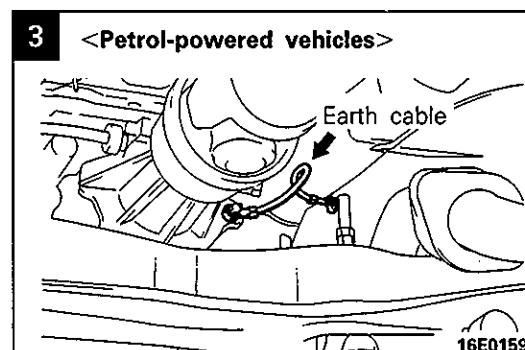
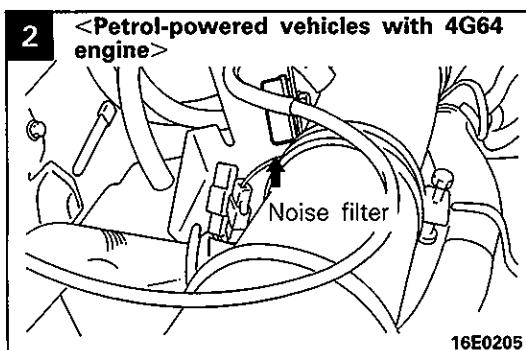
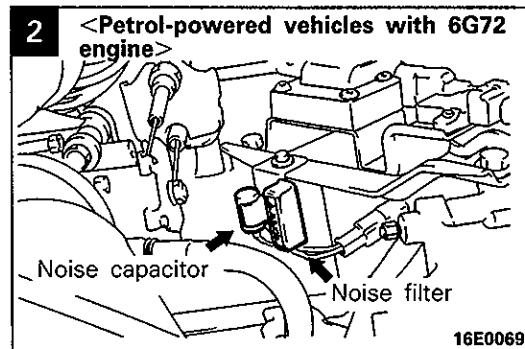
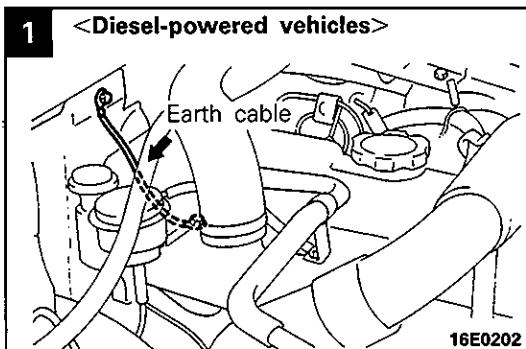
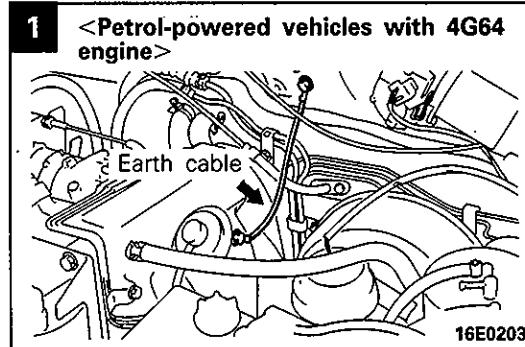
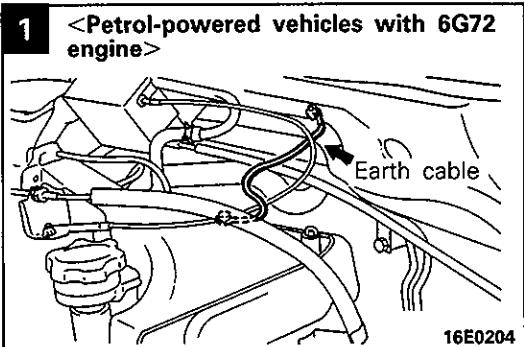
against A.C.) decreases, and current flow is facilitated. A noise suppressing condenser which takes advantage of this property is inserted between the power line for the noise source and the earth. This suppressed noise by earthing the noise component (A.C. or pulse signal) to the body of the vehicle.

- Coil**
The coil passes D.C. current, but impedance rises as the number of waves increases relative to the A.C. current. A noise suppressing coil which takes advantage of this property is inserted into the power line for the noise source, and works by preventing the noise component from flowing or radiating out of the line.

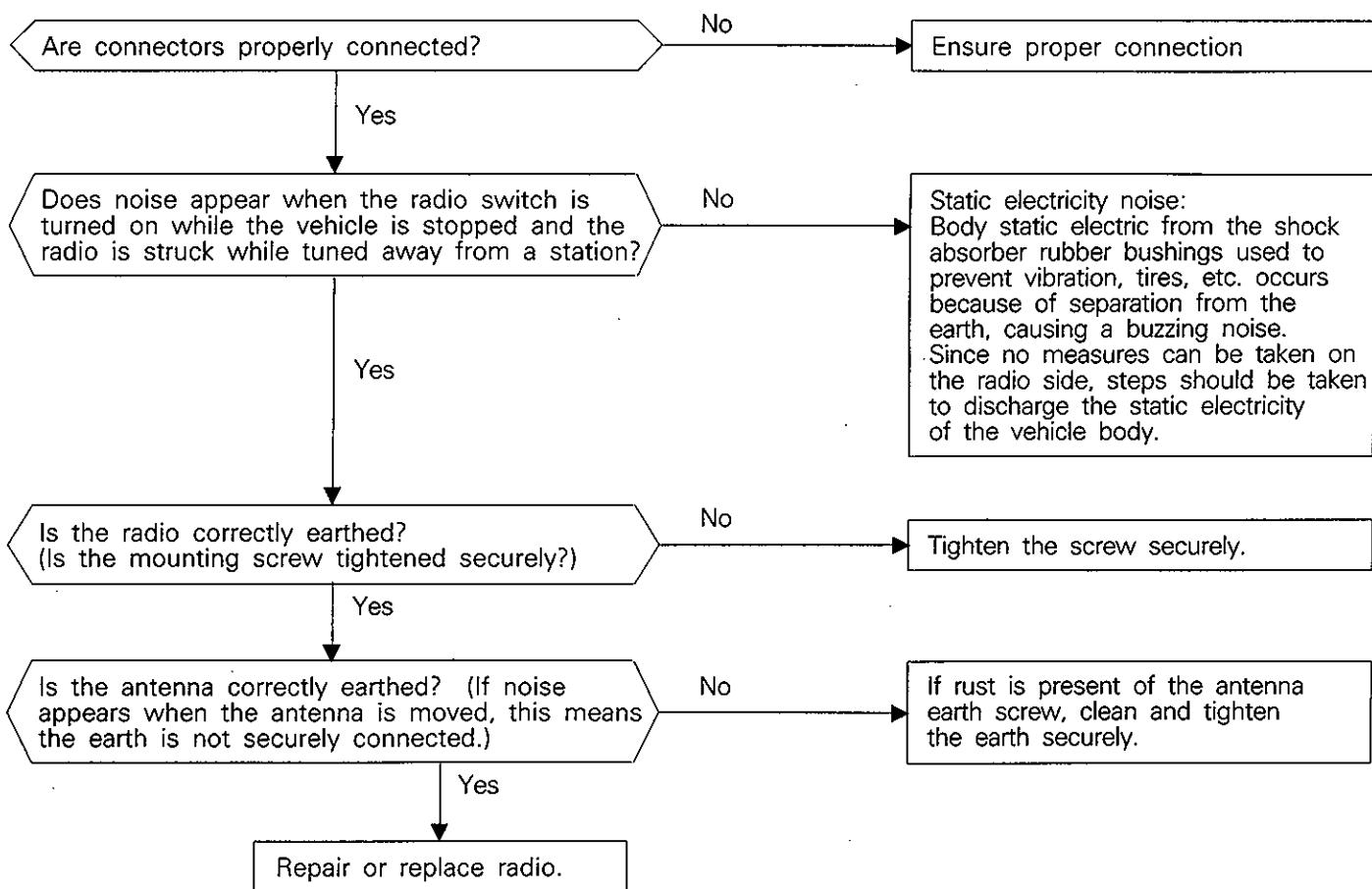
NOISE SUPPRESSOR MOUNTING LOCATION



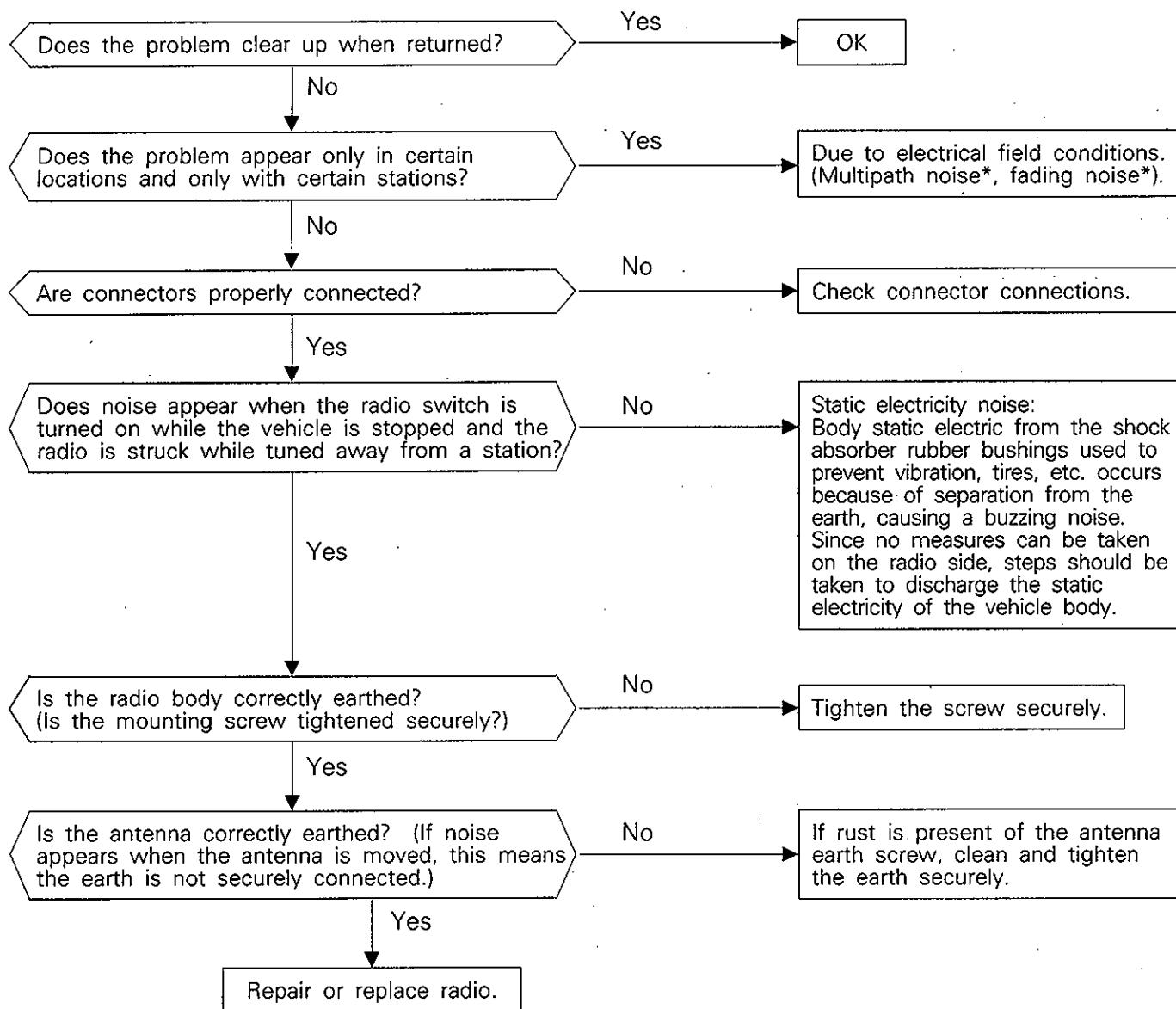
18E0003



A-7 Some noise appears when there is vibration or shocks during traveling.



A-8 Noise sometimes appears on FM during traveling.



- * About multipath noise and fading noise
Because the frequency of FM waves is extremely high, it is highly susceptible to effects from geological formations and buildings. These effects disrupt the broadcast signal and obstruct reception in several ways.
- Multipath noise
This describes the echo that occurs when the broadcast signal is reflected by a large obstruc-

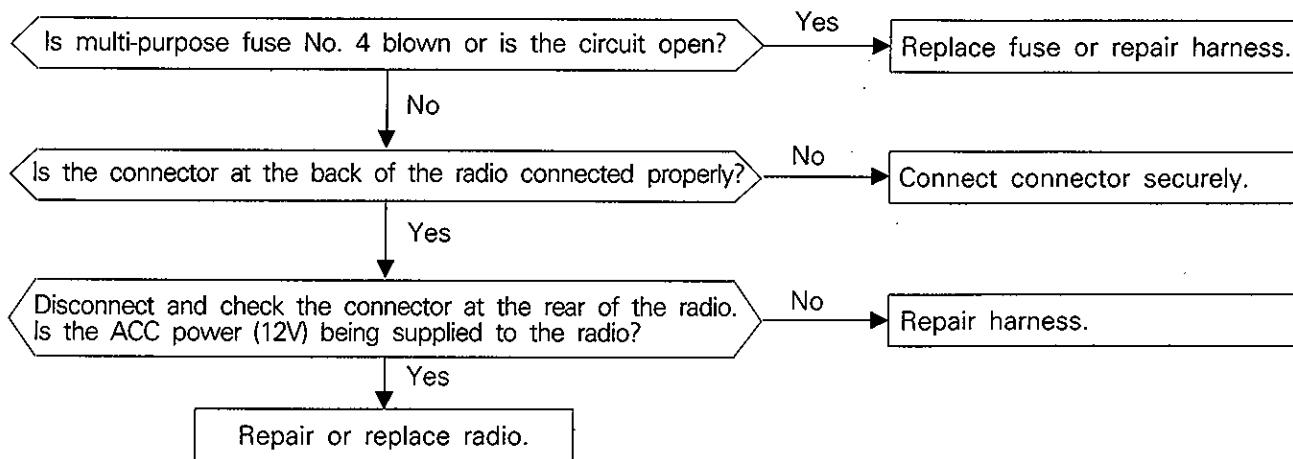
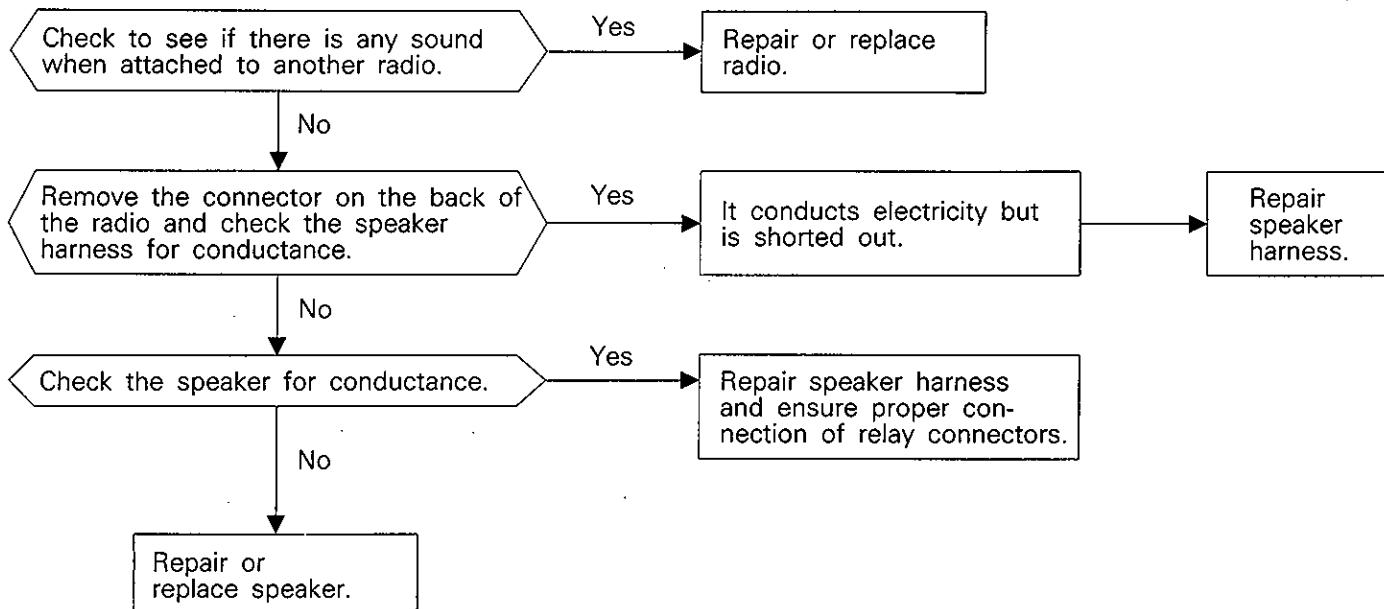
- tion and enters the receiver with a slight time delay relative to the direct signal (repetitious buzzing).
- Fading noise
This is a buzzing noise that occurs when the broadcast beam is disrupted by obstructing objects and the signal strength fluctuates intricately within a narrow range.

A-9 Ever-present noise.

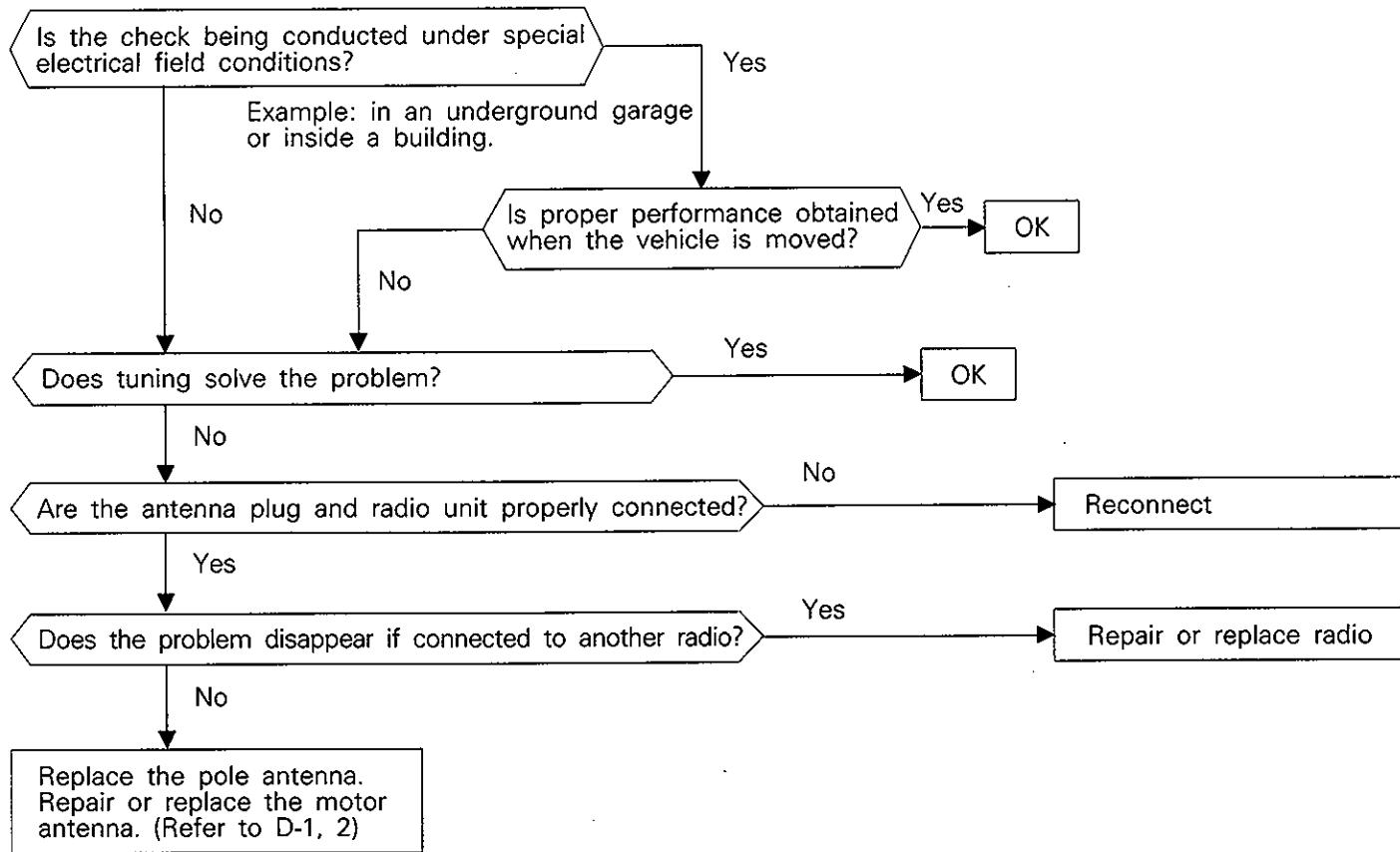
Noise is often created by the following factors, and often the radio is OK when it is checked individually.

- Traveling conditions of the vehicle
- Terrain of area traveled through
- Surrounding buildings
- Signal conditions
- Time period

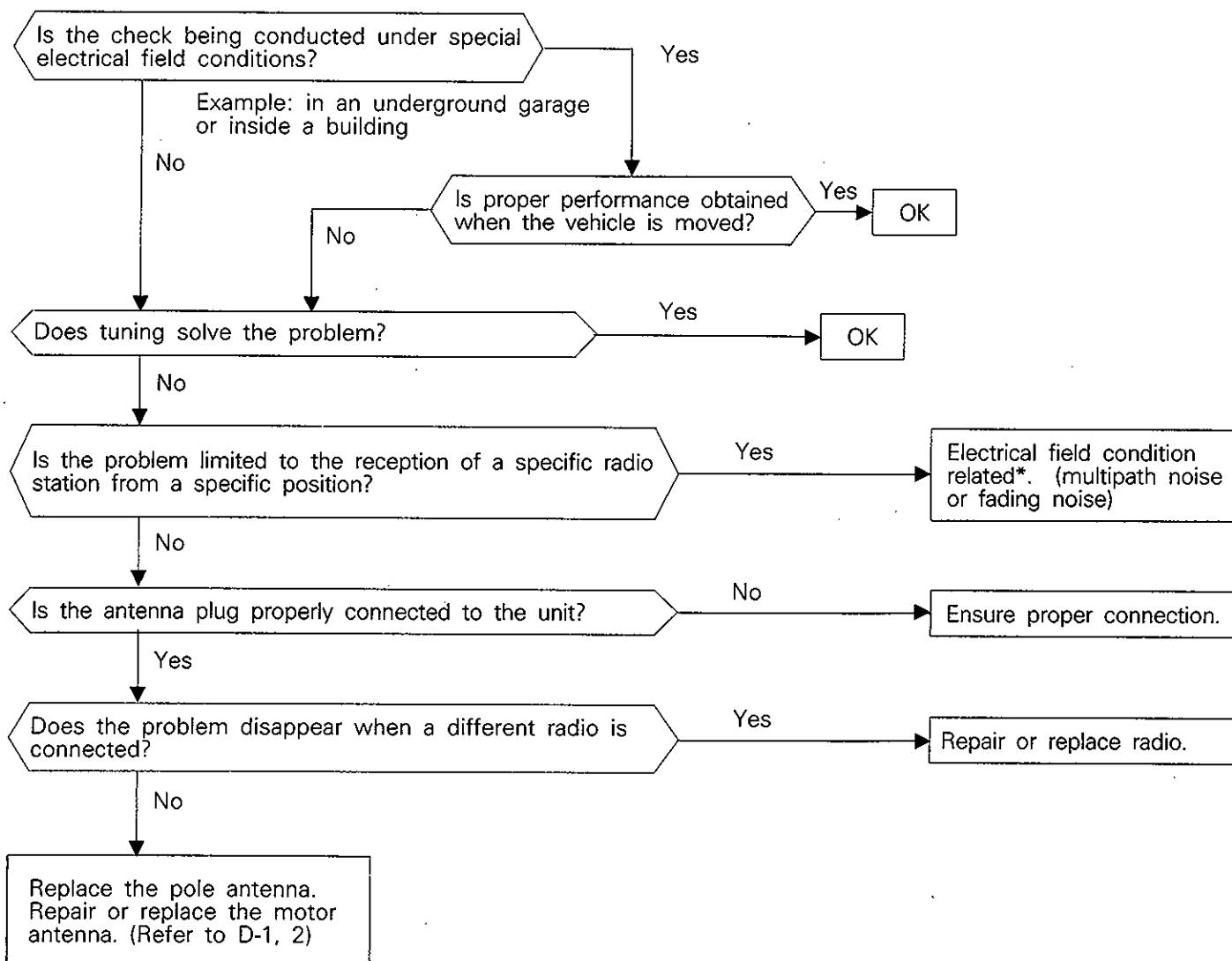
For this reason, if there are still problems with noise even after the measures described in steps A-1 to A-8 have been taken, get information on the factors listed above as well as determining whether the problem occurs with AM or FM, the station names, frequencies, etc., and contact a service center.

B. RADIO**B-1 No power is supplied when the switch is set to ON.****B-2 No sound from one speaker.**

B-3 There is noise but no reception for both AM and FM or no sound from AM, or no sound from FM.

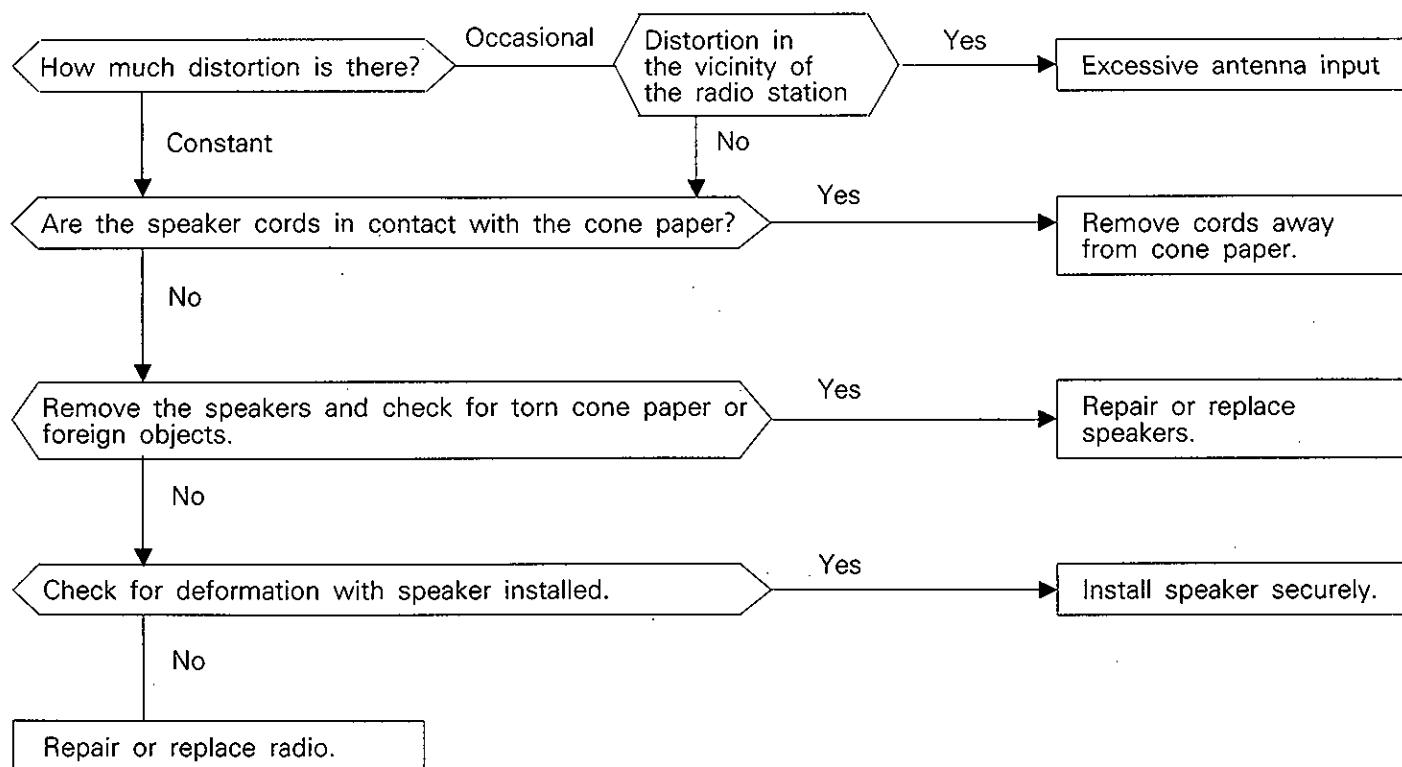


B-4 Unsufficient sensitivity.

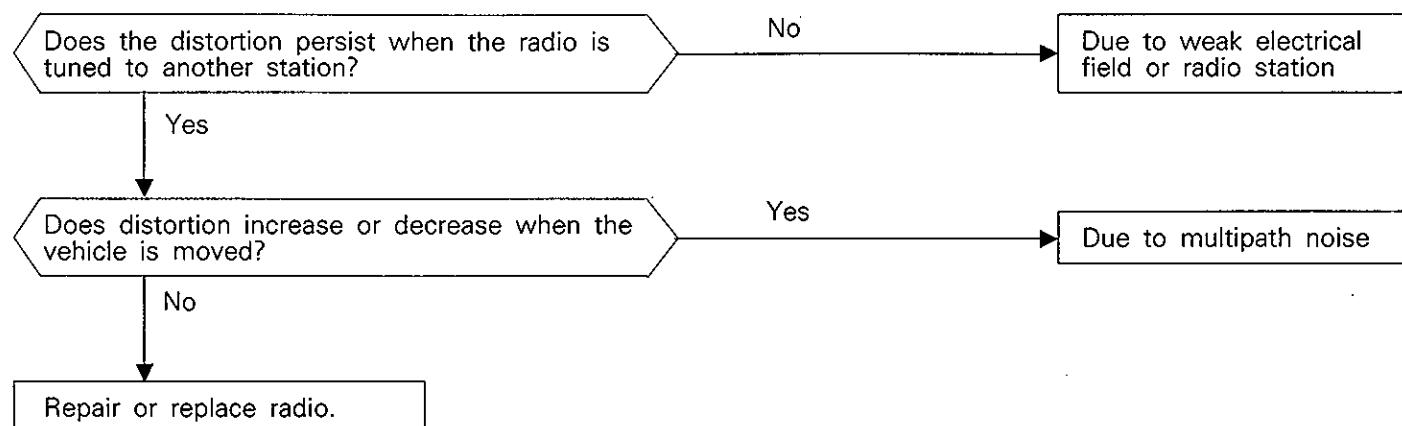


* For multipath noise and fading noise problems, refer to P.54-41.

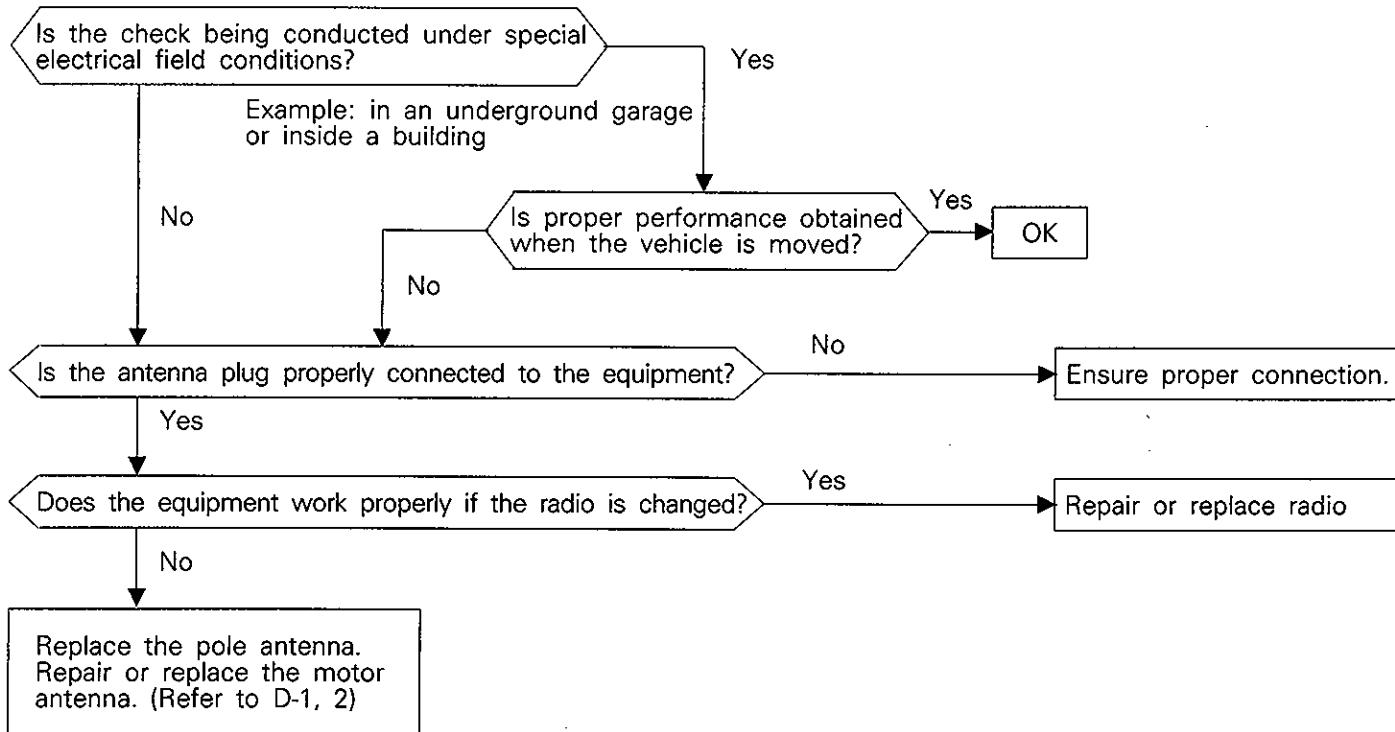
B-5 | Distortion on AM or on both AM and FM.



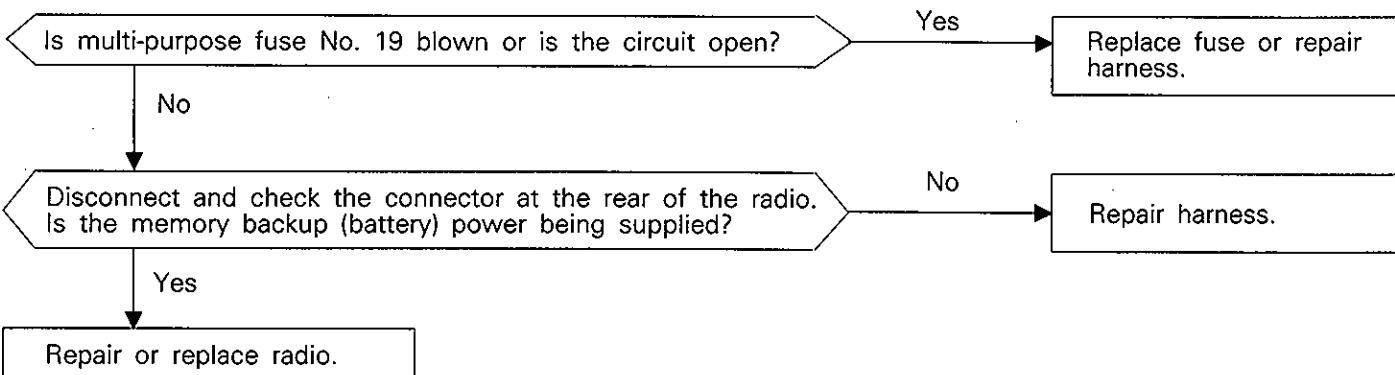
B-6 | Distortion on FM only.



B-7 Too few automatic select stations.

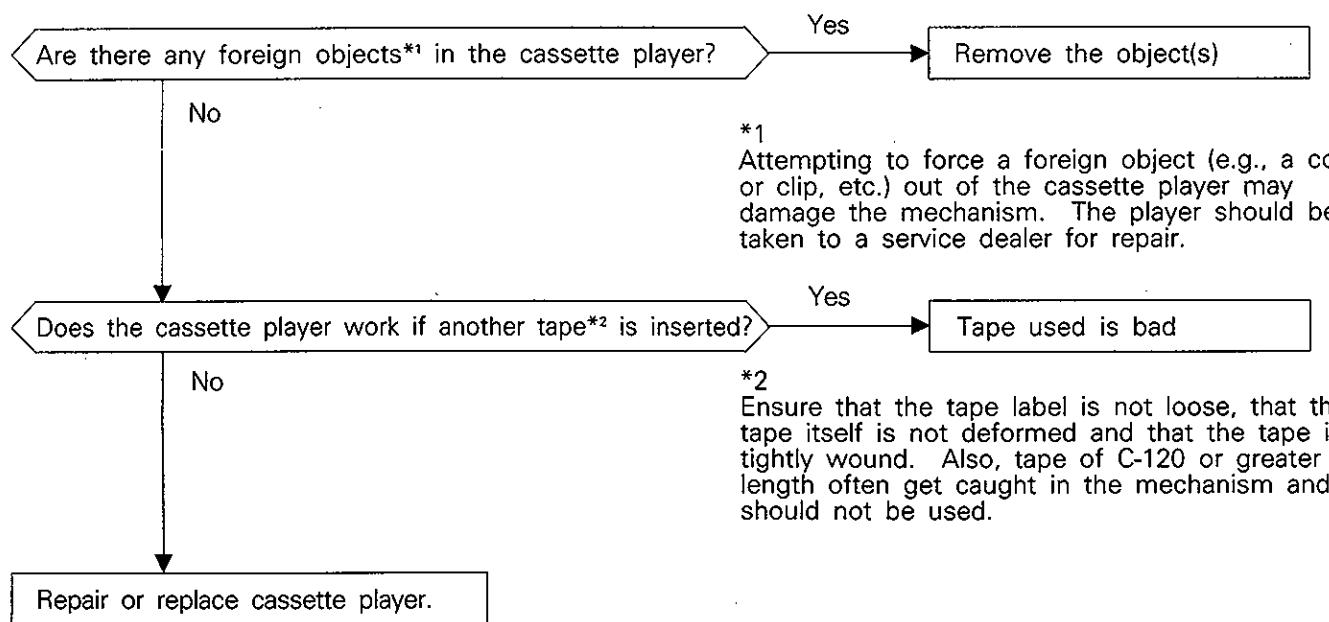


B-8 Insufficient memory (preset stations are erased).

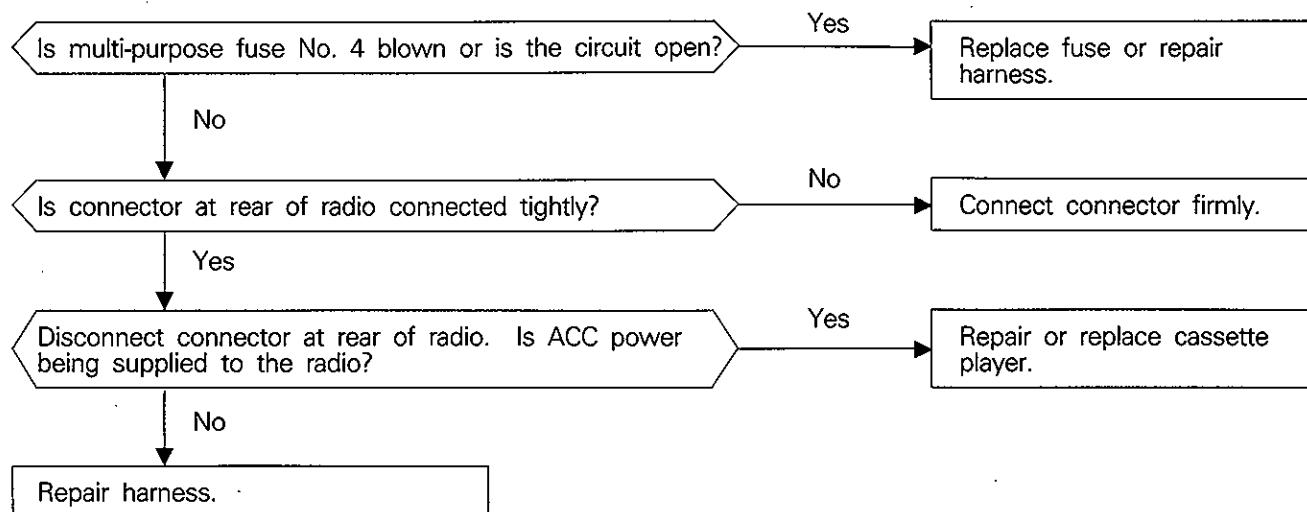


C. CASSETTE PLAYER

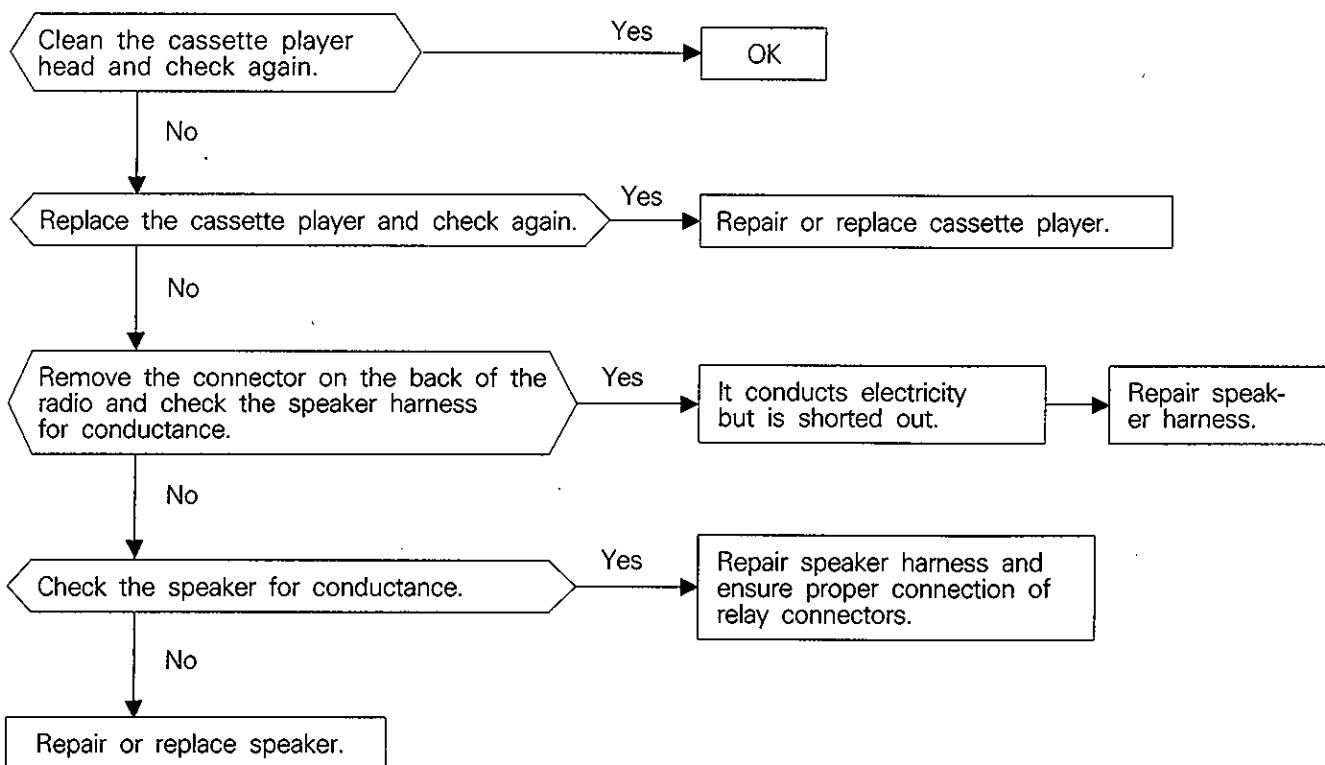
C-1 Cassette tape will not be inserted.



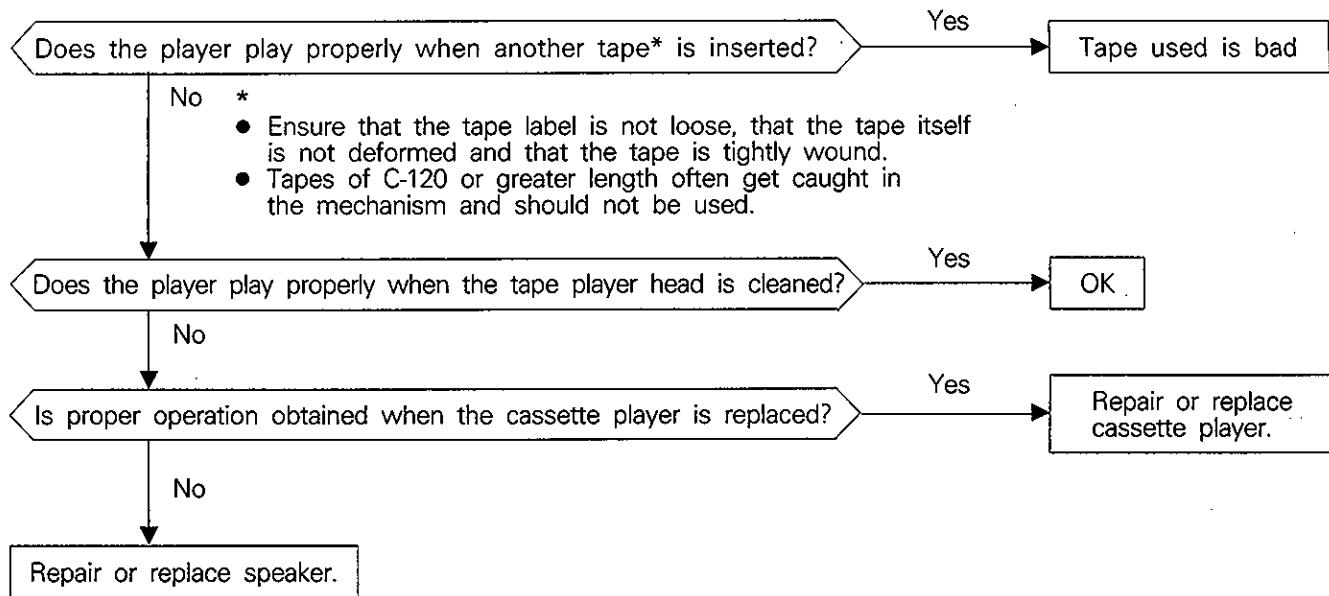
C-2 No sound (even after a tape has been inserted).



C-3 No sound from one speaker.



C-4 Sound quality is poor, or sound is weak.

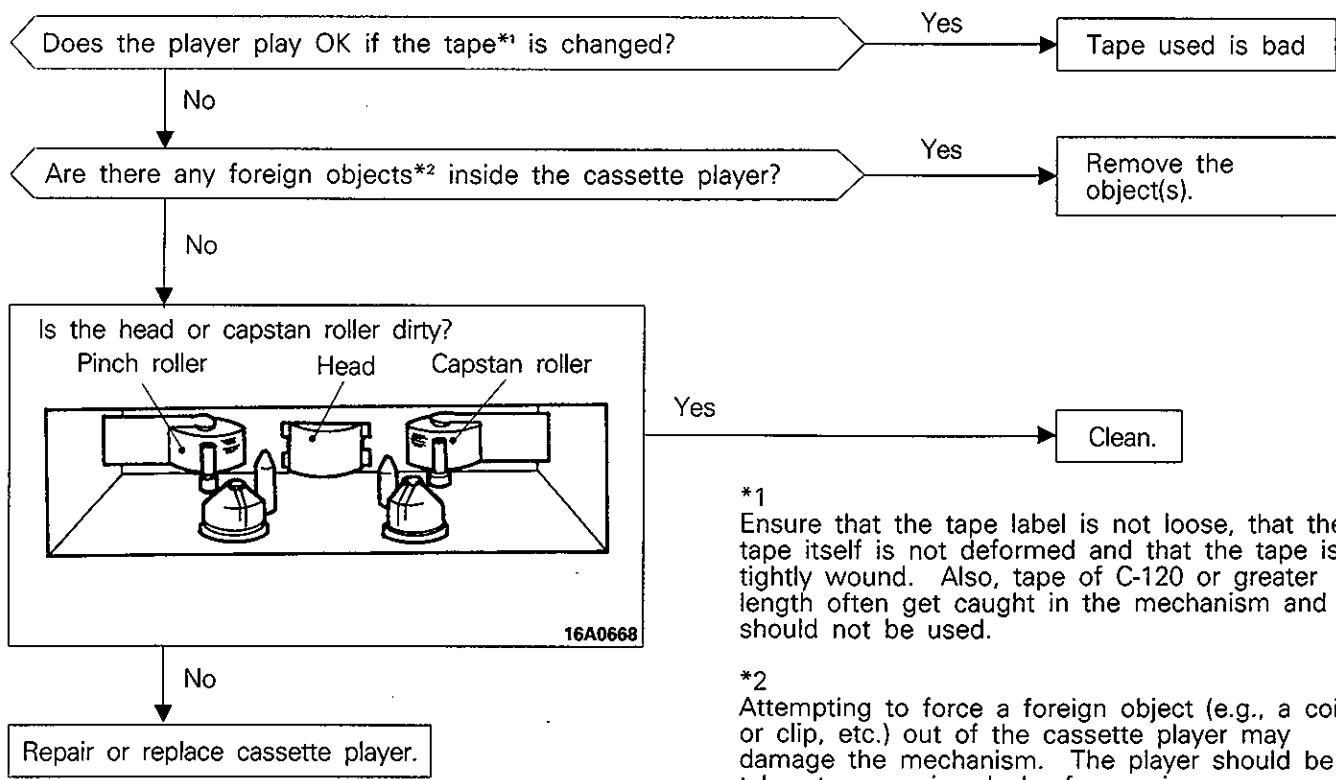


C-5 Cassette tape will not eject.

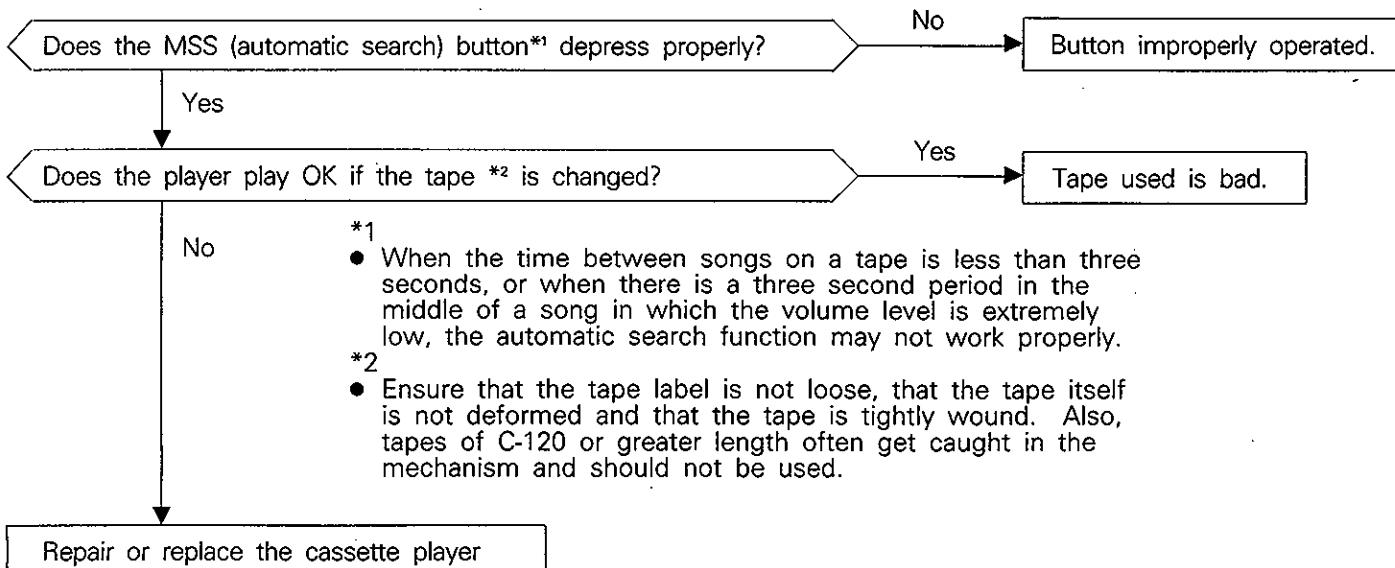
The problems covered here are all the result of the use of a bad tape (deformed or not properly tightened) or of a malfunction of the cassette player itself. Malfunctions involving the tape becoming caught in the mechanism and ruining

the case are also possible, and attempting to force the tape out of the player can cause damage to the mechanism. The player should be taken to a service dealer for repair.

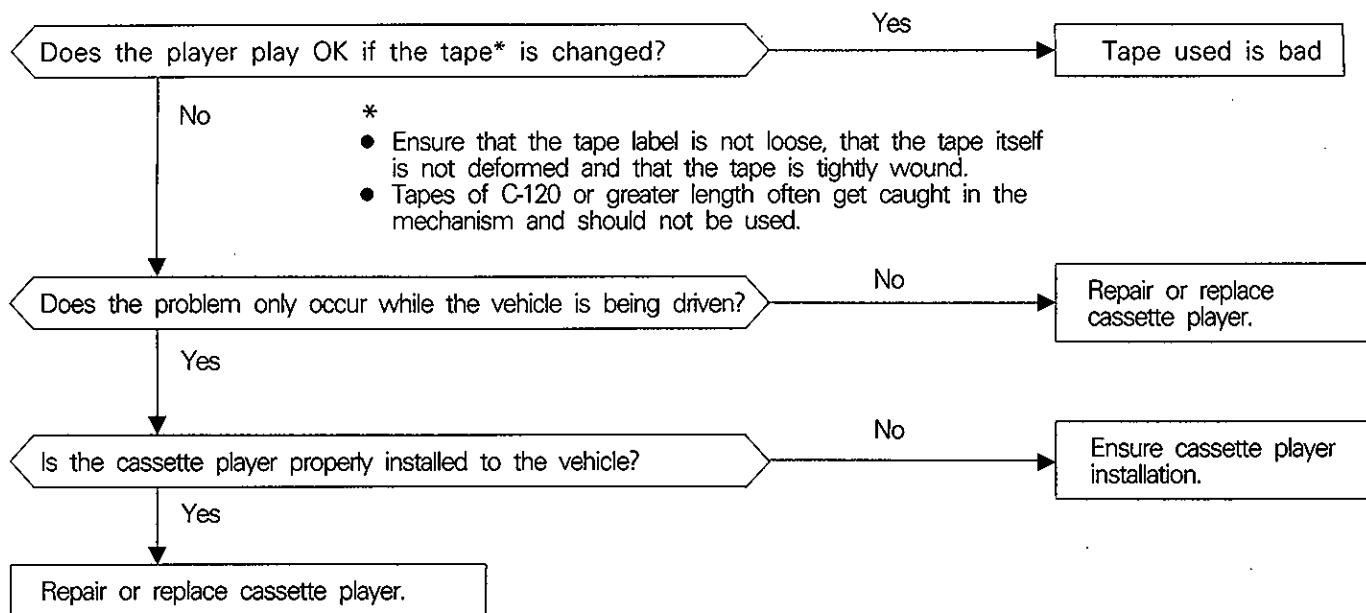
C-6 Uneven revolution. Tape speed is fast or slow.



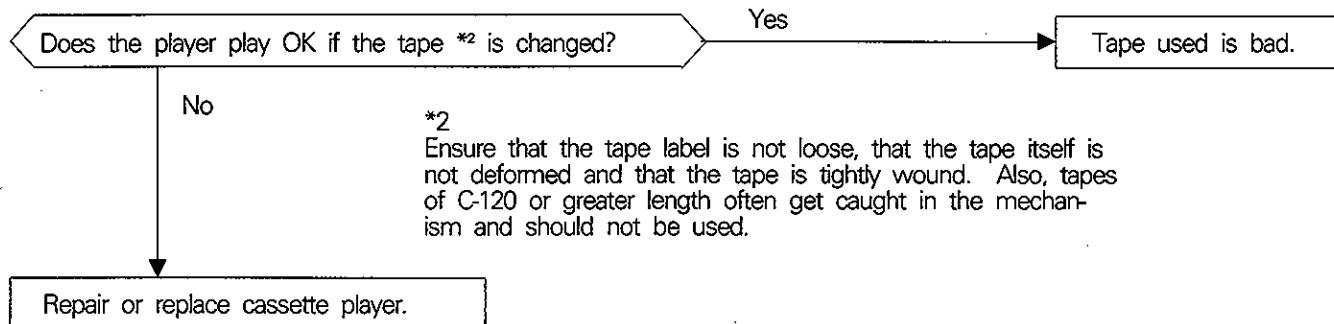
C-7 Automatic search does not work.



C-8 Faulty auto reverse.

C-9 Tape gets caught in mechanism*¹.¹

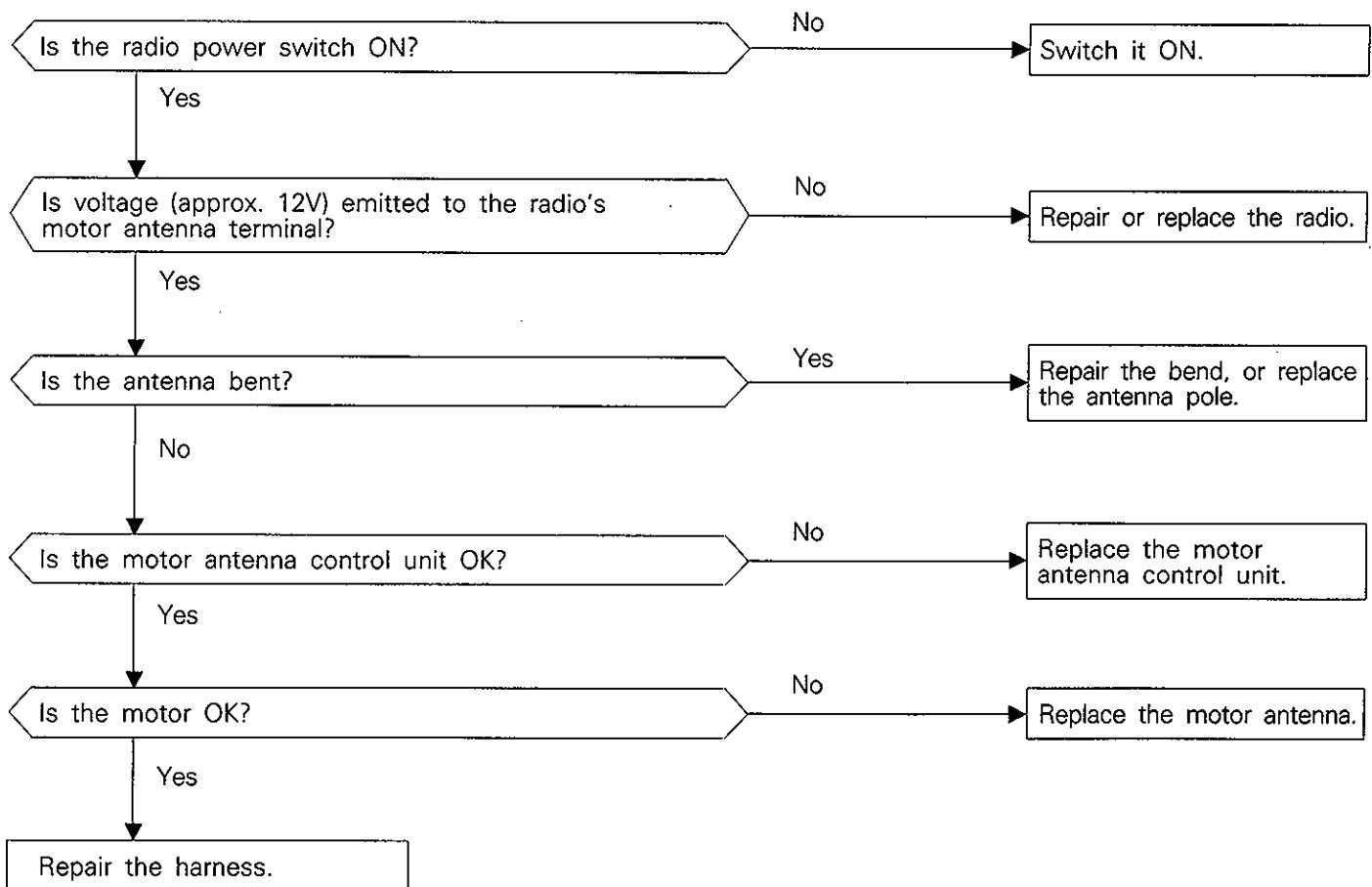
When the tape is caught in the mechanism, the case may not eject. When this occurs, do not try to force the tape out as this may damage the tape player mechanism. Take the cassette to a service dealer for repair.



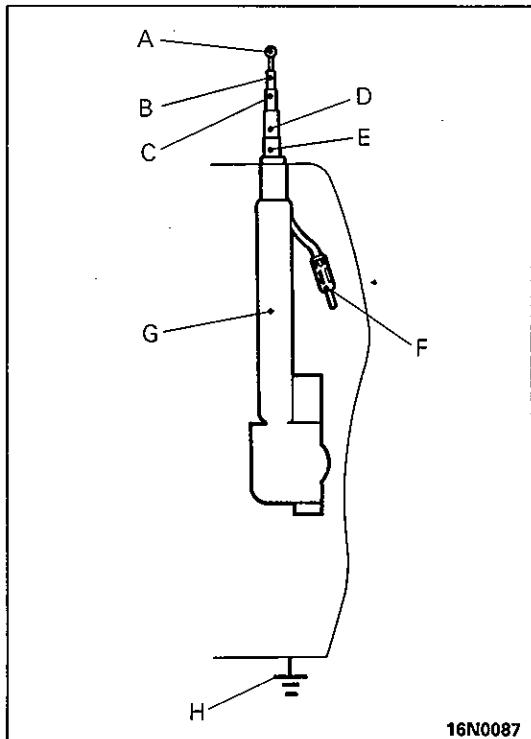
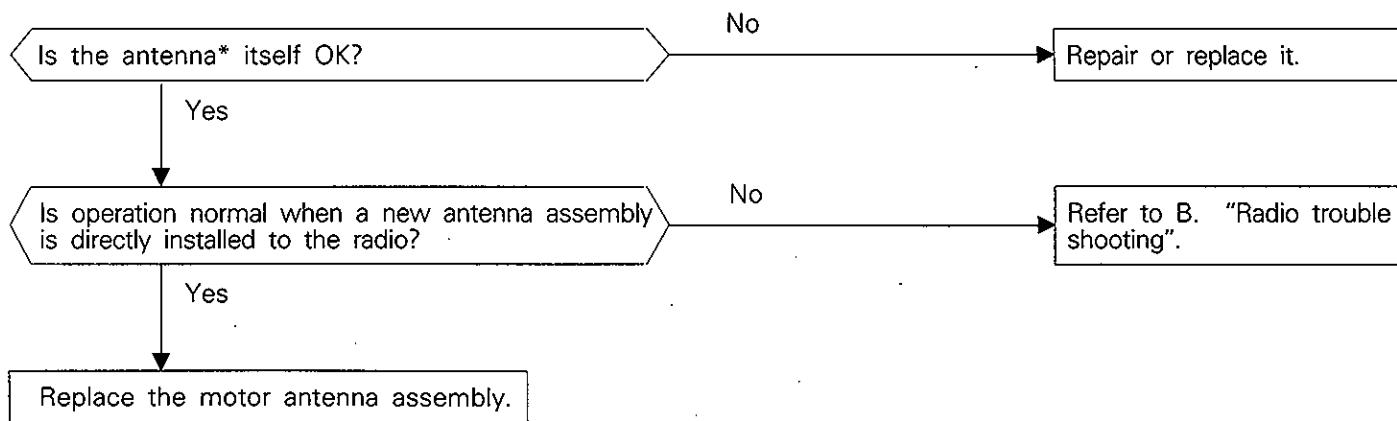
D. MOTOR ANTENNA

D-1 Motor antenna won't extend or retract.

Clean and polish the surface of the antenna pole.



D-2 Motor antenna extends and retracts but does not receive.



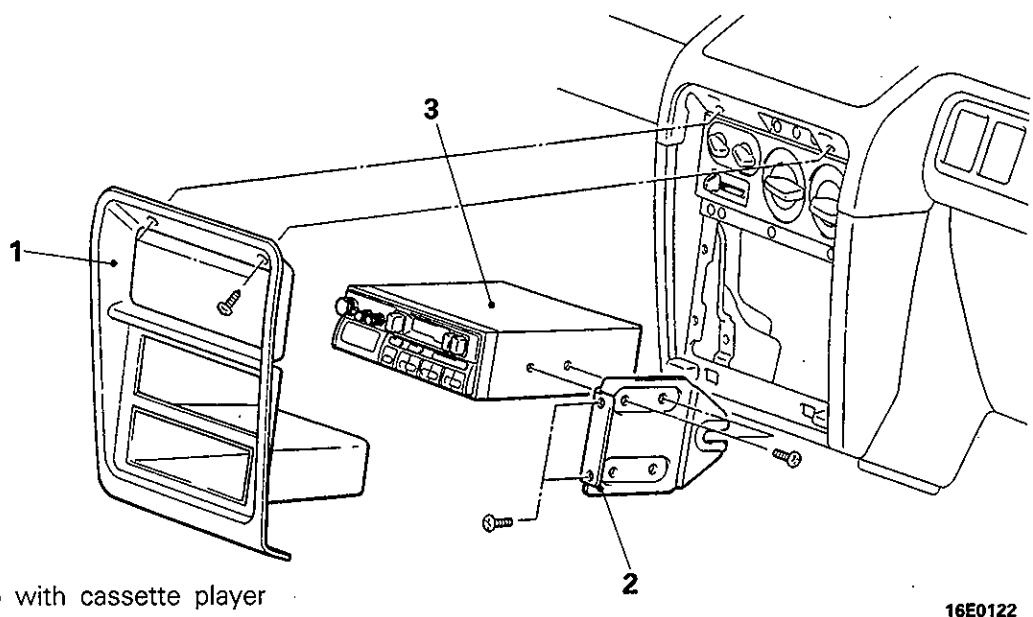
Checking the antenna*

Ohmmeter measurement locations	Result
Circuits from F to A, B, C, D and E	Continuity
Circuit between G and H	Continuity
Circuits from H to A, B, C, D and E	No continuity

RADIO OR RADIO WITH CASSETTE PLAYER

ES4LHAM

REMOVAL AND INSTALLATION

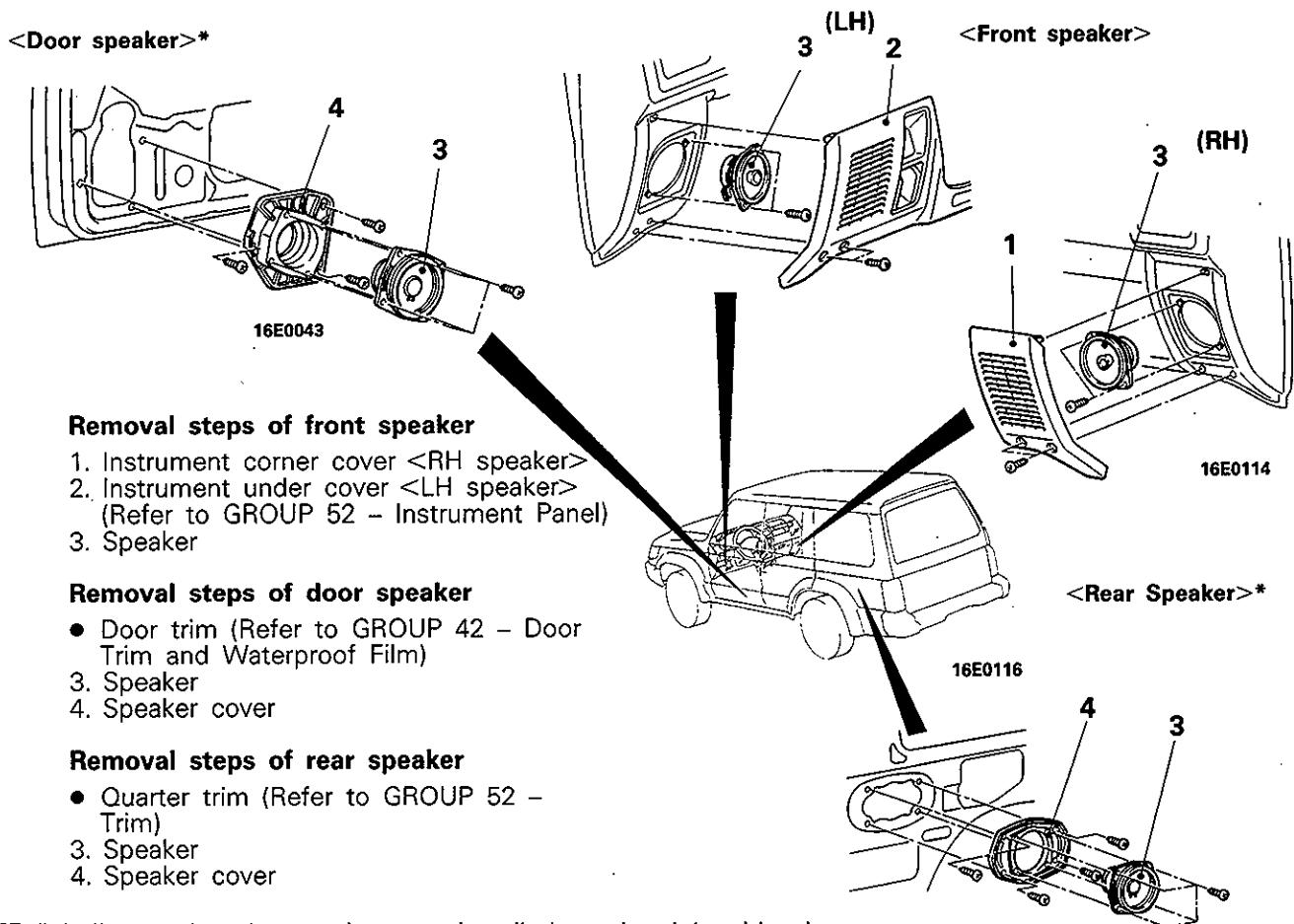


16E0122

SPEAKER

ES4LIAI

REMOVAL AND INSTALLATION



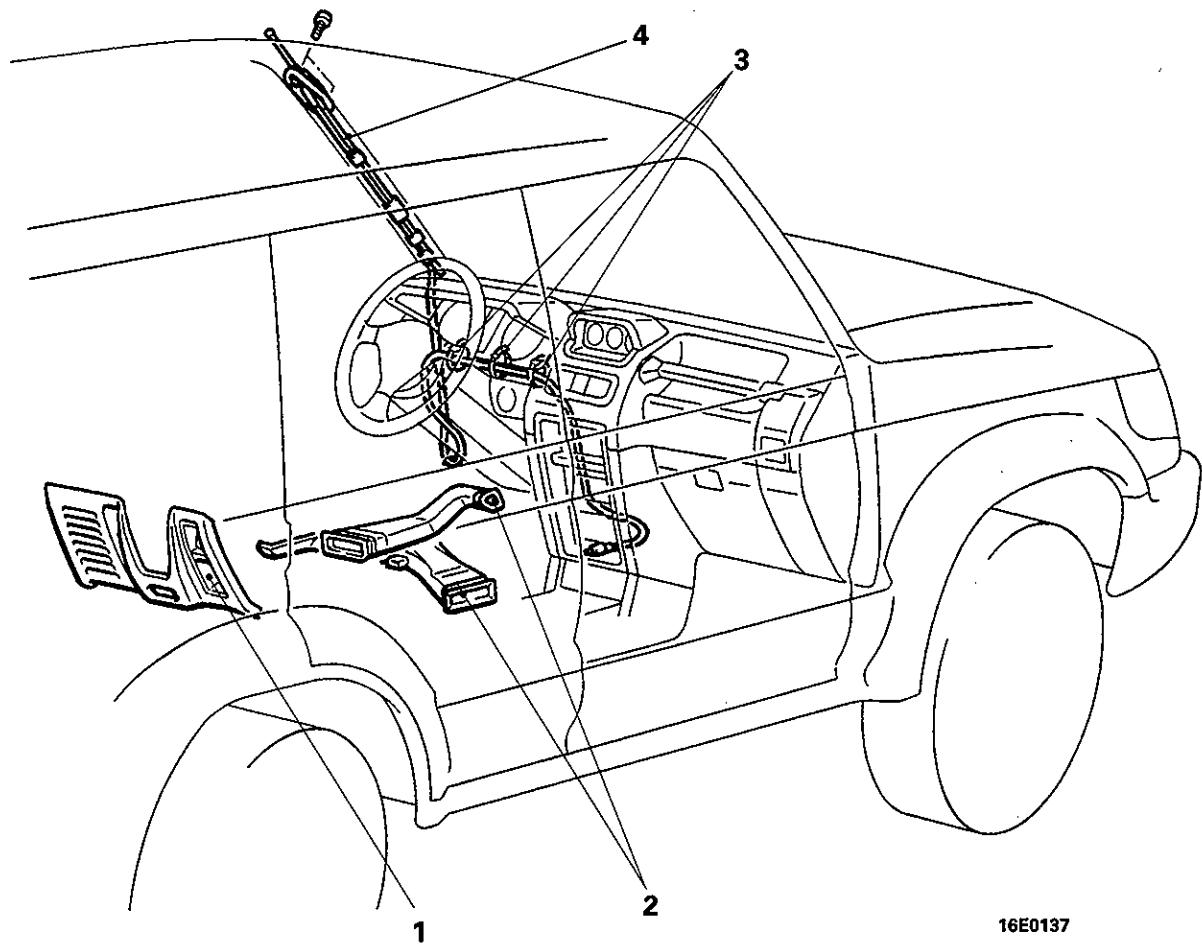
NOTE * indicates that the speakers are installed on the right side also.

16E0044

POLE ANTENNA AND ANTENNA FEEDER CABLE

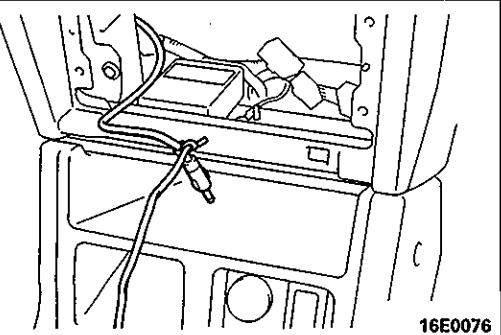
REMOVAL AND INSTALLATION

E54LJAH



Removal steps

1. Instrument under cover
(Refer to GROUP 52 – Instrument Panel)
2. Foot shower duct (LH) and lap cooler duct (A)
3. Cable band
 - Radio or radio with cassette player
(Refer to P.54-54.)
4. Pole antenna and antenna feeder cable



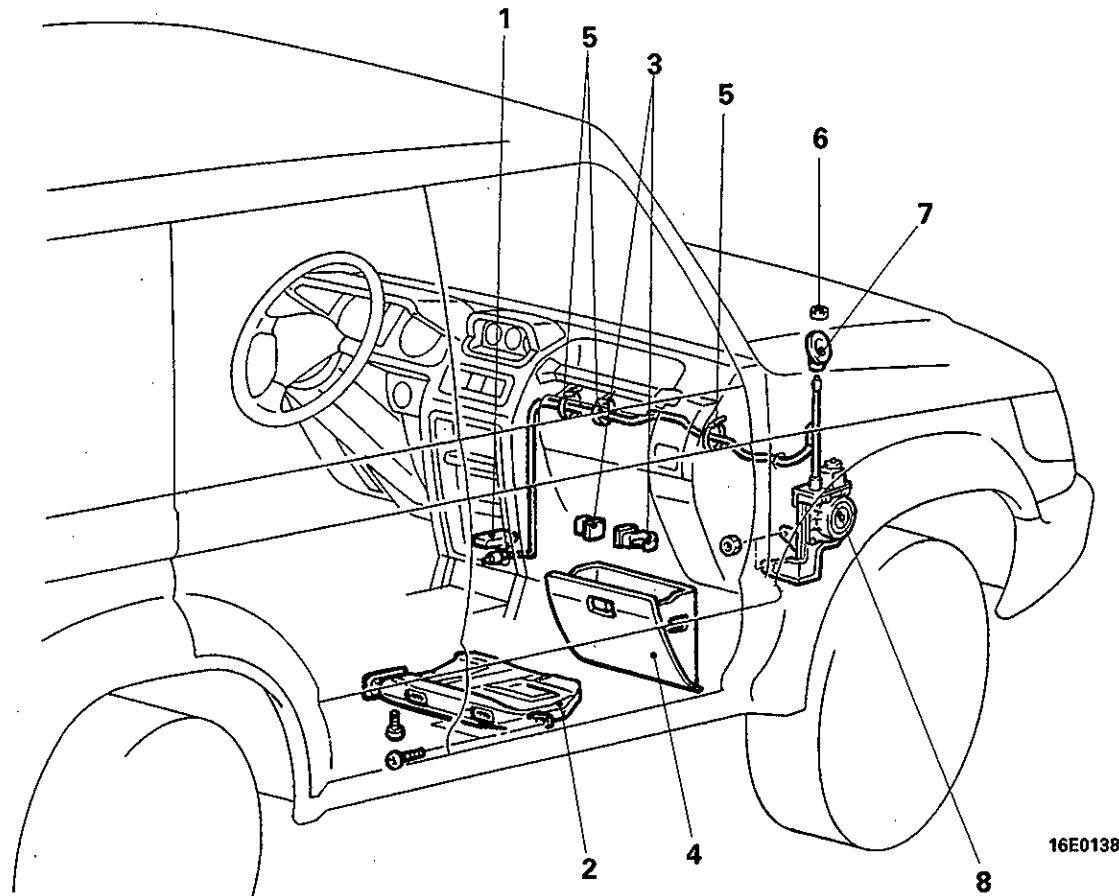
SERVICE POINT OF REMOVAL

4. REMOVAL OF POLE ANTENNA AND ANTENNA FEEDER CABLE

To facilitate installation, tie a rope [approx. 3m (9.84 ft.)] to the feeder cable, and pull out the pole antenna and antenna feeder cable.

MOTOR ANTENNA AND ANTENNA FEEDER CABLE

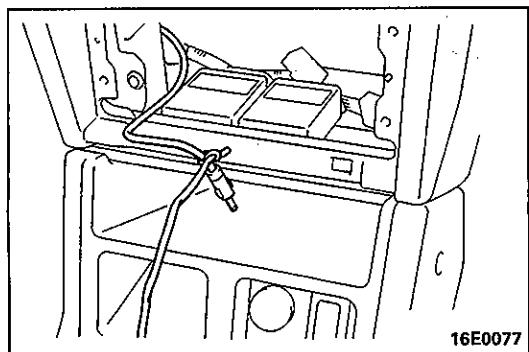
E54LJBE

REMOVAL AND INSTALLATION**Removal steps of motor antenna control unit**

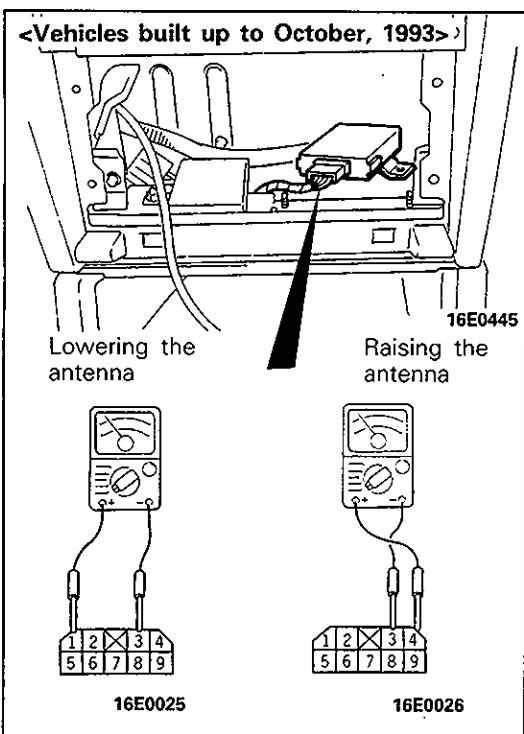
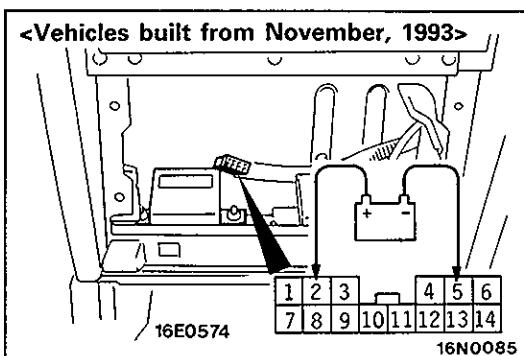
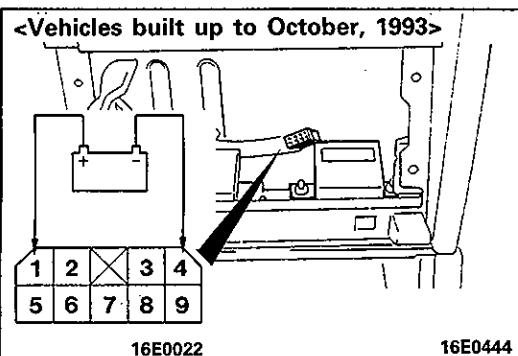
- Radio or radio with cassette player (Refer to P.54-54)
- 1. Motor antenna control unit

Removal steps of motor antenna and antenna feeder cable

- Radio or radio with cassette player (Refer to P.54-54)
- 2. Foot shower duct
- 3. Glove box stopper
- 4. Glove box assembly
- 5. Cable band
- 6. Ring nut
- 7. Base
- 8. Motor antenna and antenna feeder cable

**SERVICE POINT OF REMOVAL****8. REMOVAL OF MOTOR ANTENNA AND ANTENNA FEEDER CABLE**

To facilitate installation, tie a rope [approx. 3m (9.84 ft.)] to the feeder cable, and pull out the motor antenna and antenna feeder cable.



INSPECTION

MOTOR ANTENNA INSPECTION

<Vehicles built up to October, 1993>

- (1) Remove the radio or radio with cassette player. (Refer to P.54-54)
- (2) Remove the motor antenna control unit connector and check if the antenna goes up when the battery (+) side is connected to terminal (1), and the battery (-) side to terminal (4), and check if it goes down when the connections are reversed.

<Vehicles built from November, 1993>

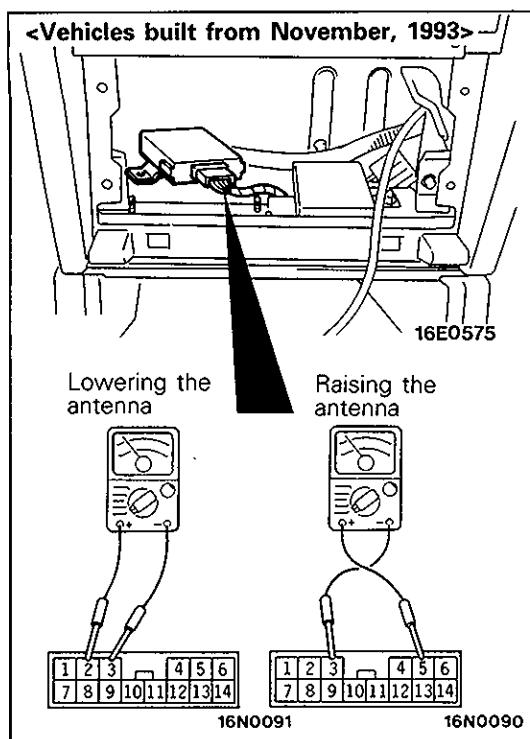
- (1) Remove the radio or radio with cassette player. (Refer to P.54-54)
- (2) Remove the motor antenna control unit connector and check if the antenna goes up when the battery (+) side is connected to terminal (2), and the battery (-) side to terminal (5), and check if it goes down when the connections are reversed.

MOTOR ANTENNA CONTROL UNIT INSPECTION

<Vehicles built up to October, 1993>

- (1) Remove the radio or radio with cassette player (Refer to P.54-54.)
- (2) Remove the motor antenna control unit mounting bolt.
- (3) With the ignition switch turned to ACC or ON, operate the radio switch and check the voltage between the terminals while raising and lowering the antenna.

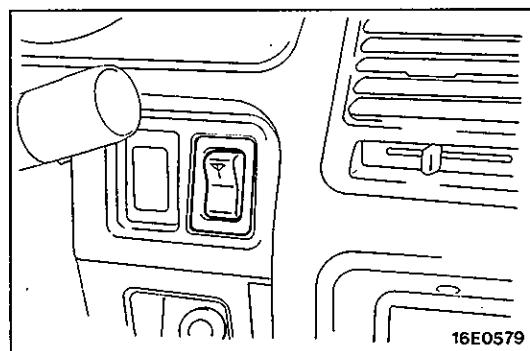
Antenna operation direction	Measurement terminals	Voltage (V)
Lowering	1-3	10-13
Raising	4-3	10-13



<Vehicles built from November, 1993>

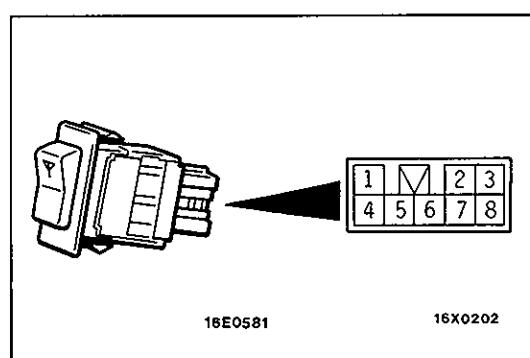
- 1) Remove the radio or radio with cassette player (Refer to P.54-54.)
- 2) Remove the motor antenna control unit mounting bolt.
- 3) With the ignition switch turned to ACC or ON, operate the radio switch and check the voltage between the terminals while raising and lowering the antenna.

Antenna operation direction	Measurement terminals	Voltage (V)
Lowering	2-3	10-13
Raising	5-3	10-13



ANTENNA SWITCH INSPECTION

- (1) Remove the antenna switch.

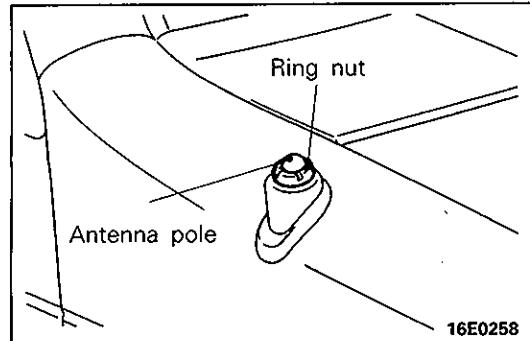


- (2) Operate the switch to check continuity between terminals.

Terminal	1		7	2	4	6
Switch position						
FULL	○	ILL	○	○	○	○
HALF	○	○	○	○	○	○

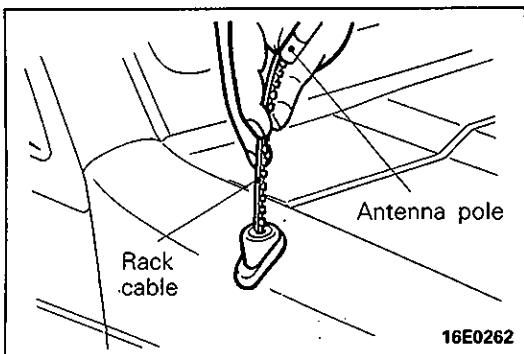
NOTE

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

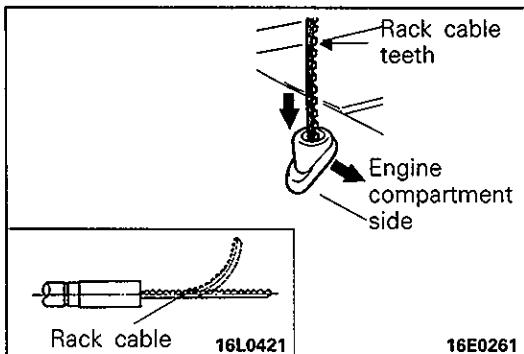


ANTENNA POLE REPLACEMENT

- (1) Remove the ring nut.



(2) After turning the ignition switch to ACC or ON, turn the radio switch to ON to raise the antenna pole, and remove it, together with the rack cable.

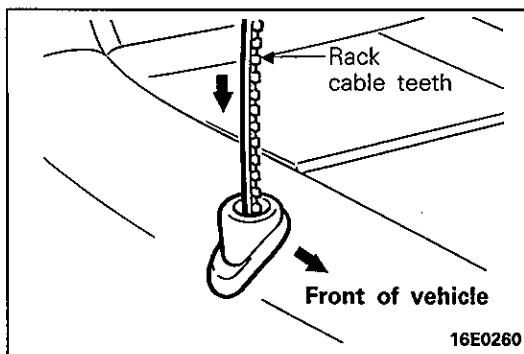


(3) Draw out the antenna pole to the maximum extension.

NOTE

If there is a bend in the motor end of the rack cable, remove the bend.

(4) Insert the rack cable into the motor assembly with the rack cable teeth facing the engine compartment side.

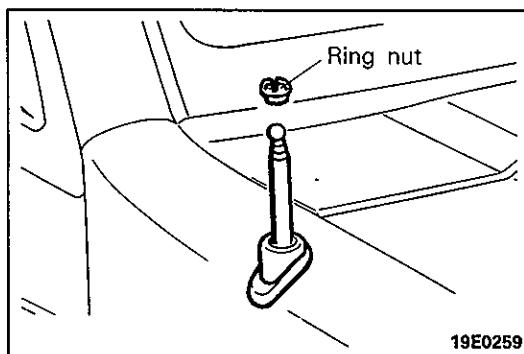


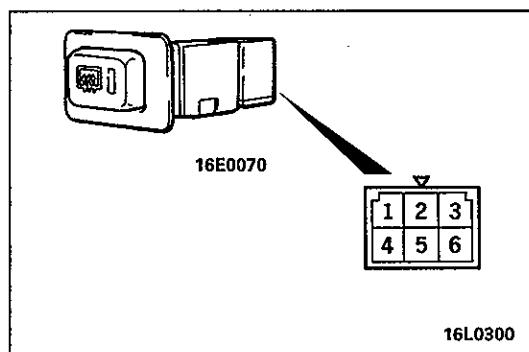
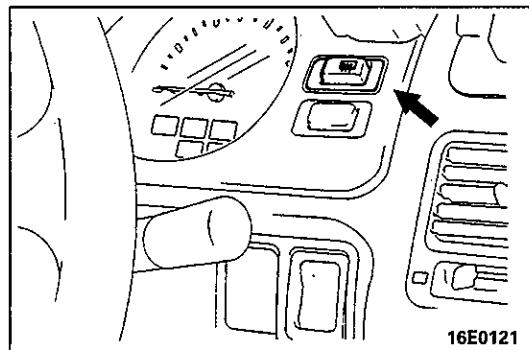
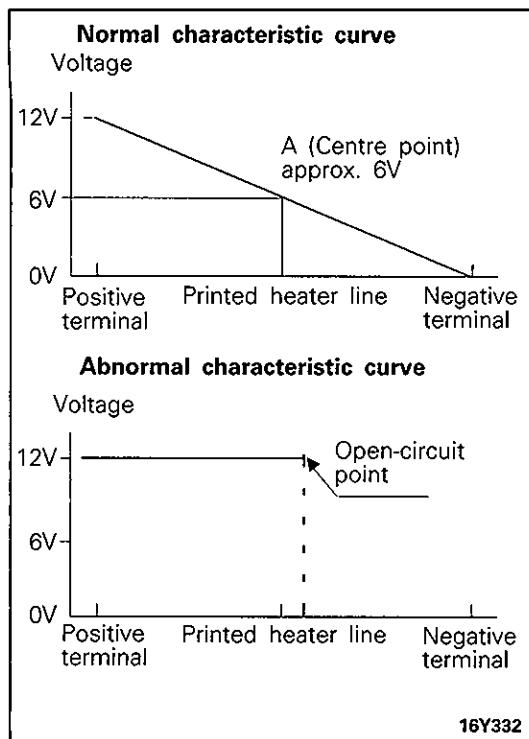
(5) Turn the rack cable teeth towards the front of the vehicle (90° to right) so that the rack cable meshes with the motor gear.

(6) If the rack cable pulls out with no resistance when it is lightly pulled, then the cable is not meshed with the motor gear, so check that there are no bends in the end of the rack cable, and then repeat steps (3) and (4) above.

(7) Set the antenna pole vertically and turn the radio switch OFF to wind up the rack cable. Insert the antenna to the motor antenna side to align it with the wound-up rack cable.

(8) After tightening the ring nut, check the movement of the antenna by turning the radio switch ON and OFF.





REAR WINDOW DEFOGGER SERVICE ADJUSTMENT PROCEDURES

E54MLAA

THE PRINTED-HEATER LINES CHECK

- Run engine at 2,000 r/min. Check heater element with battery at full.
- Turn ON rear window defogger switch. Measure heater element voltage with circuit tester at rear window glass centre A. Condition good if indicating about 6V.
- 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).
- 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.

INSPECTION

E54MOAC

- Remove the rear window defogger switch from the meter bezel.
- Operate the switch, and check the continuity between the terminals.

Switch position \ Terminal	1	4		3	2		5
OFF						ILL	
ON	○	○	IND	○	○	ILL	○

NOTE

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