

HOW TO READ CONFIGURATION DIAGRAMS

The wiring harness diagrams clearly show the connector locations and harness routings at each site on actual vehicles.

Denotes connector No.
The same connector No. is used throughout the circuit diagrams to facilitate connector location searches.
The first alphabetical symbol indicates the location site of the connector to parts in clockwise order on the diagram.
In addition, the number of connector wires and the connector colour (except milk white)* are shown for ease of retrieval.

Example: A-77 (5-B)

Connector colour
(milk white if no colour is indicated)

Number of connector wires

Number specific to connector (serial number)

Connector location site symbol

A : Engine compartment
B : Dash panel
C : Instrument panel
D : Floor and roof
E : Seat
F : Door
G : Trunk room
H : Rear floor lower section

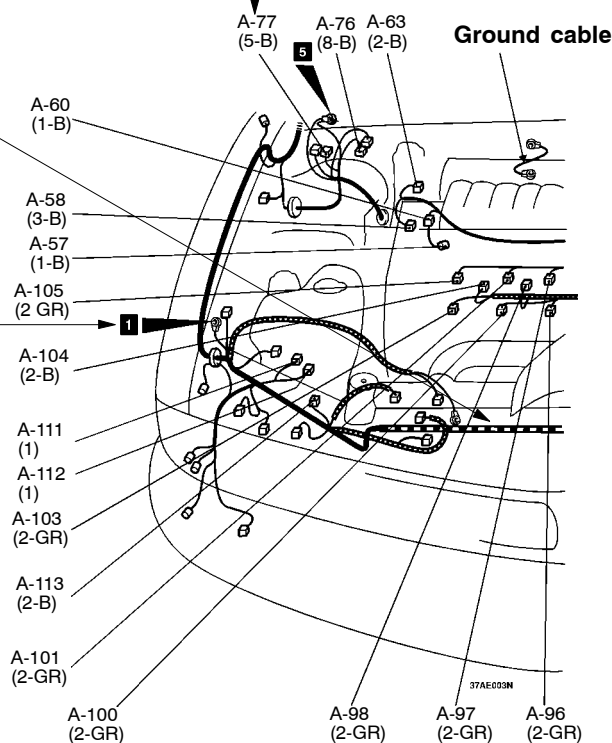
*: Typical connector colours

B : Black
Y : Yellow
L : Blue
G : Green
R : Red
BR : Brown
V : Violet
O : Orange
GR : Gray

Denotes a section covered by a corrugated tube.

Denotes ground point.
Same ground number is used throughout circuit diagrams to facilitate search of ground point. Refer to [Group 54A](#) for details of ground points.

Indicates the device to which the connector is to be connected.

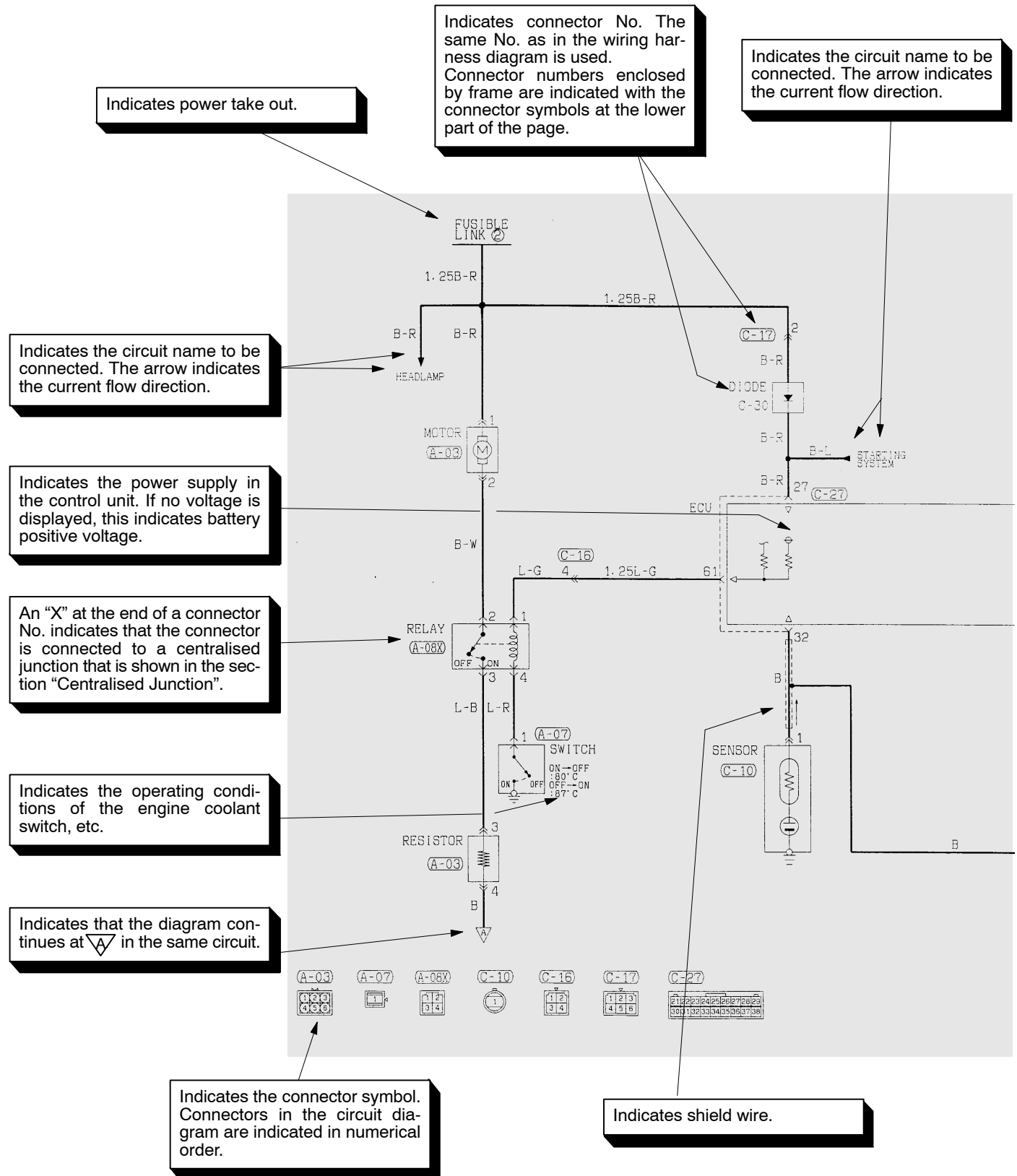


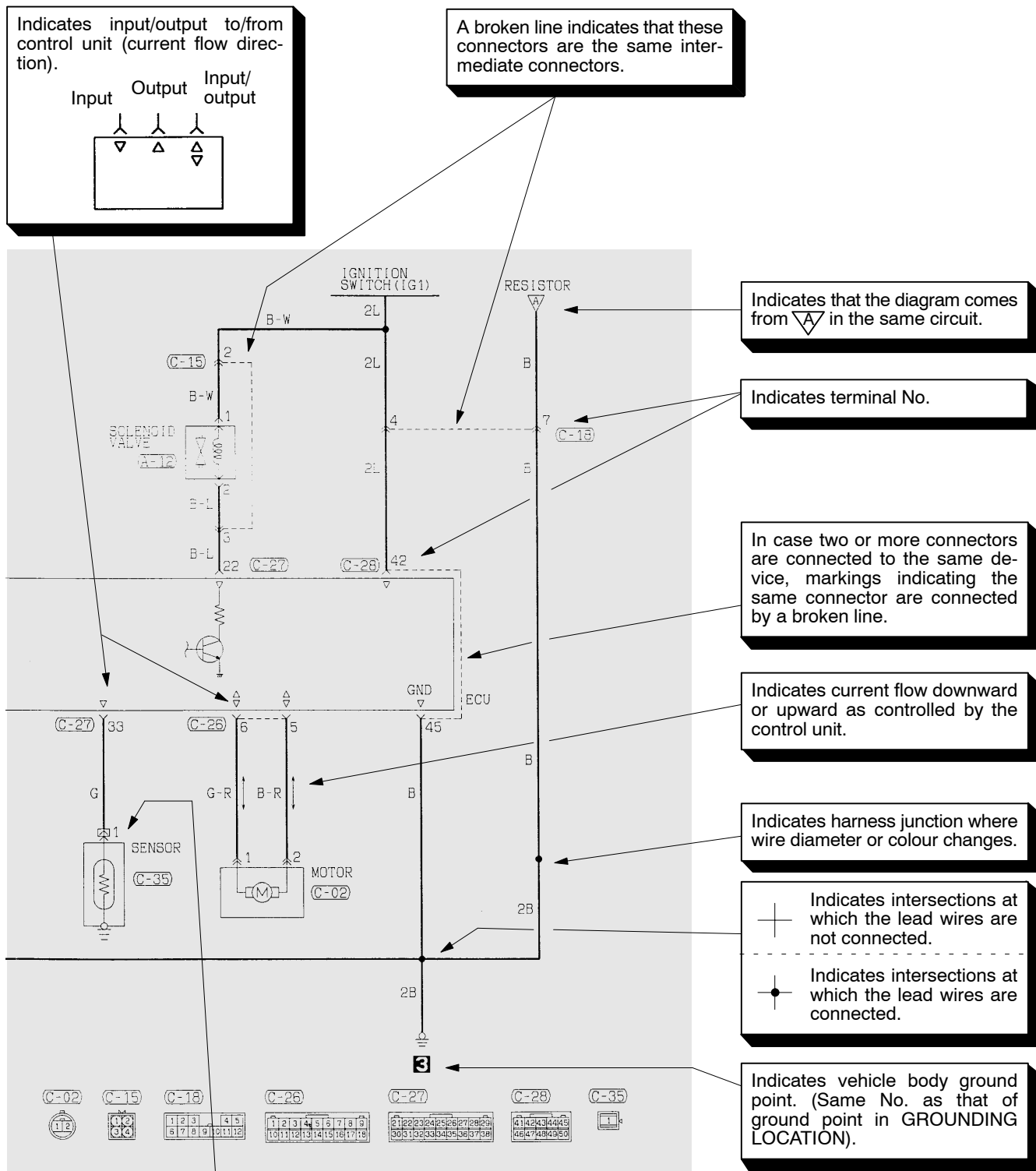
A-77 Valve relay <ABS>
A-57 Power steering oil pressure switch
A-58 Crank angle sensor
A-60 Connection of control harness and power steering harness
A-63 Knock sensor
A-67 Condenser
A-68 Throttle position sensor
A-70 Idle speed control servo

A-72 Air flow sensor
A-75 Checking connector (for adjusting ignition timing, checking fuel pump)
A-76 Hydraulic unit <ABS>
A-82 Distributor assembly
A-84 Connection of control harness and battery harness
A-85 Output shaft speed sensor
A-86 Input shaft speed sensor

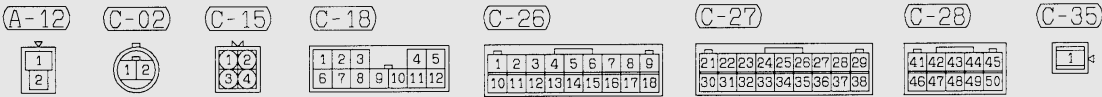
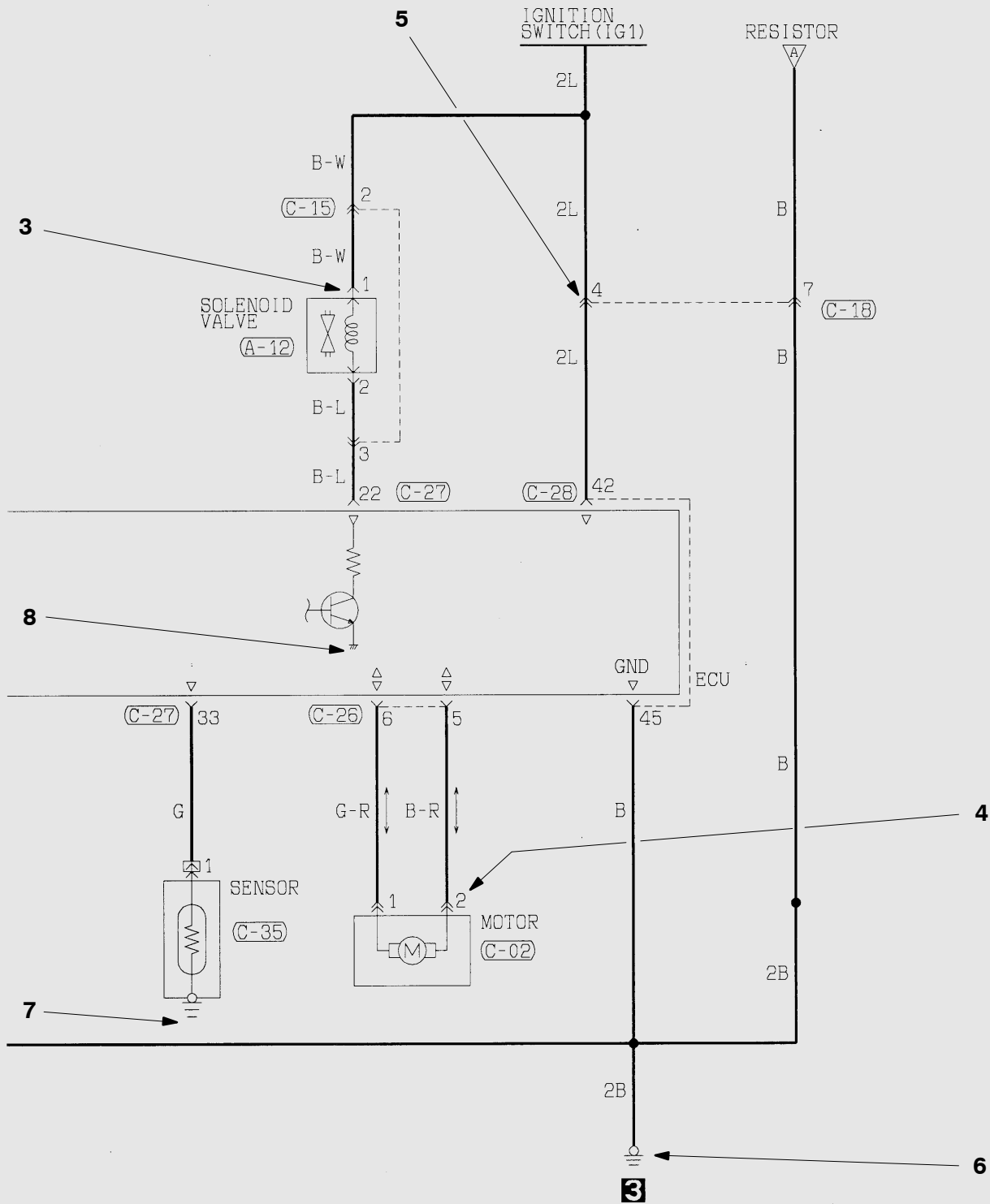
HOW TO READ CIRCUIT DIAGRAMS

The circuit of each system from the fuse (or fusible link) to ground is shown. The power supply is shown at the top and the ground at the bottom to facilitate understanding of how the current flows.





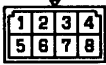

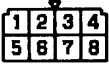

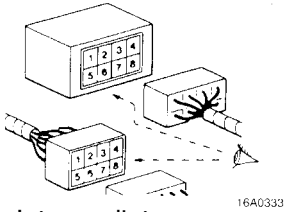
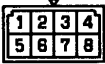

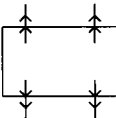
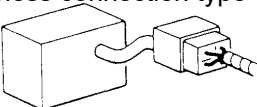
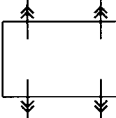


MARKINGS FOR CONNECTOR EARTHING

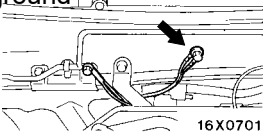







54 CHASSIS ELECTRICAL – Markings for Connector Earthing

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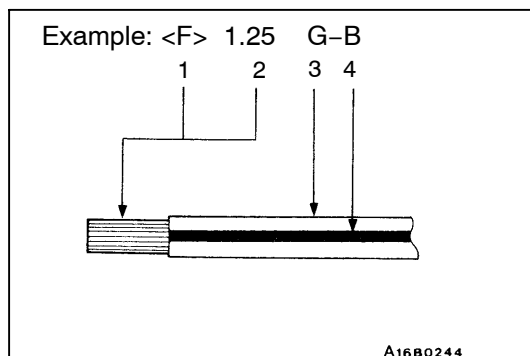
Item	NO	Connector/Earthing	Symbol	Contents
Connector marking	1	Male  WH-1	 WH-3	Double connector contour lines indicate male connector terminals and single contour lines indicates female terminals as illustrated here.
	–	Female  WH-2	 WH-4	
Connector symbol marking	2	Device  Intermediate connector	 WH-1	The symbol indicates the connector as viewed from the illustrated direction. At the connection with a device, the connector symbol on the device side is shown, and for an intermediate connector, the male connector symbol is shown. For the diagnosis connector, its contents differ from the previous description. Refer to MUT-II operation instruction in detail.
Connector connection marking	3	Direct connection type  16X0700 16A0100	 WH-5	A connection between a device and connector on the harness side is either by direct insertion in the device (direct connection type) or by connection with a harness connector furnished on the device side (harness connection type). The two types are indicated as illustrated.
	4	Harness connection type  16A0334	 WH-6	
	5	Intermediate connector  16A0339	 WH-7	

Item	NO	Connector/Earthing	Symbol	Contents
Ground markings	6	Body ground  16X0701	 WH-8	Ground is either by body ground, device ground or control unit interior ground. These are indicated as illustrated.
	7	Device ground  16X0702	 WH-9	
	8	Ground in control unit  16X0703	 WH-10	

WIRE COLOUR CODES

Wire colours are identified by the following colour codes.

Code	Wire colour	Code	Wire colour
B	Black	P	Pink
BR	Brown	R	Red
G	Green	SB	Sky blue
GR	Gray	V	Violet
L	Blue	W	White
LG	Light green	Y	Yellow
O	Orange	–	–



If a cable has two colours, the first of the two colour code characters indicates the basic colour (colour of the cable casing) and the second indicates the marking colour.

No.	Meaning
1	<F>: Flexible wire
	<T>: Twisted wire
2	Wire size (mm ²)
3	Basic colour (colour of the cable casing)
4	Marking colour

NOTE

*: No code indicates 0.5 mm².
Cable colour code in parentheses indicates 0.3 mm².

ABBREVIATION SYMBOLS

The abbreviation symbols used in wiring diagrams are defined below.

1. Abbreviation symbols used for wiring harness

Abbreviation symbol	Meaning	Abbreviation symbol	Meaning
ABS	Antilock braking system	ELC-4A/T	Electronic controlled 4-speed automatic transmission
A/C	Air conditioner	BEM	Body Electronics Module
A/T	Automatic transmission	MPI	Multi-point injection
EGR	Exhaust gas recirculation	M/T	Manual transmission
		SRS	Supplemental restraint system

2. Abbreviation symbols for combination meters

Abbreviation symbol	Meaning	Abbreviation symbol	Meaning
ABS	Antilock braking system warning lamp	OIL	Oil pressure warning lamp
BEAM	High beam indicator lamp	SEAT BELT	Seat belt warning lamp
BRAKE	Brake warning lamp	SPEED	Speedometer
CHECK ENGINE	Check engine warning lamp	SRS	Supplemental restraint system warning lamp
CHG	Charging warning lamp	TACHO	Tachometer
DOOR	Door-ajar warning lamp	T/GA	Engine coolant temperature gauge
F/GA	Fuel gauge	TURN (LH)	Turn signal indicator lamp (L.H.)
FUEL	Low fuel warning lamp	TURN (RH)	Turn signal indicator lamp (R.H.)


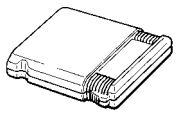
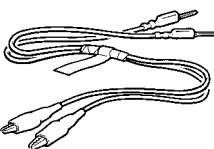
3. Abbreviation symbols used for switches and relays

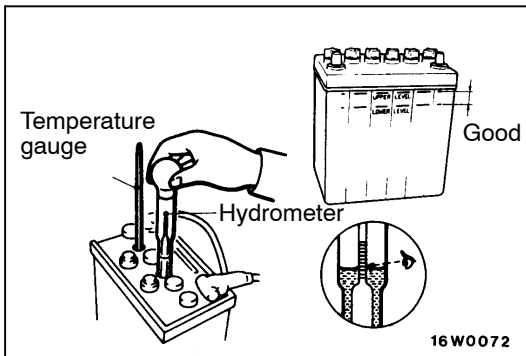
Names of switches and relays	Abbreviation symbols	Operation	Name of switches and relays	Abbreviation symbols	Operation
Ignition switch	ACC	When turned to the ACC (ACCESSORY) or ON position, the power circuit will start	Blower switch	LO	Blower operates at low speed
				ML	Blower operates at medium low speed
	IG1	Even when at the ST (START) position, the power circuit will start		MH	Blower operates at medium high speed
				HI	Blower operates at high speed
	IG2	When at the ST (START) position, the power circuit will not start functioning	Wind-shield wiper switch	LO	Wipers operate at low speed
				HI	Wipers operate at high speed
Dimmer passing switch	LO	Low beams ON		Variable intermittent wiper control switch	INT
	HI	High beams ON	SLOW		Pause time for intermittent operation lengthen
Lighting switch	TAIL	Position, tail, licence plate and instrument panel lamps ON	Rear wiper switch		FAST
	HEAD	Headlamps ON		LO	Wiper operates at low speed
Room lamp switch	DOOR	Room lamp ON when a door is open		INT	Wiper operates intermittently
Turn signal switch	LH	L.H. turn signal lamps ON	Remote control mirror switch	LH	L.H. mirror operates
	RH	R.H. turn signal lamps ON		RH	R.H. mirror operates
Power window switch	UP	Window closes	Sunroof switch	OPEN	Sunroof slides to open
	DOWN	Window opens		CLOSE	Sunroof slides to close
Door lock actuator	LOCK	Door lock		UP	Sunroof tilted up
	UN-LOCK	Door unlock		DOWN	Sunroof tilted down
Door lock key cylinder switch	LOCK	Door lock	Others	ON	Switched on
	UN-LOCK	Door unlock		OFF	Switched off

4. Other Abbreviation symbols

Abbreviation symbol	Meaning	Abbreviation symbol	Meaning
ECU	Electronic control unit	LH	Left hand
GND	Ground	LHD	L.H. drive vehicles
ILL	Illumination lamp	RH	Right hand
IND	Indicator lamp	RHD	R.H. drive vehicles
J/B	Junction block	ROOM	Room lamp
J/C	Joint connector	STOP	Stop lamp

SPECIAL TOOLS

Tool	Tool number and name	Supersession	Application
	MB991502 MUT-II	–	Diagnosis checking
	ROM pack	–	
	MB991529 Diagnosis code check harness	–	Diagnosis checking



BATTERY

ON-VEHICLE SERVICE

FLUID LEVEL AND SPECIFIC GRAVITY CHECK

1. Check the battery electrolyte level at regular intervals. Maintain the electrolyte at a level approximately 6 mm above the plate using mineral free water.
2. Use a hydrometer and thermometer to check the specific gravity of the battery fluid.

Standard value: 1.220-1.290 [20°C]

The specific gravity of the battery fluid varies with the temperature, so use the following formula to calculate the specific gravity for 20°C. 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.

D_t: Actually measured specific gravity

t: Actually measured temperature

BATTERY INSPECTION

Make sure ignition switch is in OFF position and all battery feed accessories are OFF.

1. Disconnect ground cable from battery before disconnecting (+) cable.
2. Remove battery from vehicle.

Caution

Care should be taken in the event battery case is cracked or leaking to protect hands from the electrolyte. A suitable pair of rubber gloves (not the household type) should be worn when removing battery by hand.

3. Inspect battery carrier for damage caused by loss of acid from battery. If acid damage is present, it will be necessary to clean area with a solution of clean warm water and baking soda. Scrub area with a stiff bristle brush and wipe off with a cloth moistened with ammonia or baking soda in water.
4. Clean top of battery with same solutions as described in step 3
5. Inspect battery case and cover for cracks. If cracks are present, battery must be replaced.
6. Clean the battery post with a suitable battery post cleaning tool.
7. Clean the inside surfaces of the terminal clamps with a suitable battery terminal cleaning tool. Replace damaged or frayed cables and broken terminal clamps.
8. Install the battery in vehicle.
9. Connect (+) and (-) cables to battery in the order of mention.
10. Tighten the clamp nut securely.

BATTERY CHARGING**Caution**

When batteries are being charged, an explosive gas forms beneath the cover of each cell. Do not smoke near batteries on charge or which have recently been charged. Do not break live circuits at the terminals of the batteries on charge. A spark will occur where the live circuit is broken.

Keep all open flames away from the battery.

Battery electrolyte temperature may temporarily be allowed to rise to 55°C. Increase of electrolyte temperature above 55°C is harmful to the battery, causing deformation of battery cell, decrease in life of battery, etc.

CHARGE RATE

If the battery specific gravity is below 1,220, the battery should be charged as outlined below.

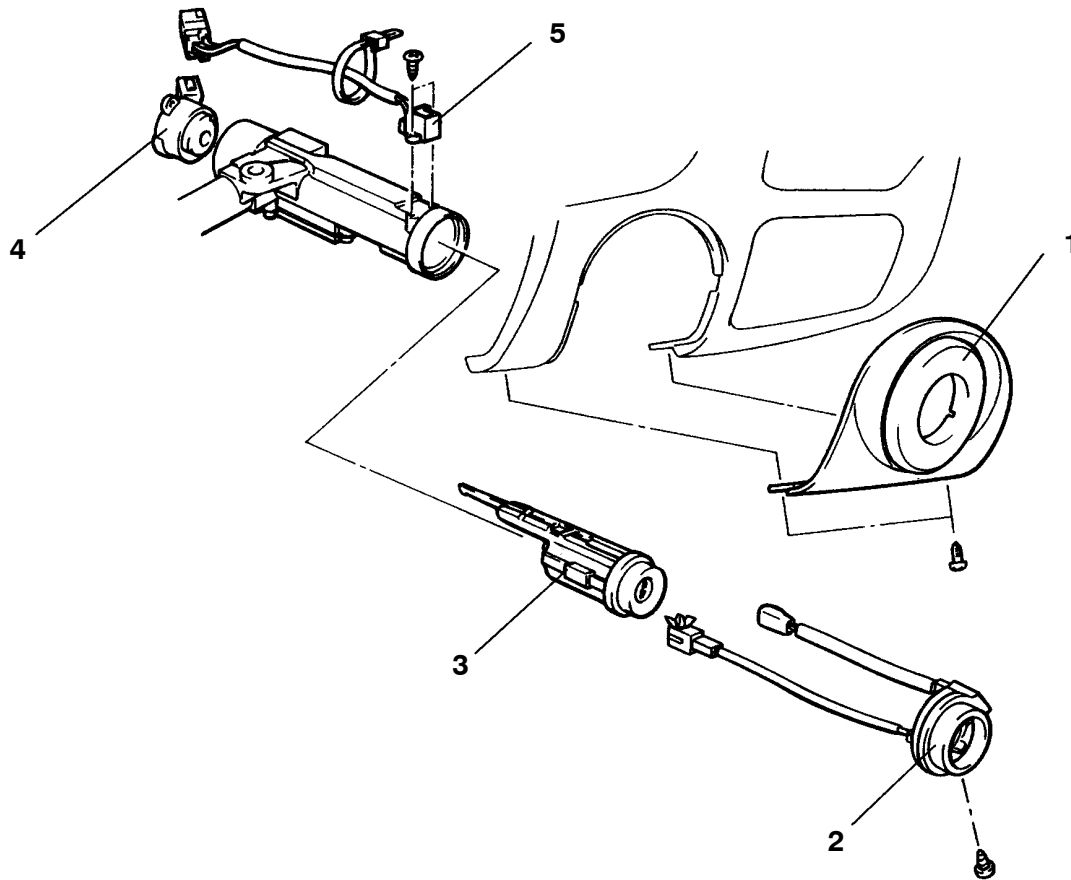
When the battery fluid specific gravity reaches 1.250–1,290 and the constant is maintained for more than an hour, charging should be stopped.

NOTE

If the battery is overcharged, the battery should be replaced; do not overcharge.

Charge Rate Chart

Battery	
Slow charging	5 amps 15 hrs.
Fast charging	20 amps 3.75 hrs.

IGNITION SWITCH**REMOVAL AND INSTALLATION**

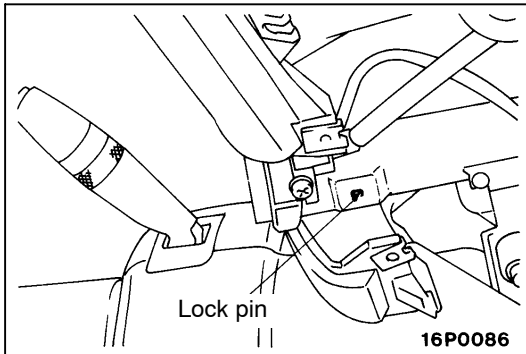
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Steering lock cylinder and ignition switch removal steps

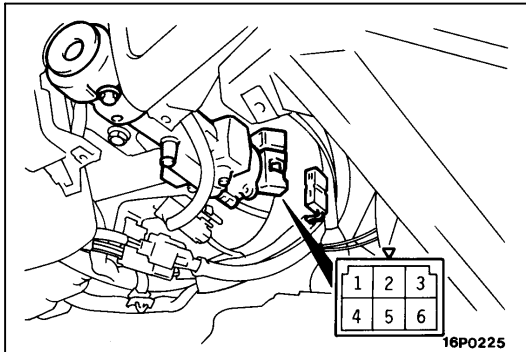
- Instrument lower cover (driver) (See Group 52A - Instrument Panel).
1. Key cylinder panel



2. Antenna and Keyhole lighting ring
3. Steering lock cylinder
4. Ignition switch
5. Key reminder switch

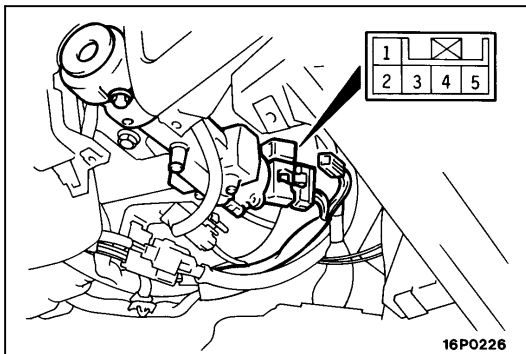
**REMOVAL SERVICE POINT****◀A▶ STEERING LOCK CYLINDER REMOVAL**

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****IGNITION SWITCH CONTINUITY CHECK**

1. Remove the instrument under cover. (Refer [Group 52A](#)).
2. Disconnect the wiring connector from the ignition switch and connect an ohmmeter to the switch side connector.
3. Operate the ignition switch and check the continuity.

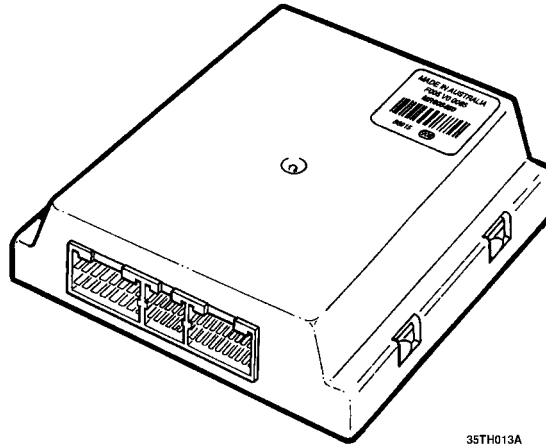
Ignition key position	Terminal No.					
	1	2	3	4	5	6
LOCK						
ACC	○					○
ON	○	○		○		○
START	○	○	○		○	

**KEY REMINDER SWITCH, KEY HOLE ILLUMINATION LIGHT CONTINUITY CHECK**

1. Remove the instrument under cover (Refer [Group 52A](#)).
2. Disconnect the wiring connector from the key reminder switch and connect an ohmmeter to the switch side connector.
3. Check the continuity when the ignition key is pulled out of and inserted into the steering lock cylinder.


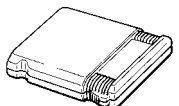
Ignition key	Terminal No.	
	Key reminder switch	
	2	5
Removed	○	○
Inserted		

BODY ELECTRONICS MODULE (BEM)



35TH013A

SPECIAL TOOLS

Tool	Tool number and name	Supersession	Application
	MB991502 MUT-II	–	Diagnosis checking
	ROM pack	–	

TROUBLESHOOTING

STANDARD FLOW OF DIAGNOSIS TROUBLESHOOTING

Refer to [Group 00](#).

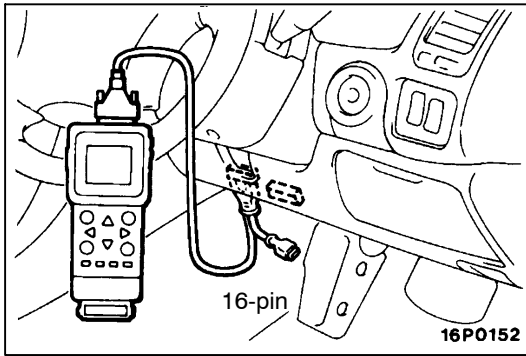
DIAGNOSIS FUNCTION

DIAGNOSIS CODES CHECK

Read a diagnosis code by the MUT-II for immobiliser functions and the high beam indicator lamp for BEM functions. (Refer to [Group 00](#)).

ERASING DIAGNOSIS CODES

Refer to [Group 00](#).



BASIC TEST MODE (BTM) PROCEDURE

1. Open drivers door.
2. Connect MUT-II to diagnosis connector (16 pin).
3. Flash high beam headlamps 2 times.

NOTE: Interior lamp will switch off (only if switched on). This indicates that the BTM has been activated.

4. Check security lamp for Flash Codes.

NOTE: Any flash codes in memory will be displayed. Refer to flash code table.

5. Check BEM outputs.

NOTE: Outputs are activated in sequence for 0.5 seconds by flashing the high beam. Refer to the [output checklist](#).

6. Check BEM inputs.

NOTE: Inputs are activated by changing their state. Refer to the [input checklist](#).

7. Disconnect MUT-II.

NOTE: BTM has been completed. The interior lamp will switch on indicating BTM is no longer active.

FLASH CODE REFERENCE TABLE

Codes	Circuits	Codes	Circuits
2 flashes	Alarm trigger memory is clear	6 flashes	Right front snib
3 flashes	Door ajar	7 flashes	Left front snib
4 flashes	Trunk	8 flashes	Right rear snib
5 flashes	Hood	9 flashes	Left rear snib

OUTPUT TEST CHECKLIST

Sequence	BEM function	Result
1	Room lamp	Switches ON
2	Ignition key lamp	Switches ON
3	Security lamp	Switches ON
4*	Seat belt warning lamp	Switches ON
5	Hazard lamps	Switch ON
6	Headlamps	Switch ON
7**	Trunk release relay / trunk unlock motor	Boot opens
8***	Rear demister	Switches ON
9****	Power window / Sunroof supply	Open / close
10	Horn	Sounds
11	Lock all doors relay	All doors lock
12	Unlock drivers door relay	Drivers door unlocks
13	Unlock passengers door relay	Passengers doors unlock

NOTE:

* Insert key before step 4 and turn ON. Remove after completion of step 4.

** Sedan only.

*** Press demister switch when buzzer sounds. (Applies to models without climate control).

**** Press power windows / sunroof switches when buzzer sounds.

INPUT TEST CHECKLIST

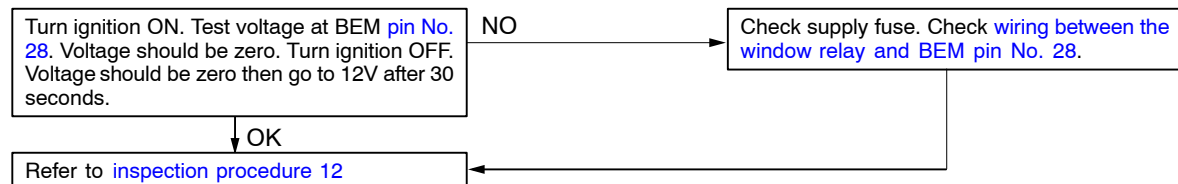
Number	Input description	Activation method
1	Key in ignition	Insert ignition key
2	Accessories	Turn key to accessories position
3	Ignition	Turn key to run position
4	Parking light	Turn parking lamps ON/OFF
5	High beam	Flash high beam lights
6	Rear demister	Turn demister ON/OFF
7	Door switches x 4 (all doors individually)	Press and release
8	Door locks x 4 (all doors individually)	Lock/unlock
9	Hood switch	Press and release
10	RH door key cylinder switch	Rotate/release (both directions)
11	LH door key cylinder switch	Rotate/release (both directions)
12	Boot / tailgate key cylinder switch	Rotate/release

INSPECTION CHART FOR TROUBLE SYMPTOMS

Trouble symptom	Inspection procedure No.
Power windows and sunroof will not operate.	1
Seat belt warning won't go off.	2
Vehicle will not respond to remote key.	3
Poor remote key range (all keys)	4
No panic function.	5
No audible warning.	6
Lock over-use function inoperative.	7
Engine will not start.	8
Ignition key slot not illuminated (except executive models).	9
No illuminated entry or fade.	10
Headlamps on at all times.	11
No headlamp delay function.	12
No headlamp reminder function.	13
No hazard flash acknowledgment.	14
Door ajar warning sounds with all doors closed.	15
Doors unlock intermittently.	16
Rear demister does not function.	17
Trunk will not release with remote key.	18
Alarm sounds if trunk is opened with the mechanical key.	19
Doors unlock and interior lamps remain on.	20
Interior lamp will not go out.	21
Battery goes flat	22
Able to lock car with key in ignition.	23

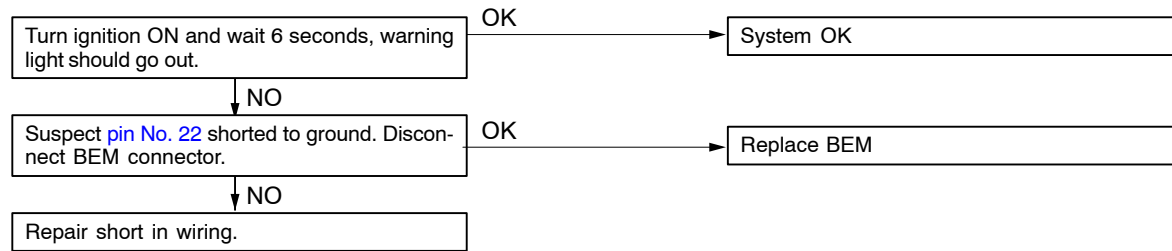
INSPECTION PROCEDURE 1

Power windows and sunroof do not operate	Probable cause
BEM supplies power to relay to operate windows and sunroof.	<ul style="list-style-type: none"> • Malfunction of window relay. • Malfunction of the BEM ECU.



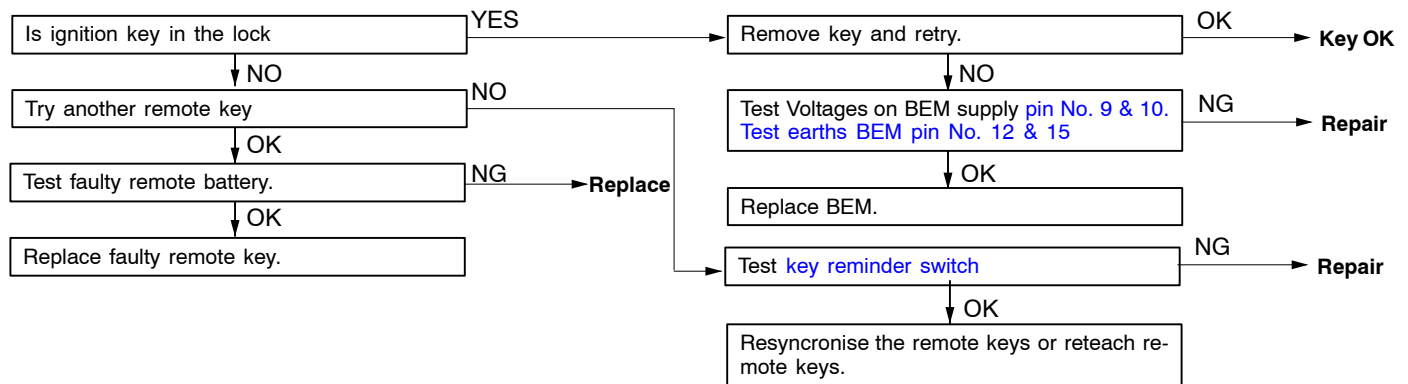
INSPECTION PROCEDURE 2

Seat belt warning won't go off	Probable cause
BEM power supply to relay interrupted to operate windows and sunroof.	<ul style="list-style-type: none"> Short in circuit. Malfunction of the BEM ECU.



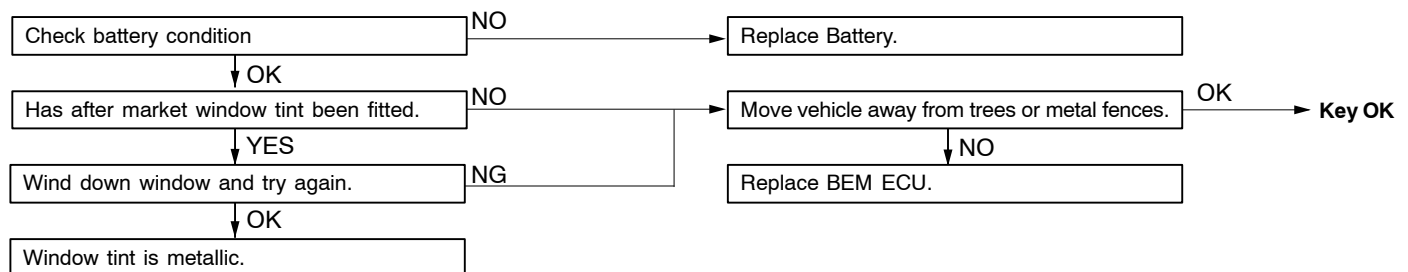
INSPECTION PROCEDURE 3

Vehicle will not respond to remote key	Probable cause
Signal from remote key not reaching or is different to BEM signal.	<ul style="list-style-type: none"> Malfunction of the BEM ECU. Bad earth Keys require reteaching



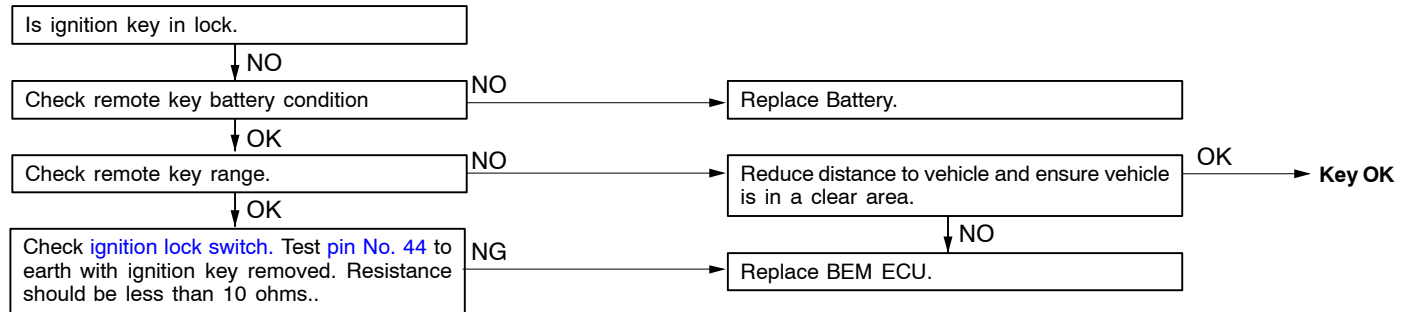
INSPECTION PROCEDURE 4

Poor remote key range. (all keys)	Probable cause
Battery condition may be down.	<ul style="list-style-type: none"> Malfunction of the BEM ECU. Metallic window tint.



INSPECTION PROCEDURE 5

No panic function	Probable cause
Remote key may be out of range.	<ul style="list-style-type: none"> Malfunction of the BEM ECU. Remote key battery voltage. Faulty ignition switch.



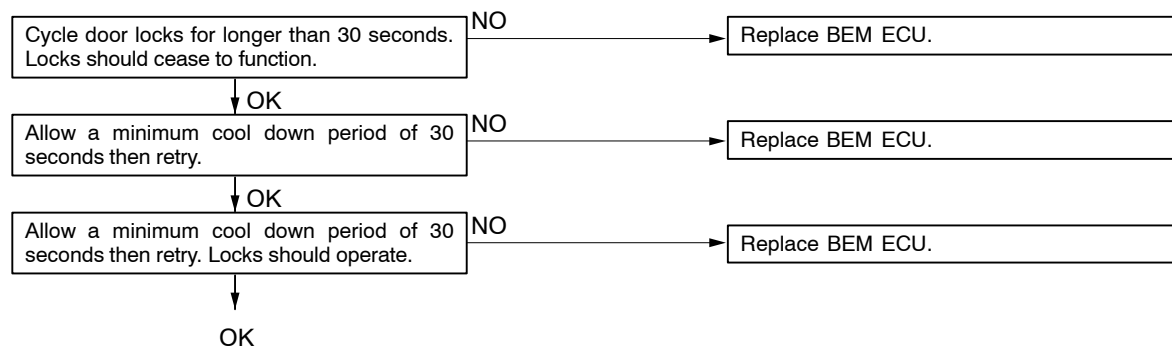
INSPECTION PROCEDURE 6

No audible warning	Probable cause
Horn relay may be defective.	<ul style="list-style-type: none"> Horn relay Malfunction of the BEM ECU.



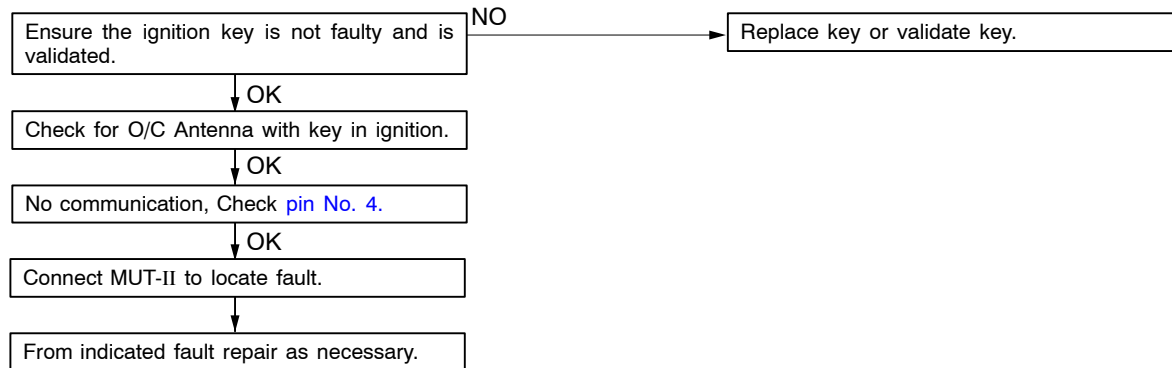
INSPECTION PROCEDURE 7

Lock over-use function inoperative	Probable cause
BEM malfunction.	<ul style="list-style-type: none"> Malfunction of the BEM ECU.



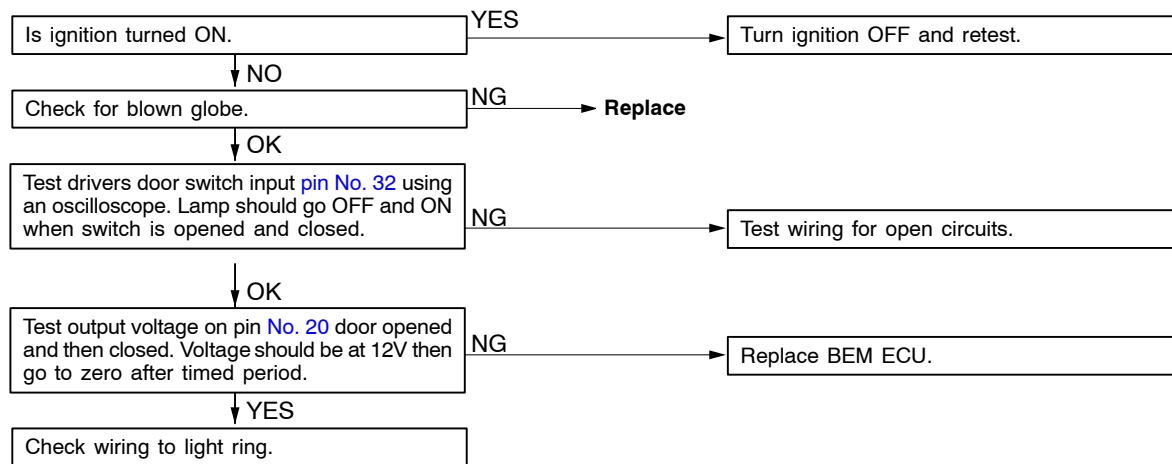
INSPECTION PROCEDURE 8

Engine will not start.	Probable cause
Key may need reteaching.	<ul style="list-style-type: none"> • Malfunction of the BEM ECU. • Faulty ignition switch.



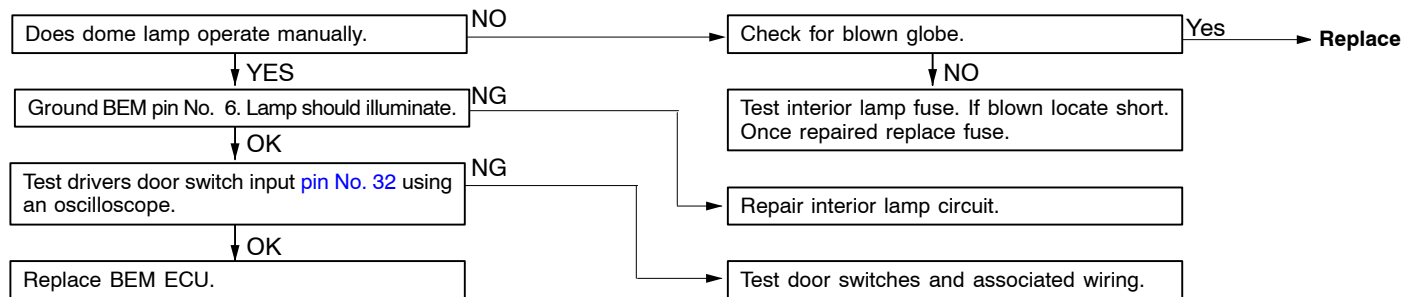
INSPECTION PROCEDURE 9

Ignition key slot not illuminated (except executive models)	Probable cause
Light ring wiring or connector may be faulty.	<ul style="list-style-type: none"> • Malfunction of the BEM ECU. • Blown globe. • Faulty Door switch.



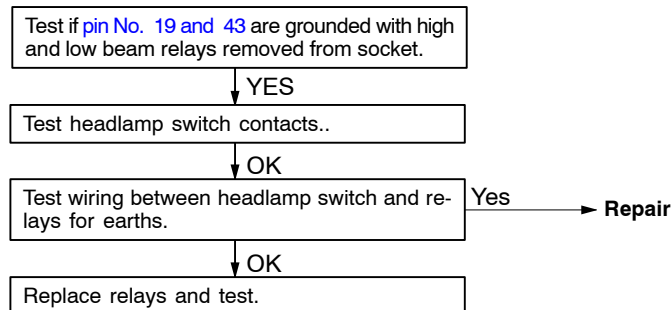
INSPECTION PROCEDURE 10

No illuminated entry or fade.	Probable cause
Light ring wiring or connector may be faulty.	<ul style="list-style-type: none"> Malfunction of the BEM ECU. Blown globe. Faulty Door switch.



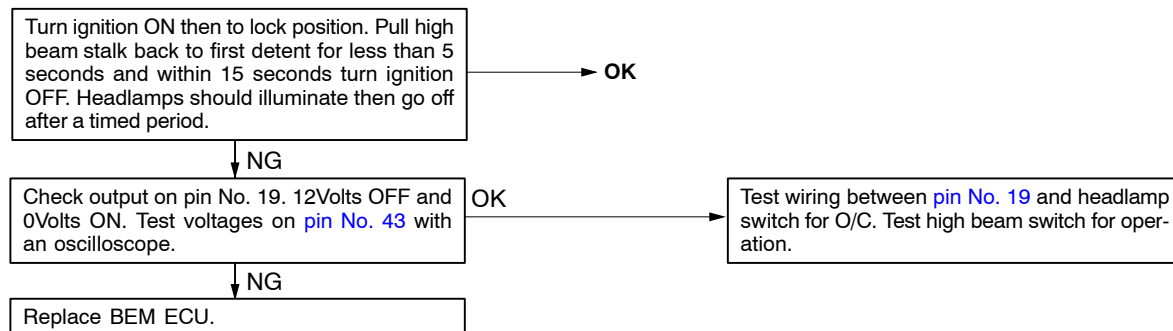
INSPECTION PROCEDURE 11

Headlamps on at all times.	Probable cause
Relay may be faulty.	<ul style="list-style-type: none"> Malfunction of headlamp switch. Short circuit.



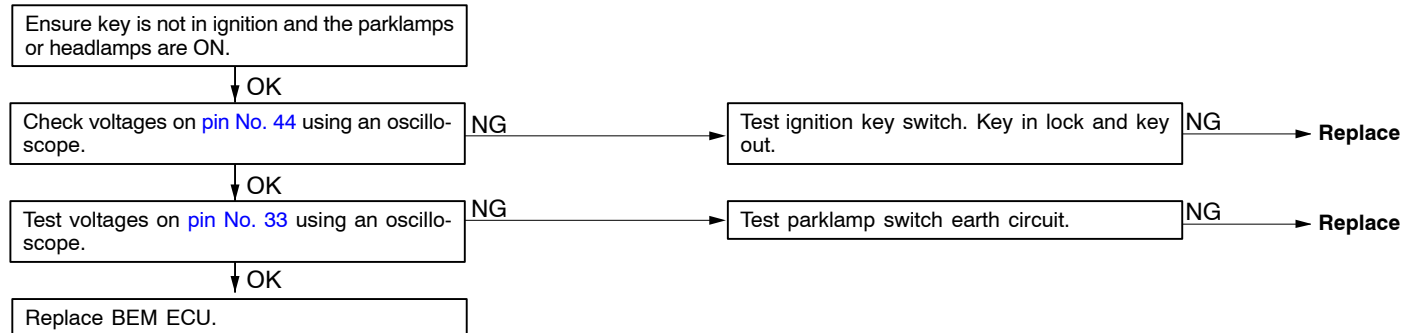
INSPECTION PROCEDURE 12

No headlamp delay function.	Probable cause
Possible faulty high beam switch.	<ul style="list-style-type: none"> Malfunction of the BEM ECU. Open circuit. Faulty high beam switch.



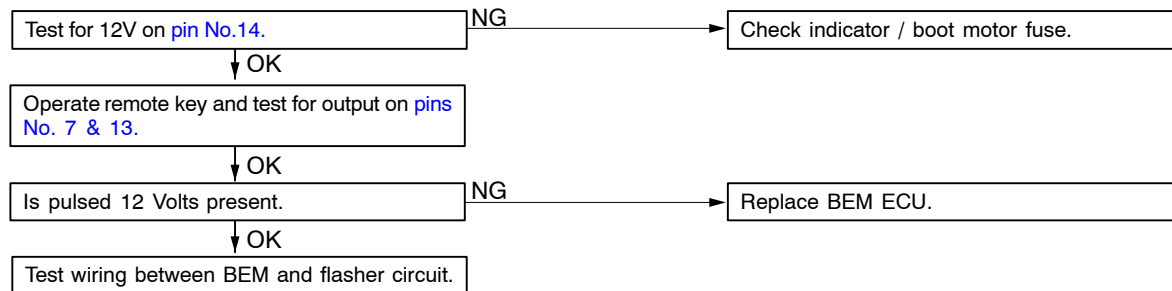
INSPECTION PROCEDURE 13

No headlamp reminder function.	Probable cause
Parklamp switch may be faulty.	<ul style="list-style-type: none"> Malfunction of the BEM ECU. Ignition switch



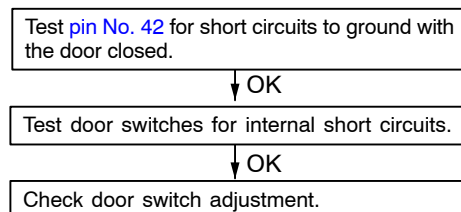
INSPECTION PROCEDURE 14

No hazard flash acknowledgment	Probable cause
Possible fault in wiring.	<ul style="list-style-type: none"> Malfunction of the BEM ECU. Blown fuse.



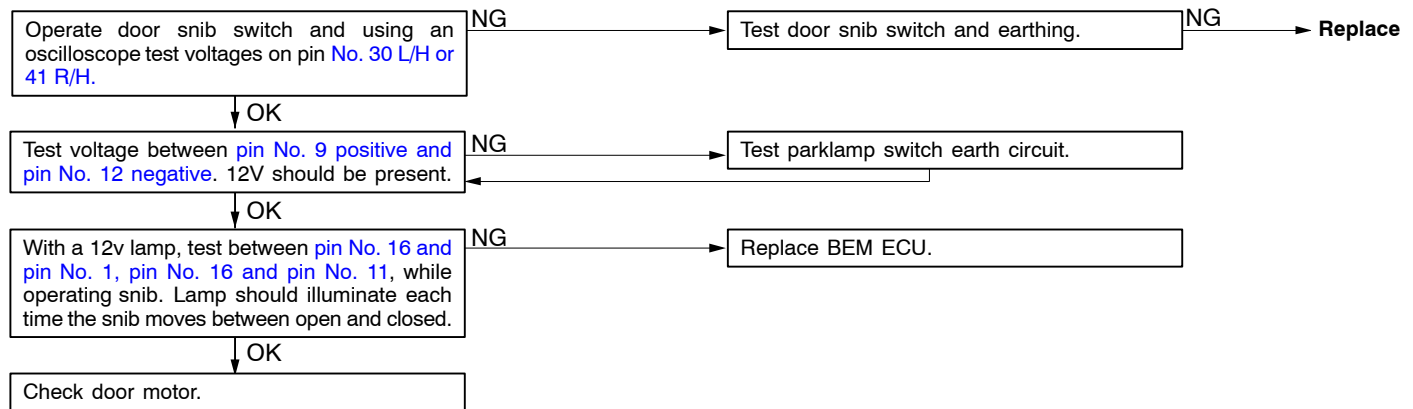
INSPECTION PROCEDURE 15

Door ajar warning sounds with all doors closed	Probable cause
Possible door switch malfunction.	<ul style="list-style-type: none"> Malfunction of door switch. Door switch adjustment.



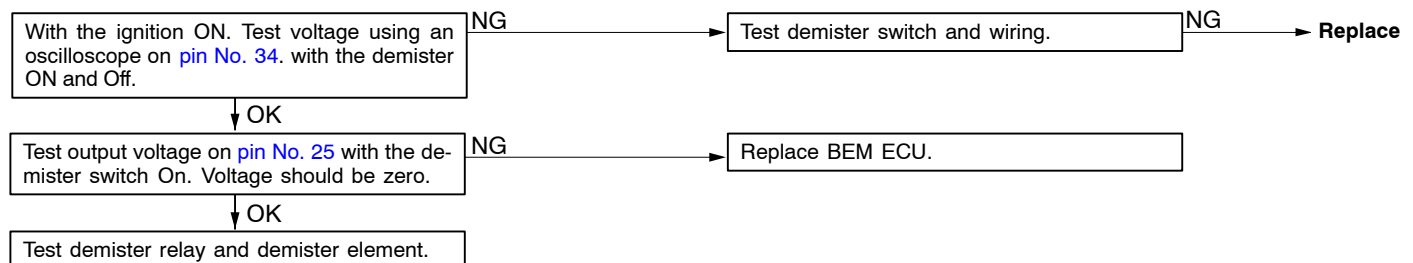
INSPECTION PROCEDURE 16

Doors unlock intermittently	Probable cause
Door snib switch may be faulty.	<ul style="list-style-type: none"> Malfunction of the BEM ECU. Faulty door snib switch



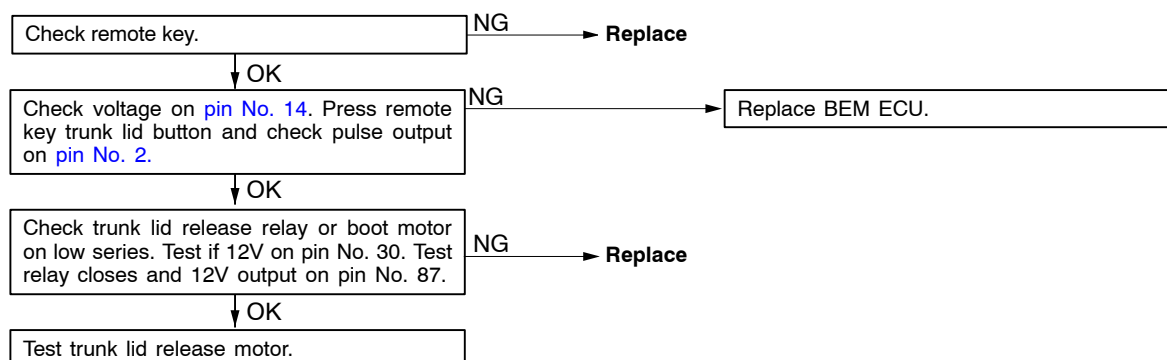
INSPECTION PROCEDURE 17

Rear demister does not function.	Probable cause
Demister element may be faulty.	<ul style="list-style-type: none"> Malfunction of the BEM ECU. Faulty demister switch. Faulty demister relay.



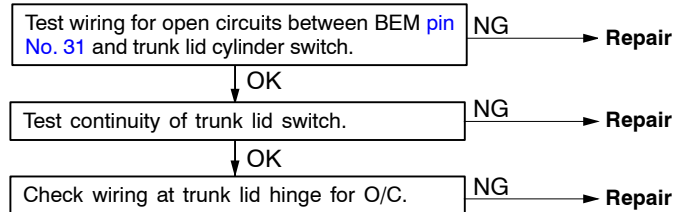
INSPECTION PROCEDURE 18

Trunk lid will not release with remote key.	Probable cause
Faulty trunk lid release motor.	<ul style="list-style-type: none"> Malfunction of the BEM ECU. Faulty trunk lid release relay. Faulty trunk lid motor.



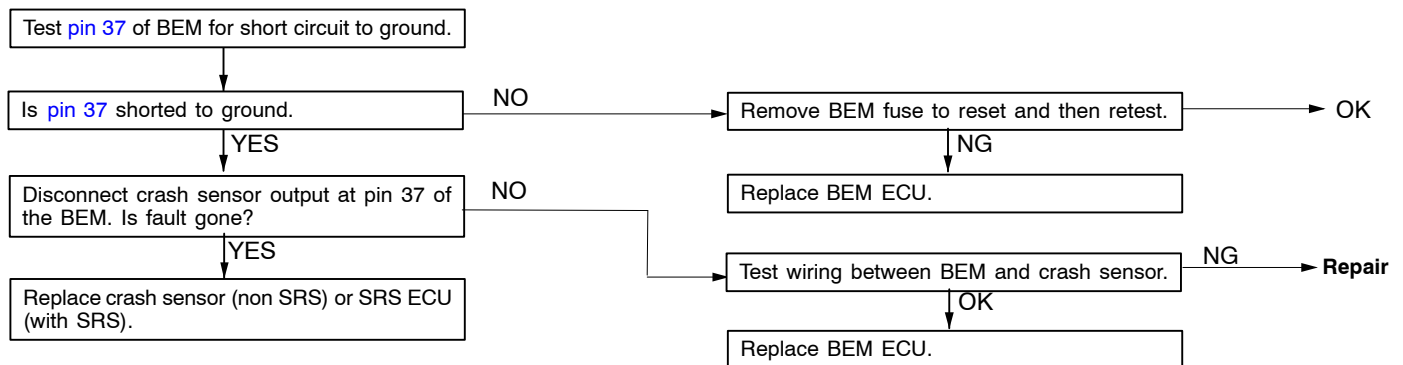
INSPECTION PROCEDURE 19

Alarm sounds if trunk lid is opened with the mechanical key.	Probable cause
Faulty trunk lid release motor.	<ul style="list-style-type: none"> • Malfunction of the BEM ECU. • Faulty trunk lid release relay. • Faulty trunk lid motor.



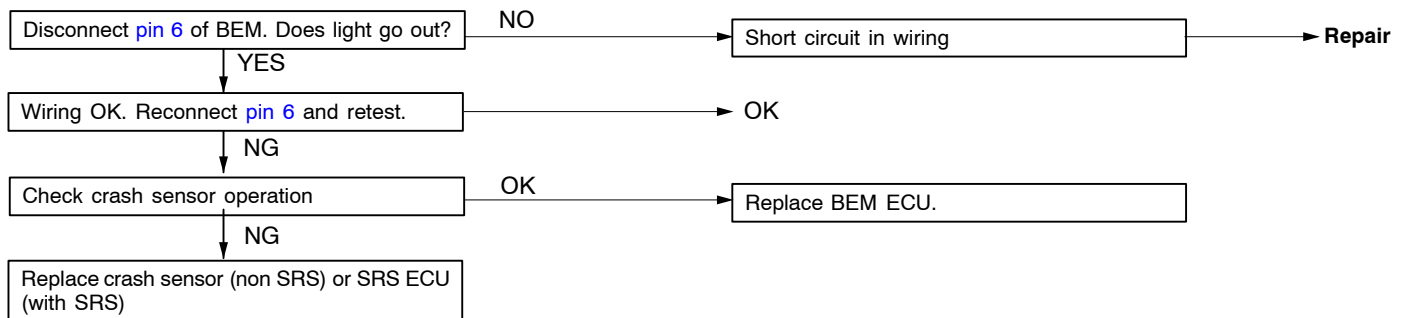
INSPECTION PROCEDURE 20

Doors unlock and interior lamps remain on.	Probable cause
Crash sensor may be faulty.	<ul style="list-style-type: none"> • Malfunction of the BEM ECU. • Faulty crash sensor. • Fault in wiring.



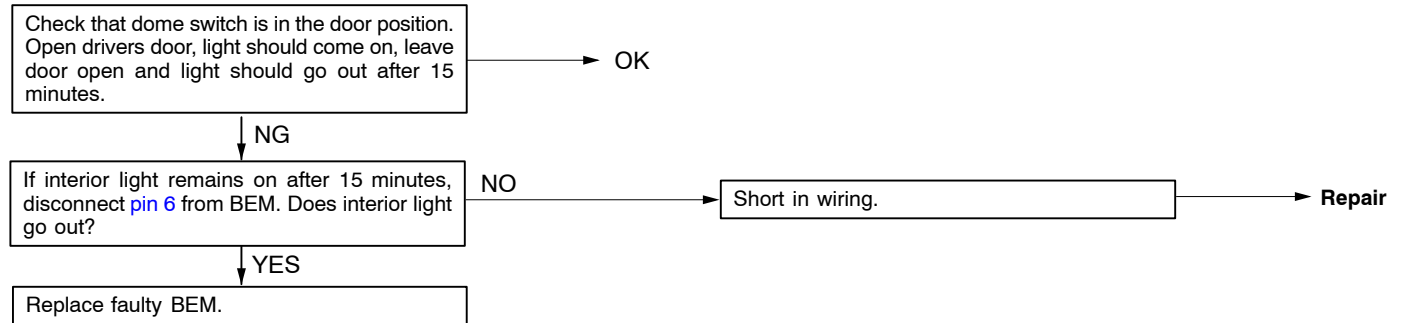
INSPECTION PROCEDURE 21

Interior lamp does not go out.	Probable cause
BEM has received a door unlock command from the crash sensor.	<ul style="list-style-type: none"> • Malfunction of the BEM ECU. • Faulty crash sensor. • Fault in wiring.



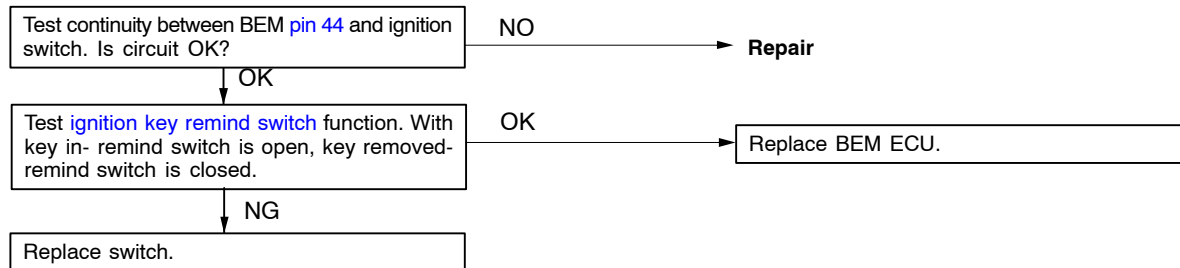
INSPECTION PROCEDURE 22

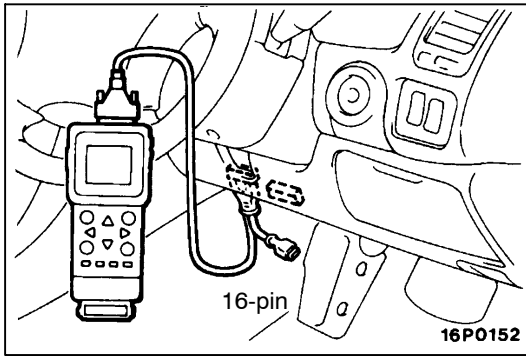
Battery goes flat.	Probable cause
Faulty battery saver function or crash sensor.	<ul style="list-style-type: none"> Malfunction of the BEM ECU. Faulty crash sensor. Faulty wiring.



INSPECTION PROCEDURE 23

Able to lock car with key in ignition.	Probable cause
Possible faulty key remind switch.	<ul style="list-style-type: none"> Malfunction of the BEM ECU. Faulty key in lock switch. Fault in wiring.





IMMOBILISER

DIAGNOSIS FUNCTION

DIAGNOSIS CODES

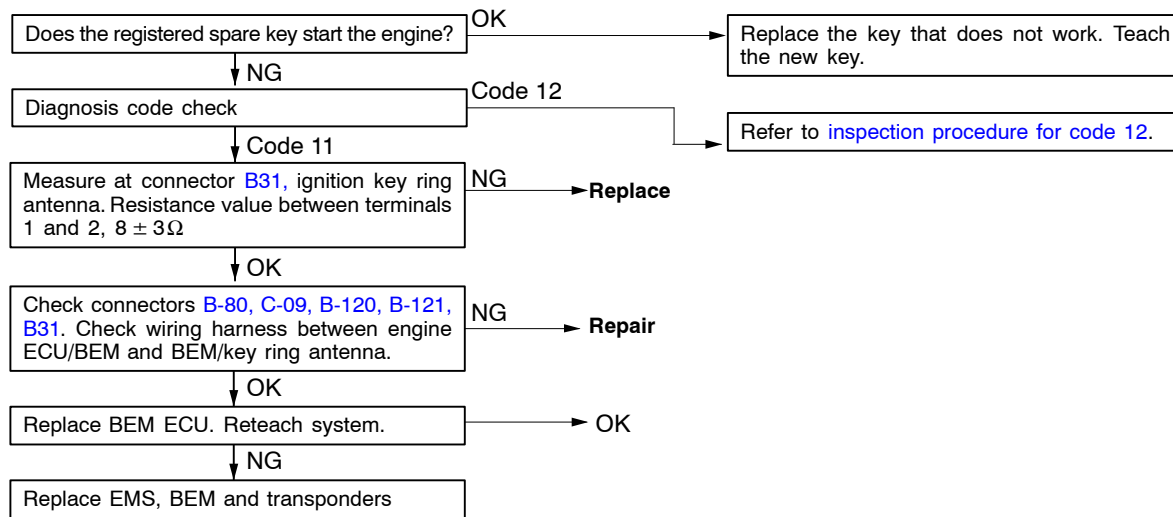
1. Insert MUT-II into diagnosis connector (16 pin).
NOTE: MUT-II will display the opening menu.
2. Select option 1 (system check & adjusting).
NOTE: MUT-II will display a new menu.
3. Select option (Immobiliser).
NOTE: MUT-II will display a new menu.
4. Select option 1 (self diagnosis code).
5. This option will perform a system check and display a fault code, if present. Refer to Inspection chart for diagnosis trouble codes.

INSPECTION CHART FOR IMMOBILISER SYSTEM DIAGNOSIS CODES

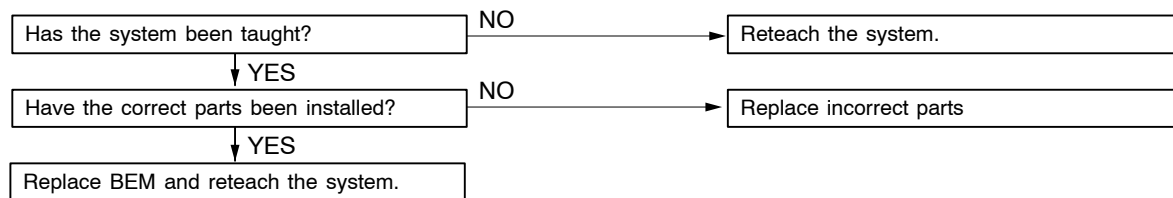
Diagnosis code	Inspection items
11	There is a communication problem.
12	The Engine ECU / BEM / transponder codes do not match or are not registered.

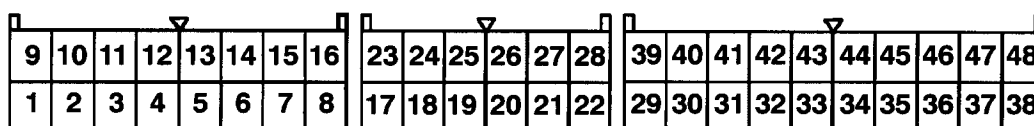
INSPECTION PROCEDURE FOR DIAGNOSIS CODES

Code No. 11 Transponder communication system	Probable cause
Indicates there is a communication problem.	<ul style="list-style-type: none"> • Malfunction of the ignition key ring antenna. • Malfunction of the harness or connectors. • Malfunction of the BEM ECU. • Malfunction of the engine ECU. • Malfunction of the transponder.



Code No. 12 EMS/BEM/Transponder codes do not match.	Probable cause
The EMS/BEM/Transponder codes do not match.	<ul style="list-style-type: none"> • System has not been taught. • Mismatched parts fitted to vehicle.





35TH014A

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Index**BEM PINOUT REFERENCE TABLE**

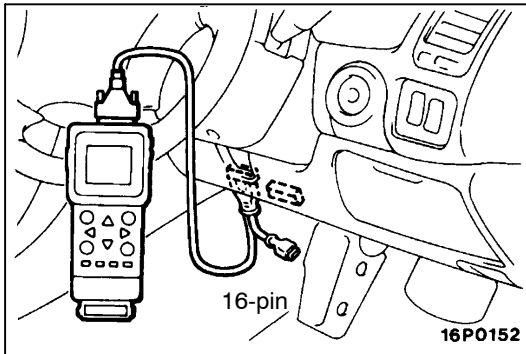
Pin No.	Circuit	Active state	Inactive state
1	Unlock passengers doors	13.3-13.9V	0.1V
2	Boot unlock	13.9V	0.0V
3	Accessory feed	14.0V	0.0V
4	Data to Engine ECU	Data stream	
5	Data to Engine ECU	Data stream	
6	Cabin illumination	0.1V	13.9V
7	Right hand indicator	13.9V	0.0V
8	Battery feed	14.0V	0.0V
9	Door locking supply	14.0V	0.0V
10	Ignition feed	14.0V	0.0V
11	Drivers door lock	13.9V	0.1V
12	Door locking ground	0.0V	N/A
13	Left hand indicator	13.9V	0.0V
14	Indicator / boot motor supply	14.0V	0.0V
15	System ground	0.0V	Continuity to ground
16	Lock all doors	13.1-13.9V	0.1V
17	–	–	–
18	Antenna 1	60Vp-p \pm 6Vp-p	0.2Vp-p (CRO)
19	Headlamp relays (LOW)	0.1-0.6V	13.9V
20	Key slot illumination	0.1-0.6V	13.9V
21	Diagnosis	–	–
22	Seat belt warning	0.1-0.6V	13.9V Ignition ON
23	–	–	–
24	Antenna 2	60Vp-p \pm 6Vp-p	0.2Vp-p (CRO)
25	Rear demist relay	0.1-0.6V	13.9V
26	Security lamp	0.1-0.6V	13.9V
27	Horn relay	0.1-0.6V	13.9V
28	Window / Sunroof relay	0.1-0.6V	13.9V

54 CHASSIS ELECTRICAL – Body Electronics Module

Pin No.	Circuit	Active state	Inactive state
29	Front door cylinder lock	0.0V	Vbat @ 20HZ
30	Tailgate cylinder lock	0.0V	Vbat @ 20HZ
31	–	–	–
32	Door ajar	0.0V	Vbat @ 20HZ
33	Parking light	0.0V	14.0V
34	Rear demist switch	0.0V	Vbat @ 20HZ
35	Right hand front door snib	0.0V	Vbat @ 20HZ
36	–	–	–
37	Crash sensor	0.0V	4.2V
38	RF probe (Bosch only)	–	–
39	Left hand rear door snib	0.0V	Vbat @ 20HZ
40	Left hand front door snib	0.0V	Vbat @ 20HZ
41	Right hand door cylinder unlock	0.0V	Vbat @ 20HZ
42	Front right hand door	0.0V	Vbat @ 20HZ
43	High beam	0.0V	O/C
44	Key in ignition	O/C key in	0V key out
45	Right hand rear door snib	0.0V	Vbat @ 20HZ
46	Hood	0.0V	Vbat @ 20HZ
47	DTC line (MUT-II)	0V	O/C
48	Trunk light	0.0V	14.0V

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ON-VEHICLE SERVICE

IMMOBILISER TEACHING OPTIONS

1. Insert MUT-II into diagnosis connector (16 pin).

NOTE: MUT-II will display the opening menu.

2. Select option 1 (system check & adjusting).

NOTE: MUT-II will display a new menu.

3. Select option (Immobiliser).

NOTE: MUT-II will display a new menu.

4. Select option 3 (Special Func).

5. Select required option.

NOTE:

MUT-II will notify the user if components have been previously taught.

Keys must be new or previously matched to the Engine /Trans ECU.

MUT-II IMMOBILISER MENU

Insert MUT-II into the diagnosis connector. (MUT-II will display the opening menu).



Select option '1. System check & adjusting. (The MUT-II will display a new menu).



Select option 'Immobiliser' (The MUT-II will display a new menu).

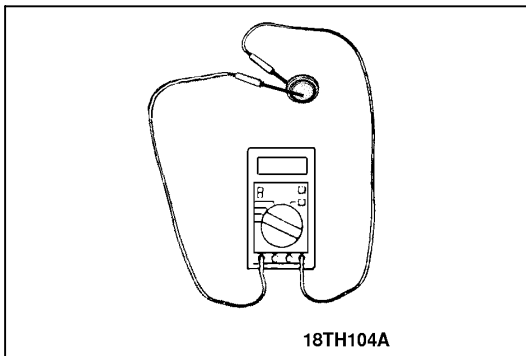


Select option '3. Special Func' (This option will display the menu with all the immobiliser options).



The special function menu will appear as follows:

1. Key ID registr
2. Password Set



RF TRANSMITTER

BATTERY TESTING

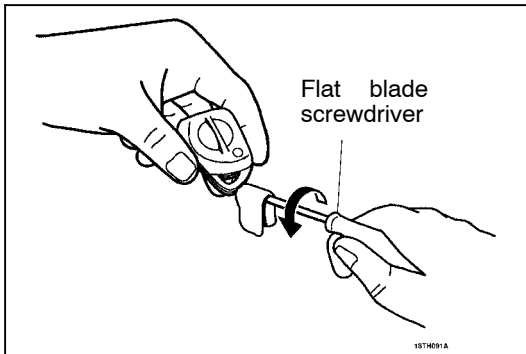
1. Using a digital voltmeter measure the battery voltage.

Battery: Lithium battery CR2032

Standard value: 3.0–3.2 Volts

Limit: 2.5 Volts

2. If the battery voltage reaches 2.5 volts or lower at room temperature, it should be replaced.



BATTERY REPLACEMENT

1. Insert a flat blade screwdriver (cloth covered) at the top of the transmitter (as shown in the diagram) and twist, to open the case.

Caution:

Be careful not to damage the silicon pad. The silicon pad creates the water proof seal, any damage to the pad will break the seal.

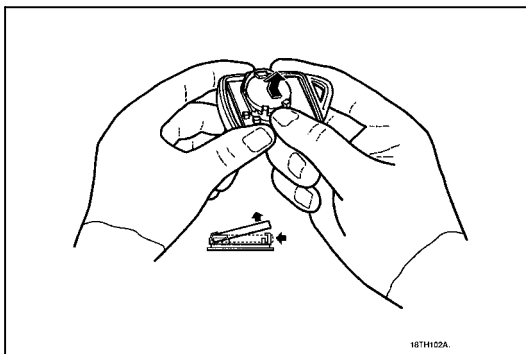
NOTE:

Latex gloves should be worn while performing this procedure to ensure no contaminants contact the circuit board or battery.

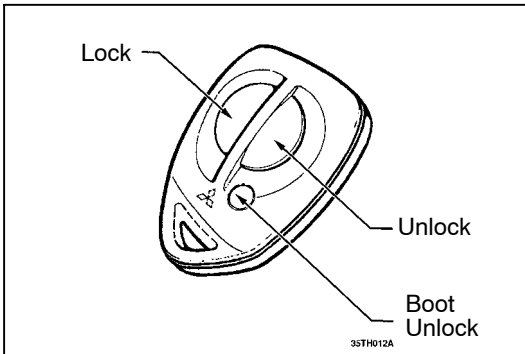
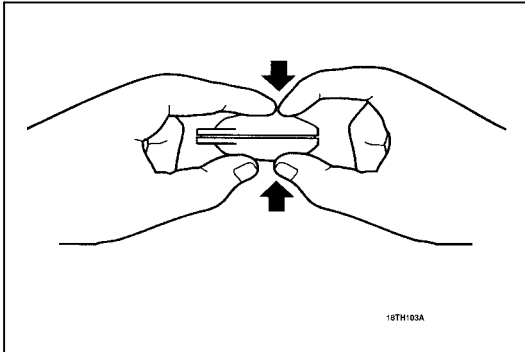
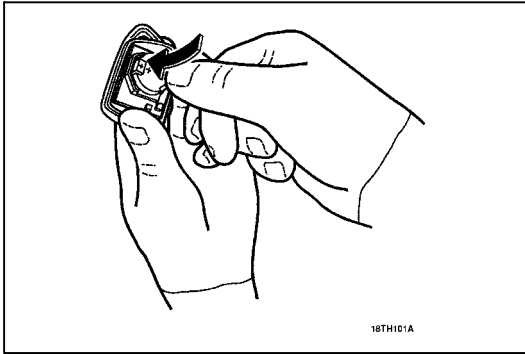
Replacement battery: Lithium battery CR2032

NOTE:

Unpack the new battery before removing the old one. The reason for this is the internal capacitor will hold the rolling code for up to 15 seconds. If more than 15 seconds elapses before the battery is replaced, resynchronisation is required.



2. Push the battery in against the spring pressure, then up at the same time. (as shown in the diagram) This will release the discharged battery from the retaining clips and allow removal from the circuit board.



3. Insert a new battery with the positive (+) side up. Push the battery in against the spring pressure, then down at the same time (as shown in the diagram).

4. Ensure the silicon pad is not puckered.
5. Push the case back together with finger pressure only.
6. Check that each switch operates its corresponding function on the vehicle.
7. If resynchronisation is required.
 1. Turn the ignition ON
 2. Immediately press any remote key button
 3. When resynchronisation has been acknowledged the buzzer in the instrument panel will sound.

PROGRAMMING RF TRANSMITTERS

Have all transmitters that are to be programmed together in the vehicle.

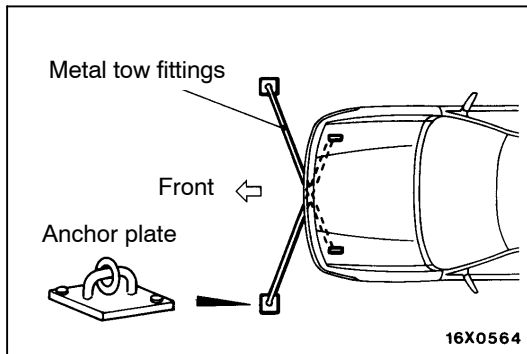
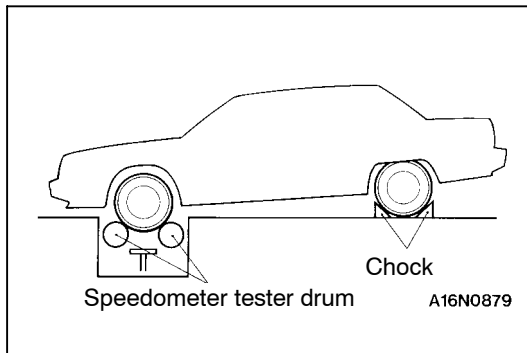
NOTE: Once teach mode has been entered all previous codes will be erased.

1. To invoke teaching mode for the RF transmitters, turn the ignition between ACC and IGN 3 times within 5 seconds and leave at the IGN position.
2. The hazard lamps will flash once if entry is successful.
3. Within 5 seconds of this acknowledgment, press any button on the first remote key.
4. The hazard lamps will flash once to indicate acceptance.
5. Within 5 seconds press any button on the next key to be taught, this process may be repeated for up to 4 keys.
6. Teaching mode will be terminated by any of the following events.
 1. The ignition is turned off.
 2. More than 5 seconds have elapsed since the last valid key code.
 3. Four keys have been taught to the BEM.
 4. No correct data has been received in 10 seconds.

COMBINATION METERS

SPEEDOMETER CHECK <2WD>

1. Adjust the pressure of the tyres to the specified value.
2. Position the vehicle on a speedometer tester drum.
3. Make sure the parking brake has been applied.



4. Attach metal fittings to the tow hook and the tie-down hook to prevent the front wheels from slipping sideways. Attach both ends to the anchor plate.
5. Securely anchor one end of the chain or a wire and attach the other end to the rear tow hook to prevent the car from jumping forward
6. Take all other necessary precautions.
7. Check if the speedometer indication range is within the standard values.

Caution

Do not increase/decrease speed rapidly while testing.

Standard values:

Vehicle Speed km/h	60	100
Allowable Indication range km/h	54.7 – 63.2	91.9 – 103.9

Limit: Pointer oscillation

(running speed over 35km/h) $\pm 3\text{km/h}$

TACHOMETER CHECK

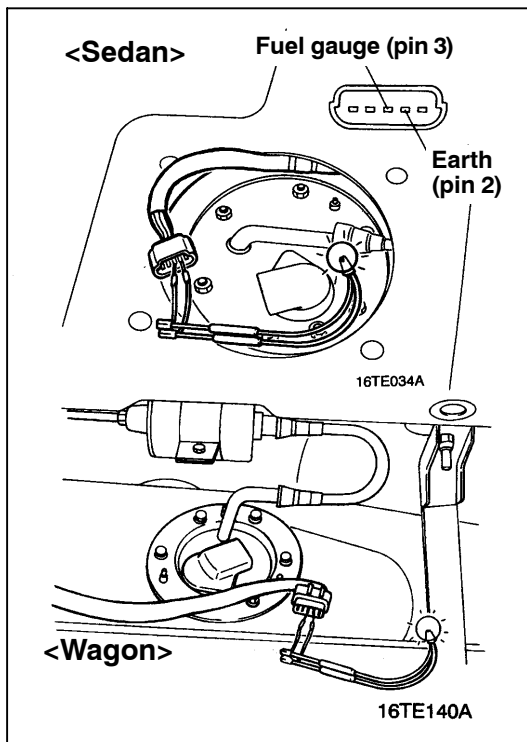
1. Compare the readings of the engine speedometer and the tachometer at every engine speed, and check if the variations are within the standard values.

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.)

Standard value:

Engine speed rpm	700	2,000	4,000	6,000
Indicated variation rpm	± 100	± 175	± 300	± 400

**FUEL GAUGE TEST <2WD>**

1. Remove the fuel gauge unit connector.
2. Dis-connect the battery.
3. Connect a resistor between the fuel gauge and earth terminals (pin 2 & 3). Select the resistor from the following chart for the desired gauge reading:-

Fuel Gauge Position or Reading	Resistor Value Required
Full	10 ohm
Half full	55 ohm
Empty	100 ohm

4. Re-connect the battery. Turn on the ignition switch and check gauge reading.
5. To check another fuel gauge reading or position, repeat steps 2 to 4. When fuel gauge check is completed, dis-connect the battery, re-connect the fuel gauge unit connector and then re-connect the battery.

Note:

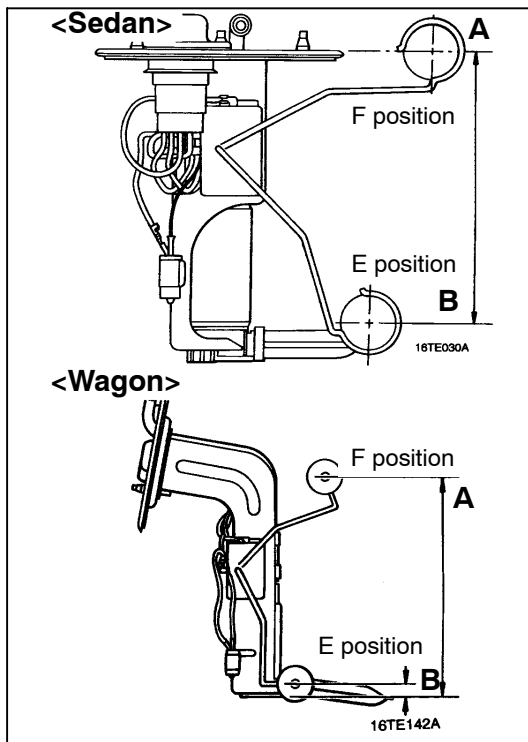
The fuel gauge is a microcontroller driven analogue gauge. The memory must be cleared by dis-connecting the battery during and after each test.

Note:

If the fuel gauge reading displayed differs from the standard value, check all wiring and connections for the combination meter before replacing the meter assembly.

LOW FUEL WARNING LAMP**Note:**

The low fuel warning lamp is operated by the internal microcontroller within the combination meter.



FUEL GAUGE UNIT CHECK

To check, remove fuel gauge unit from fuel tank. (Refer [Group 13F](#).)

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:

<Sedan>

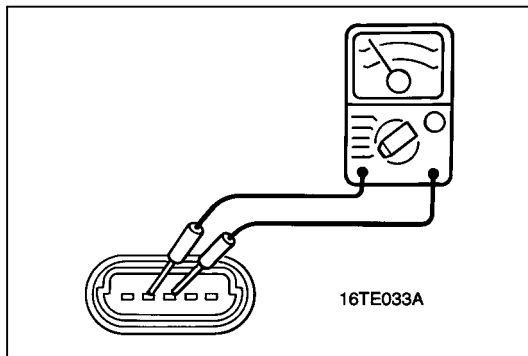
A: $0 \pm 3\text{mm}$

B: $144 \pm 3\text{mm}$

<Wagon>

A: $193 \pm 3\text{mm}$

B: $12 \pm 3\text{mm}$



FUEL GAUGE UNIT RESISTANCE

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

Standard value:

<Sedan>

POINT F: $4 \pm 1 \Omega$

POINT E: $107 \pm 1 \Omega$

<Wagon>

POINT F: $3 \pm 1 \Omega$

POINT E: $107 \pm 1 \Omega$

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

FUEL GAUGE CHECK <AWD>

Disconnect the fuel gauge unit connector.
(Refer [Group 13F.](#))

Connect a test lamp (12V–3.4W) to the harness
side connector.

Test lamp lights up when the ignition switch is
ON.

OK

Pointer of fuel gauge
moves.

NG

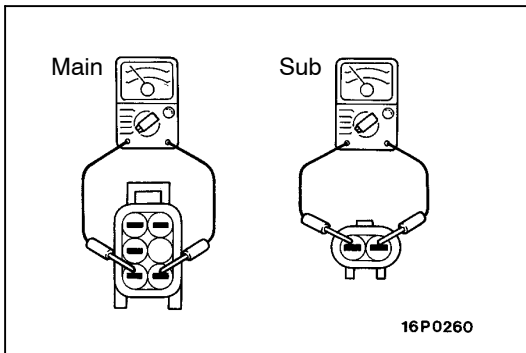
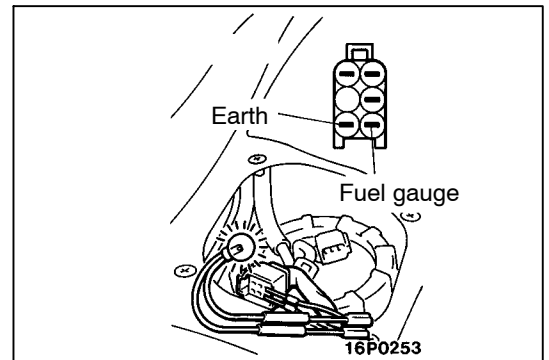
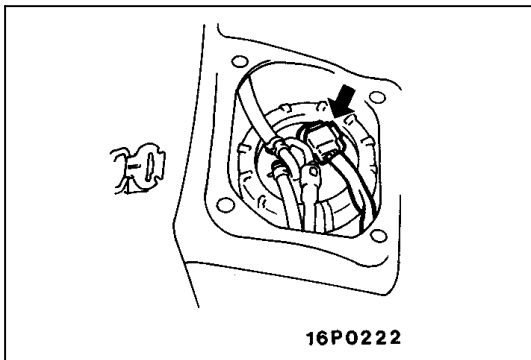
Replace the fuel
gauge.

NG

Harness to be repaired.

OK

Replace the fuel gauge
unit.

**INSPECTION**

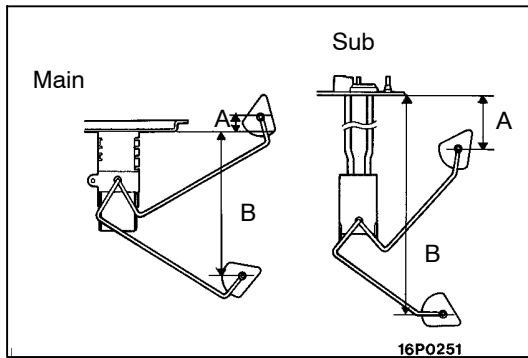
Remove fuel gauge unit from fuel tank. (Refer [Group 13F.](#))

FUEL GAUGE UNIT RESISTANCE

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

	Main	Sub
F position	$2 \pm 1 \Omega$	$2 \pm 1 \Omega$
E position	$55 \pm 1 \Omega$	$32 \pm 1 \Omega$

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.

	Main	Sub
A position	$115 \pm 3 \text{ mm}$	$104.6 \pm 3 \text{ mm}$
B position	$126.1 \pm 3 \text{ mm}$	$244.9 \pm 3 \text{ mm}$

NOTE:

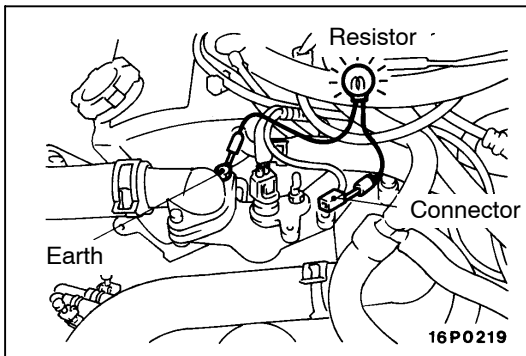
The fuel gauge is a microcontroller driven analogue gauge. The memory must be cleared by dis-connecting the battery during and after each test.

NOTE:

If the fuel gauge reading displayed differs from the standard value, check all wiring and connections for the combination meter before replacing the meter assembly.

LOW FUEL WARNING LAMP**NOTE:**

The low fuel warning lamp is operated by the internal microcontroller within the combination meter.

**ENGINE COOLANT TEMPERATURE GAUGE TEST**

1. Remove the engine coolant temperature gauge unit connector.
2. Dis-connect the battery.
3. Connect a resistor between the harness side connector and earth. Select the resistor from the following chart for the desired gauge reading:-

Temperature Gauge Position or Reading	Resistor Value Required
Hot	20 ohm
Half	45 ohm
Cold	203 ohm

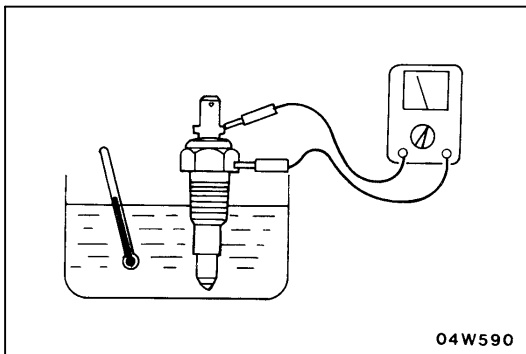
4. Re-connect the battery. Turn on the ignition switch and check gauge reading.
5. To check another temperature gauge reading or position, repeat steps 2 to 4. When temperature gauge check is completed, dis-connect the battery, re-connect the temperature gauge unit connector and then re-connect the battery.

Note:

The temperature gauge is a microcontroller driven analogue gauge. The memory must be cleared by dis-connecting the battery during and after each test.

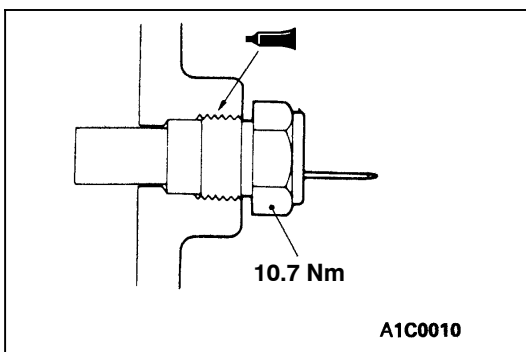
Note:

If the temperature gauge reading displayed differs from the standard value, check all wiring and connections for the combination meter before replacing the meter assembly.

**ENGINE COOLANT TEMPERATURE GAUGE UNIT CHECK**

1. Drain the engine coolant.
(Refer [Group 14](#).)
2. Remove the engine coolant temperature gauge unit.
3. Immerse the unit in 70°C water to measure the resistance.

Standard value: $104 \pm 13.5 \Omega$



4. After checking, apply the specified adhesive around the thread of engine coolant temperature gauge unit.

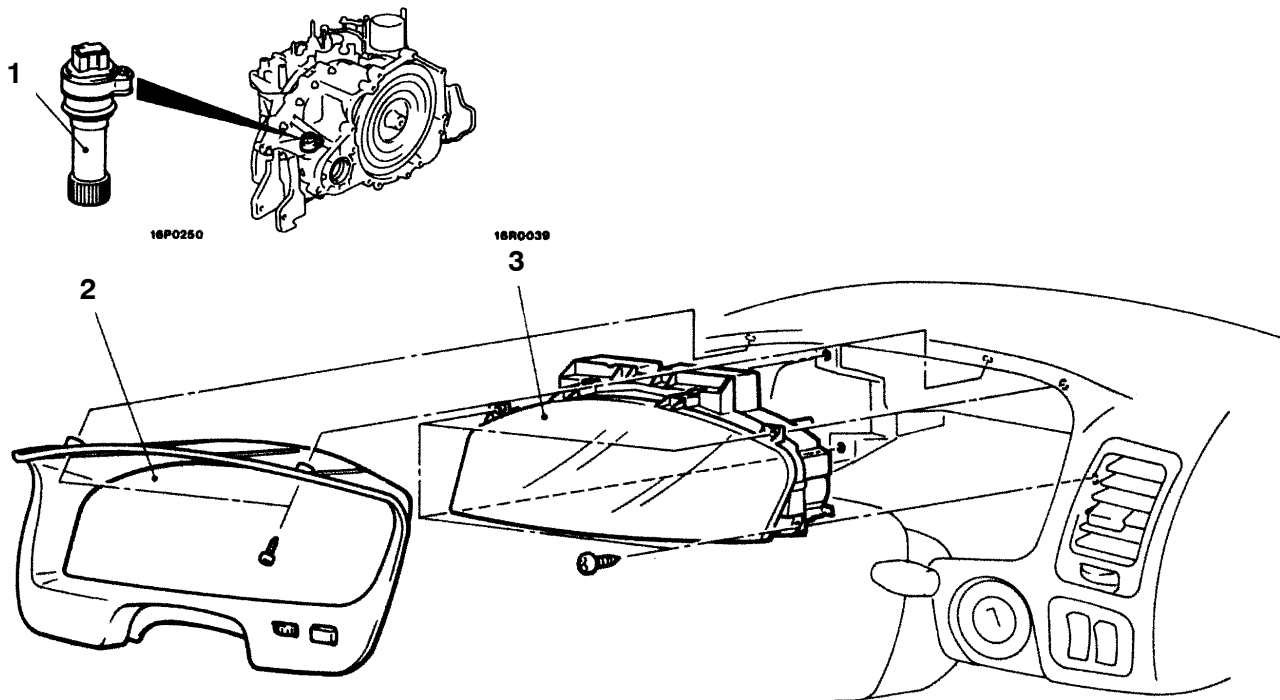
Specified sealant:

Loctite 577

5. Add engine coolant.
(Refer [Group 14](#).)

COMBINATION METERS

REMOVAL AND INSTALLATION



16P0235

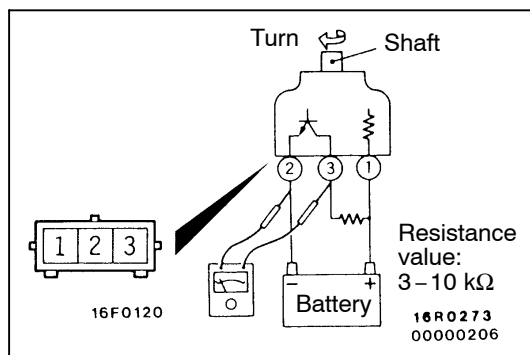
1. Vehicle speed sensor
2. Meter bezel
3. Combination meter

Vehicle speed sensor removal steps

- Air cleaner assembly (Refer [Group 15.](#))
- 1. Vehicle speed sensor

Combination meter removal steps

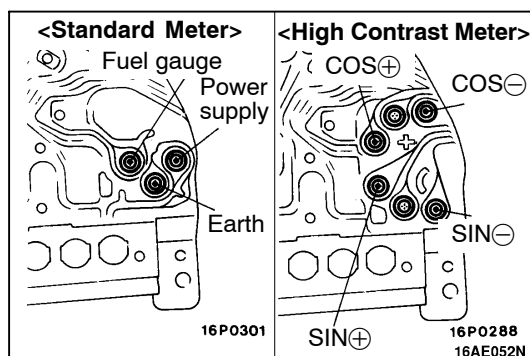
2. Meter bezel
3. Combination meter



INSPECTION

VEHICLE SPEED SENSOR CHECK

1. Remove the vehicle speed sensor and connect a 3–10 k Ω 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)



FUEL GAUGE CHECK

1. Remove the power supply tightening screw.
2. Use a circuit tester to measure the resistance value between the terminals.

Caution

When inserting the test probe into the power supply terminal, be careful not to touch the printed board.

Standard value:

<Standard Meter>

Power supply–Earth: 56.3 Ω

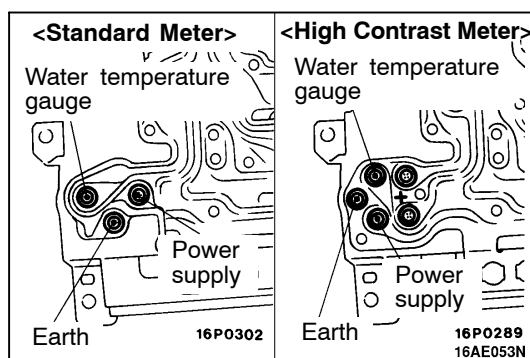
Power supply–Fuel gauge: 106 Ω

Fuel gauge–Earth: 150.3 Ω

<Hi Contrast Meter>

SIN \oplus –SIN \ominus 151.8 Ω

COS \oplus –COS \ominus 164.2 Ω



ENGINE COOLANT TEMPERATURE GAUGE CHECK

1. Remove the power supply attaching screw.
2. Use a circuit tester to measure the resistance value between the terminals.

Caution

When inserting the test probe into the power supply terminal, be careful not to touch the printed board.

Standard values:

<Standard Meter/Hi Contrast Meter>

Power supply–Water temperature gauge:

54 Ω /59 Ω

Power supply–Earth: 176.5 Ω

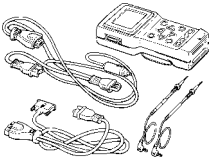
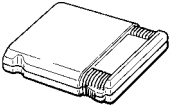
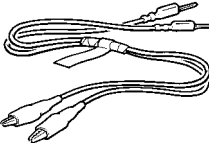
Water temperature gauge–Earth: 230.5 Ω /230.5 Ω

TRIP COMPUTER

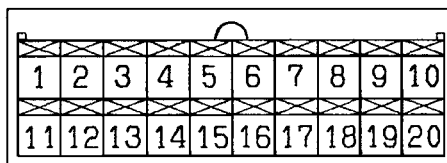
SERVICE SPECIFICATIONS

Item	Units	Resolution	Minimum	Maximum
Range	km	10	50	1000
Fuel total	litres	0.1	0.1	199.9
		1	200	2500
Average Fuel	ℓ/100 km	0.1	0.1	99.9
Instant Fuel	ℓ/100 km	0.1	0.1	199.9
Time travelled	hh/mm	minutes	0:00	199:59
Total (distance)	km	1	0	9999
Average speed	km/h	0.1	0	199.9
Set speed (Speed alarm)	km/h	5	20	195

SPECIAL TOOLS

Tool	Number	Name	Use
	MB991502	MUT-II	Diagnosis checking
		ROM pack	
	MB991529	Diagnosis code check harness	Diagnosis checking (when using a voltmeter)

PRELIMINARY TROUBLE SYMPTOM CHECKS



35TH005A

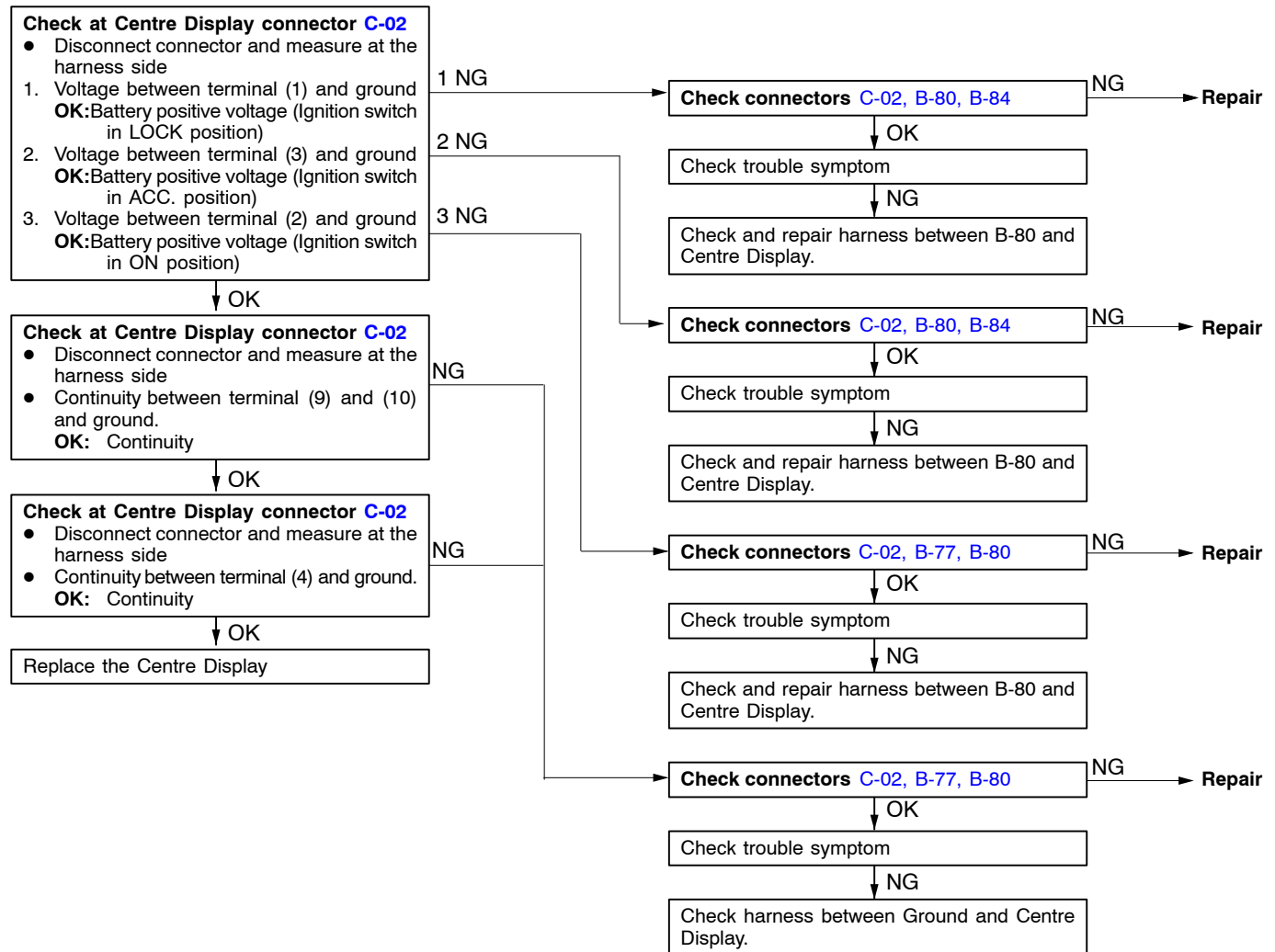
Symptom	Input wire	Symptom/ Connector pin
Fuel gauge reads "EMPTY" continuously. Range to empty displays "----".	Fuel gauge sender unit	1
Engine coolant temperature gauge displays "C" continuously.	Engine Coolant Temperature unit	2
Display illumination does not dim with rheostat.	Rheostat	3
–	–	4
–	–	5
–	–	6
–	–	7
–	–	8
–	–	9
Tachometer displays "0rpm" continuously.	Distributor	10
Meters do not illuminate or function.	Battery (IOD)	11
Meters do not illuminate or function.	Battery (IOD) High contrast only	12
Gauges & trip computer do not function.	Ignition switch	13
–	–	14
Meters do not illuminate.	Taillamp relay High contrast only	15
–	–	16
Instant / average fuel consumption is abnormally small.	No.2 Injector	17
Speedometer and speed alarm do not function.	Vehicle speed sensor	18
Meters and Trip computer do not function.	Earth	19
Meters and Trip computer do not function.	Earth	20

INSPECTION CHART FOR TROUBLE SYMPTOMS

Trouble symptom	Inspection procedure No.
Centre display backlight does not illuminate when ignition switch is in ACC. or Ignition position. (Warning lights operate normally during Ignition ON check)	1
Centre display backlight illuminates but no white segments are visible. (trip data display)	2
Centre display backlight does not illuminate when ignition switch is in ACC. or Ignition position and headlights ON. (works with headlamps off)	3
Centre display backlight does not illuminate when ignition switch is in ACC. or Ignition position and headlights OFF. (works with headlamps ON – dimmed mode)	4
Centre display resets to 1:00AM when ignition switch is turned to lock position.	5
Clock time cannot be adjusted with ACC. and/or Ignition ON.	6
Range to empty always displays flashing “---” km.	7
Range to empty does not detect refuels.	8
Total fuel used does not operate. (increase)	9
Total fuel used displays abnormally low/high value.	10
Average fuel always displays “--.-” ℓ/100 km.	11
Average fuel always displays “0.1” ℓ/100 km.	12
Average fuel displays abnormally low/high value.	13
Instant fuel always displays “--.-” ℓ/100 km.	14
Instant fuel always displays “0.1” ℓ/100 km.	15
Instant fuel displays abnormally low/high result.	16
Total distance travelled does not operate (increase).	17
Average speed always displays “--.-” km/h	18
Speed alarm warning “Beeps” do not trigger when set speed is exceeded.	19
Speed alarm set speed cannot be adjusted and/or turned off and/or operating mode cannot be changed.	20

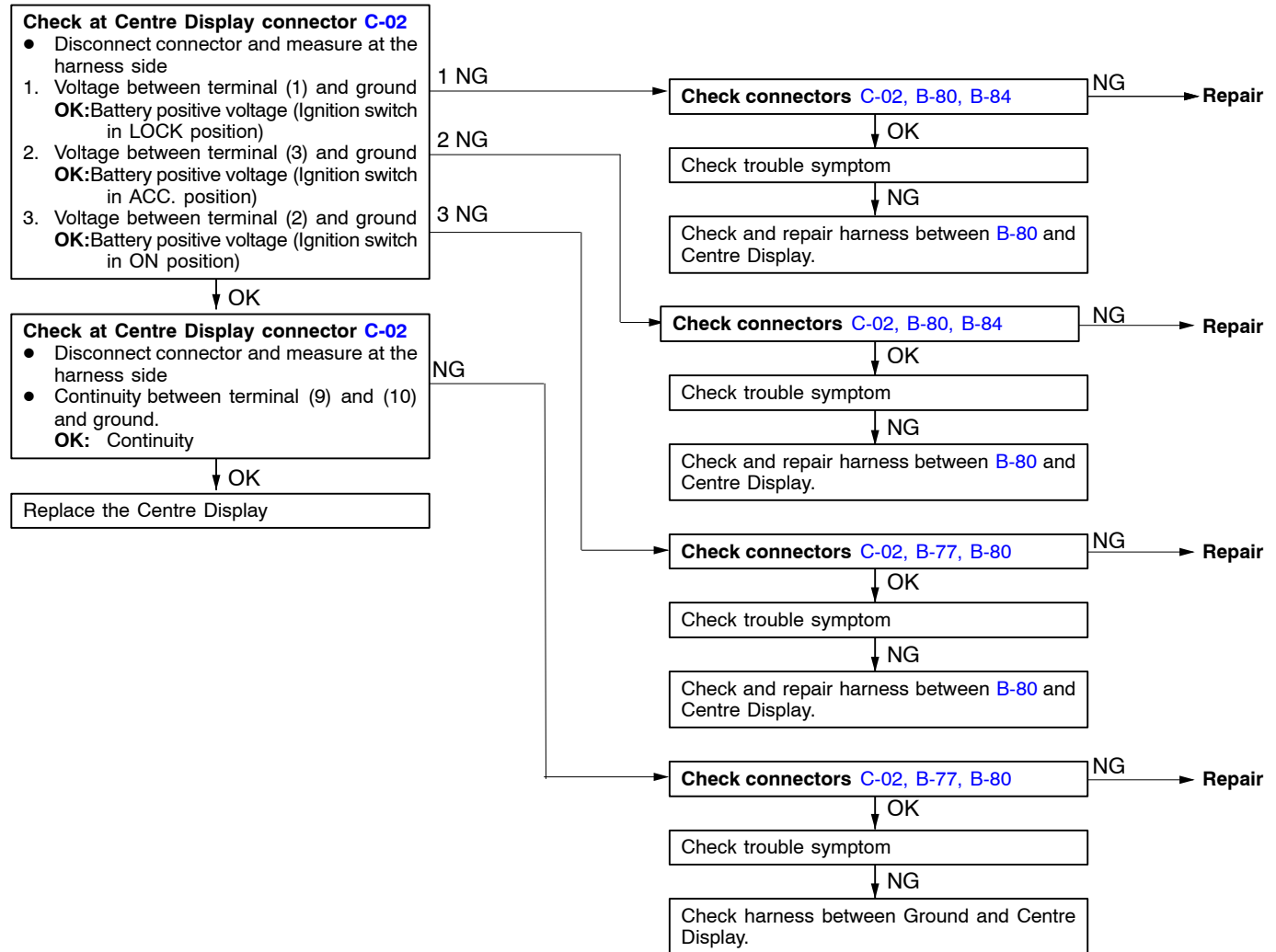
INSPECTION PROCEDURE 1

Centre Display backlight does not illuminate when ignition switch is in ACC. or Ignition position (warning lights operate normally during Ignition ON check)	Probable cause
The Centre Display power or ground circuits may be defective.	<ul style="list-style-type: none"> • Harness or Connector defective • Centre Display malfunction



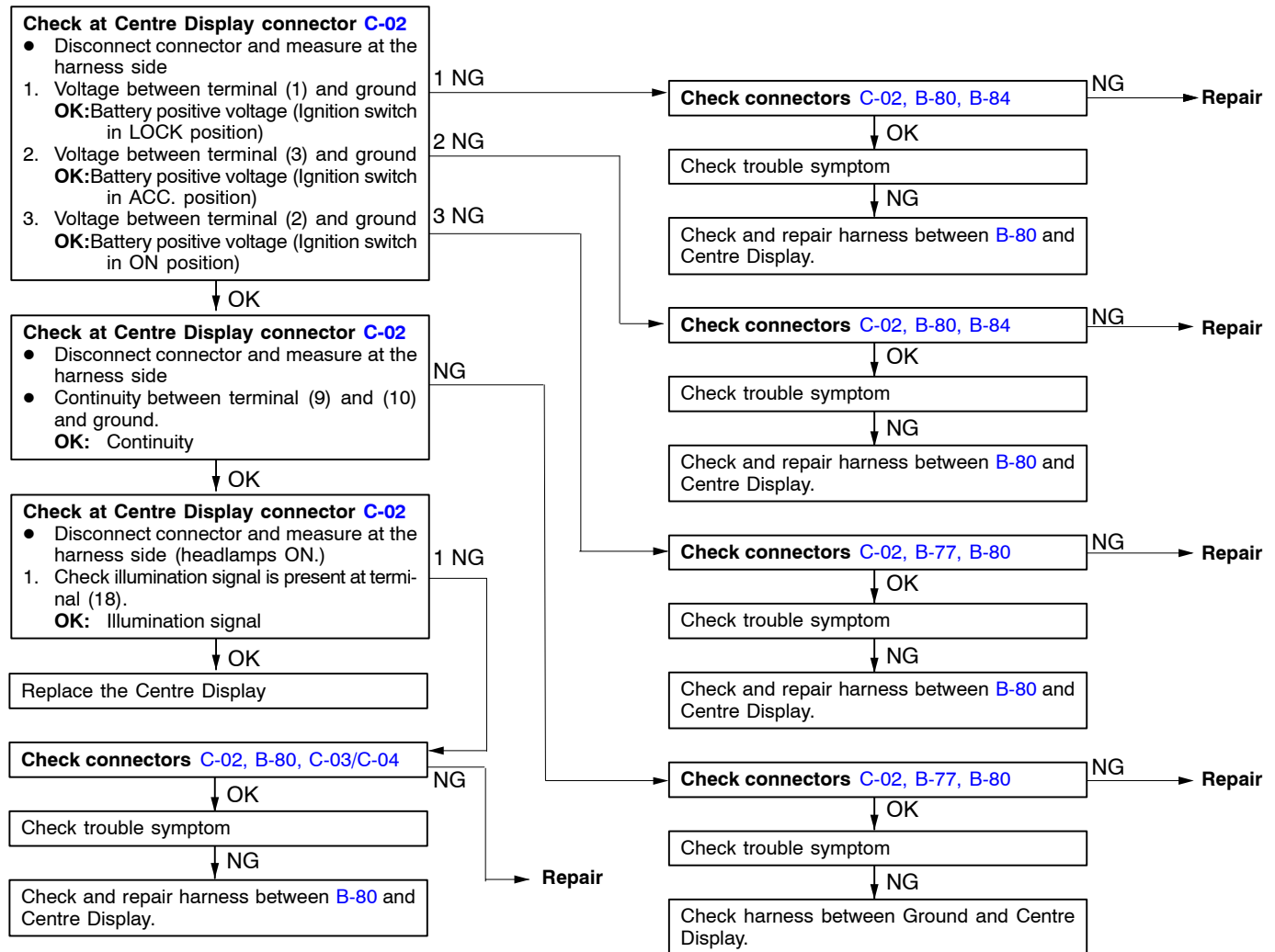
INSPECTION PROCEDURE 2

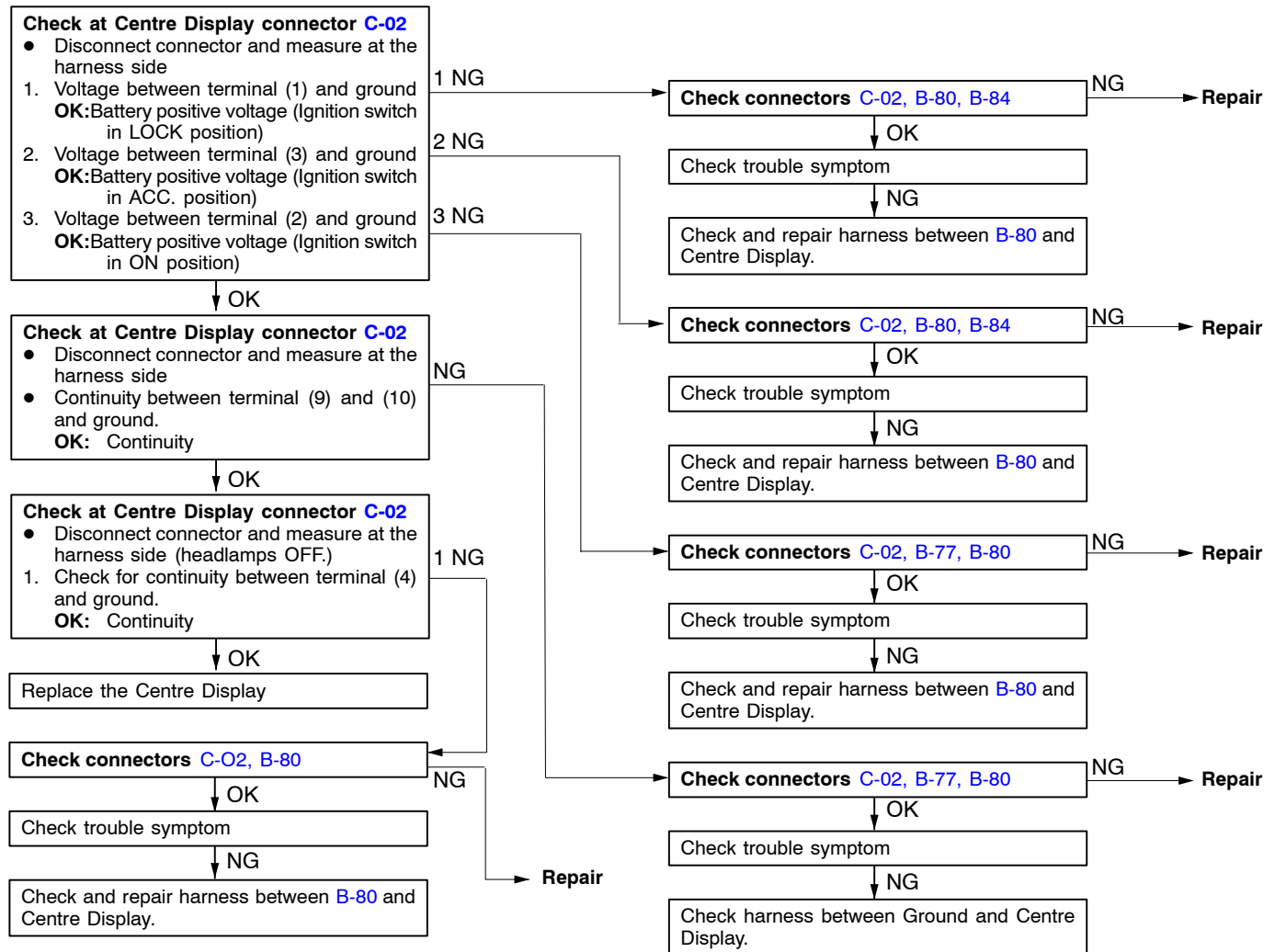
Centre Display backlight illuminates but no white segments are visible	Probable cause
The Centre Display power or ground circuits may be defective.	<ul style="list-style-type: none"> • Harness or Connector defective • Centre Display malfunction



INSPECTION PROCEDURE 3

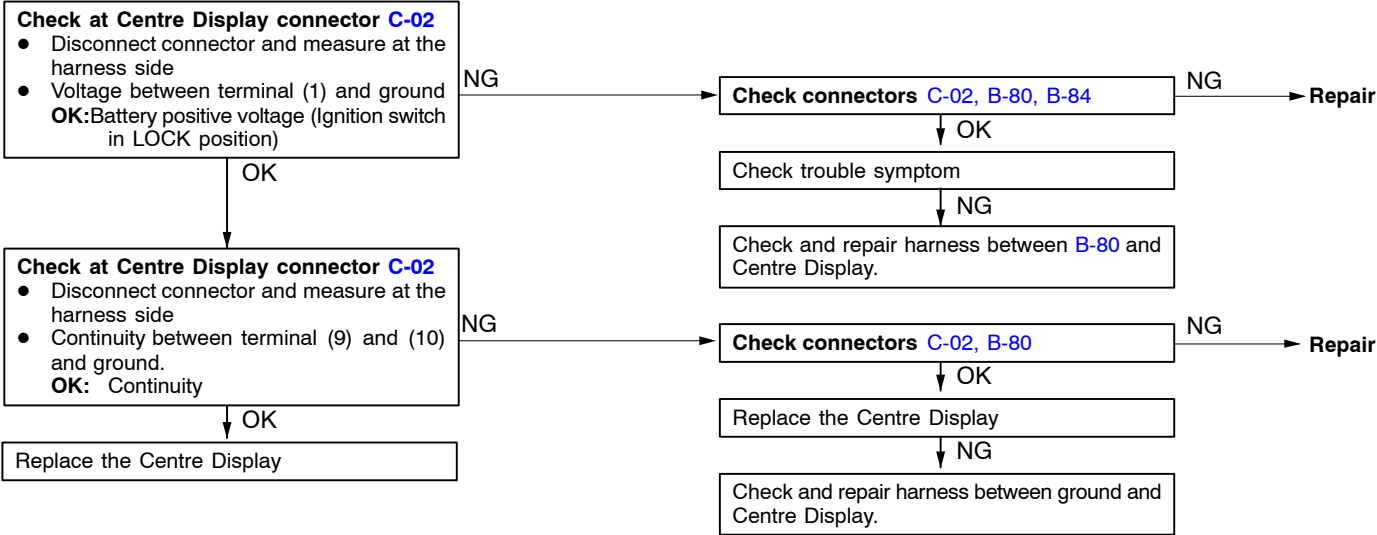
Centre Display backlight does not illuminate when ignition switch is in ACC. or ignition position and headlamps ON (works head-lights OFF)	Probable cause
The Centre Display power or ground circuits may be defective.	<ul style="list-style-type: none"> • Harness or Connector defective • Centre Display malfunction





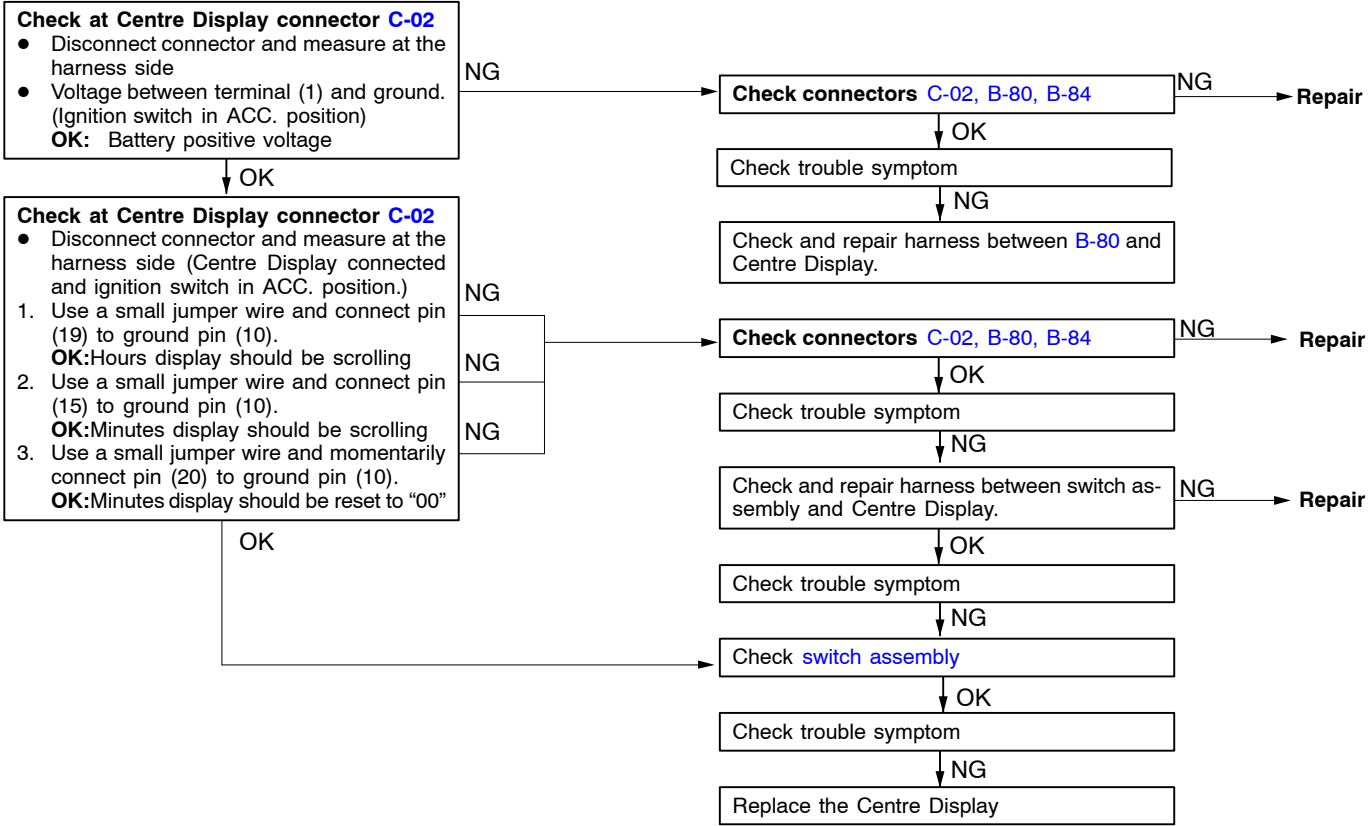
INSPECTION PROCEDURE 5

Clock display resets to 1:00 AM when ignition switch is turned to LOCK position.	Probable cause
The Centre Display power or ground circuits may be defective.	<ul style="list-style-type: none">• Harness or Connector defective• Centre Display malfunction



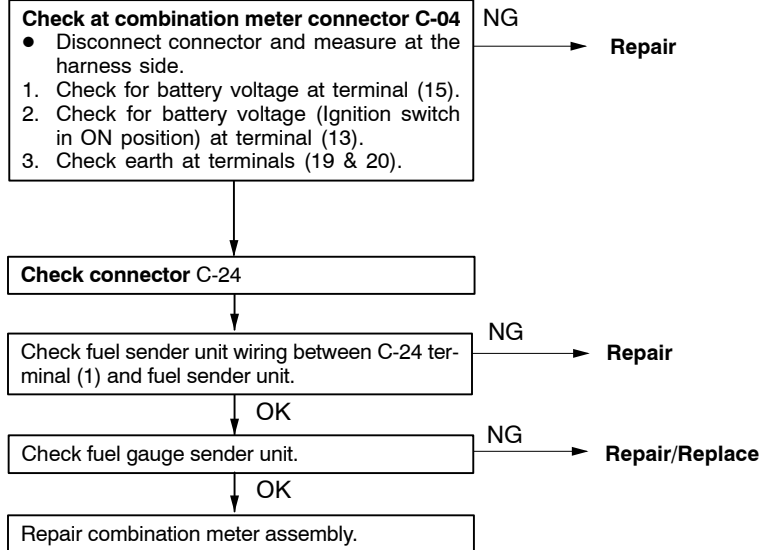
INSPECTION PROCEDURE 6

Clock time cannot be adjusted with ACC. and or ignition ON.	Probable cause
The Centre Display switch input circuits may be defective.	<div><div></div><div>Harness or Connector defective</div><div>Switch assembly defective</div><div>Centre Display malfunction</div></div>



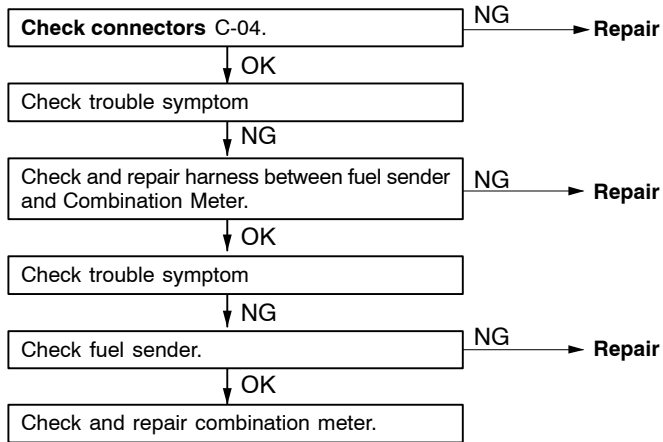
INSPECTION PROCEDURE 7

Range to empty always displays flashing “---” km (even when fuel tank is full)	Probable cause
The Trip Meter Display fuel sender circuit may be defective.	<ul style="list-style-type: none"> • Harness or Connector defective • Fuel sender assembly faulty • Trip Computer malfunction



INSPECTION PROCEDURE 8

Range to empty does not detect refuels (even when > 7 litres)	Probable cause
The Trip Computer fuel sender circuit may be defective.	<ul style="list-style-type: none"> • Harness or Connector defective • Fuel sender assembly faulty • Trip Meter malfunction



INSPECTION PROCEDURE 9

Total fuel used does not operate (increase)	Probable cause
The Trip Computer power or ground circuits may be defective.	<ul style="list-style-type: none"> • Harness or Connector defective • Injector assembly faulty • Trip Computer malfunction

Check at Combination meter connector C-04

- Disconnect connector and measure at the harness side (engine running)
- 1. Signal between injector input terminal (17) and ground

OK: Injector signal present

OK

Repair the Combination meter

NG

Check connectors A-92, A-103, B-105 & C-04

NG

Repair

OK

Check trouble symptom

NG

Check and repair harness between engine ECU injector output pin and Combination meter.

NG

Repair

OK

Check trouble symptom

NG

Check engine ECU.

NG

Repair

OK

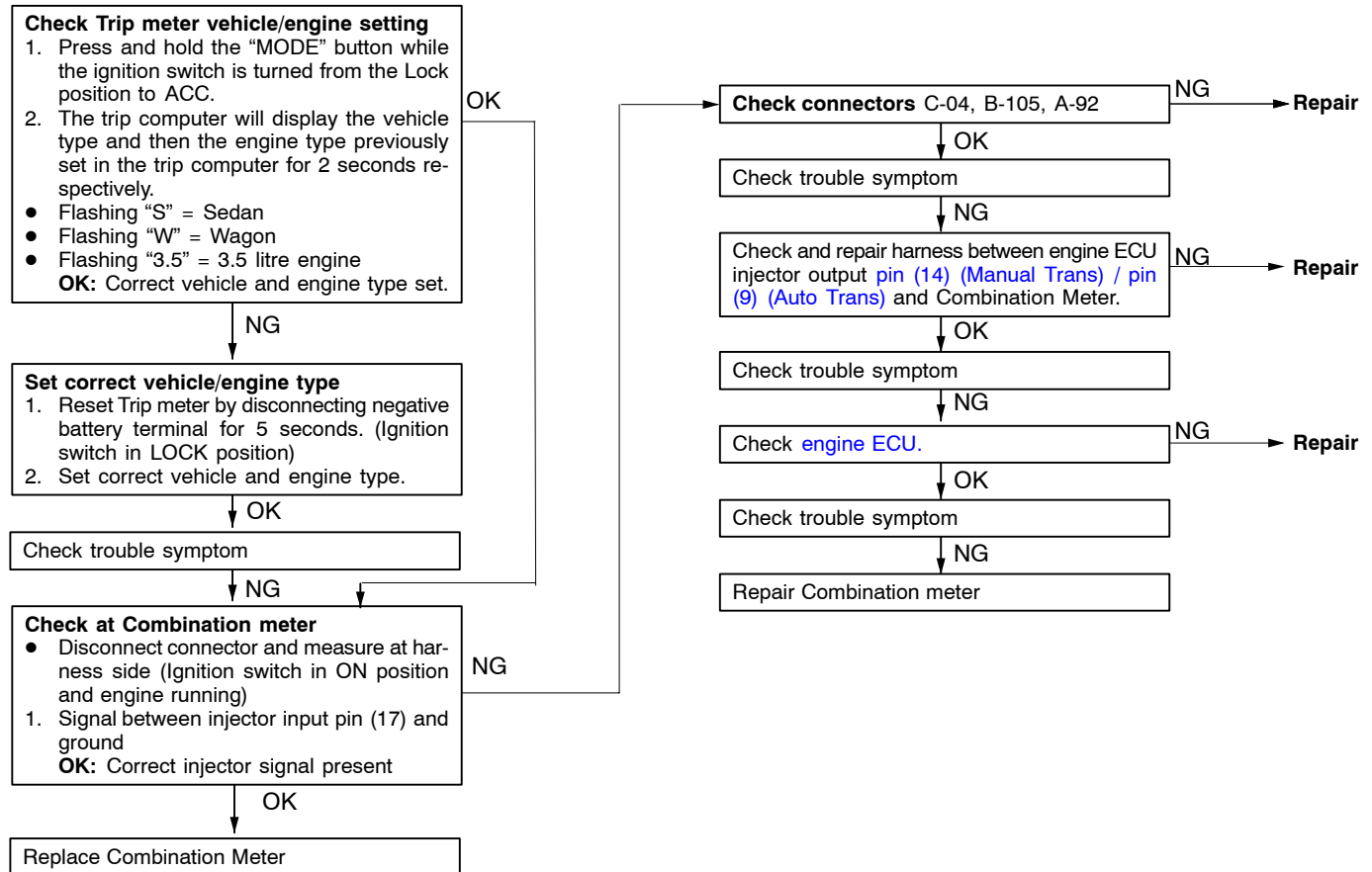
Check trouble symptom

NG

Repair the combination meter.

INSPECTION PROCEDURE 10

Total fuel used displays abnormally low/high value	Probable cause
The Trip Computer power or ground circuits may be defective.	<ul style="list-style-type: none"> • Harness or Connector defective • Trip Computer malfunction



INSPECTION PROCEDURE 11

Average fuel always displays “---” ℓ/100 km	Probable cause
The Trip Computer speed signal input circuit may be defective.	<ul style="list-style-type: none"> • Harness or Connector defective • Speed sensor defective • Trip Computer malfunction

Check at Combination meter connector C-04

- Disconnect connector and measure at the harness side (Simulate a SPEED signal using MUT II. eg. using Cruise Control system.)
- 1. Signal between SPEED input terminal (18) and ground
OK: Correct SPEED signal present

OK

Repair the Combination Meter

NG

Check connectors C-04, C-09, B-43, A-88

NG

Repair

OK

Check trouble symptom

NG

Check and repair harness between engine ECU speed output pin (80) (Auto Trans) or vehicle speed sensor and Combination Meter. (Manual Trans)

NG

Repair

OK

Check trouble symptom

NG

Check the speed sensor.

NG

Repair

OK

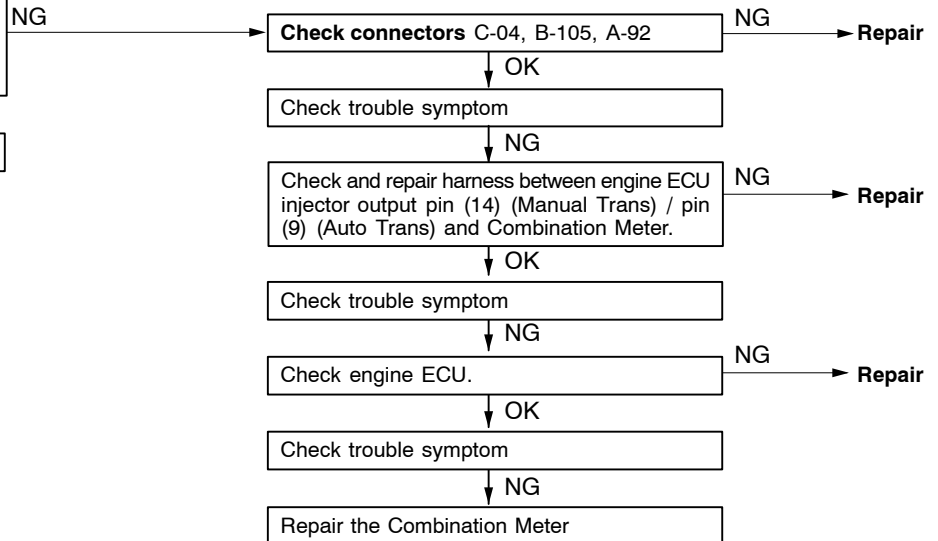
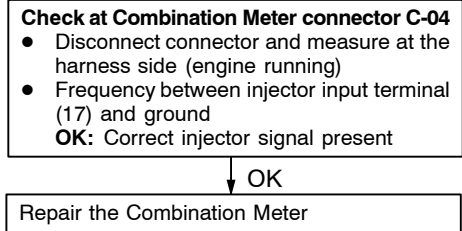
Check trouble symptom

NG

Repair the Combination Meter

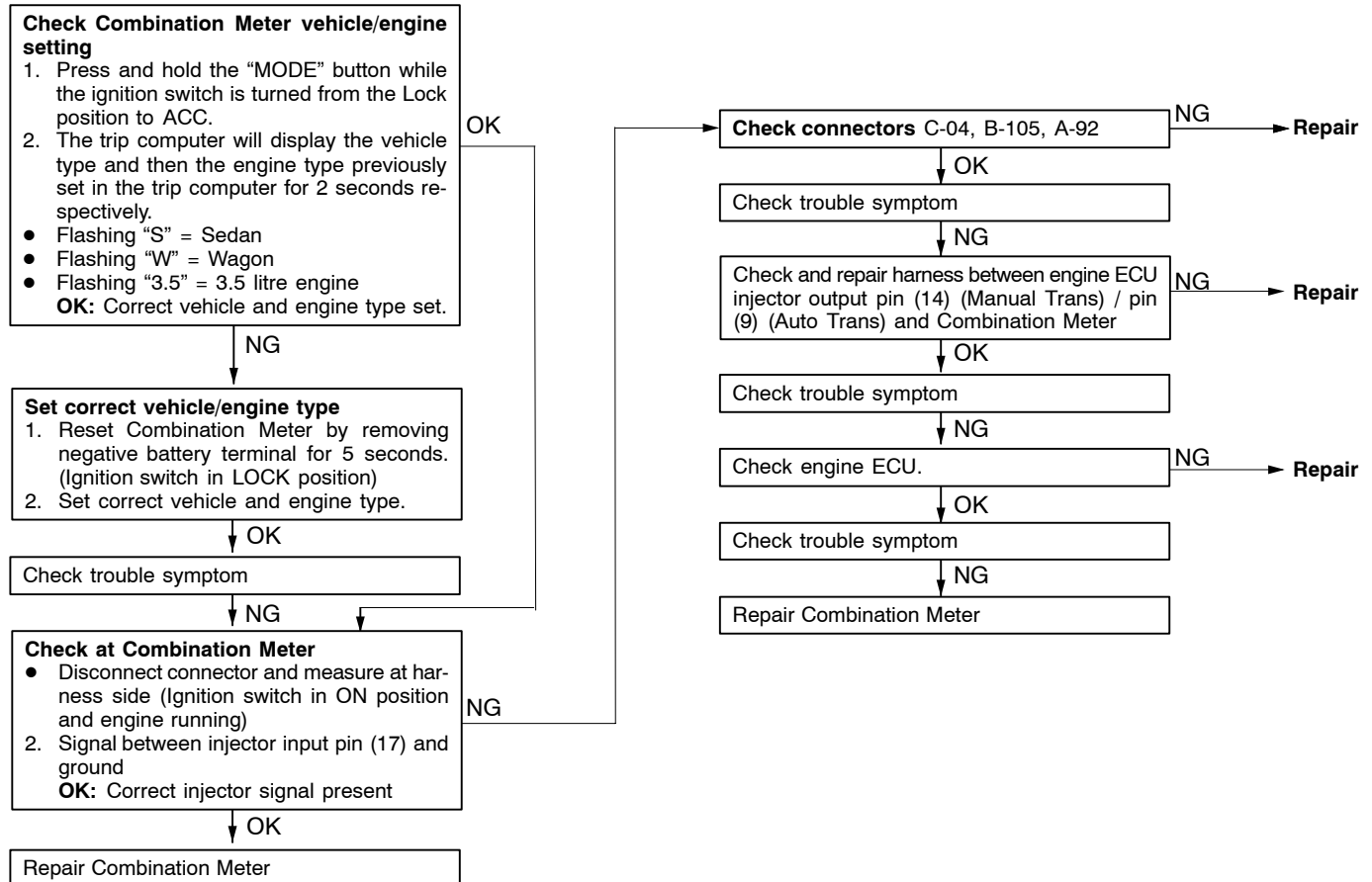
INSPECTION PROCEDURE 12

Average fuel always displays “0.1” ℓ/100 km	Probable cause
The Trip Computer injector input circuit may be defective.	<ul style="list-style-type: none"> • Harness or Connector defective • Injector assembly faulty • Trip Computer malfunction



INSPECTION PROCEDURE 13

Average fuel displays abnormally low/high value	Probable cause
The Trip Computer injector ignition circuit may be defective.	<ul style="list-style-type: none"> • Harness or Connector defective • Trip Computer malfunction



INSPECTION PROCEDURE 14

Instant fuel always displays “--.” ℓ/100 km	Probable cause
The Trip Computer speed signal input circuit may be defective.	<ul style="list-style-type: none"> • Harness or Connector defective • Speed sensor defective • Trip Computer malfunction

Check at Combination Meter connector C-24

- Disconnect connector and measure at the harness side (Simulate a SPEED signal using MUT II. eg. using Cruise Control system.)
- 1. Signal between SPEED input terminal (18) and ground
OK: Correct SPEED signal present

OK

Repair the Combination Meter

NG

Check connectors C-04, C-09, B-41

NG

Repair

OK

Check trouble symptom

NG

Check and repair harness between engine ECU injector output pin (14) (Manual Trans) / pin (9) (Auto Trans) and Combination Meter.

NG

Repair

OK

Check trouble symptom

NG

Check the speed sensor

NG

Repair

OK

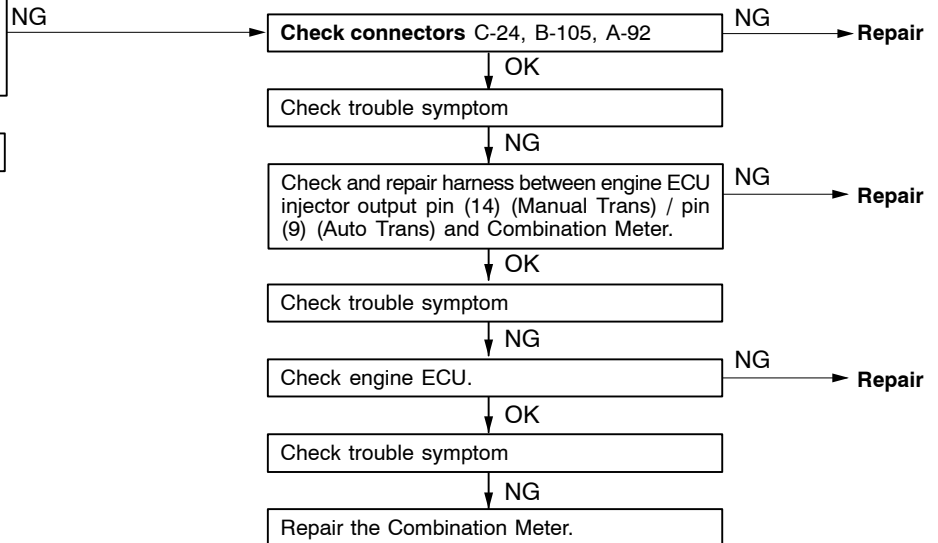
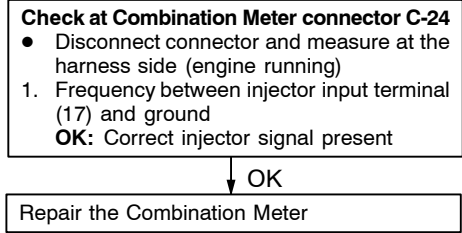
Check trouble symptom

NG

Repair the Combination Meter

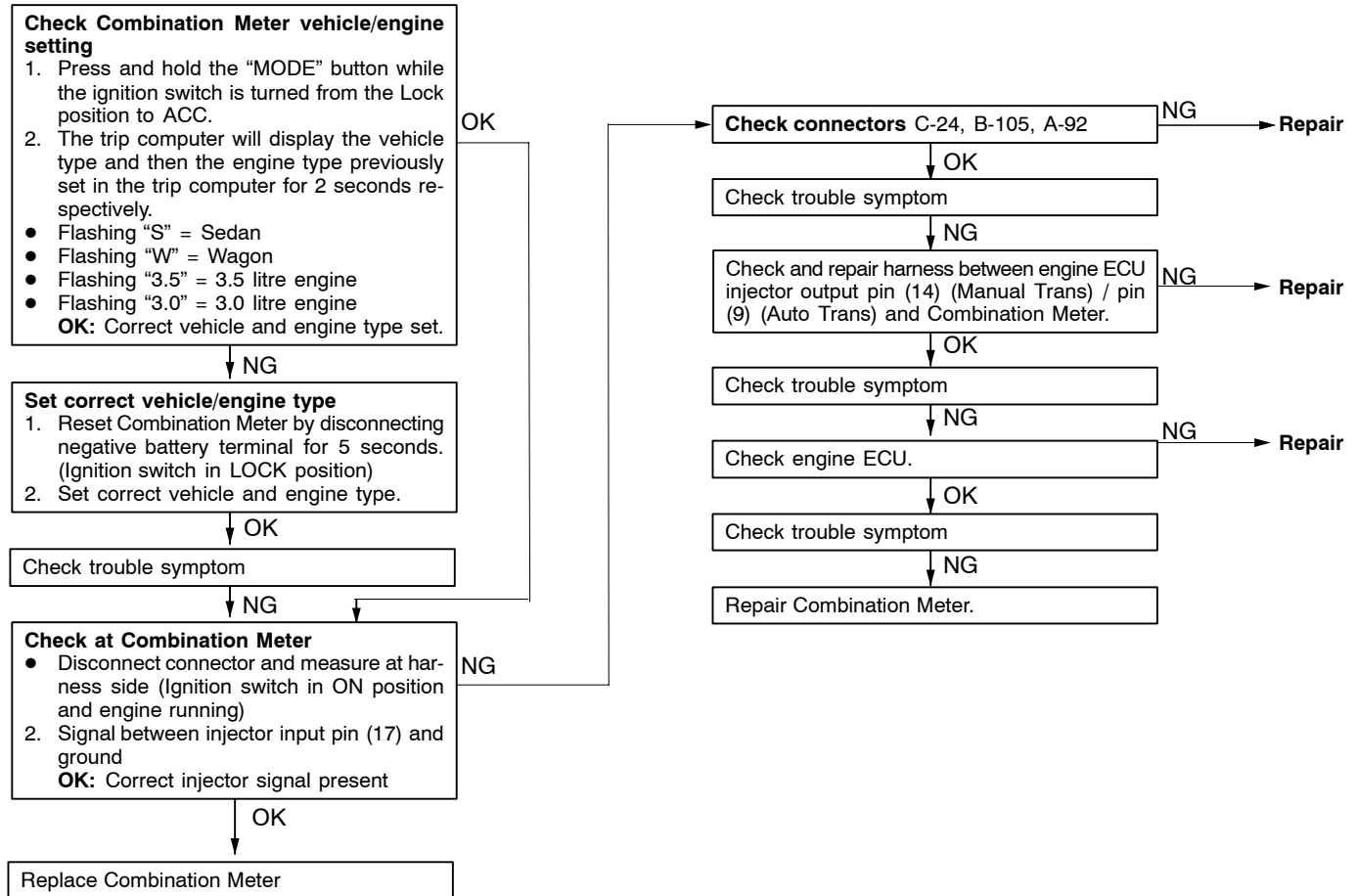
INSPECTION PROCEDURE 15

Instant fuel always displays “0.1” ℓ/100 km	Probable cause
The Trip Computer injector input circuit may be defective.	<ul style="list-style-type: none"> • Harness or Connector defective • Injector assembly faulty • Trip Computer malfunction



INSPECTION PROCEDURE 16

Instant fuel displays abnormally low/high result	Probable cause
The Trip Computer injector ignition circuit may be defective.	<ul style="list-style-type: none"> • Harness or Connector defective • Trip Computer malfunction



INSPECTION PROCEDURE 17

Total distance travelled does not operate (increase)	Probable cause
The Trip Computer Speed signal input circuit may be defective.	<ul style="list-style-type: none"> • Harness or Connector defective • Speed sender defective • Trip Computer malfunction

Check at Combination Meter connector C-24

- Disconnect connector and measure at the harness side (Simulate a SPEED signal using MUT II. eg. using Cruise Control system.)
- 1. Signal between SPEED input terminal (18) and ground
OK: Correct SPEED signal present

OK

Repair the Combination Meter

NG

Check connectors C-24, C-09, B-41, A-88

NG

Repair

OK

Check trouble symptom

NG

Check and repair harness between engine ECU speed output pin (80) (Manual Trans) / pin (86) (Auto Trans) and Combination Meter.

NG

Repair

OK

Check trouble symptom

NG

Check the speed sensor.

NG

Repair

OK

Check trouble symptom

NG

Repair the Combination Meter.

INSPECTION PROCEDURE 18

Average speed always displays "--.-" km/h	Probable cause
The Trip Computer Speed signal input circuit may be defective.	<ul style="list-style-type: none"> • Harness or Connector defective • Speed sender defective • Trip Computer malfunction

Check at Combination Meter connector C-24

- Disconnect connector and measure at the harness side (Simulate a SPEED signal using MUT II. eg. using Cruise Control system.)
- 1. Signal between SPEED input terminal (18) and ground
OK: Correct SPEED signal present

OK

Repair the Combination Meter

NG

Check connectors C-24, C-09, B-41, A-88

NG

Repair

OK

Check trouble symptom

NG

Check and repair harness between engine ECU speed output pin (80) (Auto Trans) or vehicle speed sensor and Combination Meter. (Manual Trans)

NG

Repair

OK

Check trouble symptom

NG

Check the speed sensor.

NG

Repair

OK

Check trouble symptom

NG

Repair the Combination Meter.

INSPECTION PROCEDURE 19

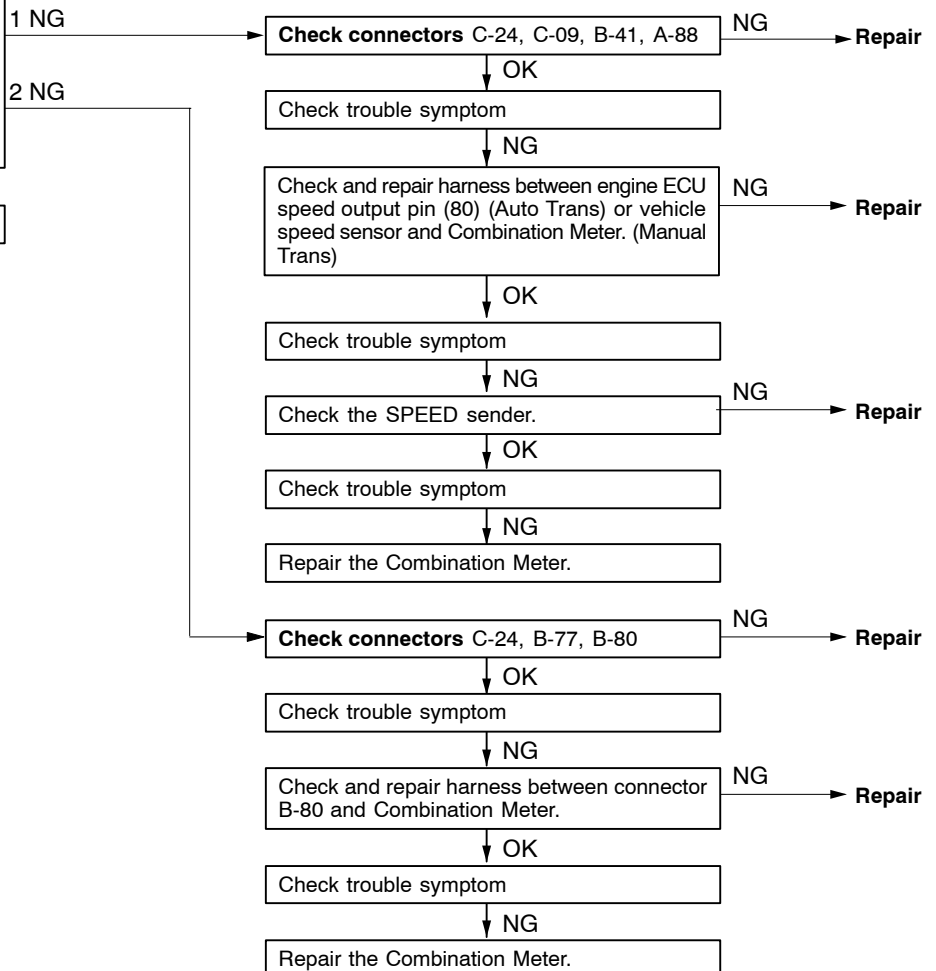
Speed Alarm warning “BEEPS” do not trigger when set speed is exceeded	Probable cause
The Trip Computer Speed signal input circuit may be defective.	<ul style="list-style-type: none"> • Harness or Connector defective • Speed sender defective • Trip Computer malfunction

Check at Combination Meter connector C-04

- Disconnect connector and measure at the harness side (Simulate a SPEED signal using MUT II. eg. using Cruise Control System.)
1. Frequency between SPEED input terminal (18) and ground.
OK: Correct SPEED signal present
 2. Voltage between terminal (13) and ground.
OK: Battery positive voltage (ignition switch in ON position)

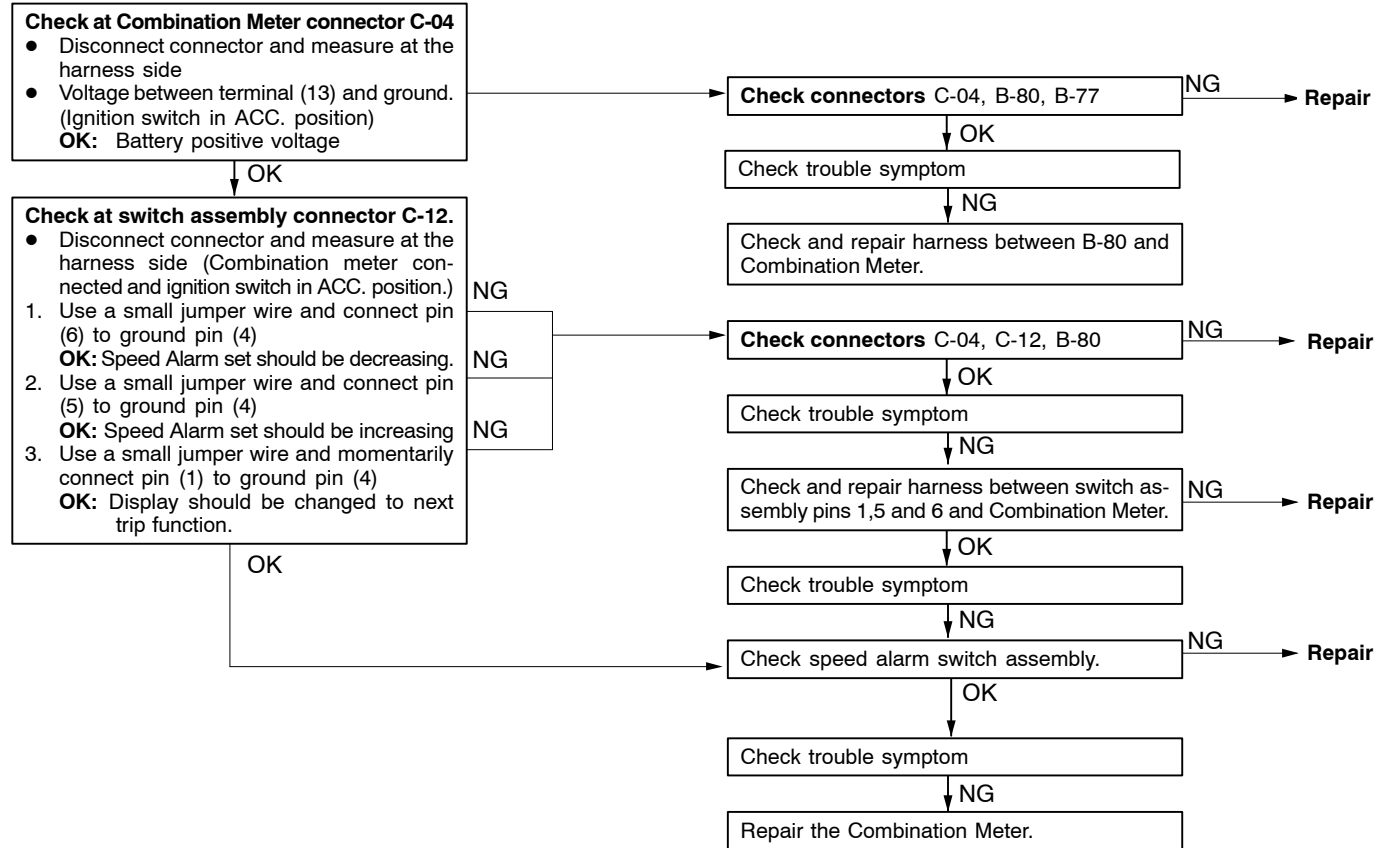
OK

Repair the Combination Meter.

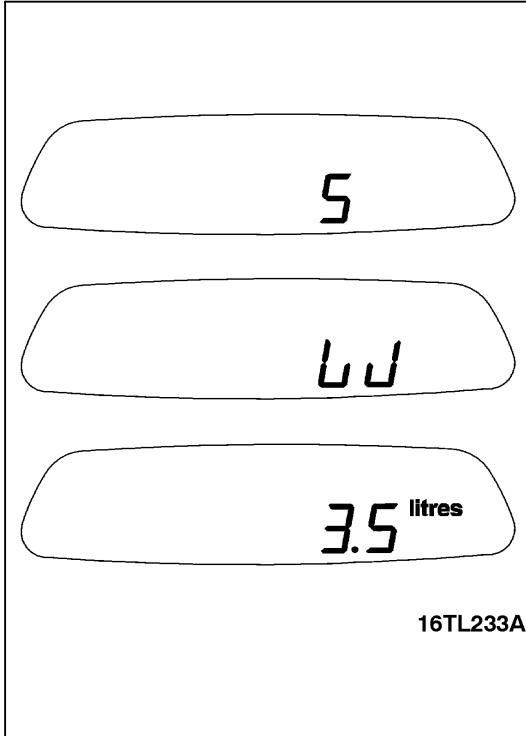


INSPECTION PROCEDURE 20

Speed Alarm set speed cannot be adjusted and/or turned off and/or operating mode cannot be changed	Probable cause
The Trip Computer switch input circuits may be defective.	<ul style="list-style-type: none"> • Harness or Connector defective • Switch assembly defective • Trip Computer malfunction



TRIP COMPUTER SETTING PROCEDURE



The Trip computer is coded to the vehicle and must be recoded if the power is removed from the unit, ie. the battery is disconnected or the unit is removed from the vehicle.

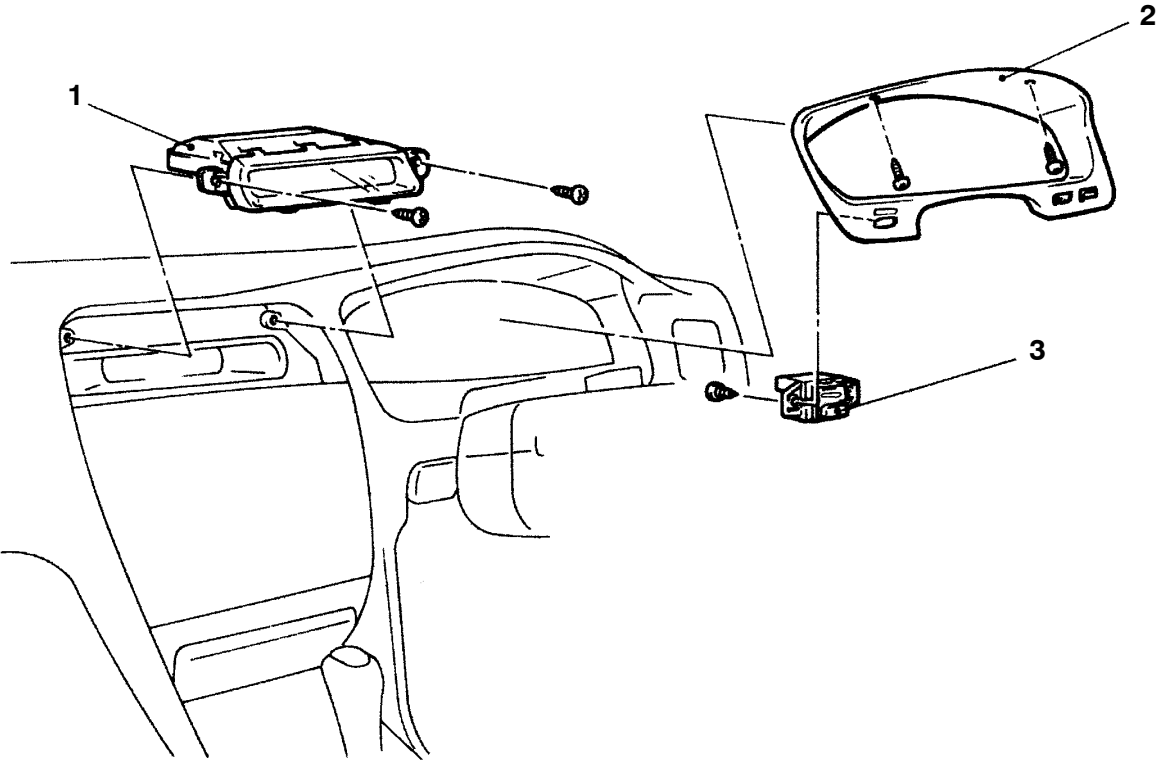
1. Ensure the unit is fitted correctly and the battery is connected.
2. Turn the ignition switch to the “ACC” or “ON” position.
3. The vehicle code screen will appear, displaying an “S” for sedan. If the vehicle is a sedan, press and hold the MODE button for more than 2 seconds to set for sedan. For a wagon, press the MODE button for less than 2 seconds and the display will change to a “W”. Press the MODE button for more than 2 seconds to set for wagon.
4. When the vehicle code is selected, the unit will beep and commence flashing the engine code “3.5 litres”. Press and hold MODE button for more than 2 seconds to set.
5. When the engine code is selected, the unit will beep and the unit is programmed.

NOTE

Range to empty will display “---” for the first continuous 5 minutes with the ignition on.

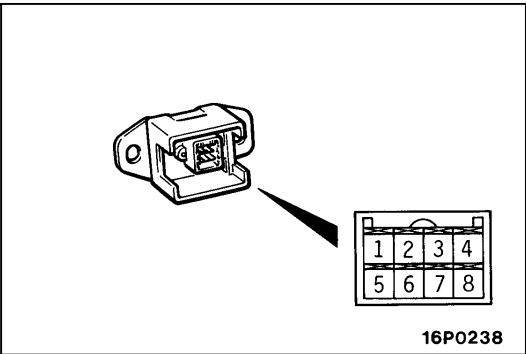
6. The “set” code can be checked by holding the MODE button and turning the key to “ACC”.

CENTRE MESSAGE DISPLAY
REMOVAL AND INSTALLATION



- 1. Centre Message Display
- 2. Meter bezel
- 3. Clock switch / Speed alarm switch

- Centre Message Display removal steps**
- Centre Air Outlet Assembly. (Refer [Group 52A.](#))
 - 1. Centre Message Display
 - 2. Meter bezel
 - 3. Clock switch / Speed alarm switch



INSPECTION
SPEED ALARM / CLOCK SWITCH CONTINUITY CHECK

Switch	Terminal No.							
	1	2	3	4	5	6	7	8
MODE	○			○				
UP ▲				○	○			
Down ▼				○		○		
Light		○		○			○	

EXTERIOR LAMPS

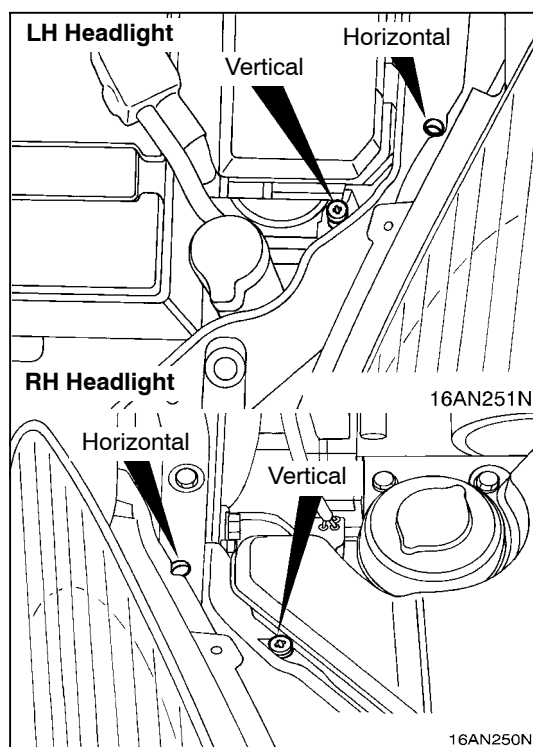
HEADLAMPS

ON-VEHICLE SERVICE

HEADLIGHT AIMING

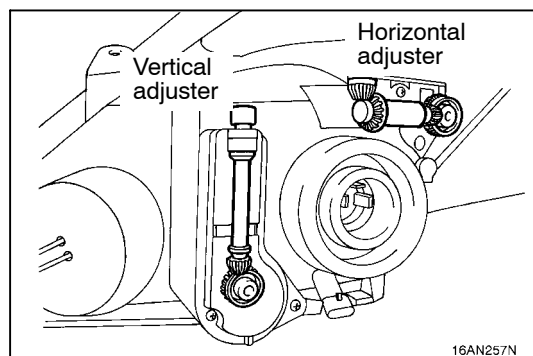
PRE-AIMING INSTRUCTIONS

1. Inspect for badly rusted or faulty headlight assemblies.
3. Place vehicle on a level floor.
4. Bounce front suspension through three (3) oscillations by applying body weight to hood or bumper.
5. Inspect tire inflation.
6. Rock vehicle sideways to allow vehicle to assume its normal position.
7. If fuel is not full, place a weight in trunk of vehicle to simulate weight of a full tank [0.72kg per litre]
8. There should be no other load in the vehicle other than driver or substituted weight of approximately 70 kg placed in driver's position.



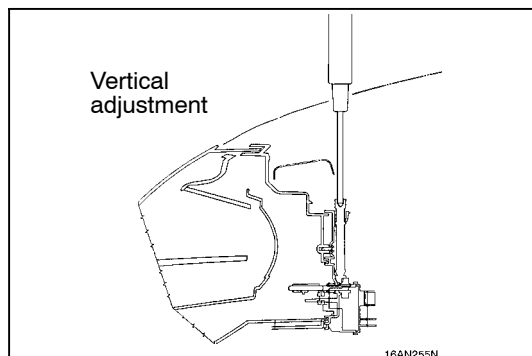
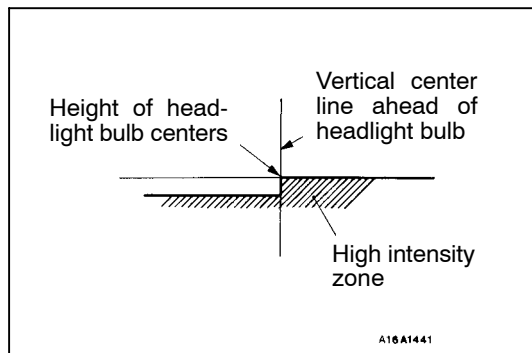
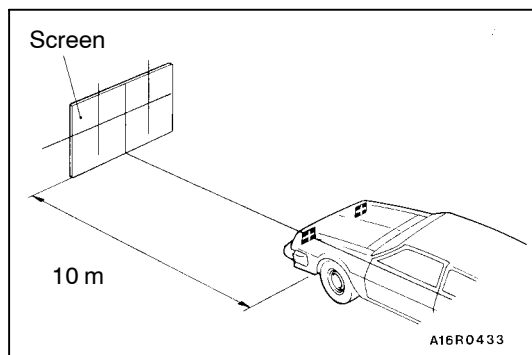
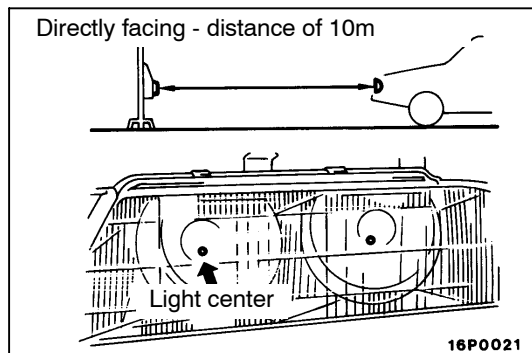
VERTICAL ADJUSTING

Adjust the vertical angle by rotating the white plastic vertical adjusting screw located at the rear of each head light assembly.



HORIZONTAL ADJUSTING

For adjusting the horizontal angle, remove the clip covering the access hole at the rear of the headlight assembly. Turn the horizontal adjusting screw located below the access hole to achieve the correct positioning of the light beam. Replace the access hole cover at the completion of the adjustment procedures.



AIMING WITH SCREEN

Headlight Aim Preparation

1. Set the distance between the screen and the bulb center marks of the headlight as shown in the illustration.
2. Mark the centre of both the high and low beam lights using the bulb as the centre reference and mark with a marking pen or similar.
3. Four lines of adhesive tape or like are required on screen or wall:
 - (1) Position a vertical tape so that it is aligned with the vehicle center line.
 - (2) Position a horizontal tape with reference to center line of headlight bulb.
 - (3) Position a vertical tape on the screen with reference to the center line of each headlight bulb.

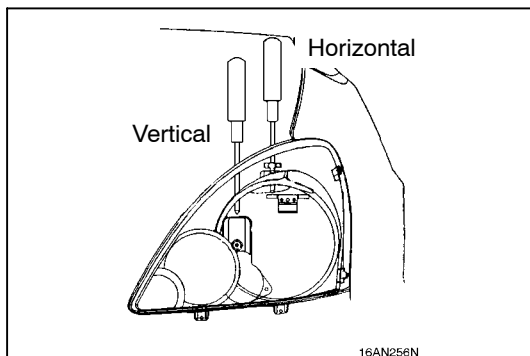
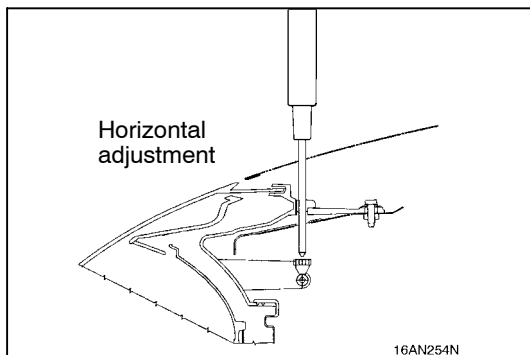
Visual Headlight Adjustment

1. A properly aimed lower beam will appear on the aiming screen 10m in front of the vehicle. The shaded area as shown in the illustration indicates high intensity zone.
2. Adjust low beam of headlights to match the low beam pattern of the right and left headlights.

NOTE: If the visual headlight adjustment at low beam is made, the adjustment at high beam is not necessary.

Vertical Adjusting

1. Adjust the vertical angle by rotating the vertical adjusting screw.
2. Check to see if the light distribution projected on the aiming screen is the same as the light distribution pattern described in Visual Headlight Adjustment.
3. In case they differ, turn the vertical adjusting screw to adjust the vertical angle until the light distribution coincides with the correct lighting pattern.



Horizontal Adjusting

1. For adjusting the horizontal angle, turn the horizontal adjusting screw.
2. Check to see if the light distribution projected on the aiming screen is the same as the light distribution pattern described in Visual Headlight Adjustment.
3. In case they differ, turn the horizontal adjusting screw to adjust the horizontal angle until the light distribution coincides with the correct lighting pattern.

LUMINOUS INTENSITY MEASUREMENT

Measure the luminous intensity of headlights with a photometer in accordance with the instruction manual prepared by the manufacturer of the photometer and make sure that the luminous intensity is within the following limit.

Limit:

High-beam: 18,000 cd or more

Low-beam: 7,000 cd or more

NOTE: When measuring the luminous intensity of headlight, keep the engine at 2,000 rpm and have the battery charged.

NOTE: If there are specific regulations for luminous intensity of headlights in the region where the vehicle is operated, make sure that the intensity conforms to the requirements of such regulations.

HEADLAMP, POSITION LAMP ASSEMBLY AND FRONT TURN SIGNAL LAMP ASSEMBLY

REMOVAL AND INSTALLATION

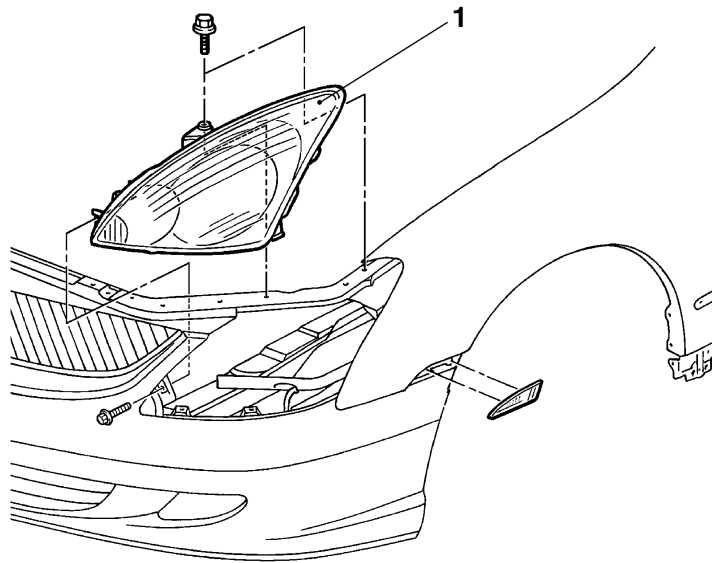
CAUTION: SRS

Before removal of air bag module and clock spring, refer to the followings:

- Group 52B – SRS Service Precautions
- Group 52B – Air Bag Module and Clock Spring

Pre-removal and Post-installation Operation

- Removal and Installation of Battery
(When replacing only left side headlamp)
- Radiator Grille [Removal and Installation](#)



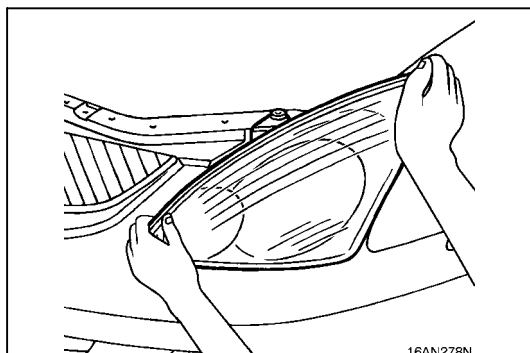
16TL279A

Headlamp, position lamp and front turn signal lamp removal steps



1. Headlamp assembly

Removal and installation of [column switch assembly](#)



REMOVAL SERVICE POINT

◀A▶ HEADLIGHT AND POSITION LIGHT ASSEMBLY REMOVAL

1. Place vehicle on hoist and remove front wheels and inner splash shields to expose inner bumper area.
2. Remove front bumper fasteners, headlight retaining bolt and headlight to front support panel bolts.
3. Remove radiator grille, air director flap and front headlight retaining bolt.
4. Release top of bumper from front support panel, remove bulb connections.
5. Push front bumper down and pull headlight assembly forward to remove.
6. Reinstall in the reverse order.

INSPECTION

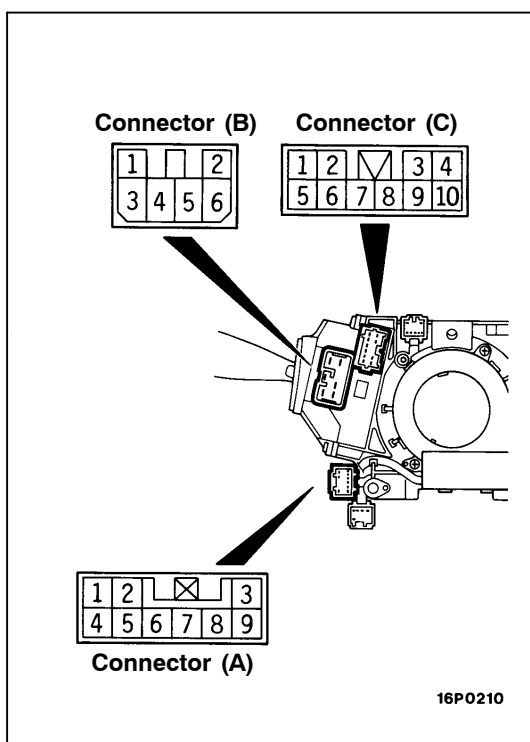
Refer [Group 51](#) – Windshield Wiper and Washer for removal and installation of the column switch.

Caution

Before removal of air bag module and clock spring, refer to the followings:

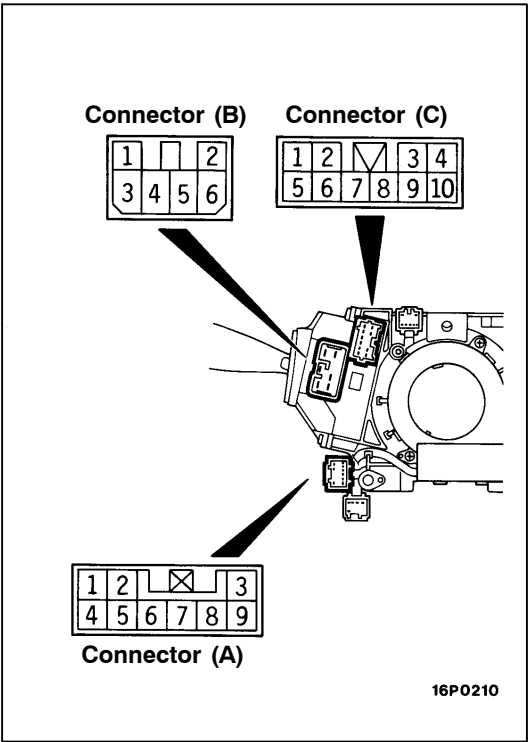
[Group 52B](#) – SRS Service Precautions

[Group 52B](#) – Air Bag Module and Clock Spring



COLUMN SWITCH CONTINUITY CHECK <Lighting Switch and Dimmer/Passing Switch>

Switch position		Connector (A) terminal No.				Connector (B) terminal No.				
		2	5	8	9	1	2	3	4	6
OFF										
Lighting Switch	Position taillamp		○	○						
	Headlamp	○	○	○						
Dimmer Switch	Low-beam							○	○	
	High-beam								○	○
	PASSING	At low beam				○	○		○	○
		At high beam				○	○		○	○

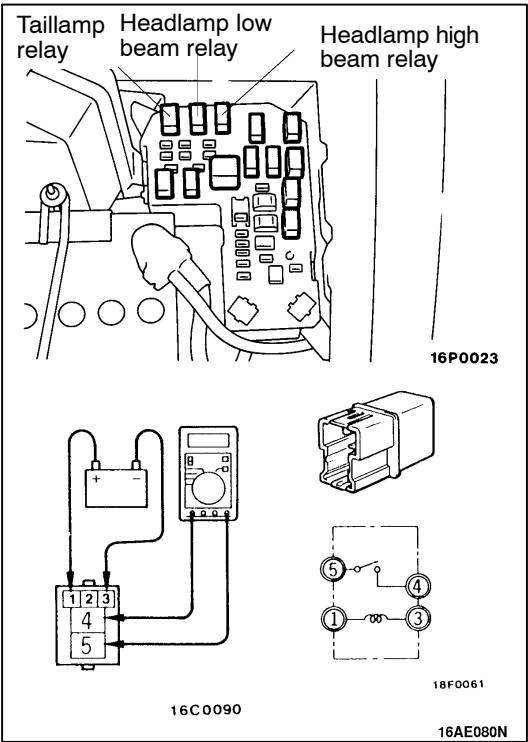


COLUMN SWITCH CONTINUITY CHECK <Turn-signal light switch>

Switch position		Connector (C) terminal No.		
		5	7	8
Turn signal lamp switch	LH	○		○
	OFF			
	RH		○	○

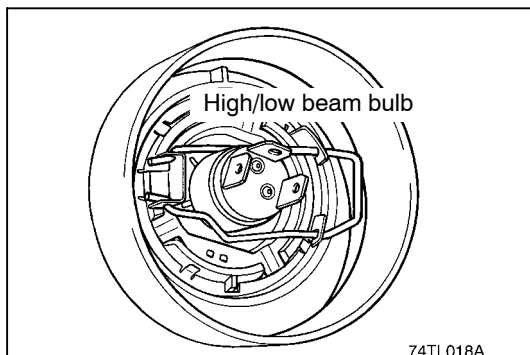
HAZARD LIGHT SWITCH CONTINUITY CHECK

Refer [On vehicle service](#).



HEADLAMP RELAY CONTINUITY CHECK

Battery voltage	Terminal No.			
	1	3	4	5
Power is not supplied	○	○		
Power is supplied	⊕	⊖	○	○

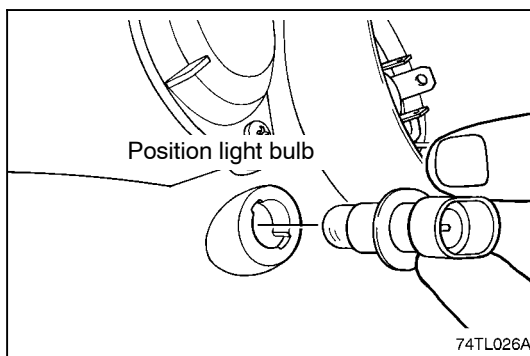
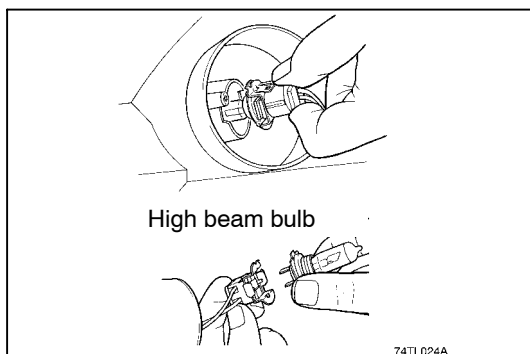


HEADLIGHT BULB REPLACEMENT

1. For right hand side, remove horn and washer bottle to gain access.
2. For left hand side, raise vehicle and remove wheel and inner splash shield to gain access.
3. Remove connectors and dust seals from bulb holders.
4. To remove high/low bulb, push wire clip forward and down to release bulb assembly
5. To remove high beam bulb, twist bulb housing anti-clockwise.

NOTE. When fitting bulb and holder assemblies ensure that tangs and slots are correctly aligned.

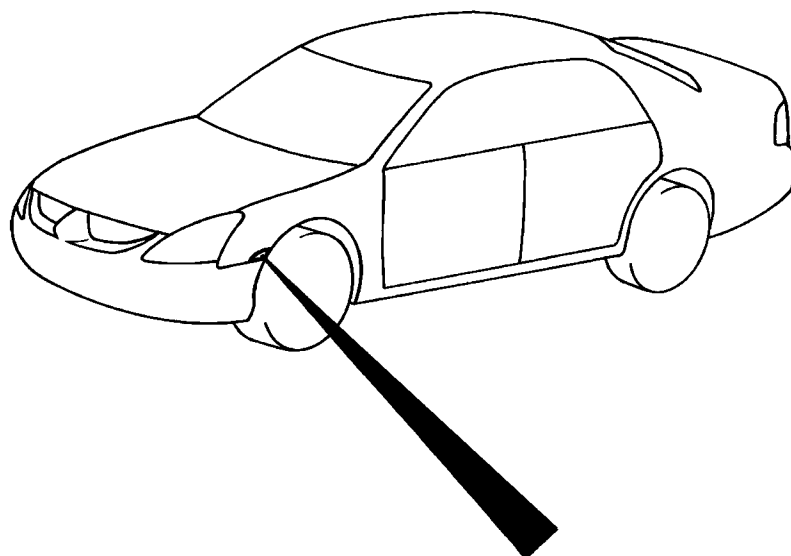
CAUTION: Do not touch the surface of the bulb with hands or dirty gloves. If the surface does become dirty, clean it with alcohol or thinner, and let it dry thoroughly before installing.



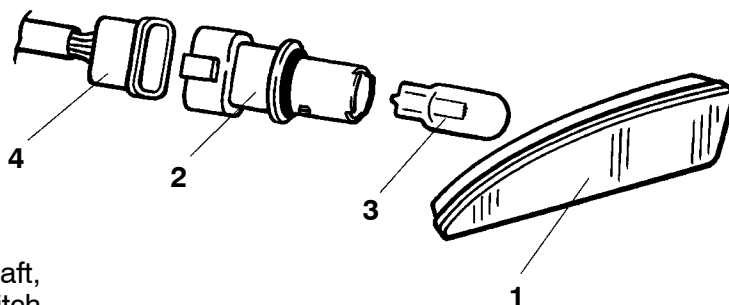
POSITION LIGHT BULB REPLACEMENT

1. For right hand side, remove horn and washer bottle to gain access.
2. For left hand side, raise vehicle and remove wheel and inner splash shield to gain access.
3. To remove, twist bulb housing 90 degrees clockwise.
4. Refit parts in the reverse order.

NOTE. When fitting bulb and holder assemblies ensure that tangs and slots are correctly aligned.

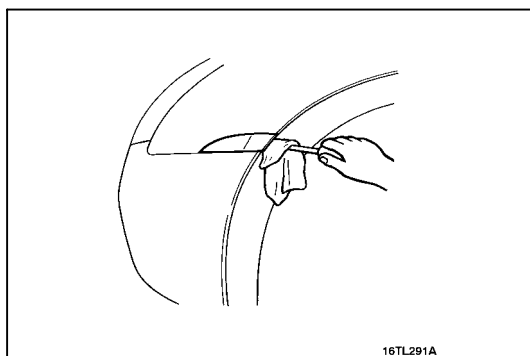
SIDE TURN SIGNAL LAMP**REMOVAL AND INSTALLATION****Removal Procedure**

1. Side turn signal lamp
2. Bulb socket
3. Bulb
4. Connector

**NOTE:**

See [Group 37A](#) - Steering Wheel and Shaft, for removal and installation of the column switch assembly (lighting switch).

16TL290A



16TL291A

REMOVAL SERVICE POINT**◀▶ SIDE TURN SIGNAL LAMP**

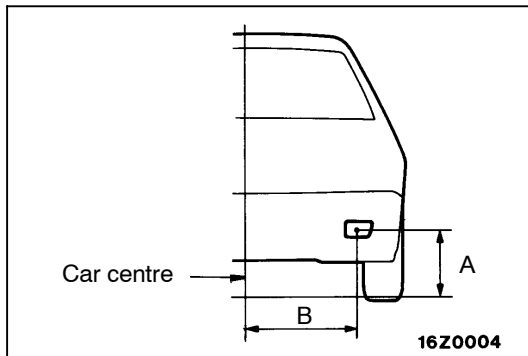
1. With a flat-bladed screwdriver, gently prise out rear edge of the side turn signal lamp near the wheel arch opening.

FOG LAMP

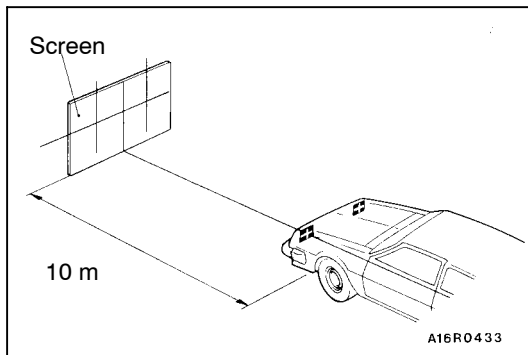
FOG LAMP AIMING

1. Inspect for badly rusted or faulty fog lamp.
2. These conditions must be corrected before a satisfactory adjustment can be made.
3. Place vehicle on a level floor.
4. Bounce front suspension through three (3) oscillations by applying body weight to hood or bumper.
5. Inspect tyre inflation.
6. Rock vehicle sideways to allow vehicle to assume its normal position.
7. If fuel tank is not full, place a weight in trunk of vehicle to simulate weight of a full tank [0.72kg per litre].
8. There should be no other load in the vehicle other than driver or substituted weight of approximately 55 kg placed in driver's position.
Thoroughly clean fog lamp lenses.

9. Measure the centre of the fog lamps as shown in the illustration.



10. Set the distance between the screen and the centre of the fog lamps as shown in the illustration.

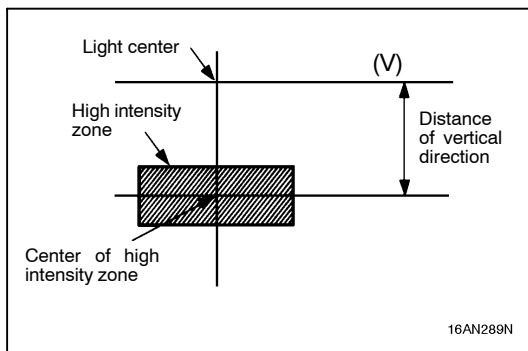


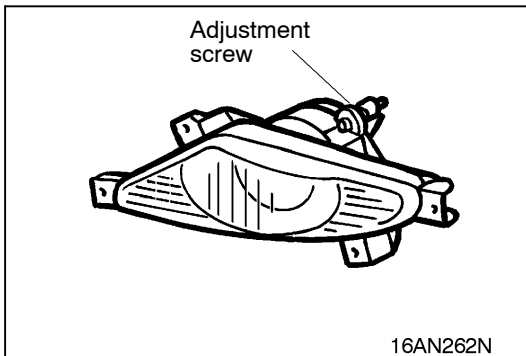
11. Check if the beam shining onto the screen is at the standard value.

Standard value:

(Vertical direction)

133mm below horizontal (H)



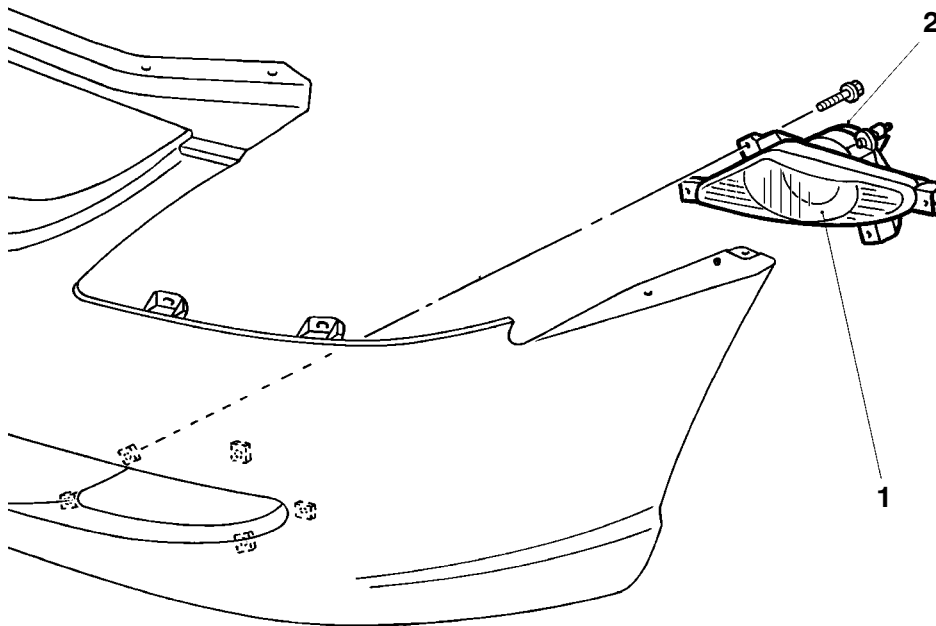


NOTE

The horizontal direction is non-adjustable. If the deviation of the lamp beam axis exceeds the standard value, check to be sure that the mounting location or some other point is not defective.

FOG LAMP

REMOVAL AND INSTALLATION

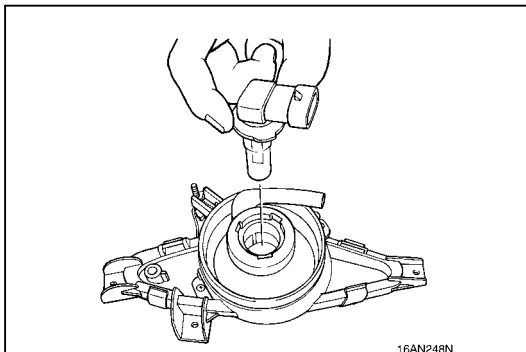


Fog lamp switch removal steps

Column switch (Refer [Group 51.](#))

Fog lamp removal steps

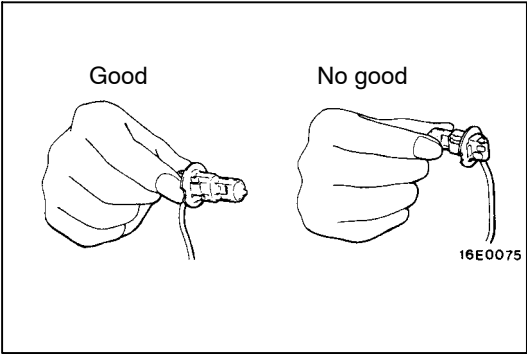
1. Fog lamp
2. Bulb



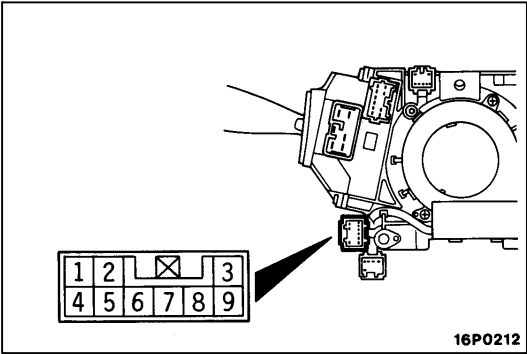
REMOVAL SERVICE POINT

◀A▶ BULB REMOVAL

1. Release connector by pressing retaining clip, pull connector to remove.
2. Twist bulb housing 90 degrees anti-clockwise and remove bulb assembly
3. Refit using reverse procedure, ensuring that tangs and slots are aligned

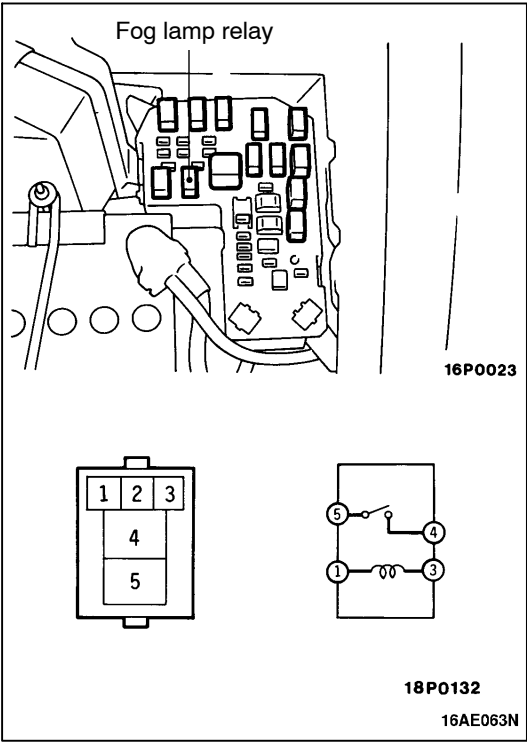


Caution
Do not touch the surface of the bulb with hands or dirty gloves. If the surface does become dirty, clean it with alcohol or thinner, and let it dry thoroughly before installing.



INSPECTION
FOG LAMP SWITCH CONTINUITY CHECK

Switch position		Terminal No.	
		3	7
Fog lamp switch	OFF		
	ON	○ — ○	○ — ○



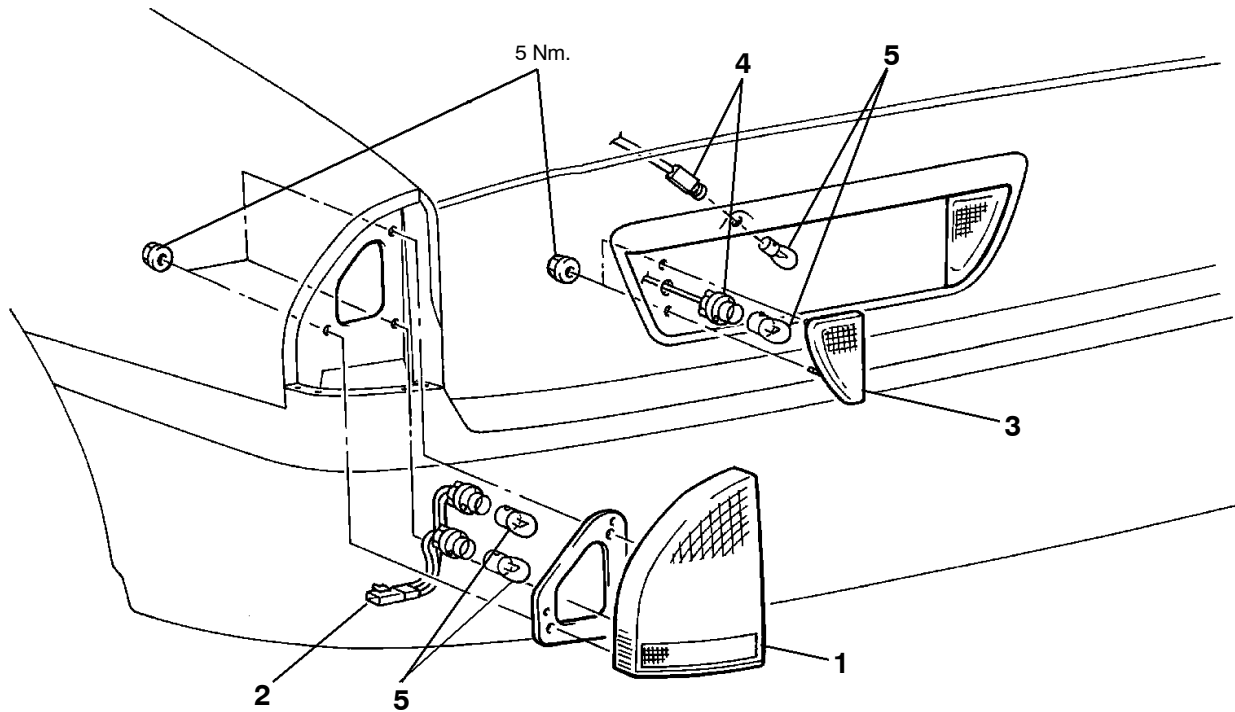
FOG LAMP RELAY CONTINUITY CHECK

Battery voltage	Terminal No.			
	1	3	4	5
Power is not supplied	○ — ○			
Power is supplied	⊕ - - - - ⊖		○ — ○	

REAR COMBINATION LAMP AND REAR LID LAMP

REMOVAL AND INSTALLATION

<SEDAN>



Rear combination lamp removal steps

- Trunk rear side trim (Refer [Group 52A](#))
- 1. Rear combination lamp
- 2. Socket holder/bulb assembly

16TL280A

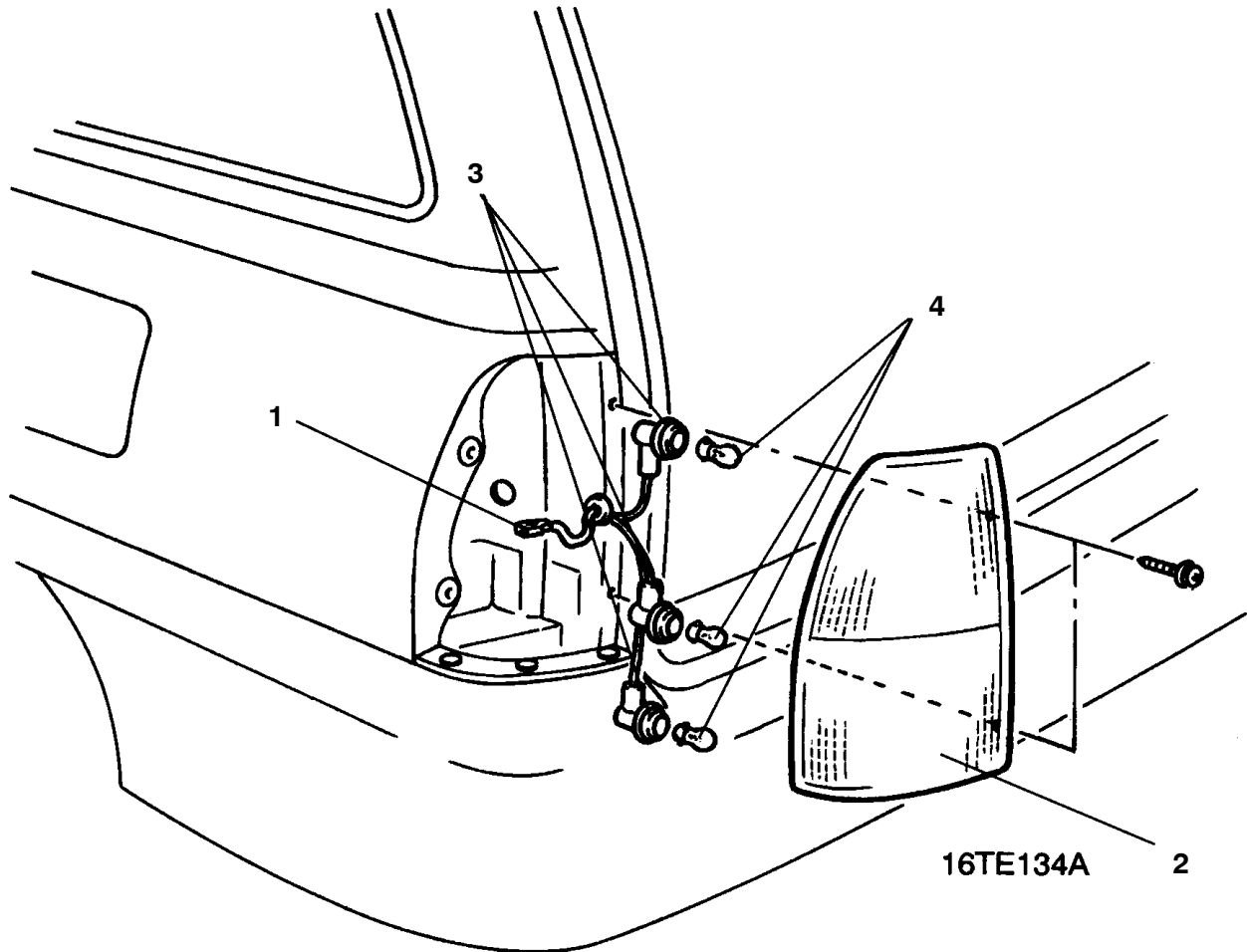
Rear lid lamp removal steps

- Trunk rear trim (Refer [Group 52A](#).)
- 3. Rear lid lamp
- 4. Socket assembly
- 5. Bulb

<WAGON>

Pre-removal and Post-installation operation

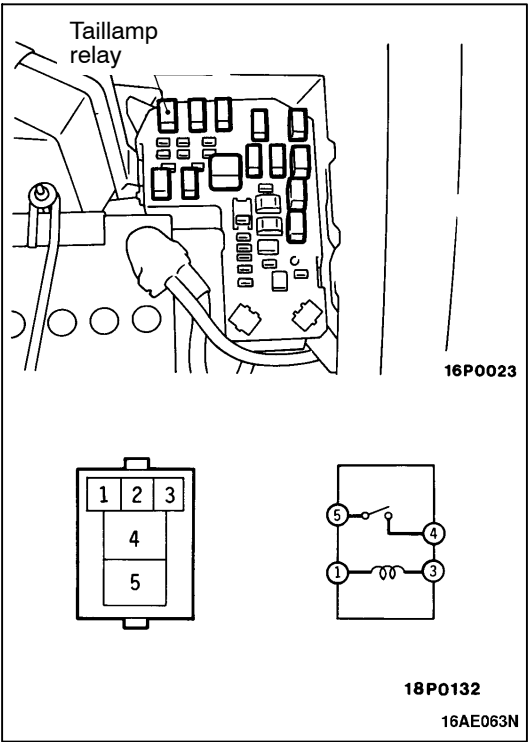
- Cargo compartment lower side trim.



Rear combination lamp removal steps

1. Connector

2. Rear combination lamp
3. Socket assembly
4. Bulb

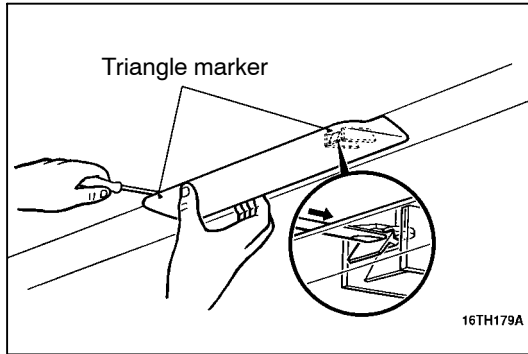


TAILLAMP RELAY CONTINUITY CHECK

Battery voltage	Terminal No.			
	1	3	4	5
Power is not supplied				
Power is supplied				

HIGH MOUNTED STOP LAMP

REMOVAL AND INSTALLATION



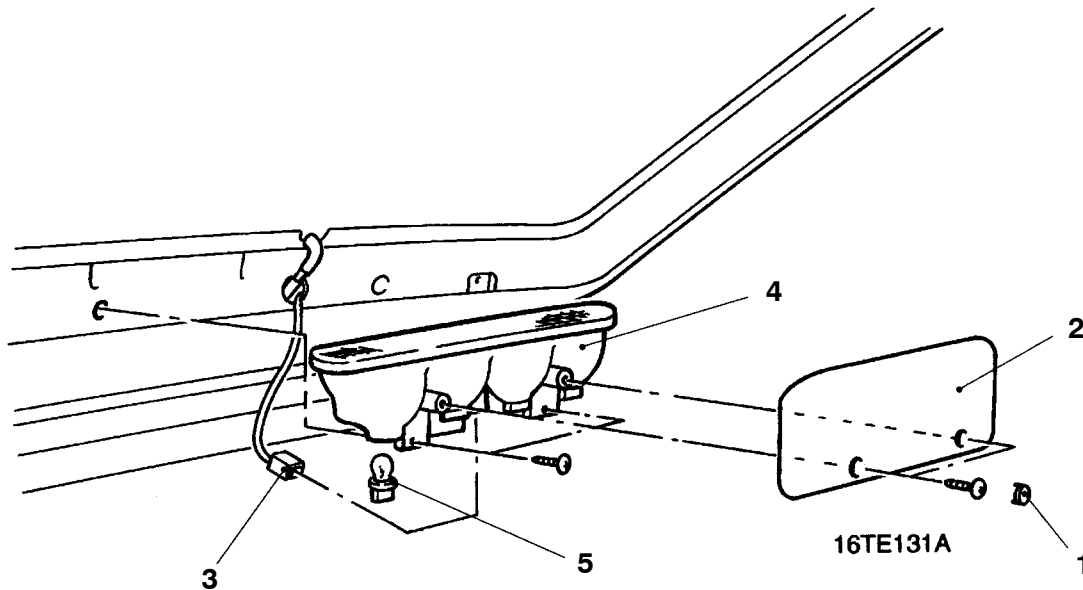
REMOVAL

1. Insert a clean flat blade screwdriver at the triangle marker position at one side of the lamp as shown in the illustration.
2. Push the screwdriver in until the retainer clip releases from the glass mounting clip and move the lamp toward the rear. Repeat this step at the other side of the lamp.
3. Disconnect the wiring connector and remove the lamp.

INSTALLATION

1. Connect the wiring connector and slide the lamp onto the glass mounting clip until the retaining clips lock on the glass mounting clips positively.

<WAGON>

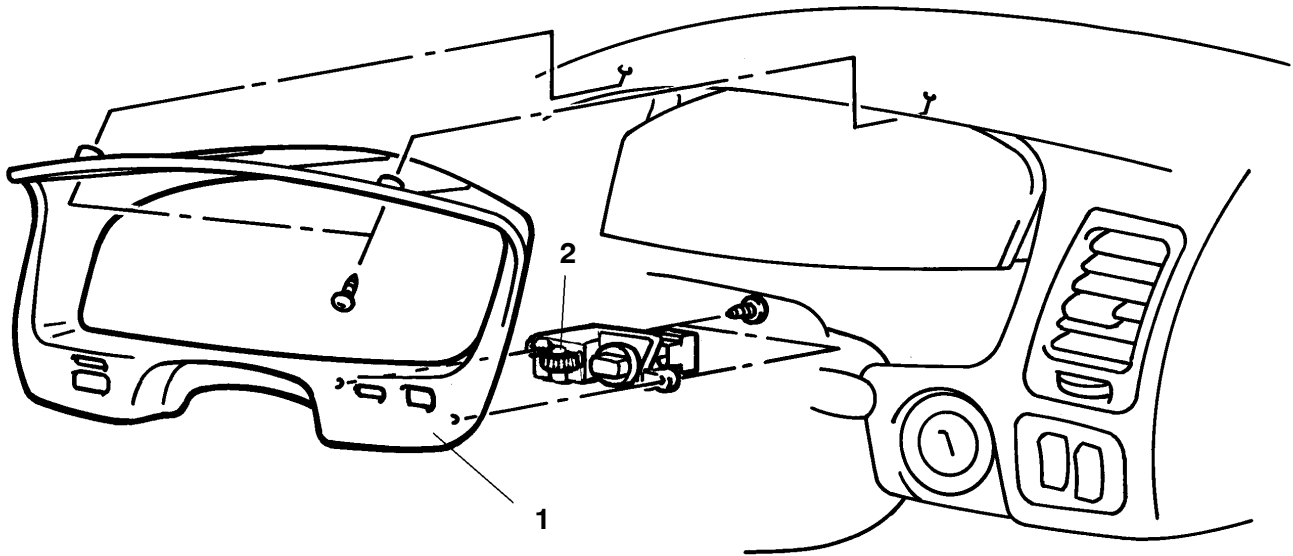


Removal steps

1. Plug
2. High mount stop lamp cover
3. Connector
4. High mount stop lamp
5. Bulb and socket assembly

RHEOSTAT

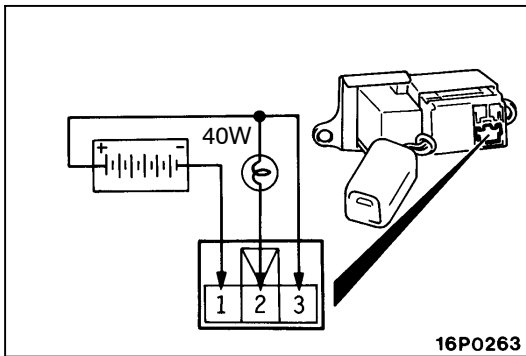
REMOVAL AND INSTALLATION



16TH181A

Removal steps

1. Meter bezel
2. Rheostat

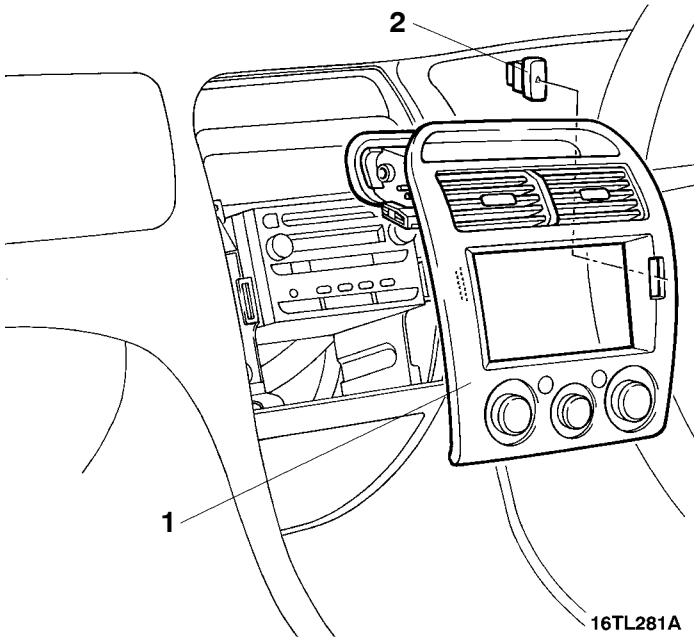


INSPECTION

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

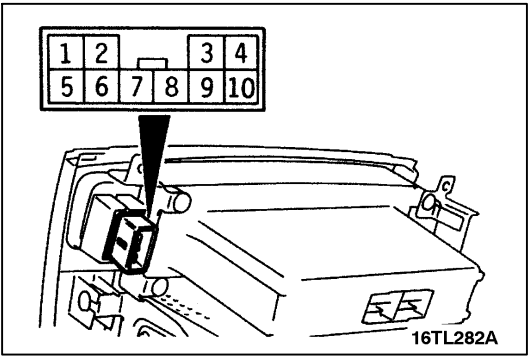
HAZARD WARNING LAMP SWITCH

REMOVAL AND INSTALLATION



Removal steps

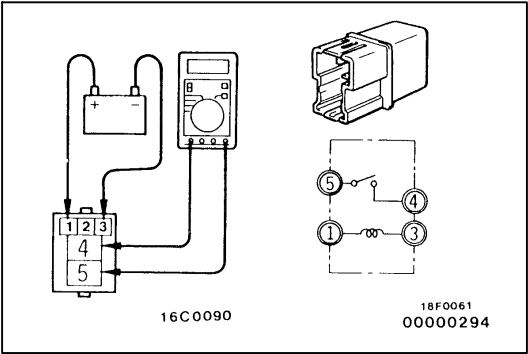
- Floor console assembly (Refer [Group 52A.](#))
- Centre air outlet assembly (Refer [Group 52A.](#))
- Storage box
- 1. Air conditioner control panel assembly
- 2. Hazard light switch



INSPECTION

HAZARD WARNING LAMP SWITCH CONTINUITY CHECK

Switch position	Terminal No.									
	1	2	3	4	5	6	7	8	9	10
OFF					○	—	○		○	ILL
ON	○	○	○	○	○	○			○	ILL



HORN

INSPECTION

HORN RELAY CONTINUITY CHECK

Battery voltage	Terminal No.			
	1	3	4	5
Power is not supplied	○ — ○			
Power is supplied	⊕ - - - - ⊖	○ — ○		

AUDIO UNIT

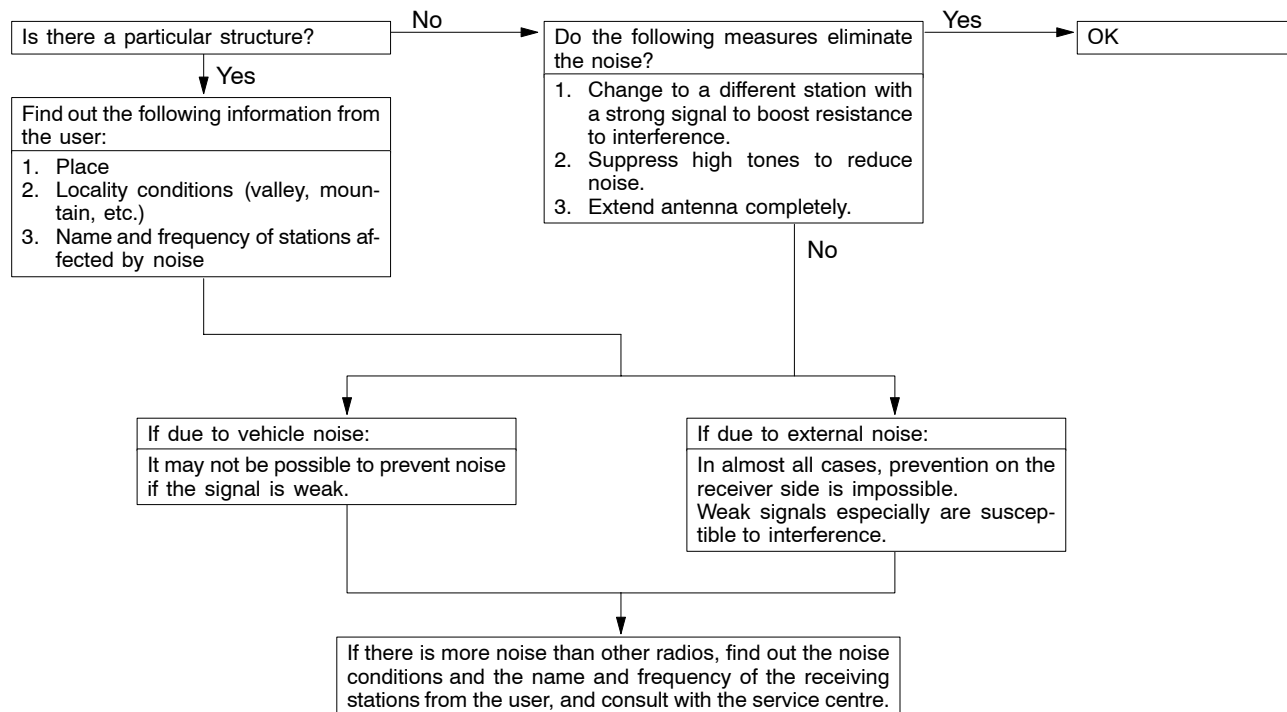
QUICK-REFERENCE TROUBLESHOOTING CHART

Items	Problem symptom and reference.	Relevant chart
Noise	Noise appears at certain places when travelling (AM).	A-1
	Noise appears at certain places when travelling (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 travelling	A-7
	Noise sometimes appears on FM during travelling.	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
CD player	CD will not be accepted.	C-1
	No sound.	C-2
	CD sound skips.	C-3
	Sound quality is poor.	C-4
	CD will not be ejected.	C-5
	No sound from one channel.	C-6
Motor antenna	Motor antenna won't extend or retract.	D-1
	Motor antenna extends and retracts but does not receive.	D-2

CHART

A. NOISE

A-1 Noise appears at certain places when travelling (AM).



A-2 Noise appears at certain places when travelling (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.
- Extend antenna completely.

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 centre.

NOTE

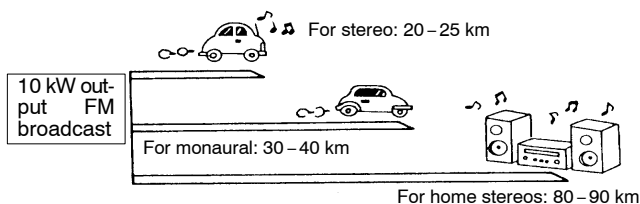
About FM waves:

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.

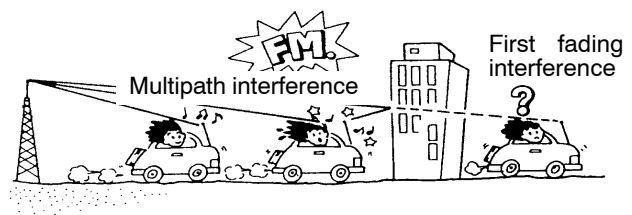
1. The signal becomes weak as the distance from the station's transmission antenna increases. Although this may vary according to the signal strength of the transmitting station and intervening geographical formation or buildings, the area of good reception is approx. 20–25 km for stereo reception, and 30–40 km 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 travelling, 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

16A0663

FM Signal Characteristics and Signal Interference

16A0664

00000295

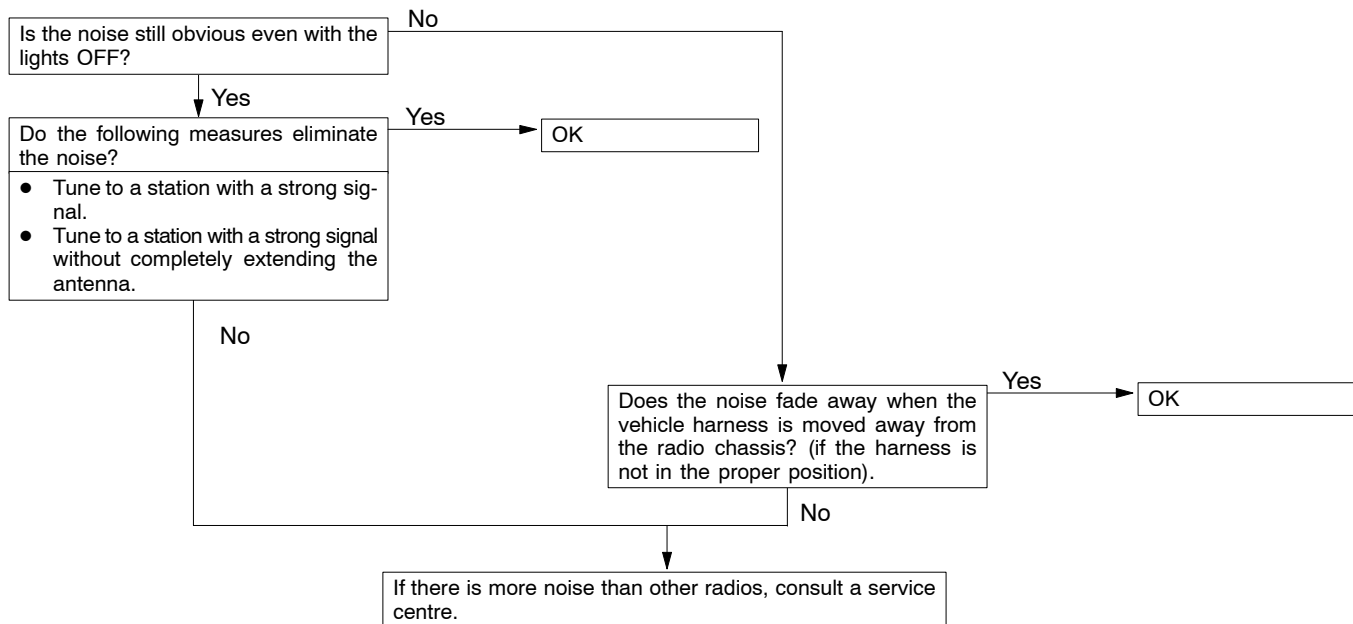
A-3 Mixed with noise, only at night (AM).

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 Broadcasts can be heard but both AM and FM have a lot of noise.

(1)

Noise occurs when the engine is stopped.

Yes

Do the following measures eliminate the noise?

- Tune to a station with a strong signal.
- Extend the antenna completely.
- Adjust the sound quality to suppress high tones.

Yes

OK

No

Is the radio body ground mounted securely?

No

Securely tighten the nuts for the body ground.

Yes

Is the antenna plug properly connected to the radio?

No

Correctly attach the antenna plug.

Yes

Is the antenna itself in good condition or is it properly mounted?

No

Clean the antenna plug and ground wire mounting area. Mount the antenna securely. On a vehicle with a motor antenna, check the antenna itself.

Yes

Is the noise eliminated?

Yes

OK

No

If there is more noise than other radios, consult a service centre.

(2)

Noise occurs when the engine is running.

Inspect the vehicle's noise suppressor.

NOTE

About noise encountered during FM reception only. 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 distortion generated by typical noise interference (first fading and multi-path).

<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.

Were conditions such as the following present when noise was received?

- Lightning was flashing. A motorcycle was passing.
- A vehicle passed close by, but it appeared to be a vehicle generating a particularly large amount of noise radiation.
- Passed beneath a power line. Passed under a bridge
- Passed beneath a telephone line.
- Passed close by a signal generator.
- Passed close by some other source of electrical noise.

Yes

No

Continue to check for static; when static is detected, check for the conditions listed above.

Yes

No

If the problem is particularly worse than other radios, consult a service centre.

Noise prevention on the radio side is difficult. If the problem is particularly worse than other radios, consult a service centre.

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 distur-

tion generated by typical noise interference (**first fading and multipath**). <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)	
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. 	Ground cable	Check or replace the ground cable.
			Noise capacitor	Check or replace the noise capacitor.
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.	Ground 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 grounded.	

Caution

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

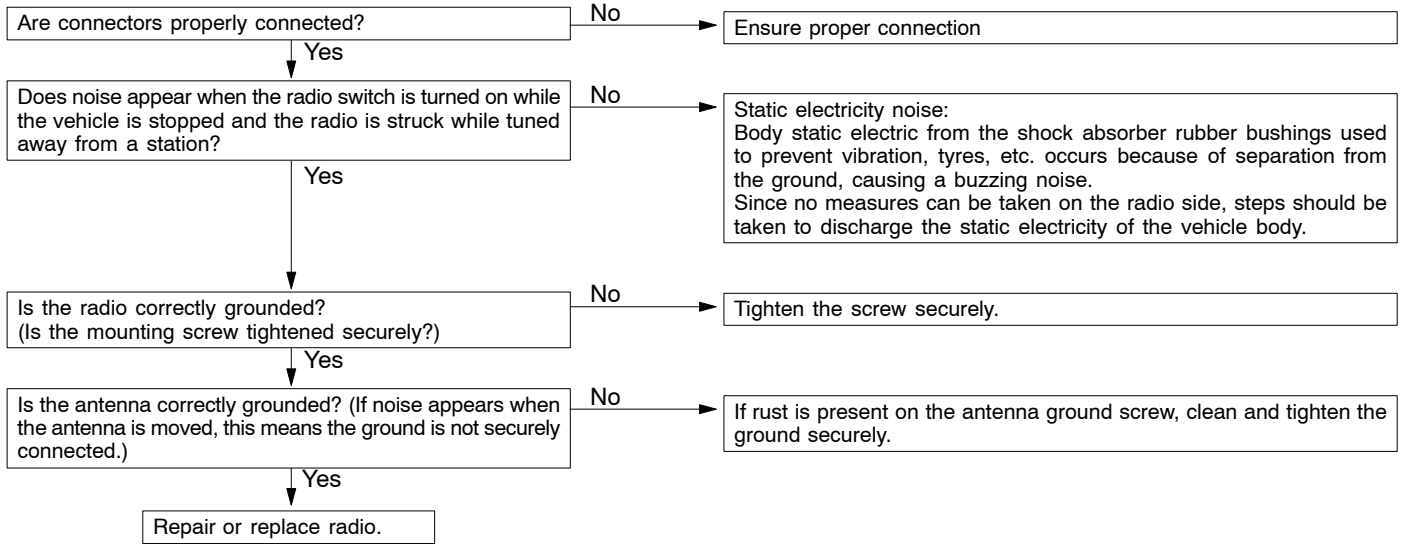
NOTE

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

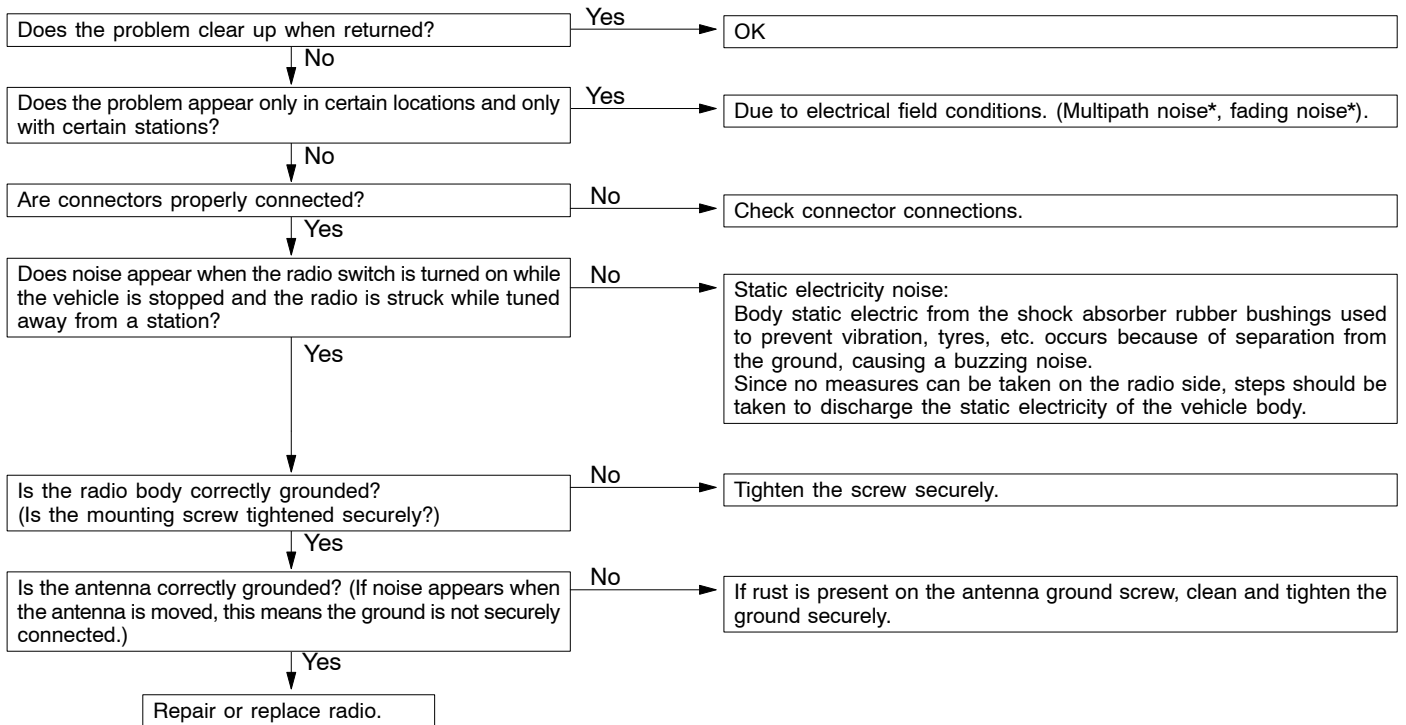
against A.C.) decreases, and current flow is facilitated. A noise suppressing condenser which takes advantage of this property is inserted between the power line for the noise source and the ground. This suppresses noise by grounding the noise component (A.C. or pulse signal) to the body of the vehicle.

2. 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.

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



A-8 Noise sometimes appears on FM during travelling.



* 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

obstruction 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.

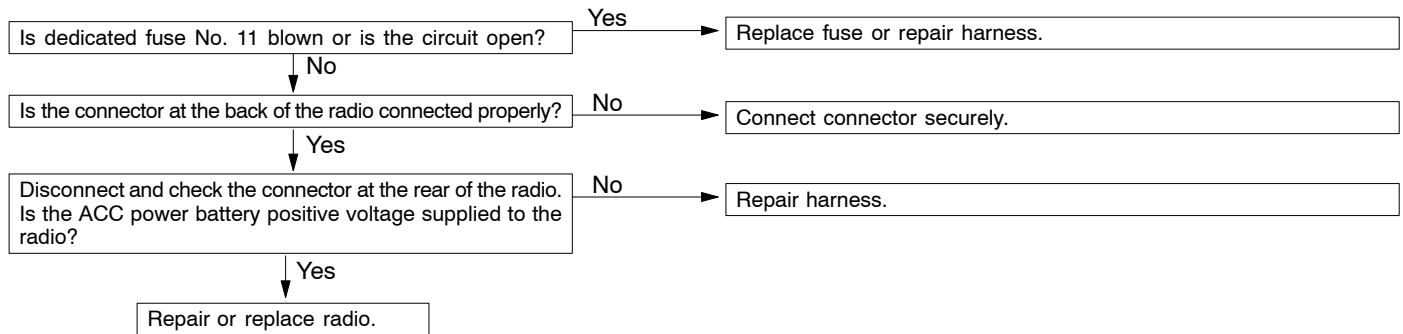
Noise is often created by the following factors, and often the radio is OK when it is checked individually.

- Travelling conditions of the vehicle
- Terrain of area travelled through
- Surrounding buildings
- Signal conditions
- Time period

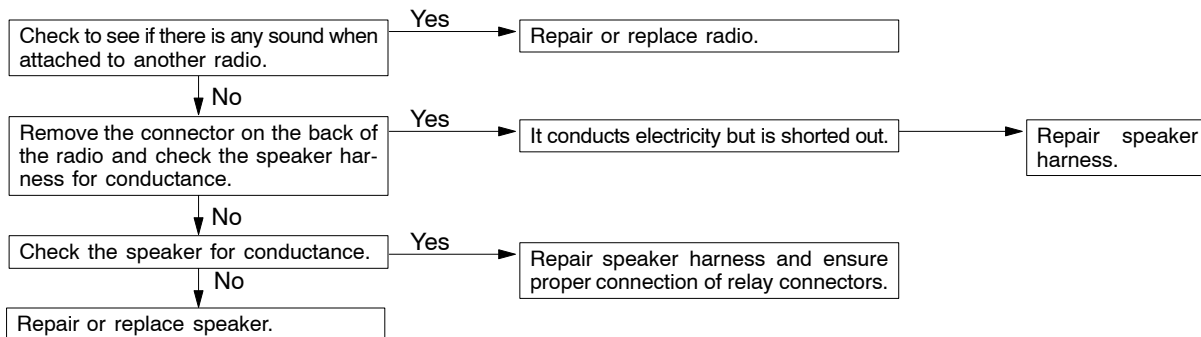
For this reason, if there are still problems with noise even after the measures described in steps A-1 to A-8 have been taken, get information on the factors listed above as well as determining whether the problem occurs with AM or FM, the station names, frequencies, etc., and contact a service centre.

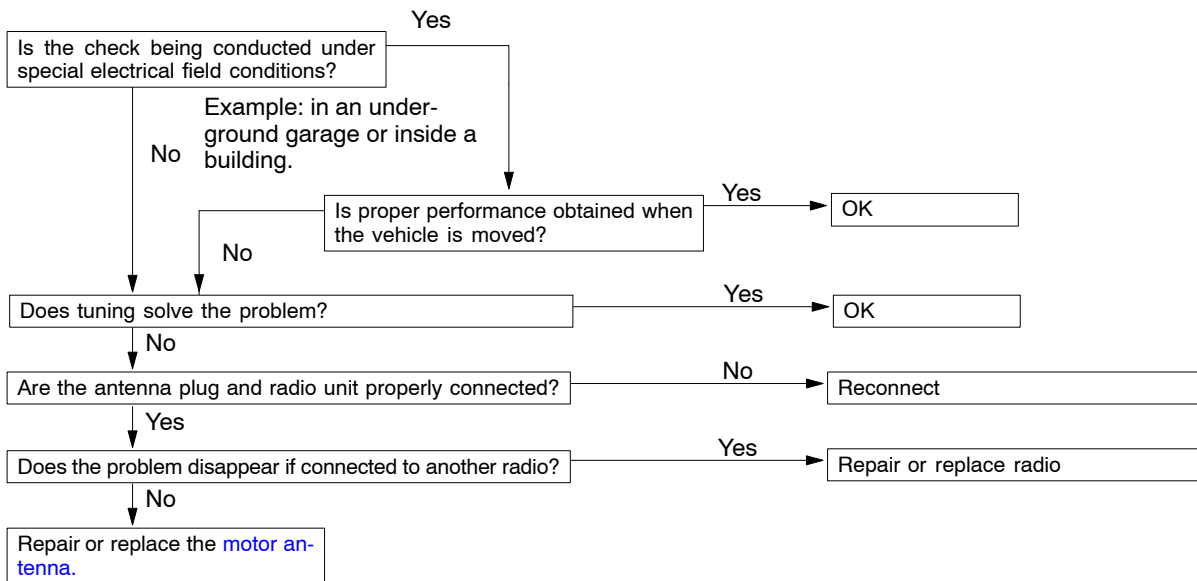
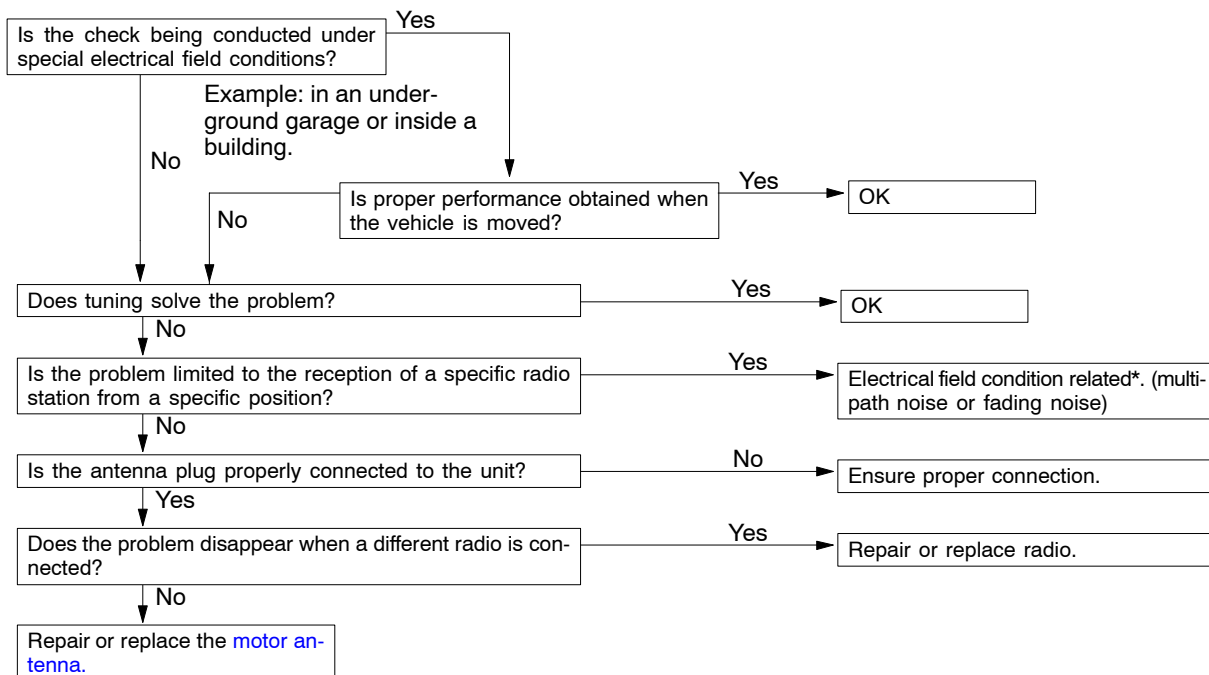
B. RADIO

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 Insufficient sensitivity.**

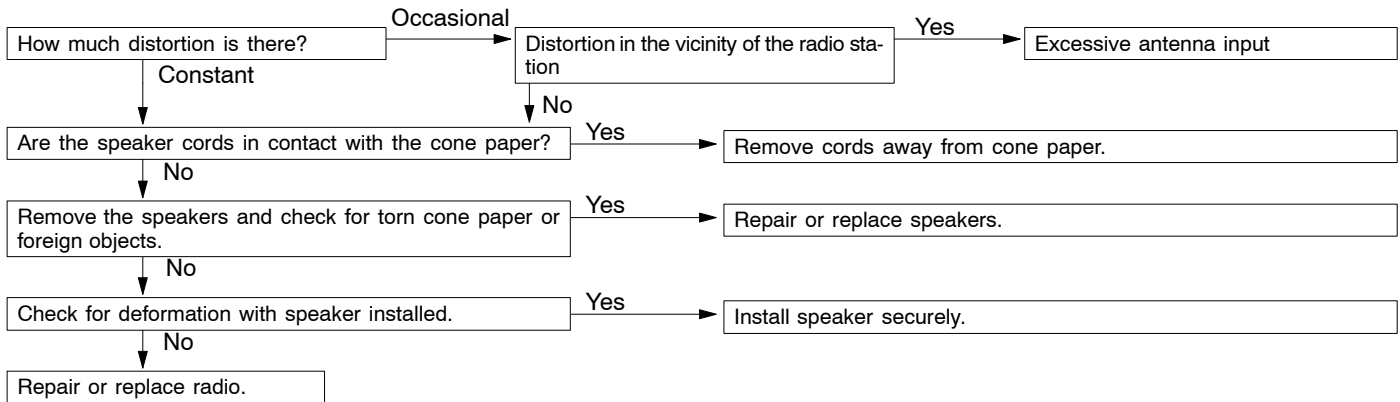
* About multipath noise and fading noise
Because the frequency of FM waves is extremely high, it is highly susceptible to effects from geological formations and buildings. These effects disrupt the broadcast signal and obstruct reception in several ways.

- Multipath noise
This describes the echo that occurs when the broadcast signal is reflected by a large

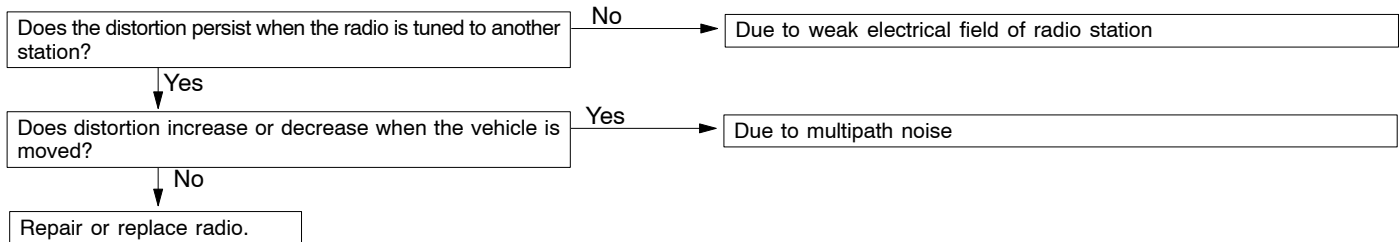
obstruction and enters the receiver with a slight time delay relative to the direct signal (repetitious buzzing).

- 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.

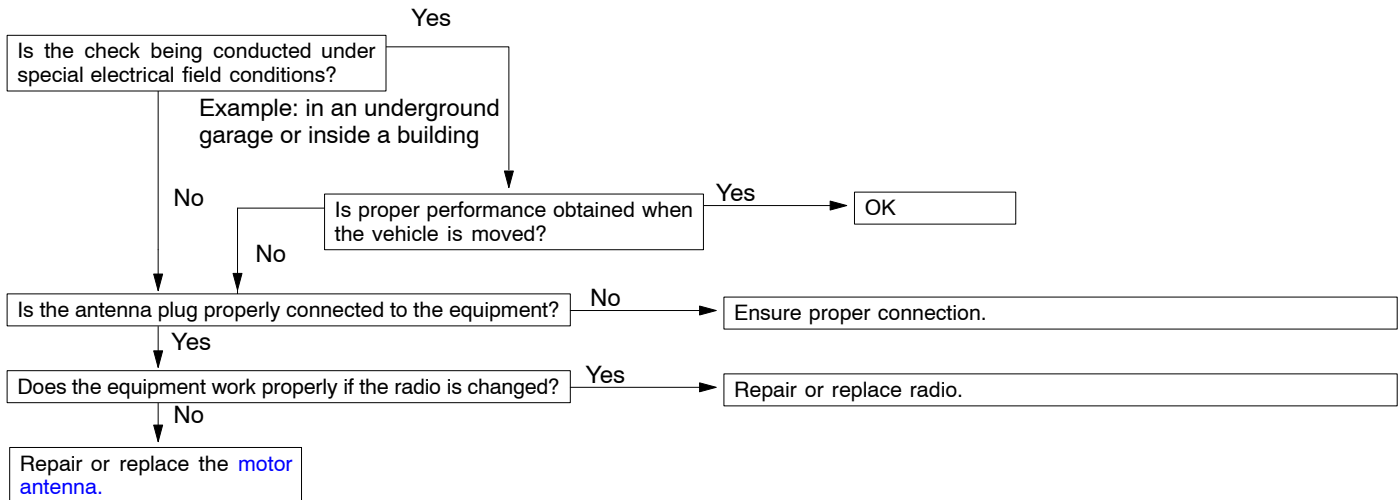
B-5 Distortion on AM or on both AM and FM.



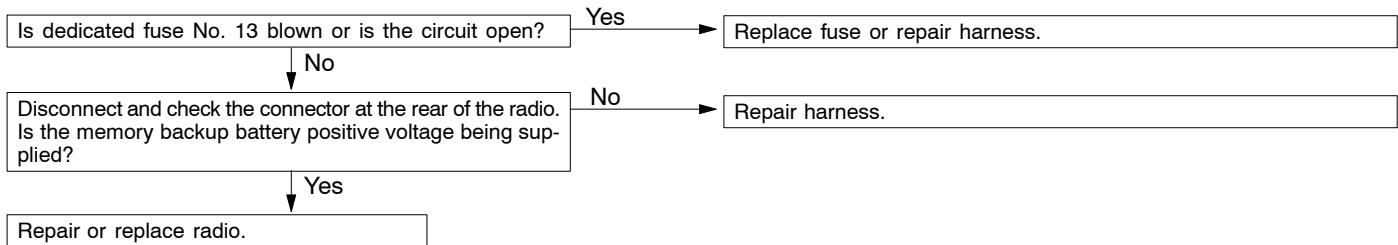
B-6 Distortion on FM only



B-7 Too few automatic select stations.

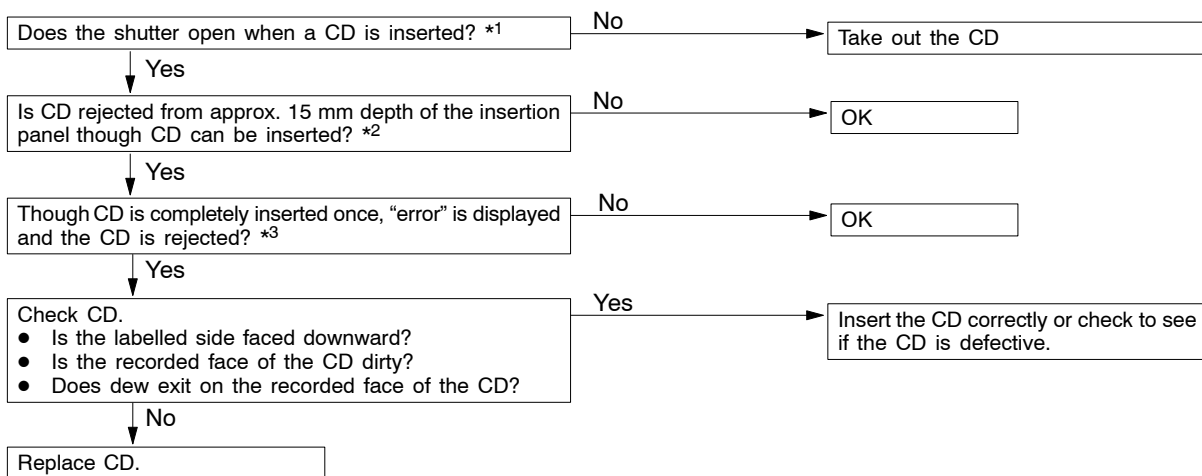


B-8 Insufficient memory (preset stations are erased).



C. CD PLAYER

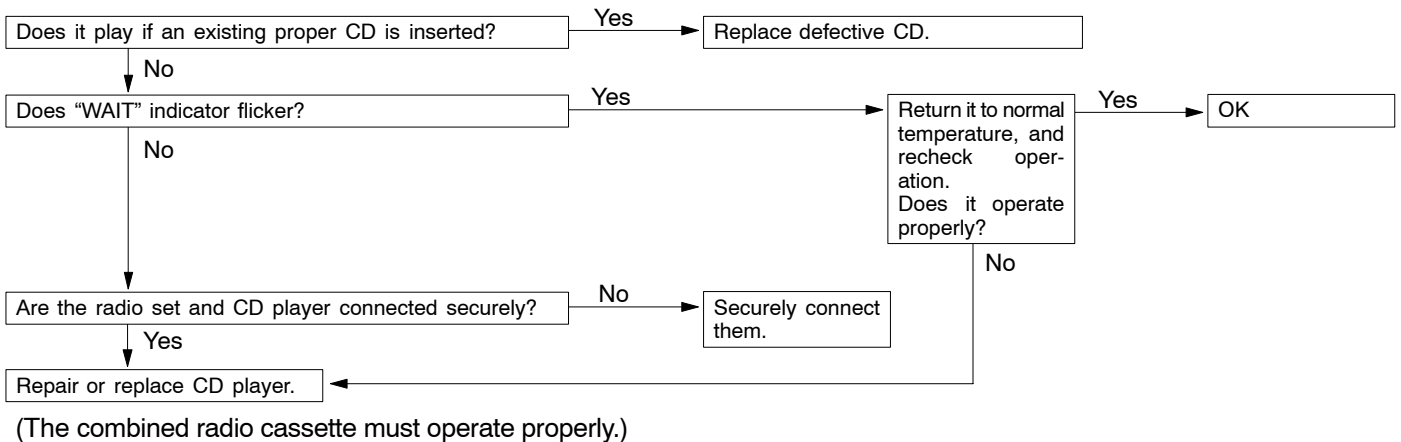
C-1 CD will not be accepted.



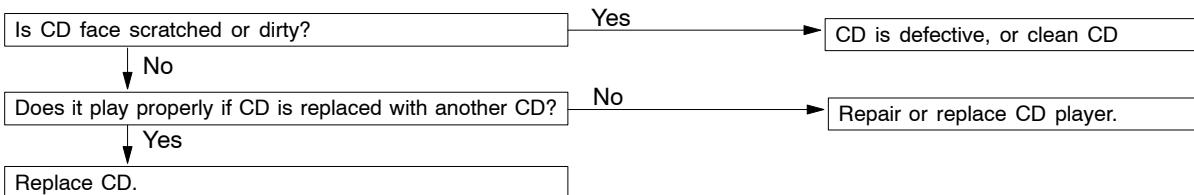
*1 If the CD is already loaded, doesn't the shutter open to allow insertion when another CD is inserted?

*2 If the key switch is not at ACC or ON, the CD stops at depth of 15 mm below the panel surface even when it is inserted, and it will be rejected when pushed farther?

*3 Even though the CD is loaded, E (error) is sometimes displayed with the CD rejected because of vibration/shock or dew on the CD face or optical lens.

C-2 No sound.

C-3 CD sound skips.

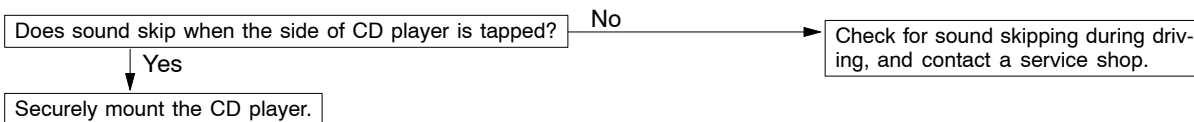
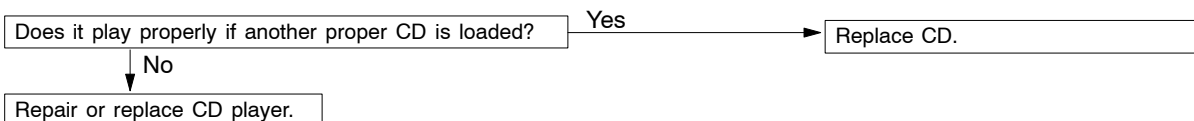
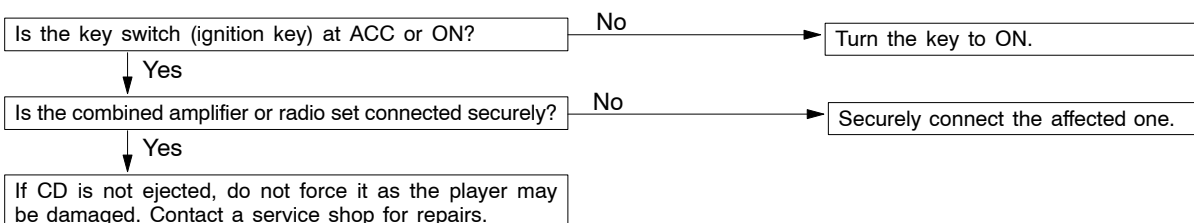
1. Sound sometimes skips during parking.



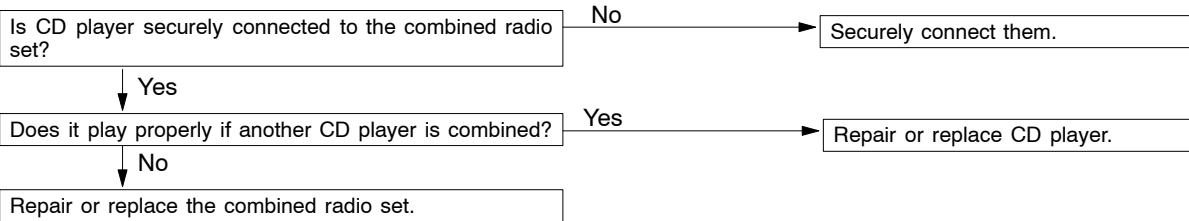
2. Sound sometimes skips during driving.

(Stop vehicle, and check it.)

(Check it by using a CD which is free of scratch, dirt or other abnormality.)


C-4 Sound quality is poor

C-5 CD will not be ejected.


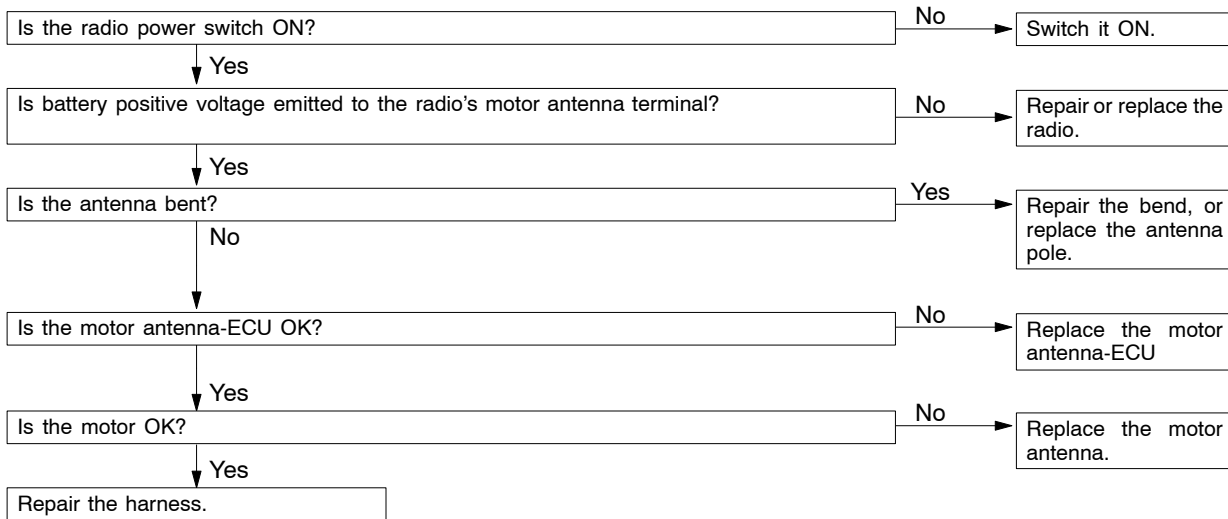
C-6 No sound from one speaker.



D. MOTOR ANTENNA

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

Clean and polish the surface of the antenna rod.



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

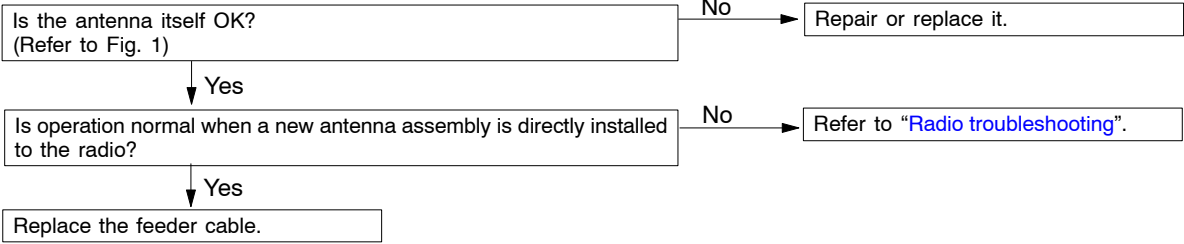
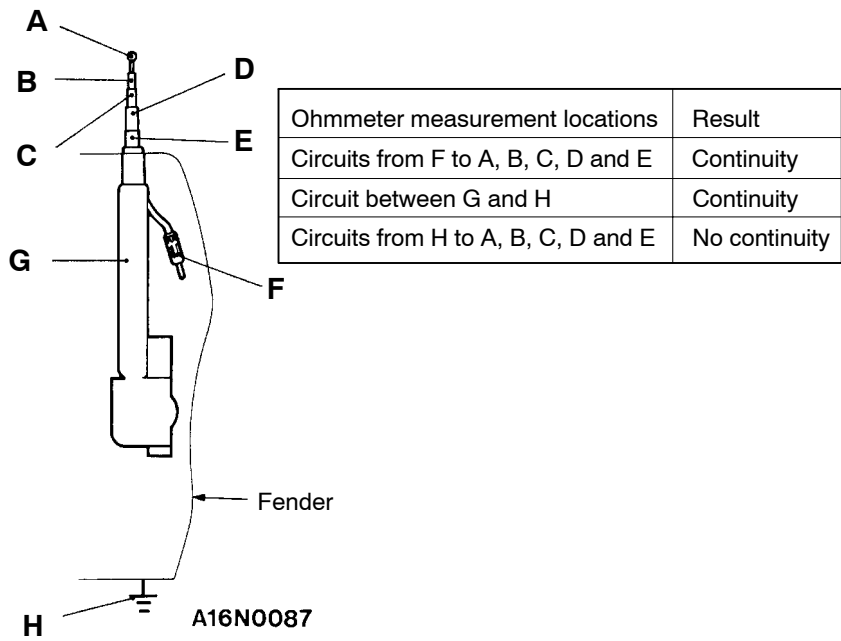
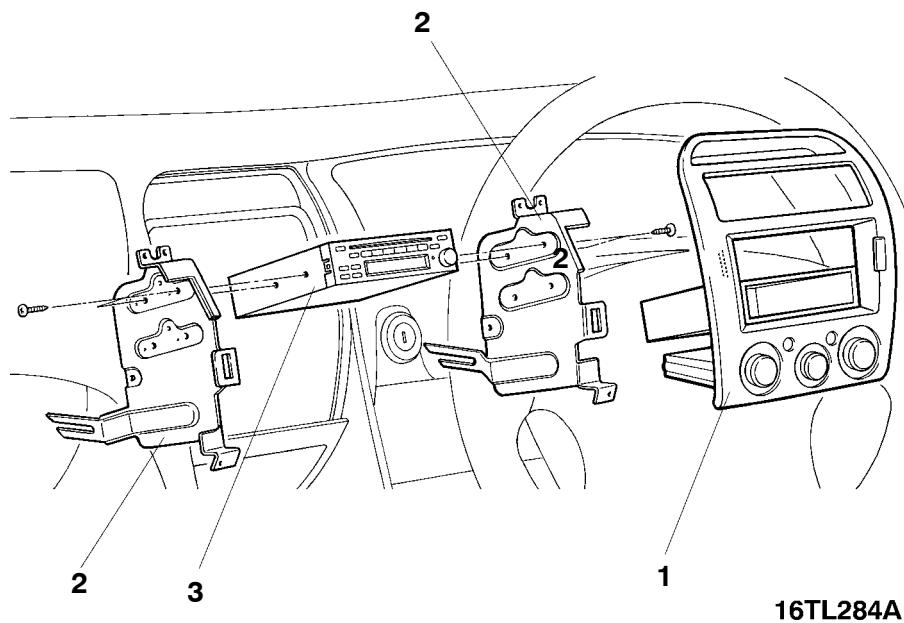
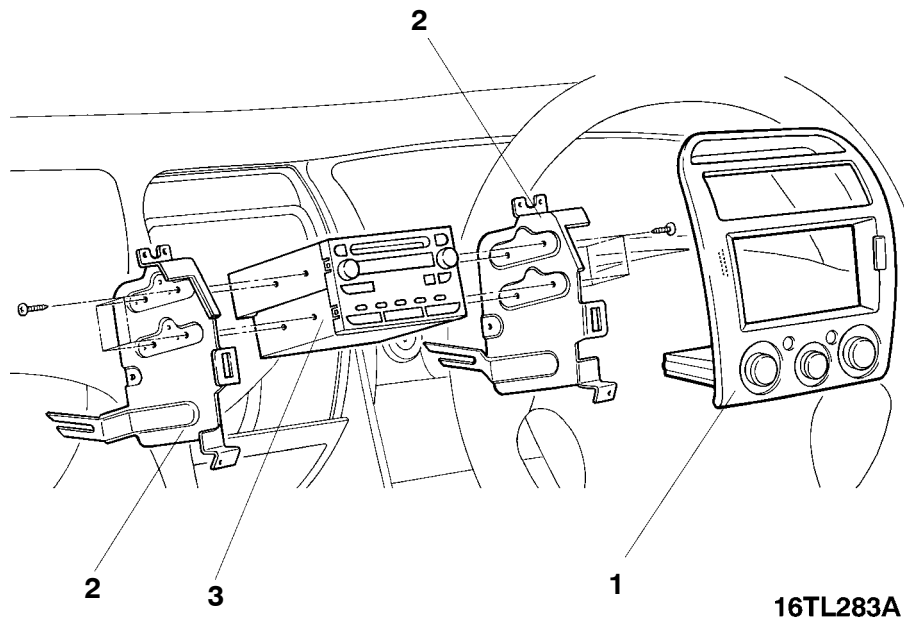


Fig. 1



AUDIO UNIT**REMOVAL AND INSTALLATION****Type 1****Type 2****Removal steps**

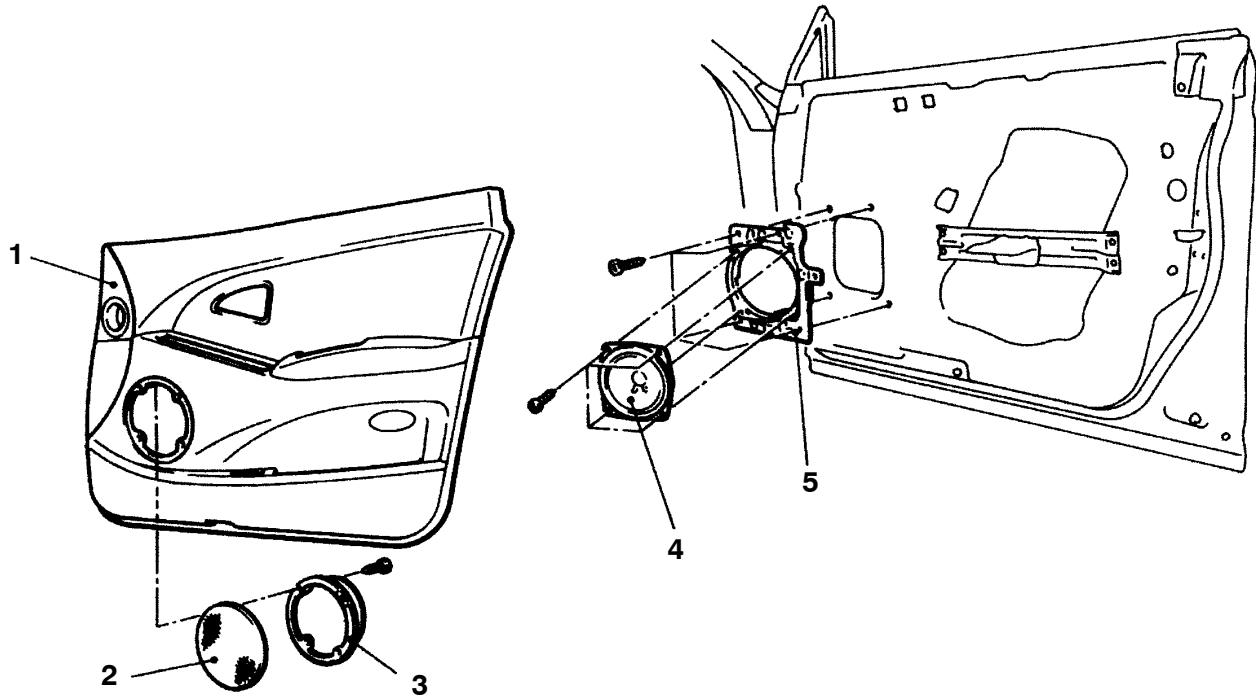
- Floor console assembly (Refer [Group 52A.](#))
- Centre air outlet assembly (Refer [Group 52A.](#))
- Storage box

1. Air conditioner control panel assembly
2. Radio bracket
3. Audio unit (Type 1)
Audio unit (Type 2)

SPEAKERS

REMOVAL AND INSTALLATION

<Door speaker>



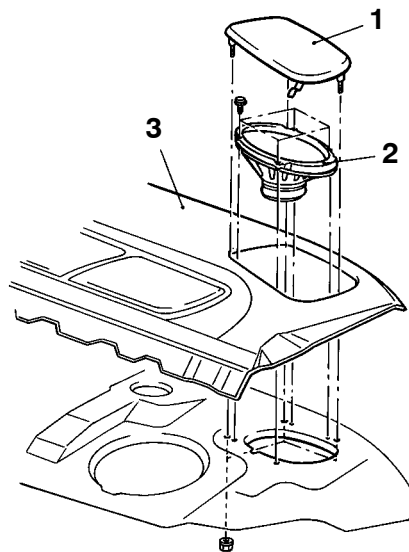
16P0279

Door speaker removal steps

1. Door trim (Refer to [Group 42.](#))
2. Speaker mesh

3. Speaker cover
4. Speaker
5. Speaker base

<Rear speaker>

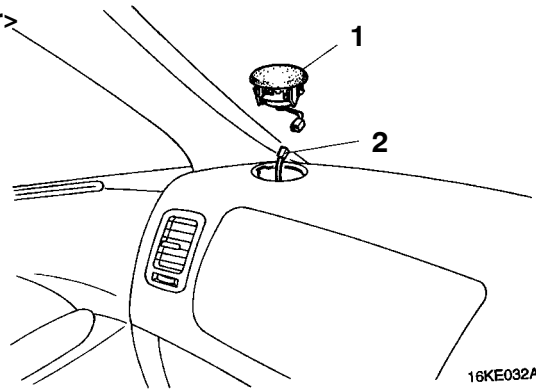


16TE002A

Rear speaker removal steps

1. Speaker mesh
2. Speaker
- Rear seat cushion (Refer [Group 52A.](#))
3. Rear shelf trim (Refer [Group 52A.](#))

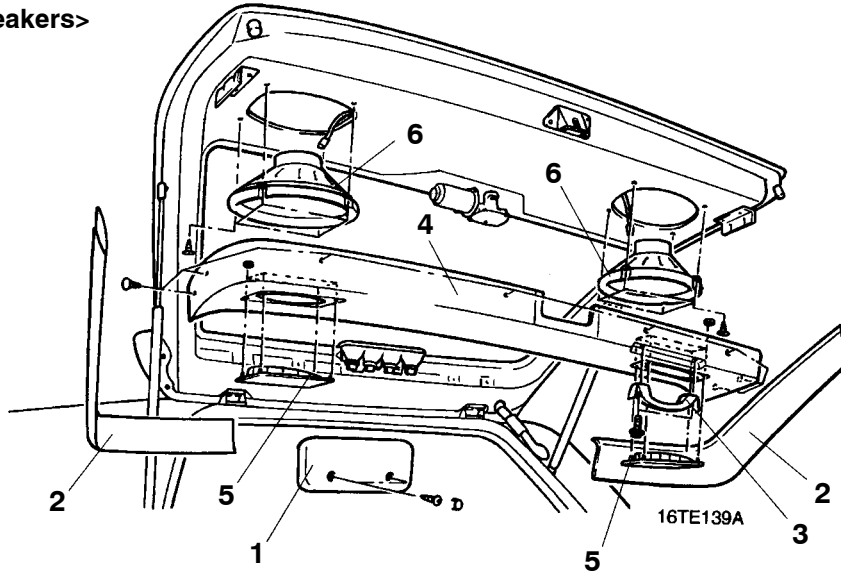
<Instrument panel speaker>



Instrument Panel speaker removal steps

1. Speaker
2. Connector

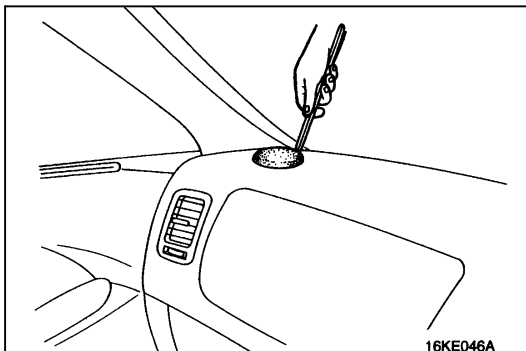
<Tailgate speakers>



Tailgate speaker removal steps

1. High mount stop lamp cover
2. Tailgate side trim
3. Grab handle

4. Tailgate lower trim
5. Speaker mesh
6. Speaker



REMOVAL SERVICE POINTS

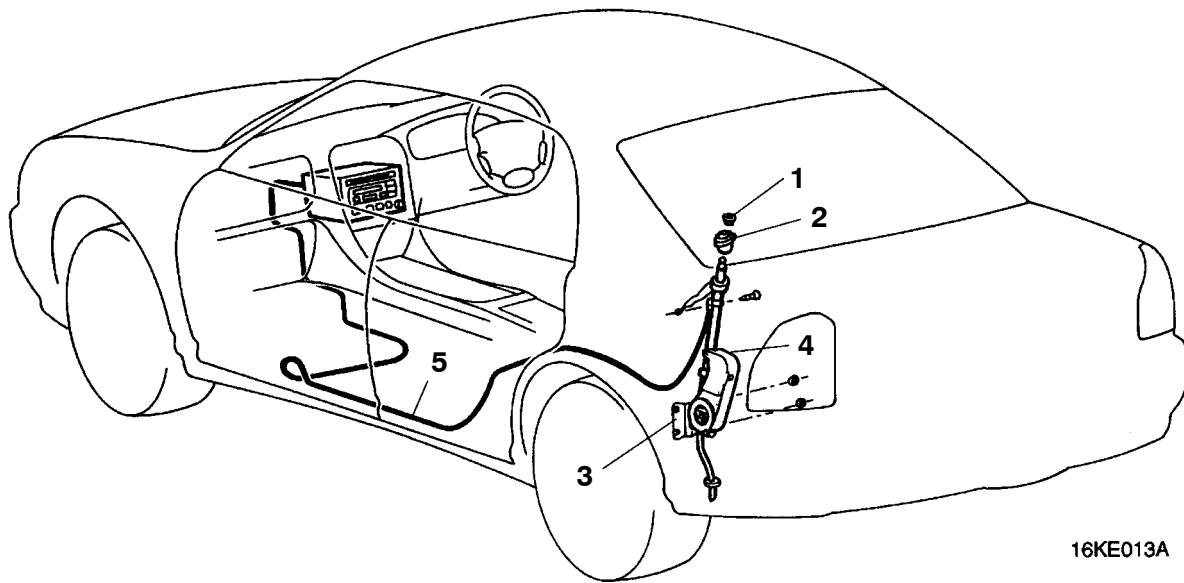
◀A▶ SPEAKER

1. Insert a nylon stick between the instrument panel and the speaker and prise the speaker out taking extra care not to damage the instrument panel.

ANTENNA

REMOVAL AND INSTALLATION

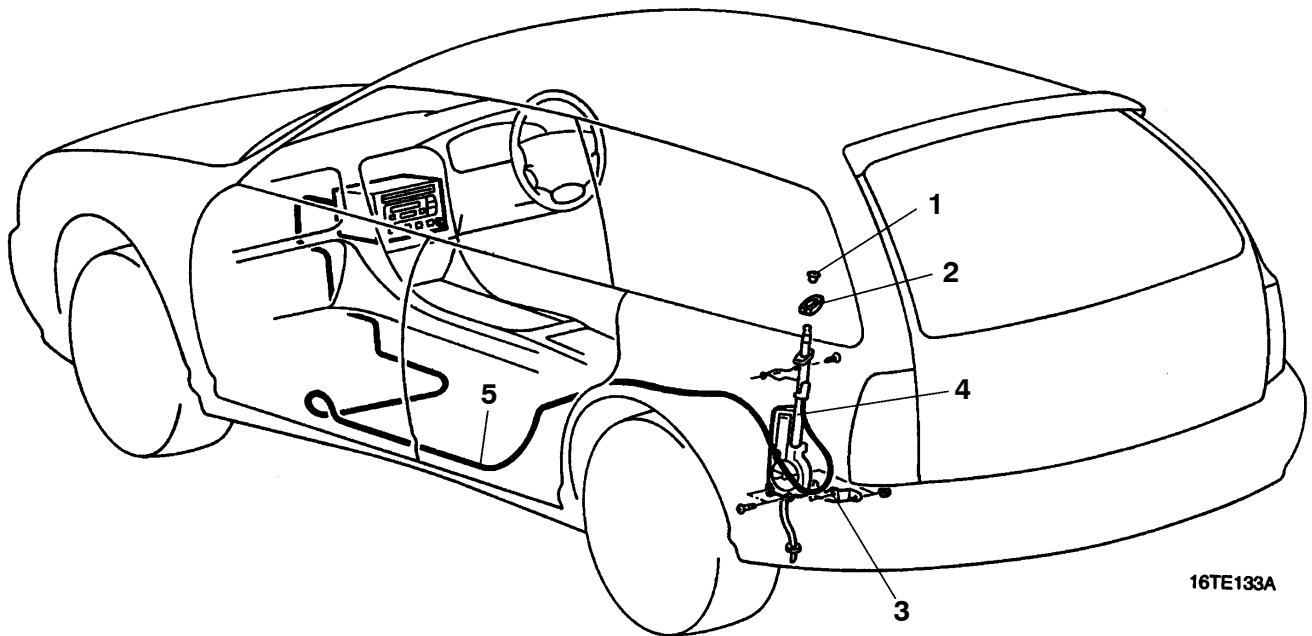
<SEDAN>



16KE013A

- Front scuff plate (LH)
(Refer [Group 52A.](#))
- Rear scuff plate (LH)
(Refer [Group 52A.](#))
- Rear seat assembly (Refer [Group 52A.](#))
- Rear pillar trim (LH)
(Refer [Group 52A.](#))
- Trunk side trim (LH)
(Refer [Group 52A.](#))
- 1. Ring nut
- 2. Base
- 3. Antenna bracket
- 4. Antenna assembly
- 5. Antenna feeder cable

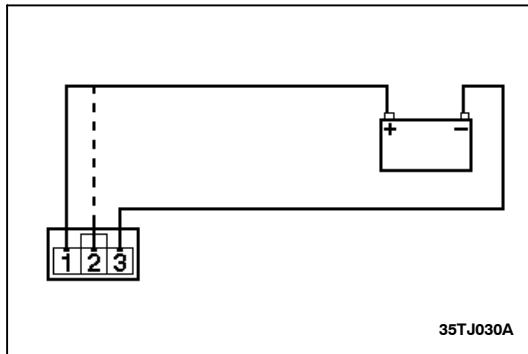
<WAGON>



- Front scuff plate (LH) (Refer [Group 52A.](#))
- Rear scuff plate (LH) (Refer [Group 52A.](#))
- Cargo compartment lower side trim (LH) (Refer [Group 52A.](#))
- Rear seat (Refer [Group 52A.](#))

1. Ring nut
2. Base
3. Antenna bracket
4. Antenna assembly
5. Antenna feeder cable

ANTENNA



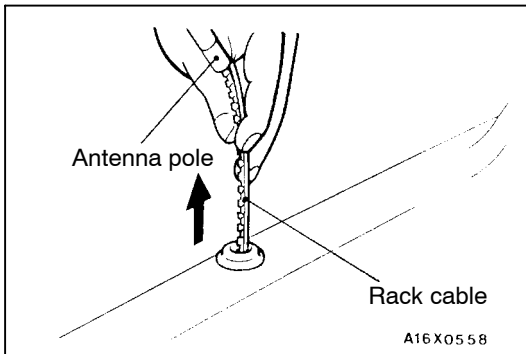
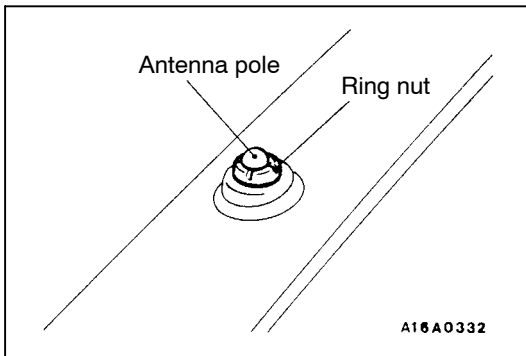
INSPECTION

ANTENNA MOTOR

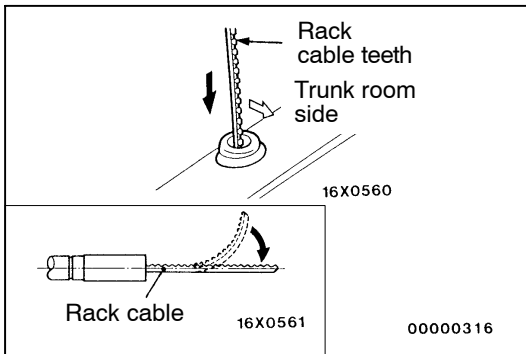
1. To test the antenna, connect the antenna motor connector (G-44) to a battery (as per illustration), terminal/pin 1 to battery positive (12 volt) and terminal/pin 3 to battery negative.
2. Connect terminal /pin 2 to battery positive. Verify that the antenna rises to the full position.
3. Dis-connect the battery positive wire from terminal/pin 2 and verify that the antenna descends all the way to the fully down position.

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.

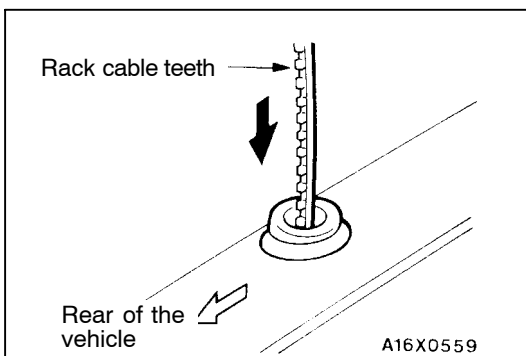


3. Draw out the antenna pole to the maximum extension.

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 trunk room side.



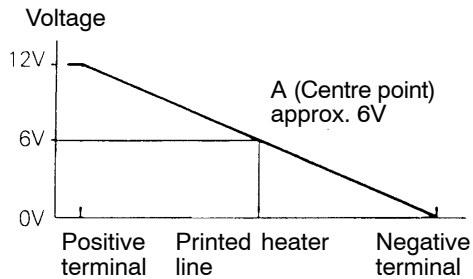
5. Turn the rack cable teeth towards the rear of the vehicle (right 90°) so that the rack cable meshes with the motor gear.
6. If the rack cable pulls out with no resistance when it is lightly pulled, then the cable is not meshed with the motor gear, so check that there are no bends in the end of the rack cable, and then repeat steps (4) and (5) 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 ON-VEHICLE SERVICE

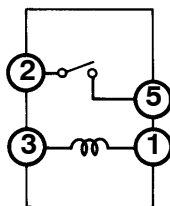
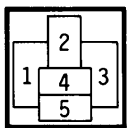
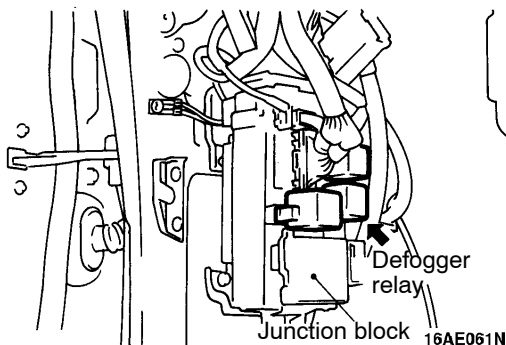
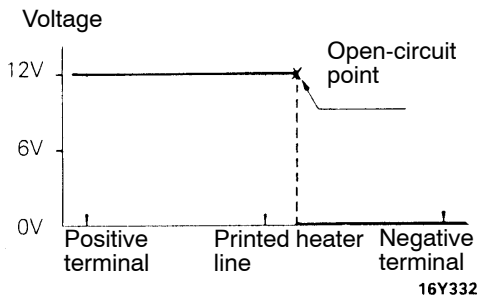
PRINTED-HEATER LINE CHECK

1. Run engine at 2,000 rpm. Check heater element with battery at full charge.
2. Turn ON rear window defogger switch. Measure heater element voltage with voltmeter at rear window glass centre A. Condition good if about 6V.
3. If battery positive voltage 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 (0V).
4. If 0V is indicated at A, there is a break in the positive terminals from A. Defect where the voltage changes suddenly (battery positive voltage) with the same method described.

Normal characteristic curve



Abnormal characteristic curve



20Z0002
16AE072N

DEFOGGER RELAY CONTINUITY CHECK

Battery voltage	Terminal No.			
	1	3	4	5
Power is not supplied	○	○		
Power is supplied	⊕ - - - ⊖		○	○

STEERING REMOTE CONTROL AND SLIP RING

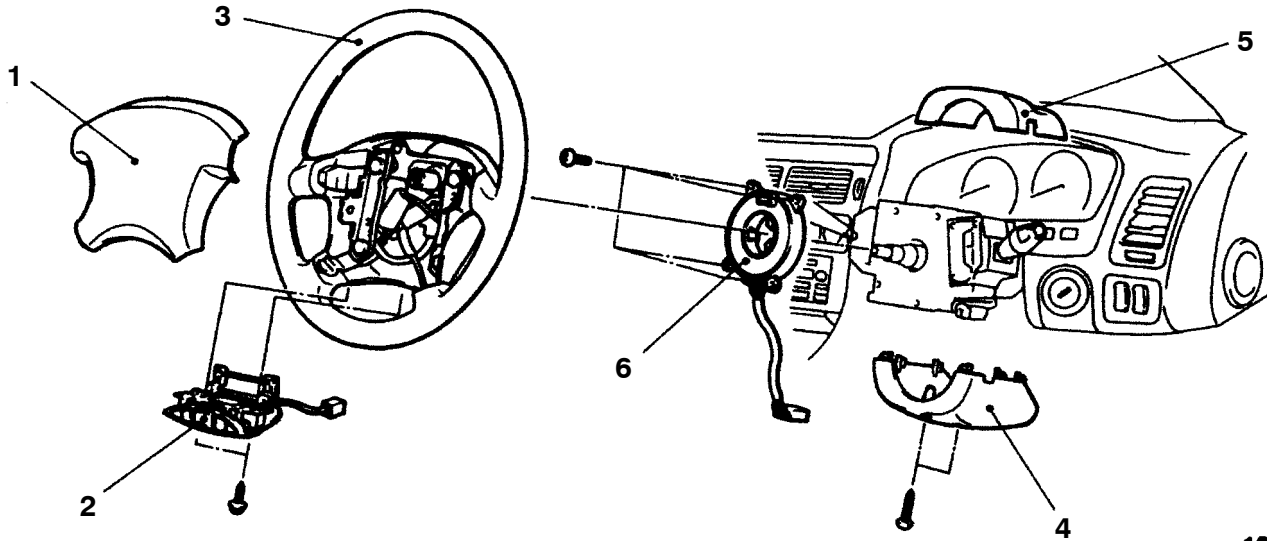
REMOVAL AND INSTALLATION

CAUTION: SRS

Before removal of air bag module and clock spring, refer to the followings:

[GROUP 52B – SRS Service Precautions](#)

[GROUP 52B – Air Bag Module and Clock Spring](#)

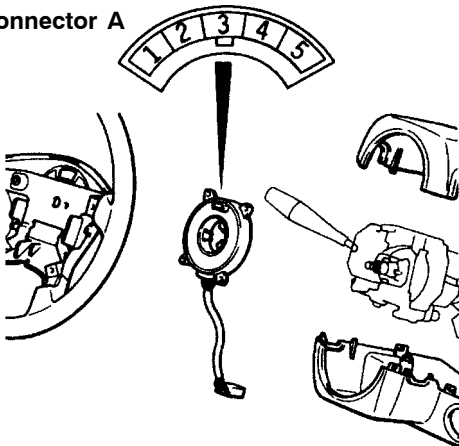


16P0257

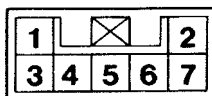
1. Horn pad / Airbag module
(refer [group 52B.](#))
2. Steering wheel remote control
3. Steering wheel
(refer [group 37A.](#))

4. Lower column cover
5. Upper column cover
6. Slip ring

Connector A



Connector B



03X0060

INSPECTION

SLIP RING CONTINUITY

Switch position	Terminal No.									
	Connector A					Connector B				
Terminal in use	1	2	3	4	5	1	2	3	6	7
ACC power supply		○				○				
Ground					○					○
Cruise control				○					○	
Steering remote control			○					○		
Horn	○					○				

NOTE

Verify that when the steering wheel is turned there is continuity.

CLOCK SPRING <SRS VEHICLES>

Refer [group 52B.](#)