Body Electrical System

GENERAL

SPECIFICATIONS ETJA7010

MULTIFUNCTION SWITCH

Items	Specifications
Rated Voltage	DC 12 V
Operating temperature range	-30°C~ +80°C (-22~+176°F)
Rated load	
Dimmer & passing switch	High : 15 A (Lamp load) Low : 10 A (Lamp load) Passing : 15 A (Lamp load)
Lighting switch	Lighting : 1A (Relay load)
Turn signal switch & lane change	6.6 ± 0.5A (Lamp load)
Wiper & mist switch	Low, High : 4 A (Motor load) Int. : 0.22 ± 0.05 A (Relay load) Lock : Max. 23 A (Motor load) Mist : 4A (Motor load)
Washer switch	4 A (Motor load)
Variable intermittent wiper volume switch	Max. 25 mA
Rear wiper&washer switch	Rear wiper : 0.2A (Relay load) Rear washer : 4A(Motor load)
Horn switch	0.2A (Relay load)

INSTRUMENTS AND WARNING SYSTEM

Warning lamps	Bulb wattage (W)	Color
Illumination	3.4	Beige
High beam	1.4	Blue
Low fuel	1.4	Amber
Turn signal (LH, RH)	1.4	Green
Battery (charge)	1.4	Red
Oil pressure	1.4	Red
Air bag	1.4	Red
Parking brake	1.4	Red
Seat belt	1.4	Red
Check engine	1.4	Amber

Warning lamps		Bulb wattage (W)	Color
ABS		1.4	Amber
Door ajar		1.4	Red
Tailgate open		1.4	Amber
Cruise		1.4	Green
TCS		1.4	Amber
Water separator (for DSL)		1.4	Red
Vacuum brake (for DSL)		1.4	Red
Glow (for DSL)		1.4	Amber
A/T	**P**	1.4	Green
	R	1.4	Amber
	N	1.4	Green
	D	1.4	Green
	4	1.4	Green
	3	1.4	Green
	2	1.4	Green
	1	1.4	Green

SERVICE SPECIFICATIONS ETJA7050

INDICATORS AND GAUGES

Speedometer

Type

o Cross - coil type.

Input spec.

o Hall IC type : 4 pulses/rev.

Indication

o Km/h : 637 rpm x 4 pulses/rev. indicates 60 Km/h

o MPH : 1026 rpm x 4 pulses/rev. indicates 60 MPH

Standard values

Velocity (Km/ h)	20	40	60	80	100	120
Tolerance (Km/ h)	20-24.1	40-43	60-64.1	80-85.2	100-105.2	120.5-126.3
Tolerance (Km/ h)	20.8-25.4	40-44	60.8-65.4	81.4-86.8	102.6-108.2	123.5-129.6

Velocity (Km/ h)	140	160	180	200	Remarks
Tolerance (Km/ h)	140.5-146.7	160.5-167.5	181-188.4	201-209.1	EXCEPT EEC & GENERAL
Tolerance (Km/ h)	144.4-151	165.4-172.4	186.3-193.8	207.2-215.2	EEC, GENERAL

Velocity (MPH)	10	20	40	60	80	100
Tolerance (MPH)	10-12.5	20-22	40-42.6	60-63.4	80.3-84.1	100.3-104.7
Tolerance (MPH)	8.5-11.5	18.5-21.5	38.5-41.5	58.3-61.7	78-82	97.7-102.3

Velocity (MPH)	120	Remarks
Tolerance (MPH)	120.3-125.3	EXCEPT USA
Tolerance (MPH)	117.5-122.5	USA

o Tap the speedometer to prevent hysterisis effects during inspection.

Tachometer

Type

o Cross - coil type. (4 cyl: 2pulses/ rev, 4 cyl: 4pulses/ rev, 6 cyl: 3pulses/ rev)

Standard values

Revolution(RPM)	1000	2,000	3,000	4,000	5,000	6,000	7,000
Tolerance(RPM)	±100	±125	±150	±150	±150	±180	±210

o Tap the speedometer to prevent hysterisis effects during inspection.

Fuel gauge

Type

o Cross - coil type (Fixed point type : Pointer should not fall into the "E" point but indicate remaining fuel level when the ignition is off.)

Standard values

Level	Gauge Resistance (Ω)	Tolerance assembled with fuel sender (°)
E (Empty)	100	-40 ± 2.5
1/2	55	0 ± 5.0
F (Full)	10	40 ± 2.5

o Inspection order : E → F → E

The level must be reached within 7 minutes after the resistance is set for Full or Empty.

o Point stabilty tolerance : Within 7°

Apply the power for 10 minutes. Then turn off the power for 30 minutes and read the position of the pointer.

<table>
<tr><th>Items</th><th>Specifications</th></tr>
<tr><td>Temperature gauge
Type
Indication standard</td><td>o Cross - coil type (Intermedia stability type).
<table>
<tr><th>Temperature</th><th>Angle (°)</th><th>Assembled tolerance (°)</th></tr>
<tr><td>60°C</td><td>-40</td><td>-</td></tr>
<tr><td>85°C~110°C</td><td>-7^{+2}_{-3}</td><td>$^{+3}_{-2}$</td></tr>
<tr><td>Red zone (over 127.4°C)</td><td>over 35±5</td><td>$^{+7}_{-4}$</td></tr>
</table>
o Inspection order : OFF→C→H</td></tr>
<tr><td>Resistance of temperature sender (NTC)</td><td>
<table>
<tr><td>Temperature (°C)</td><td>60</td><td>85</td><td>110</td><td>127.4</td></tr>
<tr><td>Resistance (Ω)</td><td>118</td><td>49</td><td>25</td><td>14.6</td></tr>
</table>
</td></tr>
</table>

ETJA310B

LIGHTING SYSTEM

Items		Bulb wattage(W)
Head lamp		60W / 55W (High / Low)
Front turn signal lamp		21W
Front position lamp		5W
Front fog lamp		55W
Rear combination lamps	Tail/stop lamp	5W / 21W
	Back up lamp	21W
	Turn signal lamp	21W
Rear fog lamp		21W
Side repeater lamp		5W
License plate lamp		5W
Luggage lamp		10W
Room lamp		10W
Map lamp		10W
High mounted stop lamp		17W/16W (only EC)
Door courtesy lamp		5W

AUDIO

Items	H240	H260	H290
Rated output	Max. 20W x 4	Max. 25W x 4	Max. 35W x 4
Speaker impedance	4ΩX4	4ΩX4	2ΩX4
Band	AM/FM, LW/MW/FM	AM/FM, LW/MW/FM	AM/FM, LW/MW/FM
Tuning type	PLL Synthesized type	PLL Synthesized type	PLL Synthesized type
Dark current	Max. 2mA	Max. 3.8mA	Max. 2mA

Items	H240	H260	H290
Frequency range / Channel	AM : 531~1602KHZ/ 9KHZ	AM : 531~1602KHZ/ 9KHZ	AM : 531~1602KHZ/ 9KHZ
	FM : 87.5~108MHZ/ 100KHZ	FM : 87.5~108MHZ/ 100KHZ	FM : 87.5~108MHZ/ 100KHZ
	LW : 153~279KHZ/1KHZ	LW : 153~279KHZ/1KHZ	LW : 153~279KHZ/1KHZ
	MW : 531~1602KHZ/ 9KHZ	MW : 531~1602KHZ/ 9KHZ	MW : 531~1602KHZ/ 9KHZ
	FM : 87.5~108MHZ/ 50KHZ	FM : 87.5~108MHZ/ 50KHZ	FM : 87.5~108MHZ/ 50KHZ

WINDSHIELD WIPER AND WASHER

Items	Specifications
Wiper motor	
Speed/current at 20kg.cm load test (2.0 Nm, 0.7 lb·ft)	Low : 39-47 rpm/4.0A or less High : 60-74 rpm/6.0A or less
Speed/current at 70kg.cm load test (7.0 Nm, 2.9 lb·ft)	Low : 34-42 rpm/7.0A or less High : 46-58 rpm/9.0A or less
Current when parking	Low : 28A or less High : 30A or less
Windshield washer	
Motor type	DC ferrite magnet
Pump type	Centrifugal
Current	5.0A or less
Discharge pressure	1.8 kg/cm^2 or more
Flow rate	1,500 cc/min. or more
Overload capacity (Continuous operation)	
With water	60 sec. or less
Without water	20 sec. or less

TROUBLESHOOTING ETJA0150

INSTRUMENTS AND WARNING SYSTEM

Symptom	Possible cause	Remedy
Tachometer does not operate	No.11 fuse (10A) blown	Check for short and replace fuse
	Tachometer faulty	Check tachometer
	Wiring faulty	Repair if necessary
Fuel gauge does not operate	No.11 fuse (10A) blown	Check for short and replace fuse
	Fuel gauge faulty	Check gauge
	Fuel sender faulty	Check fuel sender
	Wiring faulty	Repair if necessary

Symptom	Possible cause	Remedy
Low fuel warning lamp does not light	No.11 fuse (10A) blown	Check for short and replace fuse
	Bulb burned out	Replace bulb
	Fuel level sensor faulty	Check sensor
	Wiring or ground faulty	Repair if necessary
Water temperature gauge does not operate	No.11 fuse (10A) blown	Check for short and replace fuse
	Water temperature gauge faulty	Check gauge
	Water temperature sender faulty	Check sender
	Wiring or ground faulty	Repair if necessary
Oil pressure warning lamp does not light	No.11 fuse (10A) blown	Check for short and replace fuse
	Bulb burned out	Replace bulb
	Oil pressure sender faulty	Check sender
	Wiring or ground faulty	Repair if necessary
Low brake fluid warning lamp does not light	No.11 fuse (10A) blown	Check for short and replace fuse
	Bulb burned out	Replace bulb
	Brake fluid level warning switch faulty	Check switch
	Parking brake switch faulty	Check switch
	Wiring or ground faulty	Repair if necessary
Open door warning lamp does not light	No.11 fuse (10A) blown	Check for short and replace fuse
	Bulb burned out	Replace bulb
	Door switch faulty	Check switch
	Wiring or ground faulty	Repair if necessary
Seat belt warning lamp does not light	No.11 fuse (10A) blown	Check for short and replace fuse
	Bulb burned out	Replace bulb
	Buckle switch faulty	Check switch
	Wiring or gound faulty	Repair if necessary

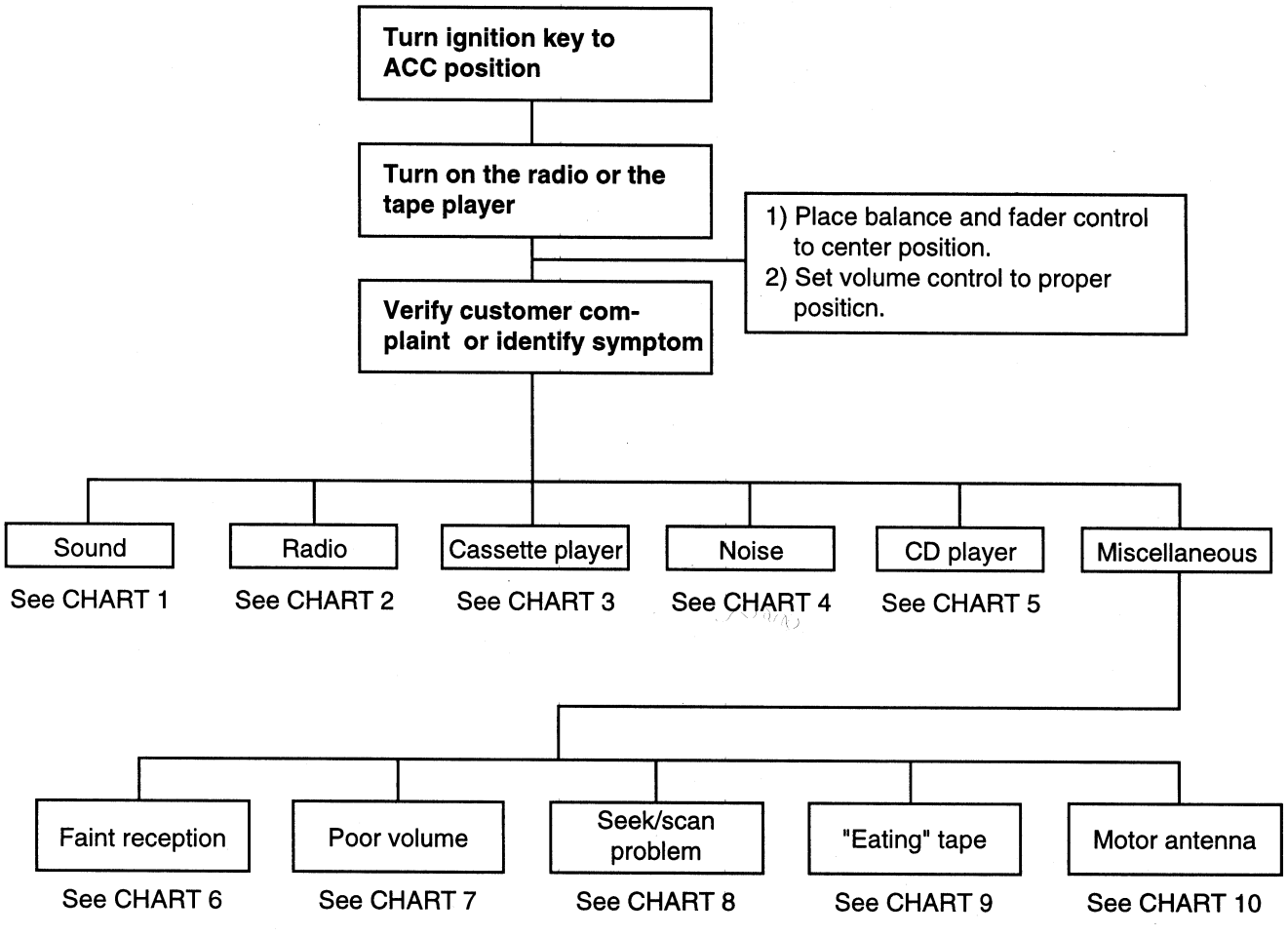
LIGHTING SYSTEM

Symptom	Possible cause	Remedy
One lamp does not light (all exterior)	Bulb burned out	Replace bulb
	Socket, wiring or ground faulty	Repair if necessary
Head lamps do not light	Bulb burned out	Replace bulb
	No.5 fuse (10A) blown	Replace fuse and check for short
	Head lamp relay faulty	Check relay
	Lighting switch faulty	Check switch
	Wiring or ground faulty	Repair if necessary

Symptom	Possible cause	Remedy
Tail lamps do not light	Tail lamp fuse blown (10A)	Replace fuse and check for short
	Fusible link blown	Replace fusible link
	Tail lamp relay faulty	Check relay
	Lighting switch faulty	Check switch
	Wiring or ground faulty	Repair if necessary
Stop lamps do not light	No.14 fuse (10A) blown	Replace fuse and check for short
	Stop lamp switch faulty	Adjust or replace switch
	Wiring or ground faulty	Repair if necessary
	Stop lamp relay faulty	Replace relay
Stop lamps stay on	Stop lamp switch faulty	Adjust or replace switch
	Stop lamp relay faulty	Replace relay
Instrument lamps do not light (Tail lamps light)	Rheostat faulty	Check rheostat
	Wiring or ground faulty	Repair if necessary
Turn signal lamp does not flash on one side	Bulb burned out	Replace bulb
	Turn signal switch faulty	Check switch
	Wiring or ground faulty	Repair if necessary
Turn signal lamps do not operate	No.27 fuse (10A) blown	Replace fuse and check for short
	Flasher faulty	Check flasher
	Turn signal switch faulty	Check switch
	Wiring or ground faulty	Repair if necessary
Hazard warning lamps do not operate	No.15 fuse (10A) blown	Replace fuse and check for short
	Flasher faulty	Check flasher
	Hazard switch faulty	Check switch
	Wiring or ground faulty	Repair if necessary
Flasher rate too slow or too fast	Lamps' wattages are smaller or larger than specified	Replace lamps
	Defective flasher	Replace flasher
Back up lamps do not light up	No.25 fuse (10A) blown	Replace fuse and check for short
	Back up lamp switch faulty	Check switch
	Wiring or ground faulty	Repair if necessary
Overhead console lamp does not light up	No.9 fuse (10A) blown	Replace fuse and check for short
	Wiring or ground faulty	Repair if necessary

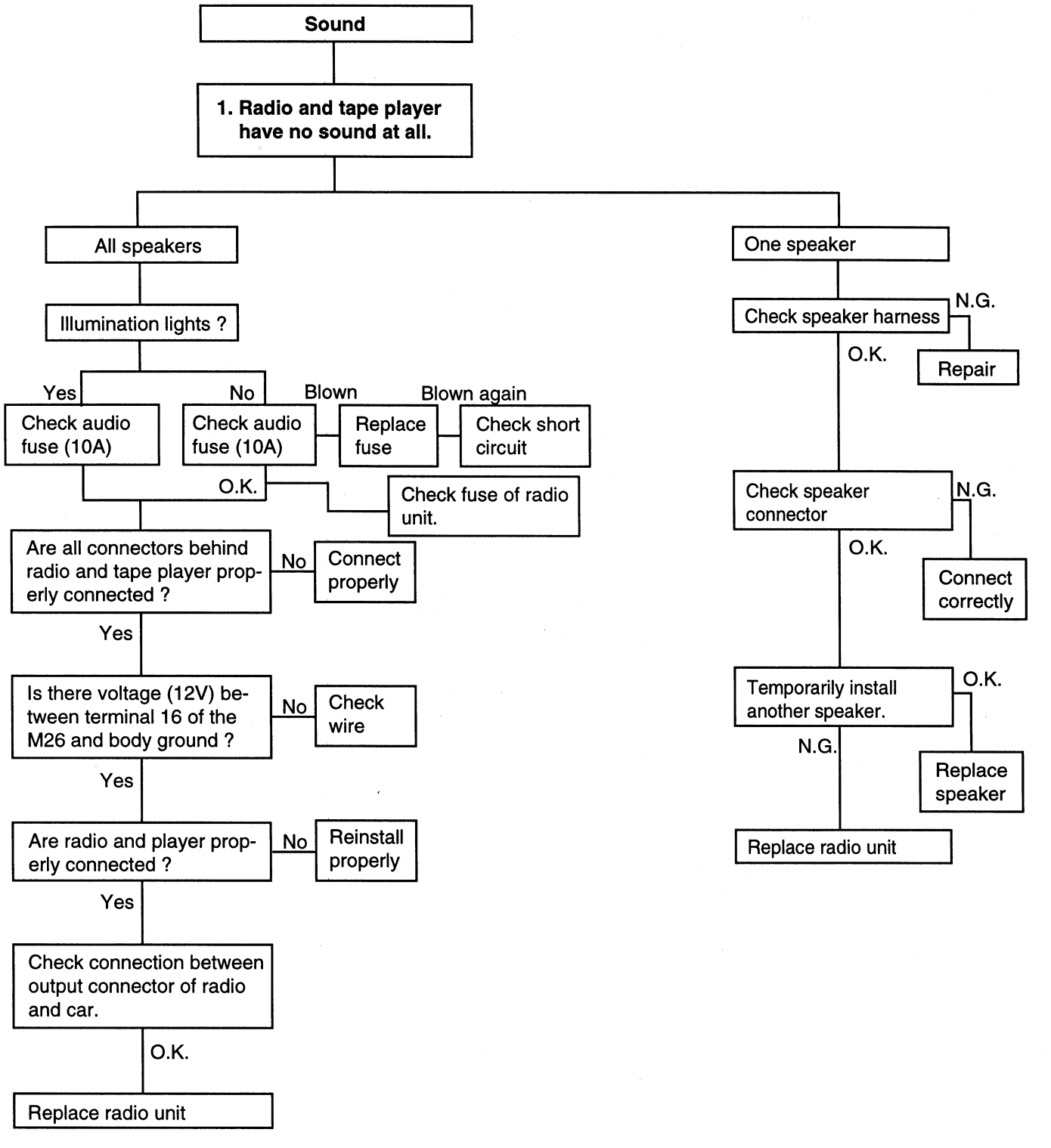
AUDIO

There are six areas where a problem can occur: wiring harness, the radio, the cassette tape deck, the CD player, the speaker, and antenna. Troubleshooting enables you to confine the problem to a particular area.

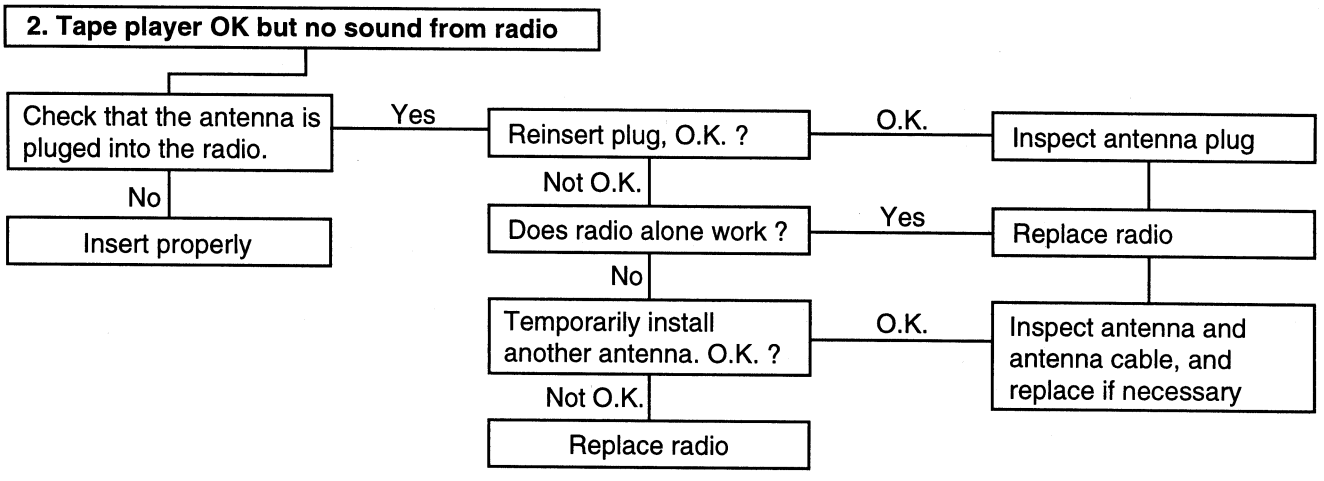


ETJA315A

CHART 1

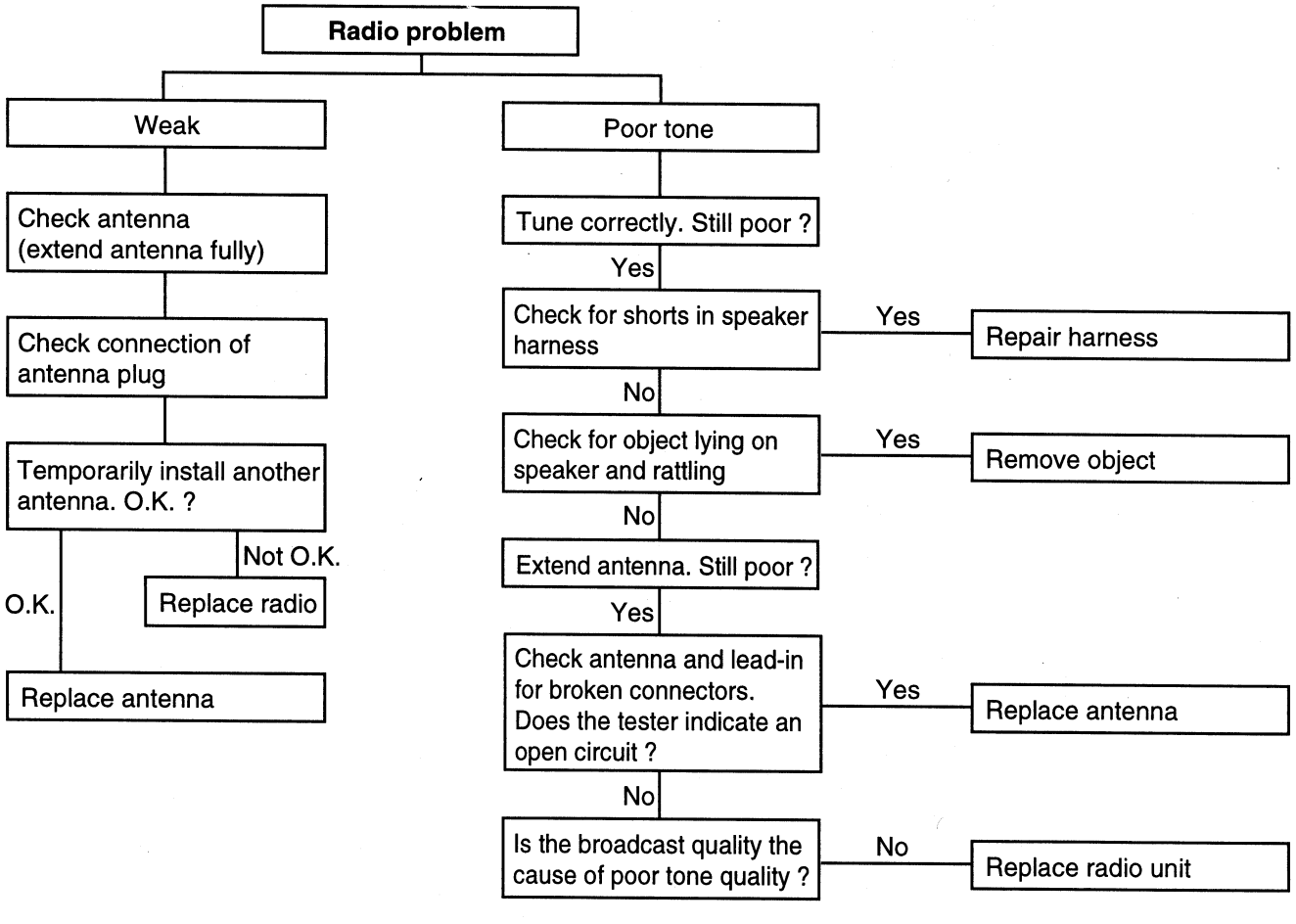


ETJA315B



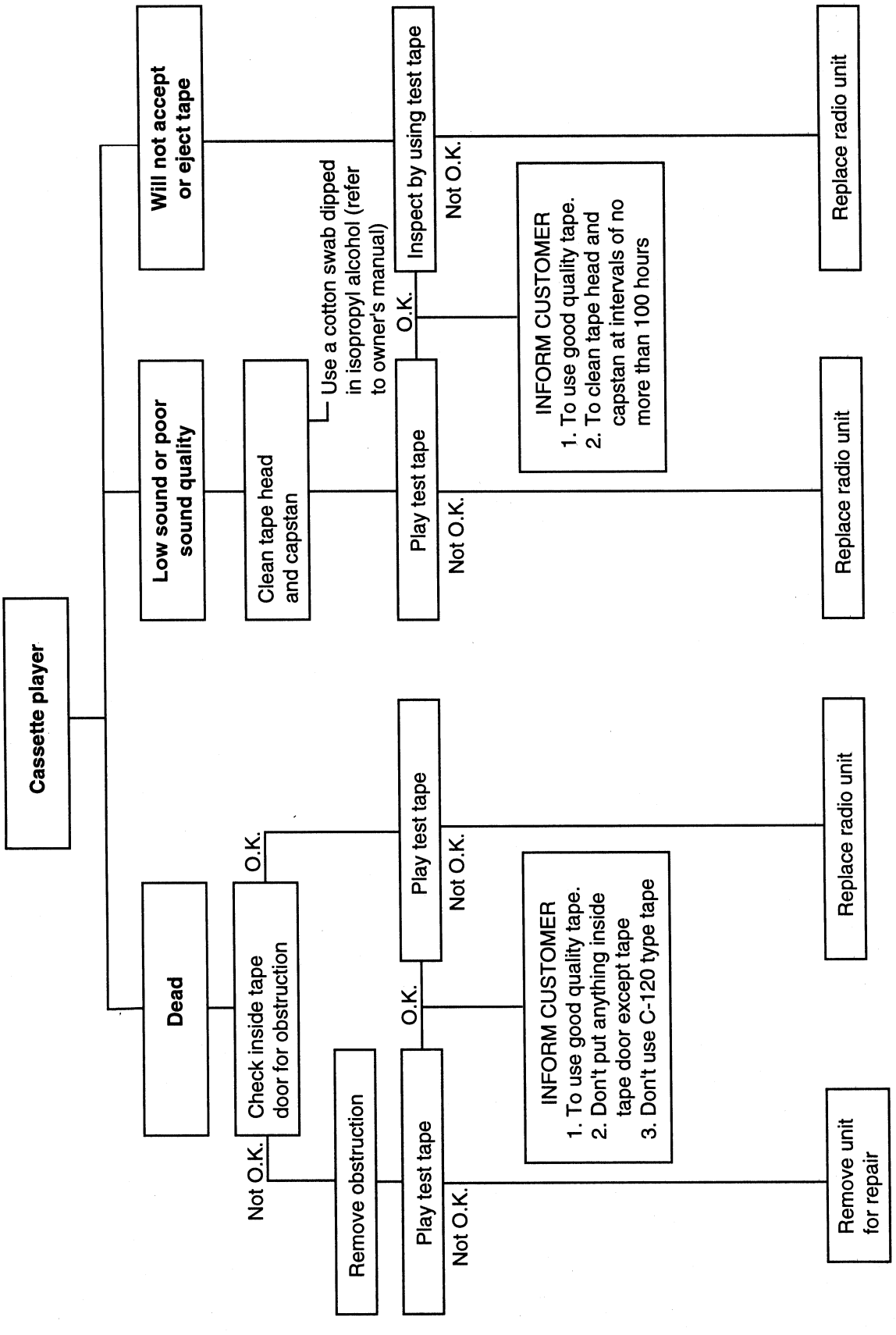
ETA9010C

CHART 2



ETA9010D

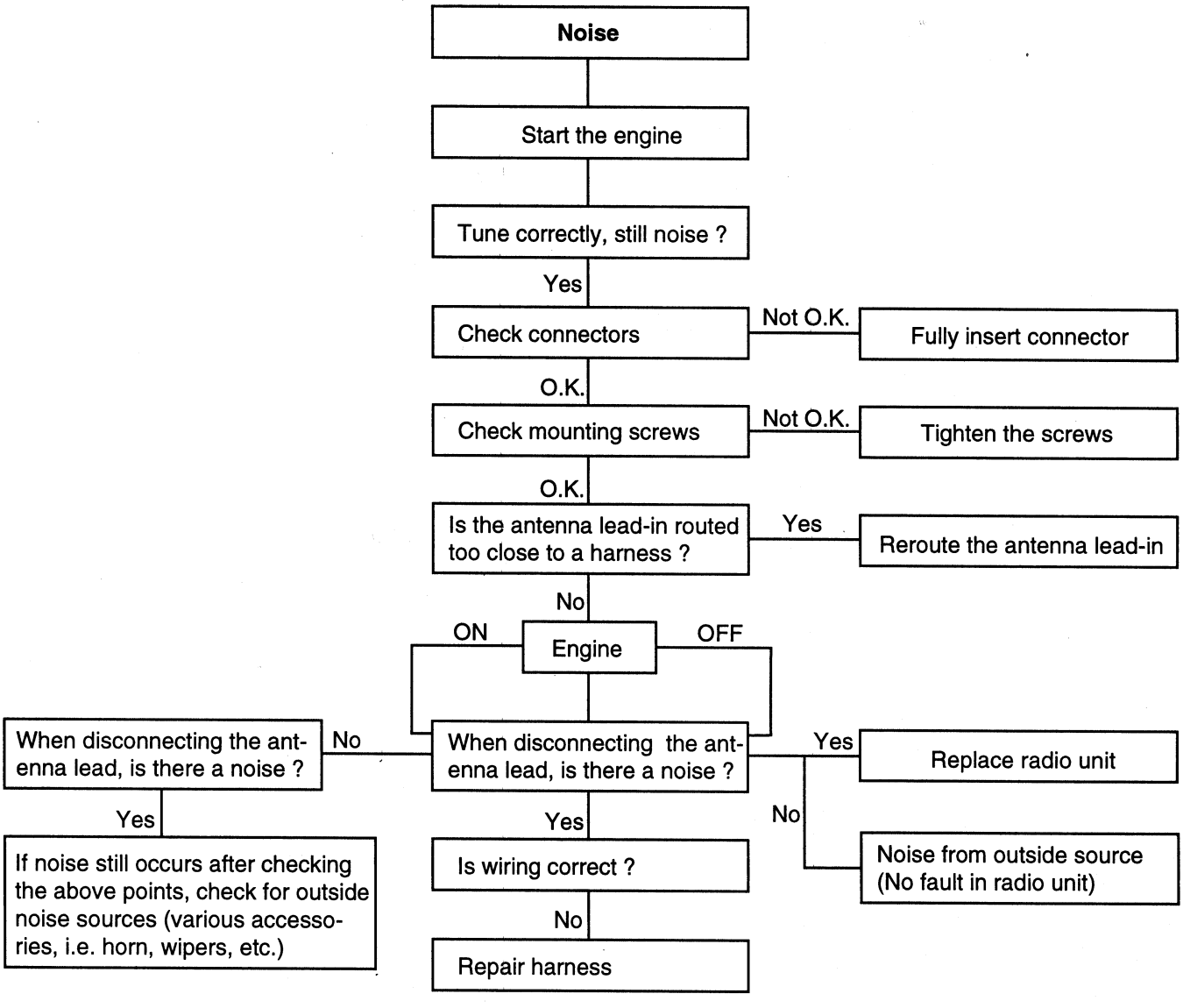
CHART 3



ETA9010E

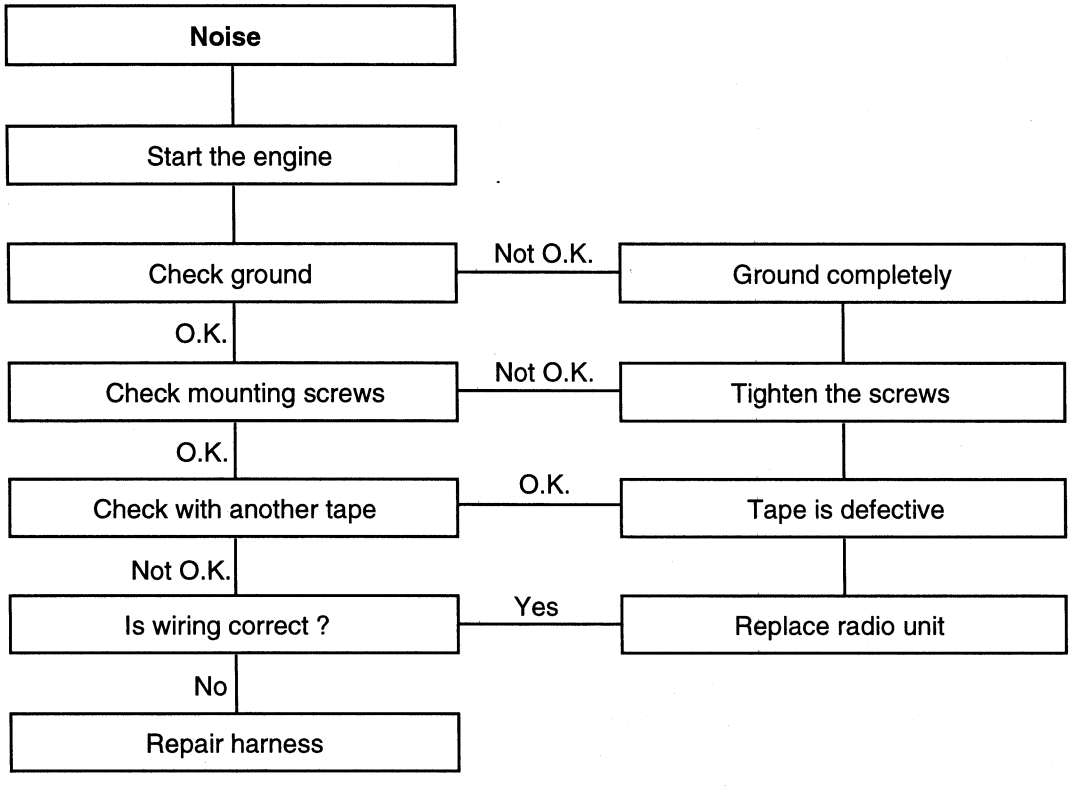
CHART 4

1. RADIO



ETA9010F

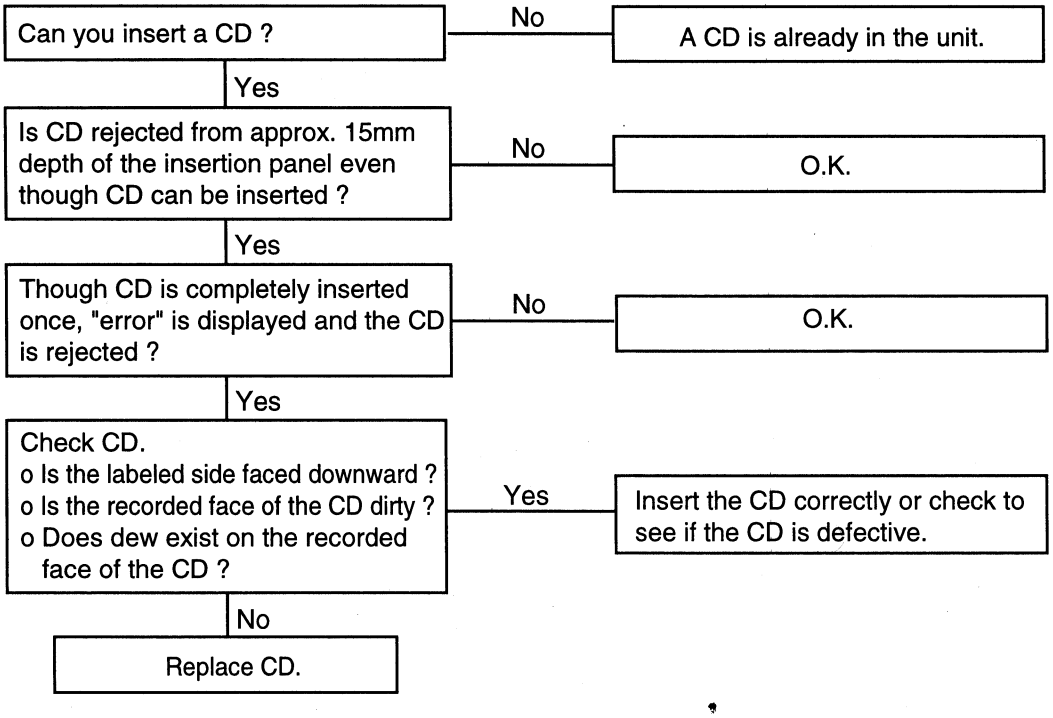
2. TAPE



ETA9010G

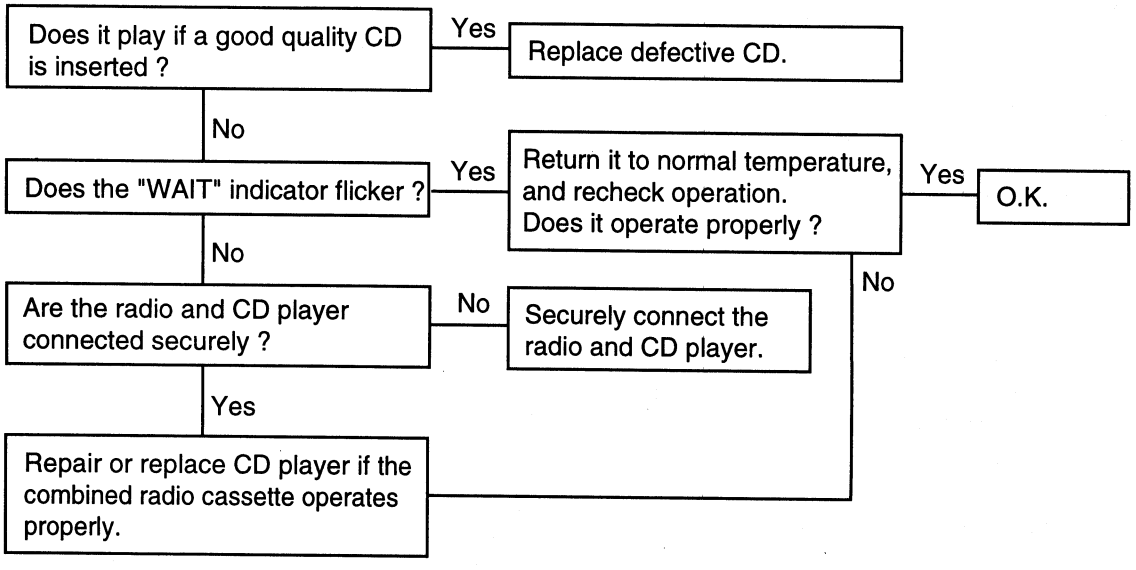
CHART 5

1. CD WILL NOT BE ACCEPTED



ETA9010H

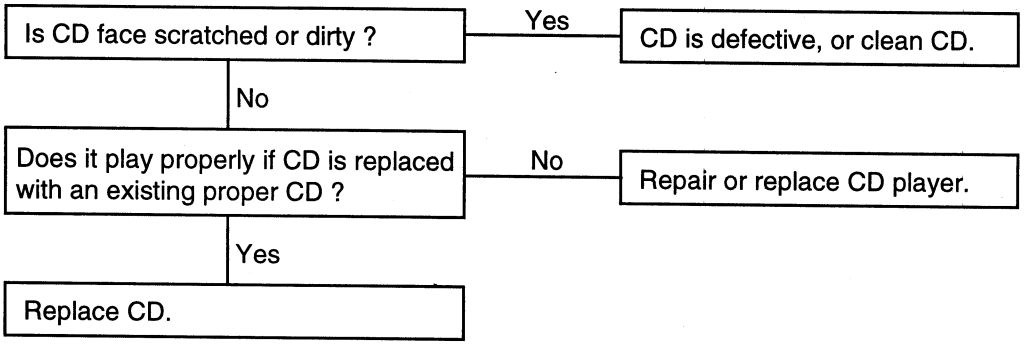
2. NO SOUND



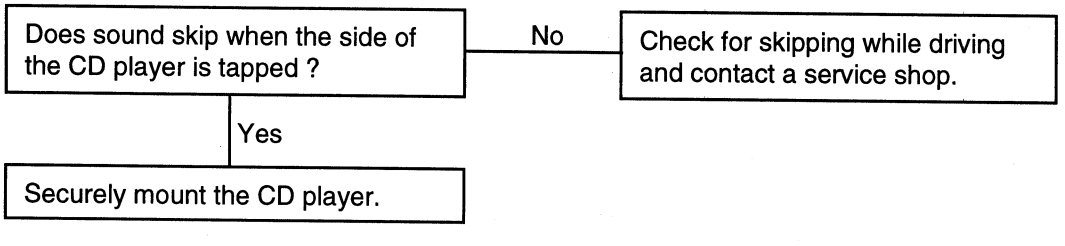
ETA9010O

3. CD SOUND SKIPS

1. Sound sometimes skips when parking.

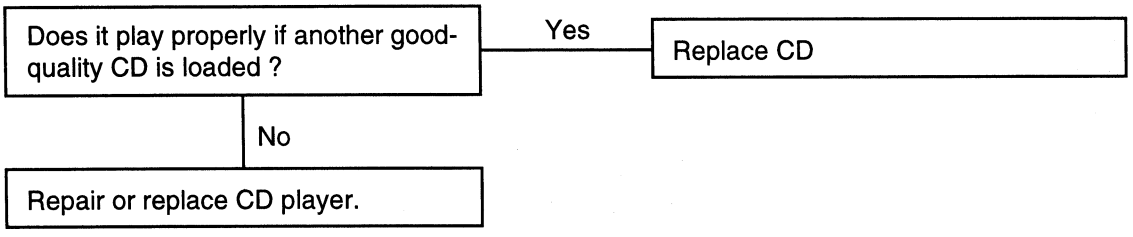


2. Sound sometimes skip when driving.
(Stop vehicle, and check it.)
(Check by using a CD which is free of scratches, dirt or other damage.)

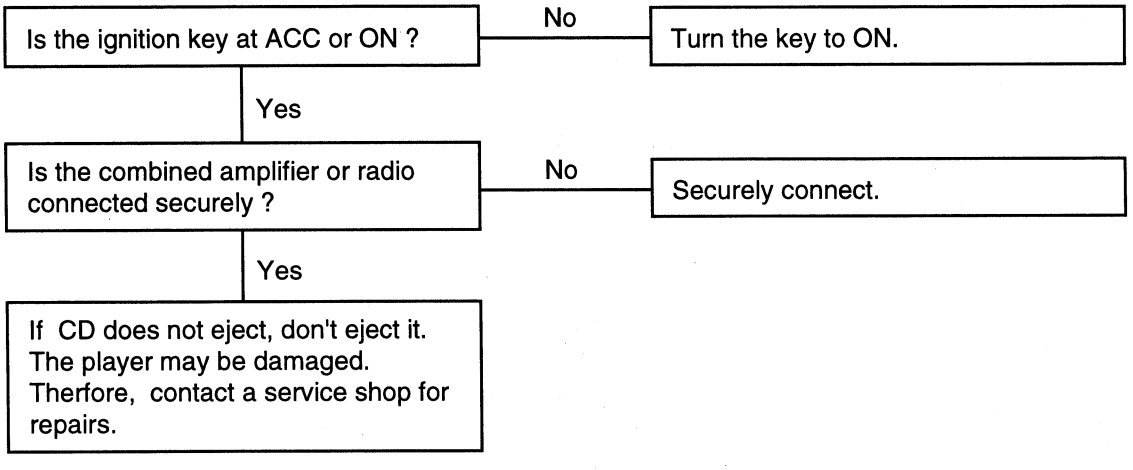


ETA9010I

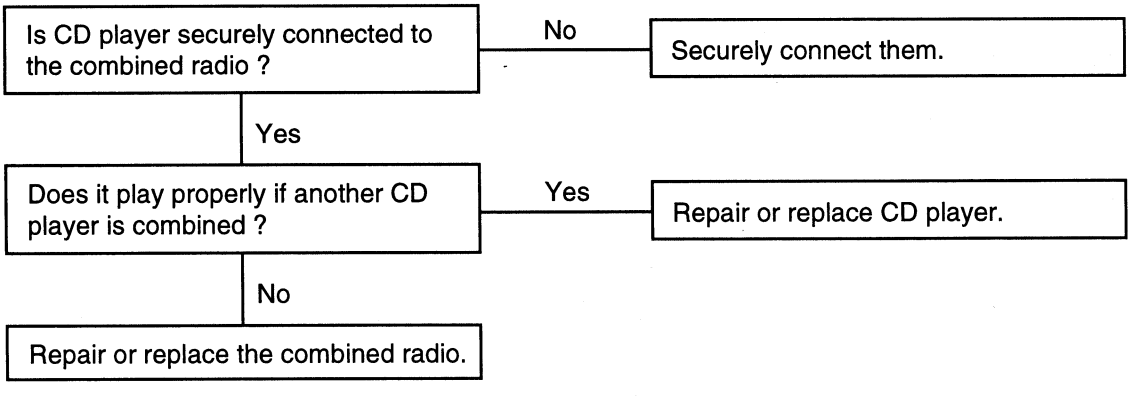
4. SOUND QUALITY IS POOR



5. CD WILL NOT EJECT

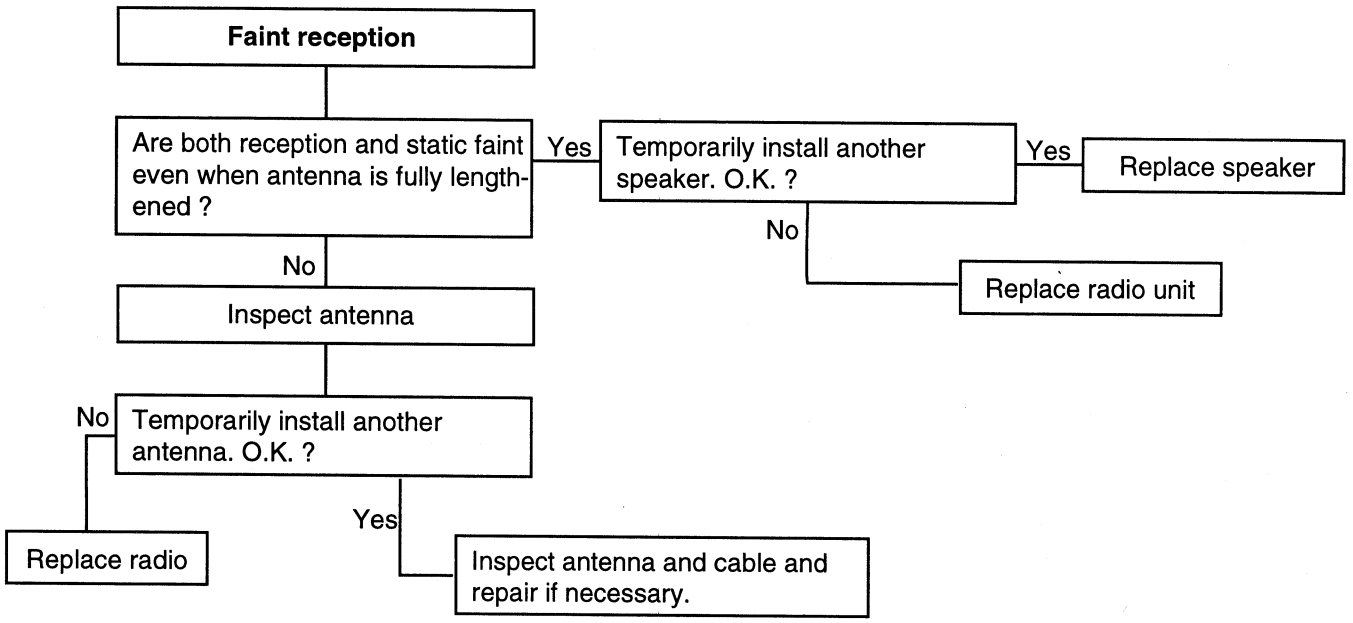


6. NO SOUND FROM ONE SPEAKER



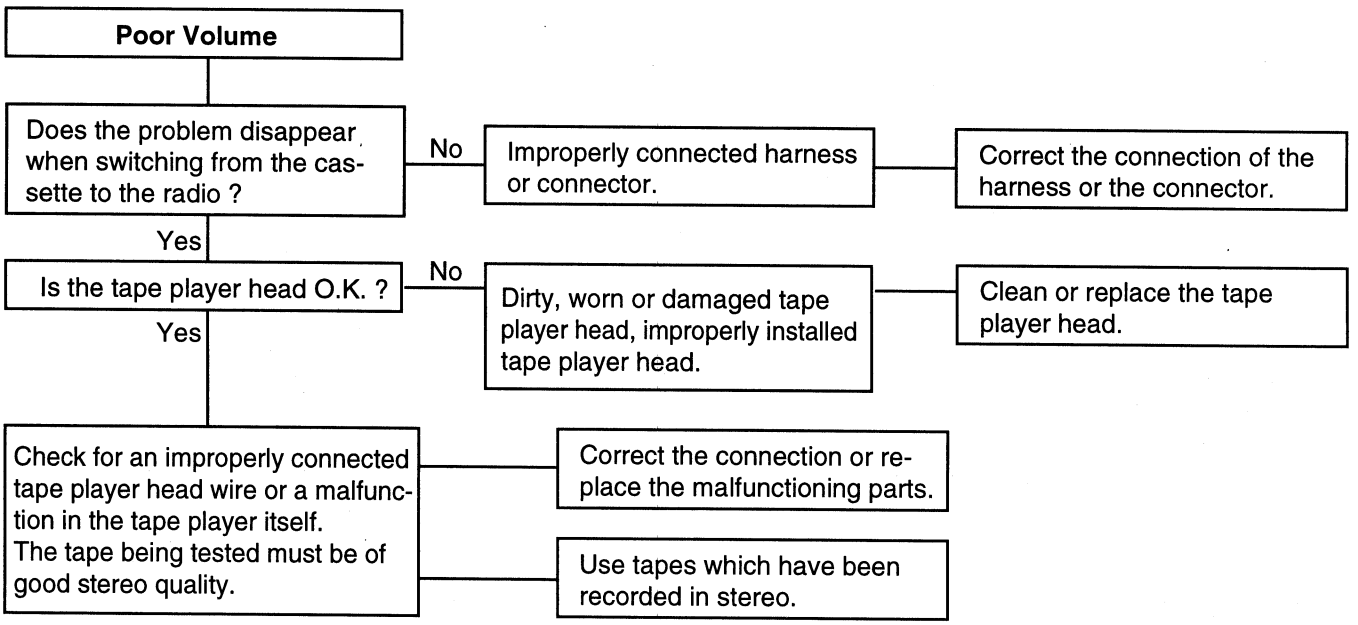
ETA9010J

CHART 6



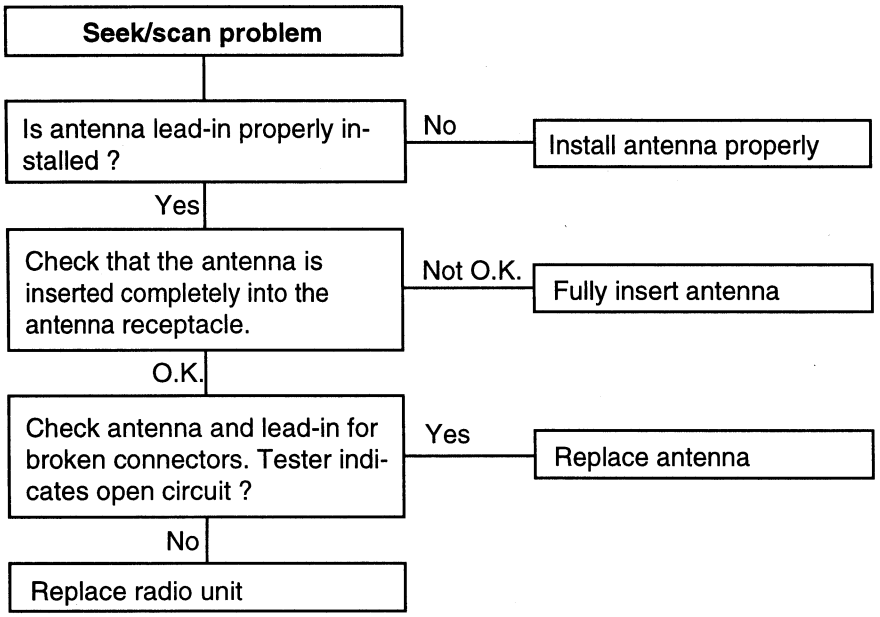
ETA9010K

CHART 7



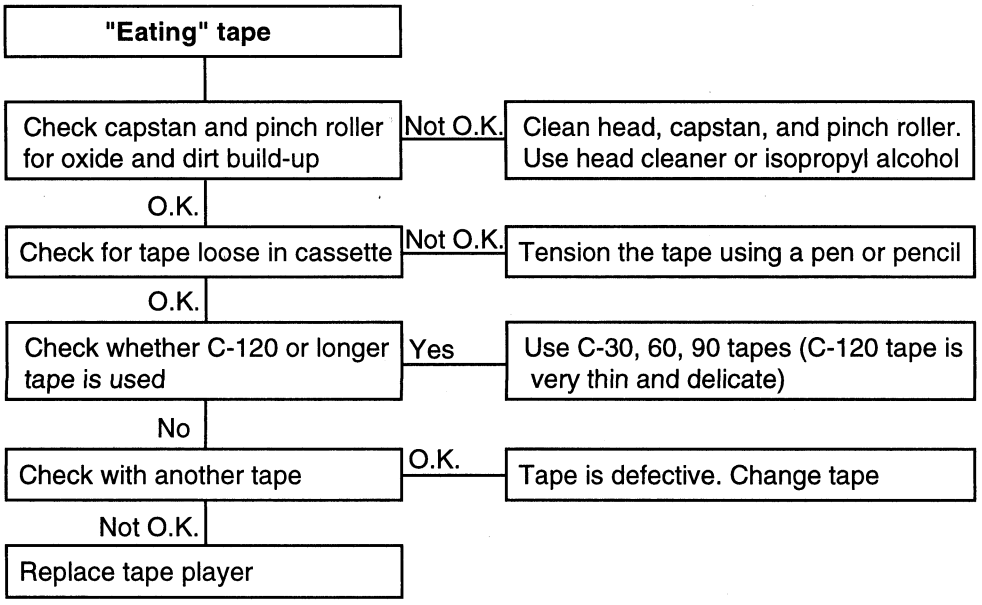
ETA9010L

CHART 8



ETA9010M

CHART 9

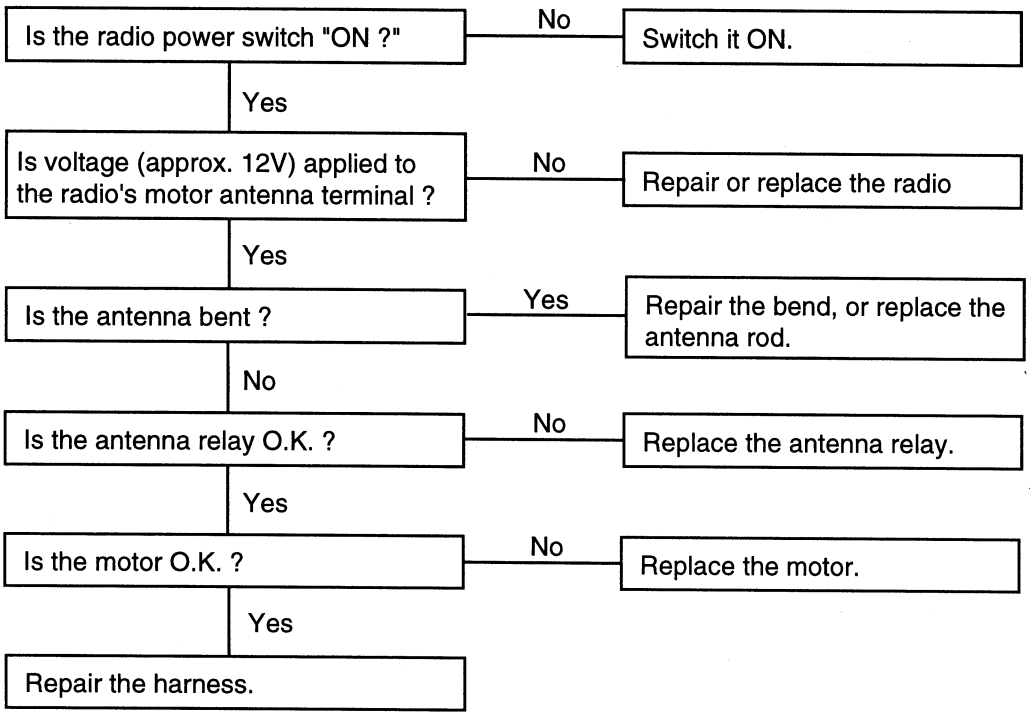


ETA9010N

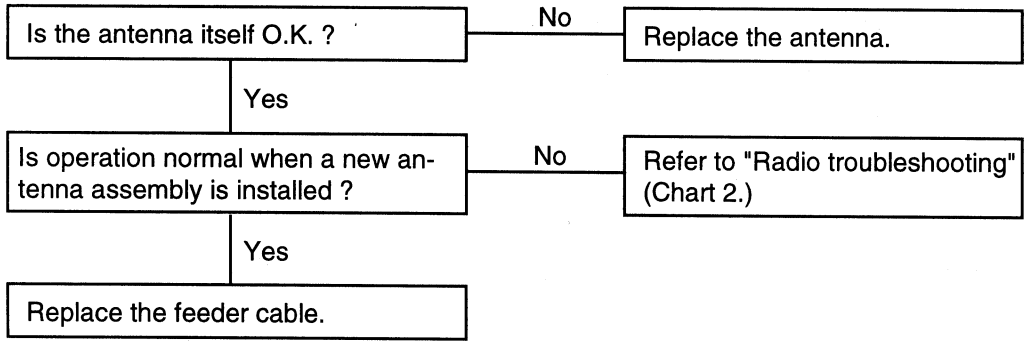
CHART 10

1. MOTOR ANTENNA WON'T EXTEND OR RETRACT

Clean and polish the surface of the antenna rod.



2. MOTOR ANTENNA EXTENDS AND RETRACTS BUT DOES NOT RECEIVE



ETAA010P

WINDSHILD WIPER

Symptom	Possible cause	Remedy
Wipers do not operate or return to off position.	Wiper fuse (No.31; 20A) blown	Check for short and replace fuse
	Wiper motor faulty	Check motor
	Wiper switch faulty	Check switch
	Wiring or ground faulty	Repair if necessary

Symptom	Possible cause	Remedy
Wipers do not operate in INT position	ETACS CM faulty	Check ETACS CM
	Wiper switch faulty	Check switch
	Wiper motor faulty	Check motor
	Wiring or ground fautly	Repair if necessary

POWER WINDOW

Symptom	Possible cause	Remedy
No windows operate from the main switch on the driver's door	Fusible link (30A for P/Window) blown	Replace the fusible link
	Poor ground	Clean and retighten the ground terminal mounting bolt
	Defective power window main switch	Check the switch Replace if necessary
	Open circuit in wires or loose or disconnected connector	Repair or replace
Driver's side window does not operate	Defective power window main switch	Check for driver's window switch
	Defective motor or circuit breaker	Replace the motor
	Open circuit in wires or loose or disconnected connector	Check the harness and the connector
Passenger's side window does operate	Defective power window subswitch	Replace the switch
	Defective motor or circuit breaker	Replace the motor
	Wiring faulty or disconnected connector	Repair if necessary

POWER DOOR MIRROR

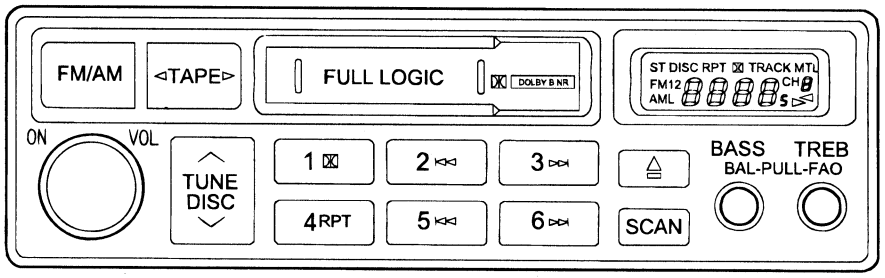
Symptom	Possible cause	Remedy
No mirrors operate	No.8 fuse (10A) blown	Check the circuit and replace fuse
	Poor ground	Clean and retighten the gound terminal mounting bolt
	Defective mirror switch	Check the switch Replace if necessary
	Open circuit in wires or loose or disconnected connector	Repair or replace
One mirror does not operate	Defective mirror switch	Check the switch Replace if necessary
	Defective mirror actuator	Replace the actuator
	Open circuit wires or loose or disconnected connector	Repair or replace

AUDIO SYSTEM

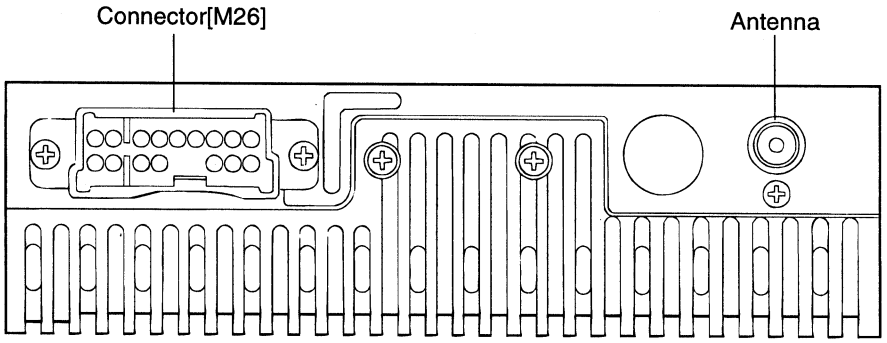
AUDIO UNIT

COMPONENTS ETJA7100

<H240>



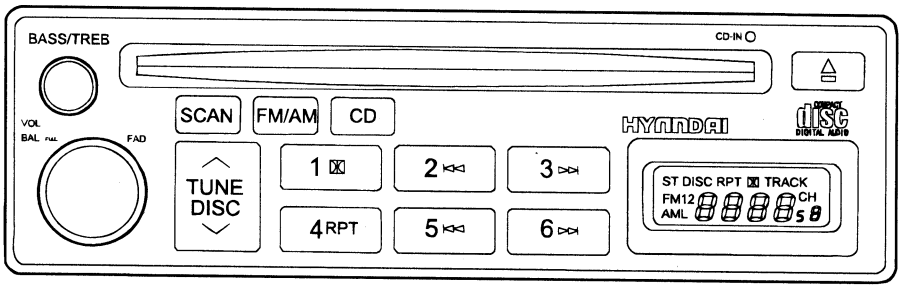
ETJA001B



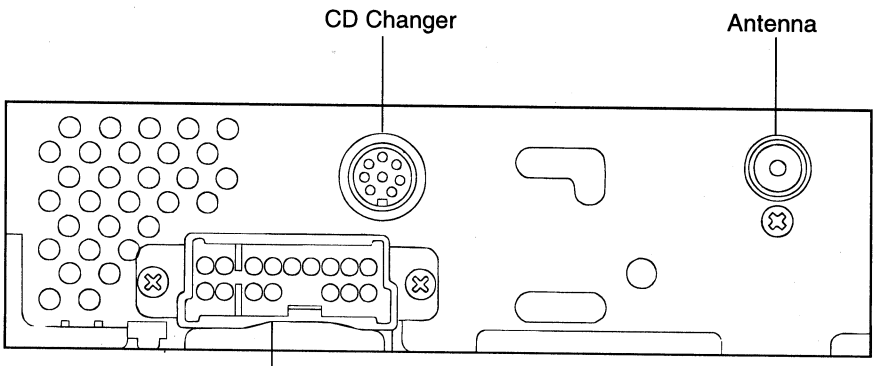
ETJA001A

Connector[M26]	Terminal	Description
[M26] ①②③ ④⑤ ⑥⑦ ⑧⑨⑩⑪⑫⑬⑭ ⑮⑯ ETJA001C	1	Antenna
	2	Rear left speaker(-)
	3	Front left speaker(-)
	4	Front right speaker(-)
	5	Rear right speaker(-)
	6	Illumination(-)
	7	ACC(+)
	8	Ground
	9	Rear left speaker(+)
	10	Front left speaker(+)
	11	N.C.
	12	N.C.
	13	Front right speaker(+)
	14	Rear right speaker(+)
	15	Illumination(+)
	16	Battery(+)

<H260>



ETJA001E

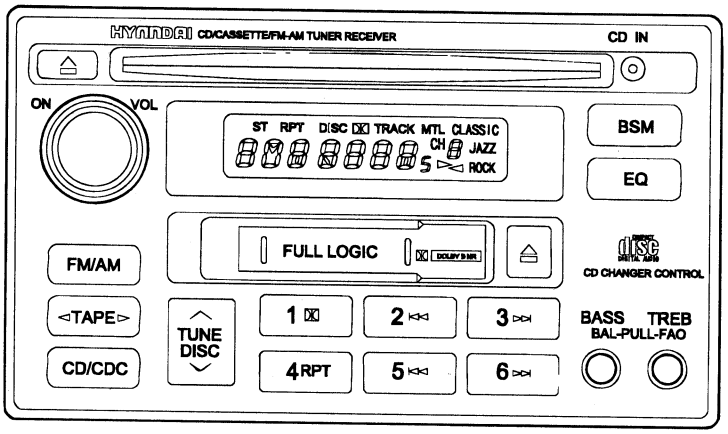


ETJA001D

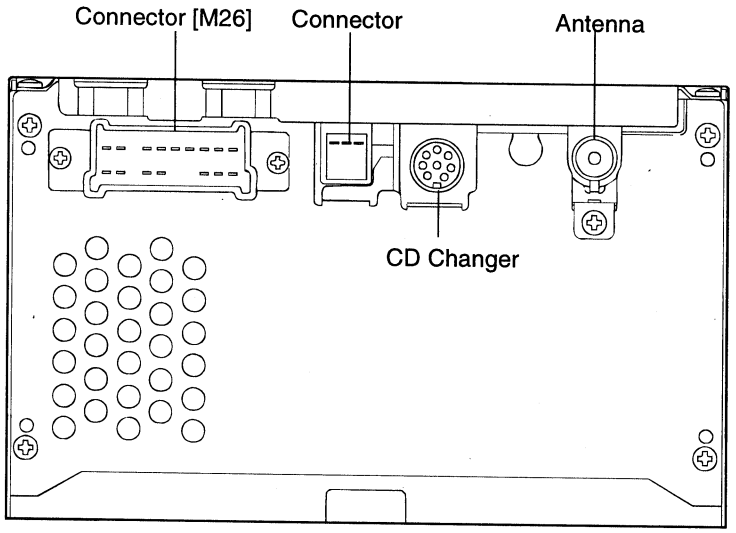
Connector[M26]	Terminal	Description
[M26] ①②③ ④⑤ ⑥⑦ ⑧⑨⑩⑪⑫⑬⑭ ⑮⑯ ETJA001C	1	N.C.
	2	Rear left speaker(-)
	3	Front left speaker(-)
	4	Front right speaker(-)
	5	Rear right speaker(-)
	6	Illumination(-)
	7	ACC(+)
	8	Ground
	9	Rear left speaker(+)
	10	Front left speaker(+)
	11	N.C.
	12	N.C.
	13	Front right speaker(+)
	14	Rear right speaker(+)
	15	Illumination(+)
	16	Battery(+)

Connector	Terminal	Description
(CD Changer) ⑦ ① ⑥ ⑧ ② ⑤ ④ ③ ETJA001G	1	R
	2	CD ON
	3	BUS
	4	B+
	5	M. Ground
	6	N.C.
	7	L
	8	A.Ground

<H290>



ETJA001I



ETJA001H

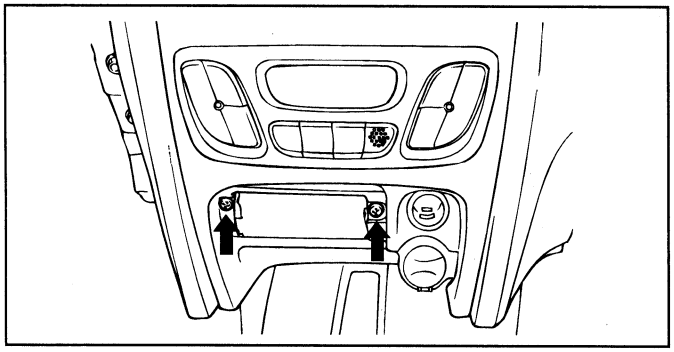
Connector[M26]	Terminal	Description
[M26] ①②③ ④⑤⑥⑦ ⑧⑨⑩⑪⑫⑬⑭ ⑮⑯ ETJA001C	1	Antenna
	2	Rear left amp(-)
	3	Front left amp(-)
	4	Front right amp(-)
	5	Rear right amp(-)
	6	Illumination(-)
	7	ACC(+)
	8	Ground
	9	Rear left amp(+)
	10	Front left amp(+)
	11	N.C.
	12	Amp remote
	13	Front right amp(+)
	14	Rear right amp(+)
	15	Illumination(+)
	16	Battery(+)

Connector	Terminal	Description
① ② ③ ETJA001K	1	Ground
	2	Signal
	3	Ground

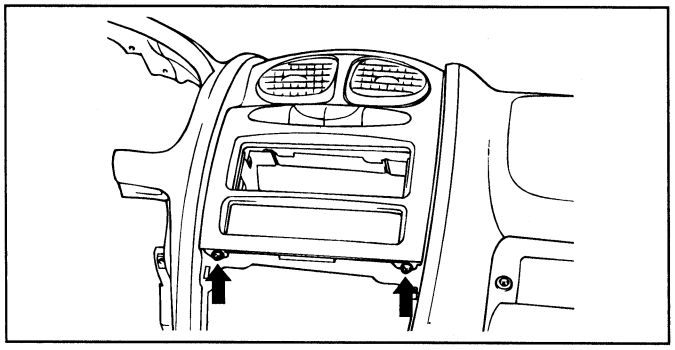
Connector	Terminal	Description
(CD Changer) ⑦ ① ⑥ ⑧ ② ⑤ ④ ③ ETJA001G	1	R
	2	CD ON
	3	BUS
	4	B+
	5	M. Ground
	6	N.C.
	7	L
	8	A.Ground

REMOVAL AND INSTALLATION ETJA0250

1. Disconnect the negative (-) battery terminal.
2. Remove the ash tray and then remove the screws holding the center facia panel.

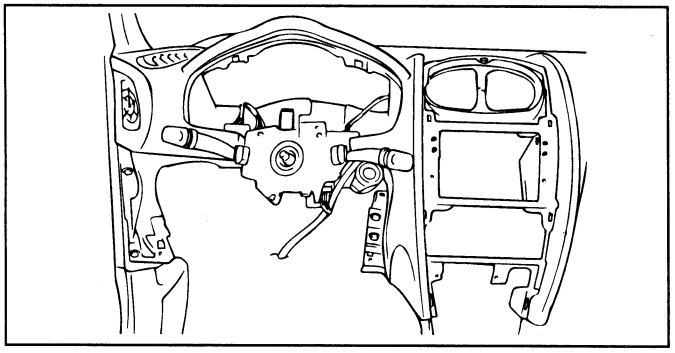


ESJA035H



ESJA035J

3. Remove the center facia panel and disconnect the connectors.
4. Remove the screws holding the audio and remove the audio assembly from the mounting bracket.



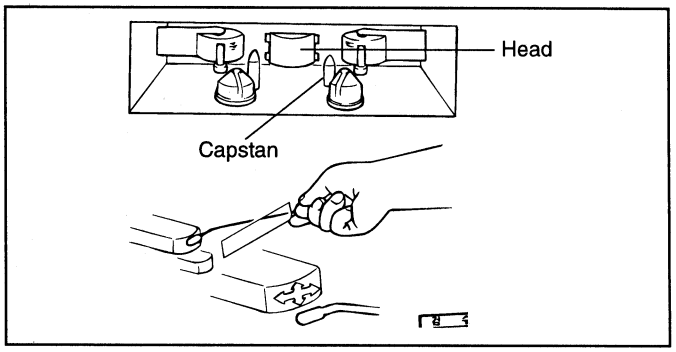
ESJA035I

5. Installation is the reverse of removal.

SERVICE INSTRUCTIONS ETHA0750

TAPE HEAD AND CAPSTAN CLEANING

1. To obtain optimum performance, clean the head, and capstan as often as necessary, depending on frequency of use and tape cleanness.
2. To clean the tape head and capstan, use a cotton swab dipped in ordinary rubbing alcohol. Wipe the head and capstan.



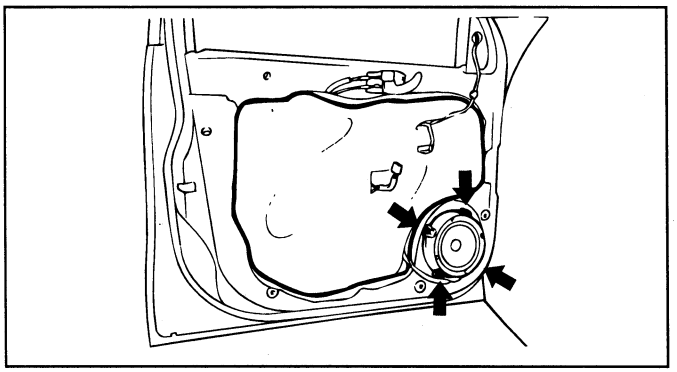
ETA9035A

SPEAKERS

REMOVAL AND INSTALLATION ETJA0300

FRONT SPEAKER

1. Remove the front door trim panel and remove the front speaker (Refer to page BD-12.)

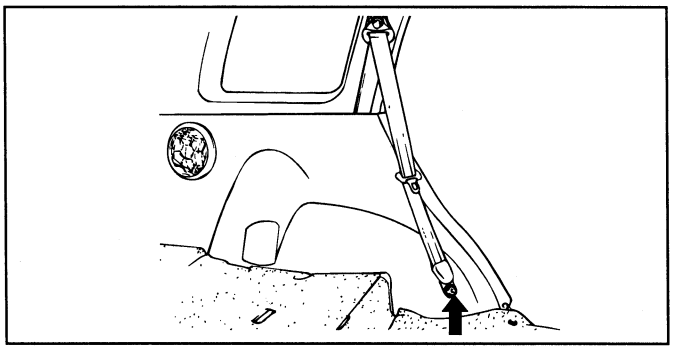


ESJA060D

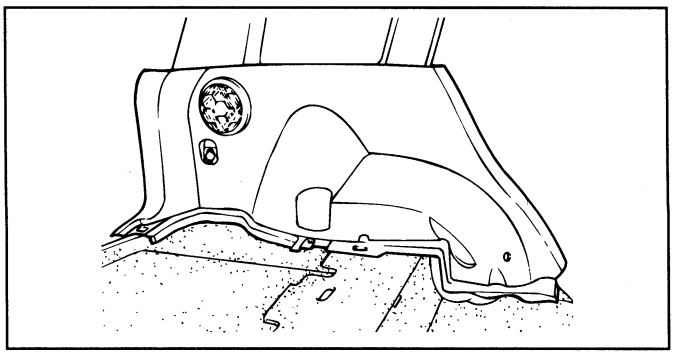
2. Installation is the reverse of removal.

REAR SPEAKER

1. Remove the bolt holding the rear seat belt lower anchor and remove the quarter trim.

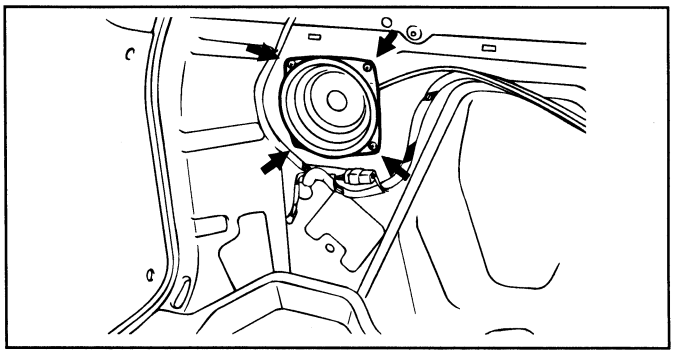


ESJA050H



ESJA050I

2. Remove the rear speaker.

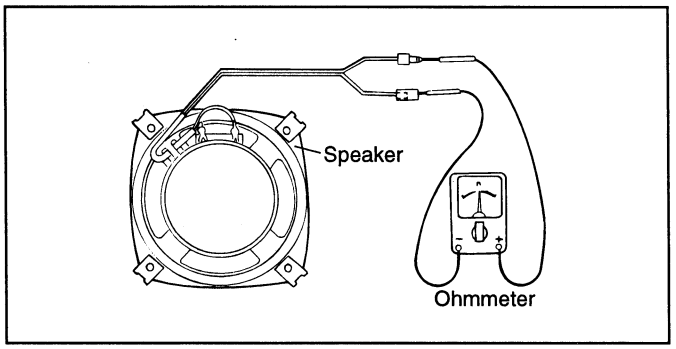


ETJA090A

SPEAKER CHECKING ETA90400

1. Check the speaker with an ohmmeter. If an ohmmeter indicates the correct impedance of the speaker when checking between the speaker (+) and speaker (-) of the same channel, the speaker is ok.

2. If a clicking sound is emitted from the speaker when the ohmmeter is connected to the speaker terminals, the speaker is ok.

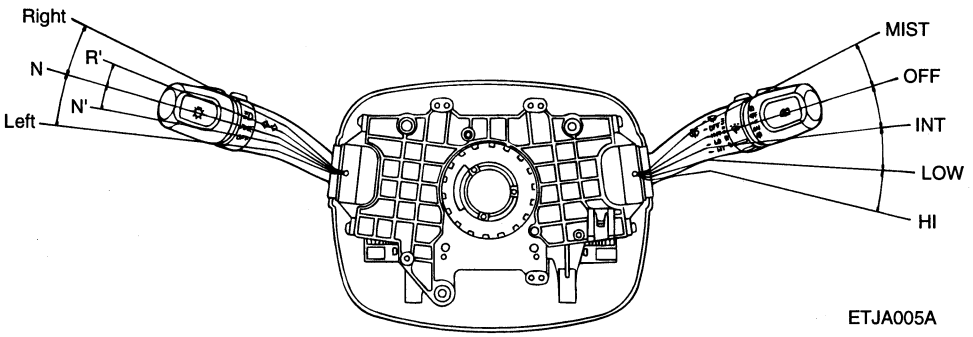


ETA9040A

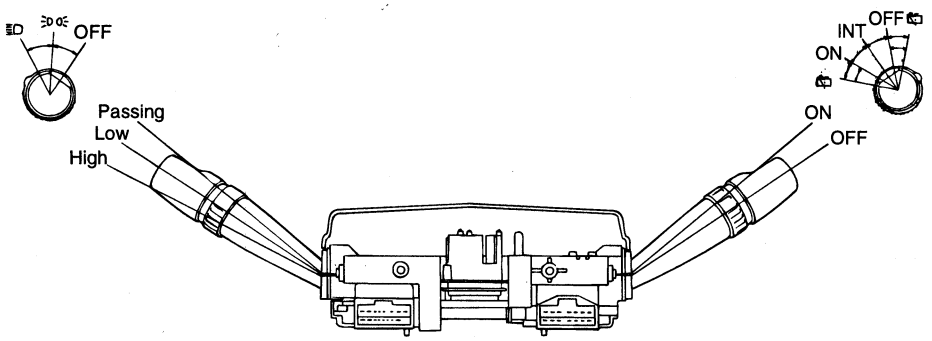
MULTI FUNCTION SWITCH

COMPONENTS ETJA7150

[WITHOUT AIR BAG]



ETJA005A



ETJA005B

[M20-1]

1	2	3	4	5	6	7
8	9	10	11	12	13	14

ETJA005G

[M20-2]

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

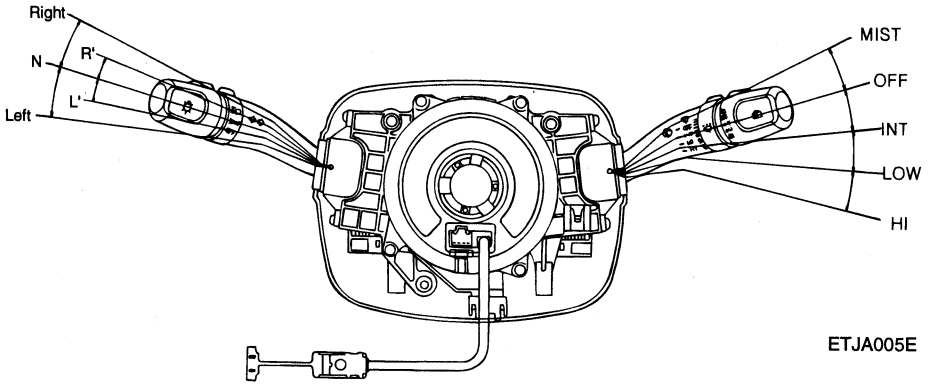
ETJA005H

Circuit connection

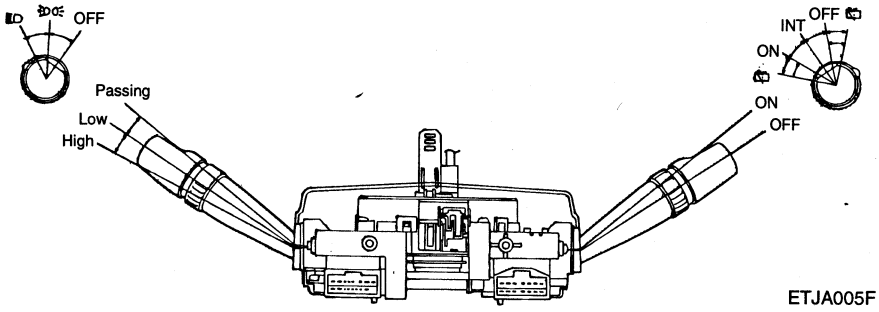
Connector No.	Terminal No.	Description
M20-2	1	Head lamp passing switch
	2	Head lamp high beam power
	3	-
	4	-
	5	-
	6	-
	7	Turn signal RH lamp switch
	8	Flasher unit power
	9	Turn signal LH lamp switch
	10	Head lamp low beam power
	11	Dimmer & passing ground
	12	-
	13	-
	14	Tail lamp switch
	15	Head lamp switch
	16	Rear fog lamp switch
	17	Lighting switch ground
	18	-

Connector No.	Terminal No.	Description
M20-1	1	Wiper high speed
	2	Wiper low speed
	3	Wiper parking
	4	Mist switch
	5	Wiper & washer ground
	6	Intermittent wiper
	7	Front washer switch
	8	Horn
	9	Rear wiper & washer ground
	10	Rear wiper (INT)
	11	Rear wiper
	12	Rear washer
	13	Intermittent wiper
	14	Intermittent wiper ground

[WITH AIR BAG]



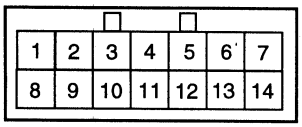
ETJA005E



ETJA005F

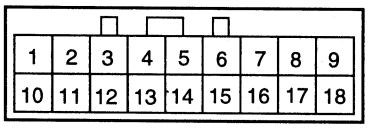
[M20-2] [M20-1]

[M20-1]



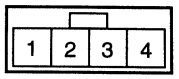
ETJA005G

[M20-2]



ETJA005H

[M20-3]



ETJA005I

Circuit connection

Connector No.	Terminal No.	Description	Connector No.	Terminal No.	Description
M20-2	1	Head lamp passing switch	M20-1	1	Wiper high speed
	2	Head lamp high beam power		2	Wiper low speed
	3	-		3	Wiper parking
	4	-		4	Mist switch
	5	-		5	Wiper & washer ground
	6	-		6	Intermittent wiper
	7	Turn signal RH lamp switch		7	Front washer switch
	8	Flasher unit power		8	-
	9	Turn signal LH lamp switch		9	Rear wiper & washer ground
	10	Head lamp low beam power		10	Rear wiper (INT)
	11	Dimmer & passing ground		11	Rear wiper
	12	-		12	Rear washer
	13	-		13	Intermittent wiper
	14	Tail lamp switch		14	Intermittent wiper ground
	15	Head lamp switch	M20-3	1	Remote control ground
	16	-		2	Remote control signal
	17	Lighting switch ground		3	Remote control power
	18	-		4	Horn

ETJA035A

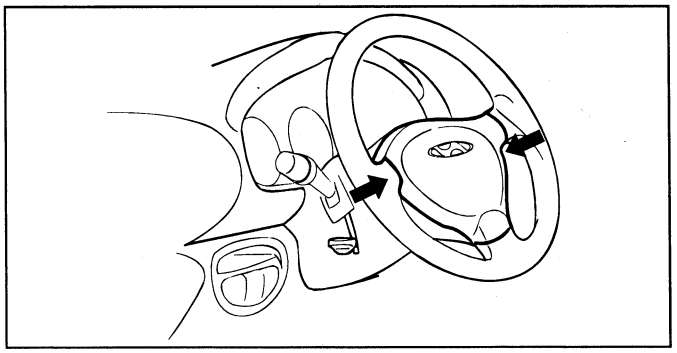
REMOVAL AND INSTALLATION ETJA0400

Prior to removing of the multi function switch assembly in vehicles equipped with air bags, be careful to follow the following:

CAUTION

- **Never attempt to disassemble or repair the air bag module or clock spring. If faulty, replace it.**
- **Do not drop the air bag module or clock spring or allow contact with water, grease or oil. Replace if a dent, crack, deformation or rust is detected.**
- **The air bag module should be stored on a flat surface and placed so that the pad surface is facing upward. Do not place anything on top of it.**
- **Do not expose the air bag module to temperatures over 93°C(200°F).**
- **After deployment of an air bag, replace the clock spring with a new one.**
- **Wear gloves and safety glasses when handing an air bag that has been deployed.**
- **An undeployed air bag module should only be disposed of in accordance with the procedures mentioned in the restraints section.**
- **When you disconnect the air bag module-clock spring connector, take care not to apply excessive force.**
- **The removed air bag module should be stored in a clean, dry place.**
- **Prior to installing the clock spring, align the mating mark and "NEUTRAL" position indicator of the clock spring, and after turning the front wheels to the straight-ahead position, install the clock spring to the column switch. If the mating mark of the clock spring is not properly aligned, the steering wheel may not completely rotate during a turn, or the flat cable within the clock spring may be broken obstructing normal operation of the SRS and possibly leading to serious injury to the vehicle's driver. To inspect the clock spring, refer to the restraints section.**

1. Remove the air bag module.



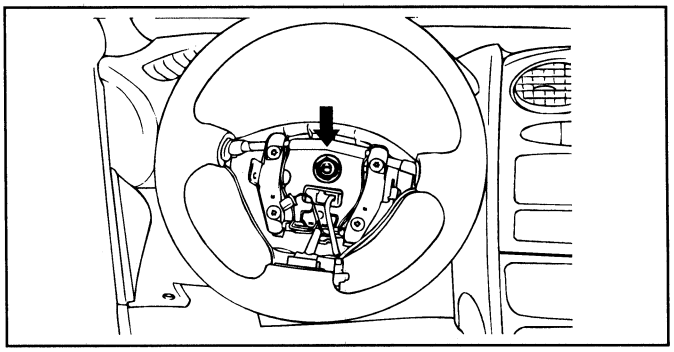
ESJA035P

Tightening torque

Air bag module mounting bolts :

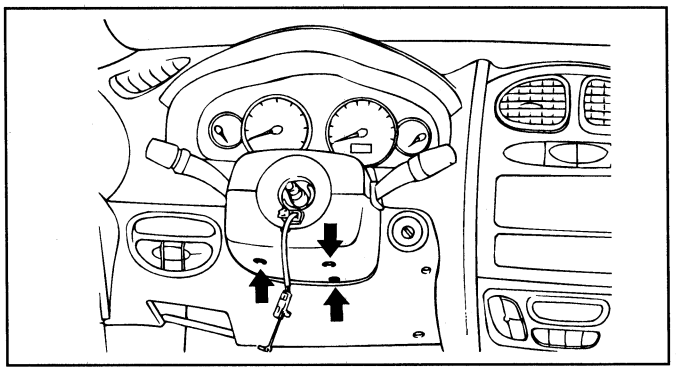
4-6 Nm (40-60 kg·cm, 2.9-4.4 lb·ft)

2. Remove the steering wheel.



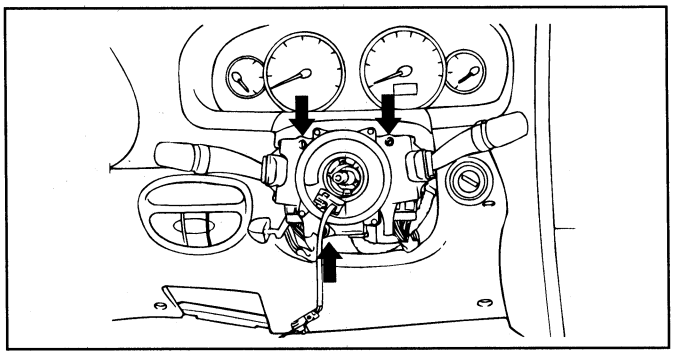
ESJA035B

3. Remove the steering column upper shroud and steering column lower shroud.



ESJA035C

4. Remove the screws holding the multi function switch and disconnect the connectors. Remove the multi function switch assembly.



ESJA035D

5. Installation is the reverse of removal.

INSPECTION ETJA0450

Check the continuity between the terminals while operating the switch.

LIGHTING SWITCH [M20-2]

Position \ Terminal	14	15	17
OFF			
I	○	—	○
II	○	○	○

KTJA040A

DIMMER AND PASSING SWITCH [M20-2]

Position \ Terminal	1	2	10	11
HU		○	—	○
HL			○	○
P	○	○		○

HU : Head lamp high beam
HL : Head lamp low beam
P : Head lamp passing switch

KTDA040B

TURN SIGNAL AND LANE CHANGE SWITCH [M20-2]

Hazard switch \ Turn signal switch \ Terminal	7	8	9
OFF — L		○	○
OFF — N			
OFF — R	○	○	

KTDA040C

WIPER AND INTERMITTENT VOLUME SWITCH [M20-1]

Position \ Terminal	1	2	3	4	5	6	13	14
MIST				○	○			
OFF		○	○					
INT		○	○		○	○	○	○
LOW		○			○			
HI	○				○			

KTDA040D

WASHER SWITCH [M20-1]

Position \ Terminal	5	7
OFF		
ON	○	○

KTJA040B

REAR WIPER AND WASHER SWITCH [M20-1]

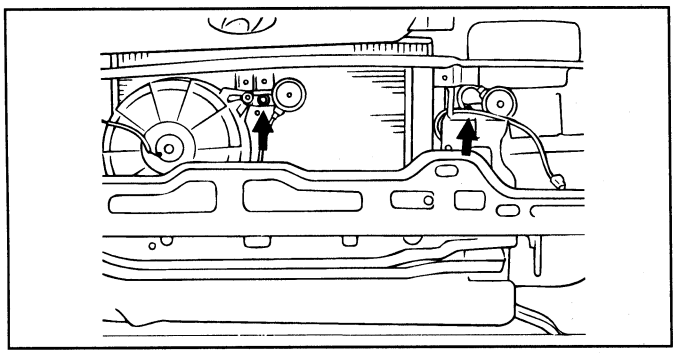
Position \ Terminal	9	10	11	12
WASHER	○			○
OFF				
INT	○	○		
LOW	○		○	
WASHER	○			○

KTJA040C

HORNS

REMOVAL AND INSTALLATION ETJA0500

1. Remove the bolts holding the horn and remove the horn assembly.



ETJA085A

2. Installation is the reverse of removal.

INSPECTION ETHA1200

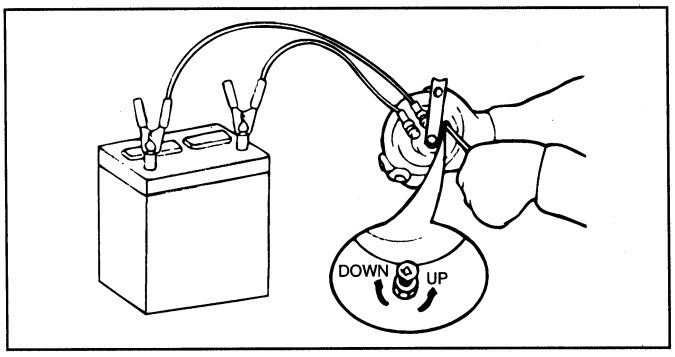
1. Test the horn by connecting battery voltage to the 1 terminal and ground the 2 terminal.
2. The horn should make a sound. If the horn fails to make a sound, replace it.

ADJUSTMENT

Operate the horn, and adjust the tone to a suitable level by turning the adjusting screw.

NOTE

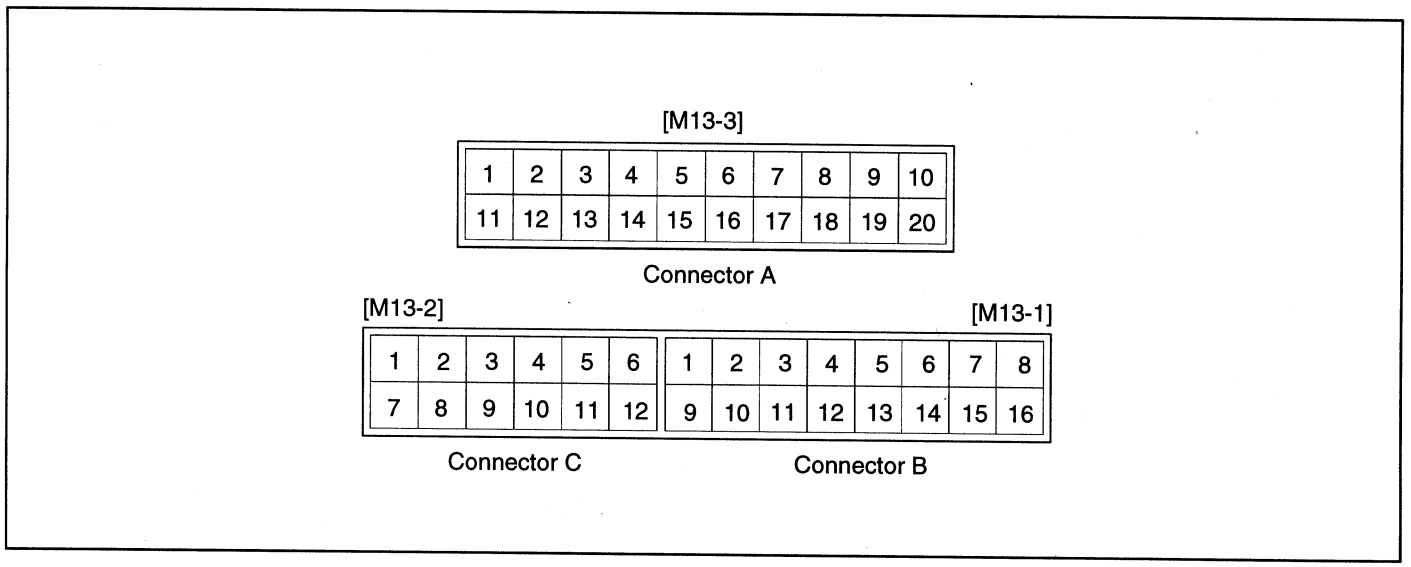
After adjustment, apply a small amount of paint around the screw head to keep it from loosening.



ETDA050A

ETACS (ELECTRONIC TIME AND ALARM CONTROL SYSTEM)

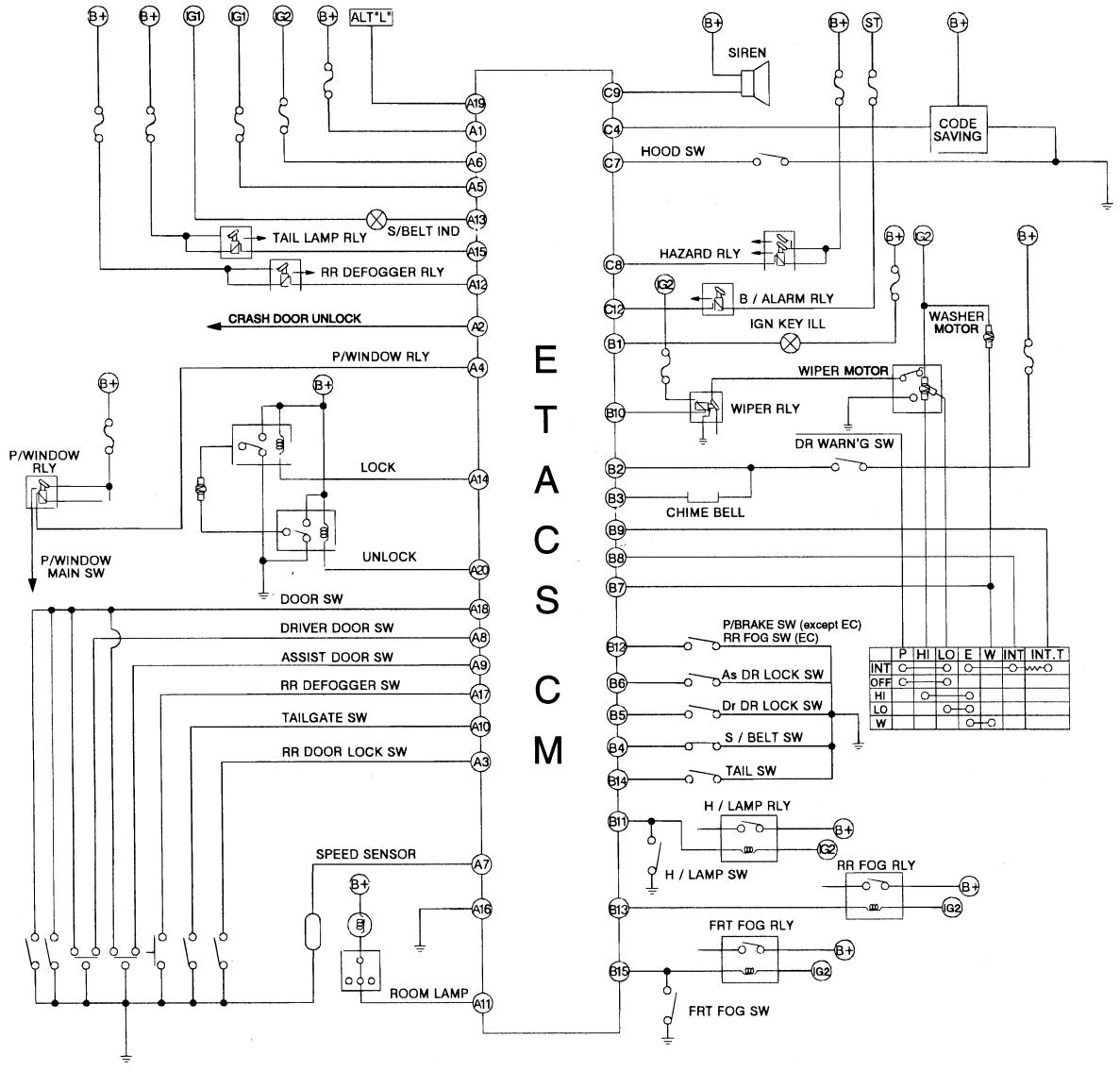
ETACS CM PIN CONNECTION ETJA7200



ETJA055A

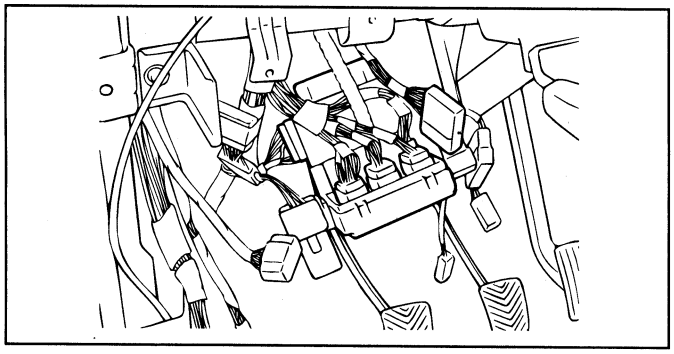
Terminal No.	Connector A	Connector B	Connector C
1	Battery(+)	Ignition key illumination	-
2	Crash door unlock	Door warning switch	-
3	Rear door lock switch	Chime bell	-
4	Power window relay	Seat belt switch	Code saving
5	IGN1	Driver door lock switch	-
6	IGN2	Assist door lock switch	-
7	Speed sensor	Washer switch	Hood switch
8	Driver door switch	INT switch	Hazard relay
9	Assist door switch	INT(T) volume	Siren
10	Tailgate switch	Wiper relay	-
11	Room lamp	Head lamp switch	-
12	Rear defogger relay	Rear fog lamp switch (only EC area) Parking brake switch (except EC area)	Burglar alarm relay
13	Seat belt indicator	Rear fog lamp relay	
14	Door lock relay	Tail lamp switch	
15	Tail lamp relay	Front fog lamp switch	
16	Ground	DRL	
17	Rear defogger switch		
18	Door switch		
19	Alternator(L)		
20	Door unlock relay		

CIRCUIT DIAGRAM ETJA7250



REMOVAL AND INSTALLATION ETJA0650

1. Disconnect the negative (-) battery terminal
2. Remove the lower crash panel.
3. Remove the ETACS CM from the junction block and disconnect the connectors.



ETJA020H

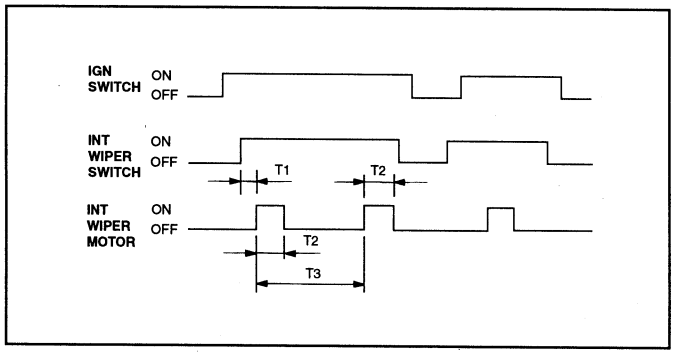
4. Installation is the reverse of removal.

INSPECTION ETJA7300

While operating the components, check whether the operations are normal with timing chart.

ETACS FUNCTION

1. Vehicle speed sensing intermittent wiper



ETHA115C

Time specification

T1 : Max. 0.5 sec.

T2 : 0.6~0.7 sec. (Time of wiper motor 1 rotation)

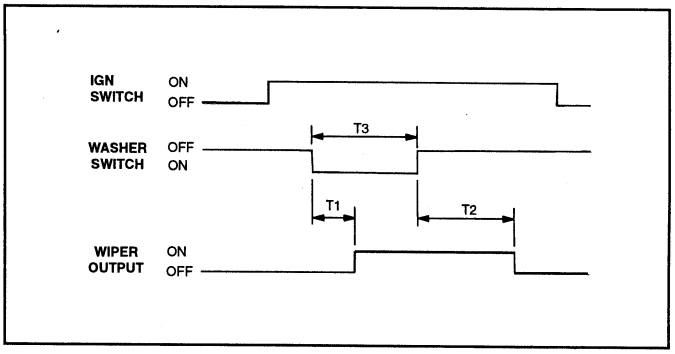
T3 : At vehicle speed = 0km/h.

2.6±0.7 sec. (VR=0kΩ)~18.0±1sec (VR=50KΩ)

At vehicle speed = 100km/h or more.

1.0±0.2sec (VR=0kΩ)~10.0±1sec (VR=50KΩ)

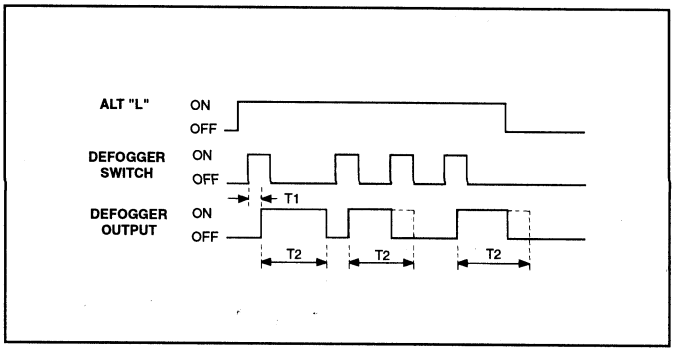
2. Washer



ETHA115D

a. Time specification
   T1 : 0.3 sec.
   T2 : 2.5 - 3.8 sec.
   T3 : 0.2 - 0.6 sec.
b. This function should be operated preferentially even though the variable intermittent wiper is operating.

3. Rear window defogger



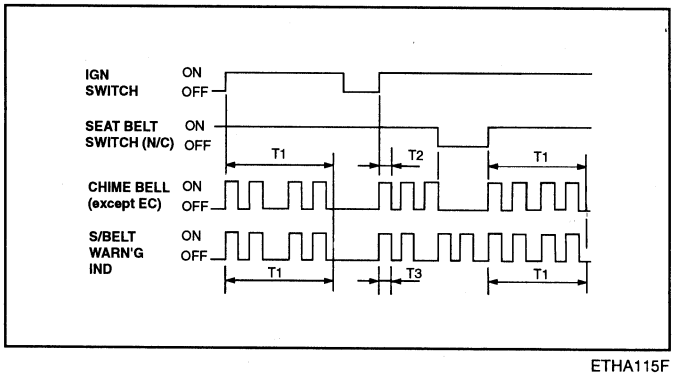
ETJA020B

Time specification

T1 : 60 msec

T2 : 20±1min.

4. Seat belt warning



ETHA115F

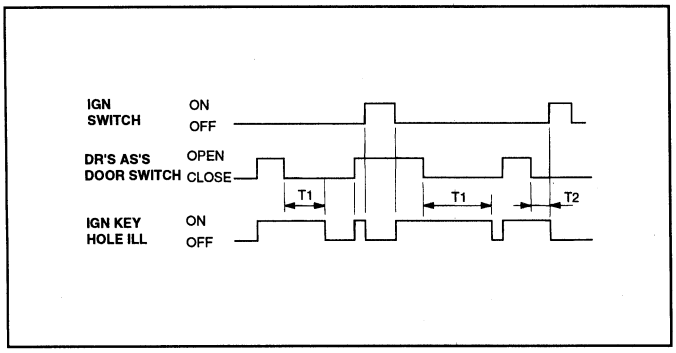
Time specification

T1 : 6±1 sec.

T2 : 0.45±0.1 sec.

T3 : 0.3±0.1 sec.

5. Ignition key hole illumination



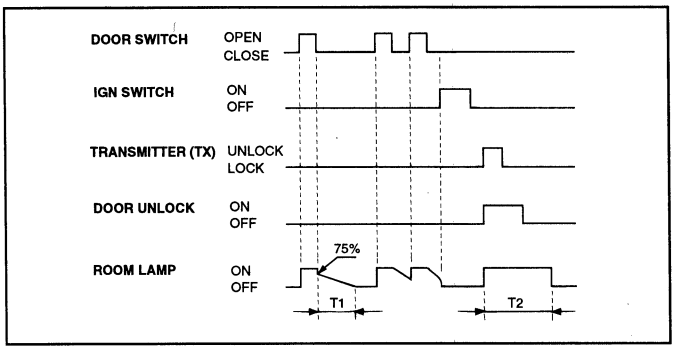
ETJA070A

Time specification

T1 : 10±1 sec.

T2 : 0-10 sec.

6. Delayed out room lamp&keyless unlock timer



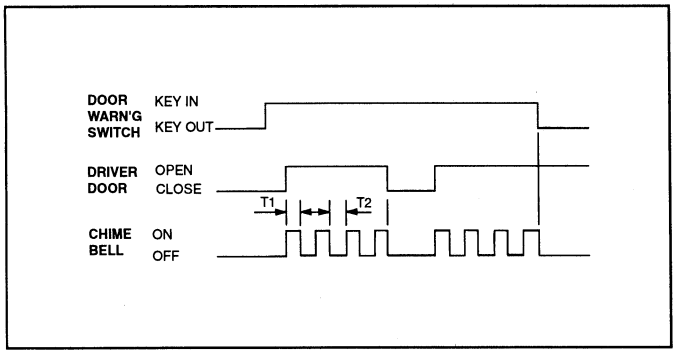
ETJA020C

Time specification

T1 : 5.5±0.5 sec.

T2 : 30±3 sec.

7. Key operated warning (except EC area)

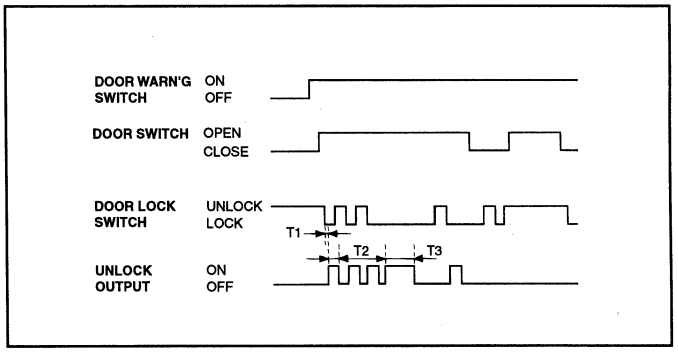


ETHA115L

Time specification

T1, T2 : 0.45±0.1 sec.

8. Ignition key reminder



ETJA020D

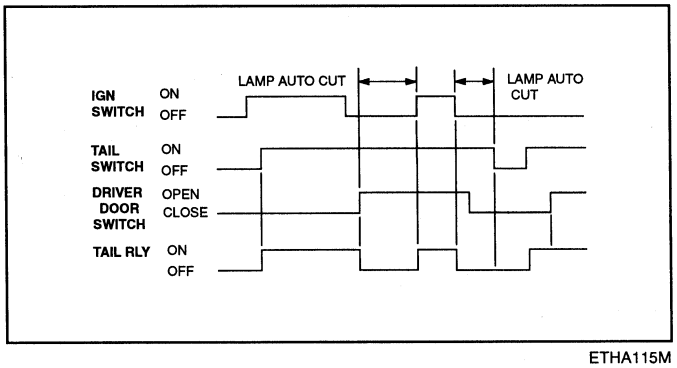
Time specification

T1 : 0.5 sec.

T2 : 1 sec.

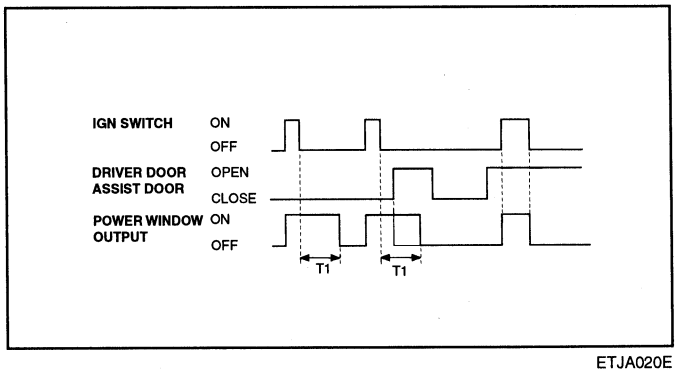
T3 : 0.5 sec., 3 times

9. Tail lamp auto cut



ETHA115M

10. Power window timer

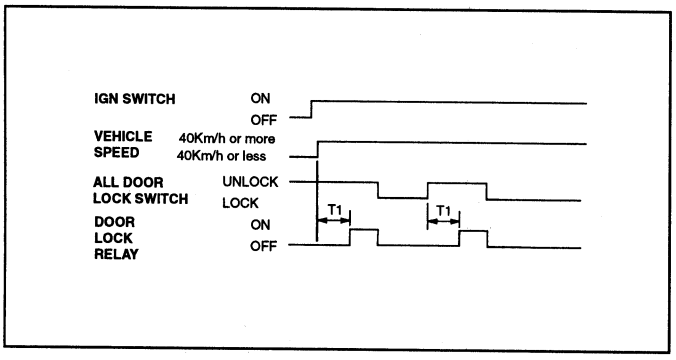


ETJA020E

Time specification

T1 : 30±3 sec.

11. Auto door lock(except EC area)

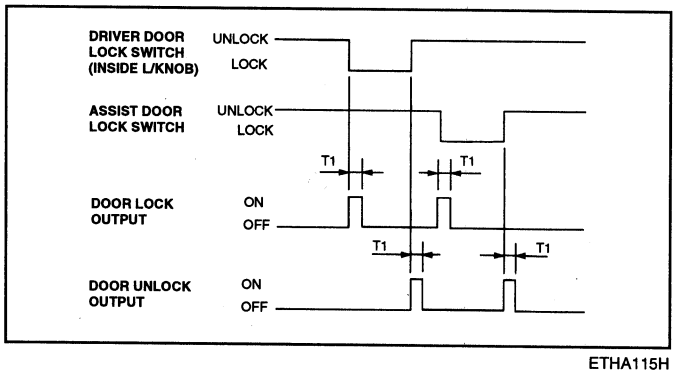


ETHA115N

Time specification

T1 : 2.5±0.5 sec.

12. Central door lock/unlock

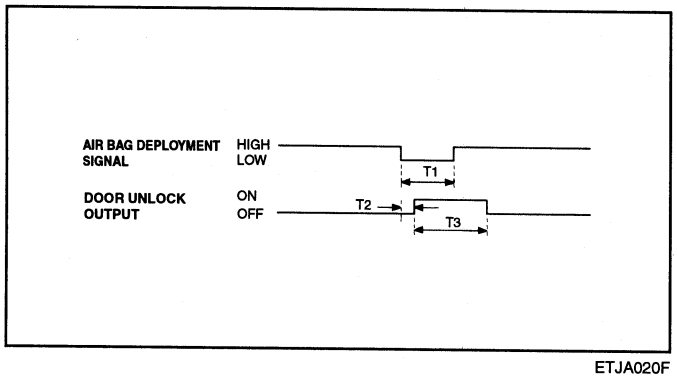


ETHA115H

Time specification

T1 : 0.5±0.1 sec.

13. Crash door unlock



ETJA020F

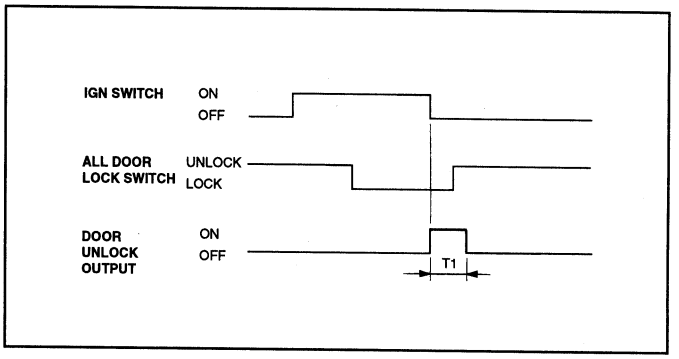
Time specification

T1 : 200ms

T2 : 40ms

T3 : 5±0.5 sec.

14. Ignition key off unlock(except EC area)

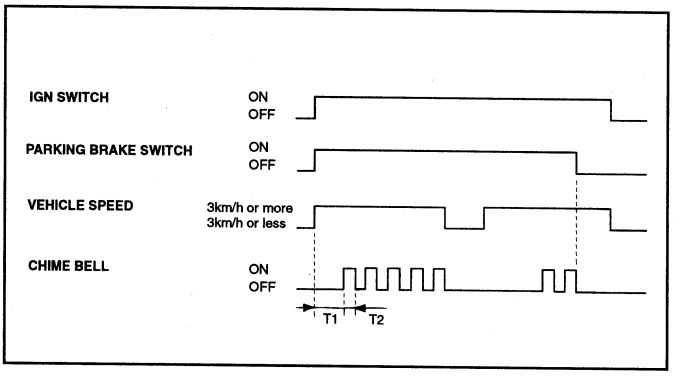


ETHA115P

Time specification

T1 : 0.5±0.1 sec.

15. Parking start warning(except EC area)



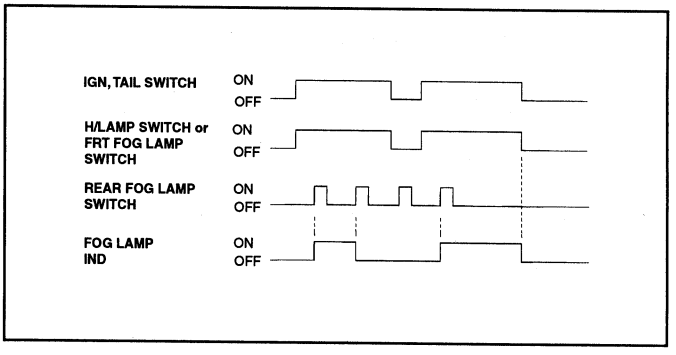
ETJA020G

Time specification

T1 : 2.5±0.5 sec

T2 : 0.3±0.1 sec

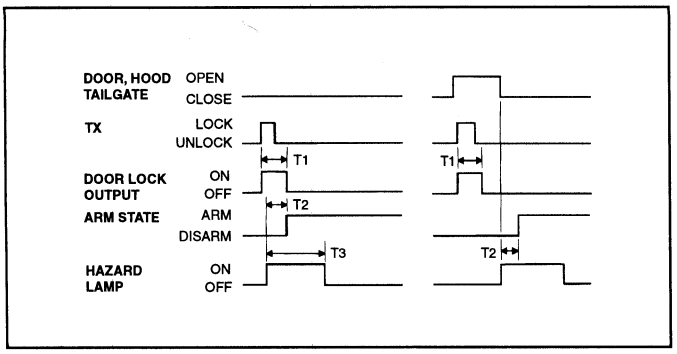
16. Rear fog lamp control(only EC area)



ETHA120E

ANTI-THEFT FUNCTION

1. Arm function



ETHA115Q

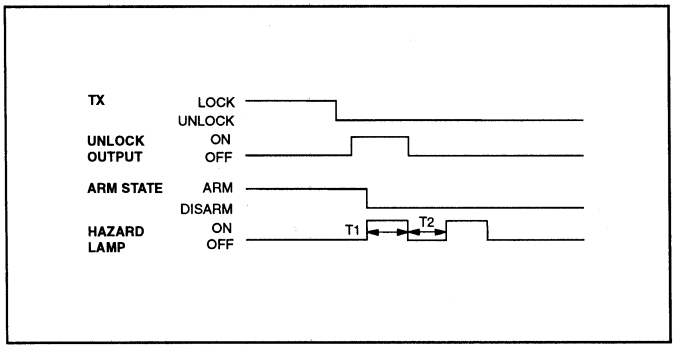
Time specification

T1 : 0.5sec.

T2 : Max 2sec.

T3 : 1.0±0.2sec.

2. Disarm function



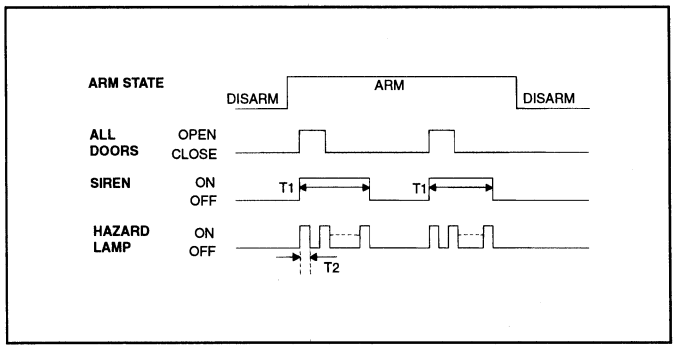
ETHA115R

Time specification

T1, T2 : 0.5±0.1sec.

3. Alarm function

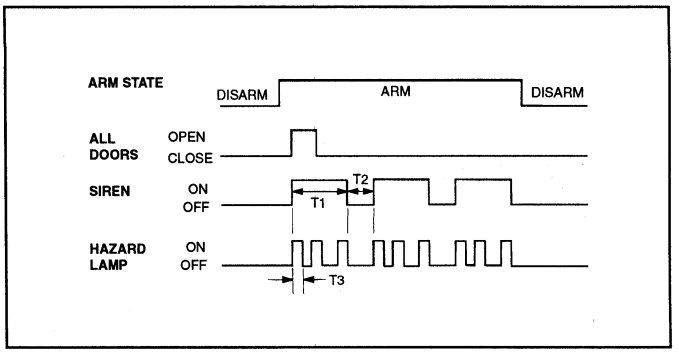
a. Only EC area



ETHA120F

Time specification
T1 : 27±2sec.
T2 : 0.5±0.1sec.

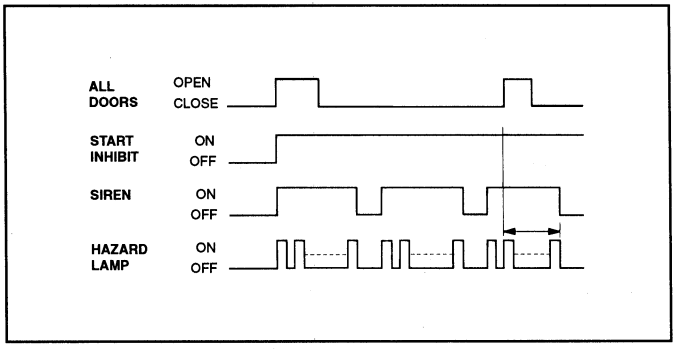
b. Except EC area



ETHA115S

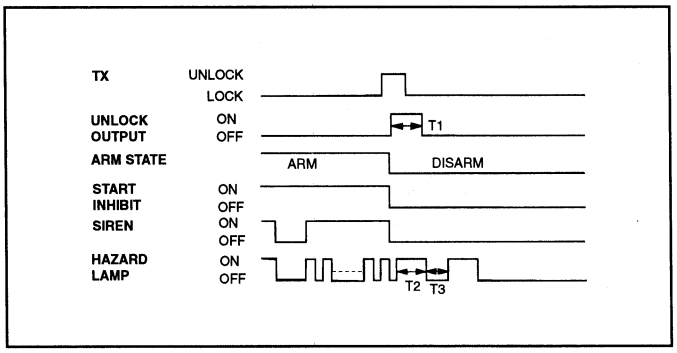
Time specification
T1 : 27±2sec.
T2 : 10±1sec.
T3 : 0.5±0.1sec.

c. New alarm occurs while the alarm is sounding.



ETHA115T

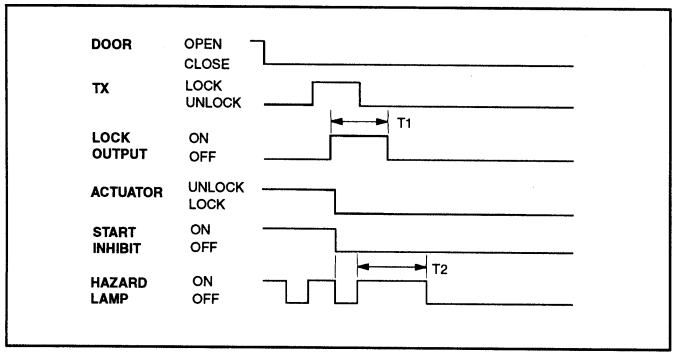
d. Disarmed with TX (Transmitter) while the alarm is sounding.



ETHA115U

Time specification
T1, T2, T3 : 0.5±0.1sec.

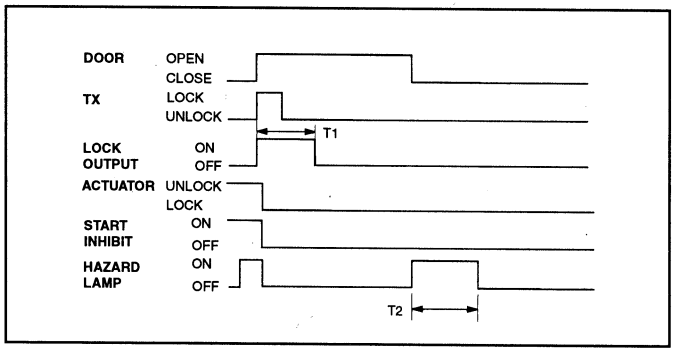
e. TX (Transmitter) lock button pressed when the door closed while the alarm is sounding.



ETHA115V

Time specification
T1 : 0.5sec.
T2 : 1.0±0.2sec.

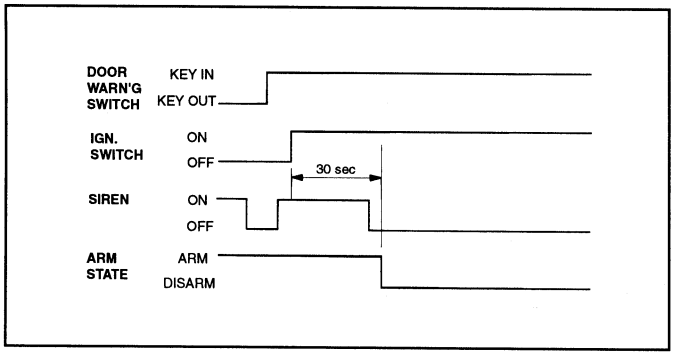
f. TX (Transmitter) lock button pressed when the door opened while the alarm is sounding.



ETHA115W

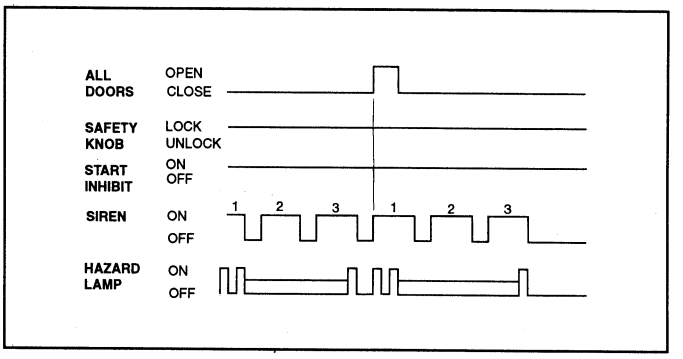
Time specification
T1 : 0.5sec.
T2 : 1.0±0.2sec.

g. Disarmed after 30 sec when the ignition switch is turned on while the alarm is sounding.



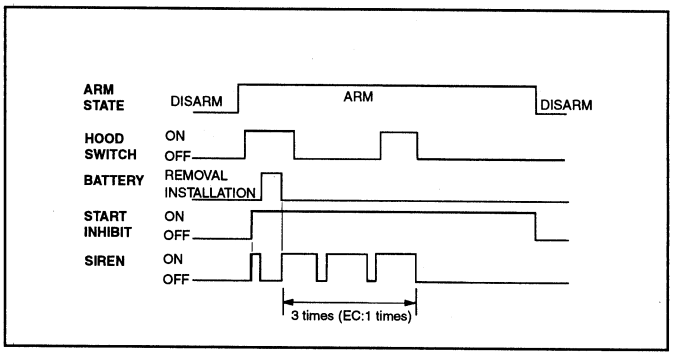
ETHA115X

h. Start inhibit is "ON" regardless of door latch lock state.



ETHA115Y

i. Battery is disconnected during the alarm state.



ETHA115Z

4. **Code saving method.**

   a. Remove the lower dash panel.

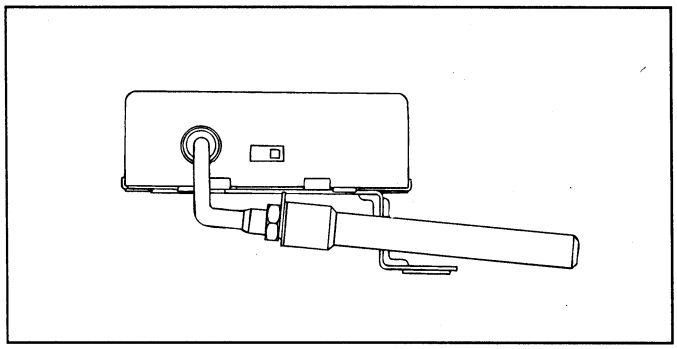
NOTE

Don't disconnect the negative (-) battery terminal.

   b. To store new codes :

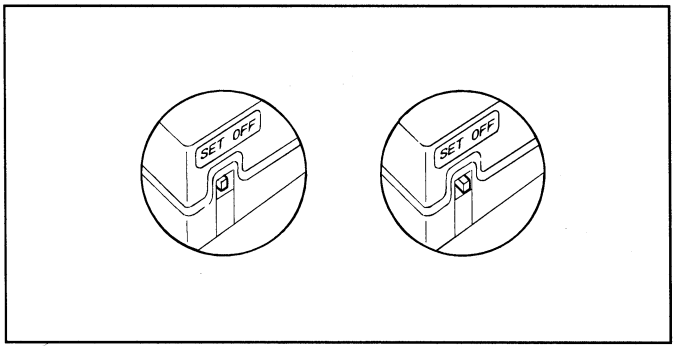
   - Activate the keyless entry/receiver unit and change code saving switch of the receiver unit from "OFF" to "SET".
   - The secret codes from the transmitter will be stored into the receiver unit when the door lock button or unlock button is pressed on the transmitter.

   - Save the 2nd transmitter codes in the same manner.



ETDA085R

   c. Return the code saving switch of the receiver unit from "SET" to "OFF".



ETHA120D

   d. Install the lower dash panel.

FUSES AND RELAYS

RELAY BOX (ENGINE COMPARTMENT)

FUSIBLE LINK ETJA0750

SPECIFICATIONS

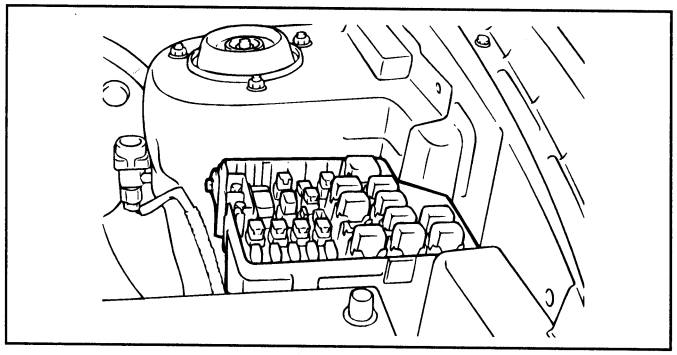
Circuit	Rated Capacity	Circuit	Rated Capacity
Battery	50A	ABS 1	30A
Generator	120A	ABS 2	30A
Power window	30A	Radiator	30A
Condenser	20A	ECM	40A
Ignition	40A	Blower	40A

INSPECTION

1. Check for a burnt fusible link with an ohmmeter.
2. If a fusible link burns out, there is a short or some other problem in the circuit. Carefully determine the cause and correct it before replacing the fusible link.

CAUTION

The fusible link will burn out within 15 seconds if a higher than specified current flows through the circuit.



ETJA075D

FUSE BOX ETJA0800

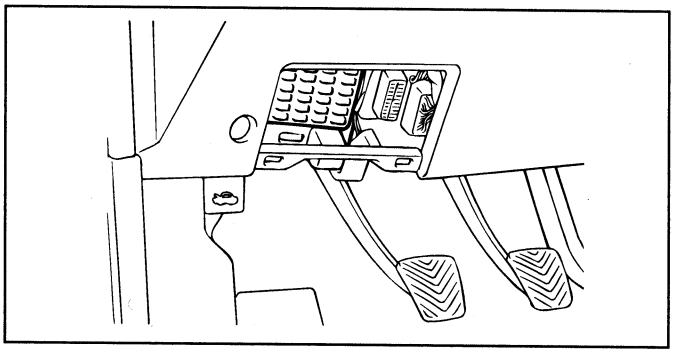
INSPECTION

1. Be sure there is no play in the fuse holders, and that the fuses are held securely.
2. Are the fuse capacities for each circuit correct?
3. Are there any blown fuses?

   If a fuse is to be replaced, be sure to use a new fuse of the same capacity. Always determine why the fuse blew first and completely eliminate the problem before installing a new fuse.

CAUTION

Never use a fuse of higher capacity than specified.



ETJA075E

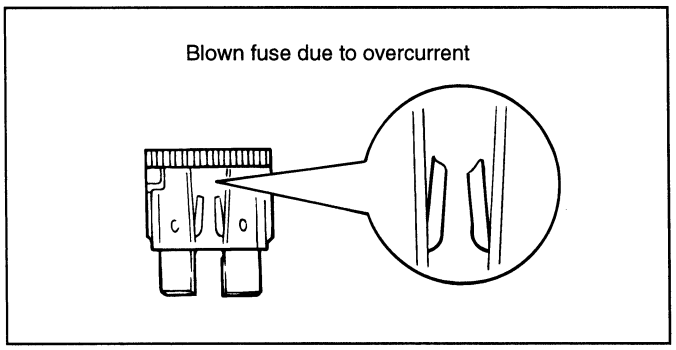
FUSES

INSPECTION ETDA0860

When a fuse is blown, there are two probable causes. The two causes can easily be determined by a visual check after removing the fuses.

1. **Fuse blown due to over-current.**

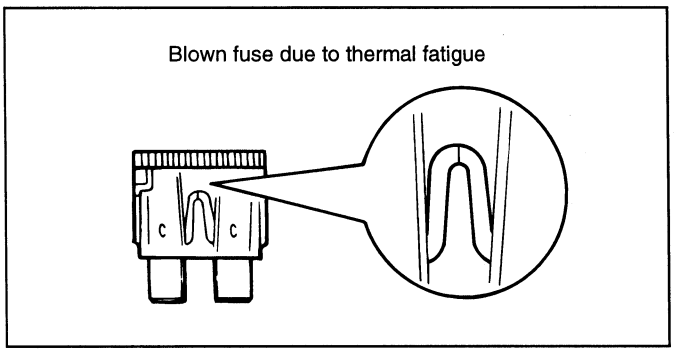
   Prior to replacing the fuse with a new one, check the circuit for a short and the related parts for abnormal conditions. Only after the correction of a short or replacement of abnormal parts, should a fuse with the same ampere rating be installed.



ETDA086A

2. **Fuse blown due to repeated on-off current.**

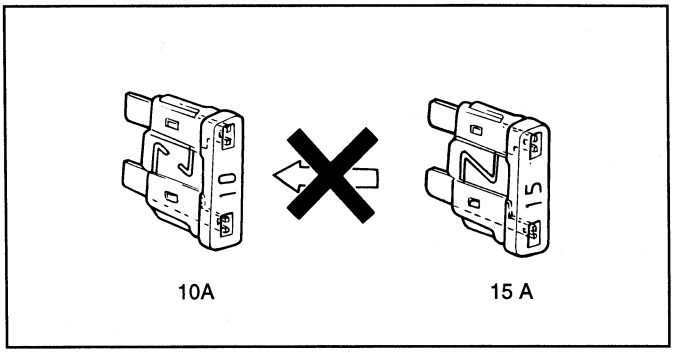
   Normally, this type of problem occurs after a fairly long period of use, and is less frequent than #1 above. In this case, you may simply replace with a new fuse of the same capacity.



ETDA086B

CAUTION

A blade type fuse is identified by the numbered value in amperes. If the fuse is blown, be sure to replace a fuse with the same ampere rating. If a fuse of higher capacity than specified is used, parts may be damaged and a danger of fire exists. To remove or insert a fuse, use the fuse puller in the fuse box.

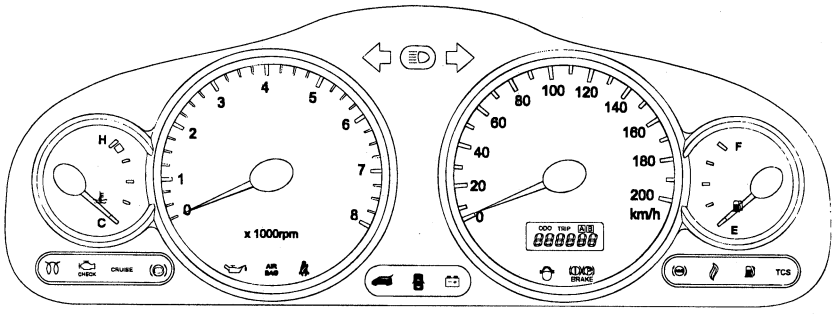


ETDA086C

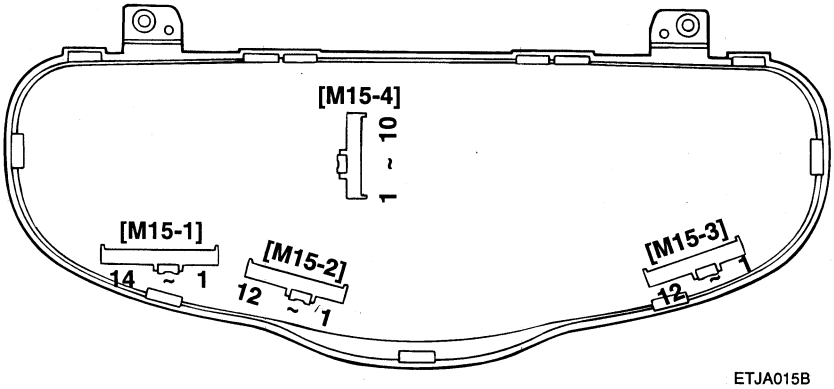
INDICATORS AND GAUGES

INSTRUMENT CLUSTER

COMPONENTS ETJA7350

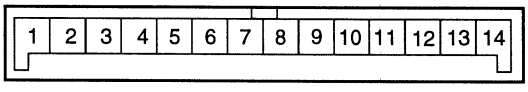


ETJA015C



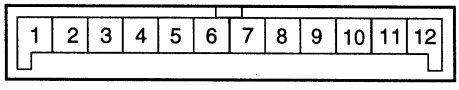
ETJA015B

[M15-1]



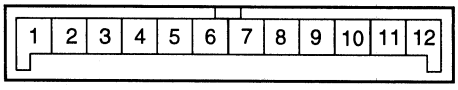
ETJA015E

[M15-2]



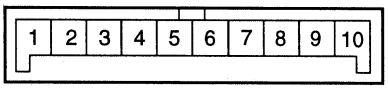
ETJA015F

[M15-3]



ETJA015F

[M15-4]

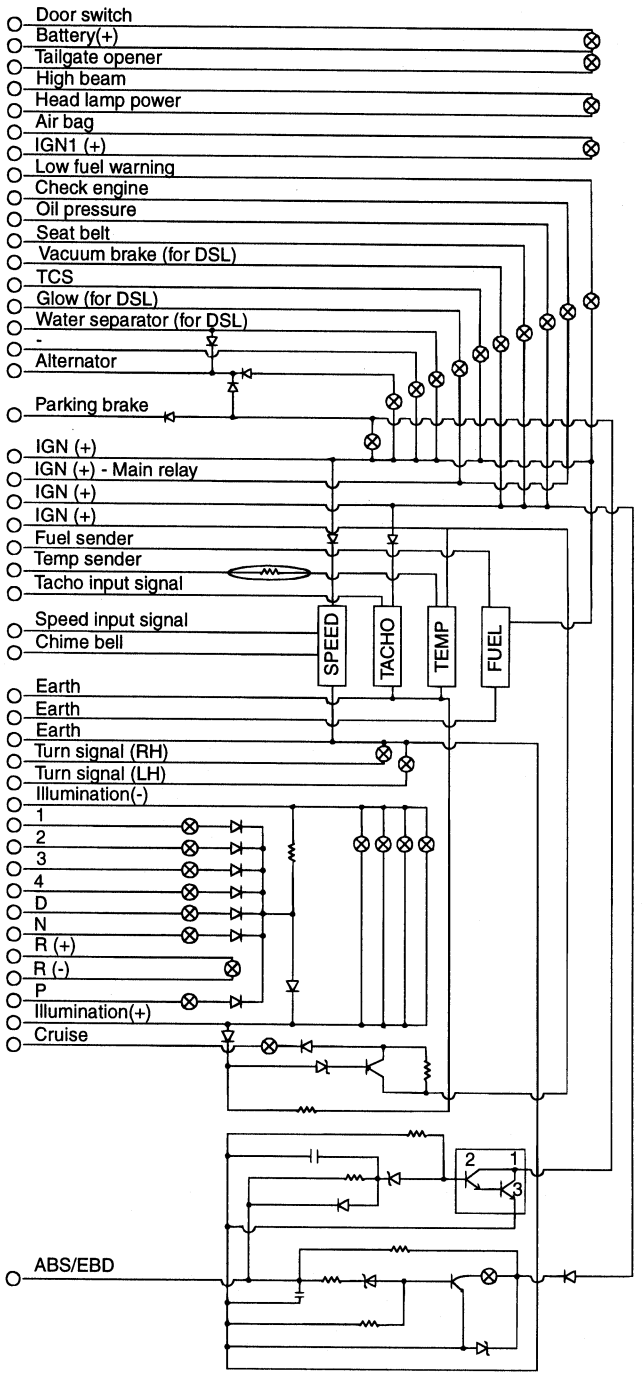


ETJA015G

ETJA735A

CIRCUIT DIAGRAM ETJA7400

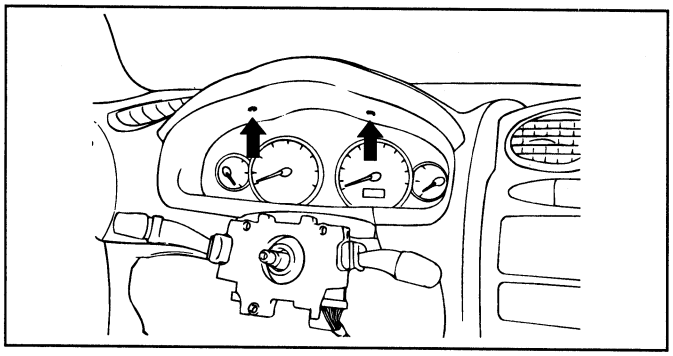
M15-1	M15-2	M15-3	M15-4
	8		
	10		
	9		
	3		
	2		
3			
4			
		3	
13			
5			
	11		
6			
		2	
14			
		9	
		10	
		8	
		4	
11			
	12		
12			
		6	
8			
2			
		11	
		12	
9			
		7	
	5		
	1		
	4		
	7		
			10
			9
			8
			7
			5
			4
			3
			2
			1
	6		
10			
		5	



ETJA740A

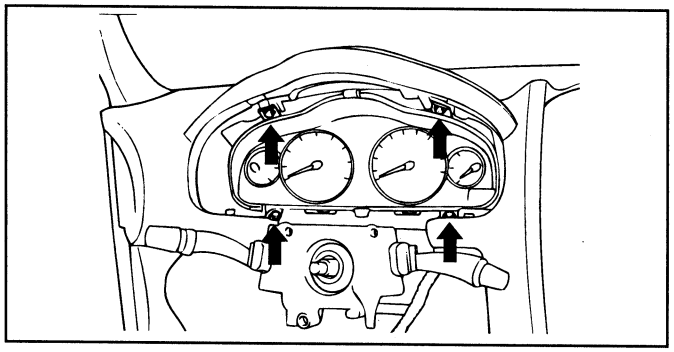
REMOVAL AND INSTALLATION ETJA0950

1. Disconnect the negative (-) battery terminal.
2. Remove the cluster facia panel.



ESJA035F

3. Remove the screws holding the cluster and remove the instrument cluster.



ESJA035G

4. Installation is the reverse of removal.

INSPECTION OF COMPONENTS ETJA7900

SPEEDOMETER

1. Adjust the pressure of the tires to the specified level.
2. Drive the vehicle onto a speedometer tester. Use wheel chocks as appropriate.
3. Check if the speedometer indicator range is within the standard values.

CAUTION

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

NOTE

Tire wear and tire over or under inflation will increase the indication error.

Velocity (Km/ h)	20	40	60	80	100	120	140	160	180	200	Remark
Tolerance (Km/ h)	20-24.1	40-43	60-64.1	80-85.2	100-105.2	120.5-126.3	140.5-146.7	160.5-167.5	181-188.4	201-209.1	Except EEC& GENERAL
	20.8-25.4	40-44	60.8-65.4	81.4-86.8	102.6-108.2	123.5-129.6	144.4-151	165.4-172.4	186.3-193.8	207.2-215.2	EEC, GENERAL

Velocity (MPH)	10	20	40	60	80	100	120	Remark
Tolerance (MPH)	10-12.5	20-22	40-42.6	60-63.4	80.3-84.1	100.3-104.7	120.3-125.3	Except U.S.A
	8.5-11.5	18.5-21.5	38.5-41.5	58.3-61.7	78-82	97.7-102.3	117.5-122.5	U.S.A

TACHOMETER

1. Connect the scan tool to the diagnostic link connector or install a tachometer.
2. With the engine started, compare the readings of the tester with that of the tachometer. Replace the tachometer if the tolerance is exceeded.

CAUTION

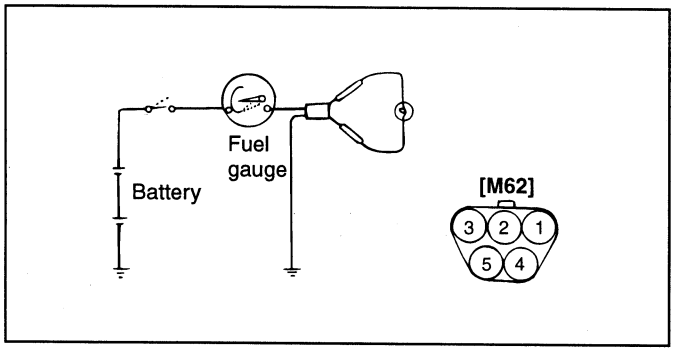
1. **Reversing the connections of the tachometer will damage the transistor and diodes inside.**
2. **When removing or installing the tachometer, be careful not to drop it or subject it to severe shock.**

Revolution (rpm)	1,000	2,000	3,000	4,000	5,000	6,000	7,000	Remark
Tolerance (rpm)	±100	±125	±150	±150	±150	±180	±210	

FUEL GAUGE

OPERATION CHECK

1. Disconnect the fuel sender connector from the fuel sender.
2. Connect a 3.4 watt, 12V test bulb to terminals 2 and 5 on the wire harness side connector.
3. Turn the ignition switch to the ON, and then check that the bulb lights up and the fuel gauge needle moves to full.

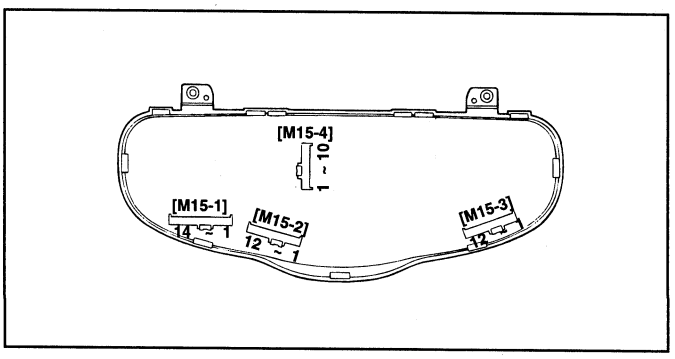


ETJA070F

RESISTANCE CHECK

1. Remove the instrument cluster (Refer to page BD-26).
2. Measure the resistance between terminal 6(M15-3) and terminal 7(M15-3).

Resistance (Ω)	Gauge level
100	E(Empty)
55	1/2
10	F(Full)



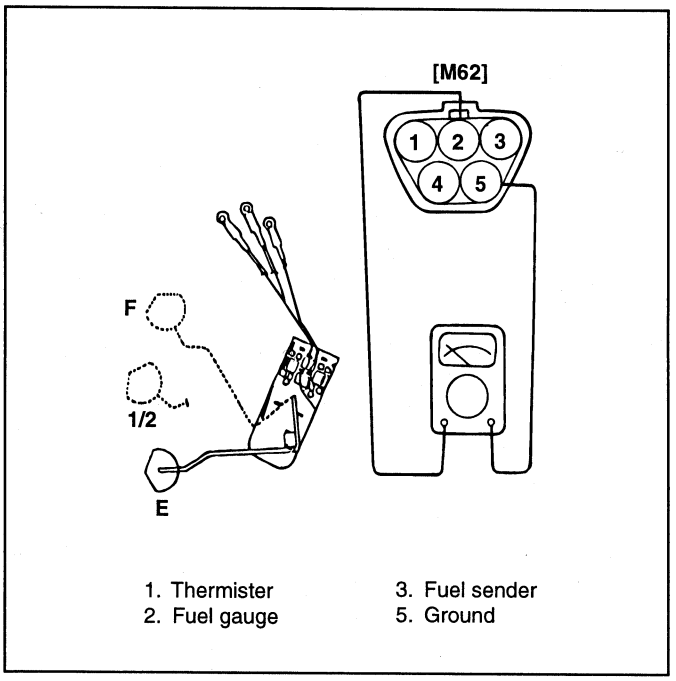
ETJA015B

FUEL SENDER

1. Using an ohmmeter, measure the resistance between terminals 2 and 5 at each float level.

Float position	F	1/2	E
Resistance (Ω)	4	55	105

2. Also check that the resistance changes smoothly when the float is moved from "E" to "F".



1. Thermister
2. Fuel gauge
3. Fuel sender
5. Ground

ETJA070G

LOW FUEL LEVEL SENSOR

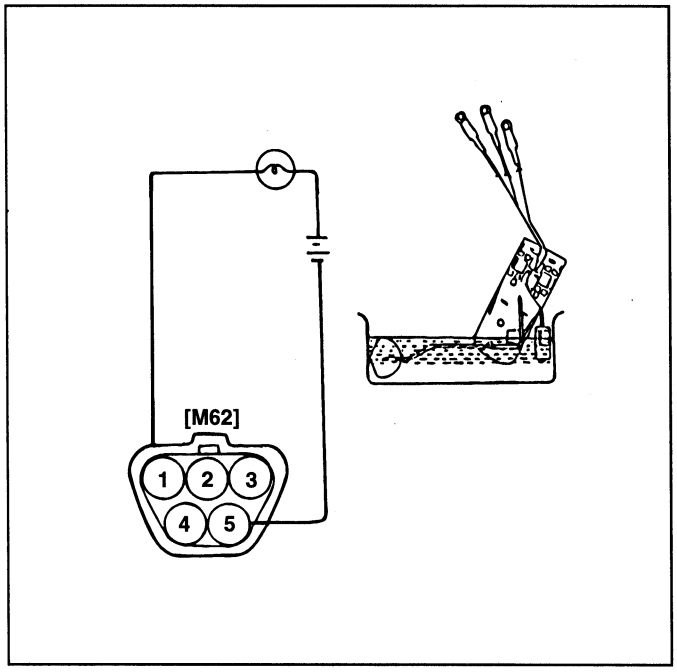
1. Connect a test lamp (12V, 3.4W) and the battery to the sender. Immerse the sender in water.
2. The lamp should be off while the thermister is submerged in the water, and should illuminate when the sender is taken out of the water.

NOTE

If there is a malfunction, replace the fuel sender as an assembly.

CAUTION

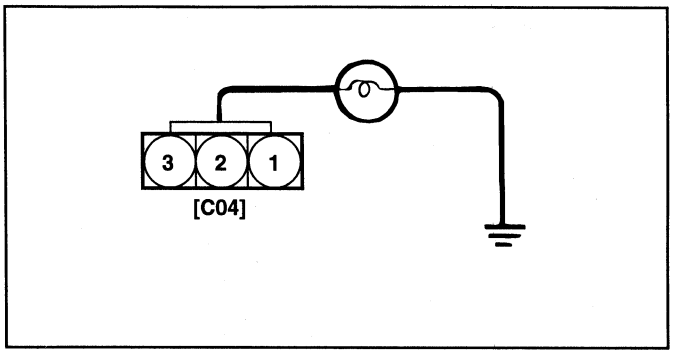
After completing this test, wipe the sender dry and reinstall it in the fuel tank.



ETJA070H

ENGINE COOLANT TEMPERATURE GAUGE

1. Disconnect the wiring connector from the engine coolant temperature sender in the engine compartment.
2. Turn the ignition switch ON. Check that the gauge needle indicates cool. Turn the ignition switch OFF.
3. Connect a 12V, 3.4 watt test bulb between the harness side connector and ground.



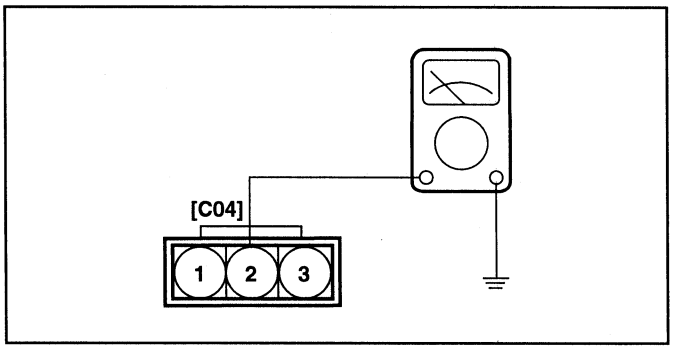
ETJA700A

4. Turn the ignition switch ON.
5. Verify that the test bulb flashes and that the indicator moves to HOT.

If operation is not as specified, replace the sender. Then recheck the system.

ENGINE COOLANT TEMPERATURE SENDER

1. Using an ohmmeter, measure the resistance between the terminal 2 and ground.



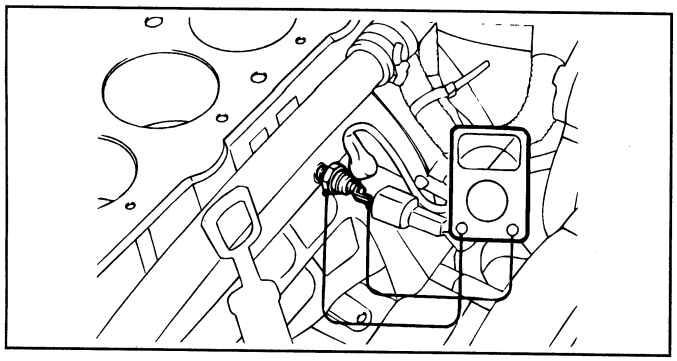
ETJA700B

2. If the resistance value is not as shown in the table, replace the temperature sender.

Temperature (°C)	60	85	110	127.4
Resistance (Ω)	118	49	25	14.6

OIL PRESSURE SWITCH

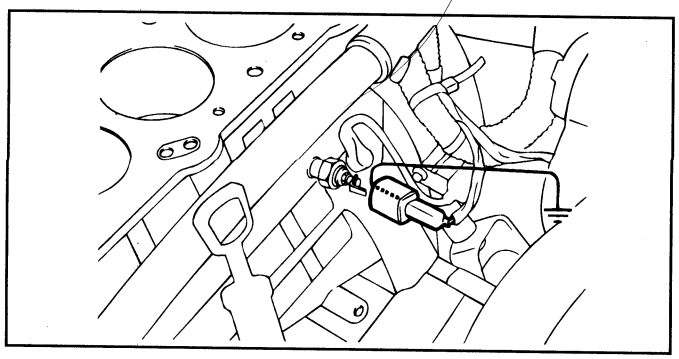
1. Check that there is continuity between the switch's terminal and ground with the engine stopped.
2. Check that there is no continuity between the terminal and ground with the engine running.
3. If operation is not as specified, replace the switch.



V5BE060K

OIL PRESSURE WARNING LAMP

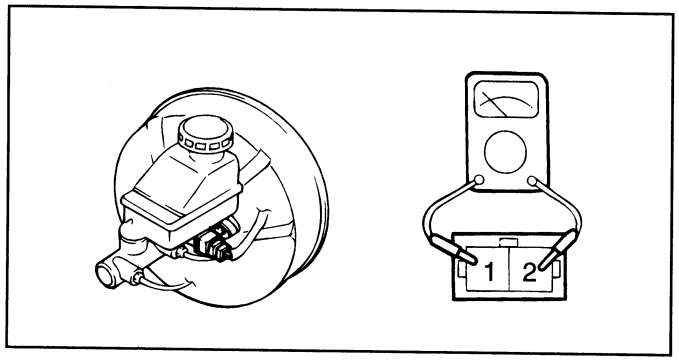
1. Disconnect the connector from the warning switch and ground the terminal on the wire harness side connector.
2. Turn the ignition switch ON. Check that the warning lamp lights up. If the warning lamp doesn't light, test the bulb or inspect wire harness.



V5BE060L

BRAKE FLUID LEVEL WARNING SWITCH

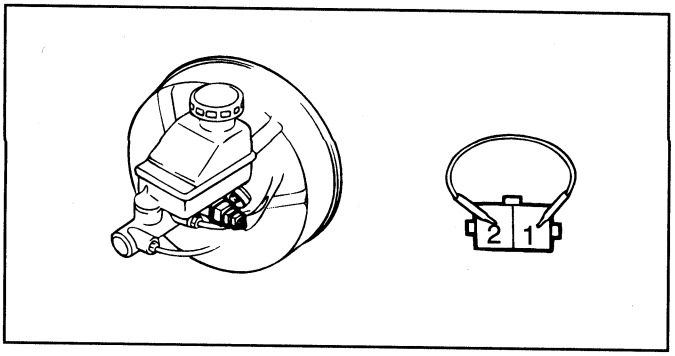
1. Remove the connector from the switch located at the brake fluid reservoir.
2. Verify that continuity exists between switch terminals 1 and 2 while pressing down the switch (float) with a rod.



V5BE060M

BRAKE FLUID LEVEL WARNING LAMP

1. Start the engine.
2. Release the parking brake.
3. Remove the connector from the brake fluid level warning switch.
4. Ground the connector at the harness side.
5. Verify that the warning lamp lights.



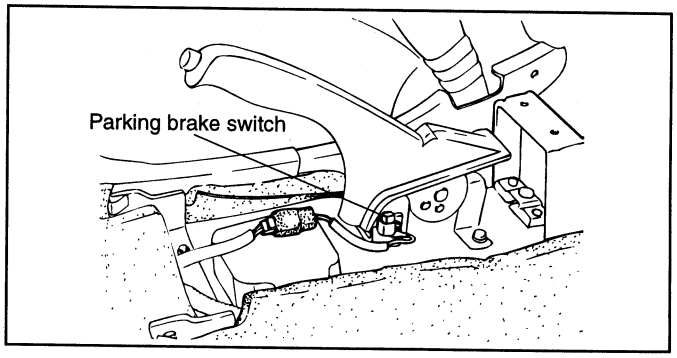
V5BE060N

PARKING BRAKE SWITCH

The parking brake switch is a push type located under the parking brake lever. To adjust, move the switch mount up and down with the parking brake lever released all the way.

1. Check that there is continuity between the terminal and switch body with the switch ON (Lever is pulled).
2. Check that there is no continuity between the terminal and switch body with the switch OFF (Lever is released).

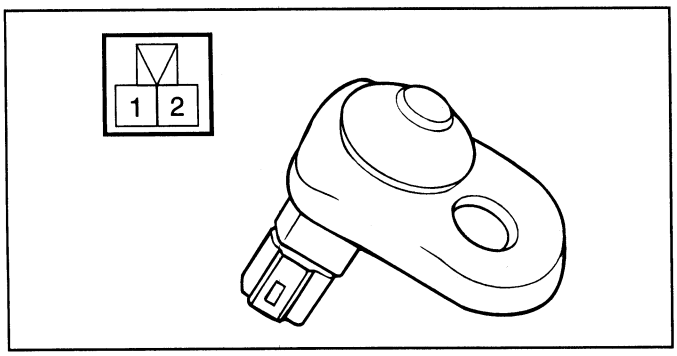
If continuity is not as specified, replace the switch or inspect its ground connection.



V5BE060O

DOOR SWITCH

Remove the door switch and check for continuity between the terminals.



V5BE060P

FRONT DOOR SWITCH

Position \ Lead wire	1	2
Free	○	○
Push		

ETJA740B

REAR DOOR SWITCH

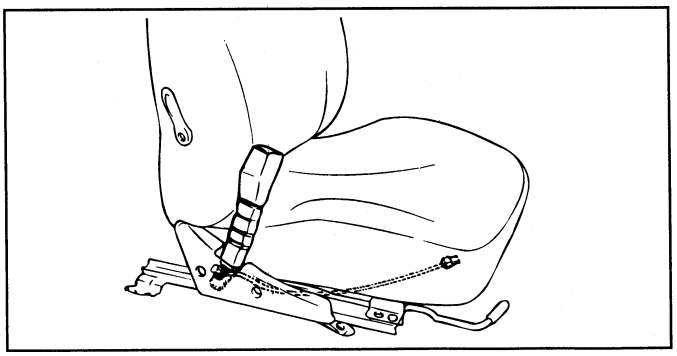
Position \ Lead wire	Ground (Body)	1
Free	○	○
Push		

ETJA740C

SEAT BELT SWITCH

1. Remove the connector from the switch.
2. Check for continuity between terminals.

Seat belt condition	Continuity
Fastened	Non-conductive (∞Ω)
Not fastened	Conductive(0Ω)



V5BE060Q

SEAT BELT WARNING LAMP

With the ignition switch turned ON, verify that the lamp glows.

Seat belt condition	Warning lamp
Fastened	OFF
Not fastened	ON

POWER DOOR LOCKS

POWER DOOR LOCK ACTUATORS

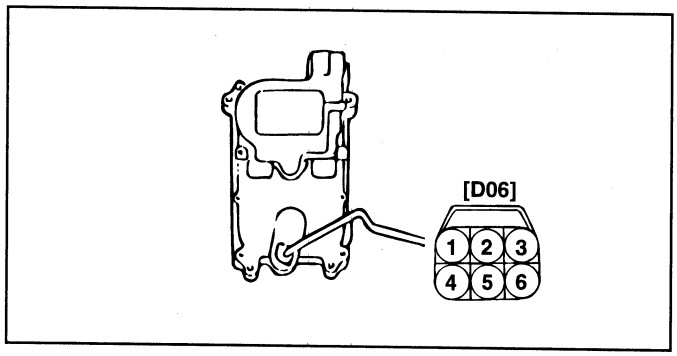
INSPECTION ETJA1050

1. Disconnect the actuator connector from the wiring harness.
2. Apply battery voltage (12V) to each terminal as shown in the table and verify that the actuator operates correctly.

[D06]

Position \ Terminal	4	6
Unlock	⊕	⊖
Lock	⊖	⊕

ETJA105A



ETJA055R

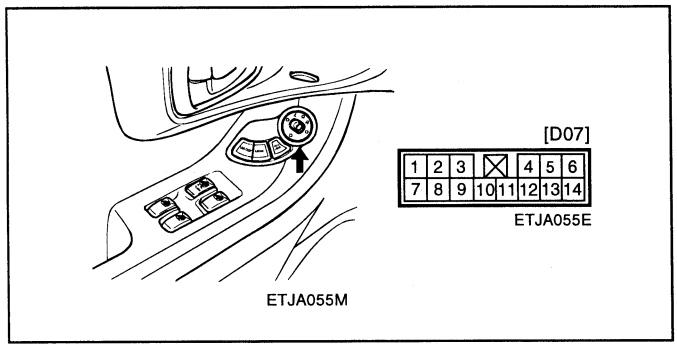
POWER DOOR MIRRORS

POWER DOOR MIRROR SWITCH

INSPECTION ETJA1100

1. Remove the power door mirror switch from the door trim panel.
2. Check for continuity between the terminals in each switch position according to the table.

   If continuity is not as specified, replace the power door mirror switch.



ETJA110A

MIRROR SWITCH

[D07]

Class	Terminal / Direction	2	5	9	10	11	12	13
LEFT HAND	UP	○	○	○	○	○		
	DOWN	○		○	○			
	OFF		○	○	○	○		
	LEFT	○	○			○		
	RIGHT	○		○	○	○		
RIGHT HAND	UP	○	○			○	○	○
	DOWN	○	○			○	○	○
	OFF		○			○	○	○
	LEFT	○	○			○	○	○
	RIGHT	○	○			○	○	○

ETJA110B

DOOR LOCK SWITCH

[D07]

Position / Terminal	2	3	4
LOCK	○		○
OFF			
UNLOCK	○	○	

ETJA110C

WINDOW LOCK SWITCH

[D07]

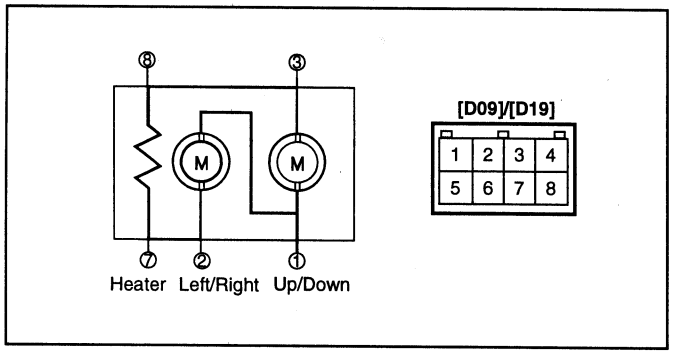
Position / Terminal	6	14
UNLOCK	○	○
LOCK		

ETJA110D

POWER DOOR MIRROR ACTUATOR

INSPECTION ETJA1150

1. Disconnect the power door mirror connector from the harness.
2. Apply battery voltage to each terminal as shown in the table and verify that the mirror operates properly.



ETJA115A

[D09(LH), D19(RH)]

Terminal / Position	1	2	3
UP	⊕	M	⊖
DOWN	⊖	M	⊕
LEFT		⊕	M ⊖
RIGHT		⊖	M ⊕

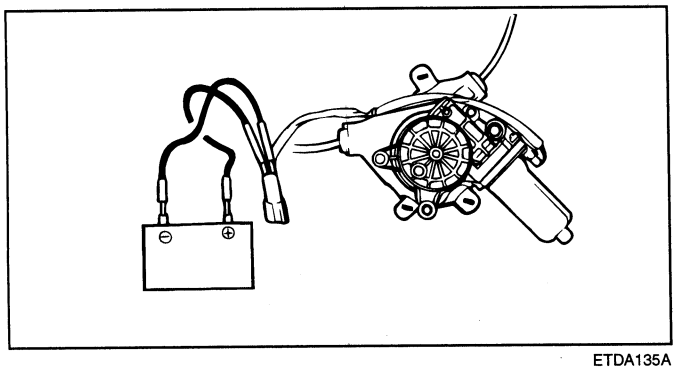
ETJA115B

POWER WINDOWS

POWER WINDOW MOTOR

INSPECTION ETJA1200

Connect the motor terminals directly to battery voltage (12V) and check that the motor operates smoothly. Next, reverse the polarity and check that the motor operates smoothly in the reverse direction. If the operation is abnormal, replace the motor.



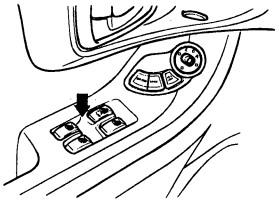
ETDA135A

POWER WINDOW SWITCH

INSPECTION ETJA1250

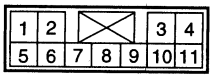
1. Remove the switch from the door trim panel.
2. Check for continuity between the terminals. If continuity is not as specified in the table, replace the power window switch.

POWER WINDOW MAIN SWITCH



ETJA055M

[D04]



ETJA055D

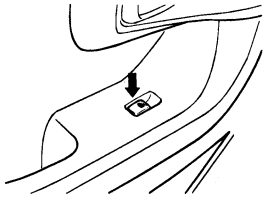
ETJA125C

[D04]

Terminal / Position	FRONT LEFT				FRONT RIGHT				REAR LEFT				REAR RIGHT			
	3	4	9	10	1	8	9	10	7	9	10	11	5	6	9	10
UP	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
OFF	○	○	○		○	○	○		○	○		○	○	○	○	
DOWN	○	○	○	○	○	○	○	○	○		○	○	○	○	○	○

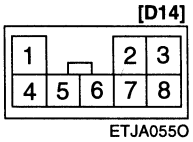
ETJA125A

POWER WINDOW SUB SWITCH



ETJA055P

[D14]



ETJA055O

ETJA125D

[D14]

Terminal / Position	1	3	4	6	8
UP	○	○	○		○
OFF	○	○	○	○	
DOWN	○				○
			○	○	

ETJA125B

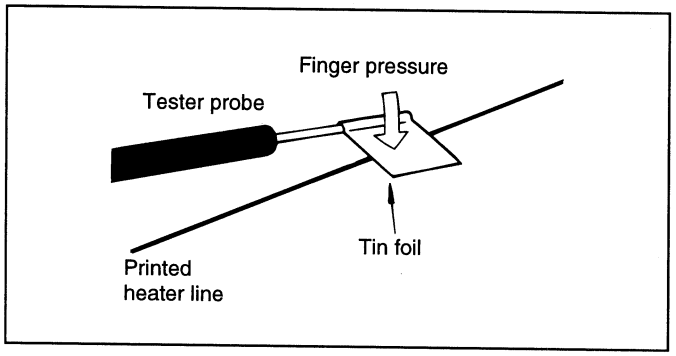
REAR WINDOW DEFOGGER

REAR WINDOW DEFOGGER PRINTED HEATER

INSPECTION ETA91650

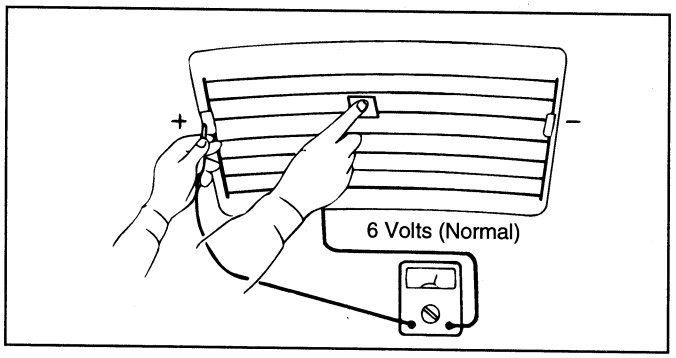
CAUTION

Wrap tin foil around the end of the voltmeter test lead to prevent damaging the heater line. Apply finger pressure on the tin foil, moving the tin foil along the grid line to check for open circuits.



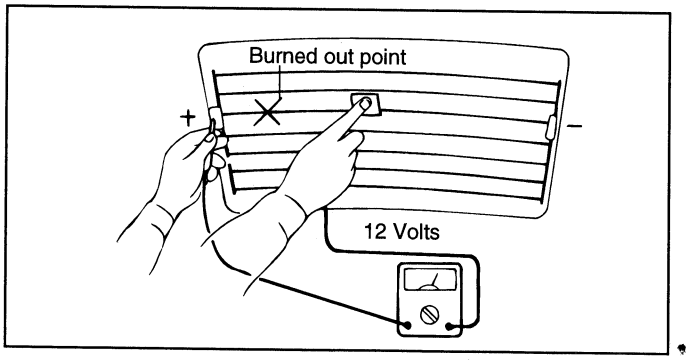
ETA9165A

1. Turn on the defogger switch and use a voltmeter to measure the voltage of each heater line at the glass center point. If a voltage of approximately 6V is indicated by the voltmeter, the heater line of the rear window is considered satisfactory.



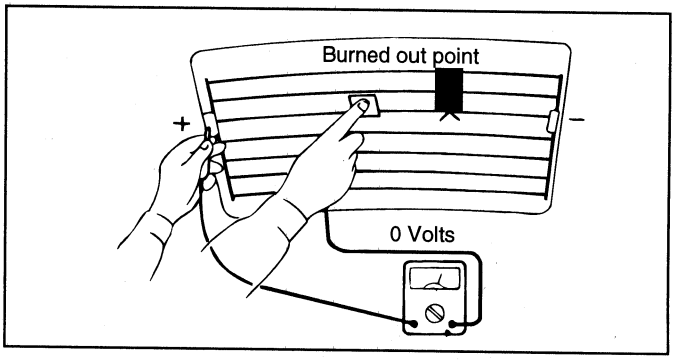
ETA9165B

2. If a heater line is burned out between the center point and (+) terminal, the voltmeter will indicate 12V.



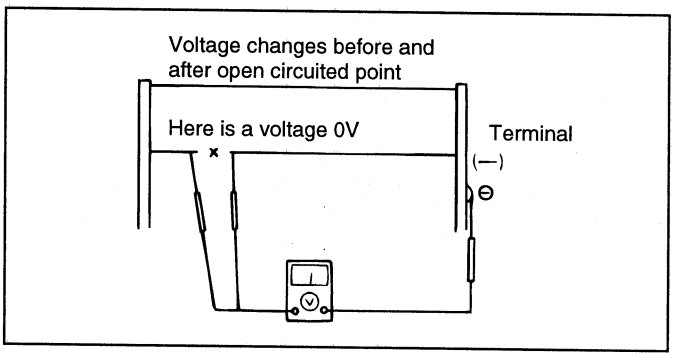
ETA9165C

3. If a heater line is burned out between the center point and (-) terminal, the voltmeter will indicate 0V.



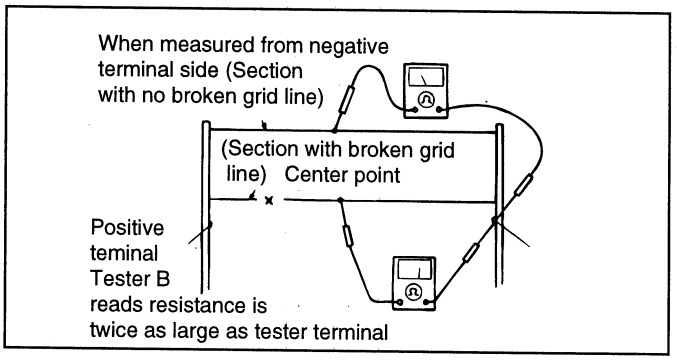
ETA9165D

4. To check for open circuits, slowly move the test lead in the direction that the open circuit seems to exist. Try to find a point where a voltage is generated or changes to 0V. The point where the voltage has changed is the open-circuit point.



ETA9165E

5. Use an ohmmeter to measure the resistance of each heater line between a terminal and the center of a grid line, and between the same terminal and the center of one adjacent heater line. The section with a broken heater line will have a resistance twice as that in other sections. In the affected section, move the test lead to a position where the resistance sharply changes.



ETA9165F

REPAIR OF BROKEN HEATER LINE

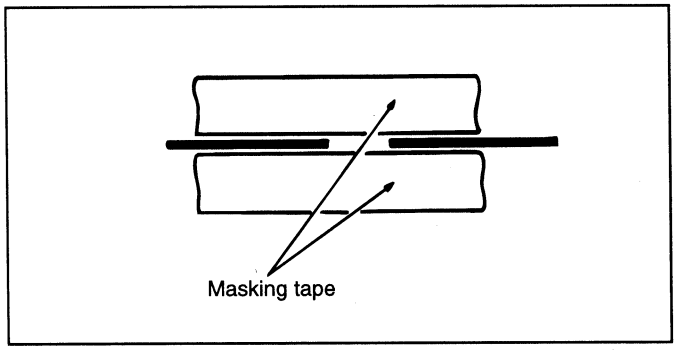
Prepare the following items:

1. Conductive paint.
2. Paint thinner.
3. Masking tape.
4. Silicone remover.
5. Thin brush.

Wipe the glass adjacent to the broken heater line, clean with silicone remover and attach the masking tape as shown. Shake the conductive paint container well, and apply three coats with a brush at intervals of about 15 minutes apart. Remove the tape and allow sufficient time for drying before applying power. For a better finish, scrape away excess deposits with a knife after the paint has completely dried. (allow 24 hours).

CAUTION

After repairing, clean the glass with a soft dry cloth or wipe along the grid line with a slightly moistened cloth.

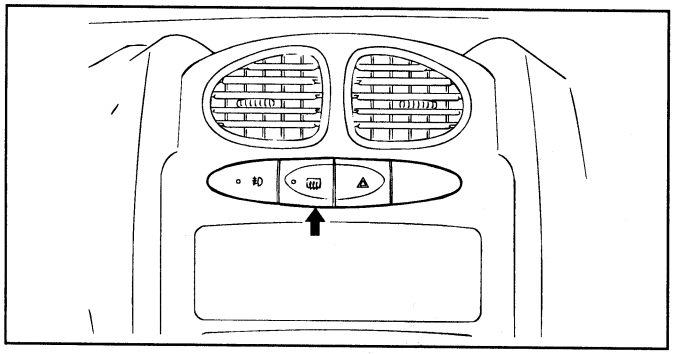


ETA9165G

REAR WINDOW DEFOGGER SWITCH

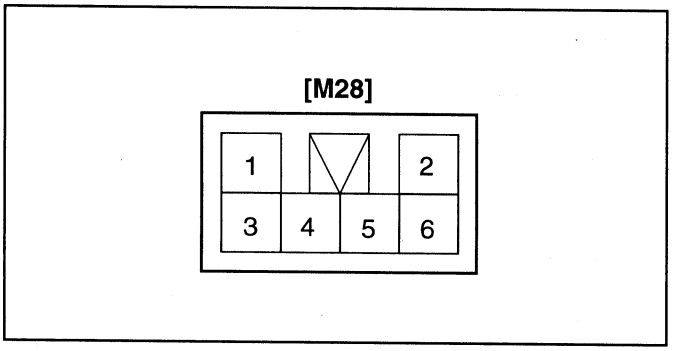
INSPECTION ETJA1300

1. Disconnect the negative(-) battery terminal.
2. Remove the center facia panel(Refer to page BD-26).
3. Disconnect the connector from the rear window defogger switch.



ETJA050C

4. Operate the switch and check for continuity between the terminals using an ohmmeter.



ETJA050B

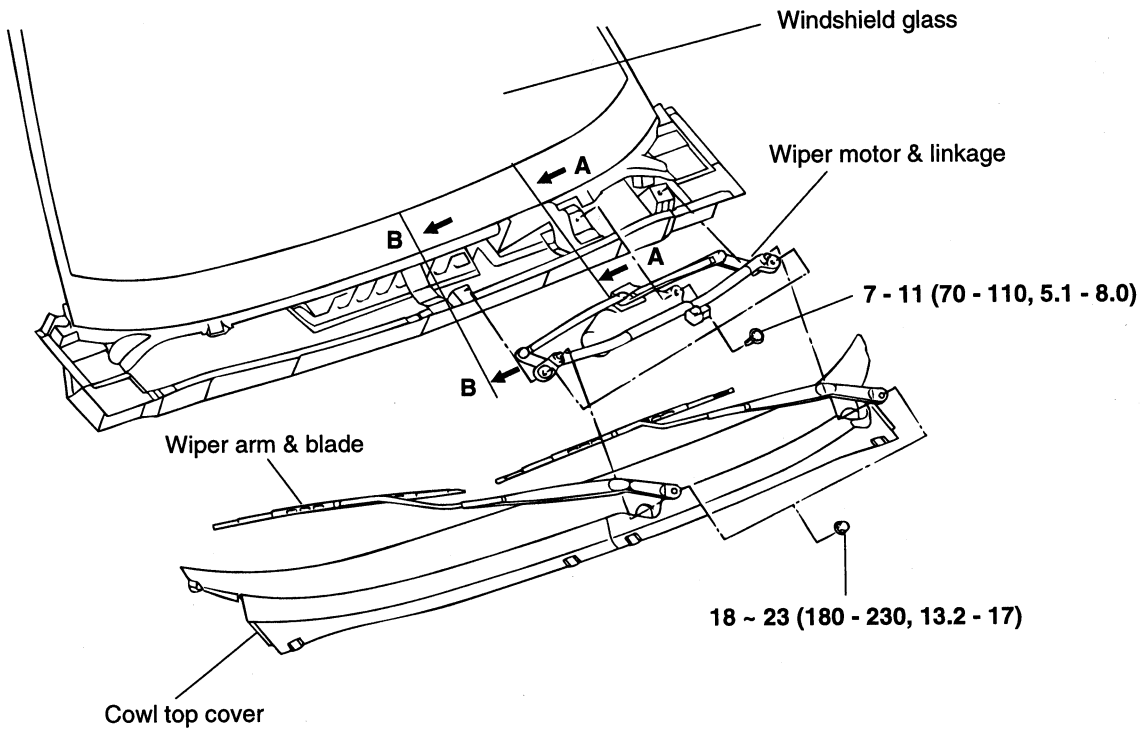
[D28]

Terminal / Position	1	2	3	4	5
ON	○		○	○	
OFF	○			○	○

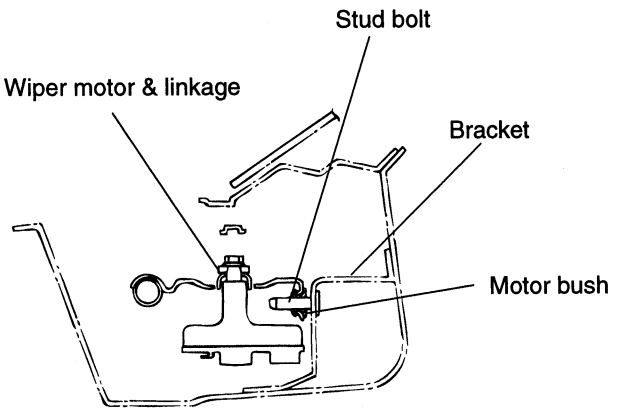
ETJA130A

WINDSHIELD WIPER/WASHER

COMPONENTS ETJA1350

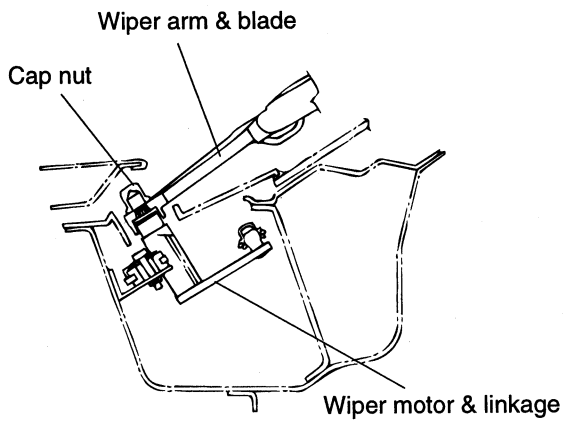


ETJA060A



SECT. A-A

ETJA060B



SECT. B-B

ETJA060C

TORQUE : N·m (kg·cm, lb·ft)

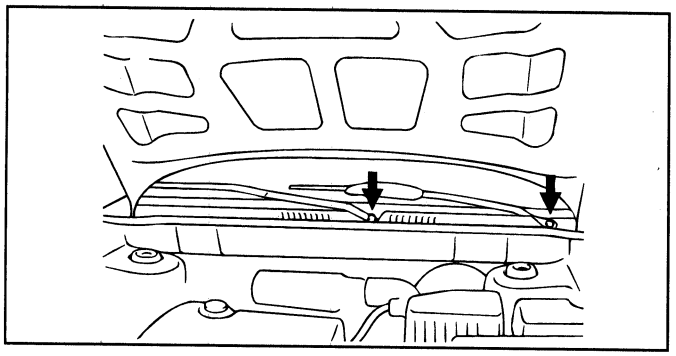
ETJA135A

REMOVAL ETJA1400

1. Remove the windshield wiper arm and blade.

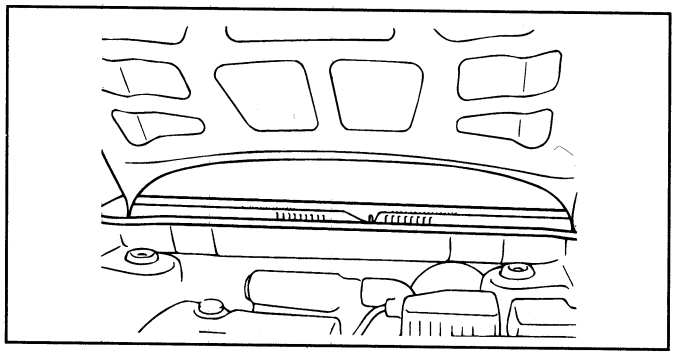
NOTE

Care must be taken not to scratch the engine hood.



ETJA060F

2. Remove the weather strip and the cowl top cover.

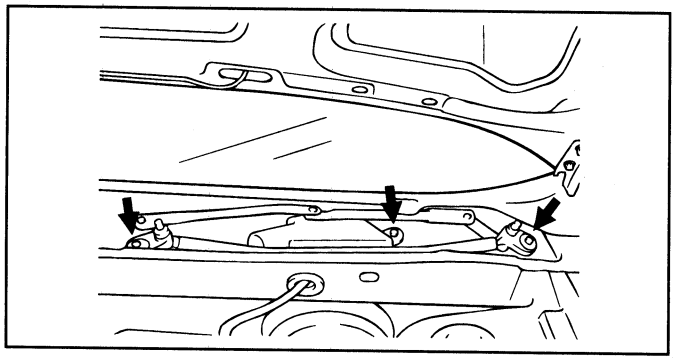


ETJA060G

3. Disconnect the windshield wiper motor connector and remove the windshield wiper motor and the link.

Tightening torque :

7-11Nm (70-110kg.cm, 5.1-8.0lb.ft)

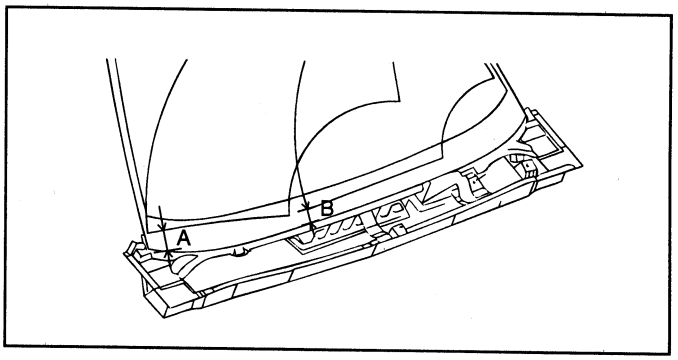


ETJA060H

INSTALLATION ETJA1450

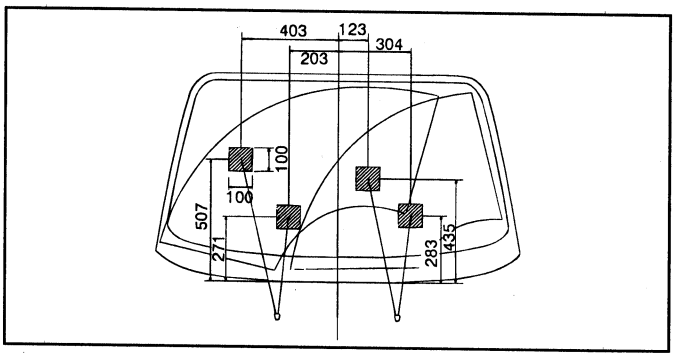
1. Install the wiper arm to the specified position.

Specified position	A	B
Distance (mm)	40	30



ETJA060I

2. Set the washer nozzle on the specified spray position.



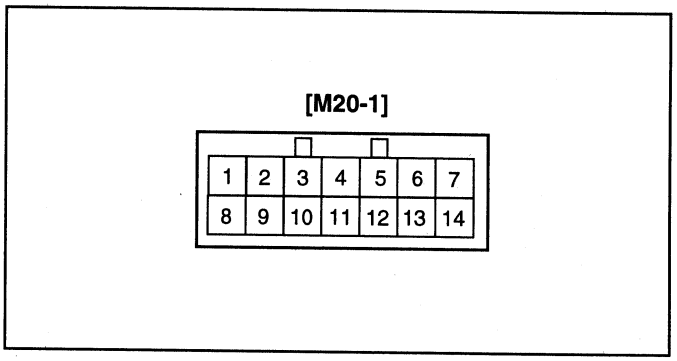
ETJA060E

INSPECTION ETJA1500

WINDSHIELD WIPER/WASHER SWITCH

Check the switch for continuity between the terminals.

If continuity is not as specified, replace the wiper and washer switch.



ETJA005G

WIPER AND INTERMITTENT VOLUME SWITCH [M20-1]

Position \ Terminal	1	2	3	4	5	6	13	14
MIST				○—○				
OFF		○—○						
INT		○—○			○—○		○≈○	
LOW		○—	—	—	—○			
HI	○—	—	—	—	—○			

KTDA040D

WASHER SWITCH [M20-1]

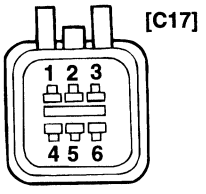
Position \ Terminal	5	7
OFF		
ON	○—	—○

ETJA150A

FRONT WIPER MOTOR ETJA1550

SPEED OPERATION CHECK

1. Remove the connector from the wiper motor.
2. Attach the positive (+) lead from the battery to terminal 5 and the negative (-) lead to terminal 2.
3. Check that the motor operates at low speed.
4. Connect the positive (+) lead from the battery to terminal 5 and the negative (-) lead to terminal 3.
5. Check that the motor operates at high speed.

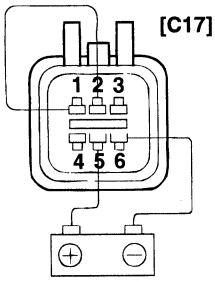


1. Parking
2. Low
3. High
4. Blank
5. Ignition "ON"
6. Ground

ETJA155A

AUTOMATIC STOP OPERATION CHECK

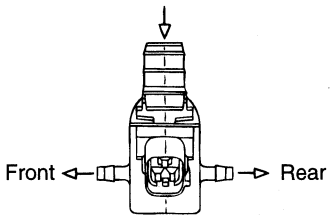
1. Operate the motor at low speed using the stalk control.
2. Stop the motor operation anywhere except at the off position by disconnecting terminal 1.
3. Connect terminals 1 and 2.
4. Connect the positive (+) lead from the battery to terminal 5 and the negative (-) lead to terminal 6.
5. Check that the motor stops running at the off position.



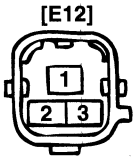
ETJA060D

WASHER MOTOR ETJA1600

1. With the washer motor connected to the reservoir tank, fill the reservoir tank with water.
2. Connect positive (+) and negative (-) battery cables to terminals 2 and 3 respectively to see that the washer motor runs and water sprays from the front nozzles.
3. Connect battery positive (+) and negative (-) cables to terminals 2 and 1 respectively to see that the washer motor runs and water sprays from the rear nozzles.



ETJA065E



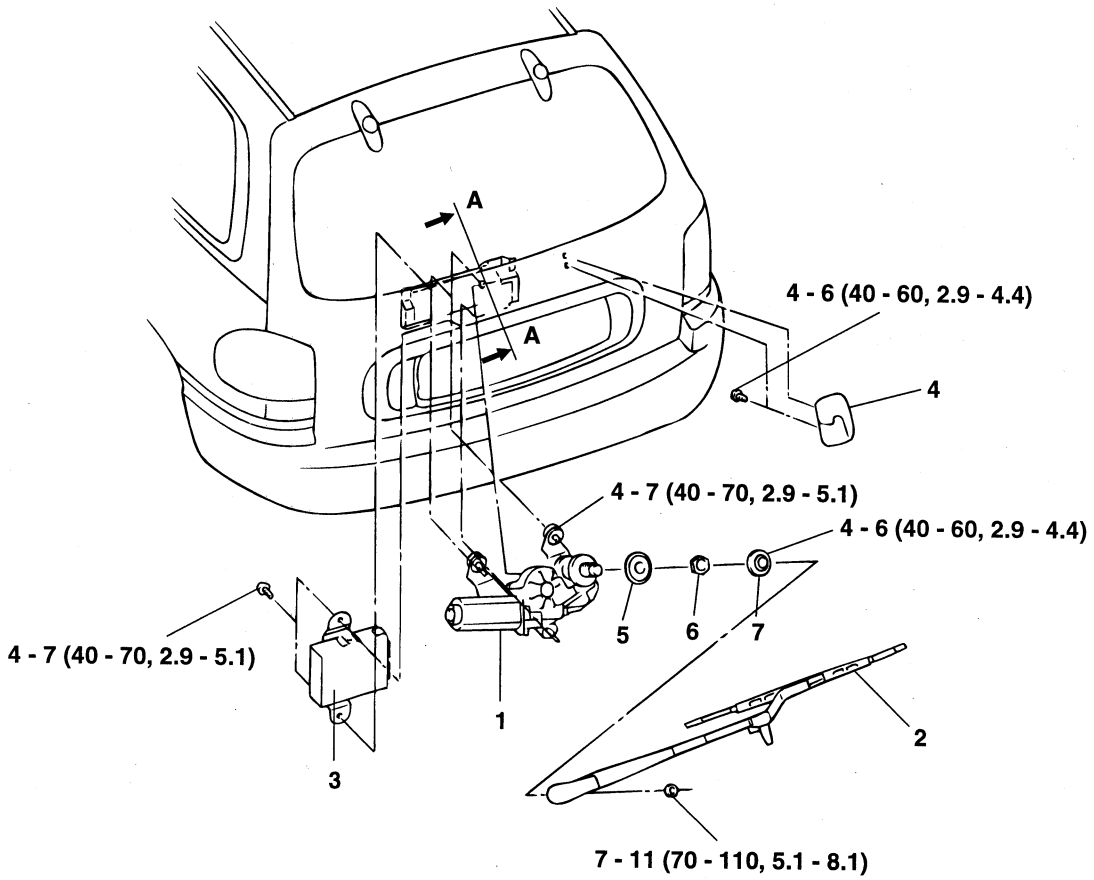
ETJA065F

1. Rear washer (-)
2. Battery (+)
3. Front washer (-)

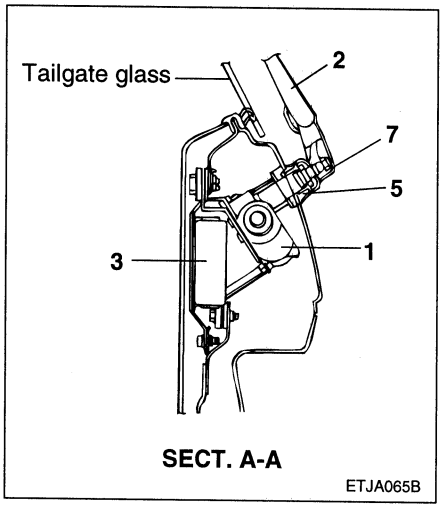
ETJA160A

REAR WIPER/WASHER

COMPONENTS ETJA1650



ETJA065A



SECT. A-A

ETJA065B

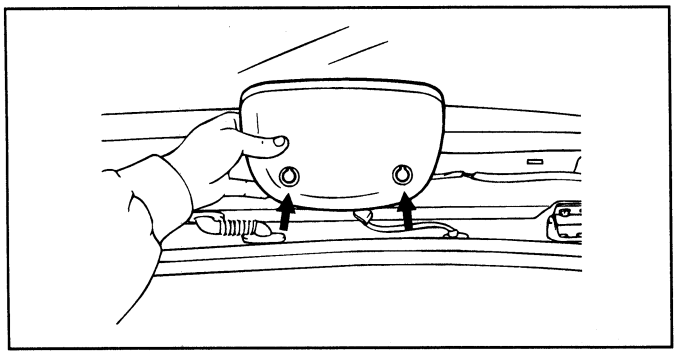
1. Rear wiper motor
2. Rear wiper arm&blade
3. Rear wiper control unit
4. Holder
5. Cap and pad
6. Nut
7. Cover

TORQUE : N·m (kg·cm, lb·ft)

ETJA165A

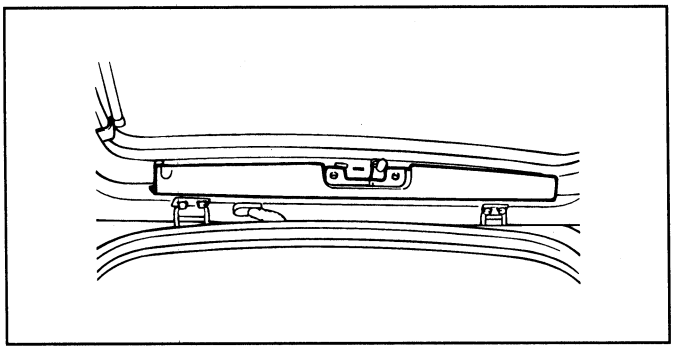
REMOVAL ETJA1700

1. Remove the center high mounted stop lamp.



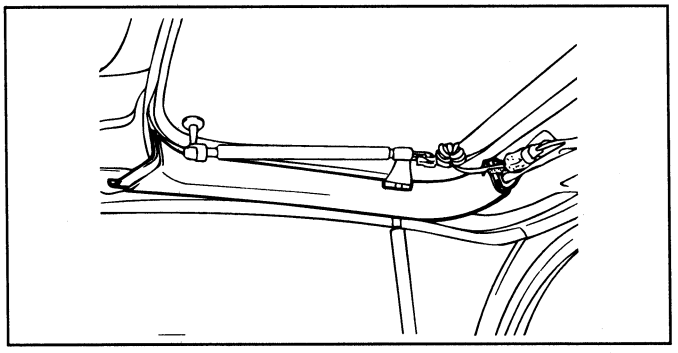
ESJA040N

2. Pry the upper trim from the tailgate frame.



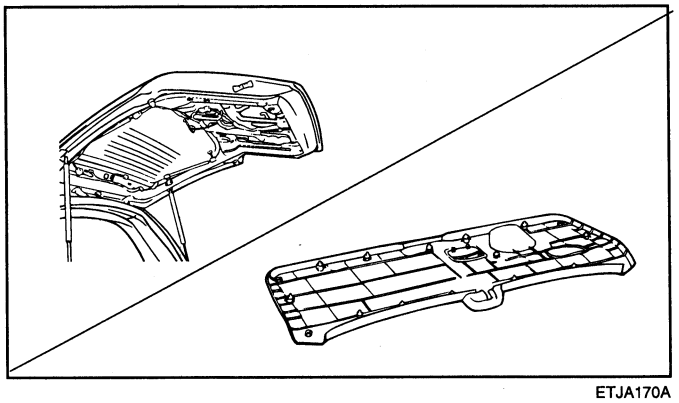
ESJA040A

3. Pry the side trim from the tailgate frame.



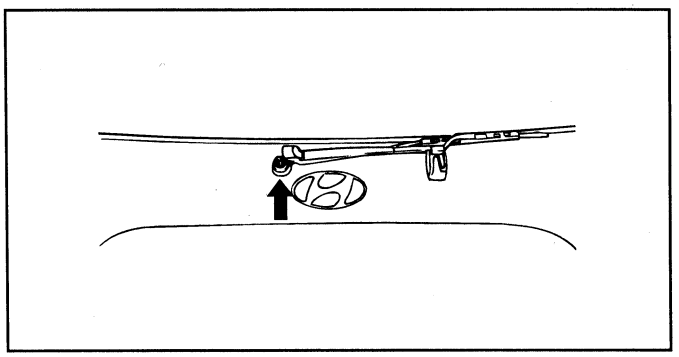
ESJA040B

4. Remove the self-tapping screws and the trim grip and then remove the tailgate trim panel.



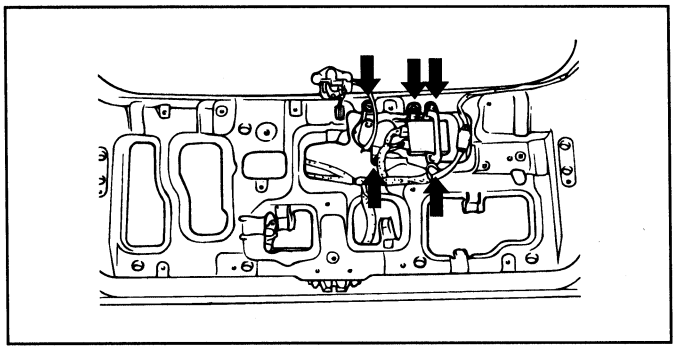
ETJA170A

5. Remove the rear wiper.

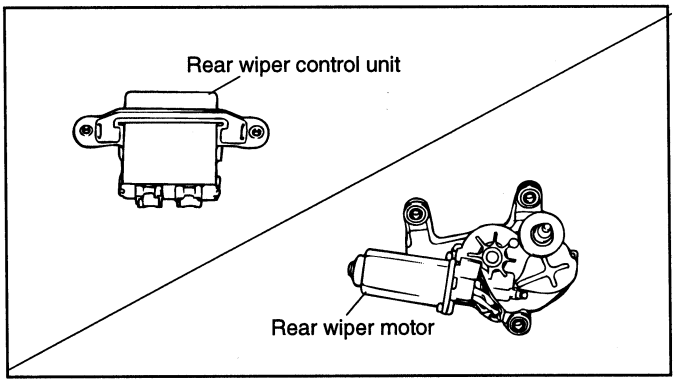


ESJA040H

6. Remove the rear wiper control unit and the rear wiper motor.



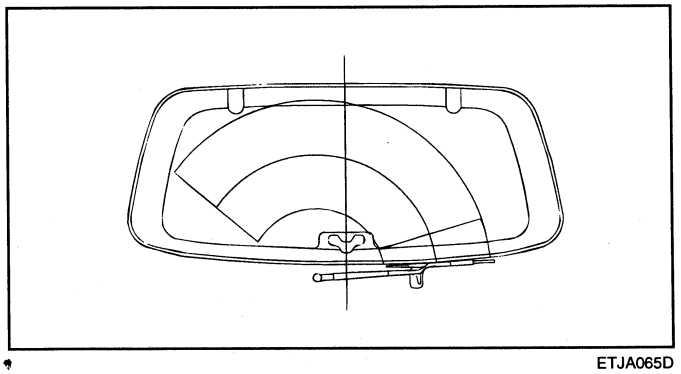
ESJA040K



ETJA170B

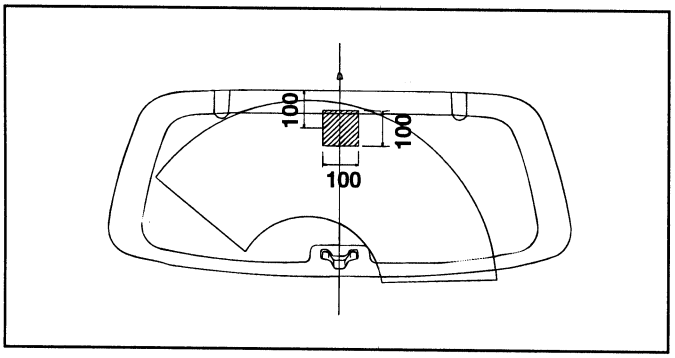
INSTALLATION ETJA1750

1. After replacing all the removed components, install the rear wiper arm to the specified stop position.



ETJA065D

2. Set the washer nozzle on the specified spray position.

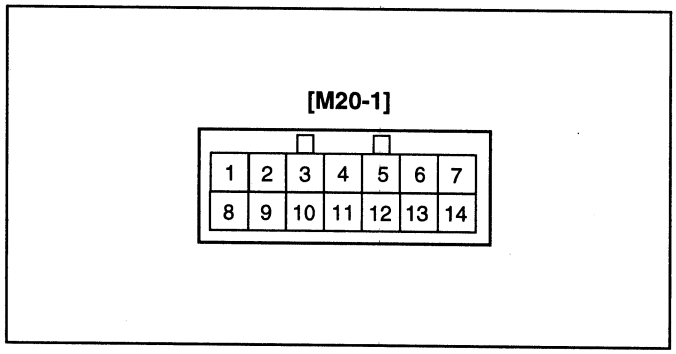


ETJA065C

INSPECTION ETJA1800

REAR WIPER/WASHER SWITCH

1. Disconnect the connector from the multifunction switch.
2. Check for continuity between the terminals.



ETJA005G

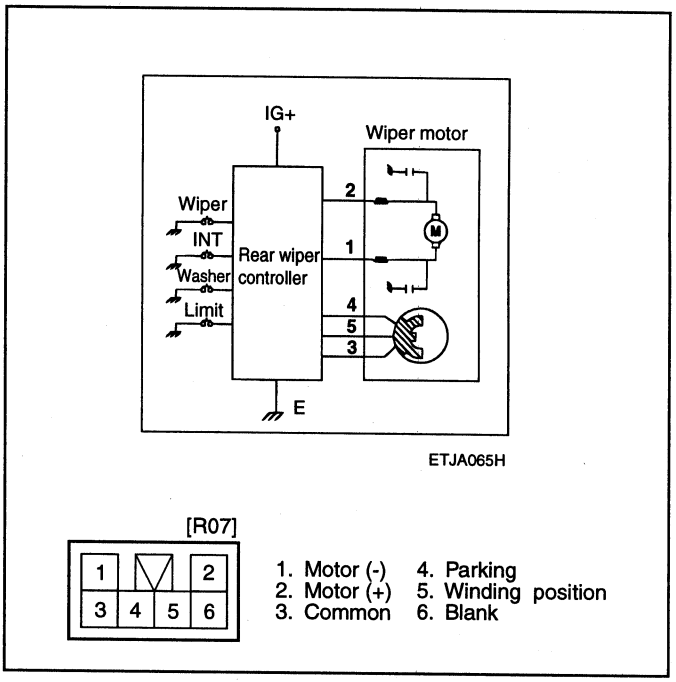
[M20-1]

Terminal / Position	9	10	11	12
WASHER	○			○
OFF				
INT	○	○		
LOW	○		○	
WASHER	○			○

ETJA180A

REAR WIPER MOTOR ETJA1850

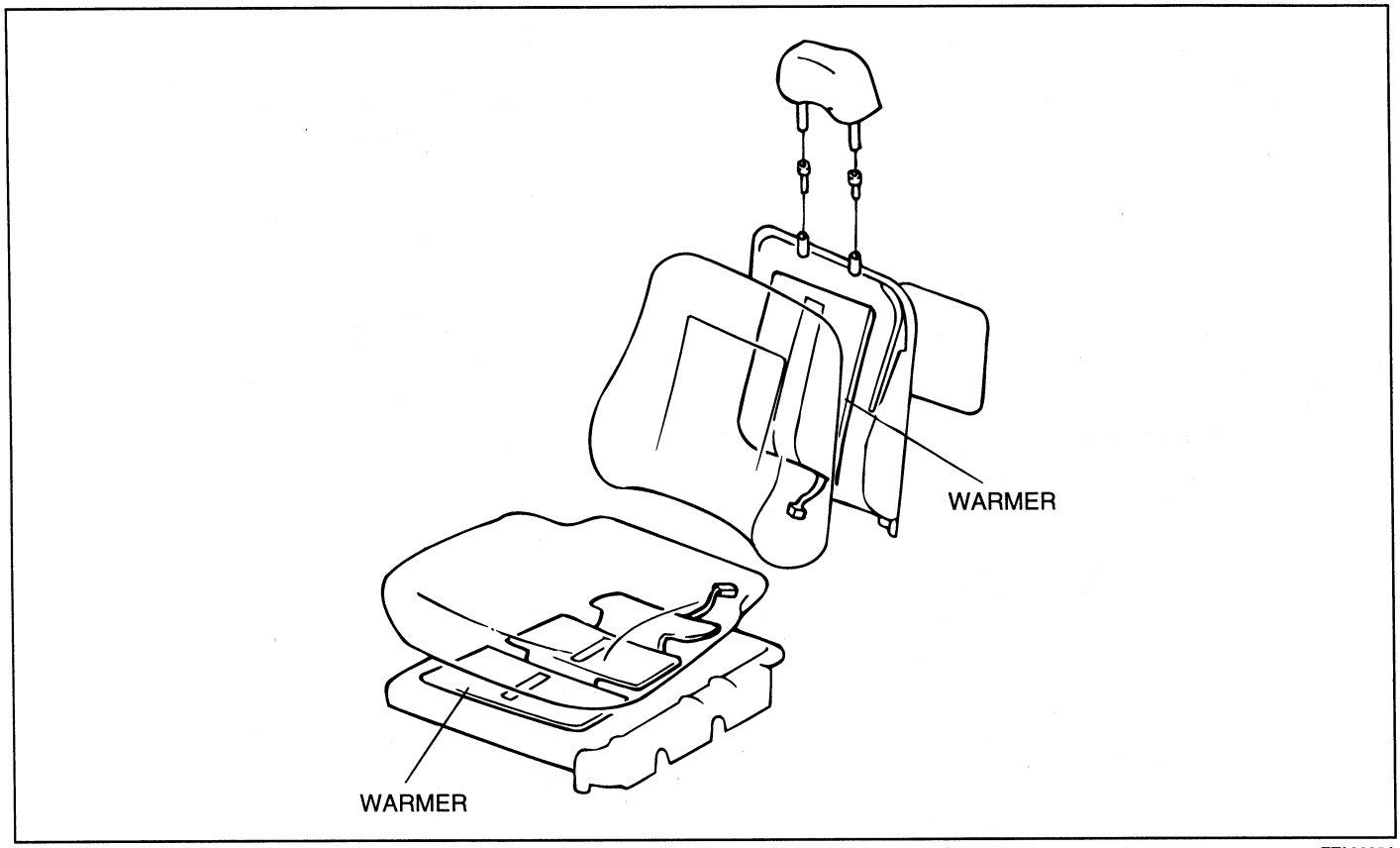
1. Remove the connector from the rear wiper motor.
2. Connect battery positive (+) and negative (-) cables to terminals 2 and 1 respectively.
3. Check that the motor operates normally. Replace the motor if it operates abnormally.



ETJA185A

SEAT WARMER

SEAT WARMER SYSTEM ETA92050

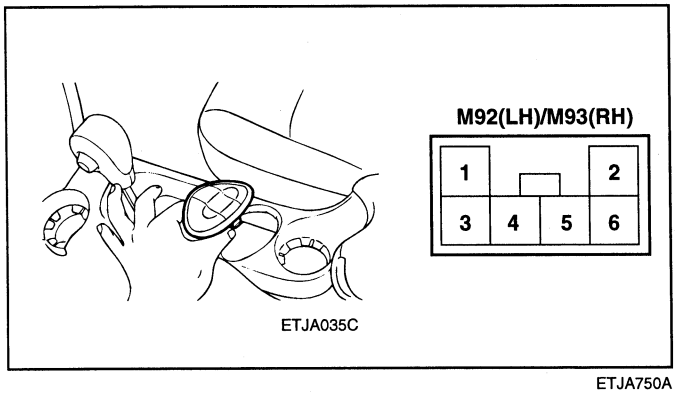


ETA9205A

SEAT WARMER SWITCH

INSPECTION ETJA7500

Inspect the switch continuity between terminals as below.



ETJA750A

M92(LH)/M93(RH)

Position \ Terminal	1	2	3	4	5
ON (PUSH)	●		●	●	
OFF (FREE)	●		●	●	●

ETJA750B

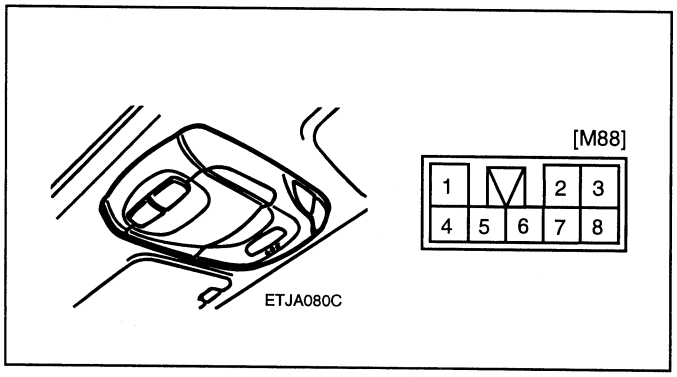
If the continuity is not as specified, replace the switch.

SUN ROOF

SUN ROOF SWITCH

INSPECTION ETJA7550

1. Using an ohmmeter, check for continuity between the terminals.
2. If the continuity is not as specified, replace the switch.



ETJA755A

[M88]

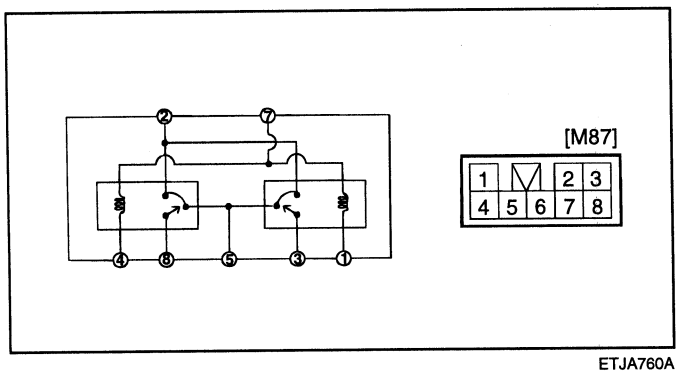
Position		Terminal 1	2	3	4	5	6	7	8
Slide switch	Open		○	○				○	
	Off			○				○	
	Close	○	○	○				○	
Tilt switch	Up		○			○			
	Off								
	Down		○				○		

ETJA755B

SUN ROOF RELAY

INSPECTION ETJA7600

Check for continuity between the terminals.



ETJA760A

[M87]

Position \ Terminal	1	2	3	4	5	6	7	8
Battery voltage not supplied (coils not energized)	○		○	○	○		○	○
Battery voltage supplied (coils energized)	⊖	○	○	⊖			⊕	○

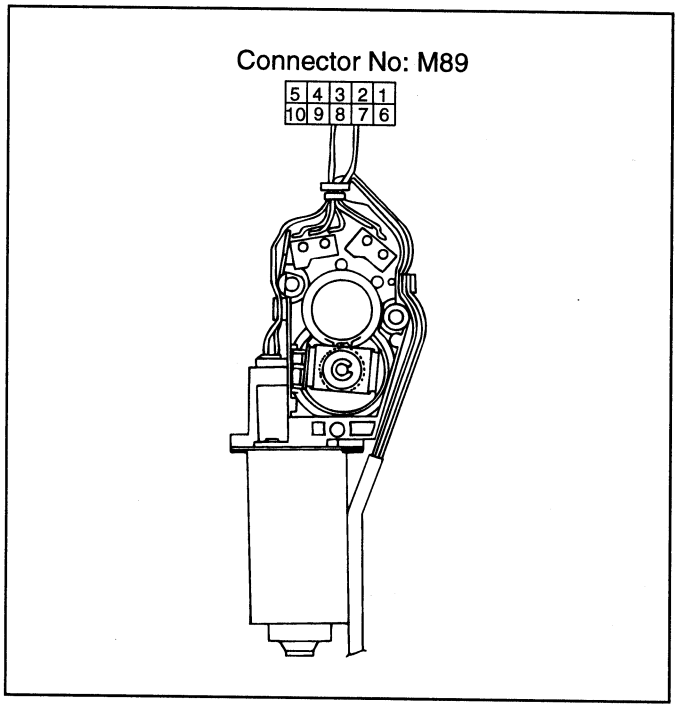
⊕- - -⊖ **Indicates battery connection**

ETJA760B

SUN ROOF MOTOR

INSPECTION ETJA7650

1. Remove the overhead console.
2. Disconnect the motor connector from sun roof harness.
3. After applying DC 12V to the terminal 5, apply the terminal 4 to the ground.
4. Check that the motor turns in the direction of the sunroof when tilted down and is open.
5. Reverse the connections and check that the motor turns in the direction when the sunroof is closed and tilted up.



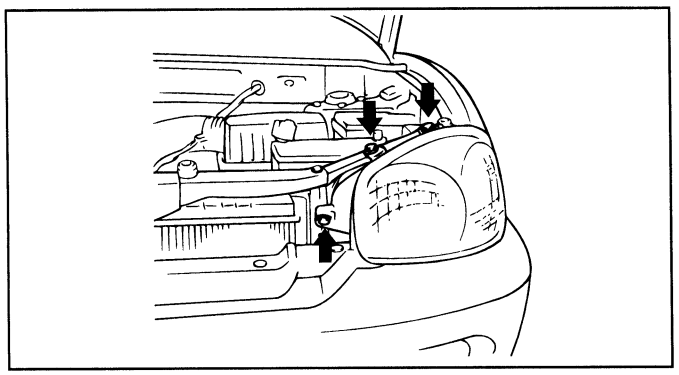
ETAA215B

LIGHTING SYSTEM

REPLACEMENT OF LAMPS ETJA1900

HEAD LAMP/TURN SIGNAL LAMP

1. Disconnect the negative battery terminal.
2. Remove the head lamp mounting bolts and remove the head lamp assembly.

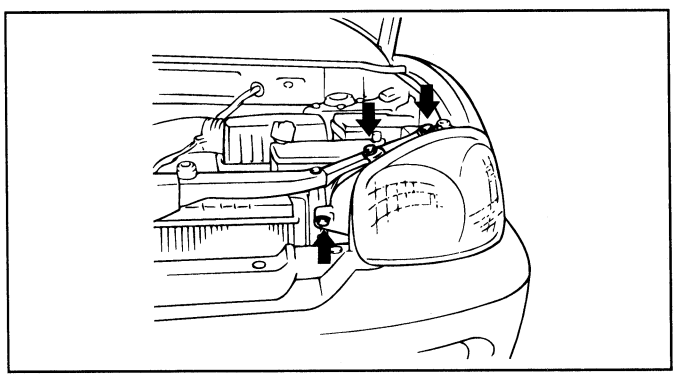


ESJA005B

3. Installation is the reverse of removal.

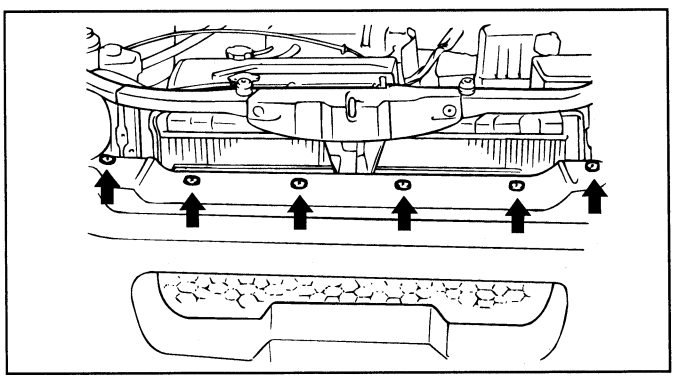
FRONT FOG LAMP

1. Disconnect the negative battery terminal.
2. Remove the head lamp mounting bolts and remove the head lamp assembly.



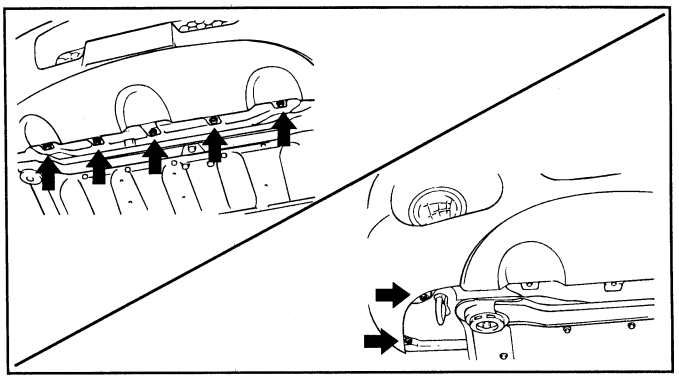
ESJA005B

3. Remove the screws in the front bumper cover.



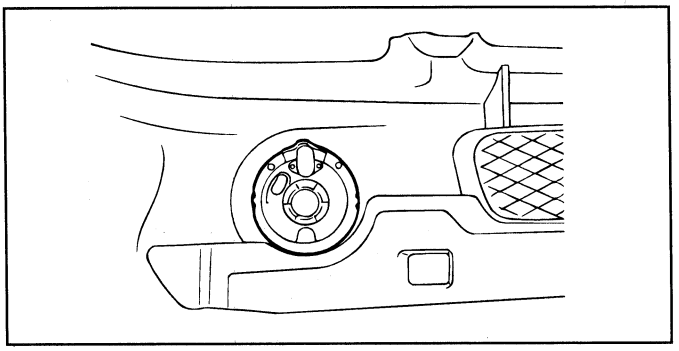
ESJA005C

4. Raise the vehicle then remove the screws holding the front bumper and the front wheel guard.



ETJA190A

5. Remove the front fog lamp from the bumper cover.

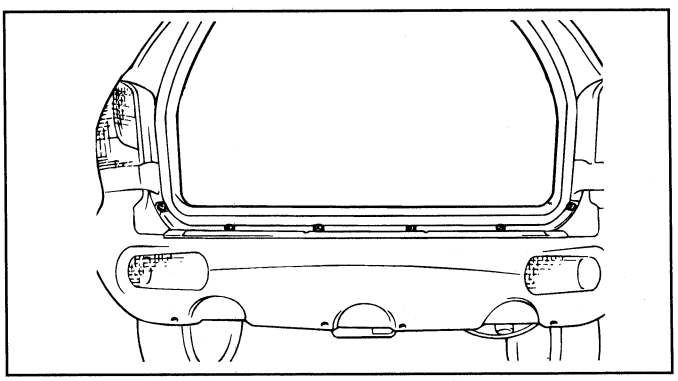


ETJA010H

6. Installation is the reverse of removal.

REAR COMBINATION LAMP

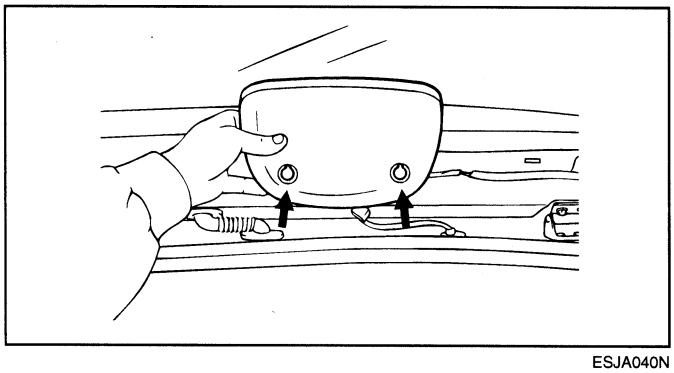
1. Disconnect the negative battery terminal.
2. Open the tailgate and loosen the screws holding the rear combination lamp.
3. Disconnect the connector and remove the lamp assembly.
4. Installation is the reverse of removal.



ESJA010C

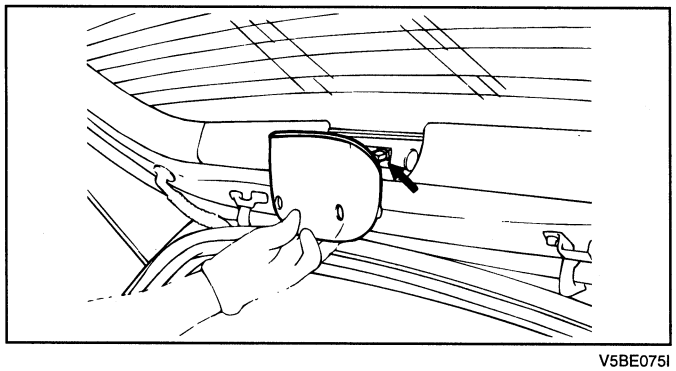
CENTER HIGH MOUNTED STOP LAMP

1. Disconnect the battery negative terminal.
2. Using a flat-bladed screwdriver detach 2 blanking covers on both sides of the lamp.
3. Remove the two mounting screws.



ESJA040N

4. Disconnect the connector and then remove the lamp assembly.

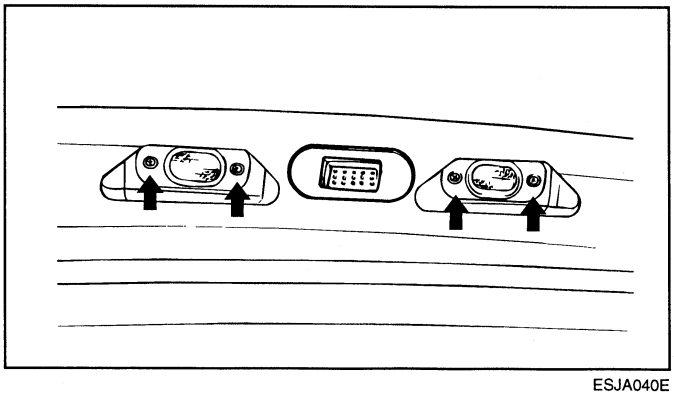


V5BE075I

5. Installation is the reverse of removal.

LICENSE PLATE LAMP

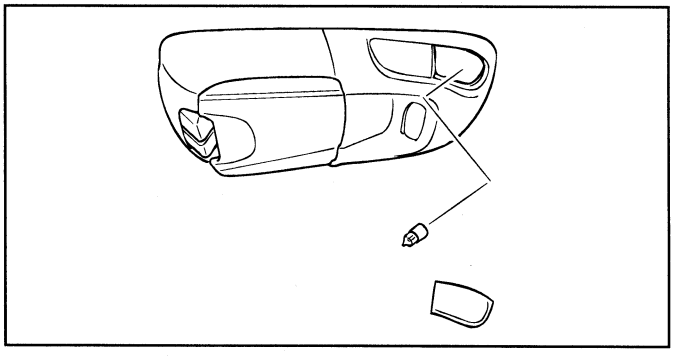
1. Disconnect the battery negative terminal.
2. Remove the mounting bolt, and disconnect the lamp connector.
3. Installation is the reverse of removal.



ESJA040E

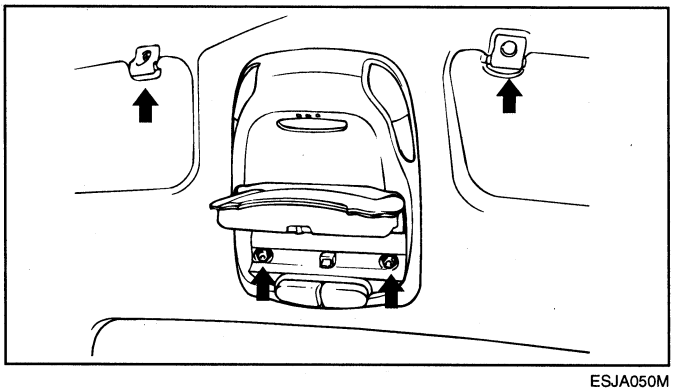
MAP LAMP

1. Disconnect the battery negative terminal.
2. Using a flat-bladed screwdriver detach the map lamp lens.



ETJA010L

3. Detach the lamp assembly from the headlining after removing the screws.

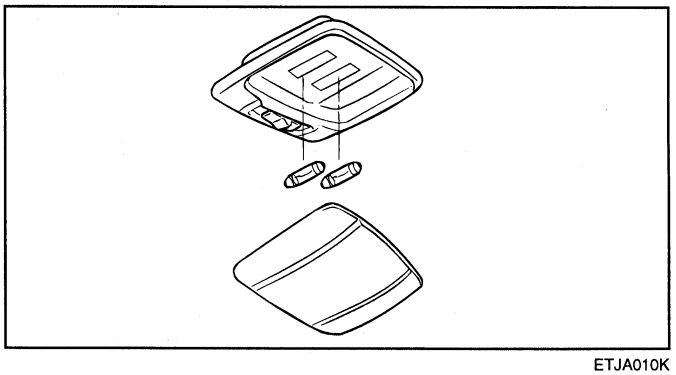


ESJA050M

4. Disconnect the connector from the roof harness.
5. Installation is the reverse of removal.

ROOM LAMP

1. Disconnect the battery negative terminal.
2. Using a flat-bladed screwdriver detach the room lamp lens.



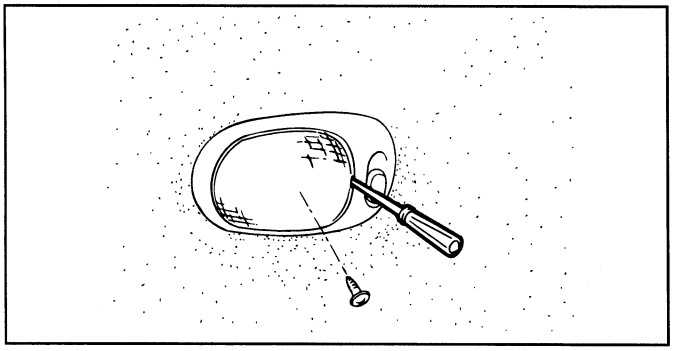
ETJA010K

3. Detach the lamp assembly from the headlining after removing the screws.

4. Disconnect the connector from the roof harness.
5. Installation is the reverse of removal.

LUGGAGE LAMP

1. Using a flat-bladed screwdriver detach the luggage lamp lens.
2. Detach the lamp assembly from the headlining after removing the screws.



V5BE075P

INSPECTION OF COMPONENTS ETJA1950

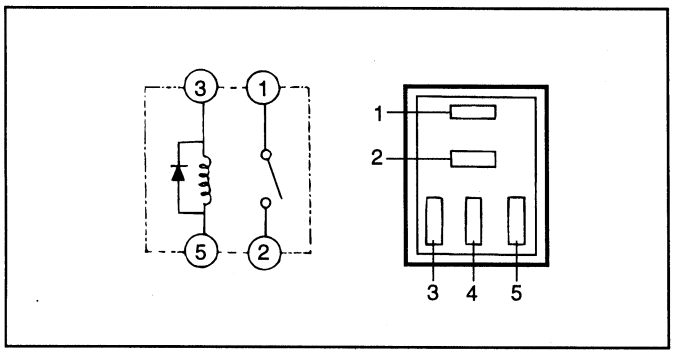
HEAD LAMP RELAY

1. Remove the headlamp relay from the relay box in the engine compartment.
2. Check for continuity between terminals on the relay.

Terminal / Position	1	2	3	5
When de-energized			○—○	
When energized	○—○		⊕—⊖	

NOTE:
1. ○—○: Indicates that there is continuity between the terminals.
2. ⊖—⊕: Indicates that power is supplied.

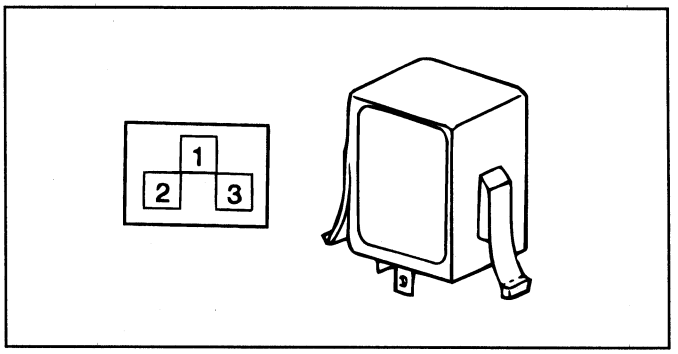
ETHA305A



ETDA211B

FLASHER UNIT

1. Remove the flasher unit from the relay box.
2. Connect the positive (+) lead from the battery to terminal 2 and the negative (-) lead to terminal 3.



KTDA212A

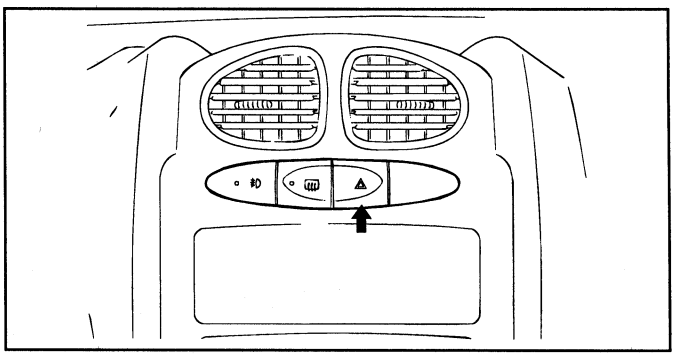
3. Connect the two turn signal lamps in parallel to terminals 2 and 3. Check that the bulbs turn on and off.

NOTE

The turn signal lamps should flash 60 to 120 times per minute. If one of the front or rear turn signal lamps has an open circuit, the number of flashes will be more than 120 per minute. If operation is not as specified, replace the flasher unit.

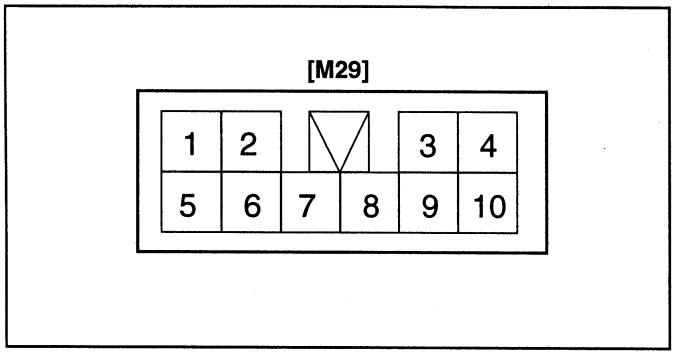
HAZARD SWITCH ETJA2050

1. Disconnect the negative (-) battery terminal.
2. Remove the center facia panel(Refer to page BD-26).
3. Disconnect the connector from the hazard lamp switch.



ETJA051C

4. Operate the switch and check for continuity between terminals with an ohmmeter.



ETJA205B

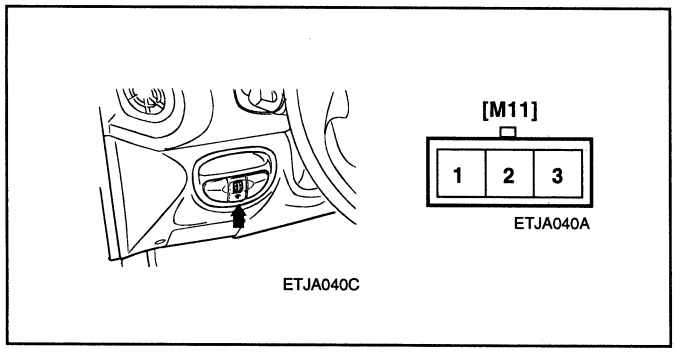
[M29]

Terminal / Position	1	2	3	5	6	7	8	9	10
OFF		●	●	●			●		
ON					●	●	●	●	●

ETJA205A

RHEOSTAT ETJA2100

1. Disconnect the negative (-) battery terminal.
2. Remove the crash pad lower panel.
3. Disconnect the connector from the rheostat.

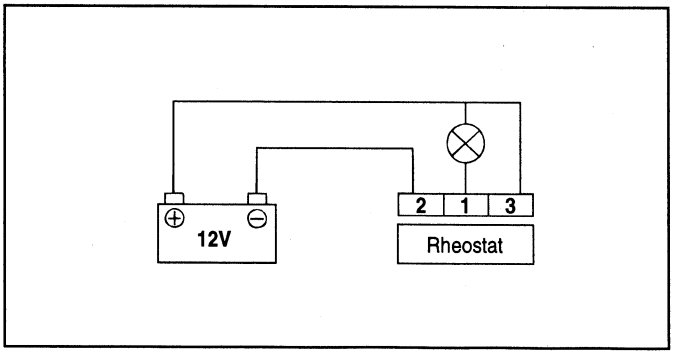


ETJA040A

ETJA040C

ETJA210A

4. Check for intensity. If the light intensity of the lamps changes smoothly without any flickering when the rheostat is turned, it can be assumed that the rheostat is normal.



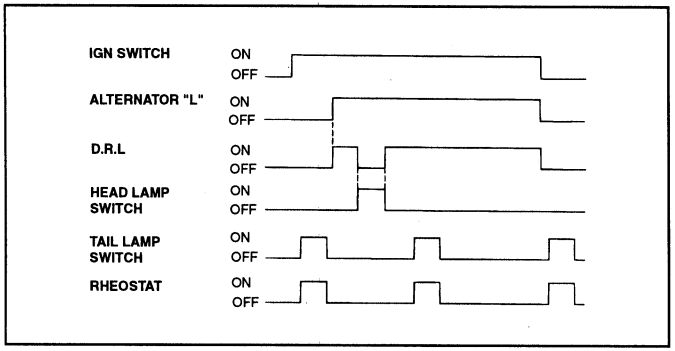
ETJA040B

DAYTIME RUNNING LIGHT (DRL) ETJA7660

OPERATION CHECK

Check that the lights operate according to the following timing chart.

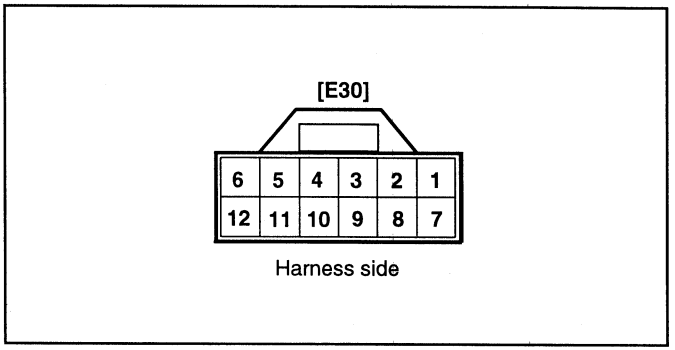
TIMING CHART



ETKA241A

INSPECT CIRCUITS FOR DAYTIME RUNNING LIGHT SYSTEM

Disconnect the connector from DRL module and inspect the connector on wire harness side as shown.



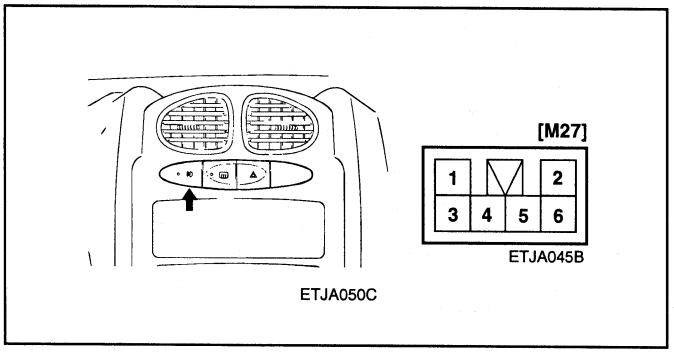
ETJA766A

Check For	Test Connection	Condition		Test Specification
Continuity	9–Ground	Tail lamp switch	OFF	No continuity
			ON	Continuity
	5–Ground	Head lamp switch	OFF	No continuity
			ON	Continuity
	6–Ground	Constant		Continuity
	7–Ground	Dimmer&passing switch	Head light ON	Continuity
			Head light OFF	No continuity
Voltage	7–Ground	Constant		Battery voltage
	5–Ground	Ignition switch	ON	Battery voltage
			ACC or LOCK	No voltage
	11–Ground	Constant		Battery voltage
	3–Ground	Engine	Stop	No voltage
			Running	Battery voltage

If circuit is not as specified, refer to schematic diagram and inspect short or circuits.

FRONT FOG LAMP SWITCH ETJA2200

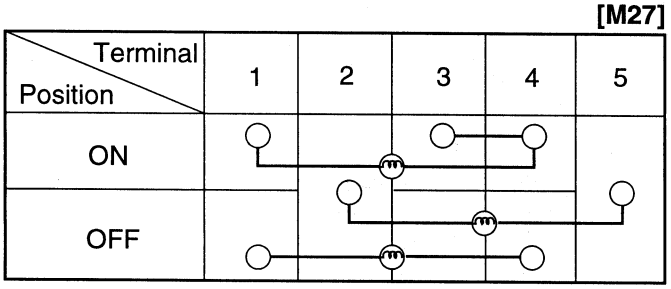
1. Disconnect the negative (-) battery terminal.
2. Remove the center facia panel(Refer to page BD-26).
3. Disconnect the connector from the front fog lamp switch.



ETJA220A

4. Operate the switch and check for continuity between the terminals with an ohmmeter.

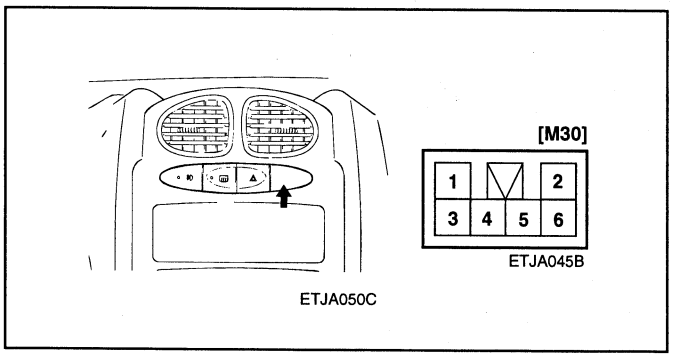
[M27]



ETJA220B

REAR FOG LAMP SWITCH ETJA7700

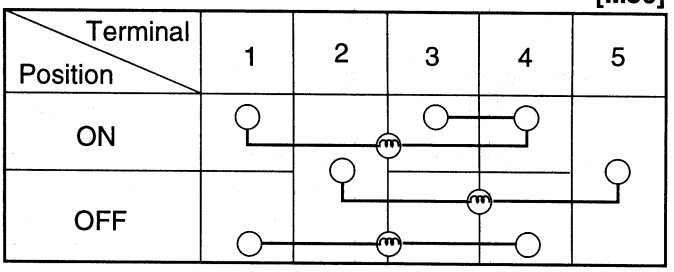
1. Disconnect the negative (-) battery terminal.
2. Remove the center facia panel (Refer to page BD-26).
3. Disconnect the connector from the rear fog lamp switch.



ETJA770A

4. Operate the switch and check for continuity between the terminals with an ohmmeter.

[M30]

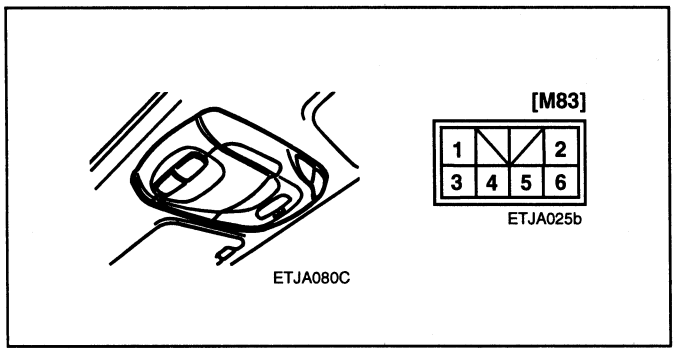


ETJA770B

MAP LAMP SWITCH ETJA7750

1. Disconnect the negative (-) battery terminal.
2. Remove the overhead console.
3. Disconnect the connector from the map lamp switch and then check for continuity between the terminals.

[VEHICLES WITHOUT SUN ROOF]



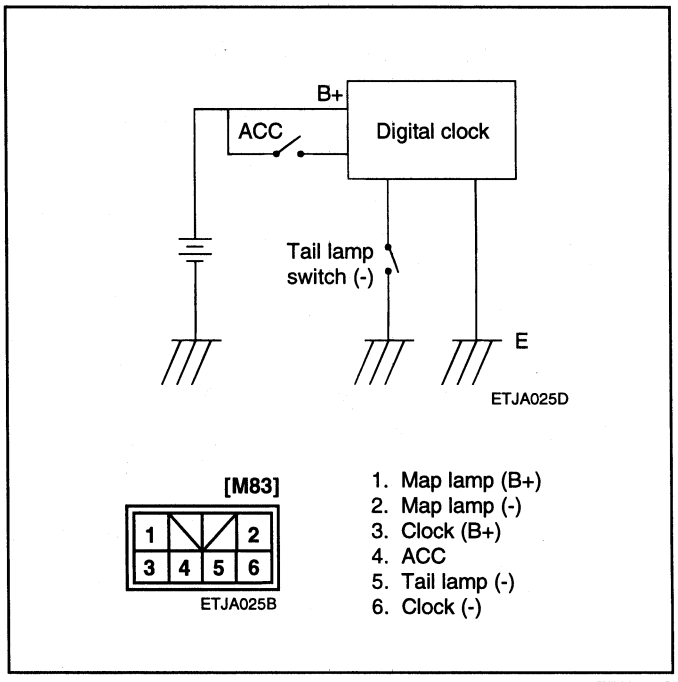
ETJA225A

[M83]

Sort / Position / Terminal	MAP LAMP SWITCH			
	LH		RH	
	ON	OFF	ON	OFF
1	○		○	
2	○		○	

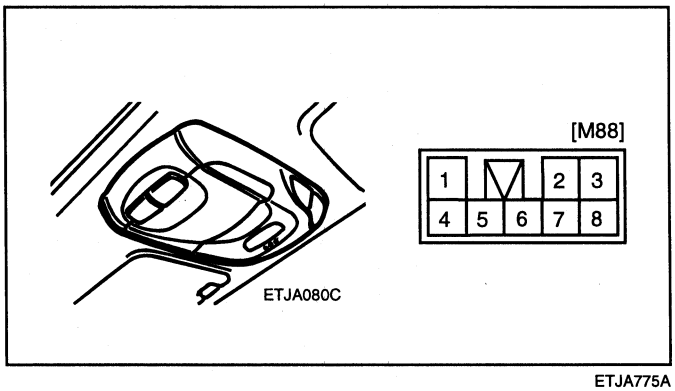
ETJA225B

DIGITAL CLOCK



ETJA225C

[VEHICLES WITH SUN ROOF]



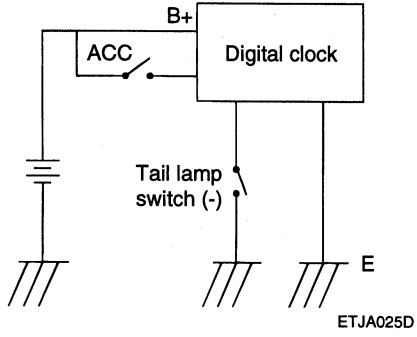
ETJA775A

[M88]

Sort / Position / Terminal	MAP LAMP SWITCH			
	LH		RH	
	ON	OFF	ON	OFF
2	○		○	
4	○		○	

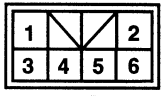
ETJA775B

DIGITAL CLOCK



ETJA025D

[M83]



ETJA025B

1. Blank
2. Blank
3. Clock (B+)
4. ACC
5. Tail lamp (-)
6. Clock (-)

ETJA775C

HEAD LAMP ETJA7950

HEAD LAMP AIMING INSTRUCTIONS

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

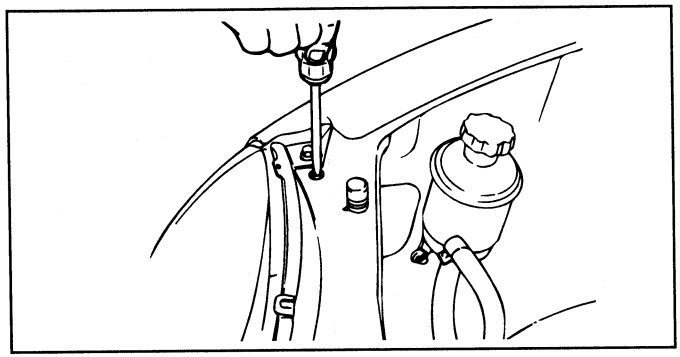
NOTE

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

Alternately turn the adjusting gear to adjust the head-lamp aiming. If beam-setting equipment is not available, proceed as follows:

1. Inflate the tires to the specified pressure and remove any loads from the vehicle except the driver, spare tire, and tools.
2. The vehicle should be placed on a flat floor.
3. Draw vertical lines (Vertical lines passing through respective headlamp centers) and a horizontal line (Horizontal line passing through center of head-lamps) on the screen.
4. With the headlamp and battery in normal condition, aim the headlamps so the brightest portion falls on the horizontal and vertical lines.

   Make vertical and horizontal adjustments to the lower beam using the adjusting wheel.

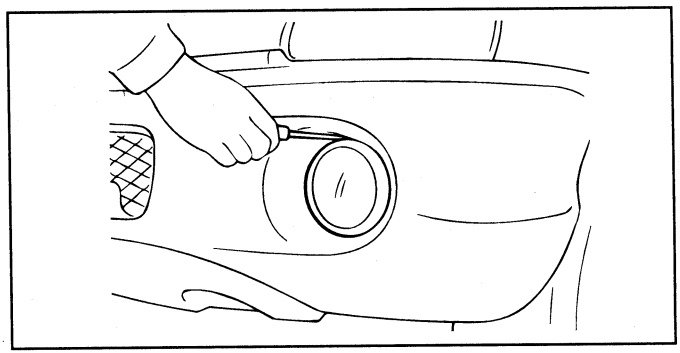


ETA9230A

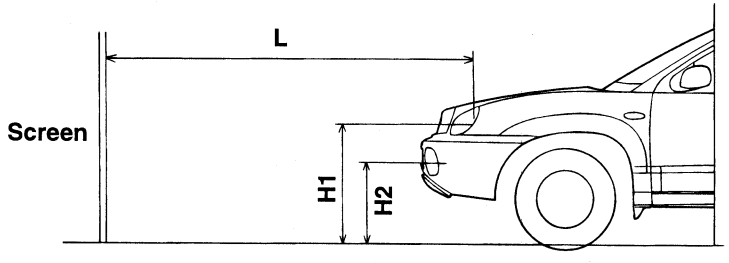
FRONT FOG LAMP

The front fog lamps should be aimed as the same manner of the head lamps aiming.

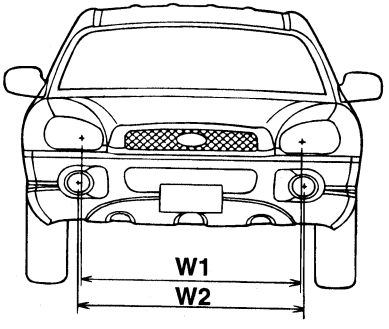
With the front fog lamps and battery normal condition, aim the front fog lamps by turning the adjusting gear.



ETJA010I



ETJA010A



ETJA010B

H1 : Height between the head lamp bulb center and ground (low beam)
H2 : Height between the fog lamp bulb center and ground

W1 : Distance between the head lamp bulb center (low beam)
W2 : Distance between the fog lamp bulb center

L : Distance between the head lamp bulb center and screen.

ETJA230A

HEAD LAMP AND FOG LAMP AIMING POINT

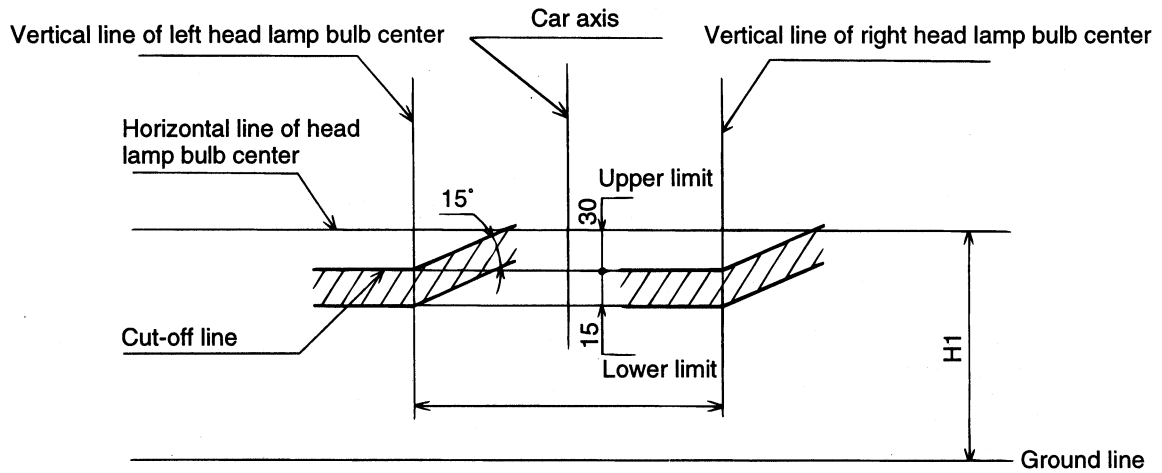
Unit : mm

Vehicle condition	H1		W1	H2		W2	L
	2WD	4WD	2WD/4WD	2WD	4WD	2WD/4WD	
Without driver	830	850	1,178	558	578	1,201	3,000
With driver	822	843	1,178	551	571	1,201	

ETJA230B

- Turn the low beam on without the driver aboard. The cut-off line should be projected in the allowable range (shaded region).

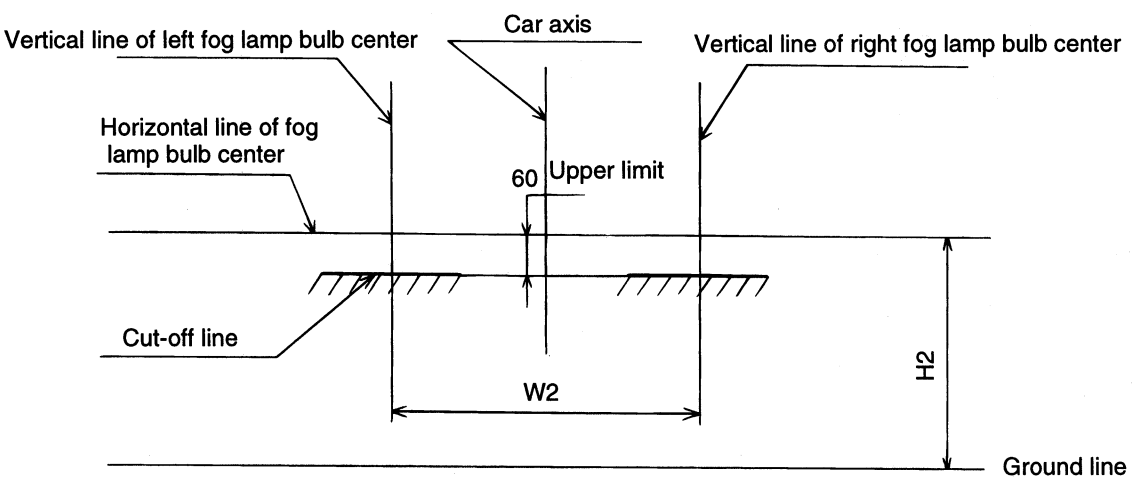
Unit : mm



ETJA010E

- Turn the front fog lamp on without the driver aboard. The cut-off line should be projected in the allowable range. (shaded region)

Unit : mm



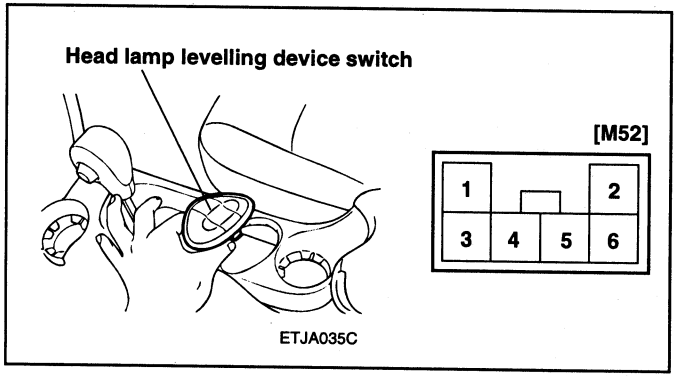
ETJA010D

HEAD LAMP LEVELLING DEVICE

HEAD LAMP LEVELLING SWITCH

INSPECTION ETJA7960

1. Remove the head lamp levelling device switch from the floor console.



ETJA796A

2. Connect the battery voltage between terminals 3 and 4.

3. Measure the voltage between terminals 4 and 5. If the voltage is not as specified, replace the head lamp levelling switch.

Position No.	Voltage (V)
0	1.80
1	3.61
2	5.65
3	6.23

IMMOBILIZER CONTROL SYSTEM

IMMOBILIZER SYSTEM ETJA7970

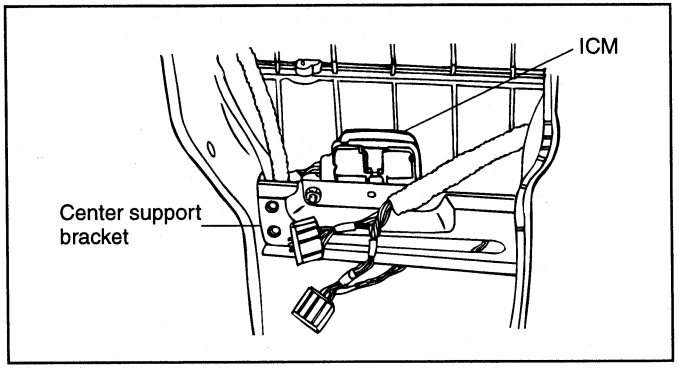
DESCRIPTION

The immobilizer system is an anti-theft device which enables starting to be possible only when the mechanical and wireless secret codes are aligned simultaneously.

The transponder built in the ignition key signals its unique frequency code and at this time the ICM compares it with the memorized code.

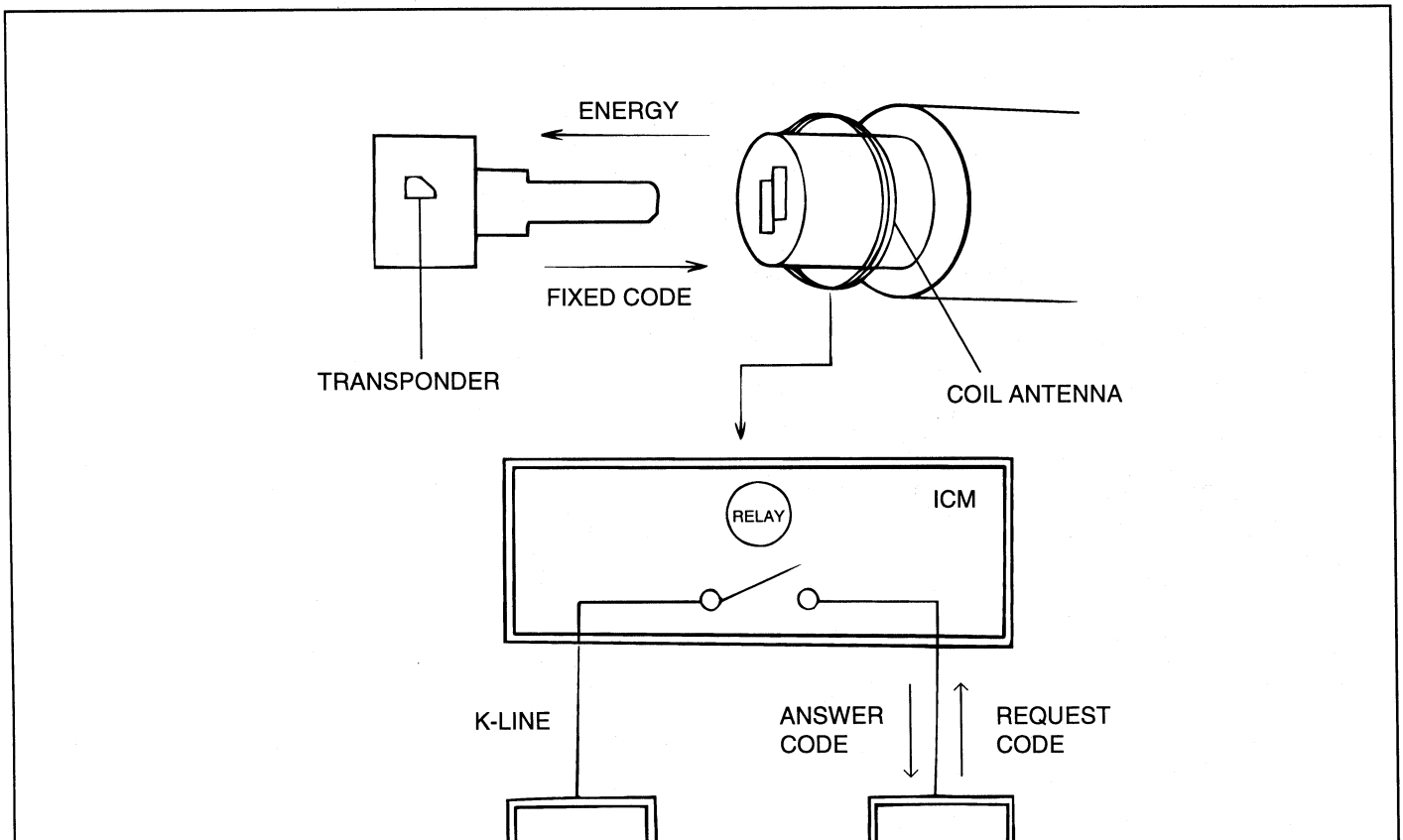
When the codes are aligned, the ICM sends signals to the ECM so that starting is possible.

ICM : Immobilizer Control Module
ECM : Engine Control Module

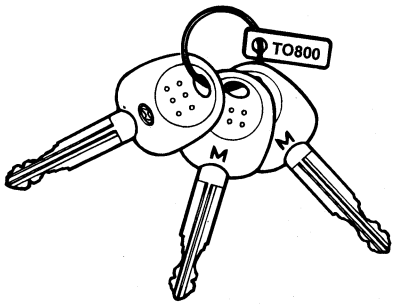
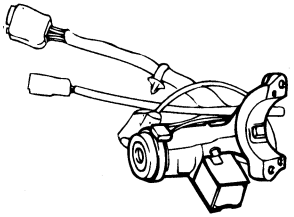
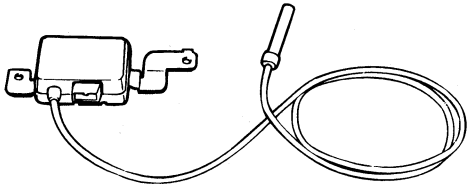
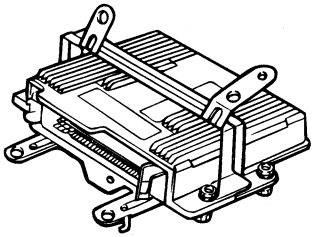


ETJA797A

SYSTEM BLOCK DIAGRAM



COMPONENT

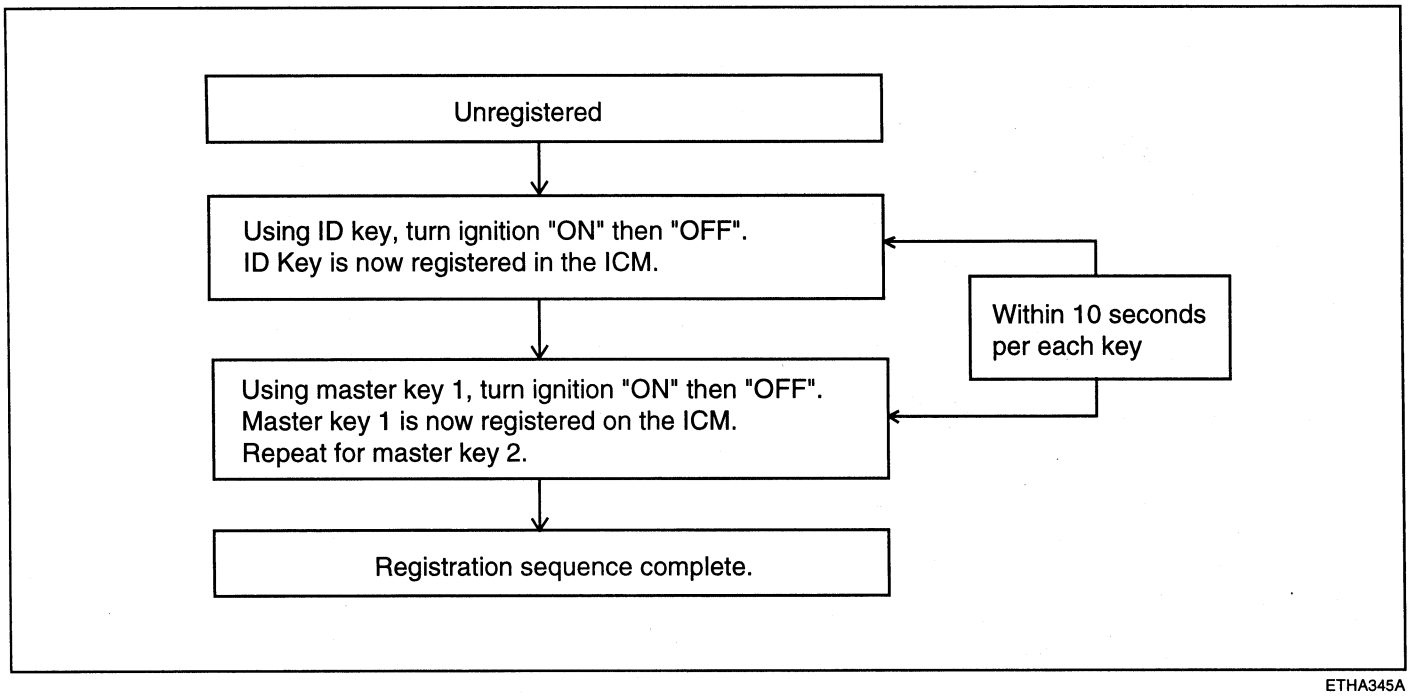
A. TRANSPONDER KEY	B. COIL ANTENNA
 B880B01A	 B6BE225C
C. IMMOBILIZER CONTROL MODULE	D. ENGINE CONTROL MODUEL
 B6BE710D	 B6BE710E

DESCRIPTION

COMPONENT	DESCRIPTION
TRANSPONDER (built-in keys)	When ignition "ON", the coil supplies energy to the transponder, which in turn accumulates energy in the condenser. Once the energy supply from the coil has stopped, using the stored energy in the condenser, the transponder transmits the ID CODE.
COIL ANTENNA	Supplies energy to the transponder. Receives signal from the transponder. Sends transponder signal to the ICM.
IMMOBILIZER CONTROL MODULE	Supplies power to the coil antenna. Receives and analyzes signal from the coil antenna.

KEY REGISTRATION

1. ID Code registration sequence

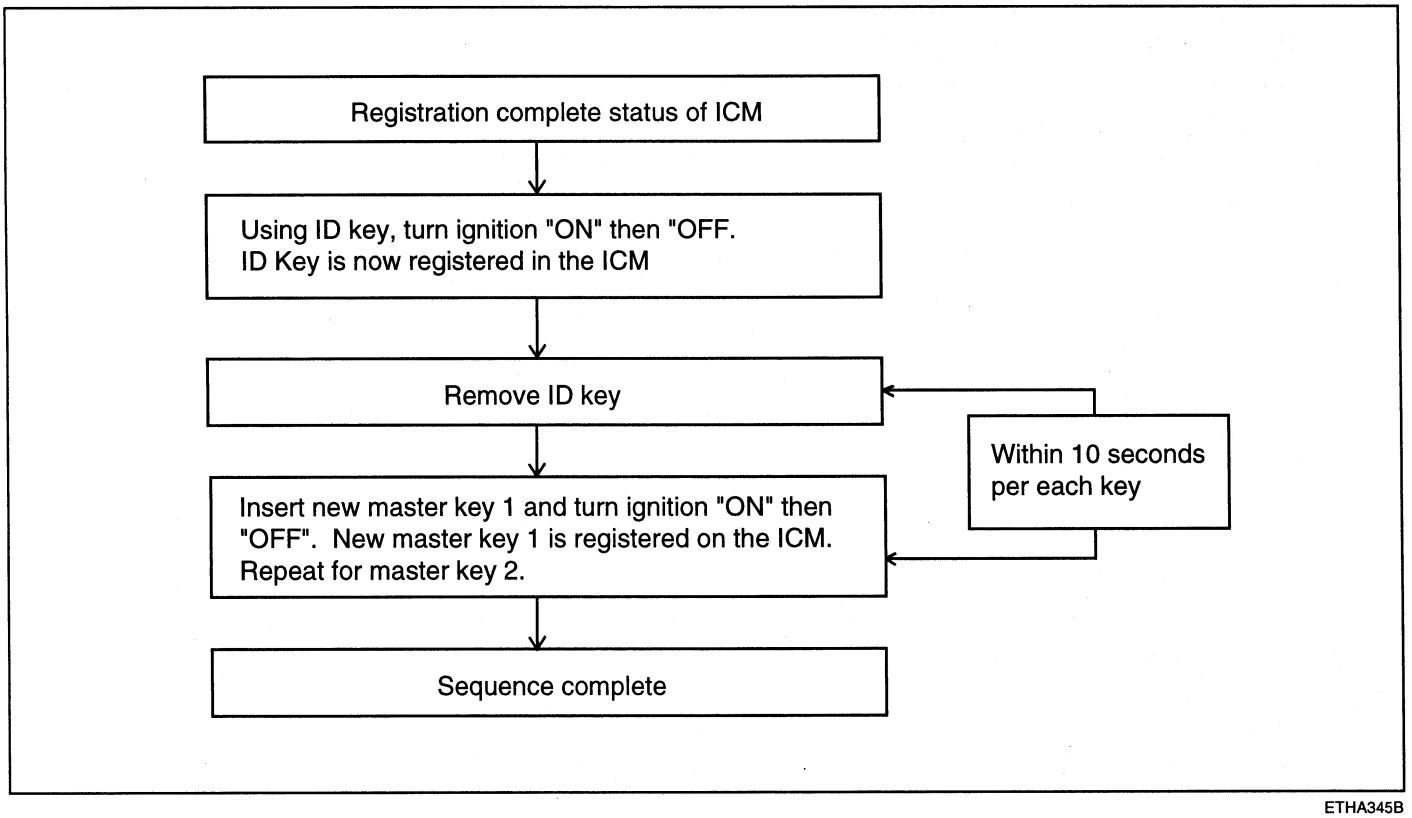


ETHA345A

2. Master key correction

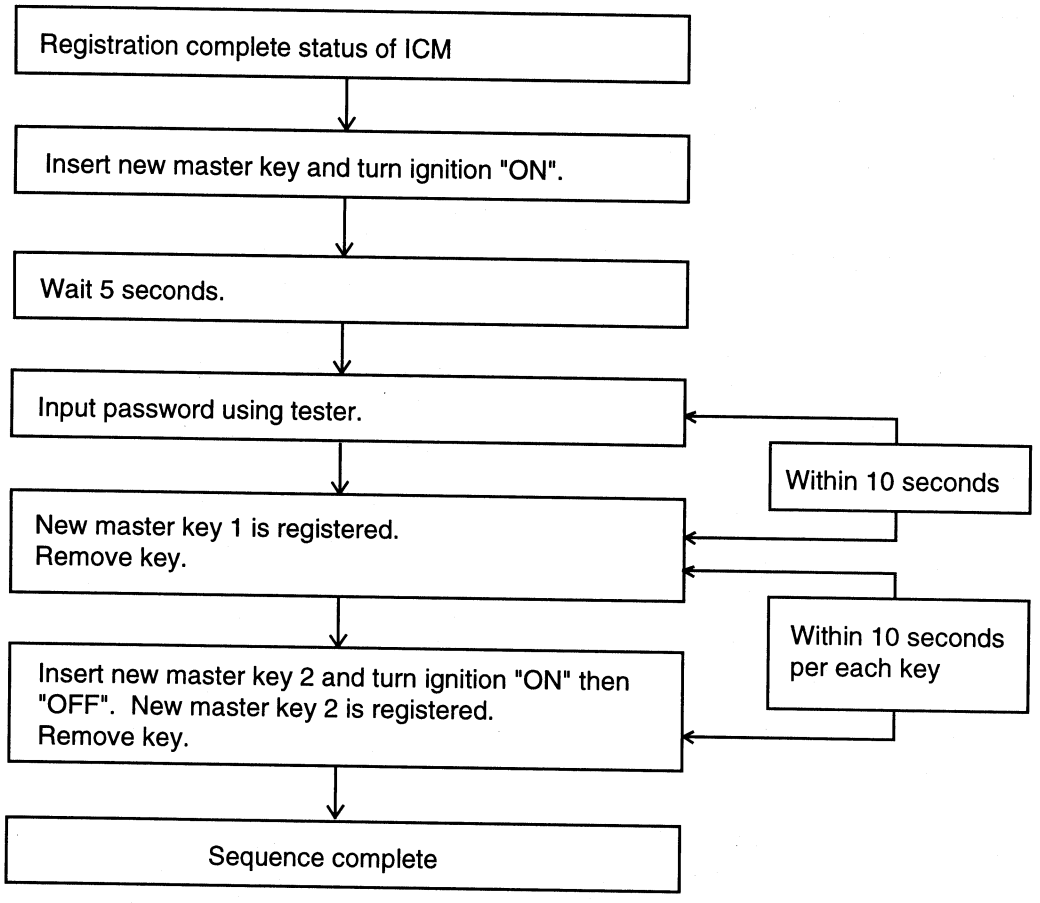
If a new set of master keys needs to be produced, it can be done by two methods:

a. Using ID key



ETHA345B

b. Using password



NOTE

- **Once the password is mis-registered, it is impossible to register new password during 10 seconds regardless of ignition ON/OFF.**
- **When the master 3 keys have been registered, the codes for existing master keys are all cleared.**
- **The password should consist of 4 numbers among ten (0~9) numbers.**

ETHA345C