OPTIMA(MS) > 2005 > G 2.7 DOHC > Body Electrical System

Body Electrical System > General Information > Troubleshooting

Troubleshooting

Instrument and warning system

Symptom	Possible cause	Remedy
Tachometer does not operate	Fuse blown	Check for short and replace fuse
	Tachometer faulty	Check tachometer
	Wiring faulty	Repair if necessary
Fuel gauge does not operate	Fuse blown	Check for short and replace fuse
	Fuel gauge faulty	Check gauge
	Fuel sender faulty	Check fuel sender
	Wiring faulty	Repair if necessary
Low fuel warning lamp does not light	Fuse blown	Check for short and replace fuse
	Bulb burned out	Replace bulb
	Fuel level sensor faulty	Check sensor
	Wiring or ground fraulty	Repair if necessary
Water temperature gauge does not operate	Fuse 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	Fuse 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	Fuse 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	Fuse blown	Check for connection
	Bulb burned out	Replace bulb
	Door switch faulty	Check switch
	Wiring or ground faulty	Repair if necessary
Seat belt warning lamp does not light	Fuse blown	Check for short and replace fuse
	Bulb burned out	Replace bulb

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	Buckle switch faulty	Check switch
	Wiring or ground 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
	Fuse blown - Low beam	Check for short and replace fuse
	Fuse blown - high beam	Check for short and replace fuse
	Head lamp relay faulty	Check relay
	Lighting switch faulty	Check switch
	Wiring or ground faulty	Repair if necessary
Tail lamps do not light	Tail lamp fuse blown	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	Fuse 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	Fuse 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	Fuse blown	Replace fuse and check for short
	Flasher faulty	Check flasher
	Hazard switch faulty	Check switch
	Wiring or ground faulty	Repair if necessary

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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	Fuse 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	Fuse blown	Check for short and replace fuse
	Wiring or ground faulty	Repair if necessary

Windshild wiper

Symptom	Possible cause	Remedy
Wipers do not operate or return to off position.	Wiper fuse blown	Check for short and replace fuse
	Wiper motor faulty	Check motor
	Wiper switch faulty	Check switch
	Wiring or ground faulty	Repair if necessary
Wipers do not operate in INT position	ETACS Module faulty	Check ETACS Module
	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	Fuse blown	Check for short and rplace fuse
	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 not 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

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Symptom	Possible cause	Remedy
No mirrors operate	Fuse 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

Body Electrical System > General Information > Specifications

Instruments and warning system

Warning lamps	Bulb wattage (w)	Color
Turn signal	LED	Green
(LH, RH)	LED	Blue
High beam	LED	Green
Front fog	LED	Yellow
Trunk lid open	LED	Red
Door ajar	1.4	Red
Air bag	1.4	Amber
Engine check	LED	Green
Auto Cruise	LED	Red
Oil pressure	LED	Red
Parking brake	LED	Red
Battery charge	LED	Yellow
ABS	LED	Yellow
TCS	LED	Red
Seat belt	LED	Yellow
Low fuel	LED	
A/T	LED	Orange
R	LED	Green
P, N, D		

Service specifications
Indicators and gauges

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Items	Specifications

Speedometer

Type

o Stepper motor

Standard values

Velocity (Km/h)	20	40	60	80	100	120
Tolerance (Km/h)	+4.1	+3.0	+4.1	+5.2	+5.2	+6.3
	0	0	0	0	0	0.5
Velocity (Km/h)	140	160	180	200	220	240
Tolerance (Km/h)	+6.3	+7.5	+8.4	+9.1	+10.0	+10.0
	+0.5	+0.5	+1.0	+1.0	+1.0	+1.0

Velocity (MPH)	10	20	40	60	80	100
Tolerance (MPH)	±1.5	±1.5	±1.5	±1.7	±2.0	±2.3
Velocity (MPH)	120	140	150	-	-	-
Tolerance (MPH)	±2.5	±2.7	±2.7	-	-	-

o Tap the speedometer to prevent hysterisis effects during inspection.

Tachometer

Type

o Stepper motor

Standard values

Revolution (RPM)	1,000	2,000	3,000	4,000	5,000	6,000	7,000	Remarks
Tolerance (RPM)	±120	±140	±170	±170	±200	±240	±260	

o Tap the tachometer to prevent hysterisis effects during inspection.

Fuel gauge

Type

o Stepper motor

Standard values

Level	Gauge	Gauge angle (°)
	Resistance (Ω)	
E (Empty)	95	-40 ± 2.4
1/2	32.5	0 ± 2.4
F (Full)	7.0	40 ± 2.4

o Inspection order : F → E
The level must be reached within 7 minutes after the resistance is set for Full or Empty.

o Point stability tolerance : Within 9°
Apply power for 10 minutes. Then turn off the power for 30 minutes and read the position of the pointer.

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<table>
<tr><th>Items</th><th>Specifications</th></tr>
<tr><td>Temperature gauge
Type
Indication standard

Resistance of temperature sender (NTC)</td><td>o Stepper motor
<table>
<tr><th>Temperature</th><th>Angle (°)</th></tr>
<tr><td>122°F (50°C)</td><td>-40</td></tr>
<tr><td>185°F~230°F (85°C - 110°C)</td><td>-7~7</td></tr>
<tr><td>Red zone (over 257°F (125°C))</td><td>30</td></tr>
</table>
o Inspection order : OFF → C → H
<table>
<tr><td>Temperature [°F(°C)]</td><td>122(50)</td><td>185(85)</td><td>230(110)</td><td>250(125)</td></tr>
<tr><td>Resistance (Ω)</td><td>153.0</td><td>65.0</td><td>29.0</td><td>16.5</td></tr>
</table></td></tr>
</table>

Lighting system

Items	Bulb wattage(W)
Head lamp	65W / 55W (High / Low)
Front turn signal lamp	28W
Front position lamp	8W
Front fog lamp	28W
Rear combination lamps Tail/stop lamp Back up lamp Turn signal lamp	 8W / 27W 16W 27W
License plate lamp	5W
Sun visor illumi.lamp	5W
Room lamp	10W
Over head lamp	5W
Courtesy lamp	5W
High mount stop lamp	18W
Side mark lamp	5W

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Body Electrical System > Audio > Troubleshooting

CUSTOMER COMPLAINT ANALYSIS CHECK SHEET

TROUBLE IN	☐ ALL ☐ AM ☐ FM ☐ TAPE ☐ CD ☐ MP3 ☐ CD changer ☐ AMP ☐ Athers
TROUBLE OCCURS	☐ Always ☐ Engine start ☐ Engine Running ☐ Cold ☐ Warm ☐ Sometimes ☐ Most of the time ☐ Engine off
TYPE OF TROUBLE	☐ Will not play ☐ Tape speed not proper ☐ Weak ☐ Noise squeal ☐ East tape ☐ Display/illumination poor ☐ CD skips & jumps ☐ Tape/CD will not eject or insert ☐ Others (Describe) :
OTHERS	▶ Customer complaint contents : ▶ Have you checked customer's defects :
★ Using the customer complaint analysis check sheet for reference, ask the customer as much detail as possible about the problem.	

TROUBLESHOOTING

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

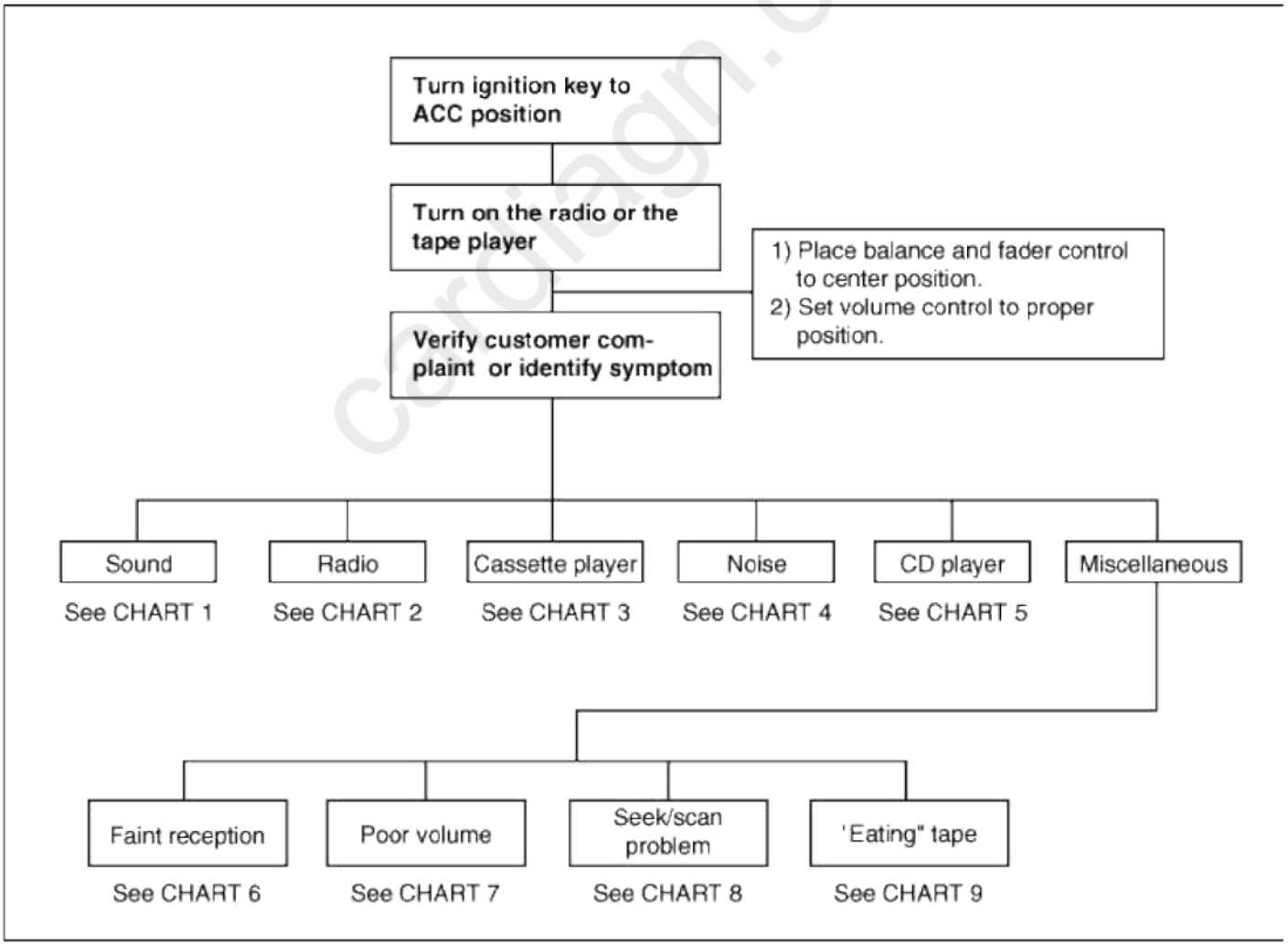
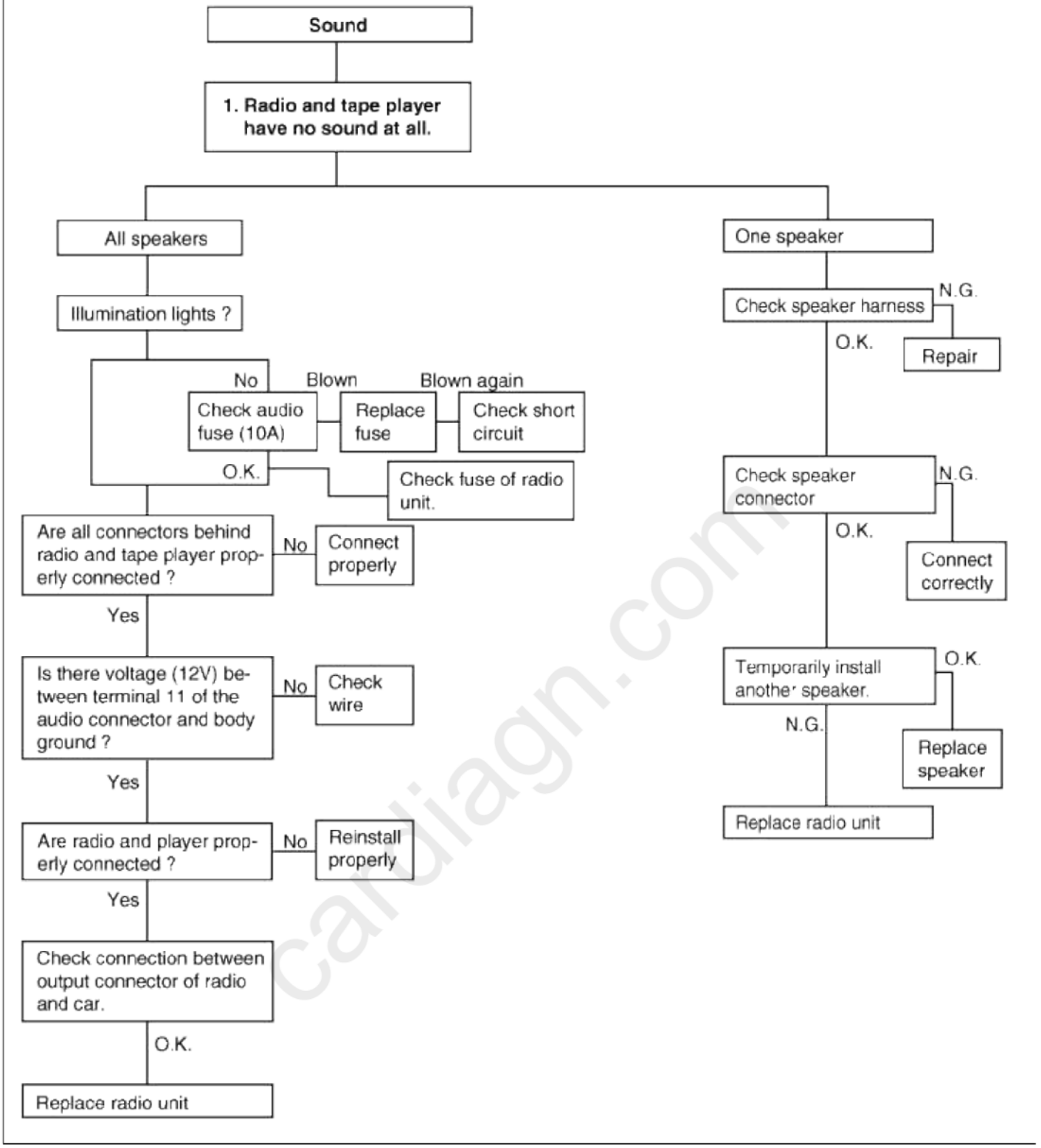


Chart 1

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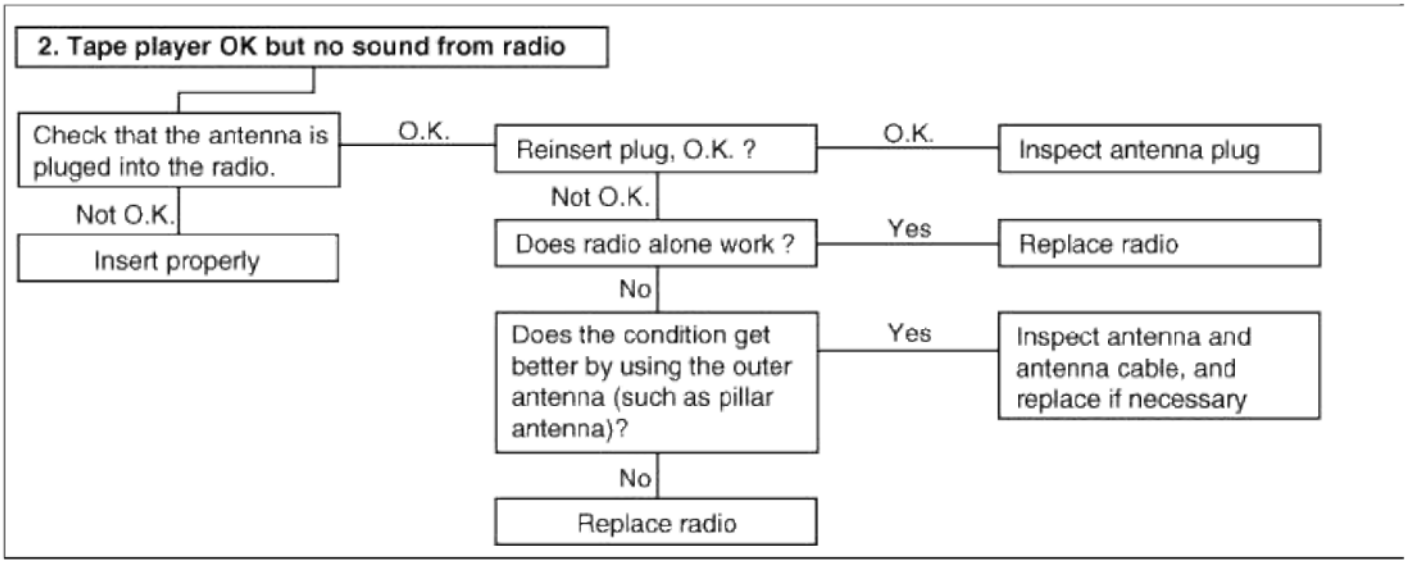


Chart 2

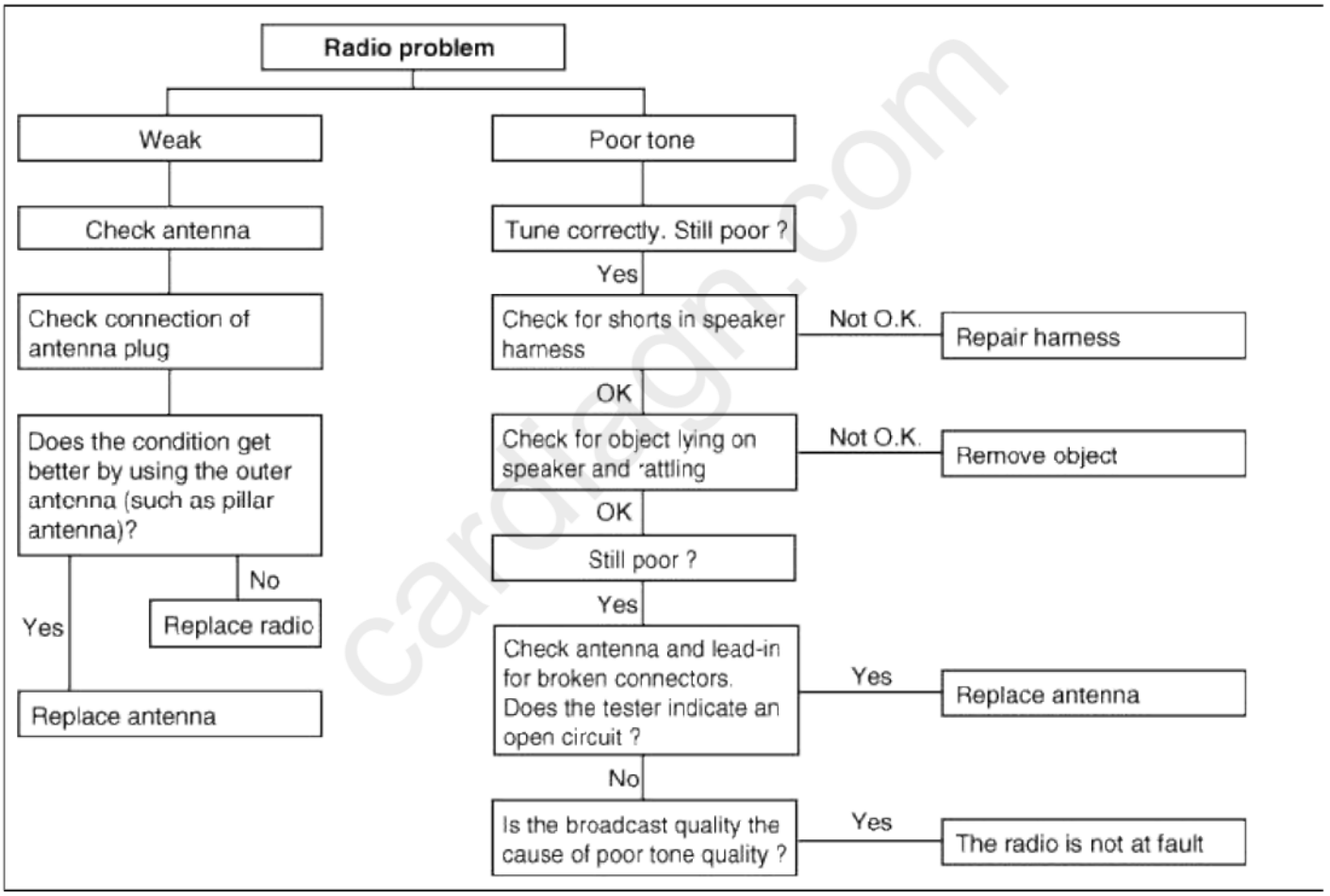


Chart 3

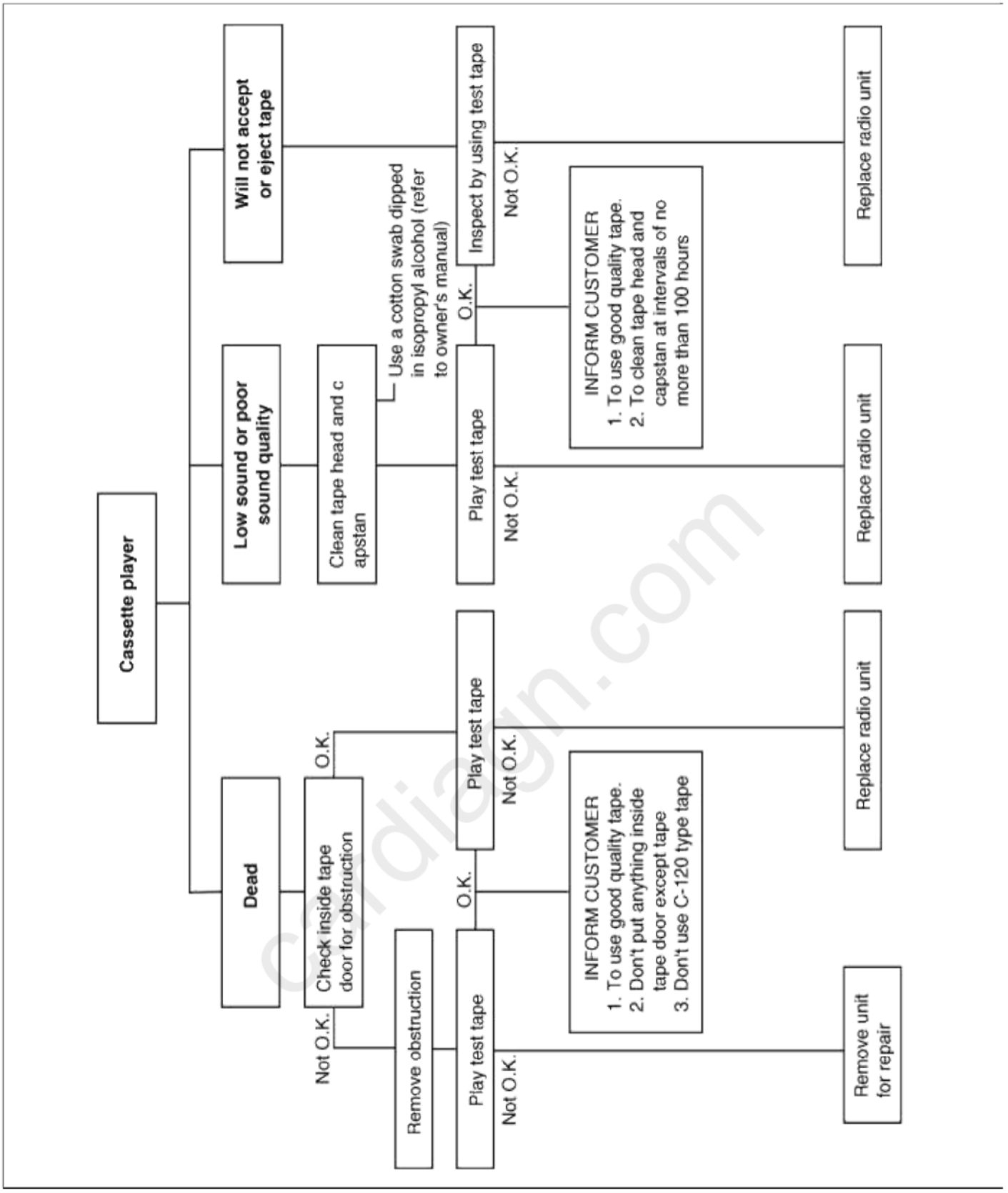
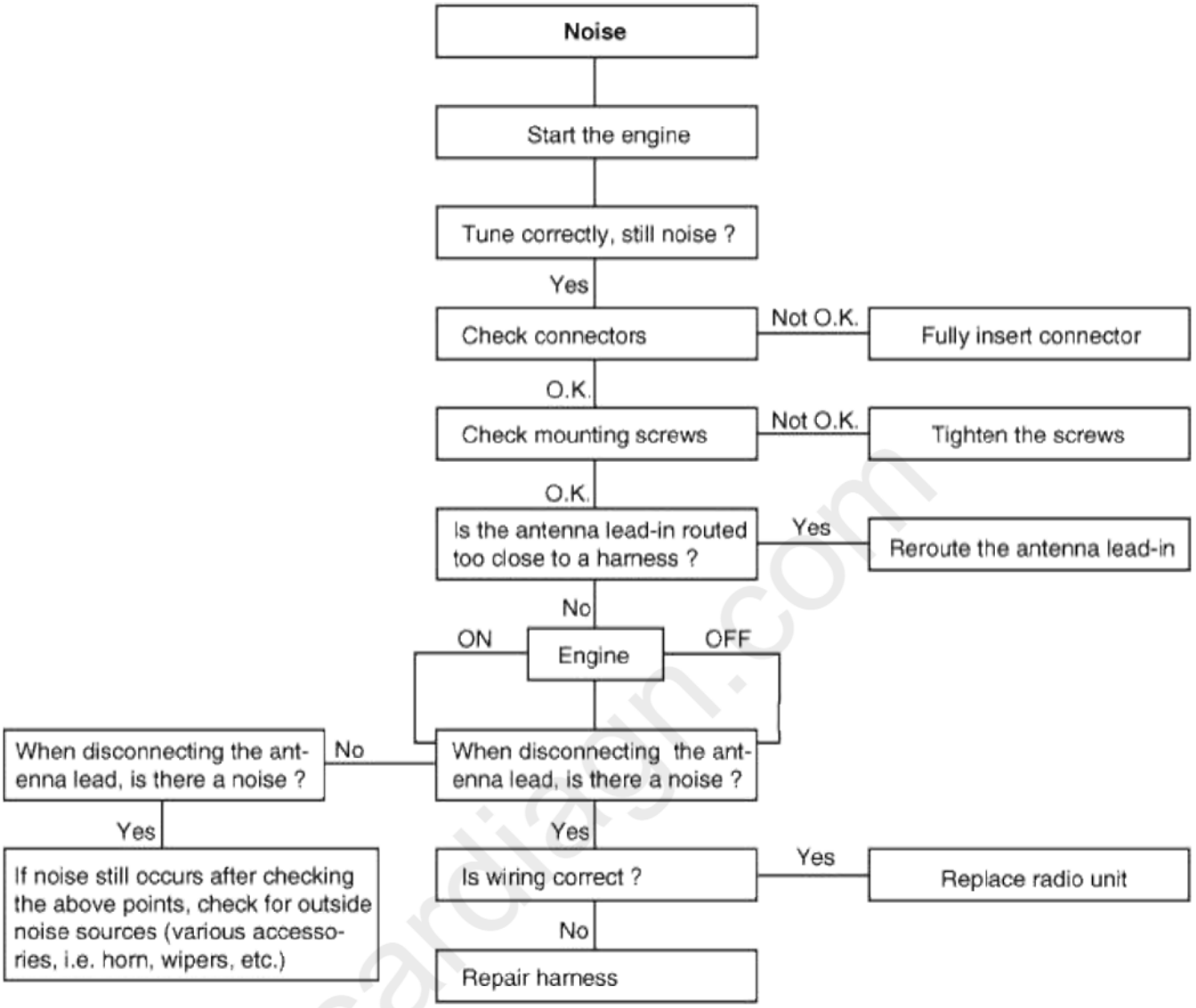

Cassette player
Will not accept or eject tape
Inspect by using test tape
Not O.K.
Replace radio unit
O.K.
Low sound or poor sound quality
Clean tape head and c apstan
Use a cotton swab dipped in isopropyl alcohol (refer to owner's manual)
Play test tape
Not O.K.
Replace radio unit
INFORM CUSTOMER
1. To use good quality tape.
2. To clean tape head and capstan at intervals of no more than 100 hours
Dead
Check inside tape door for obstruction
O.K.
Play test tape
Not O.K.
Replace radio unit
INFORM CUSTOMER
1. To use good quality tape.
2. Don't put anything inside tape door except tape
3. Don't use C-120 type tape
Not O.K.
Remove obstruction
Play test tape
O.K.
Not O.K.
Remove unit for repair

Chart 4

1. RADIO



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2. TAPE

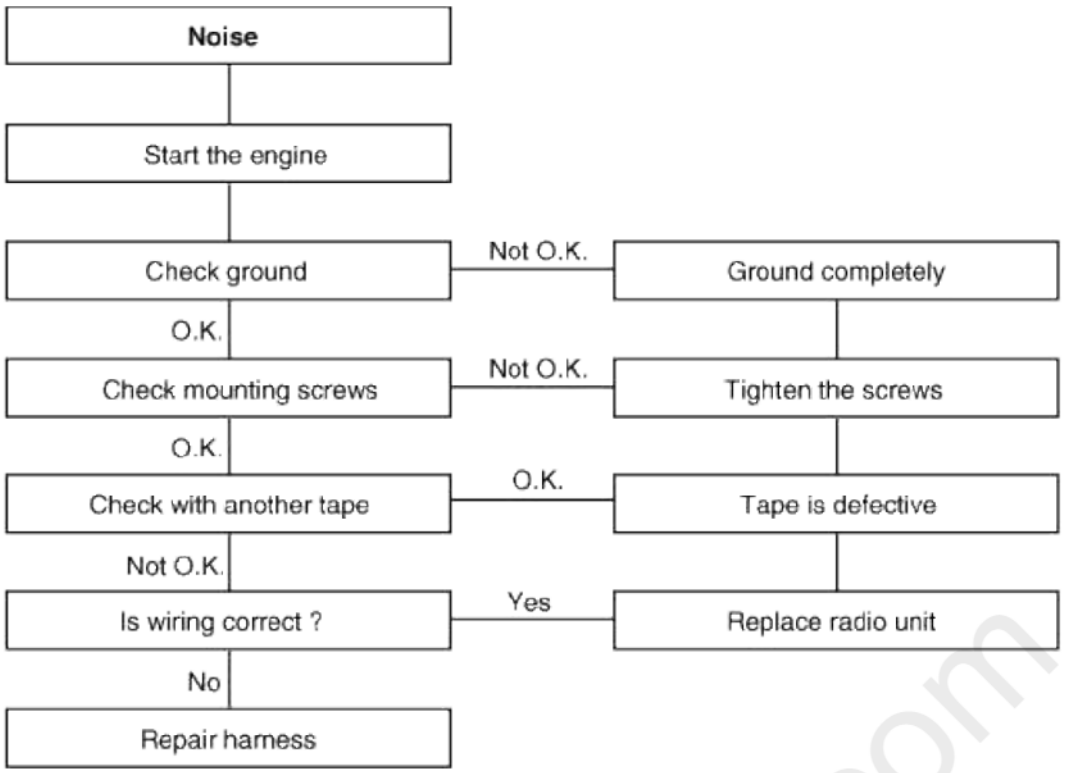
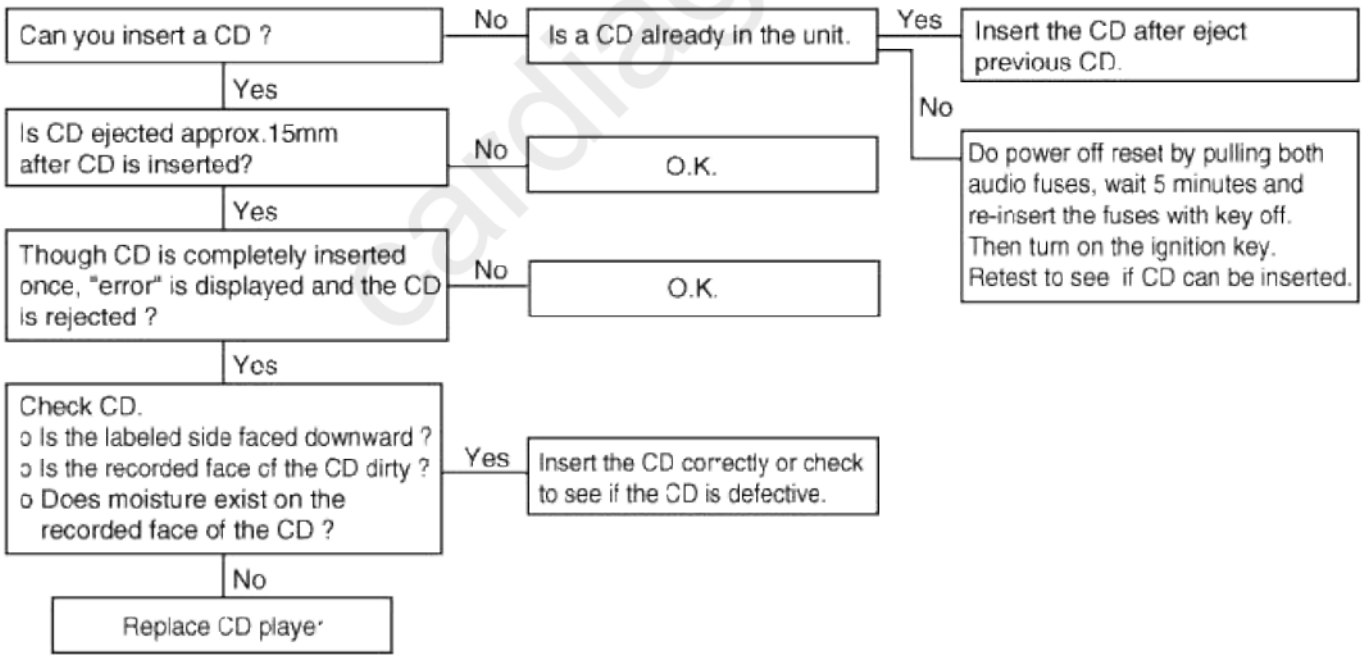


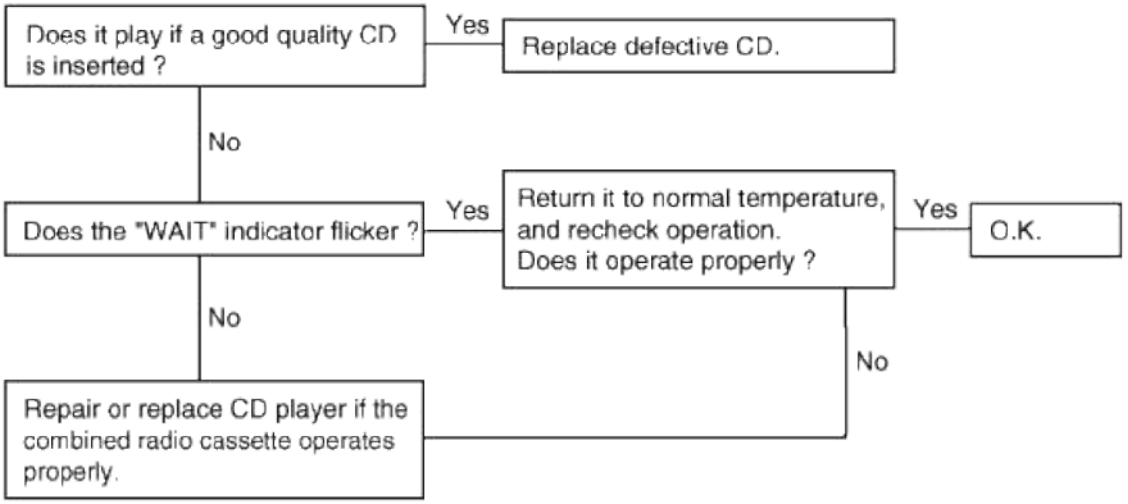
Chart 5

1. CD WILL NOT BE ACCEPTED



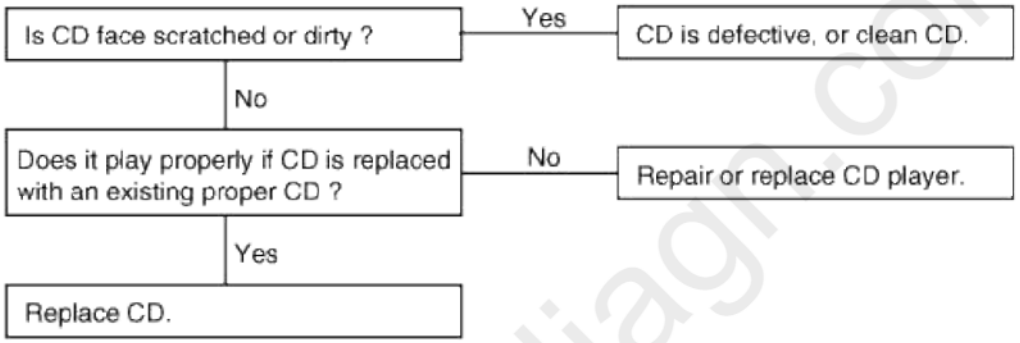
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2. NO SOUND

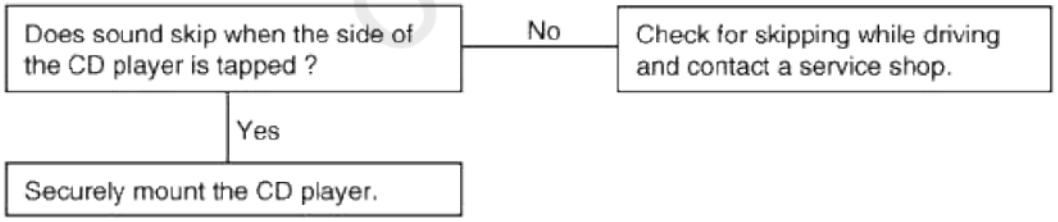


3. CD SOUND SKIPS

1) Sound sometimes skips when parking.

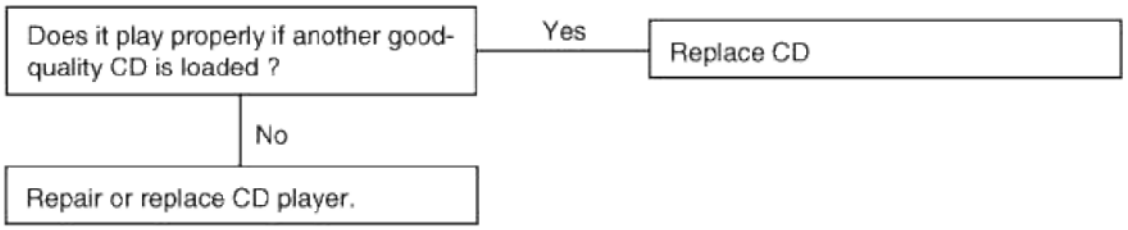


2) Sound sometimes skips when driving.
(Stop vehicle, and check it.)
(Check by using a CD which is free of scratches, dirt or other damage.)

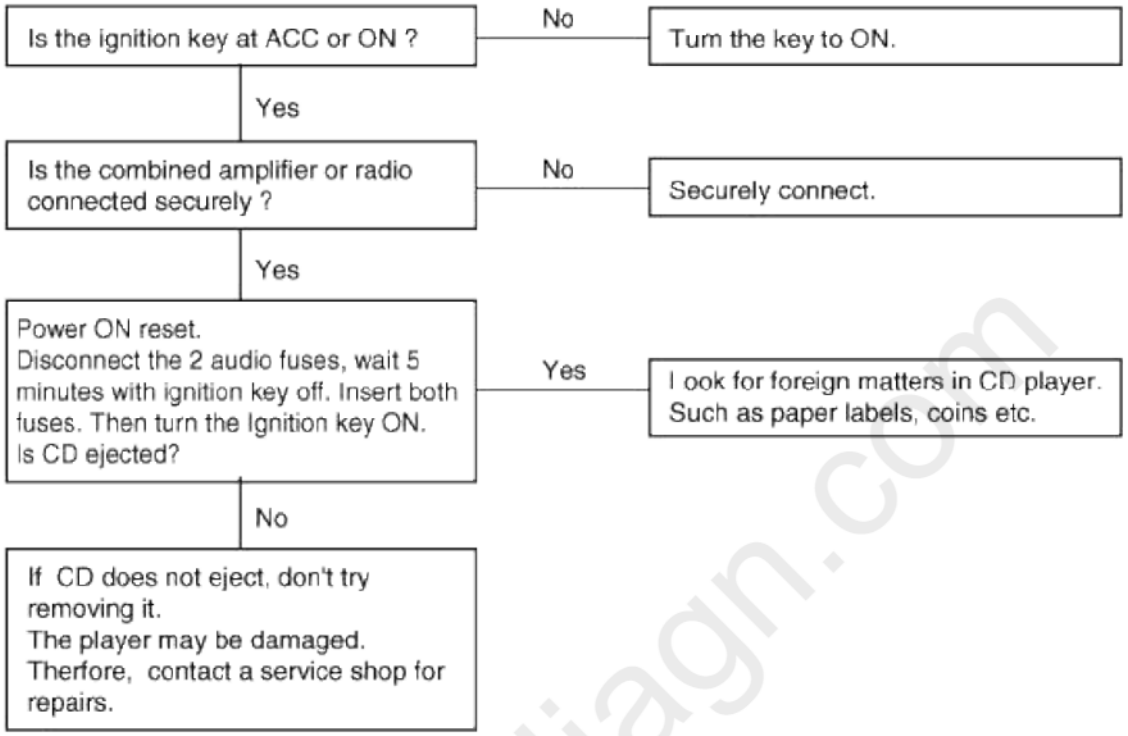


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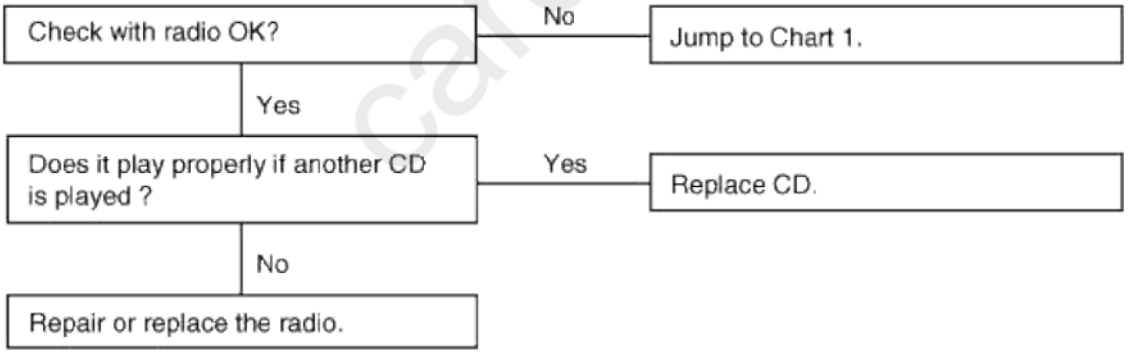
4. SOUND QUALITY IS POOR



5. CD WILL NOT EJECT



6. NO SOUND FROM ONE SPEAKER



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Chart 6

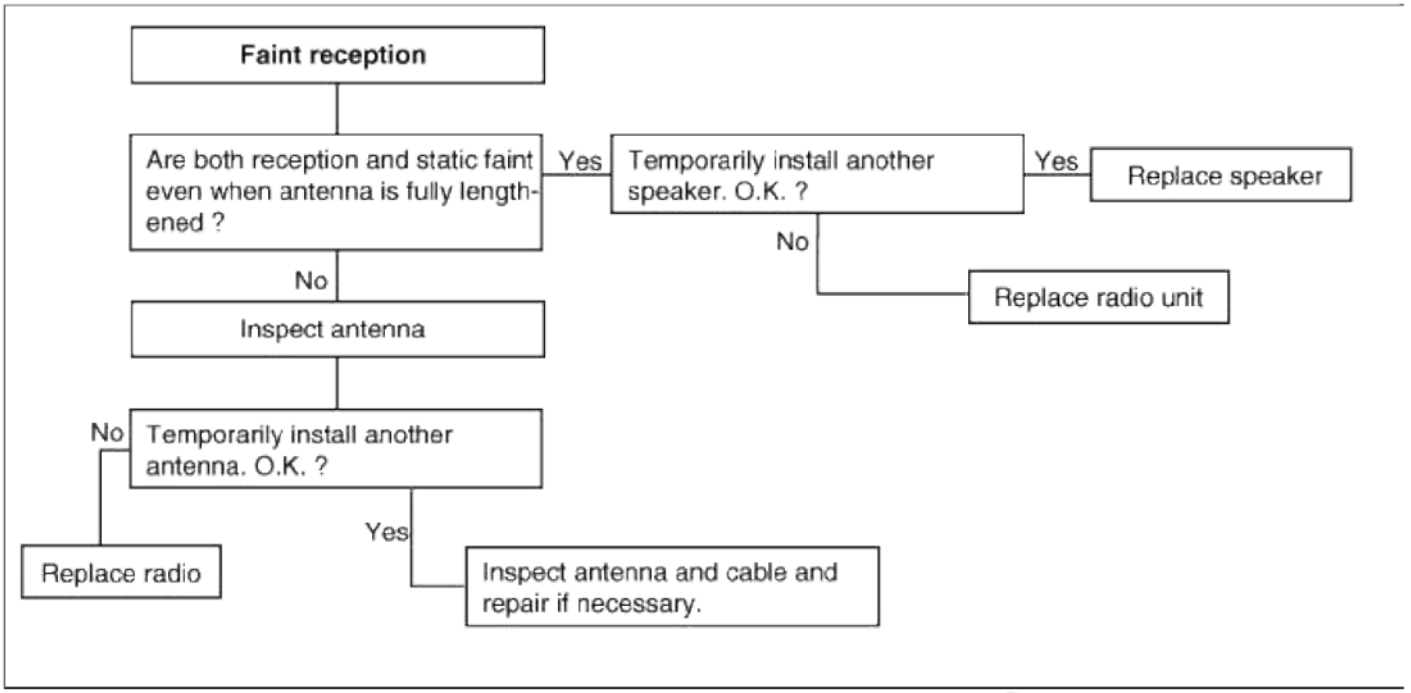


Chart 7

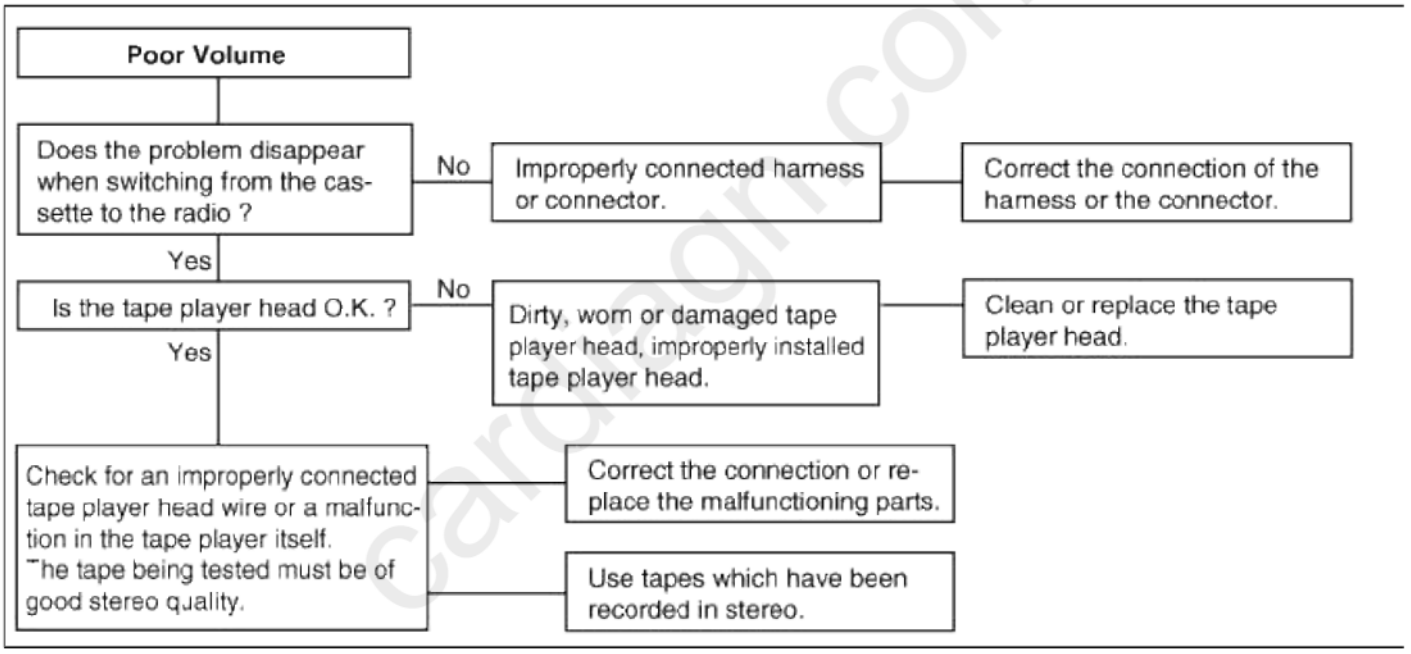


Chart 8

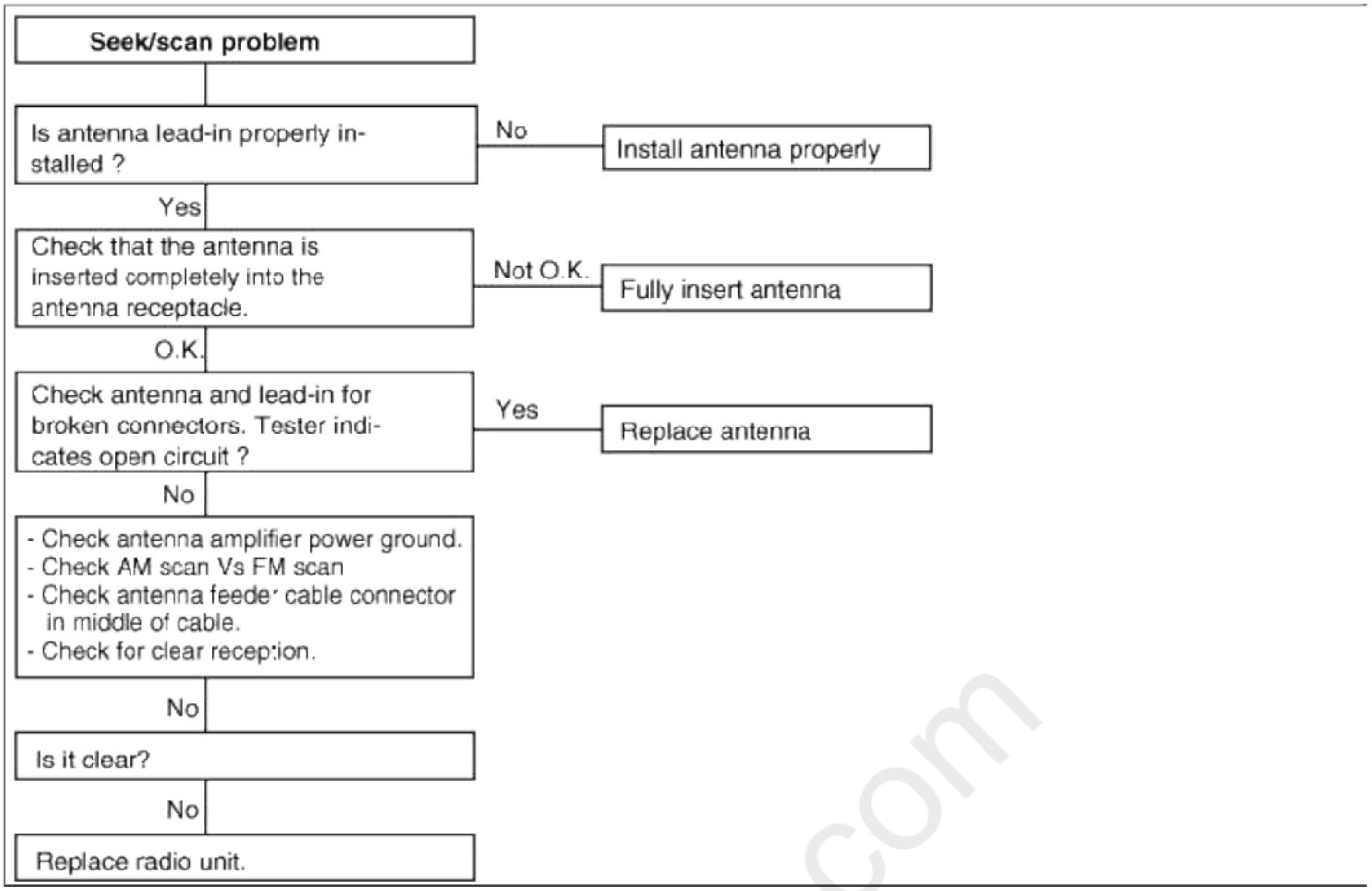
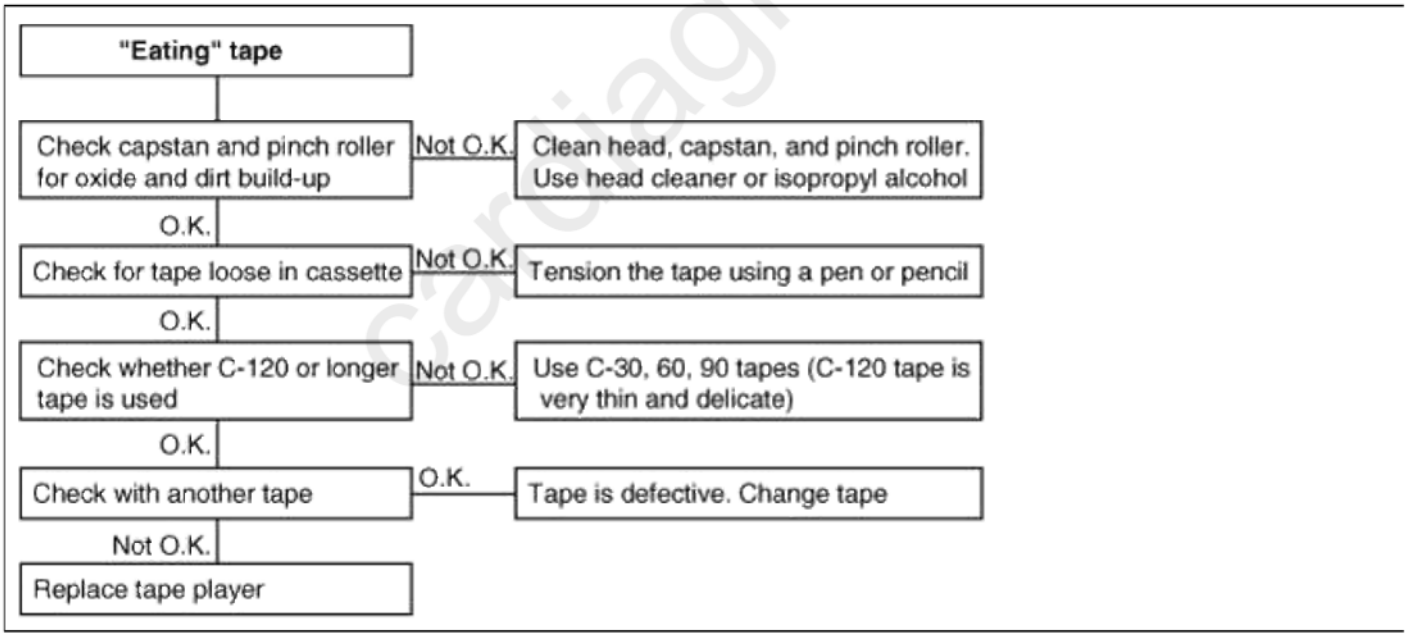


Chart 9

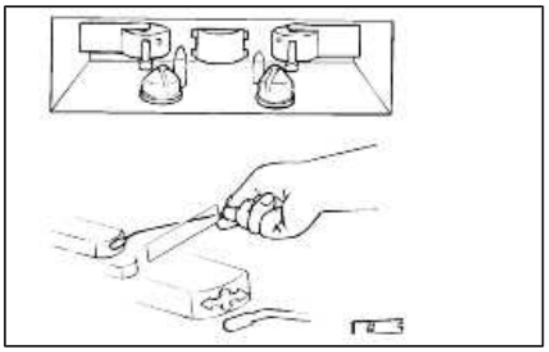


Body Electrical System > Audio > Audio Unit > Repair procedures

Tape head and capstan cleaning

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1. To obtain optimum performance, clean the head and capstan as often as necessary, depending upon 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.

Installation of radio equipment

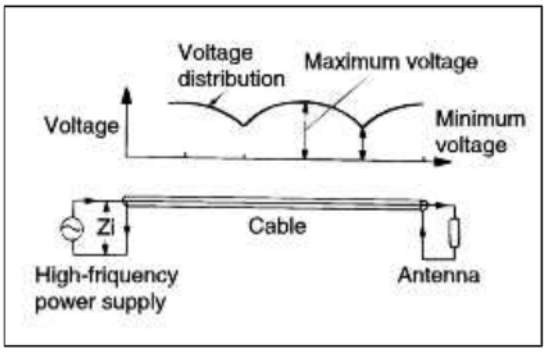
The electronic control systems have been designed so that external radio waves ill not interfere with their operation. However, if the antenna or cableof the amateur transceiver is routed near the computers, it may affect the peration of the computers, even if the output of the transceiver is no morethan 25W.

To protect each of the computers from interference by transmitter (hum, transceiver, etc.) the following should be observed.

1. Install the antenna on the roof or rear bumper.
2. Because radio waves are emitted from the coaxial cable of the antenna, keep it 200 mm (8 in.) away from the computers and the wiring harness. If the cable must cross the wiring harness, route it so that it runs at right angles to the wiring harness.
3. The antenna and the cable should be well matched, and the standing-wave ratio* should be kept low.
4. A transmitter having a large output should not be installed in the vehicle.
5. After installation of transmitter, run the engine at idle, emit radio waves from the transmitter and make sure that the engine is not affected.

*** STANDING-WAVE RATIO**

STANDING-WAVE RATIO If an antenna and a cable having different impedances are connected, the input impedance Zi will vary in accordance with the length of the cable and the frequency of the transmitter, and the voltage distribution will also vary in accordance with the location. The ratio between this maximum voltage and minimum voltage is called the standing-wave ratio. It can also be represented by the ratio between the impedances of the antenna and the cable. The amount of radio waves emitted from the cable increases as the standing-wave ratio increases, and this increases the possibility of the electronic components being adversely affected.

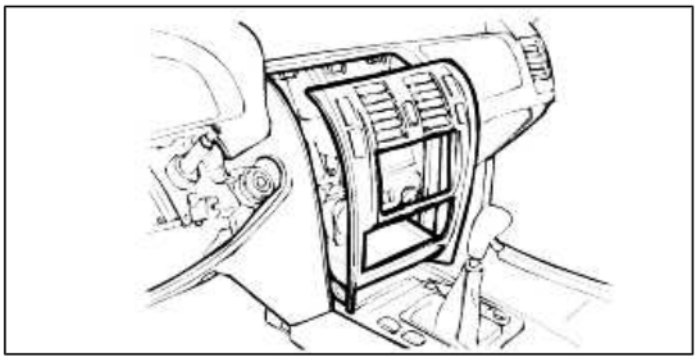


Removal and installation

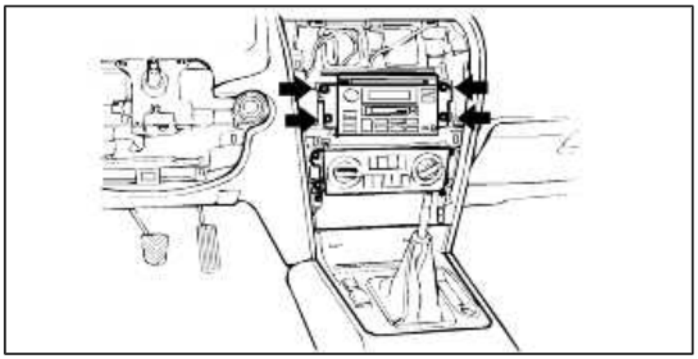
1. Disconnect the negative (-) battery terminal.

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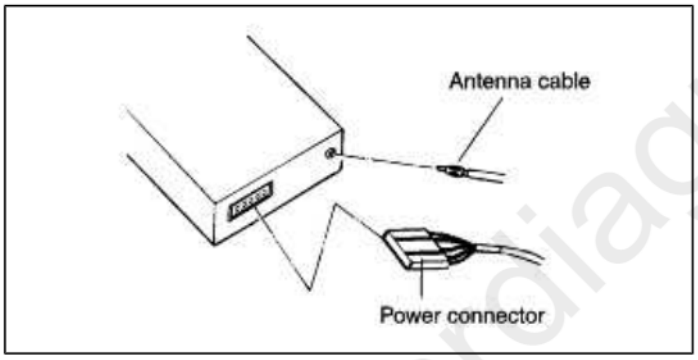
2. Remove the center facia panel and disconnect the wire connectors.



3. Remove the 4 screws holding the audio unit then remove the audio assembly.



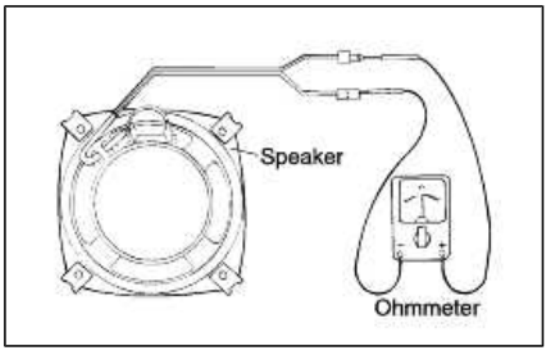
4. Disconnect the power connector and antenna cable jack from the audio unit.
5. Installation is the reverse of removal.



Body Electrical System > Audio > Speakers > Repair procedures

Speaker checking

1. Check the speaker by using an ohmmeter If an ohmmeter indicates the impedance of the speaker when checking between the speaker (+) and speaker (-) of the same channel, the speaker is okay.
   standard impedance is stamped at the back of speaker.



2. If clicking sound is emitted from the speaker when the ohmmeter plugs touch the speaker terminals, the speaker is okay.

Body Electrical System > Audio > Antenna > Description and Operation

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Description and operation

The antenna is an intergral part of the AM/FM radio. The antenna is mounted to left rear fender and receives AM and FM signals which are sent through antenna cable to the radio.

Body Electrical System > Audio > Antenna > Repair procedures

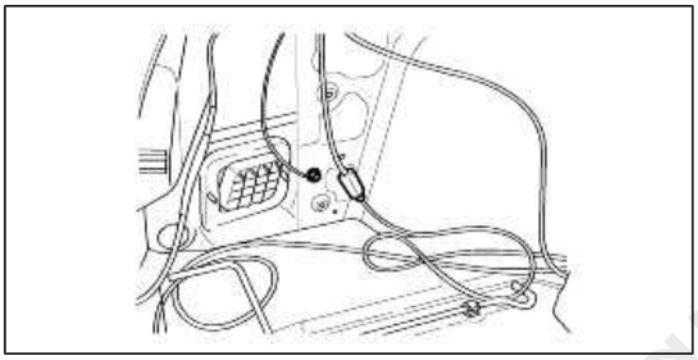
Antenna cable

Inspection

1. Inspect Antenna cable for obvious damage.
2. Inspect Antenna cable connectors for obvious damage.

Removal

1. Remove one screw from center panel trim.
2. pull out center panel trim.
3. Remove four screws that secure radio to center panel.
4. Remove connectors from rear of radio.
5. Disconnect antenna cable connector from antenna.



6. Remove antenna cable connector from antenna.
7. Pull carpet back toward driver seat.
8. Remove antenna cable.

Installation

Install in reverse order of removal.

Antenna mast

Inspection

1. Inspect antenna mast and mount for damage.
2. Make certain antenna mast is clean and not corroded.
3. Make certain antenna mast is secure in antenna mount.

Removal

Remove antenna mast from antenna mount by unscrewing antenna mast from mount.

Installation

Install antenna mast into antenna mount by screwing antenna mast into mount.

Antenna mount

Inspection

Inspect antenna mount for obvious damage.

Removal

1. Remove antenna mast by unscrewing antenna mast from mount.
2. Remove bezel nut from antenna.
3. Disconnect antenna cable from antenna.
4. Remove one nut from antenna mount support.
5. Remove antenna mount from bottom.

Installation

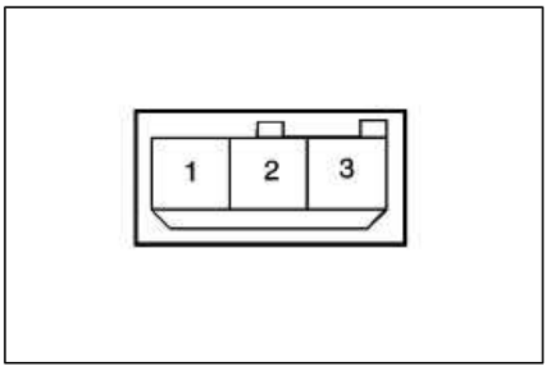
1. Install antenna mount.

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2. Connect antenna cable connector to antenna.
3. Install bezel nut.
4. Install antenna mast.

Power antenna inspection

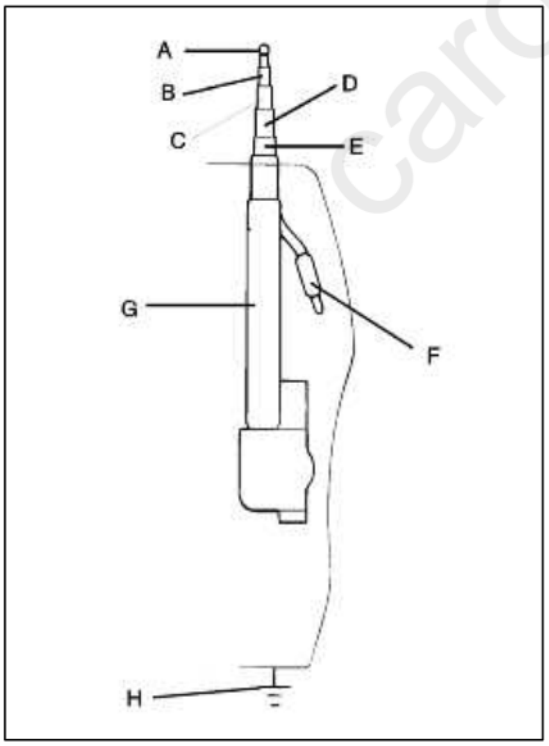
1. Disconnect the 3P connector from the motor.
2. Check battery voltage is measured between terminal 1 and terminal 3 at all time.



3. Check if the battery voltage is measured between terminal 2 and termianl 3 when ignition switch and audio switch is turned on.
4. Connect battery source to terminal 2 and terminal 1 of component side and check that motor operates (Antenna moves up).
5. Then, disconnect battery source from terminal 2 and check that motor operates (Antenna moves down).

Checking the antenna

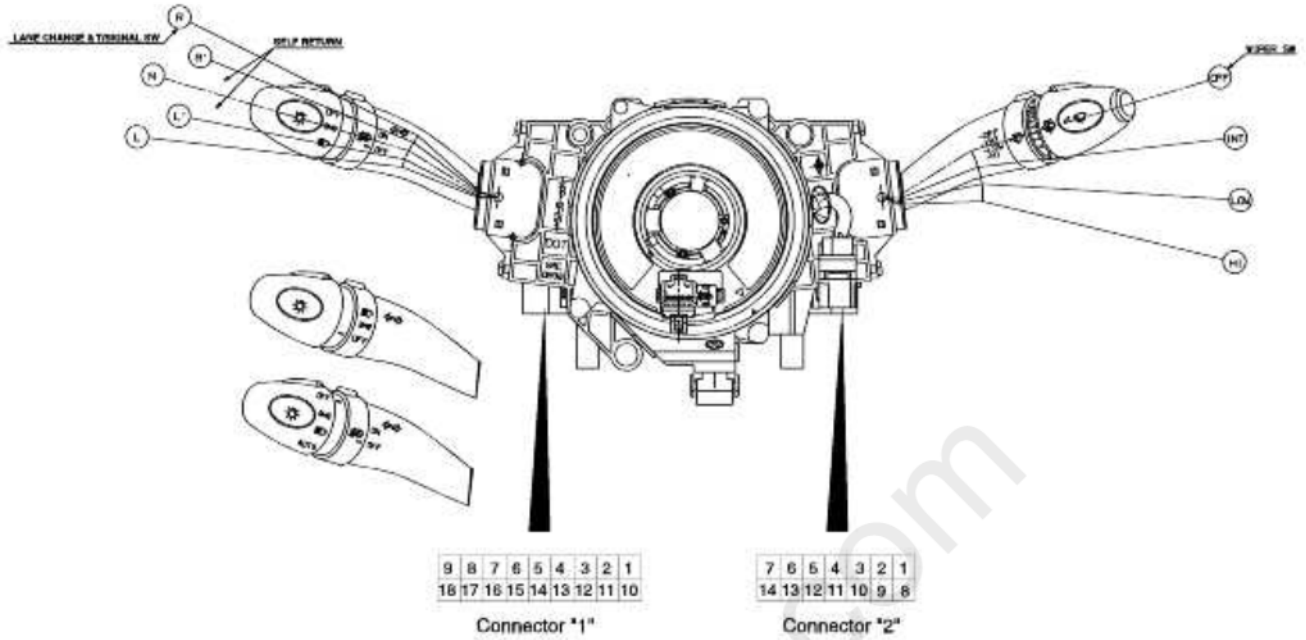
Ohmmeter measurement locations	Result
Circuits from F to A, B, C, D and E	Continuity
Circuit between G and H	Continuity
Circuit from H to A, B, C, D and E	No continuity

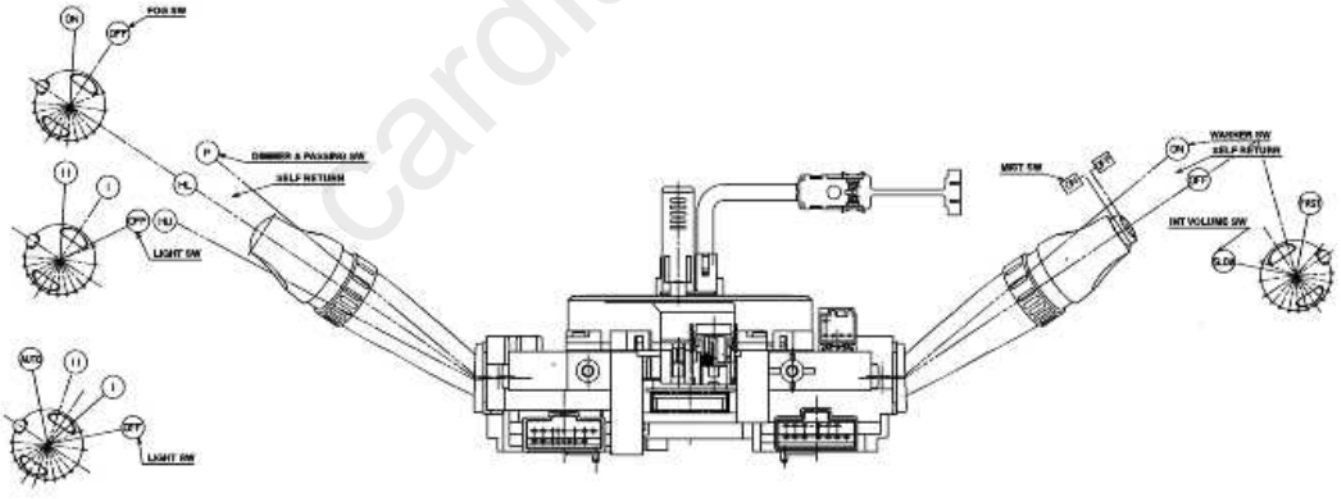


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Body Electrical System > Multifunction switch > Multi Function Switch > Components and Components Location

Component





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Body Electrical System > Multifunction switch > Multi Function Switch > Repair procedures

Removal and installation

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.

Check the continuity between the terminals while operating the switch.

Lighting switch (Connector "1")

Terminal / Position	14	13	12	11
OFF				
I	○			○
II	○	○	○	○

Terminal / Position	14	13	12	11
OFF				
I	○			○
II	○	○		○
AUTO			○	○

Dimmer and passing switch (Connector "1")

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Terminal / Position	9	8	18	17
HU		○		○
HL			○	○
P	○	○		○

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

Turn signal and lane change switch (Connector "1")

Hazard switch / Turn signal switch / Terminal	3	2	1
OFF — L		○	○
OFF — N			
OFF — R	○	○	

Front fog switch (Connector "1")

Terminal / Position	15	16
OFF		
ON	○	○

Wiper switch (Connector "2")

Terminal / Position	7	6	5	4	3	8	9
OFF		○	○				
INT		○	○	○	○	○	○
LOW		○			○		
HI	○				○		

Washer switch (Connector "2")

Terminal / Position	2	3
OFF		
ON	○	○

Mist switch (Connector "2")

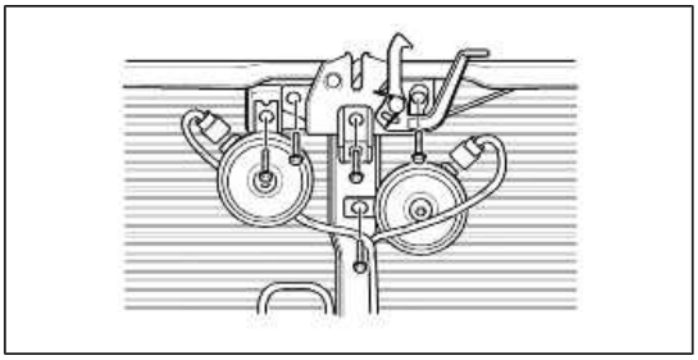
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Terminal / Position	11	12
OFF		
ON	○———	———○

Body Electrical System > Horn > Repair procedures

Removal

1. Disconnect negative battery cable.
2. Disconnect horn wire.
3. Remove one bolt and remove horn.



Installation

Horn is electrically grounded through mounting. Be sure that metal-to-metal contact is established before installing attaching bolt.

1. Disconnect negative battery cable.
2. Position horn on chassis and install one bolts.
3. Connect two wires to horn.
4. Connect negative battery cable.

Inspection

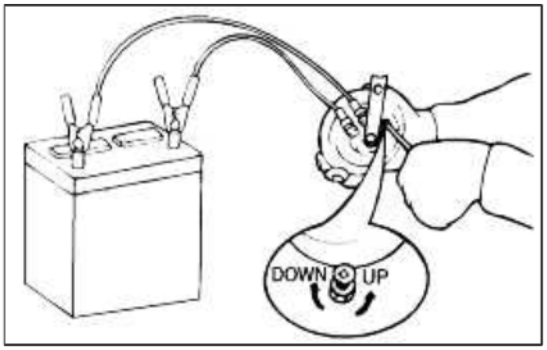
1. Test the horn by connecting battery voltage to the 1 and 2 terminals.
2. The horn should sound, if the horn fails to sound, replace it.

Adjustment

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

NOTE

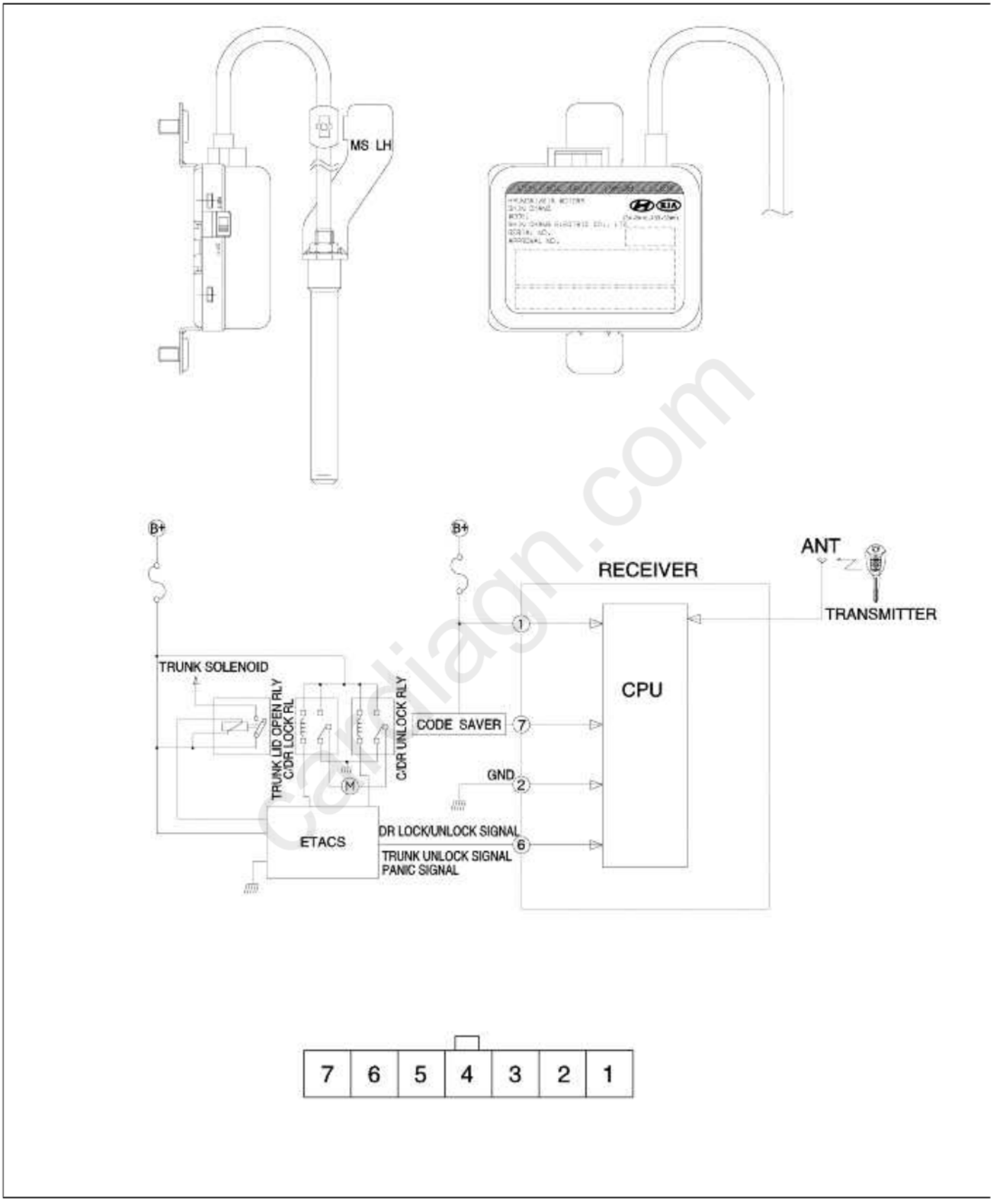
After the adjustment, apply a small amount of paint around the screw head to keep it from loosening.



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Body Electrical System > Keyless Entry And > Schematic Diagrams

Circuit diagram

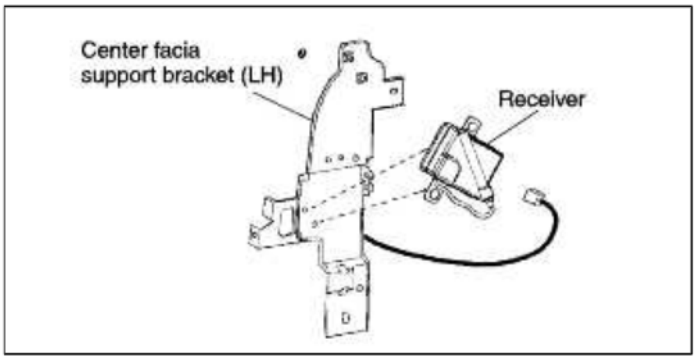


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Body Electrical System > Keyless Entry And > Description and Operation

Description

The keyless entry and burglar alarm system consists of ETACS components and some other parts.
Without a key, the keyless entry system is able to lock and unlock all the doors at a distance, transmitting a weak radio wave from a transmitter.



Body Electrical System > Keyless Entry And > Repair procedures

Inspection of components

Transmitter

1. Check that the red light flickers when the door lock button or unlock button is pressed on the transmitter.
2. Remove the battery and check voltage if the red light does't flicker.

   Standard value : 3V

3. Replace the battery if voltage is below 3V and replace the remote control switch if it is inoperable after replacing the battery.

   Battery : Lithium CR2032 (3V, 220mA/h)

Transmitter code saving methood

1. Store the transmitter cade by using Hi-scan pro.

Inspection of components

Transmitter

1. Check that the red light flickers when the door lock button or unlock button is pressed on the transmitter.
2. Remove the battery and check voltage if the red light does't flicker.

   Standard value : 3V

3. Replace the battery if voltage is below 3V and replace the remote control switch if it is inoperable after replacing the battery.

   Battery : Lithium CR2032 (3V, 220mA/h)

Body Electrical System > Keyless Entry And > Specifications

Specifications

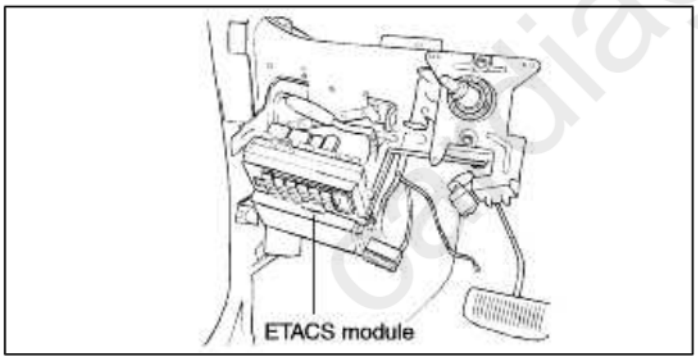
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Items	Specifications
Keyless entry transmitter	
Power source	Lithium 3V battery (1EA)
Transmissible distance	10m or more
Life of battery	2 years or more (at 20 times per day)
Button	Door lock, door unlock, trunk lid open
Transmission frequency	315 MHz
Receiver	
Operating voltage	DC 9V-16V
Operating temperature range	-30°C ± 80°C
Maximum standby current	3mA or less
Output pattern	Door lock, door unlock, trunk lid open

Body Electrical System > ETACS (Electronic Time > ETACS Module > Repair procedures

Removal and installation

1. Disconnect the negative (-) battery terminal.
2. Remove the lower crash pad (Refer to BD group).
3. Remove the bolts holding the ETACS moduld and disconnect the connectors.
4. Installation is the reverse of removal.



Operation check of components

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

Etacs function

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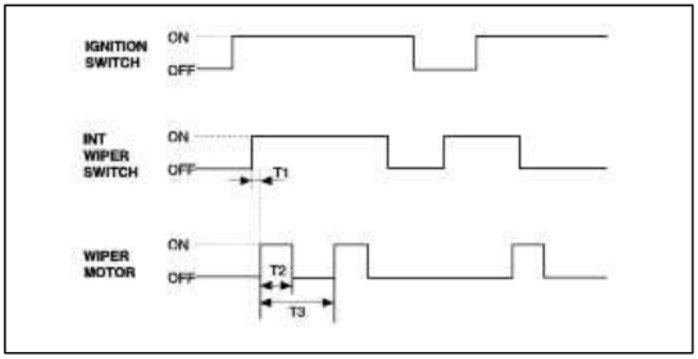
1. Variable intermittent wiper

Time specification

T1 : Max. 0.3 sec.

T2 : Time of wiper motor 1 rotation (0.6~0.8 sec.).

T3 : 2.2 ± 0.2 sec. (VR=0 kΩ)~10.0 ± 1.0 sec. (VR=50 kΩ)



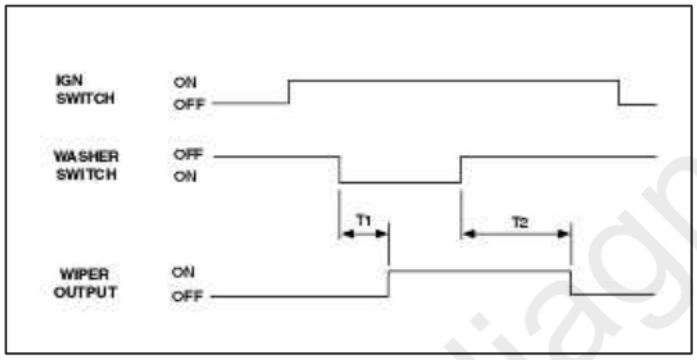
2. Washer related wiper

(1) Time specification

T1 : 0.6 sec.

T2 : 2.5~3.8 sec.

(2) This function should be operated preferentially even though the variable intermitten wiper is operating.

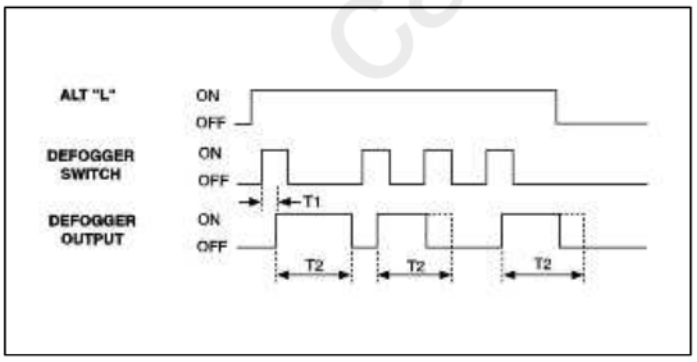


3. Rear window defogger

Time specification

T1 : 60m sec.

T2 20 ± 1 Min.



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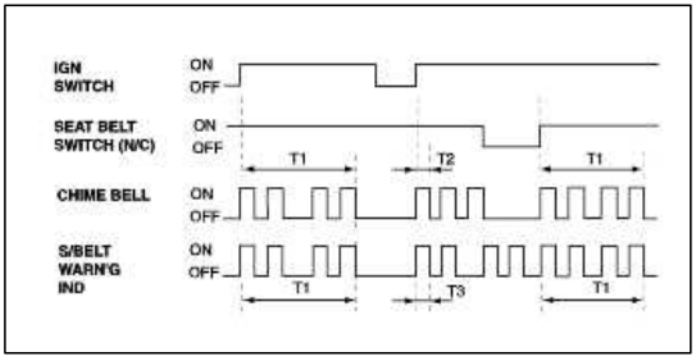
4. Seat belt warnig

Time specification

T1 : 6 ± 1 sec.

T2 : 0.45 ± 0.1 sec.

T3 : 0.3 ± 0.1 sec,

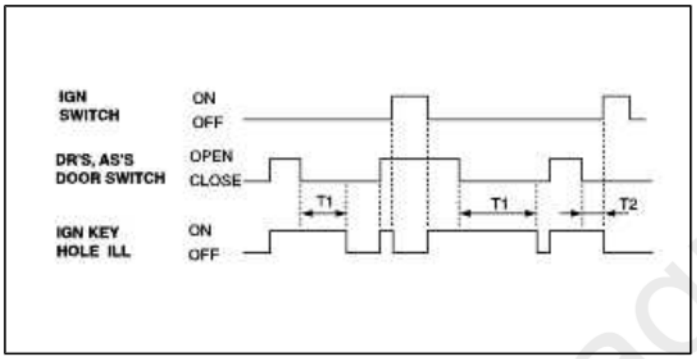


5. Ignition key hole illumination

Time specification

T1 : 10 ± 1.0 sec.

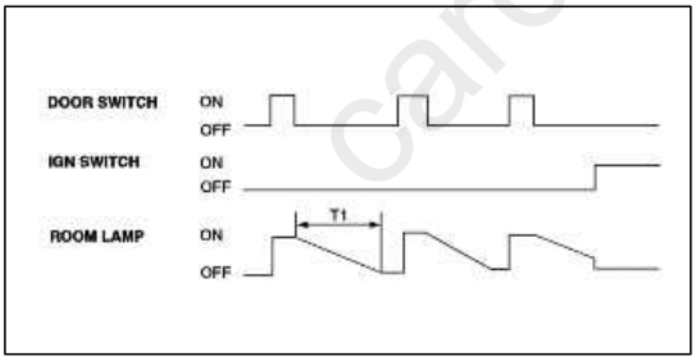
T2 : 0 ~ 10 sec.



6. Delayed out room lamp

Time specification

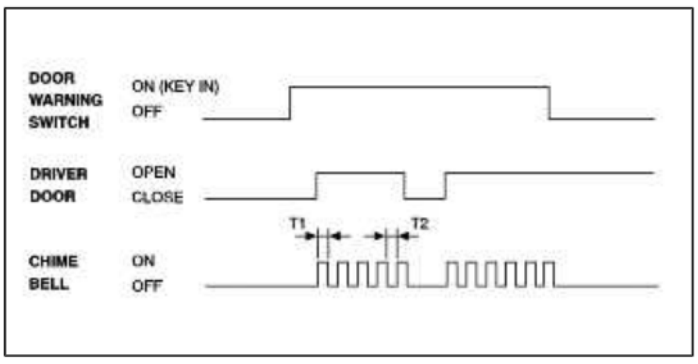
T1 : 5.5 ± 0.5 sec.



7. Key operated warning

Time specification

T1, T2 : 0.45 ± 0.1 sec.



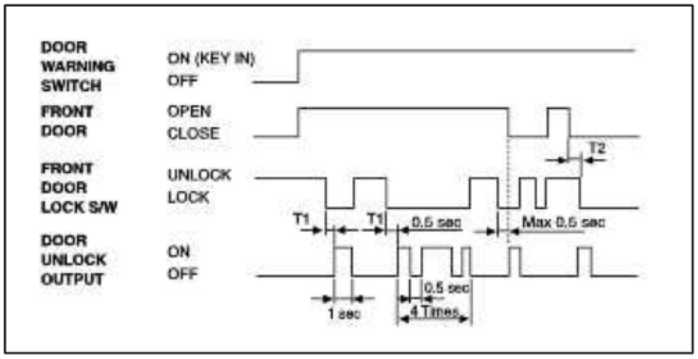
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8. Ignition key reminder

Time specification

T1 : 0.5 sec.

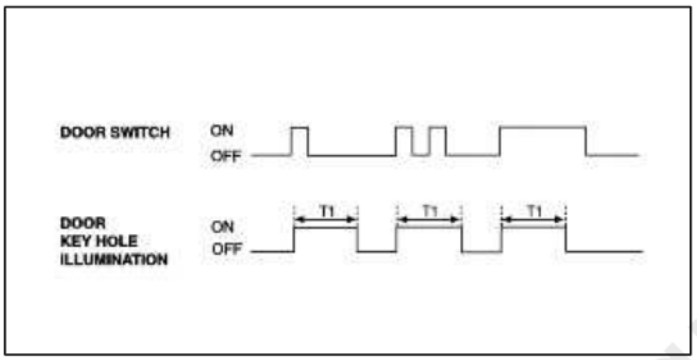
T2 : 0~0.5 sec.



9. Outside Door key illumination (Without burglar alarm)

Time specification

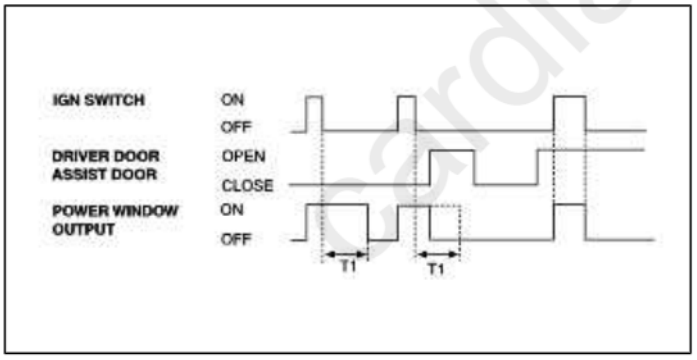
T1 : 10 ± 1.0 sec.



10. Power window timer

Time specification

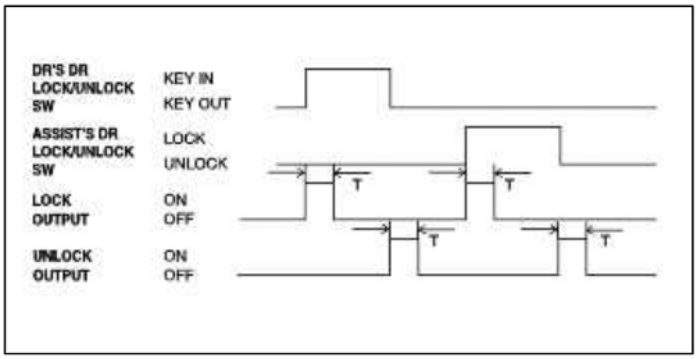
T1 : 30 ± 5 sec.



11. Central door lock/unlock (without burglar alarm)

Time specification

T : 0.5 ± 0.1 sec.



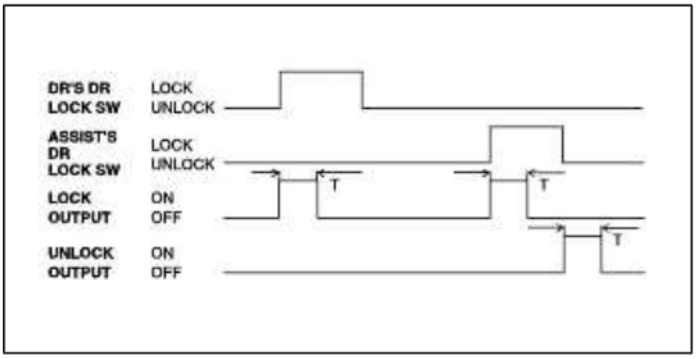
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12. Central door lock./unlock (with burglar alarm)

(1) When using the door key

Time specification

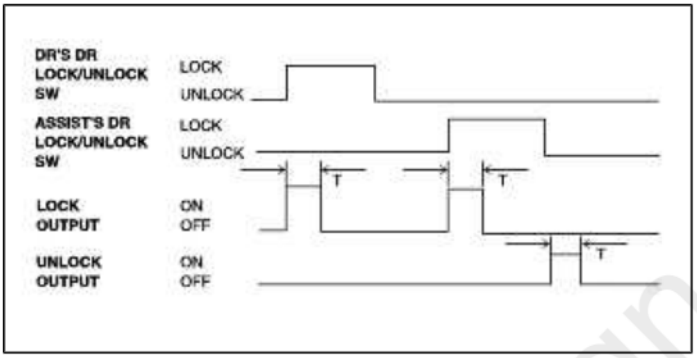
T : 0.5 ± 0.1 sec.



(2) When using the door lock knob switch

Time specification

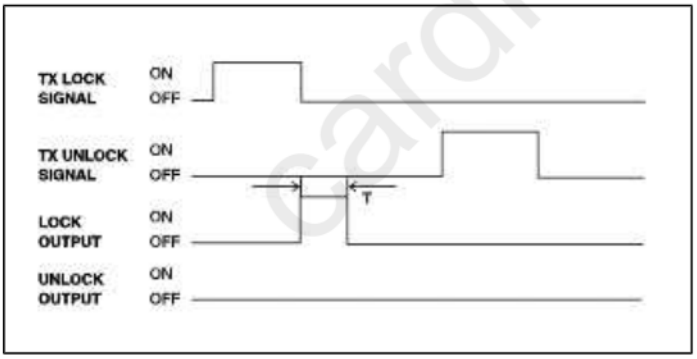
T : 0.5 ± 0.1 sec.



(3) When using the transmitter (TX)

Time specification

T : 0.5 ± 0.1 sec.

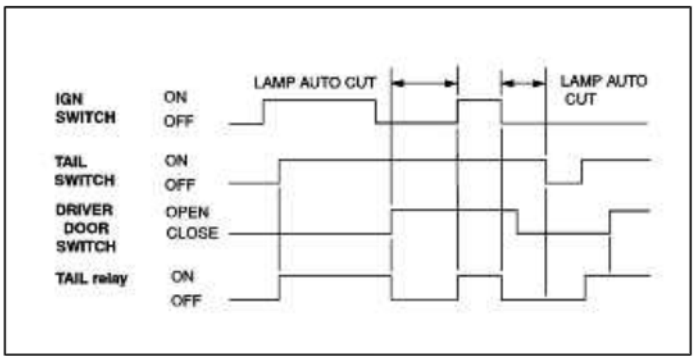


(4) Power window main door lock switch

Time specification

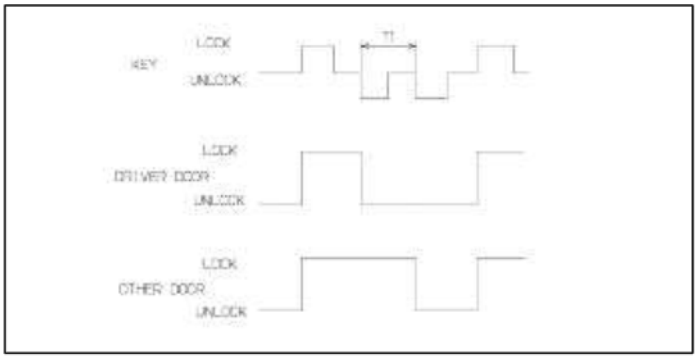
T : 0.5 ± 0.1 sec.

13. Tail lamp auto cut



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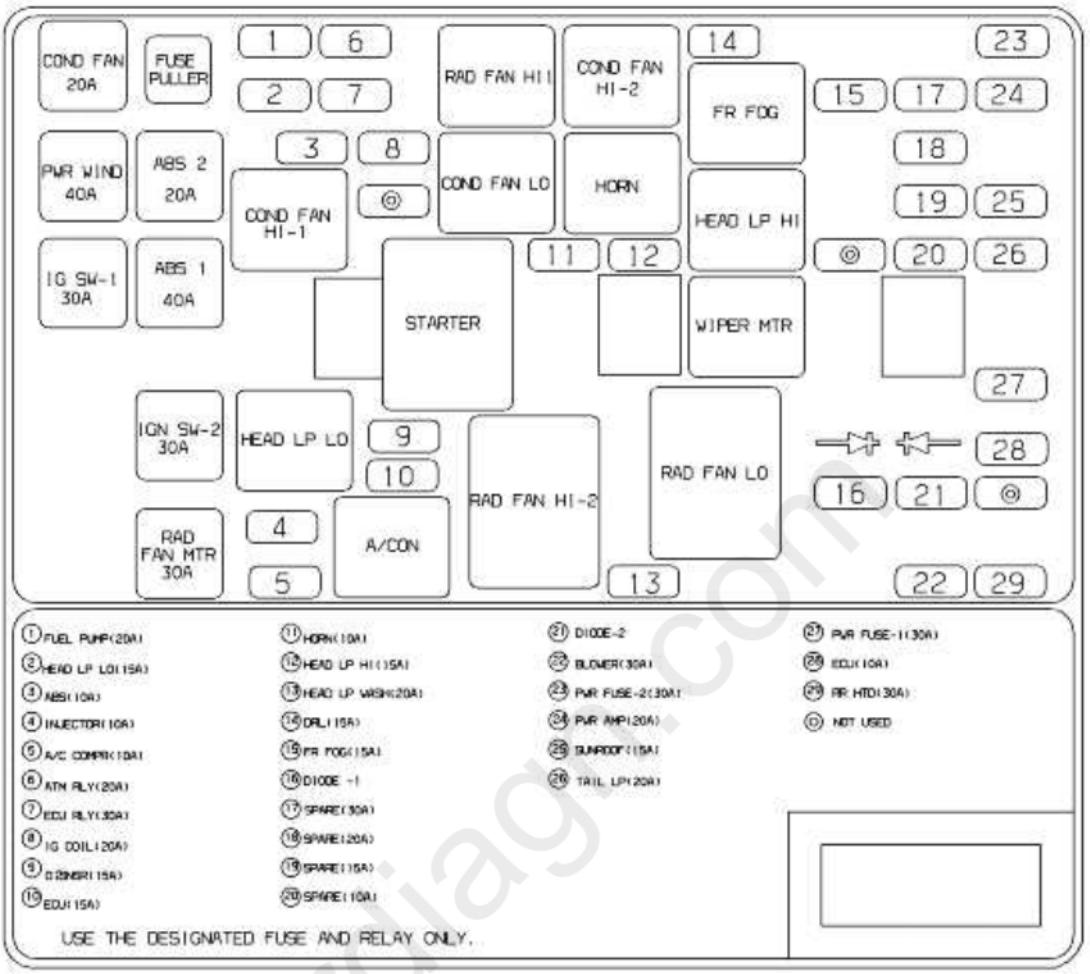
14. Two-Turn unlock
    Time specification
    T1 : 3 ± 0.5 sec.



Body Electrical System > Fuses And Relays > Relay Box (Engine Compartment) > Schematic Diagrams

Components

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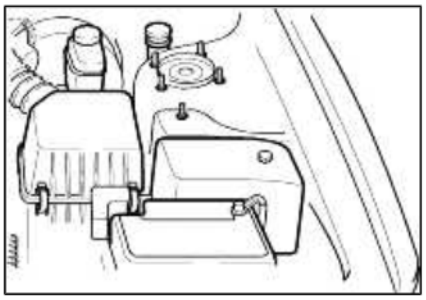
Body Electrical System > Fuses And Relays > Relay Box (Engine Compartment) > Repair procedures

Inspection

1. Check for a burnt fusible link with an ohmmeter.

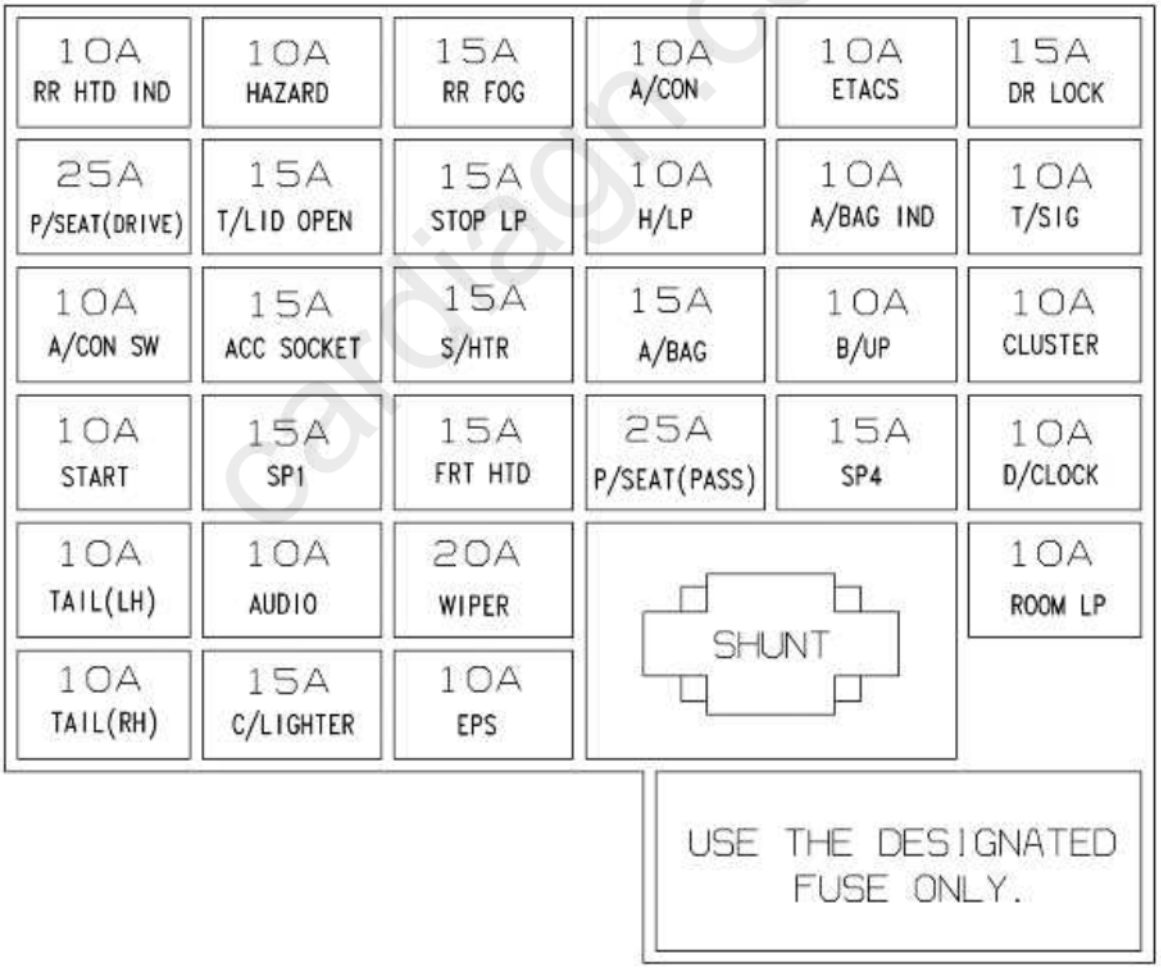
2. If a fusible link burns out, there is a short or some other problem in the circuit. Carefully determine the cause and correct it before replacing the fusible link

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



Body Electrical System > Fuses And Relays > Fuses > Schematic Diagrams

Specification



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Body Electrical System > Fuses And Relays > Fuses > Repair procedures

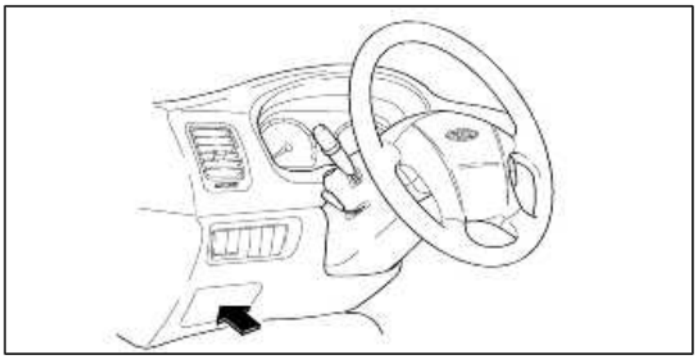
Inspection

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.

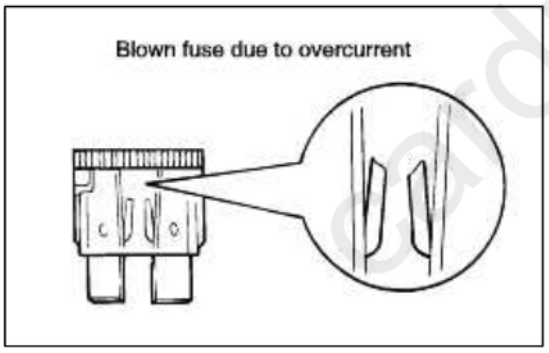


Inspection of fuses

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.

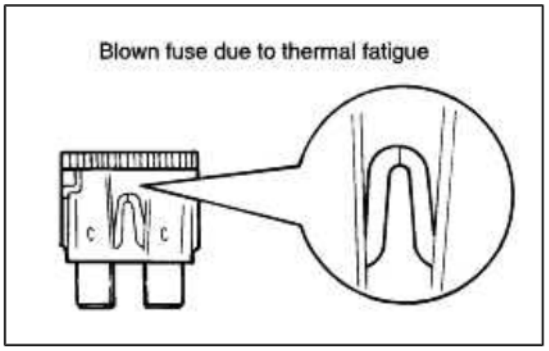
1. Fuse blown due to over-current.

   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.



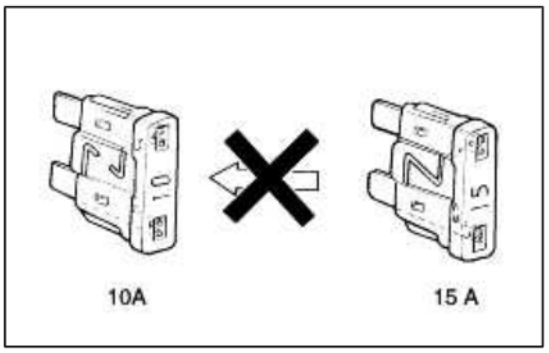
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2. Fuse blown due to repeated on-off current.
   Normally, this type of problem occurs after a fairly long period of use, and is less frequent than #1 above. In this case, you may simply replace with a new fuse of the same capacity.



CAUTION

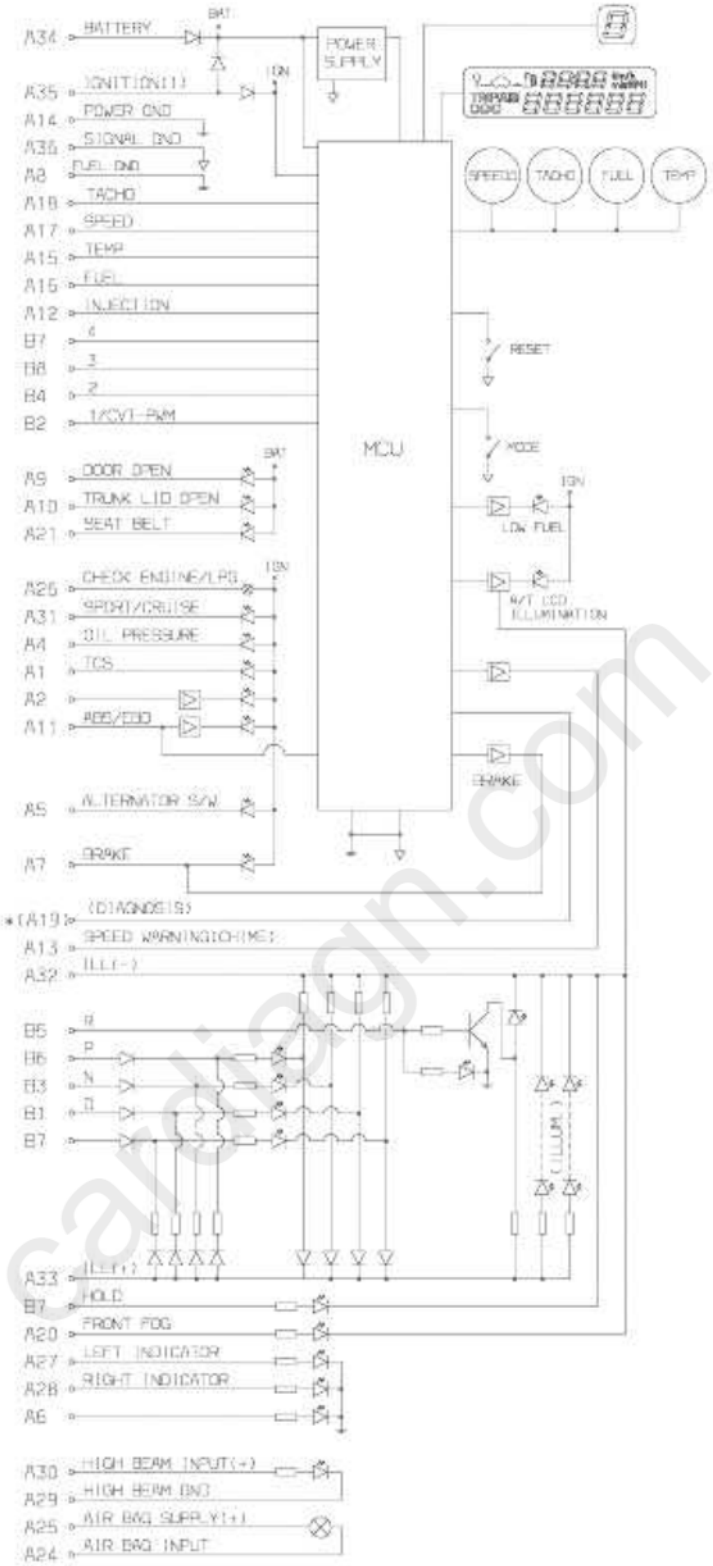
A blade type fuse is identified by the numbered value in amperes. If the fuse is blown, be sure to replace a fuse with the same ampere rating. If a fuse of higher capacity than specified is used, parts may be damaged and a danger of fire exists. To remove or insert a fuse, use the fuse puller in the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



Body Electrical System > Indicators And Gauges > Instrument Cluster > Schematic Diagrams

Circuit diagram

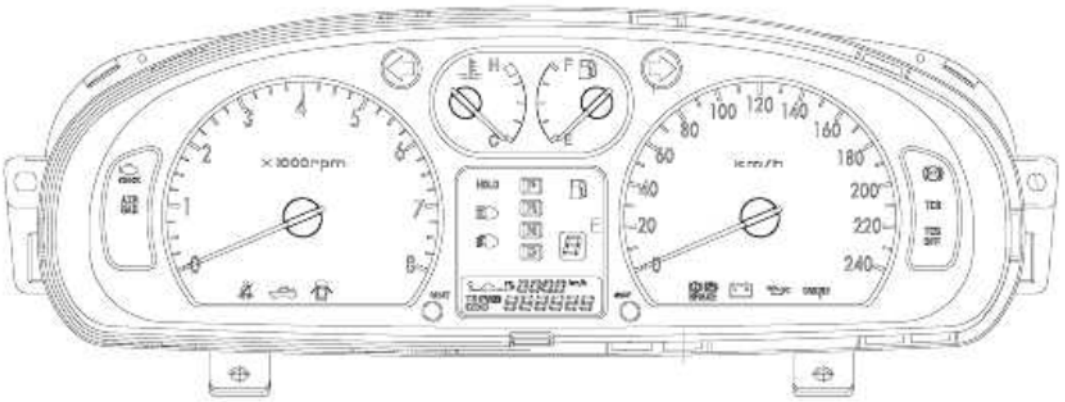
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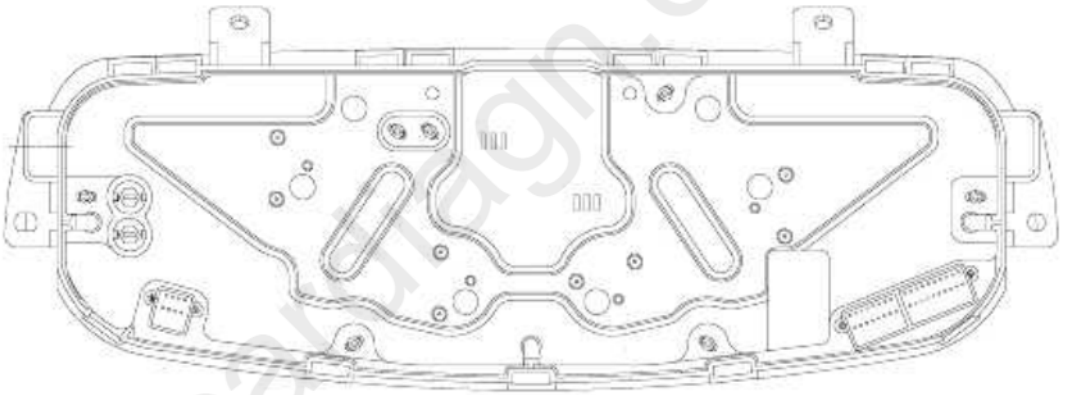
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Body Electrical System > Indicators And Gauges > Instrument Cluster > Components and Components Location

Component

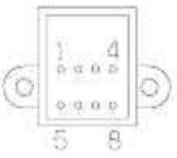








Connector "A"



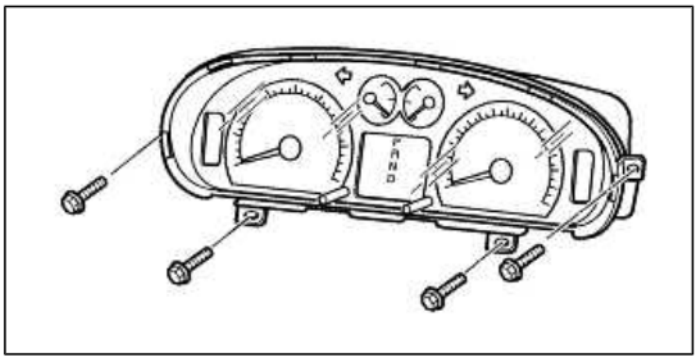
Connector "B"

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Body Electrical System > Indicators And Gauges > Instrument Cluster > Repair procedures

Removal

1. Remove three screws from instrument cluster trim.



2. Remove four mounting screws.
3. Pull cluster from instrument panel.
4. Disconnect two connectors.
5. Remove instrument cluster.

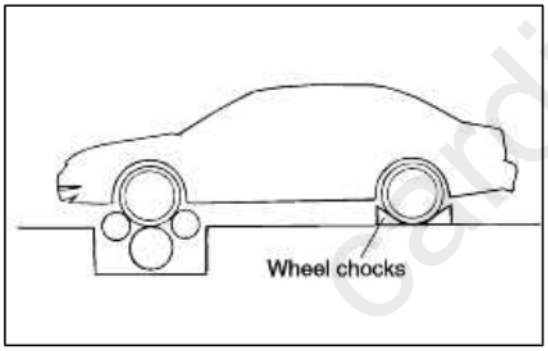
Installation

1. Place cluster in instrument panel.
2. Connect two connectors.
3. Push cluster into instrument panel.
4. Install four cluster mounting screws.
5. Install three screws on instrument cluster trim.

Inspection of components

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 in the service specifications.

> 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.

Tachometer

1. Connect the scan tool to the diagnostic link connector or install a tachometer.

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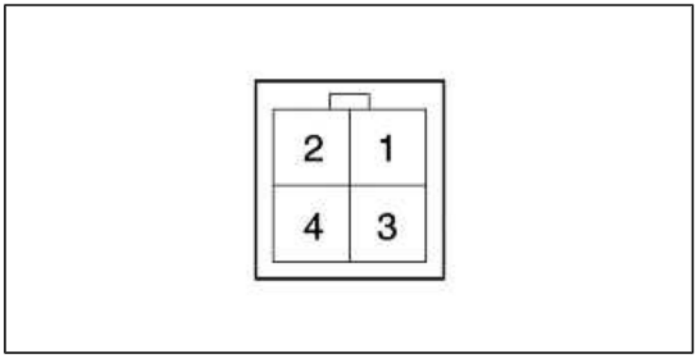
2. With the engine started, compare the readings of the tester with that of the tachometer. Replace the tachometer if the standard values in the service specifications is exceeded.

> **CAUTION**
>
> When removing or installing the tachometer, be careful not to drop it or subject it to severe shock.

Body Electrical System > Power Door Locks > Power Door Lock Actuators > Repair procedures

Door lock control actuator

1. Disconnect the actuator connector from the wiring harness.
2. Apply battery voltage (DC 12 V) to each terminal as shown in the table below and confirm that the actuator makes corresponding operation.

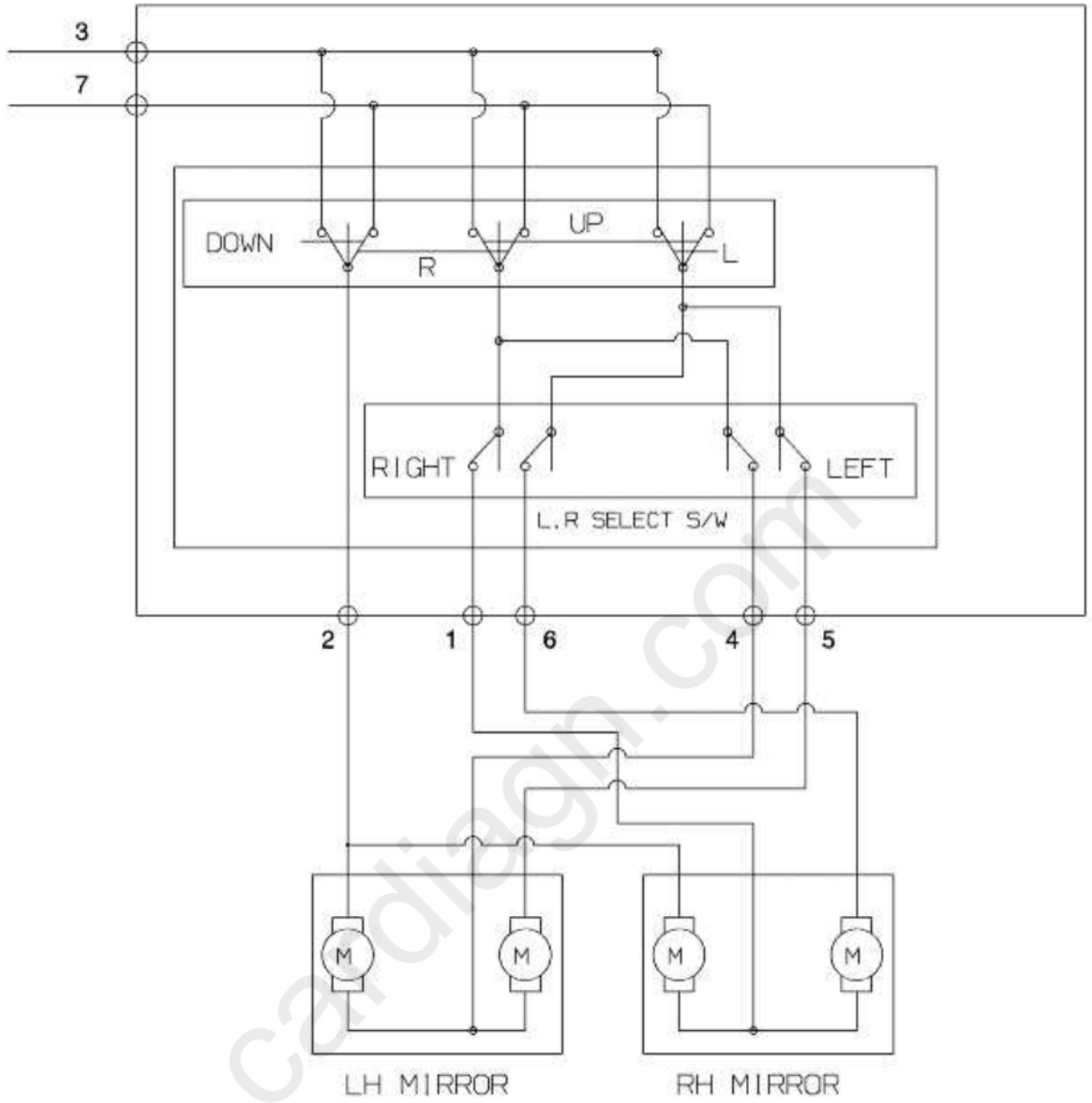


Terminal / Position	1	3
Push (Unlock)	⊕	⊖
Pull (Lock)	⊖	⊕

Body Electrical System > Power Door Mirrors > Schematic Diagrams

Circuit

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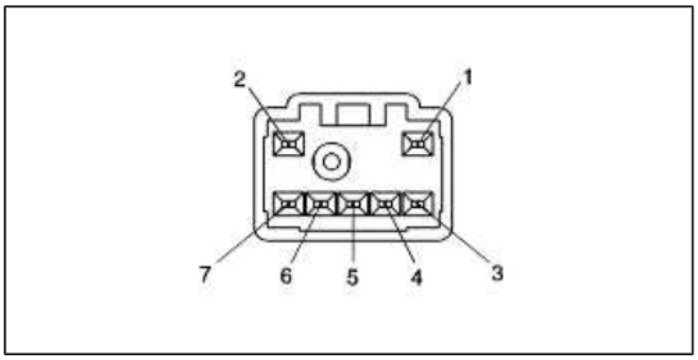
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Body Electrical System > Power Door Mirrors > Power out side mirror switch > Repair procedures

Inspection

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.

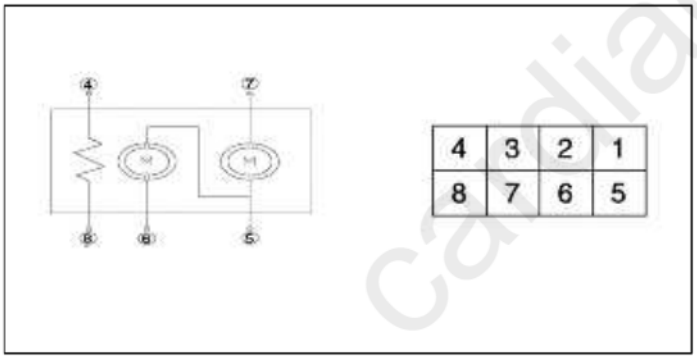


CLASS	DIR	4	5	1	6	2	7	3
LEFT HAND	UP	○	○			○	○	○
	DOWN	○	○			○	○	○
	OFF	○	○			○	○	
	LEFT	○	○			○	○	○
	RIGHT	○	○			○	○	○
RIGHT HAND	UP			○	○	○	○	○
	DOWN			○	○	○	○	○
	OFF			○	○	○	○	
	LEFT			○	○	○	○	○
	RIGHT			○	○	○	○	○

Body Electrical System > Power Door Mirrors > Power Door Mirror Actuator > Repair procedures

Inspection

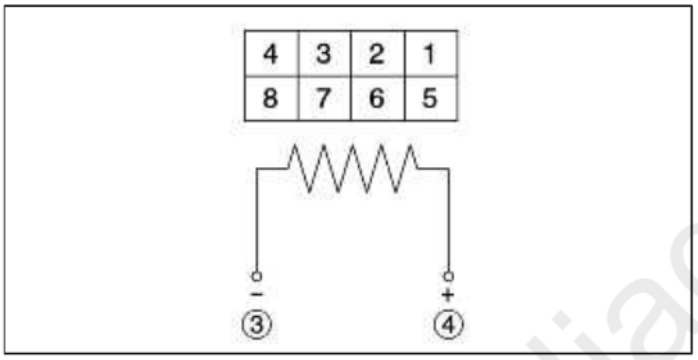
1. Disconnect the power door mirror connector from the harness.
2. Apply battery voltage to each terminal as shown in the table and verify that the mirror operates properly.



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Position		Terminal ⑤	⑥	⑤	⑥	⑦	⊕	⊖
LH	UP	○	○			○	○	○
	DOWN	○	○			○	○	○
	OFF	○	○				○	
	RIGHT	○				○	○	○
	LEFT		○			○		○
RH	UP			○	○		○	○
	DOWN			○	○	○		○
	OFF			○	○		○	
	RIGHT			○		○	○	○
	LEFT				○		○	○

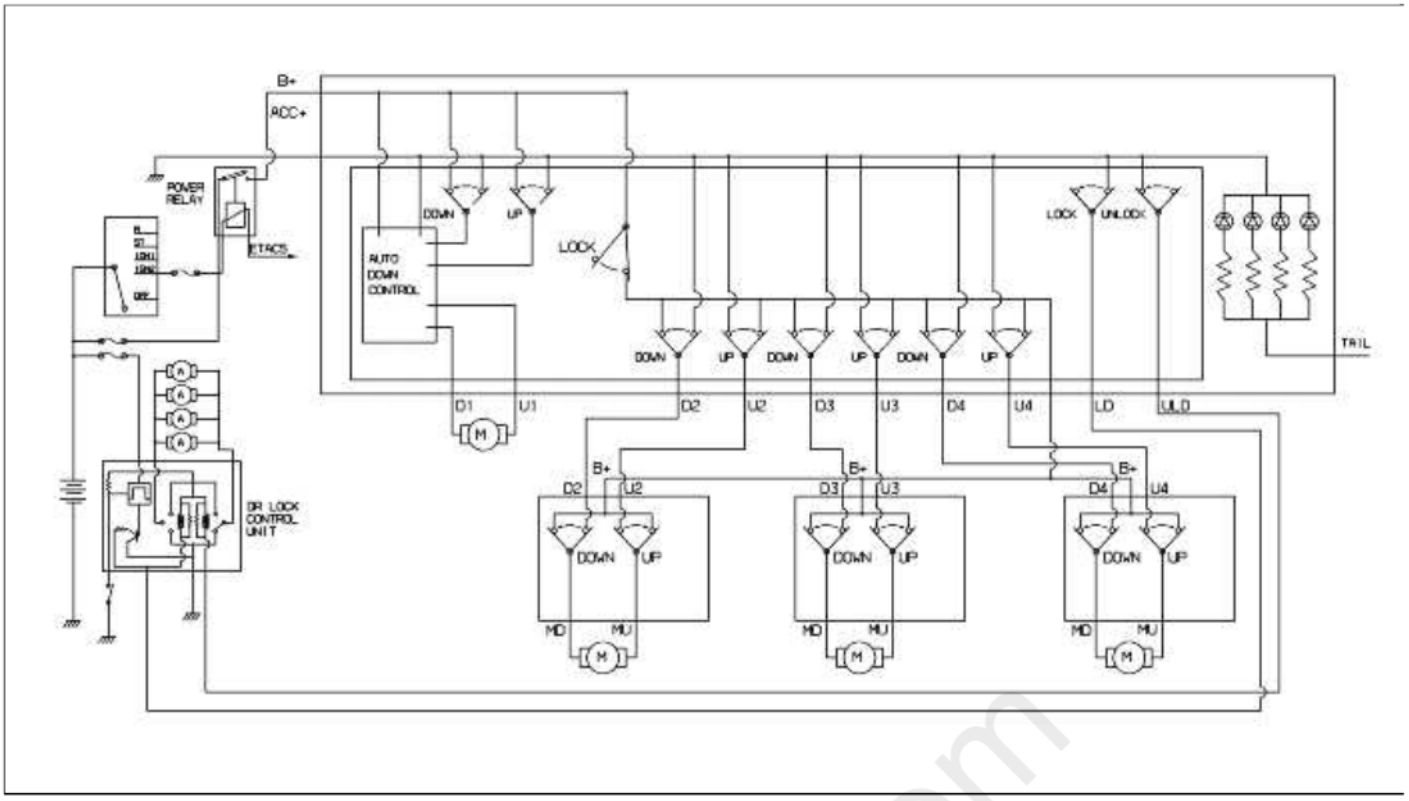
Mirror heating inspection



Body Electrical System > Power Windows > Schematic Diagrams

Circuit diagram

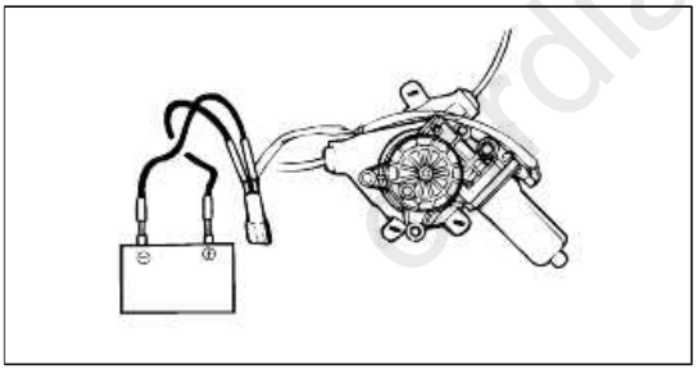
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Body Electrical System > Power Windows > Power Window Motor > Repair procedures

Inspection

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.



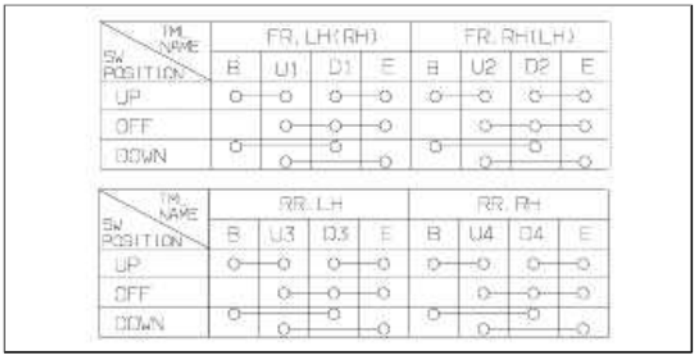
Body Electrical System > Power Windows > Power Window Switch > Repair procedures

Inspection

Power window main switch

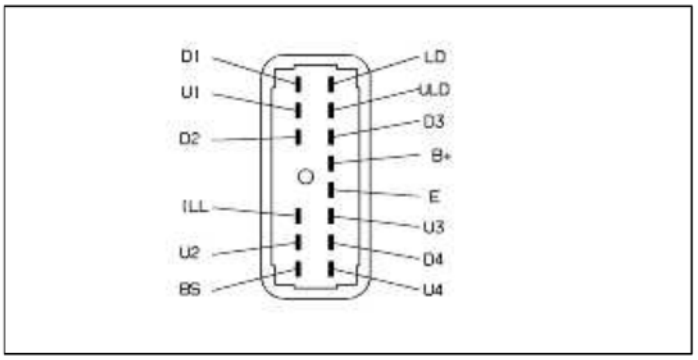
1. Remove the switch from the door trim panel.
2. Check for continuity between the terminals. If continuity is not as specified in the table, replace the power window switch.

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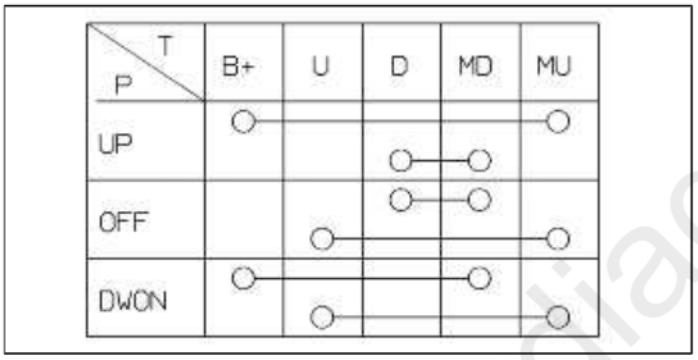


TM NAME / SW POSITION	FR. LH(RH)				FR. RH(LH)			
	B	U1	D1	E	B	U2	D2	E
UP	○	○	○	○	○	○	○	○
OFF		○	○	○		○	○	○
DOWN	○		○		○		○	
	○	○		○		○		○

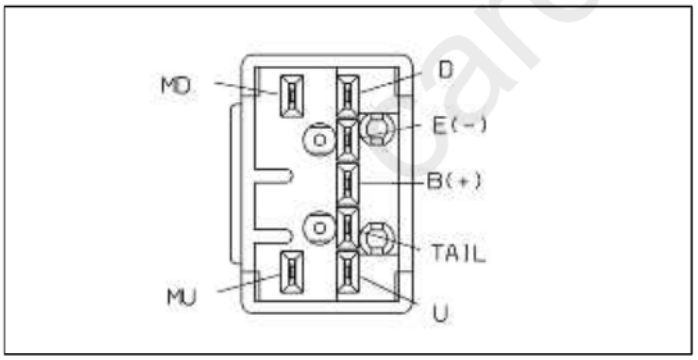
TM NAME / SW POSITION	RR. LH				RR. RH			
	B	U3	D3	E	B	U4	D4	E
UP	○	○	○	○	○	○	○	○
OFF		○	○	○		○	○	○
DOWN	○		○		○		○	
	○	○		○		○		○



Power window sub switch



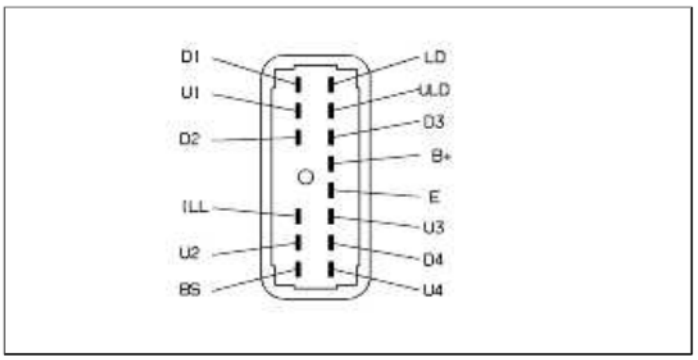
T / P	B+	U	D	MD	MU
UP	○		○	○	○
OFF		○	○	○	○
DWON	○			○	
		○			○



Door lock switch

Terminal / Position	LD	ULD	E
LOCK	○		○
OFF			
UNLOCK		○	○

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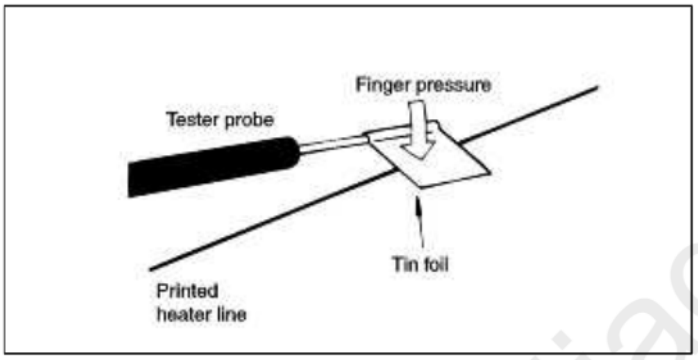


Body Electrical System > Rear Window Defogger > Rear Window Defogger Printed Heater > Repair procedures

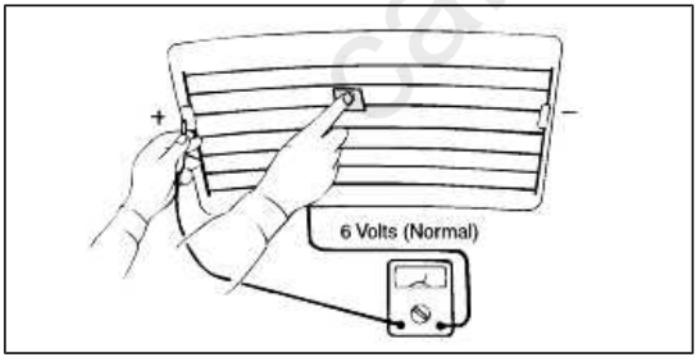
Inspection

CAUTION

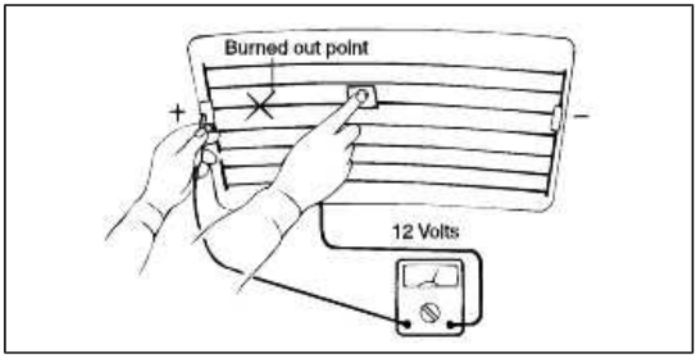
Wrap tin foil around the end of the voltmeter test lead to prevent damaging the heater line. Apply finger pressure on the tin foil, moving the tin foil along the grid line to check for open circuits.



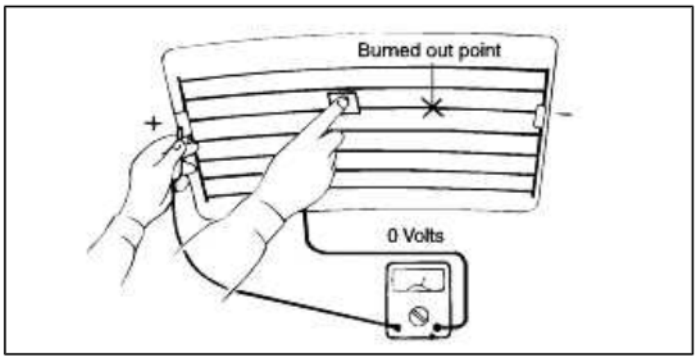
1. Turn on the defogger switch and use a voltmeter to measure the voltage of each heater line at the glass center point. If a voltage of approximately 6V is indicated by the voltmeter, the heater line of the rear window is considered satisfactory.



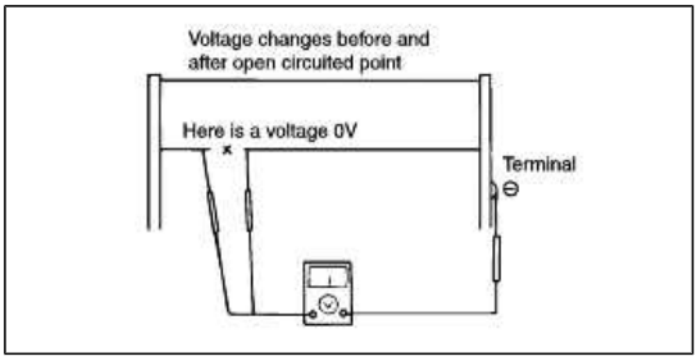
2. If a heater line is burned out between the center point and (+) terminal, the voltmeter will indicate 12V.



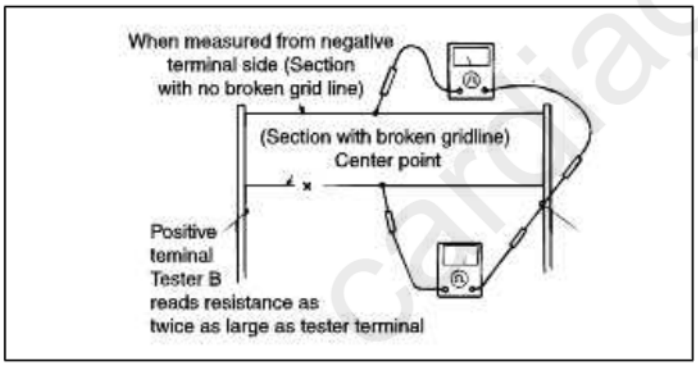
3. If a heater line is burned out between the center point and (-) terminal, the voltmeter will indicate 0V.



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.



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.



Repair of broken heater line

Prepare the following items:

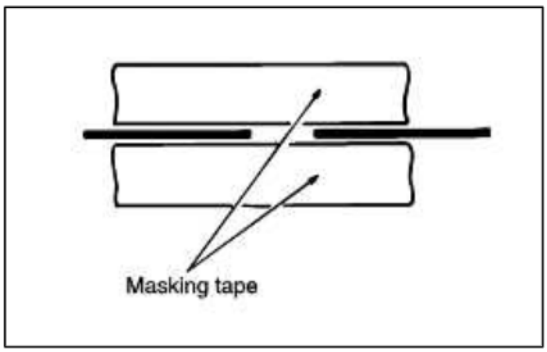
1. Conductive paint.
2. Paint thinner.
3. Masking tape.
4. Silicone remover.

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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.



Body Electrical System > Windshield Wiper/Washer > Description and Operation

Description and operation

Washer system

This is equipped with a variable speed (intermittent), modular wiper/washer system. Wiper system consists of a wiper motor, a wiper link assembly, and two wiper arms with blades. Washer assembly consists of a washer tank, a washer motor, two washer nozzles, and connecting hoses. Both systems are then connected to a wiper lever and a timer unit in steering column combination switch.

Hoses

Washer hoses are neoprene lines that carry washer fluid to washer nozzles. There are three hose pieces, a three-port hose joint, and a two-port hose joint. Hoses can be replaced individually. Washer hose system also has three replaceable hold-down clips.

Lever assembly

Wiper assembly is located in combination switch on steering column. For switch-related electrical problems, refer to Wiring Diagram Manual. For removal procedures, refer to Group ST, Steering System.

Motor

Washer motor pumps washer fluid to washer nozzles. It is a single speed 12V DC motor to a pump mechanism. It is a replaceable item.

Nozzles

Washer nozzles deliver washer fluid directly to windshield. Nozzles are replaceable as an individual item.

Tank assembly

Washer tank assembly stores washer fluid used by washer system. It is a plastic assembly with a fill port and a connection port to washer motor. It is a replaceable item.

Timer unit

Timer unit controls intermittent operation of wiper system. It is part of wiper unit assembly in steering column combination switch. For unit-related electrical problems, refer to Wiring Diagram Manual. For removal procedures, refer to Group ST, Steering System.

Wiper system

ARM

Wiper arms are metal arms which pull wiper blades across windshield. They are spring-loaded to firmly hold blades onto windshield during operation of wiper system. They are individual units consisting of a driver's side and a

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passenger side arm.

Blades

Wiper blades are metal frames with rubber inserts. They are available as a unit, or inserts can be replaced separately.

Link assembly

Wiper link assembly connects wiper motor to wiper arms. It consists of two connecting rods and two pivot units. When in operation, assembly converts wiper motor's rotational motion into proper left/right movement needed by wiper arms. If faulty, it can be disassembled, but replacement of full assembly is recommended.

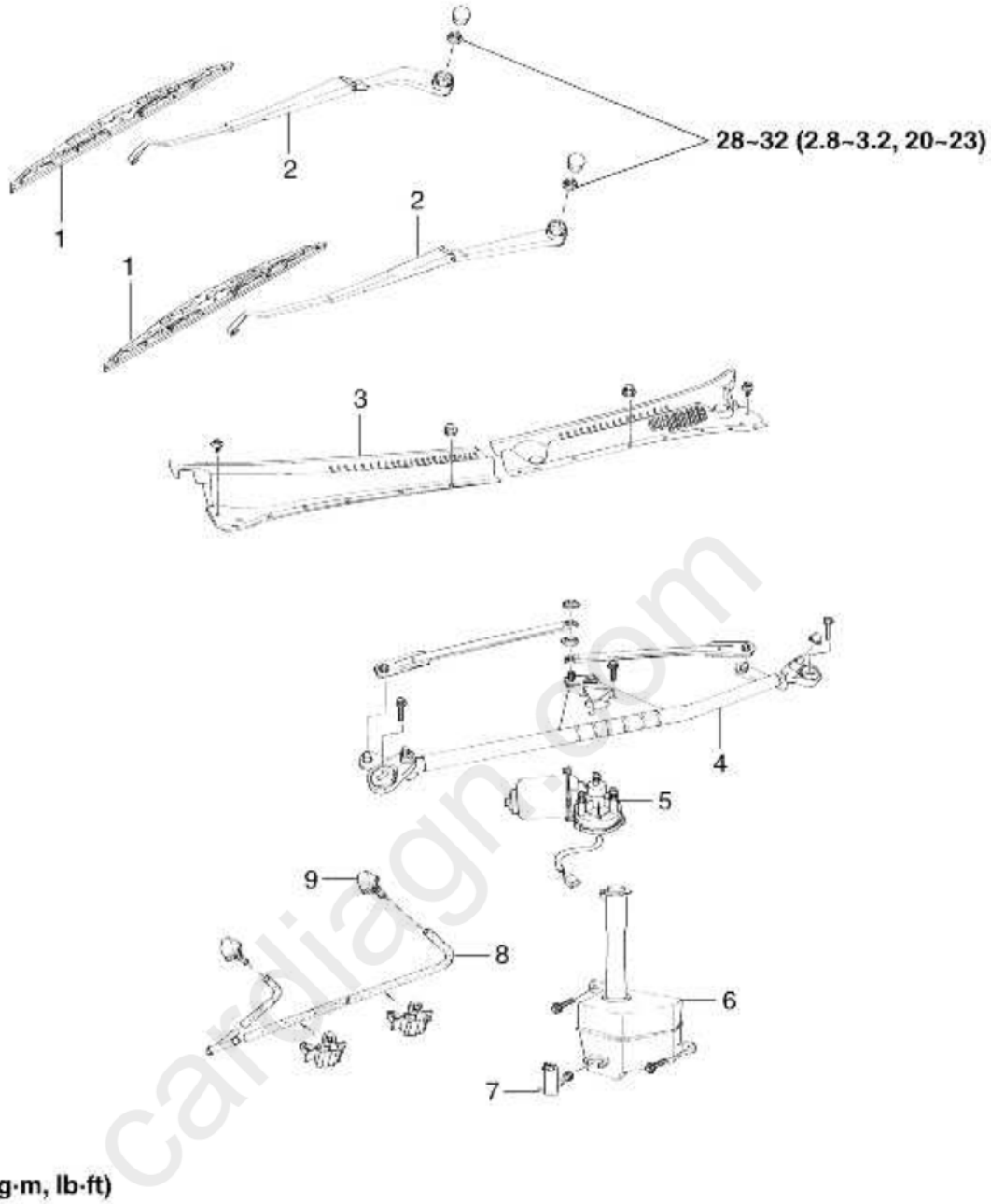
Motor and bracket

Motor is a 12V DC, two-speed unit which provides power to wiper system. It is connected to a transmission (gear box) in mounting bracket which reduces motor rpm and increases torque. This low rpm, high torque motion is then transmitted to wiper link assembly. Motor and bracket are a single, replaceable item.

Body Electrical System > Windshield Wiper/Washer > Components and Components Location

Component

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TORQUE : Nm (kg·m, lb·ft)

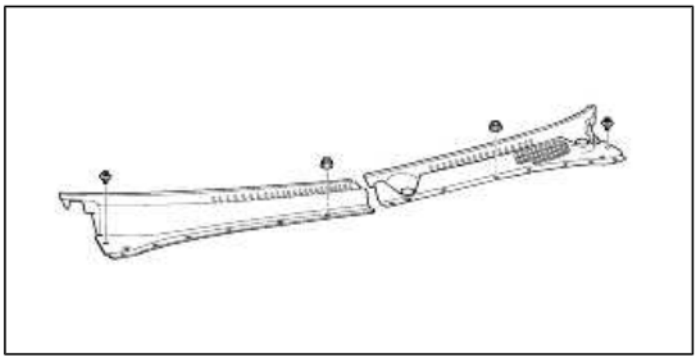
1. Wiper blade
2. Wiper arm
3. Cowl top cover
4. Wiper link assembly
5. Wiper motor
6. Washer tank
7. Washer motor
8. Washer hose
9. Washer nozzle

Body Electrical System > Windshield Wiper/Washer > Front Wiper Motor > Repair procedures

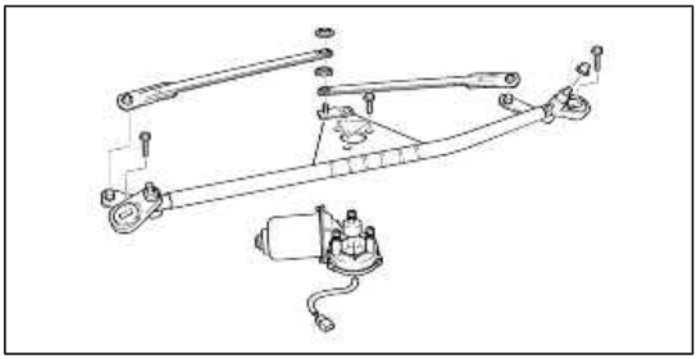
Removal

1. Disconnect negative battery cable.
2. Remove wiper arms and blades. Refer to "Windshield Wiper/Washer System" in this section.

3. Remove nuts and fasteners from cowl vent.



4. Remove wiper motor and link assembly.



(1) Disconnect wiper motor harness connector.

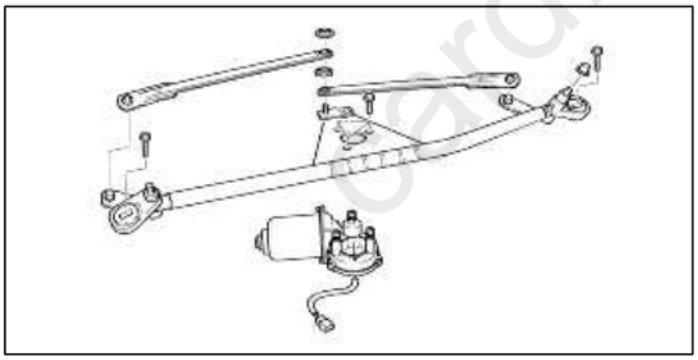
(2) Remove two bolts from wiper motor and link assembly.

(3) Separate motor assembly from wiper link assembly.

5. Remove three wiper motor mounting bolts from wiper motor and link assembly.

Installation

1. Install three wiper motor mounting bolts on wiper motor and link assembly.
2. Install wiper motor and link assembly.



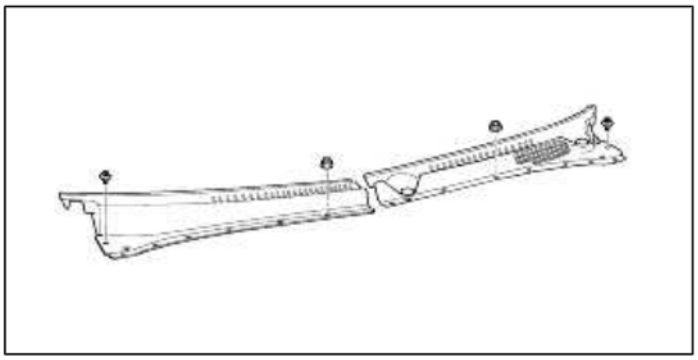
(1) Attach wiper motor ball joint to wiper link assembly.

(2) Install and tighten two mounting bolts.

(3) Connect wiper motor harness connector.

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3. Place cowl vent in position and install nuts and fasteners.

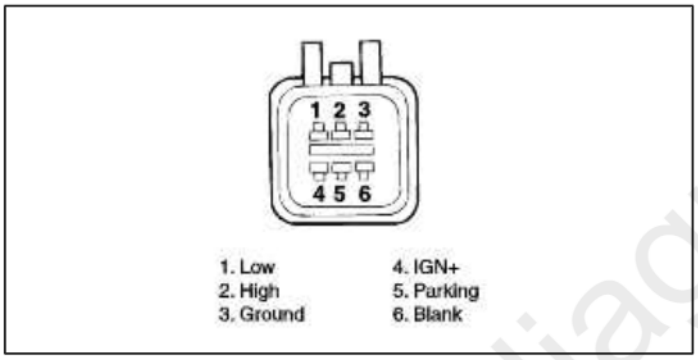


4. Connect negative battery cable.

Inspection

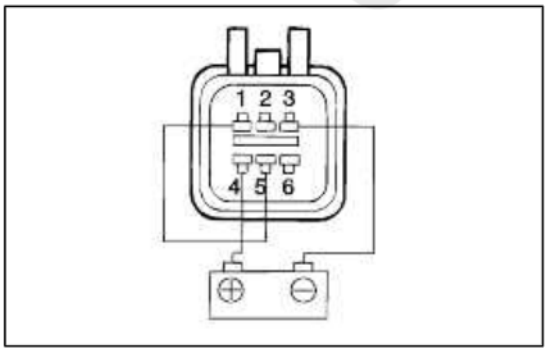
Speed operation check

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



Automatic stop operation check

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



Body Electrical System > Windshield Wiper/Washer > Wiper Arm > Repair procedures

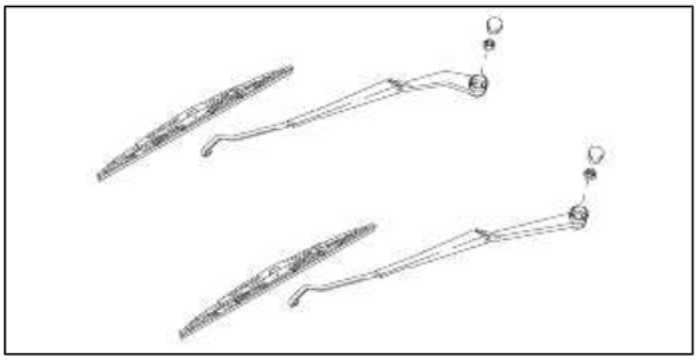
Removal

Wiper arm

1. Before removal check that wiper has stopped at its off position.

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2. Remove nut cover and then wiper arm nut.

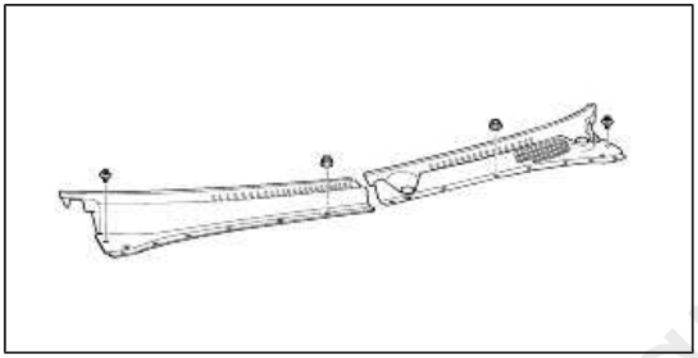


3. Check that arms are marked "Dr" (Driver Side) and "As" (Passenger Side). If not, mark them before removal.
4. Remove wiper arms.

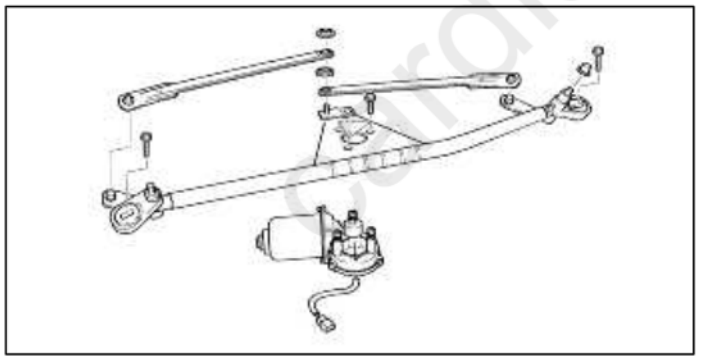
Link assembly

Removal

1. Remove wiper arms and blades. Refer to "Windshield Wiper/Washer System" in this section.
2. Remove nuts and fasteners from cowl vent.

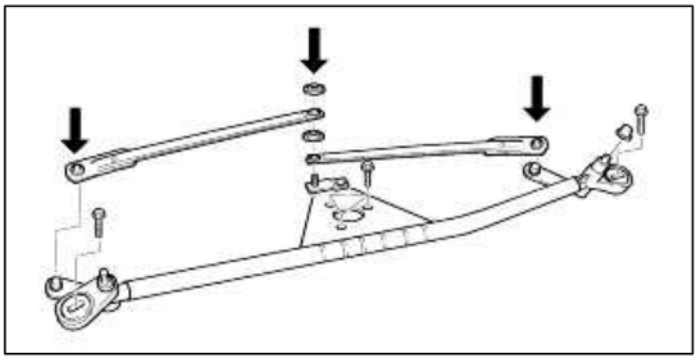


3. Remove wiper motor and wiper link assembly.
   (1) Disconnect wiper motor harness connector.
   (2) Remove two mounting bolts from assembly.



Inspection

1. Check for any resistance by moving each part of link assembly by hand.
2. If any resistance is found, remove linkage and apply grease to indicated joints.



Installation

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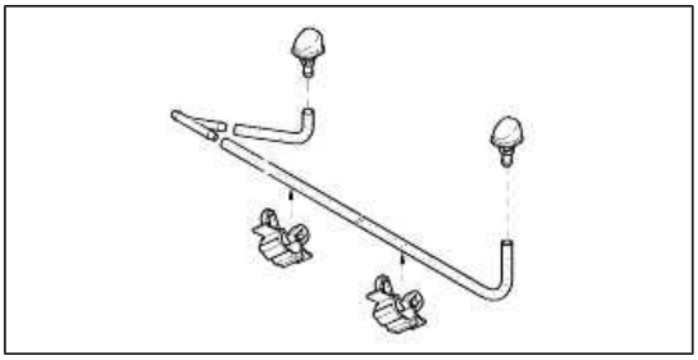
1. Install two bolts on wiper motor and link assembly.
2. Connect wiper motor harness connector.
3. Place cowl vent in position and install nuts and fasteners.
4. Install wiper arms and blades. Refer to "Windshield wiper/washer system" in this section.
5. Check system movement. Wiper arms should stop 1.18 inch (30 mm) (Driver side) and 1.46 inch (37 mm) (Passenger side) from lower windshield edge.

Body Electrical System > Windshield Wiper/Washer > Front Washer Motor > Repair procedures

Removal

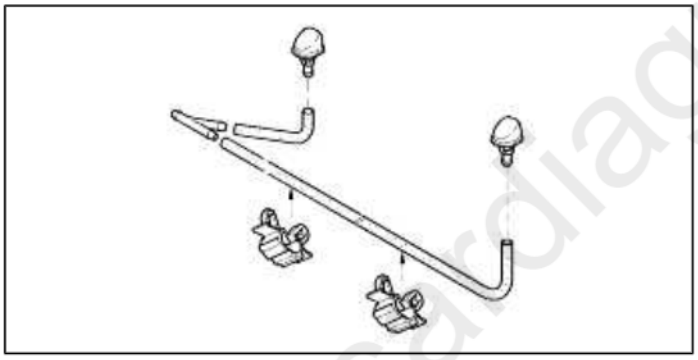
washer nozzle

1. Release holding clip by inserting a thin screwdriver between nozzle and bushing.
2. Remove nozzle from hood and then disconnect nozzle from neoprene hose.



Washer hose

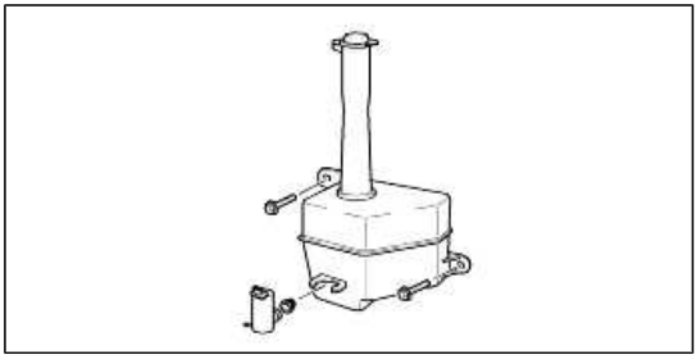
1. Disconnect washer nozzles from hood panel.



2. Unclip hoses from hood clips.
3. Disconnect hose clips on side panel.
4. Disconnect hose from washer motor.

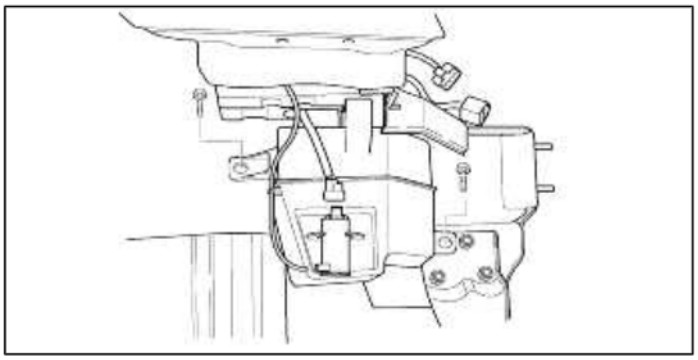
Front washer motor

1. Disconnect negative battery cable.
2. Remove fasteners and bolt from mud guard and gently pull mud guard downward fully.



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3. Remove two bolts on washer tank.



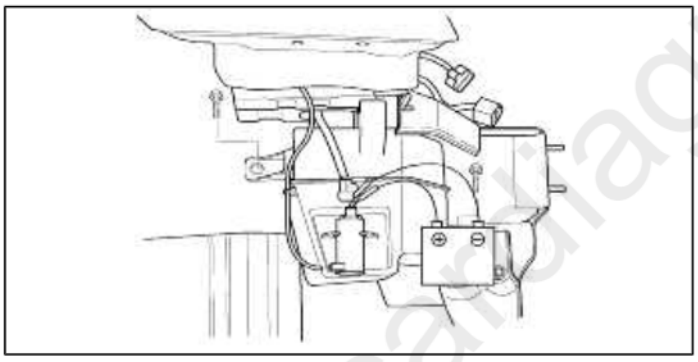
4. Remove hose connector from washer motor.
5. Remove washer motor and washer tank.
6. Drain washer tank and then separate washer motor from washer tank.

Installation

1. Install in reverse order of removal.
2. Connect nozzle to neoprene hose.
3. Face nozzle exit toward windshield and push in place on hood.

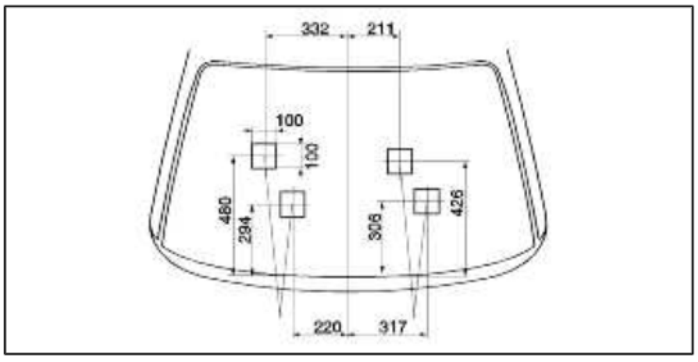
Inspection

1. With the washer motor connected to the washer tank, fill the washer tank with water.
2. Connect battery positive (+) and negative (-) cables to termnals 2 and 1 respectively to see that the washer motor runs and water is pumped.



Adjustment

1. Spray should center on driver and passenger sides of front windshield. If off-line, adjust by slightly turning the nozzle.



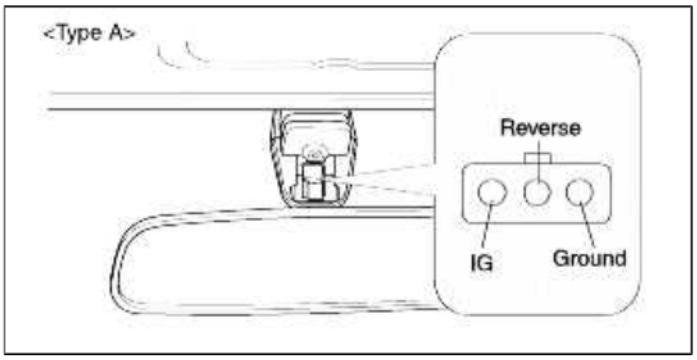
2. If clogged or restricted, use a needle or wire to clelar nozzle exit.

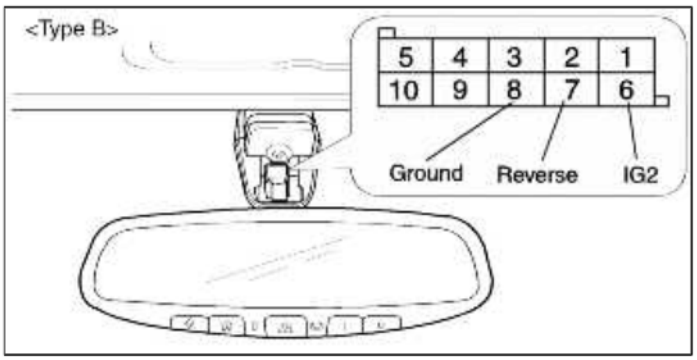
Body Electrical System > Electro chromic Inside > Description and Operation

Description

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The electrochromic (EC) inside rear view mirror receives power, ground and a reverse signal on the three wires that connect to it. It uses two light sensors to sense glare.



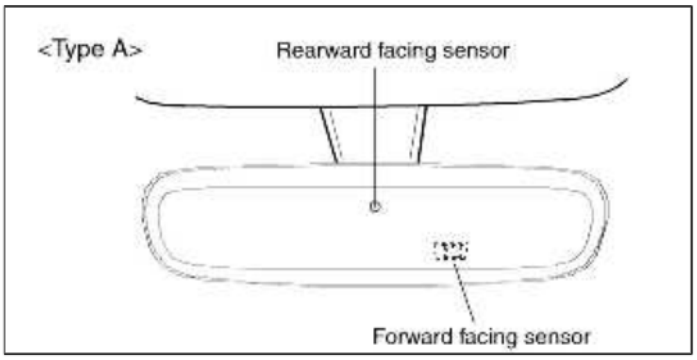


1. The forward facing sensor determines if the outside light levels are low enough for the mirror to operate.
2. The rearward facing sensor detects glare from lights behind the mirror. When glare is detected, it outputs a signal to the mirror to dim at the required level.
3. The mirror dims to the level as directed by the rearward facing sensor. When the glare is no longer detected, the mirror returns to normal.
4. Press the "O" button to turn the automatic dimming function off.
   The mirror indicator light will turn off. (Only Type B)
5. Press the "I" button to turn the automatic dimming function on.
   The mirror indicator light will illuminate. (Only Type B)

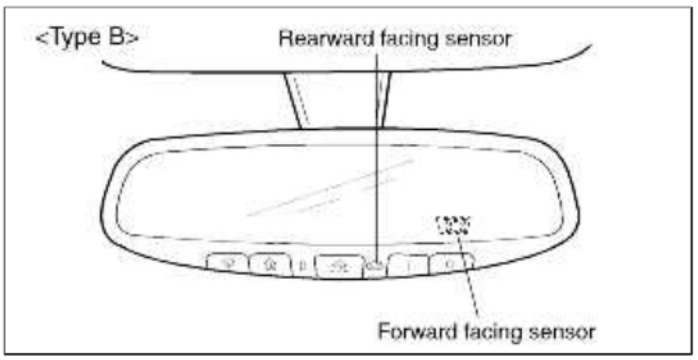
Body Electrical System > Electro chromic Inside > Repair procedures

Inspection

To determine if the EC mirror will dim, check it as below procedure.



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1. Turn the ignition key to the "ON" position.
2. Cover the forward facing sensor.
3. Shine a flashlight into the rearward facing sensor.
4. The mirror should dim as soon as the rearward facing sensor detects the high light level.

> NOTE
>
> If this test is performed in a bright area, the mirror may darken as soon as the forward facing sensor is covered.

5. Put the vehicle into reverse, the mirror should not dim.
6. Aim a flashlight at the forward sensor and another flashlight at the rearward sensor the mirror should not darken.

Body Electrical System > Lighting System > Description and Operation

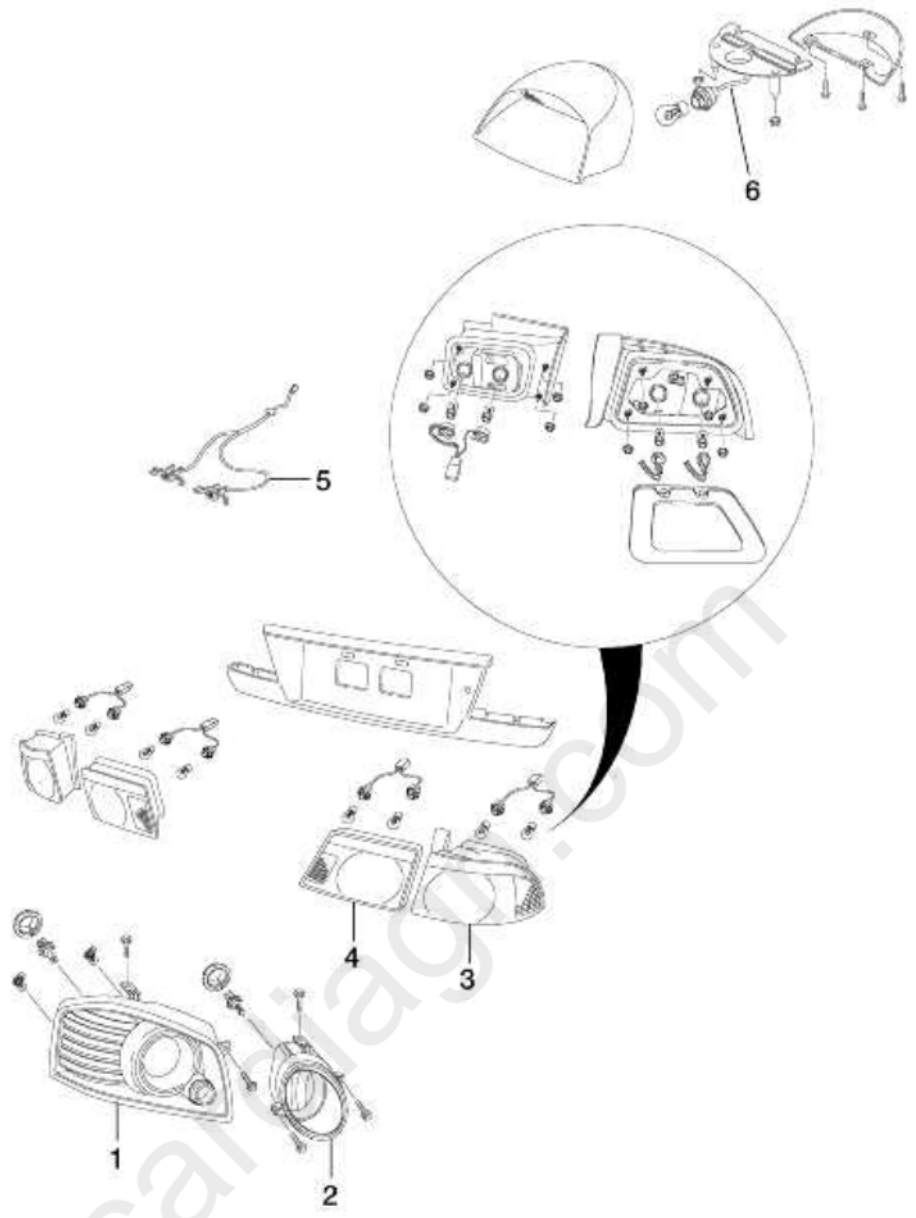
Description and operation

Exterior lights consist of six lighting systems: headlights, turn-signal lights, parking lights, hazard lights, brake lights, and license plate lights (rear only).Six systems include left and right headlight and combination light assemblies, left and right rear combination light assemblies, a rear high-mounted brakelight assembly, and two license plate light assemblies (for rear license only). All lights are powered by 12-volt electrical system.

Body Electrical System > Lighting System > Components and Components Location

Component

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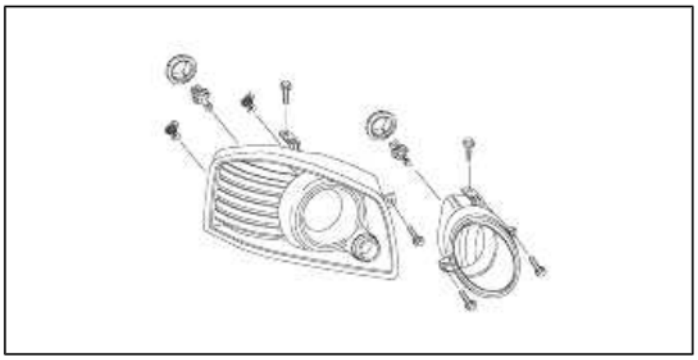
1. Headlight (Low beam)
2. Headlight (High beam)
3. Rear combination lamp (Outside)
4. Rear combination lamp (Inside)
5. License lamp
6. Hi-mounted brake lights

Body Electrical System > Lighting System > Head Lamps > Repair procedures

Removal

1. Open hood. Disconnect negative battery cable.

2. Remove five bolts attaching headlight and combination light assembly to vehicle.



3. Pull headlight and combination light assembly forward clear of vehicle.
4. Rotate back cover counterclockwise to disengage from light assembly.
5. Pull socket with bulb straight out of headlight and combination light assembly.

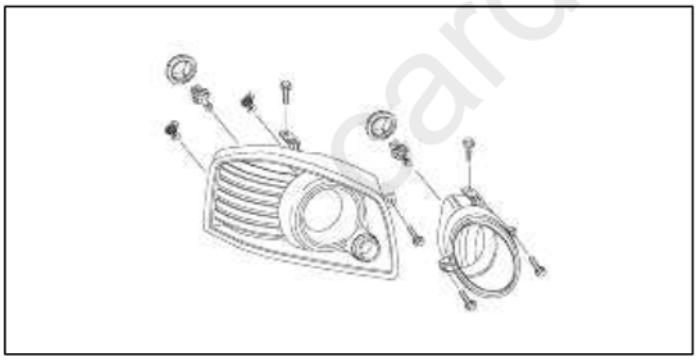
Replacement

1. Disconnect negative battery cable.
2. Disconnect electrical connector from headlight assembly.
3. Remove back cover by pushing in on cover, then rotating cover counterclockwise to disengage from headlight assembly.

> CAUTION
>
> The headlight bulb is filled with a gas which is under pressure. Damage to glass part of bulb can cause bulb to explode causing possible personal injury.

> NOTE
>
> Use care when handling halogen headlight bulb. Do not touch glass part of bulb with bare hands. Oil from skin can cause bulb to fail.

4. Pull socket with bulb straight back and remove it from headlight and combination light assembly.



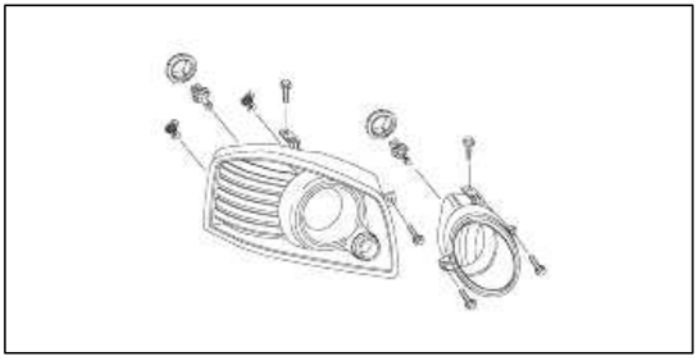
5. If bulb has failed, place it in new bulb carton and dispose of properly.
6. Hold replacement bulb by base, or use clean cloth or paper to avoid touching glass, and install bulb in socket.
7. Align slots on bulb with corresponding bosses on headlight assembly. Insert bulb into headlight and combination light assembly.
8. Install back cover to hold bulb in place.
9. Connect electrical connector.
10. Connect negative battery cable.

Installation

1. With bulb installed in socket, align grooves of socket with bosses on headlight and combination light assembly and insert socket into headlight and combination light assembly.

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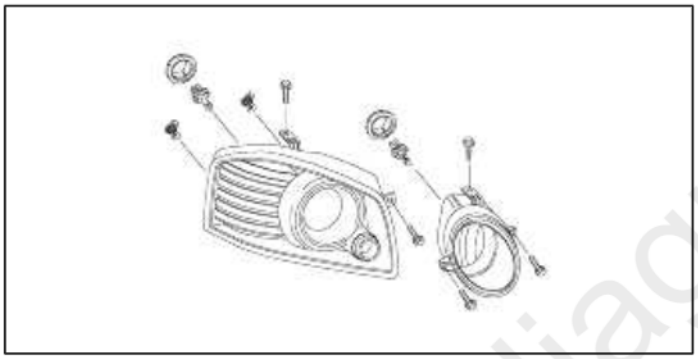
2. Align back cover with headlight and combination light assembly and install, turning clockwise until properly engaged.
3. Position headlight and combination light assembly on vehicle.
4. Connect electrical connector to headlight and combination light assembly.
5. Install five bolts.



6. Connect negative battery cable.

Disassembly

1. Turn back cover counterclockwise to disengage, then move away from assembly.
2. Pull bulb straight out of assembly.

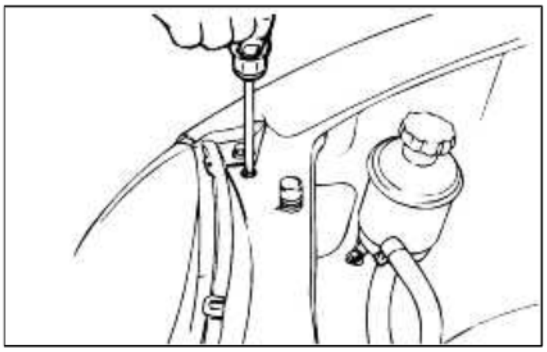


Reassembly

1. Push bulb into back of headlight and combination assembly.
2. Position back cover to headlight and combination light and turn clockwise to engage.

Pre-aiming instructions

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

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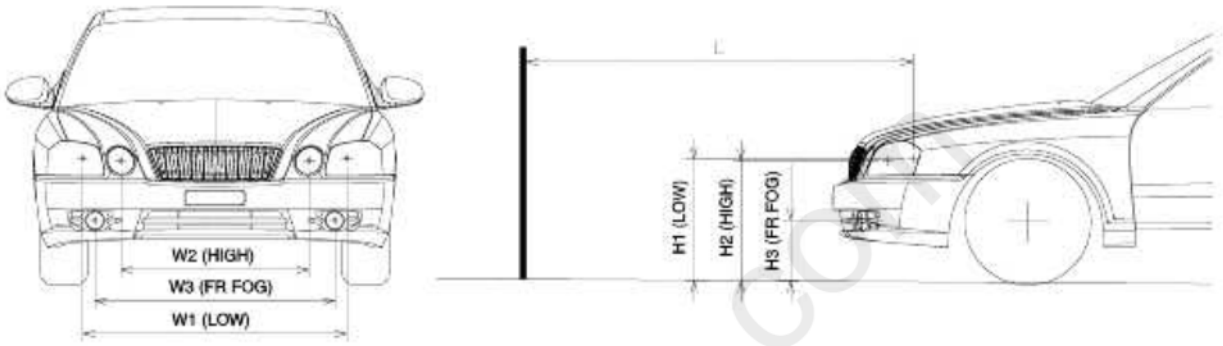
Alternately turn the adjusting bolts to adjust the headlamp aiming. If beam-setting equipment is not available, proceed as follows :

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 throught center of headlamps) on the sereen.
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.

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.



H1 : Height between the head lamp bulb center and ground (low beam)
H2 : Height between the head lamp bulb center and ground (high beam)
H3 : Height between the fog lamp bulb center and ground

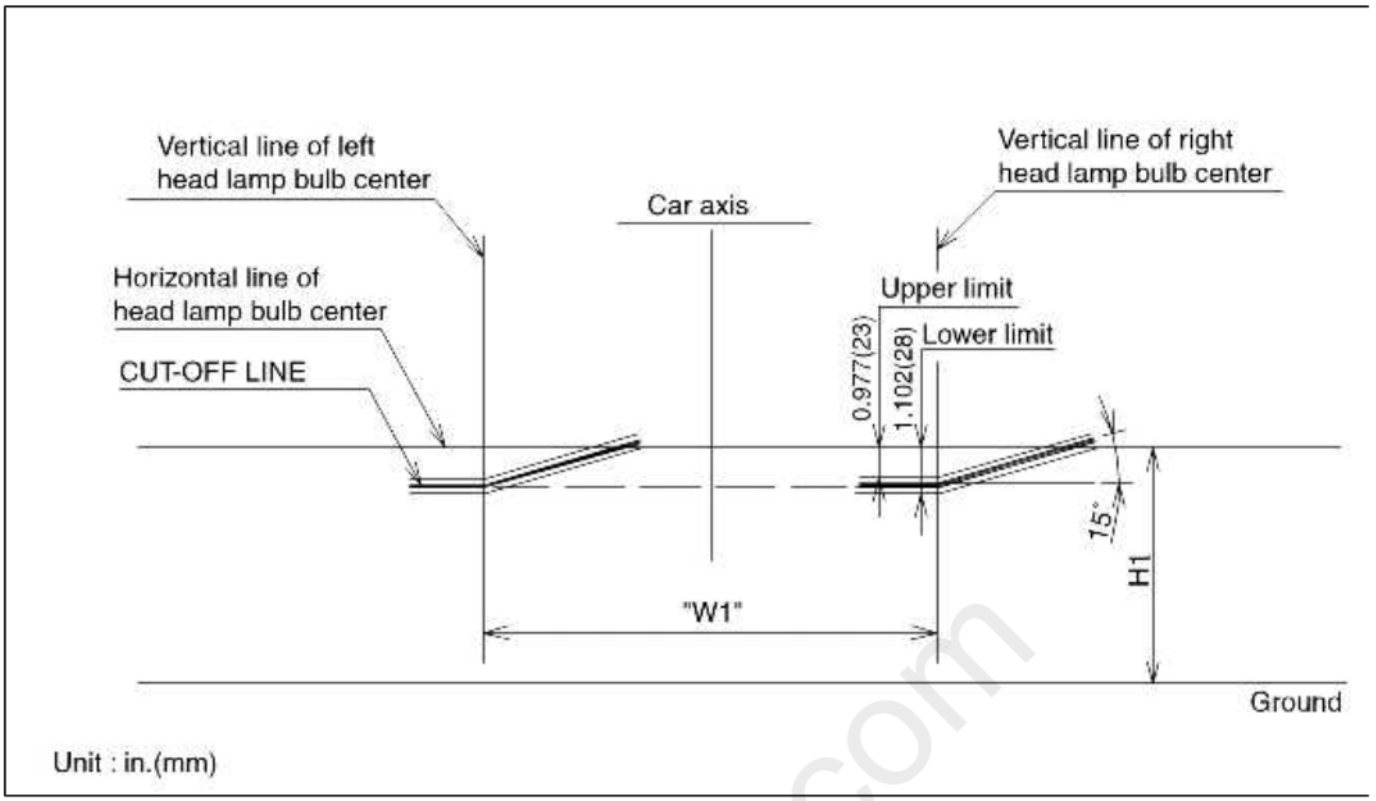
W1 : Distance between the head lamp bulb center (low beam)
W2 : Distance between the head lamp bulb center (high beam)
W3 : Distance between the fog lamp bulb center

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

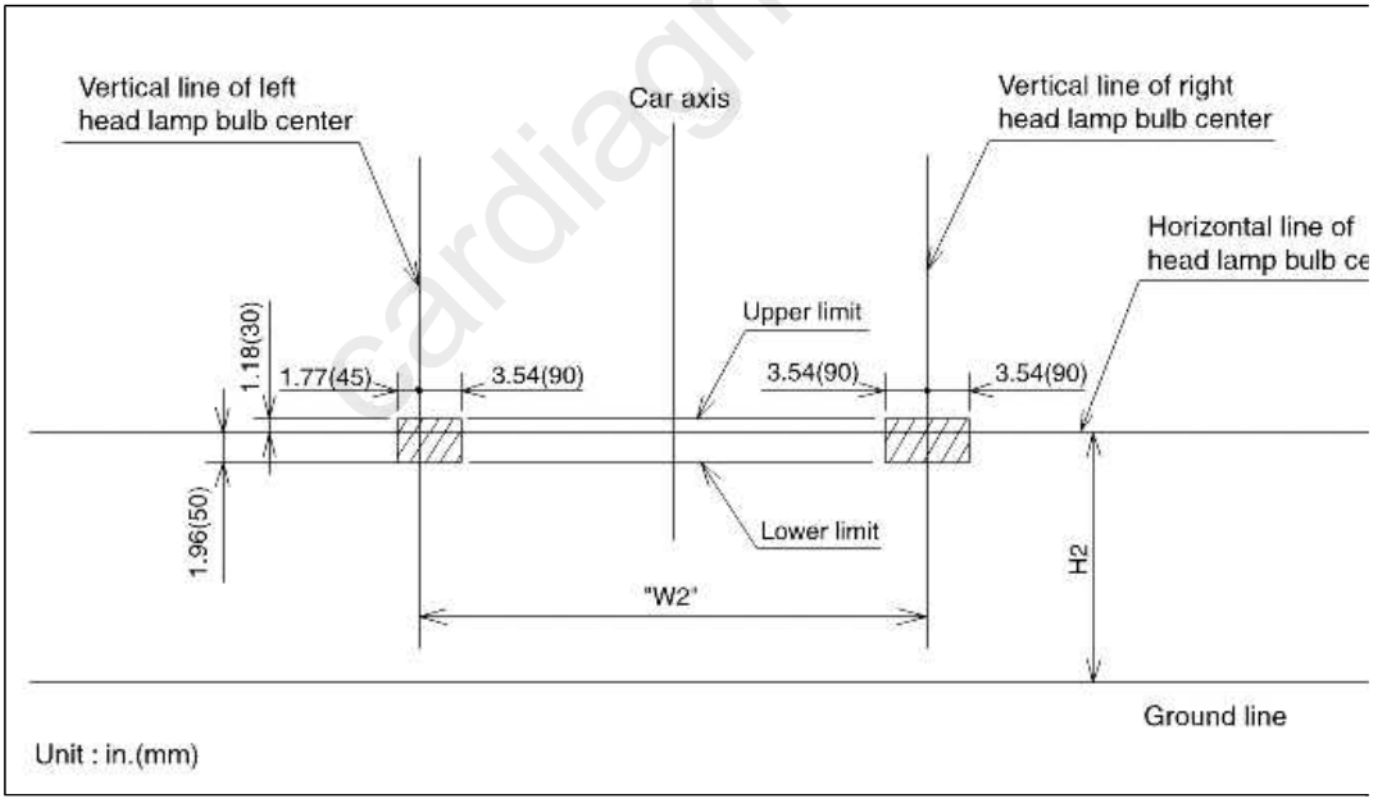
Unit : in (m

Vehicle condition	H1	H2	H3	W1	W2	W3	L
Without driver	25.08 (637)	24.65 (626)	13.11 (333)	51.18 (1,300)	36.46 (926)	46.46 (1,180)	118.1 (3,00
With driver	24.49 (621)	24.02 (610)	12.48 (317)				

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

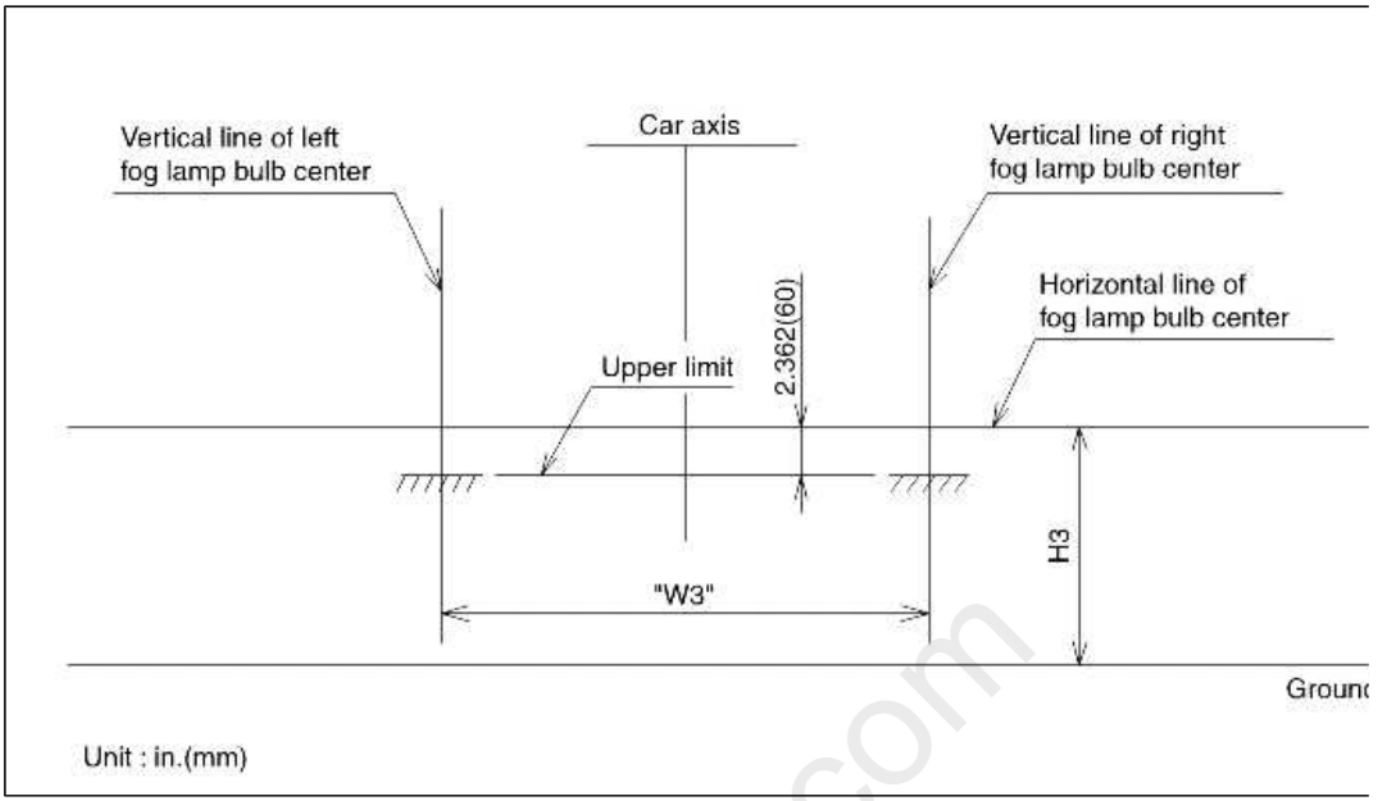


2. Turn the high beam on without the driver aboard.
   The cut-off line should be projected in the allowable range (shaded region).



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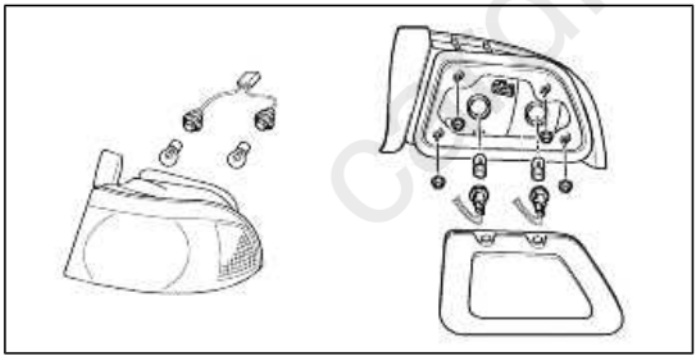
3. Turn the front fog lamp on without the driver aboard.
   The cut-off line should be projected in the allowable range (shaded region).



Body Electrical System > License Lamps > Repair procedures

Removal (outside)

1. Disconnect negative battery cable.
2. Remove two bolts from service hole cover.
3. Remove four nuts attaching rear combination light assembly to vehicle.

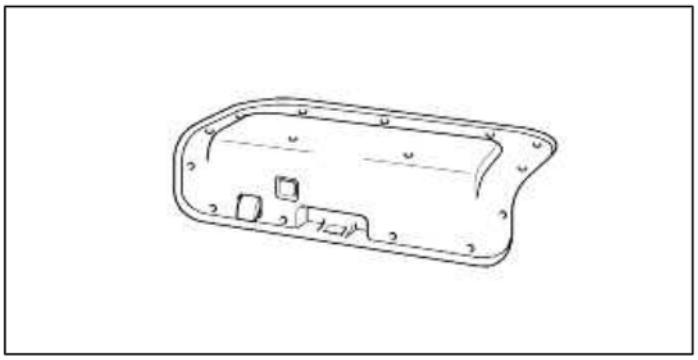


4. Disconnect electrical connector.
5. Remove light assembly.

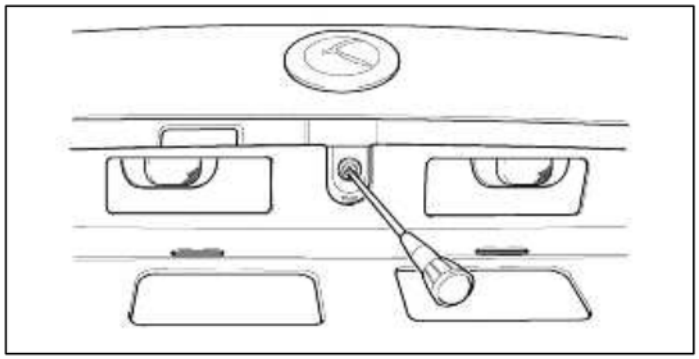
Removal (Inside)

1. Disconnect negative battery cable.

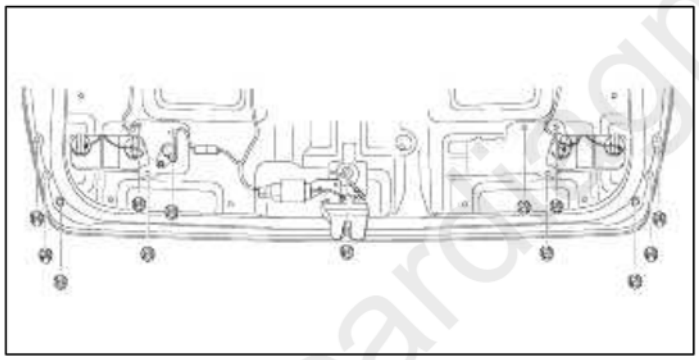
2. Remove three screws and thirteen fasteners from trunk lid trim.



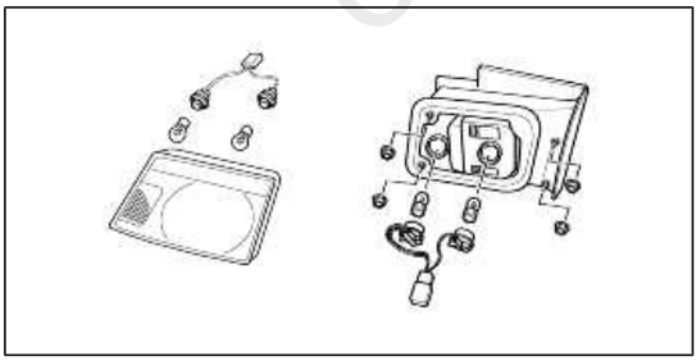
3. Remove back panel molding assembly.
   (1) Disconnect electrical connector.
   (2) Remove one screw from outside of trunk lid.



   (3) Remove thirteen nuts from trunk lid.



4. Remove four screws from light assembly.

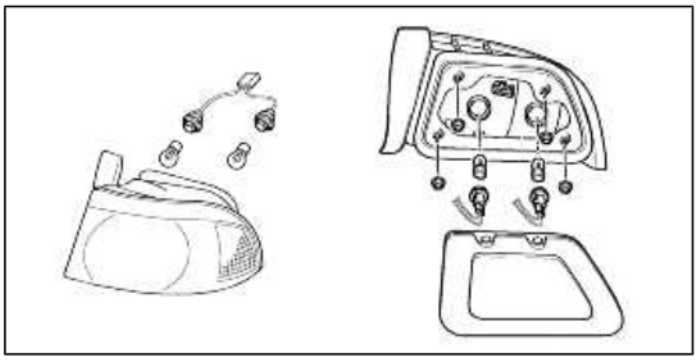


Replacement (outside)

1. Disconnect negative battery cable.

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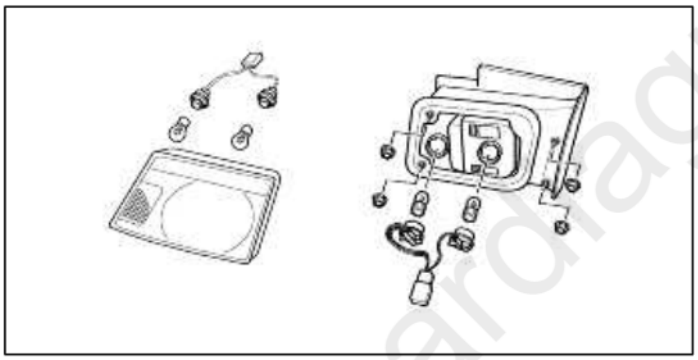
2. Remove two bolts from service hole cover.



3. With bulb holder disengaged,pull bulb holder carefully forward relative to vehicle, and remove from light assembly. Disconnect electrical connector.
4. Remove bulb as required from bulb holder.
5. Install new bulb of proper type, as shown on bulb holder.
6. Position bulb holder on light assembly and press to engage with light assembly.
7. Install two bolts on service hole cover.
8. Connect negative battery cable.

Replacement (Inside)

1. Disconnect negative battery cable.
2. Remove fasteners and screws from trunk lid trim.
3. Disconnect electrical connector.
4. With bulb holder disengaged, pull bulb holder carefully forward relative to vehicle, and remove from light assembly.



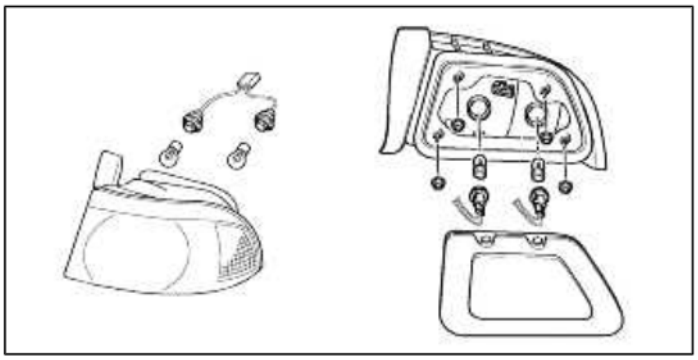
5. Remove bulb as required from bulb holder.
6. Install new bulb of proper type, as shown on bulb holder.
7. Position bulb holder on light assembly and press to engage with light assembly.
8. Install fasteners and screws on trunk lid trim.
9. Connect negative battery cable.

Installation (outside)

1. Position light assembly on vehicle with studs through mounting holes on vehicle.
2. Connect electrical connector.

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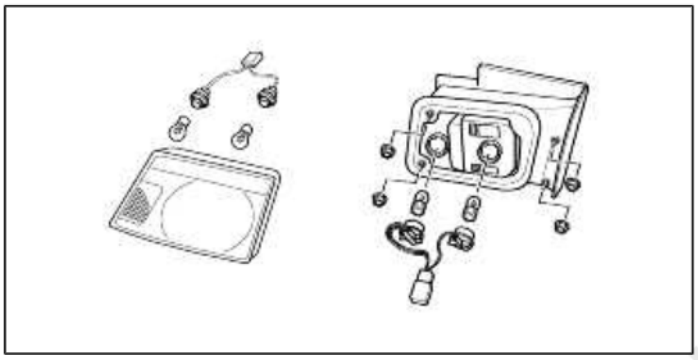
3. Install four nuts on rear combination light.



4. Install two bolts on service hole cover.
5. Connect negative battery cable.

Installation (Inside)

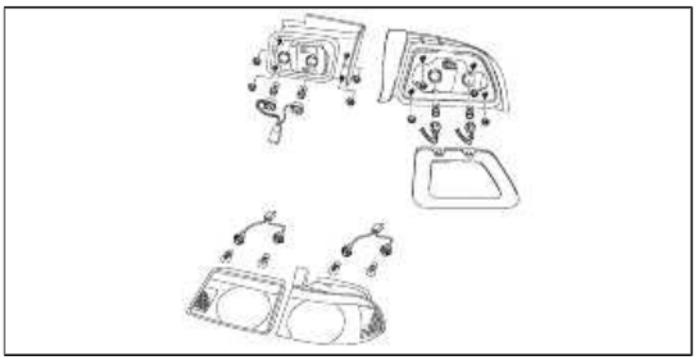
1. Position light assembly on back panel molding assembly.
2. Install four screws on light assembly.



3. Install back panel molding assembly.
   (1) Install thirteen nuts on trunk lid.
   (2) Install one screw on outside of trunk lid.
   (3) Connect electrical connector.
4. Install three screws and thirteen fasteners on trunk lid trim.
5. Connect negative battery cable.

Disassembly

All parts except the lens-housing assembly is interchangeable from left to right.



1. Remove bulb holder from lens-housing assembly.
2. Remove bulbs from bulb holder.

Reassembly

All parts except the lens-housing assembly is interchangeable from left to right.

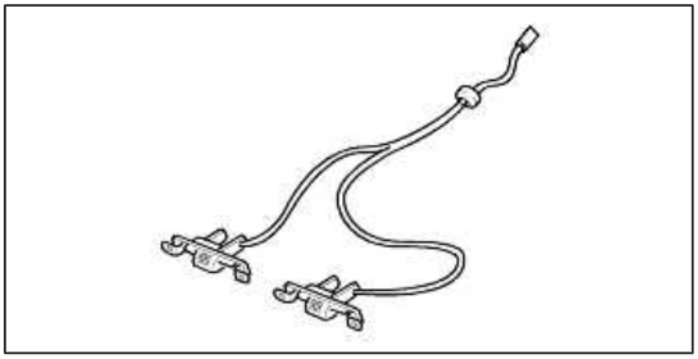
1. Install bulbs in bulb holder in accordance with instructions on bulb holder.

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Body Electrical System > License Lamps > License Lamps > Repair procedures

License lamp

1. Remove two screws attaching each lens; remove each lens from bracket.



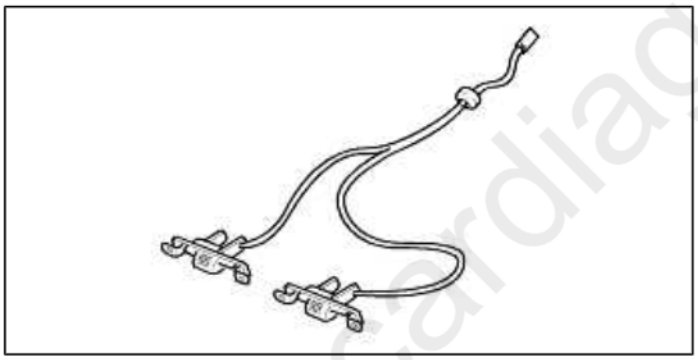
2. Remove bulbs.
3. Remove wiring harness from bracket.

Reassembly

1. Install wiring harness on bracket.
2. Install bulbs.
3. Install each lens with two screws.

replacement

1. Disconnect negative battery cable.
2. Remove two screws attaching license plate light assembly.



3. remove bulb.
4. Install replacement bulb.
5. Install lens with two screws.

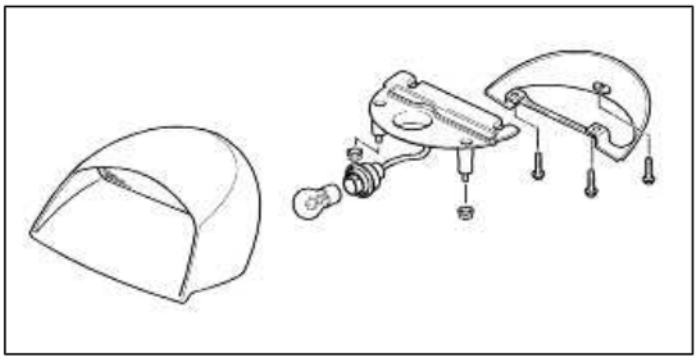
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Body Electrical System > High Mounted stop lamp > High Mounted stop lamp > Repair procedures

Removal

1. Disconnect negative battery cable.
2. Open trunk lid.

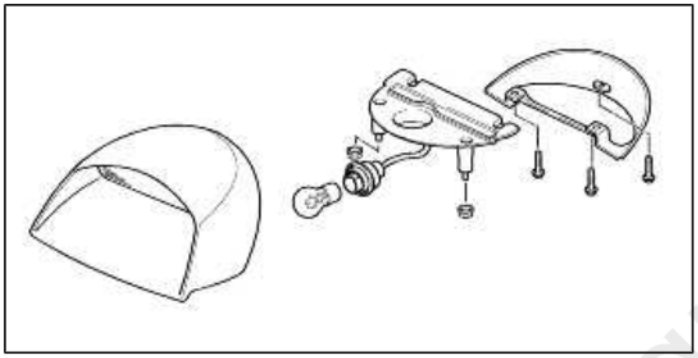
3. Remove two nuts that attach light assembly to vehicle.



4. Disconnect electrical connector from light assembly; remove light assembly.

Replacement

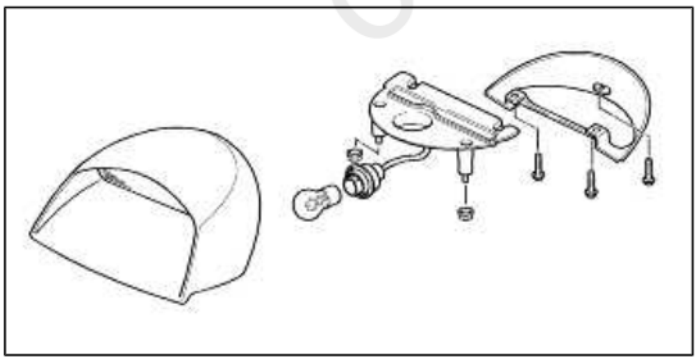
1. Disconnect negative battery cable.
2. Open trunk lid.
3. Remove socket from light assembly.



4. Remove bulb from socket.
5. Install replacement bulb in socket.
6. Connect negative battery cable.

Installation

1. Connect electrical connector to light assembly.
2. Position light assembly on package tray.
3. Install two nuts attaching light to vehicle.

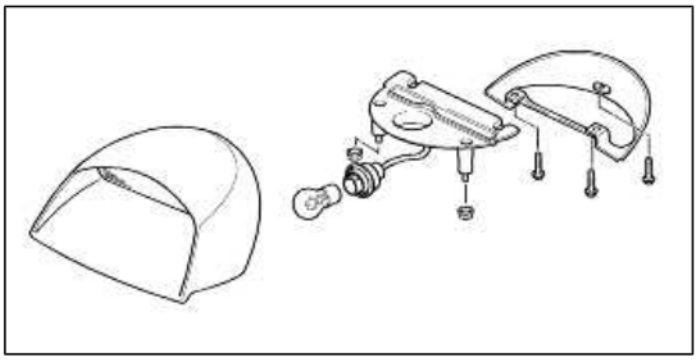


4. Connector negative battery cable.

Disassembly

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1. Remove socket from light assembly.



2. Remove bulb from socket.

Reassembly

1. Install bulb.
2. Install socket on light assembly.

Body Electrical System > Auto Lighting Control System > Description and Operation

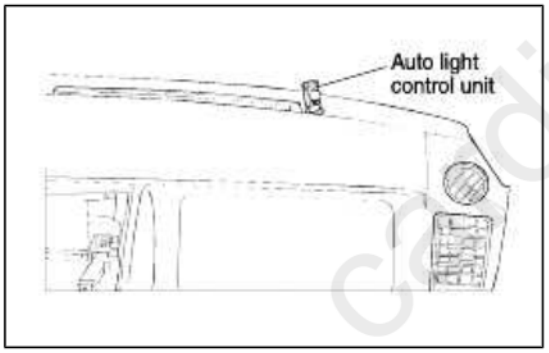
Description

The auto light control system operates by using the auto light switch, and turns the head lamp and tail lamp on or off automatically in accordance with the detection illumination.

Body Electrical System > Auto Lighting Control System > Auto Light Contorl unit > Repair procedures

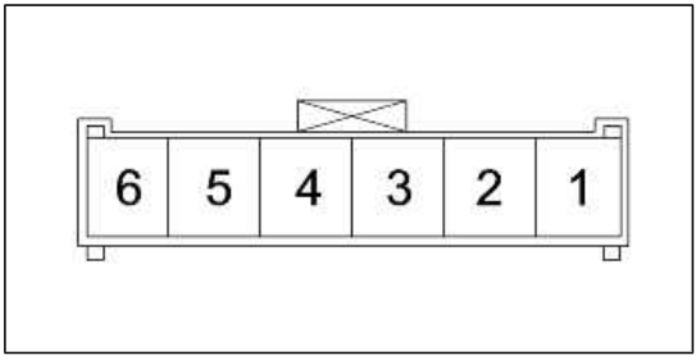
Removal

1. Removal the sensor unit from the defroster nozzel cover using the suitable tool.



Inspection

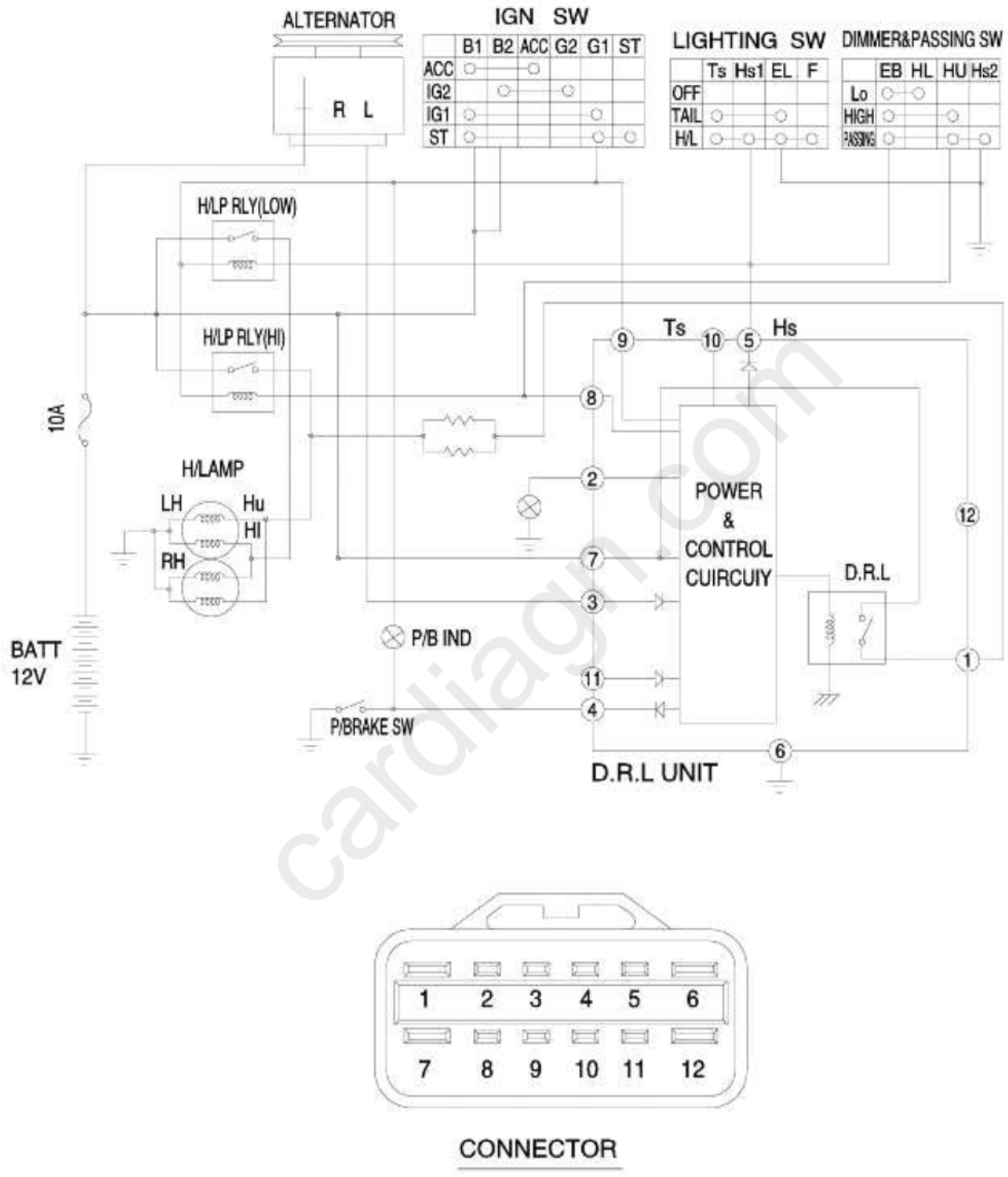
1. Apply the battery voltage to terminal 1 and ground the terminal 6.
2. Expose the ALCS unit to the sun.
3. Check the continuity between the terminals 2 & 3 and the terminals 2 & 5.



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Body Electrical System > Daytime Running Lights > Schematic Diagrams

Circuit diagram



CONNECTOR

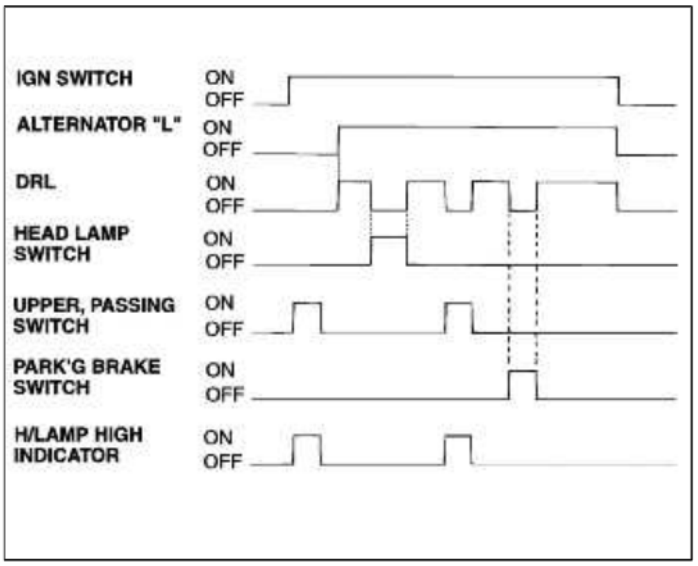
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Body Electrical System > Daytime Running Lights > Repair procedures

Inspection

Operation check

Daytime running unit is installed at the behind of right head lamp.
Check that the light operate according to the following timing chart.



Body Electrical System > Troubleshooting > C1161

Brake light switch

DTC No. C1161 Brake light switch	Probable cause
[Comment] Check relevant connector Check wiring for open circuit, short to ground. Check function of brake light switch. Brake pedal not actuated : 0V Brake pedal actuated : BV Replace brake light switch	• Malfunction of wiring harness or connector • Malfunction of brake light switch • Malfunction of brake lights

DTC No. ABS, EBD and TCS warning lamp	Probable cause
[Comment] Check HECU connector (Pin No. 19, 20, 21, 25) Check wiring for open circuit, short to ground. Check warning lamp	• Malfunction of wiring harness or connector • Malfunction of warning lamp

DTC No. TCS off switch	Probable cause
[Comment] Check relevant connector Check wiring for open circuit, short to ground. Check TCS off switch. TCS off switch not actuated : 0V TCS off switch actuated : BV Replace TCS off switch	• Malfunction of wiring harness or connector • Malfunction of TCS off switch

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