BODY ELECTRICAL SYSTEM

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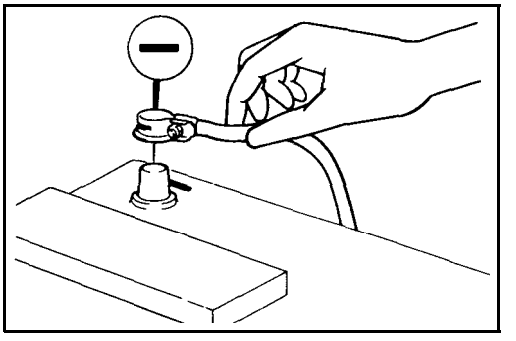
GENERAL

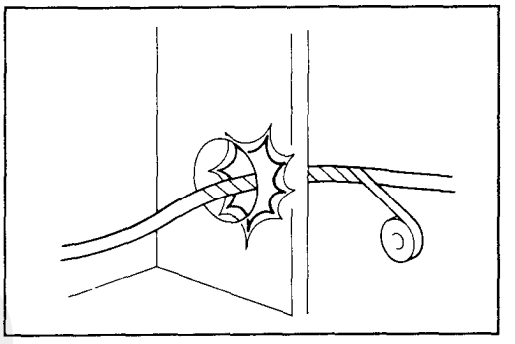
SERVICING THE ELECTRICAL SYSTEM



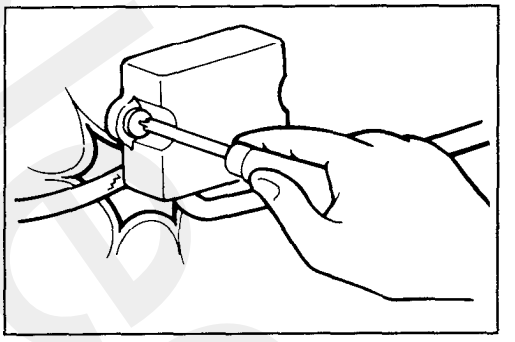
1. When servicing the electrical system, disconnect the negative cable from the terminal of the battery.

   Caution

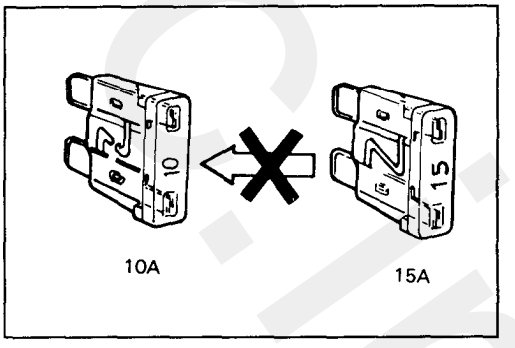
   1. Before connecting or disconnecting the negative cable, be sure to turn off the ignition switch and the lighting switch.
      (If this is not done, there is the possibility of semiconductor parts being damaged.)
   2. For MPI-equipped models, after completion of the work steps [when the battery's negative (-) terminal is connected], warm up the engine and allow it to idle described below, in order to stabilize engine control conditions, and then check to be sure that the idling is satisfactory.
      Engine coolant temperature : 80-95°C (176-203°F)
      Lamps, electric fans, accessories: OFF
      Transaxle: neutral position
      (A/T models: "N" or "P")
      Steering wheel: neutral (center) position



2. If any section of a wiring harness interferes with the edge of a part, or a corner, wrap the section of the harness with tape or something similar in order to protect it from damage.

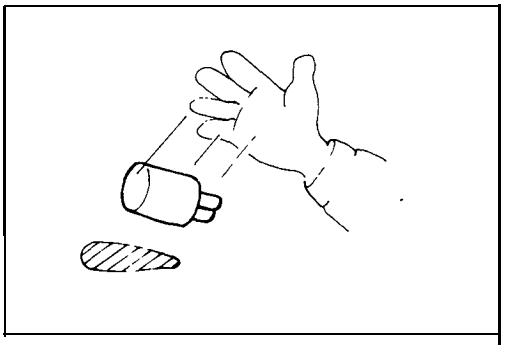


3. When installing any of the vehicle parts, be careful not to pinch or damage any of the wiring harnesses.

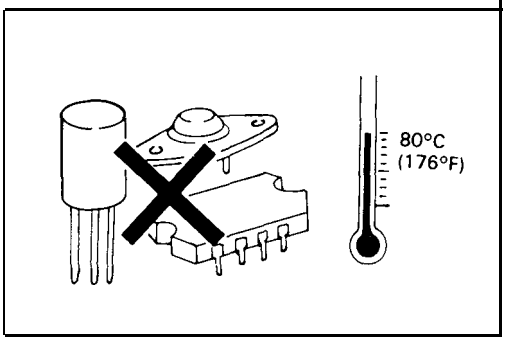


4. If a burned-out fuse is to be replaced, be sure to use only a fuse of the specified capacity. If a fuse a capacity larger than that specified is used, parts may be damaged and the danger of fire also exists.

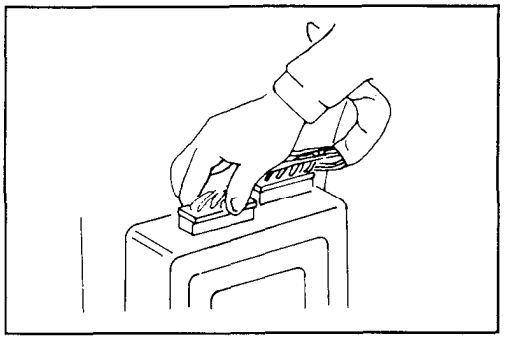
5. The sensor, relay, etc, must never be subjected to strong shocks. Do not allow them to fall and do not throw then when handling.



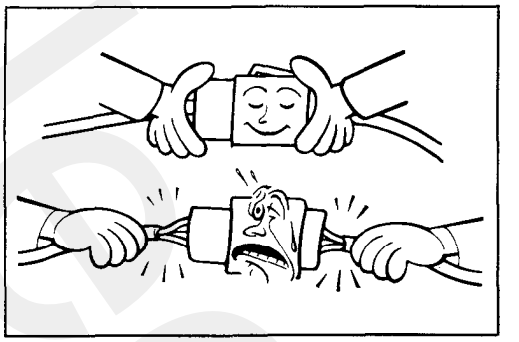
6. The electronic parts used in the computer, relays, etc. are readily damaged by heat. If there is a need for service operations that may cause the temperature to exceed 80°C (176°F), remove the electronic parts beforehand.



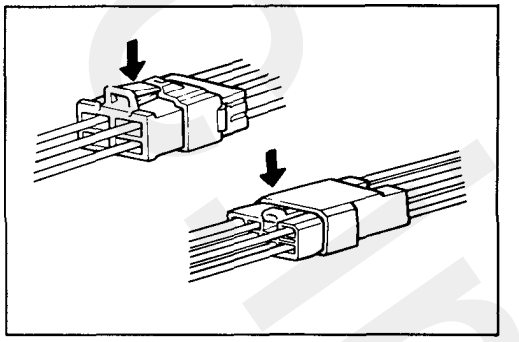
7. Loose connectors could troubles. Make sure that the connectors are connected securely.



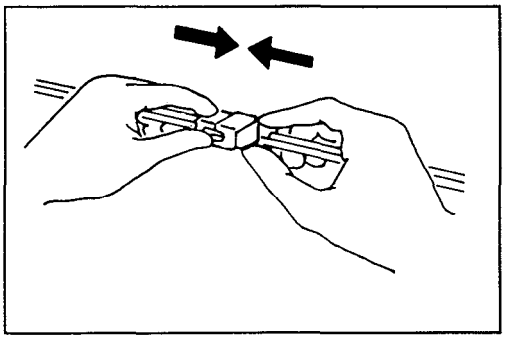
8. When disconnecting a connector, be sure to pull only the connector, not the harness.



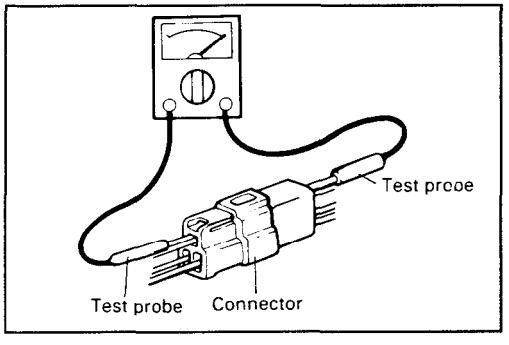
9. Disconnect connectors which have catches by pressing in the direction indicated by the arrows in the illustration.



10. Connect connectors which have catches by inserting the connectors until a “click” noise is heard.

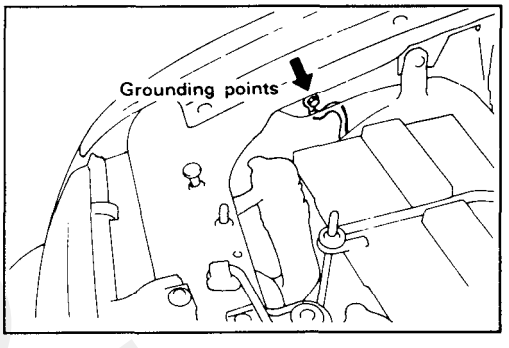


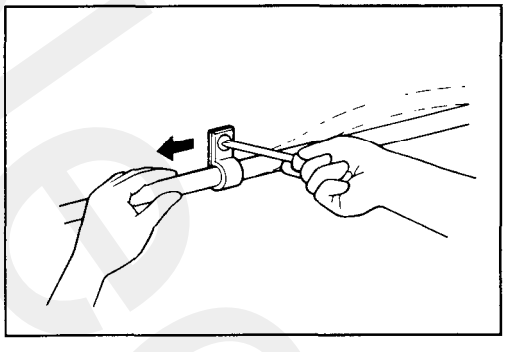
11. When using a circuit tester to perform continuity or voltage checks on connector terminals, insert the test probe from the harness side.
    If the connector is a sealed connector, insert the test probe in through the hole in the rubber cap for the electrical wires, being careful not to damage the insulation of the wires continue to insert the test probe until it contacts the terminal.



CHECKING CABLES AND WIRES

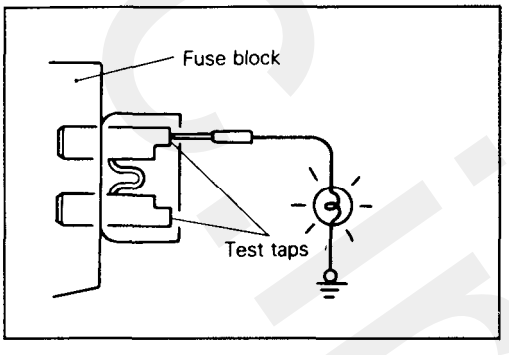
1. Checking the terminal for tightness.
2. Check terminals and wires for corrosion by battery electrolyte, etc.
3. Check terminals and wires for open circuit or impending open circuit.
4. Check wire insulation and coating for damage, cracks and degrading.
5. Check conductive parts of terminals for contact with other metallic parts
   (vehicle body and other parts).
6. Check grounding parts to verify that there is complete continuity between attaching bolt(s) and vehicle body.
7. Check for incorrect wiring.
8. Check that wirings are so clamped as to prevent contact with sharp corners of the vehicle body, etc. or hot parts (exhaust manifold, pipe, etc.)
9. Check that wirings are clamped firmly to secure enough clearance from the fan pulley, fan belt and other rotating or moving parts.
10. Check that the wirings between the fixed parts such as the vehicle body and the vibrating parts such as the engine are made with adequate allowance for vibrations.





CHECKING FUSES

A blade type fuse has test taps provided to allow checking of the fuse itself without removing it from the fuse block. The fuse is okay if the test lamp comes on when its one lead is connected to the test taps (one at a time) and the other lead is grounded. (Change the ignition switch position adequately so that the fuse circuit becomes live.)



INSTALLATION OF RADIO EQUIPMENT

The computers of the electronic control system has been designed so that external radio waves will not interfere with their operation. However, if the antenna or cable of the amateur transceiver etc. is routed near the computers, it may affect the operation of the computers, even if the output of the transceiver is no more than 25W.

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

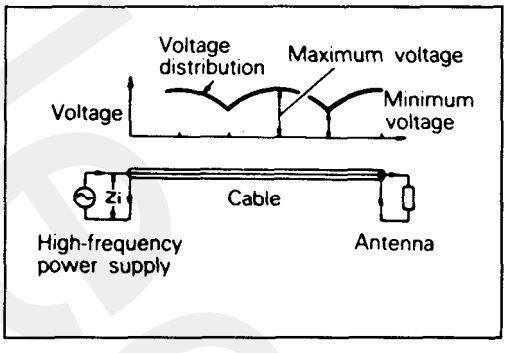
1. Install the antenna on the roof or rear bumper.
2. Because radio waves are emitted from the coaxial cable of the antenna, keep it 200 mm (8 in.) away from the computers and the wiring harness. If the cable must cross the wiring harness, route it so that it runs at right angles to the wiring harness.
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

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.



FUSIBLE LINKS AND FUSES

FUSIBLE LINK

Specifications

Items: Specifications

Main fusible link

Rated capacity	Circuit	Type	Housing color
60A	Charging	Screw-up	Yellow
20A	Cooling	Screw-up	Blue

Sub. fusible link (Located in engine compartment relay box)

Item \ Circuit	P/WDW	H/LAMP	BATT	ECI	RAD	IGN SW	ABS
Rated capacity	30A	30A	50A	20A	30A	30A	40A
Housing color	Pink	Pink	Red	Blue	Pink	Pink	Green
Type	Connector type						

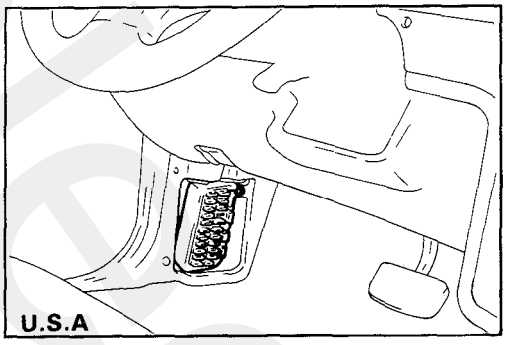
Inspection

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

FUSES

Inspection

1. Be sure there is no play in the fuse holders, and that the holders hold the fuses securely.
2. Are fuse capacities for each circuit correct ?
3. Are there any blown fuse?
   If a fuse is to be replaced, be sure to use a new fuse of the specified 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.


U.S.A


CANADA, AUSTRALIA

IGNITION SWITCH

INSPECTION

1. Separate the connector located under the steering column.
2. Inspect the switch continuity between the terminals.
3. If continuity is not as specified, replace the switch.

Switch position	Key	Ignition switch 1	2	3	4	5	6	Door warning switch 7	8	Lock RO	RE
LOCK	Removed									L	L
	Inserted							○—○	○—○	L	F
ACC		○—○			○—○					F	F
ON		○—○	○—○		○—○	○—○				F	F
START				○—○	○—○	○—○	○—○			F	F

NOTE

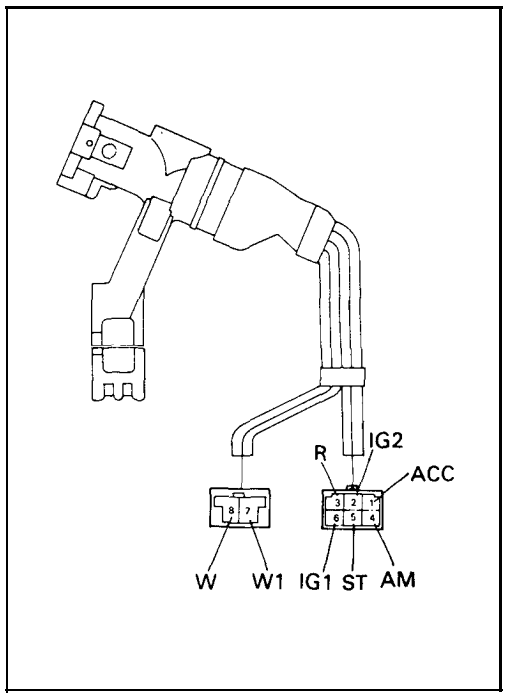
○—○ indications that there is continuity between the terminal.

RO : Round the locking bar

RE : Return the locking bar

L : Lock

F : Free



INSTRUMENTS, GAUGES AND WARNING LAMPS

INSTRUMENT CLUSTER

SPECIFICATIONS OF INDICATOR AND WARNING LAMPS

Items	Specification (wattage)	Items	Specification (wattage)
Indicator lamps		Trunk lid ajar	1.2 W
Direction indicator (LH/RH)	1.2 W	Illumination lamps	3.4 W
Battery charging	1.2 W	A/T position indication	
Oil pressure	1.2 W	P	1.2 W
Brake failure	1.2 W	R	1.2 W
Door warning	1.2 W	N	1.2 W
Rear window defogger	1.2 W	D	1.2 W
Check engine	1.2 W	L	1.2 W
High beam	1.2 W	OD OFF	1.2 W
Low washer (Canada)	1.2 W		
Low fuel	3.0 W		
Safety belt	1.2 W		
ABS warning	1.2 W		

SERVICE STANDARD

Speedometer indication error

Standard speed (MPH)	10	20	40	60	80	100	120
Allowable error (MPH)	+1.5	±1.5	±1.5	±1.5	±1.5	±1.5	±1.5

Standard speed (Km/h)	20	40	60	80	100	120	140	160
Tolerance (Km/h)	+4	+3	+4	+5	+5	+5.5	+5.5	+5.5
	0	0	0	0	0	+0.5	+0.5	0.5

Tachometer indication error

Standard RPM	1000	2000	3000	4000	5000	6000	7000
Allowable RPM	±100	±100	±150	± 200	± 250	± 300	±350

Fuel gauge

Fuel tank level	E	1/2	F
Standard resistance (Ω)	95	32.5	6.5
Indication error	±2° 24'	± 5	± 2°24'

Fuel sender

Float position	F	1.2	E
Resistance (Ω)	3	32.5	110
Allowable error (Ω)	±2	±4	±7

Water temperature gauge

Temperature (°C)	60	85	110	125
Angle	-30”	-7°	-7°	+30°
Tolerance		+ 2° - 3°	+ 2° - 3°	±1.5°

Water temperature sender

Temperature (°C)	60	85	110	125
Resistance (Ω)	128	49.5	24.9	14.8

Voltage gauge

Voltage (V)	8	10	12	14	16
Angle	-30°	-16°	0°	16°	30°
Allowable error (V)		± 0.5	± 0.5		± 0.6

Oil pressure gauge

Pressure (Kg/cm^2)	0.3	2.7	7	10
Angle	-32.5°	-21.5°	16°	32.5°
Resistance (Ω)	± 3°			± 4°

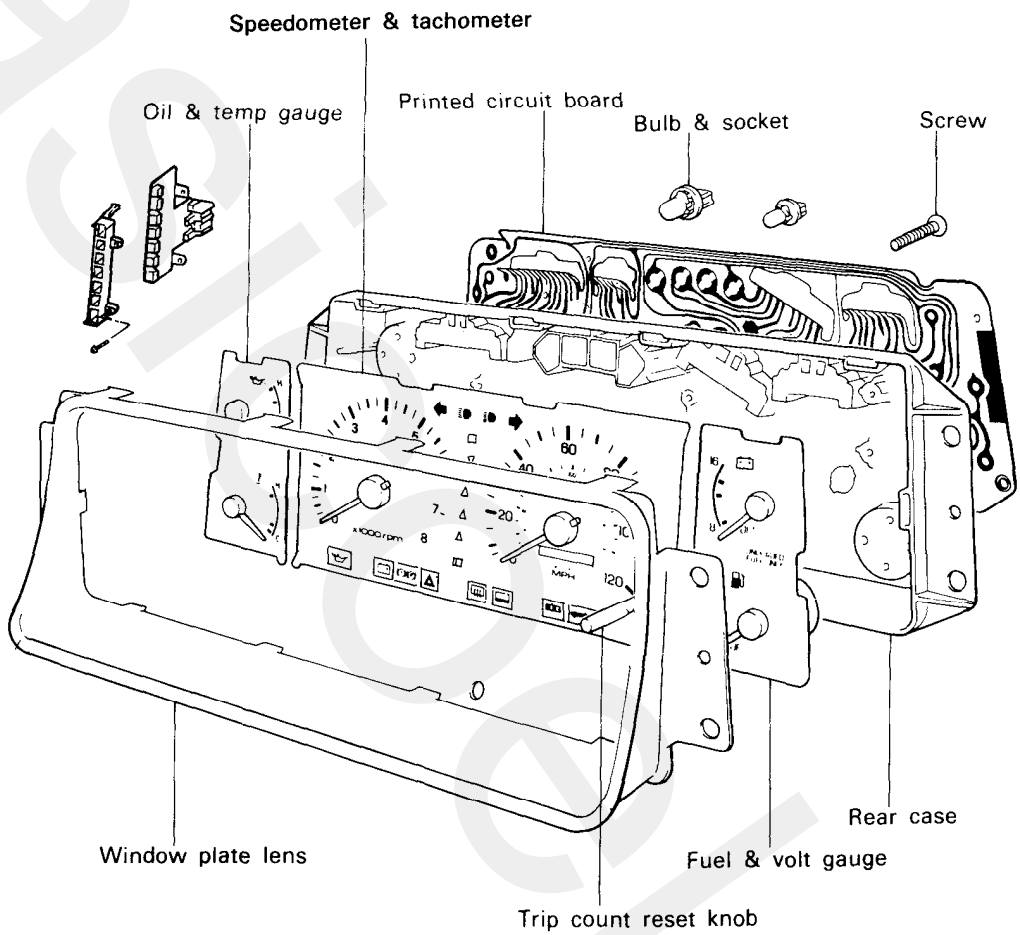
Oil pressure sender

Pressure (Kg/cm^2)	0.3	2.7	7	10
Resistance (Ω)	310 ± 25	195 ± 16	49 ± 12	20 ± 8

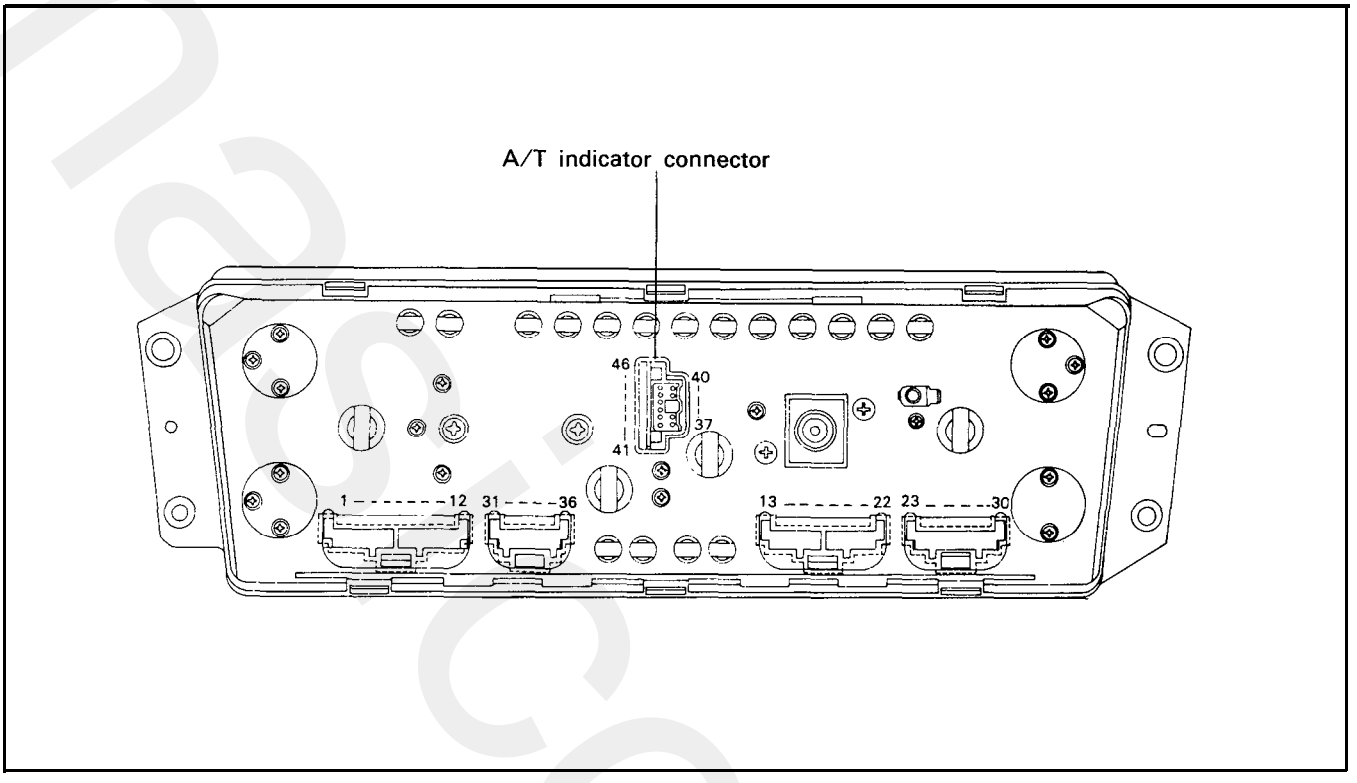
TIGHTENING TORQUE

Items	Specifications		
	Nm	Kg.cm	lb.ft
Coolant temperature sender	10-12	100-200	7-9
Oil pressure sender	8-12	80-120	6-9
Oil pressure switch	8-12	80-120	6-9

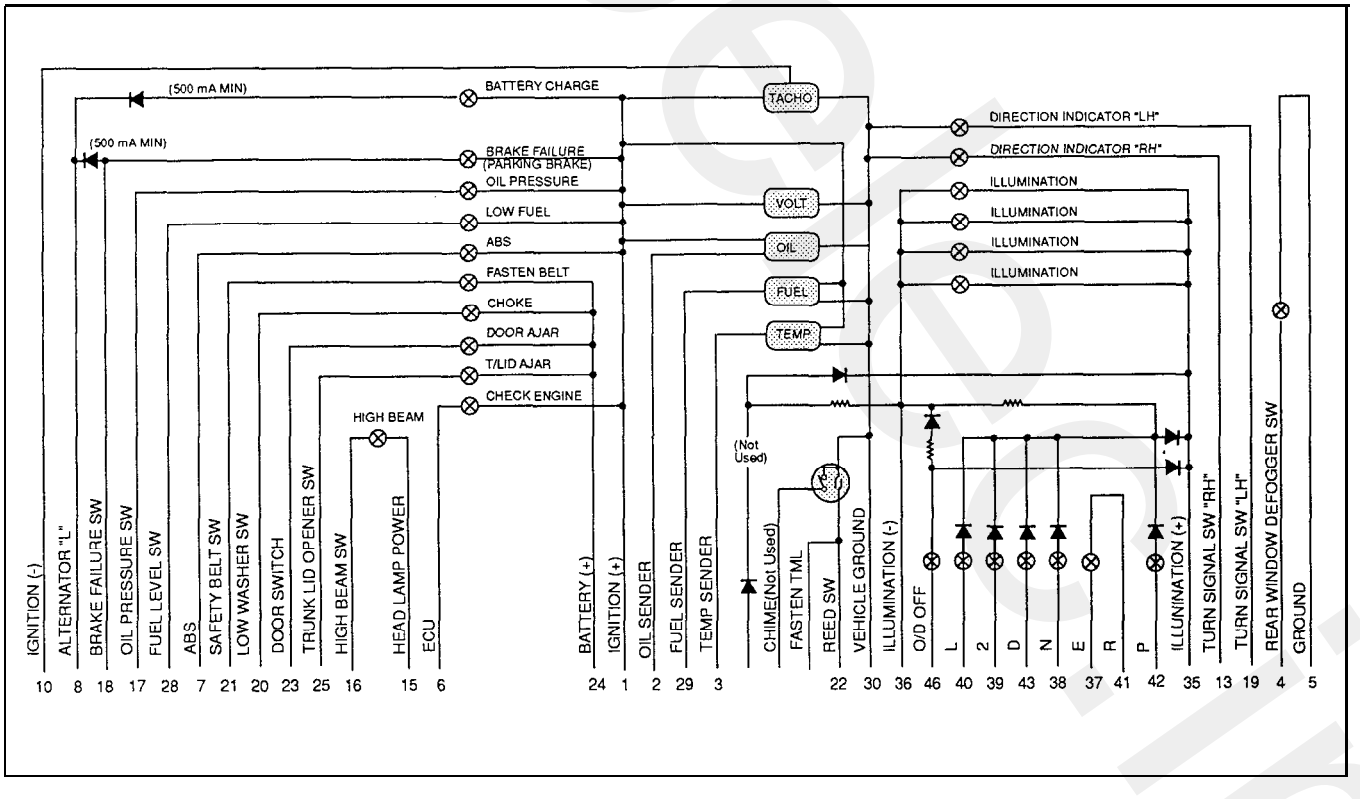
COMPONENTS


Speedometer & tachometer
Oil & temp gauge
Printed circuit board
Bulb & socket
Screw
Window plate lens
Rear case
Fuel & volt gauge
Trip count reset knob

PRINTED CIRCUIT BOARD



CIRCUIT DIAGRAM



COMPONENT CHECK

Speedometer

1. Using a speedometer tester, inspect the speedometer for allowable indicating error and check the operation of the odometer.

   NOTE

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

Standard indication (MPH)	10	20	40	60	80
Allowable error (MPH)	±1.5	±1.5	±1.5	±1.5	±1.5

2. Check the speedometer for pointer vibration and abnormal noises.

   NOTE

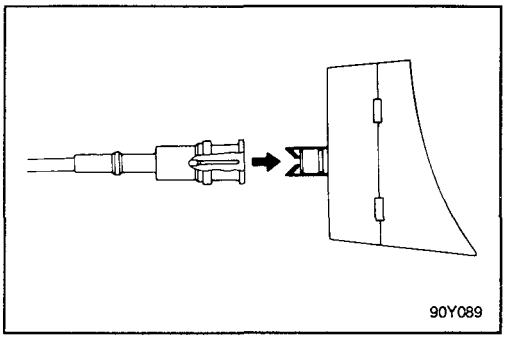
   Pointer vibration can be caused by a loose or dry speedometer cable.

Speedometer cable

Insert the cable until the stopper properly fits into the speedometer groove.

CAUTION

Poor installation of the cable may cause a fluctuating pointer, noise and a damaged harness inside the instrument panel.

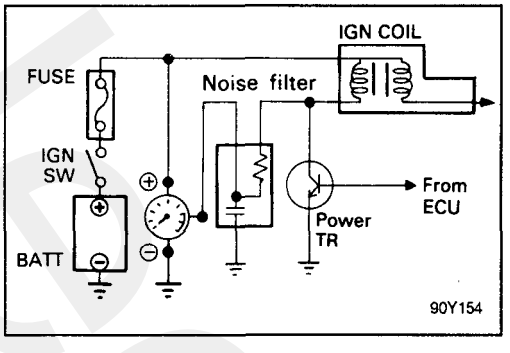


Tachometer

1. Connect a tachometer and start the engine.
2. Compare the tester and tachometer indications.
   If the difference is excessive, replace the tachometer.

   CAUTION

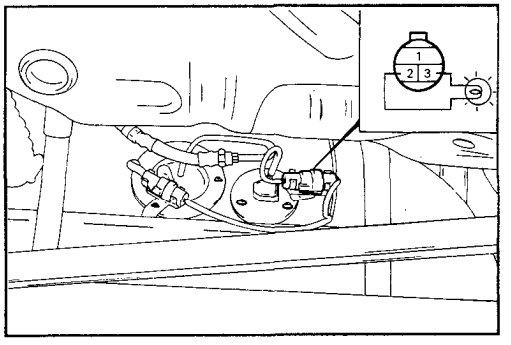
   1) Reversing the connections of the tachometer will damage the transistor and diodes.
   2) When removing or installing the tachometer, be careful not to drop it or subject it to severe shock.



rpm / Temp	1,000	2,000	3,000	4,000	5,000	6,000	7,000
25°C (77°F) DC 13.5 V	±100	±100	±150	±200	±250	±300	±350

Fuel gauge

1. Lift up the vehicle and disconnect the connector of the fuel gauge from the fuel sender .2. Ground to the harness side connector via (terminals 3) the 12V, 3.4W bulb.
3. Turn the ignition key to the ON position.
4. Check to be sure that the test bulb flashes and that the indicator moves.

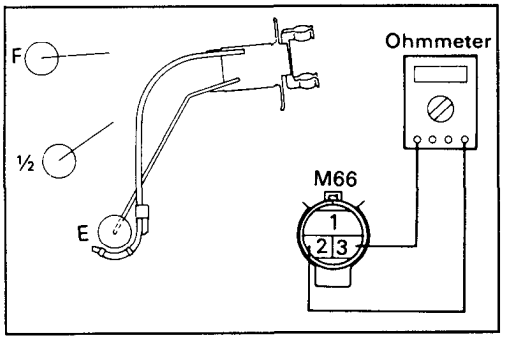


Fuel sender resistance

1. Measure (with the float as the "F" position and at the "E" position) the resistance between ground and the sender terminal for the fuel gauge.

   Standard specification : Point F : 3 ± 2 Ω
   Point E : 110 ± 7 Ω

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



Fuel level sensor

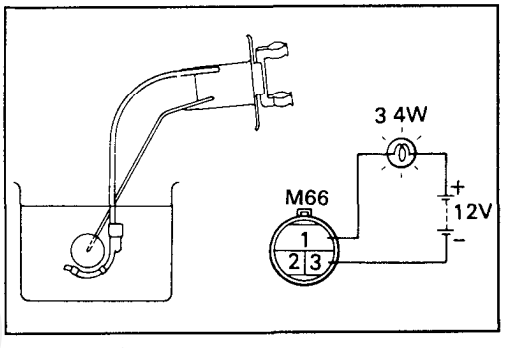
1. Connect the sender with a test lamp **(12V,** 3.4W) to the battery and immerse it in water.
2. The lamp should be off while the thermistor is beneath the water, and should illuminate when the sender is taken out of the water.

NOTE

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

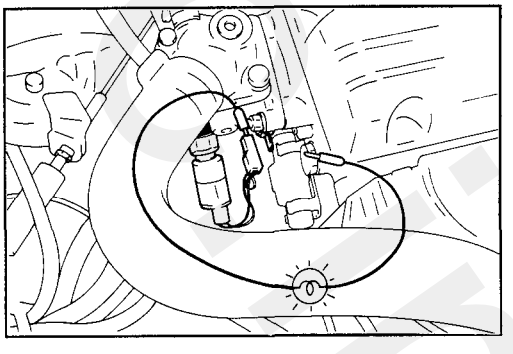
CAUTION

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



WATER TEMPERATURE GAUGE

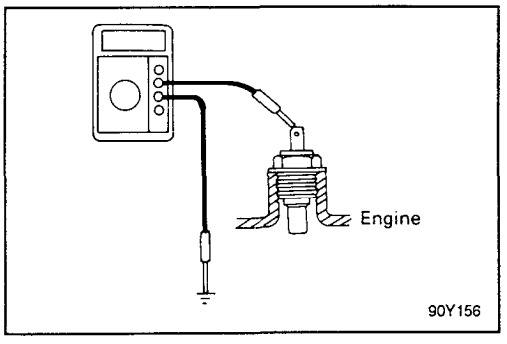
1. Disconnect the wiring connector from the water temperature sender in the engine compartment.
2. Ground to the harness side connector via the 12V, 2.3W bulb.
3. Turn the ignition key to the ON position.
4. Check to be sure that the test bulb flashes and that the indicator moves.



Water temperature sender

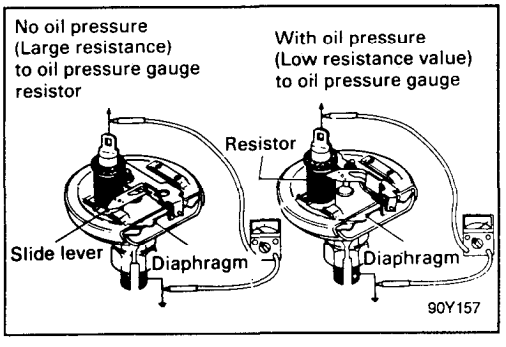
1. Using an ohmmeter, measure the resistance between the terminal and ground.
2. If the resistance value is not as shown in the table below, replace the temperature sender.

Temperature °C (°F)	60 (140)	110 (230)
Resistance Ω	125	24



Oil pressure sender

1. Check the engine oil level. Add oil if insufficient, or replace it if the connection is bad.
2. Measure the resistance changes by connecting an ohmmeter between a good ground (vehicle body) and the terminal of the sender.
3. Refer to service standard.

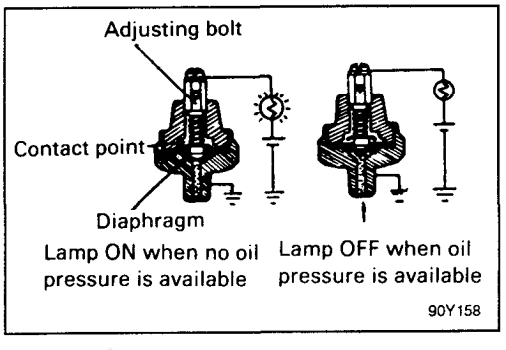


Oil pressure switch

Specifications

Type	Contact points
Lighting oil pressure	0.3 kg/cm^2 (4.27 psi)

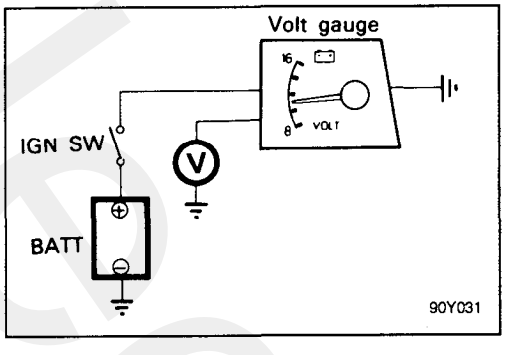
If operation is not as specified, replace the oil pressure switch.



Voltage gauge

1. Connect the voltmeter in parallel with the volt gauge.
2. The voltmeter indication should be equal to the volt gauge.

Voltage (V)	8	10	12	14	16
Allowable error (V)	-	± 0.5	± 0.5	-	± 0.6

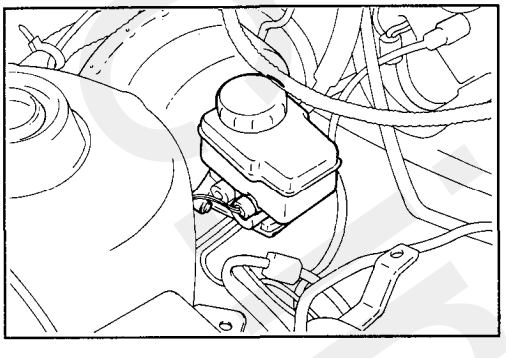


Brake warning lamp and switch

The brake fluid level sensor or the parking brake switch is switched ON, and the brake warning lamp illuminates, when, with the ignition switch at the "ON" position, the brake fluid level is at or below the specified level, or the parking brake lever is pulled.

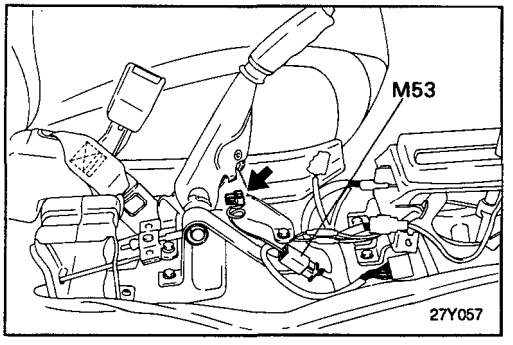
NOTE

The brake fluid level sensor is built into the master cylinder reservoir cap.



Parking brake switch

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

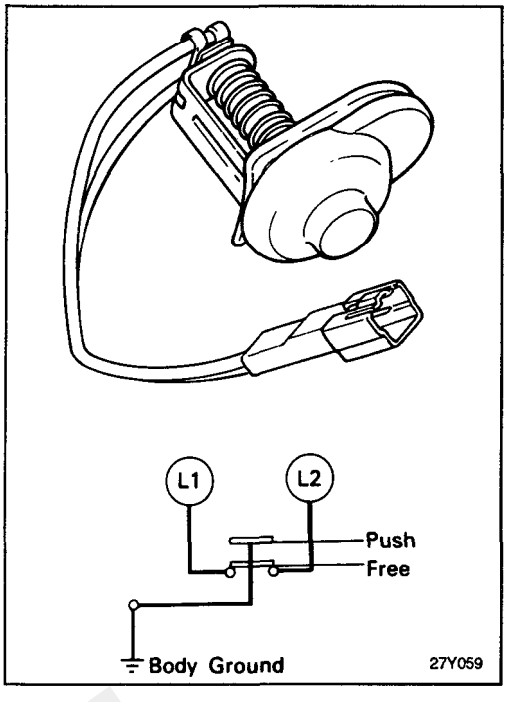


Door switch

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

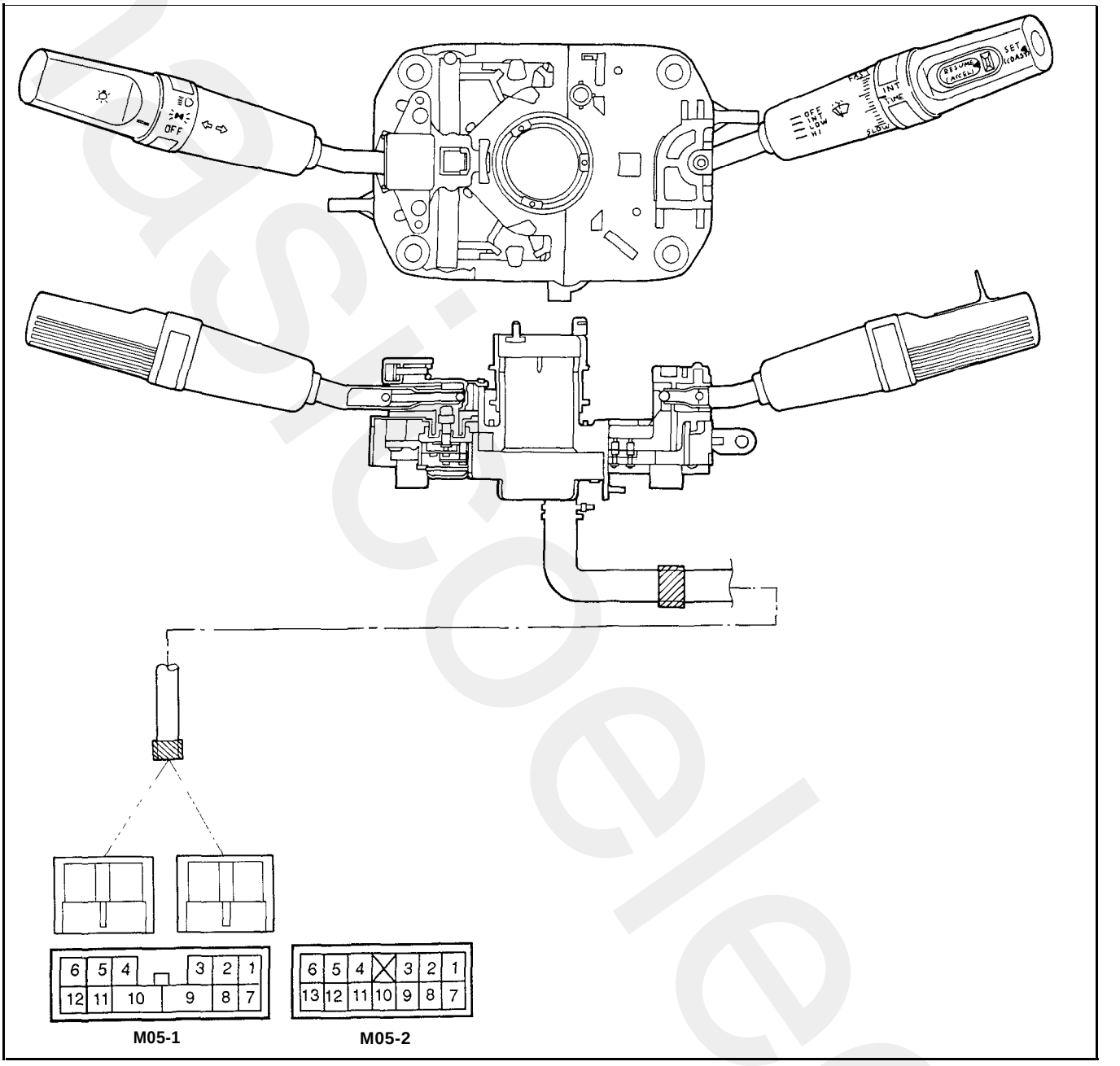
If continuity is not as specified, replace the door switch

Lead wire / Position	Ground (Body)	L1 (0.5RB)	L2 (0.5RL)
Free	○———	○	——○
Push			



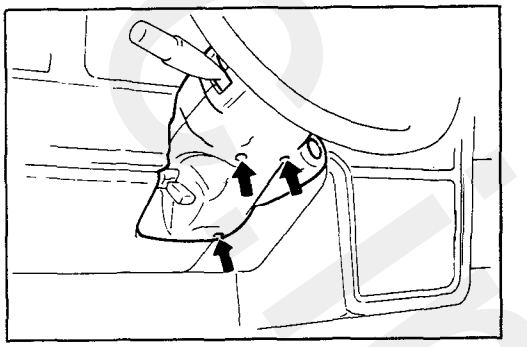
MULTIFUNCTION SWITCH

COMPONENTS



REMOVAL AND INSTALLATION

1. Remove the steering wheel.
2. Remove the steering column lower and upper shroud.



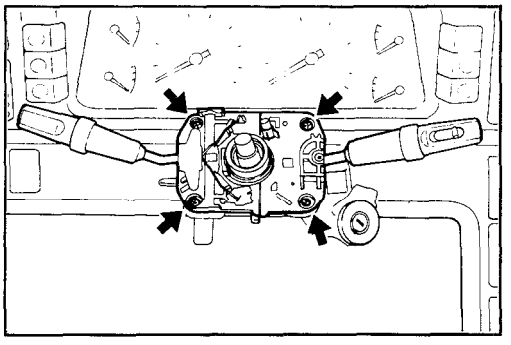
3. Remove the multifunction switch mounting screws.
4. Disconnect the harness connector.

CAUTION

Make sure the wire leads are not being pulled when you move the lever.

Check that lever works freely without binding.

5. Installation is the reverse order of removal.

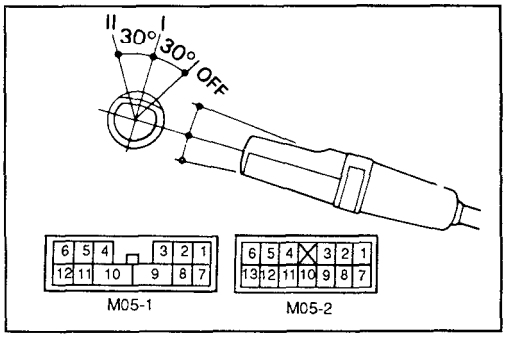


OPERATION CHECK

Check the continuity between the terminals while operating the switch.

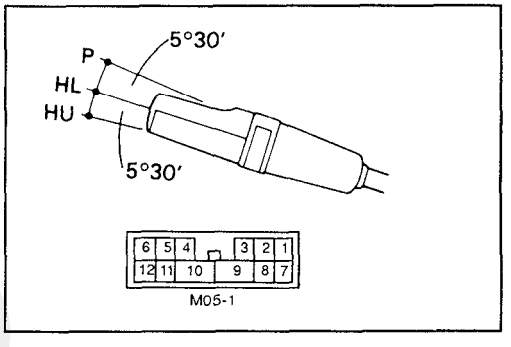
Lighting switch (M05-1/*M05-2)

Position \ Termial	1	2	*10	7
OFF				
I	○		○	
II	○	○	○	○



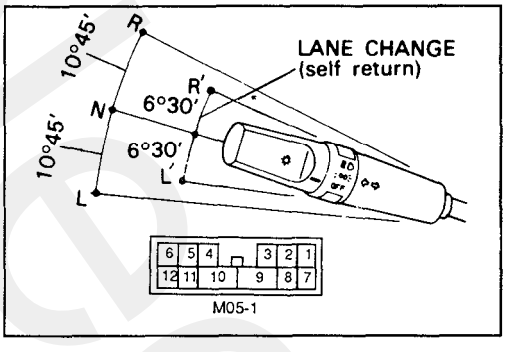
Dimmer and passing switch (M05-1)

Position \ Termial	3	8	9	10
HU			○	○
HL	○			○
P		○	○	○



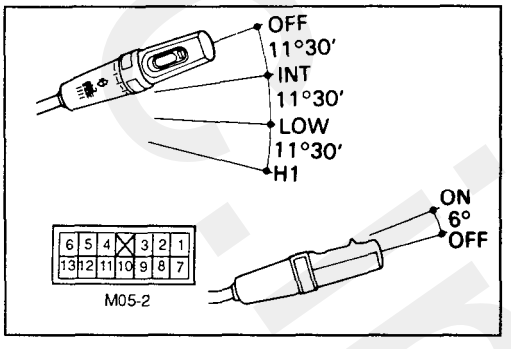
Turn signal switch (M05-1)

Hazard / T/SIG \ Termial		4	5	6
OFF	L	○	○	
	N			
	R	○		○



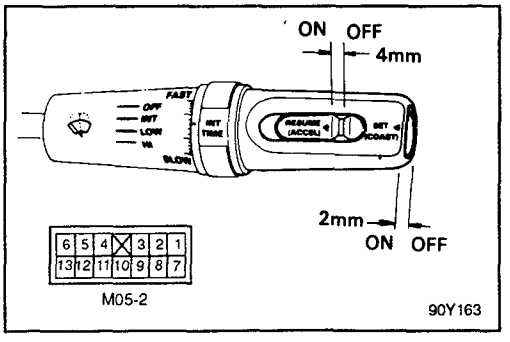
Wiper and washer switch (M05-2)

Switch	Position \ Termial	1	2	3	7	8	9	10
Wiper	OFF	○		○				
	INT	○		○	○		○	○
	LOW			○				○
	HIGH		○					○
Washer	OFF							
	ON					○		○



Automatic speed control (cruise) switch (M05-2)

Terminal / Position	6	12	13
SET	○——	——○	
OFF			
RESUME	○——	——	——○



LIGHTING SYSTEM

SPECIFICATIONS

	North America	Australia
Head lamp	60/45 W	60/55 W
Front combination lamps		
Turn signal lamp	28/8 W	21 W
Front position lamp	5 W	4 W
Rear combination lamps (outside)		
Turn signal lamp	27 W	21 W
Stop and tail lamp	27/8 W	21/5 W
Rear combination lamps (inside)		
Stop(Fog, Australia only) and tail lamp	27/8 W	21/-w
Back-up lamp	27 W	21 W
Interior lamps		
Luggage and glove box lamp	5 W	5 W
Room lamp	10 W	10 W
Door lamp	5 W	5 W
High mounted stop lamp	17 W	17 W
Licence plate lamp	8 W	5 W
Flasher unit		
Turn signal blinking frequency	85 ± 10 C/M at 12.8 V	
Hazard warning blinking frequency	80 ± 12 C/M at 12.8 V	

HEAD LAMP AIMING

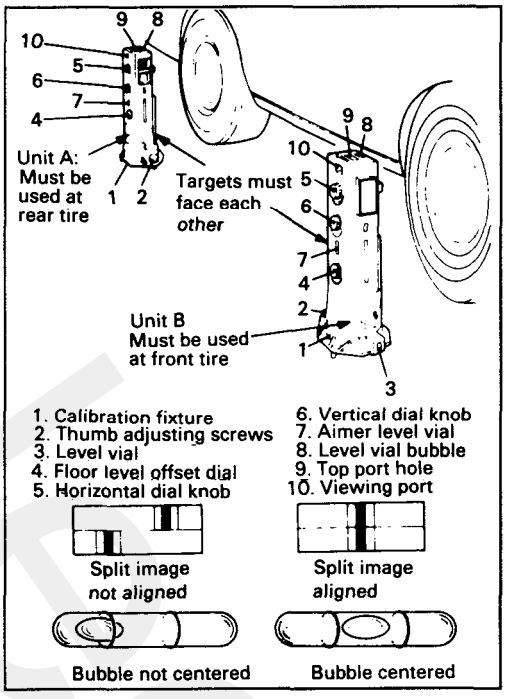
Pre-aiming instructions

1. Test dimmer switch operation.
2. Observe operation of high beam indicator lamp mounted in the instrument cluster.
3. Inspect for badly rusted of faulty head lamp assemblies. These conditions should be corrected before a satisfactory adjustment can be made.
4. Place the vehicle on a level floor.
5. Bounce the front suspension through three (3) oscillations by applying body weight to the bumper.
6. Check and correct tire inflation pressures.
7. Rock vehicle sideways to allow vehicle to assume its normal position.
8. If the fuel tank is not full, place a weight in the trunk of the vehicle to simulate the weight of a full tank.
9. There should be no other load in the vehicle other than that of the driver or substituted weight of approximately 75 kg (165 Ibs.) placed in the driver's position.
10. Thoroughly clean the head lamp lenses.

Compensating the aimers for floor slope

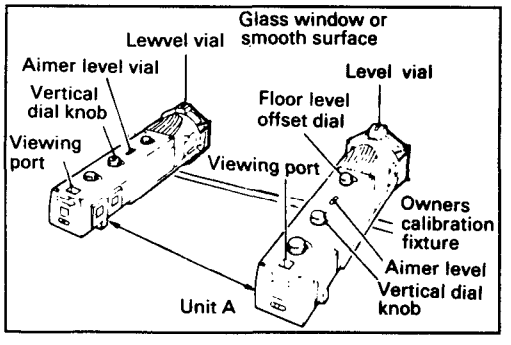
The floor level offset dial must coincide with the floor slope for accurate aiming. Calibration fixtures are included with the aimers.

1. Attach one calibration fixture to each aimer. Fixtures will easily snap into position on the aimer when properly positioned.
2. Place the aimers at the center line of each wheel on one side of the vehicle. Unit A must be placed at the rear wheel with the target facing forward. Unit B must be placed at the front wheel with the target facing rearward.
3. Adjust the thumb screw on each calibration fixture by turning either clockwise or counter-clockwise until the level vial bubble registers in a centered, level position.
4. Look into the top port hole of Unit A. Turn the horizontal knob until the split image is aligned.
5. Transfer the plus or minus reading indicated on the horizontal dial to the floor level offset dial on each aimer. Press the floor level dial inward to set reading.
6. Remove the calibration fixtures from both units.



Testing aimer calibration

The aimer calibration may be off due to extended use. Calibration fixtures used in conjunction with the aimers can be used to check and adjust the aimer.



1. Turn the thumb adjusting screw on each calibration fixture until it is approximately the same distance as the supporting posts.
2. Attach the calibration fixtures to each unit with the level vials on top.
3. Locate a true vertical plate glass window or smooth surface and position the aimers three to five feet apart so that the split image targets can be located in the viewing ports.
4. Set the floor level dial to zero.
5. Rotate the thumb adjusting screws on each calibration fixture until the level vials on the fixtures are centered.
6. With both calibration level vials centered, turn the vertical dial knobs on each aimer until the aimer level vials are centered. If the aimer vertical dial pointers read between 1/2 up and 1/2 down, the aimers are within allowable vertical tolerance, Recalibrate the units if they are beyond these limits.

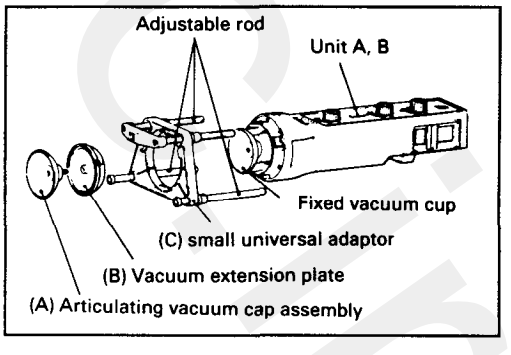
Vertical dial pointer reading (on each aimer)	1/2 up to 1/2 down

7. Adjust the horizontal dial knob on each aimer until the split image targets align. If the aimer horizontal dial pointers read between 1 left and 1 right, the aimers are within allowable tolerance limits. Recalibrate the units if beyond these limits.

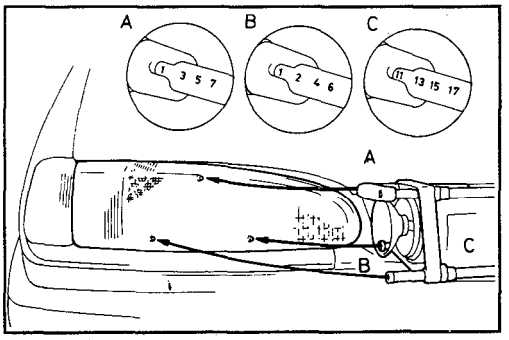
Horizontal dial pointer reading (on each aimer)	1 left to 1 right

Mounting aimers

1. Remove the calibration fixture from the each unit.
2. As shown in the figure, install the articulating vacuum cup assembly (A), vacuum extension plate (B) and small universal adaptor (C) to each unit.



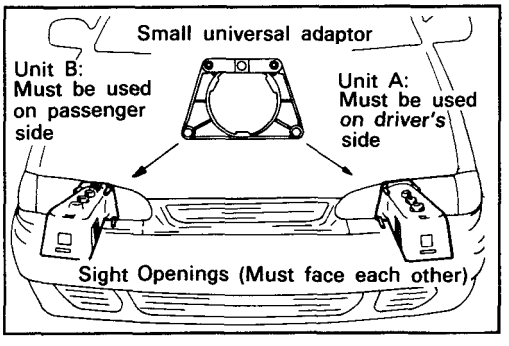
3. Make the length of the adjustable rod as shown in the figure.



4. Position the aimers on the head lamps pushing the piston handle forward, engaging the rubber suction cup. Immediately pull back the piston handle until it is locked in place.

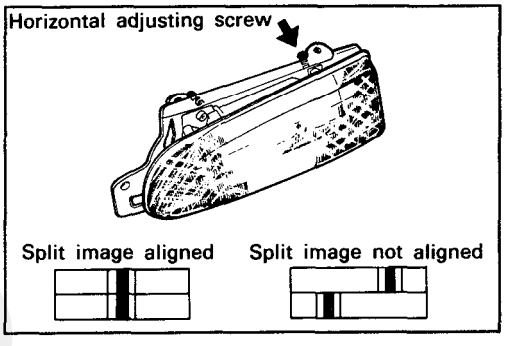
   NOTE

   Steel inserts are molded into position on the adaptor to insure accuracy. These inserts should be in contact with the three guide points on the lamps when the aimers are properly positioned.



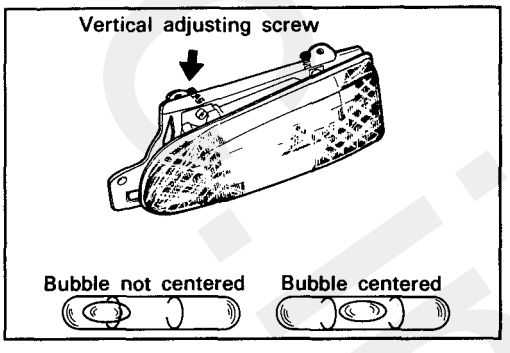
Horizontal adjustment

1. Set the horizontal dial to zero.
2. Check to see that the split image target lines are visible in the viewing port. If necessary, rotate each aimer slightly to locate the target.
3. Turn the horizontal screw on the side of the head lamp until the split image of target line appears in the mirrors as one solid line. To remove “backlash”, make the final adjustment by turning adjusting screw in a clockwise direction.
4. Repeat the last three steps on the apposite head lamp.



Vertical adjustment

1. The vertical dial should be set a zero. (For passenger vehicles, “0” setting is generally required. For special settings, consult local state laws.)
2. Turn the vertical adjusting screw until the level bubble is centered between the lines.
3. Repeat the last two steps on the opposite head lamp.
4. Re-check the target alignment on both aimers and readjust the horizontal aimer if necessary.
5. Remove the aimers by pressing ‘Vacuum release” button located on the piston handle.

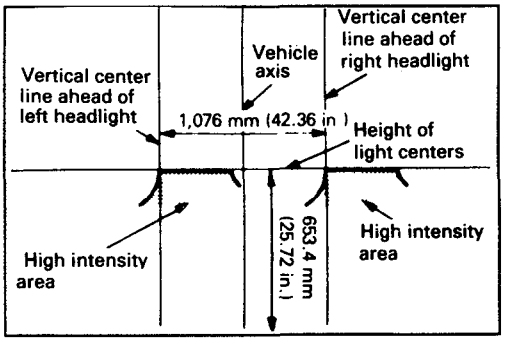


Aiming with screen

Head lamp aiming preparation

Place the vehicle on a level floor 7.6 m (25 feet) apart from the aiming screen or a light-colored wall. Four lines of adhesive tape are required on the screen or wall:

1. Position a vertical piece of tape so that it is aligned with the vehicle center line.
2. Position a horizontal piece of tape with reference to the center line of the head lamp.
3. Position a vertical piece of tape on the screen for vertical adjustment, adjust the side screw for horizontal adjustment.



Vertical center line ahead of left headlight
High intensity area
Vehicle axis
Vertical center line ahead of right headlight
Height of light centers
High intensity area

Visual head lamp adjustment

1. A properly aimed low beam will appear on the aiming screen 7.6m (25 feet) in front of the vehicle. The shaded area as shown in the illustration indicates a high intensity zone.
2. Adjust the low beam head lamps to match the low beam pattern of the right and left head lamps.

   NOTE

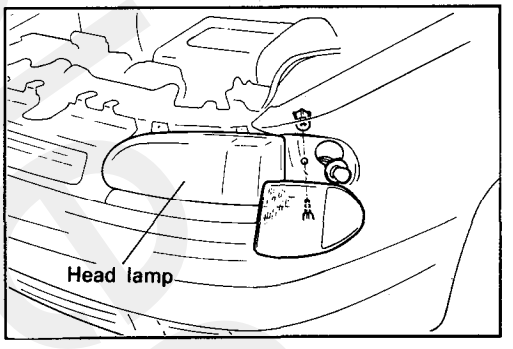
   If the visual head lamp adjustment at low beam is made, the adjustment at high beam is not necessary.

REPLACEMENT OF LAMPS

Head lamp/Front position lamp

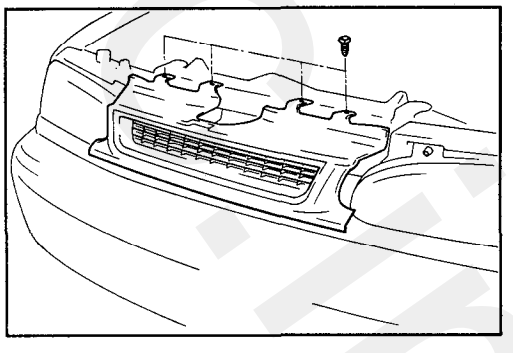
1. Disconnect the battery negative terminal.
2. After loosening the nut, pull out the front combination lamp (turn signal lamp incorporated)

Tightening torque of front combination lamp mounting nut	
	0.5-1.0 Nm (5-10 kg.cm, 0.4-0.7 lb.ft)



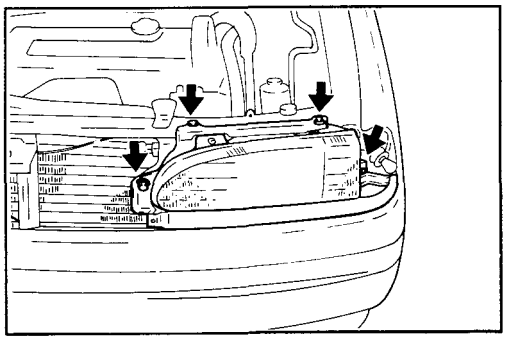
3. Remove the radiator grille.

Tightening torque of radiator grille mounting screw	
	0.5-1.0 Nm (5-10 kg.cm, 0.4-0.7 lb.ft)



4. Remove the headlamp assembly with transverse filler by loosening the 4 mounting bolts.
5. Disconnect the headlamp connector.
6. Disconnect the transverse filler from headlamp assembly.
7. Installation is the reverse order of removal.

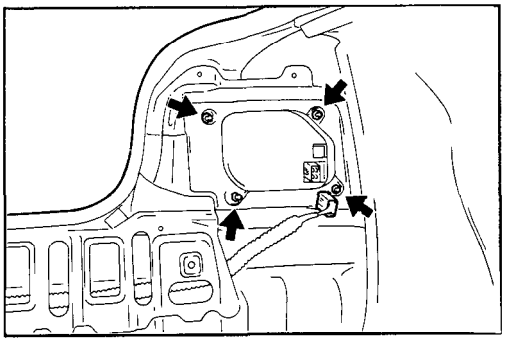
Tightening torque of headlamp mounting bolt
. . . . . 3-5 Nm (30-50 kg.cm, 2.2-3.6 lb.ft)



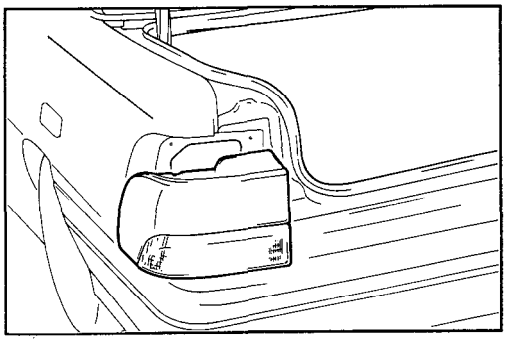
Outside rear combination lamp

1. Disconnect the negative terminal from the battery.
2. Open the trunk lid.
3. With rear luggage cover opened, loosen the 4 mounting nuts.

Tightening torque of rear combination (outside) lamp-mounting nut
. . . . . 2.0-25Nm (20-25 kg.cm, 1.5-1.8 lb.ft)

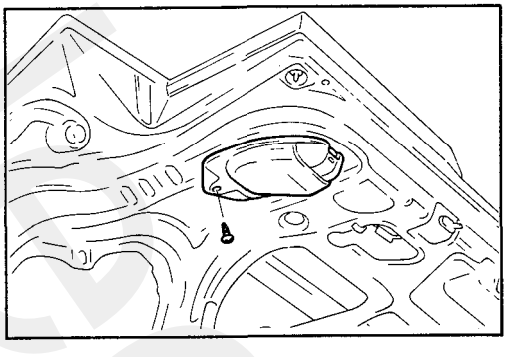


4. After disconnecting the connector, remove the lamp assembly.
5. Installation is the reverse order of removal.



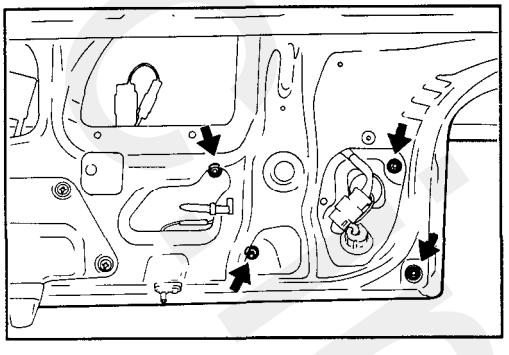
Inside rear combination lamp

1. Disconnect the negative terminal from the battery.
2. Remove the inside rear combination lamp cover.

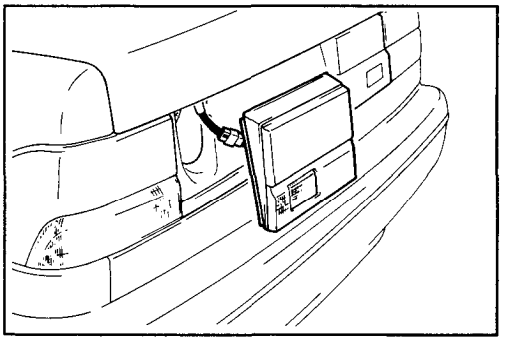


3. Remove the inside rear combination mounting nuts.

Tightening torque of rear combination (inside) lamp mounting nut
. . . . . 2.0-2.5 Nm (20-25 kg.cm, 1.5-1.8 lb.ft)

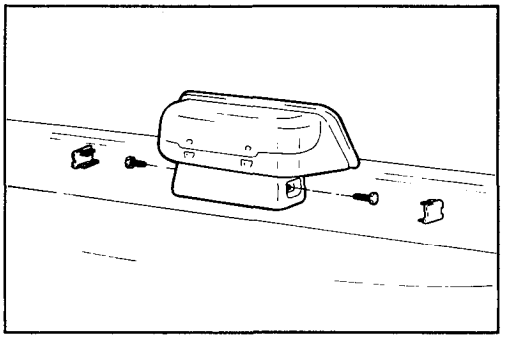


4. After-disconnecting the connector, remove the lamp assembly.
5. Installation is the reverse order of removel.

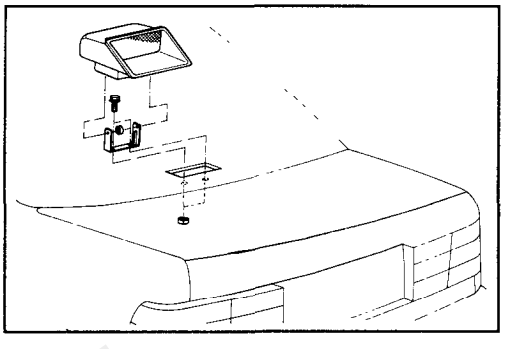


High Mounted Stop Lamp

1. Disconnect the battery negative terminal.
2. Using a screw driver, detach 2 blanking covers on both sides of the lamp.
3. Loosening the mounting screws.

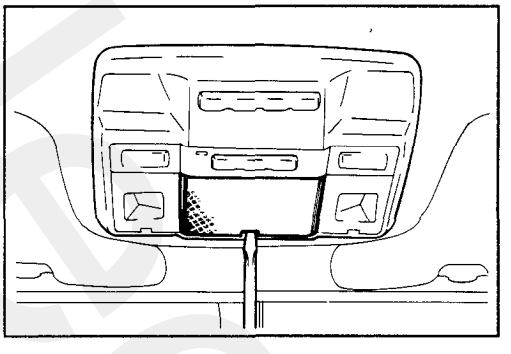


4. Remove the lamp assembly from the rear package tray trim
5. Disconnect the connector from harness.
6. Installation is the reverse order of removal.

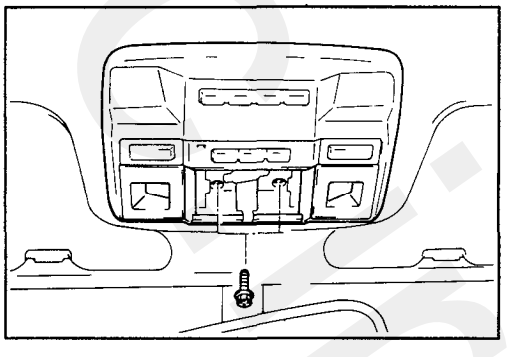


Overhead Console Lamp (Vehicles with sunroof)

1. Disconnect the battery negative terminal.
2. Using a screw driver, detach the overhead console lamp lens.

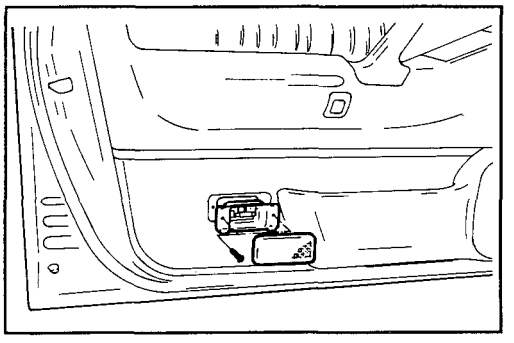


3. Remove the lamp assembly from the head lining by loosening 2 screws.
4. Disconnect the connector from the roof harness.
5. Installation is the reverse order of removal.



Door lamp

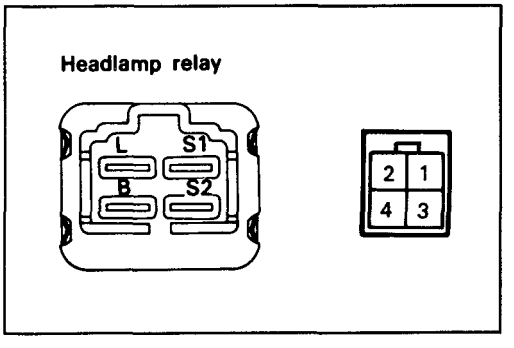
1. Disconnect the battery negative terminal.
2. Remove the door lamp while inserting the screw driver.
3. Disconnect the connector from door harness.
4. Installation is the reverse order of removal.



INSPECTION OF COMPONENTS

Relay

1. Remove the head lamp and taillamp relay from engine compartment relay box.
2. Check for continuity between the terminals.



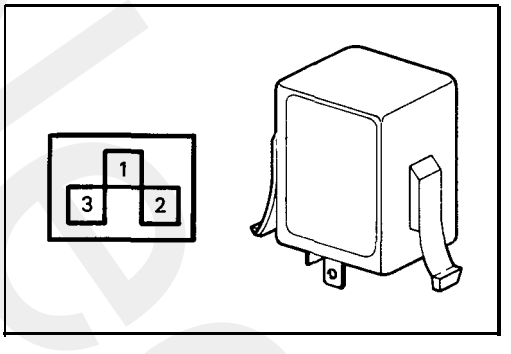
Condition \ Terminal	1	2	3	4
When de-energized				
When energized				

NOTE

1. ○—○ indicates that there is a continuity between the terminals.
2. ⊕—⊖ indicates power supply connection.

Flasher unit

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



3. Connect the two turn signal lamps parallel to each other to terminal 1 and 2, check that the bulbs turn on and off.

NOTE

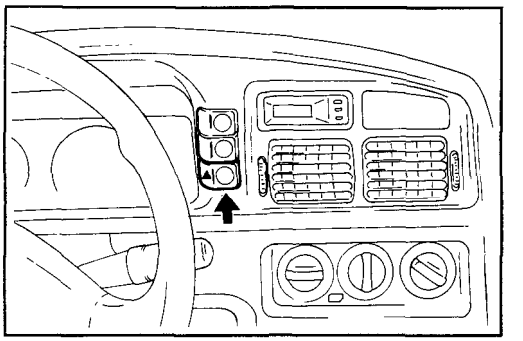
The turn signal lamps should flash 60 to 120 times per minute.

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 the operation is not as specified, replace the flasher unit.

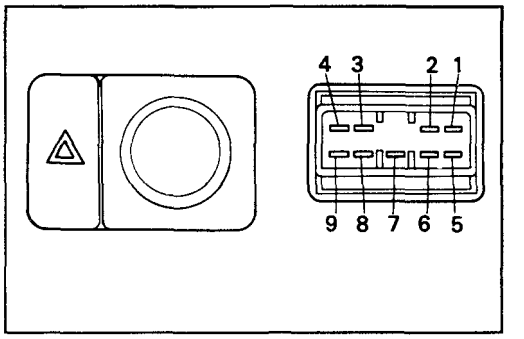
Hazard switch

1. Disconnect the battery negative terminal.
2. Remove the hazard switch from the cluster facia panel RH side.
3. Disconnect the connector from the instrument harness.



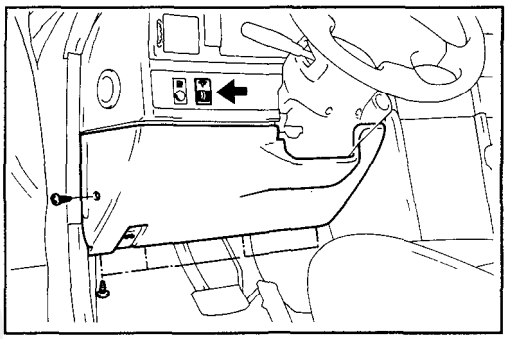
4. Operate the switch and check for continuity between terminals by using an ohmmeter.

Position \ Terminal	3	4	9	2	6	7	8	1	5
OFF	○	○	○					⊗	○
ON		○	○	○	○	○	○		

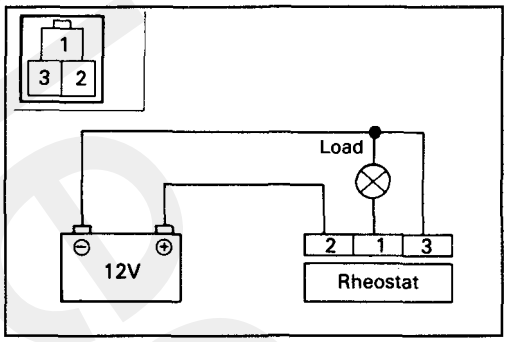


Rheostat

1. Disconnect the battery negative terminal.
2. Remove the rheostat from crash pad side panel.
3. Disconnect the connector from instrument harness.

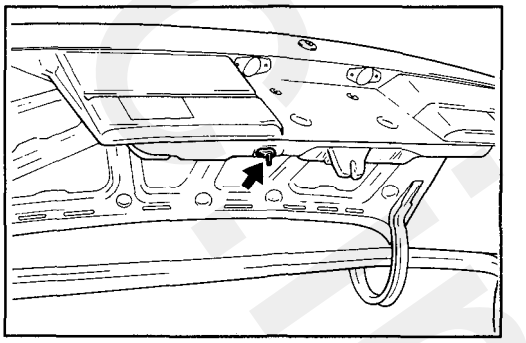


4. Check for intensity
   If the light intensity of the lamps changes smoothly without any flickering when the rheostat is turned, it can be assumed that the rheostat is functioning properly.



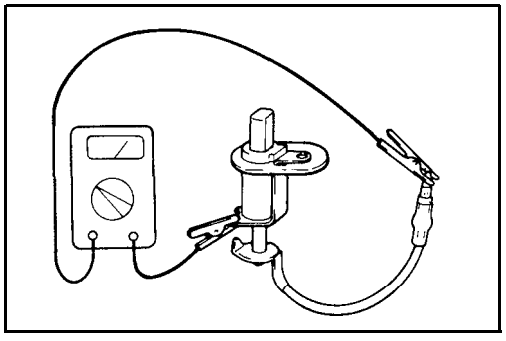
Luggage compartment lamp switch

1. Disconnect the battery negative terminal.
2. Remove the luggage compartment lamp switch from the trunk lid striker.
3. Disconnect the connector from rear harness.



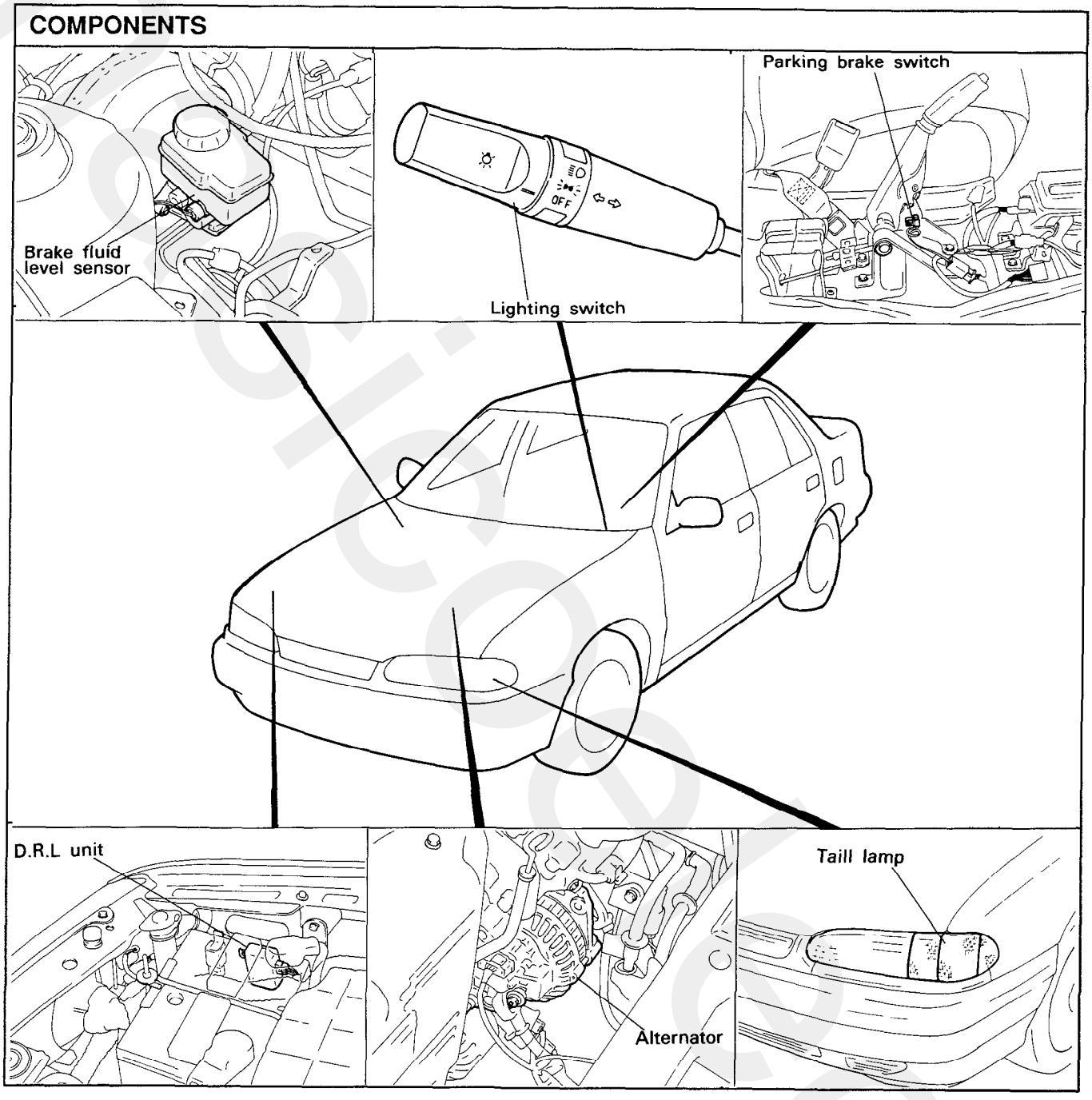
4. Check for continuity between terminal and body while pushing the rod.

Switch rod condition	Continuity
Pushed (OFF)	Non-conductive (∞ Ω)
Released (ON)	Conductive (0 Ω)



DAYTIME RUNNING LIGHT (DRL)

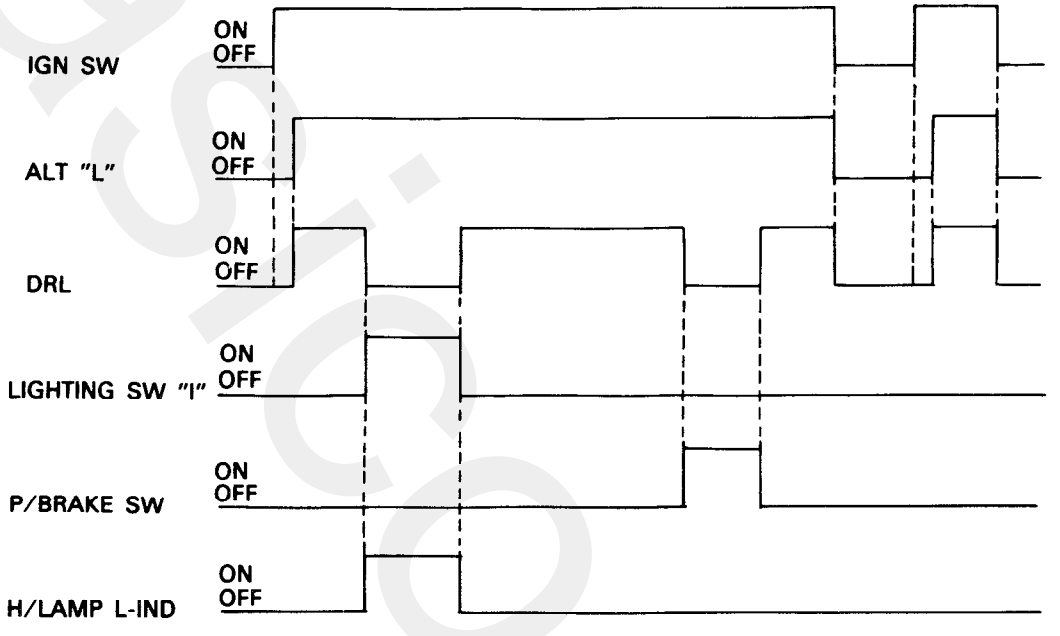
COMPONENTS



OPERATION CHECK

Check that the lights are normally operated with following timing chart.

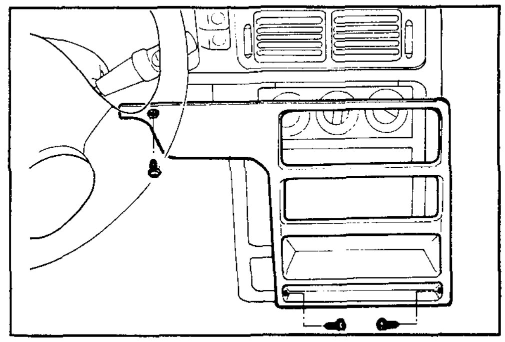
Timing chart



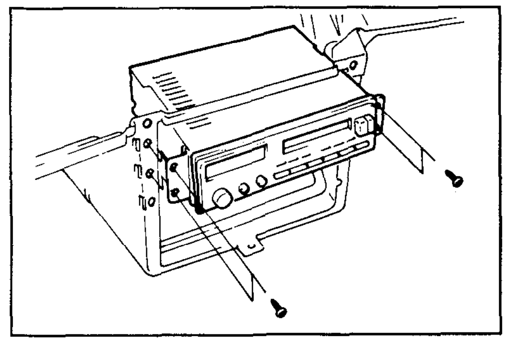
AUDIO

REMOVAL AND INSTALLATION

Radio unit

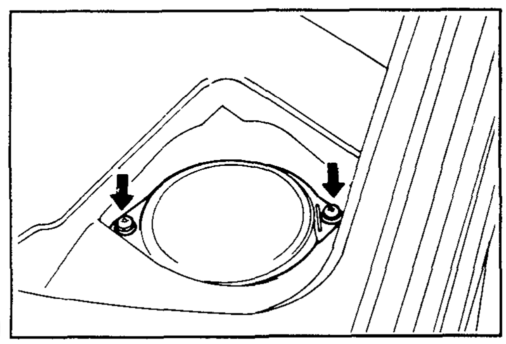


1. Remove the center lower crash pad facia panel.



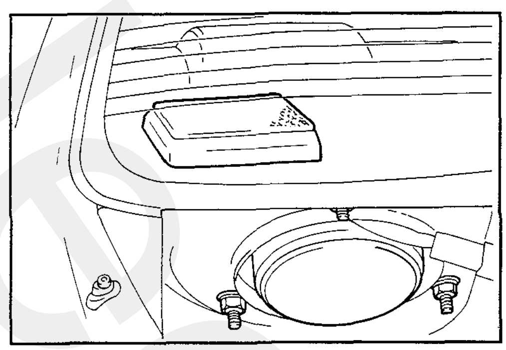
2. Remove the radio unit from the lower crash pad main assembly by loosening the mounting screws.
3. Disconnect the connector and antenna receptacle from main harness and antenna feed wire.
4. Installation is the reverse order of removal.

Front speaker



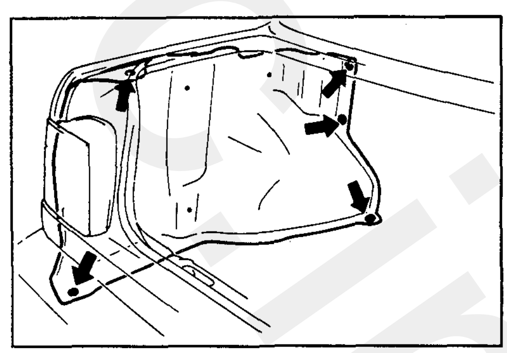
1. Detach the speaker grille.
2. Remove the speaker mounting bolts.
3. Remove the speaker assembly.
4. Installation is the reverse order of removal.

Rear speaker



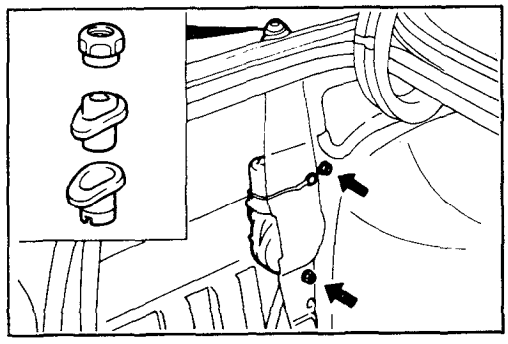
1. Remove the speaker mounting nuts.
2. Disconnect the wiring connector.
3. Replace in reverse order of the preceding steps.

Automatic antenna



1. Remove the luggage side trim.

2. Remove the antenna mounting nuts and tapping screw for ground.
3. Disconnect the wiring connector and antenna cable.
4. Remove the antenna assembly.
5. Replace in reverse order of the preceding steps.

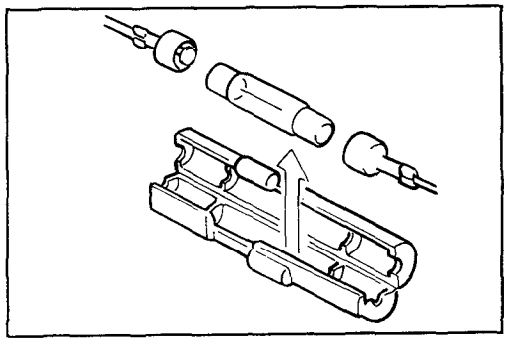


SERVICE INSTRUCTIONS

Fuse replacement

Be sure to use a specified fuse when replacing a in-line fuse, for radio unit.

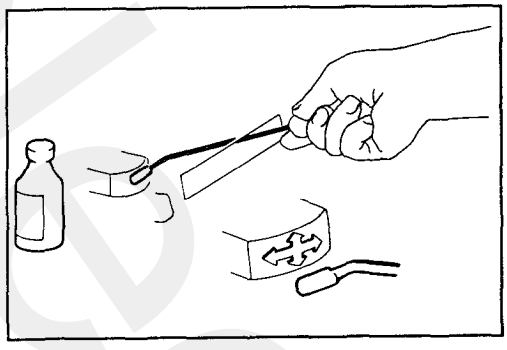
Radio unit grade	Fuse ratings
Base model	1A&3A
Others	3A & 5A



CAUTION
Substituting with a higher capacity fuse or connecting without a fuse may result in damage to the unit.

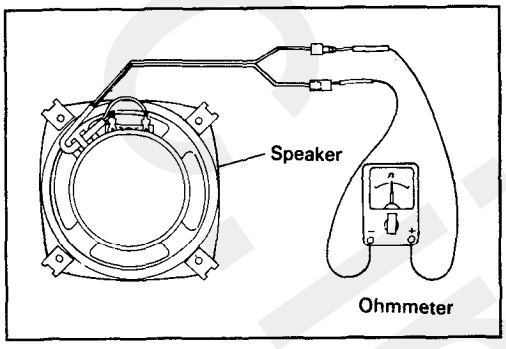
Tape head and capstan cleaning

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.



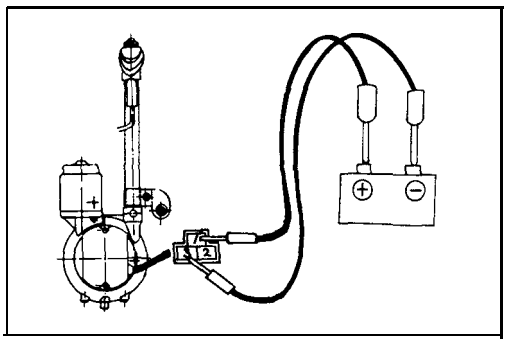
Speaker checking

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



Automatic antenna inspection

Connect the motor terminals directly to the battery and check that the motor operates smoothly. Next, reverse the polarity and check that the motor operates smoothly in the reverse direction.



WINDSHIELD WIPER AND WASHER

SPECIFICATIONS

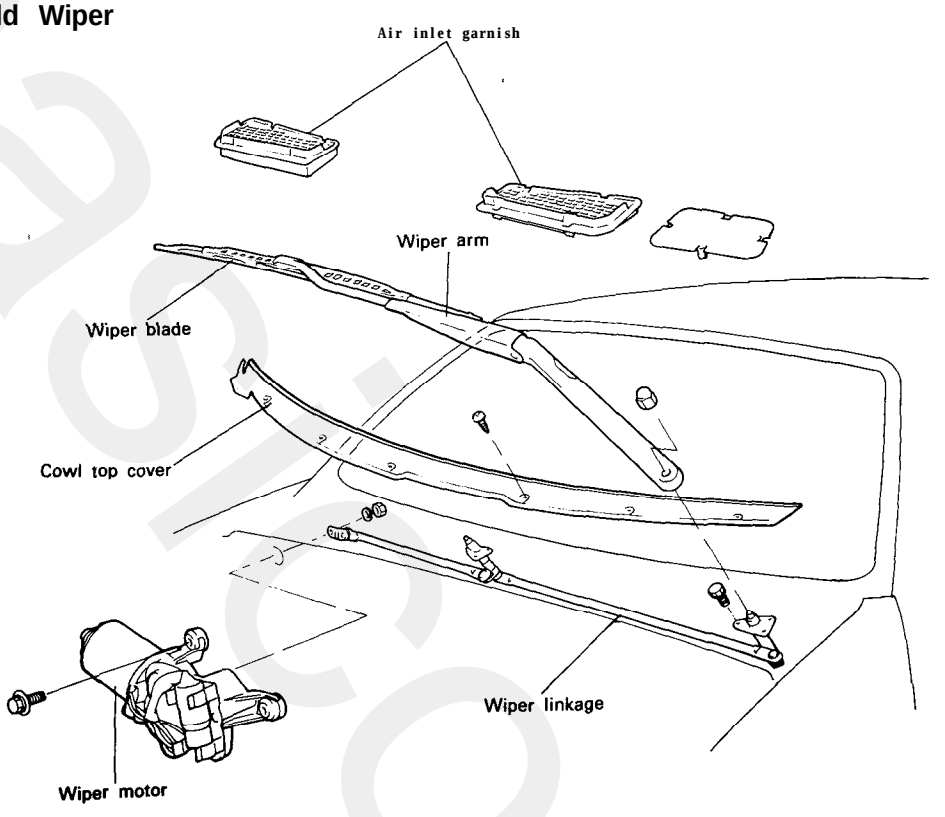
Item	Specification
Wiper motor	
10 kg.cm load speed/current	
Low	48-56 rpm/ Max. 3.5 A
High	64-78 rpm/ Max. 4.5 A
40 kg.cm load speed/current	
Low	40-48 rpm/ Max. 5.5 A
High	56-68 rpm/ Max. 7.0 A
Wiper blade	
Wiping angle	
Drivers/passenger's side	87.2°/100°
Wiper blade length	
Drivers/passenger's side	500 mm/456 mm
Windshield washer	
Motor type	DC ferrite magnet type
Pump type	Centrifugal type
Rated current	Max. 3.8 A
Flow rate	Min. 1320 cc/min.
Over load capacity (continuous operation)	
With water	Max. 60 sec.
Without water	Max. 20 sec.

TIGHTENING TORQUE

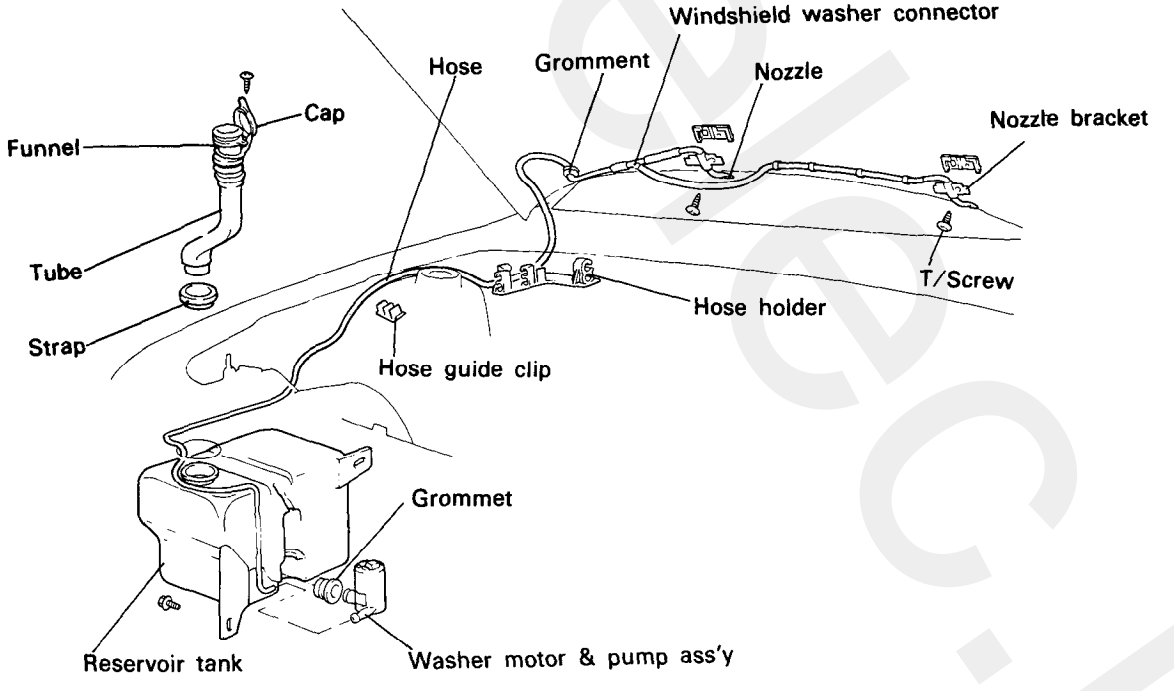
	Nm	kg.cm	lb.ft
Wiper motor mounting bolt	7-11	70-110	5.06-7.96
Wiper arm mounting nut	18-22	180-220	13.02-15.91
Wiper linkage mounting bolt	4-6	40-60	2.89-4.34

COMPONENTS

Windshield Wiper



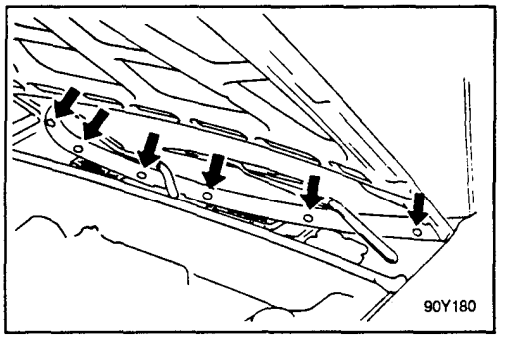
Windshield Washer



SERVICE POINT OF REMOVAL

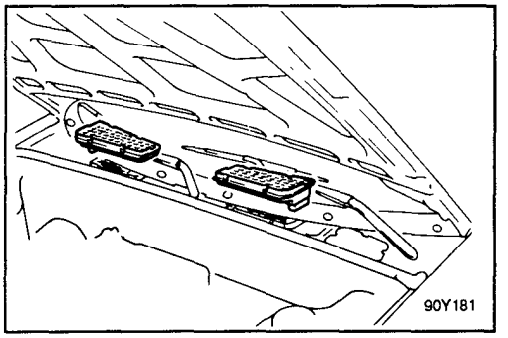
Front deck panel

Remove the mounting screws and pry up the front deck panel and remove it.



Air inlet cover

Remove the air inlet cover while pressing the tab.

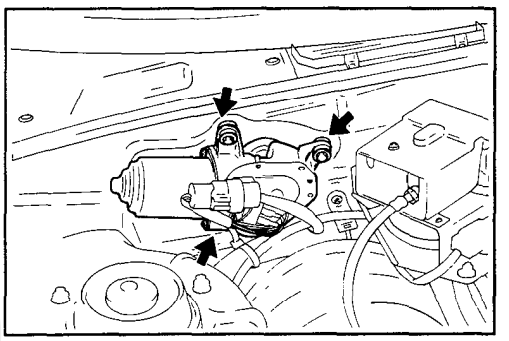


Wiper motor

1. Loosen the wiper motor assembly mounting bolts, and then remove the wiper motor assembly.
2. Disconnect the wiper motor from linkage and the motor assembly, and then remove the linkage.

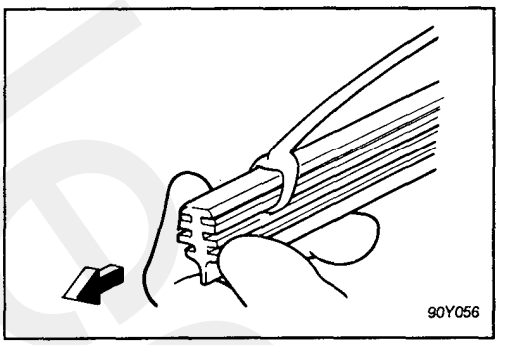
CAUTION

Because the installation angle of the crank arm and the motor has been set, do not remove them unless it is necessary to do so. If they should be removed, remove them only after marking their mounting positions.



Wiper, blade

1. Pull out the rubber and backing blade from the stopper side.
2. Remove the backing blade from the rubber.

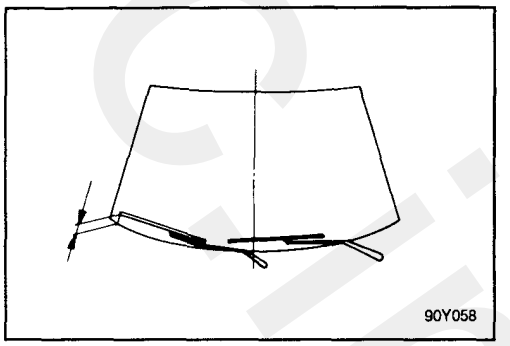


SERVICE POINT OF INSTALLATION

Wiper arm

Mount the wiper arms onto the pivot shaft so that the stopping position of the wiper blades is in agreement with the standard specifications.

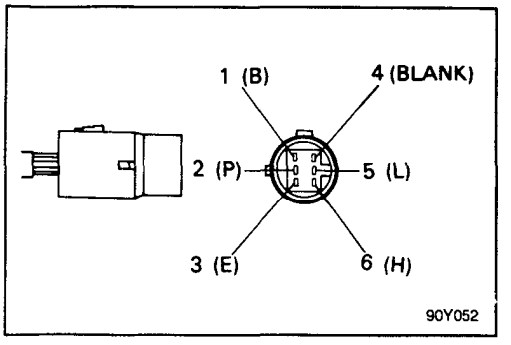
Standard specifications (distance between the blade tip and the front deck panel) : 30 ± 3 mm (1.2 ± 0.12 in.)



INSPECTION OF COMPONENTS

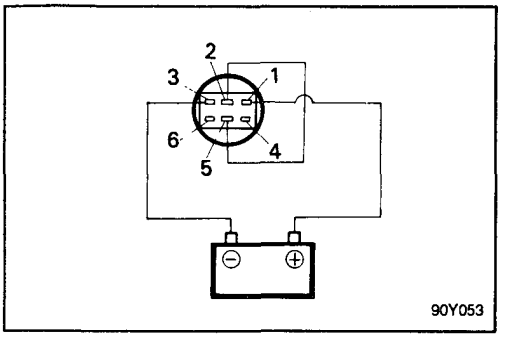
Wiper motor speed operation

1. Remove the connector from the wiper motor.
2. Attach the positive (+) lead from the battery to terminal 1 and the negative (-) lead to terminal 5.
3. Check that the motor operates at low speed.
4. Connect the positive (+) lead from the battery to terminal 1 and the negative (-) lead to terminal 6.
5. Check that the motor operates at high speed.



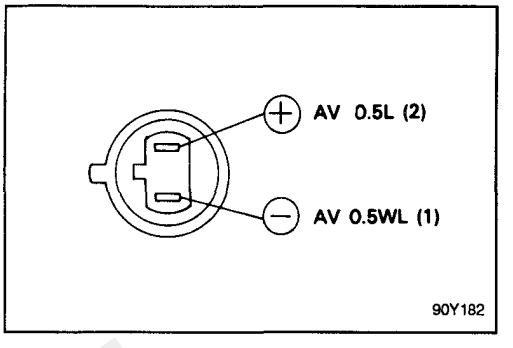
Wiper motor automatic stop operation

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



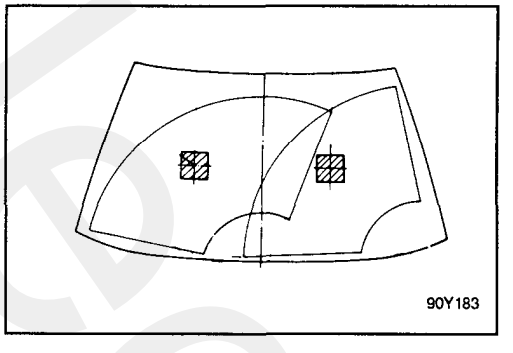
Washer motor operation

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



Washer fluid contact point

1. Check the washer fluid contact point.
2. Adjust the washer fluid contact point by using a metal wire to move the washer nozzle ball.
3. If the amount of washer fluid sprayed is too small, check for clogged, bent or crushed washer tube.



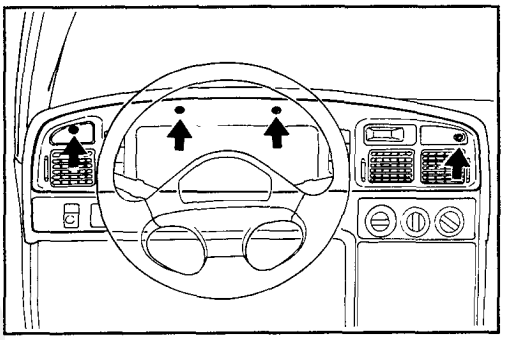
CLOCK AND CIGARETTE LIGHTER

SPECIFICATIONS

Item	Specification
Clock	
Time accuracy	Within ± 2 sec/day (at DC 13V)
Current consumption	Max. 150 mA (at DC 13V)
Cigarette lighter	
Maximum input	120 W
Return time	13 ± 5 sec (after pushing the lighter in)
Break temperature of thermal fuse	138-151°C (278.4-303.4°F)

REPLACEMENT OF CLOCK

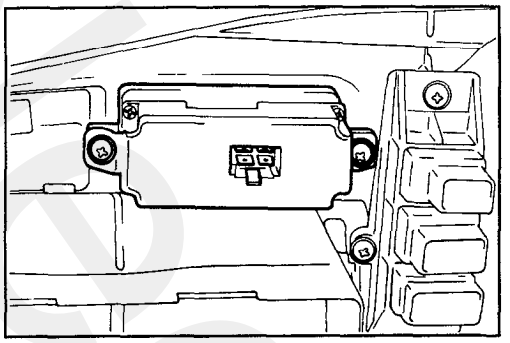
1. Remove the 4 screws and pull out the cluster.



2. Disconnect the wiring connector.
3. Remove the digital clock assembly by unscrewing the 2 screws.

CAUTION

The clock is composed of delicate electronic components containing a crystal oscillator, transistor, etc. and should be handled with care. Specialized technical skill is needed to repair the internal mechanism of this clock. Do not attempt to disassemble it. If the clock itself is malfunctioning, replace the entire assembly.



INSPECTION OF CIGARETTE LIGHTER

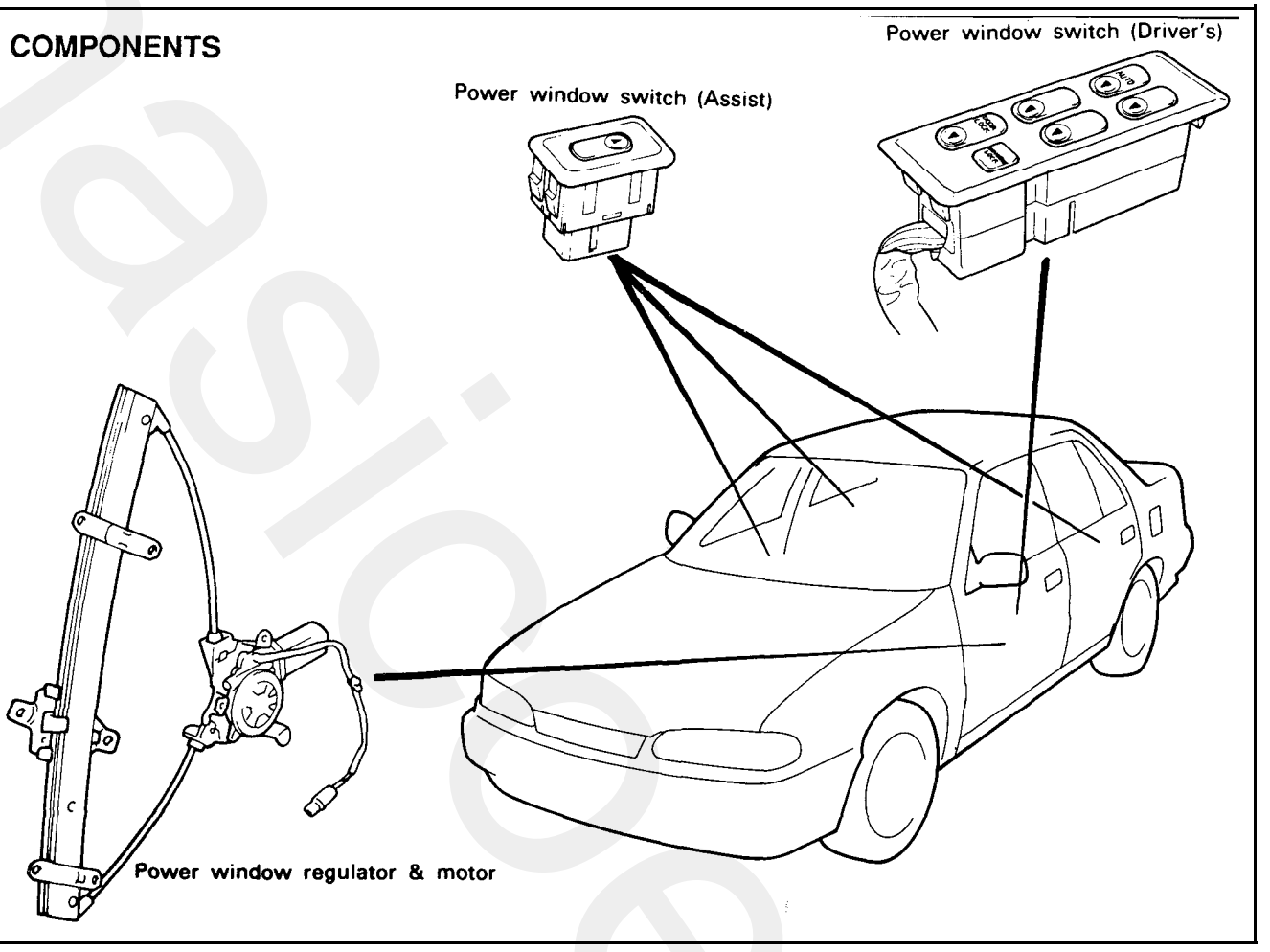
1. Take out the plug.
2. Examine the element spot connection for remnants of tobacco and other materials.
3. Using an ohmmeter, check for the continuity of the element.

Cautions for use of the cigarette lighter socket as auxiliary power.

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

POWER WINDOW

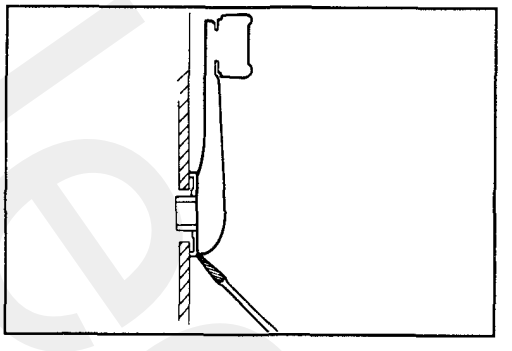
COMPONENTS



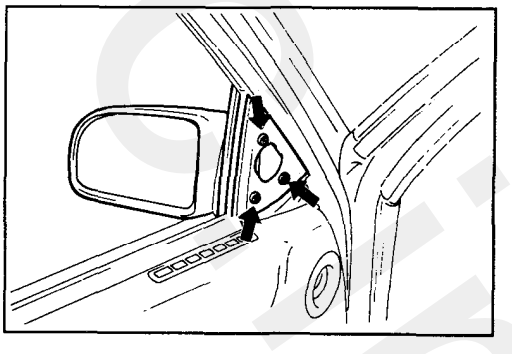
REPLACEMENT OF POWER WINDOW MOTOR

Removal

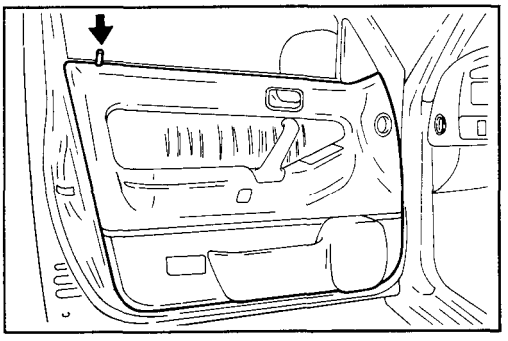
1. Using a screwdriver, remove the clip shown in the illustration to remove the regulator handle. (Manual type only)



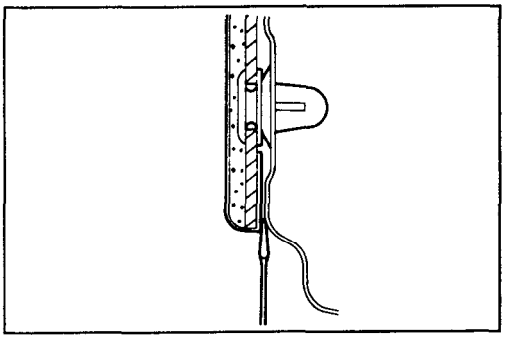
2. Remove the quadrant inner cover.
3. Remove the rearview mirror mounting screws and then remove the rear view mirror.
   Disconnect the remote control connector. (Electric type only)



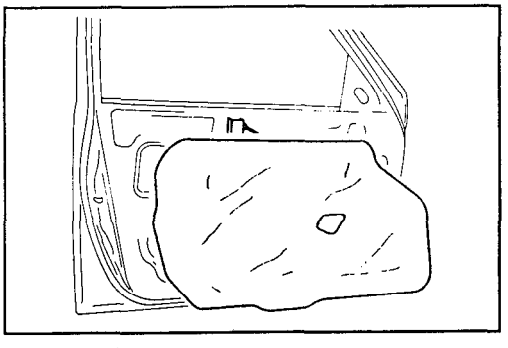
4. Remove the safety lock knob.
   Remove the screws from the inside handle bezel and arm rest



5. Insert a screwdriver between the trim fasteners and door panel to pry it loose.
   Disconnect the connectors. (Power Window Motor, Power Window Main Switch, Door Lock Actuator, Outside Mirror and Trunk Lid Opener Switch)



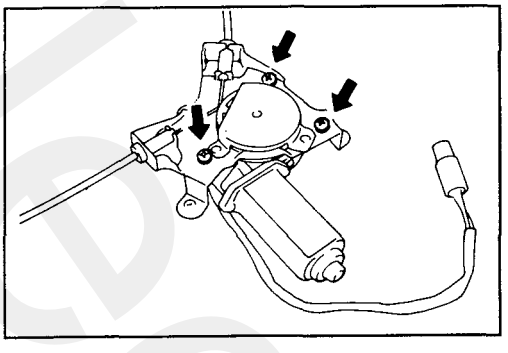
6. Remove the door trim seal.



7. Detach the regulator assembly.
8. Disconnect the power window motor from the regulator assembly.

   CAUTION

   When loosening the mounting screws of the regulator and the motor assembly, the compressed force of the regulator spring may cause the regulator arm to spring up.

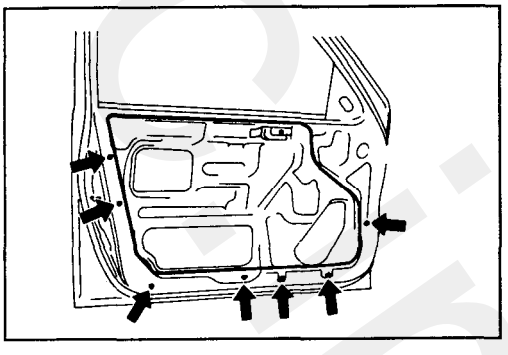


Installation

Installation is the reverse order of removal.

CAUTION

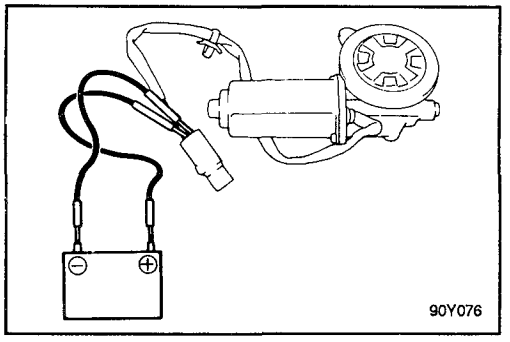
When installing the door trim seal, butyl tape should not be placed over door trim fastener mounting area.



INSPECTION OF COMPONENTS

Power window regulator motor

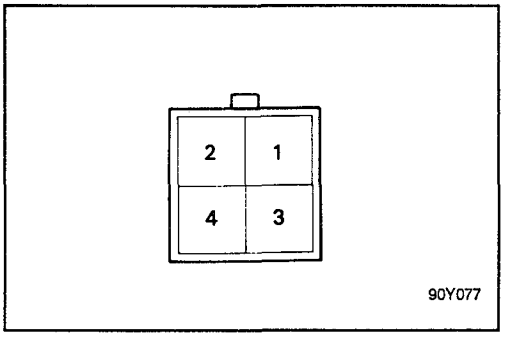
Connect the motor terminals directly to the battery and check that the motor operates smoothly. Next, reverse the polarity and check that the motor operates smoothly in the reverse direction. If the operation is abnormal, replace the motor.



Power window relay

Check for continuity between the terminals 2 and 4.

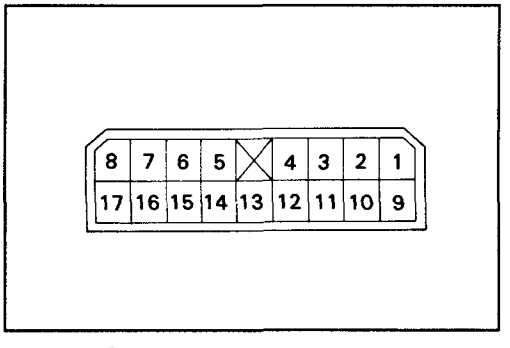
While power is not supplied : No continuity
While power is supplied : Continuity



Power window main switch

1. Disconnect the power window main switch.
2. Operate the switch, and check for continuity between the terminals.
3. If continuity is not as specified, replace the switch.

Position \ Terminal		3	4	5	6	7	11	12	14	15	16
FRT, LH	UP	○		○			○				○
	OFF			○			○				○
	DOWN	○		○							○
FRT, RH	UP	○			○		○			○	
	OFF				○		○			○	
	DOWN	○		○			○			○	
RR, LH	UP	○				○	○		○		
	OFF					○	○		○		
	DOWN	○				○			○		
RR, RH	UP	○	○				○	○			
	OFF		○				○	○			
	DOWN	○	○				○	○			



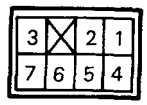
Window lock switch

Position \ Terminal	1	3
Normal	○	○
Lock		

Power window sub-switch

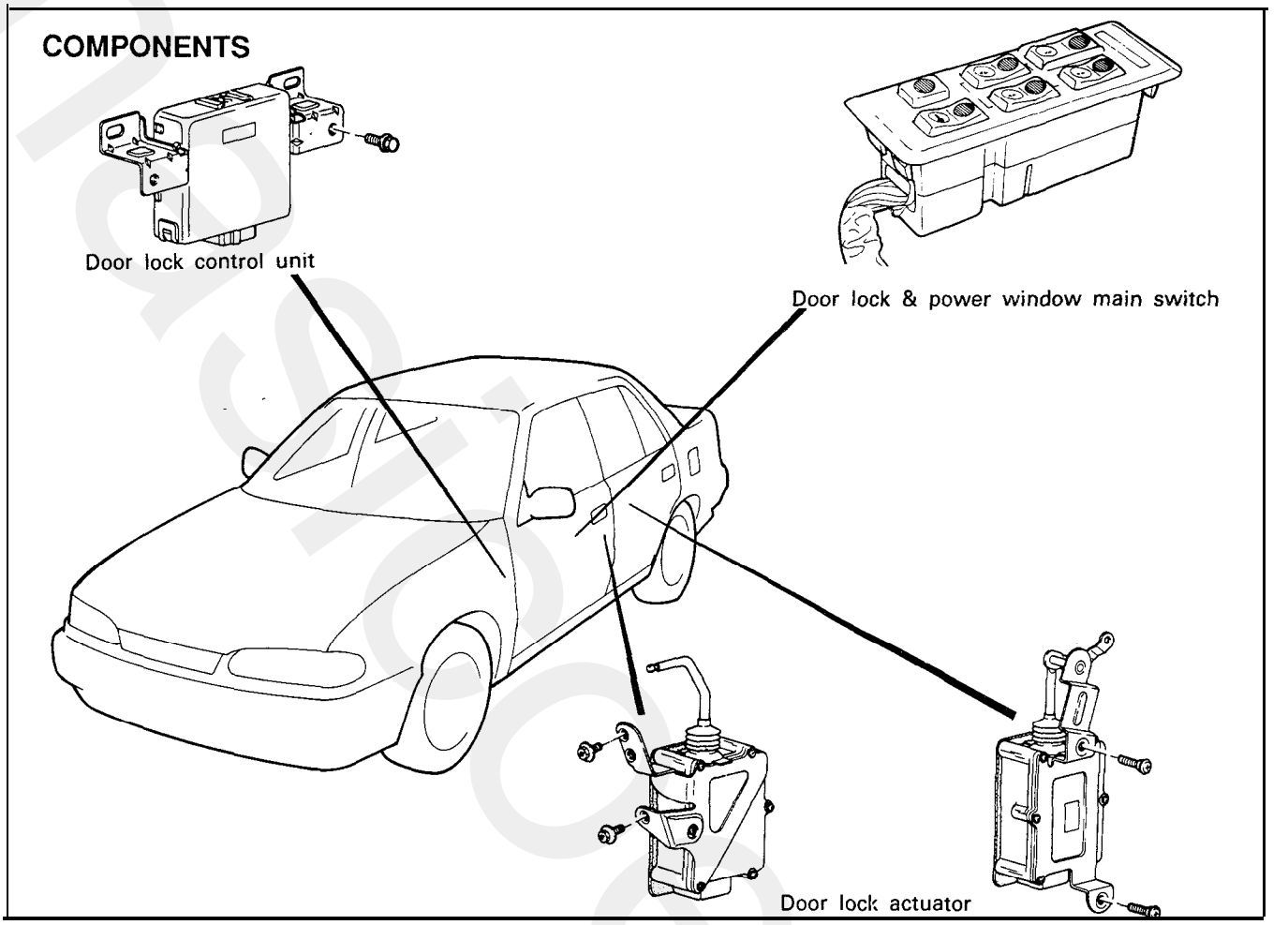
1. Operate the switch, and check for the continuity between the terminals.
2. If continuity is not as specified, replace the switch.

Position \ Terminal	1	2	4	5	6	3	7
UP		○—○		○—○			
OFF	○—○			○—○		○—⊗—○	
DOWN	○—○		○—○				



POWER DOOR LOCK

COMPONENTS

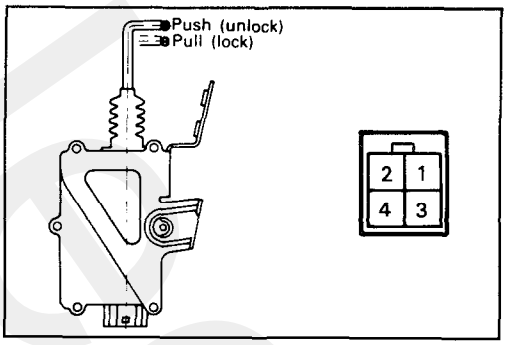


INSPECTION OF COMPONENTS

Door lock control actuator

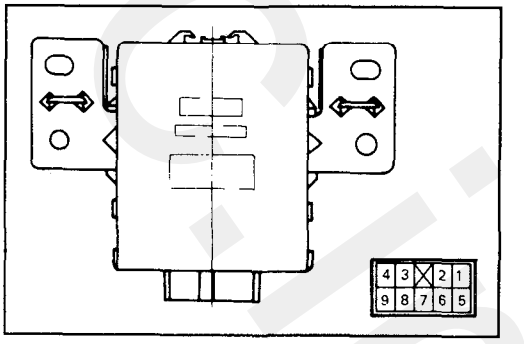
1. Disconnect the actuator connector from the wiring harness.
2. Apply battery voltage (DC 12 V) to each terminal as shown in the table below and confirm that the actuator makes corresponding operation.

Terminal / Position	1	2
Push (Unlock)	⊕	⊖
Pull (Lock)	⊖	⊕



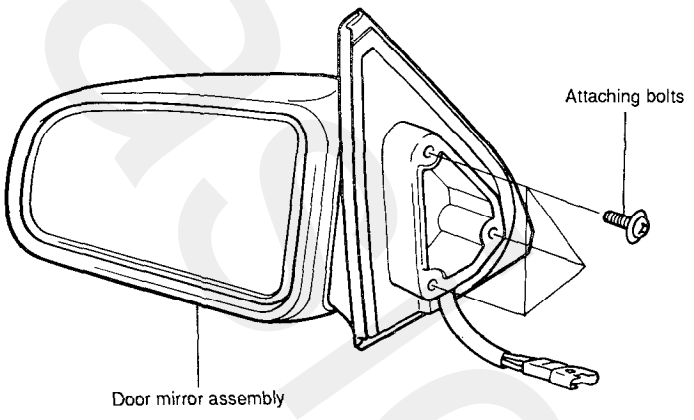
Door lock control relay

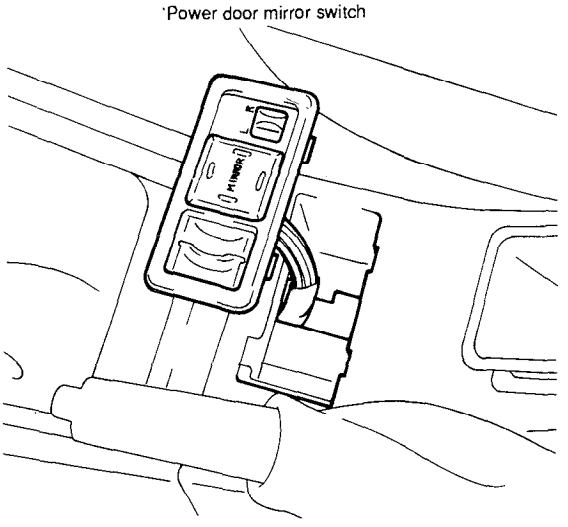
1. After tracing the problem to the control relay, replace it with a new one. Check for proper operation.
2. If system operates properly, the original control relay is faulty.



POWER DOOR MIIRROR

COMPONENTS



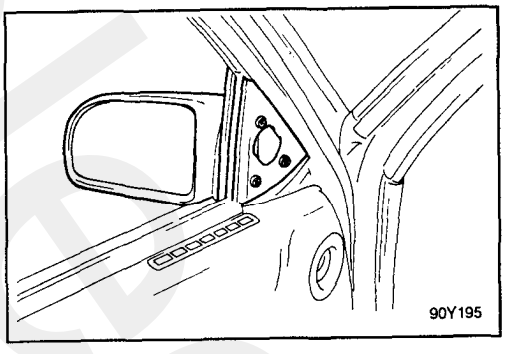


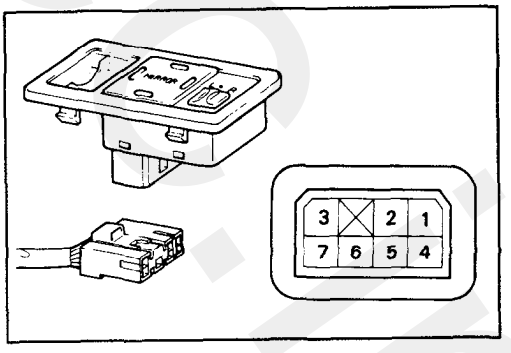
INSPECTION OF COMPONENTS

Mirror switch

1. Remove the outside mirror switch on the rear console.
2. Disconnect the connector from the harness.
3. Operate the switch and check for continuity between the terminals. If continuity is not as specified, replace the mirror switch.

Class	Terminal / Direction	1	2	3	4	5	6	7
LH	UP		○		○			○
	DOWN	○			○	○		○
	OFF							
	LEFT			○	○	○		○
	RIGHT			○	○	○		○
RH	UP	○			○	○		○
	DOWN	○			○	○		○
	OFF							
	LEFT				○		○	
	RIGHT				○	○		○

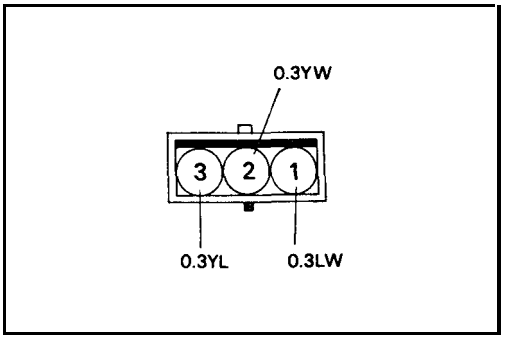




Mirror actuator

Apply battery voltage to each terminal as shown in the table and confirm that the mirror operates properly.

Direction \ Terminal	1	2	3
UP	⊕		⊖
DOWN	⊖		⊕
LEFT		⊕	⊖
RIGHT		⊖	⊕



HORN, FUEL FILLER DOOR AND TRUNK LID OPENER

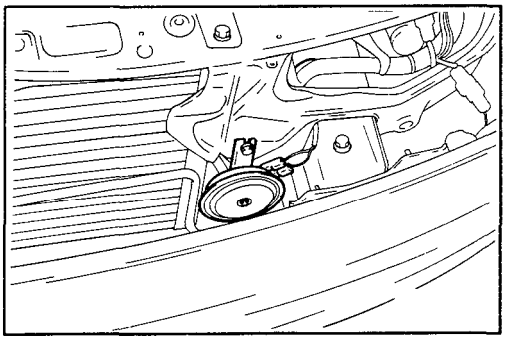
SPECIFICATIONS

Item	Specification
Horn	
Type	Plate type
Current consumption	Max. 3.5 A (at DC 12V)
Sound level	105 ± 5 dB (at DC 12V, 2m)
Basic frequency	
Low pitch	360 ± 20 Hz (at DC 12V)
High pitch	420 ± 20 Hz (at DC 12V)
Fuel filler door opener	
Exciting current	Max. 15A (at DC 12V)
Trunk lid opener	
Current consumption	Max. 12A (at DC 12V)
Circuit breaker	
Trip time	4-9 sec.
Recovery time	5 sec

HORN

Removal and installation

1. Disconnect the negative cable of the battery.
2. Remove the horn attaching bolt (on the radiator support panel).
3. Disconnect the horn connector from engine harness.
4. Remove the horn.

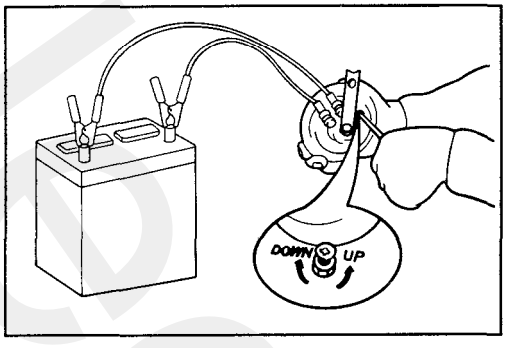


Sound level adjustment

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

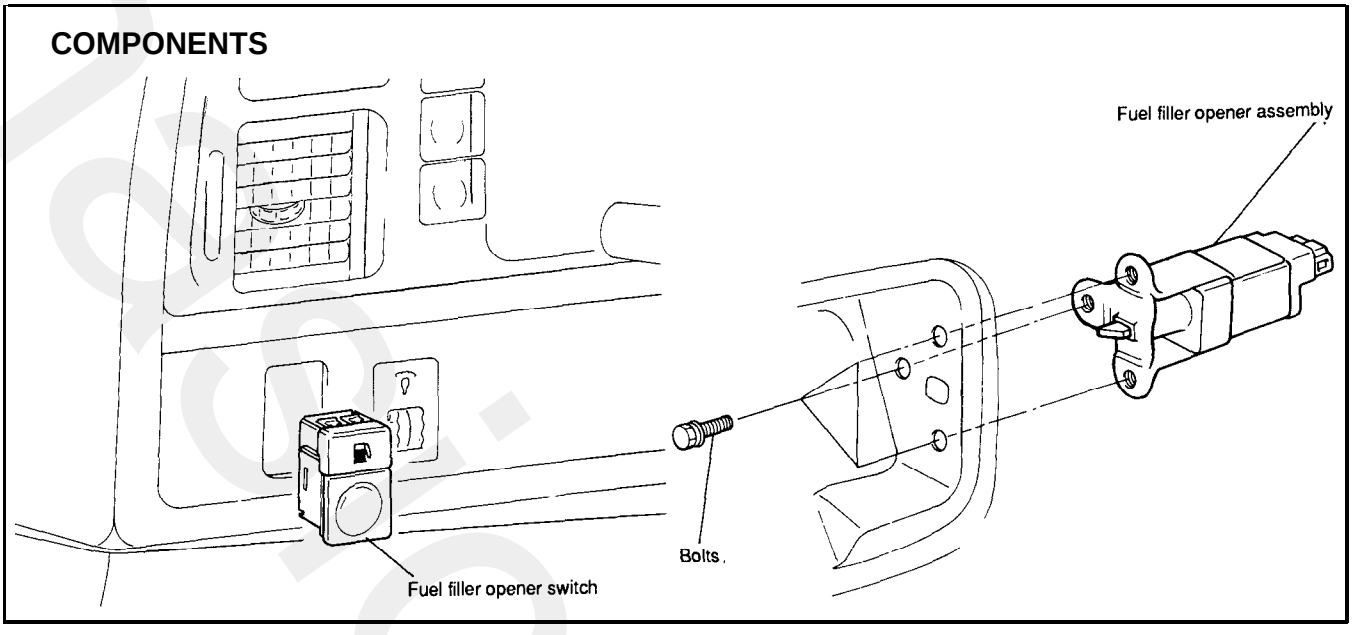
CAUTION

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



FUEL FILLER DOOR OPENER

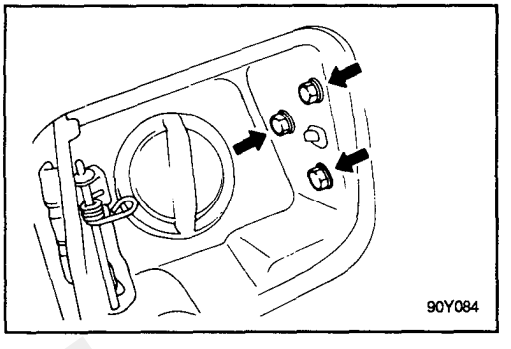
COMPONENTS



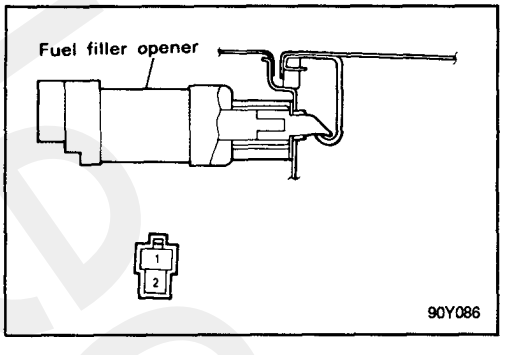
INSPECTION OF COMPONENTS

Fuel filler door opener

1. Remove the luggage compartment side trim.
2. Open the fuel filler door.
3. Loosen the three bolts securing the fuel filler door opener and then disconnect the wiring connector.



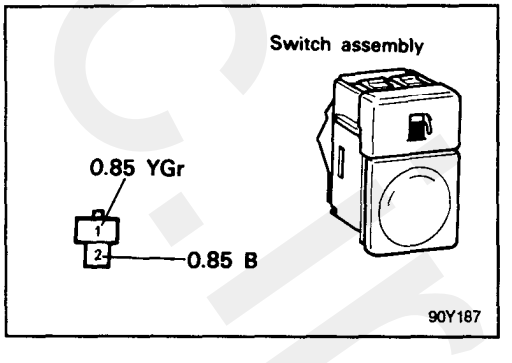
4. Check for continuity between terminals 1 and 2. If there is no continuity, replace the fuel filler door opener.



Fuel filler door opener switch

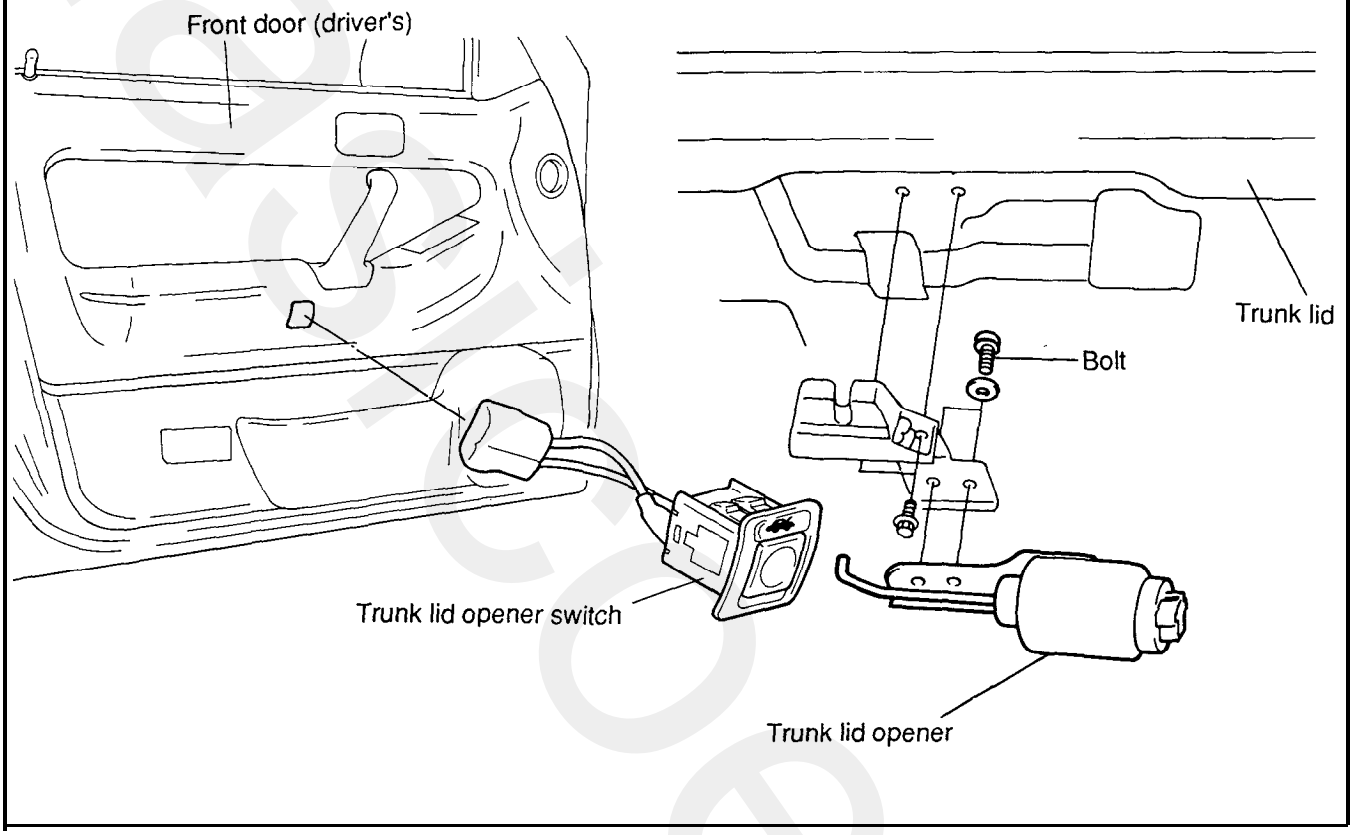
Operate the switch, and check for continuity between the terminals. If continuity is not as specified, replace the switch.

Terminal / Position	1	2
ON	o——o	
OFF		



TRUNK LID OPENER

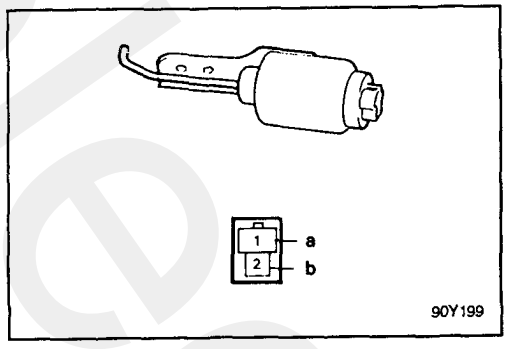
COMPONENTS



INSPECTION OF COMPONENTS

Trunk lid opener

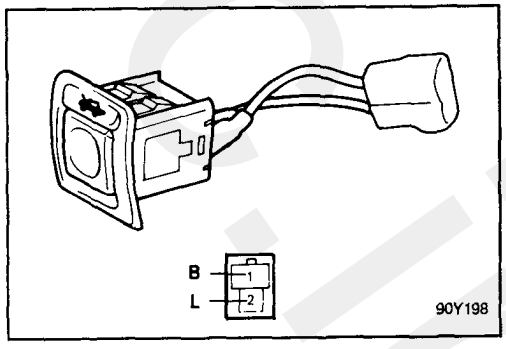
1. Remove the trunk lid opener and check continuity between the terminal “a” and “b”.
2. If there is no continuity, replace the opener assembly.



Trunk lid opener switch

Remove the trunk lid opener switch and check continuity between the terminals.

Terminal / Position	1	2
ON	○———	———○
OFF		



SUN ROOF

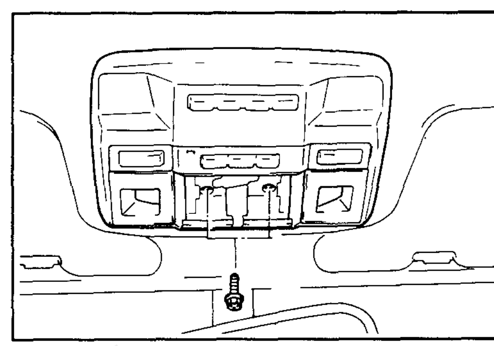
SPECIFICATIONS

Item	Specification
Sun roof motor	
No load speed/current	Max. 180 rpm/Max. 6 A
Lock current	Max. 35 A
Sun roof relay	
Rated load	Motor 6 A/Lock 15 A
Exciting current	Max. 250 mA
Sun roof motor switch	
Type of operation	Push on and self-return
Rated load	1 A

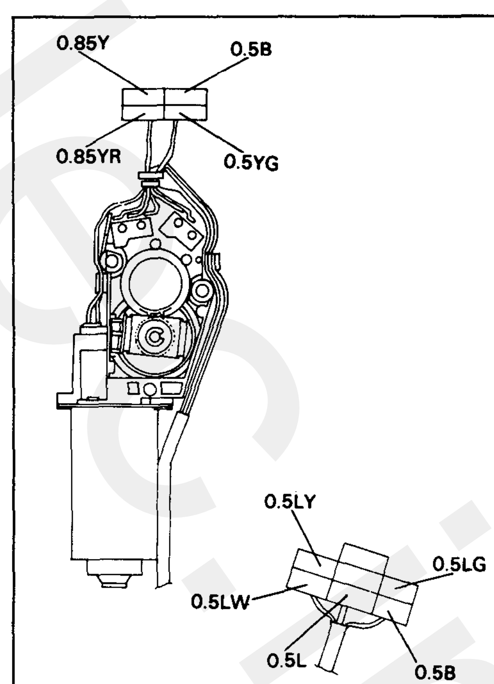
INSPECTION OF COMPONENTS

Sun roof motor

1. Remove the overhead console lamp.
2. Disconnect the motor connector from sun roof harness.



3. Apply DC 12V to the 0.85 YR wire and ground the 0.85Y wire.
4. Check that the motor turns in the direction to tilt up and closed position,
5. Reverse the connections and check that the motor turns from open, to closed, to tilt up position.

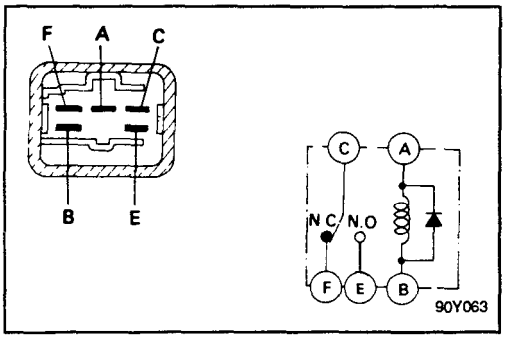


Sun roof relay

Check for continuity between the terminals.

Condition \ Terminal	1	2	3	4	5
Battery voltage not applied		○——○			○——○
Battery voltage applied between terminals		⊕ - - - ⊖			

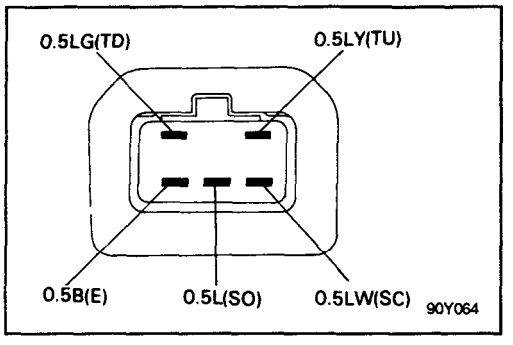
⊕— —⊖ indicates battery connection.



Sun roof switch

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

Condition \ Terminal		1	2	3	4	5
Off						
Slide switch	Open				○——○	○——○
	Close			○——○		○——○
Tilt switch	Open	○——○				○——○
	Close		○——○			○——○

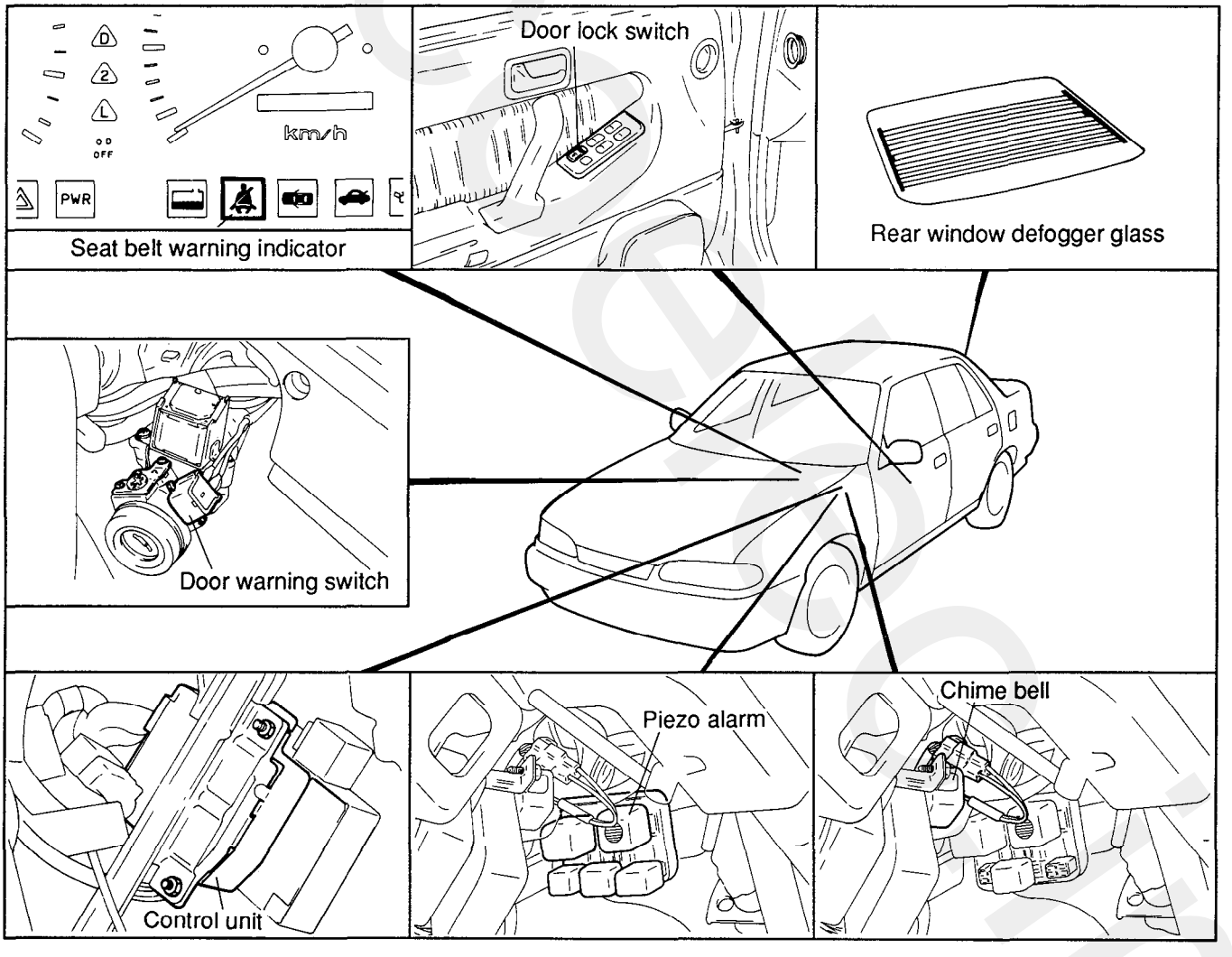


E.T.A.C.S. (Electronic Time and Alarm Control System)

SPECIFICATIONS

ETACS unit	
Rated load	
Variable intermittent wiper	DC 12V, 6A (Inductive load)
Rear defogger timer	DC 12V, 200 mA (Inductive load)
Seat belt warning	DC 12V, 1.2W (Lamp load)
Key illumination & delay out room lamp	DC 12V, 1.2W, 10W (Lamp load)
Door lock actuator (lock, unlock)	DC 12V, 200 mA (Inductive load)
Chime bell	DC 13.5V, 350 mA (inductive load)
Leakage current	Max. 4 mA (at 12.8V)
Rear window defogger glass	
Power consumption	**185** ± 10 W (Per sheet)

COMPONENTS

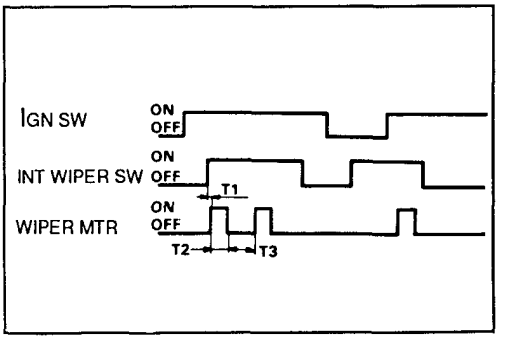


OPERATION CHECK OF COMPONENTS

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

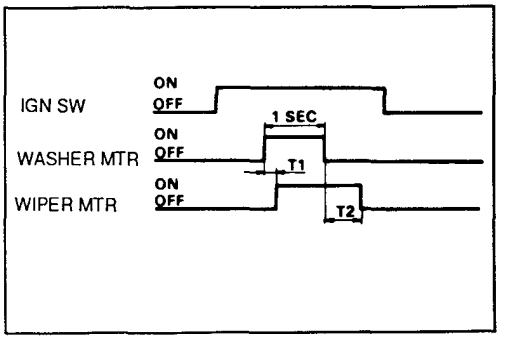
Variable intermittent wiper

1. Time specification
   T_1: Max. 0.5 sec.
   T_2: Time of wiper motor 1 rotation.
   T_3: 1.5 ± 0.7 sec. (VR=0kΩ) ~ 10.5 ± 3 sec. (VR=50 kΩ)
2. Variable resistance (VR) : 0I ~ 50 kΩ



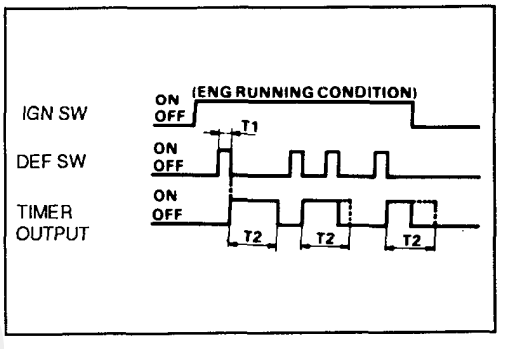
Washer

1. Time specification
   T_1: 0.4 ~ 1.2 sec
   T_2: 2.0 ~ 4.7 sec
2. This function should be operated preferentially even though the variable intermittent wiper is operating.



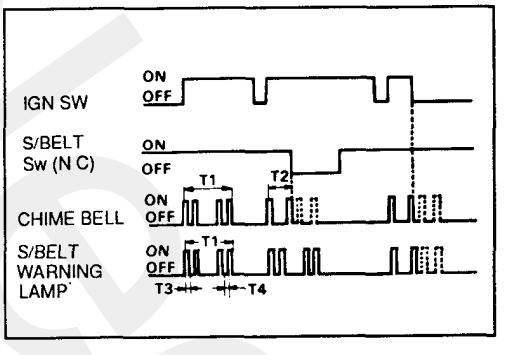
Rear window defogger

1. Time specification
   T_1: Min. 0.5 sec.
   T_2: 10 ± 3 min.



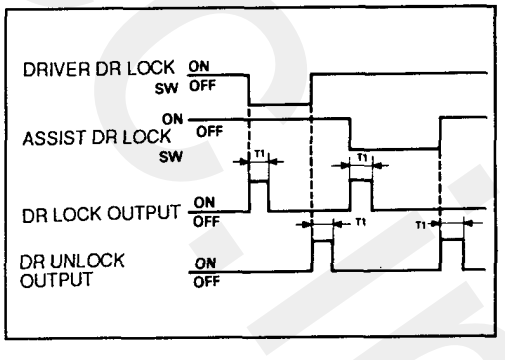
Seat belt warning

1. Time specification
   T_1: 6 ± sec.
   T_2: 6 ± 1 sec.
   T_3, T_4: 0.3 ± 0.1 sec.



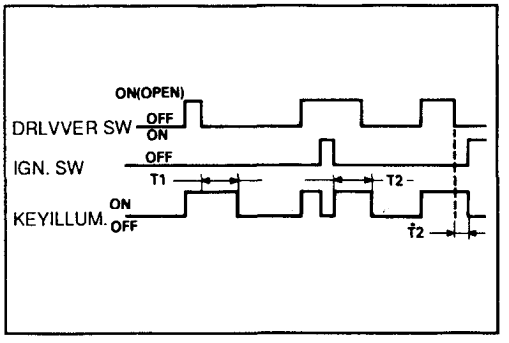
Door lock actuator

1. Time specification
   T_1: 0.5 sec.



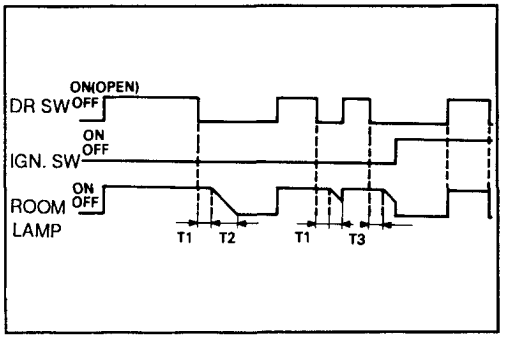
Ignition key hole illumination

1. Time specification
   T 1 : 6 sec.
   T 2 : 016 sec.



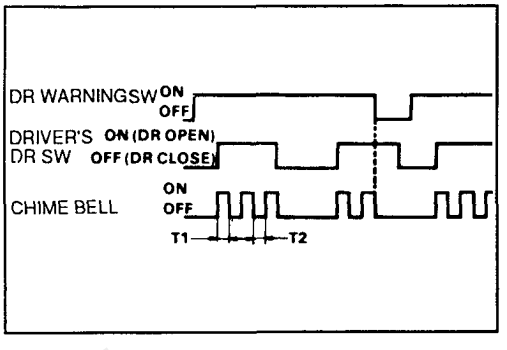
Delayed out room lamp

T 1 : 2 sec.
T 2 : 4 sec.
T 3 : 014 sec.



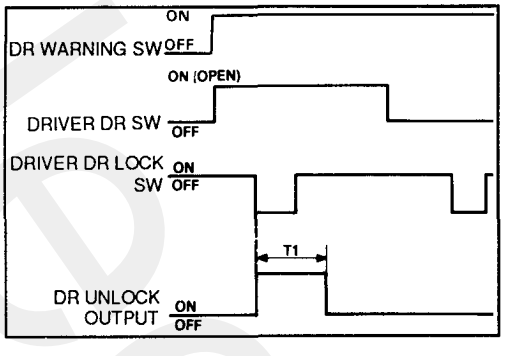
Door warning

1. Time specification
   T 1, T 2 : 0.3 ± 0.1 sec.



Ignition key reminder

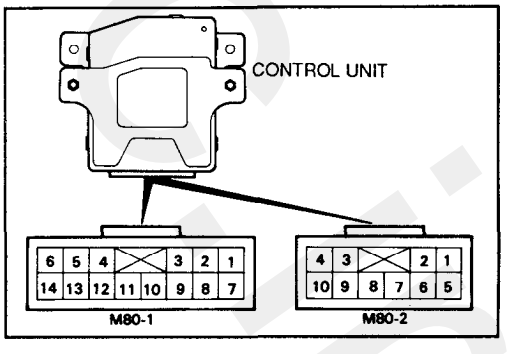
1. Time specification
   T 1 : 5.0 sec.



INSPECTION OF COMPONENTS

E.T.A.C.S. unit

1. After tracing the problem to the control unit, replace it with a new one. Check for proper operation.
2. If system operates properly, the original control unit is faulty.

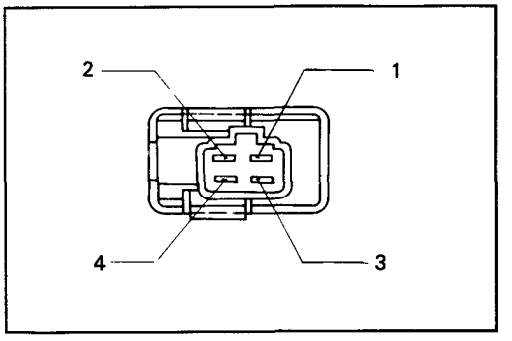


Rear window defogger switch

1. Disconnect the defogger switch connector from the wiring harness.
2. Operate the switch, and check the continuity between the terminals.

Position \ Terminal	1	2	3	4
ON				
OFF	●	⊗		●

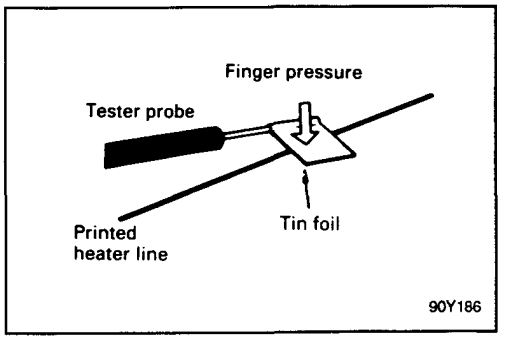
3. If continuity is not as specified, replace with new one.



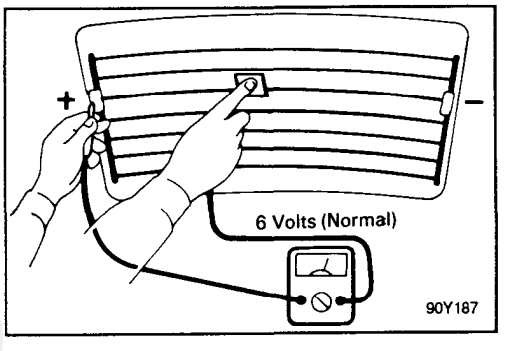
Printed heater line

CAUTION

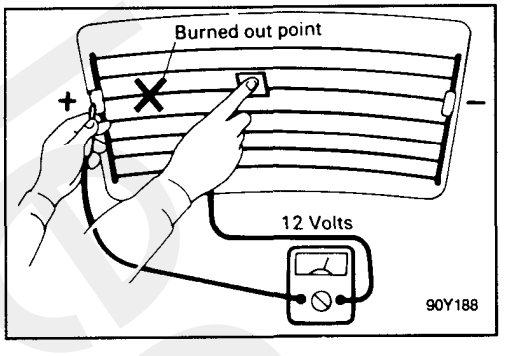
Wrap tin foil around the end of the voltmeter test lead to prevent damaging the heater line. Apply finger pressure on the tin foil, moving the tin foil along the grid line to check for open circuits.



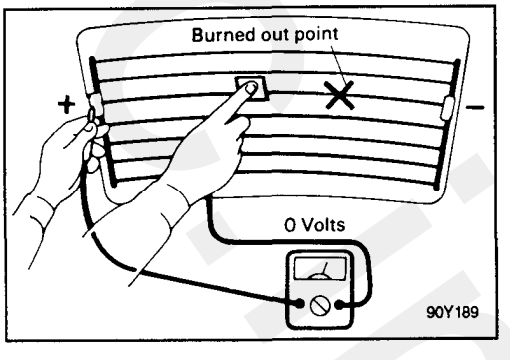
1. Turn on the defogger switch and use a voltmeter to measure the voltage of each heater line at the glass center point. If a voltage of approximately 6V is indicated by the voltmeter, the heater line of the rear window is considered satisfactory.



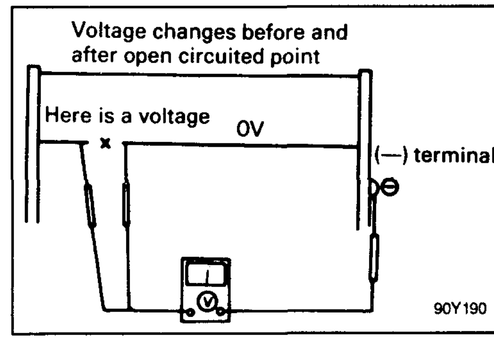
2. If a heater line is burned out between the center point and (+) terminal, voltmeter indicates 12 volts.



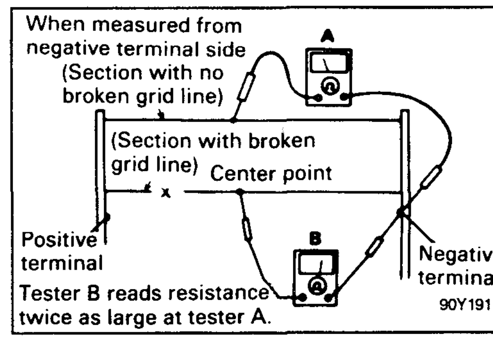
3. If a heater line is burned out between the center point and (-) terminal, the voltmeter indicates 0 volt.



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 OV. The point where the voltage has changed is the open-circuited 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 after another with defogger OFF. The section involving a broken heater line indicates resistance twice as that in other section. In the affected section, move the test lead to a position where resistance sharply changes.



Repair of broken heater line

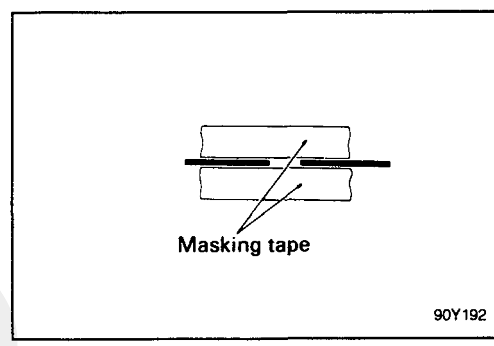
Provide the following items:

1. Conductive paint.
2. Paint thinner.
3. Making 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 completely dried. (allow 24 hours)

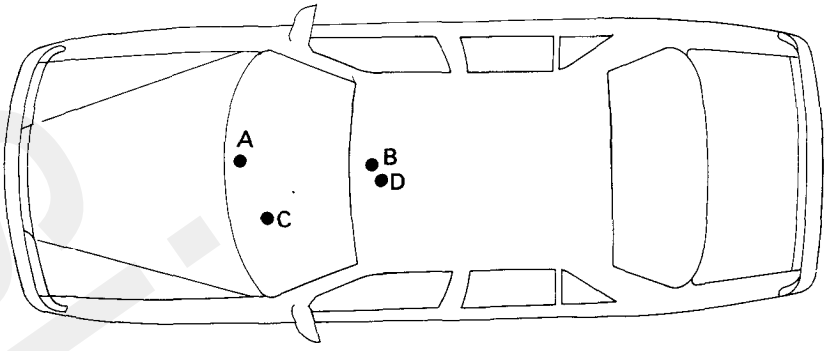
CAUTION

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



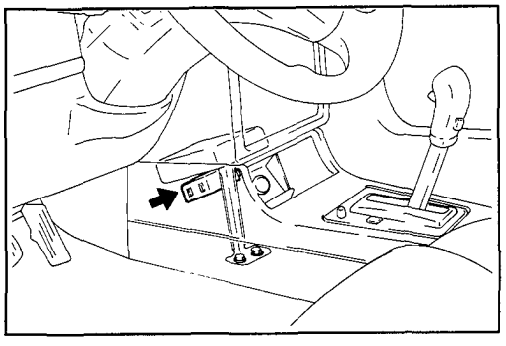
AUTOMATIC TRANSAXLE AND KEY LOCK CONTROL SYSTEM

COMPONENTS

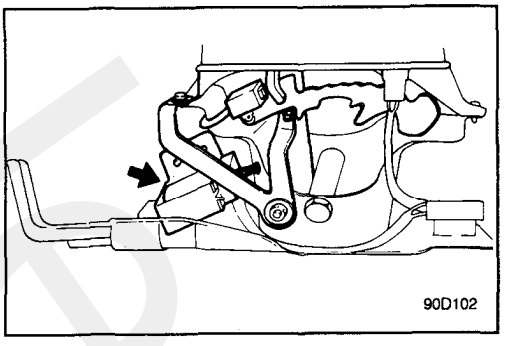


A. Below front of center console
B. Shift lever assembly
C. Ignition key
D. Shift lever assembly

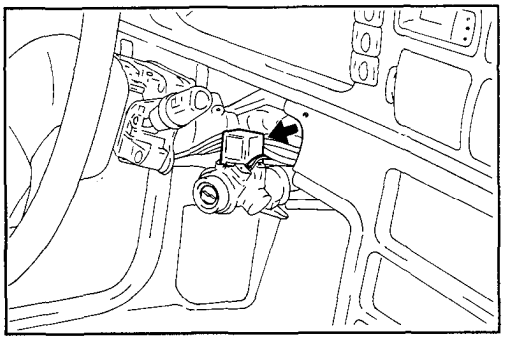
A. Control unit



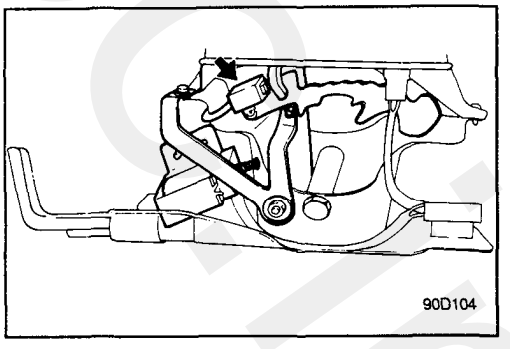
B. A/T solenoid



C. Key lock solenoid



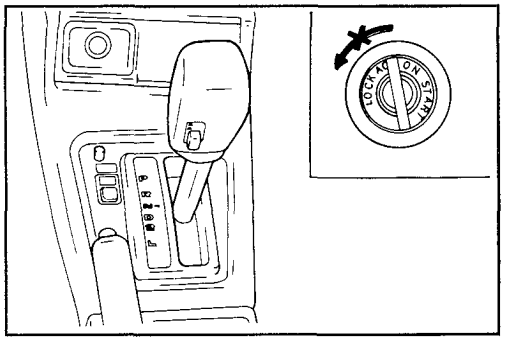
D. P-position switch



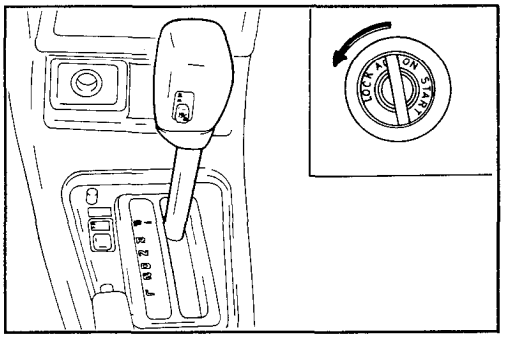
SYSTEM OPERATION CHECK

Key lock system

1. Check that the ignition key cannot be turned to “LOCK (OFF)” position, when the position of the shift lever is not in “P” position.



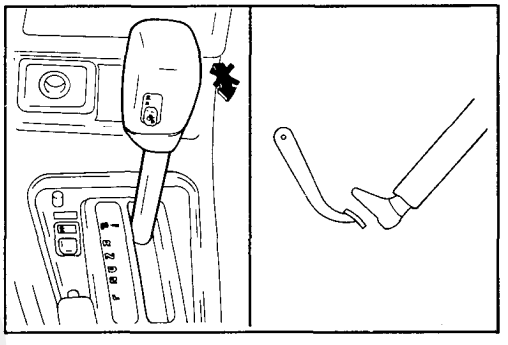
2. Check that the ignition key turns to the “LOCK (OFF)” position, when the shift lever is set to the “P” position.



A/T shift lock system

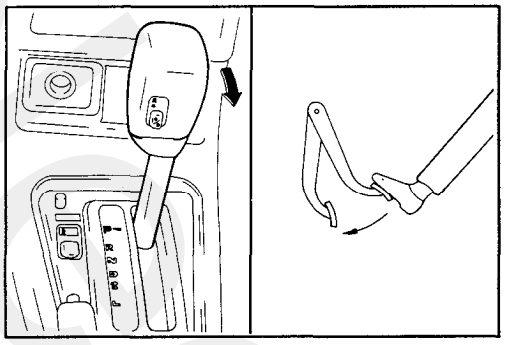
1. Check that under the following conditions, the shift lever cannot be moved from the “P” position to any other position.

   IGNITION KEY POSITION : “ON”
   BRAKE PEDAL : NOT DEPRESSED
   BUTTON : PRESSED

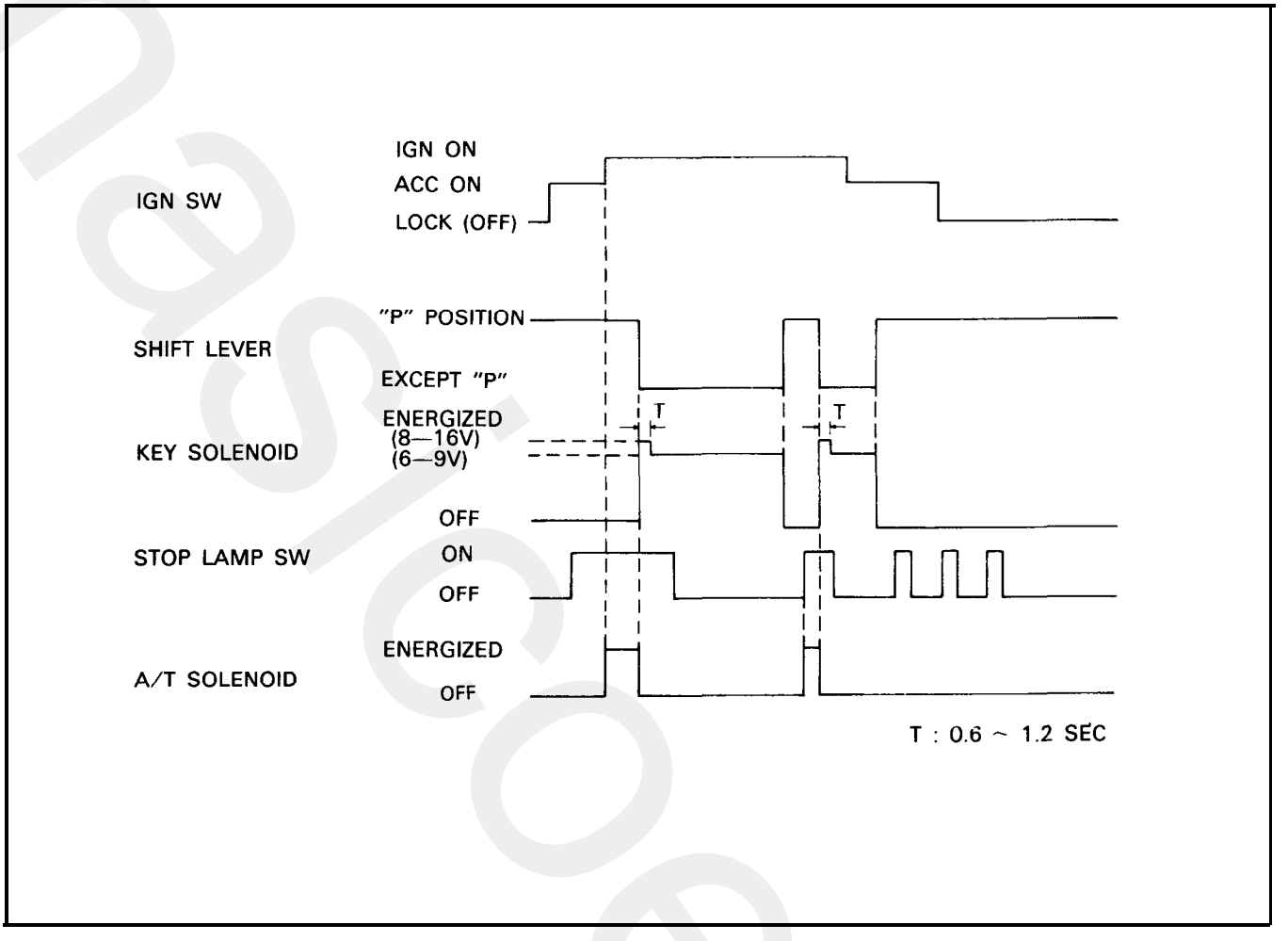


2. Check that under the following conditions, the shift lever can be moved from the “P” position to other position.

   IGNITION KEY POSITION : “ON”
   BRAKE PEDAL : DEPRESSED
   BUTTON : PRESSED



Timing Chart

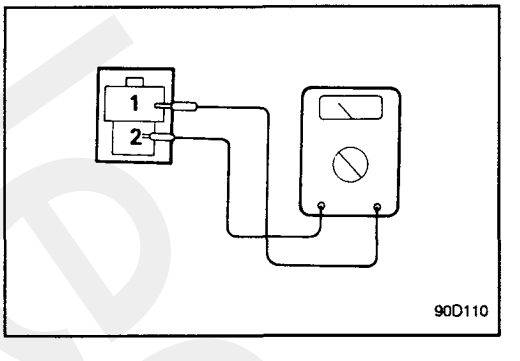


INSPECTION OF COMPONENTS

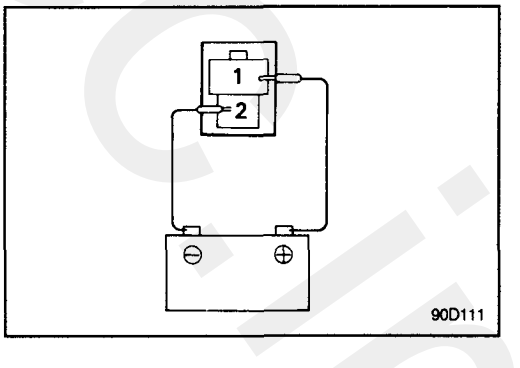
Automatic Transaxle Solenoid

1. Remove the solenoid connector.
2. Using an ohmmeter, measure the resistance between terminals.

Standard resistance : **12 - 16 Ω**

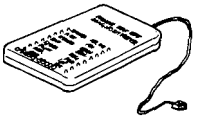


3. Attach the positive (+) lead from the battery to terminal **1.** and the negative (-) lead to terminal 2.
4. Check that an operation noise can be heard from the solenoid.



PASSIVE SEAT BELT (For U.S.A.)

SPECIAL SERVICE TOOL

Tool (Number and name)	Illustration	Use
09888-33000 Diagnostic controller		Reading diagnosis

COMPONENTS