BODY ELECTRICAL SYSTEM

6-2

SUBARU

1988

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SPECIFICATIONS AND SERVICE DATA

			XT6		Others	
Battery	Type		55D23R (MF)*1	75D23R (MF)*2	50D20R (MF)*1	65D23R (MF)*2
	Capacity	Reserve capacity	99 minutes	111 minutes	78 minutes	111 minutes
		Cold cranking ampere	356 ampere	490 ampere	306 ampere	420 ampere
Fuses			15A : 17, 20A : 4		15A : 18, 20A : 2	
Combination meter	Type		Analogue meter			
	Speedometer		Eddy current type			
	Temperature gauge		Thermister-cross coil type			
	Fuel gauge		Resistor-cross coil type			
	Tachometer		Electric impulse type			
	Oil pressure gauge		Bimetal-bimetal type			
	Voltmeter		Cross coil type			
	Turn signal indicator light		12V-3W (x 2)			
	Low fuel indicator light		12V-3W			
	Charge indicator light		12V-1.4W			
	Oil pressure indicator light [DL model only]		–		12V-1.4W	
	CHECK ENGINE warning light		12V-1.4W			
	High beam indicator light		12V-1.12W			
	Brake fluid level warning light		12V-1.4W			
	Door ajar warning light		12V-1.12W (x 2)			
	Seat belt warning light		12V-1.12W			
	Stop light warning light		12V-1.4W			
	Parking brake warning light		12V-1.12W			
	Four wheel drive indicator light [Selective 4WD model only]		–		12V-1.12W (x 1 or x 2)	
	Front wheel drive indicator light [4WD AT model only]		12V-1.12W		–	
	Meter illumination light		12V-3.4W (x 2) 12V-3W (x 2)			

*1: MT, *2: AT

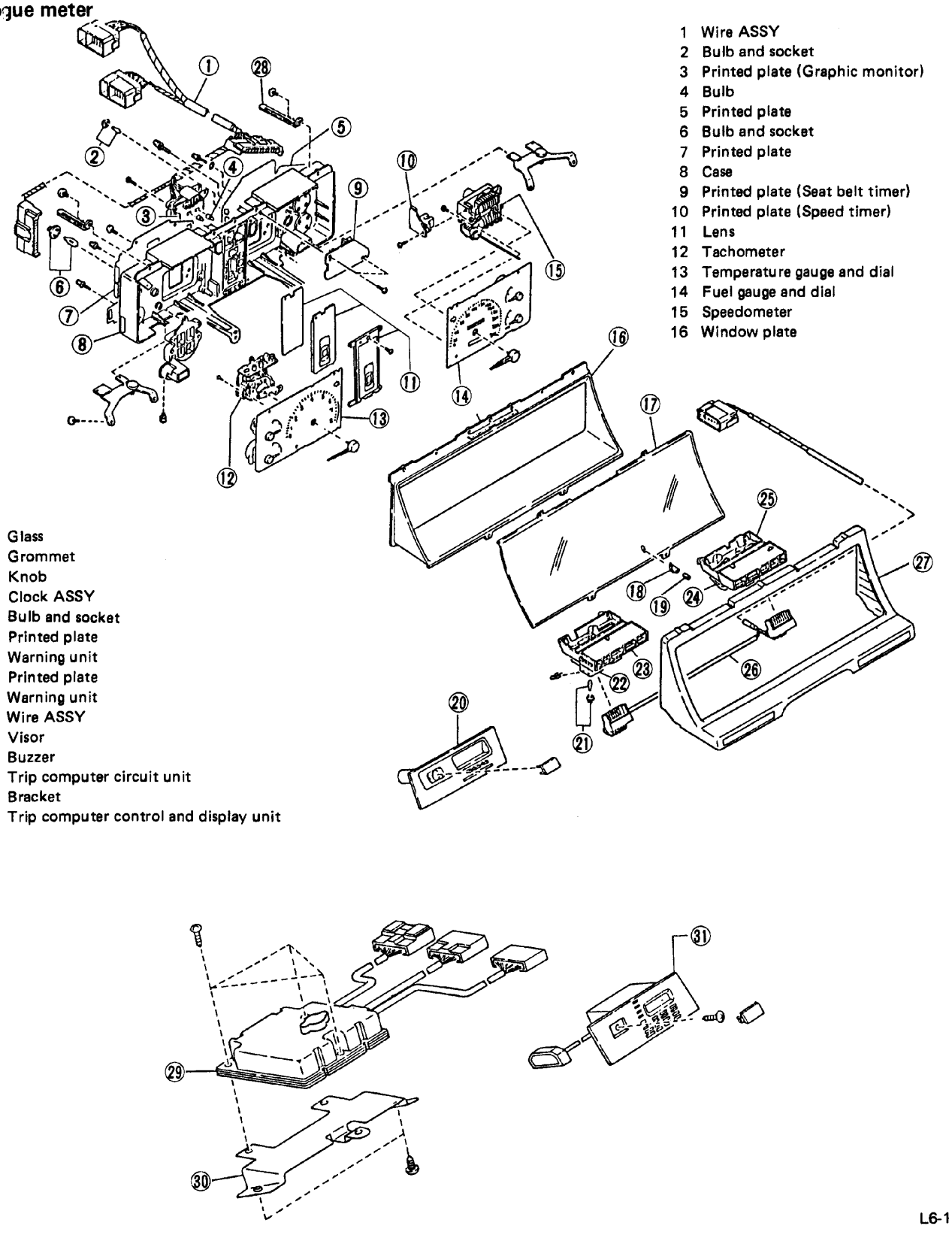
		XT6	Others
Headlight		12V-65/55W (Halogen)	
Front combination light	Turn signal light	12V-27W	
	Clearance light	12V-8W	
Front fog light		12V-55W	–
Side marker light	Front	12V-3.8W	
	Rear	12V-3.8W	
Rear combination light	Stop and tail light	12V-27/8W	
	Turn signal light	12V-27W	
	Back-up light	12V-27W	
License plate light		12V-3.8W (x 2)	
High-mount stop light		12V-27W	
Spot & room light		12V-8W (x 3)	
Trunk room light		12V-5W	
Glove box light		12V-3.4W	
Front ash tray illumination light		12V-1.4W	
Automatic transmission selector illumination light		12V-3.4W	
Windshield wiper	Motor speed	2-speed with intermittent operation	
	Input	12V-50W or less	
Windshield washer	Pump type	Centrifugal	
	Input	12V-35W or less	
Radio	Type	AM/FM Mono, AM/FM Stereo	
		Push-button station selection or ETR	
	Speaker position	Front doors (x 2) Rear luggage shelf (x 2)	
Horn		12V-420 Hz, 12V-350 Hz	
Cigarette lighter	Input	12V-120W	
	Illumination light	12V-1.4W (x 2)	
Rear window defogger	Input	12V-150W	
	Indicator light	12V-1.4W (x 2)	

		XT6	Others
Power window (Option)	Rated voltage	12V	
	Rated current	7A or less	
	Rated revolutions	55 rpm	
	Rated load	2.4 N·m (24 kg-cm, 21 in-lb)	
	Stalling current	20A or less	
	Stalling torque	8.3 N·m (85 kg-cm, 74 in-lb)	
	Working voltage	10V – 15V	
	Working temperature	–25 to 80°C (–13 to 176°F)	
	Raising or lowering time	Approx. 3.5 seconds (varies depending on ambient temperature, working voltage and type of glass)	
	Excess raising force	Approx. 196 N (20 kg, 44 lb) (varies depending on ambient temperature, working voltage and type of glass)	
Heater fan	Motor type	Electromagnetic type	
	Input	12V-160W or less	
Cooling fan	Motor type	Electromagnetic type	
	Input	12V-140W or less	12V-120W or less
Fuel pump	Input	12V-9.6W or less	
Headlight washer	Pump type	Centrifugal	
	Input	12V-240W or less	

COMPONENT PARTS

Combination Meter

Analogue meter

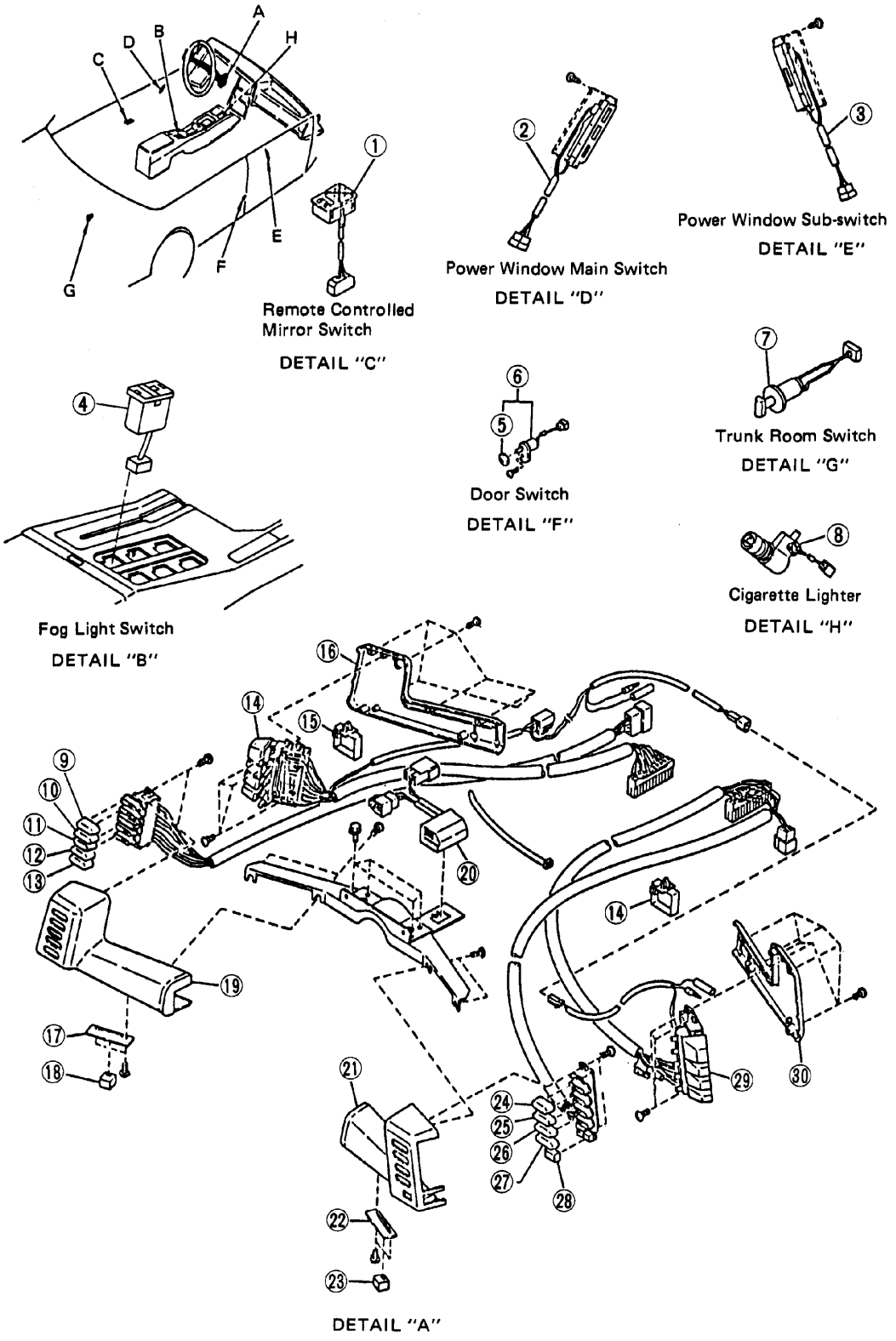


1 Wire ASSY
2 Bulb and socket
3 Printed plate (Graphic monitor)
4 Bulb
5 Printed plate
6 Bulb and socket
7 Printed plate
8 Case
9 Printed plate (Seat belt timer)
10 Printed plate (Speed timer)
11 Lens
12 Tachometer
13 Temperature gauge and dial
14 Fuel gauge and dial
15 Speedometer
16 Window plate
17 Glass
18 Grommet
19 Knob
20 Clock ASSY
21 Bulb and socket
22 Printed plate
23 Warning unit
24 Printed plate
25 Warning unit
26 Wire ASSY
27 Visor
28 Buzzer
29 Trip computer circuit unit
30 Bracket
31 Trip computer control and display unit

L6-1756

Fig. 1

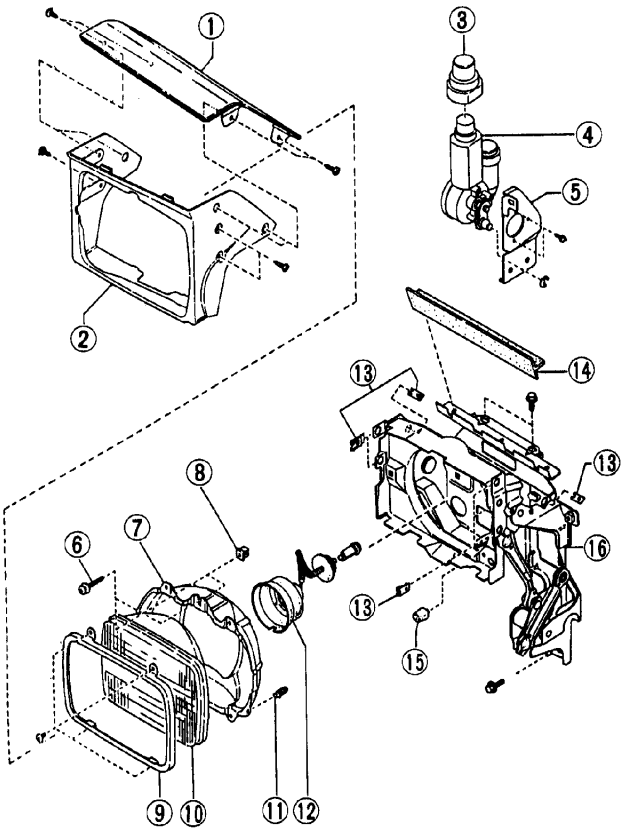
Switches



1 Remote controlled rearview mirror switch
2 Power window main switch
3 Power window sub-switch
4 Fog light switch (XT6 only)
5 Boot
6 Door switch
7 Trunk room switch
8 Cigarette lighter
9 Rear defogger knob
10 Retractable headlight knob
11 Headlight washer knob
12 Cruise knob
13 Height knob
14 Lighting switch ASSY
15 Control wink clip
16 Case (LH-B)
17 Illumination volume
18 Illumination knob
19 Case (LH-A)
20 Illumination unit
21 Case (RH-A)
22 Intermittent volume
23 Intermittent knob
24 Front defroster knob
25 Heat knob
26 Bilevel knob
27 Vent or A/C knob
28 OFF knob
29 Wiper switch ASSY
30 Case (RH-B)

Fig. 2 L6-1469

Retractable Headlight

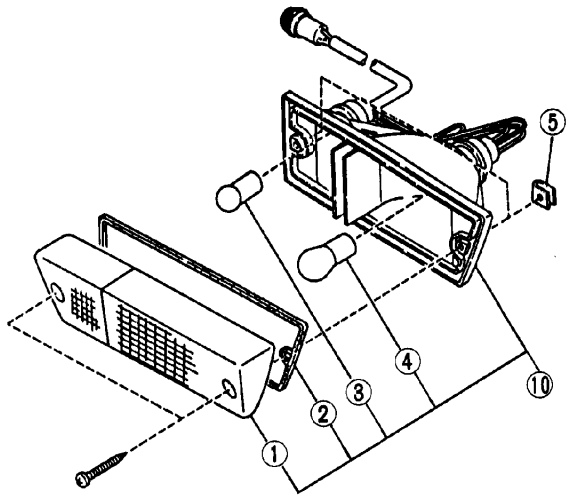


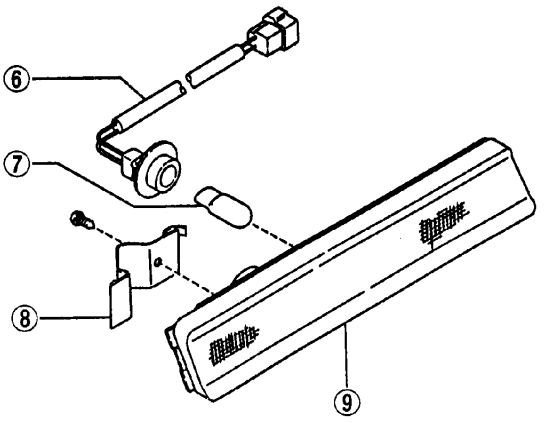
1 Lid
2 Cover
3 Cap
4 Retractable headlight motor
5 Bracket
6 Adjusting screw
7 Mounting ring
8 Screw grommet
9 Retaining ring
10 Sealed beam unit
11 Spring
12 Cord
13 Spring nut
14 Protector
15 Stopper
16 Retractable headlight ASSY

L6-1470

Fig. 3

Front Combination Light





1 Lens
2 Packing
3 Bulb
4 Bulb
5 Spring nut
6 Socket CP
7 Bulb
8 Spring
9 Front side marker light lens and body
10 Front combination light ASSY

L6-1471

Fig. 4- ①

Fog Light

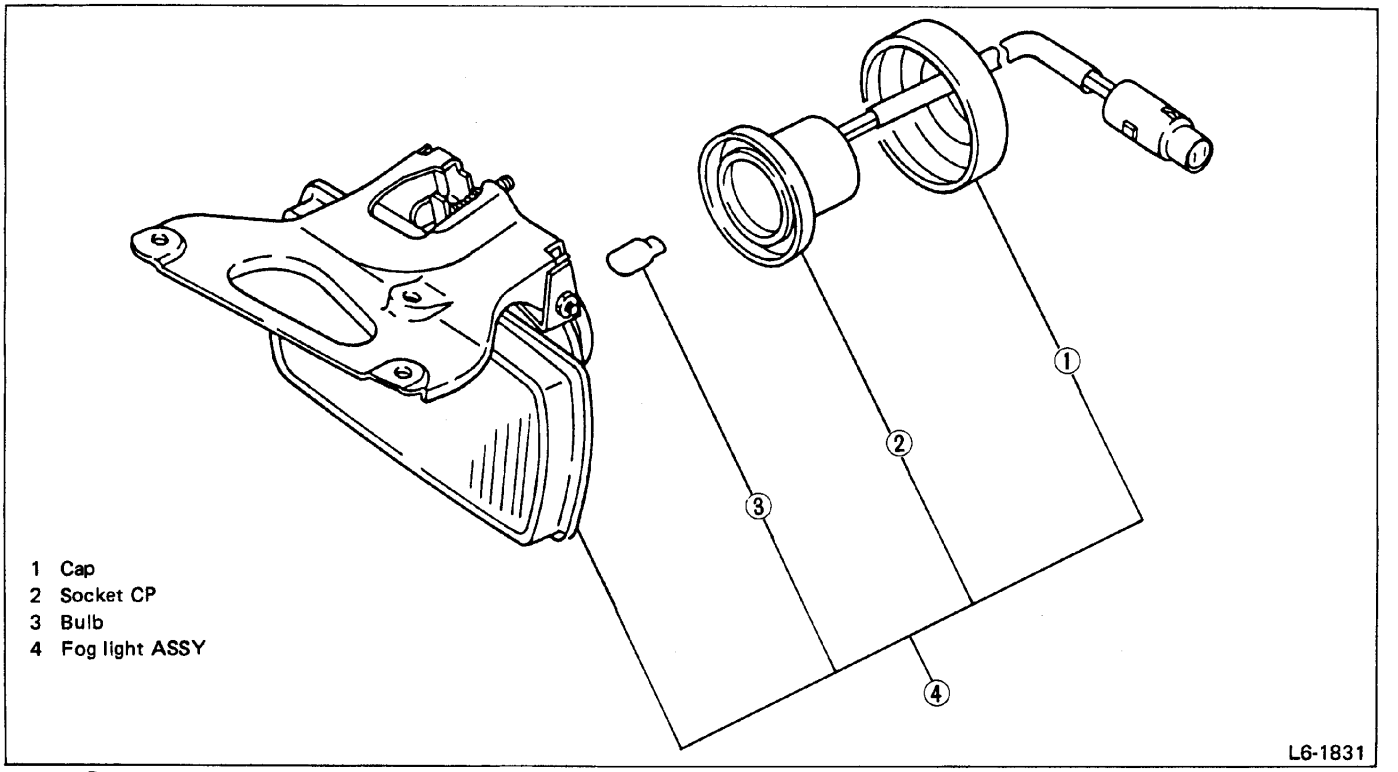


Fig. 4-②

Rear Combination Light

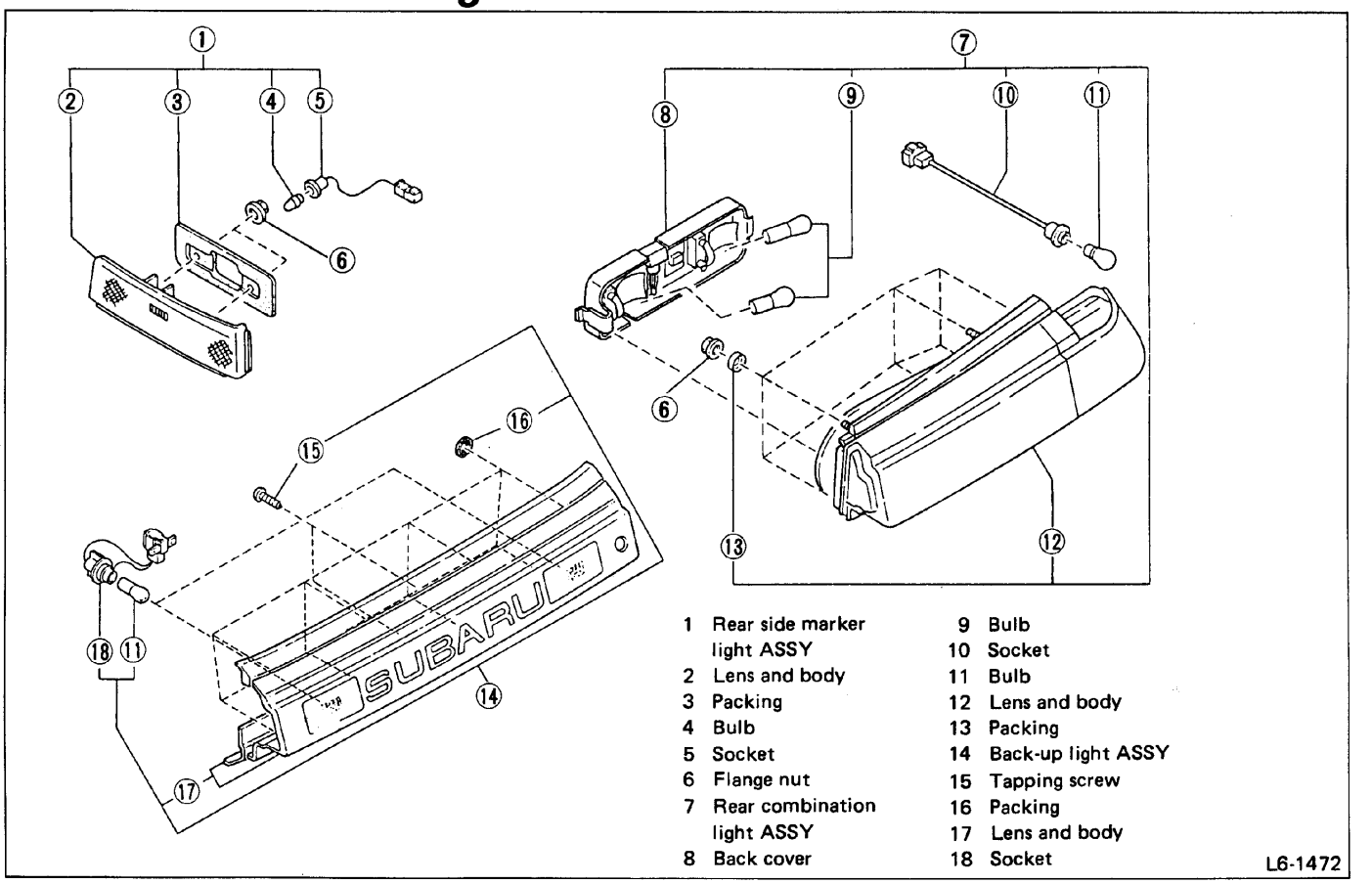


Fig. 5

High-Mount Stop Light

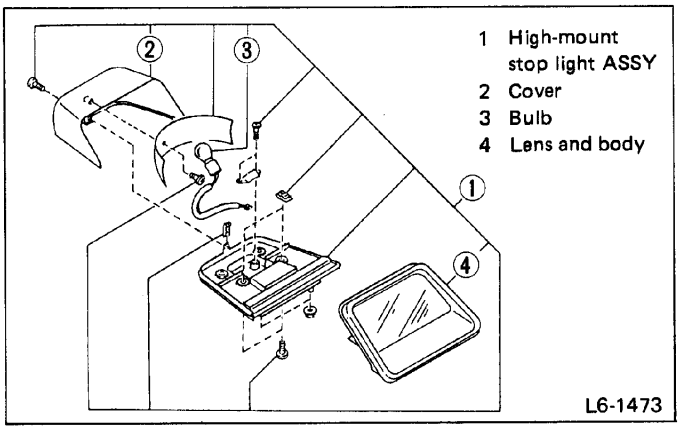


Fig. 6

License Plate Light

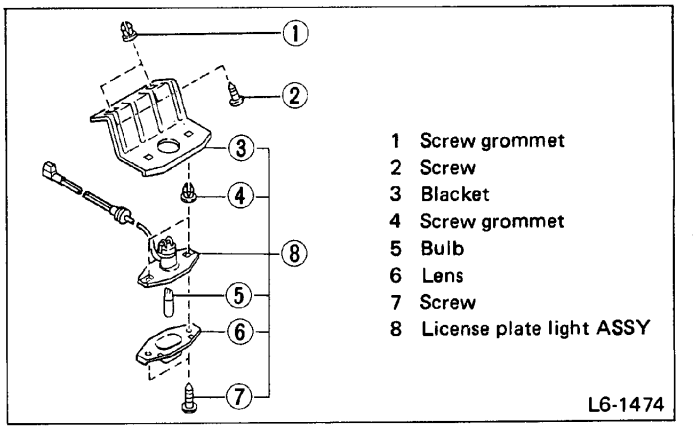


Fig. 7

Room Light

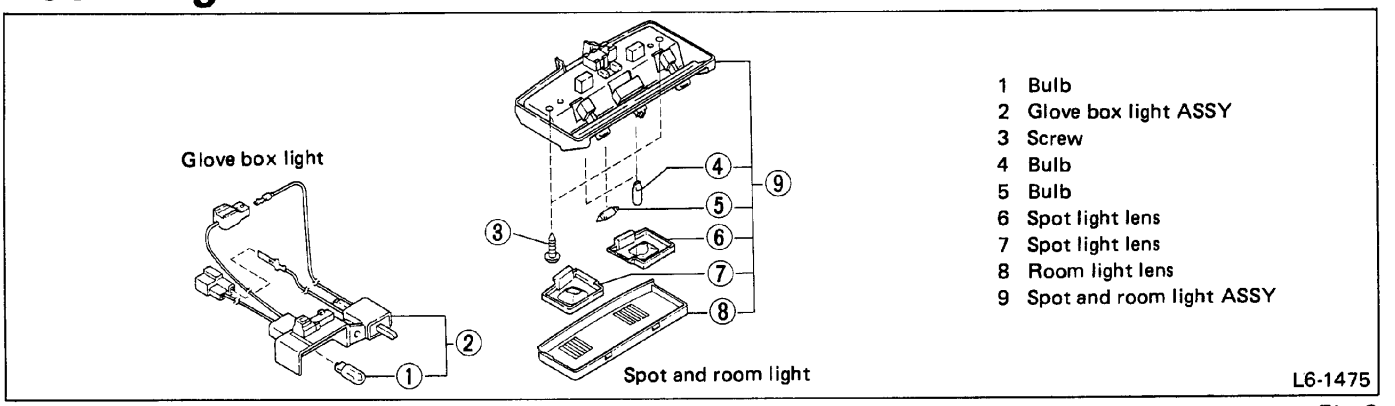


Fig. 8

Wiper

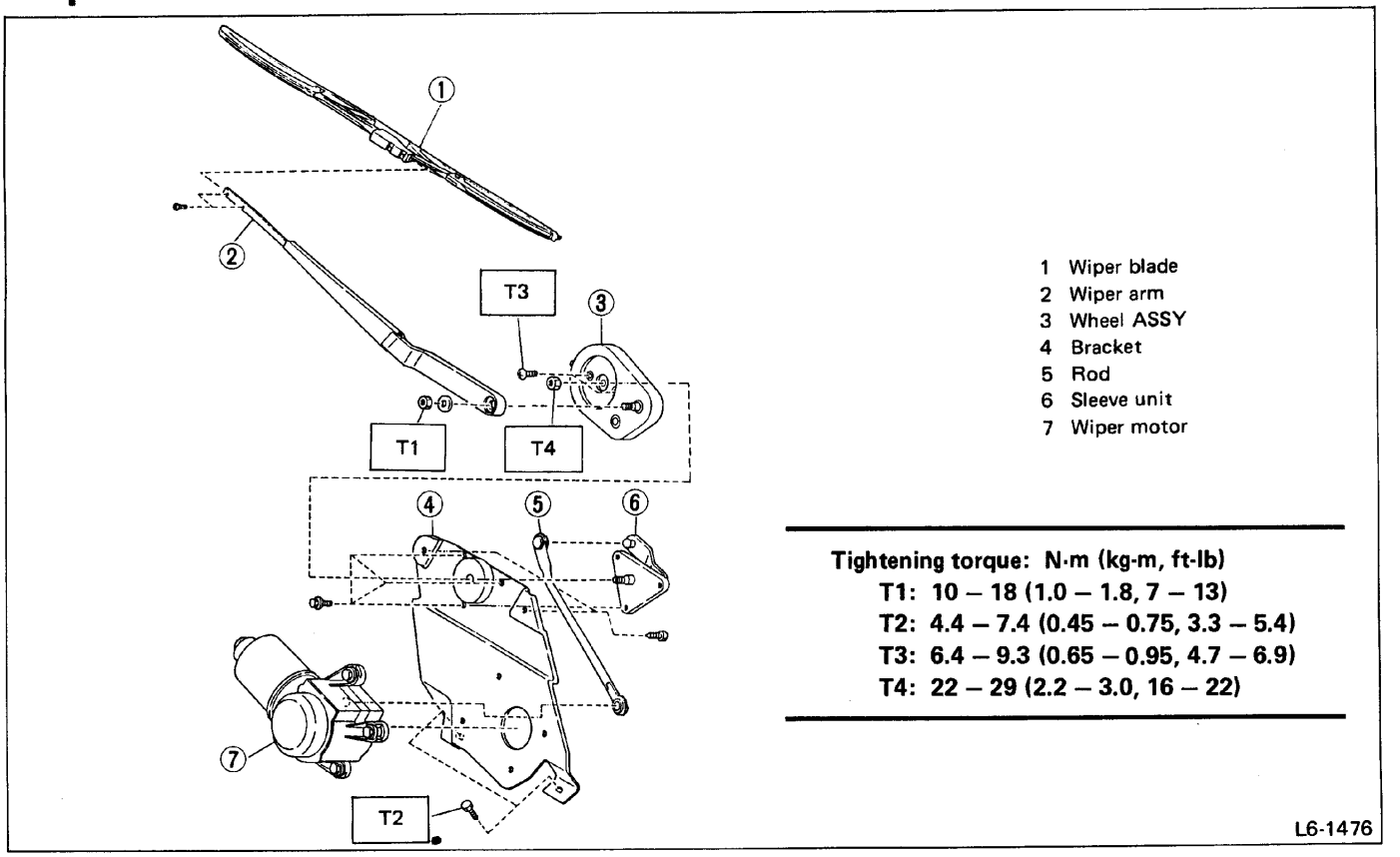


Fig. 9

Window Washer

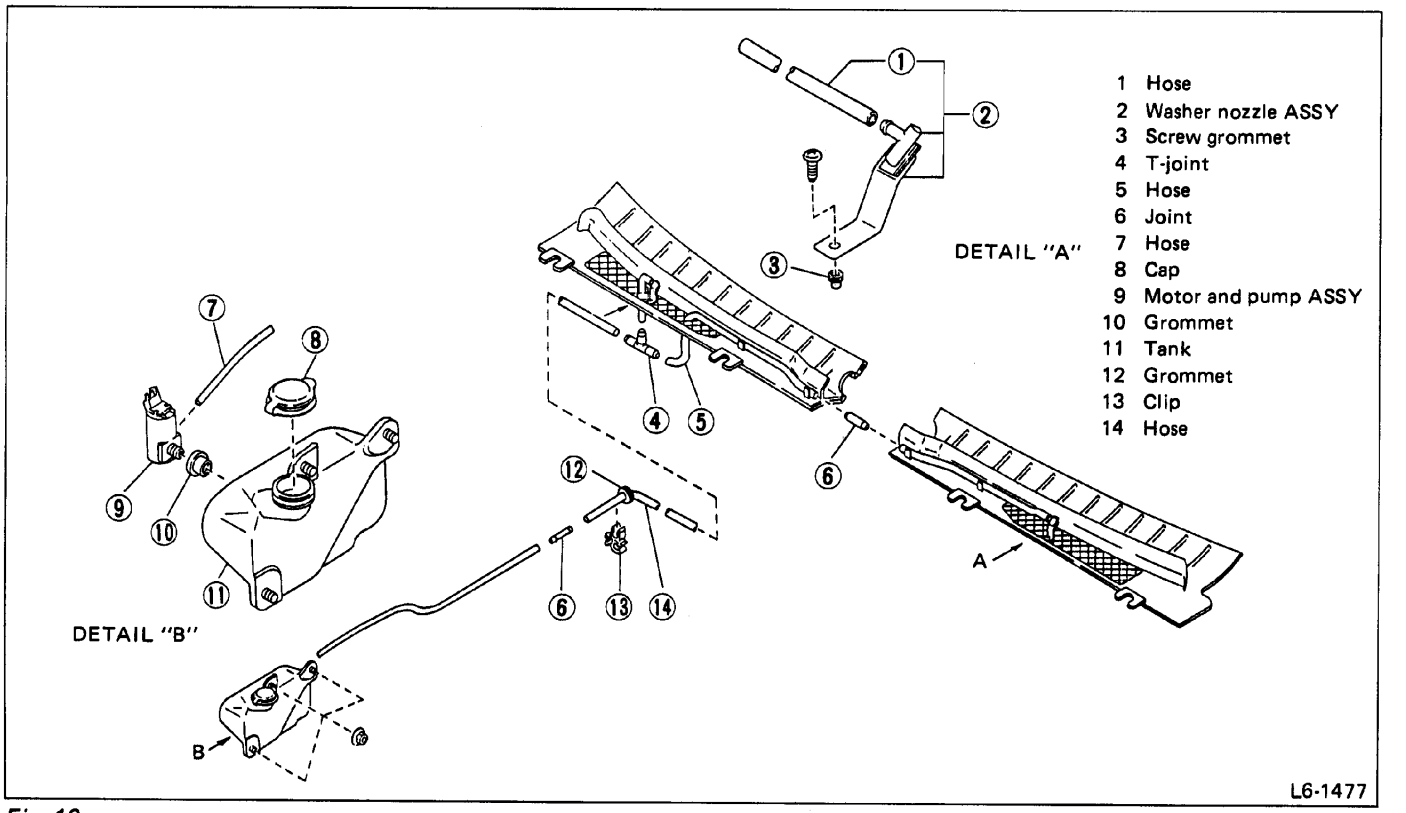


Fig. 10

Headlight Washer

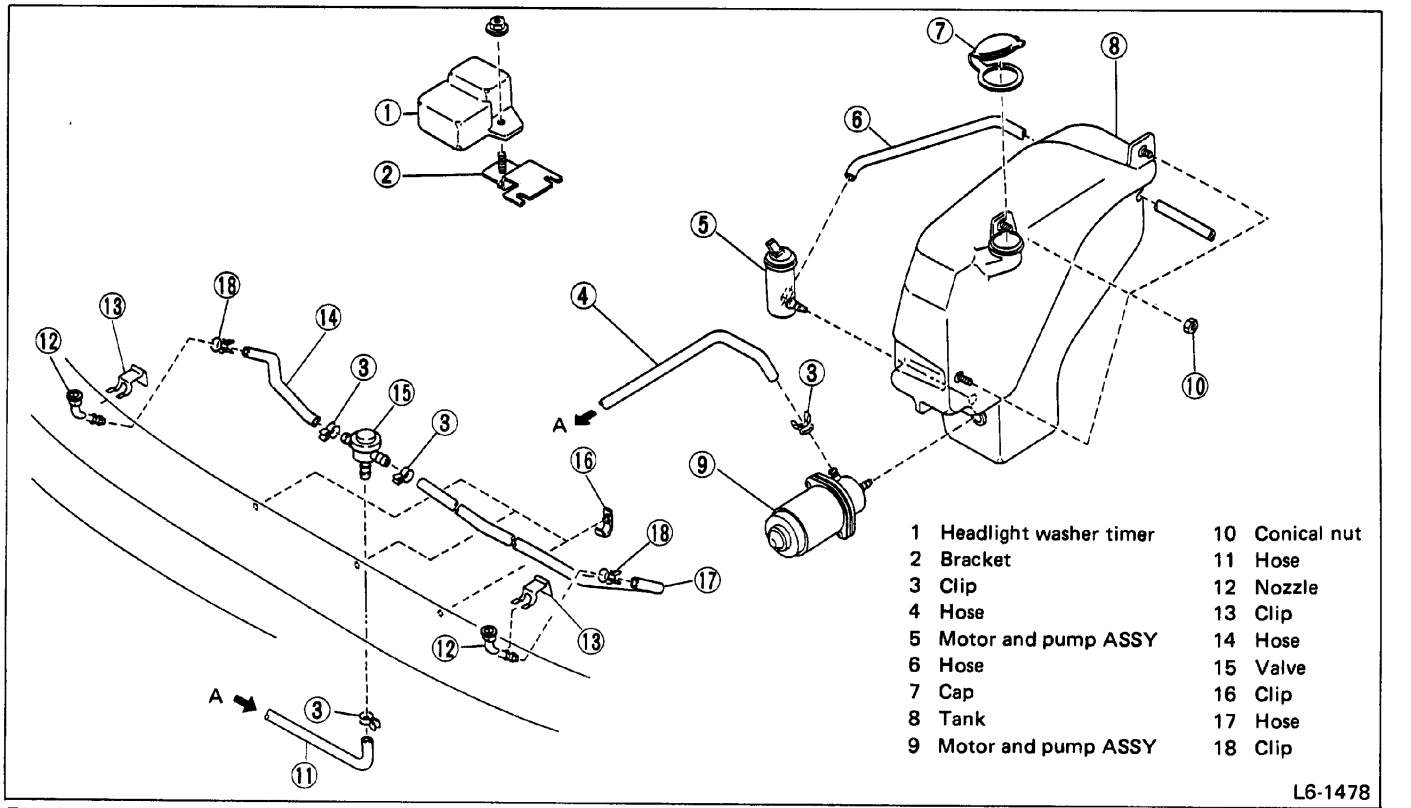
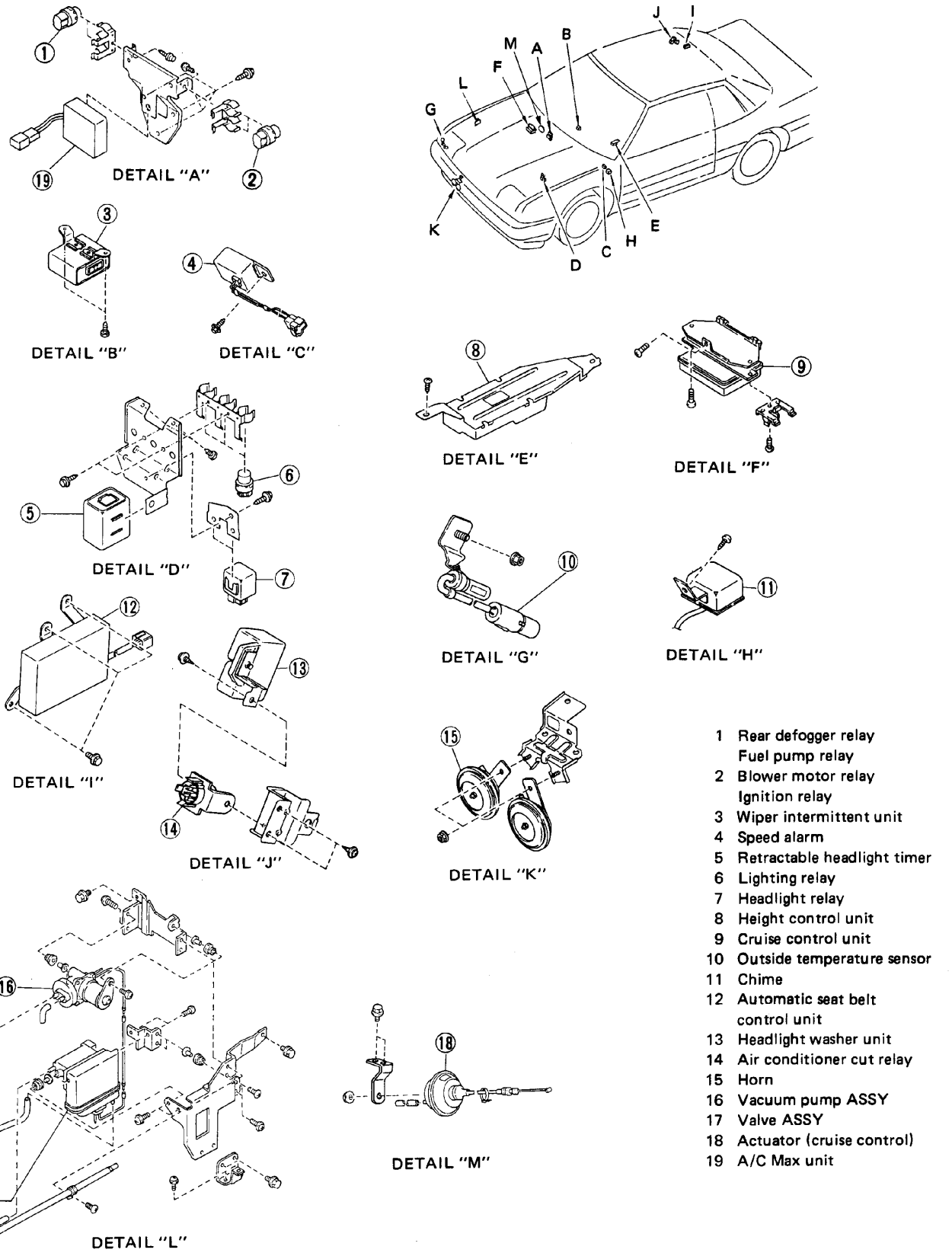


Fig. 11

Electrical Equipment



1 Rear defogger relay
Fuel pump relay
2 Blower motor relay
Ignition relay
3 Wiper intermittent unit
4 Speed alarm
5 Retractable headlight timer
6 Lighting relay
7 Headlight relay
8 Height control unit
9 Cruise control unit
10 Outside temperature sensor
11 Chime
12 Automatic seat belt control unit
13 Headlight washer unit
14 Air conditioner cut relay
15 Horn
16 Vacuum pump ASSY
17 Valve ASSY
18 Actuator (cruise control)
19 A/C Max unit

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Fig. 12

SERVICE PROCEDURE

Battery

REMOVAL AND INSTALLATION

1) Disconnect the positive (+) terminal after disconnecting the negative (−) terminal of battery.
2) Remove flange nuts from battery rods and take off battery holder.
3) Remove battery.
4) Installation should follow the removal procedure in the reverse order.

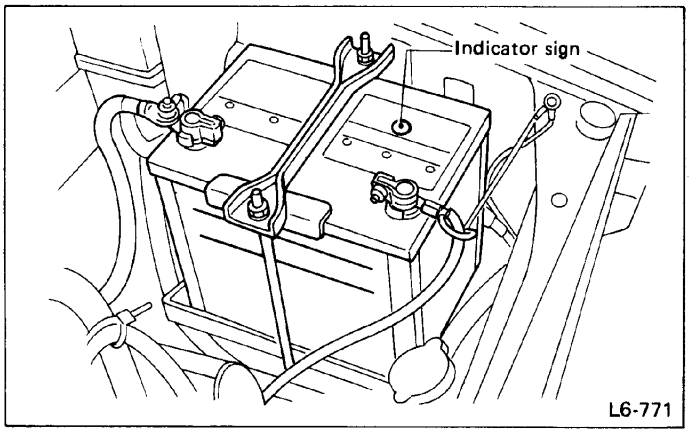


Fig. 13

a. Clean battery cable terminals and apply grease to retard the formation of corrosion.
b. Connect the positive (+) terminal of battery and then the negative (−) terminal of the battery.

INSPECTION

1) External parts
Check for the existence of dirt or cracks on the battery case, top cover, vent plugs, and terminal posts. If necessary, clean with water and wipe with a dry cloth.
Apply a thin coat of grease on the terminal posts to prevent corrosion.
2) Electrolyte level
Check the electrolyte level in each cell. If the level is below MIN LEVEL, bring the level to MAX LEVEL by pouring distilled water into the battery cell. Do not fill beyond MAX LEVEL.

a. Electrolyte has toxicity; be careful handling the fluid.
b. Avoid contact with skin, eyes or clothing. Especially at contact with eyes, blush with water for 15 minutes and get prompt medical attention.
c. Batteries produce explosive gasses. Keep sparks, flame, cigarettes away.
d. Ventilate when charging or using in enclosed space.
e. On the 75D23R battery, peel off the label along the cutting line, remove the cap and add distilled water.

3) Specific gravity
Indicator is provided for checking the specific gravity and the battery condition.

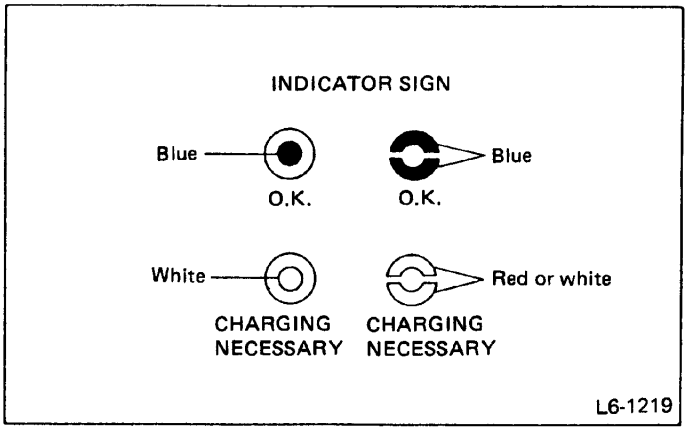


Fig. 14

"OK"	Charged condition Specific gravity > 1.15
"Charging necessary"	The battery must be recharged when engine does not start. Specific gravity < 1.15

4) Voltage under high discharge
Charging (or discharging) the battery raises (or lowers) the voltage but after stopping the charging (or discharging) the voltage gradually varies and finally settles at about 2 volts per cell. Therefore, to check the real condition of the battery, it is necessary to measure the voltage with the battery under high discharge. A simple method is the use of a high-discharge battery tester.
Check that the individual cell voltages are more than 1.5 volts and the voltage differences between the cells are within 0.1 volt when the measurements are made for 5 seconds per cell.

CHARGING

Measuring the specific gravity of the electrolyte in the battery will disclose the state of charge of the battery. The relation between the specific gravity and the state of charge is as shown in figure.

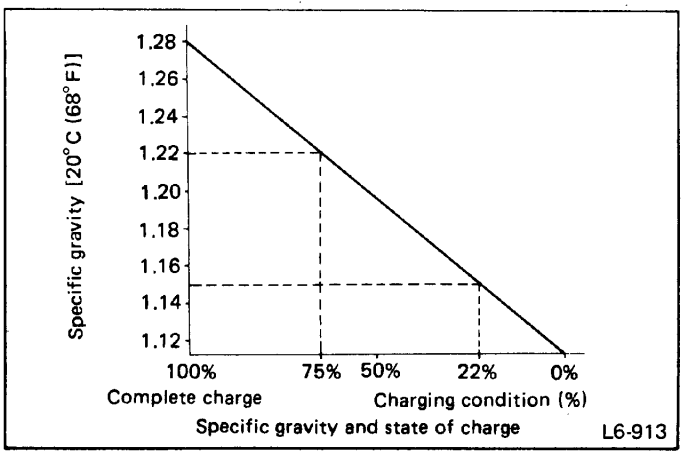


Fig. 15

1) Normal charging

a. Do not bring an open flame close to the battery at this time.
b. Prior to charging, corroded terminals should be cleaned with a brush and common baking soda solution.

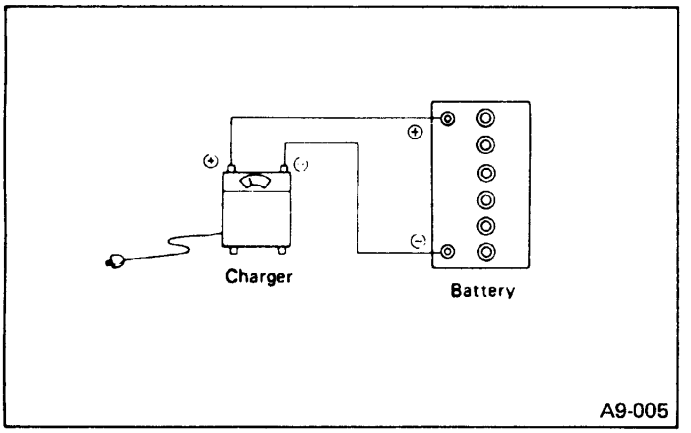


Fig. 16

The battery must be charged when indicator shows "charging necessary" and also engine does not start.
Perform charging for 5 hours or more with a constant current of 6A.
At the condition of full charged, the charging current is 0.5A or less.

2) Quick charging

Quick charging is a method in which the battery is charged in a short period of time with a relatively large current by using a quick charger.

Since a large current flow raises electrolyte temperature, the battery is subject to damage if the large current is used for prolonged time. For this reason, the quick charging must be carried out within a current range that will not increase the electrolyte temperature above 40°C (104°F).
It should be also remembered that the quick charging is a temporary means to bring battery voltage up to a fair value and, as a rule, a battery should be charged slowly with a low current.

a. Observe the items in NOTE in 1) Normal charging.
b. The battery should not be charged with 10A or more.

Fuse

FUSE BOX

The fuse box is located underneath of the instrument panel.
The connection between each fuse and main electrical units/devices is as shown in the following illustration. (Also refer to the wiring diagram at the end of this manual.)

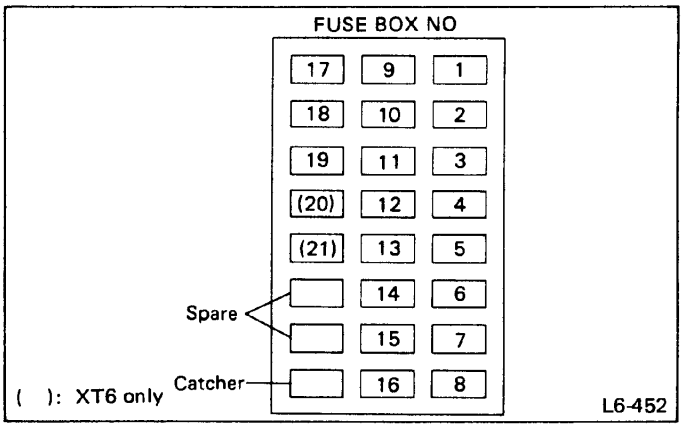


Fig. 17

a. When replacing fuse, be sure to use fuse of specified rating.
b. If fuse is blown, be sure to eliminate cause before installing new fuse in position.
c. Poor contact of any fuse holder will often lead to voltage drop or heating in the circuit or fuse holder and could result in blown fuse, so be careful with holder contacting and clean metal parts if necessary.

4WD-FWD SELECT FUSE
[4WD-AT model only]

For changing from 4WD to the FWD drive mode during servicing, insert a 15-ampere fuse into the FWD fuse holder. The FWD pilot lamp on the combination meter will come on to indicate that the vehicle is set in the FWD drive mode.

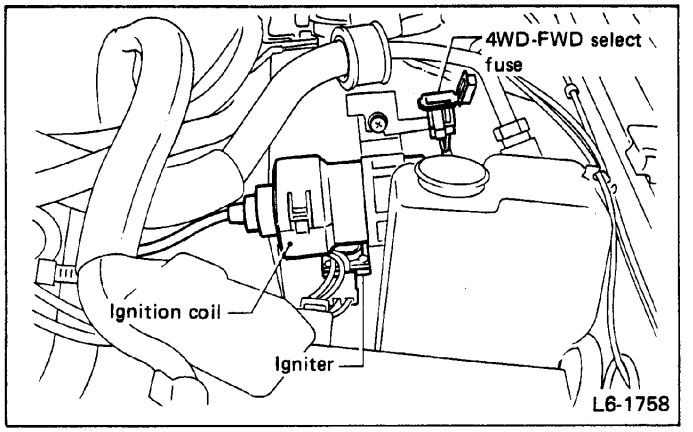


Fig. 18

PRECAUTIONS WHEN INSTALLING OPTIONAL UNITS/DEVICES

1) If there is no designated spare terminals available, attach separate fuses and connect new wiring directly from the battery. Do not modify an existing wire harness.

2) Pay attention to the following points when connecting the new wiring.

(1) Determine the wire size according to the load of the optional units/devices to be installed.

Wire size	Allowable current (A)	
	Wiring through engine compartment	Other
0.3	–	7
0.5	6	12
0.85	8	16
1.25	10	21
2.0	14	28
3.0	19	38

(2) Always attach fuses to the new circuits. Determine the fuse capacity so that the load of the units/devices to be installed does not exceed 70% of the rated capacity.

(3) Route new harnesses as close as possible to the existing ones and secure them with clamps.

XT 6

No. 1 (15A)	Heater fan motor	Connecting to fusible link
No. 2 (15A)	Heater fan motor	
No. 3 (15A)	Stop light, High-mount stop light, Room light	
No. 4 (15A)	Parking light	
No. 5 (15A)	Hazard warning, Horn, Clock, Trunk room light	
No. 6 (15A)	License plate light, Tail light, Clearance light, Grove box light, Illumination light (Combination meter)	(Through lighting relay)
No. 7 (15A)	Headlight (LH)	
No. 8 (15A)	Headlight (RH), Headlight beam indicator light	
No. 9 (15A)	Charge indicator light, Brake fluid level warning light	Connecting to alternator
No. 10 (15A)	Turn signal light, Back-up light, AT control unit	Connecting to IG terminal of ignition switch
No. 11 (15A)	Ignition coil, EGI unit, Ignition relay, Fuel pump relay	
No. 12 (15A)	Fuel gauge, Temperature gauge, Power window relay, Automatic shoulder belt control unit	
No. 13 (15A)	Power steering control unit	
No. 14 (15A)	Radio	Connecting to ACC terminal of ignition switch
No. 15 (15A)	Cigarette lighter, Remote-controlled rear view mirror	
No. 16 (20A)	Wiper and washer switch	
No. 17 (20A)	Rear window defogger	Connecting to fusible link
No. 18 (15A)	Door lock switch, Pneumatic Suspension Solenoid	
No. 19 (15A)	Cruise control unit	Connecting to IG terminal of ignition switch
No. 20 (20A)	Condenser fan (sub fan) motor	Connecting to fusible link
No. 21 (20A)	Radiator fan motor	

Others

No. 1 (15A)	Heater fan motor	Connecting to fusible link (Through lighting relay)
No. 2 (15A)	Heater fan motor	
No. 3 (15A)	Stop light, High-mount stop light, Room light	
No. 4 (15A)	Parking light	
No. 5 (15A)	Hazard warning, Horn, Clock, Trunk room light	
No. 6 (15A)	License plate light, Tail light, Clearance light, Grove box light, Illumination light (Combination meter)	
No. 7 (15A)	Headlight (LH)	
No. 8 (15A)	Headlight (RH), Headlight beam indicator light	
No. 9 (15A)	Charge indicator light, Brake fluid level warning light	Connecting to alternator
No. 10 (15A)	Turn signal light, Back-up light, 4WD selector switch, AT control unit	Connecting to IG terminal of ignition switch
No. 11 (15A)	Ignition coil, EGI unit, Ignition relay, Fuel pump relay	
No. 12 (15A)	Fuel gauge, Temperature gauge, Power window relay, Automatic shoulder belt control unit	
No. 13 (15A)	Radio	Connecting to ACC terminal of ignition switch
No. 14 (15A)	Cigarette lighter, Remote controlled rear view mirror	
No. 15 (15A)	Radiator fan motor	
No. 16 (20A)	Wiper and washer switch	
No. 17 (20A)	Rear window defogger	Connecting to fusible link
No. 18 (15A)	Door lock switch	
No. 19 (15A)	Air suspension solenoid valve	

FUSIBLE LINK

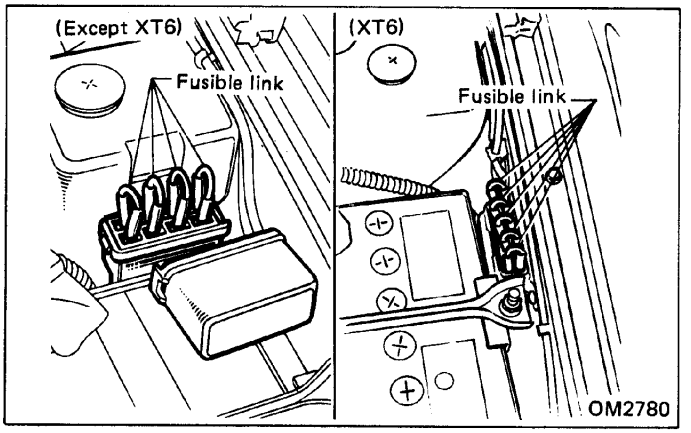


Fig. 19

If current increases beyond specified amperage, fusible metal melts and the circuit is broken, thus protecting cable and electrical equipment from burning.

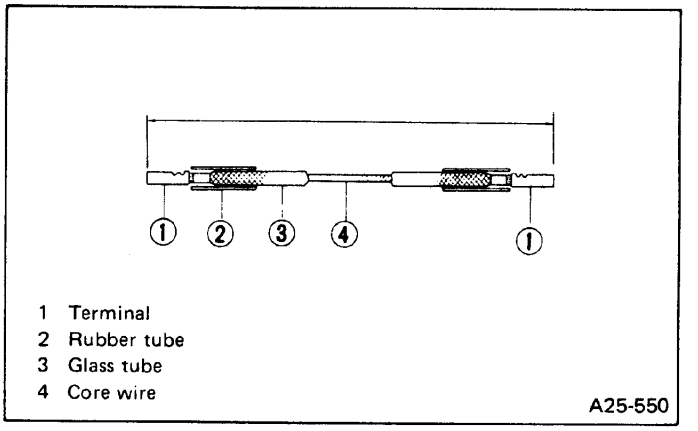


Fig. 20

Designation	Appearance	Quantity per vehicle
0.5 mm^2 (0.0008 sq in)	Green	2
0.85 mm^2 (0.00132 sq in)	Red	1
1.25 mm^2 (0.00194 sq in)	Black	1
2.0 mm^2 (0.0031 sq in)	Blue	1

a. When replacing fusible link, be sure to use one with the specified rating.
b. Blown fusible link is caused by short circuit in the source of electricity circuit or large amperage circuit, so certain check of cause and/or repair is necessary.

No.	Item	Nominal gauge size of conductor			
		0.5 mm^2 (0.0008 sq in)	0.85 mm^2 (0.00132 sq in)	1.25 mm^2 (0.00194 sq in)	2.0 mm^2 (0.0031 sq in)
1	Voltage drop	70 mV	60 mV	50 mV	40 mV
		Voltage drop across lug terminals should be less than the above value when a 10-ampere current flows through fusible link at room temperature.			
2	Melting Characteristics	Fusible link should melt within 15 seconds at a current flow of 80 amperes.	Fusible link should melt within 15 seconds at a current flow of 130 amperes.	Fusible link should melt within 15 seconds at a current flow of 190 amperes.	Fusible link should melt within 15 seconds at a current flow of 260 amperes.

Combination Meter

Warning and Indicator Lights

According to ignition switch position, each light will come on and/or go off under normal conditions as follows:

Ignition switch position		OFF	ACC	ON	ST	While engine is running
Retractable headlight indicator light	Raise	*	*	*	*	*
	Down	*	*	*	*	*
AT oil temperature warning light		OFF	OFF	ON	ON	OFF
Charge indicator light		OFF	OFF	ON	ON	OFF
Oil pressure indicator light (DL model only)		OFF	OFF	ON	ON	OFF
Stop light warning light		OFF	OFF	ON	ON	OFF
Brake fluid level warning		OFF	OFF	ON	ON	OFF
CHECK ENGINE warning light		OFF	OFF	•	•	OFF
STEERING warning light (XT6 only)		OFF	OFF	ON	ON	OFF

Symbols used: * Indicator light comes on while headlights are raised or lowered.
• Light comes on before engine starts, and stays off after engine stops.

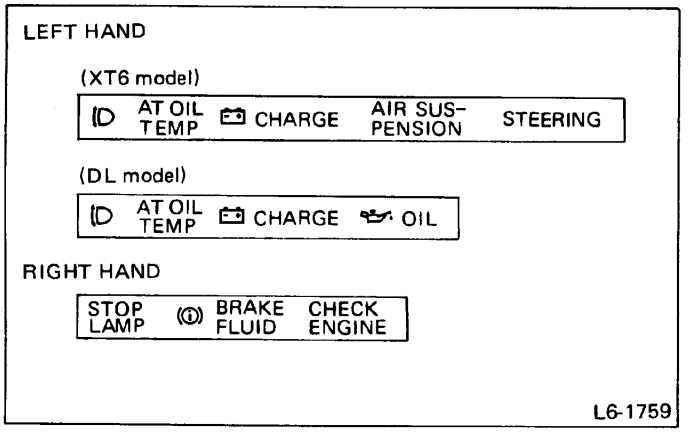


Fig. 21

Retractable Headlight Indicator Light

This indicator light turns on only when the headlight raise/down motor is in operation. It comes on and lights for about one second when the headlights pop up or down.

AT Oil Temperature Warning Light

The warning light is provided for the purpose of preventing overheating of torque converter fluid in case of repeated start-off operations in sand or on a snowy road, or when the car is operated at very low speed (near the stall speed) continuously under heavily loaded conditions.

If the temperature of the fluid at the torque converter outlet exceeds 150°C (302°F), the warning lamp "AT OIL TEMP" will illuminate and warn the driver of high oil temperature.

In such a case, the driver need not stop the car, but should avoid undue operation. The warning light will go out as the fluid temperature drops.

The thermoswitch is installed on the side of the extension case.

Charge Indicator Light

The light indicates the alternator and charging system operating condition.

If there is something wrong with the alternator and charging system, the light will come on while the engine is running.

Oil Pressure Indicator Light (DL model only)

Oil pressure indicator light indicates whether or not oil pump is feeding oil under normal pressure to various parts of engine. Indicator light is operated by oil pressure switch located in lubricating system.

Stop Light Warning Light

The light is connected to the stop light checker. This checker consists of a reed switch and magnet coils ① and ②, as shown in figure. Under normal conditions, the magnetic fields are generated in the magnet coils ① and ② by the current flowing through each light while the stop light switch is ON. These magnetic fields cancel each other because the coils turn in directions opposite to each other. As a result, the reed switch will remain OFF, and the warning light is OFF. If either the left or right hand side stop light fails, current will flow through only one magnet coil, and the resultant magnetic field causes the reed switch to turn ON. Therefore, the warning light will remain lighted as long as the brake pedal is depressed.

The light will not come ON if both right and left lamp bulbs burn out simultaneously.

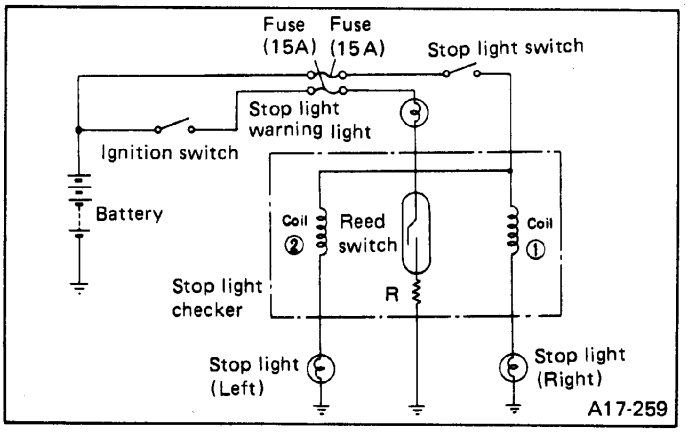


Fig. 22

Brake Fluid Level Warning Light

The light is connected to the brake fluid level sensor that is incorporated in brake fluid reserve tank.
If brake fluid decreases to less than the specified volume in the reservoir, the sensor is actuated and the light comes on while the engine is running.

Total brake fluid volume in reservoir:
180 cm³ (180 cc, 10.98 cu in)
Remaining volume when brake fluid level warning light glows:
Approx. 90 cm³ (90 cc, 5.49 cu in)

a. For checking if bulb of brake fluid level warning light is burned out, make sure that the warning light glows when ignition switch is initially turned to "ON" and it goes out when engine is running.
b. If brake fluid reservoir is inclined or vibrated abnormally, the warning light may be lighted momentarily even fluid level is above the specified limit.

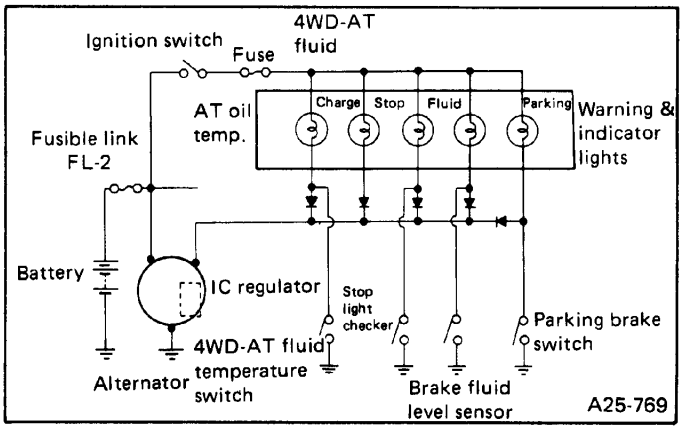


Fig. 23

CHECK ENGINE Warning Light

The warning light is provided for the purpose of indicating the condition of the MPFI system. If the MPFI system is faulty, the warning light will come on while the engine is running. For troubleshooting, refer to the chapter titled "2-7 Fuel Injection System".

STEERING Warning Light

This light comes on when trouble occurs in electronic-controlled motor drive power steering system while engine is running. It also functions as a monitor light when diagnosing the steering system. For troubleshooting, refer to Chapter 4-3 "Steering System".

Low Fuel Indicator Light

The indicator light is operated by thermistor incorporated in fuel unit on fuel tank, and goes on when amount of gasoline in fuel tank is less than the specified volume as shown below.

All models:
9 ℓ (2.4 US gal, 2.0 Imp gal)

Telltale (Graphic Monitor)

According to ignition switch position, each light will come on and/or go off under normal conditions as follows:

Ignition switch position			OFF	ACC	ON	ST	While engine is running
1	DIFF LOCK indicator light	Lock	OFF	OFF	ON	ON	ON
		Unlock	OFF	OFF	OFF	OFF	OFF
	Front wheel drive indicator light	FWD	OFF	OFF	ON	ON	ON
		4WD	OFF	OFF	OFF	OFF	OFF
2	Fasten seat belt warning light		OFF	OFF	○	○	OFF
3	Parking brake warning light	Engage	OFF	OFF	ON	ON	ON
		Disengage	OFF	OFF	ON	ON	OFF
4	Headlight beam indicator light	High-beam	OFF	OFF	ON	ON	ON
		Low-beam	OFF	OFF	OFF	OFF	OFF
5	Power mode indicator light		OFF	OFF	OFF	OFF	△
6	AT selector position indicator light		OFF	OFF	ON	ON	ON
7	First hold indicator light	Engaged (Hold)	OFF	OFF	□	□	□
		Disengaged (Not Hold)	OFF	OFF	OFF	OFF	OFF
8	Height control indicator light (Canada model only)	Disengaged (Normal position)	OFF	OFF	OFF	OFF	OFF
		Engaged (High position)	OFF	OFF	ON	ON	ON
9	Door lock indicator light	Lock	OFF	OFF	OFF	OFF	OFF
		Unlock	OFF	OFF	ON	ON	ON
10	Door ajar warning light	Open	OFF	OFF	ON	ON	ON
		Shut	OFF	OFF	OFF	OFF	OFF
11	Rear defogger indicator light	Engage	OFF	OFF	ON	ON	ON
		Disengage	OFF	OFF	OFF	OFF	OFF

Symbols used: ○ Light comes on only for 6 seconds.
□ When the first hold switch has been set to ON with the select lever in position "2", the indicator light is illuminated.
△ Immediately after engine starts, indicator light comes on. It soon goes out. It also comes on when the AT power mode is selected.

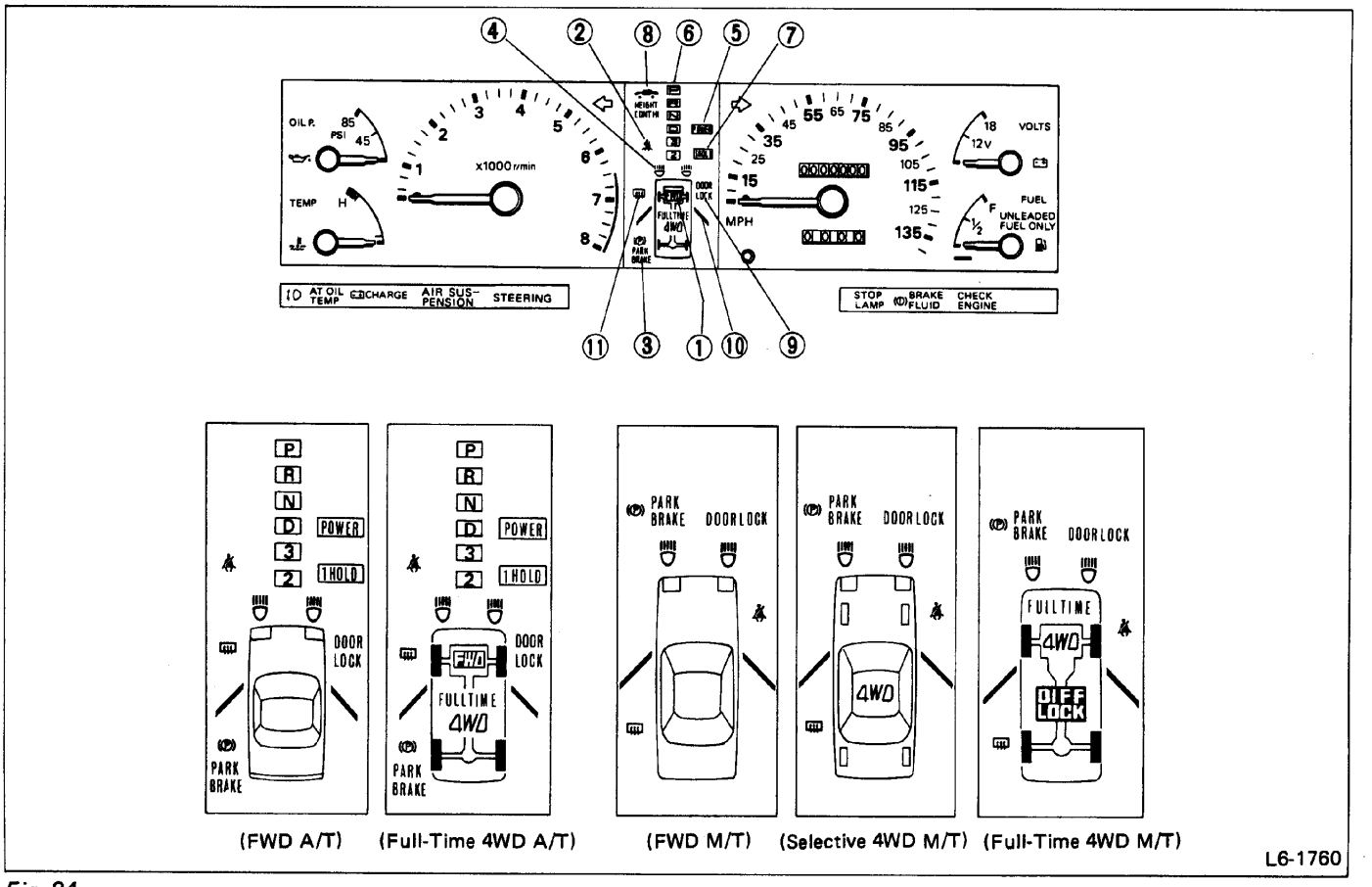


Fig. 24

Analogue Meter

REMOVAL AND INSTALLATION

For procedures used to remove and install meters, refer to Chapter 4-3 "Steering System".

Be sure to disconnect earth cable from negative (minus) terminal of battery previously.

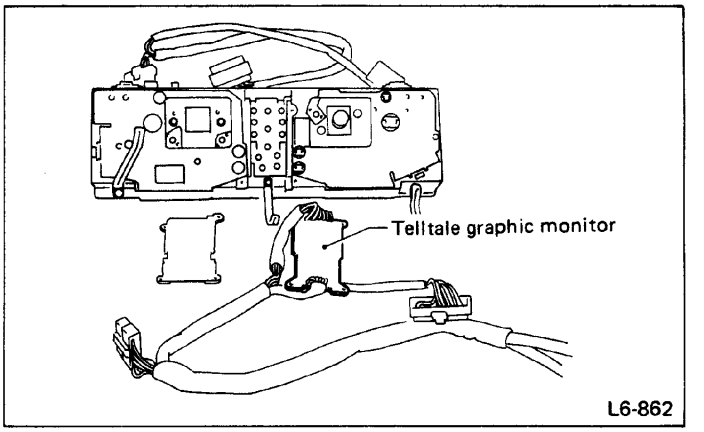


Fig. 25

DISASSEMBLY & ASSEMBLY

1) Remove trip knob by pulling it out.
2) Disconnect wire harness connector from back of meter ASSY.
3) Remove screws and detach telltale graphic monitor.
4) Remove screws and detach meter visor, meter glass and window plate.
5) Remove screws, and detach meters and gauges.

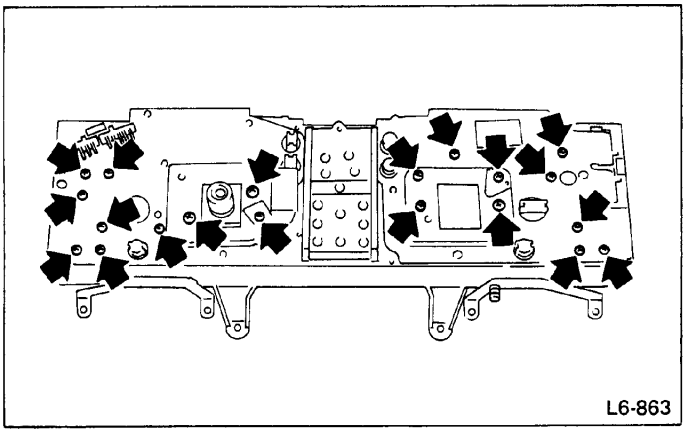


Fig. 26

6) Remove indicator & warning unit from meter visor.

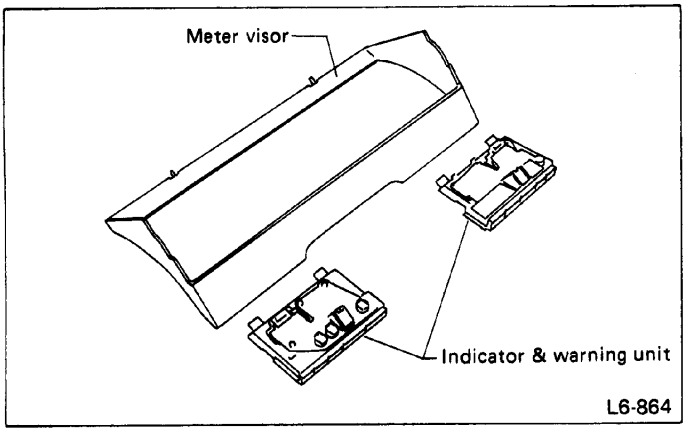


Fig. 27

7) To assemble, reverse disassembly procedures.

INSPECTION

SPEEDOMETER

It is normal if the readings of speedometer are within the tolerances shown in the table 1, against the standard indicated speeds on the speedometer tester.
Besides, speedometer should point as shown in the table 2.

Table 1

Standard indicated speed (km/h or MPH)		20	40	60	80
Readings of speed-ometer	(km/h)	17.9 – 20.9	38.3 – 40.3	56.1 – 60.2	75.6 – 79.6
	(MPH)	17.9 – 20.9	38.3 – 40.3	56.1 – 60.2	75.6 – 79.6

Table 2

Speedometer should point	Meter drive shaft speed
60 km/h	637.5 rpm
60 MPH	1,020 rpm

TEMPERATURE GAUGE

Temperature gauge (cross coil type) is operated by thermistor incorporated in temperature sending unit installed in intake manifold.
Since thermistor resistance changes with voltage, voltage regulator is provided to prevent error in gauge indication due to voltage fluctuation.

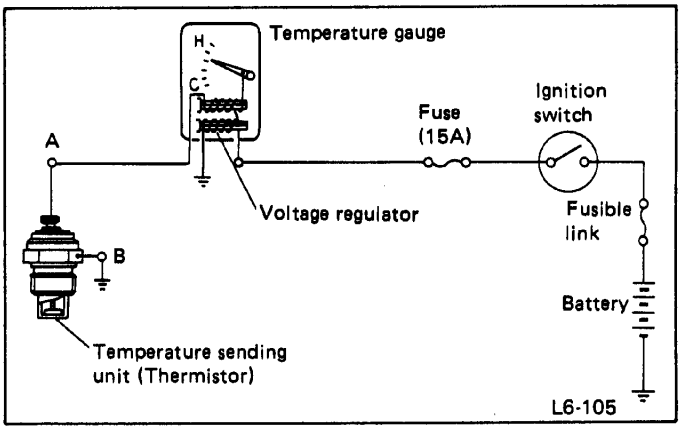


Fig. 28

It is normal if the readings of temperature gauge are within the tolerances of engine coolant temperature as shown in the following table against the standard resistance between point A and B indicated in the wiring diagram when ignition switch is "ON".

Readings of temperature gauge	Standard resistance	Temperature of engine coolant
50°C (122°F)	153.9Ω	34 – 62°C (93 – 144°F)
120°C (248°F)	(16.1Ω)	116 – 123°C (241 – 253°F)

Besides, standard resistance of temperature gauge is 45Ω.

FUEL GAUGE

Needle of fuel gauge remains indicating the amount of fuel in fuel tank after turning igniton switch to OFF position.

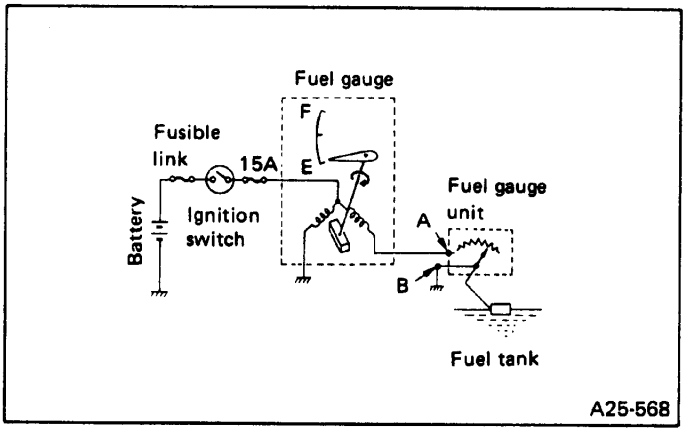


Fig. 29

It is normal if the readings of fuel gauge are within the tolerances of all length between "E" and "F" as shown in the following table, against the standard resistance between point A and B indicated in the wiring diagram when ignition switch "ON".

Reading of fuel gauge	Standard resistance	Tolerance of fuel gauge
E	7.0Ω	+1/12 to −1/24 of all length between "E" and "F"
1/2	(32.5Ω)	–
F	95Ω	+1/24 to −1/12 of all length between "E" and "F"

TACHOMETER

It is normal if readings of tachometer are within the tolerances as shown in the following table, against the standard indicated speeds on tachometer tester.

Also, tachometer should point 5,000 rpm when distributor speed is 2,500 rpm.

Standard indicated speed (rpm)	1,000	2,000	3,000	4,000	5,000	6,000
Tolerance (rpm) −20 to 60°C (−4 to 140°F)	940 to 1,090	1,955 to 2,145	2,970 to 3,200	3,980 to 4,250	4,990 to 5,305	6,000 to 6,360

OIL PRESSURE GAUGE

Oil pressure gauge (bimetal type) is operated by oil pressure unit (bimetal type) located in lubricating system.

It is normal if the readings of oil pressure gauge are within the tolerances as shown in the following table, against the standard indicated pressure values on oil pressure gauge.

Input	0 mA	75 mA
Standard indication	0 psi	45 psi
Indication tolerance	+1.5°, −3.5°	+4.5°, −5.5°

VOLTMETER

It is normal if the readings of voltmeter are within the tolerances as shown in the following table, against the standard indicated values on voltmeter.

Standard indicated Voltmeter values (V)	8	12	16
Tolerance (V)	7 – 8	11.4 – 12.6	15 – 17

Trip Computer (XT6 Only)

The trip computer essentially consists of three units – control unit, display unit and circuit unit. (On XT models, the control unit and the display unit are unitized.)
The control unit contains the "CLOCK", "ALARM", "OUT TEMP", "TRIP", "ARRIVE" and "AVG. SPEED" push-buttons. It also contains a "self-diagnosis" function. Pressing a pushbutton will display a computed result of its corresponding function on the display unit.

All information ("TRIP", "ARRIVE" and "AVG. SPEED") concerning traveling distance appears on the display in Miles for US models and kilometers for Canada models.

Connector		Connection
Terminal	Color	
1	White	Battery
2	Red	Ignition switch
3	Black	Grounding
4	Yellow	Car speed pulse
5	Red/Black	Out temperature ⊖
6	–	–
7	Green	Illumination grounding
8	Brown	Power source (Illumination light)
9	Blue	Out temperature ⊕

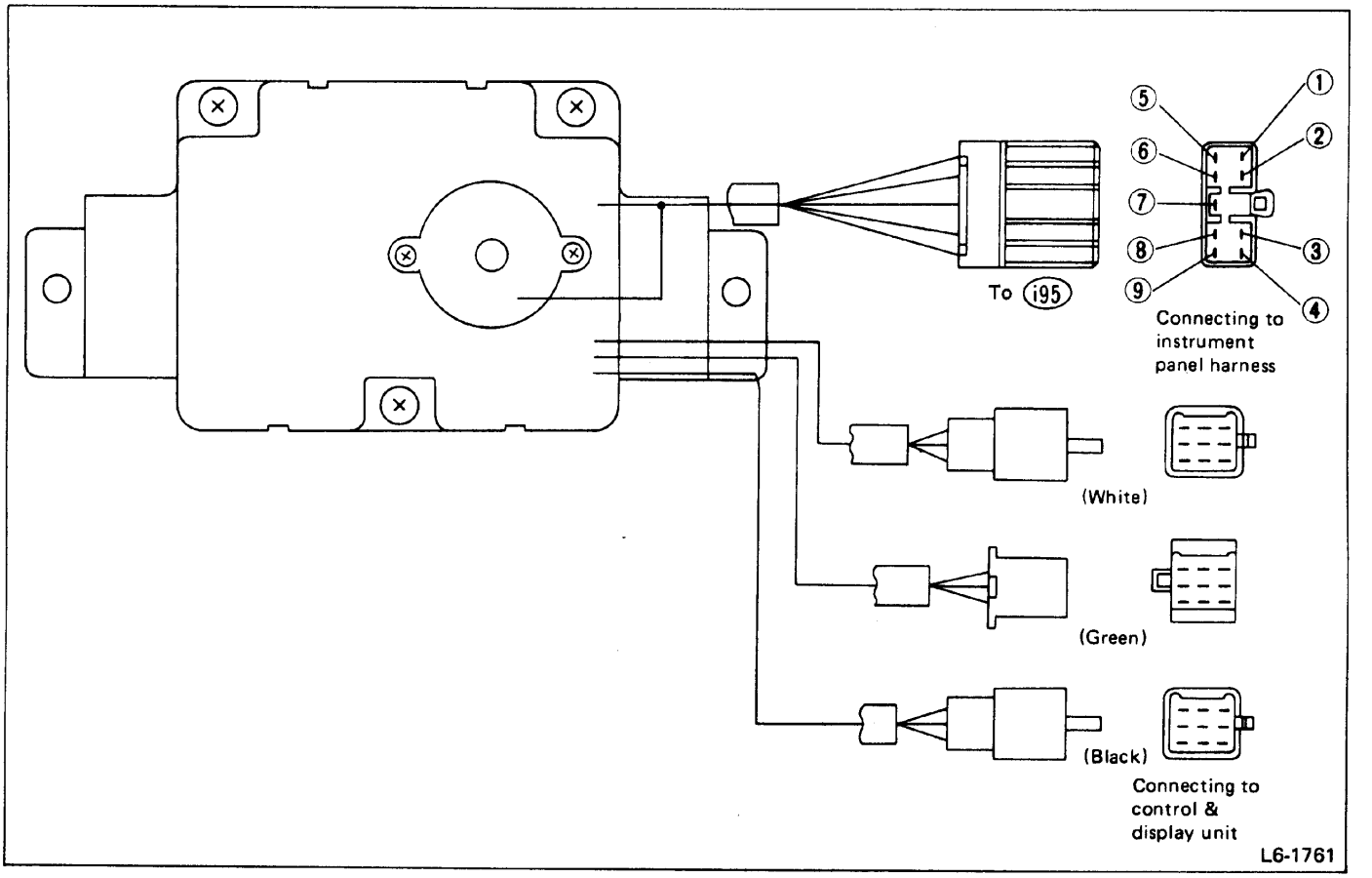


Fig. 30

OPERATION AND FUNCTION

TRIP

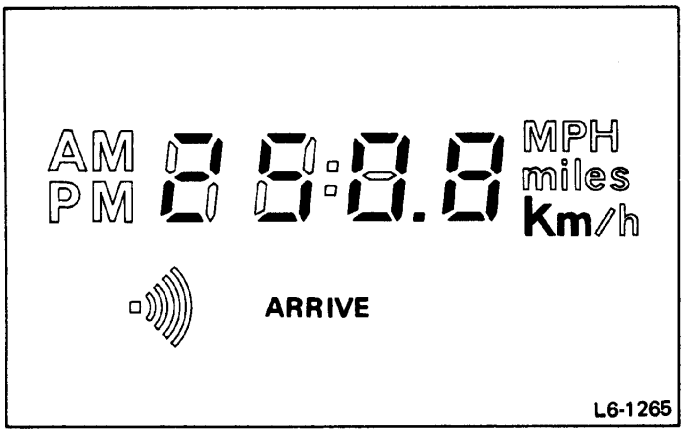


Fig. 31

Display	The travelled distance is shown by four digits of the 7-segment figures. While distance is being displayed, the TRIP button on the control unit is illuminated. "0" as a high-order digit is indicated by a blank.
Display range	<table><tr><th></th><th>Unit</th><th>Display range</th><th>Interval displayed</th></tr><tr><td>Mile</td><td>miles</td><td>0.0 – 999.9</td><td>0.1 mile</td></tr><tr><td>km</td><td>km</td><td>0.0 – 999.9</td><td>0.1 km</td></tr></table>
Function	• The travelled distance is displayed when the TRIP button is depressed. • If the "RESET" switch is depressed for more than 1.2 seconds in the TRIP functions, display returns to "0.0", and clocking of distance starts again in units of 0.1. • In case of overflow in the display, i.e., more than 999.9 is travelled the display returns to "0.0", and then continues. • While the ignition switch is turned to ON, counting is performed if an other function button is depressed. • The count increases by 1.0 km each time 637.5 x 4 pulses are applied. • The count increases by 1.0 mile each time 1020 x 4 pulses are applied. • "0.0" is displayed immediately after the battery is connected. (No memory is retained when the battery is disconnected.)

ARRIVE

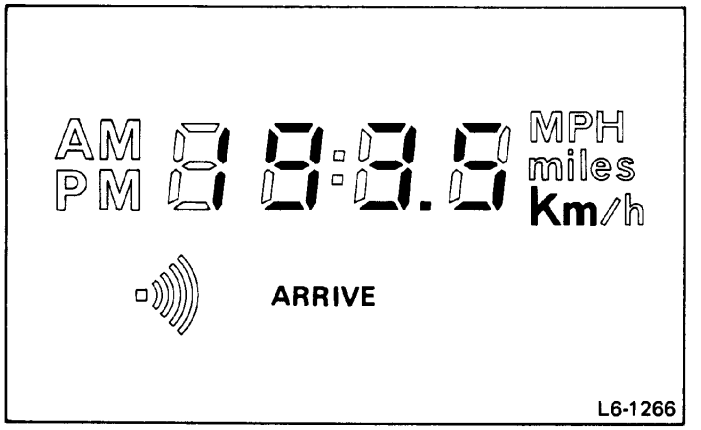


Fig. 32

Display	• The distance left to go is shown by four digits of the 7-segment figures. While the distance is being displayed, the [ARRIVE] button on the control unit is illuminated. "0" as a high-order digit is indicated by a blank, except when resetting.
Display range	• Same as the display range of the TRIP function.
Function	• The distance left to go is displayed when the ARRIVE button is depressed. • After presetting, count down in units of 0.1 starts.
Display of ARRIVE	• The [ARRIVE] display illuminates for six minutes when "0.0" has been reached, then extinguishes. The display also goes out when the ignition switch is turned to OFF; and will not reilluminate when the switch is turned to ON again. The [ARRIVE] display illuminates even if another function is being displayed. At the same time, the buzzer turned to sounds for 3 seconds. • While the ignition switch is turned to ON, counting continues if the other function button is depressed. • The count decreases by 1.0 km each time 637.5 x 4 pulses are applied. • The count decreases by 1.0 mile each time 1020 x 4 pulses are applied. • The indication immediately after connecting the battery is undefined.
Resetting	1) The resetting function is attained when "100", "10", "1" or "0.1" switches are depressed while the ARRIVE function is selected. This mode is cancelled 10 seconds after operating these switches, or when the ARRIVE button is depressed. 2) No counting of ARRIVE function is performed during the resetting mode. 3) When resetting, counted contents less than 0.1 are cleared. 4) The "100", "10", "1" or "0.1" switches function independently, and no carrying over is made at any digit position. 5 → 6 → 9 → 0 → 1 → 2 – – – – – ↳ The upper digit remains unchanged. 5) When the "100", "10", "1" or "0.1" switch is held in, the displayed number changes in sequence for each 0.5 second for the first 1.5 second period, and for each 0.25 second afterward. The number increases by one when the switch is depressed once.

CLOCK

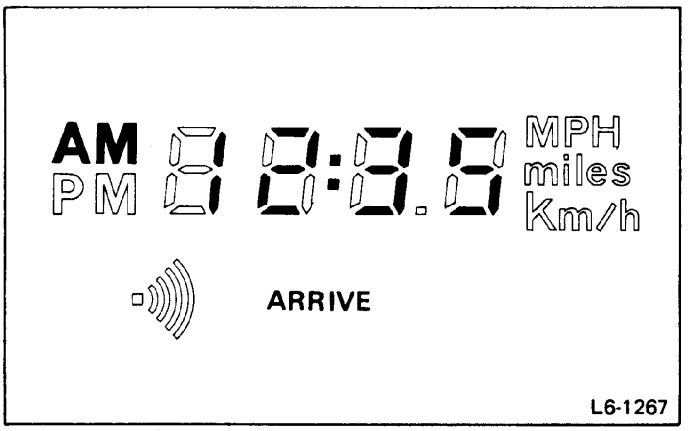


Fig. 33

Display	• The current time is displayed by "AM", "PM", and four digits of the 7-segment figures. While the time is displayed, the CLOCK button on the control unit is illuminated. When the alarm time is being displayed, the ALARM button on the control unit is illuminated. • "0" in the left digit of the "minute" position is displayed as "0", but the "0" in the left digit of the "hour" position is displayed by a blank. Example: AM 8 hours 3 minutes . . . . . AM 8 : 03
Display range	<table><tr><th></th><th>Display range</th><th>Minimum display unit</th></tr><tr><td>AM PM</td><td>1 : 00 to 12 : 59</td><td>1 MINUTE</td></tr></table>
Function	• The time is displayed when the CLOCK button is depressed. • The "AM" or "PM" display flashes once a second with the duty ratio of 50%. • The time is counted continuously as long as the battery is connected, irrespective of the display on the display unit. • Immediately after connecting the battery, the display is "PM 1 : 00", which flashes once a second with the duty ratio of 50%.
Time resetting	1) The "H", "10M", "M", and "SET" switches function only in the CLOCK function. This mode is cancelled when the "SET" switch is depressed. 2) Time is being counted even during the time resetting operation. 3) When the "SET" switch is depressed, the CLOCK display is set to a time signal. 0 to 29 second is rounded off (Ex. $10:00^{29} \rightarrow 10:00^{00}$) 30 to 59 second is carried forward (Ex. $9:59^{35} \rightarrow 10:00^{00}$) 4) The "H", "10M", and "M" switches function independently and no carrying over is made from the unit to tens place in the minute range, nor from minute nine to hour position. 5) If "12" is displayed when the "H" switch is depressed, "AM" changes to "PM", and "PM" to "AM". 6) If "H", "10M", or "M" switch is held in, the displayed number changes for each 0.5 second for the first 1.5 seconds, then for each 0.25 second afterward. The number increases by one when the switch is depressed once.

ALARM

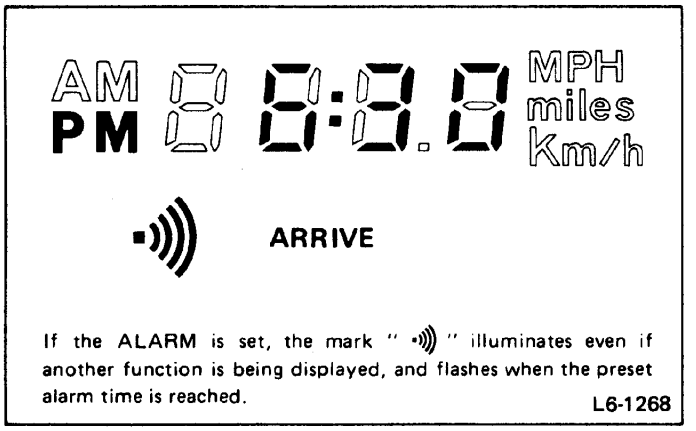
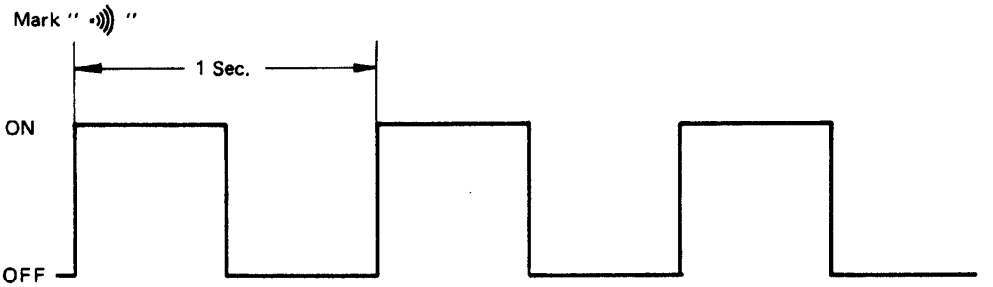


Fig. 34

Time alarm	1) When the ALARM button on the control unit is depressed, it illuminates. If the ALARM is presetted, the mark " •))) " and alarm time are displayed. This state continues until the alarm is cancelled. Neither AM nor PM flashes. 2) When the preset alarm time is reached, the buzzer sounds for six minutes or until the alarm is cancelled even if another function is displayed on the display unit. (The buzzer issues a sound four times a second.) At the same time, the mark " •))) " flashes once a second with the duty ratio of 50%.  3) When the alarm time is being set, the mark " •))) " illuminates even if another function is being displayed. 4) When the ALARM switch is pressed, alarm stops. 5) In the ALARM mode, pressing the RESET switch cancels the "set" time.
Alarm Time Resetting	1) With ALARM button depressed, the alarm time can be reset by pushing the "H", "10M", and "M" switches. This resetting mode is cancelled 10 seconds after depressing these switches, or when the "SET" switch is depressed. If other function button is depressed within 10 seconds, this mode is cancelled after time setting. 2) If "12:" is displayed when the "H" switch is depressed, "AM" or "PM" changes as follows: AM → PM, PM → AM. 3) If the "H", "10M", or "M" switch is helding the displayed number changes for each 0.5 second for the first 1.5 seconds, and for each 0.25 second afterward. When pushed once, the displayed number changes by one.

OUT TEMP

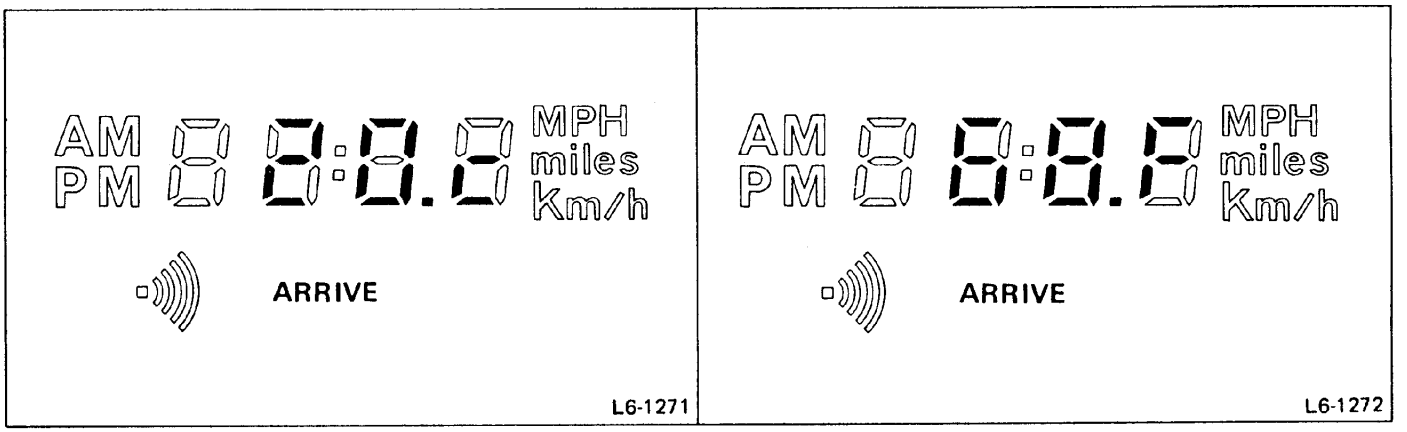


Fig. 35

Display

- The outside air temperature is displayed by three digits of the 7-segment display.
- The outside air temperature indicator on the control panel illuminates when OUT TEMP is displayed.
- The leading "0" in the tens or hundreds place is indicated by a blank.

Display range

°C: −30 to 80
°F: −24 to 176

°C indication

Display temperature (°C)	Resolution (°C)
−30 to −16	2
−16 to 30	1
30 to 80	2

°F indication

Display temperature (°F)	Resolution (°F)
−24 to 4	4
4 to 88	2
88 to 176	4

Indication

°C

Temperature (°C)	−20	20	60
Sensor resistance (kΩ)	50.53	6.244	1.244
Standard	−20±4	20±3	62±4

°F

Temperature (°F)	−4	68	140
Sensor resistance (kΩ)	50.53	6.244	1.224
Standard	−4±8	68±6	144±8

Response time	• When display temperature is decreasing: 4 seconds (The minimum time for changing one display unit) • When display temperature is increasing: 1 minute
Display after battery connection	• Undefined (The value is within the display range.)

AVG SPEED

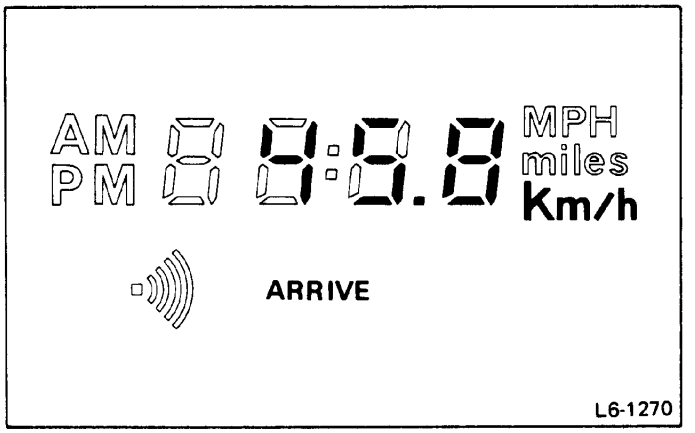
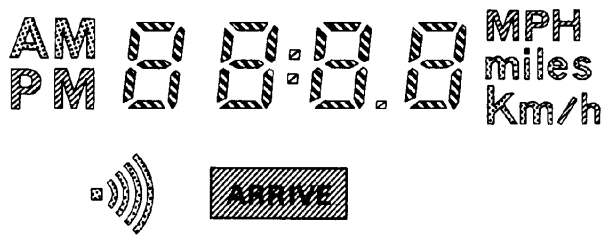


Fig. 36

Display	• The AVG (SPEED) is displayed by four digits of the 7-segment figures. • While this is being displayed, the AVG SPEED button on the control unit is illuminated. "0" as a high-order digit is indicated as a blank.
Display range	<table><tr><th></th><th>Unit</th><th>Display range</th><th>Discrimination</th></tr><tr><td>mile</td><td>MPH</td><td>0.0 – 150.0</td><td>0.1 MPH</td></tr><tr><td>km</td><td>km/h</td><td>0.0 – 240.0</td><td>0.1 km/h</td></tr></table>
Display update time	• 4.8 sec
Function	• The average speed is displayed when the AVG SPEED button is depressed. • The displayed contents are travelled distance/travelled time, and the distance and time travelled after resetting the average car speed are used.
Display at overflow	• If the travelled time exceeds 100 hours, or the travelled distance exceeds 1000.0 display unit [that is, 1000.0 km (625 mile), the previously displayed contents are displayed. In this case, "km/h" or "MPH" display flashes.
Display immediately after resetting	• If (AVG SPEED) function is selected directly after connecting the battery, or directly after resetting, bars are displayed for 4.8 seconds, that is - - - km/h (MPH).

Self-diagnosis



The hatched position and black-colored portion flash alternately, in addition to the display of the 7-segment figures.

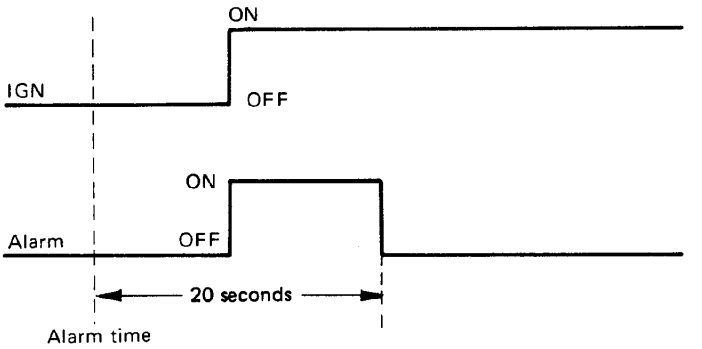
L6-1273

Fig. 37

Self-diagnosis	• The self-diagnosis function is attained when the CLOCK, ALARM and ARRIVE buttons are depressed at the same time. • In this function, all seven-segments light up for three seconds, then each digit changes from 9 to 8 to 7, . . . , 2 to 1 to 0 for 0.5 second each. During this period, ["AM", "))) ", " : ", "Miles" "(km)"] and ["PM", "ARRIVE", ".", "MPH", "(/h)"] flash alternately. • During this function, the buzzer sounds intermittently for a period of 0.5 second in synchronization with the change of the displayed figure.
Return to function after self-diagnosis	• The self-diagnosis function is cancelled when one complete cycle has ended, or when another function button is depressed. Upon completion of the self-diagnosis cycle, display returns to the CLOCK function.
Self-diagnosing of LED (pilot lamp) on control unit	• The lamps are illuminated in the sequence of CLOCK, ALARM, OUT TEMP, TRIP, ARRIVE, AVG SPEED in synchronization with the change in the displayed figure. Each lamp illuminates for 0.5 seconds period. (ON All digits and marks) Display: 9 8 7 6 5 4 3 2 1 0 CLOCK Lamp: (OFF) CLOCK CLOCK, ALARM, OUT TEMP, TRIP, ARRIVE, AVG SPEED

In addition to the above, the following functions are also provided:

Display when ignition switch is turned to ON	• When the ignition switch is turned to ON, the function selected when the ignition switch was turned to OFF is displayed again.
Multiple function input	• If two or more function inputs are made, except in the self-diagnosis, the function which is input first is displayed. The next input is accepted only after all functions are turned to OFF once.

ALARM at ignition switch OFF	• If the preset alarm time is reached while the ignition switch is OFF and the ignition switch is turned to ON within 20 seconds after the alarm time, the buzzer sounds and the sign " •))) " flashes till the 20-second period terminates. 
Operation of function button	• When any of the function buttons are depressed, the buzzer sounds for 0.05 seconds, indicating that the signal has been accepted.
Operation of "RESET" switch	• If the "RESET" switch is kept ON for 1.2 second, the buzzer sounds for 0.05 seconds.

REMOVAL AND INSTALLATION

1) Control & display unit
   (1) Pry out the cover beside the unit and remove screw in the opening.
   (2) Using screwdriver, slightly pry the unit up, being careful not to damage instrument panel.

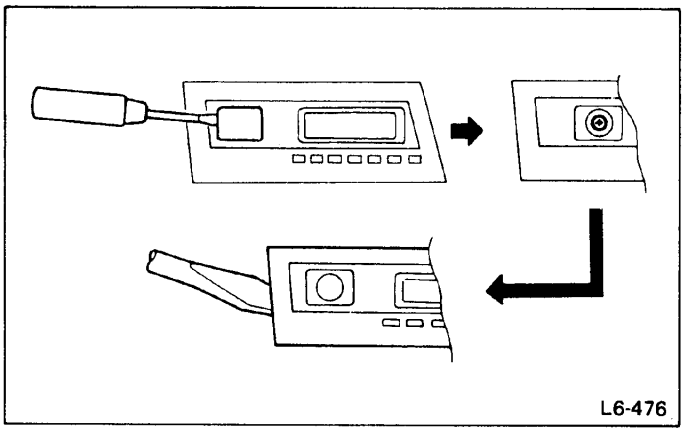


Fig. 38

(3) Disconnect the connector and take out the unit.
(4) To replace bulbs, remove five screws on the back side case.

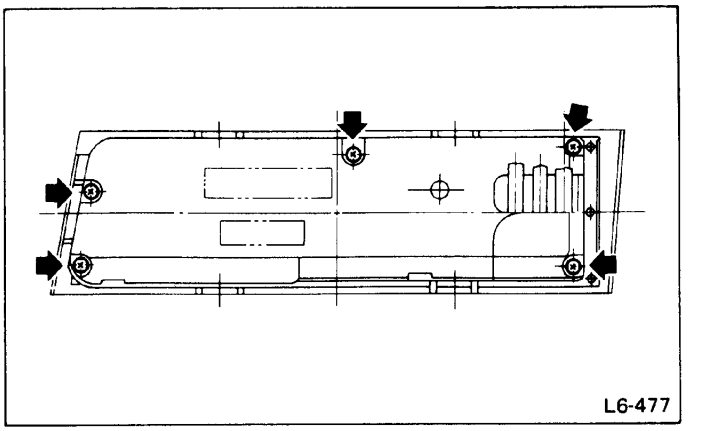


Fig. 39

(5) Installation is in the reverse order of removal.

2) Circuit unit

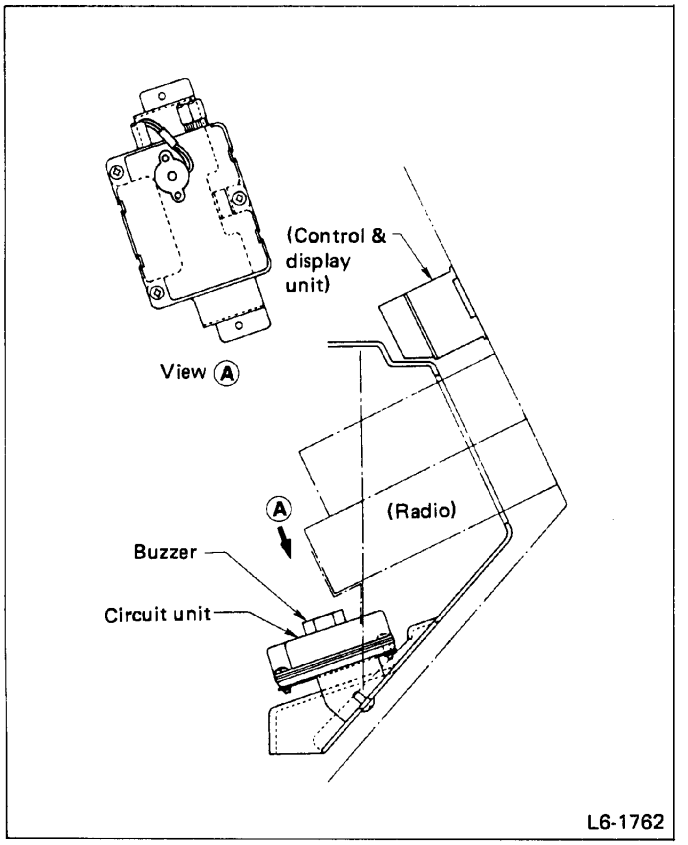


Fig. 40

(1) Detach control & display unit.
(2) Remove radio fixing screws through the opening and take out radio.
(3) Through the opening to be installed the radio, remove three screws and detach the circuit unit from the bracket.
(4) Installation is in the reverse order of removal.

Ignition Switch

Ignition switch is installed on steering column and steering lock mechanism is provided.
Key plate can be pulled out of ignition switch only in "LOCK" position.

CONNECTION

Connection of ignition switch terminals is shown in the following table.

Make sure to securely connect electric connector to ignition switch.

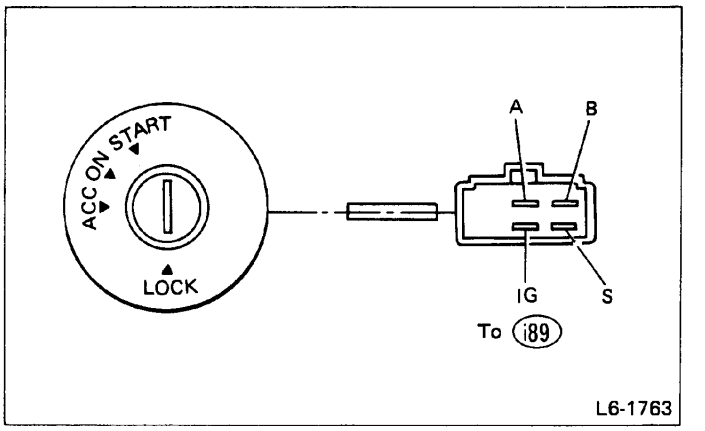


Fig. 41

Connector	Switch operation			
Terminal	LOCK	ACC	ON	START
B		○	○	○
A		○	○	○
IG			○	○
S				○

Combination Switch

Combination switch is fitted on steering column and is combined with headlight dimmer switch, turn-signal switch, hazard warning light switch, parking light switch, and wiper & washer switch. Transistorized turn & hazard unit is incorporated in combination switch. Turn signal lever has clicks for lane changing.

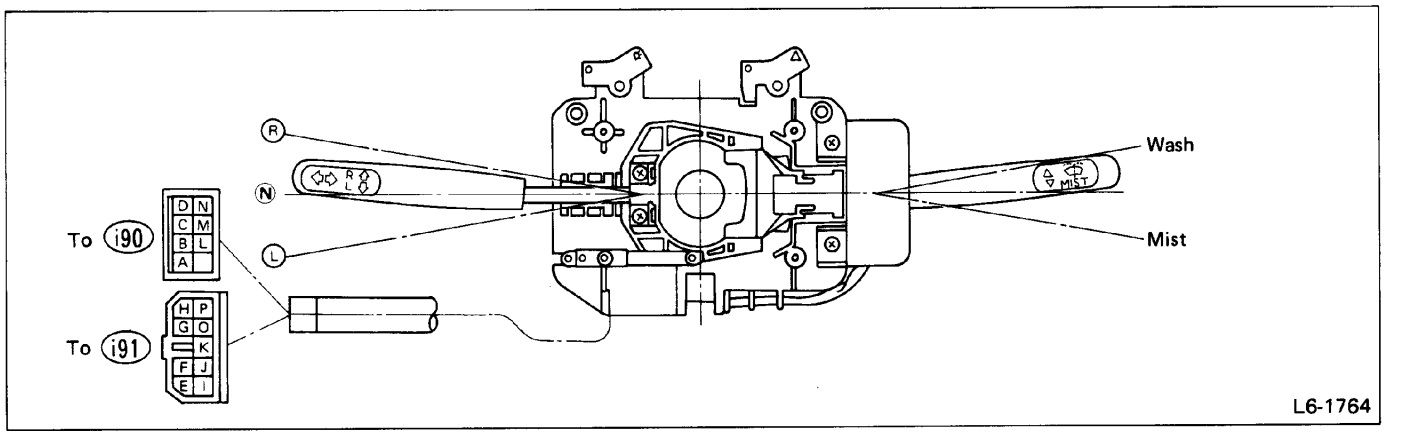


Fig. 42

CONNECTION

Connection of each terminal is shown in the following table.

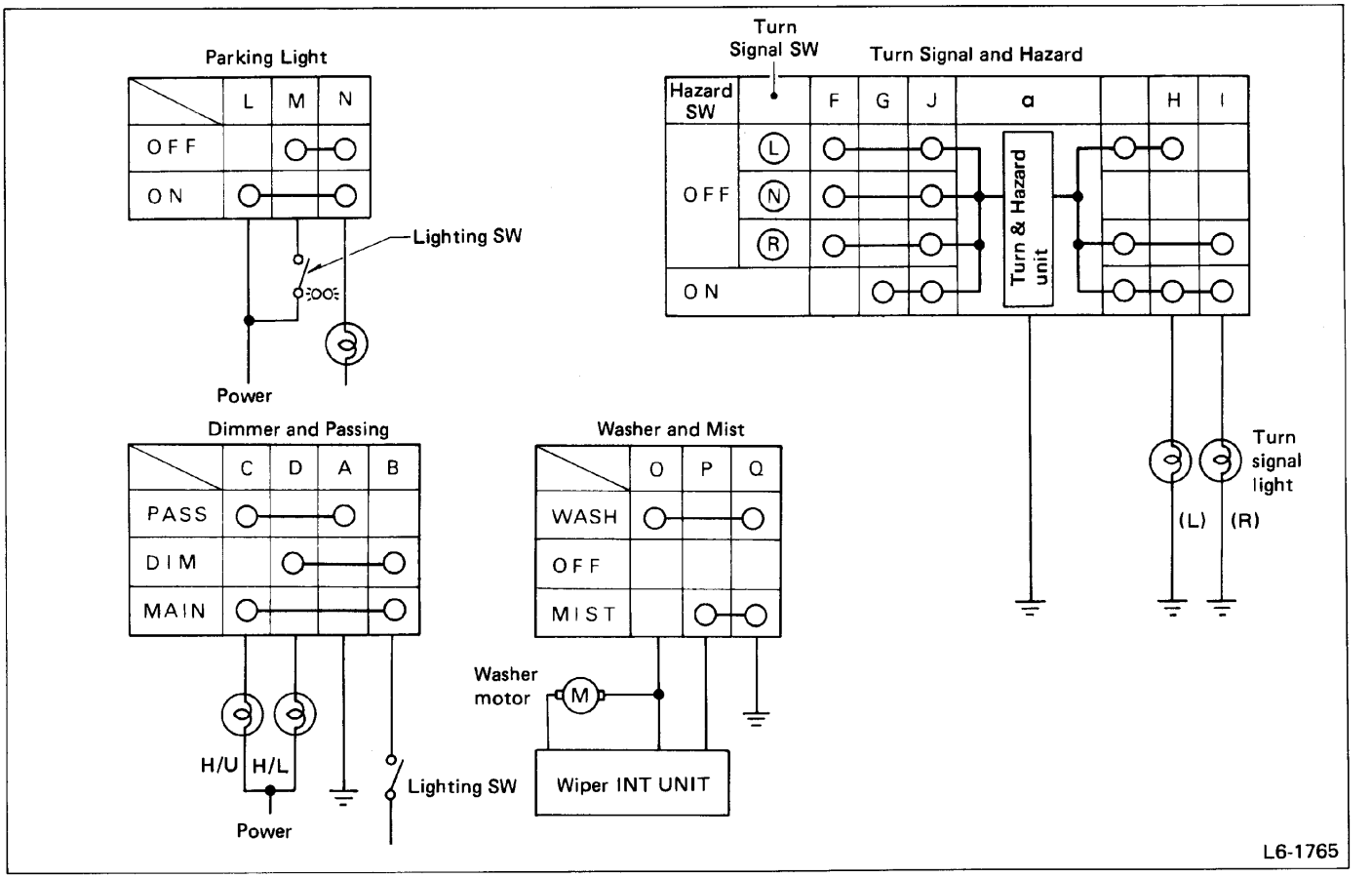


Fig. 43

REMOVAL AND INSTALLATION

1) Remove screws and detach lower cover.
2) Remove fixing screws and detach column covers (upper and lower).
3) Take out steering wheel cover and remove nut using Special Tool. Then, detach steering wheel.
4) Detach clip and band fitting harness to steering column, and disconnect the connectors.
5) Remove screws fixing combination switch to control wing bracket, and take out combination switch.
6) Installation is in reverse order of removal.

Control Wing

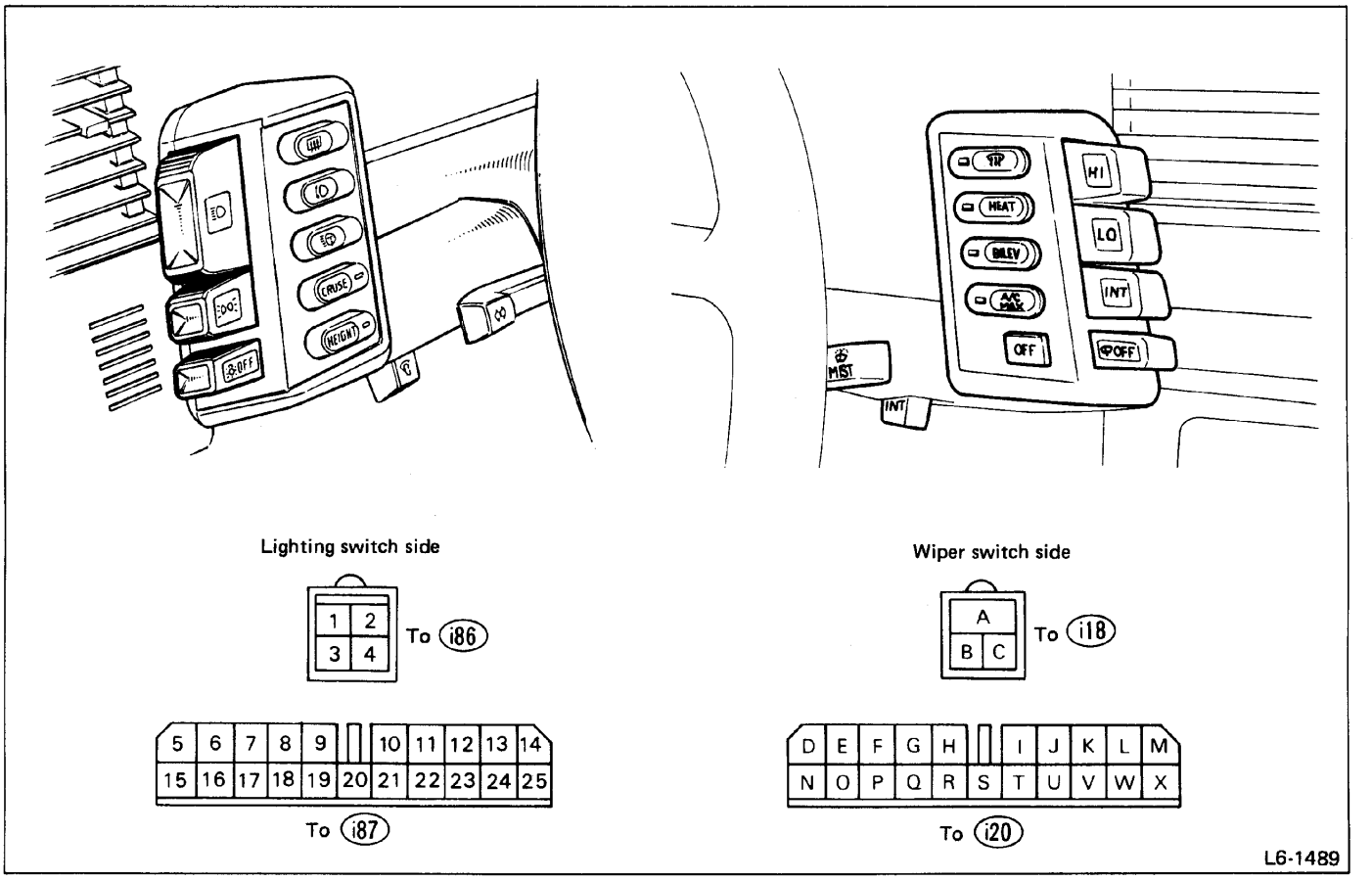


Fig. 44

Lighting switch

Connector		Switch operation			Connection
Terminal	Color	OFF	≡D◐≡	≡D	
1	RL		○	○	Power source
2	R		○	○	Combination meter and Combination switch
9	YW	○	○		
10	YW	○	○		
7	YR	○	○		Timer
3	YB			○	Headlight beam switch and Retractable headlight switch
4	B	○	○	○	Grounding
		Illumination control unit			⏚
8	RB	○	○	○	Combination meter

Wiper and washer switch

Connector		Switch operation				Connection
Terminal	Color	OFF	INT	LO	HO	
D	LW				○	Wiper motor
E	G		○	○		Wiper INT unit
F	Y	○	○			Wiper INT unit and wiper motor
G	YL	○				Wiper motor
H	R			○	○	Ignition switch (ACC)
I	RB	○				Wiper INT unit
J	YB		○			Wiper INT unit
K	B	○	○			Grounding
M	BW					Resistor
N	BY					

Heater & Ventilator Control

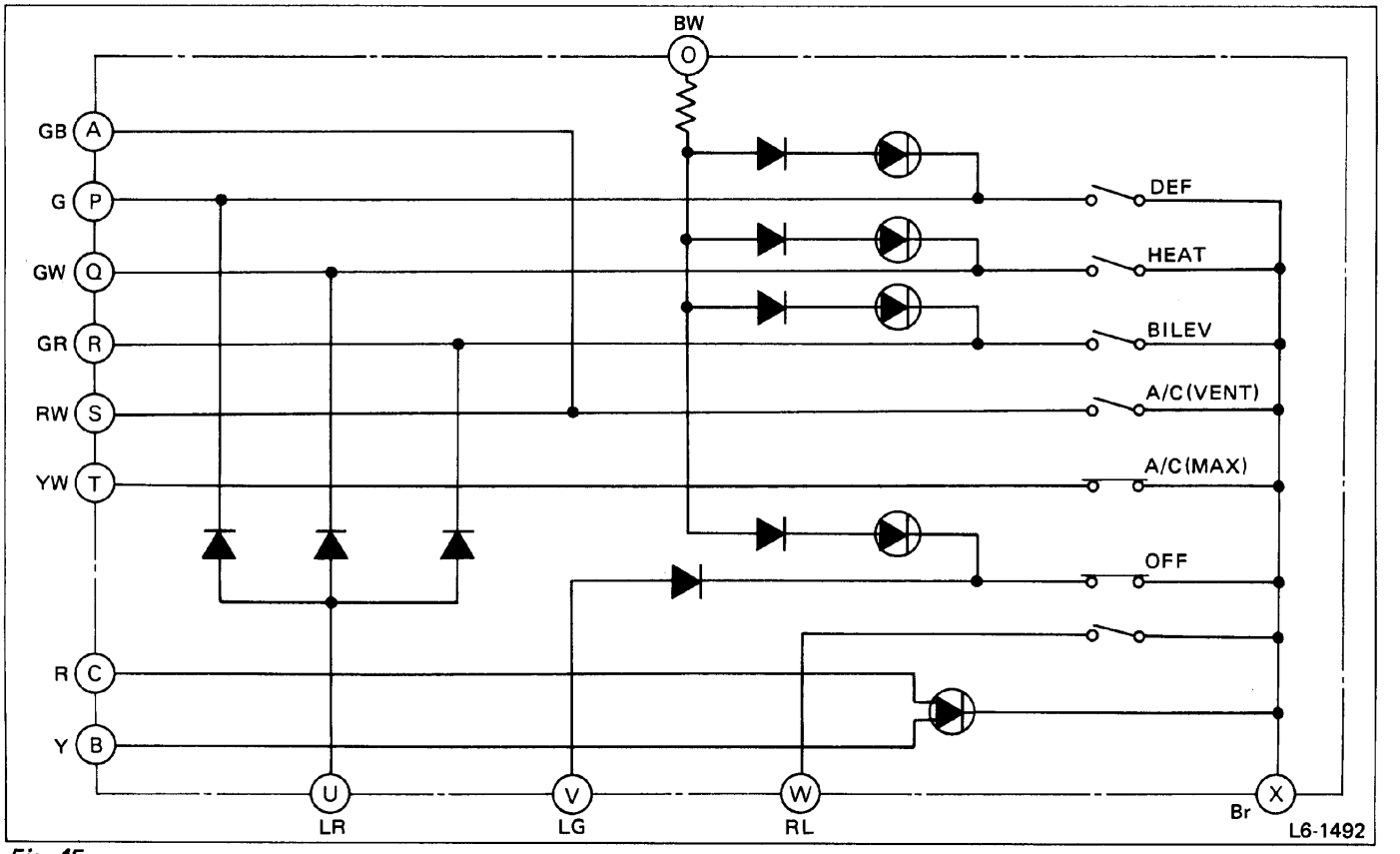


Fig. 45

SUB SWITCH

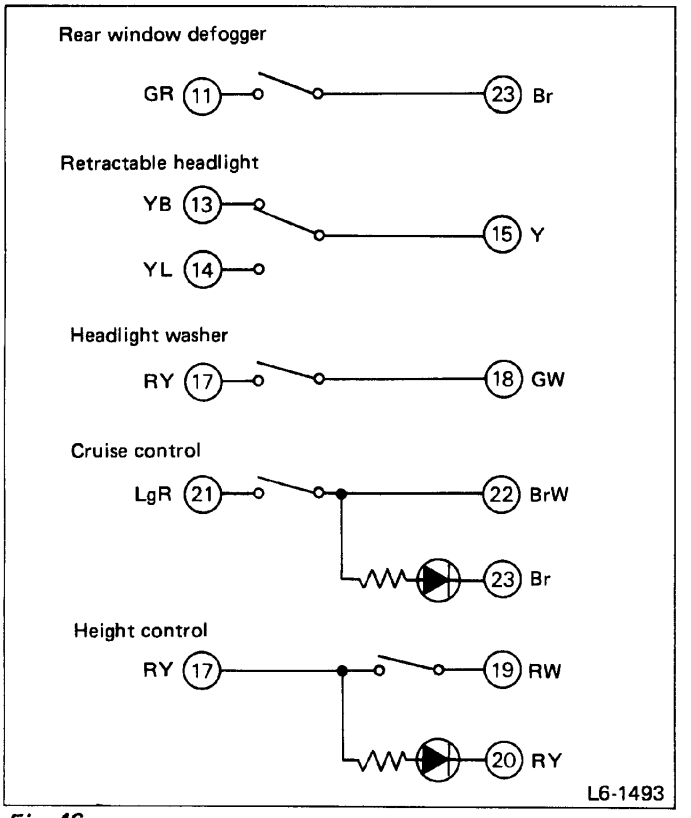


Fig. 46

REMOVAL AND INSTALLATION

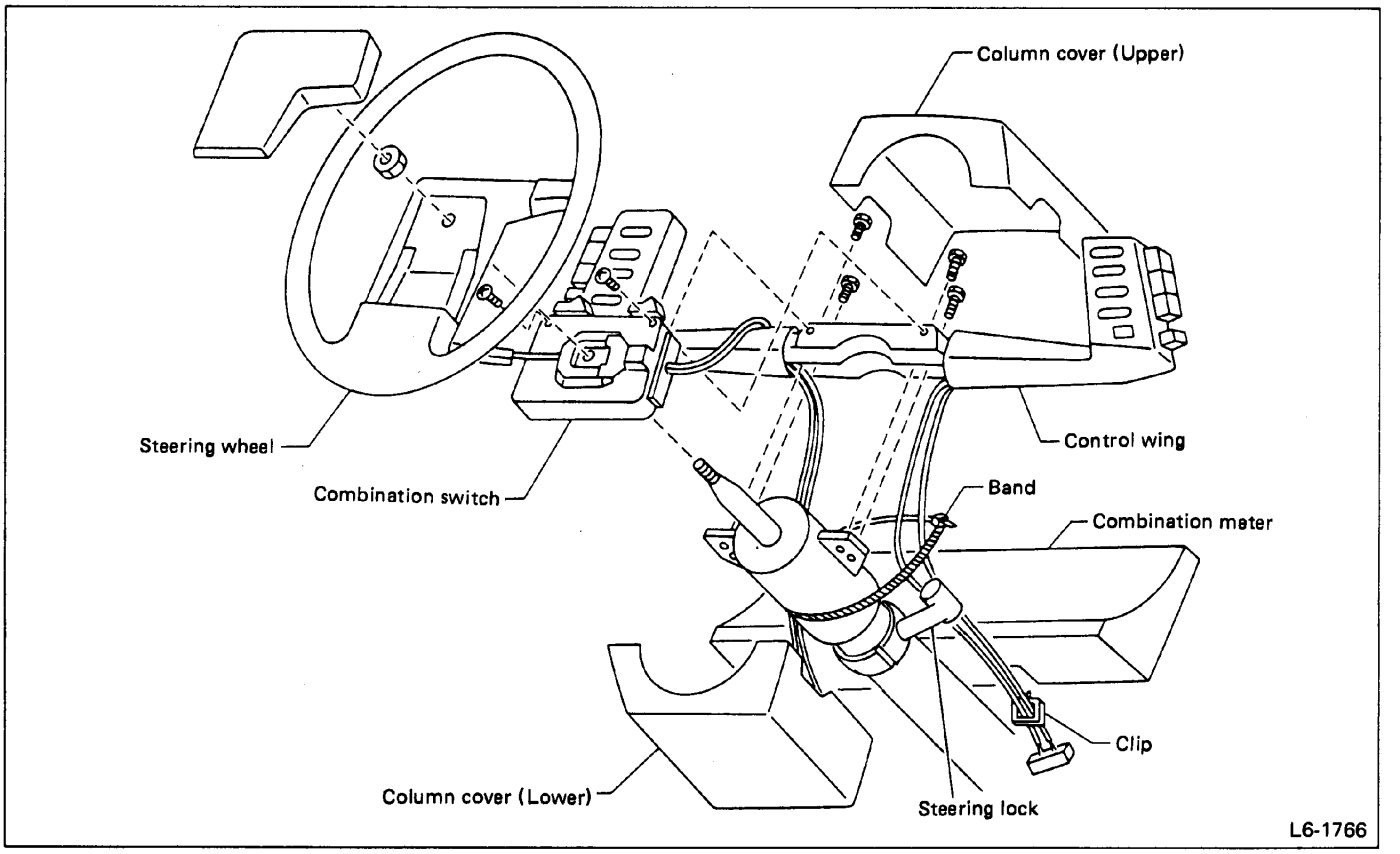


Fig. 47

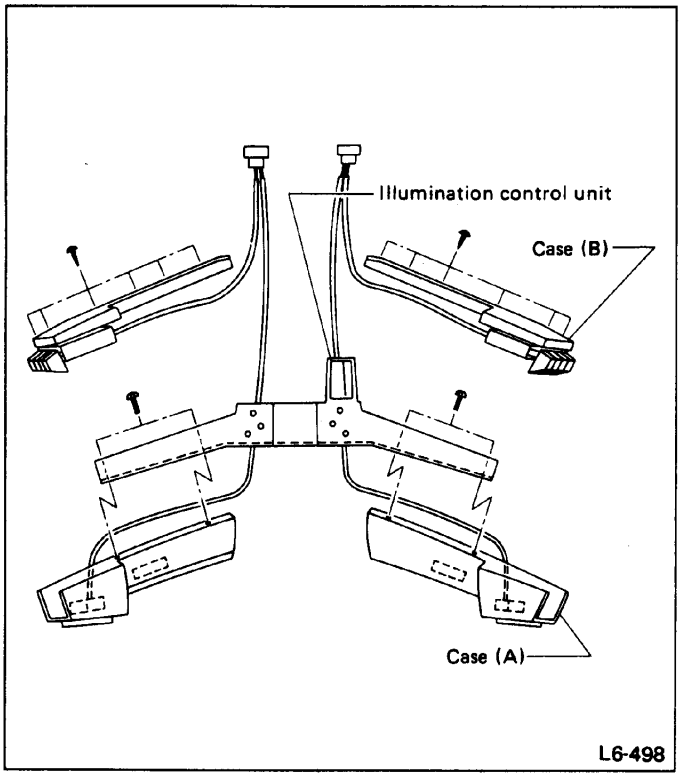


Fig. 48

1) Remove screws and detach lower cover.
2) Remove fixing screws and detach column covers (upper and lower).
3) Take out steering wheel cover and steering wheel.
4) Detach clip and band fitting harness to steering column.
5) Remove screws and take out combination switch.
6) Remove fixing bolts and detach control wing.
7) Remove screws and separate case A and case B from control wing.
8) Installation is in the reverse order of removal.

a. To remove switch knob, lightly push pawl inside it using a pin and pull the knob out.

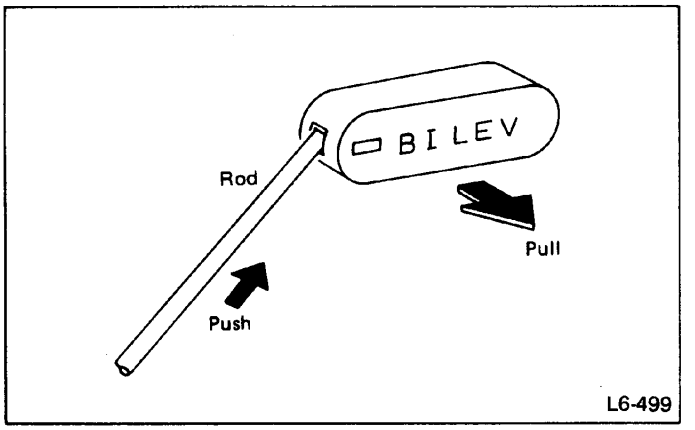


Fig. 49

b. When installing sliding switch knob and volume control, place your finger on the rear surface of the control and mesh the knob with the control.

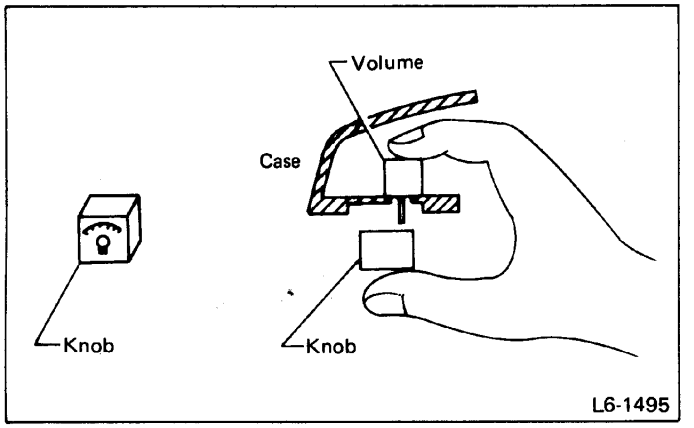


Fig. 50

c. Do not allow harness to be caught in cases A and B or pulled unnecessarily during ASSY.

Retractable Headlight

The retractable headlights are operated (opened or closed) by the retractable headlight switch, lighting switch or flasher switch.

An indicator light in the combination meter illuminates for approximately one second to indicate that current is flowing through the headlight motor during open-close operation.

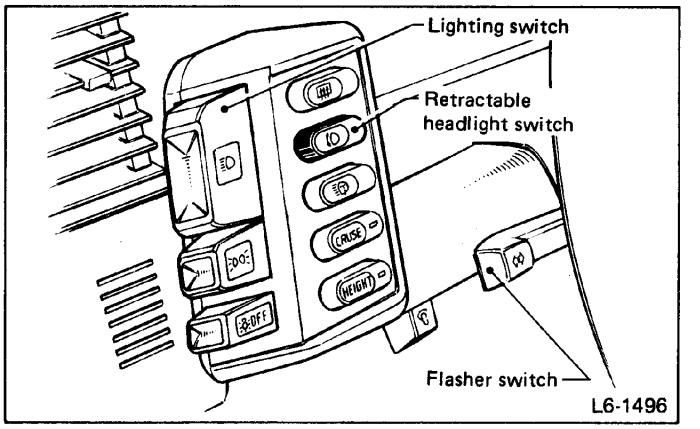


Fig. 51

a. If the headlights fail to retract or open, take emergency action as follows:

(1) Open hood and disconnect connector from retractable headlight motor.

(2) Remove rubber cover from top of the motor.

(3) Turn manual control knob on top of the motor until the headlights are open completely.

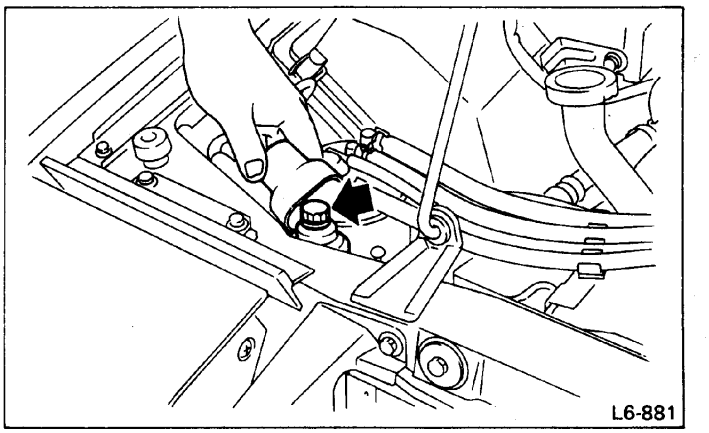


Fig. 52

(4) Install the rubber cover as before.

b. If foreign matter hampers movement of the headlights, immediately repeat steps (1) through (3) in a. above, and remove foreign matter.

Otherwise, current will continue to flow through the circuit, resulting in a rundown battery. Whether or not current is flowing through the circuit can be determined by the indicator light in the combination meter.

REMOVAL AND INSTALLATION

1) Disconnect electric connectors for retractable headlight and motor.
2). Detach plastic cover.
3) Remove screws and take out lid.

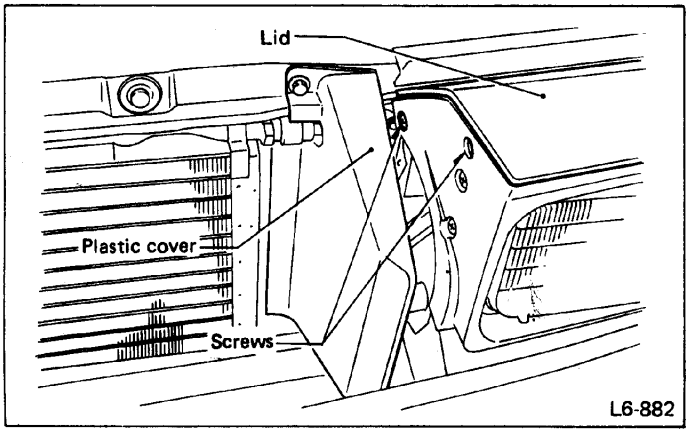


Fig. 53

4) Remove screws and take out headlight cover.

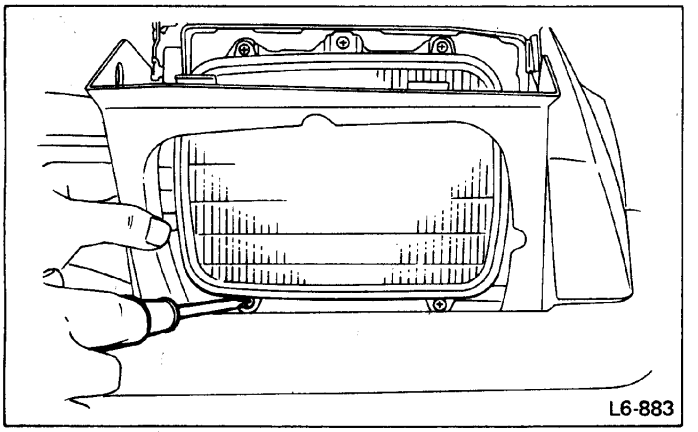


Fig. 54

5) Remove fixing bolts and take out retractable headlight ASSY.

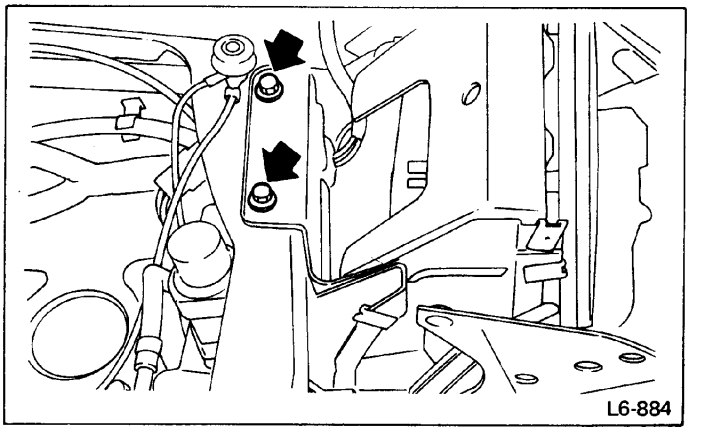


Fig. 55

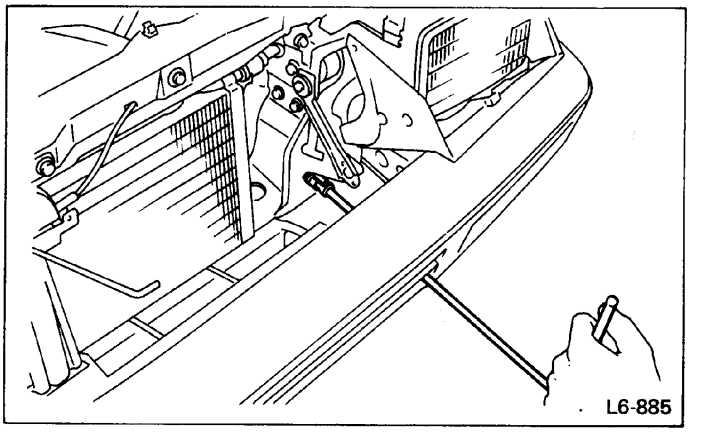


Fig. 56

6) Remove fixing bolts and separate motor from retractable headlight ASSY.

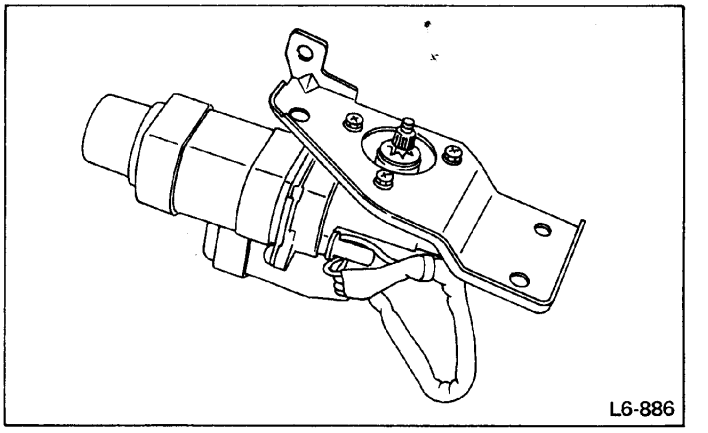


Fig. 57

INSTALLATION

Install each part in the reverse order of removal with the following cautions:
1) Tighten bolts and screws to the specifications.

Tightening torque:
Motor fixing bolts
13 – 23 N·m (1.3 – 2.3 kg-m, 9 – 17 ft-lb)
Headlight cover fixing screws
3 – 6 N·m (0.3 – 0.6 kg-m, 2.2 – 4.3 ft-lb)

2) Install retractable headlights so that the clearance between lid, hood and fender is within the range indicated in the following figure.

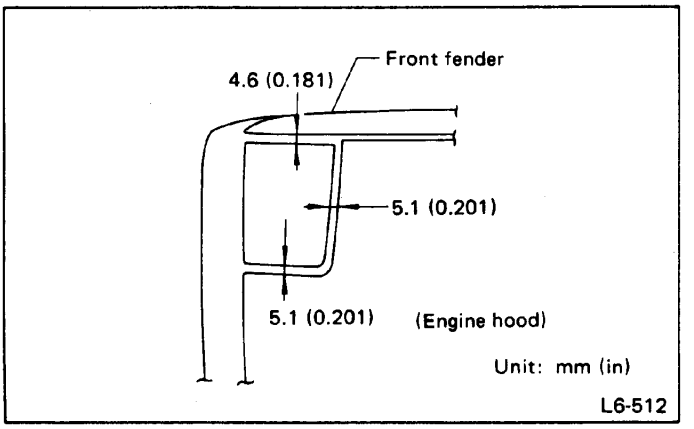


Fig. 58

3) After adjusting the headlights, recheck them for proper movement.

Wiper and Washer

ON-CAR SERVICES

ADJUSTMENT

1) When wiper switch is in "OFF" position, adjust blades in original position as shown in illustration by changing wiper arm installation.

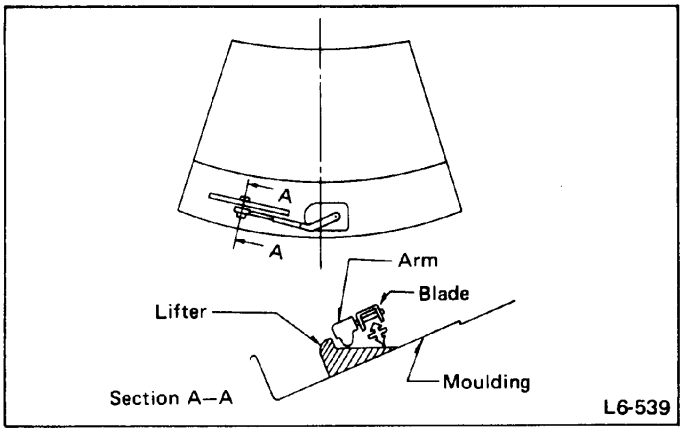


Fig. 59

2) Adjust washer ejecting point on windshield glass as shown in illustration when car stops.

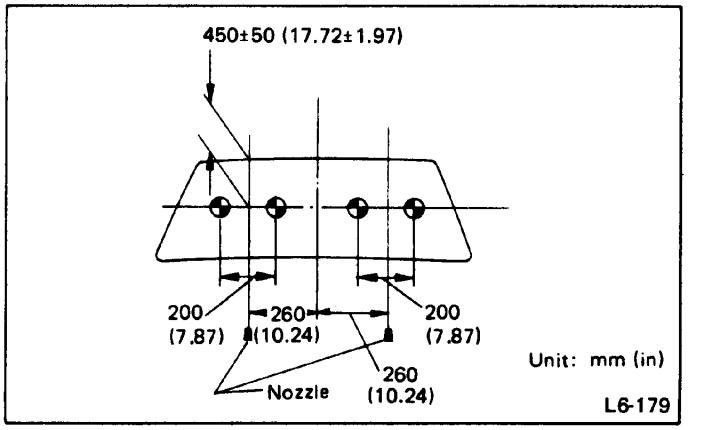


Fig. 60

REMOVAL

BLADE

Remove attaching screws and separate blade from wiper arm.

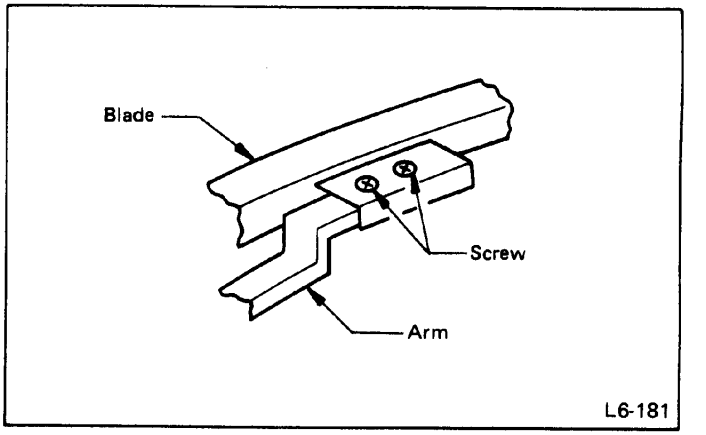


Fig. 61

ARM

With front hood opened, remove nut and take out wiper arm and arm cover.

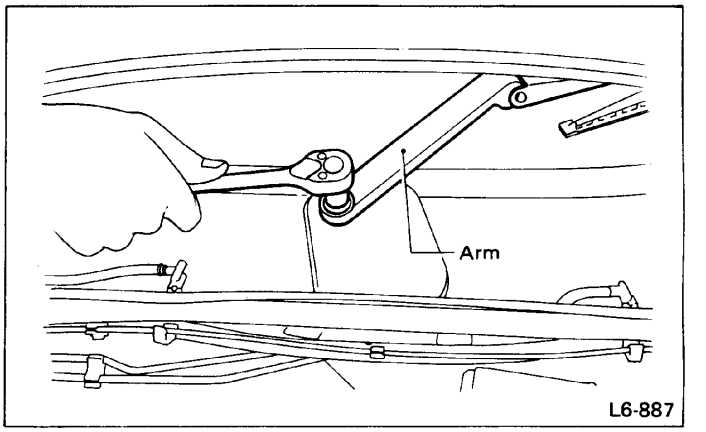


Fig. 62

WIPER MOTOR ASSEMBLY

1) Detach plugs fitting moulding.
2) Disconnect electric connector.
3) Remove fixing bolts and detach wiper motor ASSY.

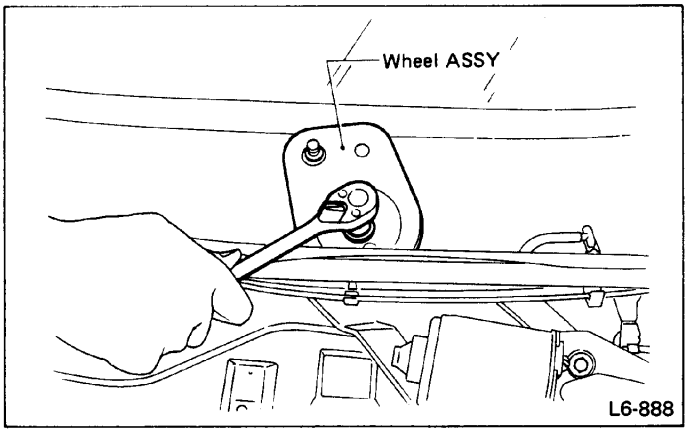


Fig. 63

4) Remove bolts and nut, and separate wheel ASSY from wiper motor ASSY.

WASHER TANK

1) With front right-hand side mud guard and air cleaner detached, disconnect electric connector and washer hose.
2) Remove nuts in engine room, and take out washer tank along with washer pump.

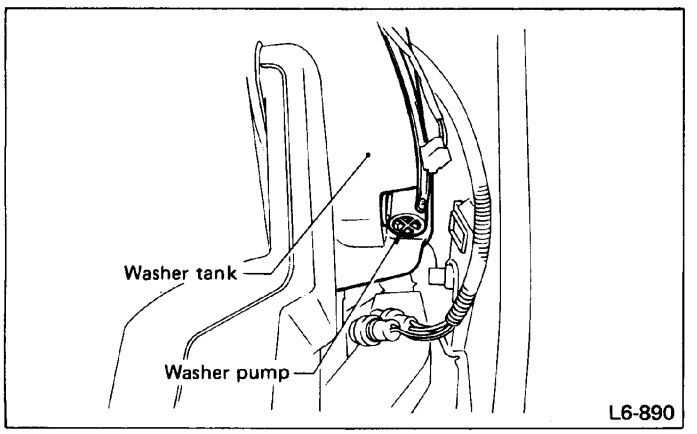


Fig. 64

NOZZLE

1) Detach front lower moulding and net.
2) Disconnect washer hose and pull out nozzle.

INSTALLATION

Install each part in the reverse order of removal with the following cautions:

1) Tighten bolts and nuts to the specifications.

Tightening torque:
Wheel ASSY attaching bolts
6.4 – 9.3 N·m (0.65 – 0.95 kg-m, 4.7 – 6.9 ft-lb)
Wiper motor to wheel ASSY attaching nut
22 – 29 N·m (2.2 – 3.0 kg-m, 16 – 22 ft-lb)
Wiper motor ASSY fixing bolts
4.4 – 7.4 N·m (0.45 – 0.75 kg-m, 3.3 – 5.4 ft-lb)
Wiper arm fixing bolts
10 – 18 N·m (1.0 – 1.8 kg-m, 7 – 13 ft-lb)
Washer tank attaching nuts
3 – 6 N·m (0.3 – 0.6 kg-m, 2.2 – 4.3 ft-lb)

2) After installation, make sure that the wiper and washer are operated in the normal condition.

Wiper Intermittent Control System

A microcomputer is used in the windshield wiper intermittent control circuit to provide a car-speed-sensing function.
The higher the car speed, the more rain on the windshield. When the wiper switch is set to the INT position, the control circuit automatically changes the time interval preset by the intermittent control switch in response to car speed. In other words, when the switch is in the INT position, the wiper operates for one cycle and then stops. If speed increases to 20 km/h (12 MPH) before the next wiper cycle (during the resting time), the wiper will complete another cycle during that time.

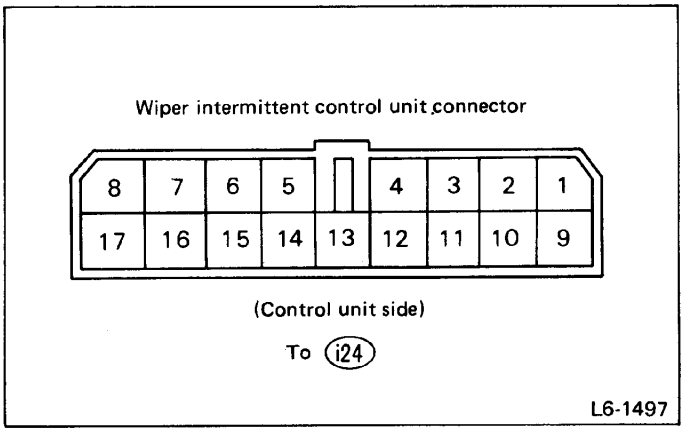


Fig. 65

CONNECTION

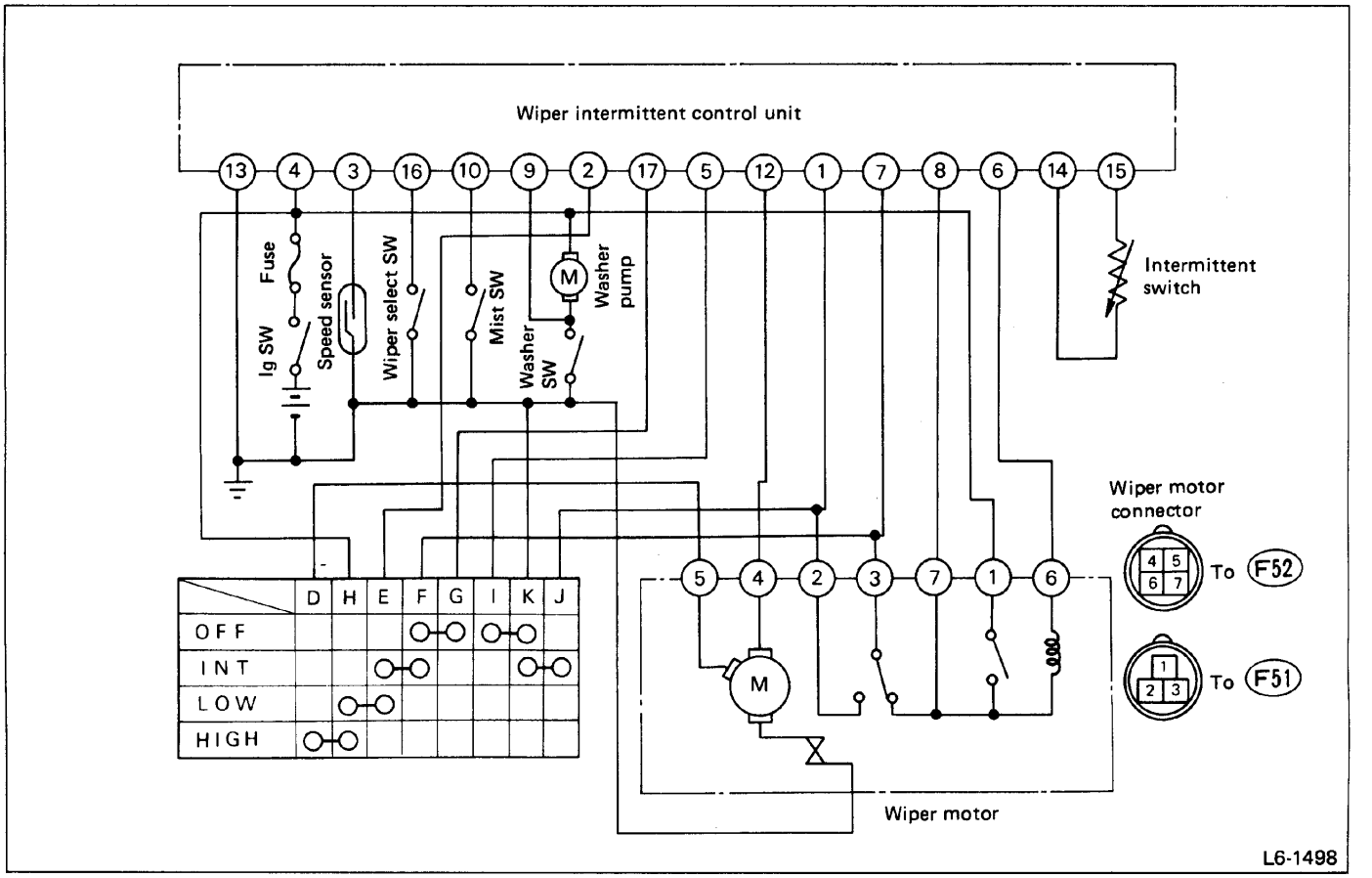


Fig. 66

Radio

REMOVAL AND INSTALLATION

RADIO BODY

1) Take off floor mat of driver's side and draw out feeder cord connectors from left side of center under portion of instrument panel.

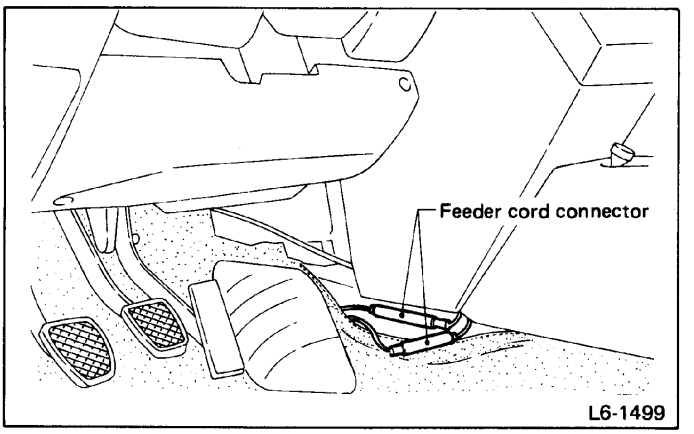


Fig. 67

2) Disconnect feeder cord connectors.
3) Take out clock.
4) Remove fitting screws, and slightly pull out radio along with bracket.
5) Disconnect electric connectors from the back side of radio, and take out radio along with antenna feeder cord and bracket.
6) Remove screws and separate bracket from radio.
7) Installation is in the reverse order of removal.

ADJUSTMENT

1) Setting push button.

- Other than ETR (Electronic tuning radio)

There are five push buttons, so five stations are selected as follows.

(1) Select a station by turning the turning dial.
(2) Pull the push button and push it back, and then the push button is kept set at the station required.

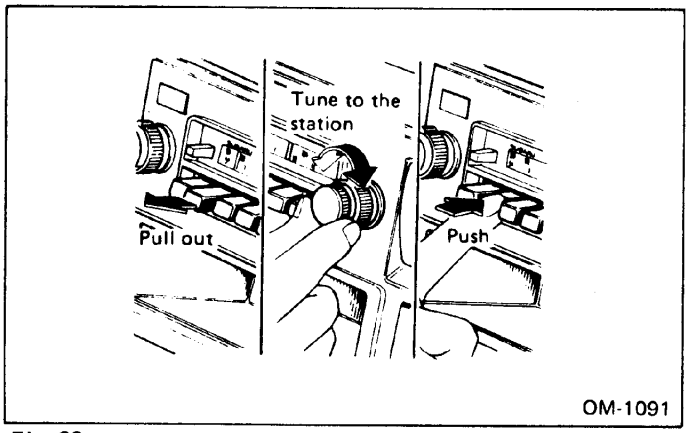


Fig. 68

a. Confirm the push button is set at the center of the channel, otherwise the tone becomes bad according to an amount of discrepancy from the center of the channel.
b. For FM/AM radio, push the FM push button once before selecting FM station.

- ETR

There are five pre-set buttons, so five stations each on AM and FM can be selected as follows.

(1) Push the AM/FM selector switch to select the required band.
(2) Push the manual or automatic tuner until the frequency of the desired station appears on the digital indicator panel.
(3) Push the memory button. "M" appears on the panel for five seconds.
Push one of the pre-set buttons while "M" appears on the panel. The frequency on the panel is then pre-set for that button.

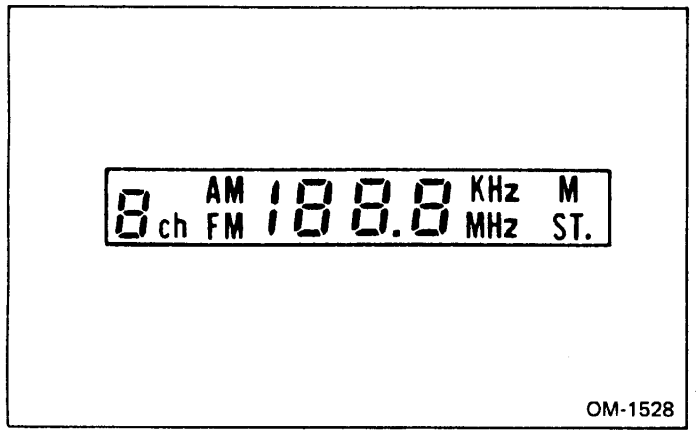


Fig. 69

- ETR with auto-reverse cassette player

There are five pre-set buttons, so five stations each on AM and FM can be selected as follows.

(1) Push the AM/FM selector switch to select the required band.
(2) Push the manual or automatic tuner until the frequency of the desired station appears on the digital indicator panel.
(3) When desired preset button is pressed for more than two seconds, the station now being received is memorized.

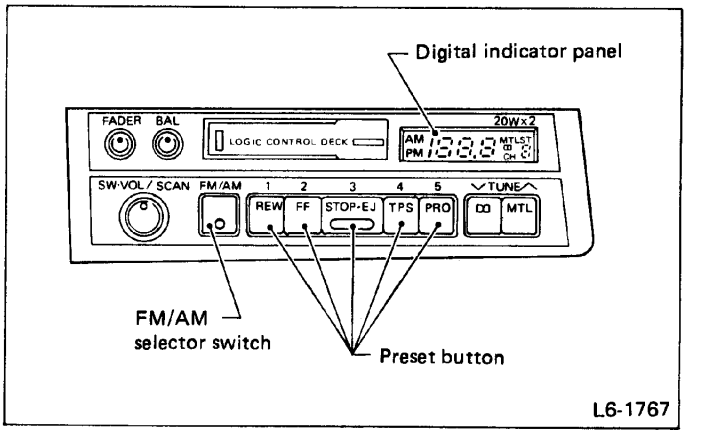


Fig. 70

2) Adjusting antenna trimmer (except ETR)

Antenna trimmer is adjusted in order to make each radio sensitive in case the sensitivity is poor or abnormal noise exists (AM band only).

(1) Attach antenna rod in position.
(2) Select the channel of a weak station between 1,400 kHz and 1,600 kHz.
(3) Adjust antenna trimmer to make the sensitivity in maximum.

Antenna trimming is available only for AM band.

3) Prevention of abnormal noise

(1) Ignition system contacts, the alternator and motor brush contact points are sources of abnormal noise in the radio. In order to prevent this noise, the vehicle is equipped with a high tension cord which contains resistance, a condenser in the ignition coil harness and a grounding wire to the body from the engine.
(2) Antenna is grounded to body through antenna installing bolts, when screws are not tightened securely, it makes abnormal noise. So, tighten antenna installing bolts securely.

Antenna

REMOVAL

1) Remove antenna mounting nut and supporter.
2) Remove two bolts which secure antenna to trunk. Extract antenna and remove band clip.
3) Disconnect feeder socket and harness connector.
4) Remove drain tube from grommet.

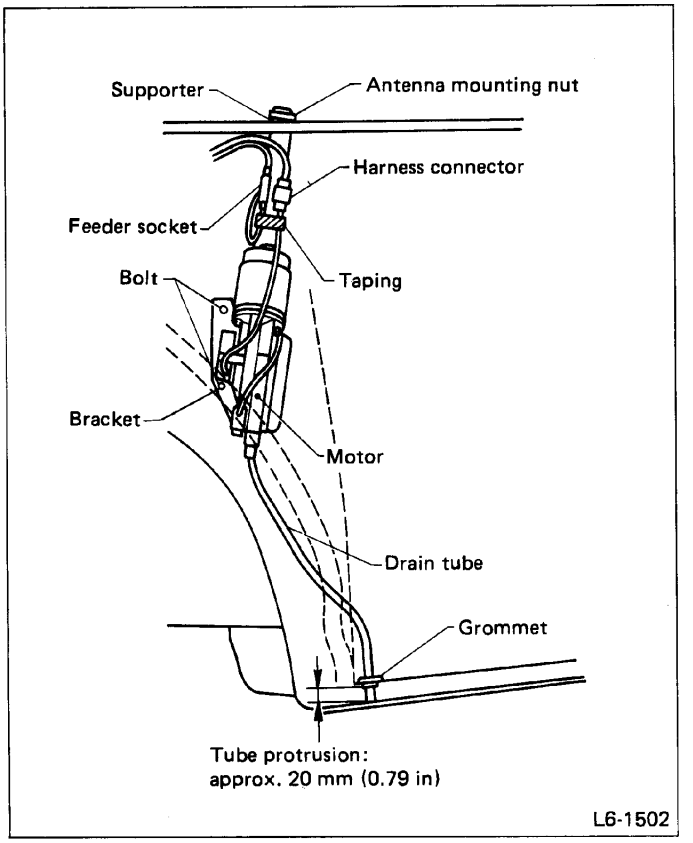


Fig. 71

INSTALLATION

1) Connect feeder socket and harness connector.
2) Pass antenna rod through mounting hole. Temporarily tighten antenna bracket with two bolts. Install supporter and tighten antenna mounting nut.
3) Tighten two bolts to secure antenna bracket.
4) Pass drain tube through grommet. Be sure tube protrudes approximately 20 mm (0.79 in).

REPLACEMENT

ANTENNA ROD

Removing antenna rod

1) Loosen antenna mounting nut enough so that it can be removed with your fingers.
2) Turn radio power switch ON and extend antenna. Remove antenna mounting nut.
3) Hold the lower section of antenna rod by hand and lift antenna rod vertically. Extract inner pipe and rope from antenna housing.

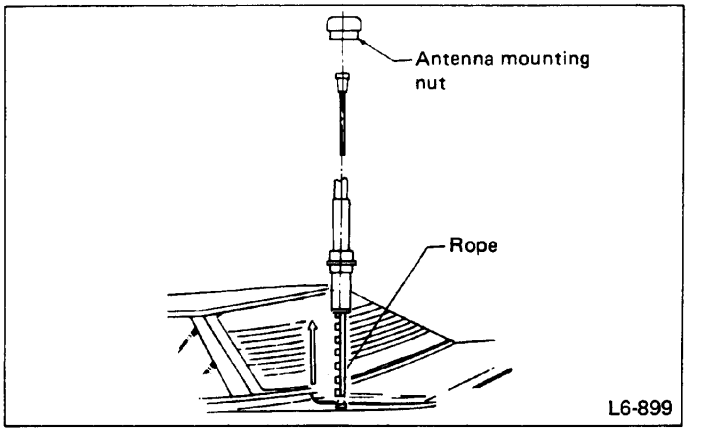


Fig. 72

Installing antenna rod

1) Insert centering pipe (furnished with an antenna rod of genuine parts) into antenna housing until it bottoms.

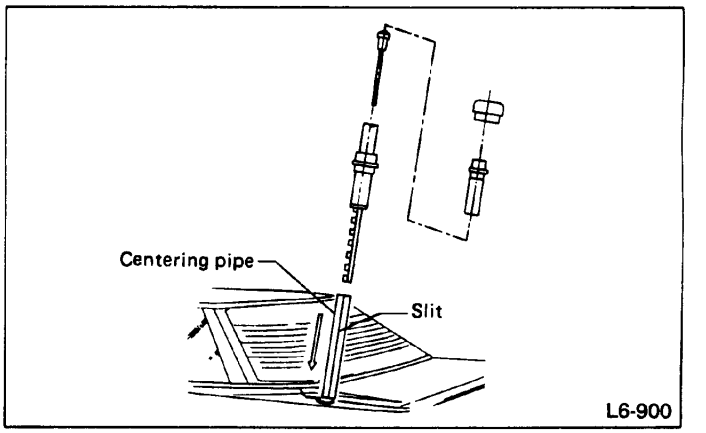


Fig. 73

2) Insert antenna rod rope into antenna housing via centering pipe with its rack facing outward; at the same time, turn radio power switch OFF.

Be sure antenna rod is vertical to antenna housing. This prevents rack from sustaining damage and makes it easy to insert rope.

3) Remove centering pipe from antenna housing and detach it from rope.

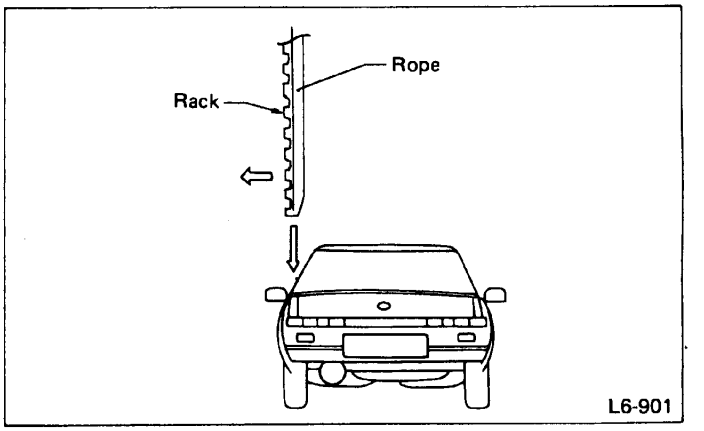


Fig. 74

4) Face inner pipe spring toward the center of car and insert inner pipe into antenna housing.
5) Temporarily tighten antenna mounting nut.
6) Turn radio switch ON and OFF to ensure antenna rod extends and retracts properly.
7) Tighten to secure antenna mounting nut.

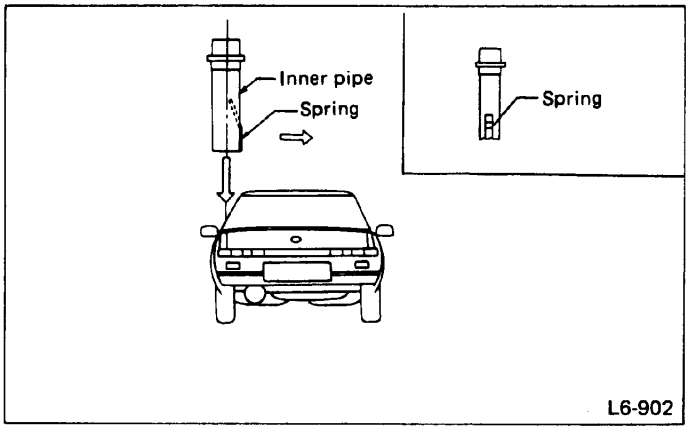


Fig. 75

Digital Clock

REMOVAL AND INSTALLATION

1) Pry out the cover beside the clock display and remove screw in the opening.
2) Using screwdriver, slightly pry the clock up, being careful not to damage instrument panel.

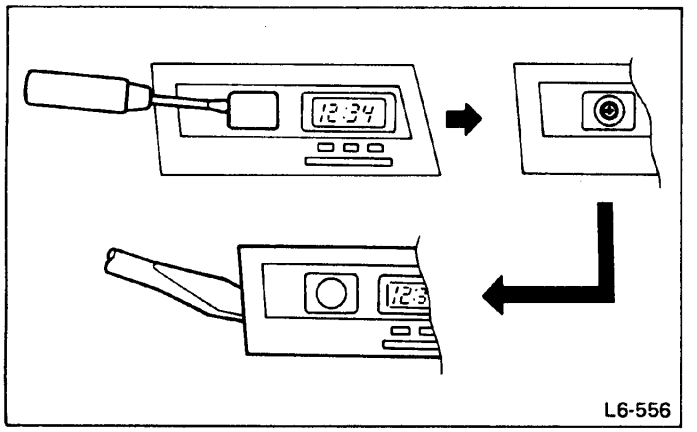


Fig. 76

3) Disconnect the connector and take out the clock.
4) Installation is in the reverse order of removal.

Horn

All models are equipped with double horns which consists of high tone and low tone horns.

Horn switch is incorporated in steering wheel. When horn button is pushed down to actuate horn switch regardless of any position of ignition-starter switch, horn make a sound.

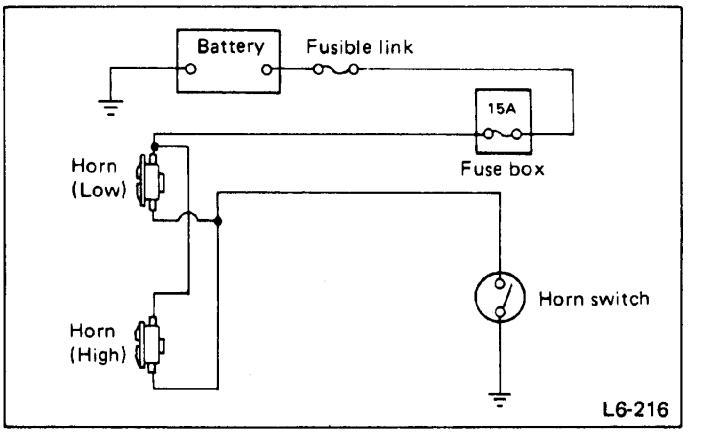


Fig. 77

For removal of high or low tone horn, disconnect electric connector with front bumper removed and take out horn by removing bolt.
For installation, follow the removal procedure in reverse order.

After installing horn, connect electric wire with it by keeping some slack to prevent wire from disconnecting by its vibration.

Rear Window Defogger

Rear window defogger is actuated when rear window defogger switch is turned to "ON" with ignition switch "ON". Indicator light glows when operating rear window defogger.

INSPECTION

1) Start engine, and turn rear defogger switch on.
2) Check each heat wire at its center position for discontinuity by setting direct-current voltmeter.

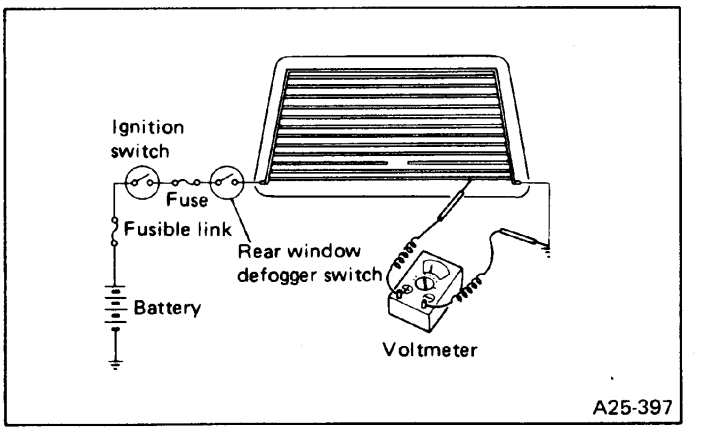


Fig. 78

3) If meter indicates 12 volts or 0 on specific wire that line is broken. Normal indication is about 6 volts.
4) For finding out broken position in the line, move positive lead of voltmeter along the line until abrupt variation in the meter indication is encountered.

REPAIR

1) Clean broken wire and its surrounding area.
2) Cut off slit on (used) thin film by 0.5 mm (0.020 in) width and 10 mm (0.39 in) length.
3) Place the slit on glass along the broken wire, and deposit conductive silver composition (DUPONT No. 4817) on the broken portion.

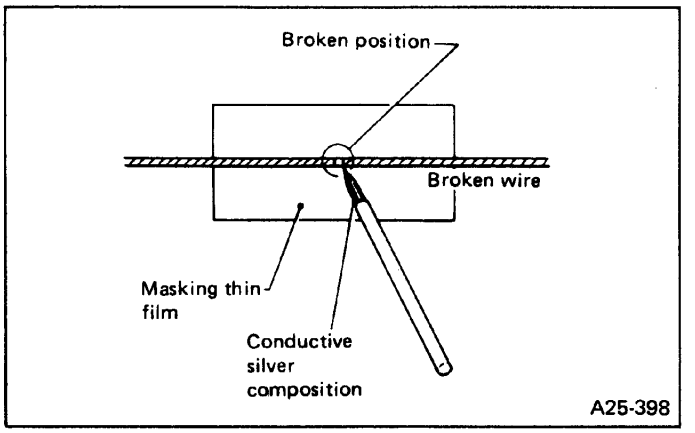


Fig. 79

4) Dry out the deposited portion.
5) Inspect the repaired wire for continuity.

Cruise Control

The cruise control automatically controls car speed and allows the car to run at a constant speed without depressing the accelerator pedal. In operation, when the driver sets a desired speed with the cruise control switch, the built-in micro-computer compares the speed set in the memory with the actual running speed detected by feedback signals from the speedometer. This feedback system operates the throttle to correct the speed difference, thereby keeping the car at a constant speed.
The major components are as follows:

- Main switch . . . . . built in LH control wing
- Cruise switch . . . . mounted on steering wheel
- Control unit . . . . inside the instrument panel, above glove box (One end is inserted into panel, and the other end is secured with screws.)
- Vacuum pump and Valve ASSY . . . . . mounted on RH strut in engine room
- Actuator . . . . . mounted on front bulkhead bracket in engine room
- Clutch switch . . . . mounted on pedal bracket
- Stop & brake switch . . . . . mounted on pedal bracket

a. The cruise control must never be used in the following driving conditions.
(1) When going up or coming down a steep slope
(2) On roads with poor traction, for example, snow-covered, icy, or gravel roads
(3) When a strong wind is blowing
(4) In congested traffic
(5) On a road with many curves
b. Modification of this device must never be attempted.
c. The main switch of the cruise control must always be turned off, except when in use.

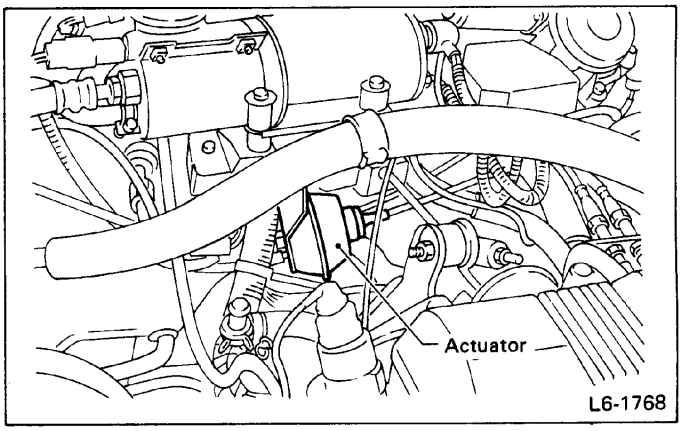


Fig. 80

ELECTRIC CIRCUIT

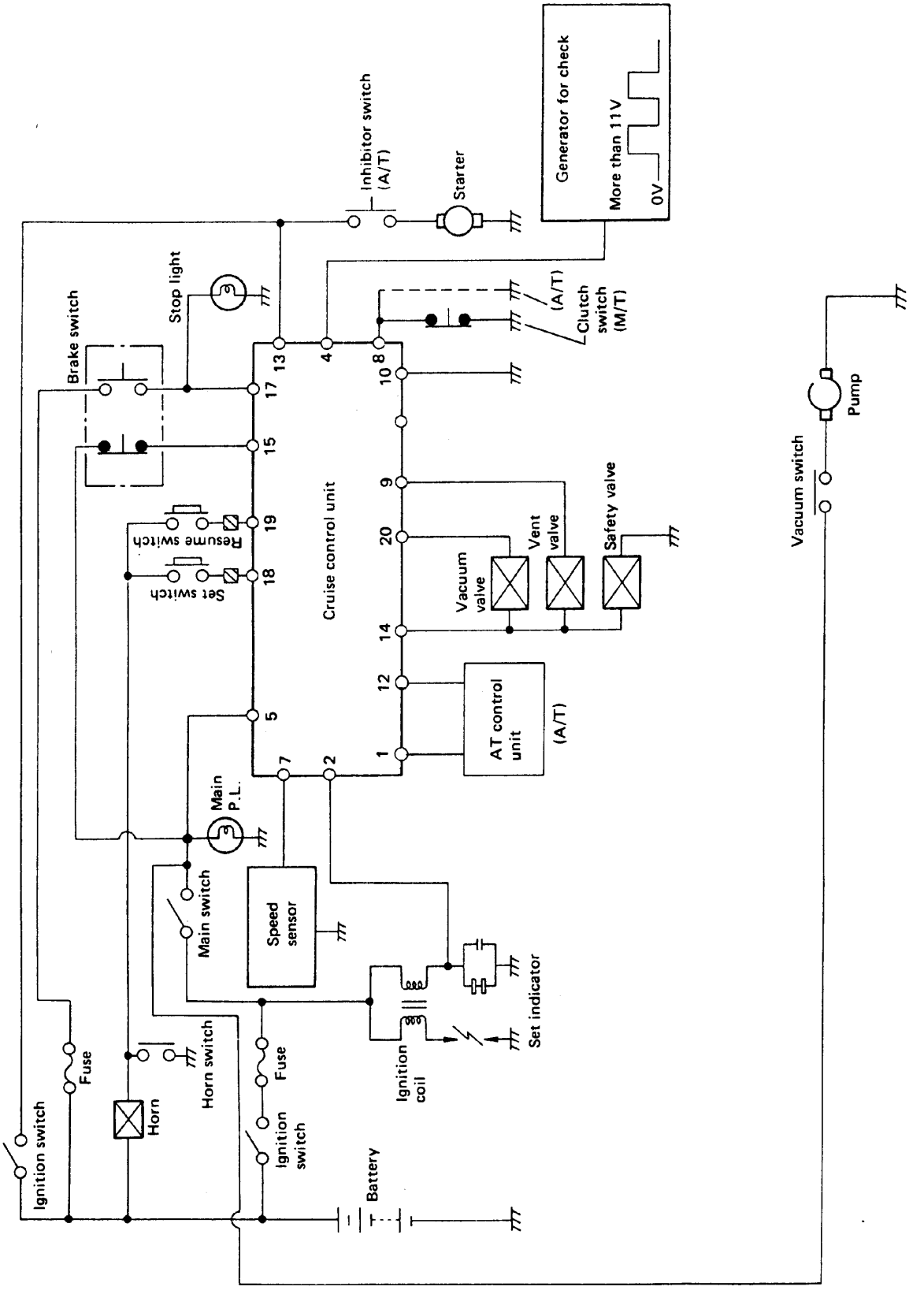
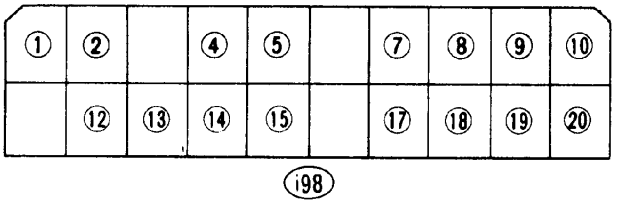


Fig. 81

L6-1769

DETAILS OF CONNECTOR TERMINALS

Cruise control unit connector (Body harness side)



Terminal No.	Color code	Name	Description
①	LY	4th range set indicator (AT)	Voltage is 0V when set in the cruise control mode.
②	Y	Ignition coil (MT)	When the engine is rotating, the ignition pulse signal is outputted.
④	YL	Check	This terminal is used for checking quality in production line.
⑤	BrW	Main switch	If the main switch is turned ON when the ignition switch is ON, the battery voltage is outputted to this terminal. If the main switch is turned OFF, no voltage appears on this terminal.
⑦	YR	Speed sensor	If speedometer cable is rotated with ignition switch turned ON, the ON-OFF signal (more than 5V and 0V) is outputted repeatedly.
⑧	B(AT) GY (MT)	Clutch switch	Manual transmission model: This terminal is grounded unless clutch pedal is depressed. Automatic transmission model: This terminal is normally grounded.
⑨	WB	Vent valve	Signal is inputted to drive vent valve.
⑩	B	Ground	This terminal is normally grounded by the grounding wire of control unit.
⑫	LG	4th range cancel (AT)	Voltage is 0V when car speed is at least 5 km/h (3 MPH) below the speed set in the cruise control mode or when accelerating using the resume switch.
⑬	BW	Inhibitor switch (AT)	This terminal is grounded when selector lever is set to N or P. It is not grounded if set in any other position.
⑭	LW	Valve common	Battery voltage is outputted from the control unit and fed to each valve while the cruise control is operating.
⑮	BR	Brake switch	When the ignition switch is ON, the battery voltage is outputted. If brake pedal is depressed, no voltage is outputted.
⑰	GB	Stop switch	The battery voltage is outputted if the brake pedal is depressed. If the brake pedal is released, the voltage is 0V.
⑱	WR	Set switch	If the set button is depressed with the ignition switch not to ON, the battery voltage is outputted. If the switch is released, the voltage is 0V.
⑲	YB	Resume switch	If the resume switch is turned when the ignition switch is ON, the battery voltage is outputted. If the switch is returned, no voltage is outputted.

Terminal No.	Color code	Name	Description
⑳	G	Vacuum valve	The signal for activating the vacuum valve is inputted to this terminal.

* The signals from terminals ⑨, ⑭ and ⑳ are not outputted unless the cruise control unit is connected to the harness and actually operated.
(Adjust each terminal of the harness side connector of the cruise control unit according to the respective troubleshooting procedure.

CONTROL AND OPERATION

Speed set range and engagement operation	If the set switch is turned ON when the car speed is in the range of 40^{+0}_{-5} km/h to 250^{+0}_{-5} km/h (25^{+0}_{-3} MPH to 155^{+0}_{-3} MPH), the car speed is set, and automatically controlled. When the set switch is kept in the ON position, the set car speed is updated every 0.4 second.
Resume/accelleration operation	If the resume switch is set to ON within the set speed range, the car is accelerated up to the memorized speed, and then automatically controlled at that speed. If the resume switch is kept ON at a speed of over 40 km/h (25 MPH), acceleration is made until the maximum engine output is reached. If the resume switch is turned OFF after exceeding the set car speed, the car will continue at the speed at the moment the switch was turned OFF. If the resume switch is turned OFF without a set speed in memory, the entire system is turned OFF. Each time the set switch is pushed while the car is cruising, the set car speed is reduced by approximately 1.6 km (1 MPH).
Coasting operation	If the set switch is kept ON while the car is running at a constant speed, the car speed will decrease as long as the switch is ON. If the set switch is turned OFF within the set speed range, the car speed, at the time the switch is set to OFF, is memorized, and the car runs at this new set speed. Each time the resume switch is pushed while the car is cruising, the car speed set in memory increases by approximately 1.6 km (1 MPH).
Cancellation	The cruise control function is cancelled by the following operations, or during the following conditions. *(a) When the main switch is set to OFF position. *(b) When the ignition switch is set to ACC or OFF position. (c) When either the brake switch, stop switch, clutch switch, or inhibitor switch is operated. *(d) When the engine speed exceeds 6,000 ± 150 rpm. (e) When the car speed is below 30 km/h (19 MPH). *(f) When the car speed input change per second is greater than ±25 km/h (±16 MPH). *(g) When both the resume switch and set switch are depressed at the same time. The operation indicated by the asterisk mark "*" causes the set speed to be erased.

Cruise control unit compares the actual car speed detected by feedback signals from speed sensor incorporated in speedometer with the speed set in the memory memorized when set switch was turned on. A signal is then transmitted according to the difference between the two speeds.

This signal is transmitted to solenoid valves of valve ASSY located in engine compartment. The movement of actuator operates throttle valve through accelerator pedal and cable, thereby keeping the car speed constant.

CONSTRUCTION OF VACUUM SYSTEM

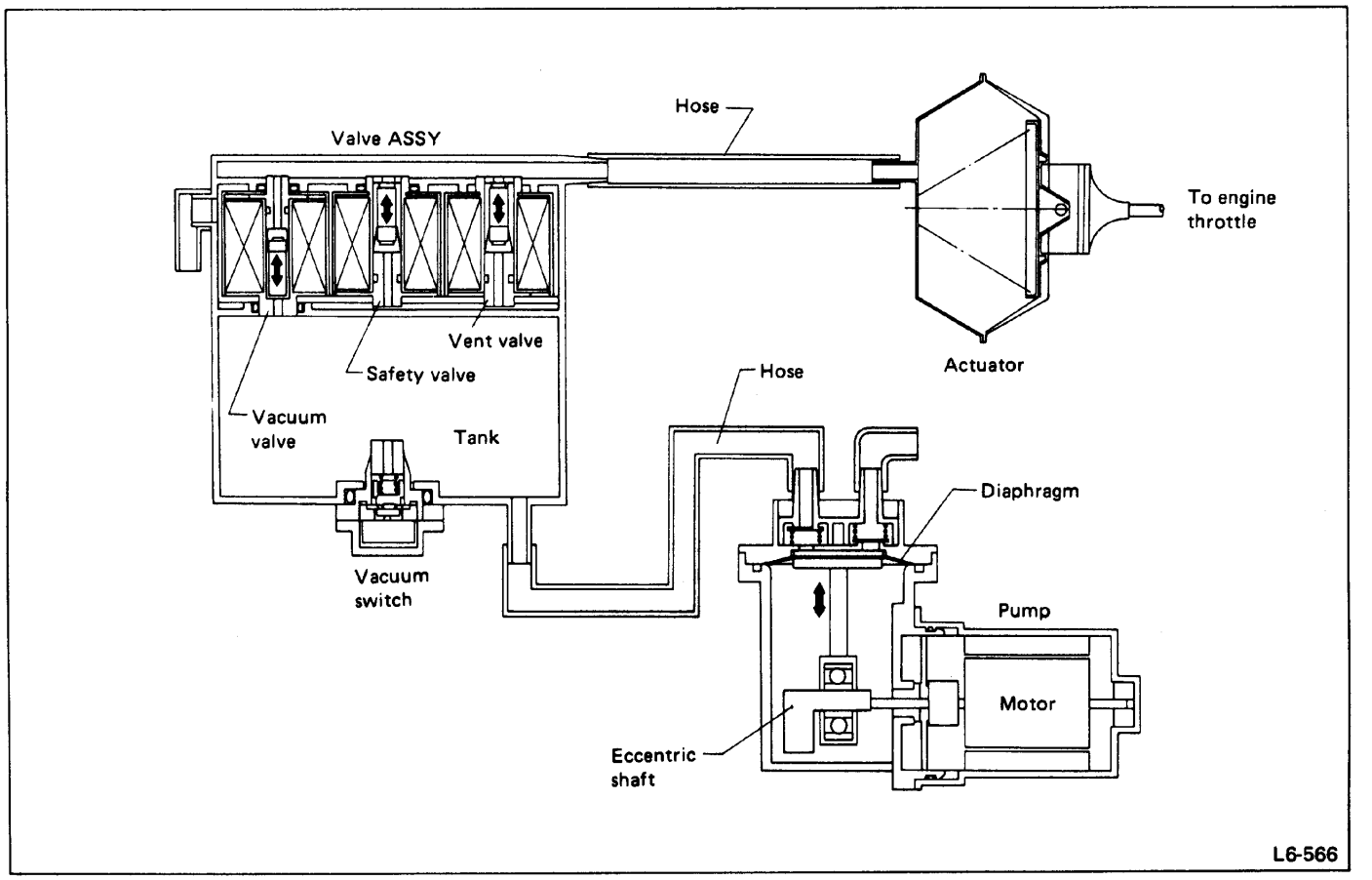


Fig. 82

1) Pump

The pump is controlled by the vacuum switch built into the valve ASSY tank, and is used to supply vacuum to the tank.

Power to the pump is fed when the vacuum switch is turned ON, and the diaphragm is moved up and down by the rotation of the offset shaft fixed to the motor shaft.

2) Valve ASSY

The vacuum valve, vent valve, and safety valve are provided, and their open-close operation lead vacuum/atmospheric pressure to actuator. Also to attached to this assembly is the tank for storing vacuum generated by the pump, and the vacuum switch for controlling the pump to maintain a constant vacuum level in the tank.

If the cruise control is turned on and a constant car speed is attained, the safety valve connected to the atmosphere is closed. Also, the vacuum valve connected to the tank and the vent valve connected to the atmosphere operate to lead the atmosphere/vacuum to the actuator. When the cruise control is cancelled, the vacuum valve closes to shut off the tank vacuum, and the safety valve opens to allow atmospheric pressure to enter the actuator.

The vacuum in the tank is consumed by the operation of the vacuum valve. If the vacuum in the tank reaches −42.7 kPa (−320 mmHg, −12.60 inHg) the vacuum switch is turned ON, and the pump feeds the vacuum into the tank. When the vacuum in the tank reaches −50.7 kPa (−380 mmHg, −14.96 inHg) the vacuum switch turns OFF to stop the pump.

Signal from control unit and valve operation

		Safety valve	Vacuum valve	Vent valve
System OFF		Open	Close	Open
System ON	Memory < actual car speed	Close	Close	Open
	Memory = actual car speed	Close	Close	Close
	Memory > actual car speed	Close	Open	Close

3) Actuator

The diaphragm is operated by vacuum or atmospheric pressure led by each valve, and this diaphragm movement actuates the wire cable via link ASSY to open or close the throttle valve. With the cruise control set to OFF (system OFF state), no diaphragm operation occurs as the atmospheric pressure is kept inside the actuator.

4) Engine throttle

The throttle body is equipped with two throttle cams. One cam is used during acceleration and the other during cruising, in order to open or close the throttle valve. These cams operate independently of each other. In other words, while one cam is operates, the other does not.

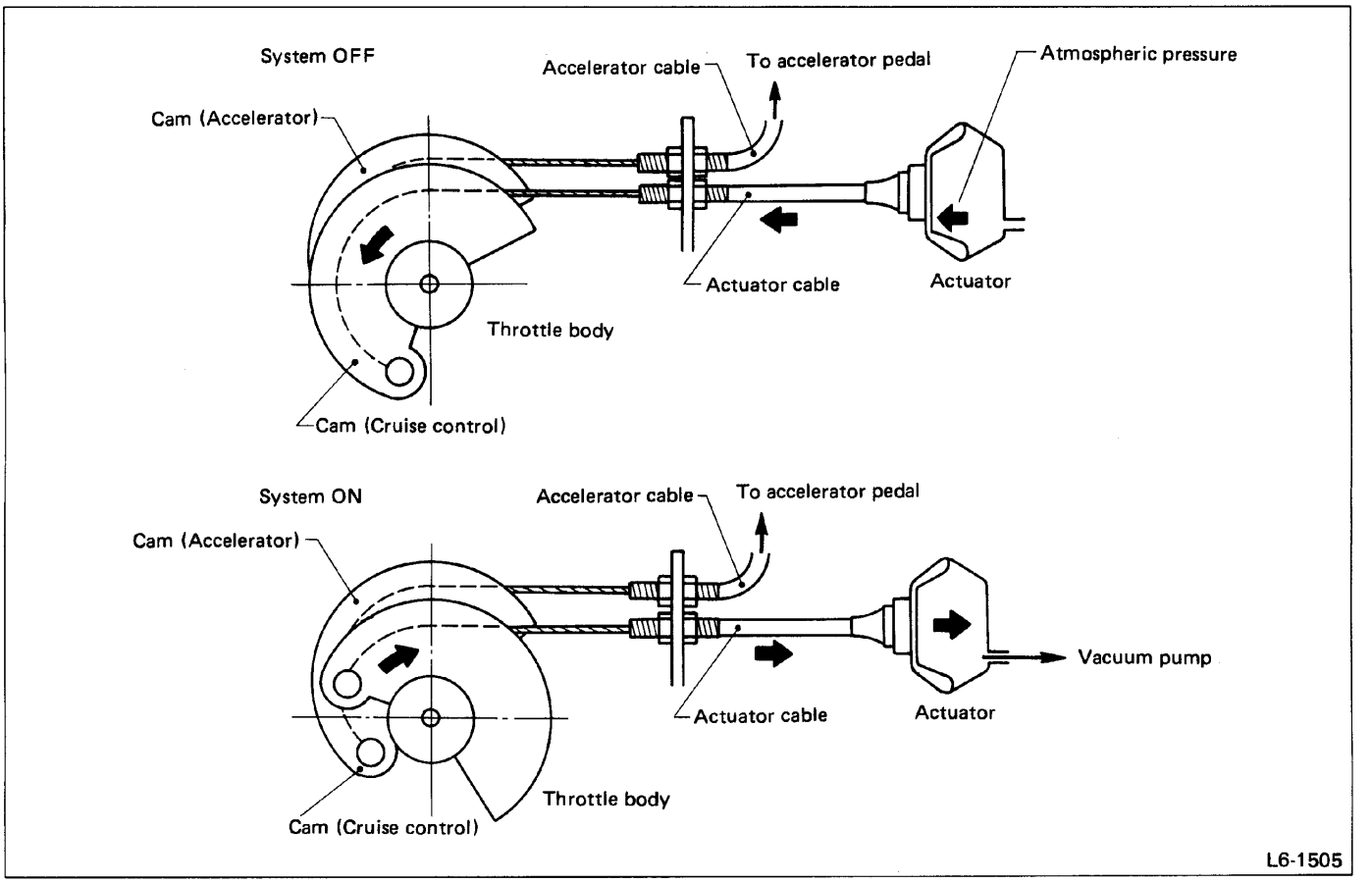


Fig. 83

Control Cable

ADJUSTMENT

a. Do not bend the control cable too sharply; otherwise, it will not operate smoothly.
b. When installing the cam to the inner end of the control cable, do not bend or crush the inner cable.

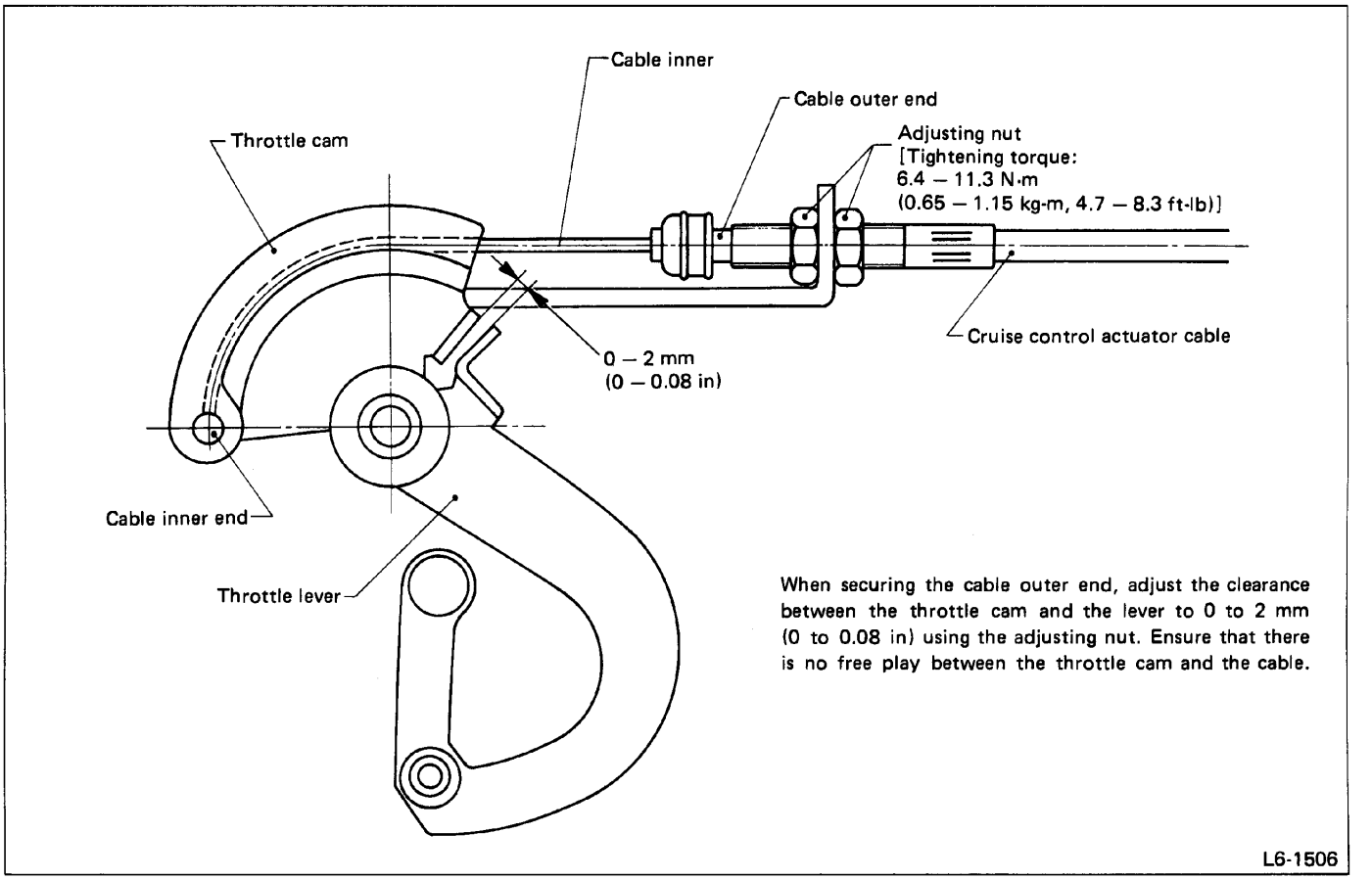


Fig. 84

Vacuum Pump and Valve

REMOVAL

a. Ensure ignition switch is OFF.
b. Be careful because exhaust system and turbocharger temperatures are high while engine was operating.
c. Always keep air cleaner, vacuum hose, etc. free from dirt and dust.

1) Removing air cleaner and air flow meter.
   (1) Loosen hose clamp.
   (2) Remove boot from air flow meter.
   (3) Undo clips on air cleaner cover.
   (4) Place air cleaner cover together with air flow meter on the engine.

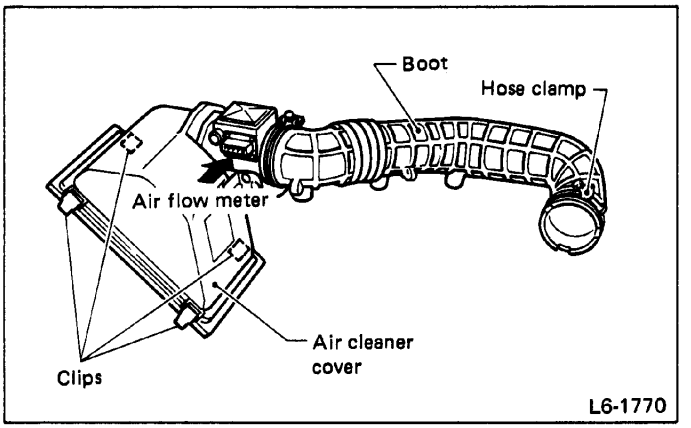


Fig. 85

2) Disconnect wiring harness connector and hose connector of the vacuum pump ASSY.
3) Remove the vacuum pump ASSY and the valve ASSY as unit.

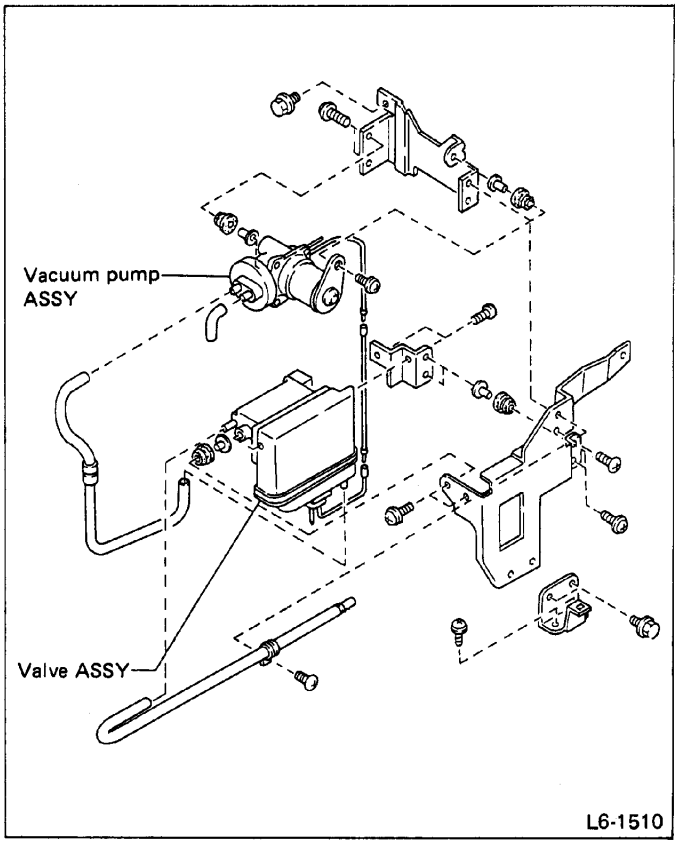


Fig. 86

DISASSEMBLY

1) Disconnect harness connector of vacuum pump ASSY.
2) Remove screws which secure vacuum pump and valve ASSY's to their brackets.
3) Disconnect hoses to separate vacuum pump and valve ASSY's.
4) To reassemble, reverse the above disassembly procedures.

Be sure to connect hoses and connectors properly.

INSTALLATION

To install, reverse removal procedures.

Tightening torque:
M6 bolt:
5.4 – 9.3 N·m (0.55 – 0.95 kg-m, 4.0 – 6.9 ft-lb)
M5 Screw:
2.0 – 2.5 N·m (0.20 – 0.25 kg-m, 1.4 – 1.8 ft-lb)

a. Be sure hoses and connectors are connected properly.
b. Ensure pump issues sound to indicate proper operation when ignition switch and cruise control switch are turned ON.
c. Also ensure pump sound automatically stops when vacuum pressure is charged in tank.

Power Window

OPERATION

Main switch

Main switch consists of auto-switch knob for driver's window, passenger's window switch knob and lock switch knob for passenger's window.

Main switch has the following five positions:

AU and AD .... Driver's window can be opened or closed fully by depressing this position for a moment.

U and D ..... Driver's window can be opened or closed while depressing this position.

N ..... OFF position.

Sub switch

Passenger's window is lowered or raised while sub switch is operated with the lock switch in main switch is in OFF position.

Control unit

Control unit is installed under assistant seat. The control unit consists of transistors, relay, transformer etc. and controls up and down of driver's window in combination with auto switch.

Relay and breaker

Relay and breaker are installed under assistant sheet. The relay provides an ignition interlock to all switches so that windows cannot be operated unless the ignition switch is in "ON" position for safety.

When overcurrent flows, breaker cuts electric current to components and electric wiring from damage and burn out.

Electric motor

Electric motors are provided for window glass regulator of each door to open and/or close the window glass.

SWITCH CONNECTOR AND CONNECTION

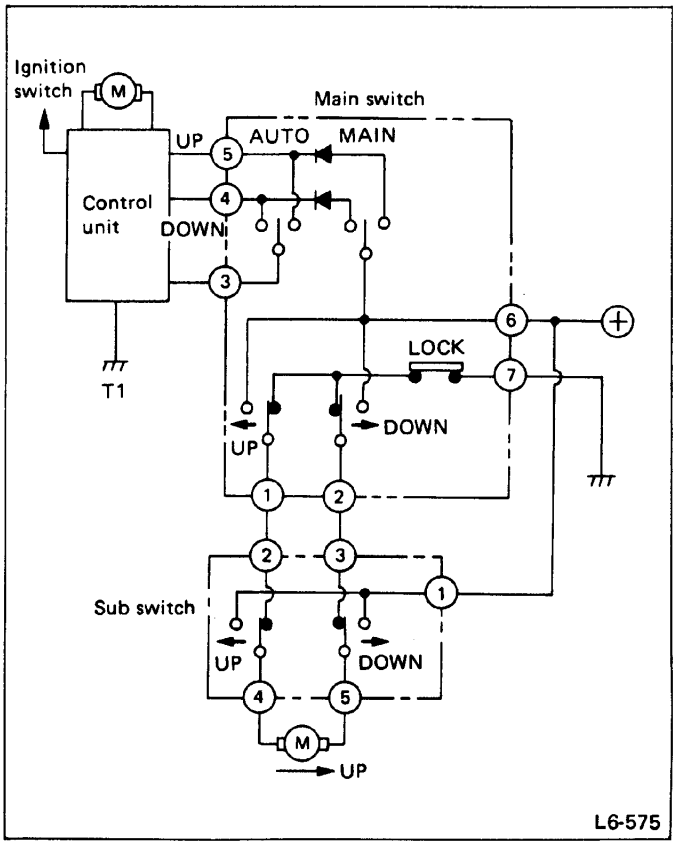


Fig. 87

Main switch

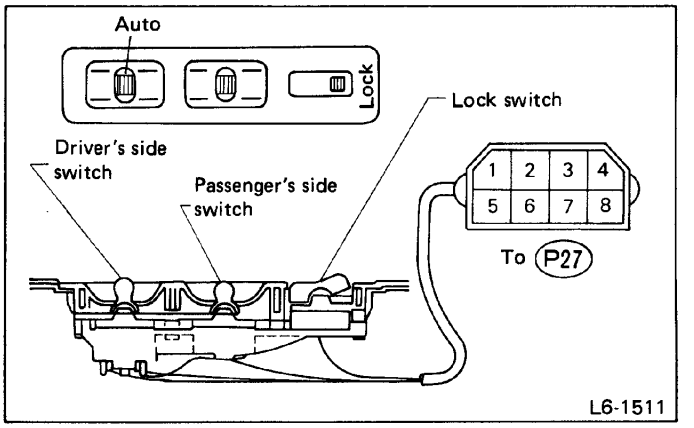


Fig. 88

Connector		Driver's side window switch					Passenger's side window switch			Connection
Terminal	Color	AU	U	N	D	AD	U	N	D	
1	WL									Sub switch (Motor Up)
2	LB									Sub switch (Motor Down)
3	R									Control unit
4	Y									Control unit
5	G									Control unit
6	RW									Ignition switch
7	B	(Lock switch)								Grounding

Sub switch

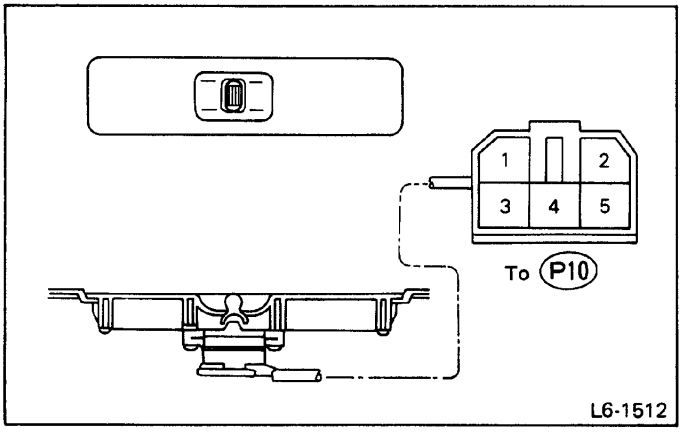


Fig. 89

Connector		Passenger's side window switch			Connection
Terminal	Color	U	N	D	
1	R				Ignition switch
2	B				Main switch
3	BW				Main switch
4	Y				Motor (Up)
5	YR				Motor (Down)

Remote Controlled Rearview Mirror

When adjacent two control knobs are pressed simultaneously, the rearview mirror will move in an oblique direction.

The remote controlled rearview mirror switch consists of a left-right changeover select knob and a control knobs. The switch is ready to function only when the ignition switch is in "ACC" or "ON". Movement of the mirror is accomplished by the motor in the mirror.

SWITCH CONNECTOR AND CONNECTION

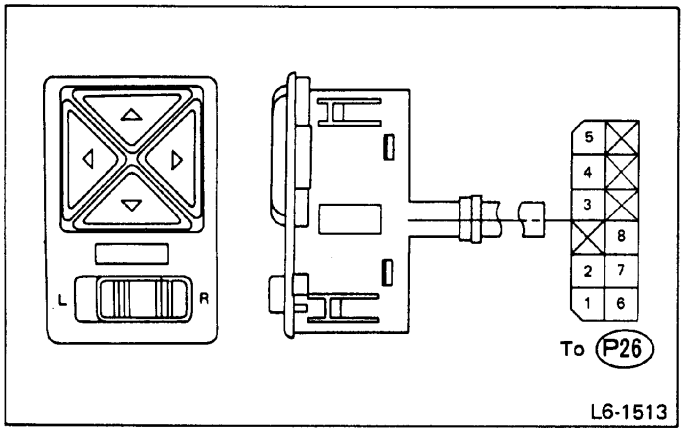


Fig. 90

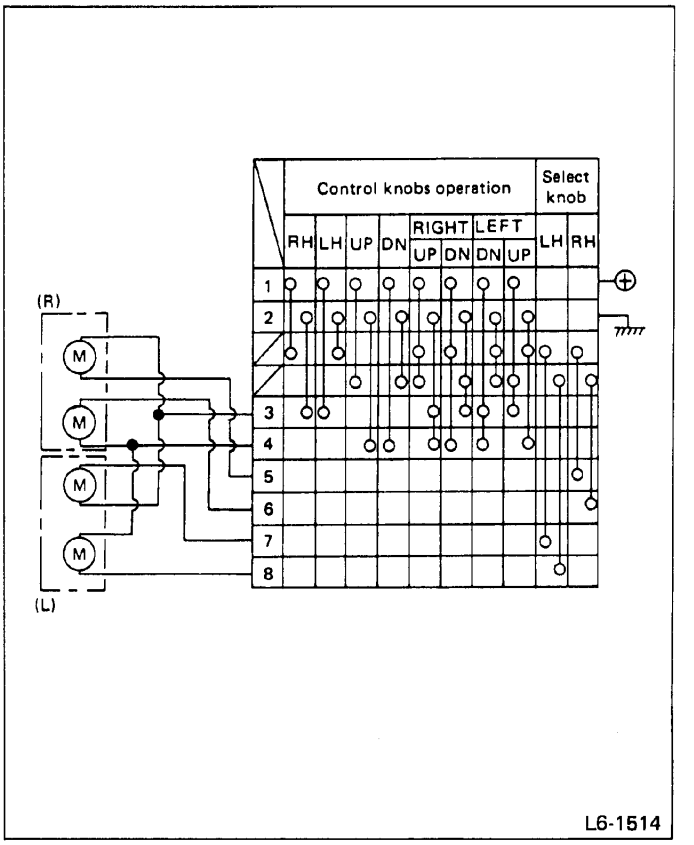


Fig. 91

Connector		Connection
Terminal	Color	
1	LB	Ignition switch (ACC)
2	B	Grounding
3	L	LH & RH mirror motor
4	LW	
5	W	RH mirror motor
6	Y	
7	Br	LH mirror motor
8	G	

REPLACEMENT

ELECTRIC WIRING

The wiring is routed from the instrument panel wiring harness connector to the rearview mirror via the front door cord and the rearview mirror cord. The front door cord can be removed after detaching the grommet. The rearview mirror cord can be detached by removing retaining clips.

First Hold Switch

SWITCH CONNECTOR AND CONNECTION

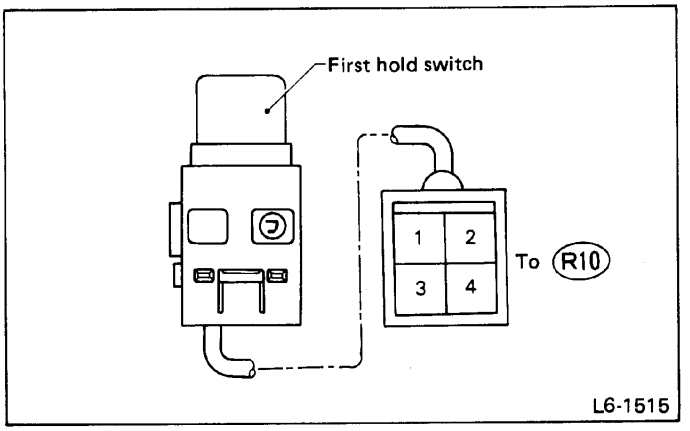


Fig. 92

Connector		OFF	ON	Connection
Terminal	Color			
2	GY			AT control unit
4	B			Grounding
1	R			Lighting switch
3	RG			Illumination control

REPLACEMENT

The first hold switch is secured to the AT select lever indicator from the rear with the two M4 tapping screws. Remove the AT select lever indicator from body when replacing the hold switch.

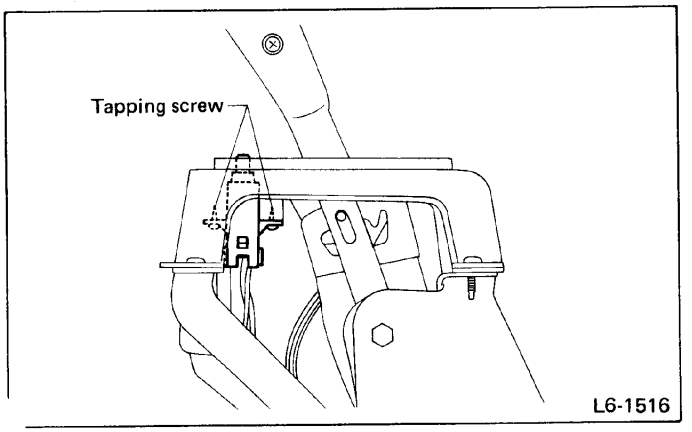


Fig. 93

Differential Lock Switch

The differential lock switch is located beside the parking lever on the console box. When the switch is turned ON, the car is set to "diff. lock driving"; when the switch is turned OFF, the car is set to the "free-driving" mode. The DIFF. LOCK indicator light in the combination meter comes on when the car is set to the "diff. lock driving" mode.

Do not shift driving modes while the wheels are slipping or while making a sharp turn.

SWITCH CONNECTOR AND CONNECTION

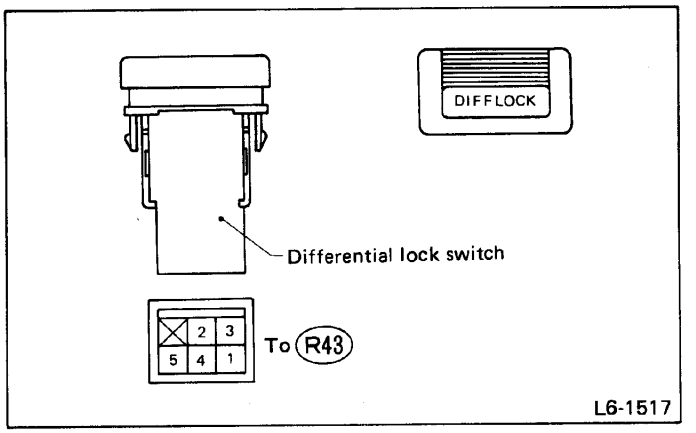


Fig. 94

Connector		OFF	ON	Connection
Terminal	Color			
1	BW			Ignition switch
2	GY			Solenoid valve (UNLOCK)
3	L			Solenoid valve (LOCK)
4	R			Lighting switch
5	RY			Illumination control

REPLACEMENT

The differential lock switch is fitted in the console box via the differential lock switch case.

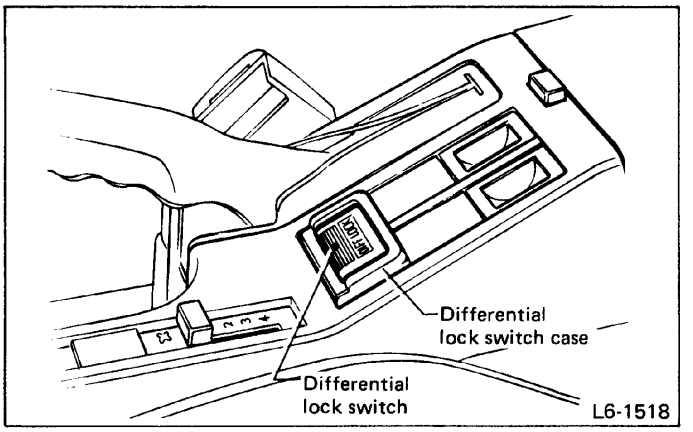


Fig. 95

REPLACEMENT

The fog light switch is fitted in the console box. Using a small screwdriver, pry up the switch, being careful not to damage the console box.

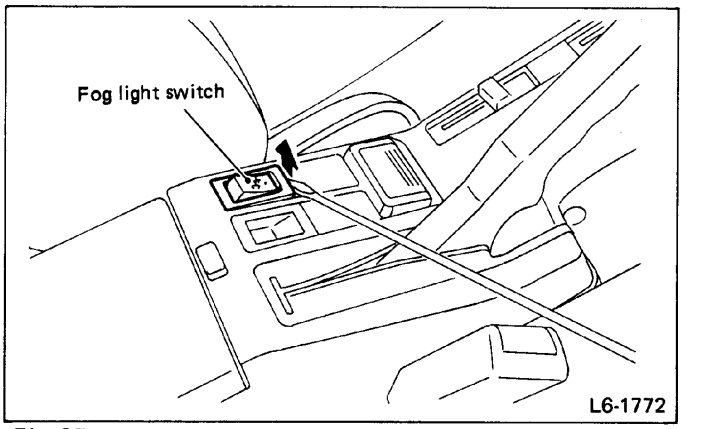


Fig. 97

Fog Light Switch

SWITCH CONNECTOR AND CONNECTION

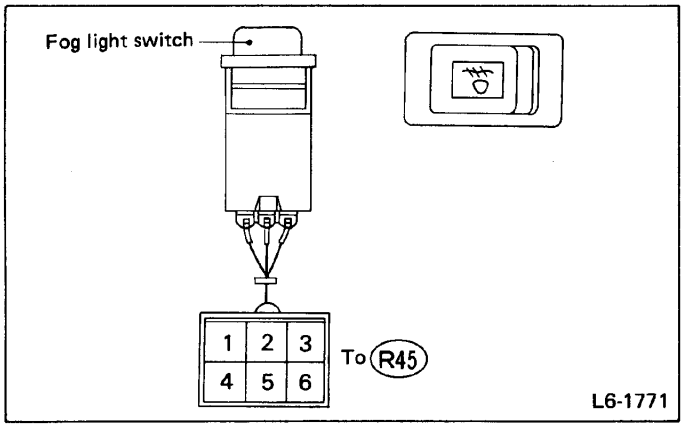


Fig. 96

Connector		OFF	ON	Connection
Terminal	Color			
1	W			Fog light relay
3	RB			Lighting switch
2	–			–
4	–			–
5	R			Illumination control (Power supply)
6	RG			Illumination control

Speed Warning Buzzer

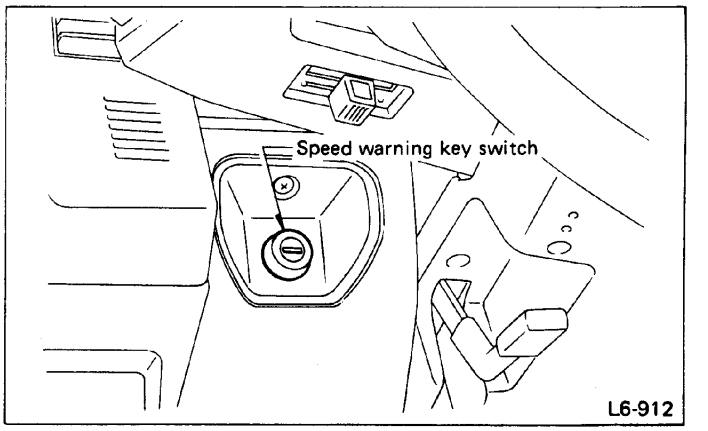


Fig. 98

When car speed exceeds 100 km/h (60 MPH), the speed warning switch built into the computer will turn on. If the speed warning key switch has already been set to "ON", the buzzer in the instrument panel will sound continuously.

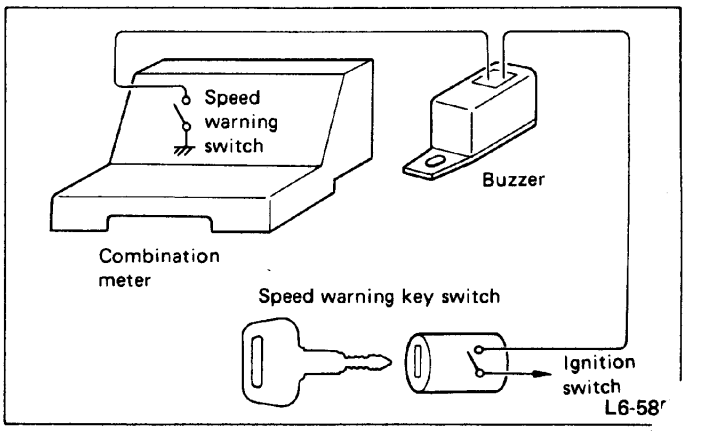


Fig. 99

Automatic Shoulder Belt and Key Warning Chime (Except Canada model)

PRECAUTIONS

a. In case the connector related to the automatic shoulder belt has been disconnected for repairs of the automatic shoulder belt or its related parts or for repairs of other parts, be sure to disconnect once the battery and reset the control unit.
If the connector of the automatic shoulder belt control unit or the connector of front or rear limit switch has once been disconnected during repairs, the control unit can enter the failure mode when the connector is reconnected, making the automatic shoulder belt inoperative.
b. If the automatic shoulder belt fails to operate, be sure to troubleshoot before disconnecting the battery.
Even if the automatic shoulder belt does not have faulty parts, it can become inoperative when the shoulder belt anchor is forced down or the front or rear limit switch is operated manually. In such case, if you disconnect the battery, the trouble will be corrected automatically without giving you the chance to determine its cause.
c. For troubleshooting electrical parts, refer to Chapter 6-3.

MOTOR DRIVE CIRCUIT

Operation

The door switch monitors the opening/closing of the door to rotate the motor in the corresponding (standard or reverse) direction.
A limit switch, situated at each end of the rail, monitors the front/rear limit position of the shoulder anchor.
When the door is opened, the motor activates so that the shoulder belt moves from the rear-limit position (fasten) to the front-limit position (release) and stops.
When the door is closed, the motor activates so that the shoulder belt moves from the front-limit position (release) to the rear-limit position (fasten) and stops.

Malfunction

Motor output timer control

If the limit switch does not activate within 13 seconds after the motor begins to run, the timer control activates to disconnect the motor from its drive circuit.

SEAT BELT WARNING SYSTEM

No.	Type of belt	Used: ○ Not used: X		Warning chime		Warning lamp		Priority	Remarks
				Duration of operation		Duration of operation			
				First 4 – 8 seconds	Thereafter	First 4 – 8 seconds	Thereafter		
1	Driver's lap belt	X		Sounds	OFF	Blinks	OFF	1	Condition of lap belt "Not Used": Ignition switch ON and buckle switch ON *
		○		OFF		Blinks	OFF		
2	Driver's shoulder belt	X	Condition 1	OFF		Illuminates		2	Condition of shoulder belt "Not Used": Condition 1 – Ignition switch ON and rear limit switch ON * Condition 2 – Ignition switch ON, rear limit switch OFF * and shoulder buckle switch ON *
			Condition 2	Sounds	OFF	Blinks	Illuminates	3	
		○		OFF		OFF		–	
3	Passenger's shoulder belt	X	Condition 1	OFF		Illuminates		4	
			Condition 2	Sounds	OFF	Blinks	Illuminates	5	
		○		OFF		OFF		–	

The asterisk "*" refers to a normally-closed switch (normally-on type).

a. The warning chime and warning light outputs are generated from the same system. For this reason, a higher priority output will preempt those of lower priority.
b. The lap belt warning chime and warning light activate when the ignition switch is turned ON. However, warning for the shoulder belts begins when condition 1 or 2 exists.

KEY WARNING CHIME

Only the driver's side.

No.	Door	Warning chime	Remarks
1	Closed	OFF	Chime operating conditions: Key is inserted into ignition and turned to any position except ON or START.
2	Open	Sounds	

CONNECTION

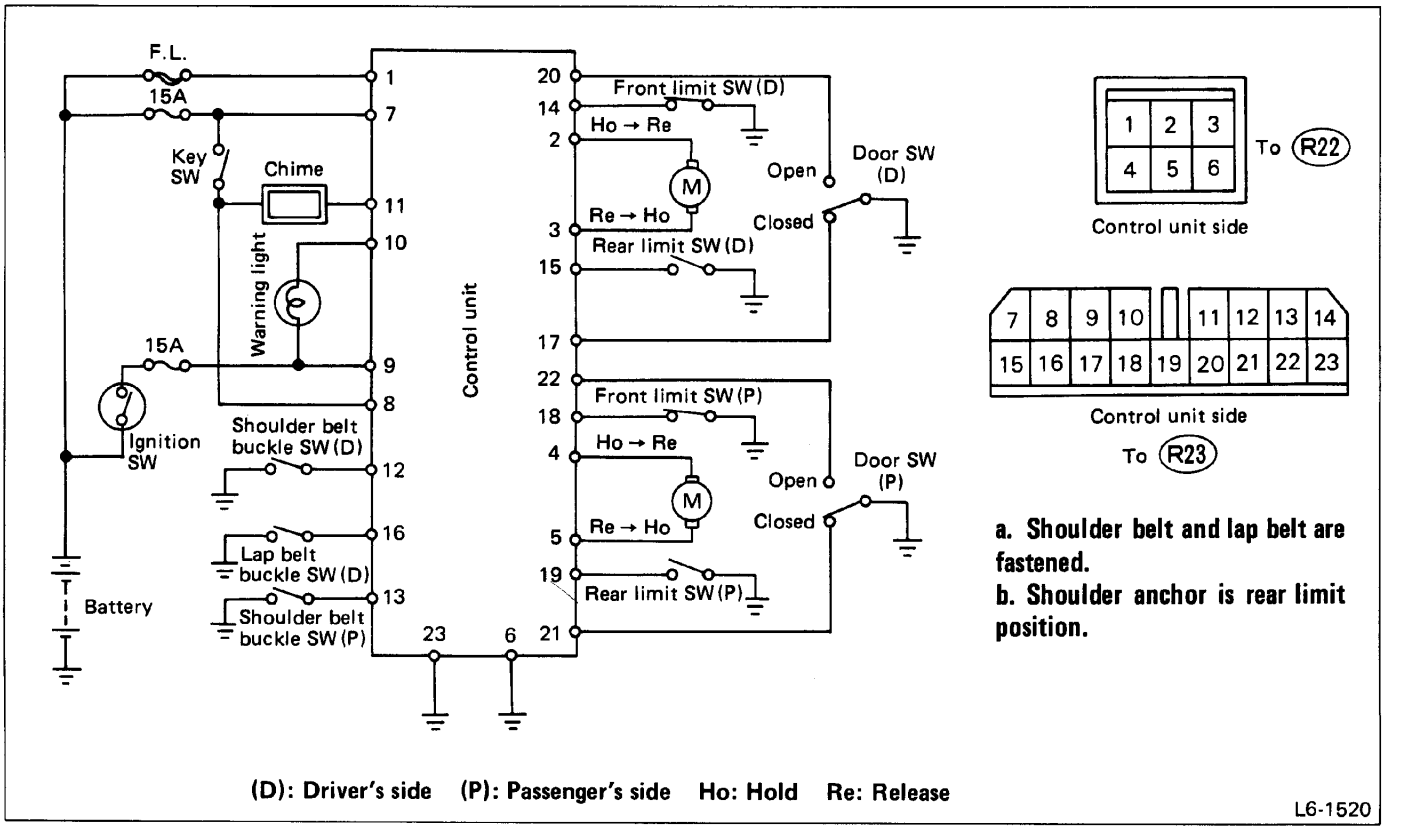


Fig. 100

Seat Belt and Key Warning Chime (Canada model Only)

Seat belt & key warning chime participates in both seat belt warning system and key warning system.

Seat belt warning system

Fasten seat belt warning light in combination meter turns on for approx. six (6) seconds after turning ignition switch to ON position.
Also, only when driver's seat belt is not fastened, the chime will sound about four (4) times.

Key warning system

The chime will sound while door is opened with the key plate inserted in ignition switch.