

BODY ELECTRICAL

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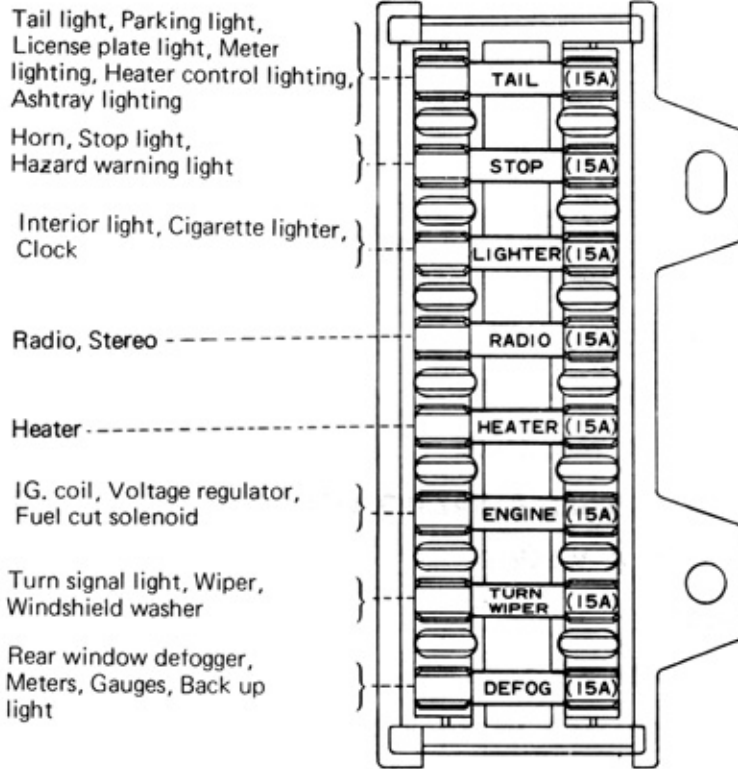
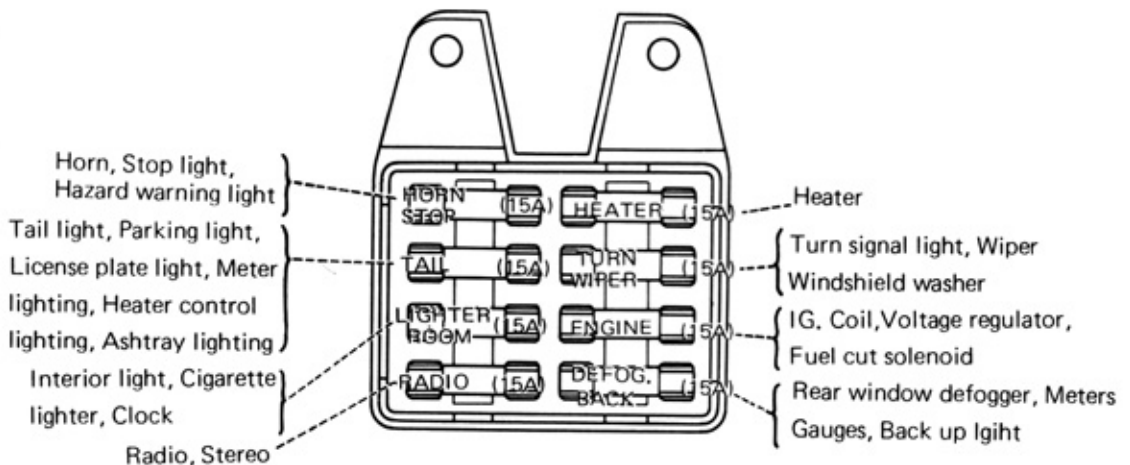
FUSE BLOCK**FOR RH. VEHICLE****FOR LH. VEHICLE**

Fig. 3-1 Fuse Block

LIGHT COMPONENTS

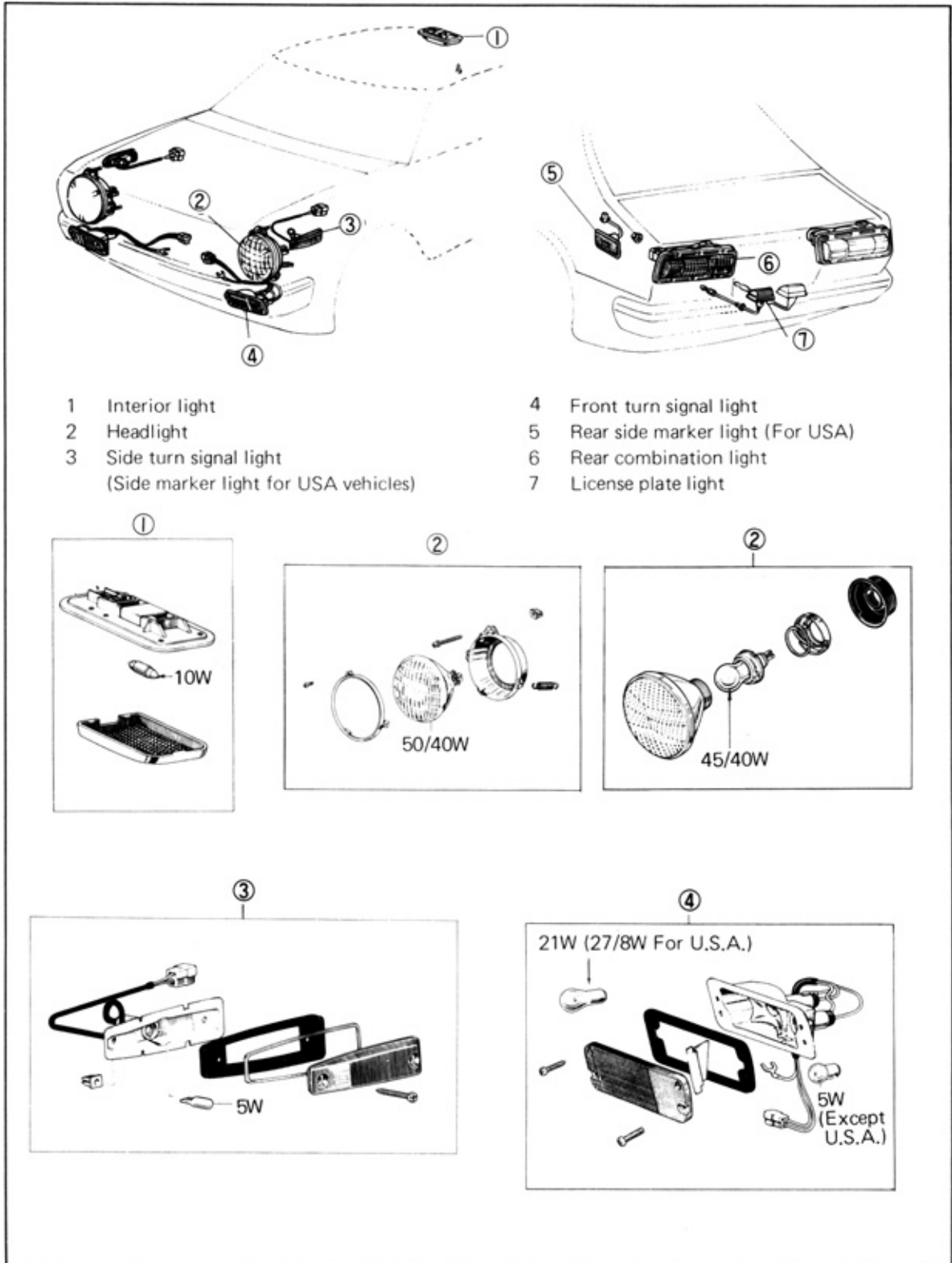


Fig. 3-2 Light Components (1)

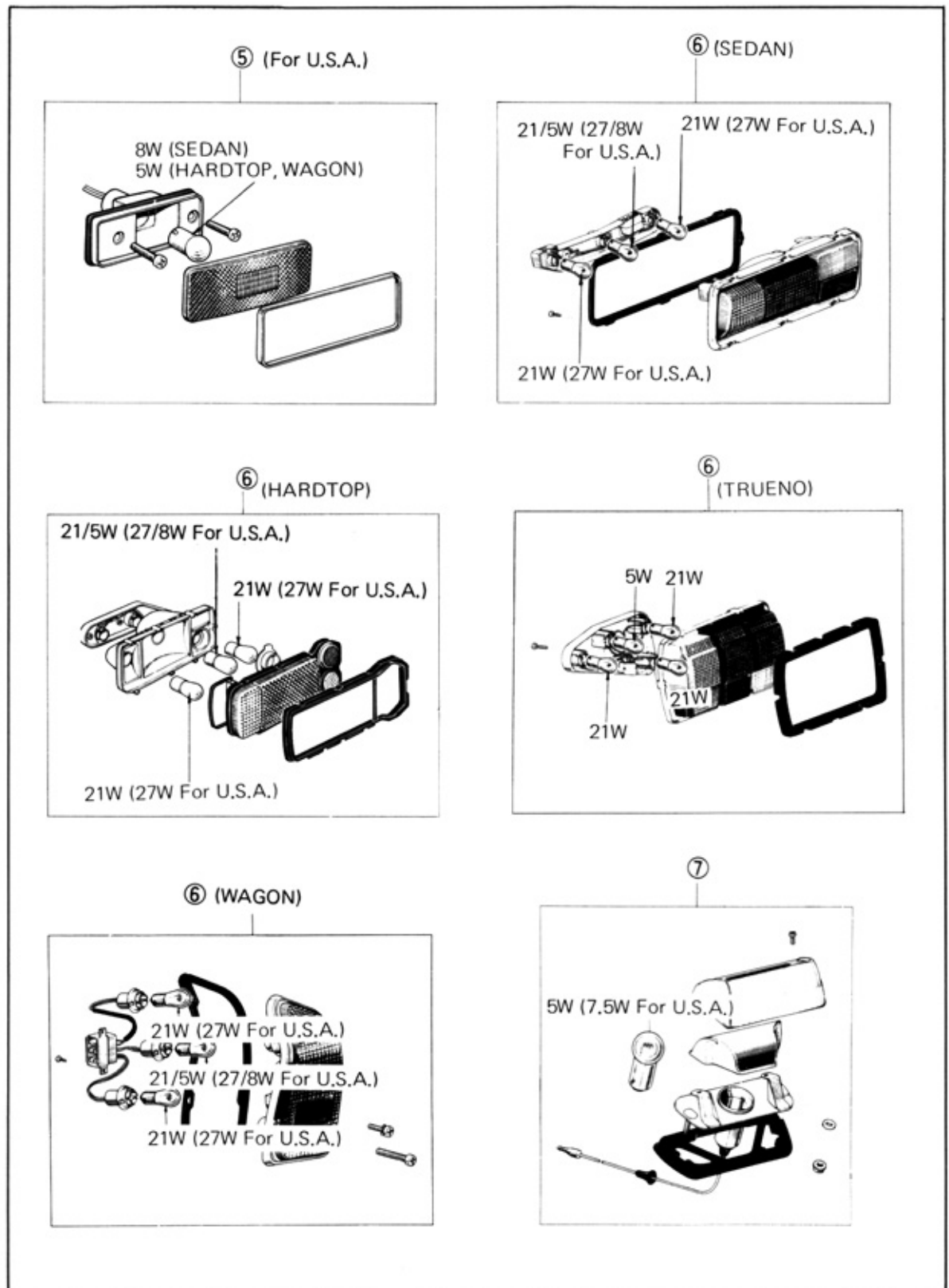


Fig. 3-3 Light Components (2)

HEAD & TAIL LIGHT

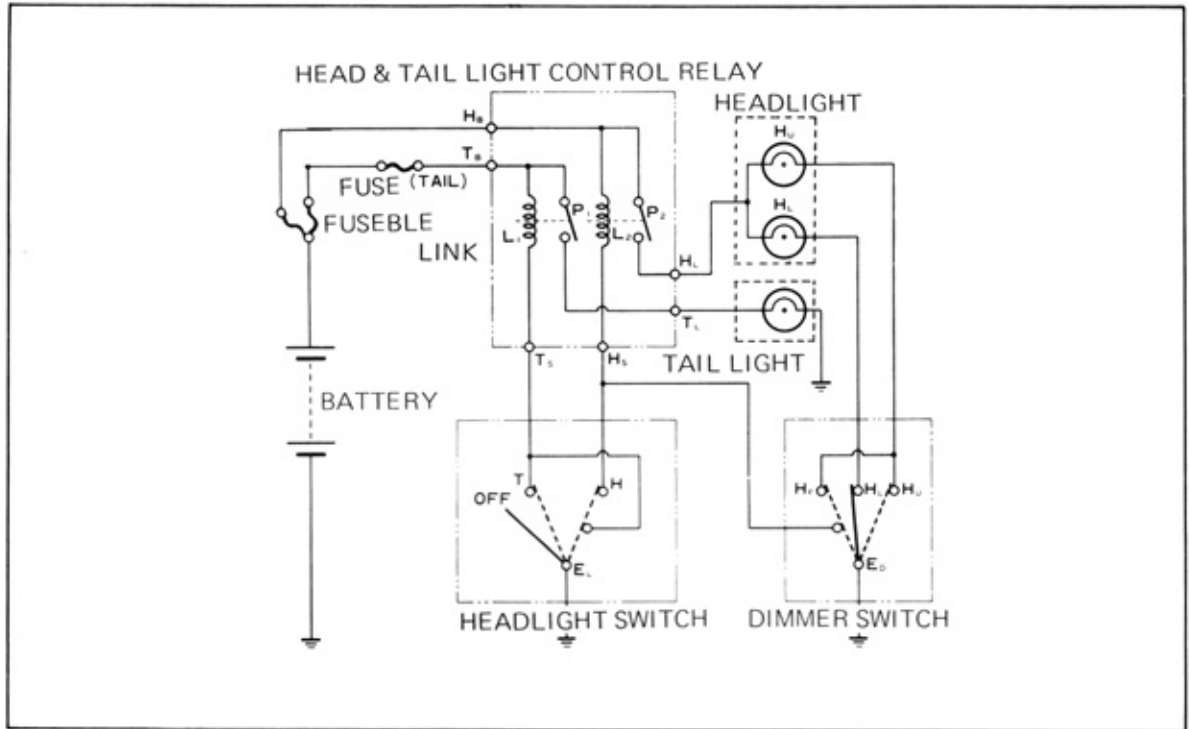


Fig. 3-4 Head & Tail Light Control Relay Circuit

OPERATION

Turning the light control switch one step (TAIL) allows current to flow from battery → TB → L1 → TS → T → ground, to energize the coil L1 and cause the point P1 to close. When the point P1 closes, a large current flows from the battery → TB → P1 → TL → tail light → ground, to turn on the tail light.

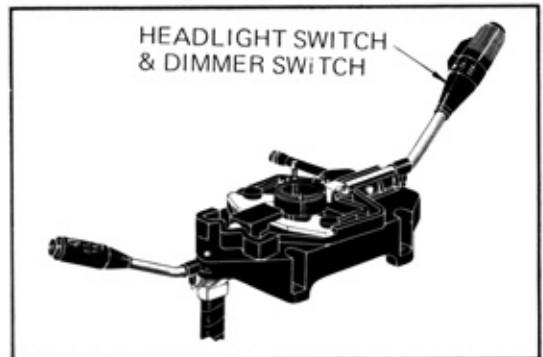


Fig. 3-5 Turn Signal Switch Assembly

Turning the light control switch to step 2 (HEAD) allow current to flow from battery → HB → L2 → HS → H → ground, to cause point P2 to close. This allows large current to flow from battery → HB → P2 → HL → headlight → dimmer switch → ground, to cause the headlight to turn on. At the same time, the tail light ground circuit is formed so that point P1 is closed, to cause the tail light to turn on.

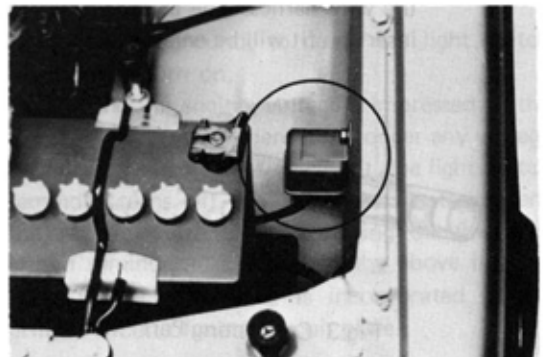
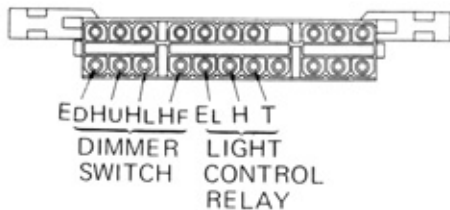


Fig. 3-6 Light Control Relay

LIGHT CONTROL SWITCH

Inspection

Remove the steering column lower cover (1), unplug the connector (22 terminals) (2), and check the continuity between the terminals.



- T Tail light control relay (TS)
 H Tail light control relay (HS)
 EL Ground
 HF Tail light control relay (HS)
 HL Headlight (lower)
 HU Headlight (upper)
 ED Ground



Fig. 3-7 Light Control Switch Connector

| Terminal Switch | T | H | EL | HU | HL | HF | ED |
|-----------------|---|---|----|----|----|----|----|
| OFF | | | | | | | |
| ONE STEP | ○ | ○ | ○ | | | | |
| TWO STEP | ○ | ○ | ○ | | | | |
| Headlight U. | | | | ○ | ○ | ○ | ○ |
| Headlight L. | | | | | ○ | ○ | ○ |
| Headlight F. | | | | | ○ | ○ | ○ |

22-Terminal Connector Handling and Inspection Precautions

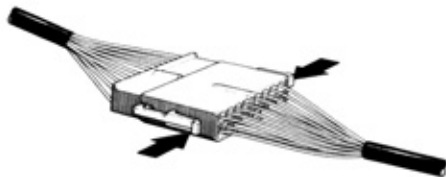


Fig. 1 Unplugging Connector

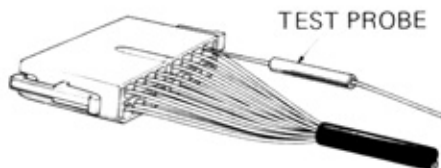


Fig. 2 Inserting tester probe

- As shown in Fig. 1 unplug the connector by pushing in the lock levers and pulling out.
- In checking the continuity or voltage with a circuit tester, always insert the tester probe from the wire harness side as shown in Fig. 2. Never insert from the receptacle side as the connector insertion fit will be enlarged and may cause defective contact.

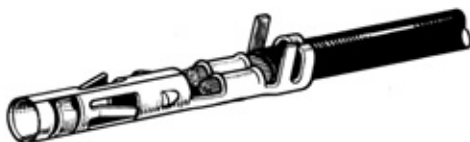


Fig.3 Connecting Part

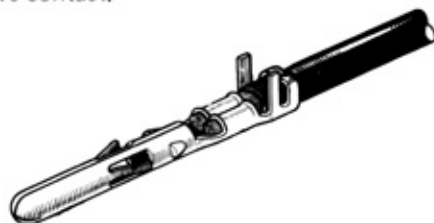


Fig. 4 Connecting Part

HEAD AND TAIL LIGHT CONTROL RELAY

Inspection

1. Check that there is 12V between connector terminals HB and TB.
2. Check that the connector is plugged into the relay.
3. Ground the terminal Ts (for tail light) or HS (for headlight), and check the relay to see if operating sound is given off, and check the light to see if turned on.
4. Coil open circuit test
Unplug the connector, and check for resistance between relay terminals.

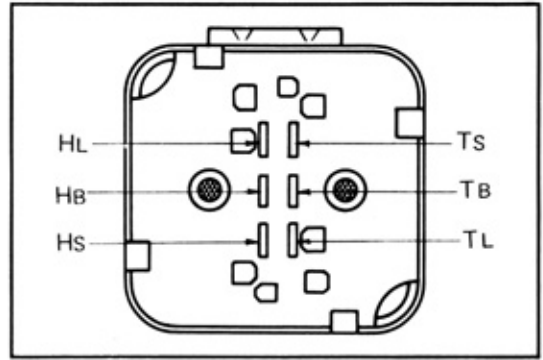


Fig. 3-8 Light Control Relay Inspection

| Terminals | Resistance (Reference) |
|-----------|------------------------|
| TB – TS | 60 Ω approx. |
| HB – HS | 60 Ω approx. |

LIGHT SWITCH REMINDER (Only SR. RH. models)

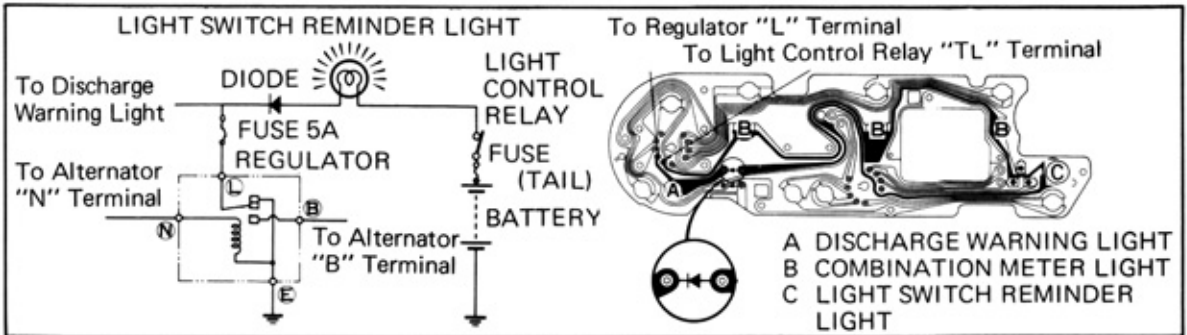


Fig. 3-9 Light Switch Reminder Circuit

If the light control switch is ON (tail or head) when the engine is stopped, the light switch reminder turns on to warn that the light has not been turned off.

Operation

The regulator L terminal is grounded when the engine is stopped. If at this time the light control switch is still turned on, the current flows from the lighting circuit → light switch reminder → regulator

L terminal → ground, to cause the light switch reminder to turn on.

On starting the engine, voltage is impressed on the L terminal and since there is no longer any voltage difference with the lighting circuit, the light switch reminder turns off. The diode serves to prevent the reverse current from turning on the light switch reminder. As shown in the above illustration, the actual wiring is incorporated in the printed circuit of meter circuit plate.

TURN SIGNAL & HAZARD LIGHT

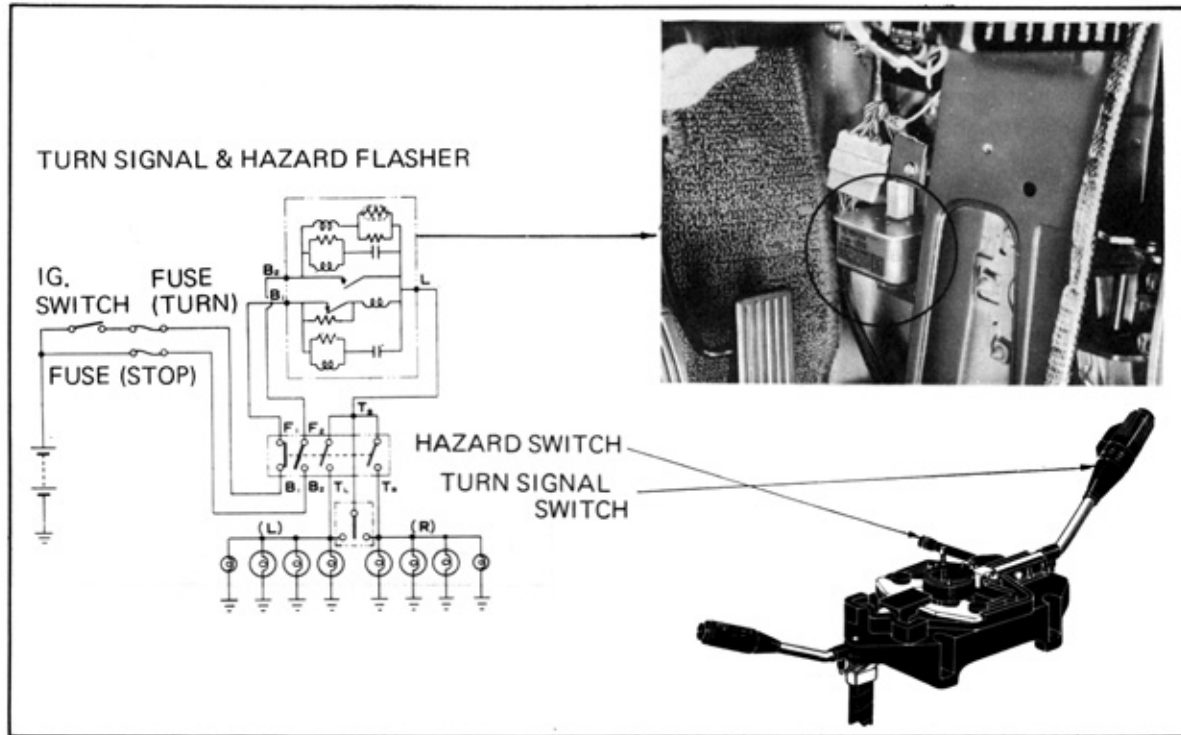


Fig. 3-10 Turn Signal & Hazard Lights

OPERATION (Except Vehicles for West Germany)

When the turn signal switch is turned ON, the current flows from B1 → point P1 → coil L2 → L → ground. At this instant, the magnetic force of L2 opens the point P1.

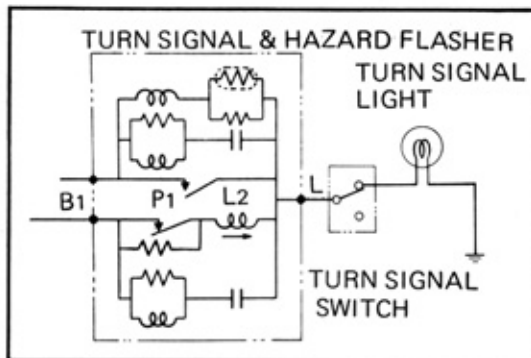


Fig. 3-11 Turn Signal Circuit (1)

Opening point P1 stops the flow of current through coil L2 so that there is no longer L2 magnetic force. But together with the opening of point P1 a charging current flows through the coil L1 and starts to charge the condenser C1. As a result, the magnetic force of L1 holds the point P1 open.

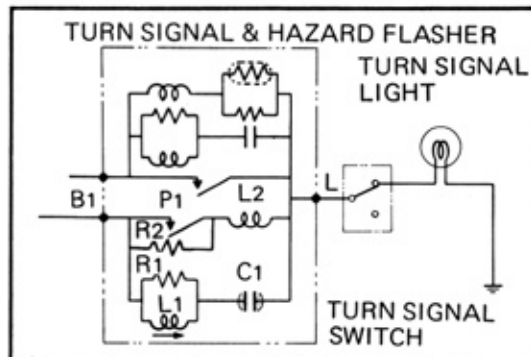


Fig. 3-12 Turn Signal Circuit (2)

When the charging of condenser C1 is completed, the current stops flowing through coil L1 and since there is no longer L1 magnetic force, point P1 is closed by spring tension.

Closing point P1 forms a discharge circuit that allows the current stored in C1 to start discharging through coil L1 and at the same time, the battery current flows from B1 → point P1 → L2 → L → ground, to cause the lights to turn on. Since the currents through coils L1 and L2 will be flowing in opposite directions at this time, the coil magnetic forces will cancel each other so that point P1 will remain closed.

When the condenser C1 is completely discharged, there is no longer any current flowing through L1 so that P1 is opened by magnetic force of L2. Thus, the circuit B1 → point P1 → L2 → L → ground is opened so that the lights turn off. At same instance, the charging current starts to flow through C1, and through the magnetic force of L1, P1 is held open until the charging is completed. Through the repetition of the above actions, the lights are kept flashing.

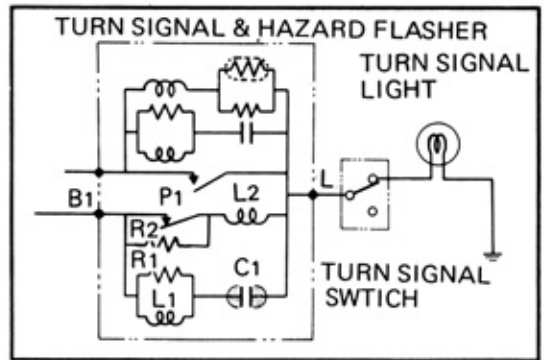


Fig. 3-13 Turn Signal Circuit (3)

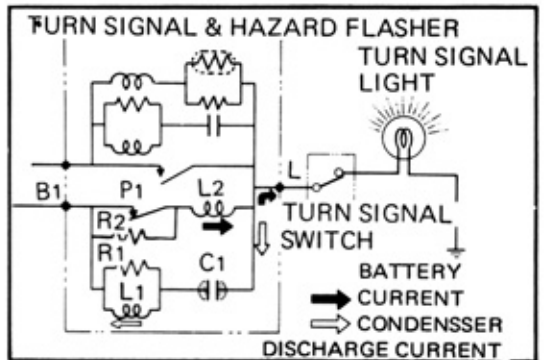


Fig. 3-14 Turn Signal Circuit (4)

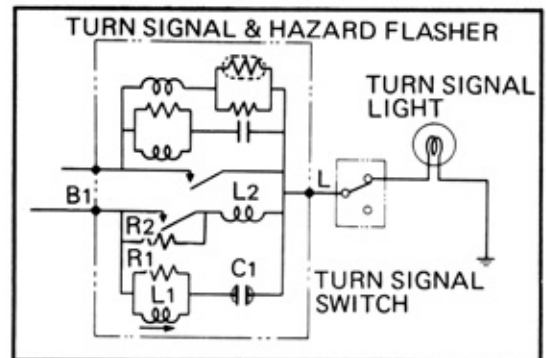


Fig. 3-15 Turn Signal Circuit (5)

- If one or more of the turn signal lights burns out, there will be less current flowing through the coil L2 so that L2 will not be able to produce enough magnetic force to open P1. Consequently, the lights will not flash but remain lit.
- In case the side turn signal or indicator light burns out, there will be less current flowing, but the decreased amount is not large enough to prevent P1 from opening and closing.

- But due to the decrease in magnetic force produced in L2, the balance with that produced in L1 is destroyed, to result in longer discharge time of C1. Therefore, P1 stays closed for longer time and the number of flashes becomes less.
- The hazard relay is a voltage type relay. Thus, unlike the turn signal relay, the number of flashes do not change in case of the light burning out.

TURN SIGNAL AND HAZARD SWITCH

Inspection

Remove the steering column lower cover (1), pull out the connector (2), and check continuities between terminals.

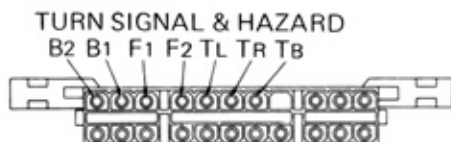


Fig. 3-16 Pulling Out 22-Terminal Connector

- TB Turn signal flasher (L)
- TR Turn signal light (R)
- TL Turn signal light (L)
- F1 Turn signal flasher (B1)
- F2 Turn signal flasher (B2)
- B1 Fuse (TURN)
- B2 Fuse (STOP)

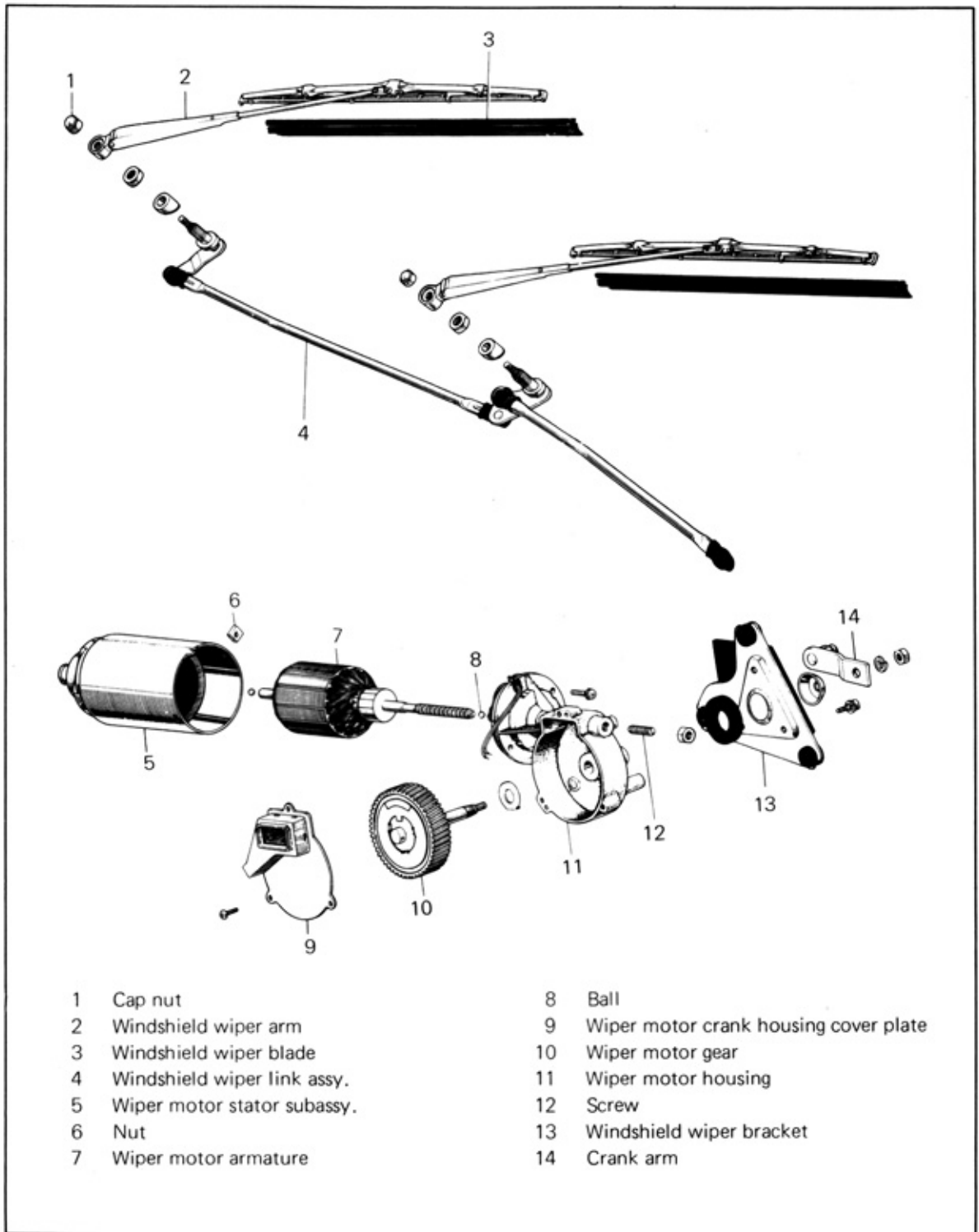
– Note –

Before starting inspection, refer to P3-6 (22-Terminal Connector Handling and Inspection Precautions).

| Terminal Switch | | TL | TB | TR | F1 | F2 | B1 | B2 |
|--------------------|-----|----------------|----|----|-----|-----|-----|-----|
| | | Turn Signal | R | | ○—○ | | ○—○ | ○—○ |
| N | | | | | ○—○ | ○—○ | | |
| L | ○—○ | | | | ○—○ | ○—○ | | |
| Hazard | | ○—○—○ | | | | ○—○ | | |

WIPER & WASHER

COMPONENTS



- | | | | |
|---|-----------------------------|----|---------------------------------------|
| 1 | Cap nut | 8 | Ball |
| 2 | Windshield wiper arm | 9 | Wiper motor crank housing cover plate |
| 3 | Windshield wiper blade | 10 | Wiper motor gear |
| 4 | Windshield wiper link assy. | 11 | Wiper motor housing |
| 5 | Wiper motor stator subassy. | 12 | Screw |
| 6 | Nut | 13 | Windshield wiper bracket |
| 7 | Wiper motor armature | 14 | Crank arm |

Fig. 3-17 Wiper Motor and Link Parts

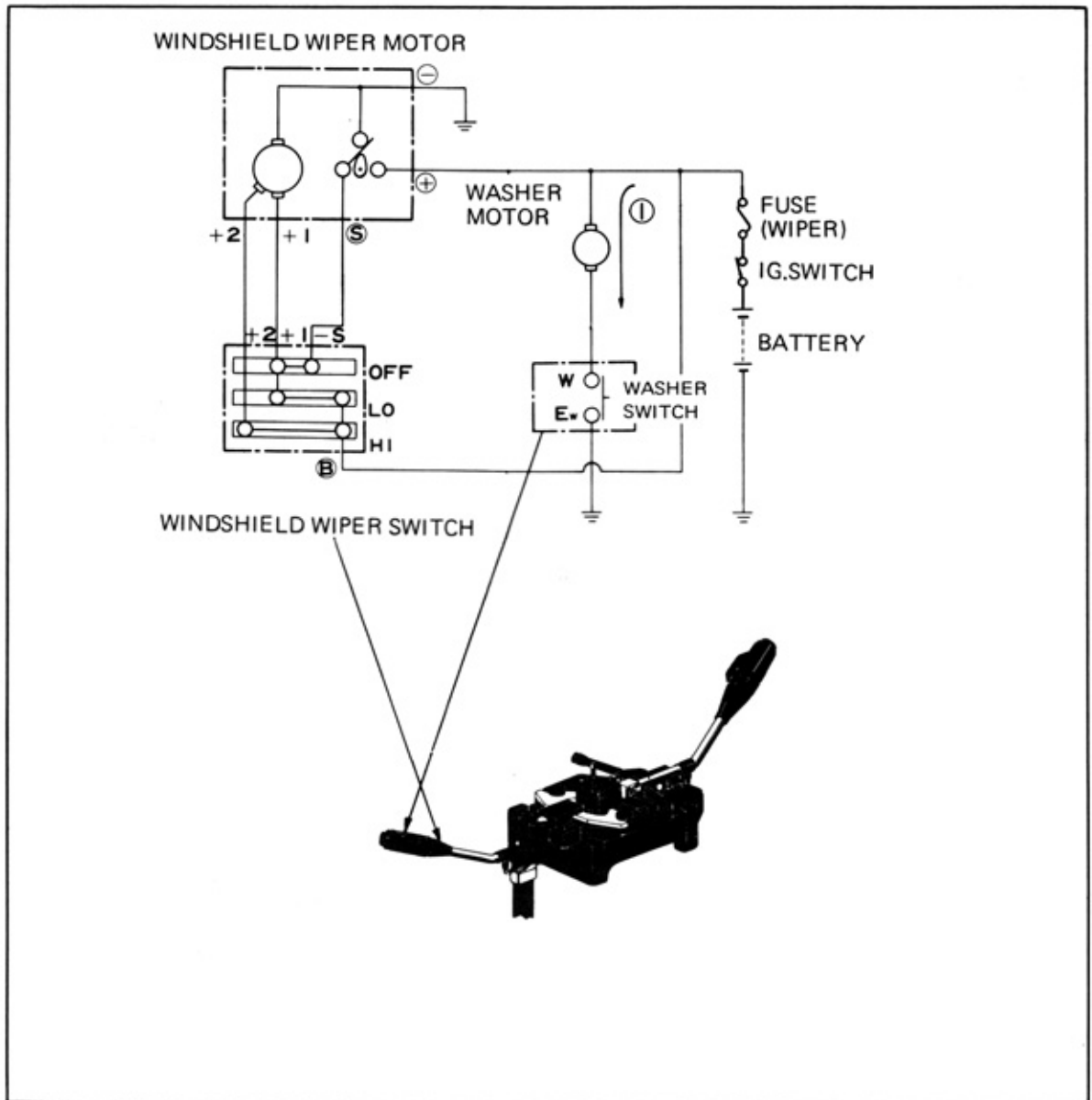


Fig. 3-18 Wiper and Washer Circuit

OPERATION

1. Turning on the washer switch allows the current to flow in arrow (1) direction and operate the washer motor.
2. Turning the wiper switch to "LO" allows the current to flow to the wiper motor (+1) terminal and operate the motor at low speed.
3. Turning the wiper switch to "HI" allows the current to flow to the wiper motor (+2) terminal and operate the motor at high speed.
4. When wiper switch is turned off.
 - As long as the wiper motor cam switch has the (+) terminal to (S) terminal closed, the wiper motor will continue to run at low speed.
 - When the wiper motor cam switch opens, the current flow stops. At the same time, (-) terminal to (S) terminal is closed by the cam switch so as to short the wiper motor armature circuit. As a result, the wiper motor is electrically braked to stop turning.

WIPER MOTOR

Removal

1. Pull out the wire harness connector (1), remove the service hole cover (2), and loosen the three bolts (3) attaching the wiper motor.
2. Remove the shield cap, pry loose the connection between the motor and link, and take out the wiper motor assembly.

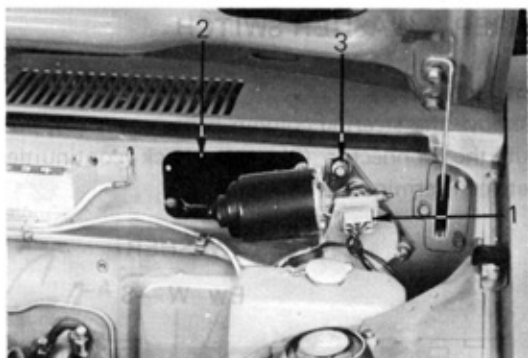


Fig. 3-19 Removing Wiper Motor (1)



Fig. 3-20 Removing Wiper Motor (2)

Installation

Perform the removal in reverse order.

– Note –

1. Install the crank arm so that it will be positioned as shown in Fig. 3-21 when the wiper motor is at its automatic stop position.
2. After installing the wiper link, check the wiper arm stop position.

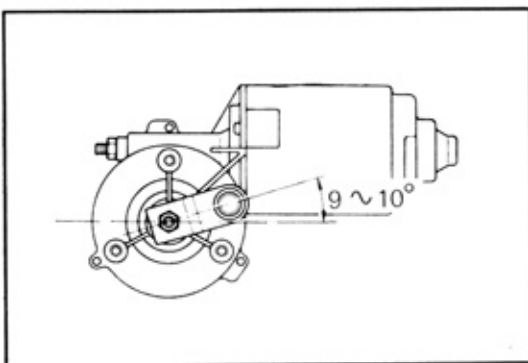


Fig. 3-21 Crank Arm Installed Position

Inspection

Pull out the connector from the wiper motor and check the continuities between the terminals at the motor. Except for the (+) terminal, there should be continuity between the rest of the terminal.

– Note –

Make the inspection with the motor at its automatic stop position.

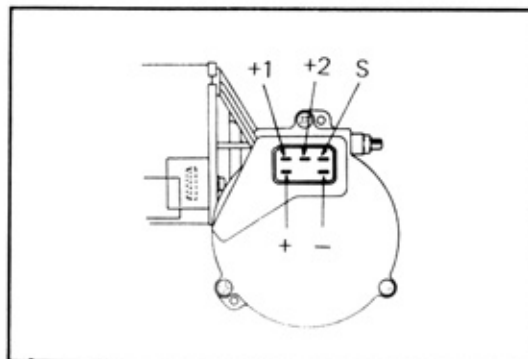
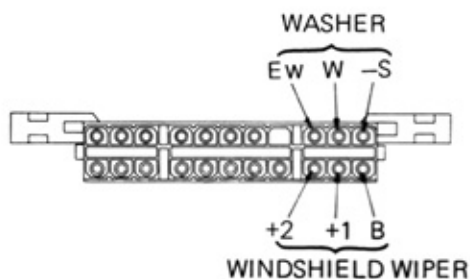


Fig. 3-22 Wiper Motor Inspection

WIPER & WASHER SWITCH

Inspection

Remove the steering column lower cover (1), pull out the connector (2), and check continuities between terminals.



- B Fuse (WIPER)
- +1 Wiper motor (+1)
- +2 Wiper motor (+2)
- S Wiper motor (S)
- W Washer motor
- EW Ground

— Note —

Before starting inspection, refer to P3-6 (22-Terminal Connector Handling and Inspection Precautions).

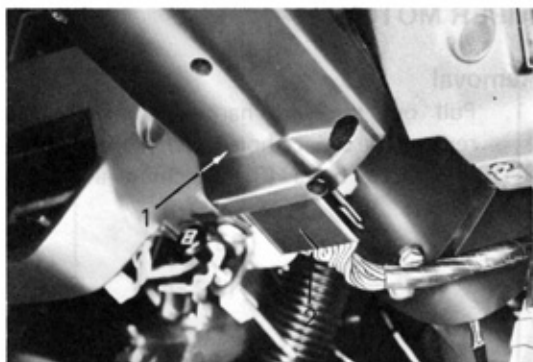
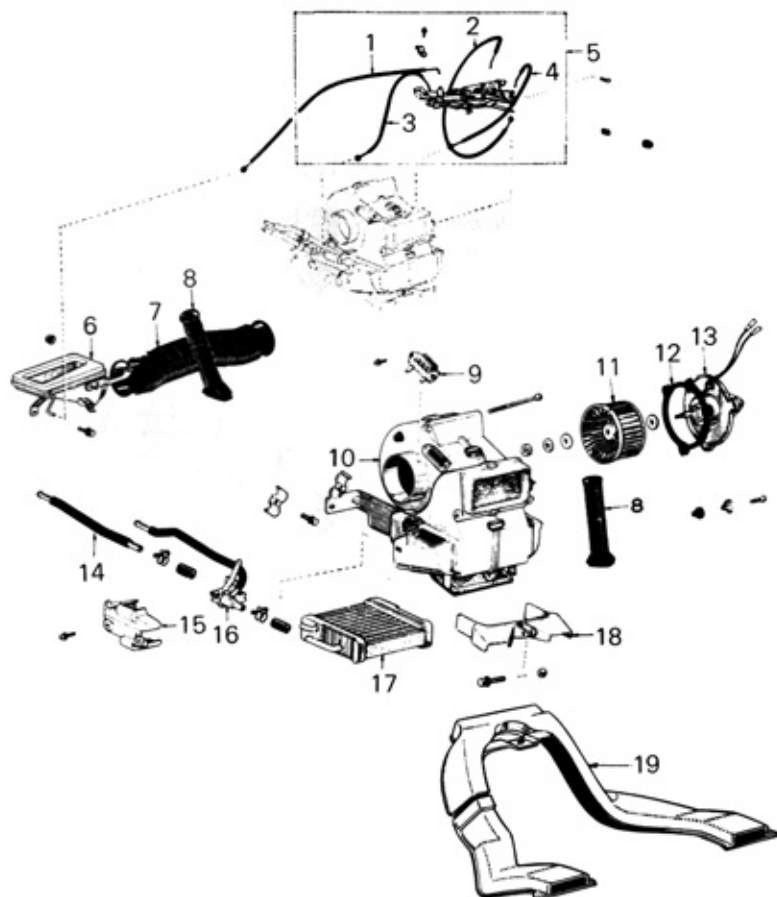


Fig. 3-23 Pulling Out 22-Terminal Connector

| Terminal Switch | +B | +1 | +2 | -S | W | EW |
|--------------------|-----|-----|----|----|-----|-----|
| OFF | | ○—○ | | ○ | ○—○ | ○—○ |
| LO | ○—○ | | | | ○—○ | ○—○ |
| HI | ○—○ | | ○ | | ○—○ | ○—○ |

HEATER**COMPONENTS**

- | | | | |
|----|--------------------------------|----|-----------------------------|
| 1 | Air inlet damper control cable | 11 | Blower fan subassy. |
| 2 | Defroster damper control cable | 12 | Heater motor blower packing |
| 3 | Temp. damper control cable | 13 | Blower motor subassy. |
| 4 | Boost ventilator control cable | 14 | Water hose |
| 5 | Heater control assy. | 15 | Protector |
| 6 | Air damper case assy. | 16 | Water valve assy. |
| 7 | Air duct | 17 | Radiator unit subassy. |
| 8 | Defroster hose | 18 | Heater cover |
| 9 | Control resistor | 19 | Heater rear air duct |
| 10 | Heater assy. | | |

Fig. 3-24 Heater Parts

HEATER ASSEMBLY

Removal

1. Drain out the engine coolant.
2. Disconnect the heater hose at the engine room.
3. Remove the defroster hose (1) and air duct (2).

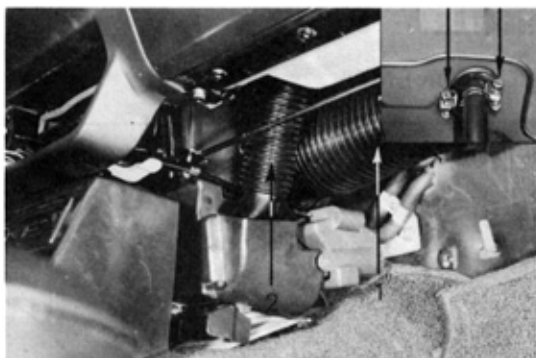


Fig. 3-25 Heater Assy. Removal (1)

4. Remove the control lever knob and blower switch, and after loosening two screws, take off the heater control panel.
5. Remove the heater control assembly together with cables attached.

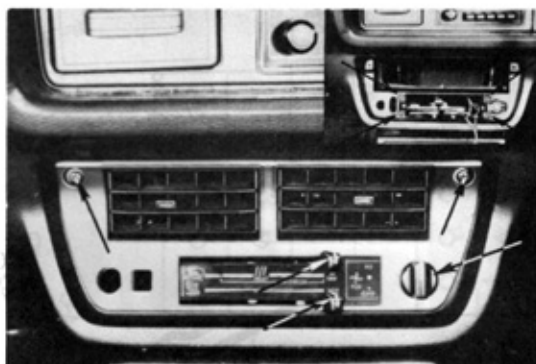


Fig. 3-26 Heater Assy. Removal (2)

6. Pull out the wire harness connector, and after removing three bolts mounting the heater body, take out the heater assembly.

Installation

Perform the removal in reverse order.



Fig. 3-27 Heater Assy. Removal (3)

HEATER BLOWER MOTOR

Removal

1. Unplug the wire harness connector.
2. Remove the defroster hose RH.
3. Loosen the three bolts mounting the motor, and take out the blower motor assembly.
4. Remove the blower fan from the motor assembly.

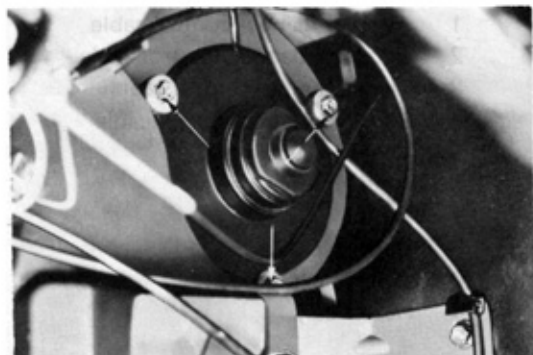


Fig. 3-28 Heater Blower Motor Removal

HEATER BLOWER SWITCH

Inspection

Pull out the connector from the blower switch and check continuities between terminals with circuit tester.

| Terminal Switch | B | L | M | H |
|--------------------|---|---|---|---|
| OFF | | | | |
| I | ○ | ○ | | |
| II | ○ | ○ | ○ | |
| III | ○ | ○ | ○ | ○ |

HEATER BLOWER MOTOR AND CONTROL RESISTOR

Inspection

Pull out four connector terminals from the heater body and check the resistances between terminals.

| Terminals | Resistance (Reference) |
|-----------|------------------------|
| B to H | 20 Ω maximum |
| H to M | 1.1 Ω |
| H to L | 2.1 Ω |

IGNITION SWITCH

Removal & Installation

Refer to Steering Section in Chassis Repair Manual for removal and installation methods.

Inspection

Check the continuities between the terminals.

| Terminal Switch | AM | ACC | IG | ST |
|--------------------|----|-----|----|----|
| LOCK | | | | |
| ACC | ○ | ○ | | |
| ON | ○ | ○ | ○ | |
| START | ○ | | ○ | ○ |

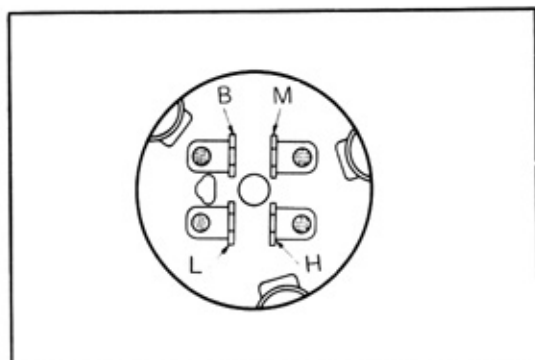


Fig. 3-29 Heater Blower Switch Inspection

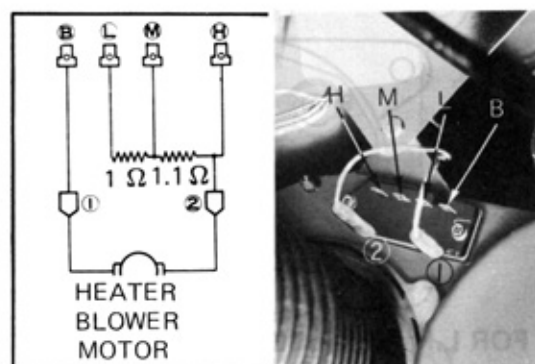


Fig. 3-30 Heater Motor & Resistor Inspection

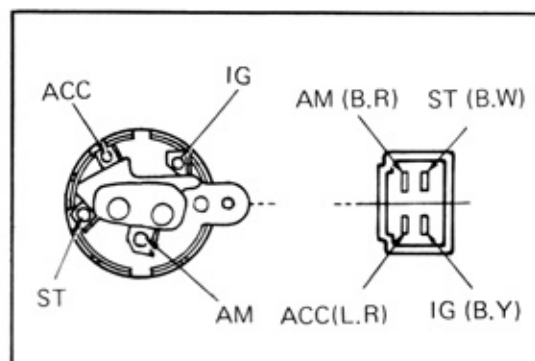


Fig. 3-31 Ignition Switch Connector

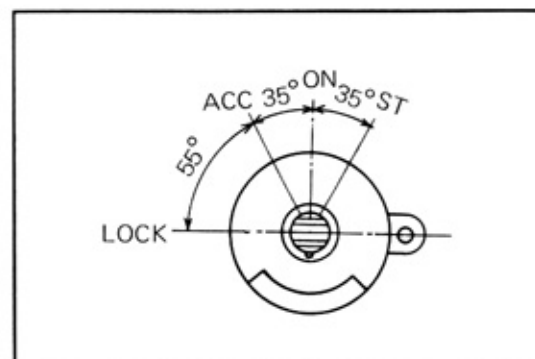
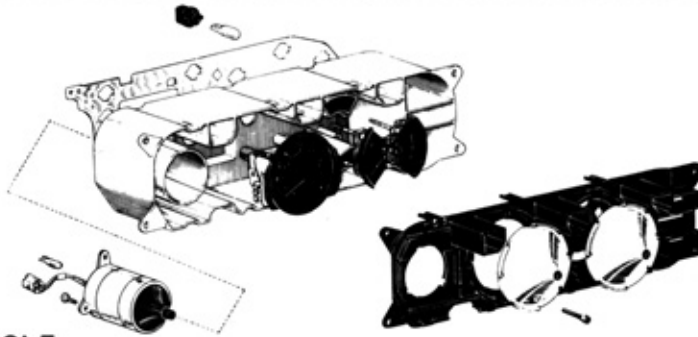


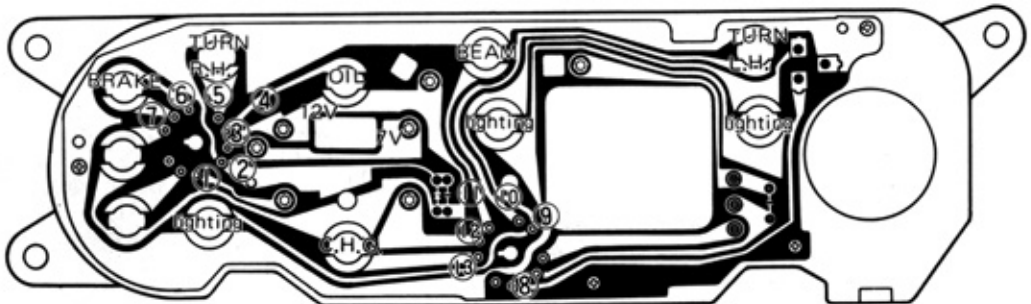
Fig. 3-32 Ignition Switch Installation

COMBINATION METER & GAUGE

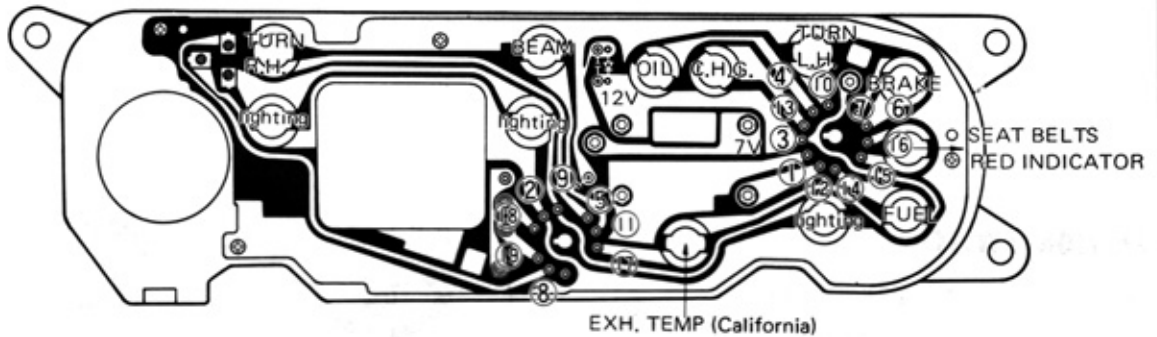
[SEDAN]



FOR R.H. VEHICLE



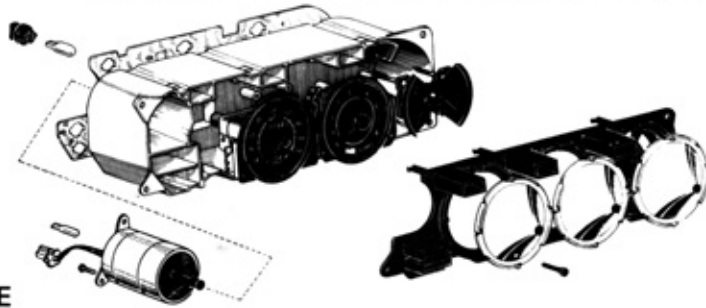
FOR L.H. VEHICLE



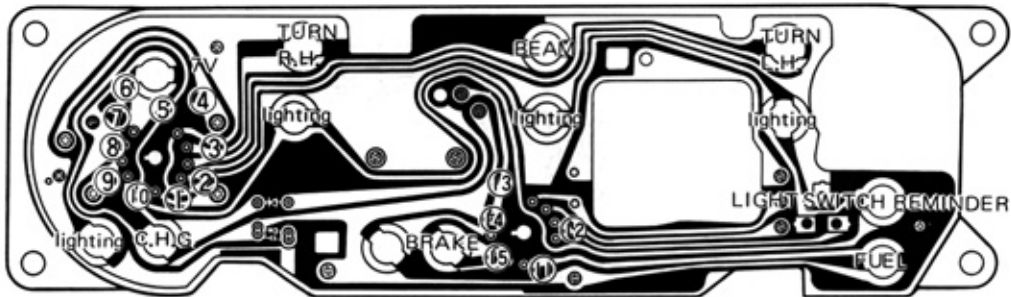
| Terminal No. | Connects to | Terminal No. | Connects to |
|--------------|--|--------------|---|
| 1 | Fuel sender gauge ↔ Fuel receiver gauge | 11 | Dimmer switch ↔ upper beam indicator light |
| 2 | Ground | 12 | Water temperature sender gauge ↔ water temperature receiver gauge |
| 3 | Ignition (+) (DEFOG fuse) | 13 | Voltage regulator L ↔ charge warning light |
| 4 | Oil pressure switch ↔ oil pressure indicator light | 14 | Fuel level switch ↔ fuel level warning light (for Calif.) |
| 5 | Turn signal switch ↔ turn signal indicator light RH | 15 | Seat belt (for USA) Hazard flasher (for West Germany) |
| 6 | Parking brake switch ↔ parking brake indicator light | 16 | Seat belt (for USA) Hazard light (for West Germany) |
| 7 | Fuse (DEFOG) ↔ parking brake indicator light | 17 | Emission computer (for Calif.) |
| 8 | Auto clock (+) | 18 | Speedometer reed switch ↔ Emission computer (for USA) |
| 9 | Meter lighting (+) ↔ tail light relay | 19 | Reed switch ↔ ground (for USA) |
| 10 | Turn signal switch ↔ turn signal indicator light LH | | |

Fig. 3-33 Combination Meter (1)

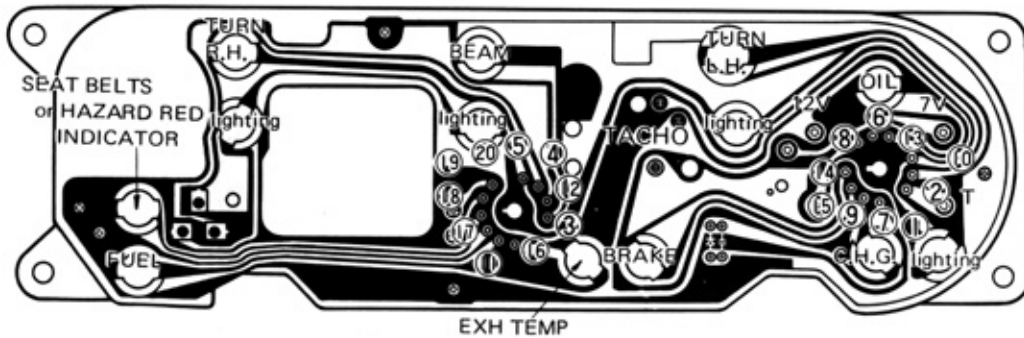
[HARDTOP]



FOR R.H. VEHICLE



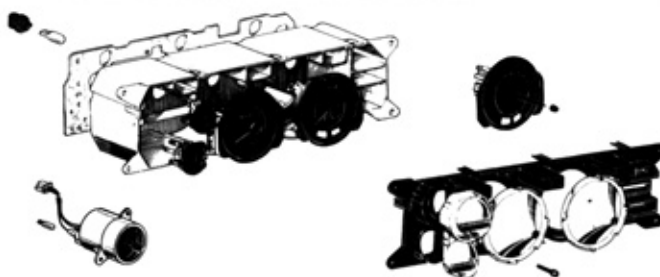
FOR L.H. VEHICLE



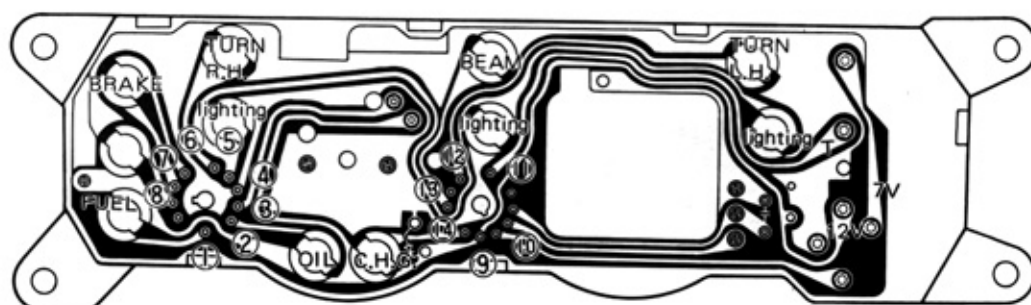
| Terminal No. | Connects to | Terminal No. | Connects to |
|--------------|---|--------------|--|
| 1 | Water temperature sender gauge ↔ water temperature receiver gauge | 11 | Fuel level switch ↔ fuel level warning light |
| 2 | Turn signal switch ↔ turn signal indicator light LH | 12 | Auto clock (+) |
| 3 | Dimmer switch ↔ upper beam indicator light | 13 | Ignition coil (-) ↔ tachometer S |
| 4 | Turn signal switch ↔ turn signal indicator light RH | 14 | Parking brake switch ↔ parking brake indicator light |
| 5 | Ground | 15 | Fuse (DEFOG) ↔ parking brake indicator light |
| 6 | Oil pressure switch ↔ oil pressure indicator light | 16 | Emission computer (Calif.) |
| 7 | Ignition (+) (DEFOG fuse) | 17 | Seat belt computer ↔ warning light (USA) Hazard flasher (West Germany) |
| 8 | Fuel sender gauge ↔ fuel receiver gauge | 18 | Seat belt ground (USA) Hazard flasher (West Germany) |
| 9 | Voltage regulator L ↔ charge warning light | 19 | Speedometer reed switch ↔ emission computer (USA) |
| 10 | Meter lighting (+) ↔ tail light relay | 20 | Reed switch ↔ ground (USA) |

Fig. 3-34 Combination Meter (2)

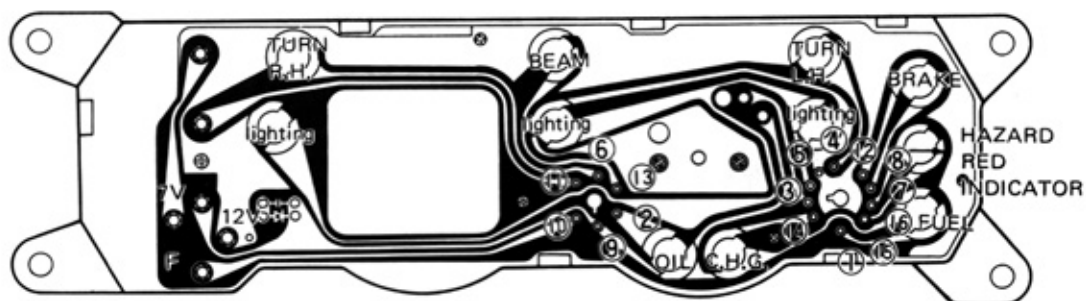
[TRUENO]



FOR R.H. VEHICLE

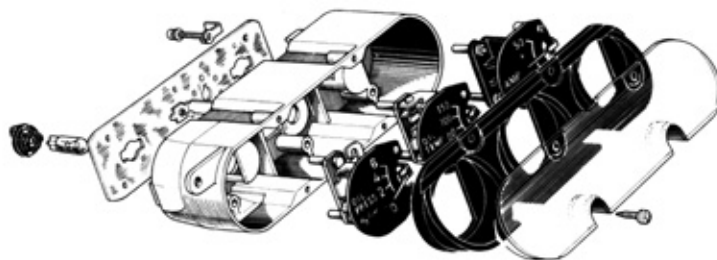


FOR L.H. VEHICLE

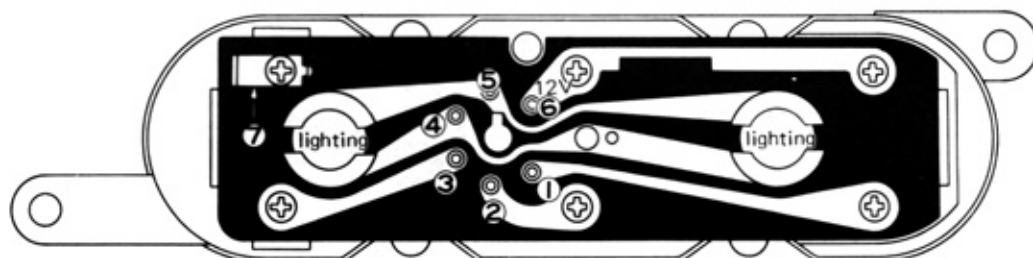


| Terminal No. | Connects to | Terminal No. | Connects to |
|--------------|--|--------------|---|
| 1 | Fuel level switch ↔ fuel level warning light | 9 | Ignition (+) (DEFOG fuse) |
| 2 | Oil pressure switch ↔ oil pressure indicator light | 10 | Fuel sender gauge ↔ fuel receiver gauge |
| 3 | Ignition coil (-) ↔ tachometer S | 11 | Water temperature sender gauge ↔ water temperature receiver gauge |
| 4 | Ground | 12 | Turn signal switch ↔ turn signal indicator light LH |
| 5 | Meter lighting (+) ↔ tail light relay | 13 | Dimmer switch ↔ upper beam indicator light |
| 6 | Turn signal switch ↔ turn signal indicator light RH | 14 | Voltage regulator L ↔ charge warning light |
| 7 | Parking brake switch ↔ parking brake indicator light | 15 | Indicator light ground (West Germany) |
| 8 | Fuse (DEFOG) ↔ parking brake indicator light | 16 | Hazard flasher ↔ indicator light (West Germany) |

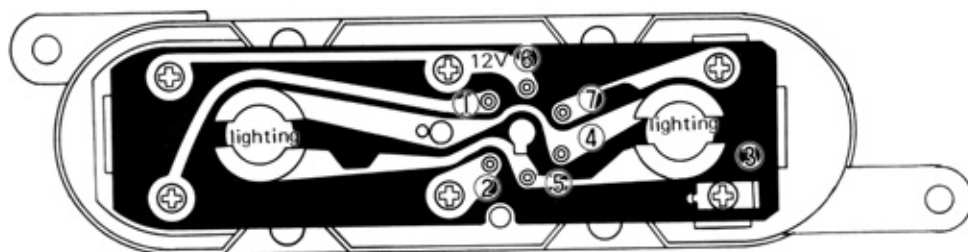
Fig. 3-35 Combination Meter (3)



FOR R.H. VEHICLE



FOR L.H. VEHICLE



Terminal
No.

Connects to

- 1 Oil pressure sender gauge ↔ oil pressure receiver gauge
- 2 Oil temperature sender gauge ↔ oil temperature receiver gauge
- 3 Ammeter (-)
- 4 Body ground
- 5 Gauge lighting
- 6 Ignition (+) (DEFOG fuse)
- 7 Ammeter (+)

Fig. 3-36 Combination Gauge

COMBINATION METER ASSEMBLY

Removal

1. Detach the battery connections.
2. Remove the instrument finish panel.
3. Pull out the speedometer cable.

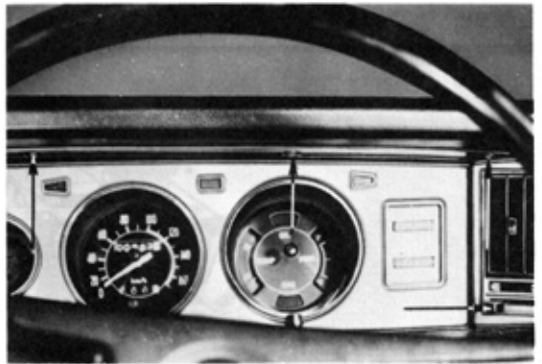


Fig. 3-37 Combination Meter Removal (1)

4. Remove the four screws attaching the meter.
5. Draw out the meter assembly, and after pulling out the multi-terminal connector from the meter back side, take out the meter assembly.

Installation

Perform the removal in reverse order.



Fig. 3-38 Combination Meter Removal (2)

COMBINATION GAUGE ASSEMBLY

Removal

1. Detach the battery connections.
2. Remove the instrument center finish panel.



Fig. 3-39 Combination Gauge Removal (1)

3. Remove the two screws attaching the gauge.
4. Draw out the gauge assembly, and after pulling out the 6-terminal connector from the gauge back side, take out the gauge assembly.

Installation

Perform the removal in reverse order.



Fig. 3-40 Combination Gauge Removal (2)

SPEEDOMETER

On-vehicle Inspection

Using a speedometer tester, inspect the meter indicating error, pointer vibrations, abnormal noise, operation of odometer, and operation of speed warning device.

– Note –

It must be noted that tire wear and tire over- and under-inflation will contribute toward indication error, and that pointer vibration is often caused by loose cable.

FUEL GAUGE

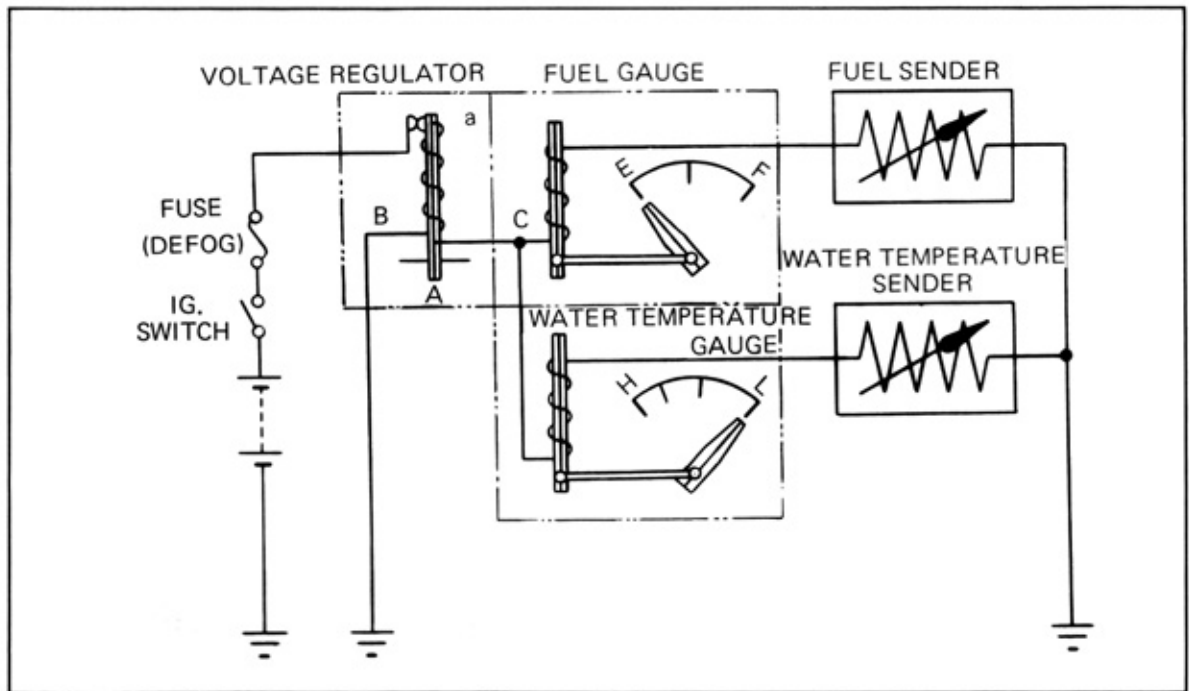


Fig. 3-41 Fuel Gauge and Water Temperature Gauge Circuits

Operation

- Voltage regulator

The voltage regulator A part is a bimetal, which when heated will bend toward a. When a coil is wound around this bimetal and a given voltage impressed on the coil, current flow will be opened and closed at same periods. If higher voltage is impressed, more current will flow through the coil so that the bimetal will be bent faster, that is, the point opening time will become longer. When closed, larger current will be flowing but the time of flow will be shorter. The adjustments have been made to have average voltage of around 7V at point C.
- Receiver gauge

The receiver gauge also uses a bimetal and a heat coil. The larger the current flowing through the heat coil, the greater will be the heating of the bimetal, and more will be the bending of the bimetal. This bending force is utilized to deflect the pointer. Thus, the pointer will deflect in accord with the amount of current flowing through the heat coil.
- Sender gauge

The sender gauge is a variable resistor, the resistance of which is varied by the changes in gasoline amount or water temperature.

Fuel Receiver Gauge

Inspection

1. Pull out the connector from the fuel sender gauge and ground the terminal through a 3.4W bulb. When the ignition switch is turned on, the bulb should light (but start to flash after few seconds) and the gauge pointer should deflect, if the gauge is in proper condition.
2. If the above test shows defective condition, remove the combination meter assembly and check on the following points.
 - (1) With the multi-terminal connector plugged in to the combination meter, turn on the ignition switch and verify that battery voltage is present at terminal (A).
 - (2) At the above condition, there should be a constantly varying voltage at terminal (B) that is fluctuating between 2V and 7V.

– Note –

When the ignition switch is turned on, the 12V battery voltage will be indicated but after a few seconds, the voltage will drop down to between 2V and 7V.

- (3) Measure the voltage between terminals (A) and (C).

Standard resistance **55 Ω**

– Caution –

Do not check the 7V terminal at 12V.

Fuel Sender Gauge

Removal

1. Drain out the gasoline from the fuel tank.
2. Pull out the sender gauge wire harness connector.
3. Remove the set bracket with SST[09808-12010], and remove the sender gauge.

Installation

Perform the removal in reverse order.

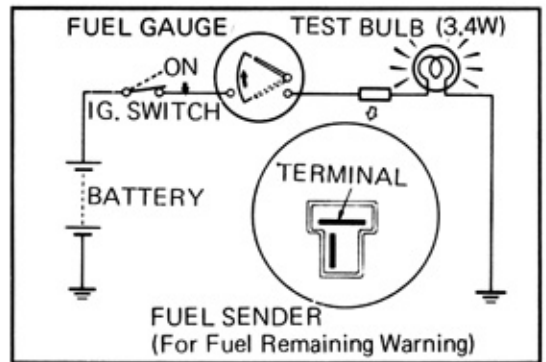


Fig. 3-42 Receiver Gauge Inspection

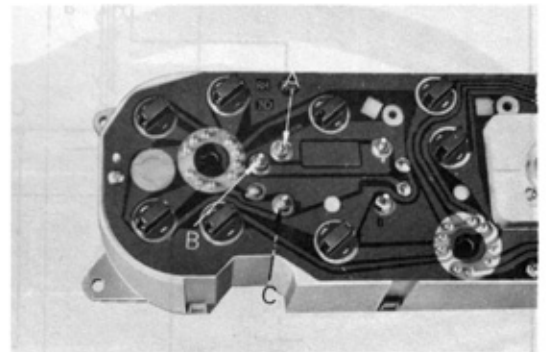


Fig. 3-43 Sedan Series Inspection

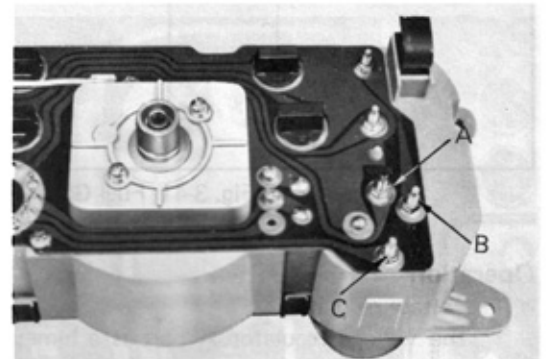


Fig. 3-44 Trueno Series Inspection

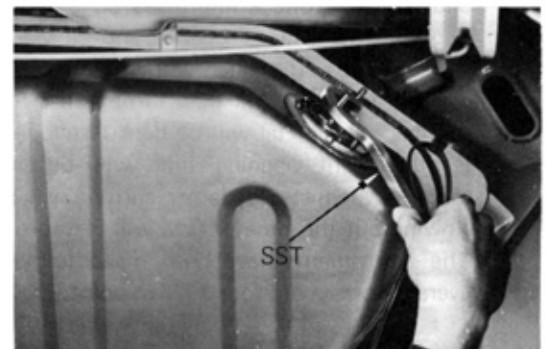


Fig. 3-45 Removing Sender Gauge

Inspection

Remove the sender gauge and measure the resistance between the terminal and ground with a circuit tester. The resistance should change smoothly when the float arm is moved, and be of the values shown in following table.

| Float Position | Resistance (Ω) |
|----------------|-------------------------|
| F | 3 ± 2.1 |
| 1/2 | 32.5 ± 4.8 |
| E | 110 ± 7.7 |

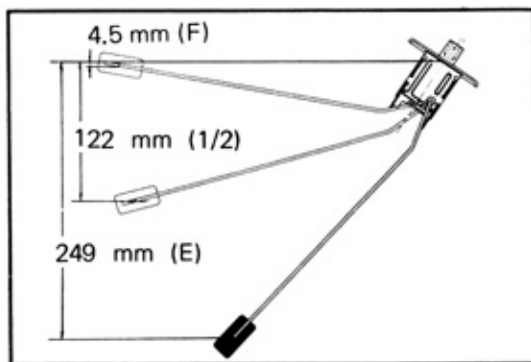


Fig. 3-46 Sender Gauge Inspection (Ex. Van)

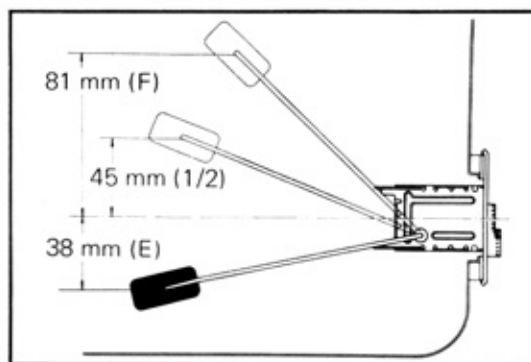


Fig. 3-47 Sender Gauge Inspection (Van only)

FUEL LEVEL WARNING LIGHT

When the amount of gasoline remaining in the fuel tank drops down to about 5 liters (5.28 US.qts. 4.4 Imp.qts.), the level switch mounted on the sender gauge senses the low level and turns on the warning light.

Operation

Turning ON the ignition switch allows the current to flow through warning light → level switch → ground. The level switch comprises of a thermistor in which the resistance changes with the temperature. When the level gauge is immersed in gasoline, the heat radiation is large so the thermistor temperature is low and the resistance large. Thus, there will be little current flowing through the circuit so the warning light remains unlit. When the gasoline drops down to about 5 liters (5.28 US.qts. 4.4 Imp.qts), the level switch becomes exposed. Since the heat radiation decreases, the thermistor resistance also increases and allows more current to flow through the circuit and allow the warning light to turn on.

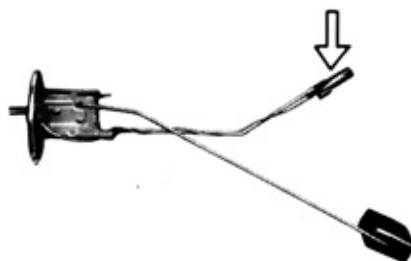


Fig. 3-48 Fuel Level Switch

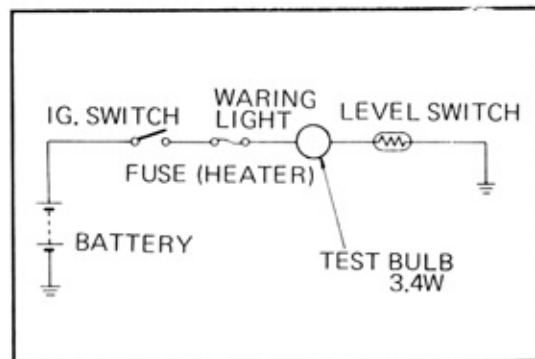


Fig. 3-49 Fuel Level Warning Circuit

Fuel Level Warning Switch

On-Vehicle Inspection

1. Drain out the gasoline from the fuel tank.
2. Turn ON the ignition switch.
3. Measure the level switch terminal voltage.
About 5V to 6V
4. Fill about 5 liters (5.28 US.qts, 4.4 Imp.qts.) of gasoline into the tank, and measure the switch terminal voltage.
About 11V to 12V

Bench Inspection

Remove the sender gauge assembly and check on the following points.

1. Impress the 12V battery voltage between the connector terminal and ground through a 3.4W bulb. The bulb should light after a short time.
2. Under the above condition, immerse the switch in gasoline or water. The bulb should turn off.

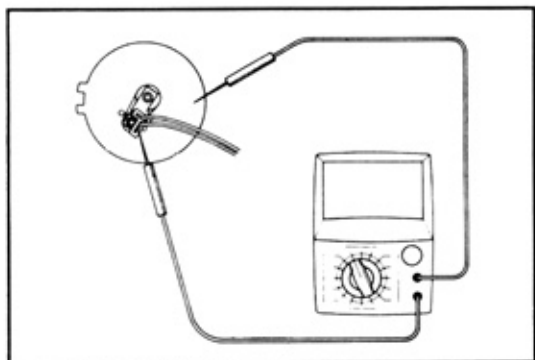


Fig. 3-50 Level Switch Inspection

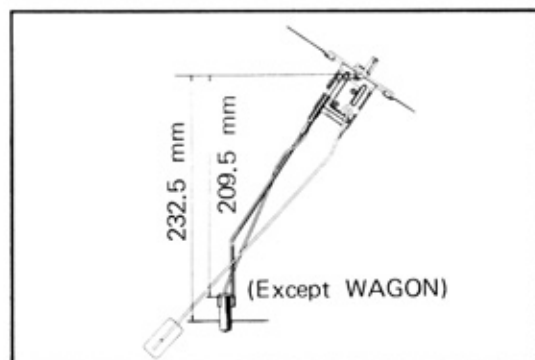


Fig. 3-51 Level Switch Installed Position (Ex. Van)

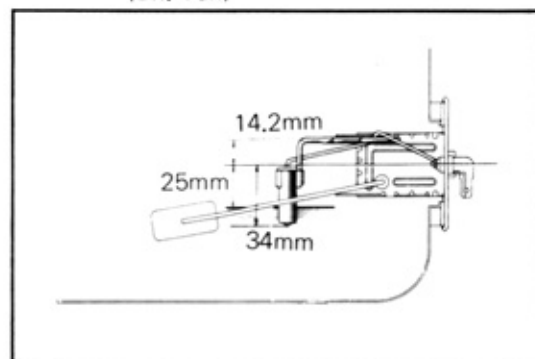


Fig. 3-52 Level Switch Installed Position (Van only)

WATER TEMPERATURE GAUGE

Operation

Refer to fuel gauge operation on P3-23.

Water Temperature Receiver Gauge

Inspection

1. Pull out the connector from the water temperature sender gauge and ground its terminal through a 3.4W bulb. When the ignition switch is turned ON, the bulb should light (but start to flash after few seconds) and the gauge pointer should deflect.

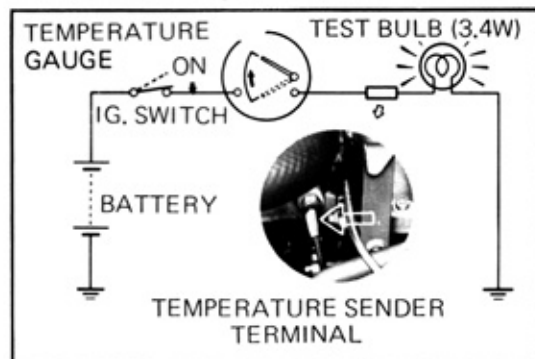


Fig. 3-53 Receiver Gauge Inspection

2. If the above test shows condition to be abnormal, remove the combination meter assembly and check on the following points.

- (1) With the multi-terminal connector plugged in to the combination meter and the ignition switch turned on, there should be a constantly varying voltage at terminal (A) that fluctuates between 2V and 7V. (A regulator is built into the fuel level gauge).

— Note —

When the ignition switch is turned on, the 12V battery voltage will be present but after a few seconds, the voltage will drop down and change be 2V and 7V.

- (2) Measure the resistance between terminals (A) and (B).

Standard resistance 55 Ω

— Caution —

Do not check the 7V terminal when at 12V.

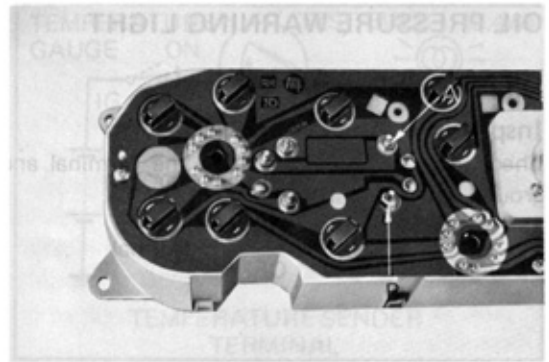


Fig. 3-54 Sedan Series Inspection



Fig. 3-55 Trueno Series Inspection

Water Temperature Sender Gauge

Inspection

Measure the resistance between the terminal and ground with a circuit tester. The resistance should vary with the water temperature as shown in the table below.

| Temperature | Resistance |
|-------------|--------------|
| (50°C) | (154 Ω app.) |
| 80°C | 25 Ω app. |
| 100°C | 27.5 Ω app. |
| (120°C) | (16 Ω app.) |

Values in () are for reference

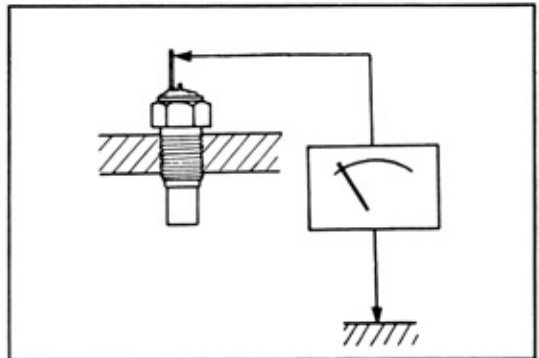


Fig. 3-56 Sender Gauge Inspection

OIL PRESSURE WARNING LIGHT

Oil Pressure Switch

Inspection

Check the continuity between the terminal and ground with a circuit tester.

| | | |
|----------------|-----|----------|
| Engine stopped | ON | } Normal |
| Engine running | OFF | |

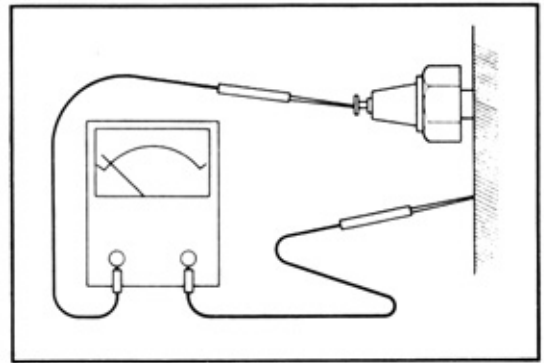


Fig. 3-57 Oil Pressure Switch Inspection

OIL PRESSURE GAUGE

Oil Pressure Receiver Gauge

Inspection

- Pull out the connector from oil pressure sender gauge and ground the terminal through a 3.4W bulb. When the ignition switch is turned on, the bulb should light and gauge pointer should deflect.
- If the above test shows abnormal condition, remove the combination gauge assembly and check on the following points.
 - With the 6-terminal connector plugged into the combination gauge and the ignition switch turned on, battery voltage should be present at terminal (A).
 - Measure the resistance between terminals (A) and (B).

Standard resistance **42 Ω**

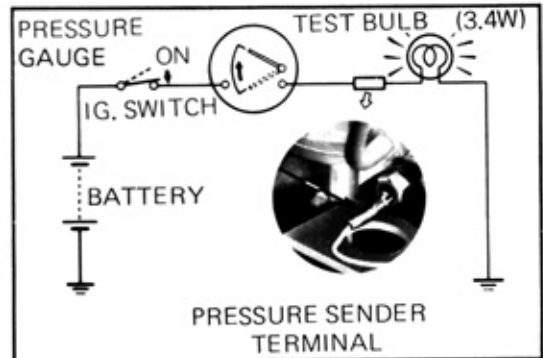


Fig. 3-58 Receiver Gauge Inspection

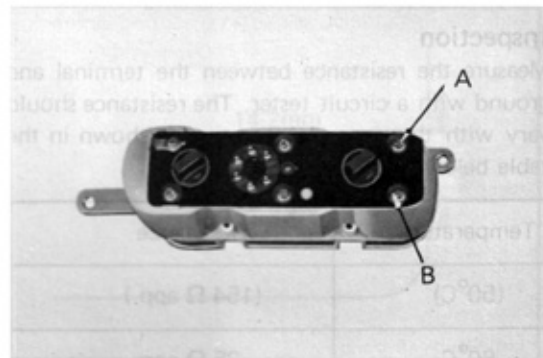


Fig. 3-59 Receiver Gauge Inspection

Oil Pressure Sender Gauge

Inspection

Pull out the connector from the sender gauge, and impress battery voltage on the gauge terminal through a 3.4W bulb. The bulb should not light when the engine is stopped, and should flash when the engine is running. The number of flashes should also vary with the engine speed.

— Note —

Even when the engine is stopped, the bulb may light for an instant when the battery voltage is impressed, but this is no trouble.

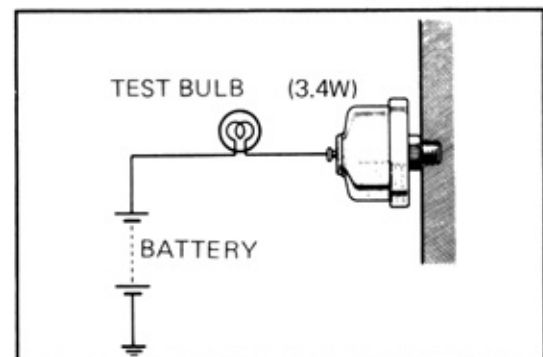


Fig. 3-60 Sender Gauge Inspection

OIL TEMPERATURE GAUGE

Oil Temperature Receiver Gauge

Inspection

1. Pull out the connector from oil temperature sender gauge and ground the terminal through a 3.4W bulb. When the ignition switch is turned on, the bulb should light (but start flashing after few seconds) and pointer should deflect to near center.

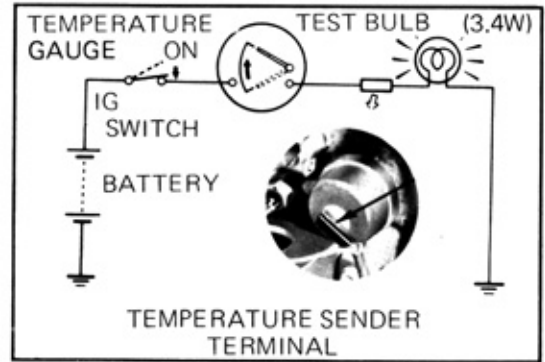


Fig. 3-61 Receiver Gauge Inspection

2. If the above test shows abnormal condition, remove the combination gauge assembly, and check on the following points.
 - (1) With a 6-terminal connector plugged in to the combination gauge and the ignition switch turned on, there should be battery voltage present at terminal (A) and a voltage at terminal (B) that is constantly fluctuating between 2V and 7V. (A regulator is built in the receiver gauge).

– Note –

When the ignition switch is turned on, the 12V battery voltage is impressed, but after a few seconds, drops down to between 2V and 7V.

- (2) Measure the resistance between the terminals (A) and (B).

Standard resistance 55 Ω

– Caution –

Do not check the 7V terminal with 12V.

Oil Temperature Sender Gauge

Inspection

Measure the resistance between the terminal and ground. Resistance values conforming to the temperatures should be indicated, as shown in following table.

| Temperature | Resistance |
|-------------|-----------------|
| (50° C) | (154 Ω approx.) |
| 80° C | 52 Ω approx. |
| 100° C | 27.5 Ω approx. |
| (120° C) | (16 Ω approx.) |

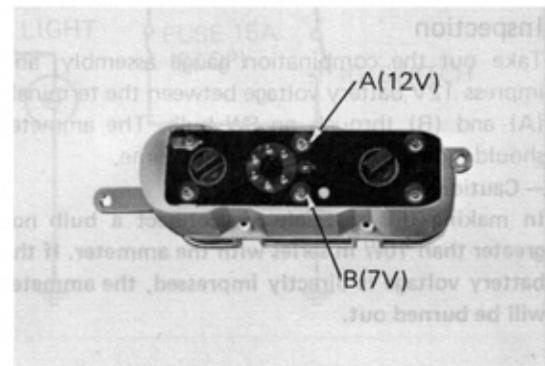


Fig. 3-62 Receiver Gauge Inspection (1)

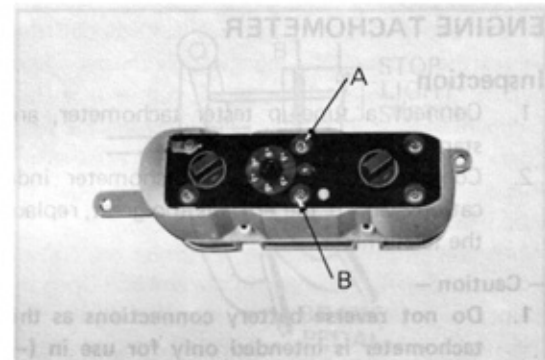


Fig. 3-63 Receiver Gauge Inspection (2)

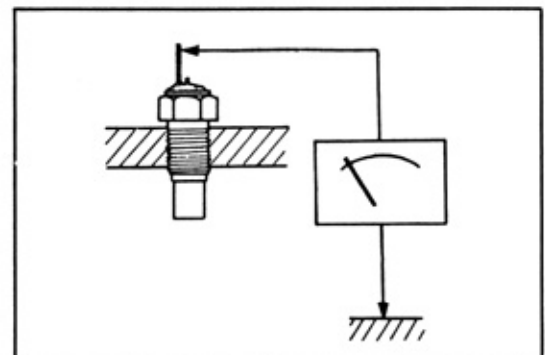


Fig. 3-64 Sender Gauge Inspection

AMMETER

Operation

The ammeter is of the shunt type in which 1/50th of the full current is shunt in to actuate the ammeter. Formerly, the ammeter indicated directly the current flowing through it, but the shunt-type ammeter is made to multiply the indication, a 1A flow through the ammeter being indicated as 50A. A shunt fusible link is used to draw out 1/50th of the full current flow.

Inspection

Take out the combination gauge assembly, and impress 12V battery voltage between the terminals (A) and (B) through an 8W bulb. The ammeter should indicate around 30A at this time.

– Caution –

In making this test, always connect a bulb not greater than 10W in series with the ammeter. If the battery voltage is directly impressed, the ammeter will be burned out.

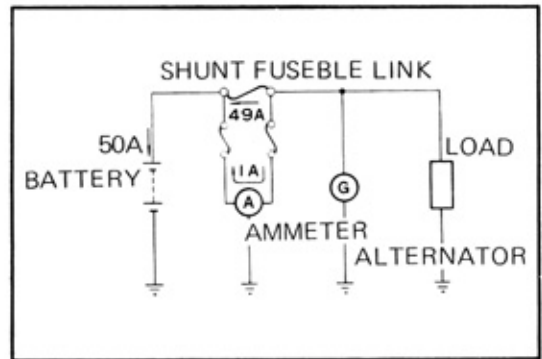


Fig. 3-65 Shunt-Type Ammeter Circuit

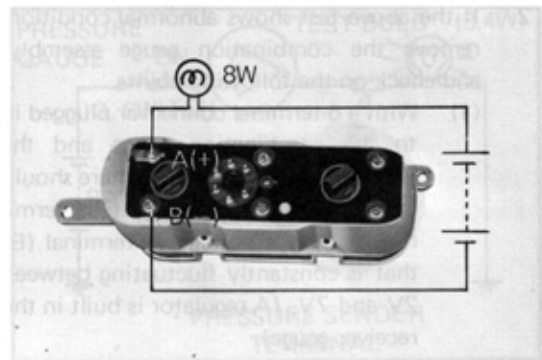


Fig. 3-66 Ammeter Inspection

ENGINE TACHOMETER

Inspection

1. Connect a tune-up tester tachometer, and start the engine.
2. Compare the tester and tachometer indications, and if the error is too great, replace the tachometer.

– Caution –

1. **Do not reverse battery connections as this tachometer is intended only for use in (-) ground vehicles. Reversed connection could damage the transistors and diodes contained inside.**
2. **In removing or installing the tachometer, be careful not to drop it or subject it to heavy shocks.**

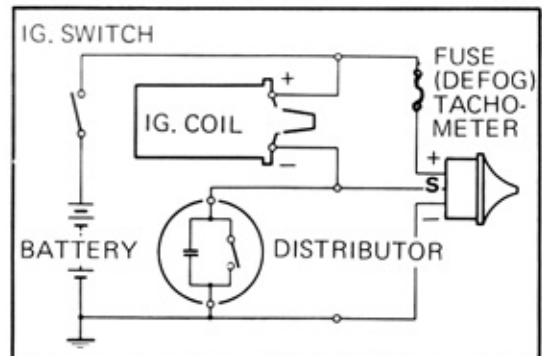


Fig. 3-67 Tachometer Circuit

PARKING BRAKE & BRAKE WARNING LIGHT

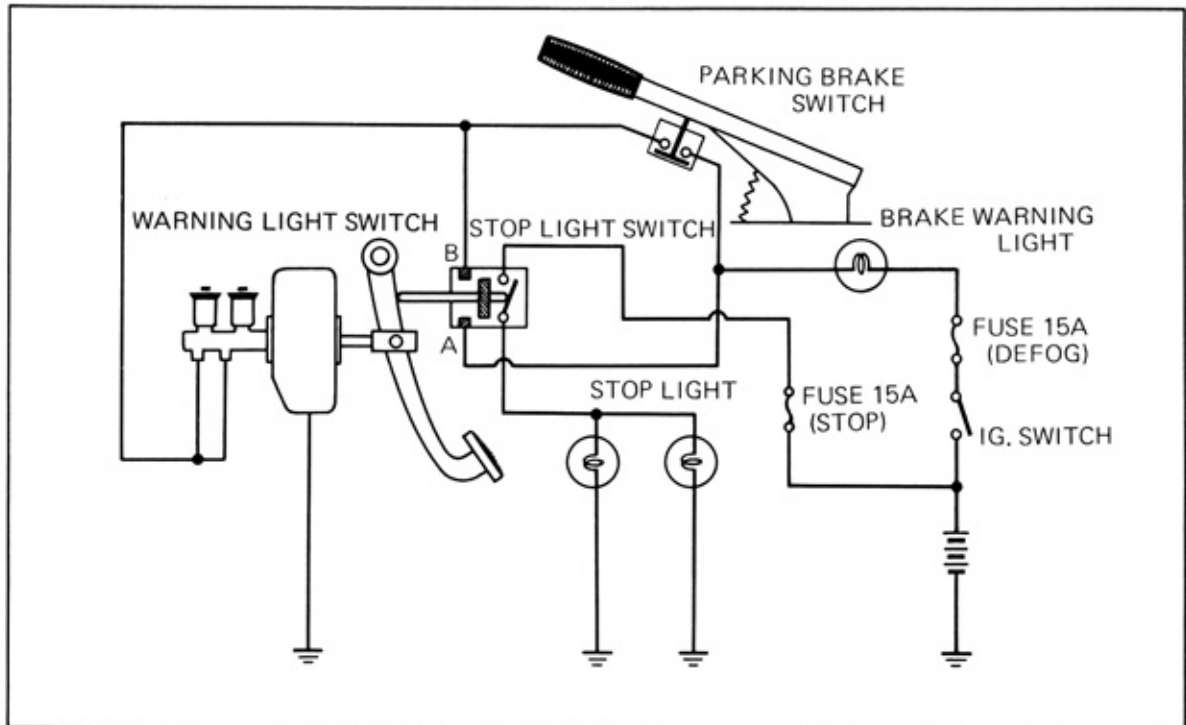


Fig. 3-68 Parking Brake & Brake Warning Light

Operation

- Stop light switches A and B are normally off, but are turned on when the brake pedal is depressed (more than one-half of pedal stroke).
- Warning light switch is normally on, but turns off when oil pressure develops.
- At normal brake operation, Even when the stop light switches are turned on, the hydraulic pressure build up in the master cylinder causes the warning light switch to remain in off state, so that warning light does not turn on.
- At abnormal brake operation, If hydraulic pressure does not develop at either the front or rear side of master cylinder, the brake pedal will move more than one-half of its stroke so that the stop light turns on. Since there is no pressure

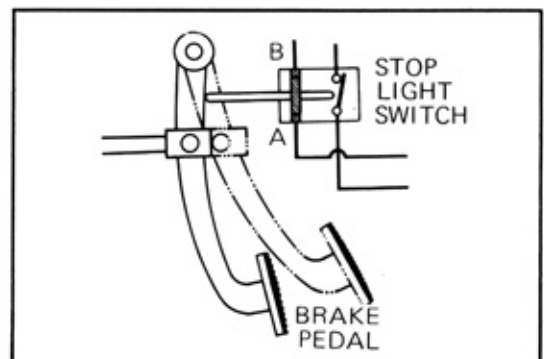


Fig. 3-69 Stop Light Switch On State

build up, the brake warning switch will also turn on, causing the warning light to turn on and warn the driver.

- Warning light and warning light switch can be inspected by pulling the parking brake and by stepping down on the brake pedal.

STOP BULB FAILURE WARNING LIGHT

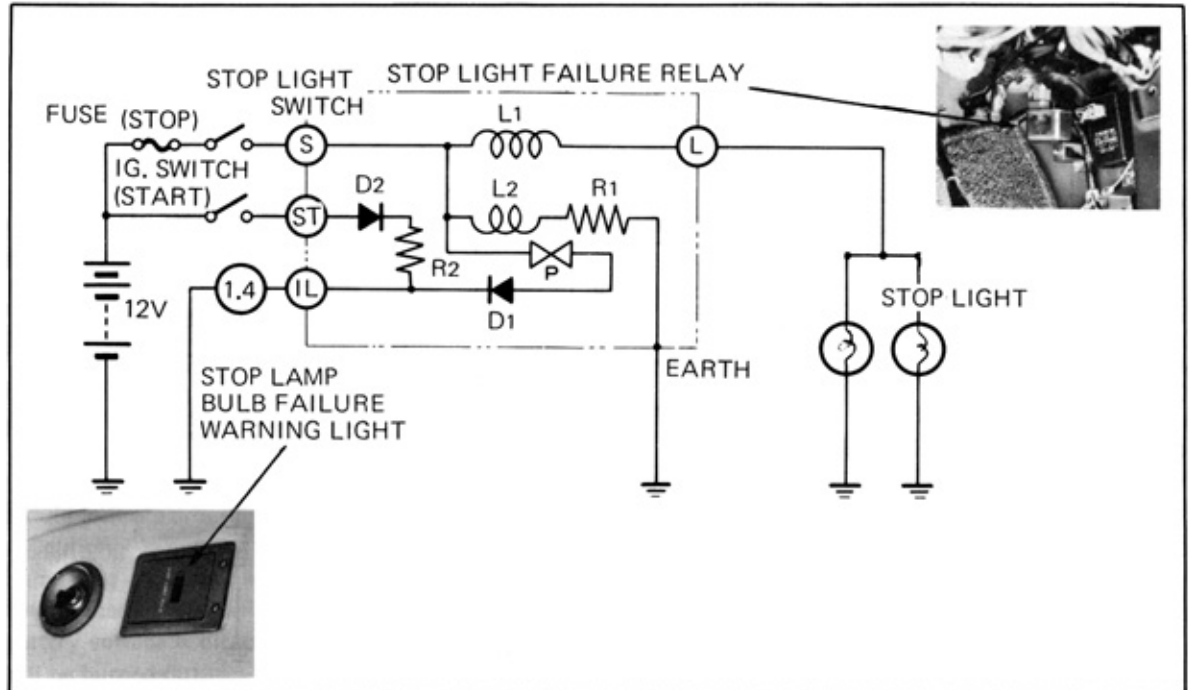


Fig. 3-70 Stop Bulb Failure Sensing Relay Circuit

OPERATION

In the above diagram, L1 is a current coil that senses the current flowing through the stop light circuit and operates the point. L2 is a voltage compensating coil that prevents erroneous relay operation caused by battery voltage fluctuation. P is a contact point that remains closed when the stop light is not operating.

When the stop light switch is turned on, current flows through L1 to energize the coil and open the point. As there will be no current flowing through the indicator light at this time, the light remains unlit. But the circuit is made such that current will

flow through the indicator light when the starter is operating, the purpose being to enable checking bulb failure at the time the engine is being started. If one or more stop light bulb should burn out, the L1 pulling force becomes insufficient so that the point closes and allows current to flow through the indicator light and turn it on.

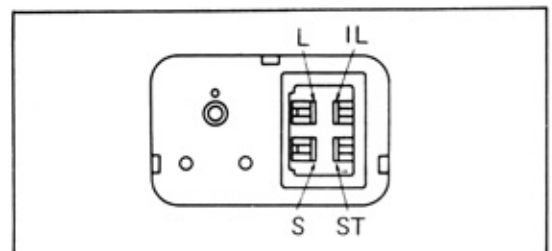


Fig. 3-71 Bulb Failure Relay Inspection

Inspection

1. Check the indicator light to see that it turns on when the starter is turning.
2. Check the indicator light to see that it turns on when one or more stop lights burns out.
3. Pull out the connector and check continuity between the terminals.

– Note –

Between terminals S and IL and terminals ST and IL, measure in both regular and reverse directions due to diode polarities.

| | |
|---------|--|
| S → L | Continuity (resistance 0) |
| S ↔ IL | Continuity |
| | No continuity reverse direction (resistance ∞) |
| ST ↔ IL | Continuity |
| | No continuity reverse direction (resistance ∞) |
| ST ↔ S | No continuity (resistance ∞) |

SWITCH & RELAY LOCATION

EXCEPT USA & CANADA

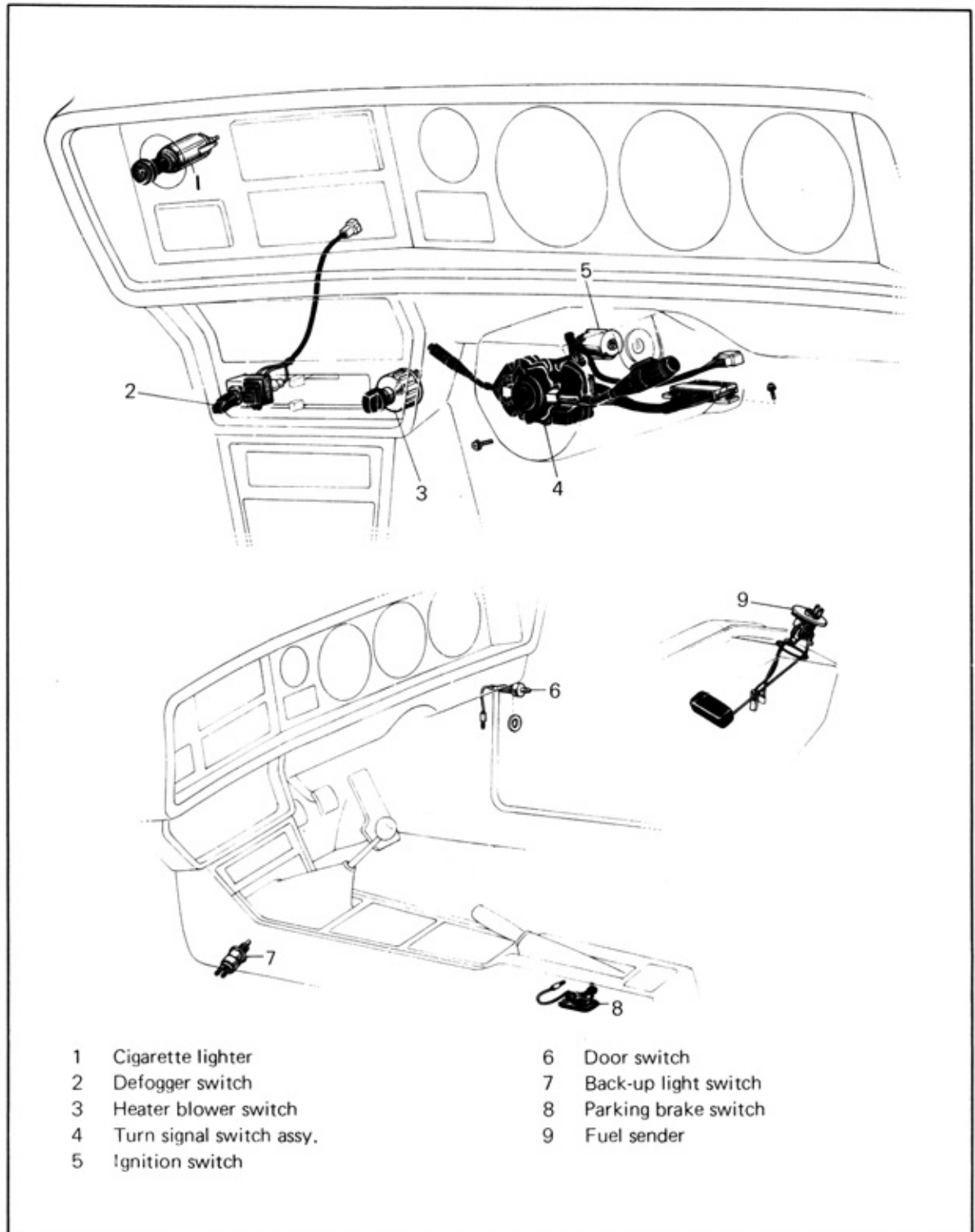


Fig. 3-72 Switch & Relay Locations (1)

EXCEPT USA & CANADA

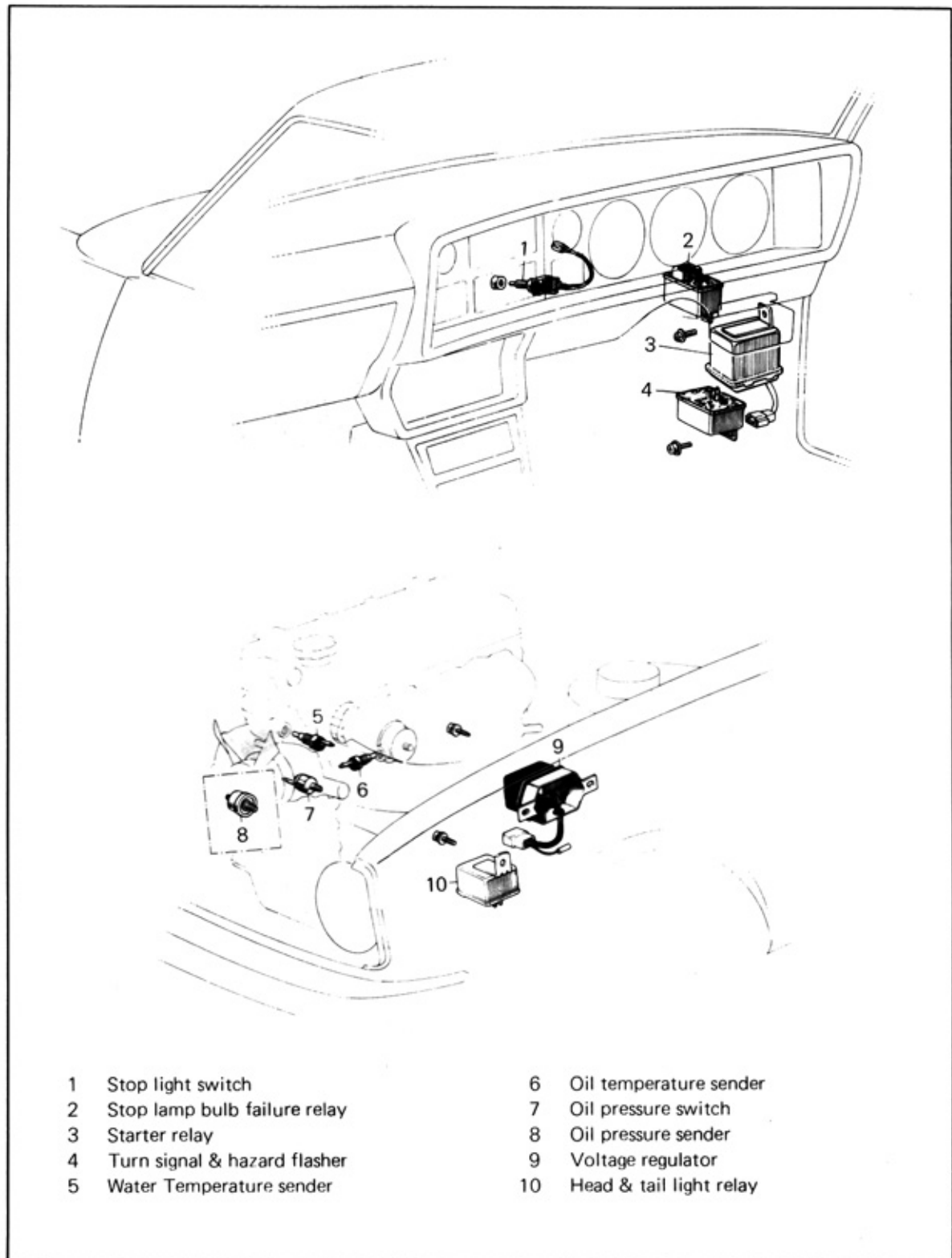


Fig. 3-73 Switch & Relay Locations (2)

FOR USA & CANADA

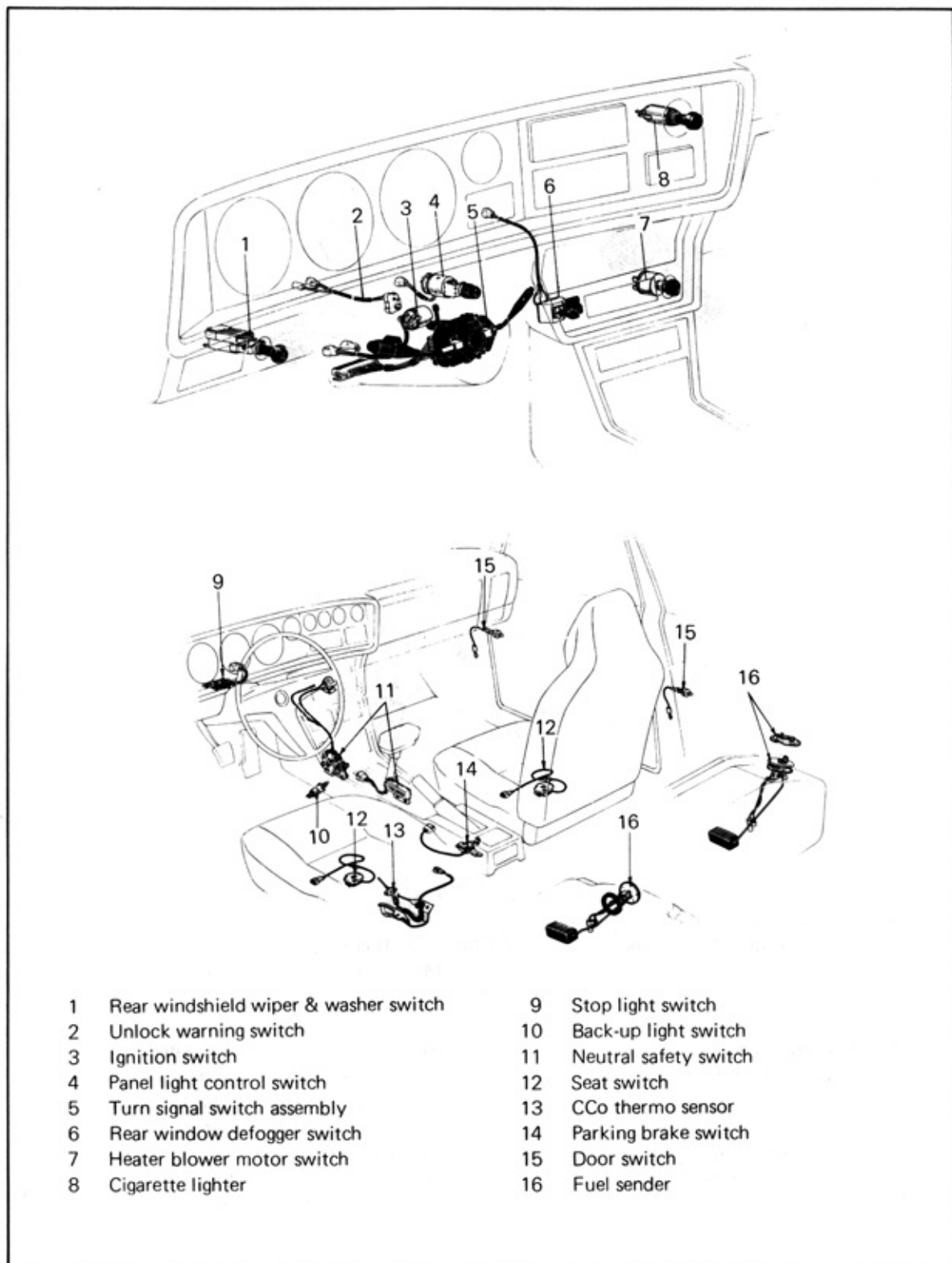
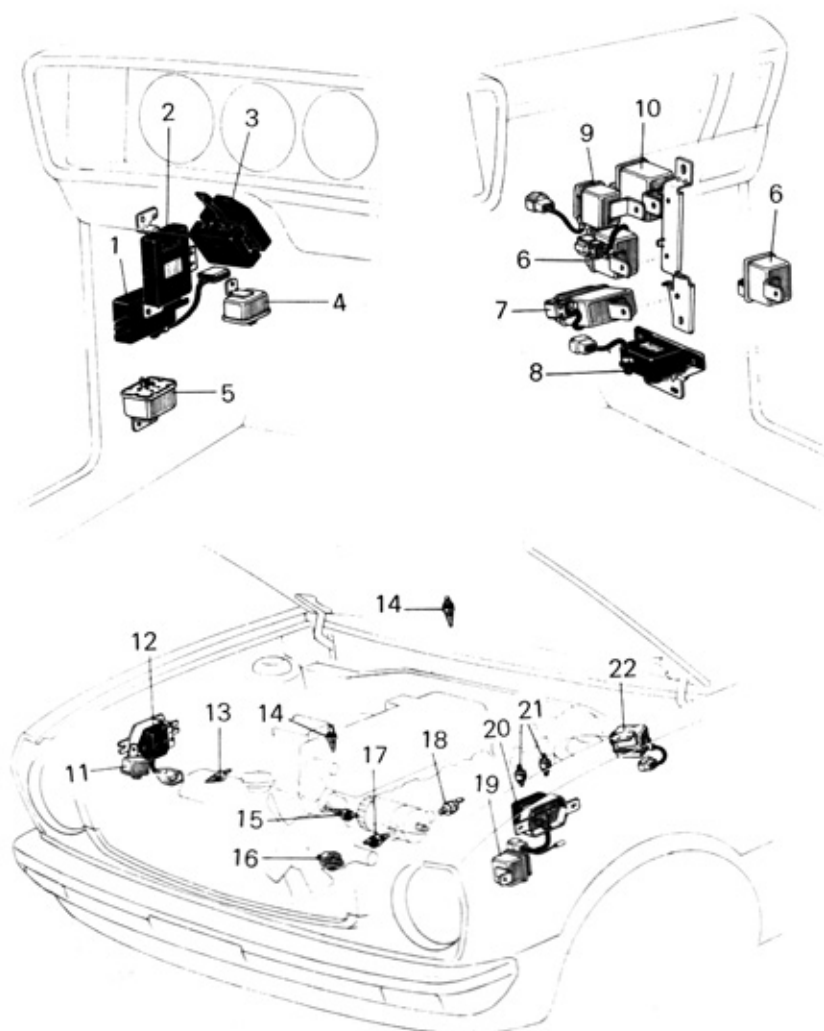


Fig. 3-74 Switch & Relay Locations (1)

FOR USA & CANADA

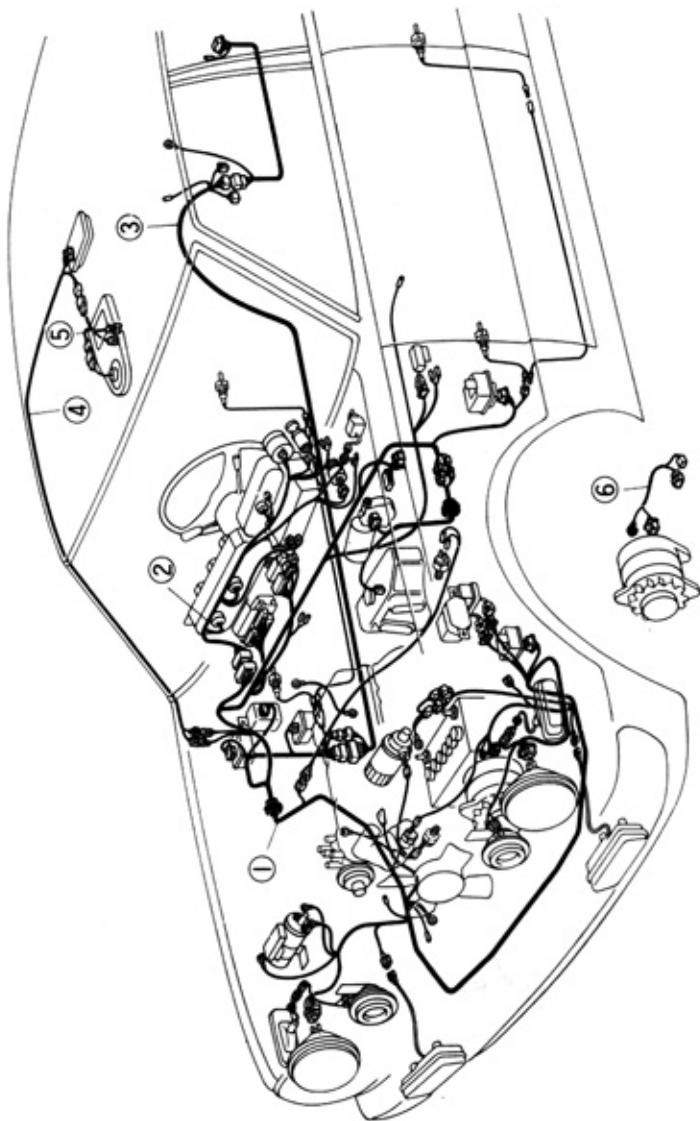


- | | | | |
|----|---|----|---|
| 1 | Seat belt computer | 12 | Igniter |
| 2 | Emission control computer | 13 | Thermo switch |
| 3 | Fuse box | 14 | Thermo switch (for emission or dual points distributor) |
| 4 | Buzzer | 15 | Water temperature sender |
| 5 | Turn signal & hazard flasher | 16 | Oil pressure sender or switch |
| 6 | Fuel pump relay or Ignition control relay | 17 | Oil temperature sender |
| 7 | Starter relay | 18 | Oil pressure switch (for fuel pump) |
| 8 | G. sensor | 19 | Head & tail light relay |
| 9 | Choke control relay | 20 | Regulator |
| 10 | Stop lamp bulb failure relay | 21 | Brake warning light |
| 11 | Horn relay | 22 | Starter Interlock cancel switch |

Fig. 3-75 Switch & Relay Locations (2)

WIRING HARNESS ROUTING

EXCEPT USA & CANADA

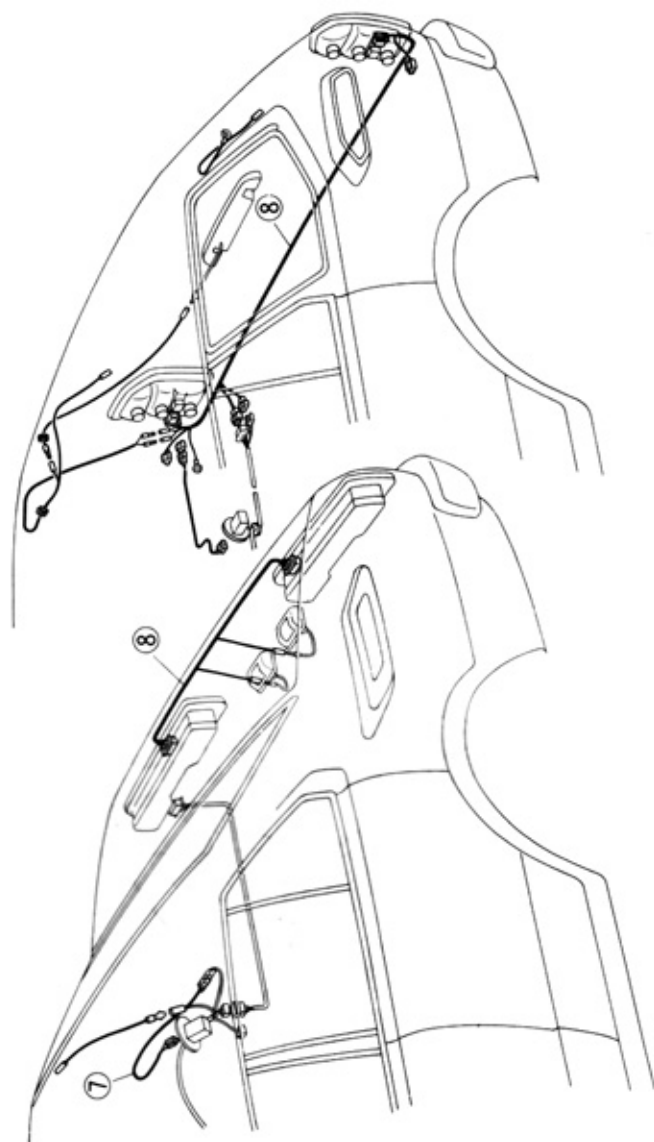


1. Cowl to headlight wiring harness
2. Instrument panel wiring harness
3. Chassis wiring harness

4. Roof wiring harness
5. Overhead console wiring harness
6. Alternator wiring harness

Fig. 3-76 Wiring Harness Routing (1)

EXCEPT USA & CANADA

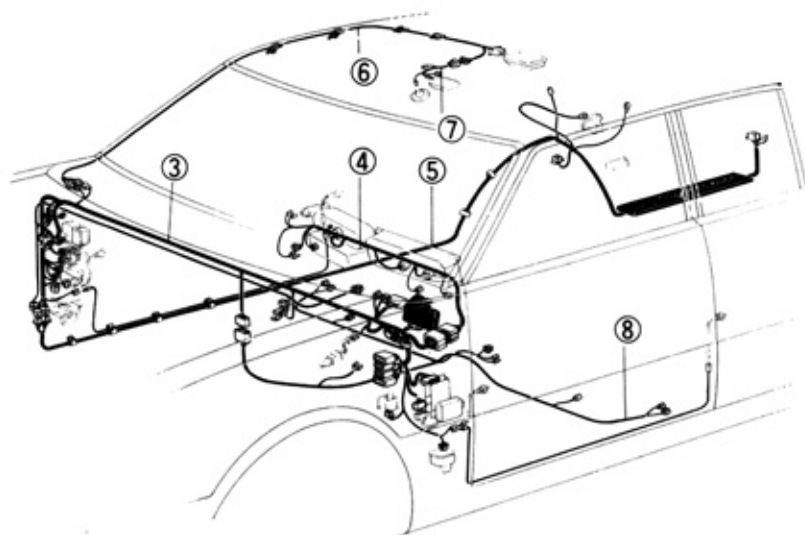
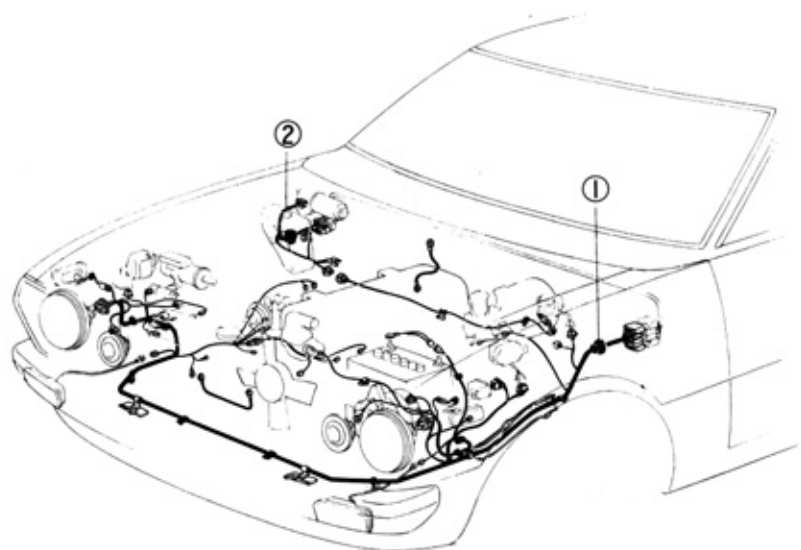


7 Fuel gauge wiring harness

8 To rear lamp wiring harness

Fig. 3-77 Wiring Harness Routing (2)

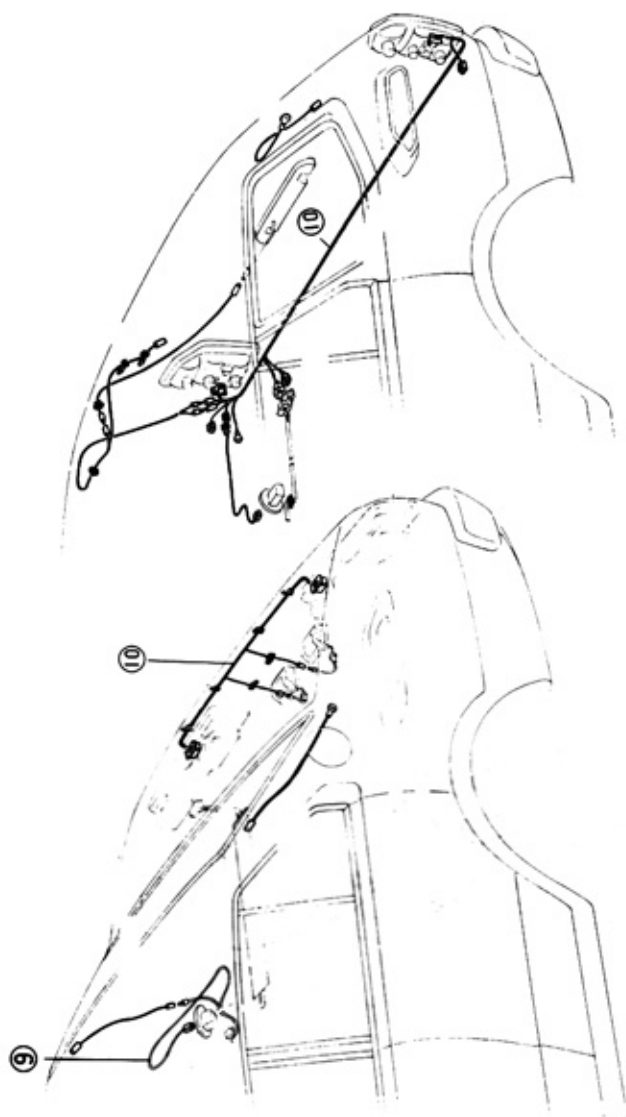
FOR USA & CANADA



- | | | | |
|---|----------------------------------|---|---------------------------------|
| 1 | Cowl to headlight wiring harness | 5 | Chassis wiring harness |
| 2 | Wiper motor wiring harness | 6 | Roof wiring harness |
| 3 | Front side wiring harness | 7 | Overhead console wiring harness |
| 4 | Instrument panel wiring harness | 8 | Seat switch wiring harness |

Fig. 3-78 Wiring Harness Routing (1)

FOR USA & CANADA



9 Fuel gauge wiring harness

10 To rear lamp wiring harness

Fig. 3-79 Wiring Harness Routing (2)