FUNCTION

The back up lights operate when shifted into reverse position with the key switch is in "ON" position.

TROUBLESHOOTING

1. One side of back up light does not light

Checkpoint		Trouble Cause	Countermeasure
Back up light bulb continuity	NG	Burned out bulb or poor connector contact	Replace the bulb or repair connector contact
OK ↓			
Continuity between connector 4 [J37] -5 [R1] or 5 [R2]	NG	Open circuit or poor connector contact	Repair open circuit or connector contact
OK ↓			
Voltage between connector 4 [R1] or 4 [R2] -ground at back up light sw. is ON position (Should be 12V present)	NG	Open circuit or poor connector contact	Repair open circuit or connector contact

2. Both side of back up light does not light

Fuse No. 5	NG	Poor fuse contact or blown	Reinstall or replace the fuse No. 5
OK ↓			
Back up light bulb continuity	NG	Burned out bulb or poor connector contact	Replace the bulb or repair connector contact
↓			
Voltage between connector 5 [R1] -ground, 5 [R2] -ground (Should be 12V present)	NG	Open circuit or poor connector contact	Repair open circuit or connector contact
OK ↓			
Back up light sw. continuity between connector 1 [J20] -1 [J21] when shift lever into the reverse position	NG	Poor sw. point contact or faulty switch	Adjust the sw. installation position or replace the sw.

ON-VEHICLE SERVISE

Side Maker Light Relay

Inspect (Figure 104)

Check continuity between terminals.

Condition \ Terminal No.	①	②	③	④
Resistance approx. 80Ω	○—○			
Continuity when applying battery voltage between ① and ②			○—○	

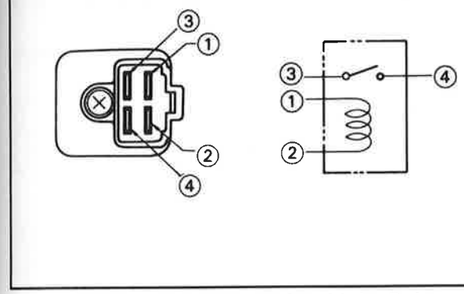


Figure 104. Side Maker Light Relay

ID Light Relay

Inspect (Figure 105)

Check continuity between terminals.

Condition \ Terminal No.	①	②	③	④	⑤
Continuity	○—○				
Resistance approx. 80Ω				○—○	
Continuity when applying battery voltage between ④ and ⑤	○—		—○		

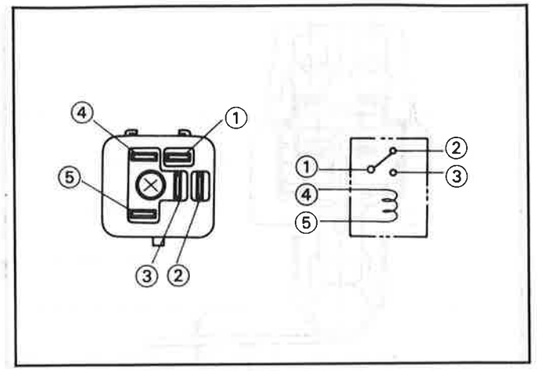


Figure 105. ID Light Relay

Back Up Light Switch

Remove or Disconnect (Figure 106)

1. Disconnect the connector.
2. Remove the back up light switch from the transmission.

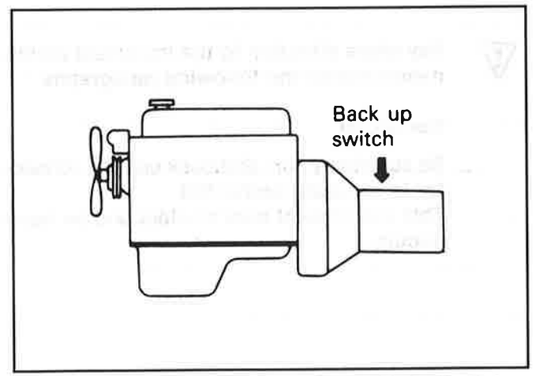


Figure 106. Location of Back Up Light Switch

Inspect (Figure 107)

1. If no continuity is checked when the ball of the back up light switch is pushed upto 0.93 mm (0.036 in), the back up light switch is judged to be normal.

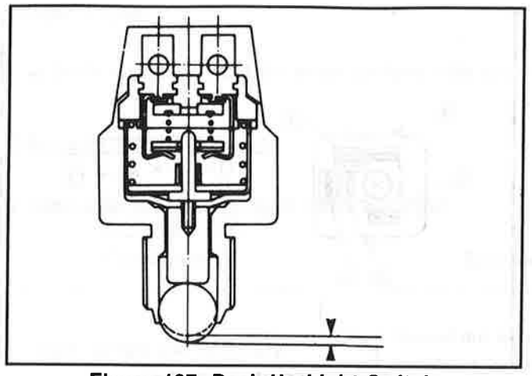


Figure 107. Back Up Light Switch

Install

1. Apply liquid gasket to threaded portion for prevent oil leakage, and install the back up light switch to the transmission.
2. Connect the connector.

Pay close attention to the important points mentioned in the following paragraphs.

Connector

Be absolutely sure that back up light connector is securely connected.
This will prevent poor contact and an open circuit.

MEMO

WARNING LIGHT. INDICATOR LIGHT. ILLUMINATING LIGHT

CIRCUIT DIAGRAM

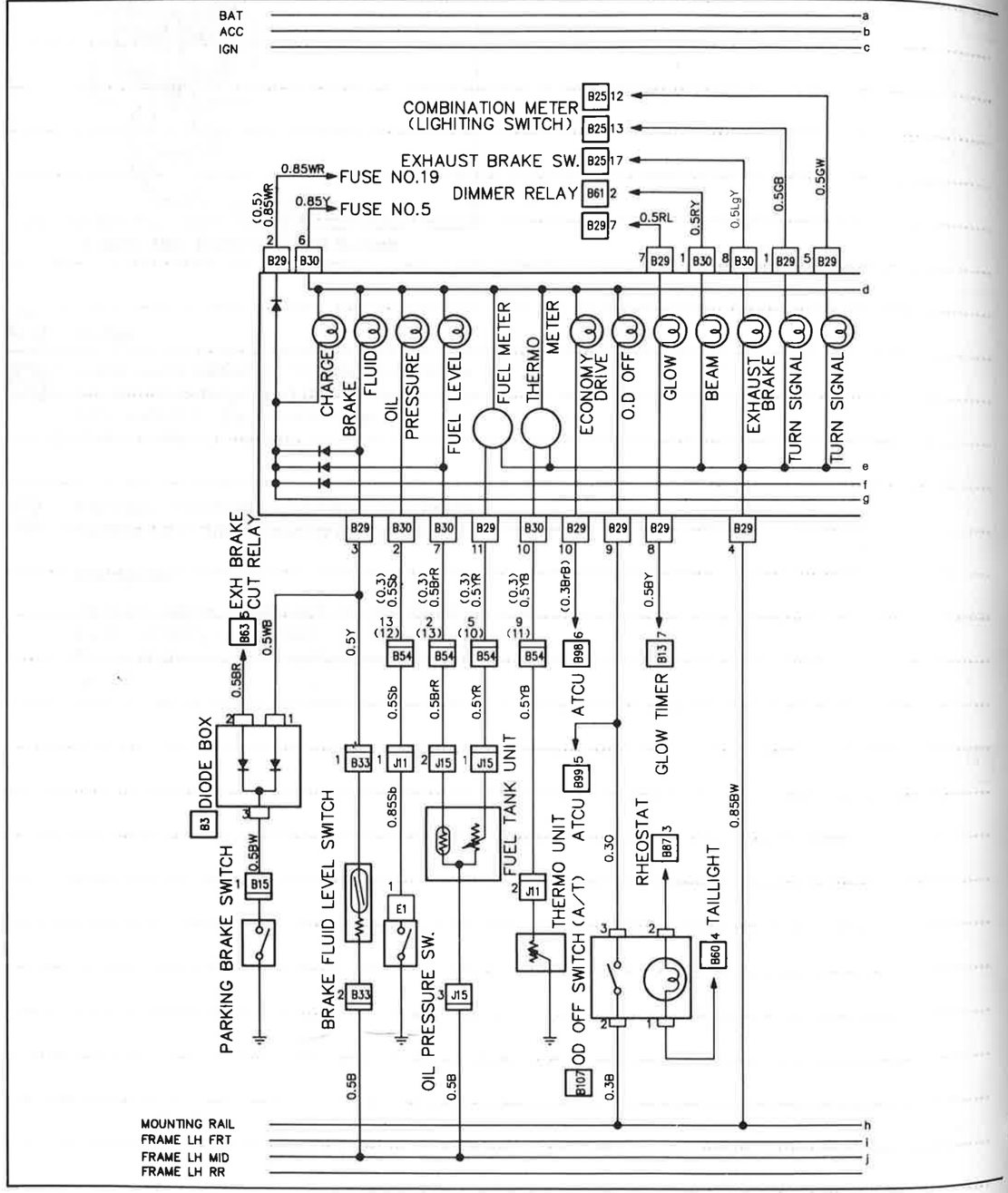


Figure 108. Circuit Diagram (1)

CIRCUIT DIAGRAM

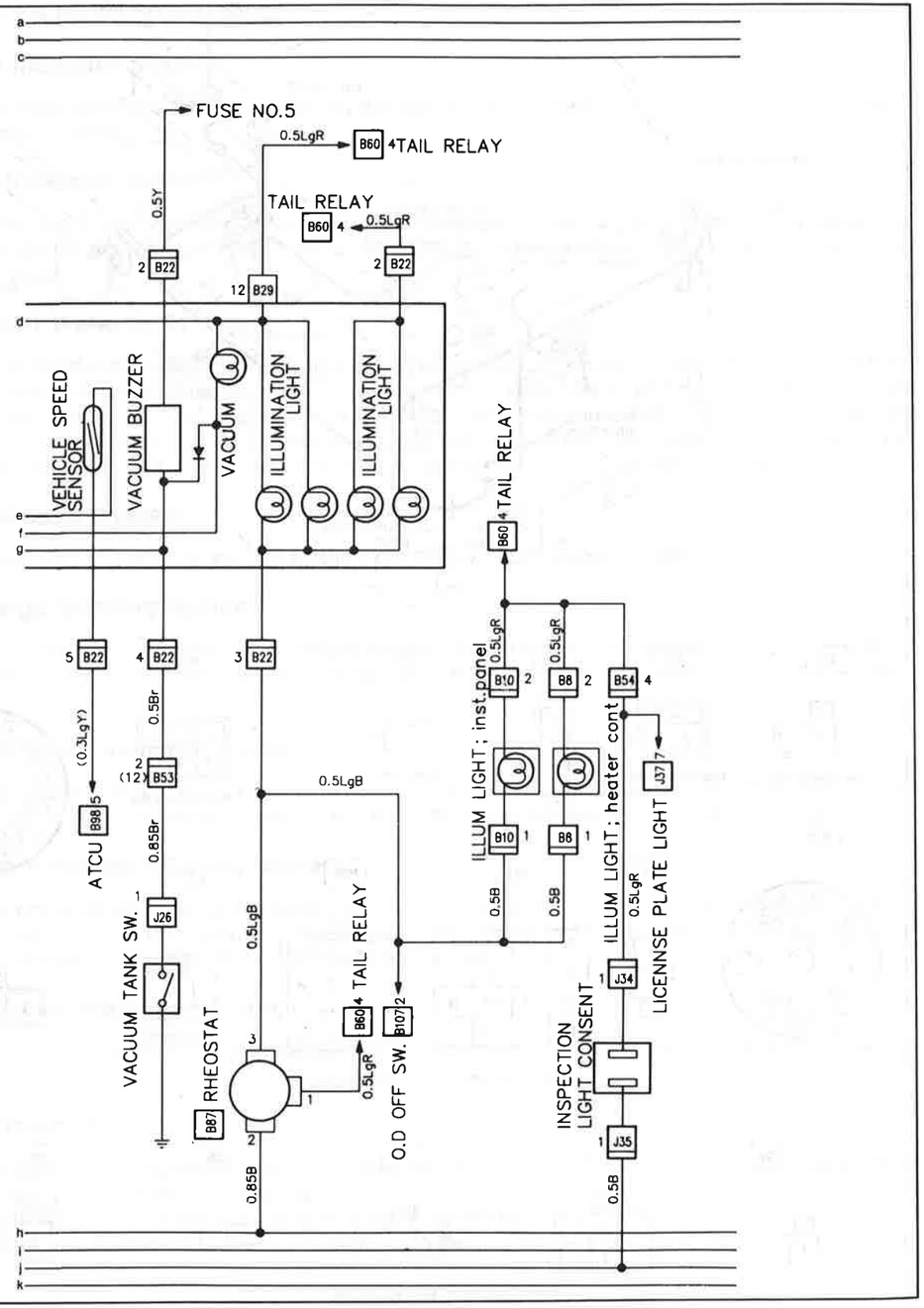


Figure 109. Circuit Diagram (2)

PARTS LOCATION

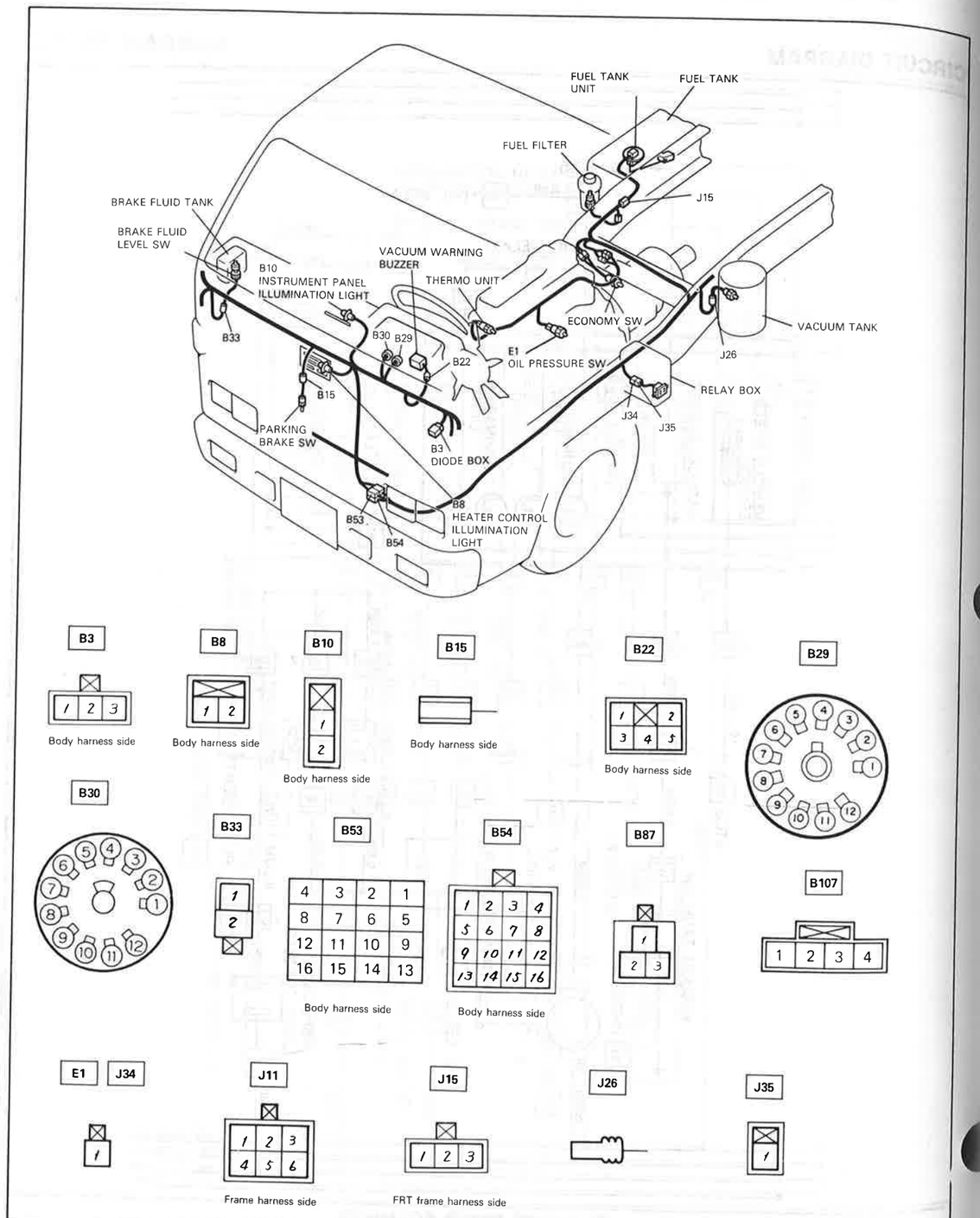


Figure 110. Parts Location

FUNCTION

The indicator and warning light systems used on this vehicle have conventional circuits. The circuits component sequence is power, indicator, sensor switch, and ground circuit. Any unusual circuits will be shown in the description of the individual systems.

Exhaust Brake Indicator System

When the exhaust brake switch is set to on position, the indicator light comes on indicating that the exhaust brake is in operative condition.

Parking Brake Indicator System

This circuit uses the same indicator light as the brake fluid level warning system switch described below that closes the ground circuit when the parking brake is pulled, thus turning on the parking brake indicator light in the instrument panel.

Brake Fluid Level Warning System

The warning light in this circuit is also the parking brake indicator light described above. The brake fluid level is monitored by a magnetic level detection switch. This switch consists of a sealed reed switch that closes when a magnet is brought near it. The magnet is ring shaped and is encased in a plastic doughnut. The doughnut floats on the surface of the brake fluid in the brake fluid reservoir. When the brake fluid level drops, the doughnut drops on the reed switch and closes it, thus causing the warning light to come on.

Turn Signal Indicator System

The turn signal indicator circuits are spliced to the right and left turn signal circuits.

Battery Discharge Warning System

When the generator voltage drops below the battery voltage, the charging relay will close a ground path to the discharge warning light, thus turning the warning light on. The relay coil is powered by the generator, not the battery.

Headlight High Beam Indicator System

The headlamp high beam indicator circuit starts on the right-hand high outer beam circuit. From there it goes to the indicator light on the instrument panel. From the indicator light the circuit goes to ground.

Engine Oil Low Pressure Warning System

The engine oil low pressure warning light is turned on by the low oil pressure switch on the engine oil gallery. Opening and closing of the contact points in the switch in controlled by the oil pressure. The switch close when oil pressure drops to between 29 and 49 kpa (4 and 7 psi).

Brake Low Vacuum Warning System

A switch, located in the vaccum tank, activates a warning light and a buzzer when vacuum falls below the specified amount.

Glow Plug Indicator System

The engine has a special starting system. Small heating elements, called "glow plugs," preheat the engine combustion chambers to improve cold starting.
This light is designed to come on when the engine control switch is turned to the "ON" position, and go off when the glow plugs are heated enough. You should start the engine when this light goes out.

Low Fuel Level Indicator System

This light is designed to come on to provide a "bulb check" when the starter key is turned on, but should go out after the engine is started. If the light fails to come on with the starter key turned on, it could indicate a burned out bulb, or a blown fuse. Have system repaired if the light does not come on when checking.
The fuel level warning light turns on when the amount of fuel remaining in the fuel tank is approximately 1.3 U.S. gallons (5 liters).

Overdrive OFF Indicator System

On models equipped with automatic transmission: The indicator light comes on when push the overdrive switch installed on the transmission selector to the "OFF" position, overdrive device will not operate even if you select the automatic transmission is in "D" position.

Coolant Temperature Gauge

The coolant temperature gauge circuit is designed to operate with 12 volts. The circuit starts at the engine control switch, goes through fuse No. 5. The circuit goes to the gauge and then to the engine coolant temperature sensor. The sensor is located at the thermostat housing.
The fuel gauge and the engine coolant temperature gauge are mounted on a single panel which is connected through the instrument cluster housing, to a printed circuit board. Electrical connections to the gauges are made through multi-pin harness connectors which plug into the circuit board.

Fuel Gauge

The fuel gauge circuit starts from the engine control switch. The circuit is turned on when the engine control switch is at the "ON" position. The circuit then passes through fuse No. 5. The fuel gauge circuit then goes to the gauge, and on to the fuel tank fuel level sensor and then to ground. The testing resistance is 110 ohms when the gauge reads empty, 32.5 ohms at one-half full, and 3 ohms when the gauge reads full. The fuel tank sensor is a float moving a variable resistance. When the float is at the empty position, the variable resistance will be 110 ohms. The reading is taken between the terminal and the mounting flange.
When the float is at the one-half full position, the resistance should be 32.5 ohms. When the float is at the full position, the resistance should be 3 ohms.
The fuel gauge and the coolant temperature gauge are mounted on a single panel which is connected, through the instrument cluster housing, to a printed circuit board. Electrical connections to the gauges are made through multi-pin harness connectors which plug into the circuit board.

Speedometer

The speedometer is a mechanically driven rotary magnet type. There are two illuminating lights that plug in from the back. The drive cable goes from the back of the speedometer to the rear of the transmission. The speedometer cable is retained by a clip lock at the speedometer and a screwed-on retainer at the transmission.

TROUBLESHOOTING

Speedometer

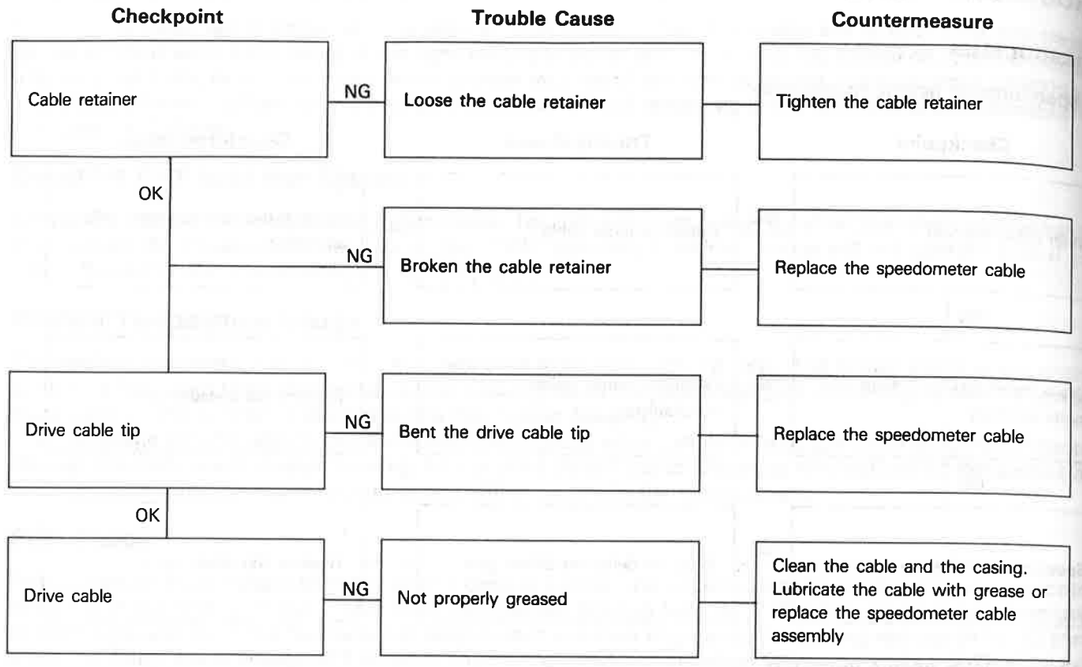
1. Speedometer needle inoperative

Checkpoint		Trouble Cause	Countermeasure
Inner cable rotation	NG	Defective inner cable	Replace the speedometer cable assembly
OK			
Use a meter tester to check the meter function	NG	Defective meter inside mechanism	Replace the speedometer
OK			
Speedometer driven gear	NG	Worn or defective driven gear	Replace the driven gear

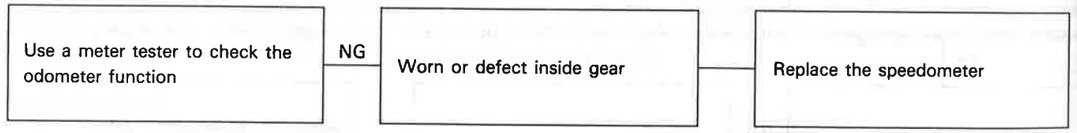
2. Speedometer needle quivering

Speedometer cable terminals	NG	Loosen terminal(s)	Tighten the terminal(s)
OK			
Speedometer cable routing	NG	Abnormal bending	Repair the speedometer cable routing
OK			
Use a meter tester to check the speedometer function	NG	Deform rotary parts	Replace the speedometer

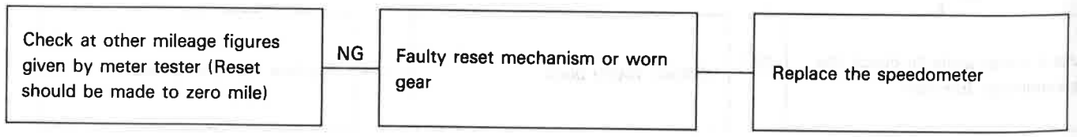
3. Speedometer Cable Abnormal Noise



4. Odometer does not operate

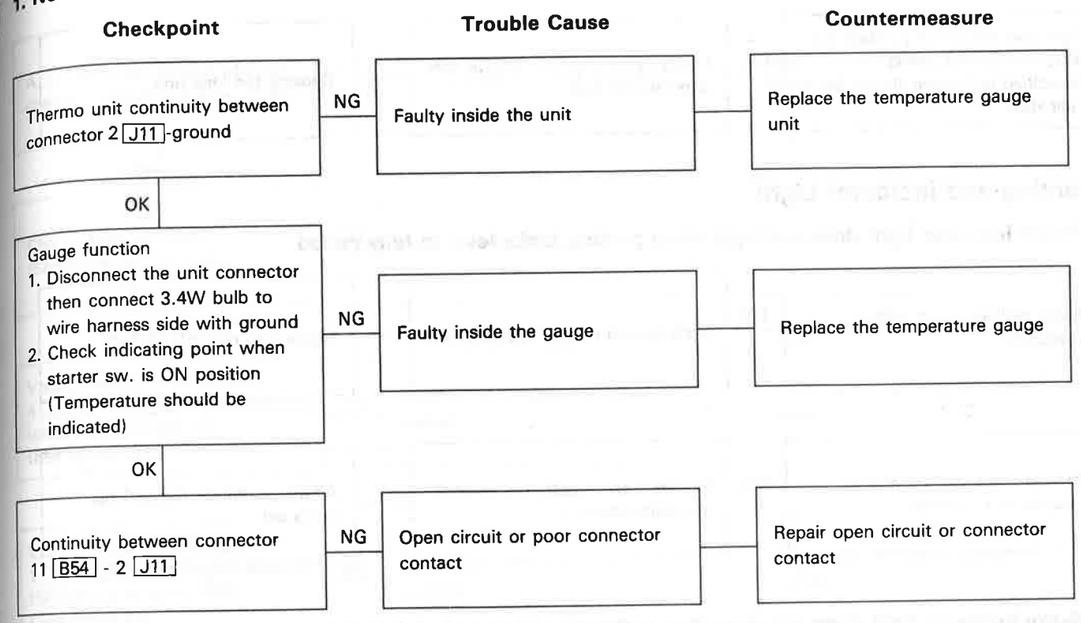


5. Trip odometer does not reset

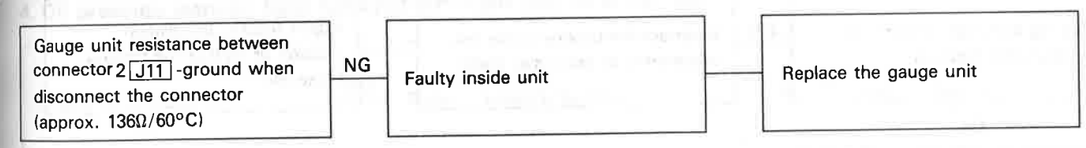


Temperature Gauge and Unit

1. No temperature indiccate at all

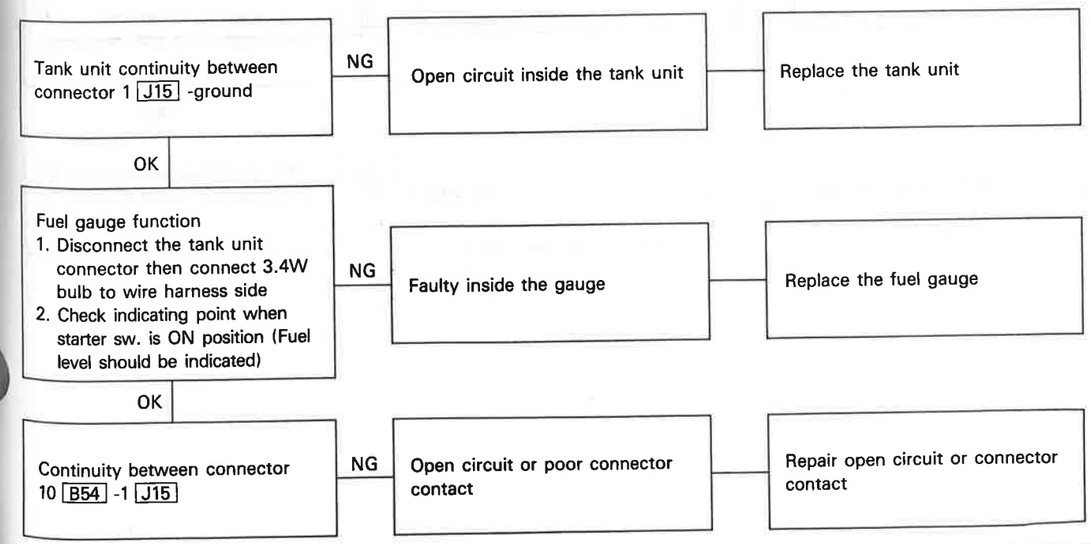


2. Temperature gauge incorrect readings in all ranges



Fuel Gauge and Tank Unit

1. No fuel level indicate at all



2. Fuel gauge gives incorrect readings in all ranges

Checkpoint		Trouble Cause	Countermeasure
Tank unit resistance position the float at checking points (Specified resistance should be indicated)	NG	Faulty inside the tank unit or fuel enter to the float	Replace the tank unit

Warning and Indicator Light

1. Brake indicator light does not light when parking brake lever is fully pulled

Brake indicator light bulb continuity	NG	Bulb burned out or loose contact	Replace or reinstall the bulb
OK			
Parking brake sw. installation position and function	NG	Incorrect sw. adjustment or poor sw. point contact	Adjust or replace the parking brake sw.

2. Brake indicator light does not dim when parking brake lever is fully released

Parking brake sw. installation position and function	NG	Incorrect the parking brake sw. adjustment or brake sw. faulty	Adjust the sw. installation position or replace the parking brake sw.
OK			
Disconnect the parking brake connector (Light should be dim)	NG	Brake fluid sw. faulty or short circuit between -ground	Replace the brake fluid sw. or repair short circuit

3. Battery discharge warning light comes on while engine is running

Checkpoint		Trouble Cause	Countermeasure
A. C. Generator voltage (Normal charging voltage is approx. 13.8V)	NG	A. C. Generator is not charged	Repair or replace the A. C. Generator
OK			
Charge relay continuity (Should be no continuity)	NG	Faulty the charge relay	Replace the relay
OK			
Voltage between connector 4 [B62] - 5 [B62] at engine running (should be indicate 13V) (See figure 55)	NG	Open circuit or poor connector contact	Repair open circuit or connector contact
OK			
Voltage between connector 1 [J9] - ground at engine running (Should be indicate 13V) (See figure 55)	NG	Open circuit or poor connector contact	Repair open circuit or connector contact

4. Oil pressure warning light does not dim while engine is running

Engine oil pressure	NG	Refer to ENGINE Section	Refer to ENGINE Section
OK			
Disconnect the oil pressure sw. connector (Should be light dim)	NG	Short circuit	Repair short circuit
OK			
Oil pressure sw. continuity (Use oil pressure tester, Should be no continuity)	NG	Faulty sw.	Replace the oil pressure sw.

5. Low fuel level indicator light comes on when fuel tank is full

Checkpoint		Trouble Cause	Countermeasure
Disconnect the fuel tank unit connector (Should be light dim)	NG	Short circuit	Repair short circuit
OK			
Fuel tank unit continuity (Should be no continuity at float is full tank position)	NG	Faulty reed sw.	Replace the fuel tank unit

6. Low fuel indicator light does not light when fuel tank is empty

Low fuel indicator light bulb continuity	NG	Bulb burned out or loose contact	Replace or reinstall the bulb
OK			
Fuel tank unit continuity (Should be no continuity at float empty position)	NG	Unsmooth float operation or tank unit faulty	Replace the fuel tank unit
OK			
Wire continuity between connector 13 [B54] -2 [J15]	NG	Open circuit and/or poor connector contact	Repair open circuit or connector contact

Illumination Controller

1. Illumination controller does not operate

Disconnect the illumination controller connector (Light should be dim)	NG	Short circuit	Repair short circuit or replace the wire
OK			
Turn the illumination controller knob (Brightness should change)	NG	Loose knob or faulty controller	Repair loose knob installation or replace the controller

ON-VEHICLE INSPECTION AND REPAIR

Speedometer

The speedometer is a rotary magnet type consisting of a magnet with shaft, rotor, hair spring, dial needle and odometer. It is designed to indicate a speed of 60km/h (60 mph) when the speedometer cable is rotating at 637 rpm (1,000 rpm). The odometer registers 1 km (1 mile) for every 637 (1,000) turns of the speedometer cable (figure 111).

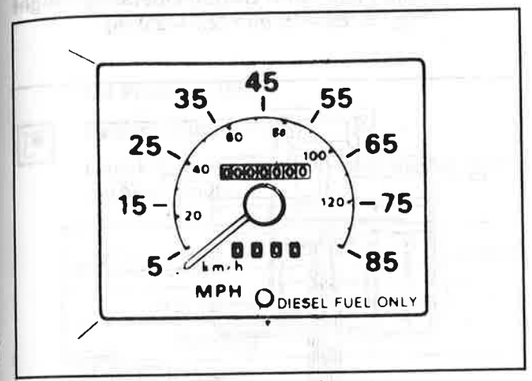


Figure 111. Speedometer

A speedometer suspected of being out of calibration should be checked with a speedometer tester following the tester manufacturers instructions (figure 112).

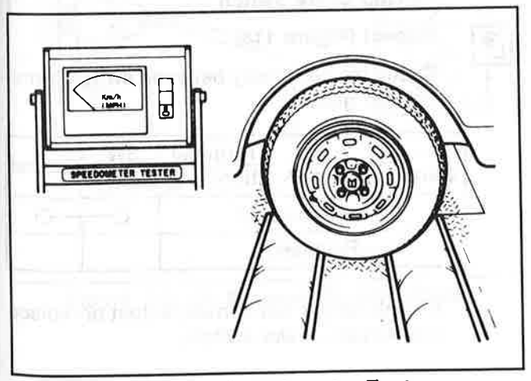


Figure 112. Speedometer Tester

Coolant Temperature Gauge

Inspect (Figure 113)

1. Diaconnect the temperature uint wire connector.
2. Connect a 3.4 watt test bulb to ground.
3. Turn the key switch on, check the bulb lights and that the gauge needle operates.
   If indication is not correct, remove and check the temperature gauge.

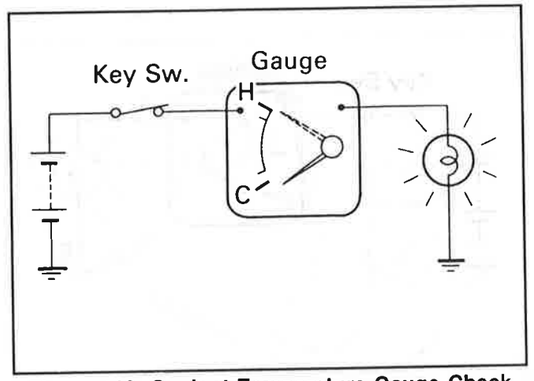


Figure 113. Coolant Temperature Gauge Check

Coolant Temperature Unit

Inspect (Figure 114)

Measure the resistance between the unit terminal and ground.

Temperature indication °C (°F)	50 (122)	115 (239)
Resistance (Ω)	189—260	24—29

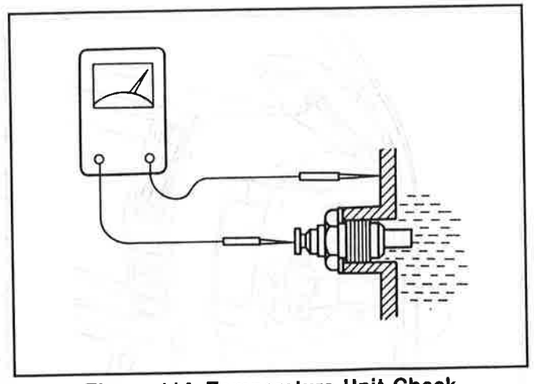


Figure 114. Temperature Unit Check

Fuel Gauge

Inspect (Figure 115)

1. Disconnect the fuel tank unit wire connector.
2. Connect a 3.4 watt test bulb between Y terminal and B terminal.
3. Turn the key switch on, check the bulb lights and that the gauge needle operates.
   If indicator is not correct, remove and check the fuel gauge.

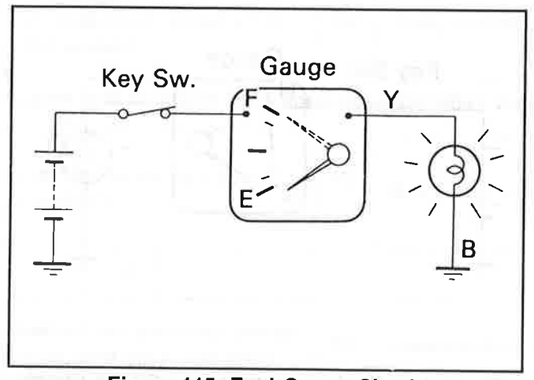


Figure 115. Fuel Gauge Check

Brake Fluid Level Switch

Check Indicator Light Operation (Figure 116)

1. Disconnect the brake fluid level switch connector.
2. Connect body side connector terminal.
3. Turn key switch on, check that the bulb lights.
   If operation is not correct, remove and check the bulb or circuit.

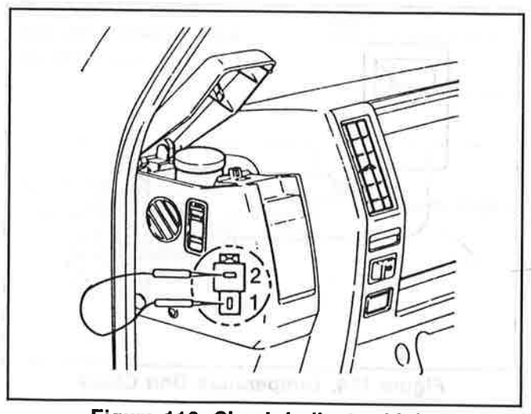


Figure 116. Check Indicator Light

Check brake fluid level switch (Figure 117)

Check the level switch continuity between termianl ① and ②.

Fluid level \ Terminal No.	①	②
More than Ⓐ		
Less than Ⓐ	○	○

If continuity is not correct, replace the brake fluid tank assembly.

Brake Fluid Level Switch Operating Height
Ⓐ = 69—75 mm (2.7—3.0 in)

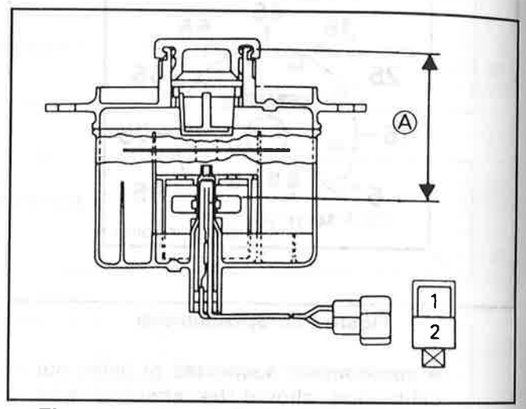


Figure 117. Check Brake Fluid Level Switch

Parking Brake Switch

Inspect (Figure 118)

Check the continuity between switch terminal and ground.

Parking Brake Position \ Terminal	SW. terminal	Ground
Applied	○	○
Released		

If continuity is not correct, adjust or replace the parking brake switch.

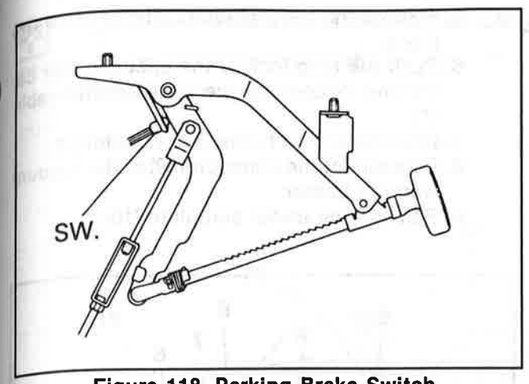


Figure 118. Parking Brake Switch

Oil Pressure Unit

Inspect (Figure 119)

Check the continuity between switch terminal and ground.

Engine condition \ Terminal	SW. Terminal	Ground
Not running	○	○
Running		

Switch Operating Pressure:
2.9—4.9 kPa (4.3—7.1 lb/in²)

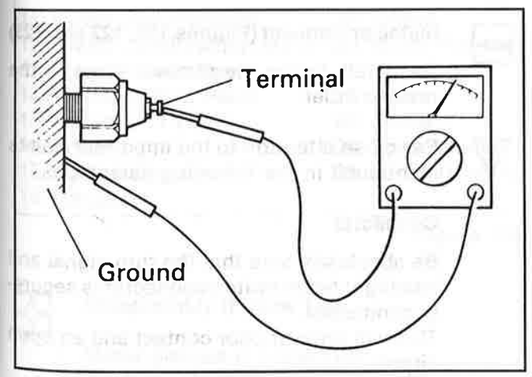


Figure 119. Oil Pressure Switch Check

Vacuum Switch

Inspect (Figure 120)

Check the continuity between switch terminal and ground.

Negative Pressure \ Terminal	SW. Terminal	Ground
Less than 320mmHg	○	○
More than 380mmHg		

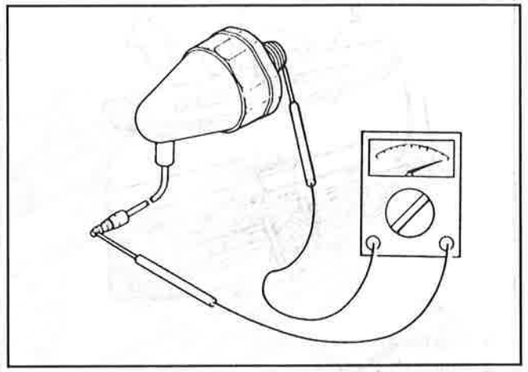


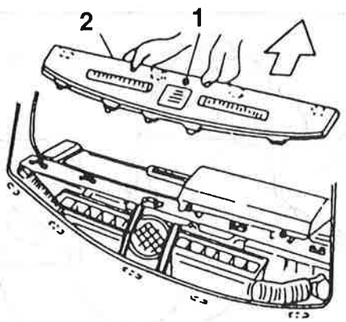
Figure 120. Vaccum Switch Check

UNIT INSPECTION AND REPAIR

Meter Complete

Remove or Disconnect (Figures 121, 122 and 123)

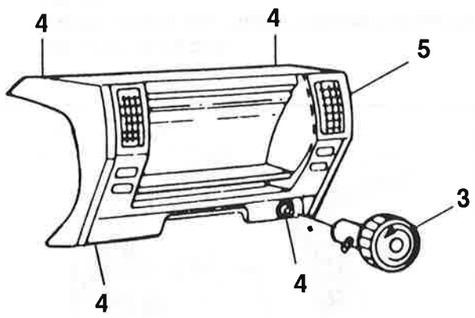
1. Turn the fastener of garnish panel 90 degrees and remove the fastener (1).
2. Lift the garnish panel (2) in the direction of the arrow in the illustration.



1. Fastener
2. Garnish Panel

Figure 121. Removing Ganish Panel

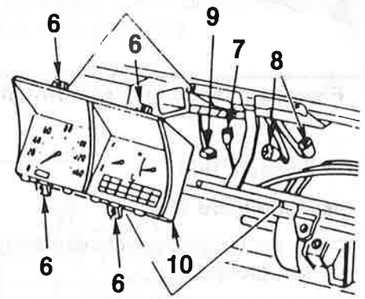
3. Loosen the idling control knob fixing screw and remove the knob (3).
4. Remove the meter cluster fixing screws (4) (4pcs) and the meter cluster (5).



3. Idling Control Konb
4. Fixing Screw
5. Meter Cluster

Figure 122. Meter Cluster Removal

5. Remove the meter complete fixing screws (6) (4pcs).
6. Push the tang lock of the speedometer cable and disconnect the speedometer cable (7).
7. Disconnect the harness connector (8).
8. Disconnect the connector (9) of the vacuum warning buzzer.
9. Remove the meter complete (10).



6. Fixing Screw
7. Speedometer Cable
8. Meter Harness Connector
9. Meter Harness Connector
10. Meter Complete

Figure 123. Meter Complete Removal

Install or Connect (Figures 121, 122 and 123)

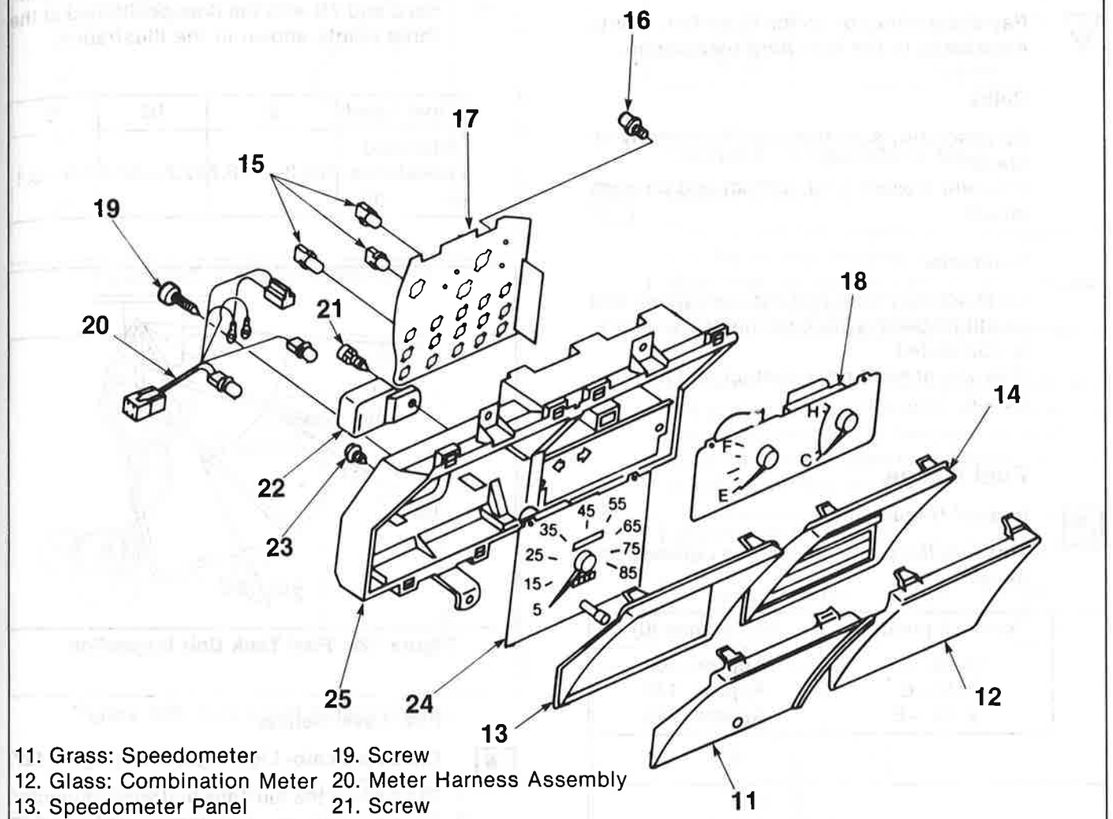
To install, follow the removal steps in the reverse order.

Pay close attention to the important points mentioned in the following paragraphs.

Connector

Be absolutely sure that the turn signal and headlight beam switch connector is securely connected.
This will prevent poor contact and an open circuit.

DISASSEMBLY AND REASSEMBLY



11. Grass: Speedometer
12. Glass: Combination Meter
13. Speedometer Panel
14. Warning Plate Panel
15. Socket and Bulbs
16. Screw
17. Printed Circuit
18. Gauges
19. Screw
20. Meter Harness Assembly
21. Screw
22. Buzzer
23. Screw
24. Speedometer
25. Meter Housing

Figure 124. Meter Complete

Disassembly (Figure 124)

1. Meter glasses (11) and (12).
2. Speedometer panel (13).
3. Warning plate panel (14).
4. Sockets and bulbs (15).
5. Screws (16) and printed circuit (17).
6. Fuel and thermo gauge (18).
7. Meter harness assembly (20).
8. Screw (21) and buzzer (22).
9. Screw (23) and speedometer (24).