SUBARU

SVX

1992

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M MECHANISM AND FUNCTION

1. Fuel Lines

The fuel lines consist of a delivery line, return line, and an evaporation line. The delivery line supplies fuel from the fuel tank to the intake manifold and consists of a pump filter, fuel pump and fuel filter. And the jet pump is used to prevent fuel from remaining in one of the two tank chambers.

The return line returns excess fuel to the fuel tank via the pressure regulator to maintain a constant level of fuel pressure.

The evaporation line consists of a fuel cut valve, roll over valve which is equipped with a two-way valve, canister and purge control solenoid valve.

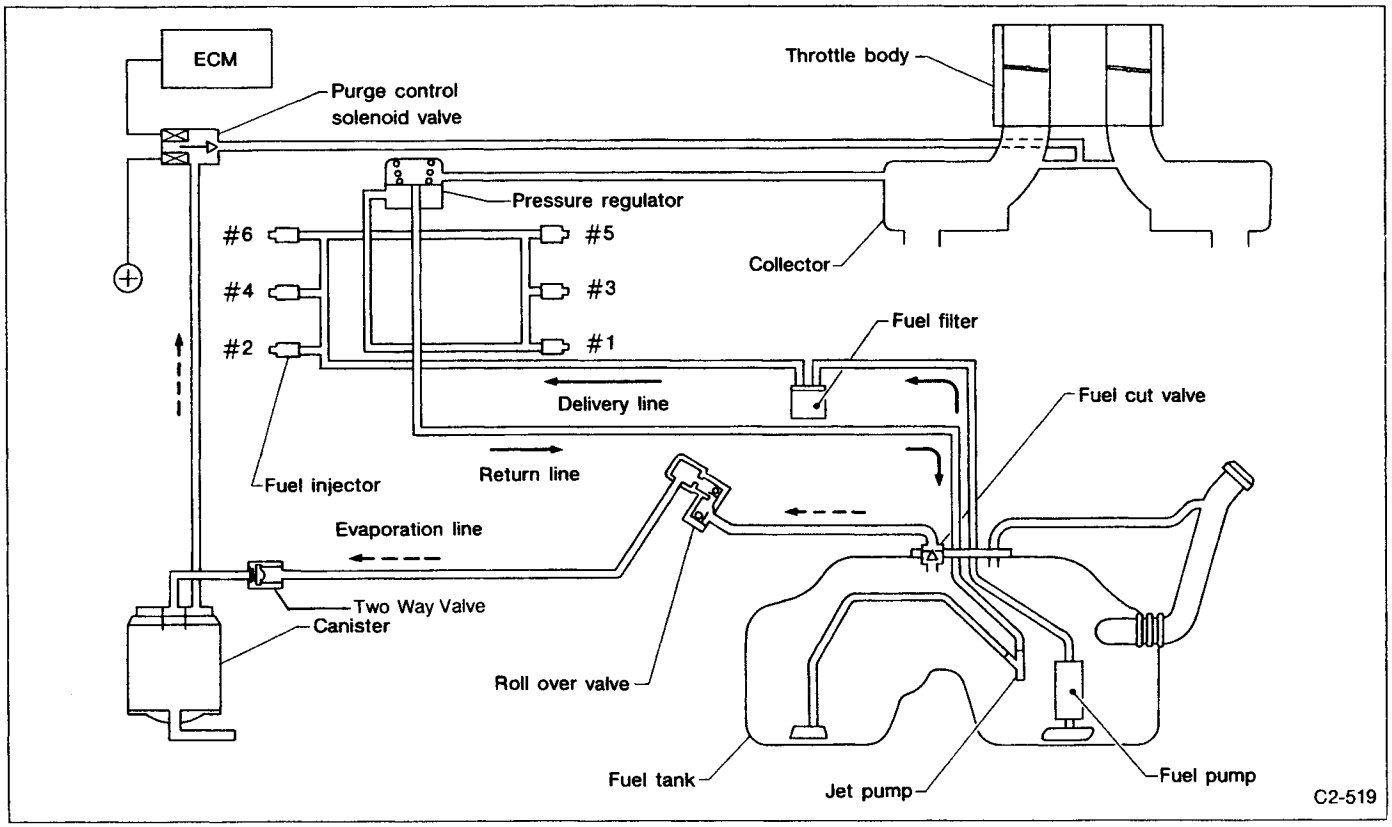


Fig. 1

2. Fuel Tank

The fuel tank is made of plastic, so that it is lighter than one made of metal, and in addition will never become rusty.
The fuel tank has two chambers, and is provided with a suction jet pump which transfers fuel from one chamber to another.

The fuel tank is located under the rear seat and secured with holddown bands.

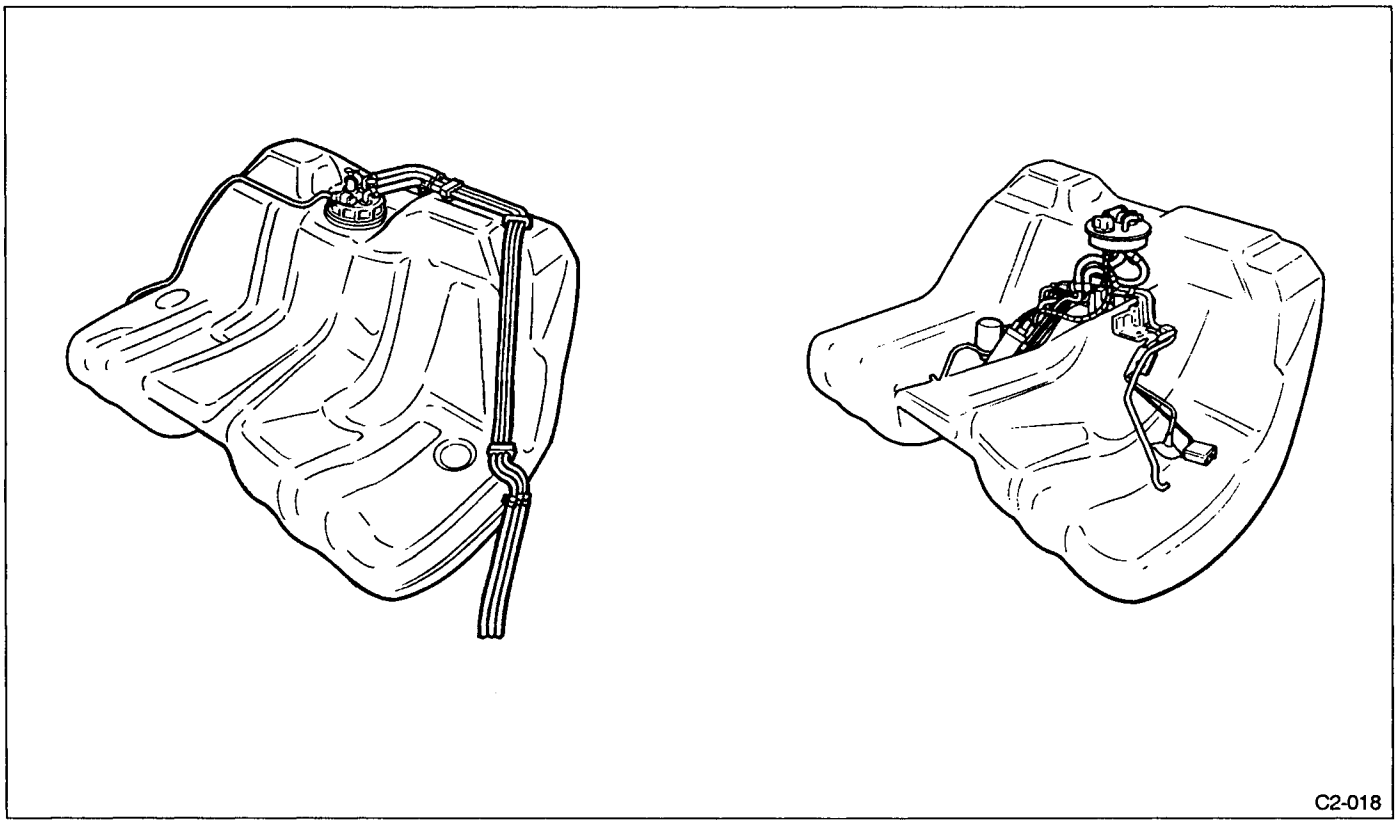


Fig. 2

3. Fuel Pump

A: CONSTRUCTION

The fuel pump is an impeller type. It is built into the fuel tank together with the fuel meter unit to provide quiet operation. The fuel pump consists of a motor, impeller, pump casing, pump cover, relief valve, check valve and pump filter.

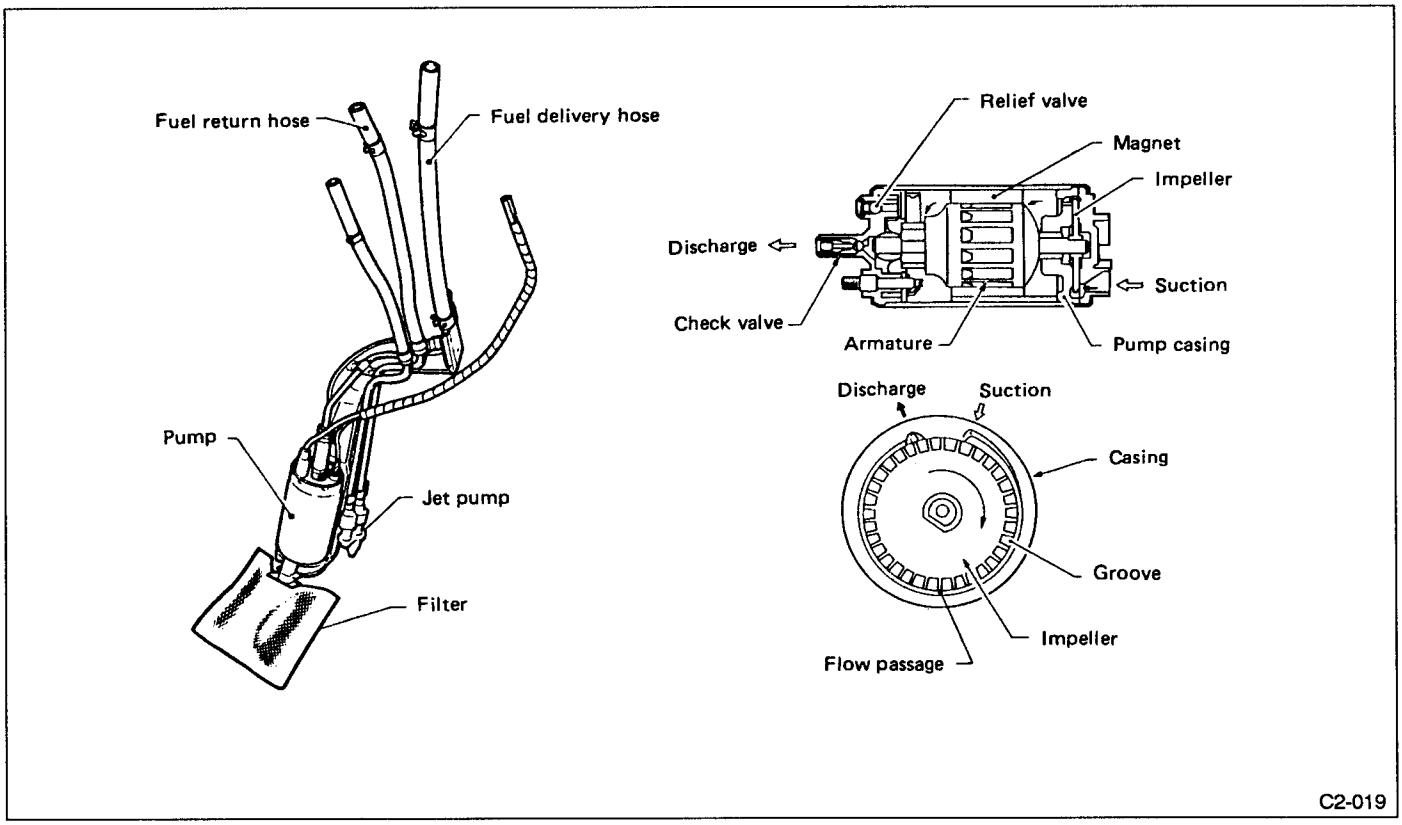


Fig. 3

B: OPERATION

1) When the engine starts, fuel pump relay activates. This operates the motor to rotate the impeller.
2) Fuel entering a vane groove of the impeller flows along the fuel passage and into the next vane groove by centrifugal force. During the time fuel flows from one groove to the next, a pressure differential is produced by friction of the flow.
3) Thus, fuel pressure increases while the action is described in step 2) above is repeated, and fuel is discharged from the pump casing. Fuel under pressure then passes through the clearance between the armature and the magnet and is discharged from the fuel pump.
4) As fuel discharge pressure reaches the specified value, the relief valve opens. This discharges fuel under pressure into the fuel tank. Fuel from the fuel tank then returns to the suction port and passes through the fuel pump. This action of fuel flow is repeated. In this manner, the relief valve prevents an abnormal increase in fuel pressure.
5) When the engine and fuel pump stop, spring force acts on the check valve to close the discharge port so that fuel pressure remains in the fuel delivery line.

4. Jet Pump

The jet pump utilizes the velocity of fuel returning from the engine to produce negative pressure inside the jet pump. This negative pressure allows fuel to be sucked up.

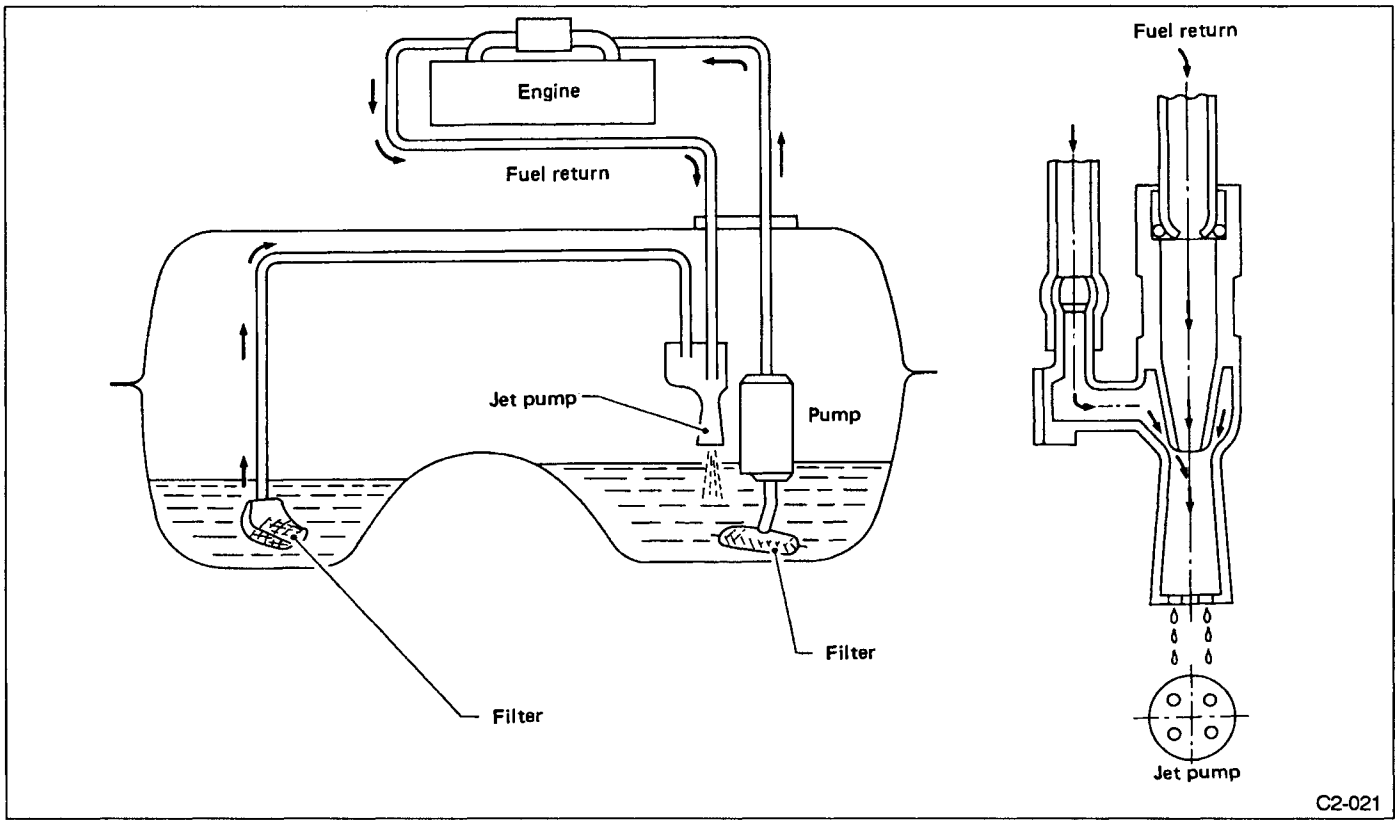


Fig. 4

5. Fuel Filter

The fuel filter utilizes a pressure-withstanding, cartridge design. It has a filter element built into the metal case. With this design, fuel flows from the perimeter of the element to the interior of the filter.

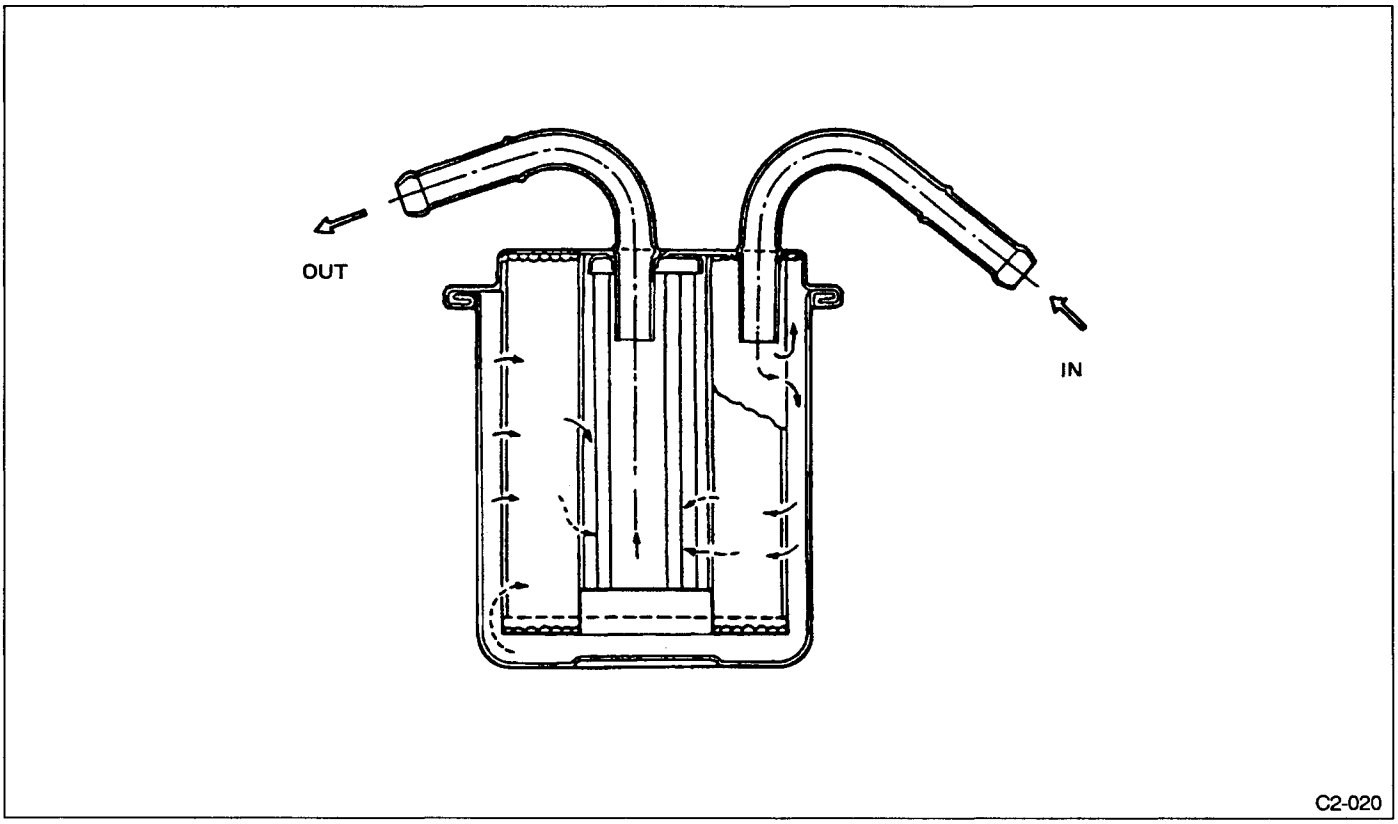


Fig. 5

6. Roll Over Valve

The roll over valve is for prevention of fuel leakage in the event of the vehicle rolling over.

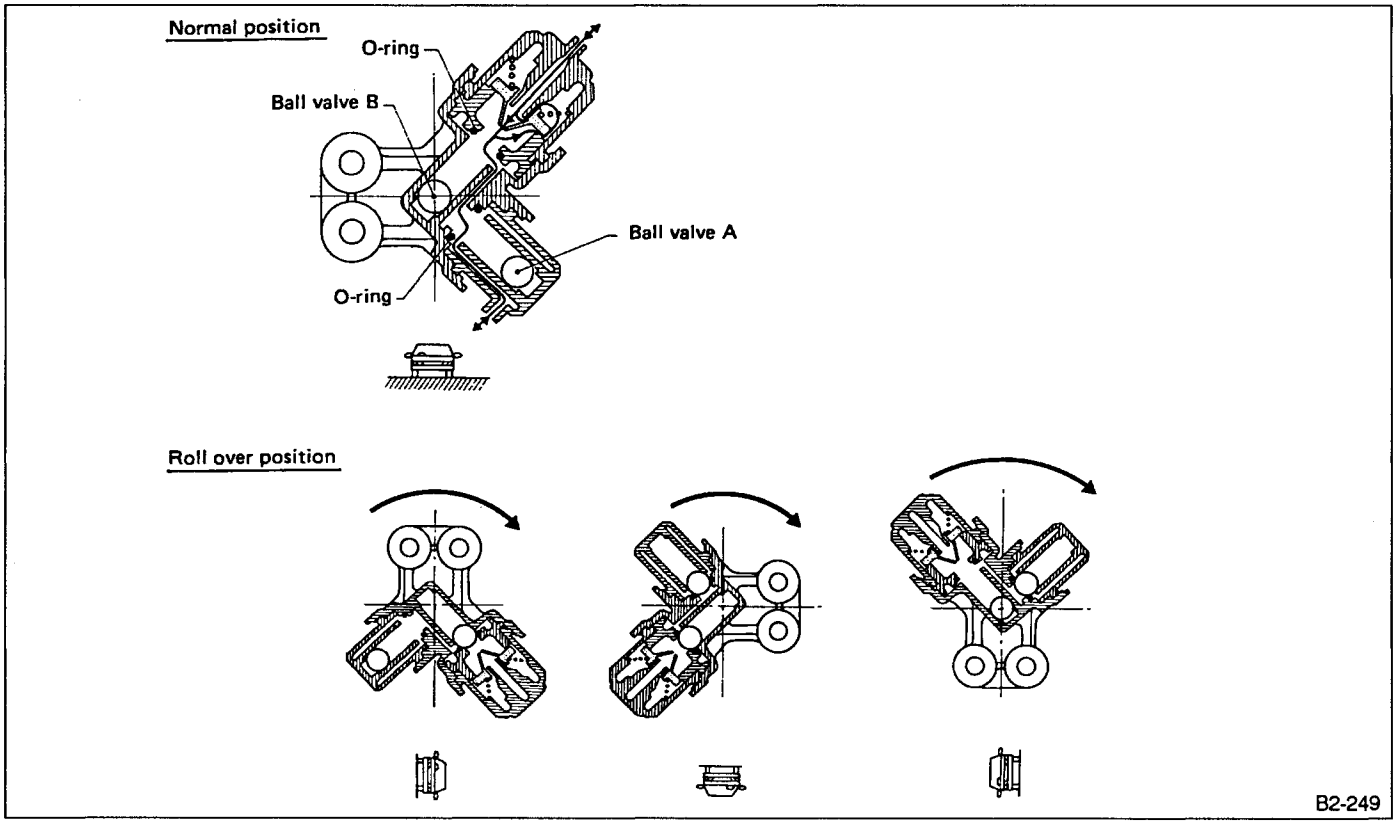


Fig. 6

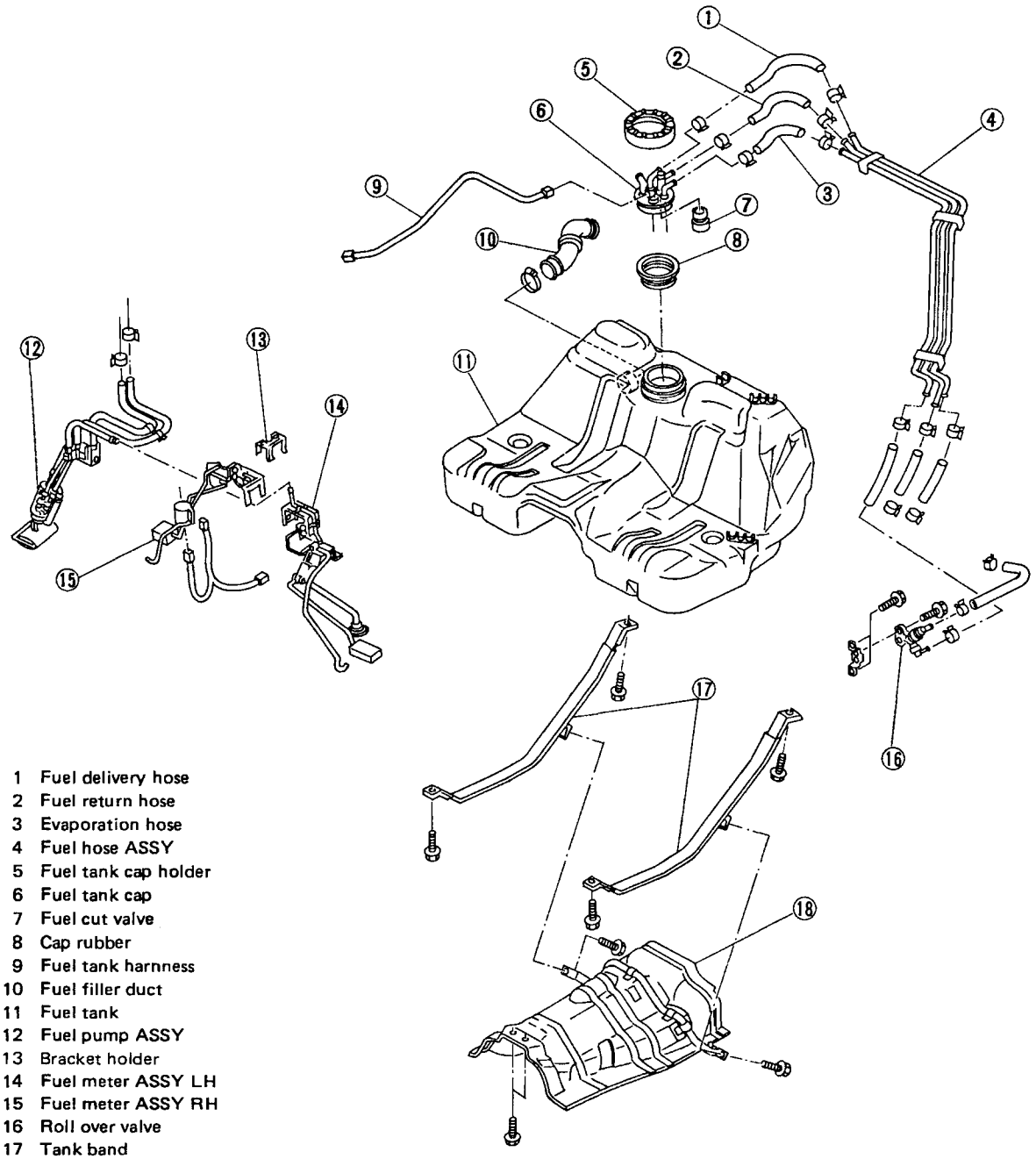
S SPECIFICATIONS AND SERVICE DATA

A: SPECIFICATIONS

Fuel tank	Capacity	70 ℓ (18.5 US gal, 15.4 Imp gal)
	Location	Under rear seat
Fuel pump	Type	Impeller
	Discharge pressure	250.1 kPa (2.55 kg/cm^2, 36.3 psi)
	Discharge flow	More than 140 ℓ (37.0 US gal, 30.8 Imp gal)/H min. [12V at 250.1 kPa (2.55 kg/cm^2, 36.3 psi)]
Fuel filter		Cartridge type

C COMPONENT PARTS

1. Fuel Tank



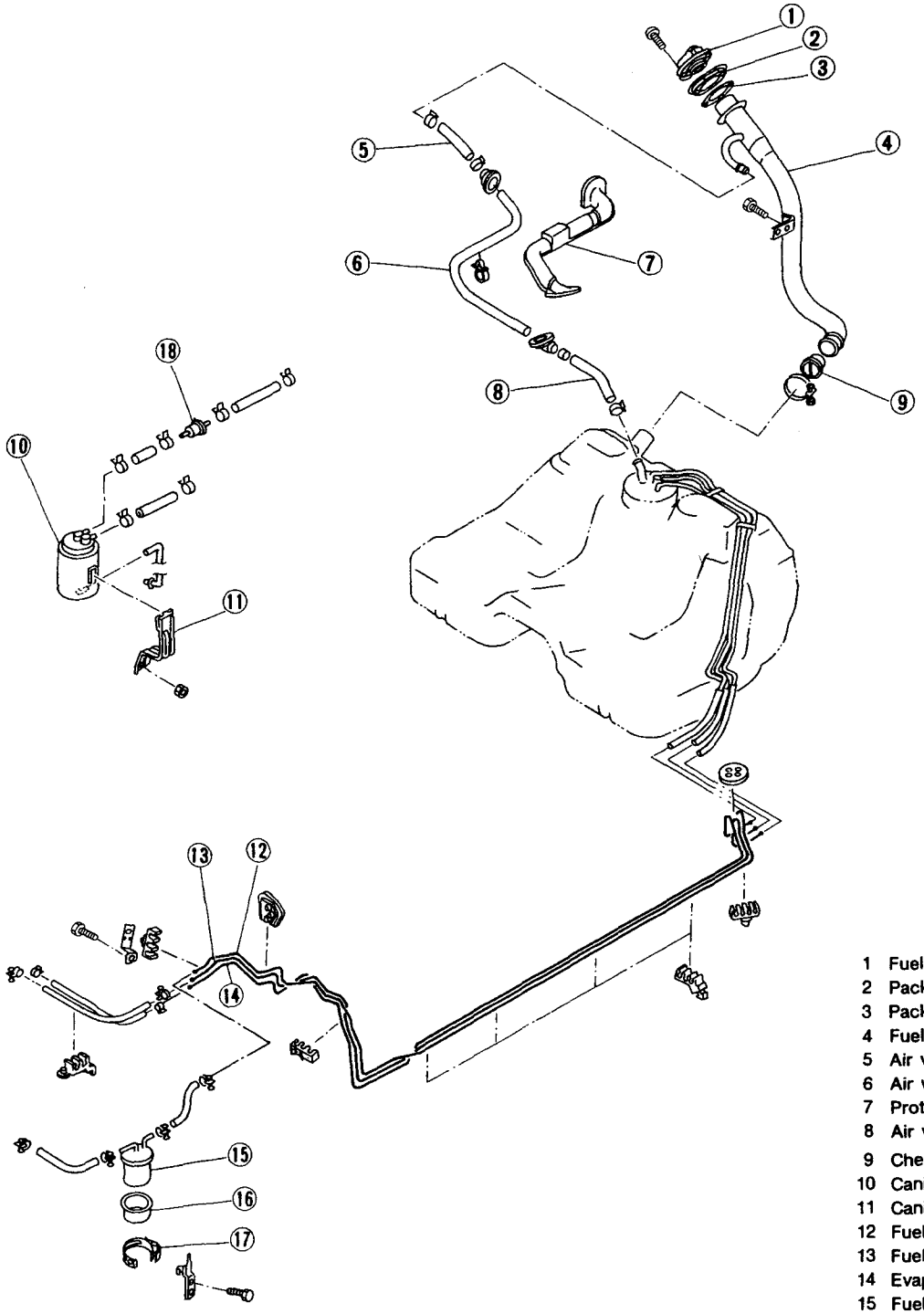
1 Fuel delivery hose
2 Fuel return hose
3 Evaporation hose
4 Fuel hose ASSY
5 Fuel tank cap holder
6 Fuel tank cap
7 Fuel cut valve
8 Cap rubber
9 Fuel tank harnness
10 Fuel filler duct
11 Fuel tank
12 Fuel pump ASSY
13 Bracket holder
14 Fuel meter ASSY LH
15 Fuel meter ASSY RH
16 Roll over valve
17 Tank band
18 Heat seled cover

C2-022

Fig. 7

C COMPONENT PARTS

2. Fuel Lines



1 Fuel filler cap
2 Packing
3 Packing
4 Fuel filler pipe
5 Air vent hose A
6 Air vent pipe
7 Protector
8 Air vent hose B
9 Check valve
10 Canister
11 Canister bracket
12 Fuel delivery pipe
13 Fuel return pipe
14 Evaporation pipe
15 Fuel filter
16 Filter cap
17 Filter holder
18 Two-way valve

C2-521

Fig. 3

W SERVICE PROCEDURE

1. Precautions

a. Before starting the job, be sure to carry out the following.
1) Place "No fire" signs near the working area.
2) Disconnect ground cable from battery.
b. Be careful not to spill fuel on the floor.

A: RELEASING OF FUEL PRESSURE

1) Fold down the rear seat back, and turn up the floor mat.
2) Remove access hole lid.
3) Disconnect fuel pump connector.

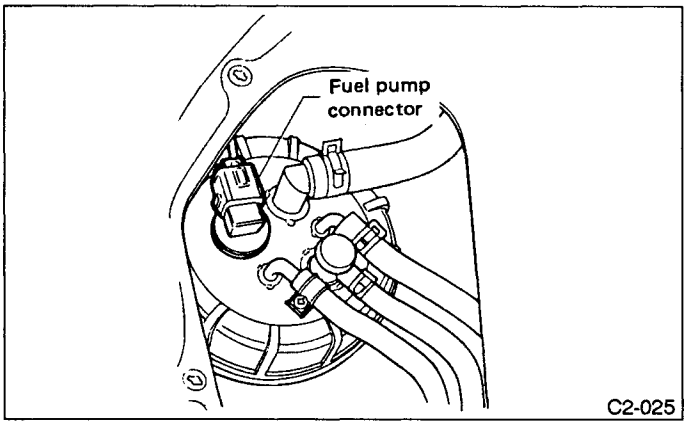


Fig. 9

4) Start the engine, and run it until it stalls.
5) After the engine has stalled, crank it for five more seconds.
6) Turn ignition switch "OFF".

2. On Car Service

A: MEASUREMENT OF FUEL PRESSURE

1) Release fuel pressure.
Refer to Section 1. [W1A0].
2) Connect fuel pump connector.
3) Install fuel pressure gauge.
(1) Disconnect fuel hose from fuel filter.
(2) Connect fuel pressure gauge between fuel filter and fuel hose.

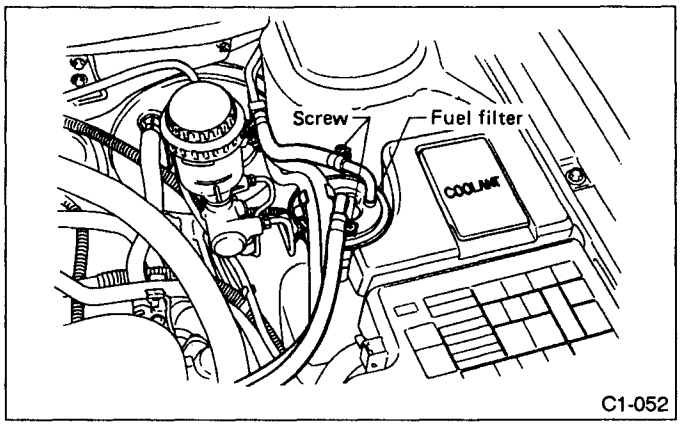


Fig. 10

4) Start the engine.
5) Measure fuel pressure while disconnecting pressure regulator vacuum hose from right side collector chamber.

Fuel pressure:
235 — 265 kPa (2.4 — 2.7 kg/cm², 34 — 38 psi)

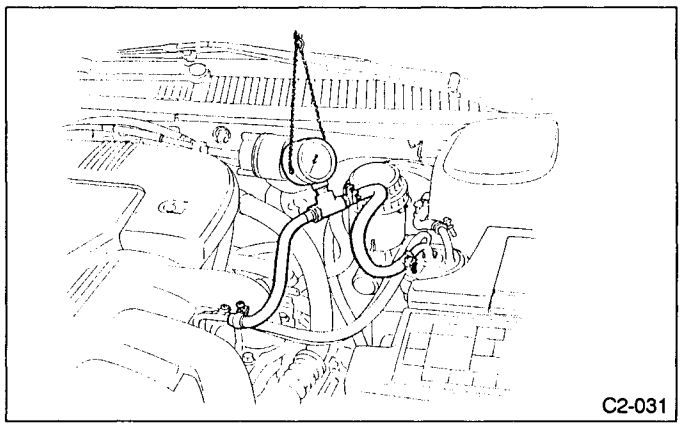


Fig. 11

6) After connecting pressure regulator vacuum hose, measure fuel pressure.

Fuel pressure:
177 — 206 kPa (1.8 — 2.1 kg/cm², 26 — 30 psi)

a. If out of specification as measured at step 6), replace pressure regulator.
b. Before removing fuel pressure gauge, release fuel pressure.

3. Fuel Tank

A: REMOVAL

1) Release the fuel pressure.
Refer to section 1. Precautions [W1A0].
2) Disconnect fuel hose and air vent hose, and remove fuel tank cap with special tool.

Special tool:
REPLACER (42911PA000)

3) Drain fuel from tank.
4) Install fuel tank cap.
5) Disconnect fuel tank connector.

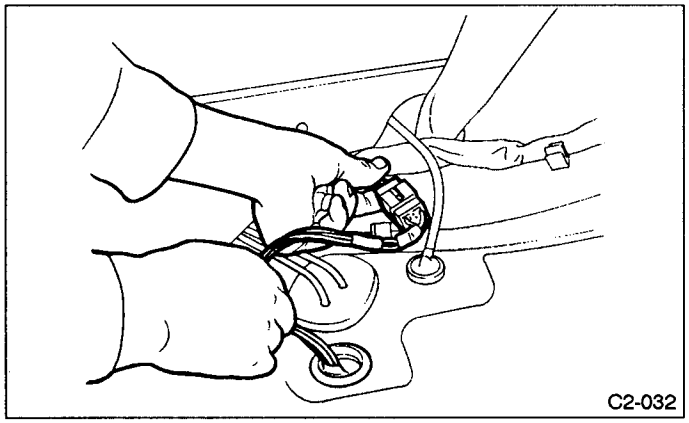


Fig. 12

6) Lift up the vehicle.
7) Remove rear exhaust pipe and muffler ASSY.
Refer to C.2-9.
8) Separate rear axle shaft from rear differential ASSY.
Refer to C.4-2.

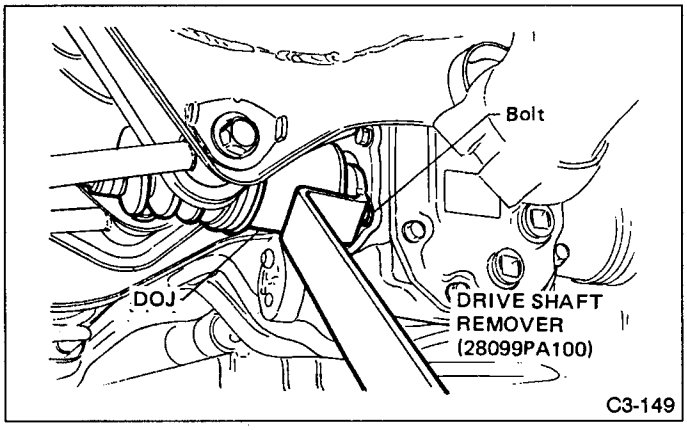


Fig. 13

9) Remove propeller shaft and rear differential ASSY.
Refer to C.3-4.
10) Remove rear sub-frame.
Refer to C.4-1.

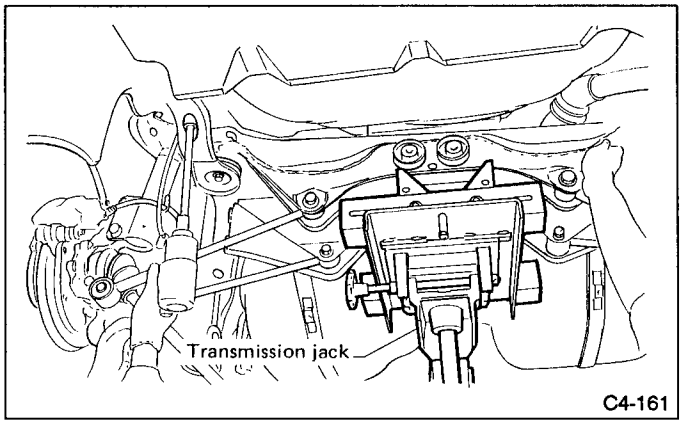


Fig. 14

11) Separate fuel filler duct from pipe.

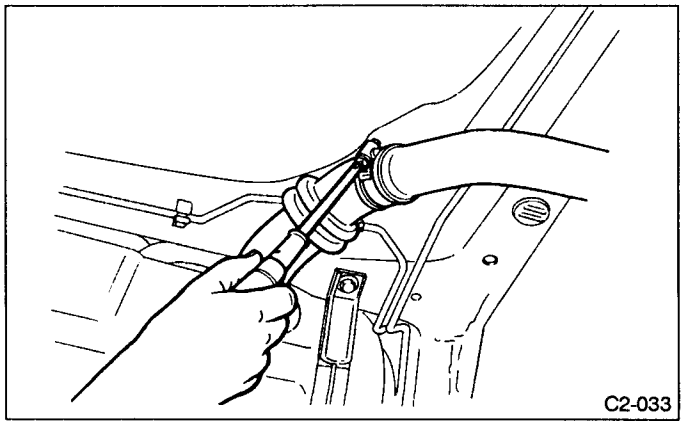


Fig. 15

12) Disconnect fuel delivery hose, return hose and evaporative hose from each pipe.

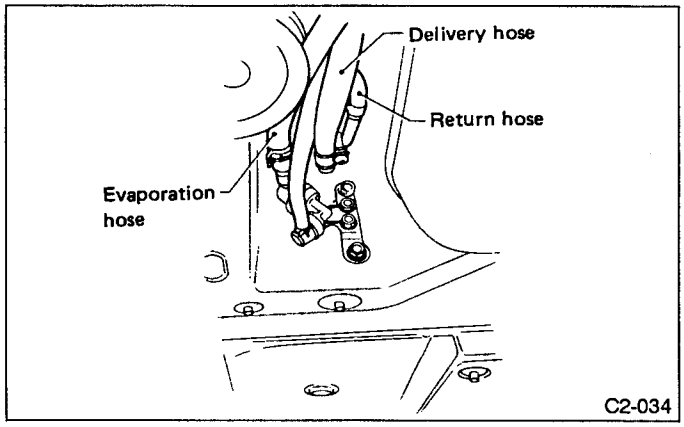


Fig. 16

13) While holding fuel tank, remove bolts from bands and dismount fuel tank.

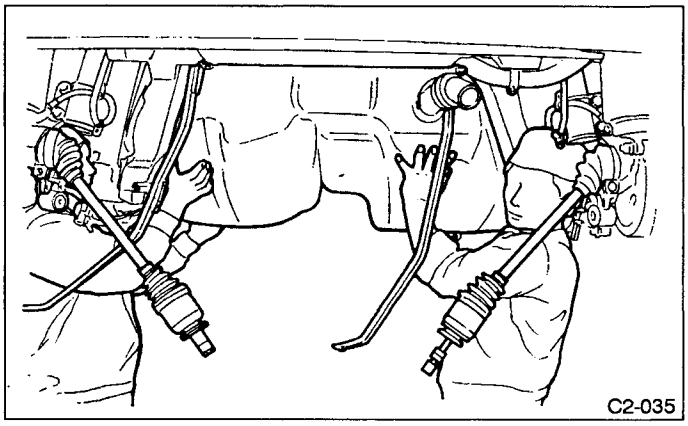


Fig. 17

Two man are required to perform step 13) above.

B: INSTALLATION

Installation is in the reverse order of removal procedures.
Observe the following:
1) When installing fuel tank, have a helper hold fuel tank while installing bands.
Be careful not to damage fuel tank.
2) Before tightening band mounting bolts, connect fuel system hoses.
3) Install hose and tube holddown clips at positions indicated in the figure.

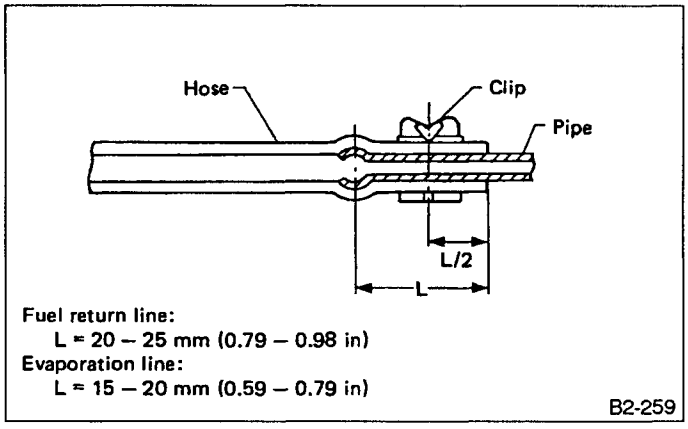


Fig. 18

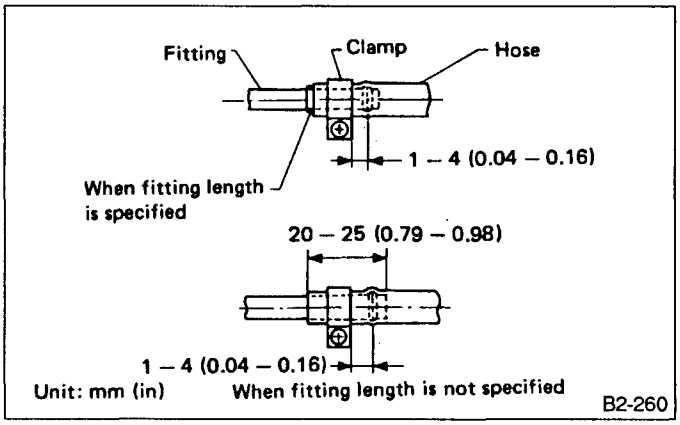


Fig. 19

Tightening torque:
1.0 — 1.5 N•m (0.1 — 0.15 kg-m, 0.7 — 1.1 ft-lb)

4) Tighten band mounting bolts.

Tightening torque:
23 — 42 N•m (2.3 — 4.3 kg-m, 17 — 31 ft-lb)

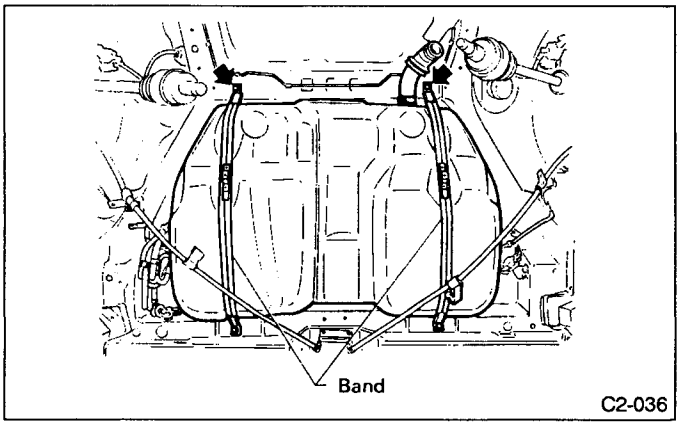


Fig. 20

5) Install rear sub-frame.
Refer to C.4-3.
6) Install rear differential ASSY and propeller shaft.
Refer to C.3-4.
7) Connect rear axle shaft for rear differential ASSY.
Refer to C.4-2.
8) Install muffler and rear exhaust pipe.
Refer to C.2-9.
9) Lower the vehicle.
10) Connect fuel tank connector.

4. Fuel Filler Pipe

A: REMOVAL

1) Completely drain fuel from fuel tank.
2) Install fuel tank cap.
3) Open fuel filler flap and remove filler cap.
4) Remove right rear wheel.
5) Remove screws holding packing in place.

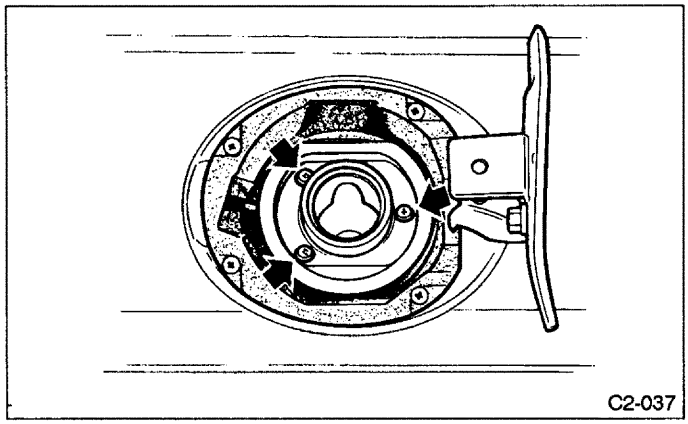


Fig. 21

6) Lift up the vehicle.
7) Separate fuel filler pipe from duct.

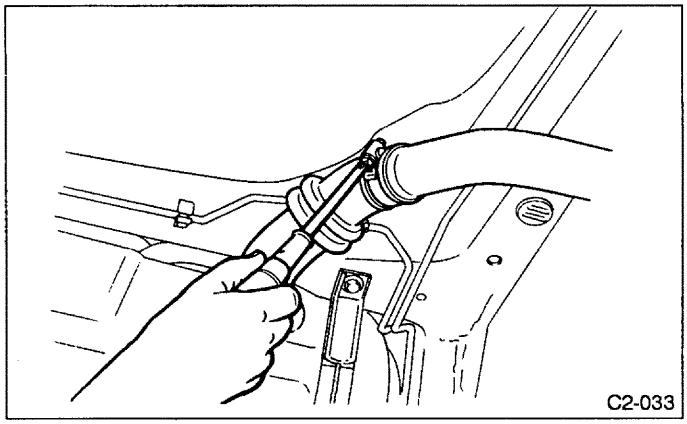


Fig. 22

8) Remove right side rear fender cover.
9) Remove fuel filler pipe from the vehicle.
10) Separate air vent hose from tube.

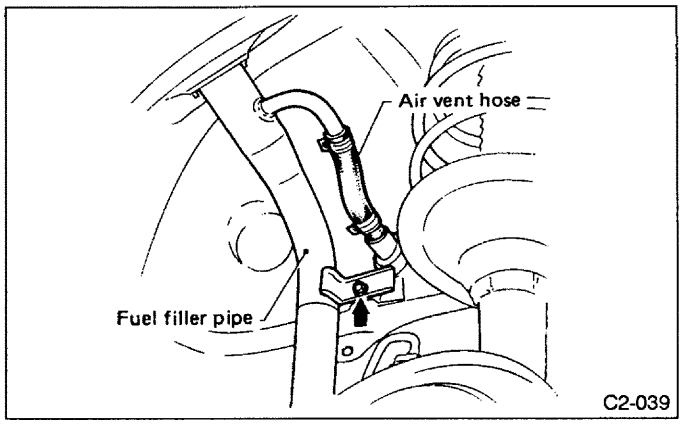


Fig. 23

Place a container under pipe connection to catch fuel which way remain in filler pipe.

B: INSTALLATION

1) Hold fuel filler flap open.
When installing check valve on filler pipe, ensure it faces in correct direction.
2) Insert fuel filler pipe into hole in fuel saucer from the inner side of apron. Align holes in fuel filler pipe neck and packing and tighten screws.

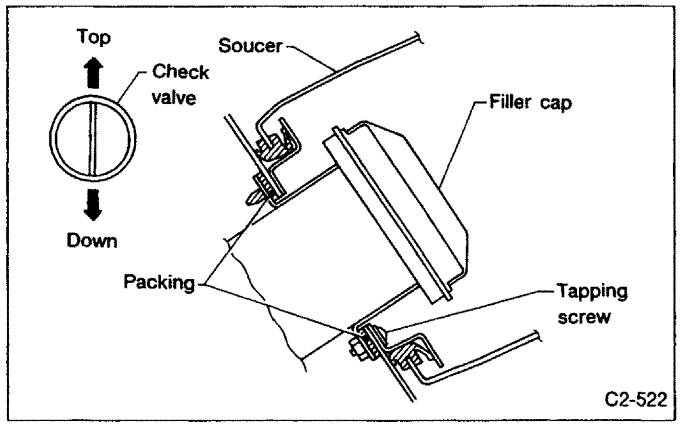


Fig. 4

3) If edges of rubber packing are folded toward the inside, straighten it with a standard screwdriver.
4) Insert fuel filler hose approximately 25 to 30 mm (0.98 to 1.18 in) over the lower end of fuel filler pipe and tighten clamps. Do not allow clips to touch air vent hose, air breather hoses and rear suspension crossmember.
5) Insert air vent hose approximately 25 to 30 mm (0.98 to 1.18 in) into the lower end of air vent pipe and tighten with clips.

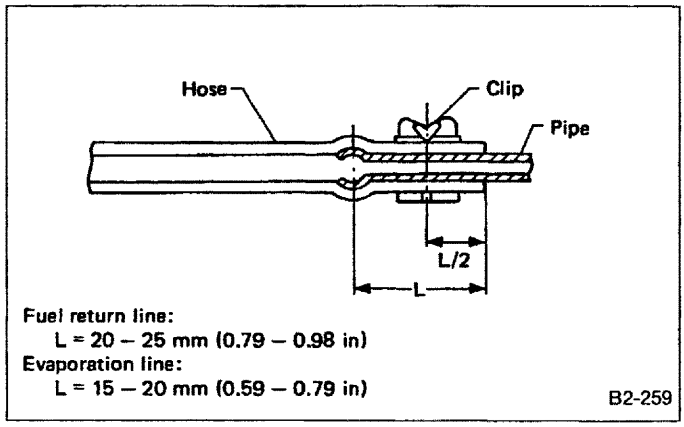


Fig. 5

6) Install protector together with fuel filler pipe. Check to be sure clamp for filler hose and clip for air vent hose do not touch body.

5. Fuel Filter

A: REMOVAL

1) Release the fuel pressure.
Refer to Section 1. [W1A0].
2) Loosen the screw of the hose clamp and pull off the hose from the filter.
3) Remove the filter from the holder.

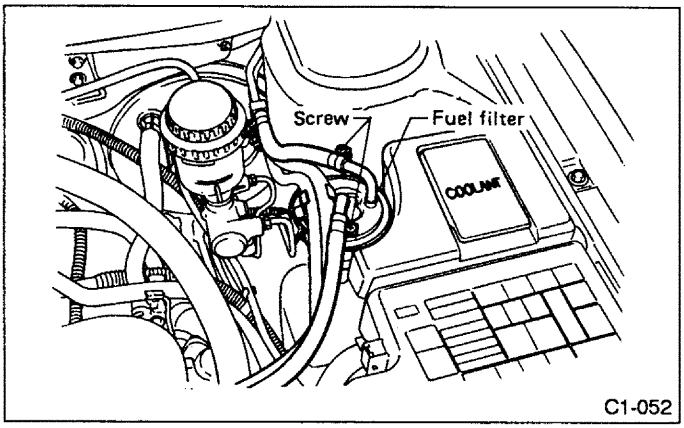


Fig. 26

B: INSPECTION

1) Check the inside of the filter for dirt and water sediment.
2) If the filter is clogged or cracked, or if the replacement interval has been reached, replace the filter.
3) If water is found in the filter, shake the filter with its inlet port facing down, to expel the water.

C: INSTALLATION

1) Connect the hose as illustrated below:

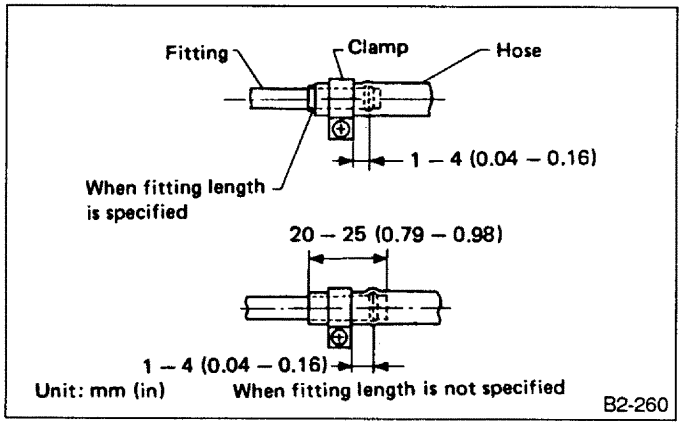


Fig. 27

2) Tighten the hose clamp screw to the specified torque.

Tightening torque:
1.0 — 1.5 N•m (0.1 — 0.15 kg-m, 0.7 — 1.1 ft-lb)

3) If the hose is damaged at the clamping portion, replace the hose with a new one.
4) If the hose clamp is too deformed, replace with a new one.
5) Fit the hose to the filter, then install the filter to the holder. Correct the hose position by removing any twist so that it will not interfere with the filter body or washer tank, before tightening the screw of the hose clamp.

6. Fuel Pump

A: REMOVAL

1) Release fuel pressure.

Refer to section 1 Precaution [W1A0].

2) Keep connector disconnected.
3) Disconnect hoses.

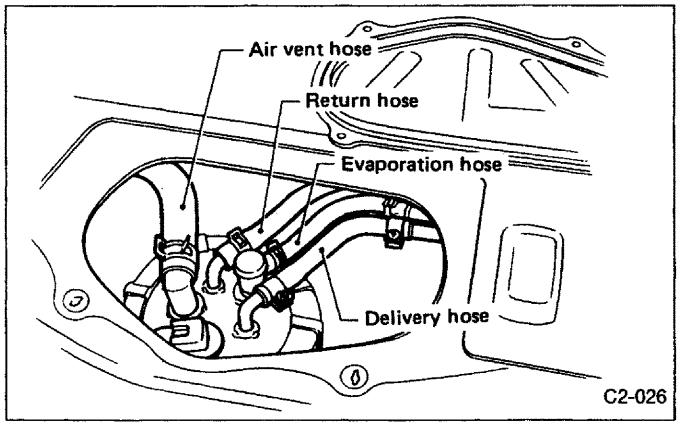


Fig. 6

4) Remove fuel tank cap using special tool.

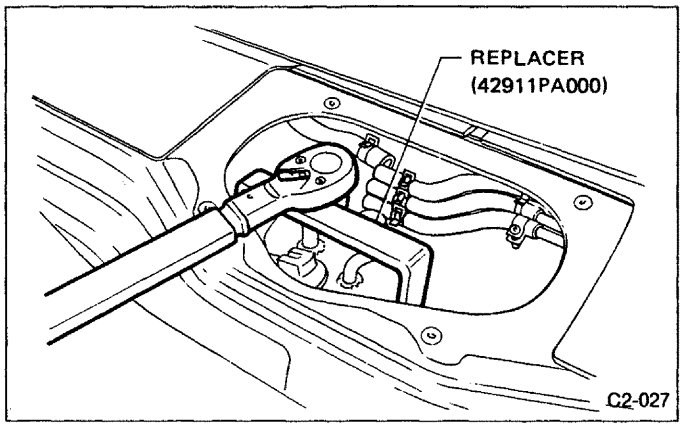
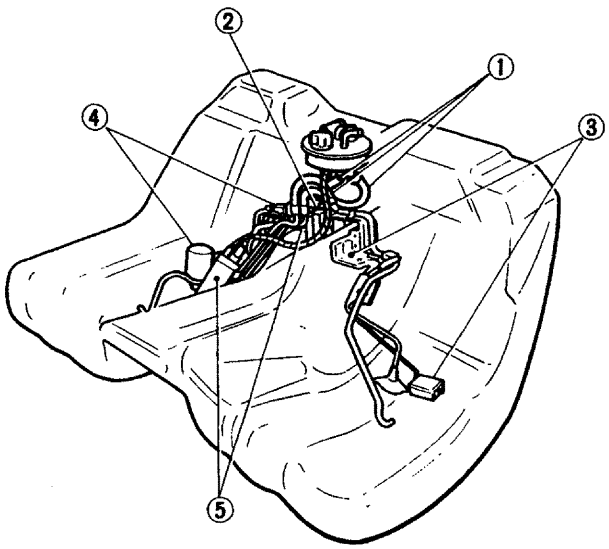


Fig. 7

5) Remove fuel pump from tank.
Remove in the numerical sequence in Fig. 8.



(1) Disconnect hoses and harness connector, and remove fuel tank cap.
(2) Remove bracket cover for installing each assembly bracket onto tank inner.
(3) Take out fuel meter unit LH.
(4) Take out fuel meter unit RH.
(5) Take out fuel pump ASSY.

C2-042

Fig. 8

B: INSPECTION

1) Connect the leads to the harness connector, and apply a 12-volt power supply to check whether the pump operates.

a. Keep the battery apart from the pump as far as possible.

b. Be sure to turn the 12V supply ON and OFF on the battery side.

c. Do not run the pump for a long time under non-loaded condition.

C: INSTALLATION

Installation is in the reverse order of removal procedures. Observe the following.

(1) Always use a new gasket.

(2) Ensure sealing portion is free from fuel or foreign particles before installation. (Wipe mounting holes, packing, etc. with a cloth.)

(3) When installing fuel tank cap, use special tool.

Special tool:
REPLACER (42911 PA000)

(4) Connect fuel delivery hose, return hose and evaporation hose.

(5) Connect fuel pump connector.

7. Fuel Meter Unit

A: REMOVAL

Fuel meter unit is built into fuel pump ASSY, so that removal of fuel meter unit is in the same order for fuel pump.

1) Release fuel pressure.
Refer to section 1. [W1A0].
2) Disconnect fuel delivery hose, return hose, evaporation hose and air vent hose.
3) Remove fuel tank cap using special tool.
4) Take out fuel meter unit.
Refer to Fig. 31.

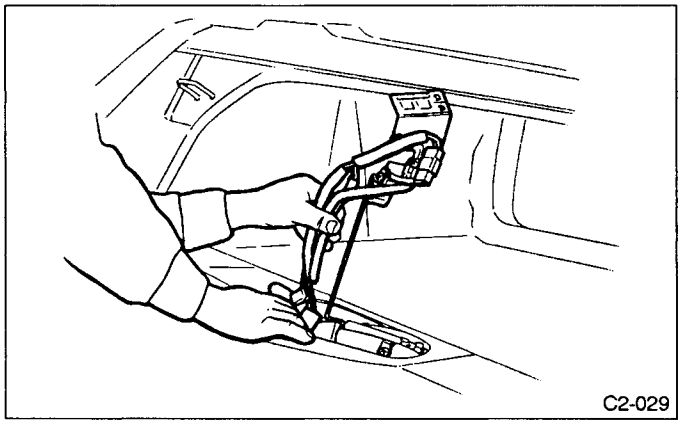


Fig. 31

B: INSTALLATION

Refer to "INSTALLATION" of fuel pump.

8. Fuel Delivery, Return and Evaporation Lines

A: REMOVAL

Remove fuel delivery pipes and hoses, fuel return pipes and hoses, and evaporation pipes and hoses.

1) Remove inner trim, insulator, rear seat and fuel tank.

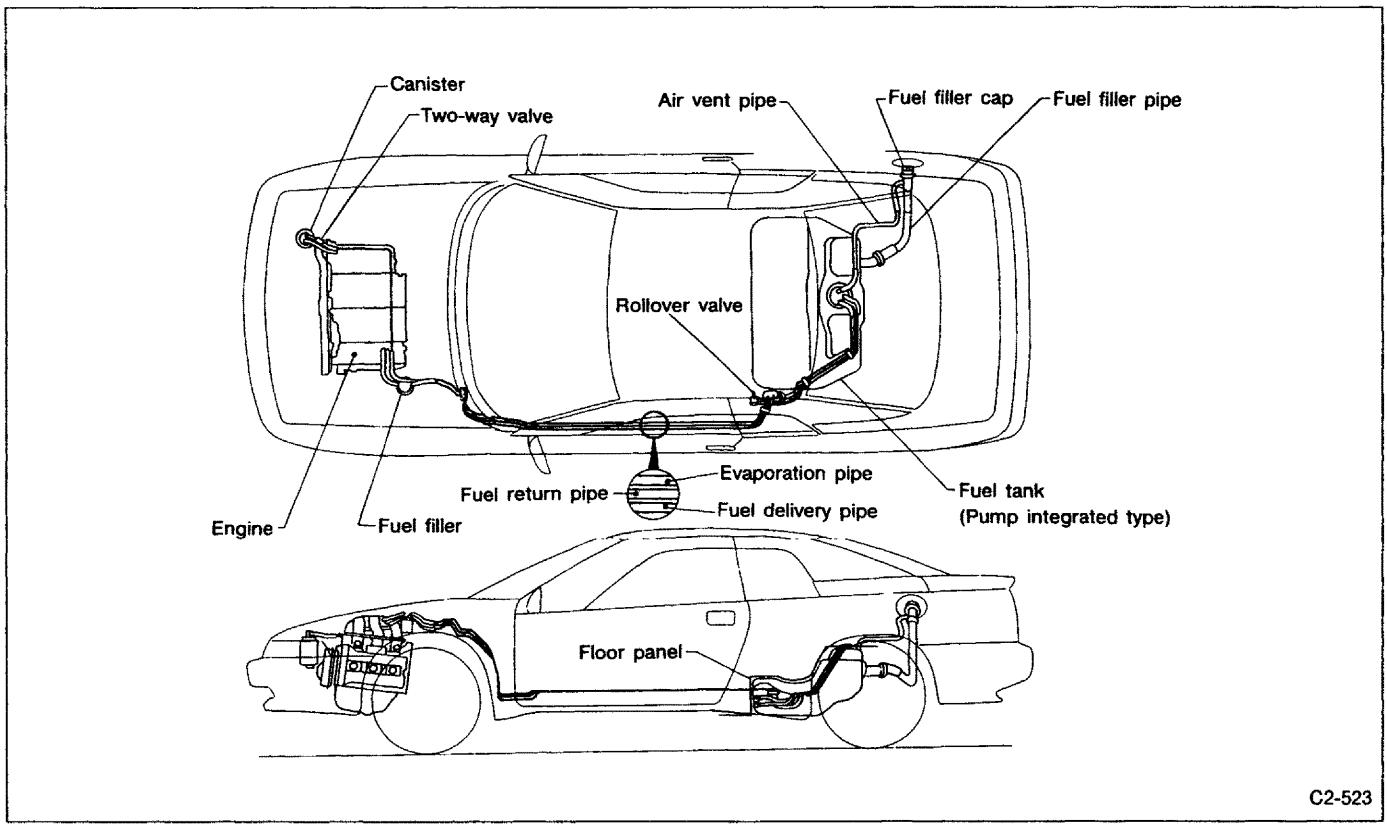


Fig. 9

2) In engine compartment, detach fuel delivery hoses, return hoses, evaporation tubes and canister.

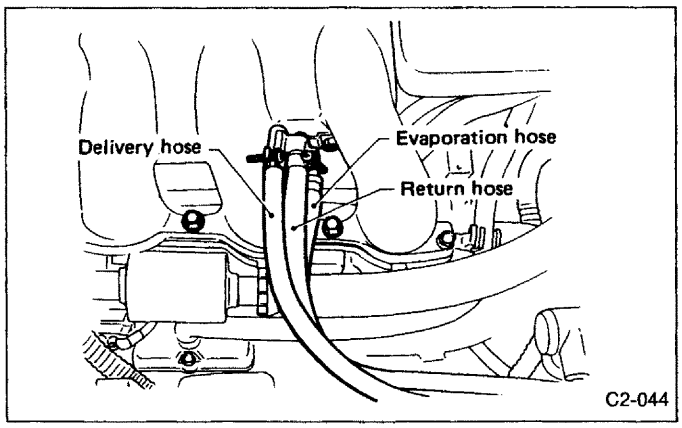


Fig. 10

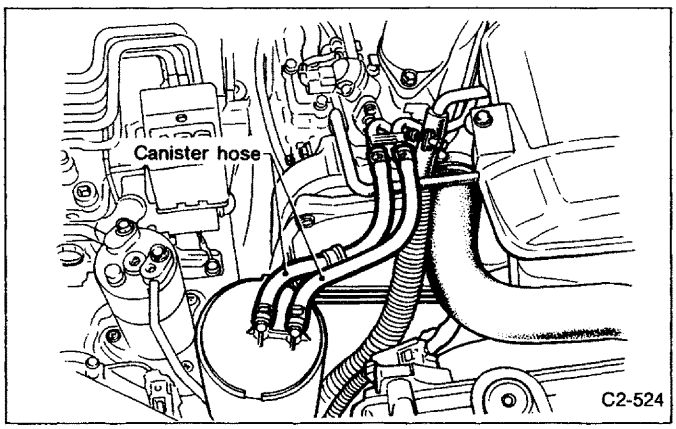


Fig. 11

B: INSTALLATION

Install in the reverse order of removal.
1) Connect delivery hose to delivery pipe with an overlap of 20 to 25 mm (0.79 to 0.98 in).
2) Connect delivery hoses and fuel return hose to fuel tank until they reach the base of each pipe.
3) Insert evaporation tube into evaporation pipe by approx. 15 mm (0.59 in) and position a clip with approx. 8 mm (0.31 in) from hose end.
4) Be sure to inspect hoses and their connections for any leakage of fuel.

9. Roll Over Valve with Two-way Valve

A: REMOVAL

1) Remove bracket, and remove roll over valve.

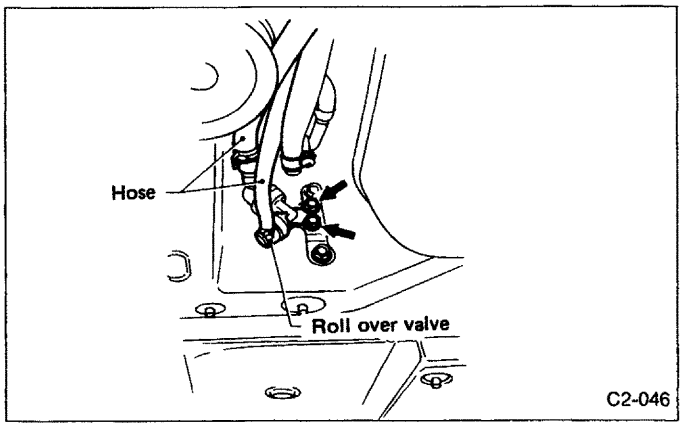


Fig. 12

2) Remove hose from roll over valve.
3) Remove valve from bracket.

B: INSPECTION

1) Connect hose to valve as shown.
2) While blowing through open end of tube, tilt valve at least 90° left and right from normal position.
3) Ensure that there is no air flow when tube is tilted greater than 90°.

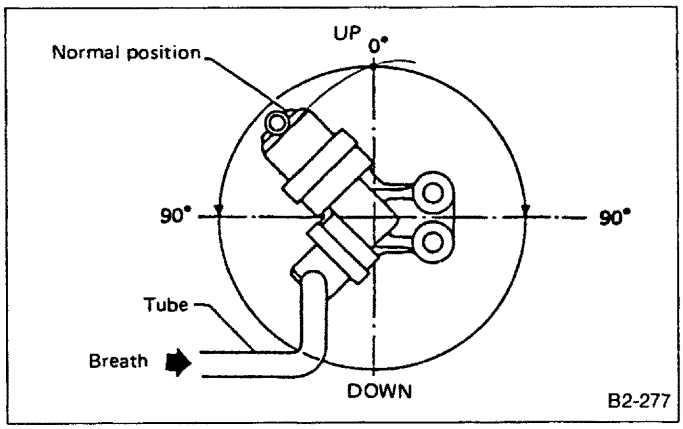


Fig. 13

C: INSTALLATION

Installation is in the reverse order of removal.
Observe the following:
1) Do not install top side of valve down.
2) Before installing bracket on body, securely fit concave part of bracket to hole in body.

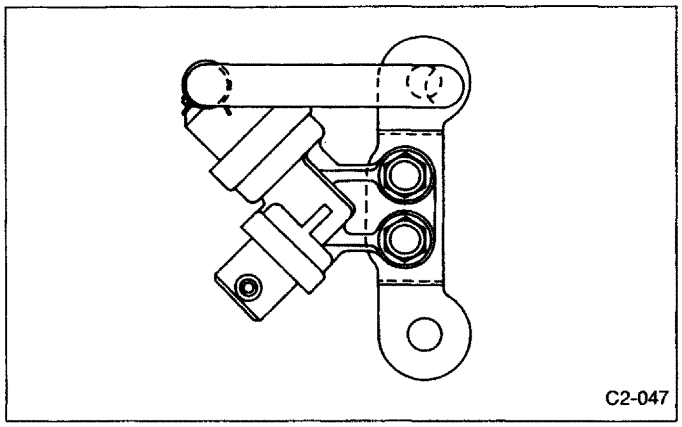


Fig. 14

10. Canister

A: REMOVAL

1) Disconnect canister hose on engine side as shown by an arrow.
2) Remove canister drain hose from frame.
3) Slide canister upward and remove from bracket.

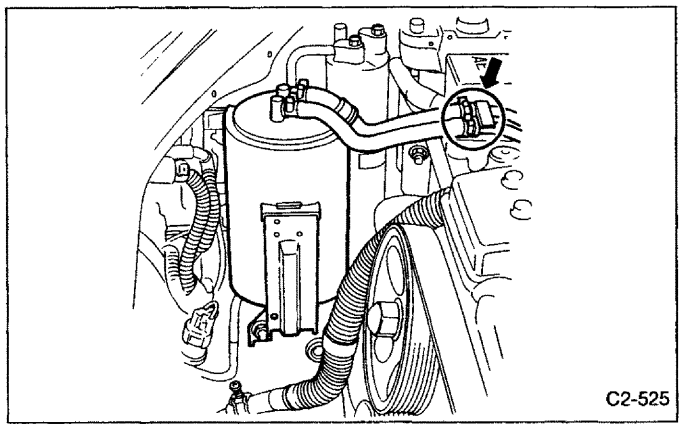


Fig. 15

B: INSTALLATION

Installation is in the reverse order of removal procedure.

Ensure drain hose is inserted into frame.

T TROUBLESHOOTING

Trouble and possible cause		Corrective action
1. Insufficient fuel supply to the injector		
1)	Fuel pump will not operate.	
	○ Defective terminal contact.	Inspect connections, especially ground, and tighten securely.
	○ Trouble in electromagnetic or electronic circuit parts.	Replace fuel pump.
2)	Lowering of fuel pump function.	Replace fuel pump.
3)	Clogged dust or water in the fuel filter.	Replace fuel filter, clean or replace fuel tank.
4)	Clogged or bent fuel pipe or hose.	Clean, correct or replace fuel pipe or hose.
5)	Air is mixed in the fuel system.	Inspect or retighten each connection part.
6)	Clogged or bent breather tube or pipe.	Clean, correct or replace air breather tube or pipe.
7)	Damaged diaphragm of pressure regulator.	Replace.
2. Leakage or blow out fuel		
1)	Loosened joints of the fuel pipe.	Retightening.
2)	Cracked fuel pipe, hose and fuel tank.	Replace.
3)	Defective welding part on the fuel tank.	Replace.
4)	Defective drain packing of the fuel tank.	Replace.
5)	Clogged or bent air breather tube or air vent tube.	Clean, correct or replace air breather tube or air vent tube.
3. Gasoline is smelling inside of compartment		
1)	Loosened joints at air breather tube, air bent tube and fuel filler pipe.	Retightening.
2)	Defective packing air tightness on the fuel saucer.	Correct or replace packing.
3)	Cracked fuel separator.	Replace separator.
4)	Inoperated fuel pump modulator, or this circuit.	Replace. **Refer to C. 2-1 [M10C0].**
4. Defective fuel meter indicator		
1)	Defective operation of fuel meter unit.	Replace.
2)	Defective operation of fuel meter.	Replace.
5. Noise		
1)	Large operation noise or vibration of fuel pump.	Replace.

a. When the vehicle is left unattended for an extended period of time:

1) Water may accumulate in the fuel tank. To prevent water condensation, top off the fuel tank or drain the fuel completely.

2) Drain water condensation from the fuel filter.

b. Refilling the fuel tank.

1) Refill the fuel tank while there is still some fuel left in the tank.

c. Protecting the fuel system against freezing and water condensation.

1) Cold areas

In snow-covered areas, mountainous areas, skiing areas, etc. where ambient temperatures drop below 0°C (32°F) throughout the winter season, use an anti-freeze solution in the cooling system.

Refueling will also complement the effect of anti-freeze solution each time the fuel level drops to about one-half.

After the winter season, drain water which may have accumulated in the fuel filter and fuel tank in the manner same as that described under the Moderate Areas.

2) Moderate areas

When water condensation is notched in the fuel filter, drain water from both the fuel filter and fuel tank or use a water removing agent (or anti-freeze solution) in the fuel tank.

- **Observe the instructions, notes, etc., indicated on the label affixed to the anti-freeze solution (water removing agent) container before use.**