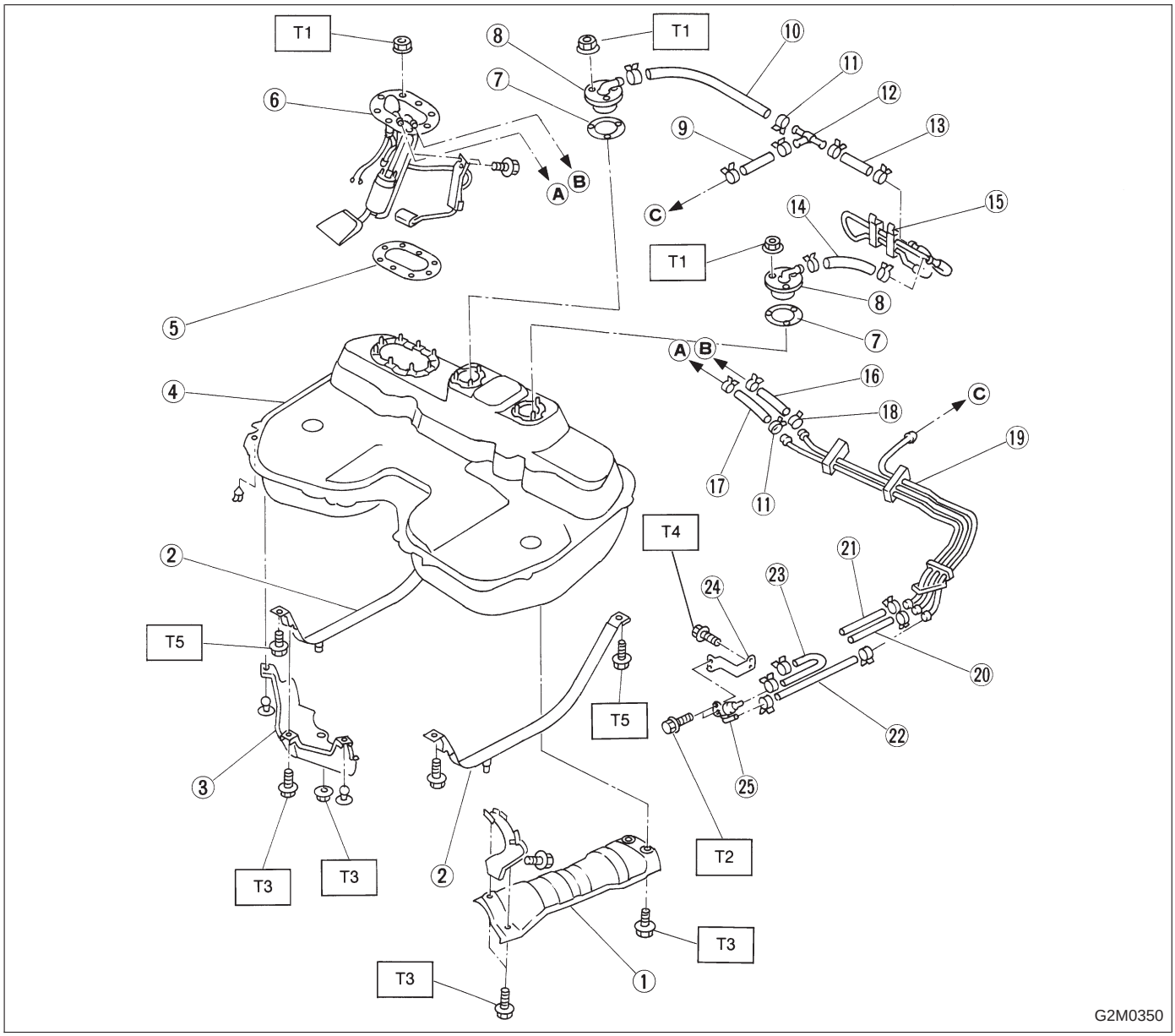
FUEL SYSTEM 2-8

1. Specifications

Fuel tank	Capacity	60 ℓ (15.9 US gal, 13.2 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 80 ℓ (21.1 US gal, 17.6 Imp gal)/h [12V at 250.1 kPa (2.55 kg/cm^2, 36.3 psi)]
Fuel filter		Cartridge type

1. Fuel Tank

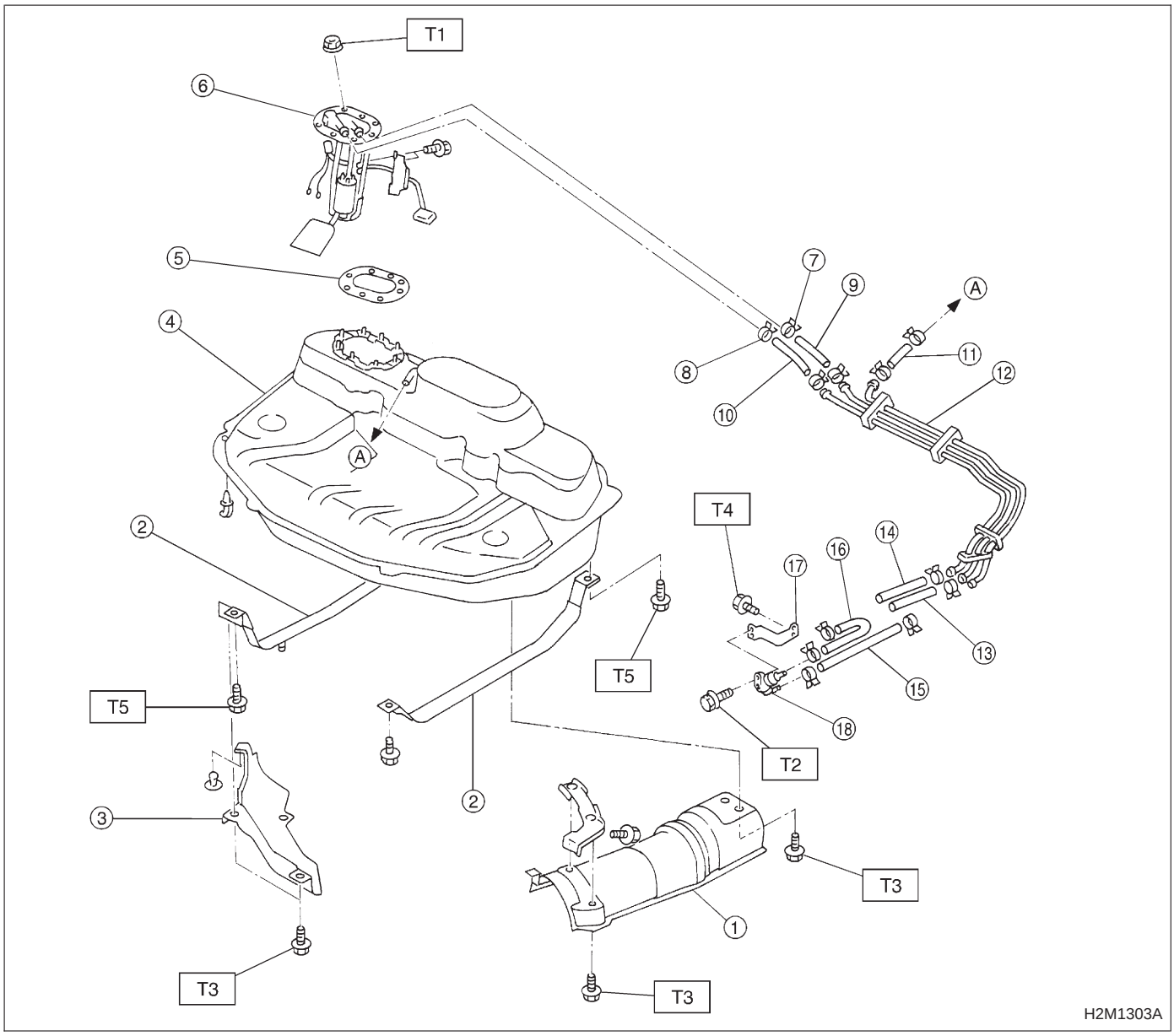
1. AWD MODEL



① Heat sealed cover
② Fuel tank band
③ Protector
④ Fuel tank
⑤ Fuel pump gasket
⑥ Fuel pump ASSY
⑦ Fuel cut valve gasket
⑧ Fuel cut valve
⑨ Evaporation hose C
⑩ Evaporation hose A
⑪ Clip
⑫ Joint pipe
⑬ Evaporation hose B
⑭ Evaporation hose D
⑮ Evaporation pipe ASSY
⑯ Fuel delivery hose A
⑰ Fuel return hose A
⑱ Clamp
⑲ Fuel pipe ASSY
⑳ Fuel delivery hose B
㉑ Fuel return hose B
㉒ Evaporation hose E
㉓ Evaporation hose F
㉔ Roll cover valve bracket
㉕ Roll over valve

Tightening torque: N·m (kg-m, ft-lb)
T1: 4.4±1.5 (0.45±0.15, 3.3±1.1)
T2: 6.5±1.5 (0.65±0.15, 4.8±1.1)
T3: 7.4±2.0 (0.75±0.2, 5.4±1.4)
T4: 18±5 (1.8±0.5, 13.5±3.5)
T5: 33±10 (3.4±1.0, 25±7)

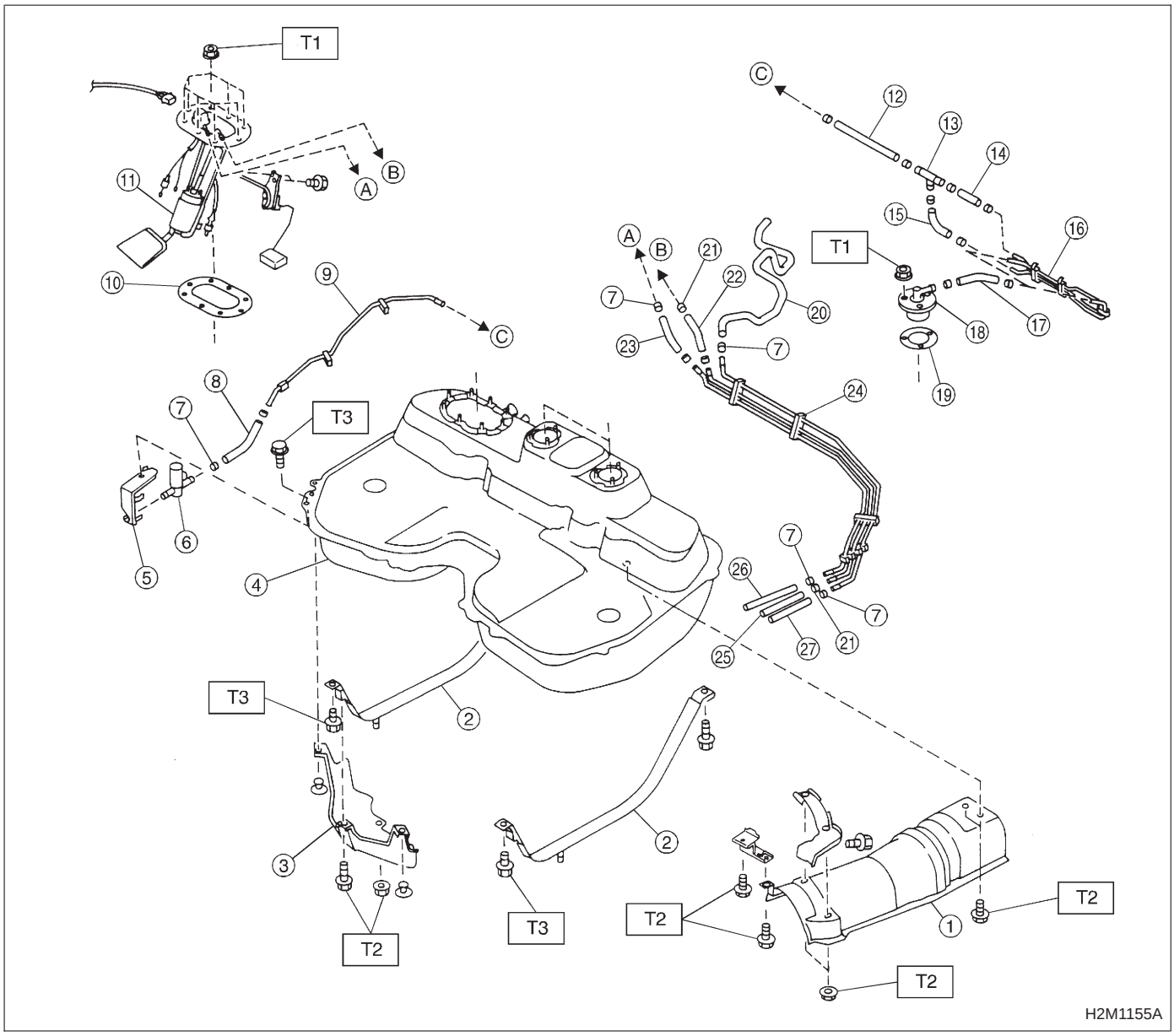
2. FWD MODEL (EXCEPT CALIFORNIA)



① Heat seated cover
② Fuel tank band
③ Protector
④ Fuel tank
⑤ Fuel pump gasket
⑥ Fuel pump ASSY
⑦ Clamp
⑧ Clip
⑨ Fuel delivery hose A
⑩ Fuel return hose A
⑪ Evaporation hose A
⑫ Fuel pipe ASSY
⑬ Fuel delivery hose B
⑭ Fuel return hose B
⑮ Evaporation hose B
⑯ Evaporation hose C
⑰ Roll over valve bracket
⑱ Roll over valve

Tightening torque: N·m (kg-m, ft-lb)
T1: 4.4±1.5 (0.45±0.15, 3.3±1.1)
T2: 6.5±1.5 (0.65±0.15, 4.8±1.1)
T3: 7.4±2.0 (0.75±0.2, 5.4±1.4)
T4: 18±5 (1.8±0.5, 13.5±3.5)
T5: 33±10 (3.4±1.0, 25±7)

3. CALIFORNIA FWD MODEL

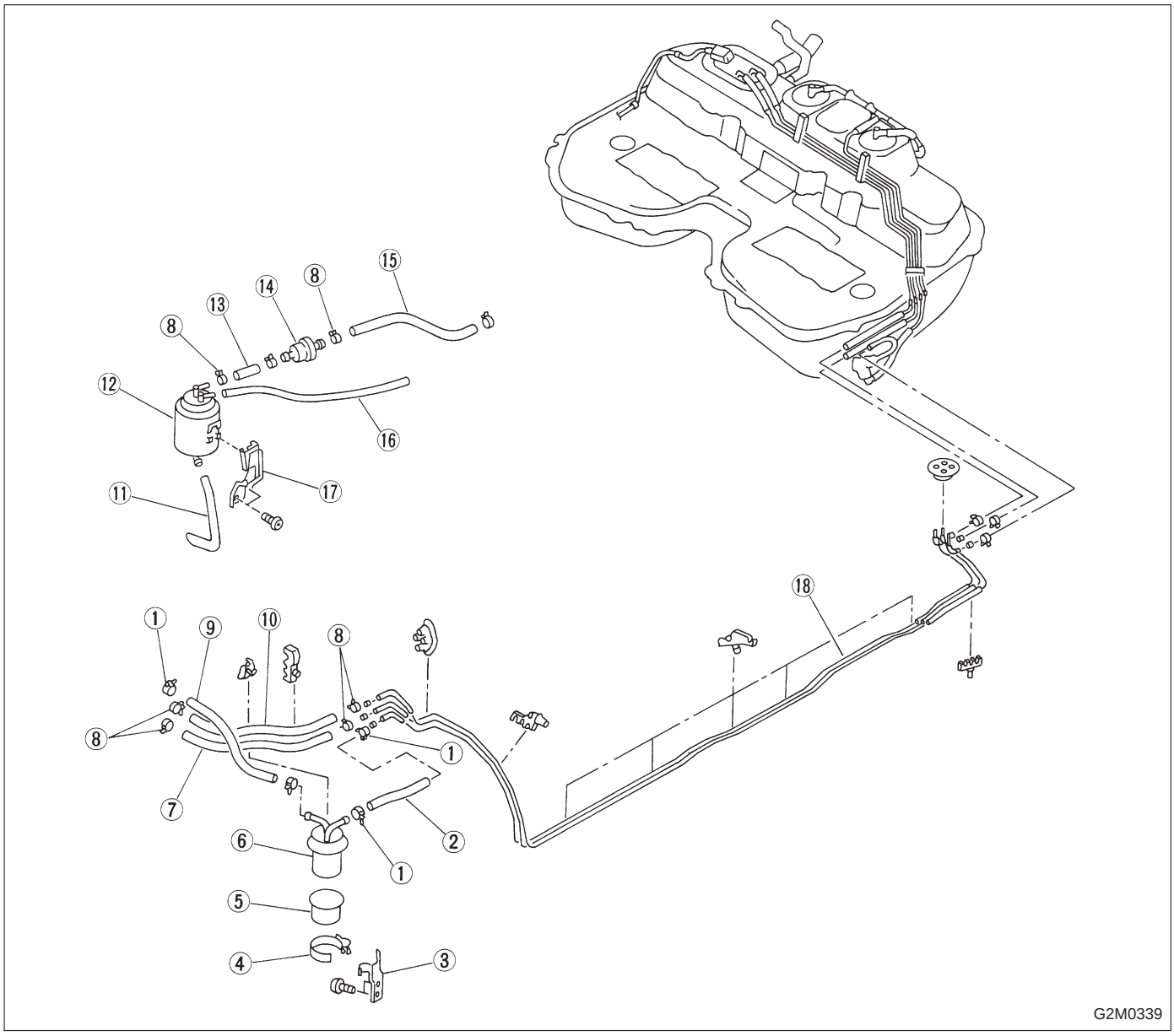


① Heat sealed cover
② Fuel tank band
③ Protector
④ Fuel tank
⑤ Fuel tank pressure control solenoid valve bracket
⑥ Fuel tank pressure control solenoid valve
⑦ Clip
⑧ Evaporation hose G
⑨ Evaporation pipe A
⑩ Fuel pump gasket
⑪ Fuel pump ASSY
⑫ Evaporation hose F
⑬ Joint pipe
⑭ Evaporation hose B
⑮ Evaporation hose A
⑯ Evaporation pipe ASSY
⑰ Evaporation hose D
⑱ Fuel cut valve
⑲ Fuel cut valve gasket
⑳ Evaporation hose C
㉑ Clamp
㉒ Fuel delivery hose A
㉓ Fuel return hose A
㉔ Fuel pipe ASSY
㉕ Fuel delivery hose B
㉖ Fuel return hose B
㉗ Evaporation hose E

Tightening torque: N·m (kg-m, ft-lb)
T1: 4.4±1.5 (0.45±0.15, 3.3±1.1)
T2: 7.4±2.0 (0.75±0.2, 5.4±1.4)
T3: 33±10 (3.4±1.0, 25±7)

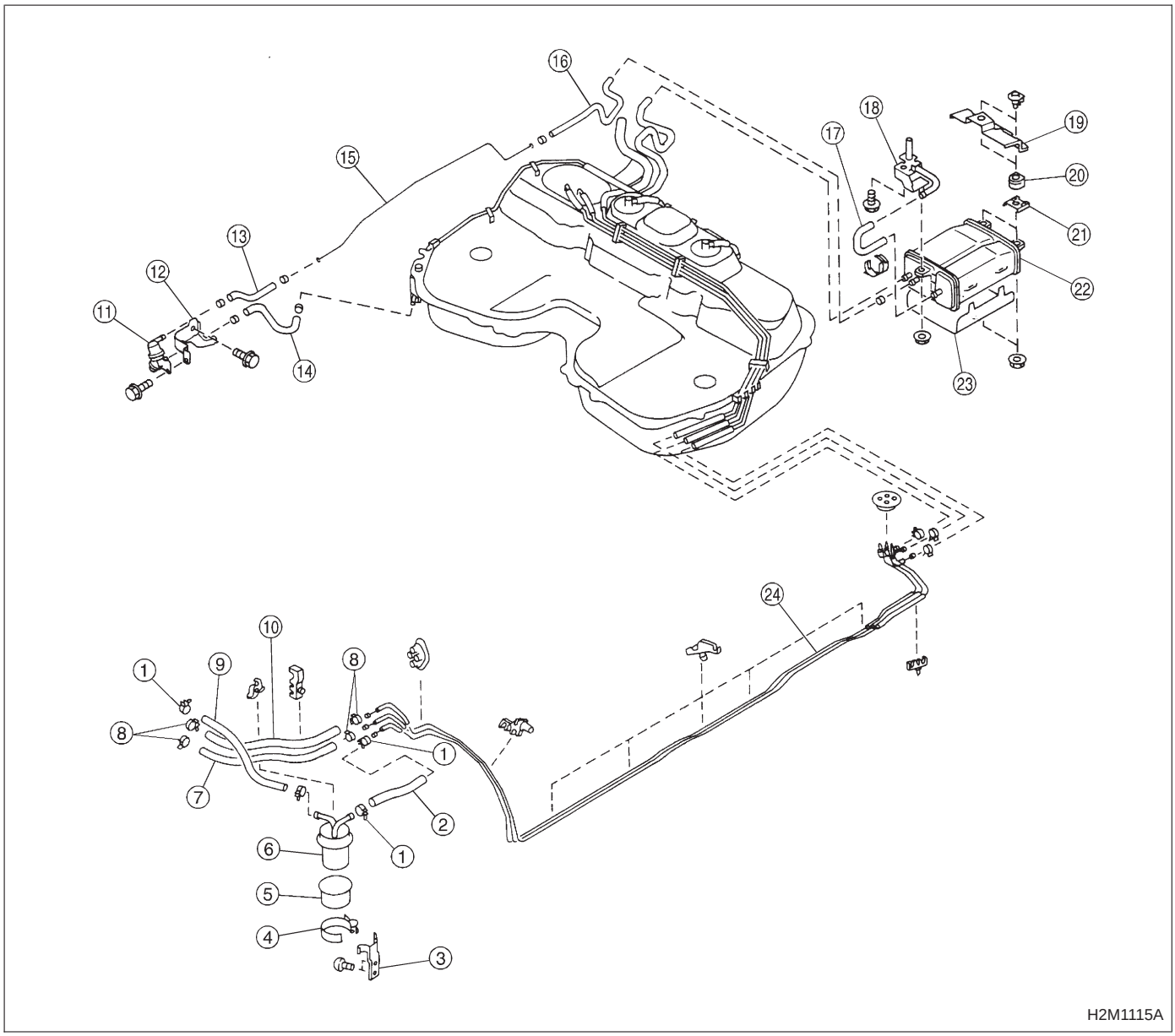
2. Fuel Line

1. FWD (EXCEPT CALIFORNIA) AND AWD MODEL



① Clamp
② Fuel delivery hose A
③ Fuel filter bracket
④ Fuel filter holder
⑤ Fuel filter cup
⑥ Fuel filter
⑦ Evaporation hose
⑧ Clip
⑨ Fuel delivery hose B
⑩ Fuel return hose
⑪ Air vent hose
⑫ Canister
⑬ Canister hose A
⑭ Two-way valve
⑮ Canister hose B
⑯ Canister hose C
⑰ Canister bracket
⑱ Fuel pipe ASSY

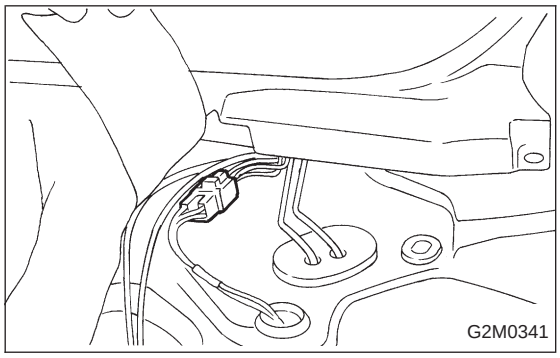
2. CALIFORNIA FWD MODEL



① Clamp
② Fuel delivery hose A
③ Fuel filter bracket
④ Fuel filter holder
⑤ Fuel filter cup
⑥ Fuel filter
⑦ Evaporation hose
⑧ Clip
⑨ Fuel delivery hose B
⑩ Fuel return hose
⑪ Roll over valve
⑫ Roll over valve bracket
⑬ Evaporation hose H
⑭ Evaporation hose I
⑮ Evaporation pipe B
⑯ Canister hose A
⑰ Canister hose B
⑱ Canister holder
⑲ Canister upper bracket
⑳ Cushion rubber
㉑ Canister lower bracket
㉒ Canister
㉓ Canister cover
㉔ Fuel pipe ASSY

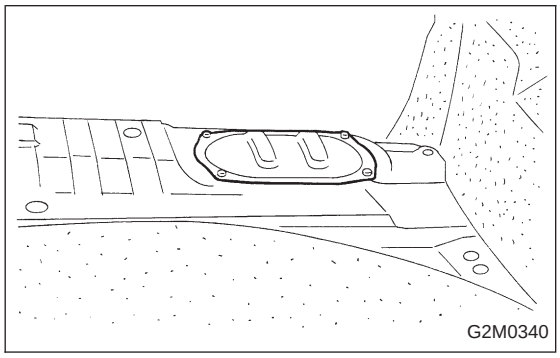
1. Precautions

WARNING:
- **Place “No fire” signs near the working area.**
- **Disconnect ground terminal from battery.**
- **Be careful not to spill fuel on the floor.**



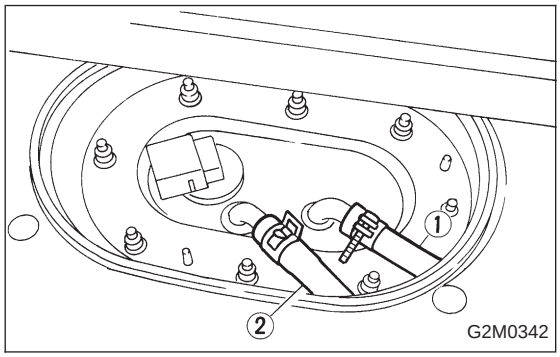
A: RELEASING OF FUEL PRESSURE

1) Remove rear seat, and turn up floor mat.
2) Disconnect connector from fuel tank.
3) Start the engine, and run it until it stalls.
4) After the engine stalls, crank it for five more seconds.
5) Turn ignition switch OFF.

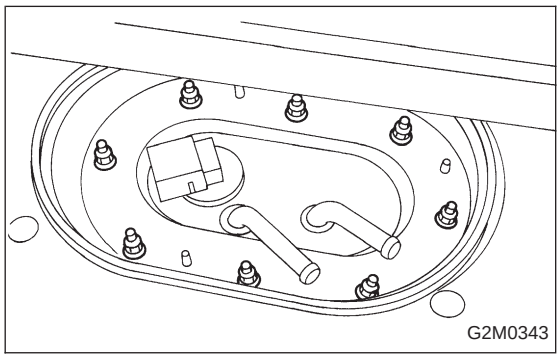


B: DRAINING OF FUEL

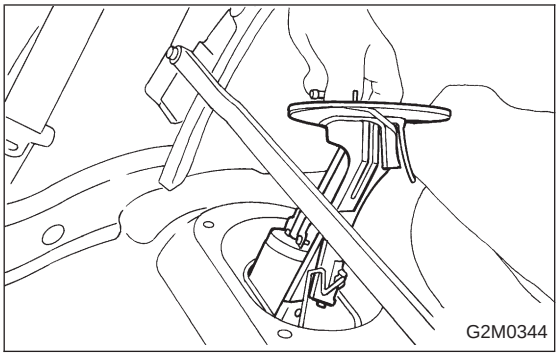
1) Remove rear seat and seat back.
2) Remove access hole lid.
3) Disconnect connector from fuel pump.
4) Release fuel pressure. <Ref. to 2-8 [W1A0].>



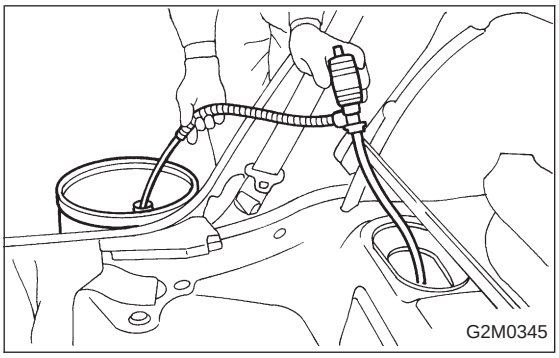
5) Disconnect fuel delivery hose ① and return hose ②.



6) Remove nuts which install fuel pump assembly onto fuel tank.

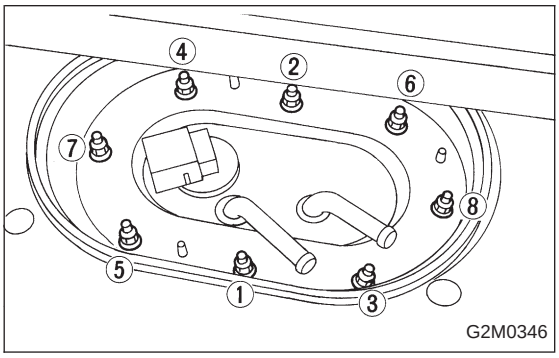


7) Take off fuel pump from fuel tank.



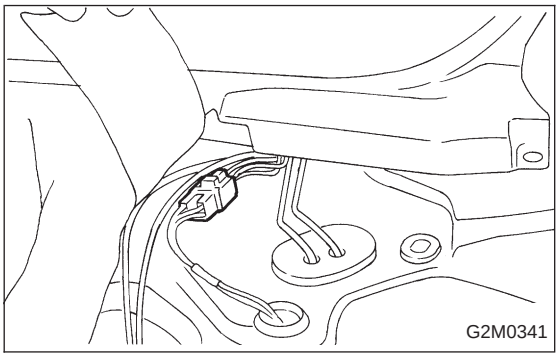
8) Drain fuel from fuel tank by using a hand pump.

WARNING:
Do not use a motor pump when draining fuel.



9) After draining fuel, reinstall fuel pump.
Tighten nuts in numerical sequence shown in Figure to specified torque.

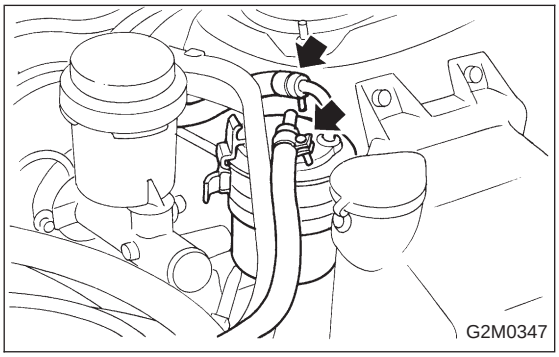
Tightening torque:
3 — 6 N·m (0.3 — 0.6 kg-m, 2.2 — 4.3 ft-lb)



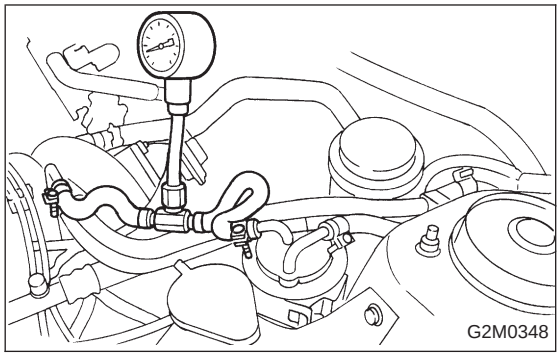
2. On-Car Services

A: MEASUREMENT OF FUEL PRESSURE

1) Release fuel pressure. <Ref. to 2-8 [W1A0].>
2) Connect connector to fuel tank.



3) Disconnect fuel delivery hose from fuel filter, and connect fuel pressure gauge.


G2M0348

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

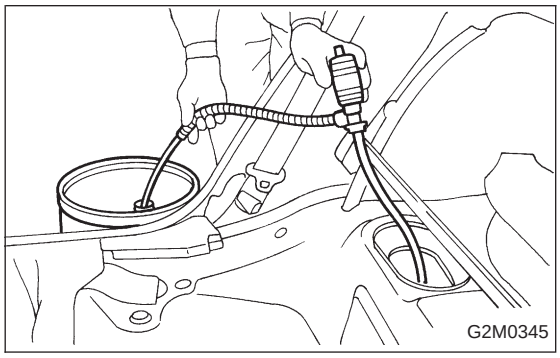
Fuel pressure:
235 — 265 kPa (2.4 — 2.7 kg/cm^2, 34 — 38 psi)

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

Fuel pressure:
177 — 206 kPa (1.8 — 2.1 kg/cm^2, 26 — 30 psi)

WARNING:
Before removing fuel pressure gauge, release fuel pressure.

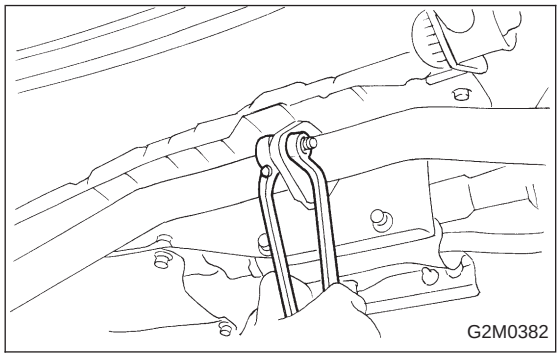
NOTE:
If out of specification as measured at step 6), check or replace pressure regulator and pressure regulator vacuum hose.


G2M0345

3. Fuel Tank

A: REMOVAL

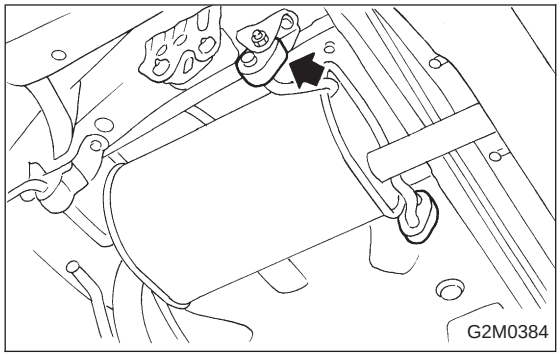
1) Release fuel pressure. <Ref. to 2-8 [W1A0].>
2) Drain fuel from fuel tank. <Ref. to 2-8 [W1B0].>


G2M0382

3) Remove rear exhaust pipe.
   (1) Lift up the vehicle.
   (2) Separate rear exhaust pipe from front catalyst converter.
   (3) Separate rear exhaust pipe from muffler.
   (4) Remove hook from rubber cushion, and remove exhaust pipe.

NOTE:
To facilitate the removal of parts, apply a coat of SUBARU CRC5-56 (004301003)

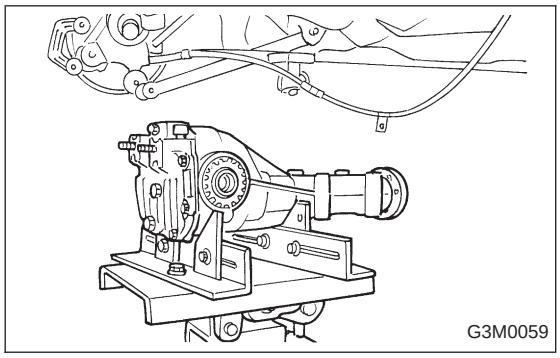
<Ref. to 2-9 [W2A0].>



4) Remove muffler assembly.

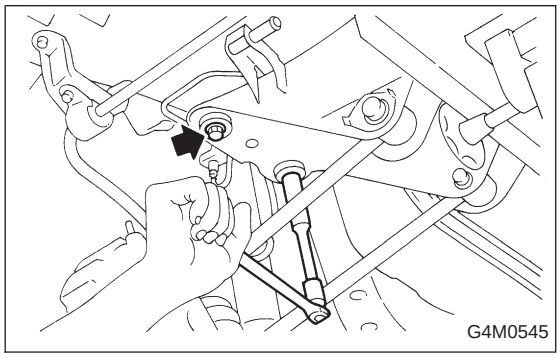
NOTE:
To facilitate the removal of parts, apply a coat of SUBARU CRC5-56 (004301003)

<Ref. to 2-9 [W3A0].>



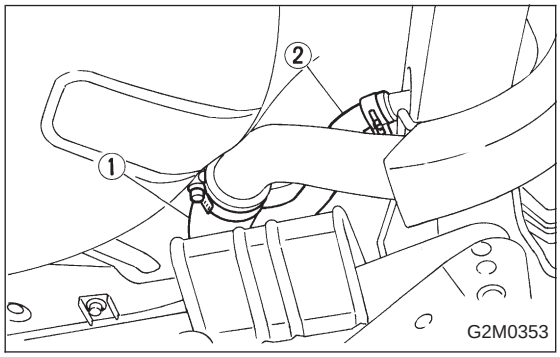
5) Remove rear differential assembly. (AWD model)
(1) Remove rear axle shafts from rear differential assembly.
(2) Remove rear differential front cover.
(3) Remove propeller shaft.
(4) Remove lower differential bracket.
(5) Set transmission jack under rear differential.
(6) Remove bolts which install rear differential onto rear crossmember.

<Ref. to 3-4 [W2C0].>



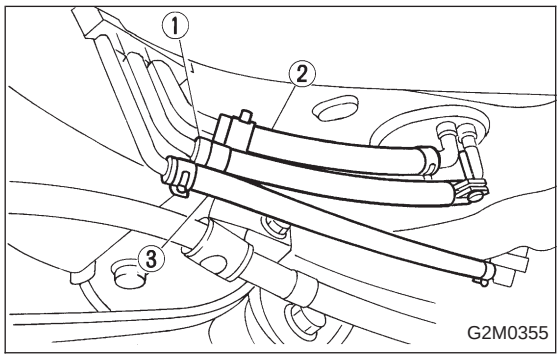
6) Remove rear crossmember. (AWD model)

<Ref. to 4-1 [W11A0].>

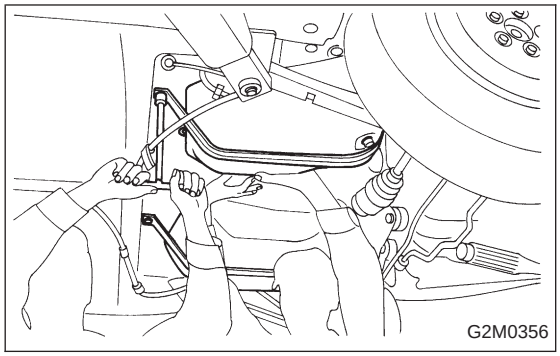


7) Loosen clamp, and disconnect fuel filler hose from pipe.
8) Loosen clamp, and disconnect air vent hose from air vent pipe.

① Fuel filler hose
② Air vent hose



9) Loosen clip and clamps, and disconnect fuel delivery hose ①, return hose ② and evaporation hose ③.

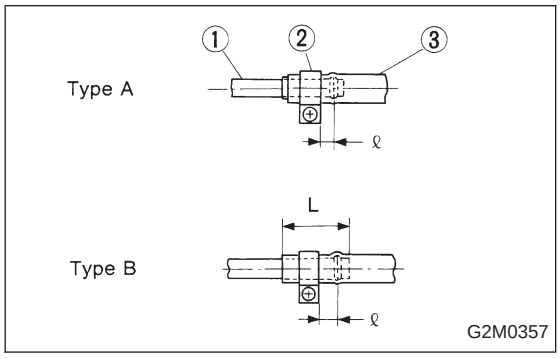


10) While holding fuel tank, remove bolts from bands and dismount fuel tank.

WARNING:
A helper is required to perform step 10).

B: INSTALLATION

Installation is in the reverse order of removal. Observe the following:
1) When installing fuel tank, have a helper hold fuel tank while installing bands.
2) Before tightening band mounting bolts, connect fuel system hoses.



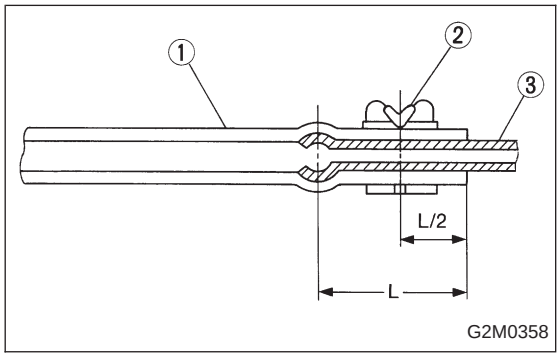
3) Install hose and hold down clips at positions indicated in Figure.

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

Type A: When fitting length is specified.
Type B: When fitting length is not specified.

① Fitting
② Clamp
③ Hose

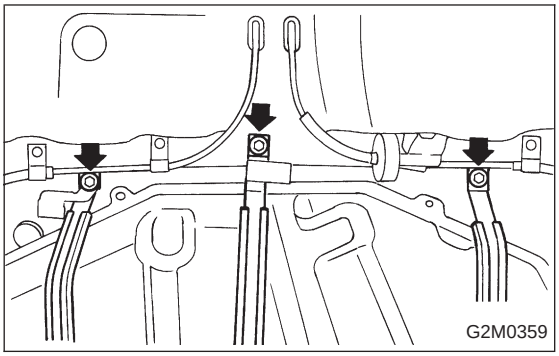
ℓ : 1.0 — 4.0 mm (0.04 — 0.16 in)
L: 20 — 25 mm (0.79 — 0.98 in)



① Hose
② Clip
③ Pipe

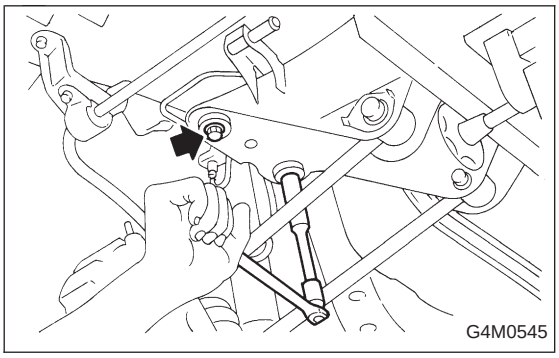
Fuel return hose:
L = 20 — 25 mm (0.79 — 0.98 in)

Evaporation hose:
L = 15 — 20 mm (0.59 — 0.79 in)

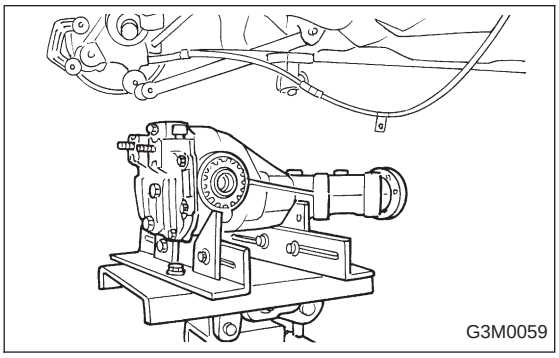


4) Tighten band mounting bolts.

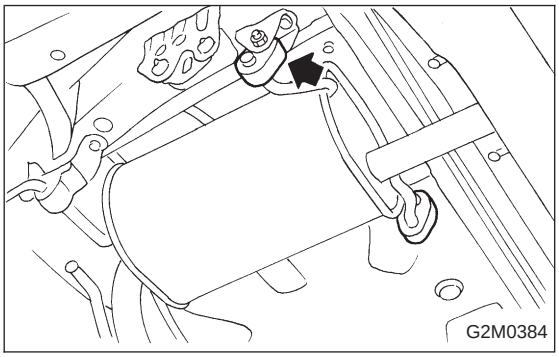
Tightening torque:
33±10 N·m (3.4±1.0 kg-m, 25±7 ft-lb)



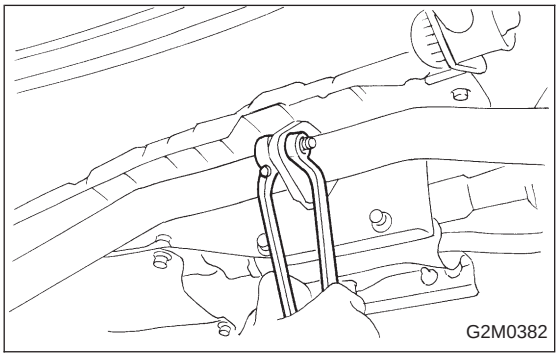
5) Install rear crossmember. <Ref. to 4-1 [W11C0].>



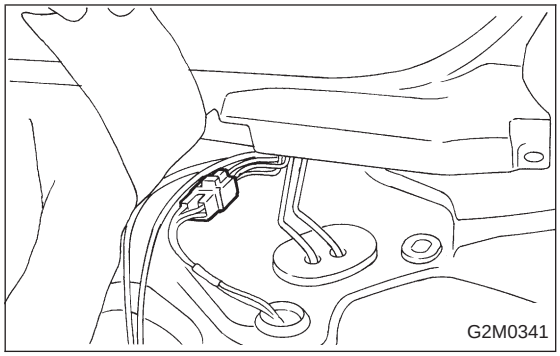
6) Install rear differential assembly. <Ref. to 3-4 [W2G0].>



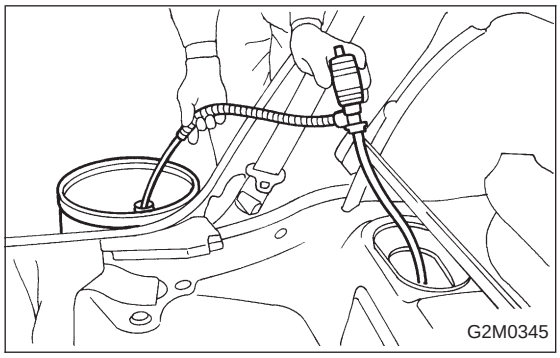
7) Install muffler assembly.



8) Install heat sealed cover.
9) Install rear exhaust pipe.


G2M0341

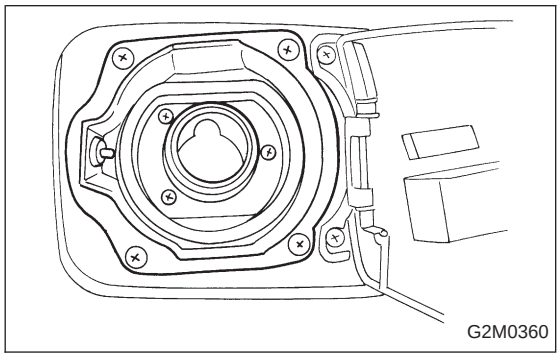
10) Lower the vehicle, and connect connector to fuel pump.
11) Install access hole lid.
12) Install rear seat back and rear seat.


G2M0345

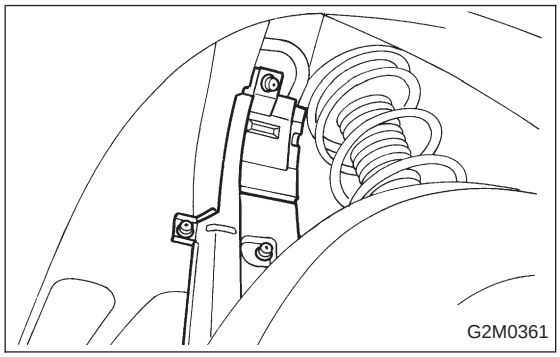
4. Fuel Filler Pipe

A: REMOVAL

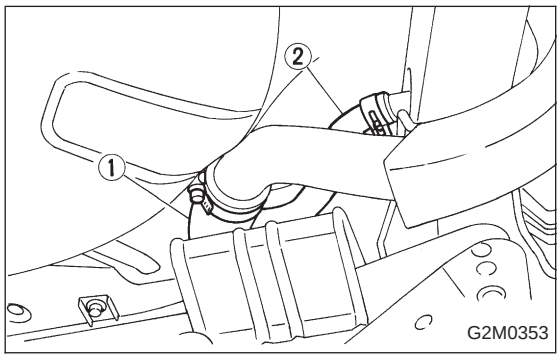
1) Release fuel pressure. <Ref. to 2-8 [W1A0].>
2) Drain fuel from fuel tank. <Ref. to 2-8 [W1B0].>


G2M0360

3) Remove right rear wheel.
4) Open fuel filler flap and remove filler cap.
5) Remove screws holding packing in place.

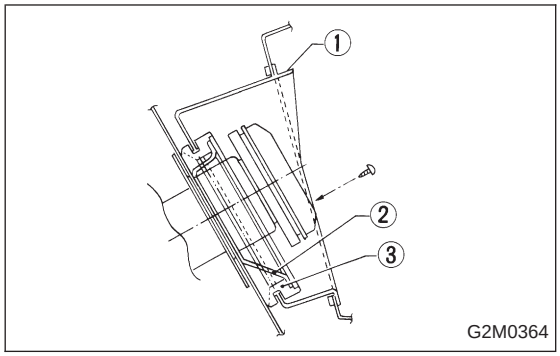

G2M0361

6) Lift up the vehicle.
7) Remove fuel filler pipe protector.



G2M0353

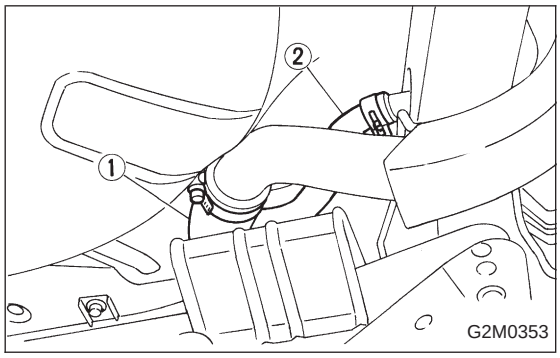
8) Remove clip, and separate air vent hose from pipe.
9) Loosen clamp, and separate fuel filler hose from pipe.
① Fuel filler hose
② Air vent hose
10) Remove fuel filler pipe to under side of the vehicle.



B: INSTALLATION

1) Hold fuel filler flap open.
2) Set fuel saucer ① with rubber packing ③, and insert fuel filler pipe into hole from the inner side of apron.
3) Align holes in fuel filler pipe neck and set cup ②, and tighten screws.

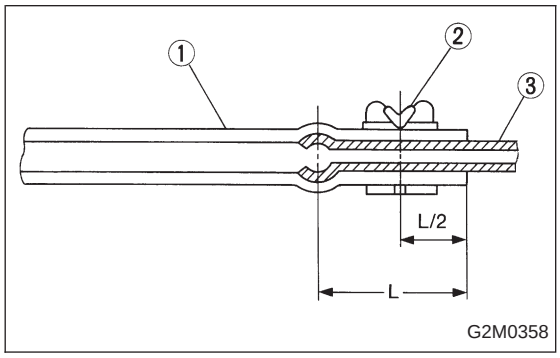
NOTE:
If edges of rubber packing are folded toward the inside, straighten it with a screwdriver.



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 clamp.

① Fuel filler hose
② Air vent hose

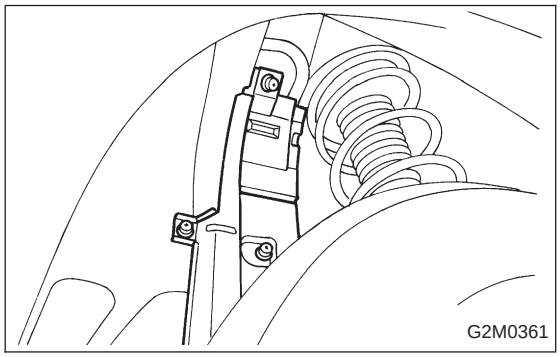
CAUTION:
Do not allow clips to touch air vent hose and rear suspension crossmember.



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 hold clip.

① Hose
② Clip
③ Pipe

L = 25 — 30 mm (0.98 — 1.18 in)

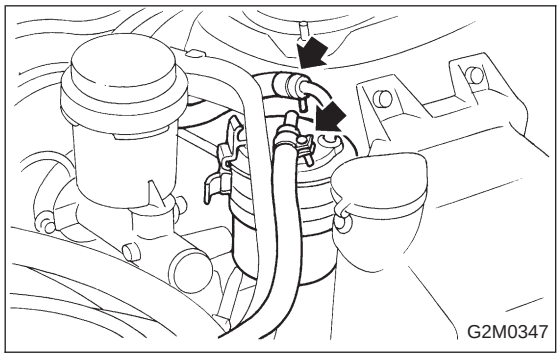


6) Install fuel filler pipe protector.
7) Install right rear wheel.

5. Fuel Filter

A: REMOVAL

1) Release fuel pressure. <Ref. to 2-8 [W1A0].>



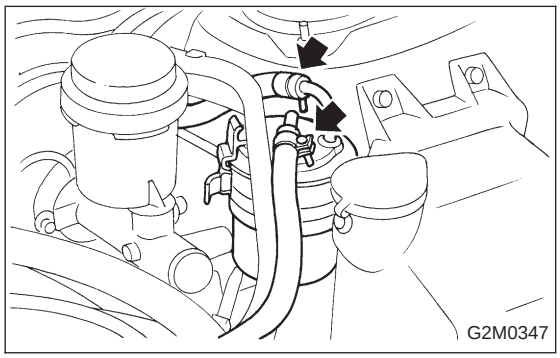
2) Disconnect fuel hoses from fuel filter.
3) Remove filter from holder.

B: INSPECTION

1) Check the inside of fuel filter for dirt and water sediment.
2) If it is clogged, or if replacement interval has been reached, replace it.
3) If water is found in it, shake and expel the water from inlet port.

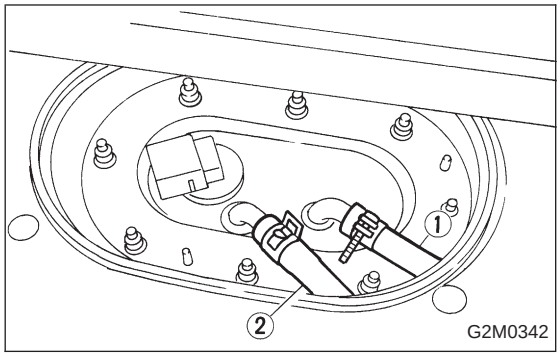
C: INSTALLATION

CAUTION:
● If fuel hoses are damaged at the connecting portion, replace it with a new one.
● If clamps are badly damaged, replace with new ones.



1) Installation is in the reverse order of removal.
2) Tighten hose clamp screws.

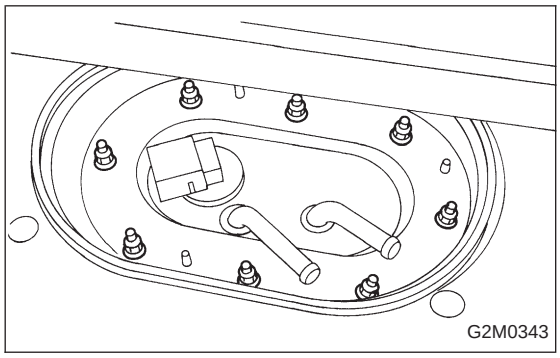
Tightening torque:
1.0 — 1.5 N·m (0.1 — 0.15 kg-m, 0.7 — 1.1 ft-lb)



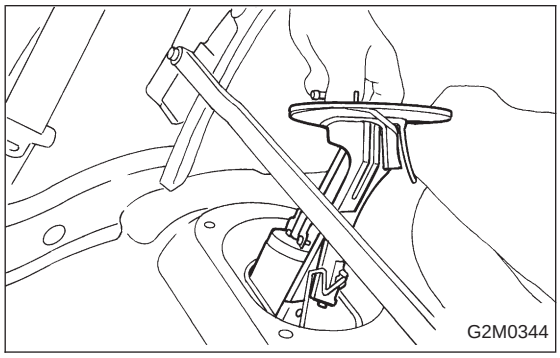
6. Fuel Pump

A: REMOVAL

1) Release fuel pressure. <Ref. to 2-8 [W1A0].>
2) Disconnect fuel delivery hose ① and return hose ②.

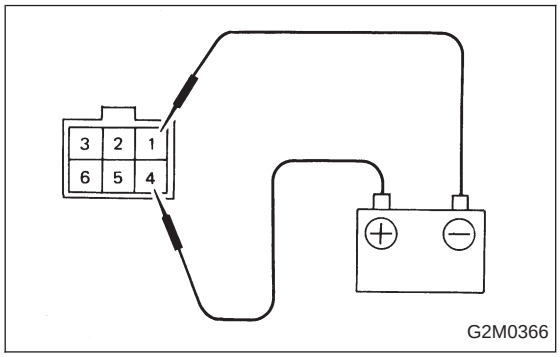


3) Remove nuts which install fuel pump onto fuel tank.



4) Take off fuel pump from fuel tank.

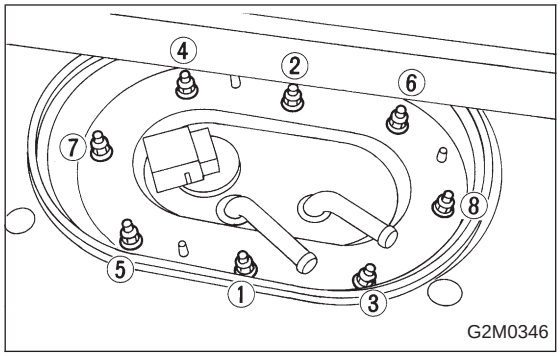
B: INSPECTION



Connect lead harness to connector terminal of fuel pump, and apply a 12 V power supply to check whether the pump operate.

WARNING:

- **Wipe off the fuel completely.**
- **Keep battery as far apart from fuel pump as possible.**
- **Be sure to turn the 12 V supply ON and OFF on the battery side.**
- **Do not run fuel pump for a long time under non-load condition.**



C: INSTALLATION

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

(1) Always use new gaskets.
(2) Ensure sealing portion is free from fuel or foreign particles before installation.
(3) Tighten nuts in numerical sequence shown in Figure to specified torque.

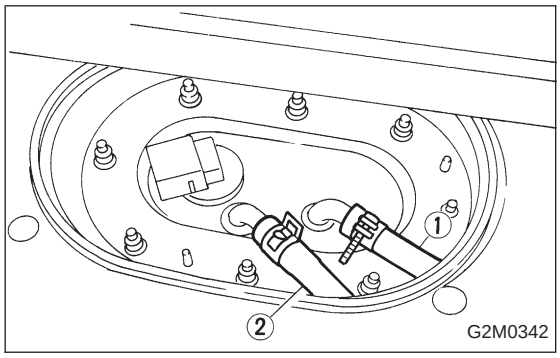
Tightening torque:
4.4±1.5 N·m (0.45±0.15 kg-m, 3.3±1.1 ft-lb)

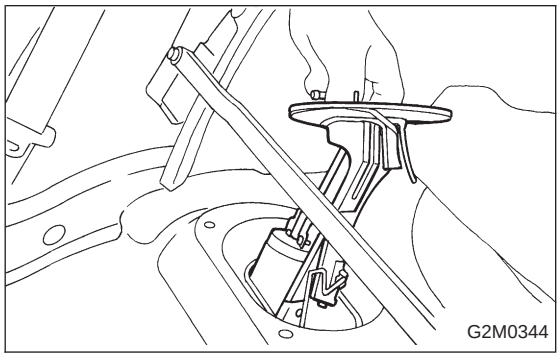
7. Fuel Meter Unit

A: REMOVAL

NOTE:
Fuel meter unit is built in fuel pump assembly.

1) Release fuel pressure. <Ref. to 2-8 [W1A0].>
2) Disconnect fuel delivery hose ① and return hose ②.



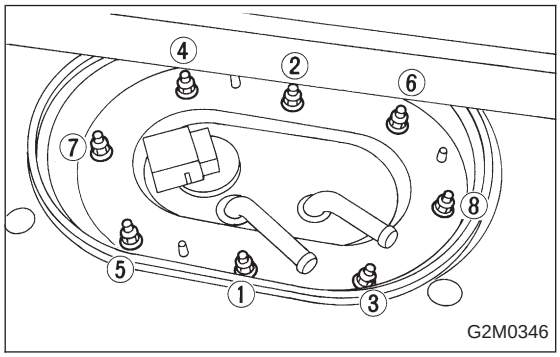


3) Remove nuts which install fuel pump onto fuel tank.
4) Take off fuel pump assembly.

B: INSTALLATION

Installation is in the reverse order of removal. <Ref. to 2-8 [W6C0].>
Tighten nuts in numerical sequence shown in Figure to specified torque.

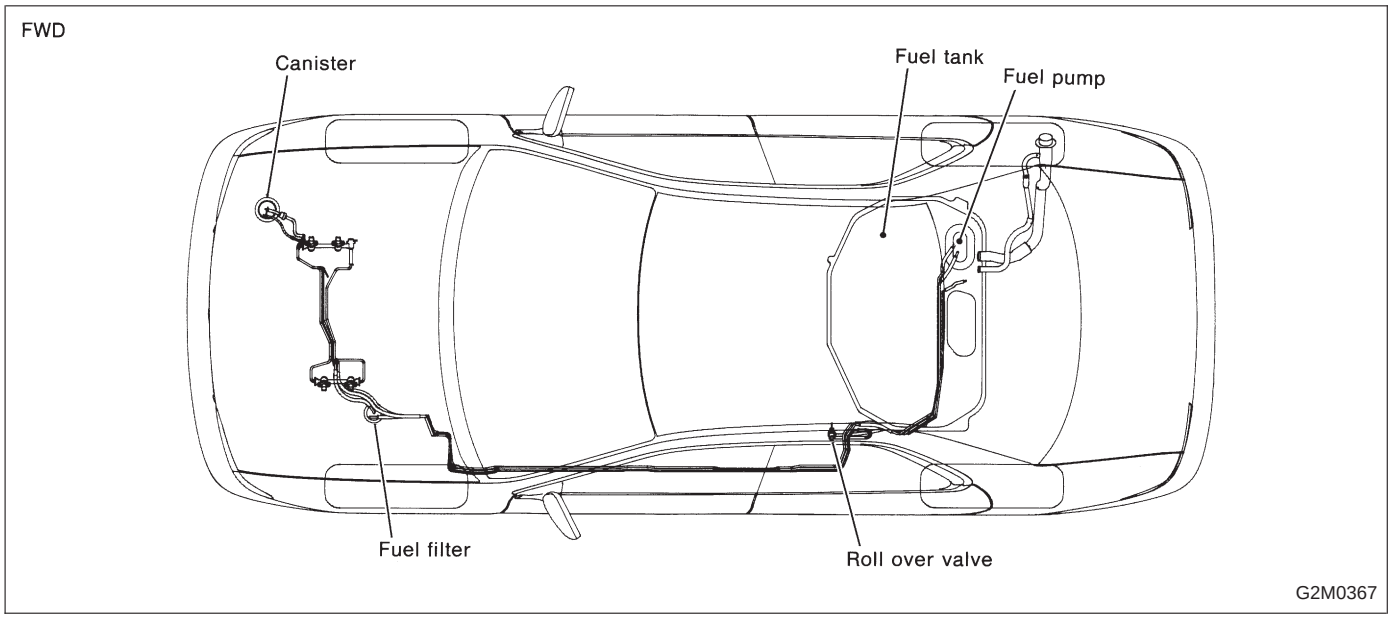
Tightening torque:
4.4±1.5 N·m (0.45±0.15 kg-m, 3.3±1.1 ft-lb)

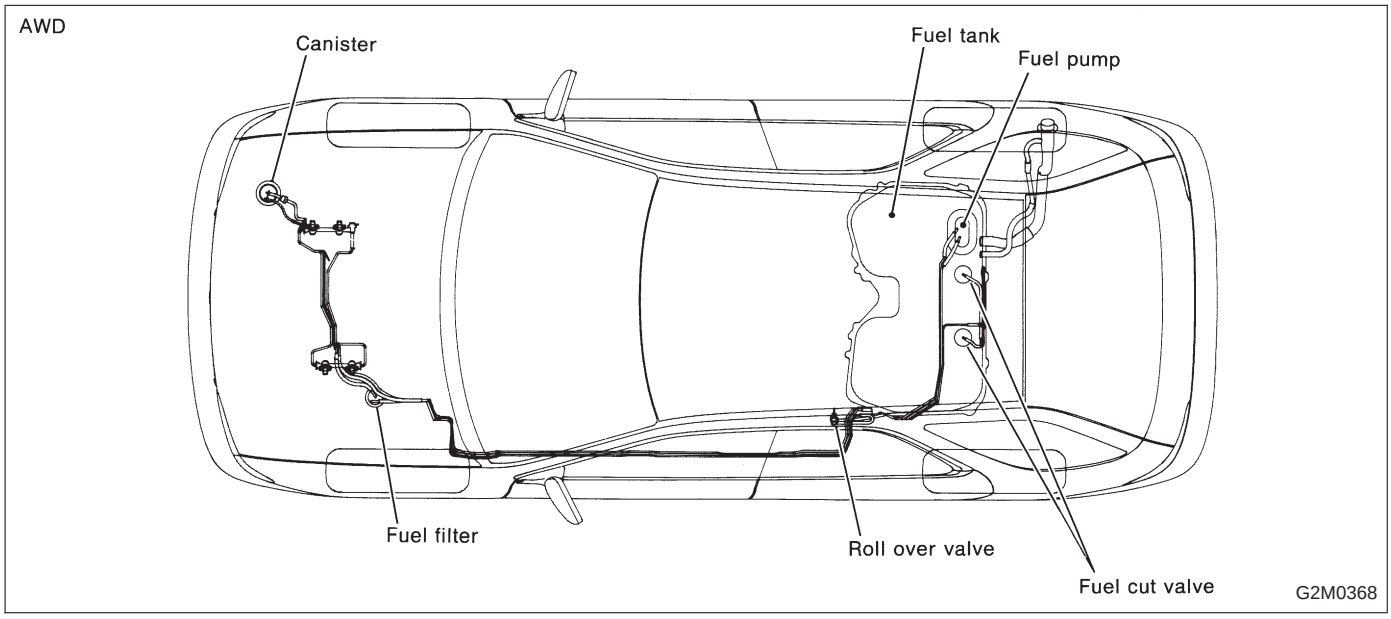


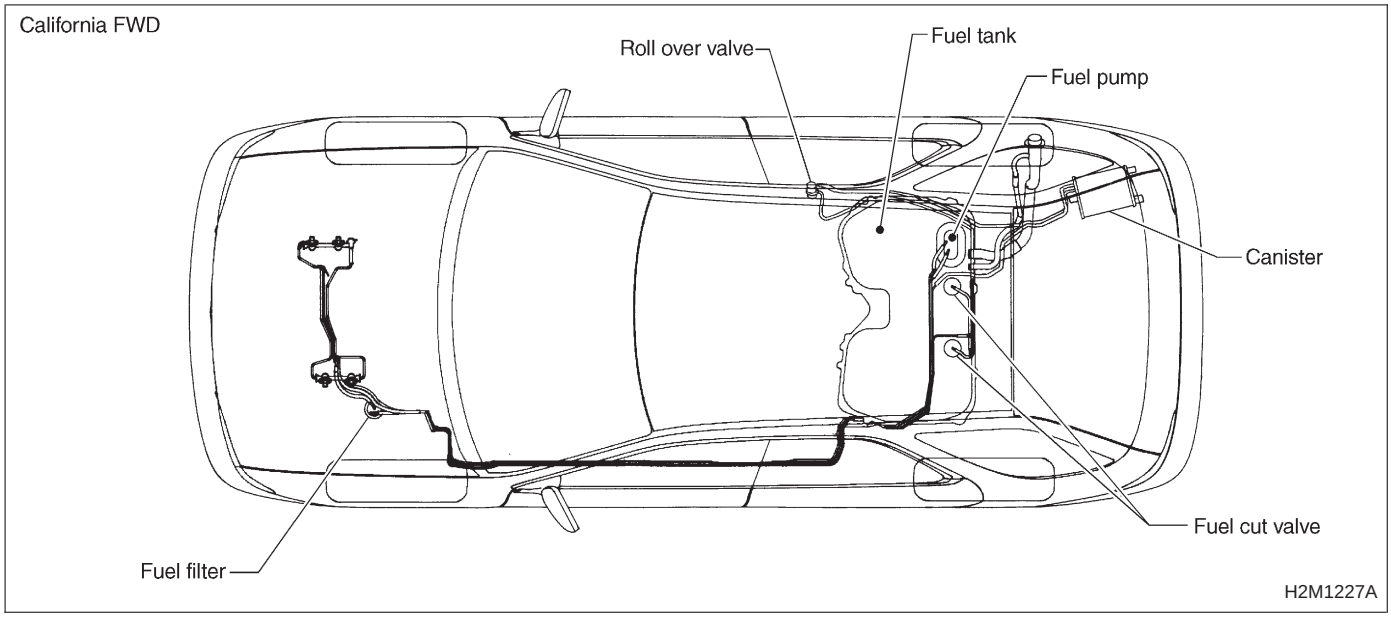
8. Fuel Delivery, Return and Evaporation Lines

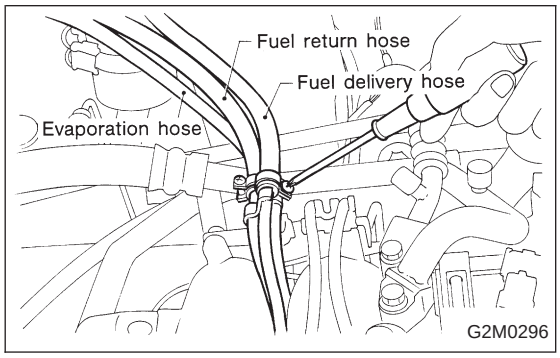
A: REMOVAL

1) Release fuel pressure. <Ref. to 2-8 [W1A0].>
2) Remove inner trim, insulator and rear seat. <Ref. to 5-3 [W2A0], [W3A0].>
3) Remove fuel delivery pipes and hoses, fuel return pipes and hoses, and evaporation pipes and hoses.

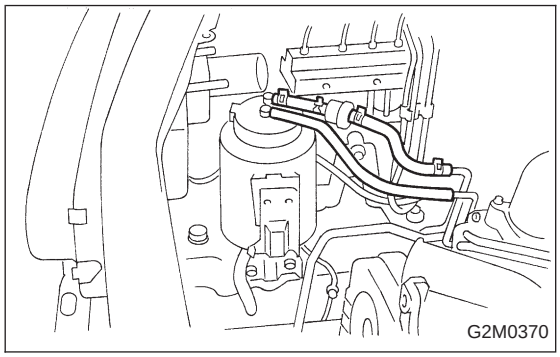




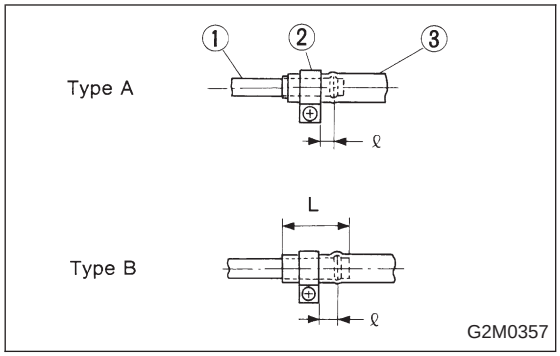




4) In engine compartment, detach fuel delivery hoses, return hoses and evaporation hose.



5) In engine compartment, detach canister hoses from canister. (Except California FWD model)



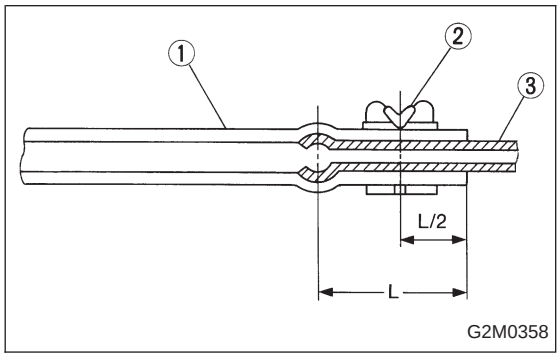
B: INSTALLATION

Installation is in the reverse order of removal.
1) Connect fuel delivery hose to pipe with an overlap of 20 to 25 mm (0.79 to 0.98 in).

Type A: When fitting length is specified.
Type B: When fitting length is not specified.

① Fitting
② Clamp
③ Hose

ℓ : 1.0 — 4.0 mm (0.04 — 0.16 in)
L: 20 — 25 mm (0.79 — 0.98 in)

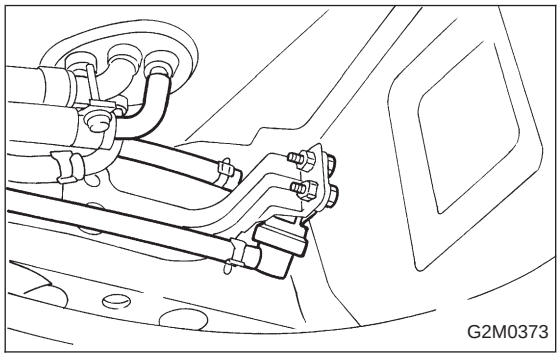


2) Connect evaporation hose to pipe by approx. 15 mm (0.59 in) from hose end.

① Hose
② Clip
③ Pipe

L = 15 — 20 mm (0.59 — 0.79 in)

CAUTION:
Be sure to inspect hoses and their connections for any leakage of fuel.

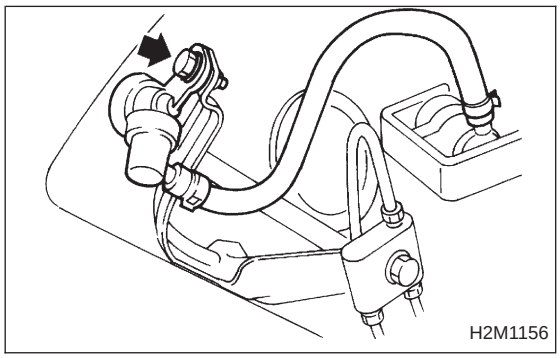


9. Roll Over Valve

A: REMOVAL

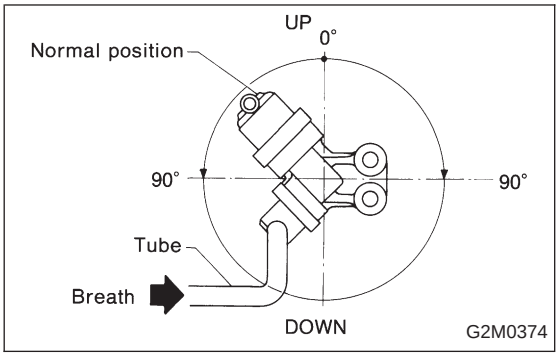
1. EXCEPT CALIFORNIA FWD MODEL

1) Lift up the vehicle.
2) Remove roll over valve with bracket.
3) Disconnect hoses from roll over valve, and remove it from bracket.



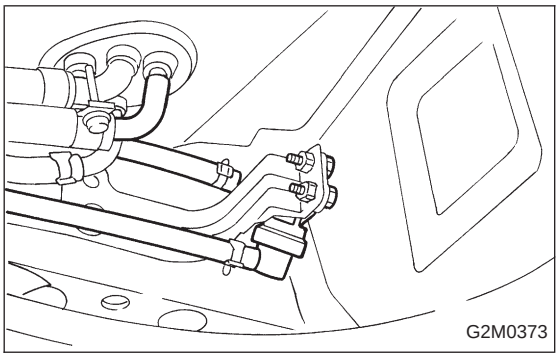
2. CALIFORNIA FWD MODEL

1) Lift up the vehicle.
2) Remove roll over valve from bracket.
3) Disconnect hoses from roll over valve.



B: INSPECTION

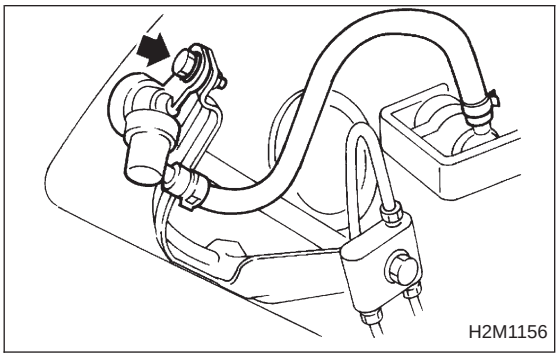
1) Connect hoses to roll over valve as shown in Figure.
2) While blowing through open end of hose, tilt valve at least 90° left and right from normal position.
3) Ensure that there is no air flow when hose is tilted greater than 90°.

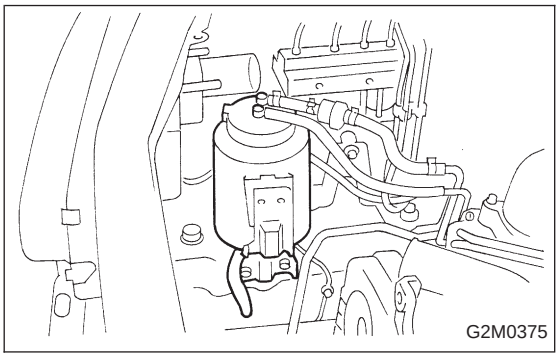


C: INSTALLATION

Installation is in the reverse order of removal.

CAUTION:
- **Do not install top side of valve down.**
- **Before installing bracket on body, securely fit concave part of bracket to hole in body.**





10. Canister

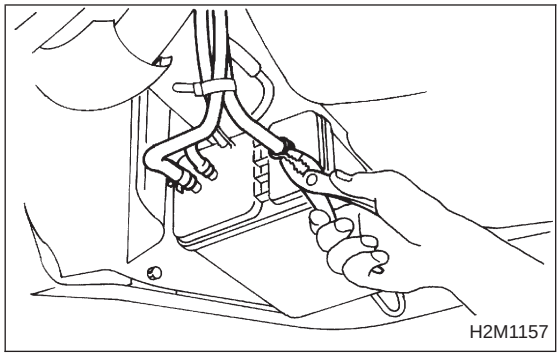
A: REMOVAL AND INSTALLATION

1. EXCEPT CALIFORNIA FWD MODEL

1) Disconnect canister hoses from evaporation pipes.
2) Remove canister with bracket.

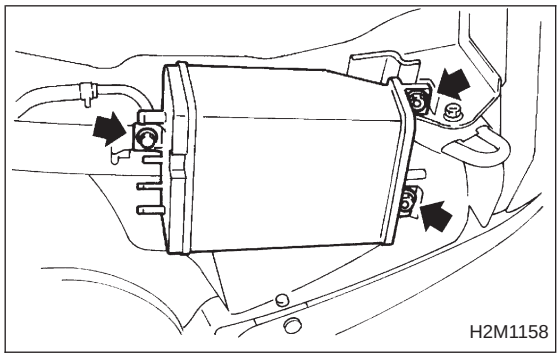
3) Installation is in the reverse order of removal.

CAUTION:
Insert air vent hose of canister into the hole on body.



2. CALIFORNIA FWD MODEL

1) Lift up the vehicle.
2) Disconnect evaporation hoses from canister.

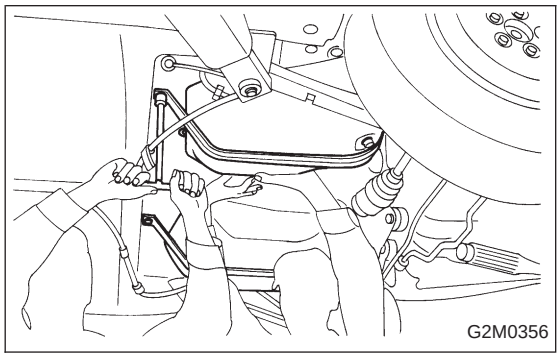


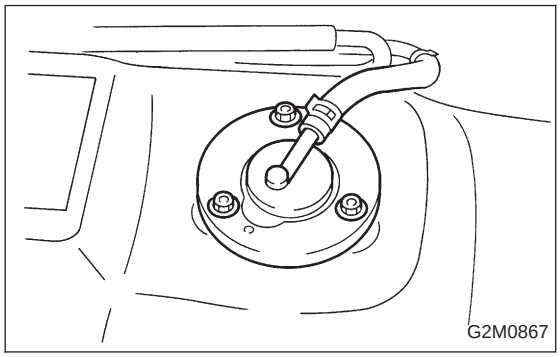
3) Remove canister from body.
4) Installation is in the reverse order of removal.

11. Fuel Cut Valve (AWD and California FWD model)

A: REMOVAL AND INSTALLATION

1) Remove fuel tank. <Ref. to 2-8 [W3A0].>





2) Disconnect evaporation hose from fuel cut valve.
3) Remove fuel cut valve.
4) Installation is in the reverse order of removal procedure.

Tightening torque:
4.4±1.5 N·m (0.45±0.15 kg-m, 3.3±1.1 ft-lb)

1. Fuel System

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 smell inside of compartment		
1)	Loose joints at air breather tube, air vent 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)	Inoperable fuel pump modulator or circuit.	Replace. **Refer to 2-1.**
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.

NOTE:
● When the vehicle is left unattended for an extended period of time, water may accumulate in the fuel tank. To prevent water condensation:
1) Top off the fuel tank or drain the fuel completely.
2) Drain water condensation from the fuel filter.
● Refilling the fuel tank.
1) Refill the fuel tank while there is still some fuel left in the tank.
● 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 Affected areas below.
2) Affected 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.