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FUEL INJECTION (FUEL SYTEMS)

General Description

FUEL INJECTION (FUEL SYSTEMS)

1. General Description

A: SPECIFICATIONS

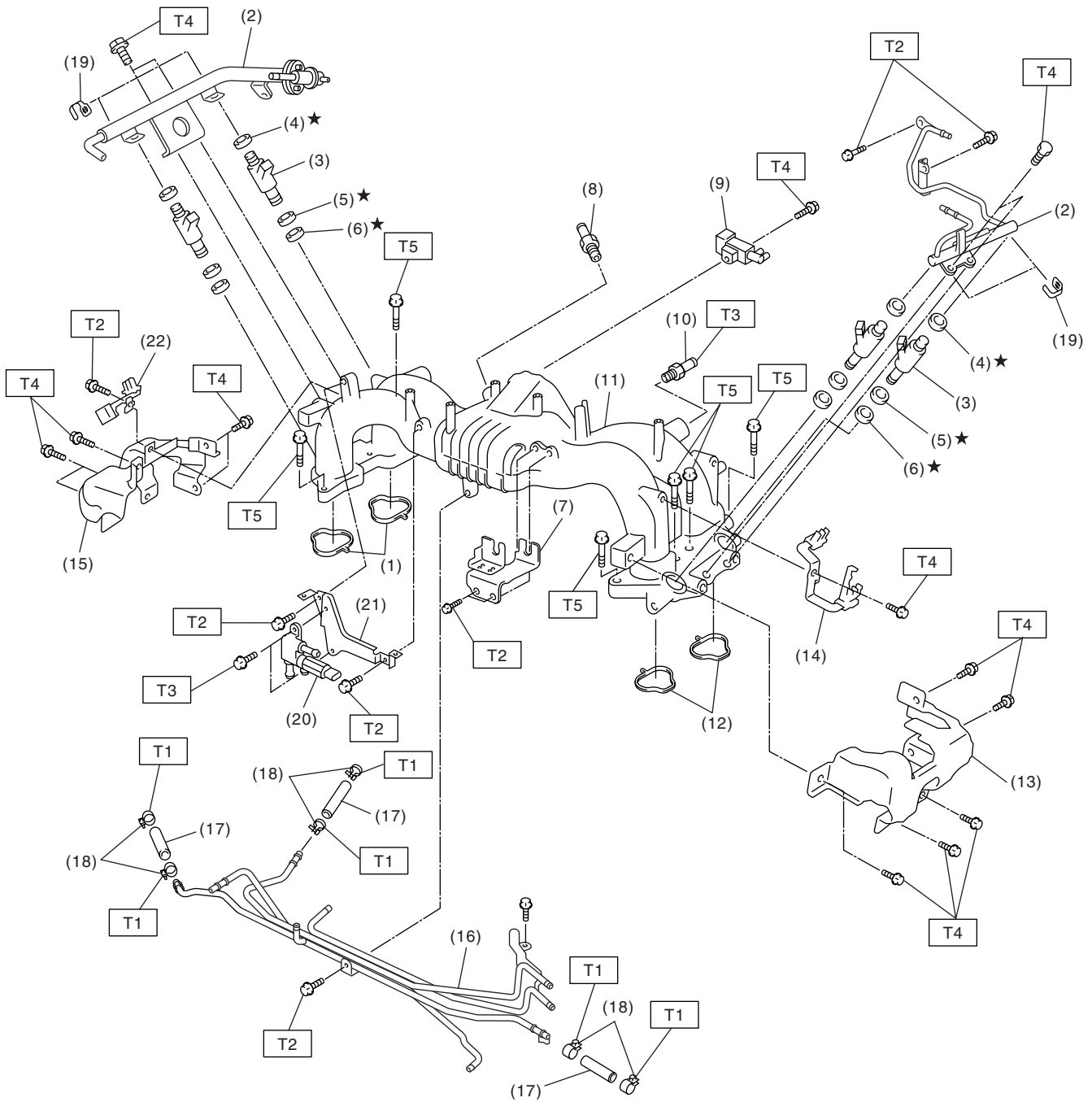
Item		Specification
Fuel tank	Capacity	60 ℓ (15.9 US gal, 13.2 Imp gal)
	Location	Under rear seat
Fuel pump	Type	Impeller
	Shutoff discharge pressure	370 — 677 kPa (3.77 — 6.9 kg/cm ² , 53.6 — 98 psi)
	Discharge flow	More than 65 ℓ (17.2 US gal, 14.3 Imp gal)/h [12 V at 300 kPa (3.06 kg/cm ² , 43.5 psi)]
Fuel filter		Cartridge type

General Description

FUEL INJECTION (FUEL SYSTEMS)

B: COMPONENT

1. INTAKE MANIFOLD



FU-01020

General Description

FUEL INJECTION (FUEL SYSTEMS)

- | | | |
|----------------------------------|---|---|
| (1) Intake manifold gasket RH | (11) Intake manifold | (21) Air assist injector solenoid valve bracket |
| (2) Fuel injector pipe | (12) Intake manifold gasket LH | (22) Plug cord holder RH |
| (3) Fuel injector | (13) Fuel pipe protector LH | |
| (4) O-ring | (14) Plug cord holder LH | |
| (5) O-ring | (15) Fuel pipe protector RH | |
| (6) O-ring | (16) Fuel pipe assembly | |
| (7) Plug | (17) Fuel hose | |
| (8) Nipple | (18) Clip | |
| (9) Purge control solenoid valve | (19) Clip | |
| (10) Nipple | (20) Air assist injector solenoid valve | |

Tightening torque: N-m (kgf-m, ft-lb)

T1: 1.5 (0.15, 1.1)

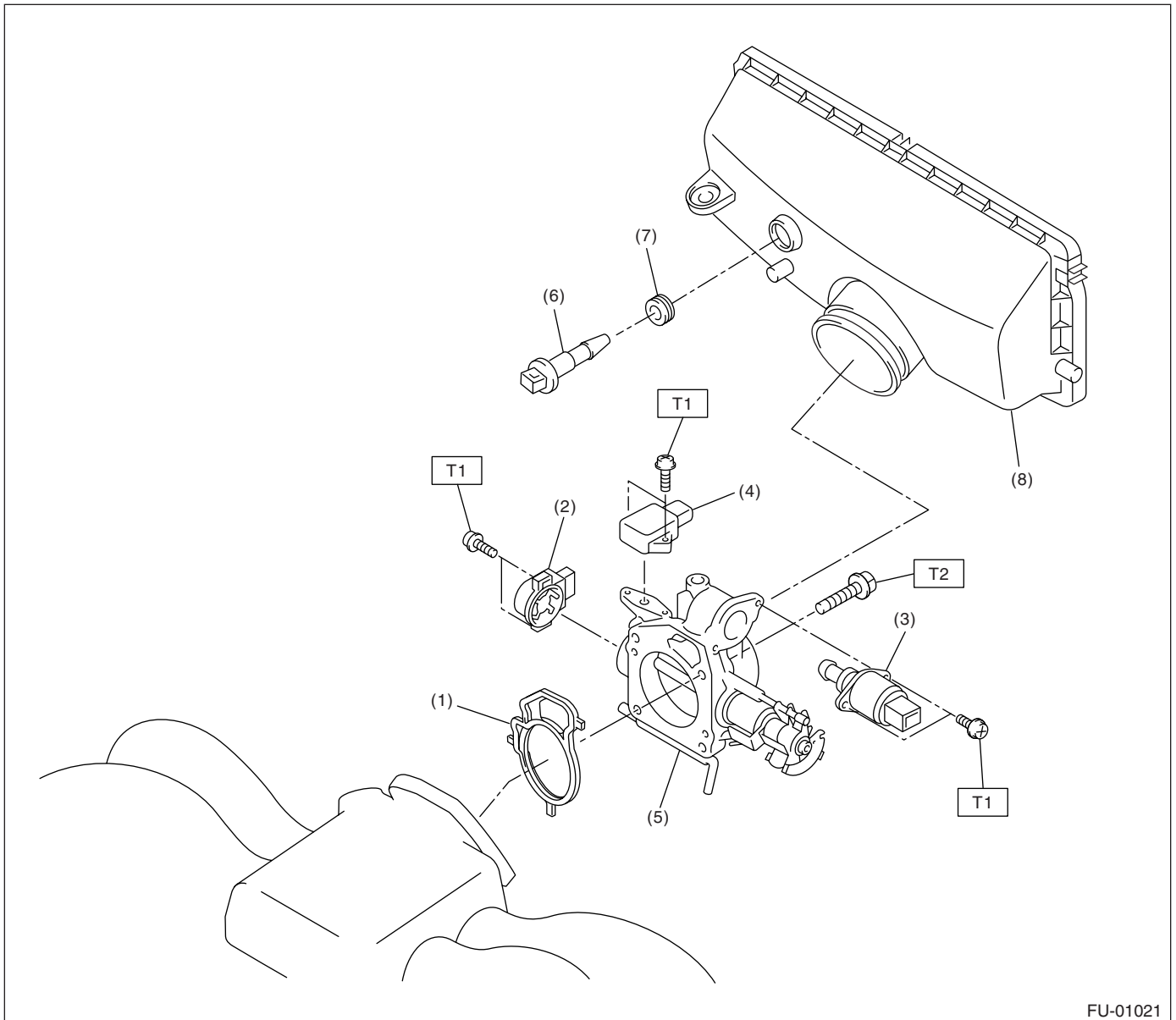
T2: 5.0 (0.51, 3.7)

T3: 17 (1.7, 12.5)

T4: 19 (1.9, 13.7)

T5: 25 (2.5, 18.1)

2. AIR INTAKE SYSTEM



FU-01021

- | | |
|---------------------------------------|-----------------------------------|
| (1) Gasket | (5) Throttle body |
| (2) Throttle position sensor | (6) Intake air temperature sensor |
| (3) Idle air control solenoid valve | (7) Grommet |
| (4) Manifold absolute pressure sensor | (8) Air cleaner case |

Tightening torque: N-m (kgf-m, ft-lb)

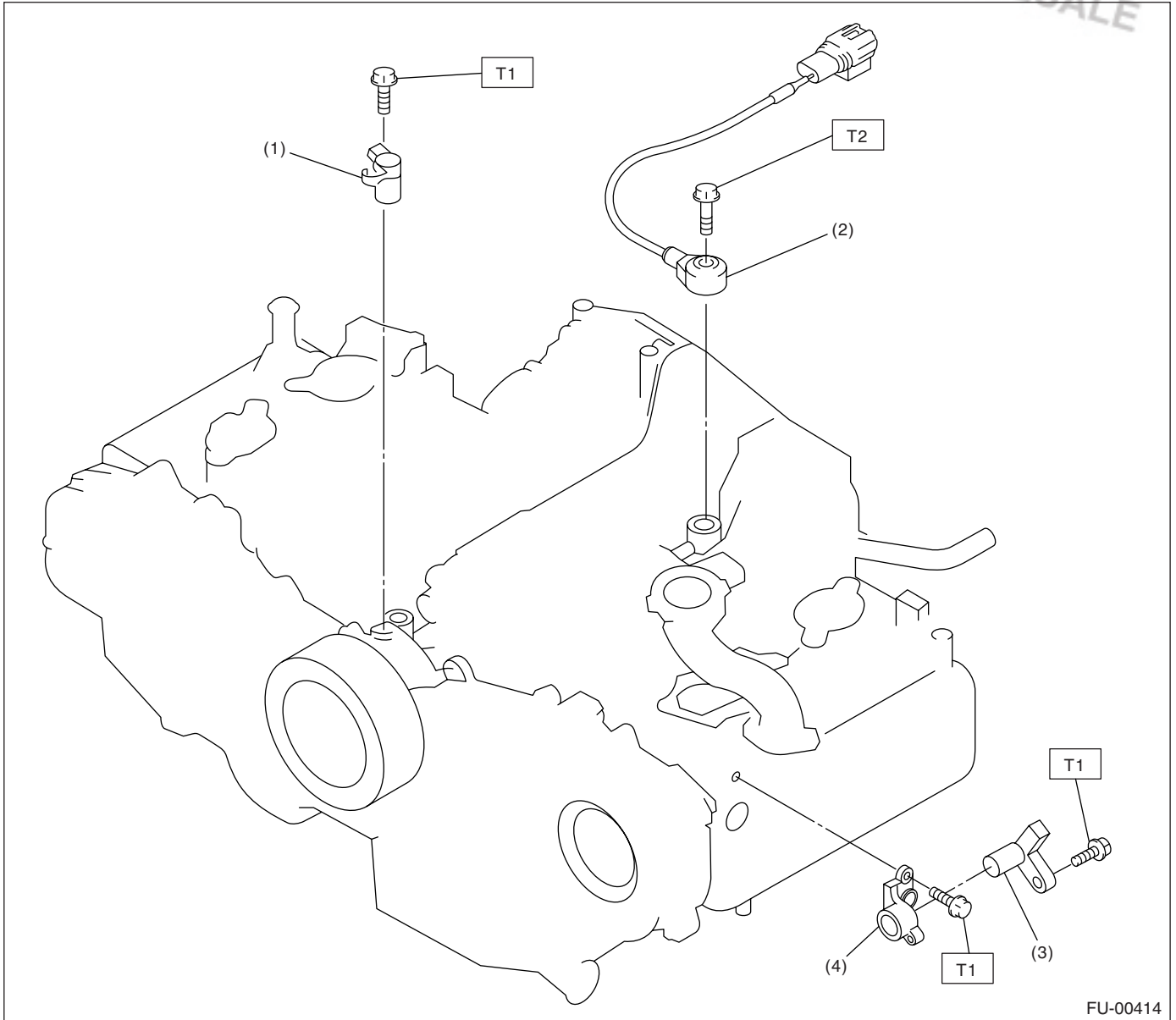
T1: 1.6 (0.16, 1.2)

T2: 22 (2.2, 15.9)

General Description

FUEL INJECTION (FUEL SYSTEMS)

3. CRANKSHAFT POSITION, CAMSHAFT POSITION AND KNOCK SENSORS



FU-00414

- (1) Crankshaft position sensor
- (2) Knock sensor
- (3) Camshaft position sensor

- (4) Camshaft position sensor support

Tightening torque: N·m (kgf·m, ft·lb)

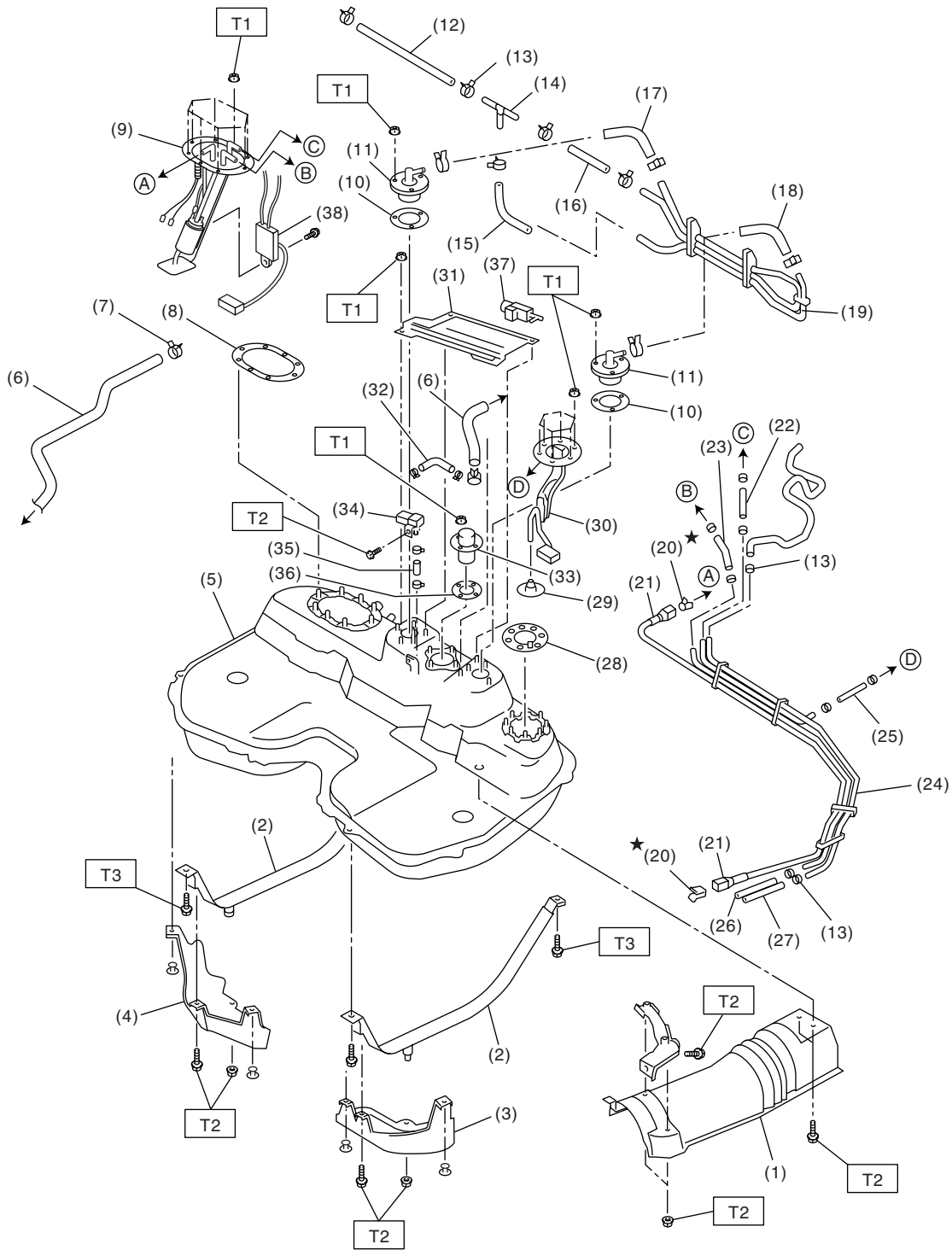
T1: 6.4 (0.65, 4.7)

T2: 24 (2.4, 17.4)

General Description

FUEL INJECTION (FUEL SYSTEMS)

4. FUEL TANK



FU-01030

General Description

FUEL INJECTION (FUEL SYSTEMS)

(1) Heat shield cover	(16) Evaporation hose B	(31) Protector cover
(2) Fuel tank band	(17) Evaporation hose D	(32) Vent valve hose
(3) Protector LH	(18) Evaporation hose E	(33) Vent valve
(4) Protector RH	(19) Evaporation pipe assembly	(34) Fuel tank pressure sensor
(5) Fuel tank	(20) Retainer	(35) Fuel tank pressure sensor hose
(6) Canister hose A	(21) Quick connector	(36) Vent valve gasket
(7) Clamp	(22) Jet pump hose A	(37) Fuel tank sensor control valve
(8) Fuel pump gasket	(23) Fuel return hose A	(38) Fuel level sensor
(9) Fuel pump assembly	(24) Fuel pipe assembly	
(10) Fuel cut valve gasket	(25) Jet pump hose B	
(11) Fuel cut valve	(26) Fuel return hose B	
(12) Evaporation hose A	(27) Evaporation hose F	
(13) Clip	(28) Fuel sub level sensor gasket	
(14) Joint pipe	(29) Jet pump filter	
(15) Evaporation hose C	(30) Fuel sub level sensor	

Tightening torque: N·m (kgf-m, ft-lb)**T1: 4.4 (0.45, 3.3)****T2: 7.4 (0.75, 5.4)****T3: 33 (3.4, 25)**

General Description

FUEL INJECTION (FUEL SYSTEMS)

(1) Clip	(12) Evaporation hose B	(23) Canister holder
(2) Fuel delivery hose A	(13) Joint pipe	(24) Evaporation hose C
(3) Fuel filter bracket	(14) Canister hose A	(25) Pressure control solenoid valve
(4) Fuel filter holder	(15) Drain filter hose A	(26) Canister hose B
(5) Fuel filter cup	(16) Drain valve hose	(27) Canister
(6) Fuel filter	(17) Drain filter hose B	(28) Fuel pipe assembly
(7) Evaporation hose	(18) Drain filter	
(8) Fuel damper	(19) Drain valve	
(9) Fuel delivery hose B	(20) Canister upper bracket	
(10) Fuel return hose	(21) Cushion rubber	
(11) Evaporation hose A	(22) Canister lower bracket	

Tightening torque: N·m (kgf·m, ft·lb)

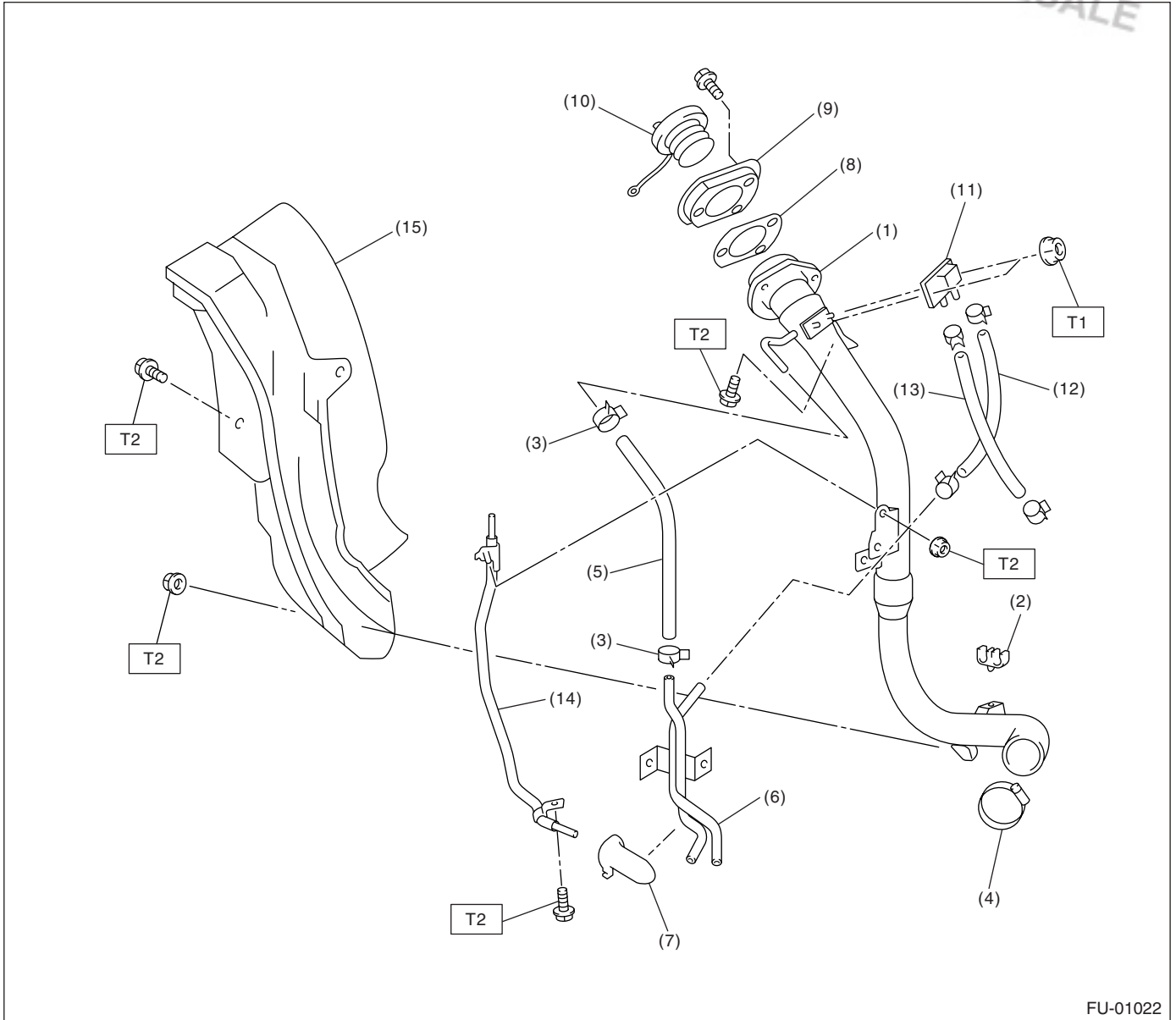
T1: 25 (2.5, 18.1)

T2: 23 (2.3, 16.6)

General Description

FUEL INJECTION (FUEL SYSTEMS)

6. FUEL FILLER PIPE



FU-01022

- | | | |
|-----------------------------|-------------------------|---------------------------------|
| (1) Fuel filler pipe ASSY | (8) Filler pipe packing | (15) Fuel filler pipe protector |
| (2) Evaporation hose holder | (9) Filler ring | |
| (3) Clamp | (10) Filler cap | |
| (4) Clamp | (11) Shut valve | |
| (5) Evaporation hose A | (12) Evaporation hose B | |
| (6) Evaporation pipe | (13) Evaporation hose C | |
| (7) Evaporation pipe holder | (14) Joint pipe | |

Tightening torque: N-m (kgf-m, ft-lb)

T1: 4.4 (0.45, 3.3)

T2: 7.5 (0.76, 5.53)

General Description

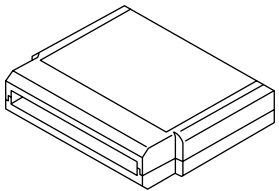

FUEL INJECTION (FUEL SYSTEMS)

C: CAUTION

- Wear working clothing, including a cap, protective goggles, and protective shoes during operation.
- Remove contamination including dirt and corrosion before removal, installation or disassembly.
- Keep the disassembled parts in order and protect them from dust or dirt.
- Before removal, installation or disassembly, be sure to clarify the failure. Avoid unnecessary removal, installation, disassembly, and replacement.

- Be careful not to burn your hands, because each part on the vehicle is hot after running.
- Be sure to tighten fasteners including bolts and nuts to the specified torque.
- Place shop jacks or safety stands at the specified points.
- Before disconnecting electrical connectors of sensors or units, be sure to disconnect the ground cable from battery.
- Place "NO FIRE" signs near the working area.
- Be careful not to spill fuel on the floor.

D: PREPARATION TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST24082AA230	24082AA230	CARTRIDGE	Troubleshooting for electrical systems.
 ST22771AA030	22771AA030	SUBARU SELECT MONITOR KIT	Troubleshooting for electrical systems.

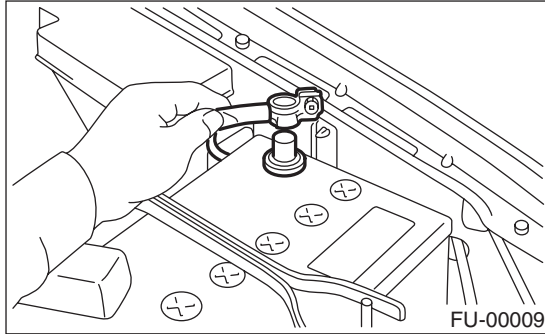
Throttle Body

FUEL INJECTION (FUEL SYSTEMS)

2. Throttle Body

A: REMOVAL

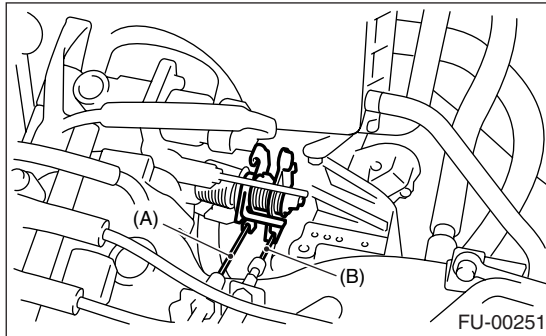
1) Disconnect the ground cable from battery.



2) Remove the air cleaner case. <Ref. to IN(H4SO)-5, REMOVAL, Air Cleaner Case.>

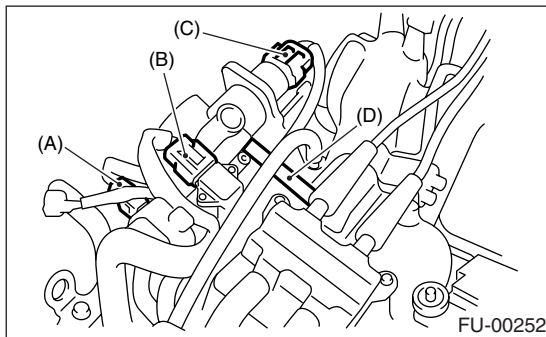
3) Disconnect the accelerator cable (A).

4) Disconnect the cruise control cable (B). (Model with cruise control)



5) Disconnect the connectors from idle air control solenoid valve, throttle position sensor and manifold absolute pressure sensor.

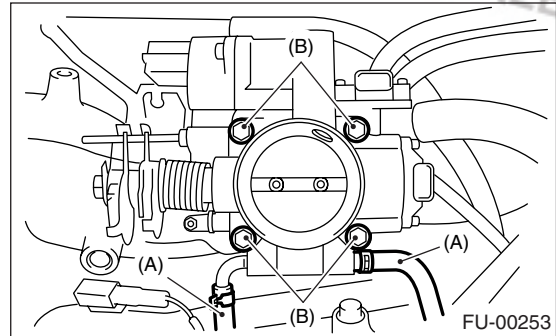
6) Disconnect the air by-pass hose from the throttle body.



- (A) Throttle position sensor
- (B) Manifold absolute pressure sensor
- (C) Idle air control solenoid valve
- (D) Air by-pass hose

7) Disconnect the engine coolant hoses (A) from the throttle body.

8) Remove the bolts (B) which install throttle body to the intake manifold.



B: INSTALLATION

1) Install in the reverse order of removal.

NOTE:

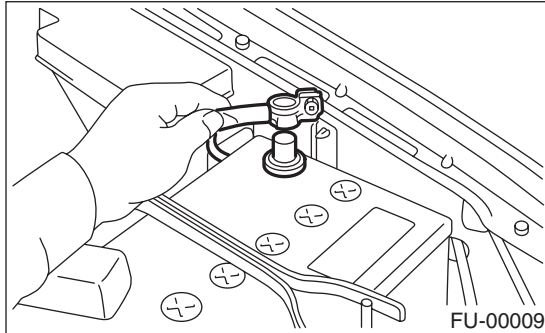
For tightening torque, refer to "COMPONENT". <Ref. to FU(H4SO)-3, COMPONENT, General Description.>

2) Adjust the accelerator cable play. <Ref. to SP(H4SO)-6, INSTALLATION, Accelerator Control Cable.>

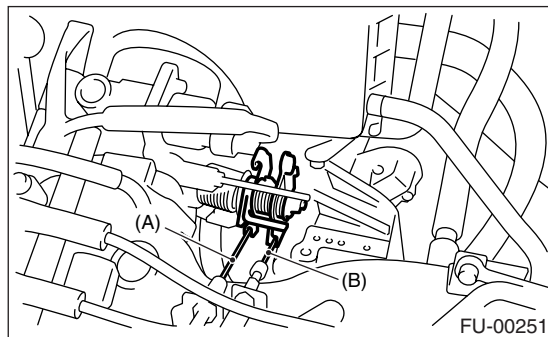
3. Intake Manifold

A: REMOVAL

- 1) Release fuel pressure. <Ref. to FU(H4SO)-47, RELEASING OF FUEL PRESSURE, PROCEDURE, Fuel.>
- 2) Open the fuel flap lid, and remove the fuel filler cap.
- 3) Disconnect the ground cable from battery.



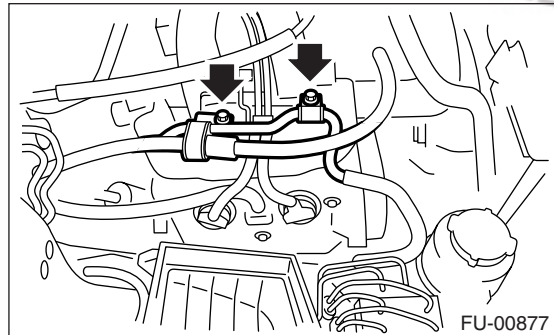
- 4) Remove the air intake duct and air cleaner case. <Ref. to IN(H4SO)-6, REMOVAL, Air Intake Duct.> A <Ref. to IN(H4SO)-5, REMOVAL, Air Cleaner Case.>
- 5) Disconnect the accelerator cable (A).
- 6) Disconnect the cruise control cable (B). (vehicles with cruise control)



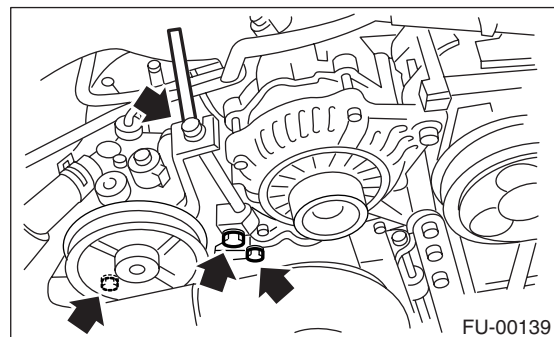
- 7) Remove the power steering pump and reservoir tank from bracket.
 - (1) Remove the resonator chamber. <Ref. to IN(H4SO)-7, REMOVAL, Resonator Chamber.>
 - (2) Remove the front side V-belt. <Ref. to ME(H4SO)-39, REMOVAL, V-belt.>
 - (3) Remove the bolts which hold power steering pipes onto the intake manifold protector.

NOTE:

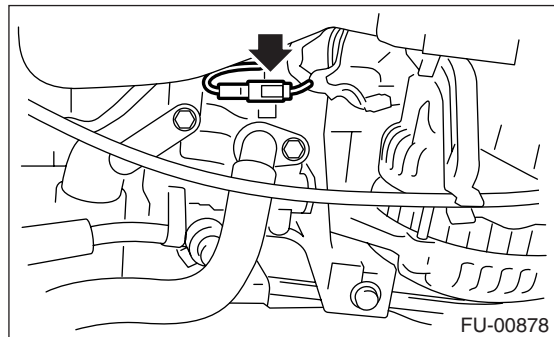
Do not disconnect the power steering hose.



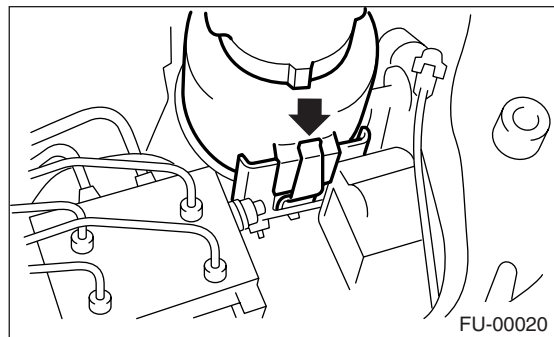
- (4) Remove the bolts which install power steering pump bracket.



- (5) Disconnect the connector from the power steering pump switch.



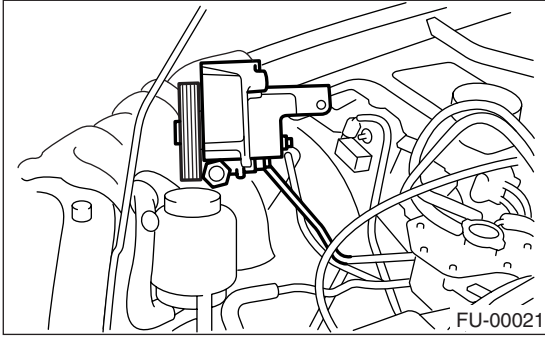
- (6) Remove the reservoir tank from the bracket by pulling it upwards.



Intake Manifold

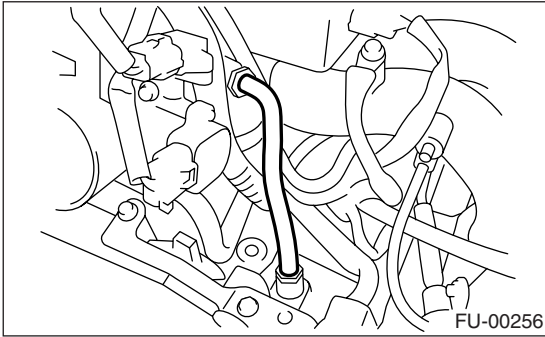
FUEL INJECTION (FUEL SYSTEMS)

(7) Place the power steering pump on the right side wheel apron.

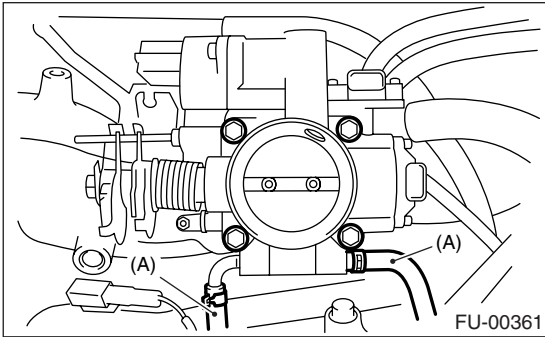


8) Disconnect the spark plug cords from the spark plugs.

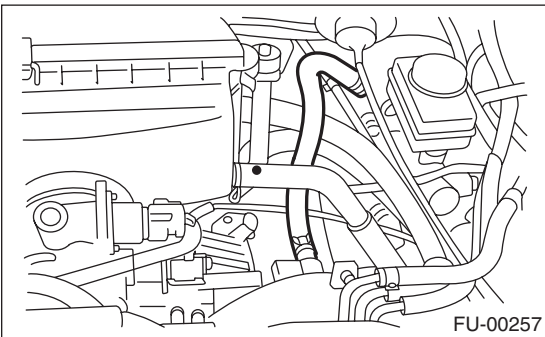
9) Disconnect the PCV hose from the intake manifold.



10) Disconnect the engine coolant hoses (A) from the throttle body.



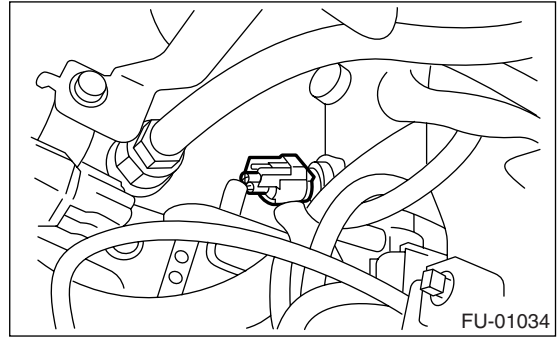
11) Disconnect the brake booster hose.



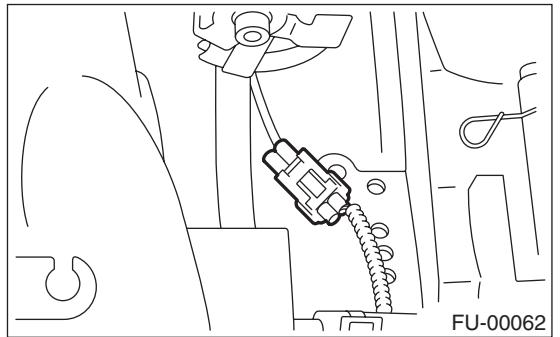
12) Remove the air cleaner case stay RH and engine harness bracket, and disconnect the engine harness connectors from the bulkhead harness connectors.



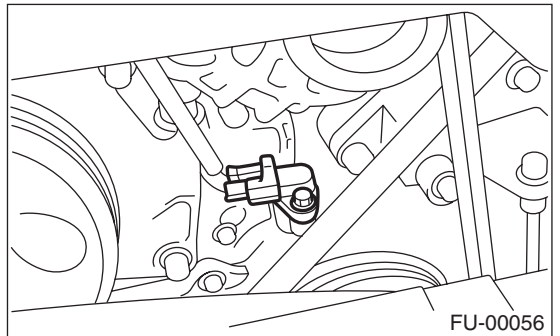
13) Disconnect the connector from engine coolant temperature sensor.



14) Disconnect the knock sensor connector.



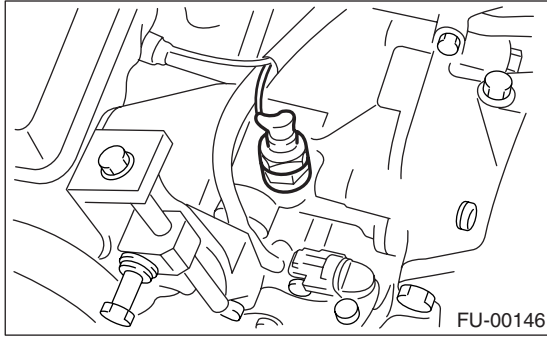
15) Disconnect the connector from crankshaft position sensor.



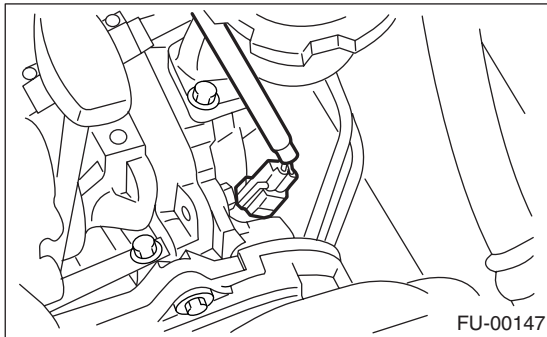
Intake Manifold

FUEL INJECTION (FUEL SYSTEMS)

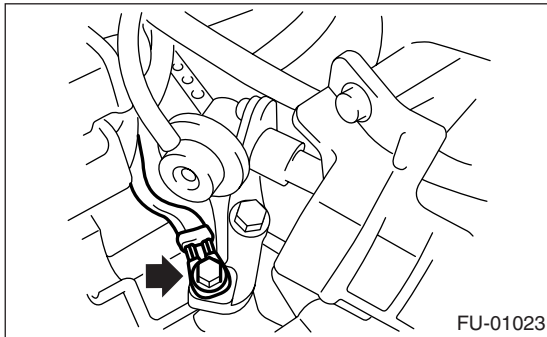
16) Disconnect the connector from oil pressure switch.



17) Disconnect the connector from the camshaft position sensor.



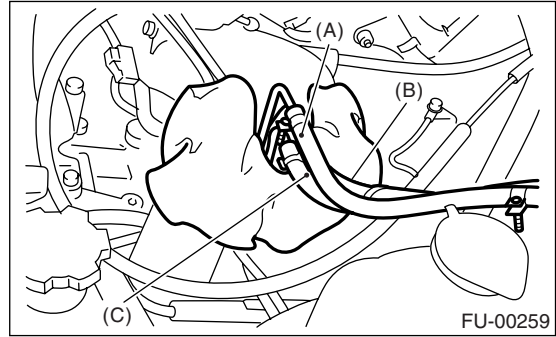
18) Disconnect the engine ground terminal from ground stay.



19) Disconnect the fuel hoses from the fuel pipes.

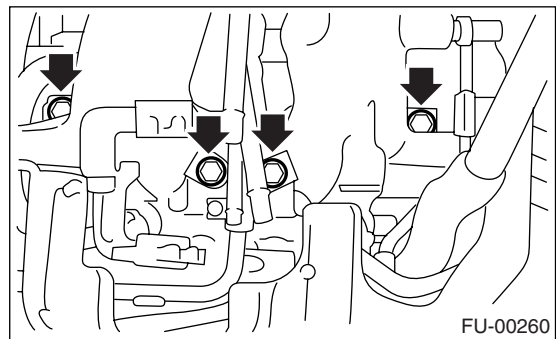
WARNING:

- Do not spill fuel.
- Catch fuel from hoses in a container or cloth.



- (A) Fuel delivery hose
- (B) Return hose
- (C) Evaporation hose

20) Remove the bolts which hold intake manifold onto the cylinder heads.



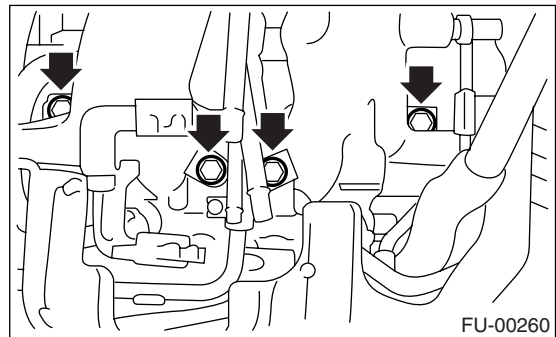
21) Remove the intake manifold.

B: INSTALLATION

1) Install the intake manifold onto the cylinder heads.

Tightening torque:

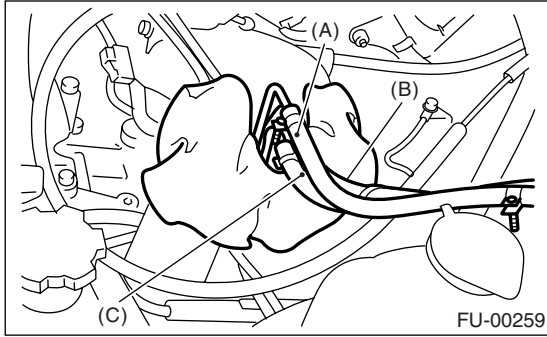
25 N·m (2.5 kgf·m, 18.1 ft·lb)



Intake Manifold

FUEL INJECTION (FUEL SYSTEMS)

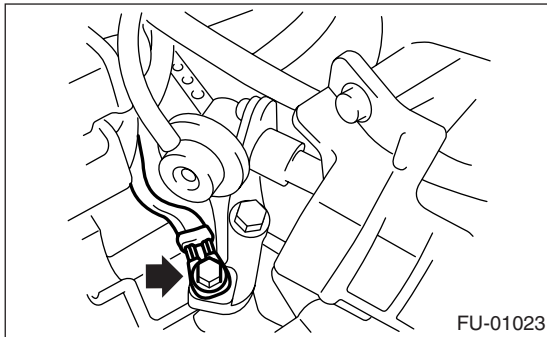
2) Connect the fuel hoses.



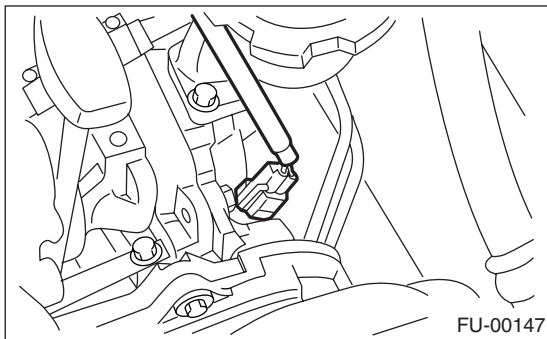
- (A) Fuel delivery hose
- (B) Return hose
- (C) Evaporation hose

3) Connect the engine ground terminal to ground stay.

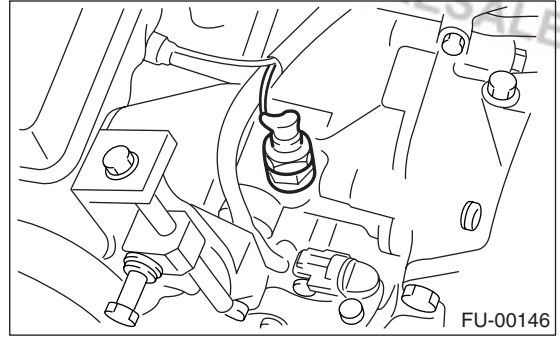
Tightening torque:
19 N·m (1.9 kgf-m, 13.7 ft-lb)



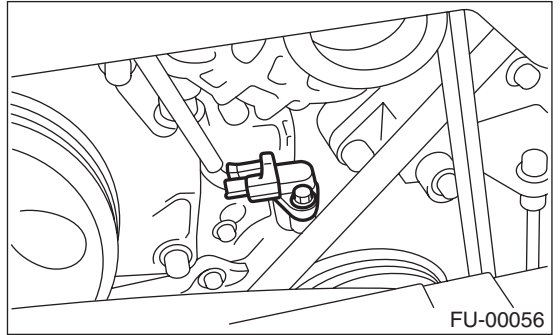
4) Connect the connector to the camshaft position sensor.



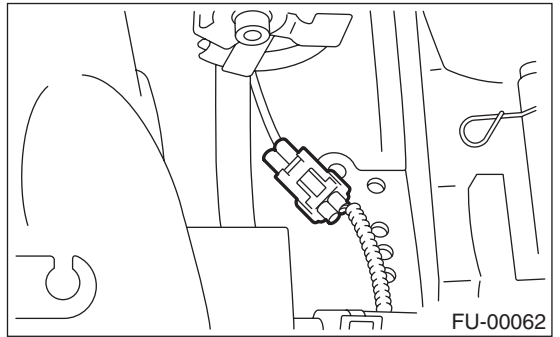
5) Connect the connector to the oil pressure switch.



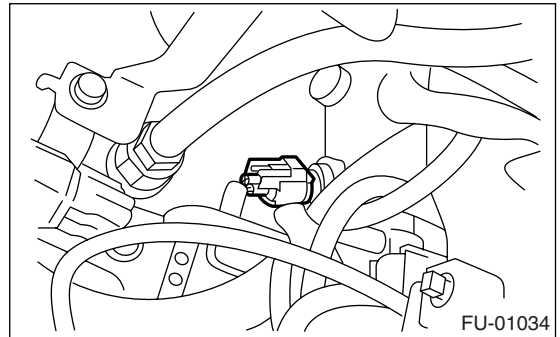
6) Connect the connector to the crankshaft position sensor.



7) Connect the knock sensor connector.



8) Connect the connectors to the engine coolant temperature sensor.



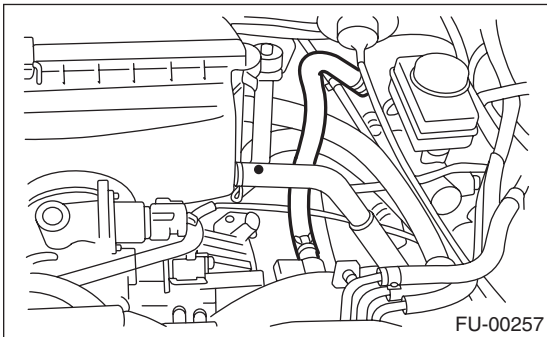
Intake Manifold

FUEL INJECTION (FUEL SYSTEMS)

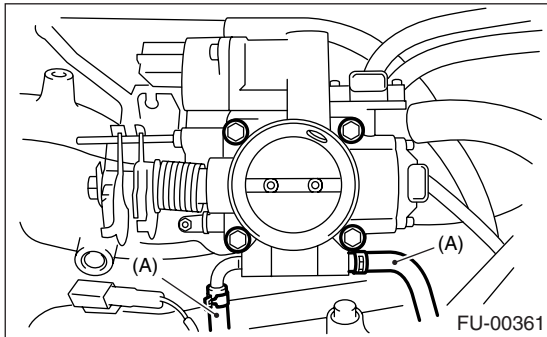
9) Install the air cleaner case stay RH and engine harness bracket, and connect the engine harness connectors to the bulkhead connectors.



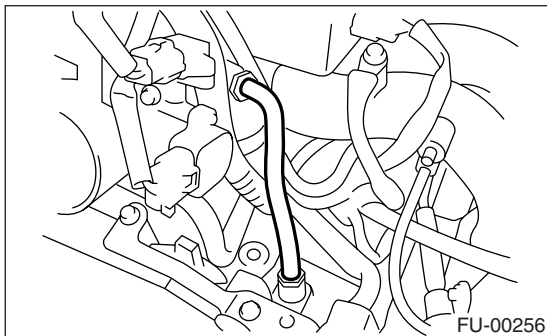
10) Connect the brake booster hose.



11) Connect the engine coolant hose (A) to the throttle body.



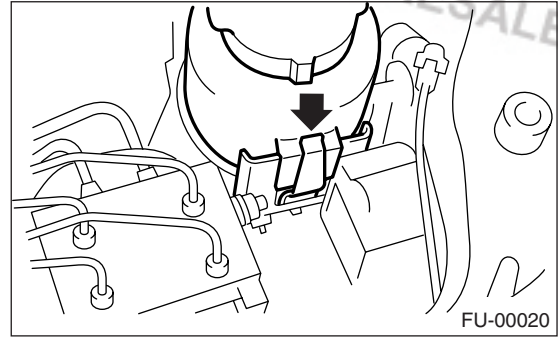
12) Connect the PCV hose to the intake manifold.



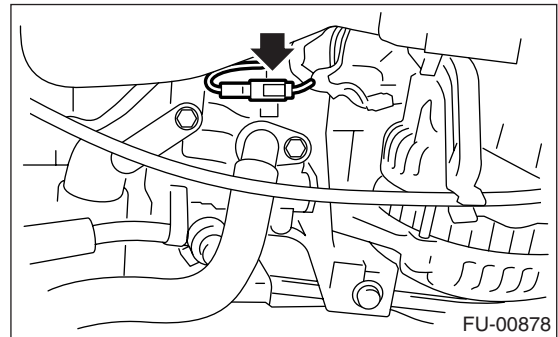
13) Connect the spark plug cords to the spark plugs.

14) Install the power steering pump and reservoir tank to bracket.

(1) Install the reservoir tank to bracket.



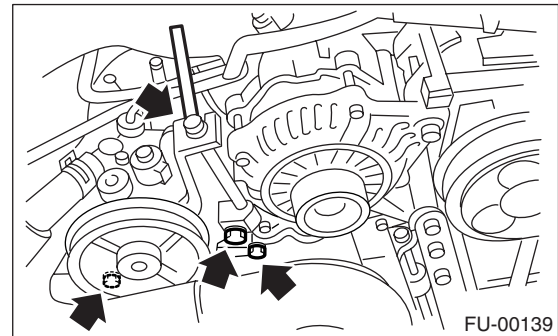
(2) Connect the connector to the power steering pump switch.



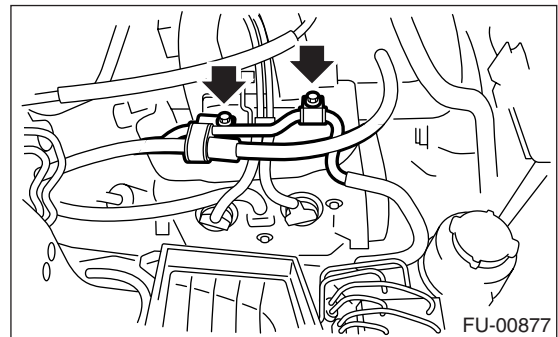
(3) Tighten the bolts which install power steering pump bracket.

Tightening torque:

22 N·m (2.2 kgf-m, 15.9 ft-lb)



(4) Install the power steering pipes onto the right side intake manifold protector.

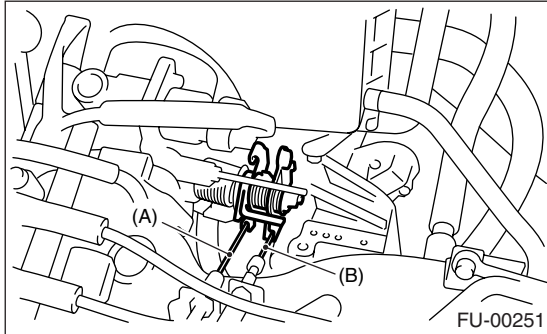


(5) Install the front side V-belt. <Ref. to ME(H4SO)-39, INSTALLATION, V-belt.>

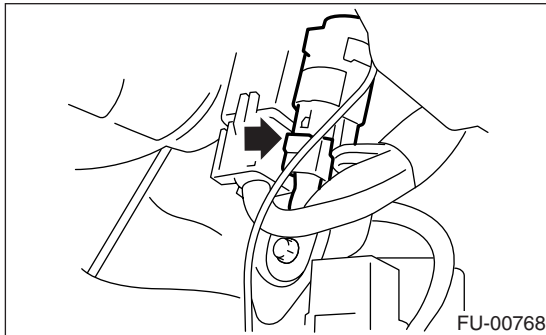
Intake Manifold

FUEL INJECTION (FUEL SYSTEMS)

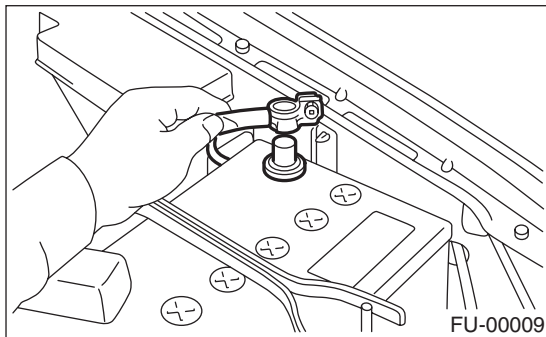
- (6) Install the resonator chamber. <Ref. to IN(H4SO)-7, INSTALLATION, Resonator Chamber.>
- 15) Connect the accelerator cable (A).
- 16) Connect the cruise control cable (B). (Model with cruise control)



- 17) Install the air intake duct and air cleaner case. <Ref. to IN(H4SO)-6, INSTALLATION, Air Intake Duct.>, <Ref. to IN(H4SO)-5, INSTALLATION, Air Cleaner Case.>
- 18) Connect the connector to the fuel pump relay.



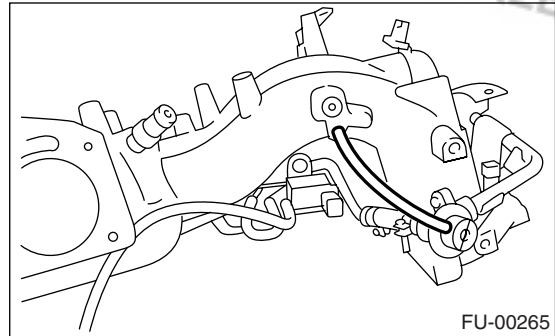
- 19) Connect the battery ground cable to battery.



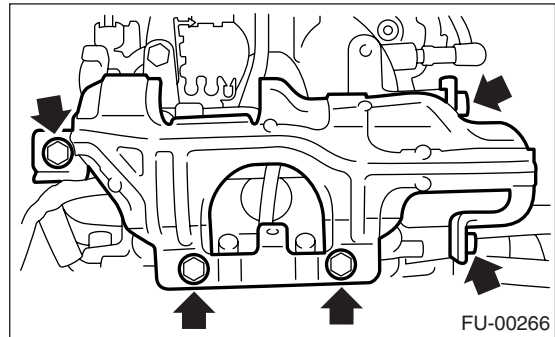
C: DISASSEMBLY

- 1) Remove the ignition coil & ignitor ASSY. <Ref. to IG(H4SO)-7, REMOVAL, Ignition Coil & Ignitor ASSY.>
- 2) Remove the throttle body. <Ref. to FU(H4SO)-12, REMOVAL, Throttle Body.>
- 3) Remove the air assist injector solenoid valve from the intake manifold. <Ref. to FU(H4SO)-33, REMOVAL, Air Assist Injector Solenoid Valve.>

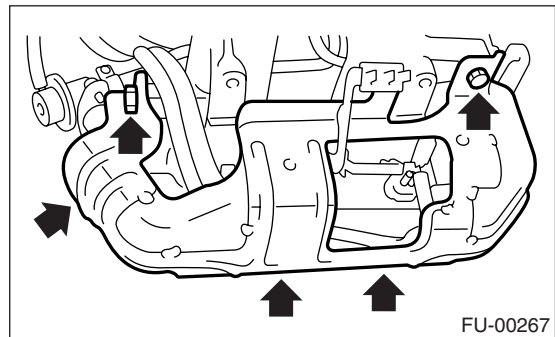
- 4) Disconnect the pressure regulator vacuum hose from the intake manifold.



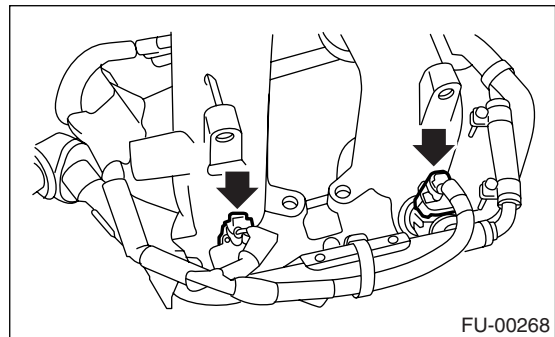
- 5) Remove the fuel pipe protector LH.



- 6) Remove the fuel pipe protector RH.



- 7) Disconnect the connectors from the fuel injectors.

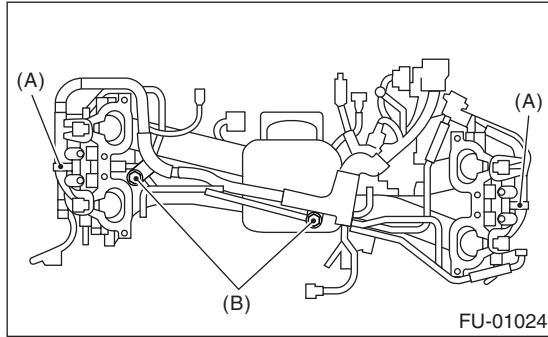


- 8) Disconnect the purge control solenoid valve. <Ref. to EC(H4SO)-6, REMOVAL, Purge Control Solenoid Valve.>

Intake Manifold

FUEL INJECTION (FUEL SYSTEMS)

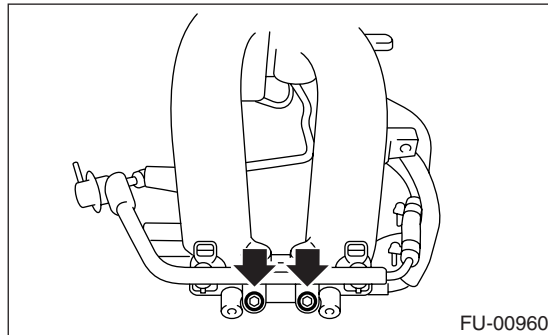
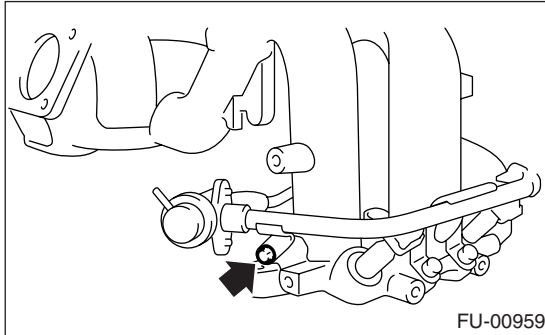
9) Remove the harness bands (A) and bolts (B) which hold the engine harness onto intake manifold.



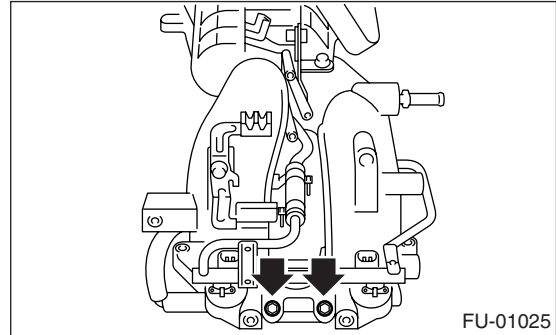
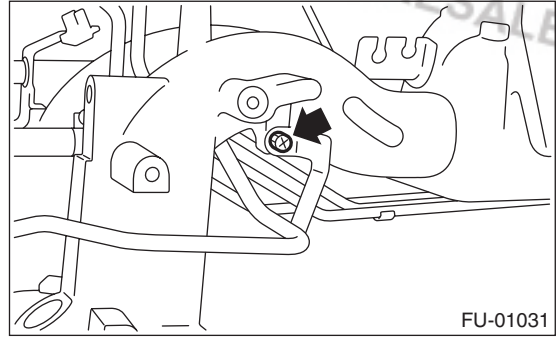
10) Remove the engine harness from the intake manifold.

11) Remove the bolt which installs injector pipe on the intake manifold as shown in figure.

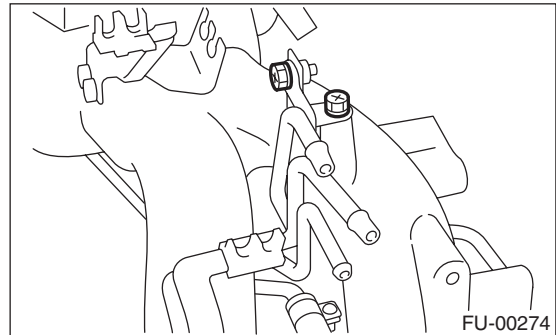
• RH SIDE



• LH SIDE

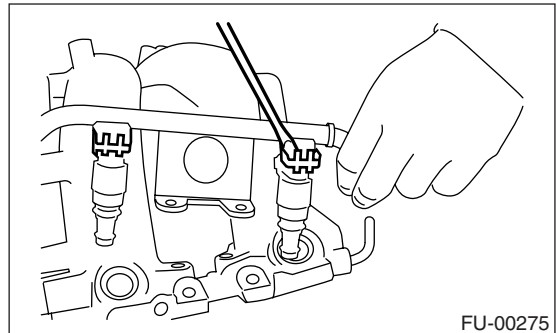


12) Remove the two bolts which hold fuel pipes on the left side of intake manifold.



13) Remove the fuel injector.

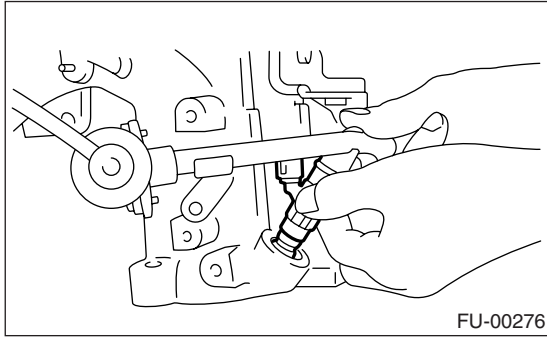
(1) Remove the fuel injector securing clip.



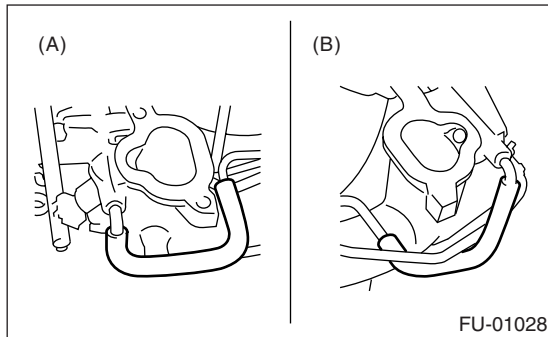
Intake Manifold

FUEL INJECTION (FUEL SYSTEMS)

(2) Remove the fuel injector while lifting up the fuel injector pipe.

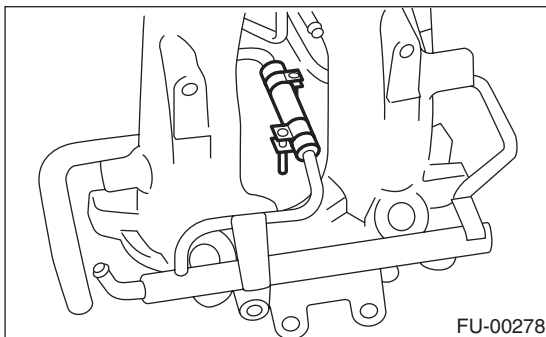


14) Disconnect the air by-pass hoses from the intake manifold.

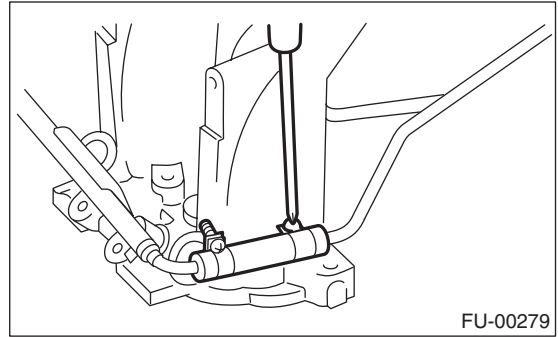


- (A) LH side
- (B) RH side

15) Loosen the clamp which holds the fuel injector pipe LH to fuel hose, and then remove the fuel injector pipe LH from fuel hose.

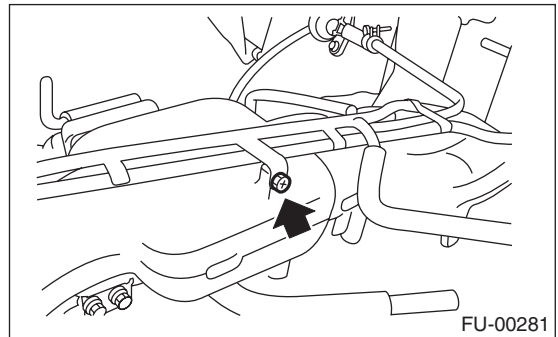


16) Loosen the clamp which holds the fuel injector pipe RH to fuel hose, and then remove the fuel injector pipe RH from fuel hose.



17) Remove the fuel injector pipe.

18) Remove the bolt which installs the fuel pipes on the intake manifold.



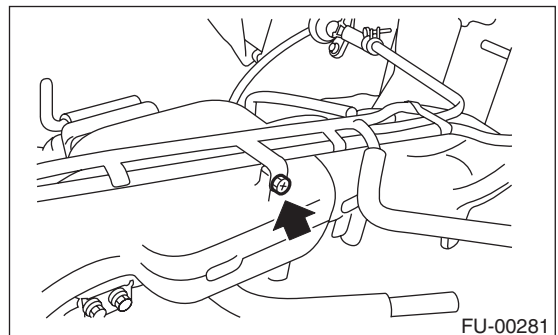
19) Remove the fuel pipe assembly and pressure regulator, from the intake manifold.

D: ASSEMBLY

- 1) Install the fuel pipe assembly and pressure regulator to the intake manifold.
- 2) Tighten the bolt which installs the fuel pipes on the intake manifold.

Tightening torque:

5.0 N·m (0.51 kgf·m, 3.7 ft·lb)

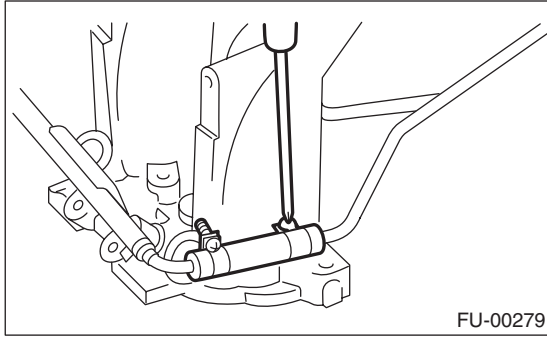


3) Install the fuel injector pipe.

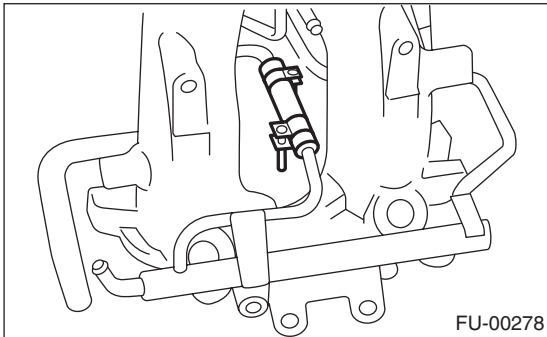
Intake Manifold

FUEL INJECTION (FUEL SYSTEMS)

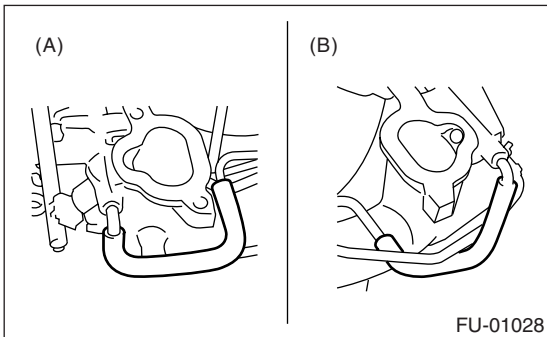
4) Connect the fuel injector pipe RH to fuel hose, and then tighten the clamp screw.



5) Connect the fuel injector pipe LH to fuel hose, and then tighten the clamp screw.



6) Connect the air by-pass hoses.

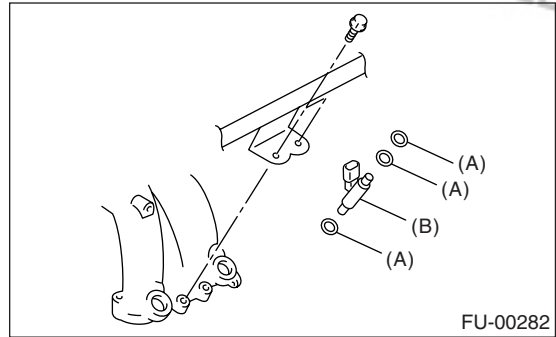


- (A) LH side
- (B) RH side

7) Install the fuel injectors.

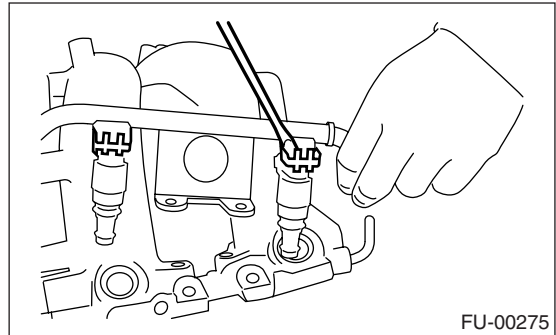
NOTE:

- Replace the O-rings with new ones.



- (A) O-ring
- (B) Fuel injector

- Do not forget to install the fuel injector securing clip.

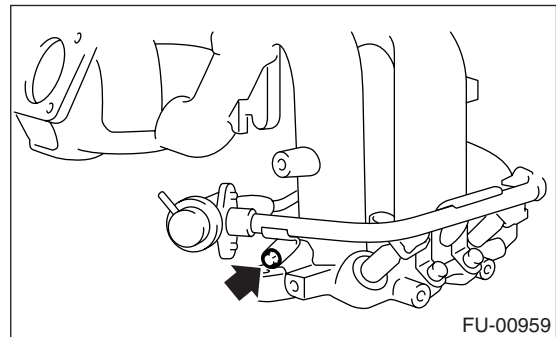


8) Tighten the bolt which installs the injector pipe on the intake manifold.

- **RH SIDE**

Tightening torque:

5.0 N·m (0.51 kgf·m, 3.7 ft·lb)

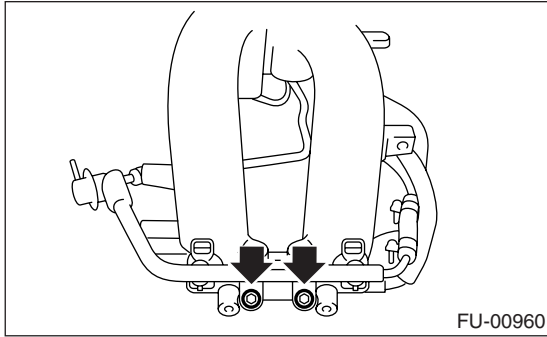


Intake Manifold

FUEL INJECTION (FUEL SYSTEMS)

Tightening torque:

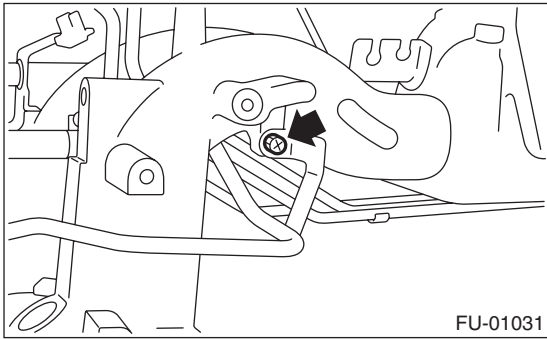
19 N·m (1.9 kgf·m, 13.7 ft·lb)



• LH SIDE

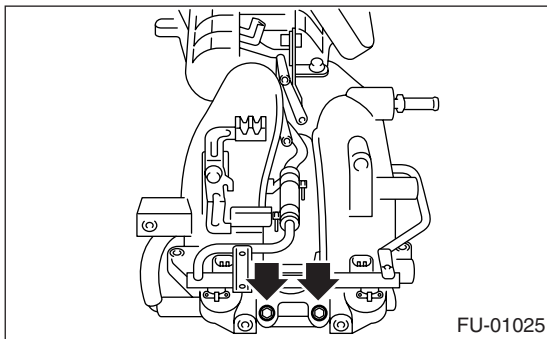
Tightening torque:

5.0 N·m (0.51 kgf·m, 3.7 ft·lb)



Tightening torque:

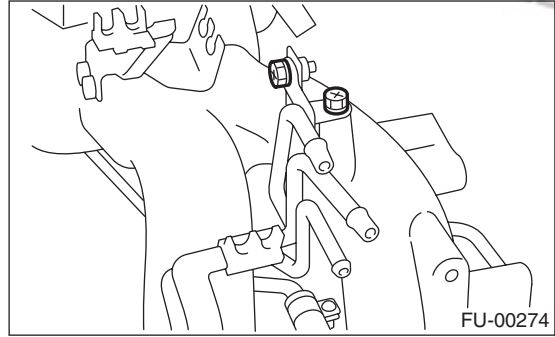
19 N·m (1.9 kgf·m, 13.7 ft·lb)



9) Tighten the two bolts which install the fuel pipes on intake manifold.

Tightening torque:

5.0 N·m (0.51 kgf·m, 3.7 ft·lb)

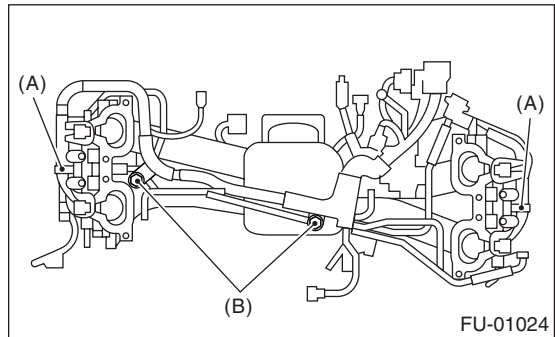


10) Install the engine harness onto the intake manifold.

11) Hold the engine harness by harness band (A) and bolts (B).

Tightening torque:

16 N·m (1.6 kgf·m, 11.8 ft·lb)

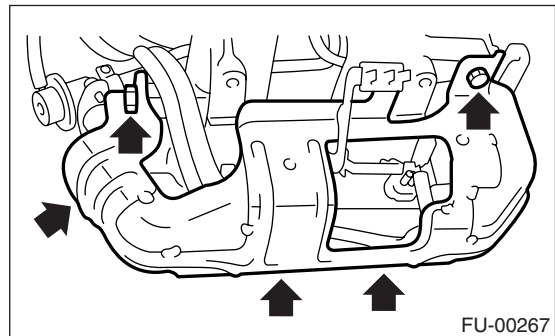


12) Connect the connector to fuel injector

13) Install the fuel pipe protector RH.

Tightening torque:

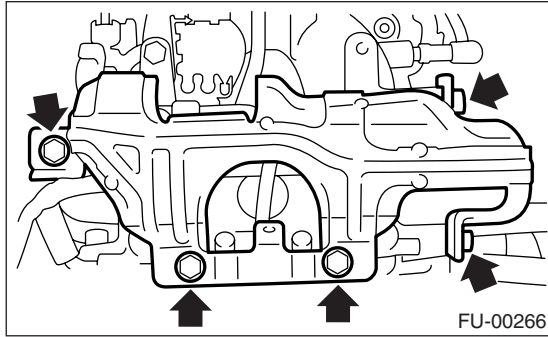
19 N·m (1.9 kgf·m, 13.7 ft·lb)



14) Install the fuel pipe protector LH.

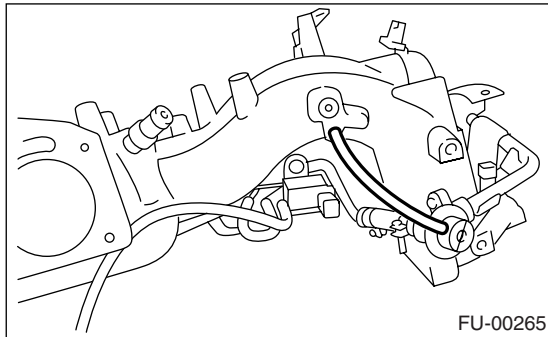
Tightening torque:

19 N·m (1.9 kgf·m, 13.7 ft·lb)



15) Install the purge control solenoid valve. <Ref. to EC(H4SO)-6, INSTALLATION, Purge Control Solenoid Valve.>

16) Connect the pressure regulator vacuum hose to the intake manifold.



17) Install the air assist injector solenoid valve to the bracket. <Ref. to FU(H4SO)-33, INSTALLATION, Air Assist Injector Solenoid Valve.>

18) Install the throttle body to the intake manifold. <Ref. to FU(H4SO)-12, INSTALLATION, Throttle Body.>

19) Install the ignition coil & ignitor ASSY. <Ref. to IG(H4SO)-7, INSTALLATION, Ignition Coil & Ignitor ASSY.>

E: INSPECTION

Make sure the fuel pipe and fuel hoses are not cracked and that connections are tight.

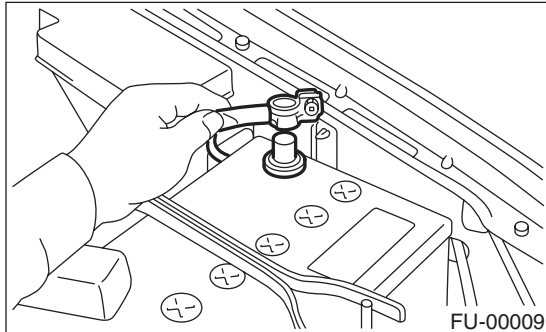
Engine Coolant Temperature Sensor

FUEL INJECTION (FUEL SYSTEMS)

4. Engine Coolant Temperature Sensor

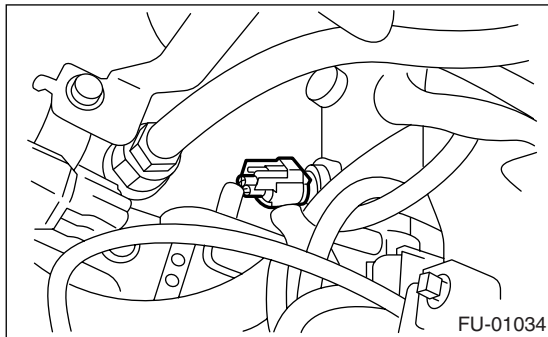
A: REMOVAL

1) Disconnect the ground cable from battery.



2) Remove the air intake duct and air cleaner assembly. <Ref. to IN(H4SO)-6, REMOVAL, Air Intake Duct.>, <Ref. to IN(H4SO)-5, REMOVAL, Air Cleaner Case.>

3) Disconnect the connector from engine coolant temperature sensor.



4) Remove the engine coolant temperature sensor.

B: INSTALLATION

Install in the reverse order of removal.

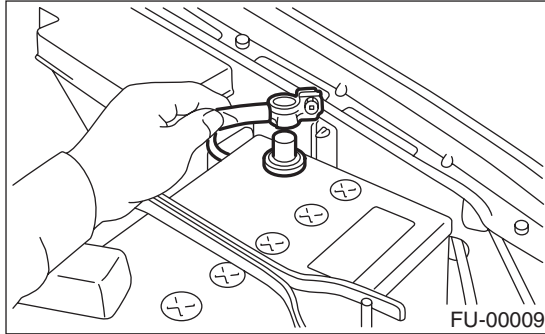
Tightening torque:

18 N·m (1.8 kgf-m, 13.0 ft-lb)

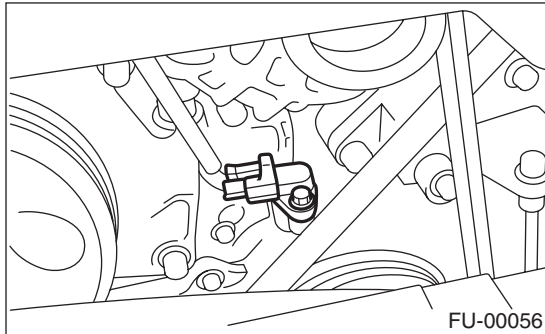
5. Crankshaft Position Sensor

A: REMOVAL

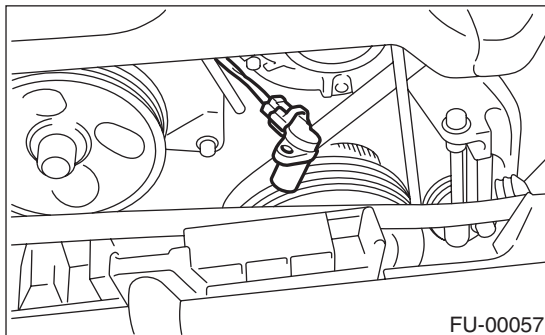
1) Disconnect the ground cable from battery.



2) Remove the bolt which install crankshaft position sensor to the cylinder block.



3) Remove the crankshaft position sensor, and disconnect the connector from the sensor.



B: INSTALLATION

Install in the reverse order of removal.

NOTE:

For tightening torque, refer to "COMPONENT".
<Ref. to FU(H4SO)-3, COMPONENT, General Description.>

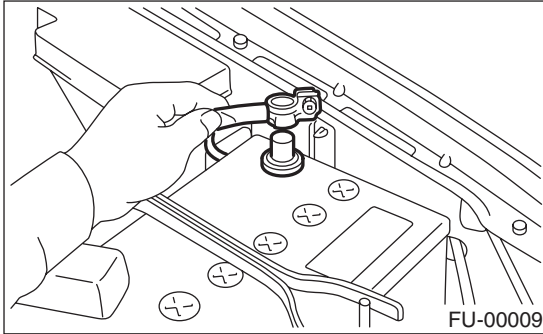
Camshaft Position Sensor

FUEL INJECTION (FUEL SYSTEMS)

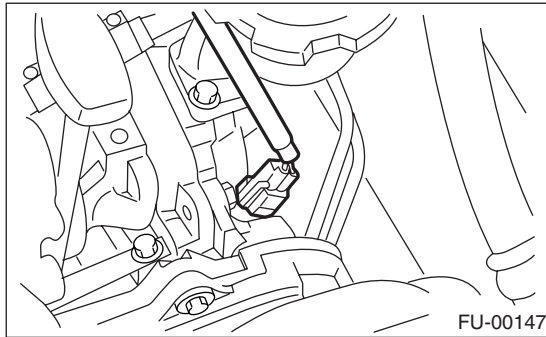
6. Camshaft Position Sensor

A: REMOVAL

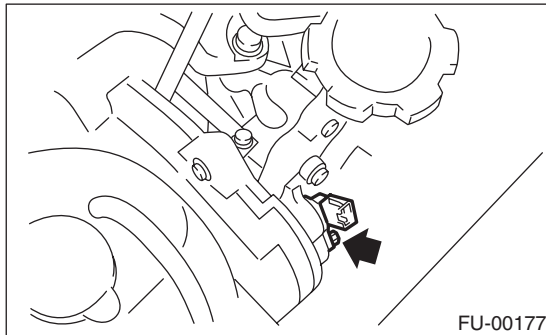
1) Disconnect the ground cable from battery.



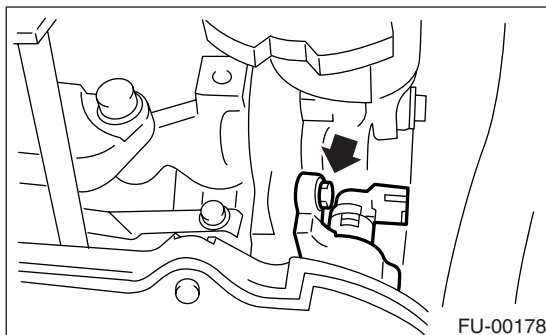
2) Disconnect the connector from the camshaft position sensor.



3) Remove the bolt which installs camshaft position sensor to the camshaft position sensor support.

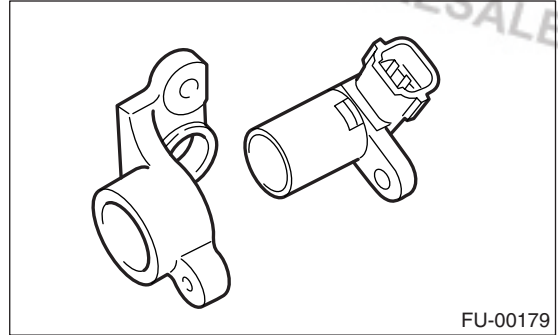


4) Remove the bolt which installs camshaft position sensor support to the camshaft cap LH.



5) Remove the camshaft position sensor and camshaft position sensor support as a unit.

6) Remove the camshaft position sensor itself.



B: INSTALLATION

Install in the reverse order of removal.

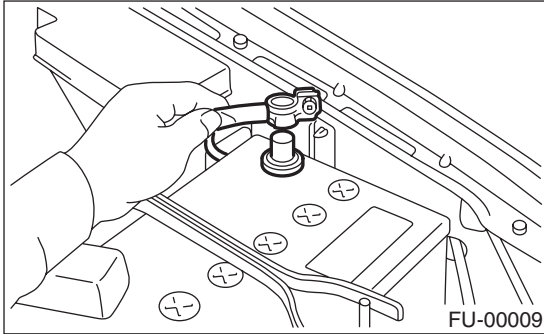
NOTE:

For tightening torque, refer to "COMPONENT".
<Ref. to FU(H4SO)-3, COMPONENT, General Description.>

7. Knock Sensor

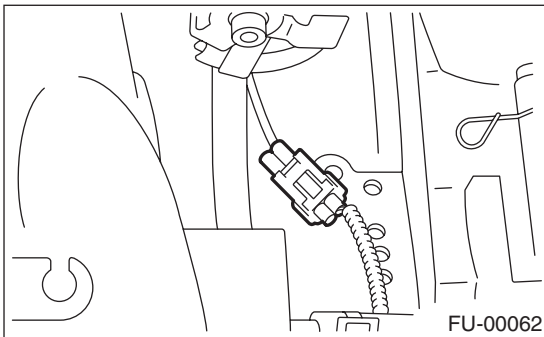
A: REMOVAL

1) Disconnect the ground cable from battery.

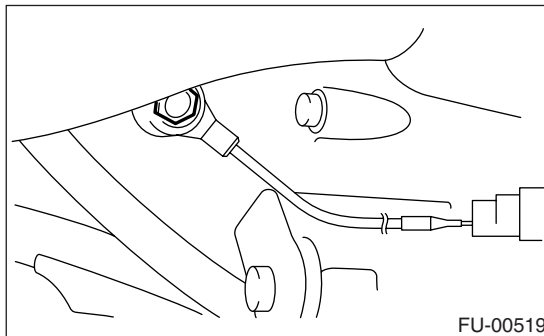


2) Remove the air cleaner case. <Ref. to IN(H4SO)-5, REMOVAL, Air Cleaner Case.>

3) Disconnect the knock sensor connector.



4) Remove the knock sensor from the cylinder block.

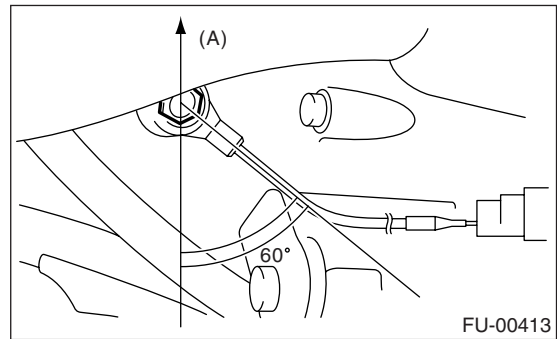


B: INSTALLATION

1) Install the knock sensor to the cylinder block.

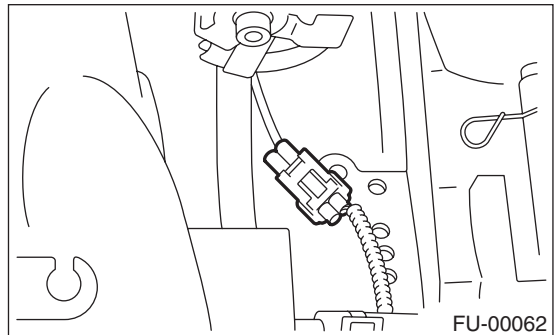
NOTE:

- The extraction area of the knock sensor cord must be positioned at a 60° angle relative to the engine rear.
- For tightening torque, refer to "COMPONENT". <Ref. to FU(H4SO)-3, COMPONENT, General Description.>



(A) Front

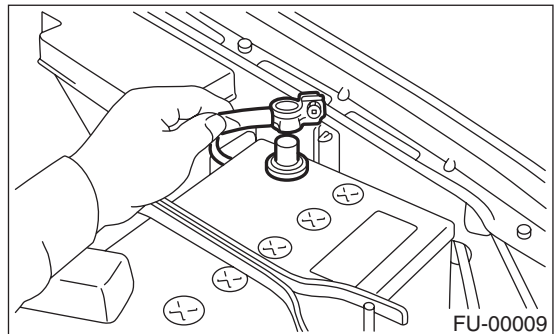
2) Connect the knock sensor connector.



3) Install the air cleaner case.

<Ref. to IN(H4SO)-5, REMOVAL, Air Cleaner Case.>

4) Connect the battery ground cable to battery.



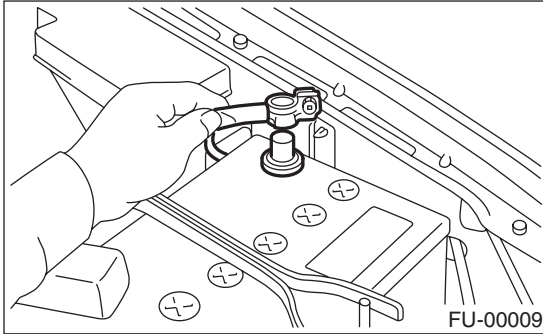
Throttle Position Sensor

FUEL INJECTION (FUEL SYSTEMS)

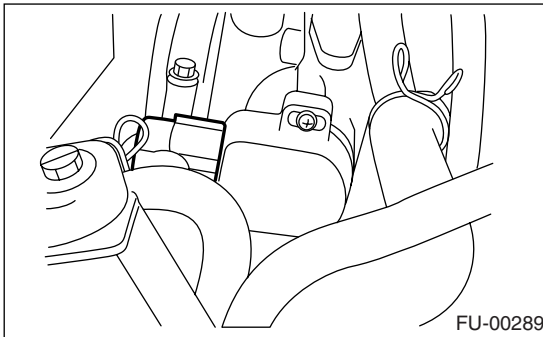
8. Throttle Position Sensor

A: REMOVAL

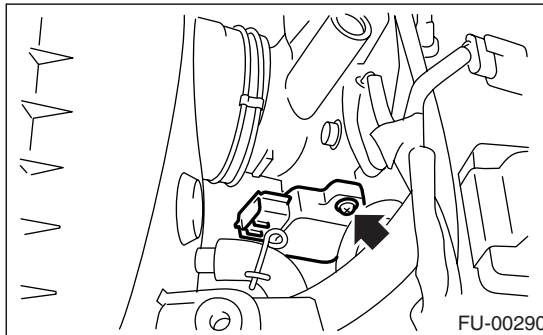
1) Disconnect the ground cable from battery.



2) Disconnect the connectors from throttle position sensor.



3) Remove the throttle position sensor holding screws, and remove it.



B: INSTALLATION

Install in the reverse order of removal.

NOTE:

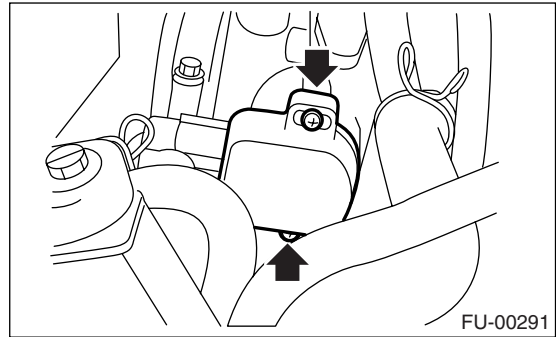
For tightening torque, refer to "COMPONENT".
<Ref. to FU(H4SO)-3, COMPONENT, General Description.>

CAUTION:

When installing throttle position sensor, adjust to the specified data.

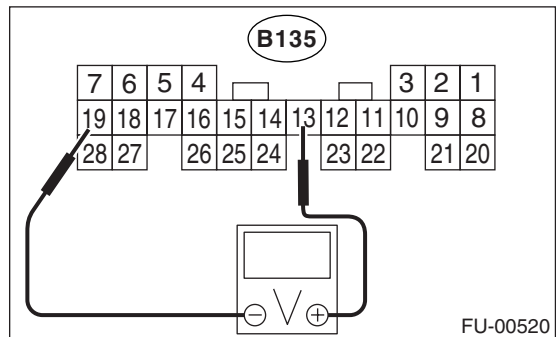
C: ADJUSTMENT

- 1) Turn the ignition switch to OFF.
- 2) Loosen the throttle position sensor holding screws.



- 3) When using a voltmeter;
 - (1) Take out the ECM.
 - (2) Turn the ignition switch to ON.
 - (3) Adjust the throttle position sensor to the proper position to allow the voltage signal to the ECM to be in specification.

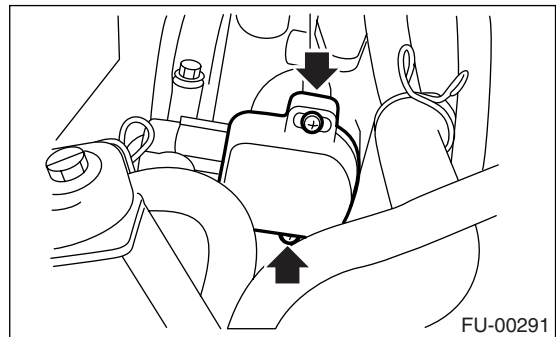
Connector & terminal / Specified voltage
(B135) No. 13 (+) — (B135) No. 19 (-) / 0.45 — 0.55 V
[Fully closed.]



- (4) Tighten the throttle position sensor holding screws.

Tightening torque:

1.6 N·m (0.16 kgf-m, 1.2 ft-lb)

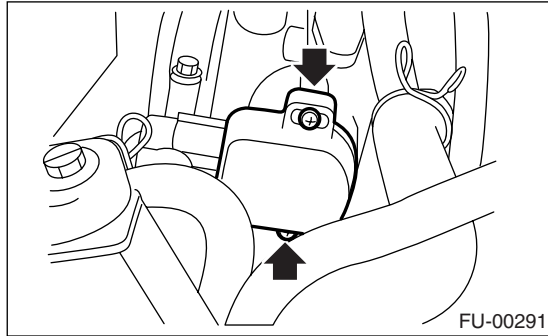


- 4) When using Subaru Select Monitor;
 - (1) Turn the ignition switch to OFF.

Throttle Position Sensor

FUEL INJECTION (FUEL SYSTEMS)

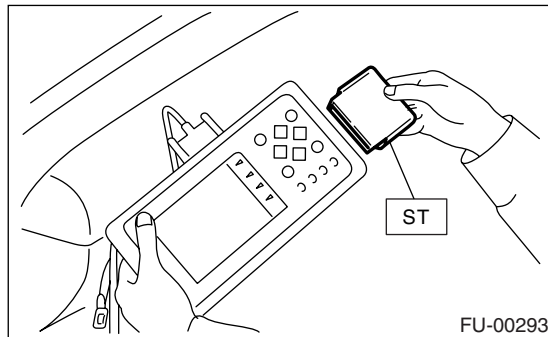
- (2) Loosen the throttle position sensor holding screws.



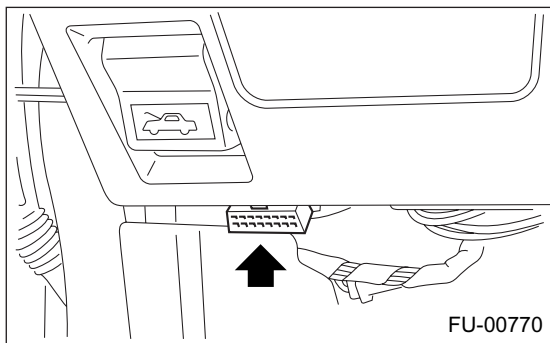
NOTE:

For detailed operation procedures, refer to the Subaru Select Monitor Operation Manual.

- (3) Insert the cartridge to the Subaru Select Monitor.



- (4) Connect the Subaru Select Monitor to the data link connector.



- (5) Turn the ignition switch to ON, and the Subaru Select Monitor switch to ON.

- (6) Select {2. Each System Check} in Main Menu.

- (7) Select {Engine Control System} in Selection Menu.

- (8) Select {1. Current Data Display & Save} in Engine Control System Diagnosis.

- (9) Select {1.12 Data Display} in Data Display Menu.

- (10) Adjust the throttle position sensor to the proper position to match with the following specifications.

Condition: Throttle fully closed

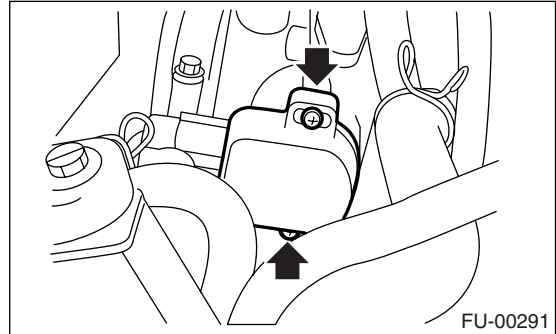
Throttle opening angle 0.00%

Throttle sensor voltage 0.50 V

- (11) Tighten the throttle position sensor holding screws.

Tightening torque:

1.6 N·m (0.16 kgf·m, 1.2 ft·lb)



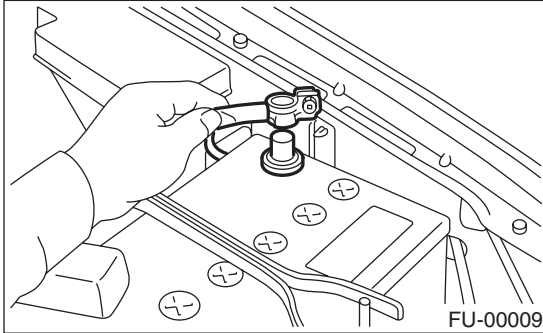
Manifold Absolute Pressure Sensor

FUEL INJECTION (FUEL SYSTEMS)

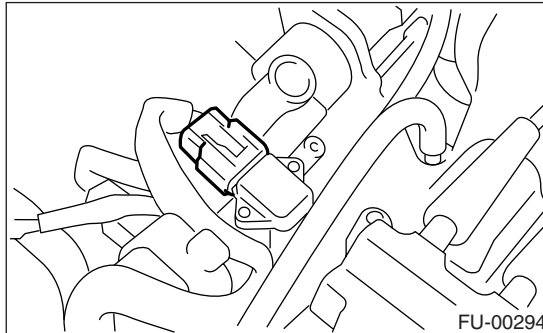
9. Manifold Absolute Pressure Sensor

A: REMOVAL

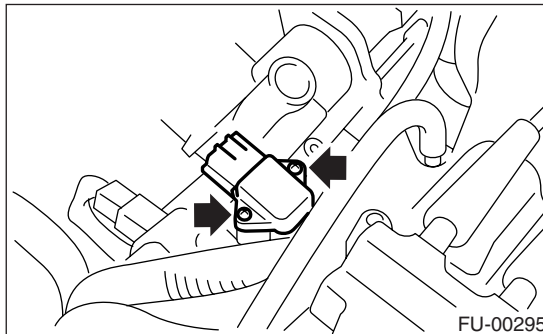
1) Disconnect the ground cable from battery.



2) Disconnect the connector from the manifold absolute pressure sensor.



3) Remove the manifold absolute pressure sensor.



B: INSTALLATION

Install in the reverse order of removal.

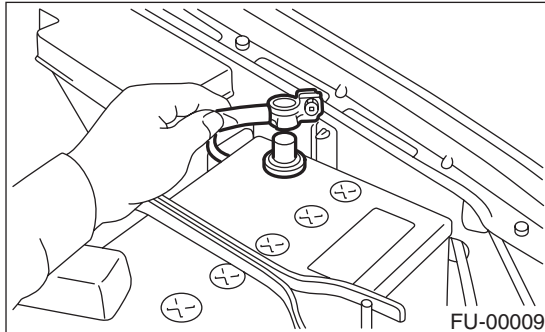
NOTE:

- Replace the O-rings with new ones.
- For tightening torque, refer to "COMPONENT".
<Ref. to FU(H4SO)-3, COMPONENT, General Description.>

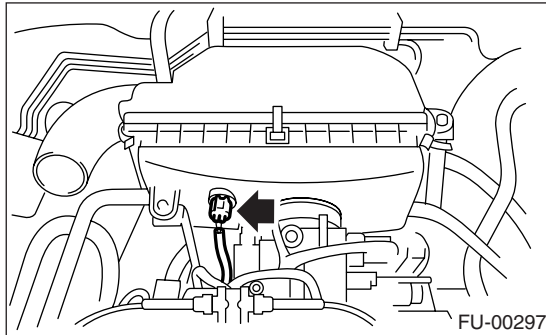
10. Intake Air Temperature Sensor

A: REMOVAL

- 1) Disconnect the ground cable from battery.



- 2) Disconnect the connector from intake air temperature sensor.
- 3) Remove the intake air temperature sensor from air cleaner case.



B: INSTALLATION

Install in the reverse order of removal.

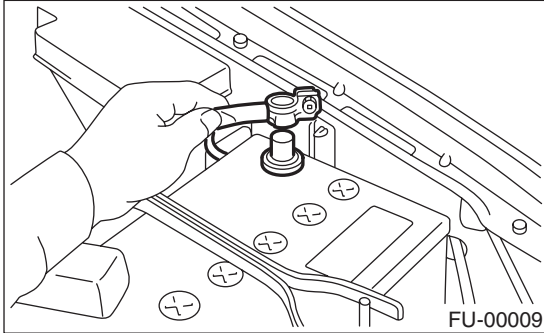
Idle Air Control Solenoid Valve

FUEL INJECTION (FUEL SYSTEMS)

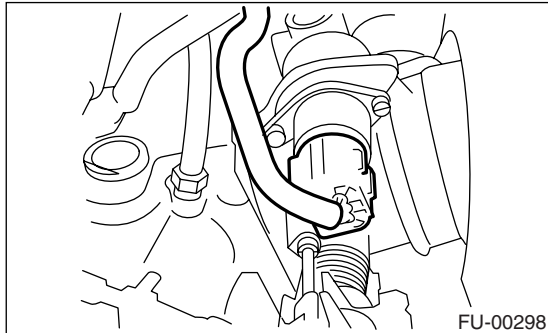
11. Idle Air Control Solenoid Valve

A: REMOVAL

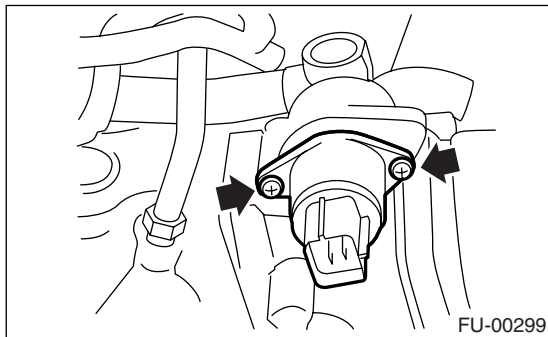
1) Disconnect the ground cable from battery.



2) Disconnect the connector from idle air control solenoid valve.



3) Remove the idle air control solenoid valve from throttle body.



B: INSTALLATION

Install in the reverse order of removal.

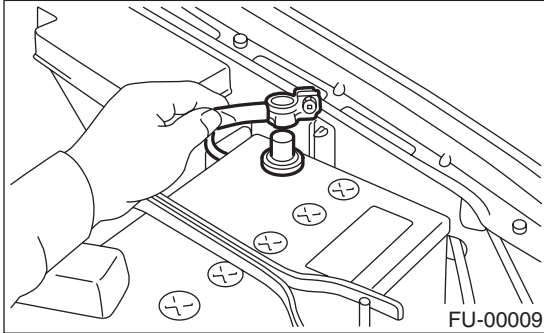
NOTE:

- Replace the gaskets with new ones.
- For tightening torque, refer to "COMPONENT".
<Ref. to FU(H4SO)-3, COMPONENT, General Description.>

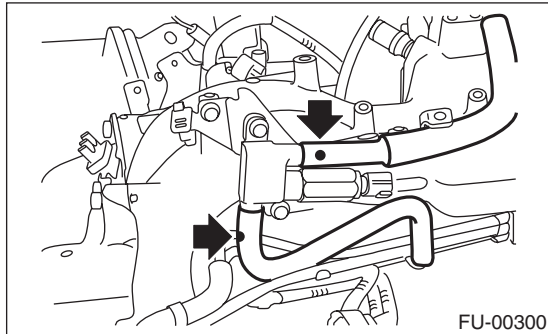
12. Air Assist Injector Solenoid Valve

A: REMOVAL

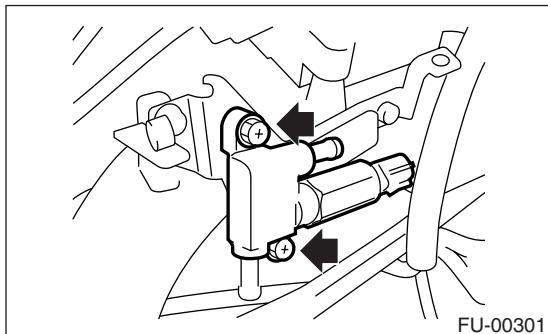
1) Disconnect the ground cable from battery.



2) Disconnect the connector from the air assist injector solenoid valve and disconnect the air bypass hoses.



3) Remove the air assist injector solenoid valve from the intake manifold.



B: INSTALLATION

Install in the reverse order of removal.

NOTE:

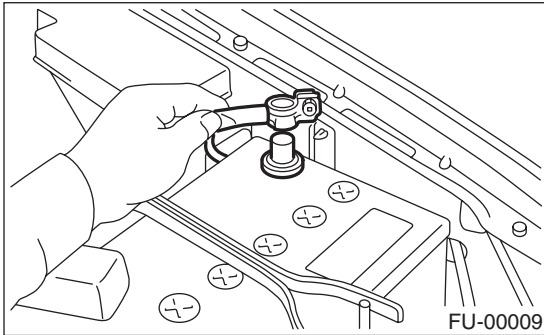
For tightening torque, refer to "COMPONENT".
<Ref. to FU(H4SO)-3, COMPONENT, General Description.>

13. Fuel Injector

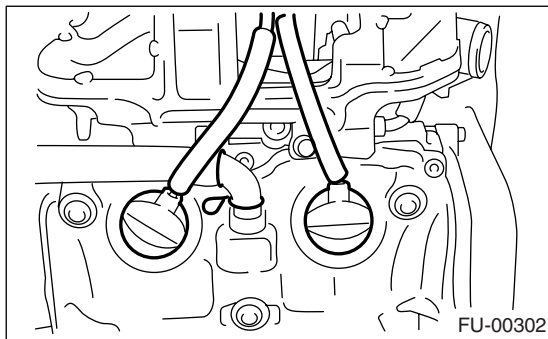
A: REMOVAL

1. RH SIDE

- 1) Release fuel pressure. <Ref. to FU(H4SO)-47, RELEASING OF FUEL PRESSURE, PROCEDURE, Fuel.>
- 2) Open the fuel flap lid, and remove the fuel filler cap.
- 3) Disconnect the ground cable from battery.

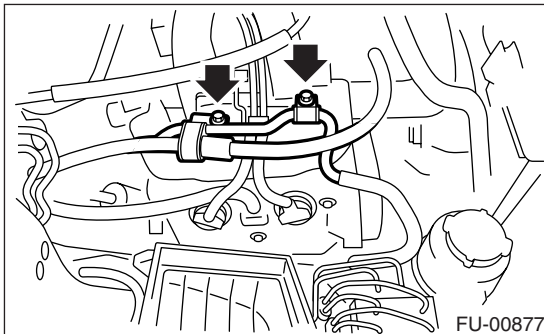


- 4) Remove the resonator chamber. <Ref. to IN(H4SO)-7, REMOVAL, Resonator Chamber.>
- 5) Remove the spark plug cords from the spark plugs (#1 and #3 cylinders).

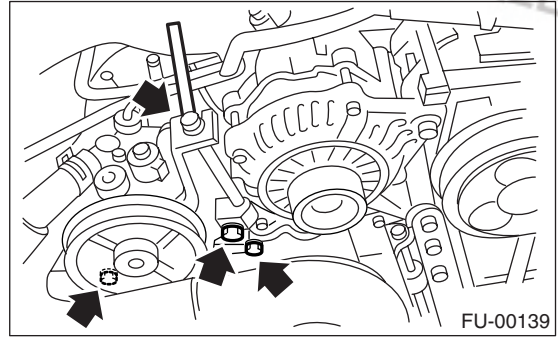


- 6) Remove the power steering pump and tank from the brackets.

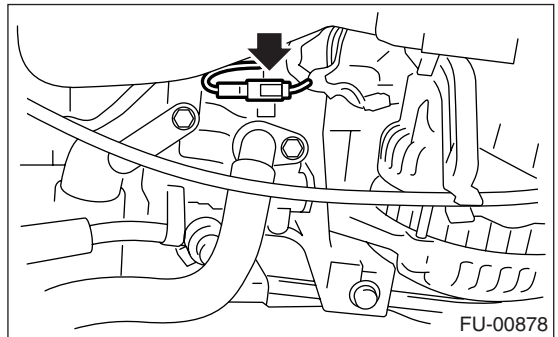
- (1) Remove the front side V-belt. <Ref. to ME(H4SO)-39, REMOVAL, V-belt.>
- (2) Remove the bolts which hold the power steering pipes onto the intake manifold protector.



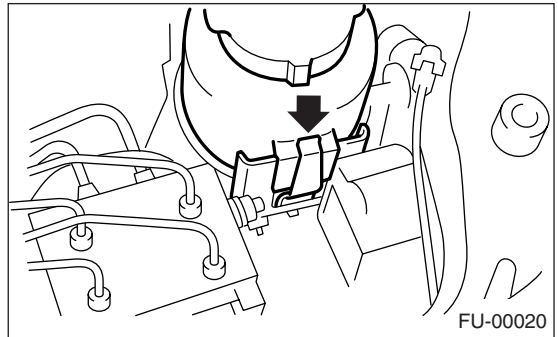
- (3) Remove the bolts which install the power steering pump to the bracket.



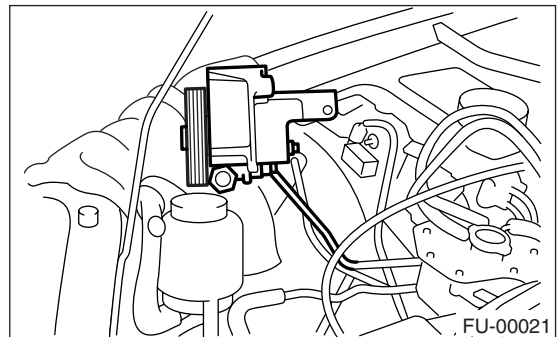
- (4) Disconnect the connector from the power steering pump switch.



- (5) Remove the reservoir tank from the bracket by pulling it upwards.



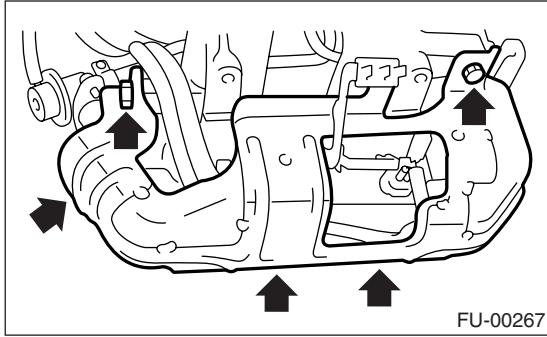
- (6) Place the power steering pump and tank on the right side wheel apron.



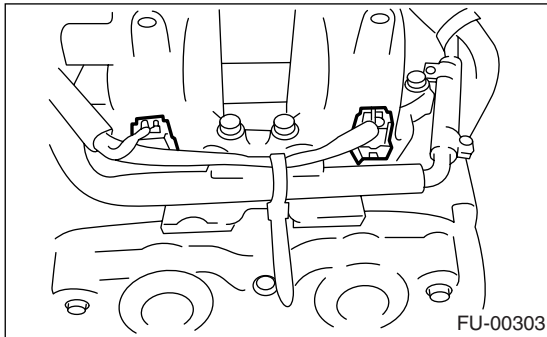
Fuel Injector

FUEL INJECTION (FUEL SYSTEMS)

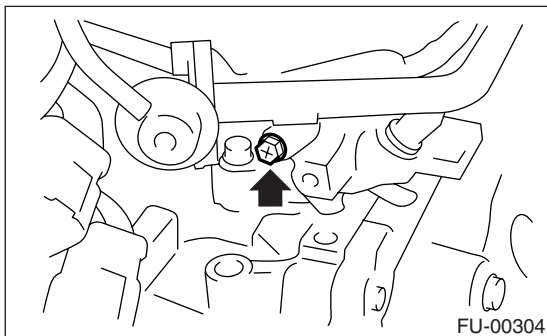
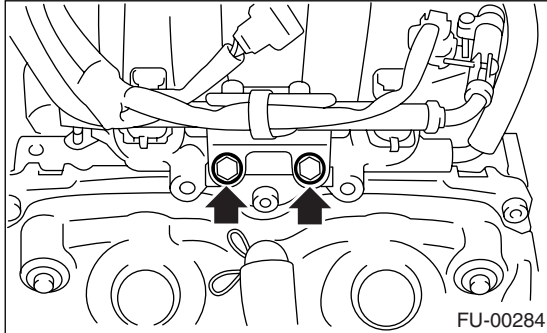
7) Remove the fuel pipe protector RH.



8) Disconnect the connectors from the fuel injectors.

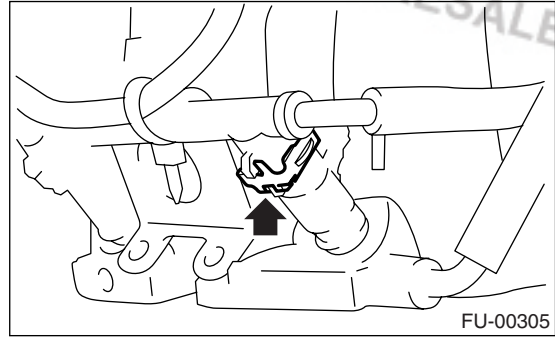


9) Remove the bolt which holds the fuel injector pipe to the intake manifold.

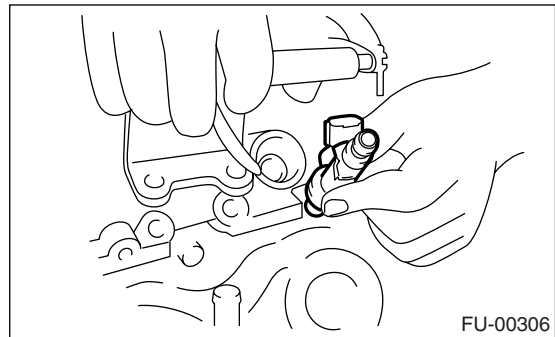


10) Remove the fuel injector from the intake manifold.

(1) Remove the fuel injector securing clip.

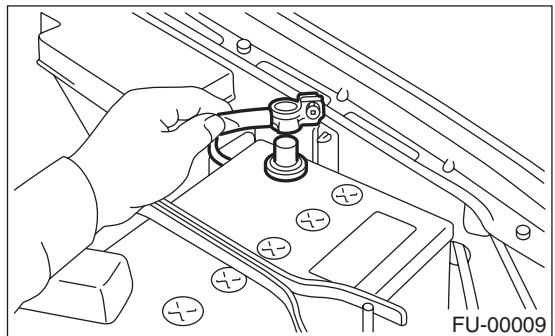


(2) Remove the fuel injector while lifting up the fuel injector pipe.



2. LH SIDE

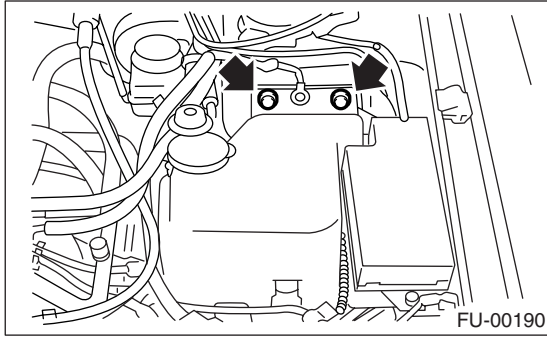
- 1) Release the fuel pressure. <Ref. to FU(H4SO)-47, RELEASING OF FUEL PRESSURE, PROCEDURE, Fuel.>
- 2) Open the fuel flap lid, and remove the fuel filler cap.
- 3) Disconnect the ground cable from battery.



Fuel Injector

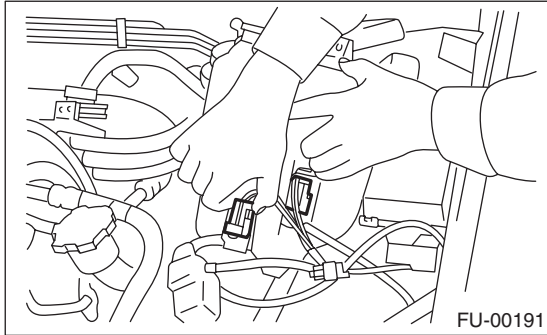
FUEL INJECTION (FUEL SYSTEMS)

4) Remove the two bolts which install the washer tank on the body.



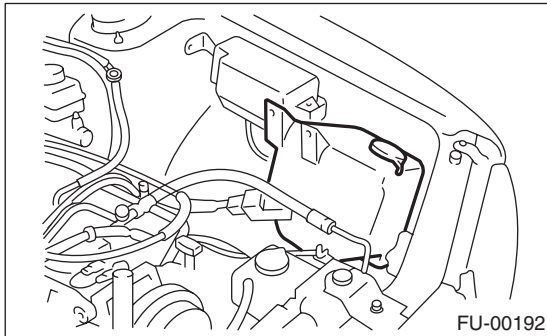
5) Disconnect the connector from the front window washer motor.

6) Disconnect the connector from the rear gate glass washer motor.

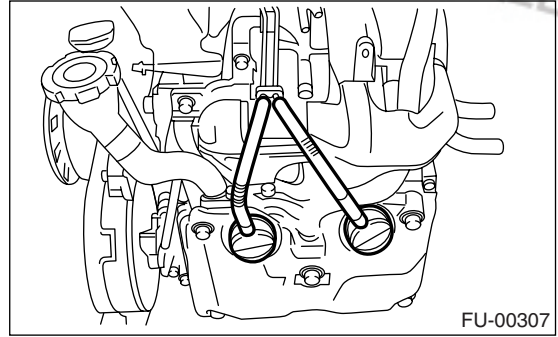


7) Disconnect the rear window glass washer hose from the washer motor, then plug the connection with a suitable cap.

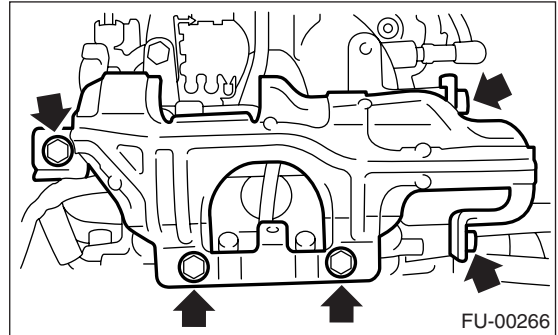
8) Move the washer tank, and secure it away from the working area.



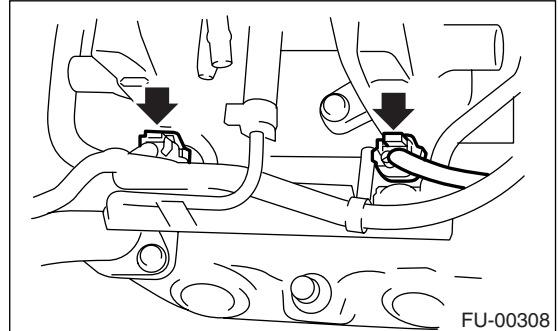
9) Remove the spark plug cords from the spark plugs (#2 and #4 cylinders).



10) Remove the fuel pipe protector LH.



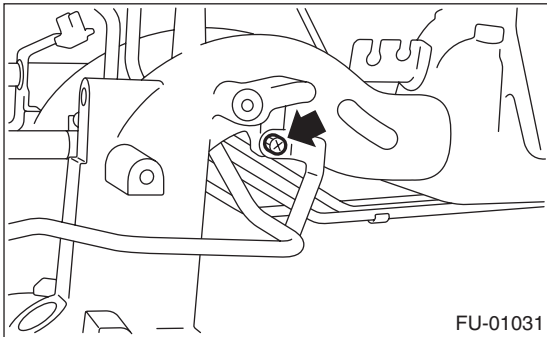
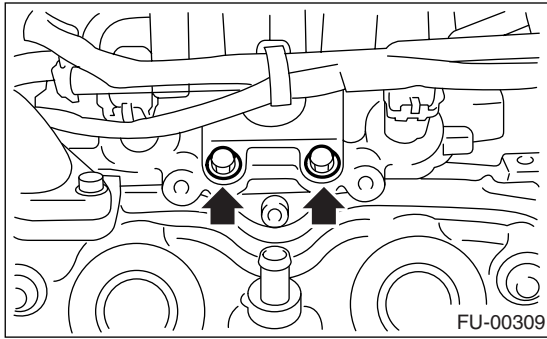
11) Disconnect the connectors from the fuel injectors.



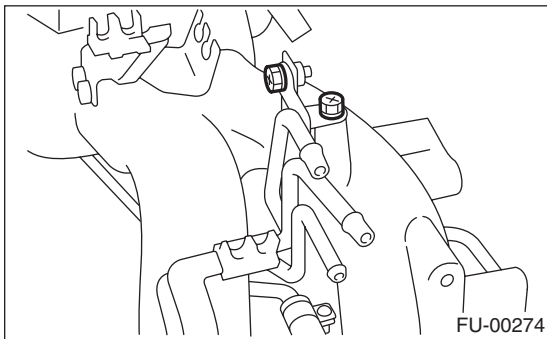
Fuel Injector

FUEL INJECTION (FUEL SYSTEMS)

12) Remove the bolt which holds the fuel injector pipe to the intake manifold.

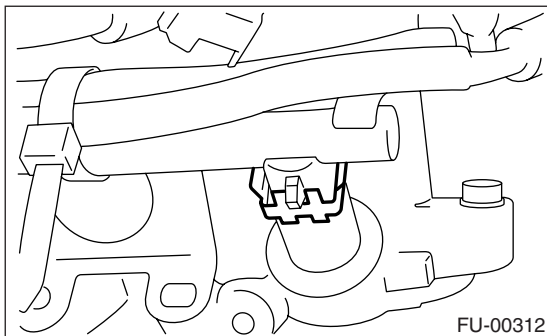


13) Remove the bolt which holds the fuel pipe on the left side intake manifold.

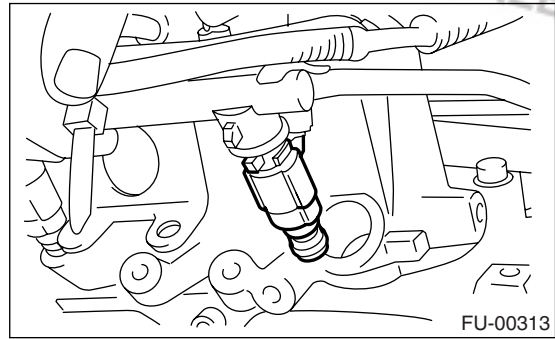


14) Remove the fuel injector from the intake manifold.

(1) Remove the fuel injector securing clip.



(2) Remove the fuel injector while lifting up the fuel injector pipe.



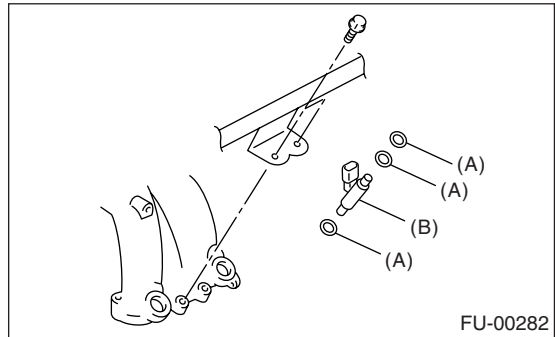
B: INSTALLATION

1. RH SIDE

Install in the reverse order of removal.

CAUTION:

Replace the O-rings with new ones.

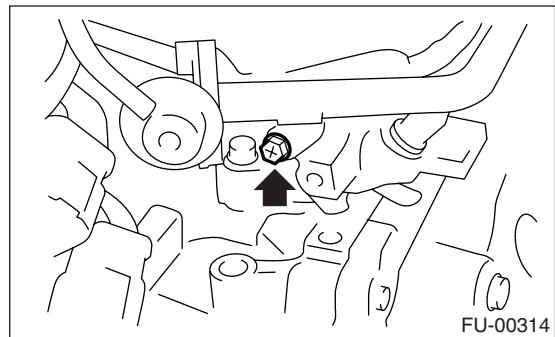


(A) O-ring

(B) Fuel injector

Tightening torque:

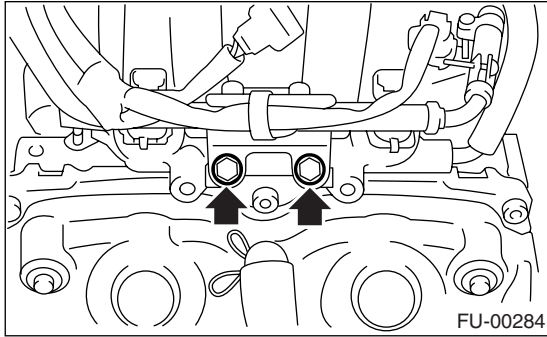
5.0 N·m (0.51 kgf-m, 3.7 ft-lb)



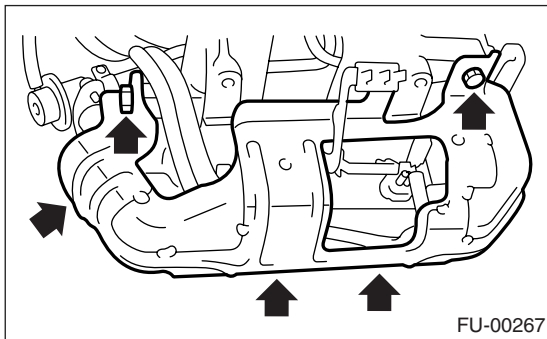
Fuel Injector

FUEL INJECTION (FUEL SYSTEMS)

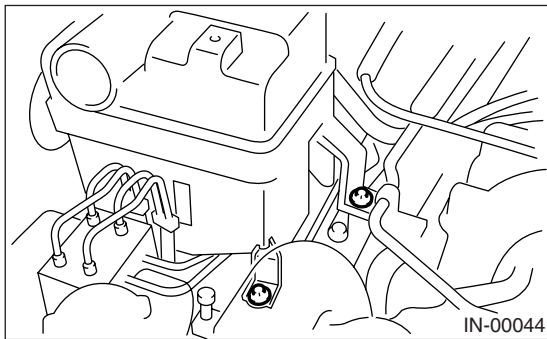
Tightening torque:
19 N-m (1.9 kgf-m, 13.7 ft-lb)



Tightening torque:
19 N-m (1.9 kgf-m, 13.7 ft-lb)



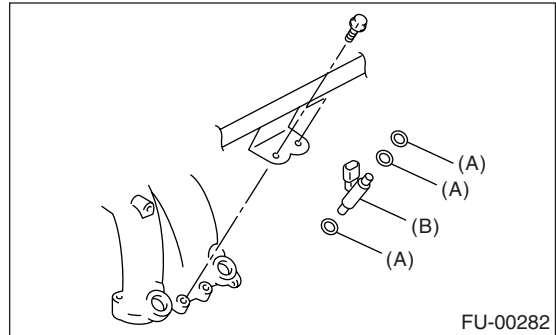
Tightening torque:
33 N-m (3.4 kgf-m, 24.3 ft-lb)



2. LH SIDE

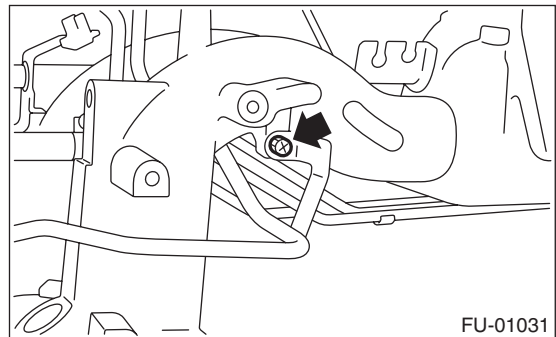
Install in the reverse order of removal.

CAUTION:
Replace the O-rings with new ones.

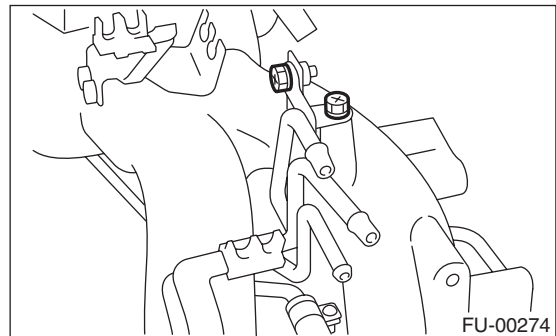


- (A) O-ring
- (B) Fuel injector

Tightening torque:
5.0 N-m (0.51 kgf-m, 3.7 ft-lb)



Tightening torque:
5.0 N-m (0.51 kgf-m, 3.7 ft-lb)

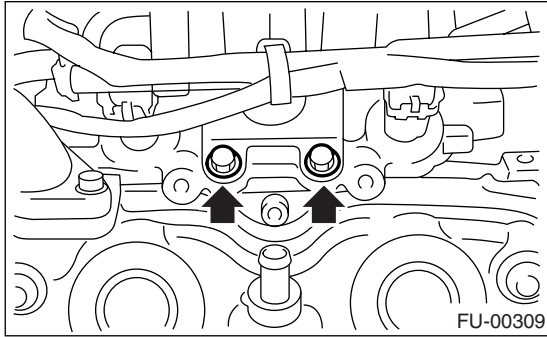


Fuel Injector

FUEL INJECTION (FUEL SYSTEMS)

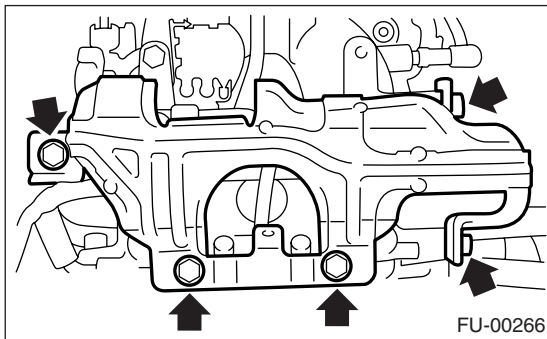
Tightening torque:

19 N·m (1.9 kgf-m, 13.7 ft-lb)



Tightening torque:

19 N·m (1.9 kgf-m, 13.7 ft-lb)



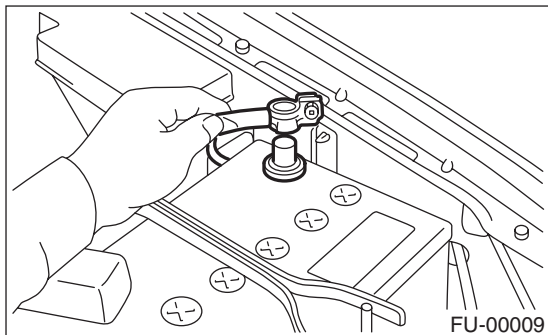
Front Oxygen (A/F) Sensor

FUEL INJECTION (FUEL SYSTEMS)

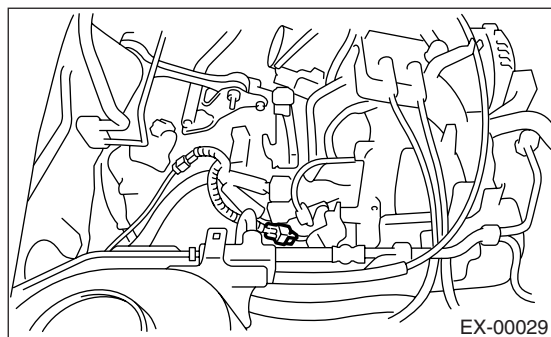
14. Front Oxygen (A/F) Sensor

A: REMOVAL

1) Disconnect the ground cable from battery.



2) Disconnect the connector from engine hanger, and then disconnect the front oxygen (A/F) sensor connector.



3) Lift up the vehicle.

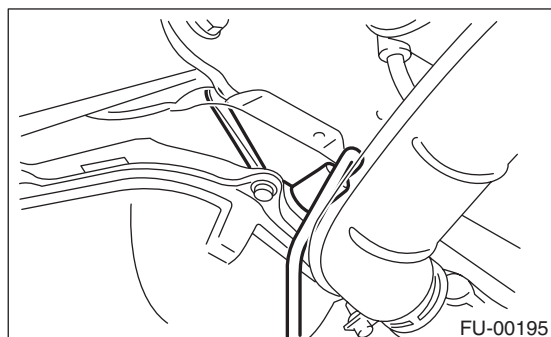
4) Apply SUBARU CRC or its equivalent to the threaded portion of front oxygen (A/F) sensor, and leave it for one minute or more.

SUBARU CRC (Part No. 004301003)

5) Remove the front oxygen (A/F) sensor.

CAUTION:

When removing the oxygen (A/F) sensor, wait until exhaust pipe cools, otherwise it will damage exhaust pipe.



B: INSTALLATION

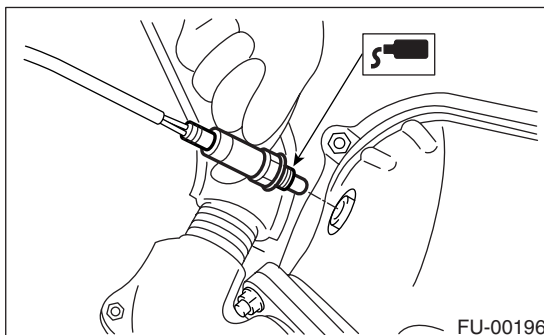
1) Before installing front oxygen (A/F) sensor, apply the anti-seize compound only to the threaded portion of front oxygen (A/F) sensor to make the next removal easier.

Anti-seize compound:

SS-30 by JET LUBE

CAUTION:

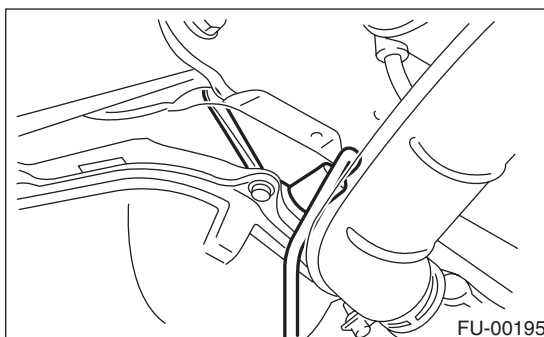
Never apply anti-seize compound to protector of front oxygen (A/F) sensor.



2) Install the front oxygen (A/F) sensor.

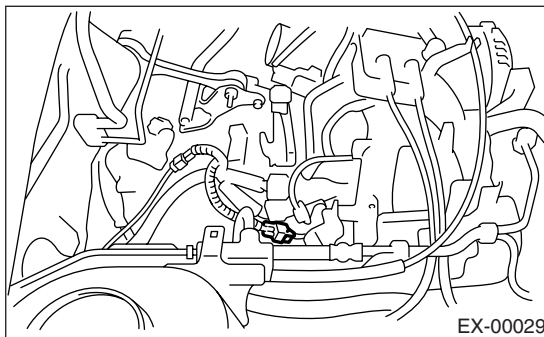
Tightening torque:

21 N·m (2.1 kgf-m, 15.2 ft-lb)



3) Lower the vehicle.

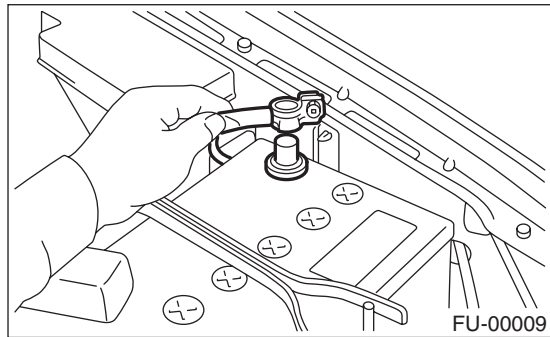
4) Connect the connector to front oxygen (A/F) sensor, and then connect the connector to engine hanger.



Front Oxygen (A/F) Sensor

FUEL INJECTION (FUEL SYSTEMS)

5) Connect the battery ground cable to battery.



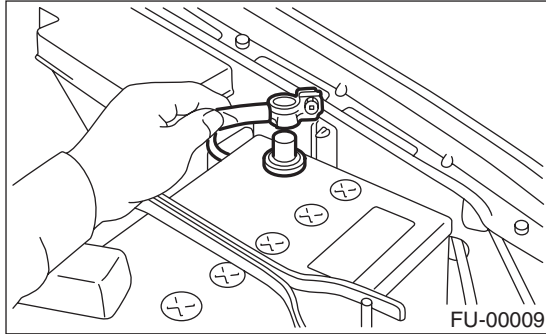
Rear Oxygen Sensor

FUEL INJECTION (FUEL SYSTEMS)

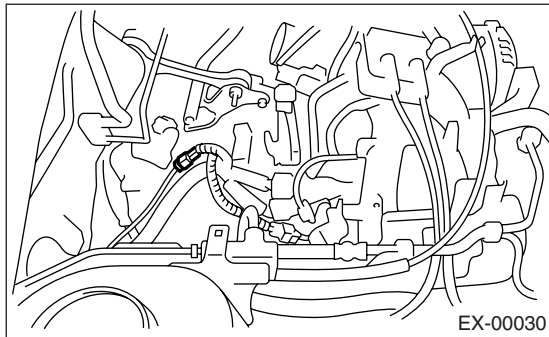
15.Rear Oxygen Sensor

A: REMOVAL

- 1) Disconnect the ground cable from battery.



- 2) Disconnect the connector from securing bracket, and then disconnect the connector of rear oxygen sensor.



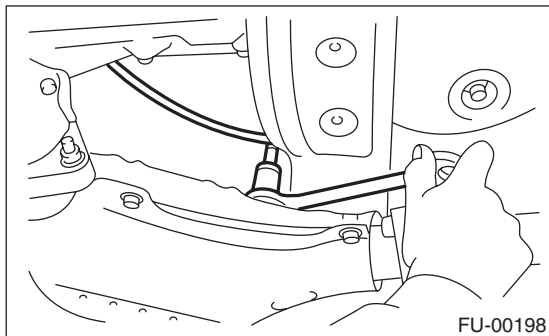
- 3) Lift up the vehicle.
- 4) Apply SUBARU CRC or its equivalent to the threaded portion of rear oxygen sensor, and leave it for one minute or more.

SUBARU CRC (Part No. 004301003)

- 5) Remove the rear oxygen sensor.

CAUTION:

When removing the rear oxygen sensor, wait until the exhaust pipe cools, otherwise it will damage the exhaust pipe.



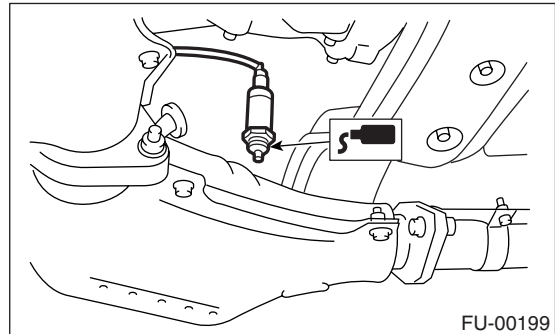
B: INSTALLATION

- 1) Before installing the rear oxygen (A/F) sensor, apply the anti-seize compound only to the threaded portion of the rear oxygen (A/F) sensor to make the next removal easier.

CAUTION:

Never apply anti-seize compound to protector of rear oxygen sensor.

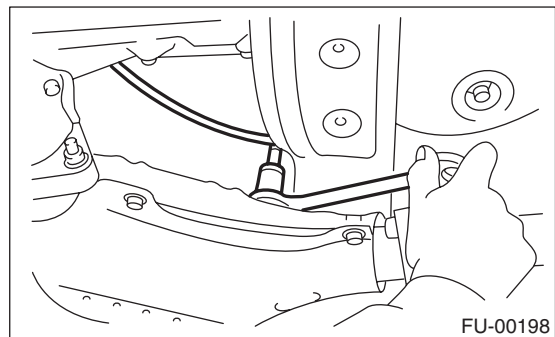
**Anti-seize compound:
SS-30 by JET LUBE**



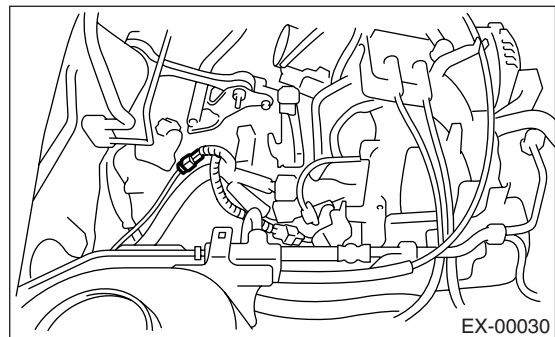
- 2) Install the rear oxygen sensor.

Tightening torque:

21 N·m (2.1 kgf-m, 15.2 ft-lb)



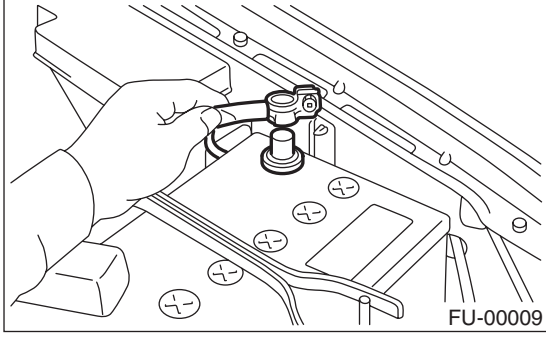
- 3) Lower the vehicle.
- 4) Connect the connector to the rear oxygen sensor, and then install the connector to securing bracket.



Rear Oxygen Sensor

FUEL INJECTION (FUEL SYSTEMS)

5) Connect the battery ground cable to battery.



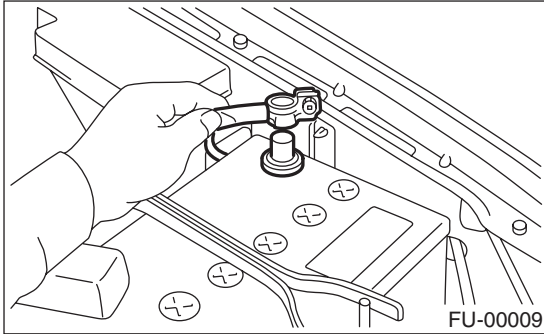
Engine Control Module (ECM)

FUEL INJECTION (FUEL SYSTEMS)

16.Engine Control Module (ECM)

A: REMOVAL

1) Disconnect the ground cable from battery.

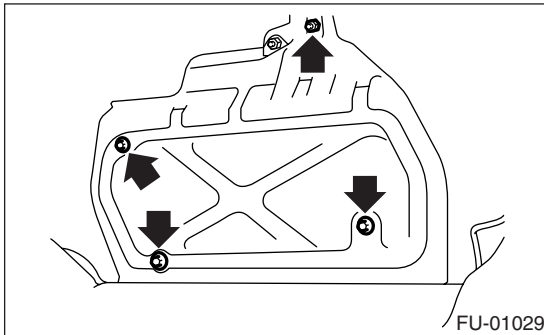


2) Remove the lower inner trim of passenger side.

<Ref. to EI-49, REMOVAL, Lower Inner Trim.>

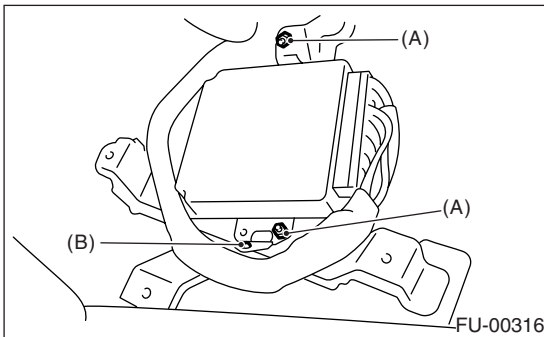
3) Detach the floor mat of front passenger seat.

4) Remove the protect cover.



5) Remove the nuts (A) which hold ECM to the bracket.

6) Remove the clip (B) from the bracket.



7) Disconnect the ECM connectors and take out the ECM.

B: INSTALLATION

Install in the reverse order of removal.

CAUTION:

When replacing the ECM, be careful not to use the wrong spec. ECM to avoid any damage on fuel injection system.

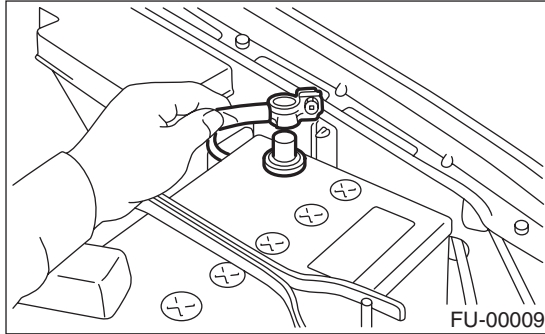
Tightening torque:

5 N·m (0.5 kgf-m, 3.6 ft-lb)

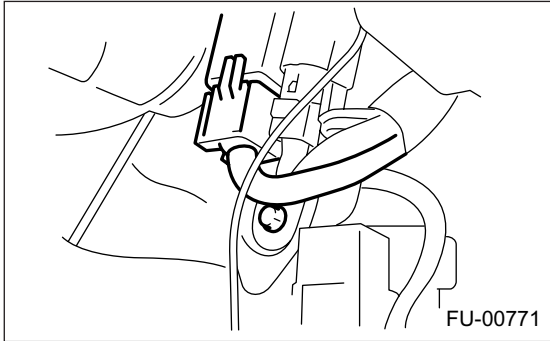
17. Main Relay

A: REMOVAL

- 1) Disconnect the ground cable from battery.



- 2) Remove the passenger's side front side sill cover.
- 3) Remove the bolt which holds main bracket on the body.
- 4) Disconnect the connectors from the main relay.



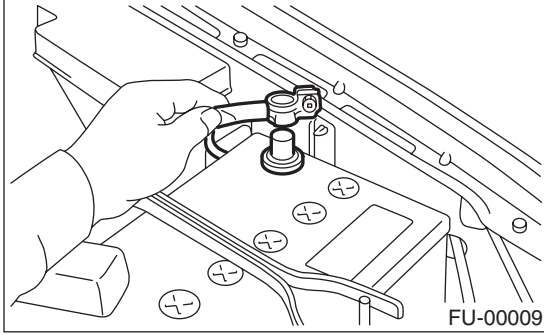
B: INSTALLATION

Install in the reverse order of removal.

18. Fuel Pump Relay

A: REMOVAL

1) Disconnect the ground cable from battery.



2) Remove the passenger's side front side sill cover.

3) Remove the bolt which holds the fuel pump relay bracket on the body.

4) Disconnect the connector from fuel pump.



5) Remove the fuel pump relay from the mounting bracket.

B: INSTALLATION

Install in the reverse order of removal.

19. Fuel

A: PROCEDURE

1. RELEASING OF FUEL PRESSURE

WARNING:

- Place “NO FIRE” signs near the working area.
- Be careful not to spill fuel on the floor.

1) Disconnect the connector from the fuel pump relay.



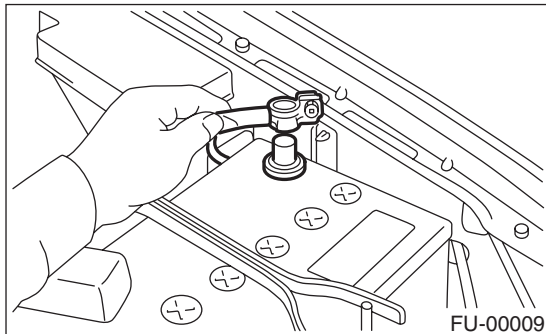
- 2) Start the engine and run it until it stalls.
- 3) After the engine stalls, crank it for five more seconds.
- 4) Turn the ignition switch to OFF.

2. DRAINING FUEL

WARNING:

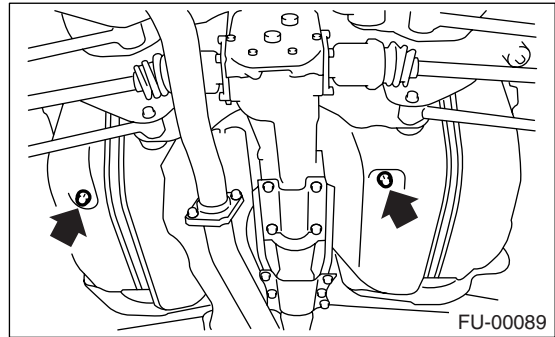
- Place “NO FIRE” signs near the working area.
- Be careful not to spill fuel on the floor.

- 1) Set the vehicle on a lift.
- 2) Disconnect the ground cable from battery.



- 3) Open the fuel filler flap lid, and then remove the fuel filler cap.
- 4) Lift up the vehicle.

5) Drain the fuel from the fuel tank.
Set a container under the vehicle and remove the drain plug from the fuel tank.



6) Tighten the fuel drain plug.

Tightening torque:

26 N·m (2.65 kgf-m, 19.2 ft-lb)

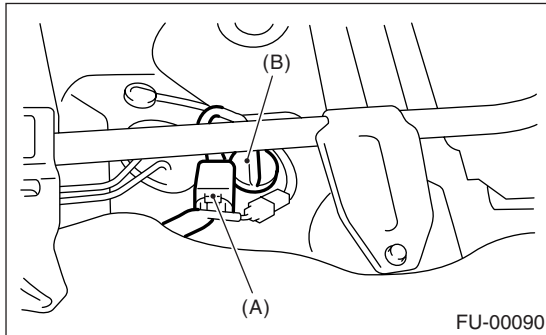
20. Fuel Tank

A: REMOVAL

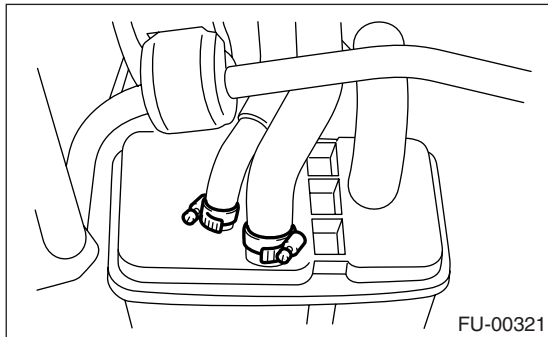
WARNING:

- Place “NO FIRE” signs near the working area.
- Be careful not to spill fuel on the floor.

- 1) Set the vehicle on a lift.
- 2) Release the fuel pressure. <Ref. to FU(H4SO)-47, RELEASING OF FUEL PRESSURE, PROCEDURE, Fuel.>
- 3) Drain the fuel from the fuel tank. <Ref. to FU(H4SO)-47, DRAINING FUEL, PROCEDURE, Fuel.>
- 4) Remove the rear seat.
- 5) Disconnect the connector (A) of fuel tank cord to the rear harness.
- 6) Push the grommet (B) which holds the fuel tank cord on floor panel into under the body.

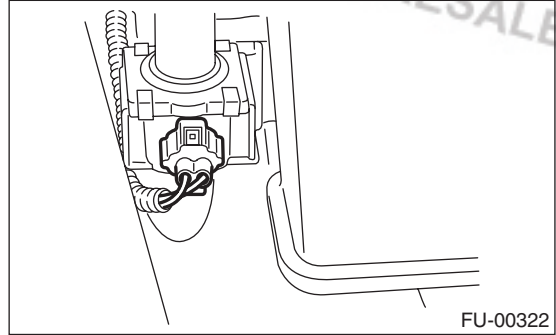


- 7) Remove the rear crossmember. <Ref. to RS-18, REMOVAL, Rear Crossmember.>
- 8) Move the clamp, and disconnect the evaporation hose from canister.

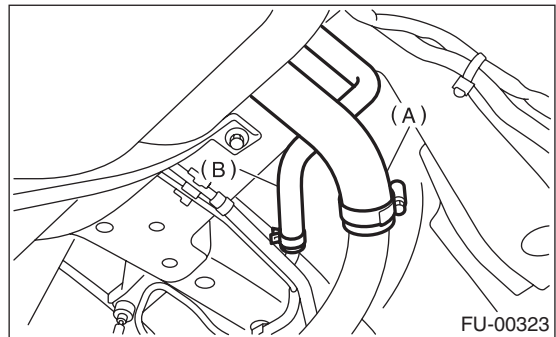


- 9) Disconnect the connector from pressure control solenoid valve.

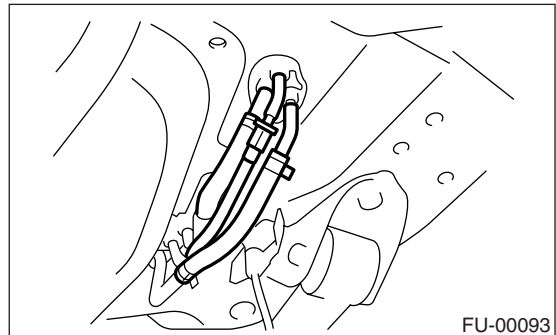
- 10) Disconnect the connector from drain valve.



- 11) Loosen the clamp and disconnect the fuel filler hose (A) and evaporation hose (B) from the fuel filler pipe.



- 12) Move the clips, and disconnect the quick connector. <Ref. to FU(H4SO)-62, REMOVAL, Fuel Delivery, Return and Evaporation lines.>
- 13) Disconnect the fuel hoses.

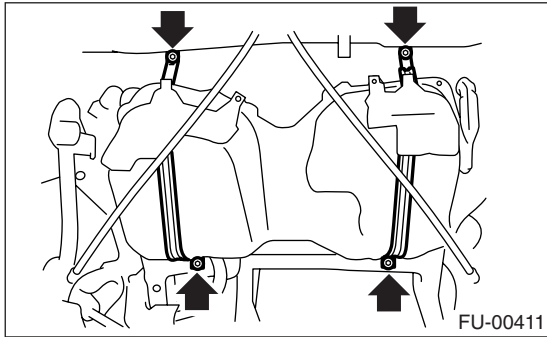


- 14) Support the fuel tank with a transmission jack, remove the bolts from bands and dismount the fuel tank from the vehicle.

Fuel Tank

FUEL INJECTION (FUEL SYSTEMS)

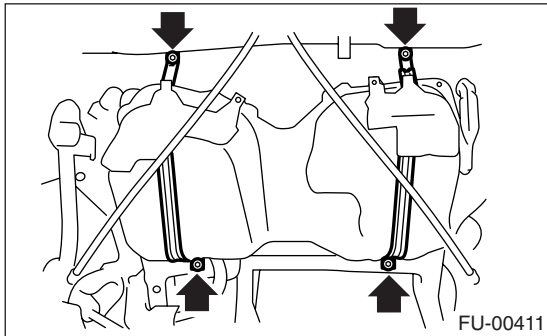
WARNING:
An assistant is required to perform this work.



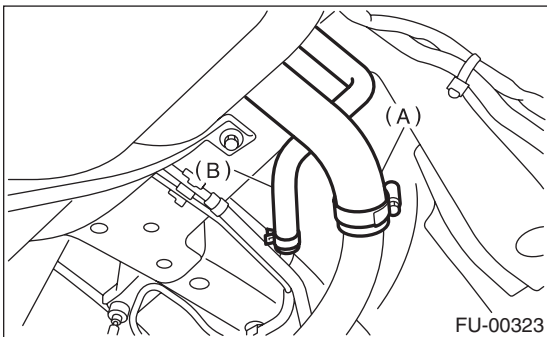
B: INSTALLATION

- 1) Support the fuel tank with a transmission jack and push the fuel tank harness into the access hole with the grommet.
- 2) Set the fuel tank and temporarily tighten the bolts of fuel tank bands.

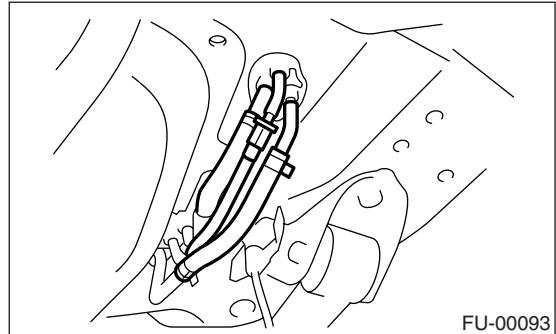
WARNING:
An assistant is required to perform this work.



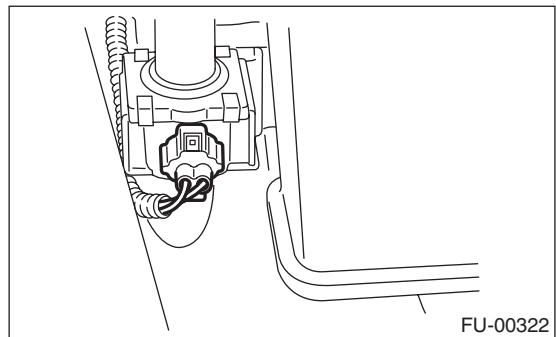
- 3) Connect the fuel filler hose (A) and air vent hose (B).



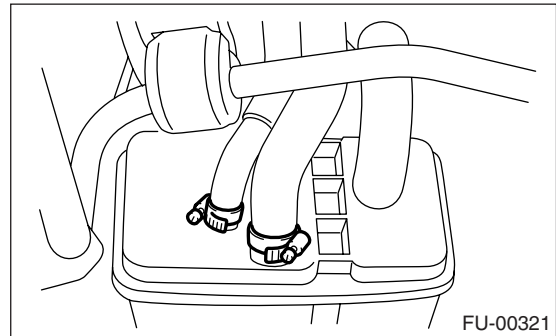
- 4) Connect the fuel hoses, and hold them with clips and quick connector. <Ref. to FU(H4SO)-62, REMOVAL, Fuel Delivery, Return and Evaporation lines.>



- 5) Connect the connector to the drain valve.



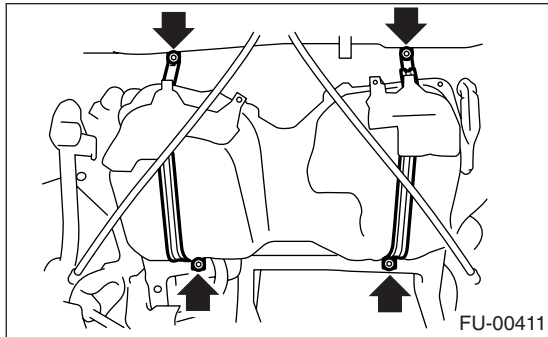
- 6) Connect the connector to the pressure control solenoid valve.
- 7) Connect the evaporation hose to the canister and secure with the clamp.



- 8) Tighten the band mounting bolts.

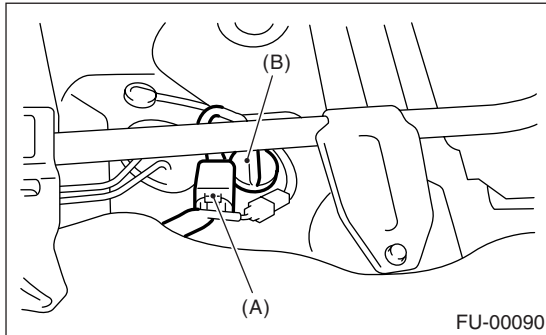
Tightening torque:

33 N·m (3.4 kgf·m, 25 ft·lb)



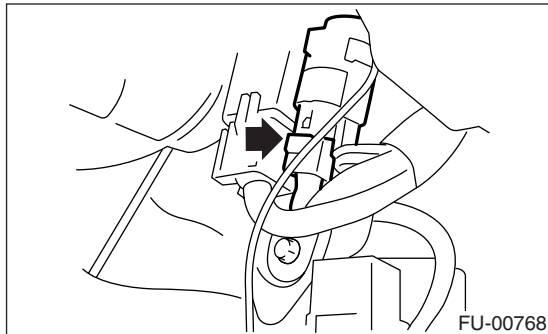
9) Install the rear crossmember. <Ref. to RS-18, INSTALLATION, Rear Crossmember.>

10) Connect the connectors (A) to the fuel tank cord and plug the service hole with grommet (B).



11) Set the rear seat and floor mat.

12) Connect the connector to the fuel pump relay.



C: INSPECTION

1) Make sure there are no cracks, holes, or other damage on the fuel tank.

2) Make sure that the fuel hoses and fuel pipes are not cracked and the connections are tight.

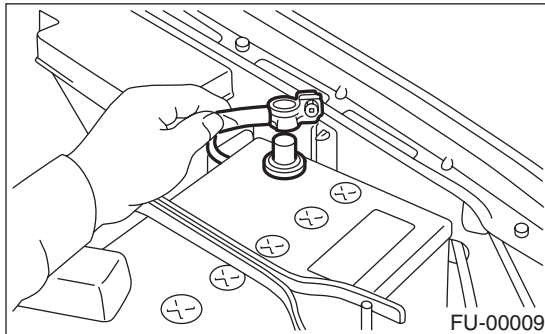
21. Fuel Filler Pipe

A: REMOVAL

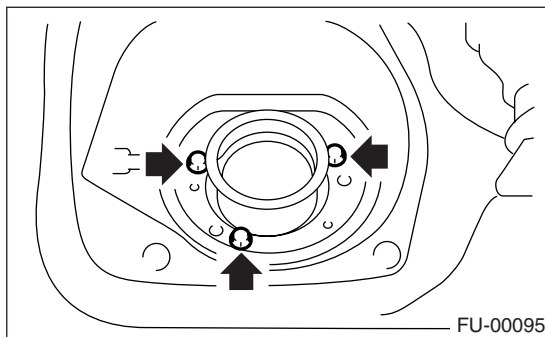
WARNING:

- Place "NO FIRE" signs near the working area.
- Be careful not to spill fuel on the floor.

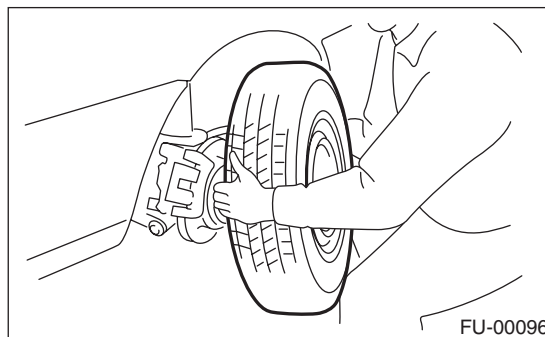
- 1) Release the fuel pressure. <Ref. to FU(H4SO)-47, RELEASING OF FUEL PRESSURE, PROCEDURE, Fuel.>
- 2) Open the fuel filler flap lid and remove the filler cap.
- 3) Disconnect the ground cable from battery.



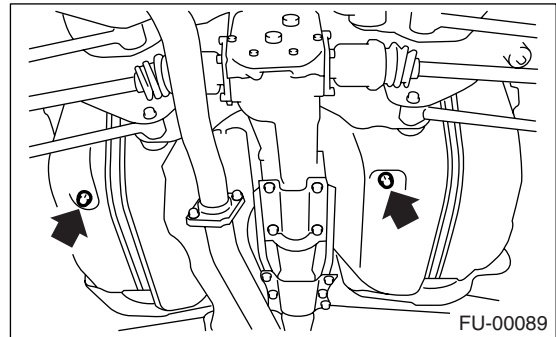
- 4) Remove the screws holding packing in place.



- 5) Lift up the vehicle.
- 6) Remove the rear right side wheel nuts.
- 7) Remove the rear right side wheel.



- 8) Drain the fuel from the fuel tank. Set a container under the vehicle and remove the drain plug from the fuel tank.

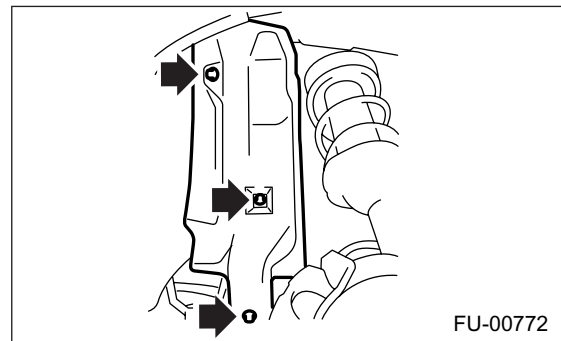


- 9) Tighten the fuel drain plug.

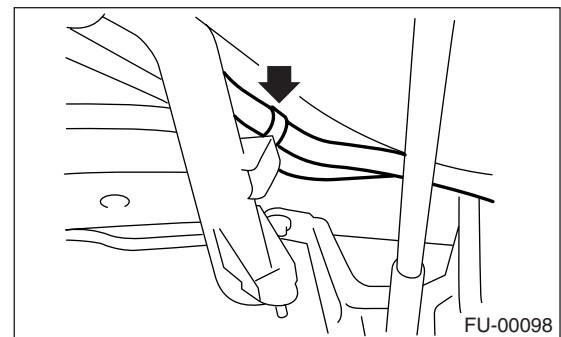
Tightening torque:

26 N·m (2.65 kgf-m, 19.2 ft-lb)

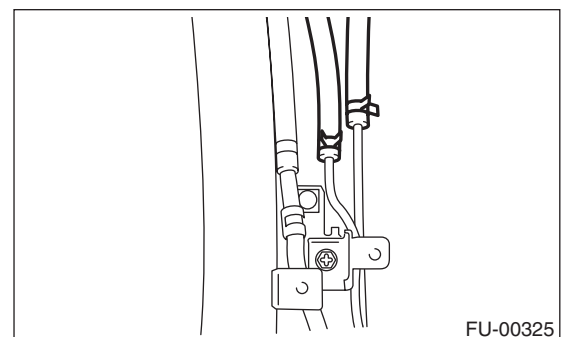
- 10) Remove the fuel filler pipe protector.



- 11) Separate the evaporation hoses from the clip of fuel filler pipe.



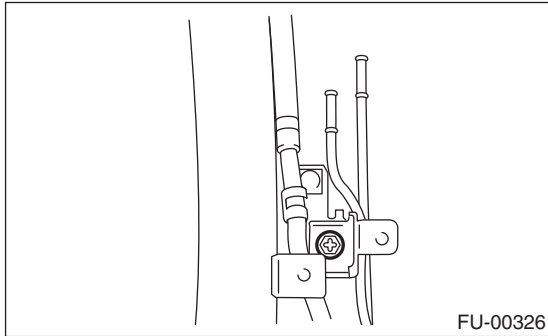
- 12) Disconnect the evaporation hoses from the pipes.



Fuel Filler Pipe

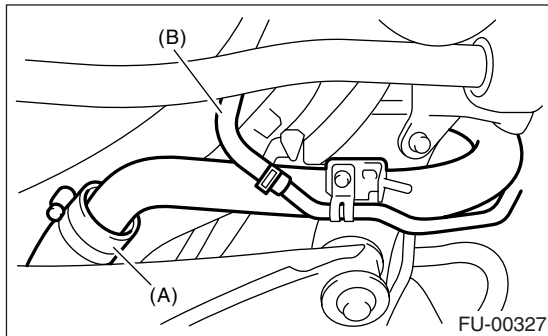
FUEL INJECTION (FUEL SYSTEMS)

13) Remove the bolts which hold the fuel filler pipe bracket on the body.



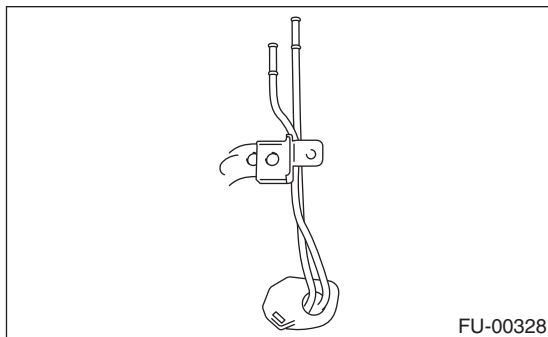
14) Loosen the clamp and separate the fuel filler hose (A) from the fuel filler pipe.

15) Move the clip and separate the evaporation hose (B).



16) Remove the fuel filler pipe to under side of the vehicle.

17) Remove the evaporation pipe together with clip from the body.

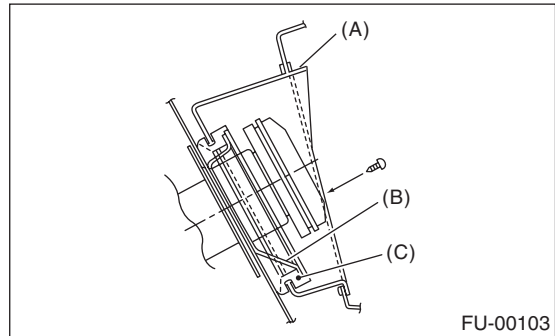


B: INSTALLATION

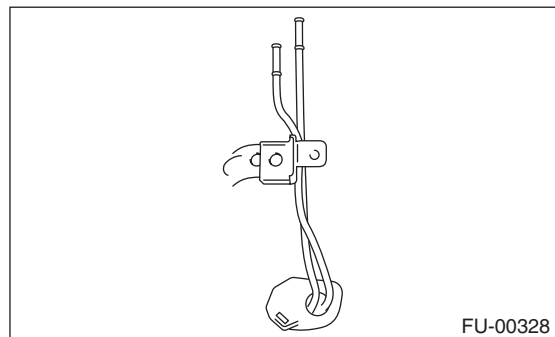
- 1) Open the fuel filler flap lid.
- 2) Set the fuel saucer (A) with rubber packing (C) and insert the fuel filler pipe into hole from the inner side of apron.
- 3) Align the holes in fuel filler pipe neck and set the cup (B), and tighten the screws.

NOTE:

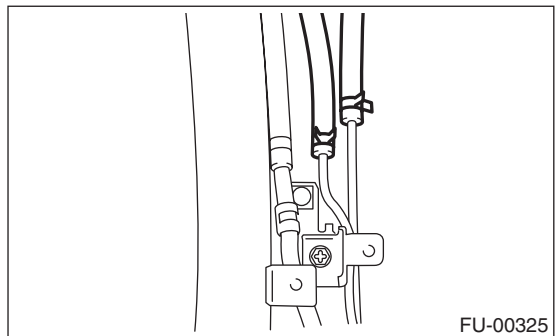
If the edges of rubber packing are folded toward the inside, straighten it with a screwdriver.



4) Install the evaporation pipe.



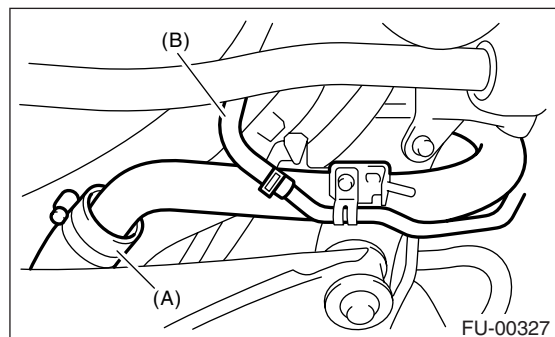
5) Connect the evaporation hose to the pipe.



6) Insert the fuel filler hose (A) approximately 35 to 40 mm (1.38 to 1.57 in) over the lower end of fuel filler pipe and tighten the clamp.

CAUTION:

Do not allow clips to touch evaporation hose (B) and rear suspension crossmember.

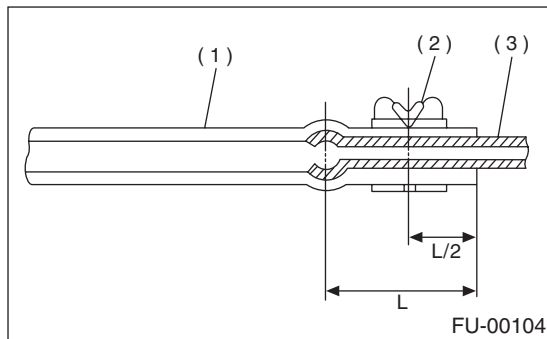


Fuel Filler Pipe

FUEL INJECTION (FUEL SYSTEMS)

7) Insert the evaporation hose approximately 25 to 30 mm (0.98 to 1.18 in) into the lower end of evaporation pipe and hold the clip.

$L = 27.5 \pm 2.5 \text{ mm (1.083 \pm 0.098 in)}$

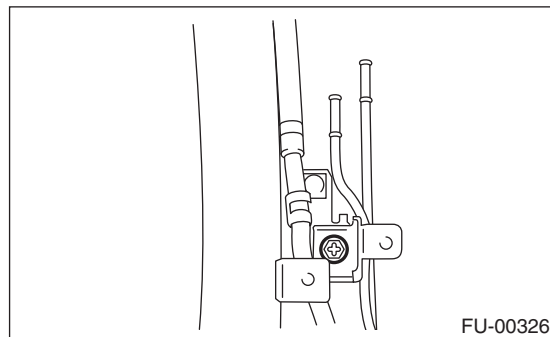


- (1) Hose
- (2) Clip
- (3) Pipe

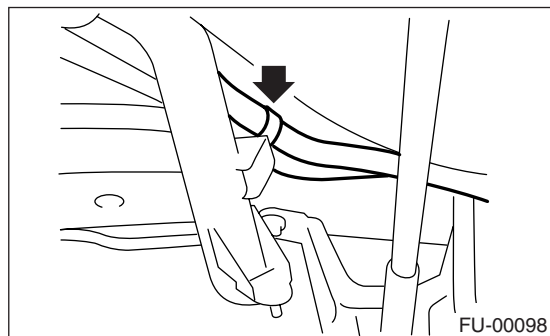
8) Tighten the bolt which holds the fuel filler pipe bracket on the body.

Tightening torque:

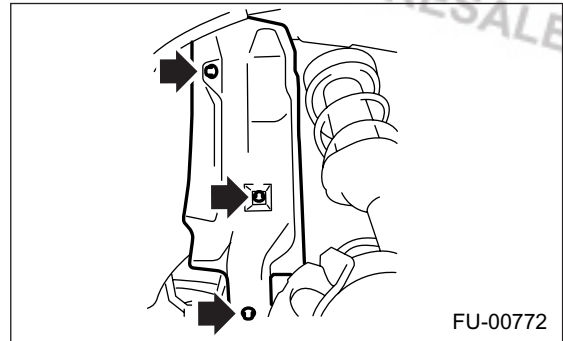
$7.5 \text{ N}\cdot\text{m (0.75 kgf}\cdot\text{m, 5.4 ft}\cdot\text{lb)}$



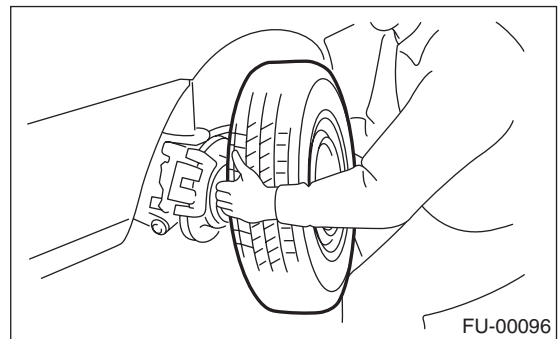
9) Secure the evaporation hose to clip of fuel filler pipe.



10) Install the fuel filler pipe protector.



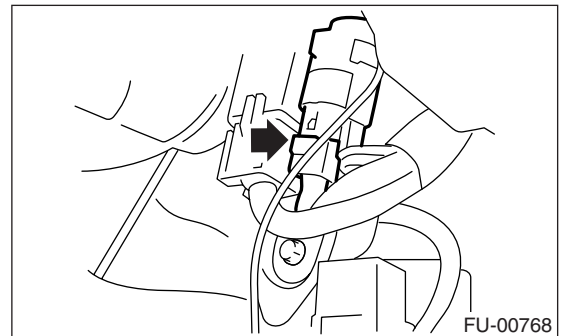
11) Install the rear right wheel.



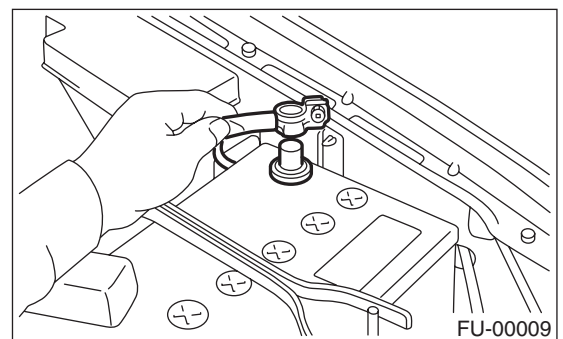
12) Lower the vehicle.

13) Tighten the wheel nuts.

14) Connect the connector to the fuel pump relay.



15) Connect the battery ground cable to battery.

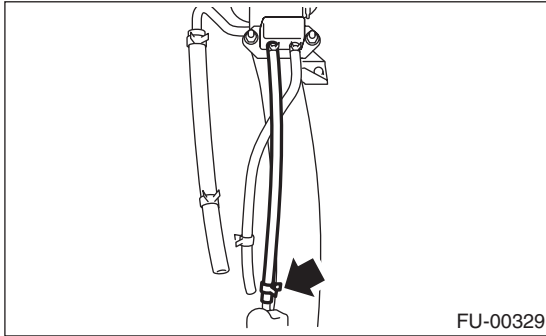


Fuel Filler Pipe

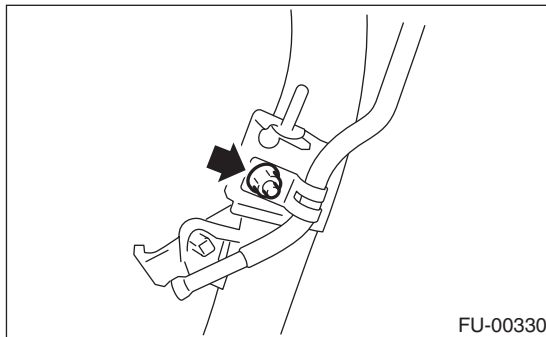
FUEL INJECTION (FUEL SYSTEMS)

C: DISASSEMBLY

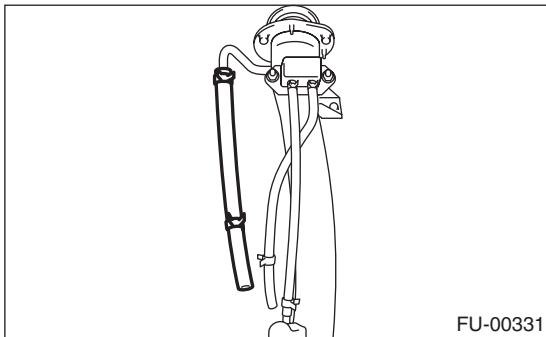
1) Move the clamp, and disconnect the evaporation hose from the joint pipe.



2) Remove the bolt which installs the joint pipe on the fuel filler pipe.



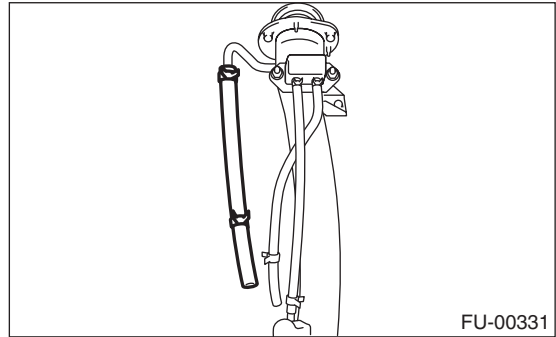
3) Disconnect the evaporation hose from the fuel filler pipe.



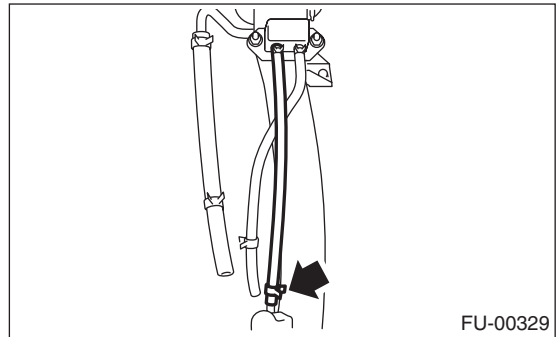
4) Remove the shut valve from the fuel filler pipe. <Ref. to EC(H4SO)-17, REMOVAL, Shut Valve.>

D: ASSEMBLY

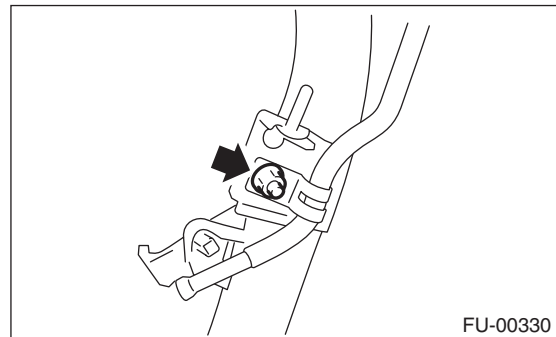
1) Install the shut valve on the fuel filler pipe. <Ref. to EC(H4SO)-17, INSTALLATION, Shut Valve.>
2) Connect the evaporation hose to the fuel filler pipe.



3) Connect the evaporation hose to the evaporation pipe.



4) Install the evaporation pipe to the fuel filler pipe.



22. Fuel Pump

A: REMOVAL

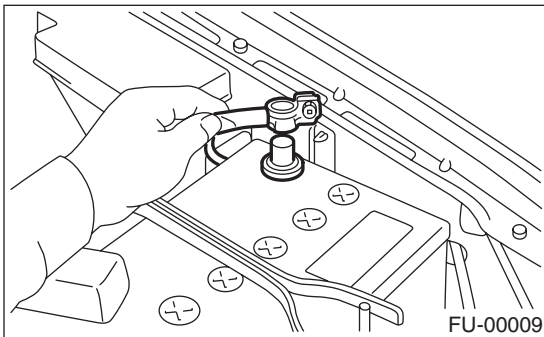
WARNING:

- Place “NO FIRE” signs near the working area.
- Be careful not to spill fuel on the floor.

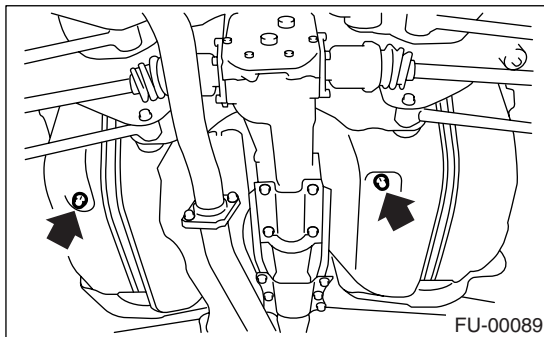
NOTE:

The fuel pump assembly consists of a fuel pump and a fuel level sensor.

- 1) Release the fuel pressure. <Ref. to FU(H4SO)-47, RELEASING OF FUEL PRESSURE, PROCEDURE, Fuel.>
- 2) Open the fuel filler flap lid and remove the fuel filler cap.
- 3) Disconnect the ground cable from battery.



- 4) Lift up the vehicle.
- 5) Drain the fuel from the fuel tank. Set a container under the vehicle and remove the drain plug from the fuel tank.



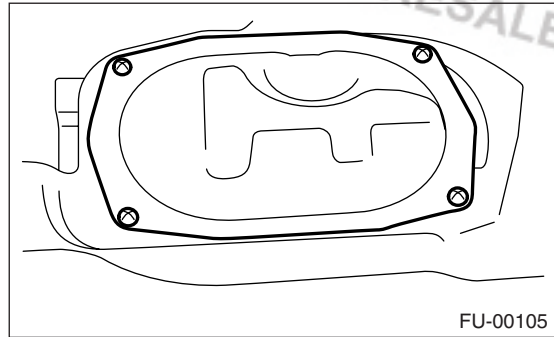
- 6) Tighten the fuel drain plug.

Tightening torque:

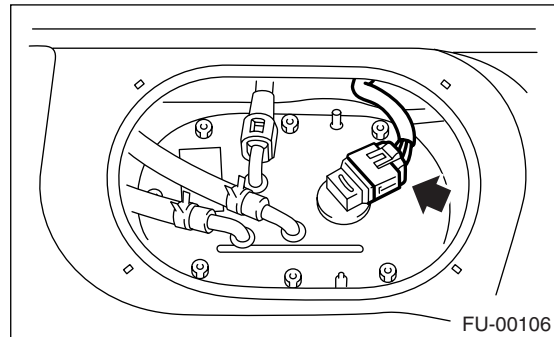
26 N·m (2.65 kgf·m, 19.2 ft·lb)

- 7) Raise the rear seat and turn the floor mat up.

- 8) Remove the access hole lid.

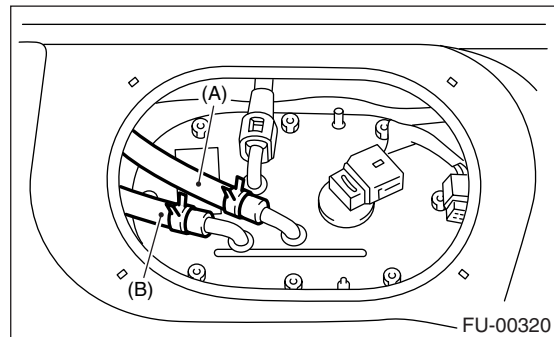


- 9) Disconnect the connector from fuel pump.

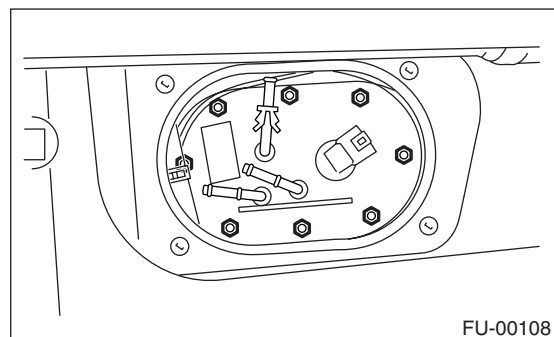


- 10) Disconnect the quick connector and then disconnect the fuel delivery hose. <Ref. to FU(H4SO)-62, REMOVAL, Fuel Delivery, Return and Evaporation lines.>

- 11) Move the clip and then disconnect the fuel return hose (A) and jet pump hose (B).



- 12) Remove the nuts which install the fuel pump assembly onto the fuel tank.



- 13) Take off the fuel pump assembly from the fuel tank.

B: INSTALLATION

Install in the reverse order of removal. Do the following:

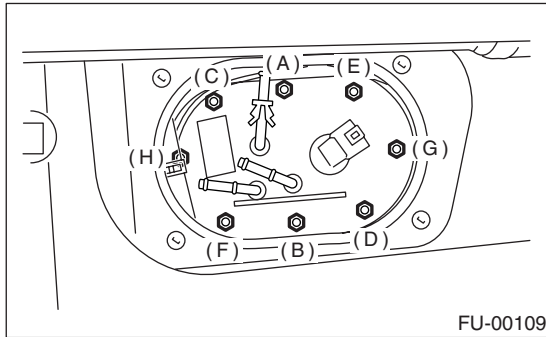
NOTE:

Replace the gaskets with new ones.

- (1) Ensure the sealing portion is free from fuel or foreign particles before installation.
- (2) Tighten the nuts in alphabetical sequence shown in figure to specified torque.

Tightening torque:

4.4 N·m (0.45 kgf-m, 3.3 ft-lb)

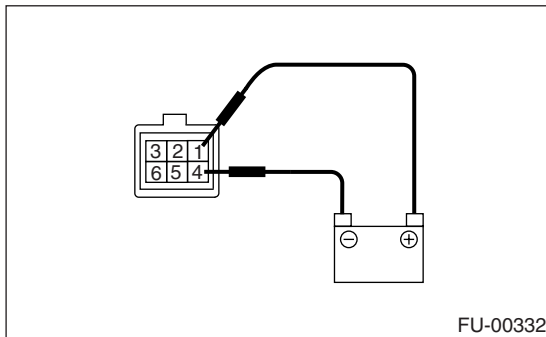


C: INSPECTION

Connect the lead harness to the connector terminal of fuel pump and apply the battery power supply to check whether the pump operates.

WARNING:

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



23. Fuel Level Sensor

A: REMOVAL

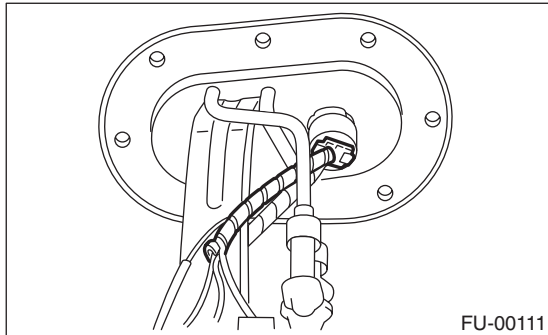
WARNING:

- Place “NO FIRE” signs near the working area.
- Be careful not to spill fuel on the floor.

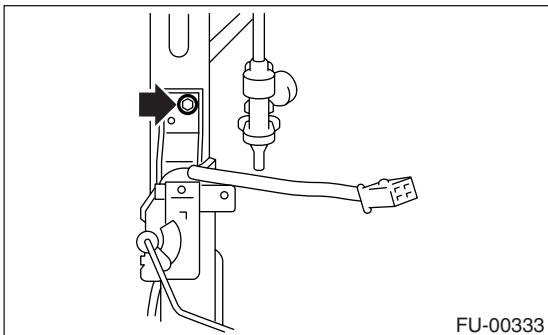
NOTE:

The fuel level sensor is built in the fuel pump assembly.

- 1) Remove the fuel pump assembly. <Ref. to FU(H4SO)-55, REMOVAL, Fuel Pump.>
- 2) Disconnect the connector from the fuel pump bracket.



- 3) Remove the bolt which installs the fuel level sensor on the mounting bracket.



B: INSTALLATION

Install in the reverse order of removal.

Tightening torque:

4.4 N·m (0.45 kgf·m, 3.3 ft·lb)

Fuel Sub Level Sensor

FUEL INJECTION (FUEL SYSTEMS)

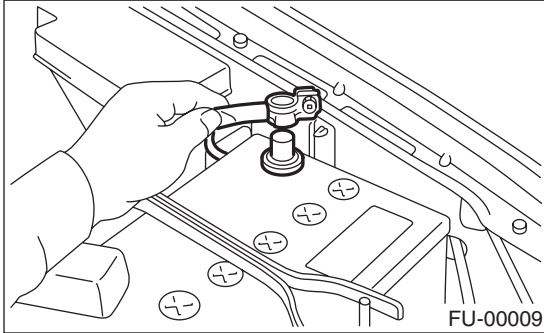
24. Fuel Sub Level Sensor

A: REMOVAL

WARNING:

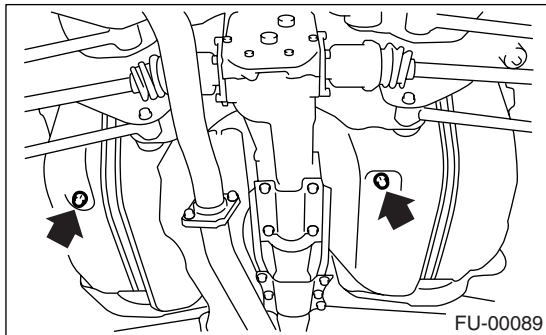
- Place "NO FIRE" signs near the working area.
- Be careful not to spill fuel on the floor.

1) Disconnect the ground cable from battery.



2) Lift up the vehicle.

3) Drain the fuel from the fuel tank. Set a container under the vehicle and remove the drain plug from the fuel tank.



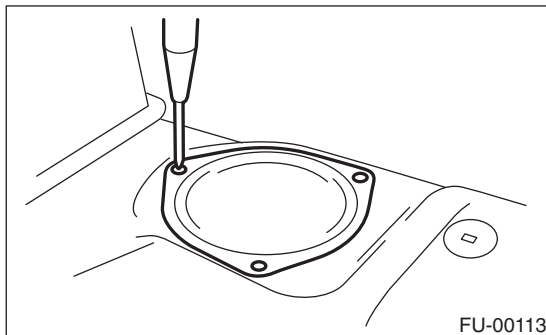
4) Tighten the fuel drain plug.

Tightening torque:

26 N·m (2.65 kgf·m, 19.2 ft·lb)

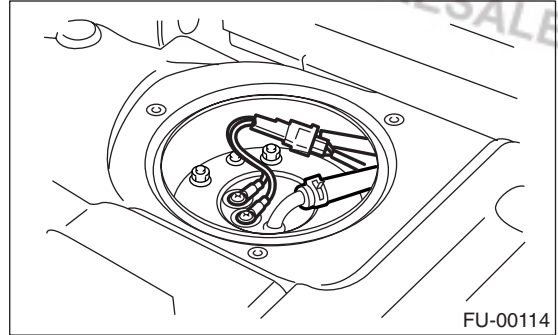
5) Remove the rear seat.

6) Remove the service hole cover.

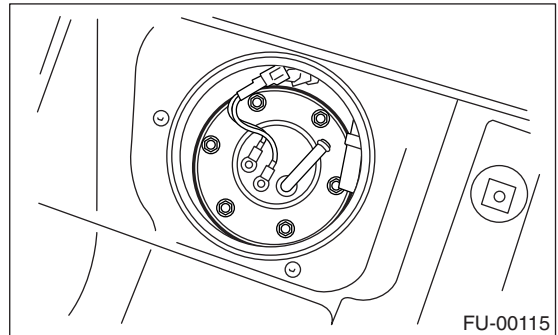


7) Disconnect the connector from the fuel sub level sensor.

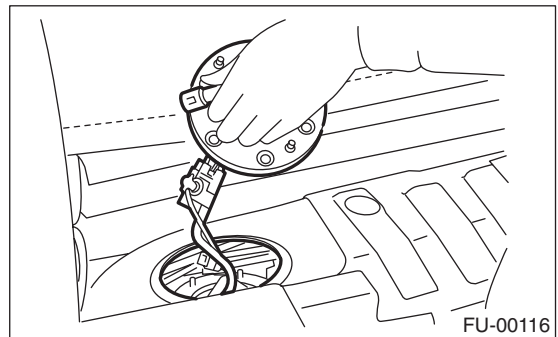
8) Disconnect the fuel jet pump hose.



9) Remove the bolts which install the fuel sub level sensor on the fuel tank.



10) Remove the fuel sub level sensor.



B: INSTALLATION

Install in the reverse order of removal.

NOTE:

For tightening torque, refer to "COMPONENT".
<Ref. to FU(H4SO)-3, COMPONENT, General Description.>

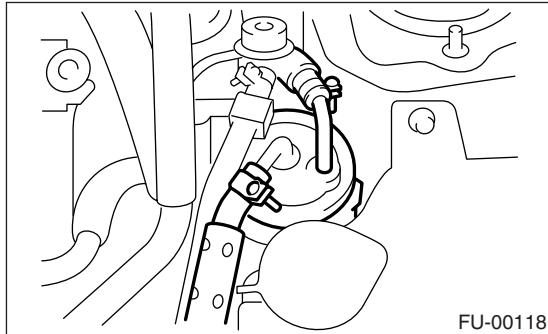
25. Fuel Filter

A: REMOVAL

WARNING:

- Place “NO FIRE” signs near the working area.
- Be careful not to spill fuel on the floor.

- 1) Release the fuel pressure. <Ref. to FU(H4SO)-47, RELEASING OF FUEL PRESSURE, PROCEDURE, Fuel.>
- 2) Disconnect the fuel delivery hoses from the fuel filter.



- 3) Remove the filter from the holder.

B: INSTALLATION

- 1) Install in the reverse order of removal.
- 2) Tighten the hose clamp screws.

Tightening torque:

1.25 N·m (0.13 kgf·m, 0.94 ft·lb)

C: INSPECTION

- 1) Check the inside of fuel filter for dirt and water sediment.
- 2) If it is clogged, or if the replacement interval has been reached, replace it.
- 3) If the water is found in it, shake and expel the water from the inlet port.
- 4) If fuel hoses are damaged at the connecting portion, replace them with new ones.
- 5) If clamps are badly damaged, replace them with new ones.

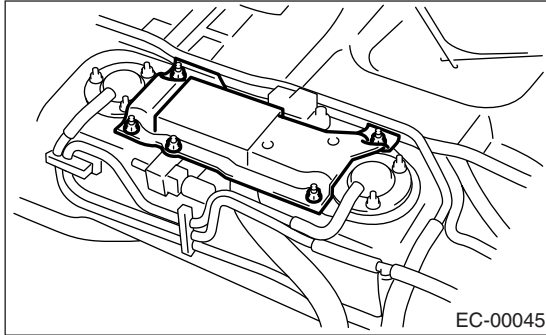
26. Fuel Cut Valve

A: REMOVAL

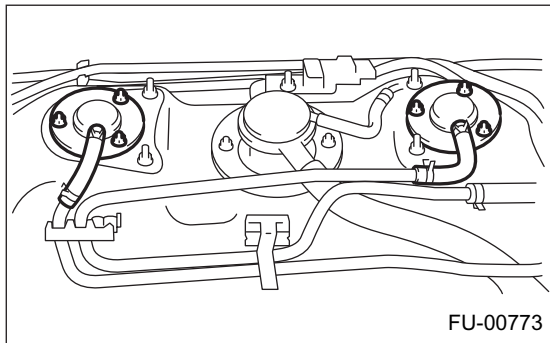
WARNING:

- Place “NO FIRE” signs near the working area.
- Be careful not to spill fuel on the floor.

- 1) Remove the fuel tank. <Ref. to FU(H4SO)-48, REMOVAL, Fuel Tank.>
- 2) Remove the protect cover.



- 3) Move the clip and disconnect the evaporation hose from the fuel cut valve.



- 4) Remove the bolts which install the fuel cut valve.

B: INSTALLATION

Install in the reverse order of removal.

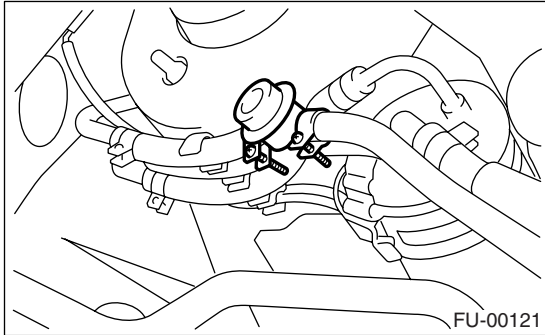
NOTE:

For tightening torque, refer to “COMPONENT”.
<Ref. to FU(H4SO)-3, COMPONENT, General Description.>

27. Fuel Damper Valve

A: REMOVAL

- 1) Release the fuel pressure. <Ref. to FU(H4SO)-47, RELEASING OF FUEL PRESSURE, PROCEDURE, Fuel.>
- 2) Remove the fuel damper valve from the fuel return line.



B: INSTALLATION

Install in the reverse order of removal.

Tightening torque:

1.25 N·m (0.13 kgf-m, 0.94 ft-lb)

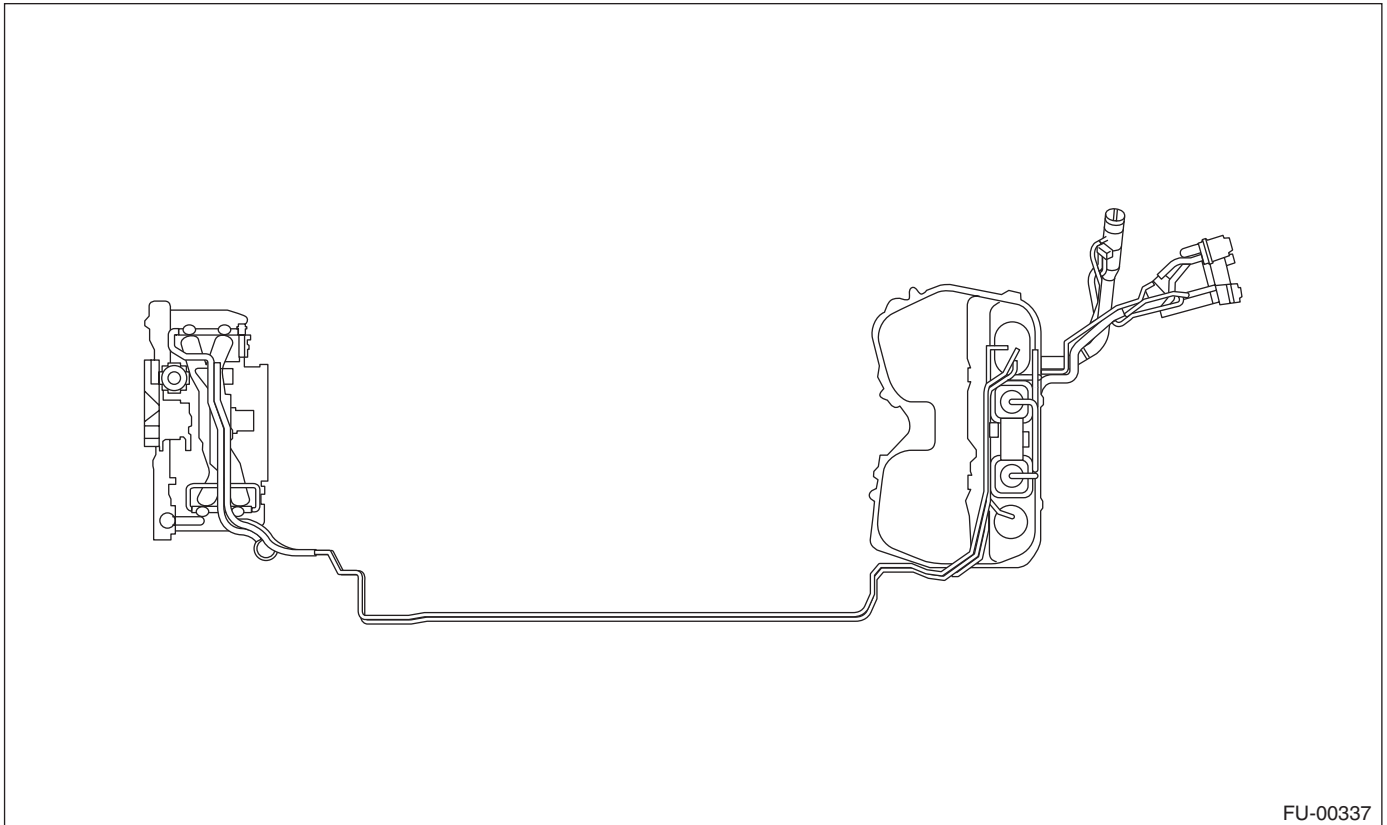
Fuel Delivery, Return and Evaporation lines

FUEL INJECTION (FUEL SYSTEMS)

28. Fuel Delivery, Return and Evaporation lines

A: REMOVAL

- 1) Set the vehicle on a lift.
- 2) Release the fuel pressure. <Ref. to FU(H4SO)-47, RELEASING OF FUEL PRESSURE, PROCEDURE, Fuel.>
- 3) Open the fuel filler flap lid and remove the fuel filler cap.
- 4) Remove the floor mat. <Ref. to EI-57, REMOVAL, Floor Mat.>
- 5) Remove the fuel delivery pipes and hoses, fuel return pipes and hoses, evaporation pipes and hoses.

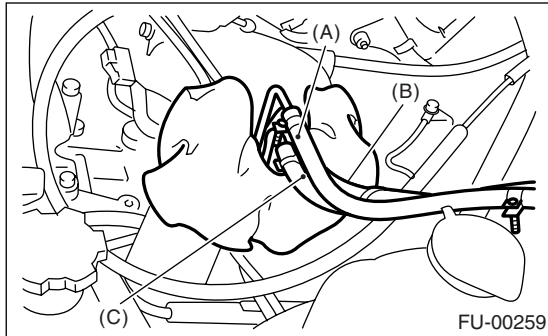


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Fuel Delivery, Return and Evaporation lines

FUEL INJECTION (FUEL SYSTEMS)

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



- (A) Fuel delivery hose
- (B) Return hose
- (C) Evaporation hose

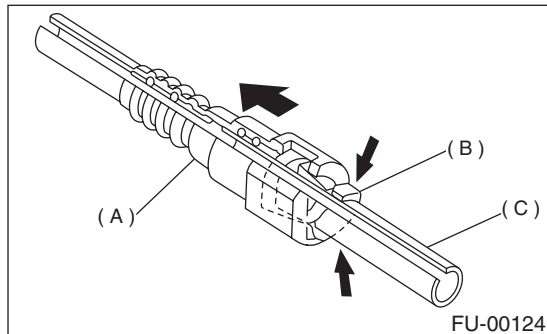
7) Lift up the vehicle.

8) Separate the quick connector on the fuel delivery line.

- (1) Clean the pipe and connector, if they are covered with dust.
- (2) Hold the connector (A) and push retainer (B) down.
- (3) Pull out the connector (A) from retainer (B).

CAUTION:

Always use a new retainer.



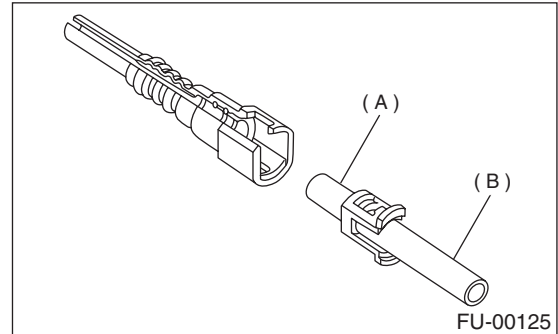
- (A) Connector
- (B) Retainer
- (C) Pipe

B: INSTALLATION

1) Connect the quick connector on fuel delivery line.

CAUTION:

- Always use a new retainer.
- Make sure that the connected portion is not damaged or has dust. If necessary, clean seal surface of pipe.

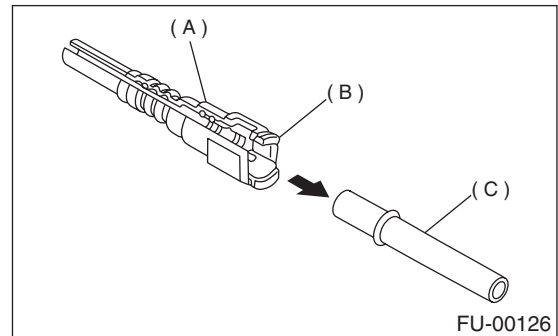


- (A) Seal surface
- (B) Pipe

- (1) Set the new retainer (B) to connector (A).
- (2) Push the pipe into the connector completely.

NOTE:

At this time, two clicking sounds are heard.



- (A) Connector
- (B) Retainer
- (C) Pipe

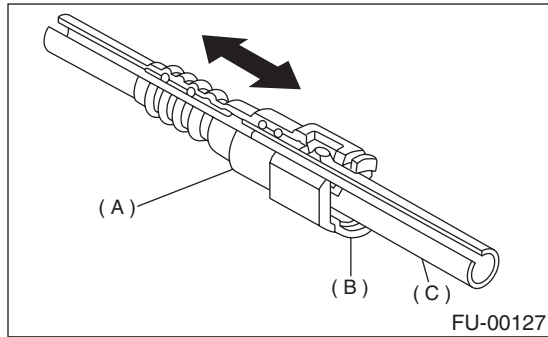
CAUTION:

- Pull the connector to ensure it is connected securely.
- Ensure the two retainer pawls are engaged in their mating positions in the connector.

Fuel Delivery, Return and Evaporation lines

FUEL INJECTION (FUEL SYSTEMS)

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



- (A) Connector
- (B) Retainer
- (C) Pipe

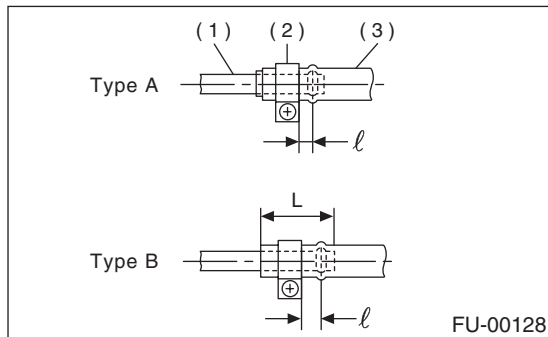
2) Connect the fuel delivery hose to the pipe with an overlap of 20 to 25 mm (0.79 to 0.98 in).

Type A: When the fitting length is specified.

Type B: When the fitting length is not specified.

$\varnothing : 2.5 \pm 1.5 \text{ mm } (0.098 \pm 0.059 \text{ in})$

$L : 22.5 \pm 2.5 \text{ mm } (0.886 \pm 0.098 \text{ in})$



- (1) Pipe
- (2) Clamp
- (3) Hose

3) Connect the return hose and evaporation hose to pipe by approx. 15 mm (0.59 in) from the hose end.

Fuel return hose:

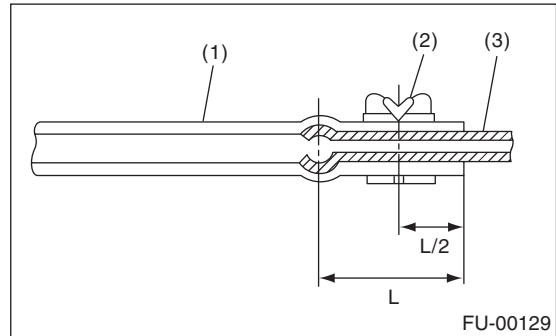
$L = 22.5 \pm 2.5 \text{ mm } (0.885 \pm 0.098 \text{ in})$

Fuel evaporation hose:

$L = 17.5 \pm 2.5 \text{ mm } (0.689 \pm 0.098 \text{ in})$

CAUTION:

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



- (1) Hose
- (2) Clip
- (3) Pipe

C: INSPECTION

1) Make sure that there are no cracks on the fuel pipes and fuel hoses.

2) Make sure that the fuel pipe and fuel hose connections are tight.

Fuel System Trouble in General

FUEL INJECTION (FUEL SYSTEMS)

29. Fuel System Trouble in General

A: INSPECTION

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 the fuel pump.
2)	Lowering of fuel pump function.	Replace the 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.	Retighten.
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 odor inside compartment		
1)	Loose joints at air breather tube, air vent tube and fuel filler pipe.	Retighten.
2)	Defective packing air tightness on the fuel saucer.	Correct or replace packing.
3)	Cracked fuel separator.	Replace separator.
4)	Inoperative fuel pump modulator or circuit.	Replace.
4. Defective fuel meter indicator		
1)	Defective operation of fuel level sensor.	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 the water condensation from the fuel filter.

- Refilling the fuel tank.

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

- Protecting the fuel system against freezing and water condensation.

(3) 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 the water which may have accumulated in the fuel filter and fuel tank in the manner same as that described under Affected areas below.

(4) Affected areas

When the water condensation is notched in the fuel filter, drain the 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.

Fuel System Trouble in General

FUEL INJECTION (FUEL SYSTEMS)

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