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FUEL INJECTION (FUEL SYTEMS)

General Description

FUEL INJECTION (FUEL SYSTEMS)

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1. General Description

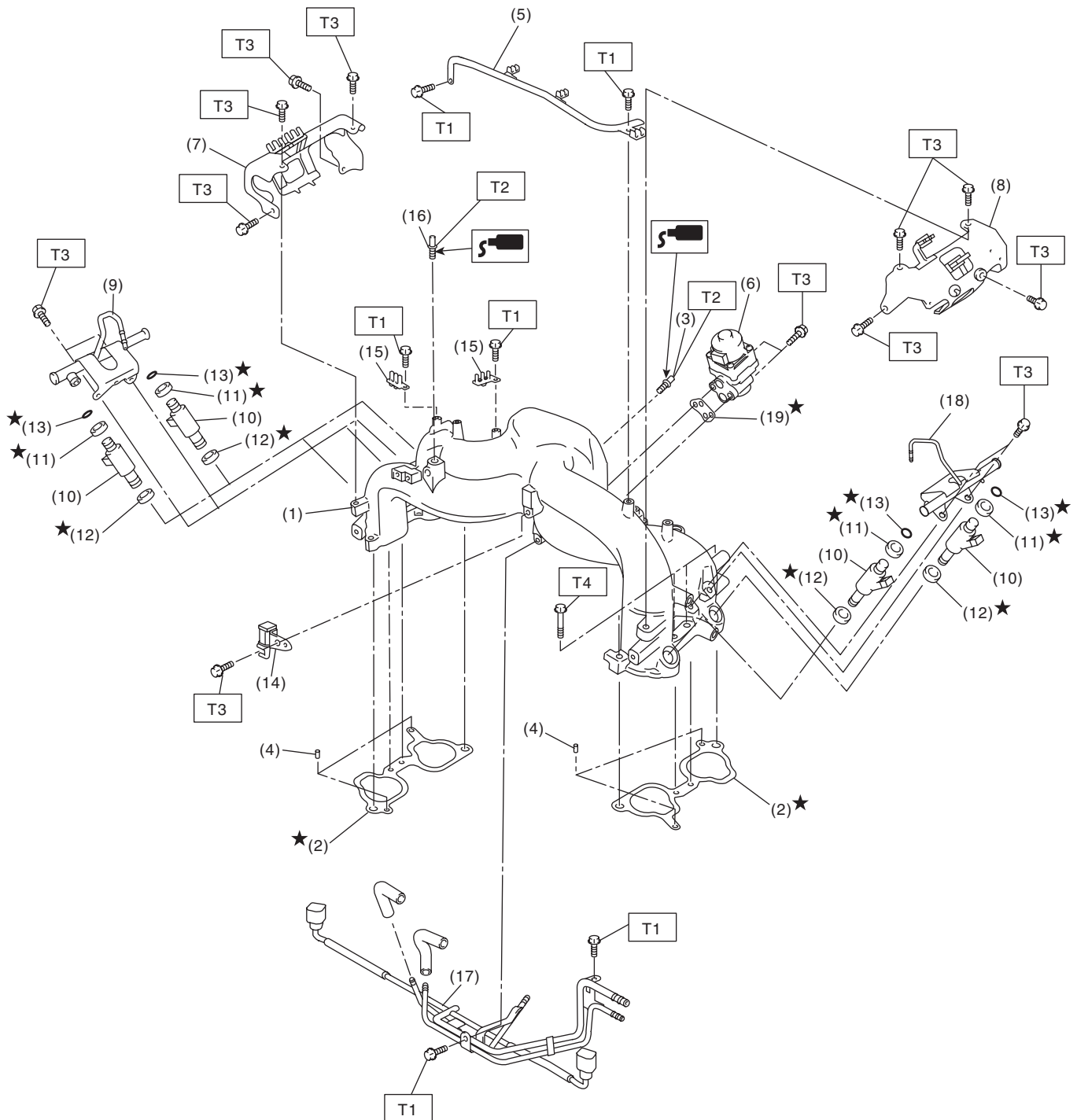
A: SPECIFICATION

Fuel tank	Capacity	64 ℓ (16.9 US gal, 14.1 Imp gal)
	Install locations	Under rear seat
Fuel pump	Type	Impeller
	Shutoff discharge pressure	550 — 850 kPa (5.6 — 8.7 kg/cm ² , 79.7 — 123.2 psi)
	Discharge rate	125 ℓ (33 US gal, 27.5 Imp gal)/h or more. [12 V at 300 kPa (3.06 kg/cm ² , 43.5 psi)]
Fuel filter		Intank type

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B: COMPONENT

1. INTAKE MANIFOLD



FU-03452

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- | | | |
|----------------------------|-----------------------------------|----------------------------|
| (1) Intake manifold | (10) Fuel injector | (18) Fuel injector pipe LH |
| (2) Gasket | (11) O-ring | (19) Gasket |
| (3) Nipple | (12) O-ring | |
| (4) Guide pin | (13) O-ring | |
| (5) Plug cord stay | (14) Purge control solenoid valve | |
| (6) EGR valve | (15) Plug cord holder | |
| (7) Fuel pipe protector RH | (16) Nipple | |
| (8) Fuel pipe protector LH | (17) Fuel pipe ASSY | |
| (9) Fuel injector pipe RH | | |

Tightening torque:N·m (kgf·m, ft·lb)

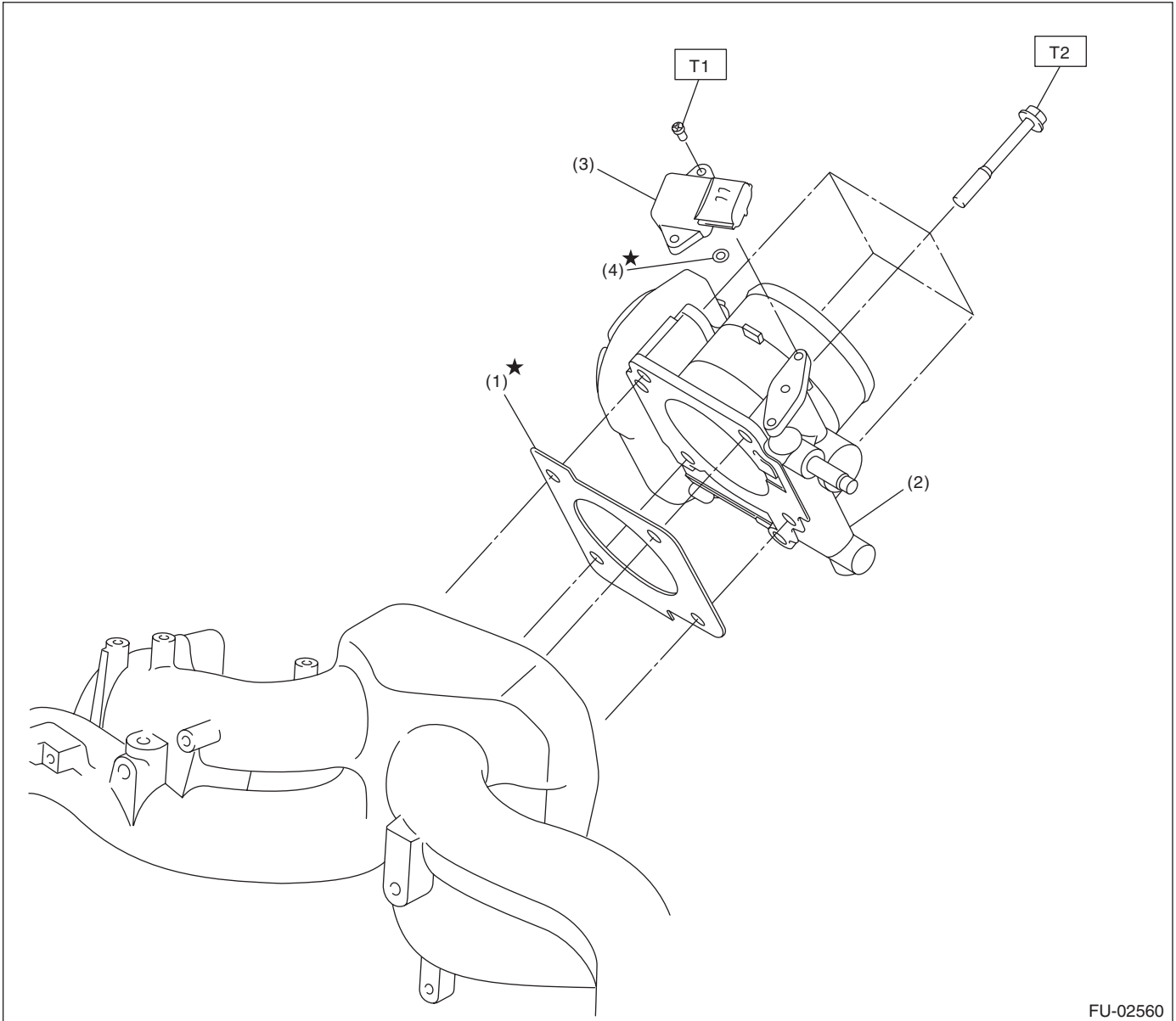
T1: 6.4 (0.65, 4.7)

T2: 17 (1.7, 12.5)

T3: 19 (1.9, 14.0)

T4: 25 (2.5, 18.4)

2. AIR INTAKE SYSTEM



FU-02560

- | | |
|---------------------------------------|------------|
| (1) Gasket | (4) O-ring |
| (2) Throttle body | |
| (3) Manifold absolute pressure sensor | |

Tightening torque:N·m (kgf·m, ft·lb)

T1: 2 (0.2, 1.5)

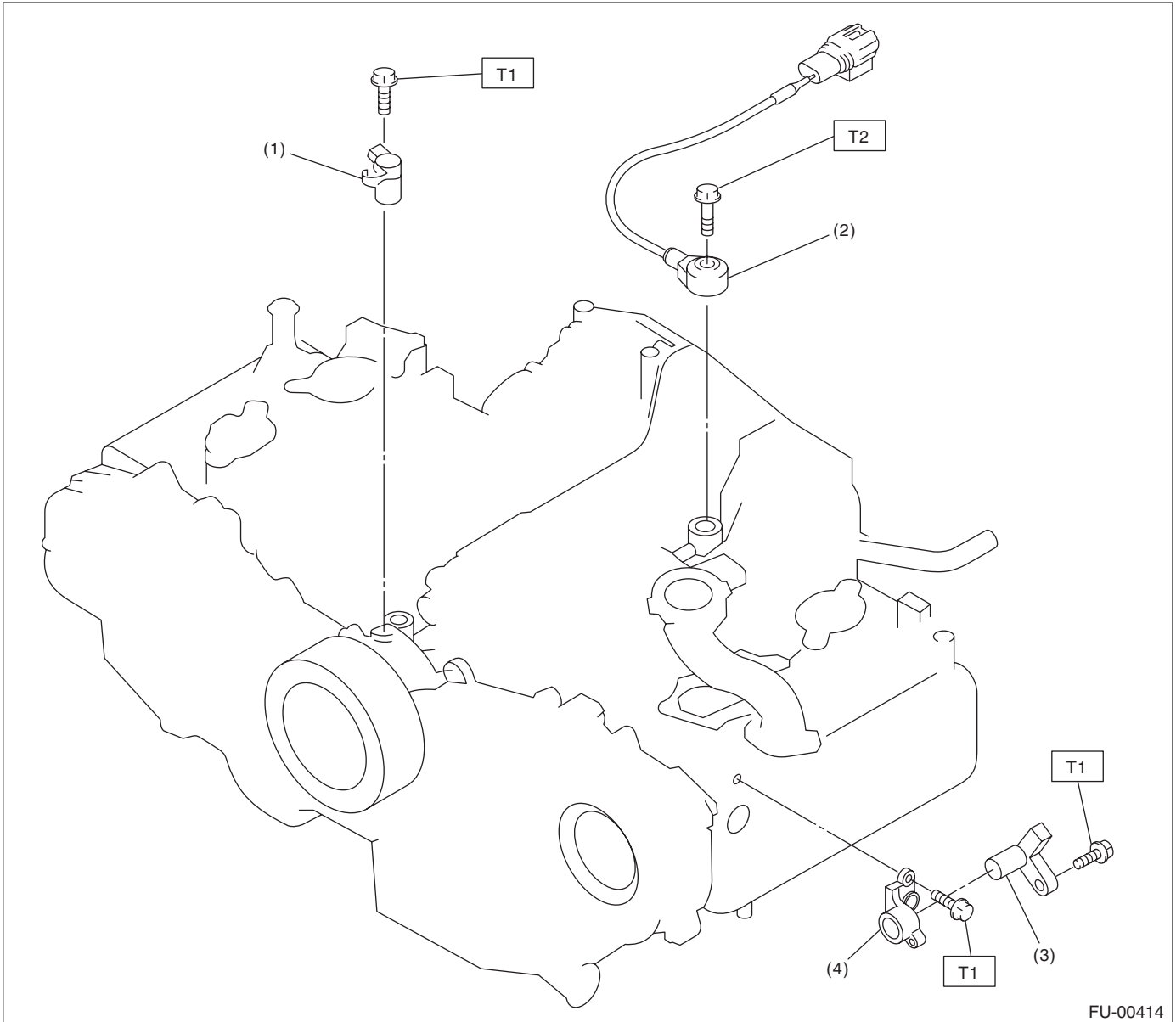
T2: 8 (0.8, 5.9)

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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)

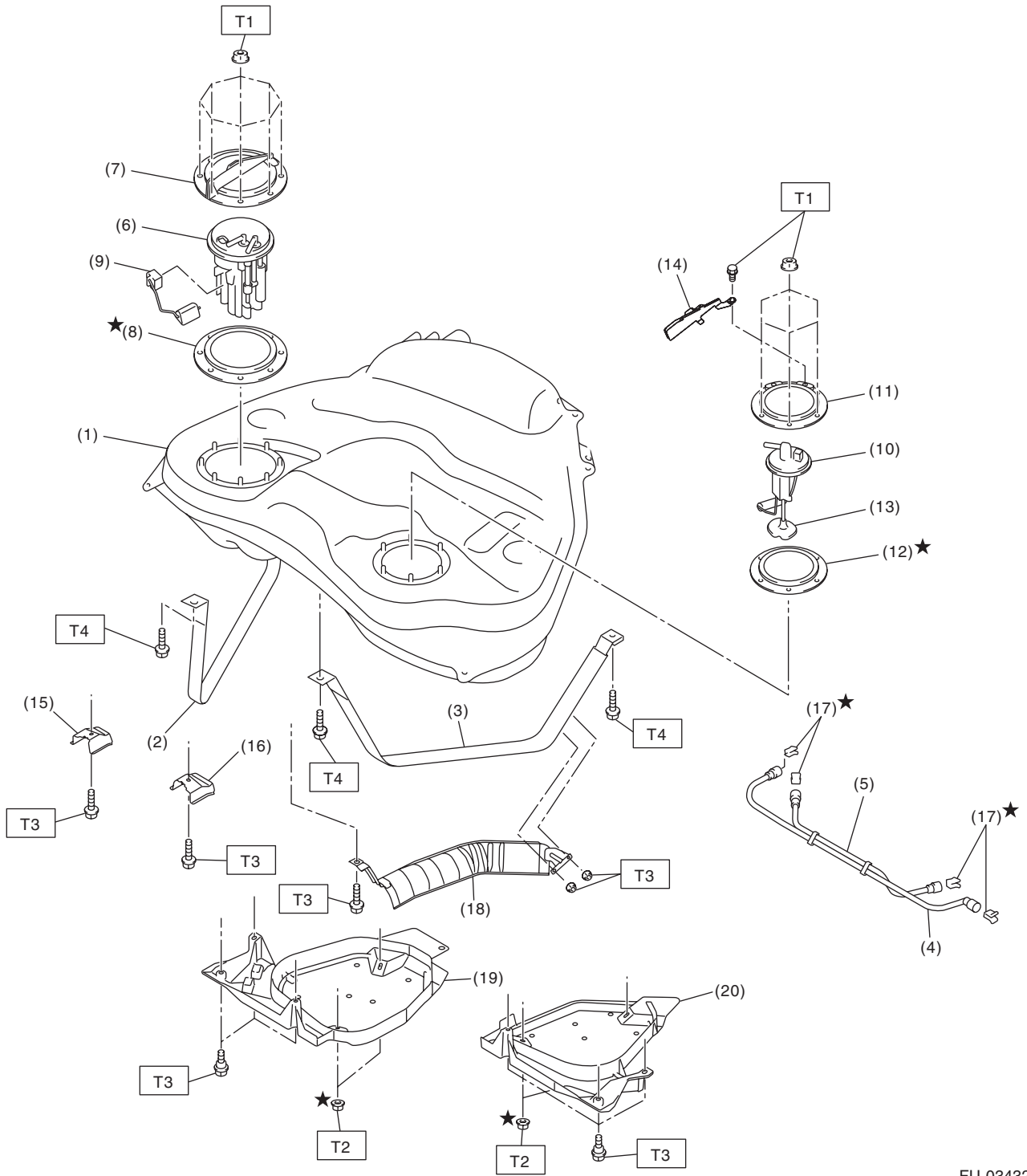
T2: 24 (2.4, 17.7)

General Description

FUEL INJECTION (FUEL SYSTEMS)

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4. FUEL TANK



FU-03432

General Description

FUEL INJECTION (FUEL SYSTEMS)

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- | | | |
|---------------------------|--|-----------------------------|
| (1) Fuel tank | (10) Fuel sub level sensor | (19) Fuel tank protector RH |
| (2) Fuel tank band RH | (11) Fuel sub level sensor upper plate | (20) Fuel tank protector LH |
| (3) Fuel tank band LH | (12) Fuel sub level sensor gasket | |
| (4) Delivery tube | (13) Fuel sub level sensor filter | |
| (5) Jet pump tube | (14) Fuel sub level sensor protector | |
| (6) Fuel pump ASSY | (15) Stopper RH | |
| (7) Fuel pump upper plate | (16) Stopper LH | |
| (8) Fuel pump gasket | (17) Retainer | |
| (9) Fuel level sensor | (18) Heat shield cover | |

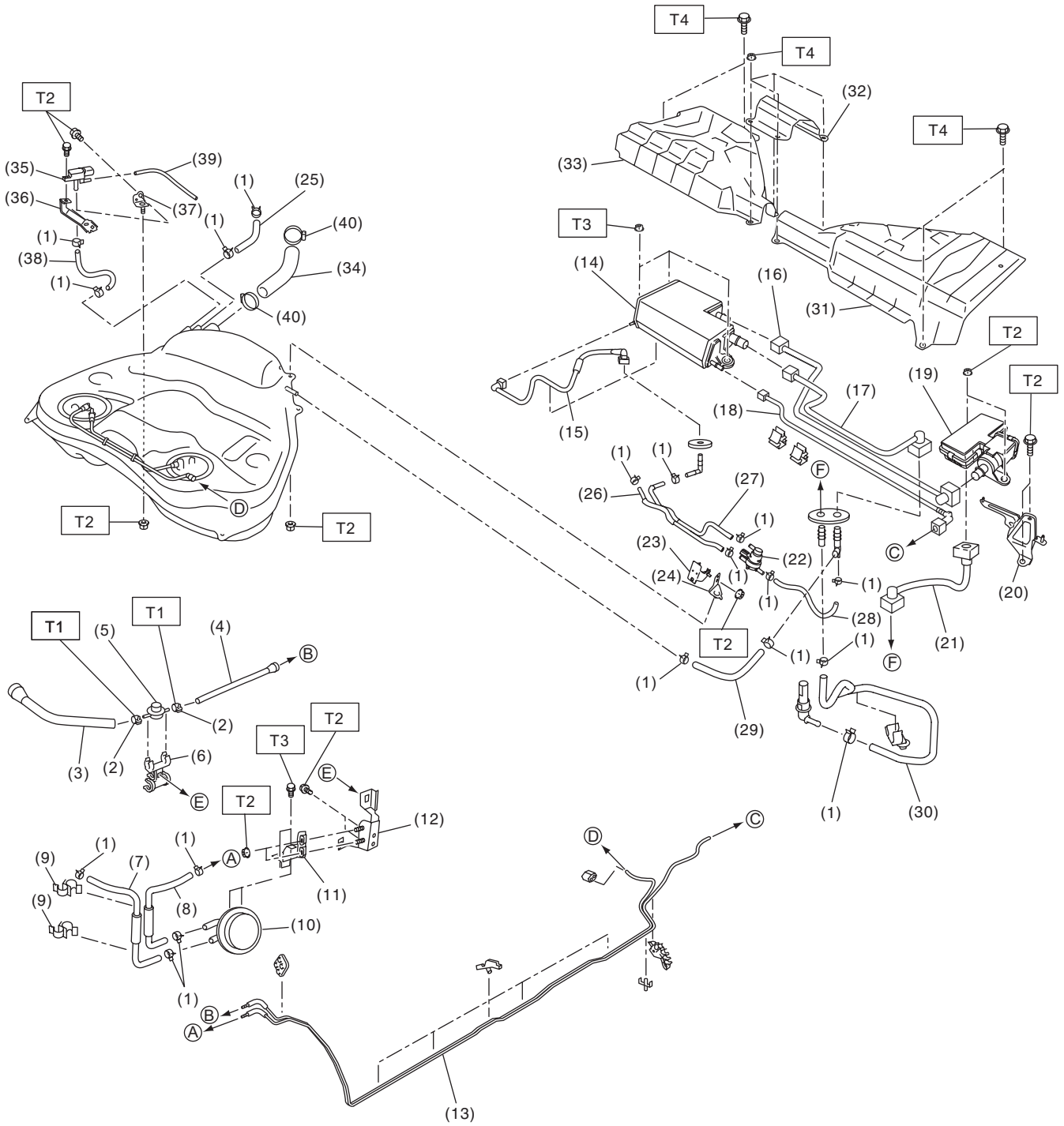
Tightening torque:N·m (kgf-m, ft-lb)**T1: 4.4 (0.45, 3.2)****T2: 9 (0.9, 6.6)****T3: 18 (1.8, 12.9)****T4: 33 (3.4, 24.3)**

General Description

FUEL INJECTION (FUEL SYSTEMS)

5. FUEL LINE

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(1) Clip	(17) Vent tube	(31) Canister cover LH
(2) Clamp	(18) Purge tube	(32) Center canister cover
(3) Fuel delivery hose A	(19) Drain valve	(33) Canister cover RH
(4) Fuel delivery hose B	(20) Drain valve bracket	(34) Fuel filler hose
(5) Fuel damper	(21) Drain tube B	(35) Fuel tank pressure sensor
(6) Fuel damper holder	(22) Pressure control solenoid valve	(36) Fuel tank pressure sensor bracket A
(7) Evaporation hose A	(23) Pressure control solenoid valve bracket A	(37) Fuel tank pressure sensor bracket B
(8) Evaporation hose B	(24) Pressure control solenoid valve bracket B	(38) Pressure hose
(9) Clamp	(25) Evaporation hose A	(39) Vacuum hose
(10) Purge damper valve	(26) Evaporation hose B	(40) Clamp
(11) Purge damper valve bracket A	(27) Evaporation hose C	
(12) Purge damper valve bracket B	(28) Evaporation hose D	
(13) Fuel pipe ASSY	(29) Evaporation hose E	
(14) Canister	(30) Canister drain hose	
(15) PCV drain tube		
(16) Drain tube A		

Tightening torque:N·m (kgf·m, ft·lb)**T1: 1.25 (0.13, 0.94)****T2: 7.5 (0.76, 5.5)****T3: 8 (0.8, 5.9)****T4: 18 (1.8, 13.3)**

C: CAUTION

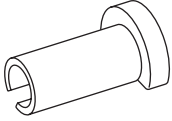
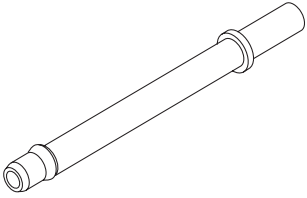
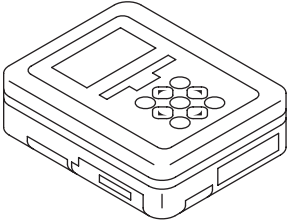
- Wear appropriate work clothing, including a cap, protective goggles and protective shoes when performing any work.
- Remove contamination including dirt and corrosion before removal, installation or disassembly.
- Keep the disassembled parts in order and protect them from dust and dirt.
- Before removal, installation or disassembly, be sure to clarify the failure. Avoid unnecessary removal, installation, disassembly and replacement.
- Vehicle components are extremely hot after driving. Be wary of receiving burns from heated parts.
- Be sure to tighten fasteners including bolts and nuts to the specified torque.
- Place shop jacks or rigid racks at the specified points.
- Before disconnecting connectors of sensors or units, be sure to disconnect the ground cable from the battery.
- Place “NO OPEN FLAMES” signs near the working area.
- Prepare a container and cloth to prevent scattering of fuels when performing work where fuels can be spilled. If the fuel spills, wipe it off immediately to prevent from penetrating into floor or flowing out for environmental protection.
- Follow all government and local regulations concerning disposal of refuse when disposing fuel.

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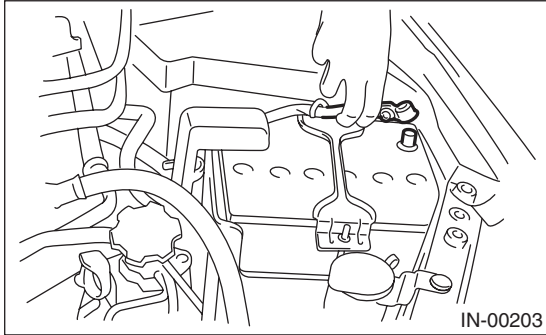
D: PREPARATION TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>ST42099AE000</p>	42099AE000	QUICK CONNECTOR RELEASE	Used for removing the quick connector.
 <p>ST18471AA000</p>	18471AA000 (Newly adopted tool)	FUEL PIPE ADAPTER	Used for draining fuel.
 <p>ST1B021XU0</p>	1B021XU0	SUBARU SELECT MONITOR III KIT	Used for extracting fuel.

2. Throttle Body

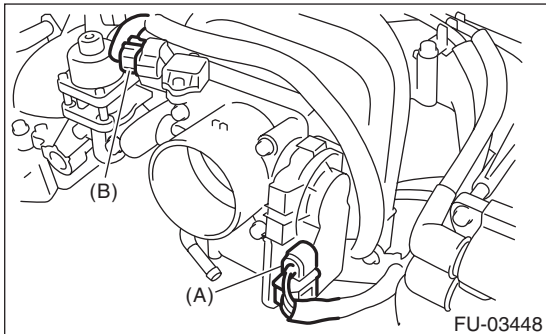
A: REMOVAL

1) Disconnect the ground cable from the battery.



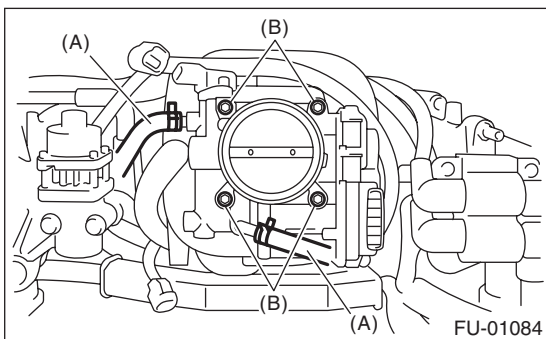
2) Remove the air intake chamber. <Ref. to IN(H4SO)-7, REMOVAL, Air Intake Chamber.>

3) Disconnect the throttle position sensor connector (A) and manifold pressure sensor connector (B).



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

5) Remove the bolts (B) which secure the throttle body to the intake manifold, and remove the throttle body.



B: INSTALLATION

Install in the reverse order of removal.

NOTE:

Use a new gasket.

Tightening torque:

8 N·m (0.8 kgf-m, 5.9 ft-lb)

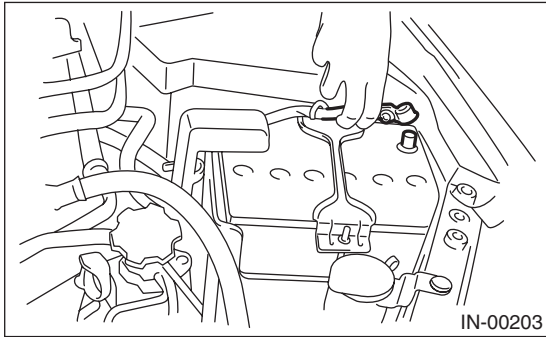
Intake Manifold

FUEL INJECTION (FUEL SYSTEMS)

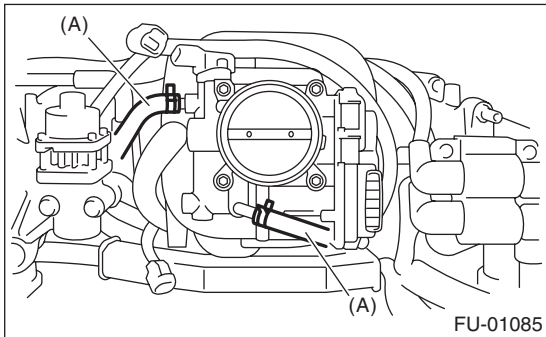
3. Intake Manifold

A: REMOVAL

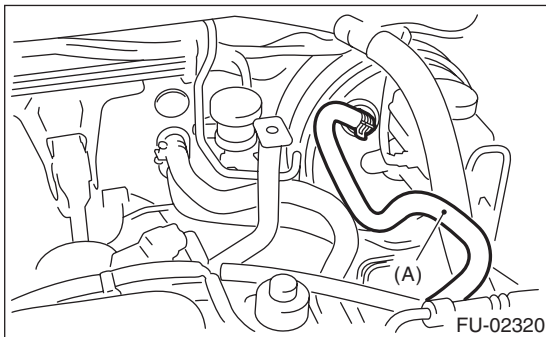
- 1) Release the fuel pressure.
<Ref. to FU(H4SO)-43, RELEASING OF FUEL PRESSURE, PROCEDURE, Fuel.>
- 2) Disconnect the ground cable from the battery.



- 3) Remove the air cleaner case and air intake chamber. <Ref. to IN(H4SO)-5, REMOVAL, Air Cleaner Case.> <Ref. to IN(H4SO)-7, REMOVAL, Air Intake Chamber.>
- 4) Remove the generator. <Ref. to SC(H4SO)-12, REMOVAL, Generator.>
- 5) Disconnect the spark plug cord from the spark plug.
- 6) Disconnect the engine coolant hoses (A) from throttle body.

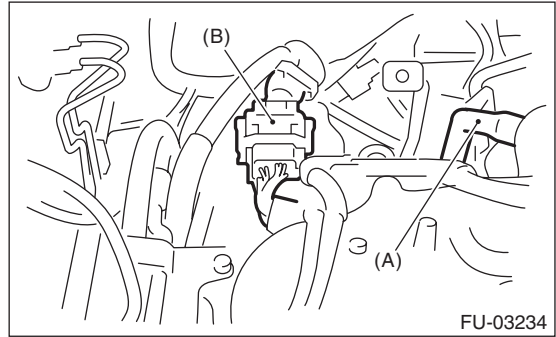


- 7) Disconnect brake booster vacuum hose (A).

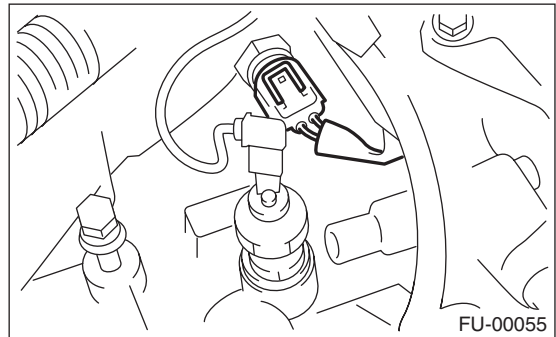


- 8) Disconnect the PCV hose (A) from intake manifold.

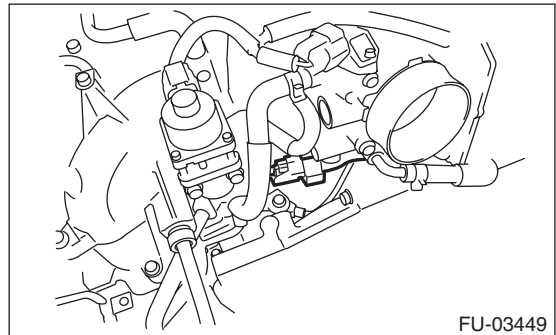
- 9) Disconnect the engine harness connectors (B) from bulkhead harness connectors.



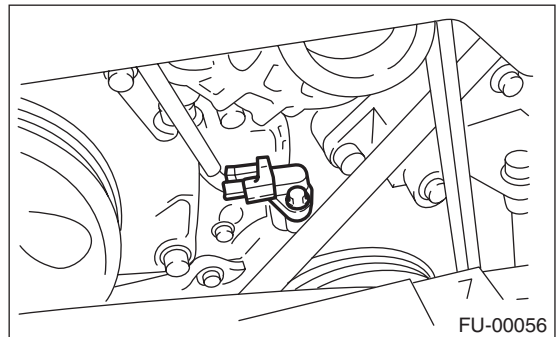
- 10) Disconnect the connectors from the engine coolant temperature sensor.



- 11) Disconnect the knock sensor connector.



- 12) Disconnect the connector from crankshaft position sensor.



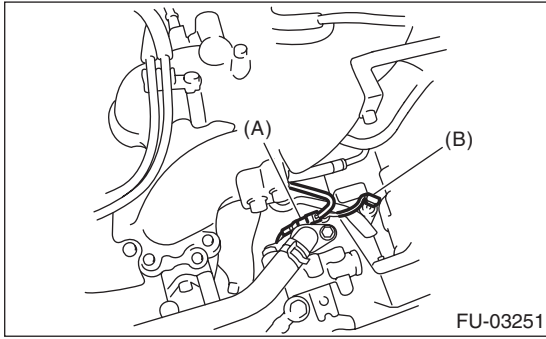
- 13) Disconnect the connector from power steering pump switch (A).

Intake Manifold

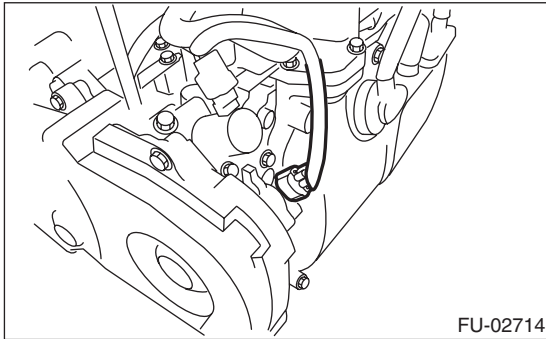
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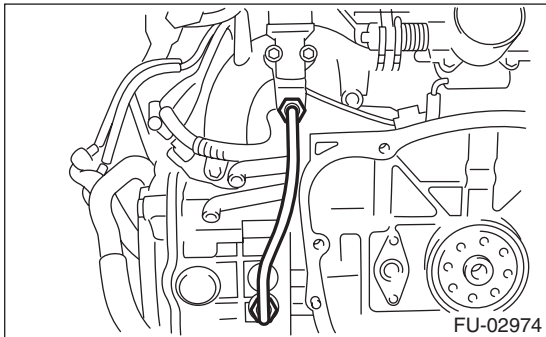
14) Disconnect the connector from the oil pressure switch (B).



15) Disconnect the connector from the camshaft position sensor.



16) Remove the EGR pipe from intake manifold.



17) Disconnect the following connector.
(1) Front oxygen (A/F) sensor connector
(2) Rear oxygen sensor connector
(3) Engine harness connectors

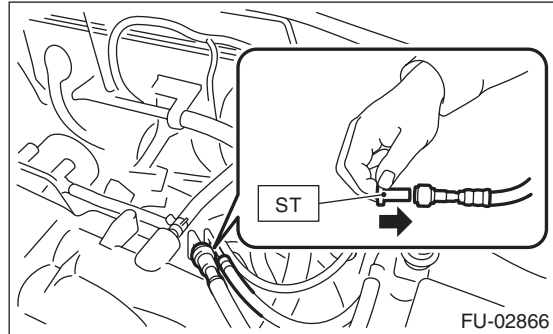
18) Disconnect the fuel hoses from fuel pipe.
(1) Disconnect the quick connector on the fuel delivery line by pushing the ST in the direction of the arrow.

ST 42099AE000 QUICK CONNECTOR RELEASE

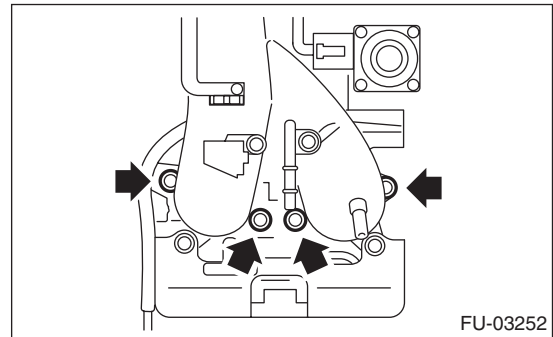
(2) Remove the clip and disconnect the evaporation hose from the pipe.

CAUTION:

- Be careful not to spill fuel.
- Catch the fuel from hoses using a container or cloth.



19) Remove the bolts which secure intake manifold to cylinder head.



20) Remove the intake manifold.

B: INSTALLATION

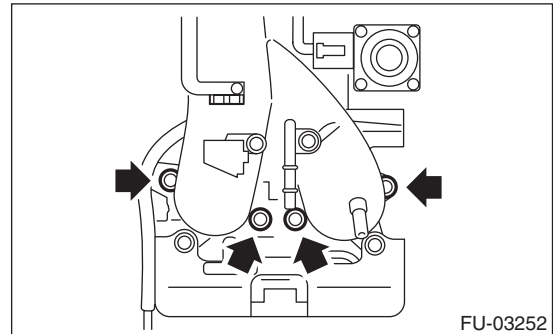
1) Install the intake manifold onto cylinder heads.

NOTE:

Use a new gasket.

Tightening torque:

25 N·m (2.5 kgf-m, 18.4 ft-lb)



Intake Manifold

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2) Connect the fuel delivery hose and evaporation hose to the fuel pipe. <Ref. to FU(H4SO)-66, INSTALLATION, Fuel Delivery and Evaporation Lines.>

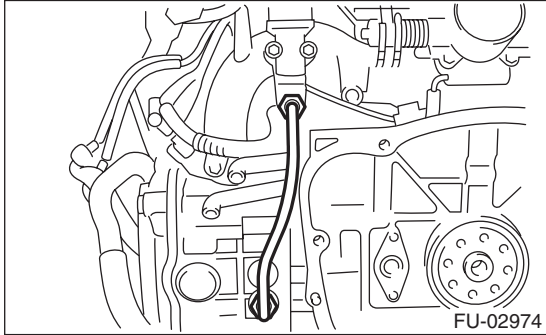
NOTE:

If fuel hoses or clamps are damaged, replace them with new parts.

3) Install the EGR pipe to intake manifold.

Tightening torque:

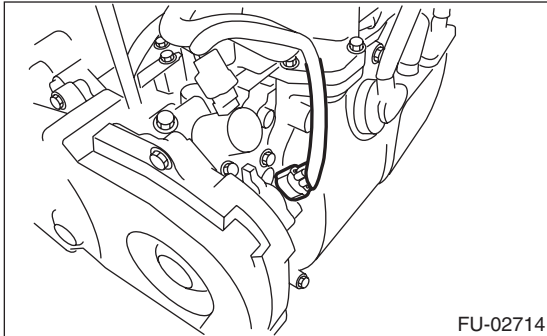
34 N·m (3.4 kgf-m, 24.6 ft-lb)



4) Connect the following connectors.

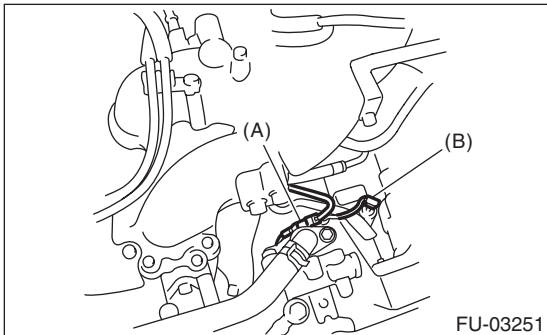
- (1) Front oxygen (A/F) sensor connector
- (2) Rear oxygen sensor connector
- (3) Engine harness connectors

5) Connect the connectors to camshaft position sensor.

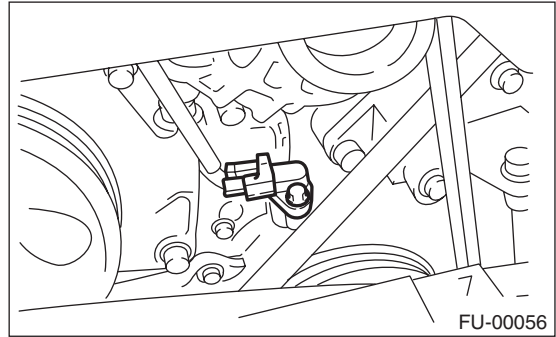


6) Connect the connector to the power steering pump switch (A).

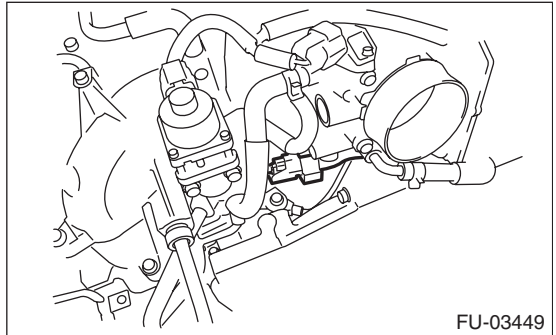
7) Connect the connector to the oil pressure switch (B).



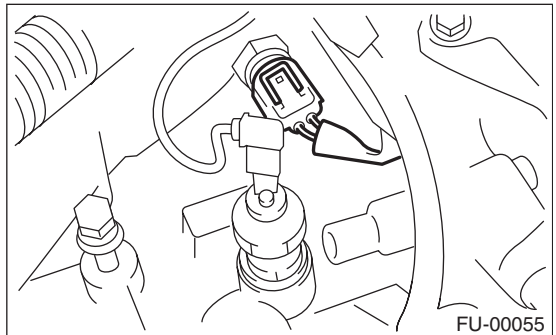
8) Connect the connector to crankshaft position sensor.



9) Connect the knock sensor connector.

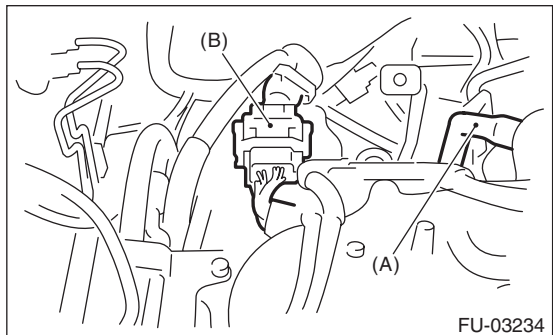


10) Connect the connector to engine coolant temperature sensor.

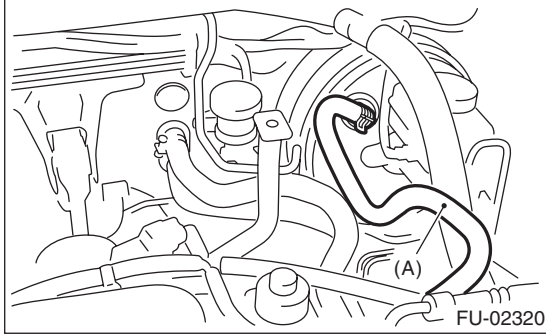


11) Connect the PCV hose (A) to intake manifold.

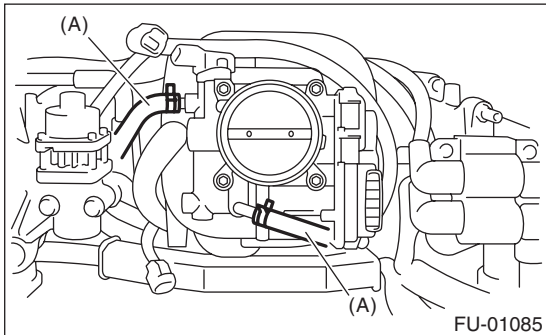
12) Connect the engine harness connectors (B) to bulkhead harness connectors.



13) Connect the brake booster vacuum hose (A).



14) Connect the engine coolant hoses (A) to throttle body.



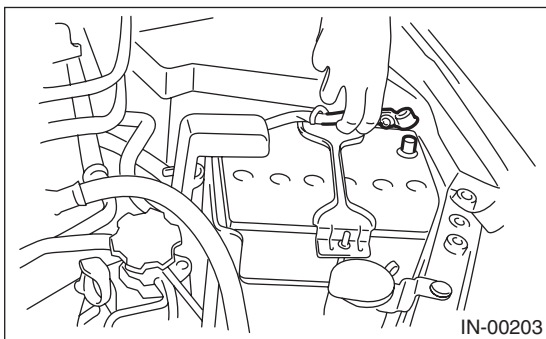
15) Connect the spark plug cords to spark plugs.

16) Install the generator. <Ref. to SC(H4SO)-12, INSTALLATION, Generator.>

17) Install the air cleaner case and air intake chamber. <Ref. to IN(H4SO)-6, INSTALLATION, Air Cleaner Case.> <Ref. to IN(H4SO)-7, INSTALLATION, Air Intake Chamber.>

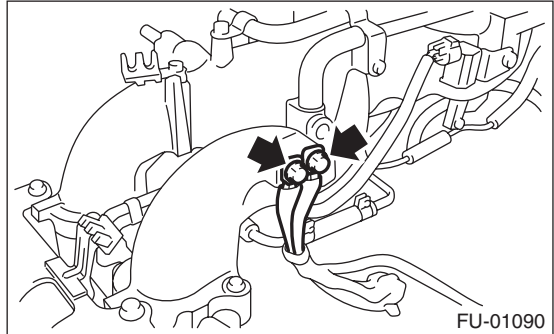
18) Install the fuse of fuel pump relay to the main fuse box.

19) Connect the battery ground cable to battery.



C: DISASSEMBLY

1) Disconnect the engine ground terminal from intake manifold.

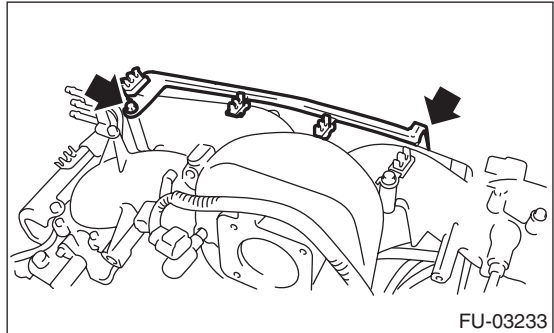


2) Remove the ignition coil and ignitor assembly. <Ref. to IG(H4SO)-6, REMOVAL, Ignition Coil and Ignitor Assembly.>

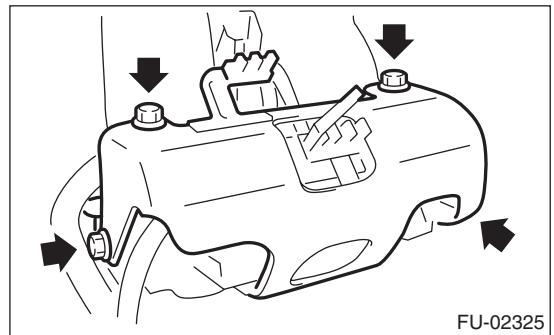
3) Remove the throttle body. <Ref. to FU(H4SO)-13, REMOVAL, Throttle Body.>

4) Remove the EGR valve. <Ref. to FU(H4SO)-29, REMOVAL, EGR Valve.>

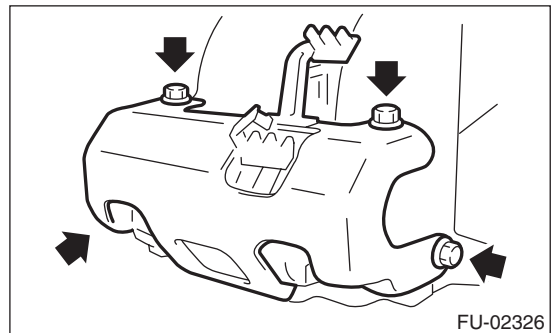
5) Remove the plug cord stay.



6) Remove the fuel pipe protector LH.



7) Remove the fuel pipe protector RH.

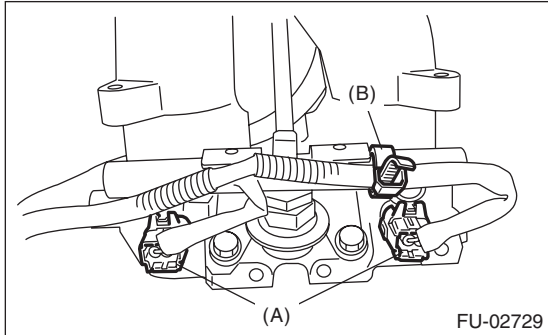


Intake Manifold

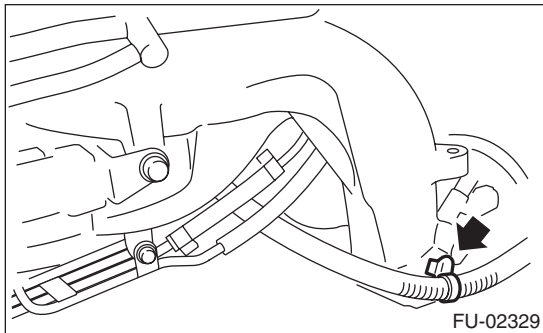
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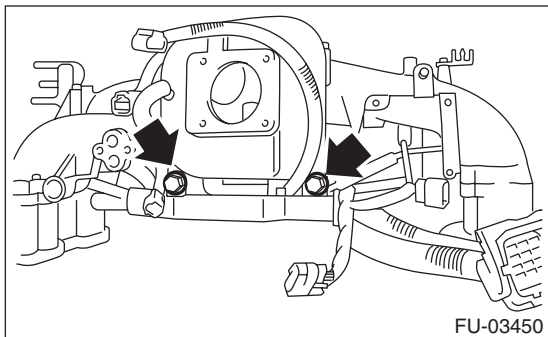
- 8) Disconnect the connectors (A) from fuel injector.
- 9) Remove the harness band (B) which holds the engine harness to injector pipe.



- 10) Remove the purge control solenoid valve. <Ref. to EC(H4SO)-9, REMOVAL, Purge Control Solenoid Valve.>
- 11) Remove the harness band clips which install the engine harness.



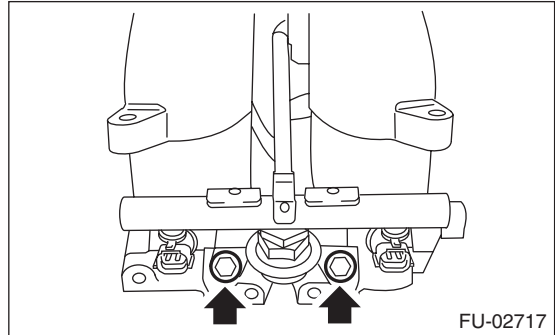
- 12) Remove the bolts which hold engine harness to intake manifold.



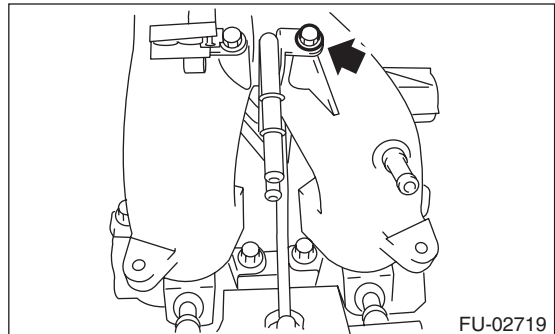
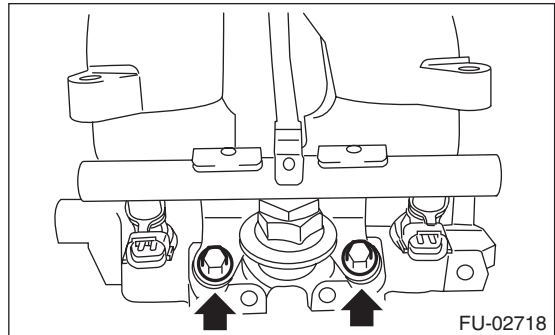
- 13) Remove the engine harness from intake manifold.

- 14) Remove the bolts which install fuel injector pipe on the intake manifold as shown in the figure

- RH side

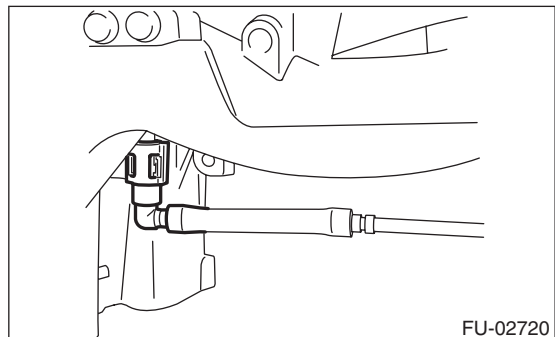


- LH side

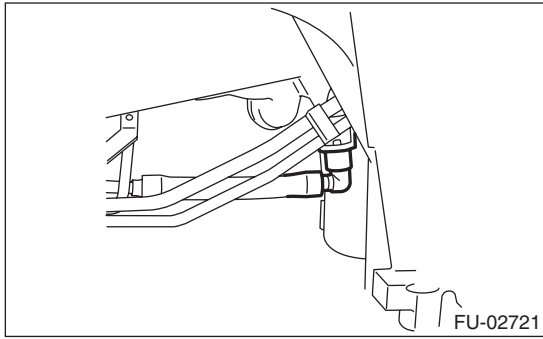


- 15) Remove the fuel injectors from the fuel injector pipe.

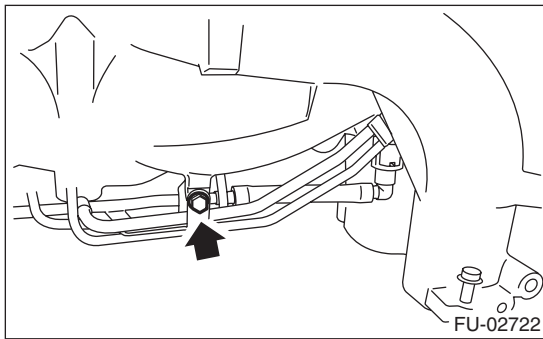
- 16) Disconnect the quick connector that fastens the fuel injector pipe RH to the fuel pipe.



17) Disconnect the quick connector that fastens the fuel injector pipe LH to the fuel pipe.



18) Remove the fuel injector pipe RH and LH.
19) Remove the bolts which install fuel pipes on intake manifold.



20) Remove the fuel pipe from intake manifold.

D: ASSEMBLY

NOTE:

When assembling the nipple, apply liquid gasket.

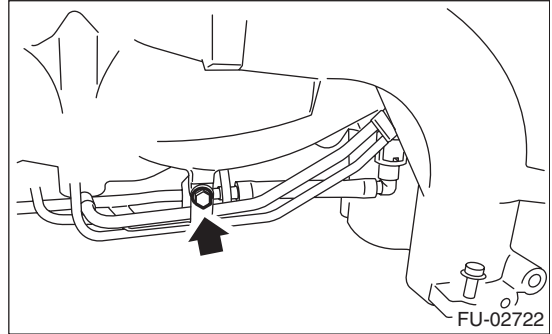
Liquid gasket:

THREE BOND 1105 (Part No. 004403010) or equivalent

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

Tightening torque:

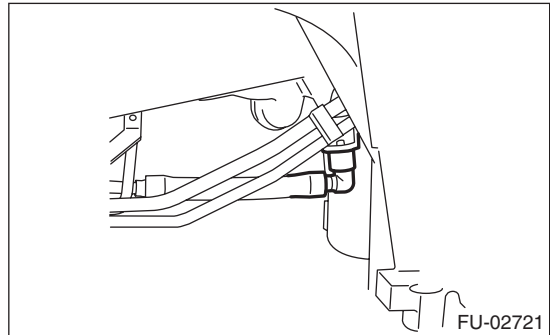
6.4 N·m (0.65 kgf·m, 4.7 ft·lb)



2) Connect the fuel injector pipe LH to the fuel pipe.

NOTE:

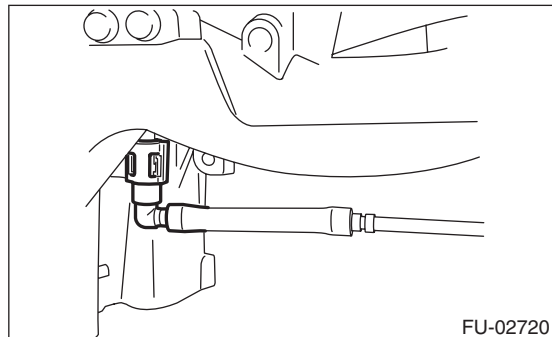
Connect the quick connector securely.



3) Connect the fuel injector pipe RH to the fuel pipe.

NOTE:

Connect the quick connector securely.



4) Install the fuel injector.

Intake Manifold

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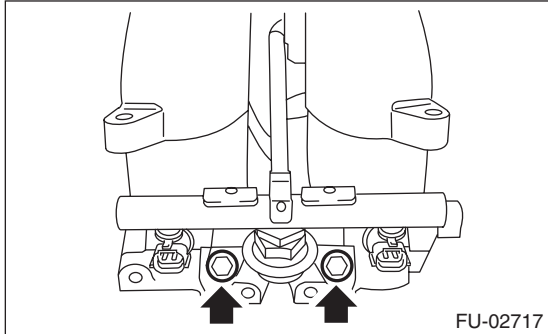
FUEL INJECTION (FUEL SYSTEMS)

5) Tighten the bolts which install fuel injector pipes on intake manifold.

- RH side

Tightening torque:

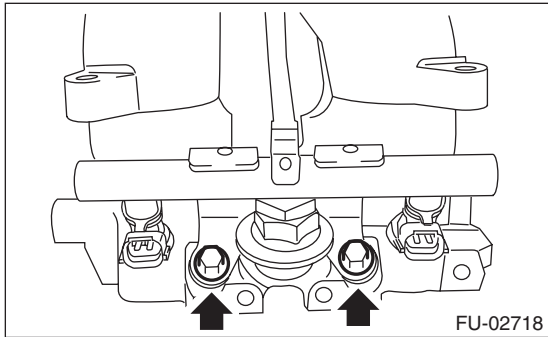
19 N·m (1.9 kgf-m, 14.0 ft-lb)



- LH side

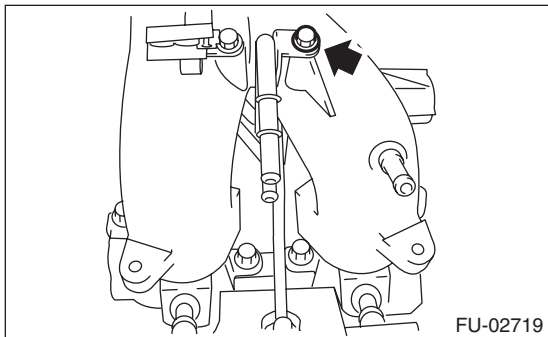
Tightening torque:

19 N·m (1.9 kgf-m, 14.0 ft-lb)



Tightening torque:

6.4 N·m (0.65 kgf-m, 4.7 ft-lb)

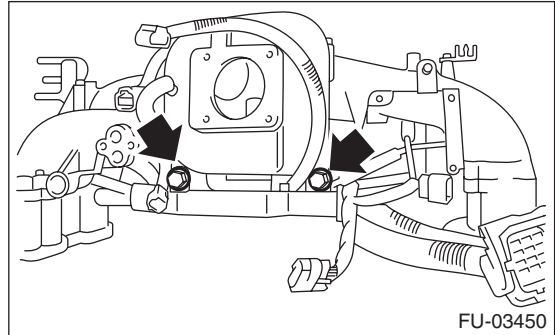


6) Install the engine harness to the intake manifold.

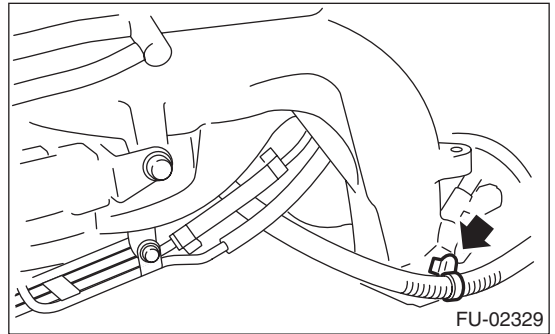
7) Tighten the bolts which install engine harness on intake manifold.

Tightening torque:

19 N·m (1.9 kgf-m, 14.0 ft-lb)



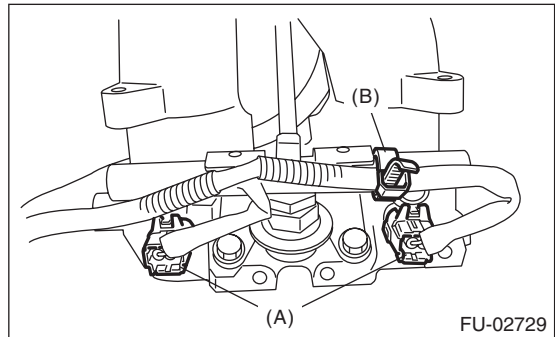
8) Hold the engine harness using the harness band clips.



9) Install the purge control solenoid valve. <Ref. to EC(H4SO)-9, INSTALLATION, Purge Control Solenoid Valve.>

10) Connect the connectors (A) to fuel injector.

11) Hold the engine harness to injector pipe by harness band (B).



Intake Manifold

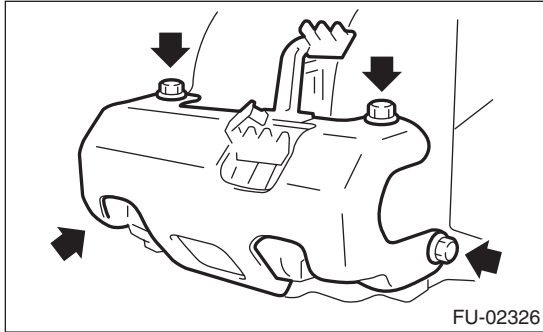
FUEL INJECTION (FUEL SYSTEMS)

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12) Install the fuel pipe protector RH.

Tightening torque:

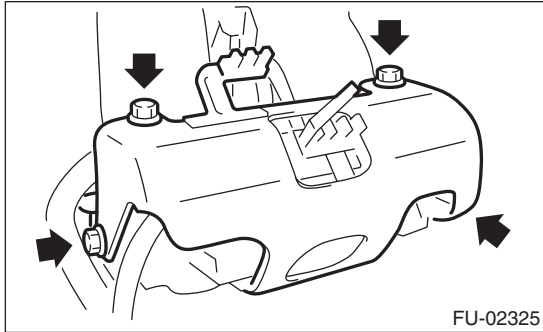
19 N·m (1.9 kgf-m, 14.0 ft-lb)



13) Install the fuel pipe protector LH.

Tightening torque:

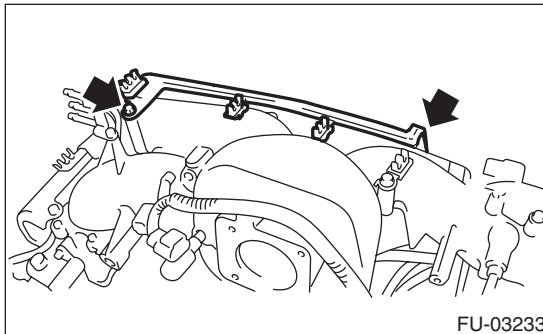
19 N·m (1.9 kgf-m, 14.0 ft-lb)



14) Install the plug cord stay.

Tightening torque:

6.4 N·m (0.65 kgf-m, 4.7 ft-lb)



15) Install the EGR valve. <Ref. to FU(H4SO)-29, INSTALLATION, EGR Valve.>

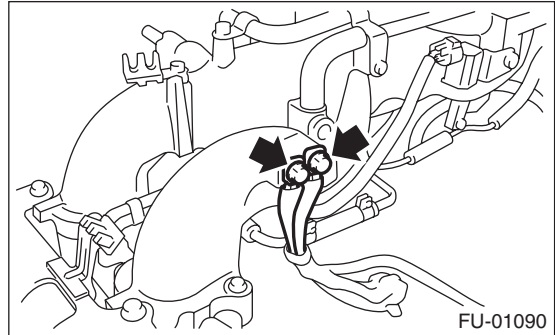
16) Install the throttle body to intake manifold. <Ref. to FU(H4SO)-13, INSTALLATION, Throttle Body.>

17) Install the ignition coil and ignitor assembly. <Ref. to IG(H4SO)-6, INSTALLATION, Ignition Coil and Ignitor Assembly.>

18) Install the engine ground terminal to intake manifold.

Tightening torque:

19 N·m (1.9 kgf-m, 14.0 ft-lb)



E: INSPECTION

Make sure the fuel pipe and fuel hoses are not damaged and the connections are tightened firmly.

Engine Coolant Temperature Sensor

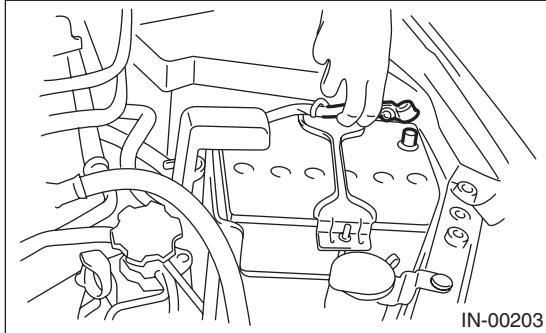
FUEL INJECTION (FUEL SYSTEMS)

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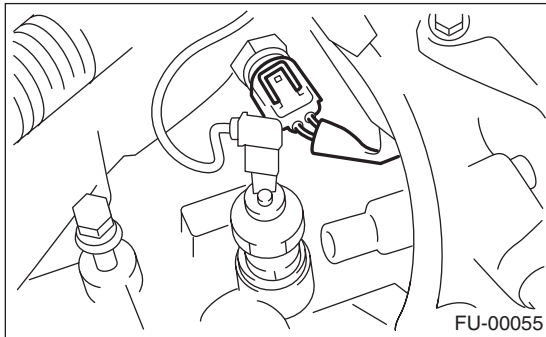
4. Engine Coolant Temperature Sensor

A: REMOVAL

- 1) Disconnect the ground cable from the battery.



- 2) Remove the generator. <Ref. to SC(H4SO)-12, REMOVAL, Generator.>
- 3) Disconnect the connectors from the engine coolant temperature sensor.



- 4) Remove the engine coolant temperature sensor.

B: INSTALLATION

Install in the reverse order of removal.

NOTE:

Use a new gasket.

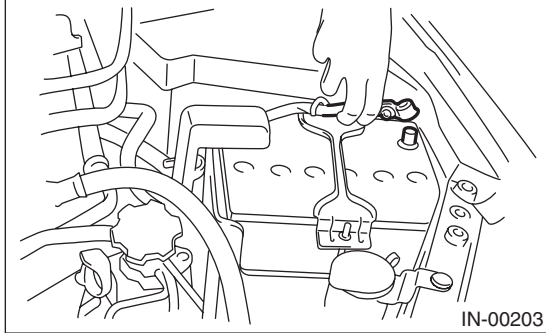
Tightening torque:

18 N·m (1.8 kgf·m, 13.3 ft·lb)

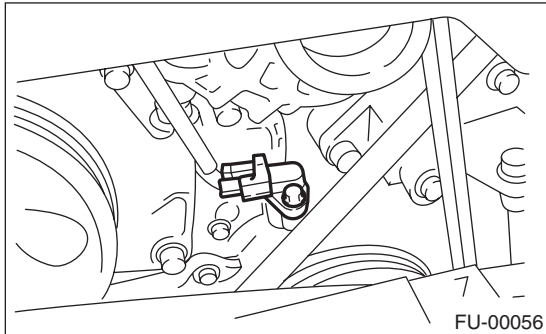
5. Crankshaft Position Sensor

A: REMOVAL

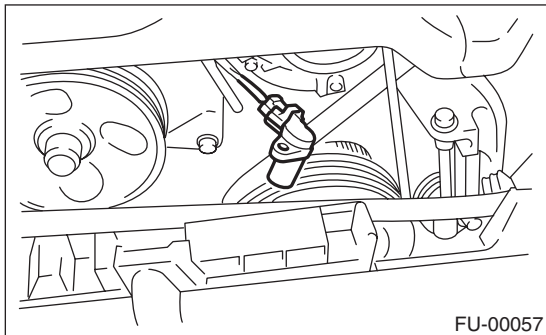
1) Disconnect the ground cable from the battery.



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



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

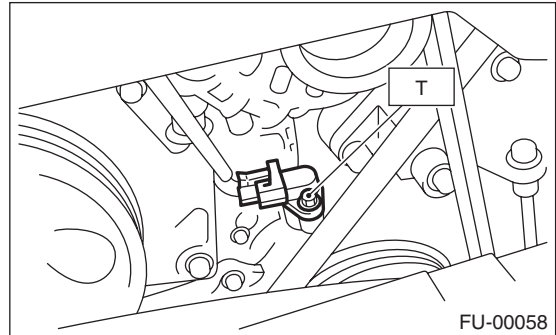


B: INSTALLATION

Install in the reverse order of removal.

Tightening torque:

T: 6.4 N·m (0.65 kgf·m, 4.7 ft·lb)



Camshaft Position Sensor

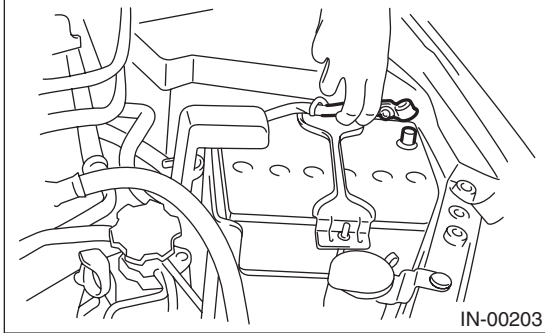
FUEL INJECTION (FUEL SYSTEMS)

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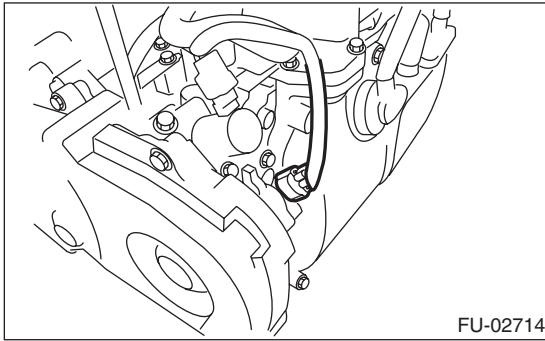
6. Camshaft Position Sensor

A: REMOVAL

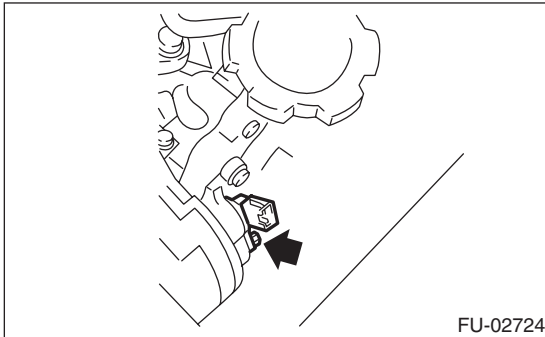
1) Disconnect the ground cable from the battery.



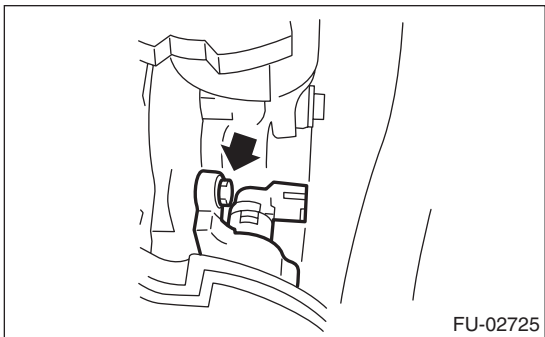
2) Disconnect the connector from the camshaft position sensor.



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

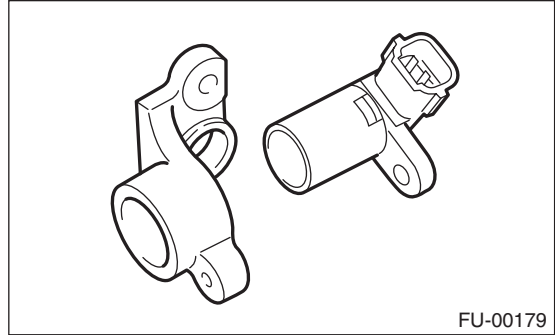


4) Remove the bolt which installs camshaft position sensor support to camshaft cap LH.



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

6) Remove the camshaft position sensor from the camshaft position sensor support.



B: INSTALLATION

Install in the reverse order of removal.

Tightening torque:

Camshaft position sensor support

6.4 N·m (0.65 kgf-m, 4.7 ft-lb)

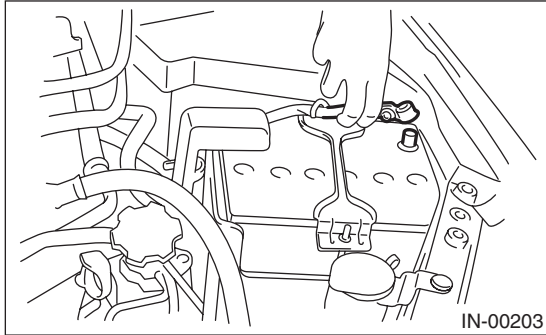
Camshaft position sensor

6.4 N·m (0.65 kgf-m, 4.7 ft-lb)

7. Knock Sensor

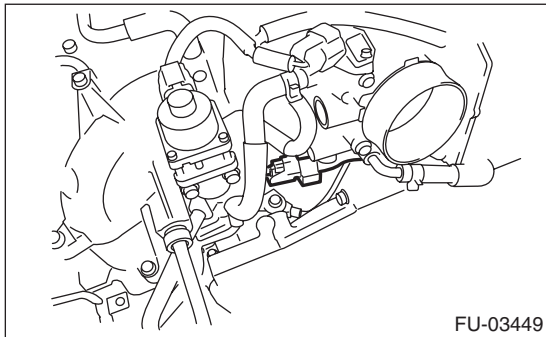
A: REMOVAL

- 1) Disconnect the ground cable from the battery.



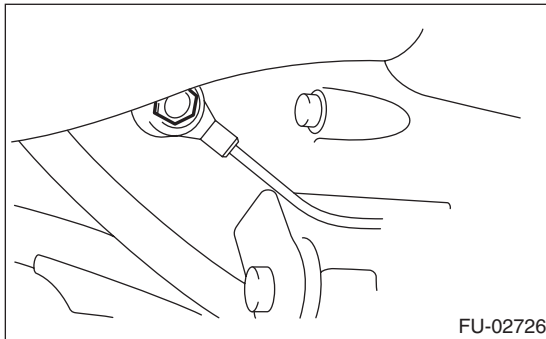
IN-00203

- 2) Remove the air intake chamber. <Ref. to IN(H4SO)-7, REMOVAL, Air Intake Chamber.>
- 3) Disconnect the knock sensor connector.



FU-03449

- 4) Remove the knock sensor from the cylinder block.



FU-02726

B: INSTALLATION

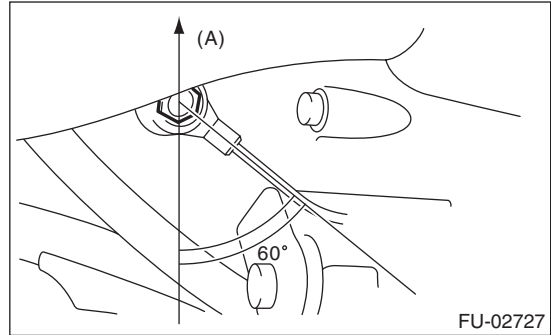
- 1) Install the knock sensor to the cylinder block.

NOTE:

Extraction area of knock sensor cord must be positioned at a 60° angle relative to the engine rear.

Tightening torque:

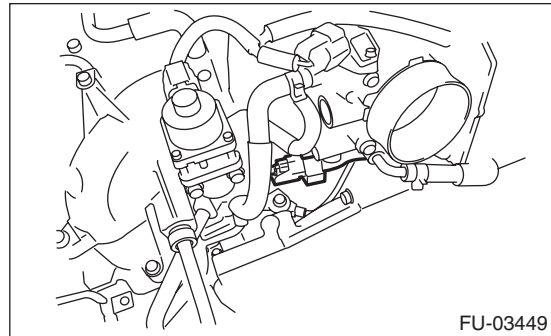
24 N·m (2.4 kgf-m, 17.7 ft-lb)



FU-02727

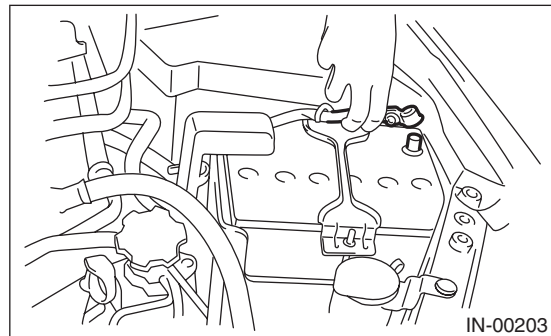
(A) Front side

- 2) Connect the knock sensor connector.



FU-03449

- 3) Install the air intake chamber. <Ref. to IN(H4SO)-7, INSTALLATION, Air Intake Chamber.>
- 4) Connect the battery ground cable to battery.



IN-00203

Throttle Position Sensor

FUEL INJECTION (FUEL SYSTEMS)

8. Throttle Position Sensor

A: SPECIFICATION

Throttle body is a non-disassembled part, so do not remove the throttle position sensor from throttle body.

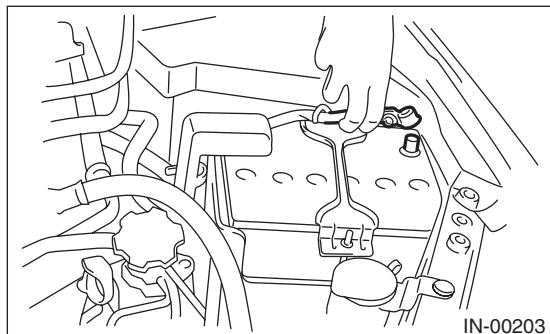
Refer to “Throttle Body” for removal and installation procedure. <Ref. to FU(H4SO)-13, REMOVAL, Throttle Body.> <Ref. to FU(H4SO)-13, INSTALLATION, Throttle Body.>

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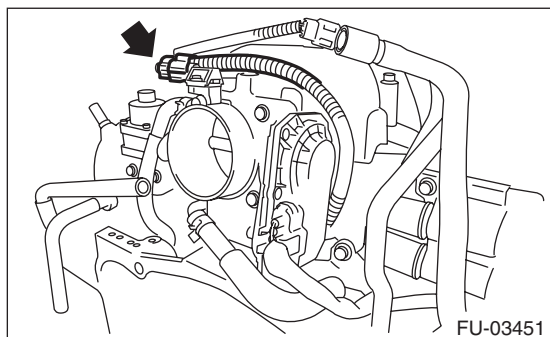
9. Manifold Absolute Pressure Sensor

A: REMOVAL

- 1) Disconnect the ground cable from the battery.



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



- 3) Remove the manifold absolute pressure sensor from throttle body.

B: INSTALLATION

Install in the reverse order of removal.

NOTE:

Use new O-rings.

Tightening torque:

2 N·m (0.2 kgf·m, 1.5 ft·lb)

Mass Air Flow and Intake Air Temperature Sensor

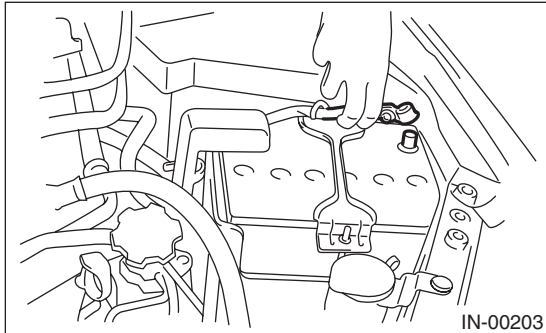
FUEL INJECTION (FUEL SYSTEMS)

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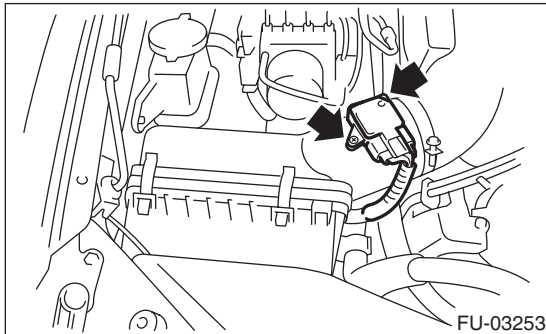
10. Mass Air Flow and Intake Air Temperature Sensor

A: REMOVAL

- 1) Disconnect the ground cable from the battery.



- 2) Disconnect the connectors from the mass air flow and intake air temperature sensor.
- 3) Remove the mass air flow and intake air temperature sensor.



B: INSTALLATION

Install in the reverse order of removal.

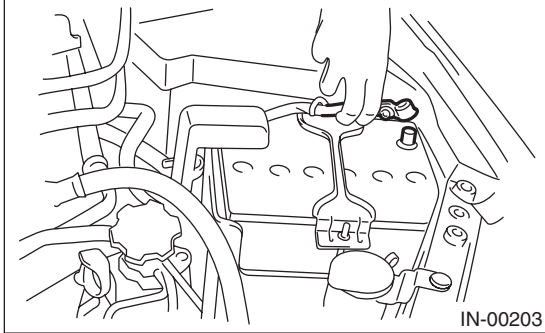
Tightening torque:

1 N·m (0.1 kgf·m, 0.7 ft·lb)

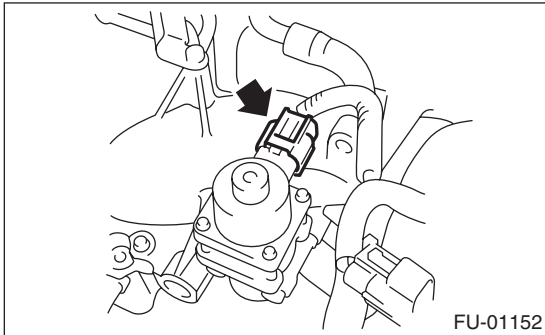
11.EGR Valve

A: REMOVAL

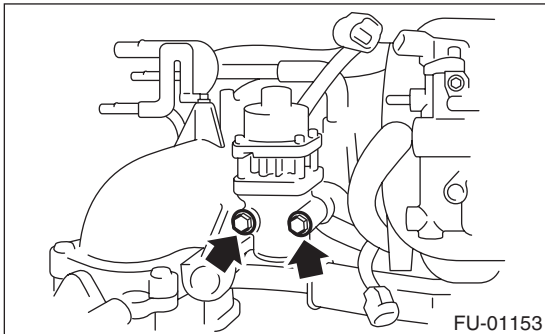
- 1) Disconnect the ground cable from the battery.



- 2) Disconnect the connector from the EGR valve.



- 3) Remove the EGR valve from intake manifold.



B: INSTALLATION

Install in the reverse order of removal.

NOTE:

Use a new gasket.

Tightening torque:

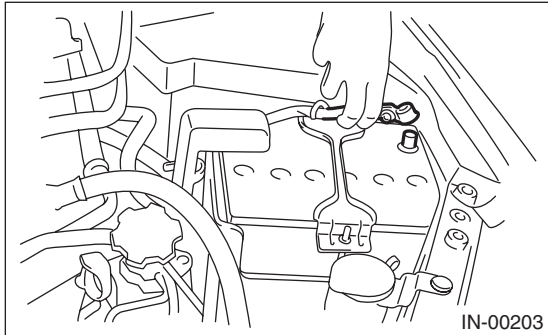
19 N·m (1.9 kgf·m, 14.0 ft·lb)

12. Fuel Injector

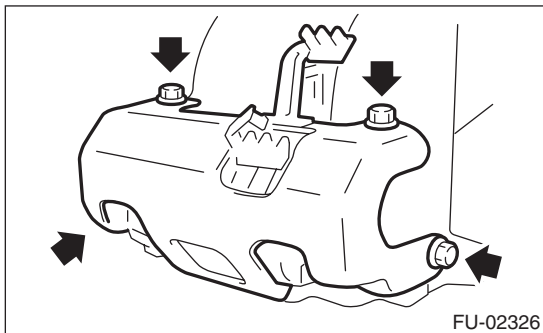
A: REMOVAL

1. RH SIDE

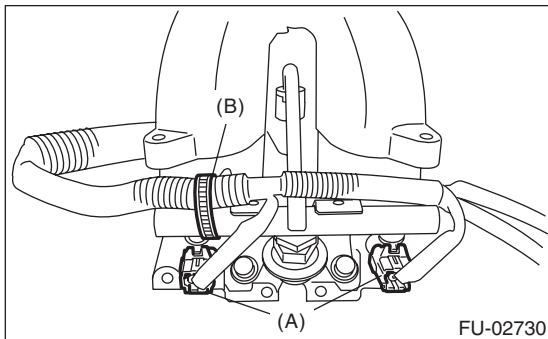
- 1) Release the fuel pressure. <Ref. to FU(H4SO)-43, RELEASING OF FUEL PRESSURE, PROCEDURE, Fuel.>
- 2) Disconnect the ground cable from the battery.



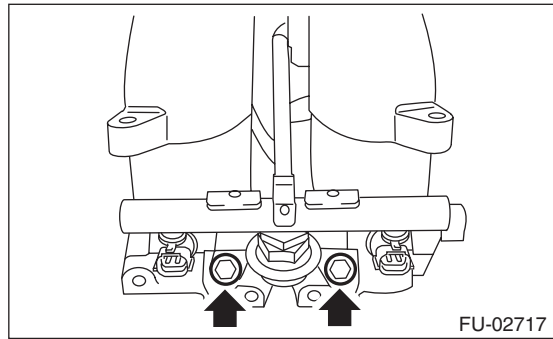
- 3) Open the fuel filler flap lid, and remove the fuel filler cap.
- 4) Remove the air intake duct and air cleaner case. <Ref. to IN(H4SO)-8, REMOVAL, Air Intake Duct.> <Ref. to IN(H4SO)-5, REMOVAL, Air Cleaner Case.>
- 5) Remove the spark plug cords from spark plugs (#1 and #3 cylinders).
- 6) Remove the fuel pipe protector RH.



- 7) Disconnect the connectors (A) from fuel injector.
- 8) Remove the harness band (B) which holds the engine harness to injector pipe.



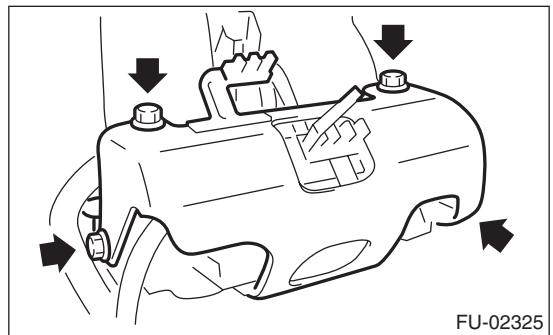
- 9) Remove the bolt which holds fuel injector pipe onto intake manifold.



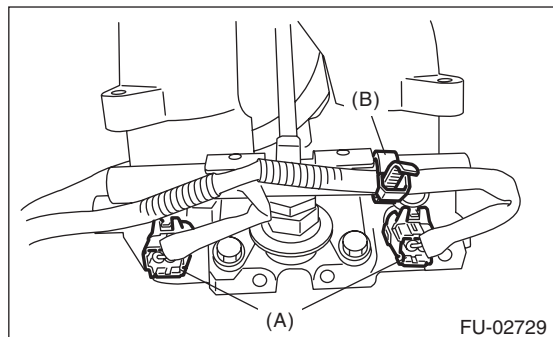
- 10) Remove the fuel injector while lifting up the fuel injector pipe.

2. LH SIDE

- 1) Release the fuel pressure. <Ref. to FU(H4SO)-43, RELEASING OF FUEL PRESSURE, PROCEDURE, Fuel.>
- 2) Remove the battery. <Ref. to SC(H4SO)-19, REMOVAL, Battery.>
- 3) Open the fuel filler flap lid, and remove the fuel filler cap.
- 4) Remove the spark plug cords from spark plugs (#2 and #4 cylinders).
- 5) Remove the fuel pipe protector LH.

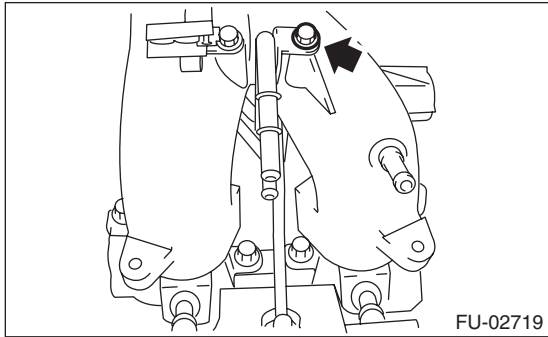
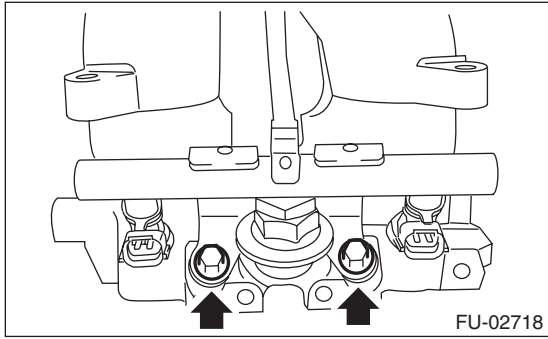


- 6) Disconnect the connectors (A) from fuel injector.
- 7) Remove the harness band (B) which holds the engine harness to injector pipe.



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8) Remove the bolt which holds fuel injector pipe onto intake manifold.



9) Remove the fuel injector while lifting up the fuel injector pipe.

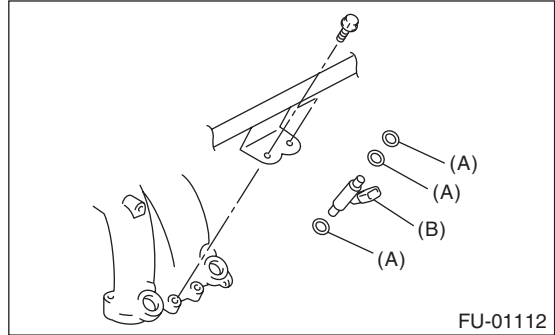
B: INSTALLATION

1. RH SIDE

Install in the reverse order of removal.

NOTE:

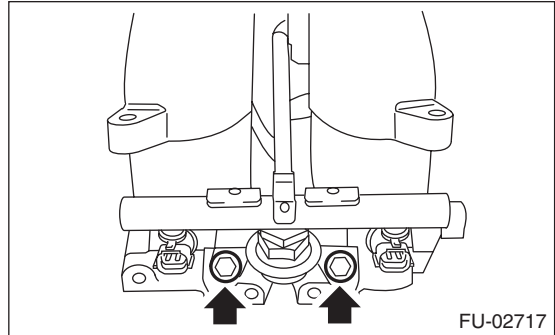
Use new O-rings.



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

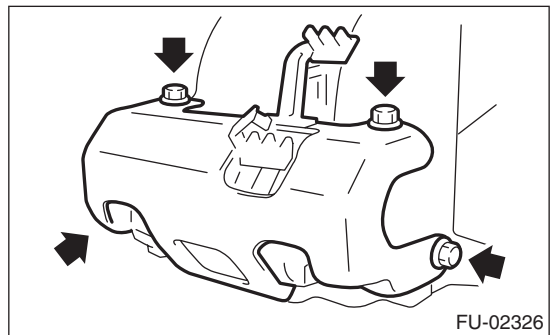
Tightening torque:

19 N·m (1.9 kgf-m, 14.0 ft-lb)



Tightening torque:

19 N·m (1.9 kgf-m, 14.0 ft-lb)



Fuel Injector

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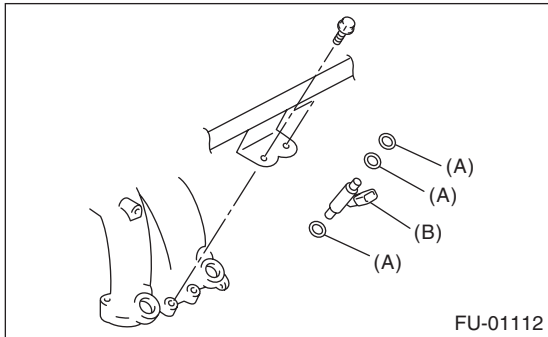
FUEL INJECTION (FUEL SYSTEMS)

2. LH SIDE

Install in the reverse order of removal.

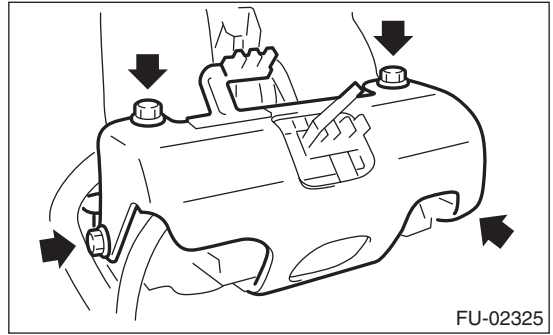
NOTE:

Use new O-rings.

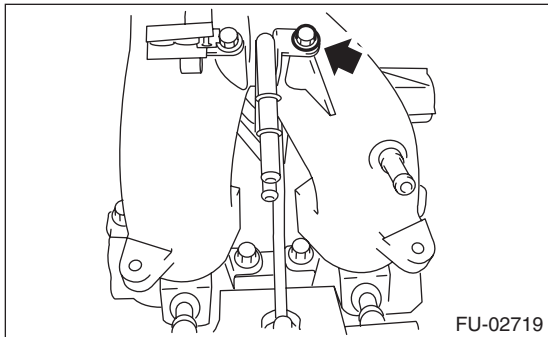


- (A) O-ring
- (B) Fuel injector

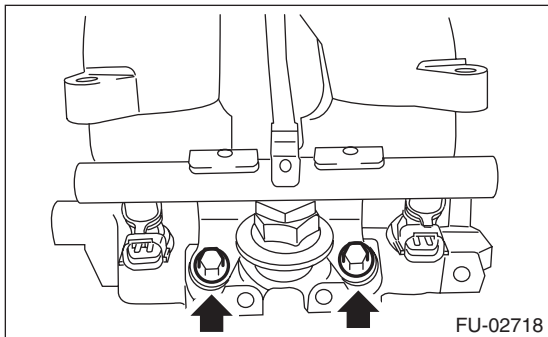
Tightening torque:
19 N·m (1.9 kgf-m, 14.0 ft-lb)



Tightening torque:
6.4 N·m (0.65 kgf-m, 4.7 ft-lb)



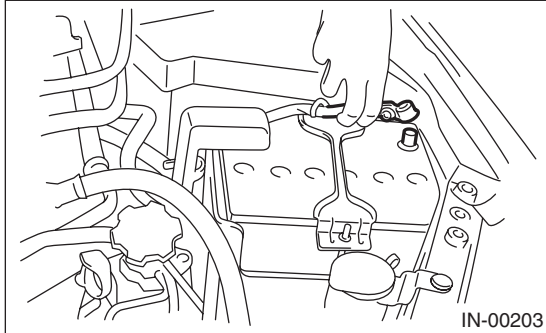
Tightening torque:
19 N·m (1.9 kgf-m, 14.0 ft-lb)



13. Variable Valve Lift Diagnosis Oil Pressure Switch

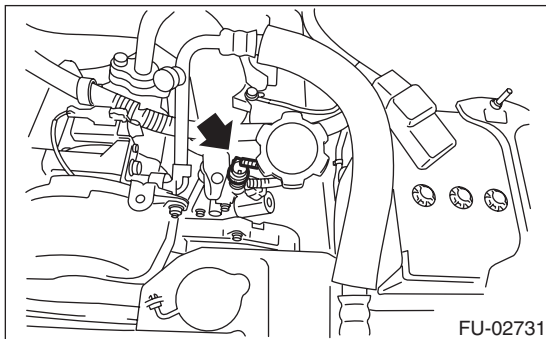
A: REMOVAL

- 1) Disconnect the ground cable from the battery.

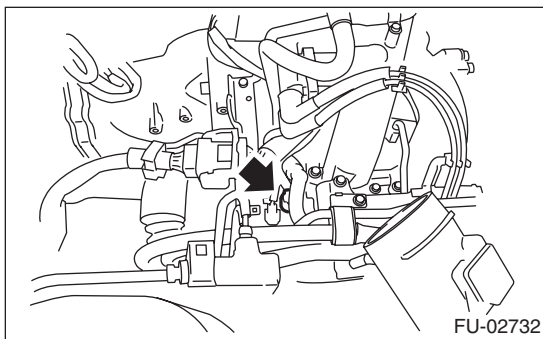


- 2) Remove the air intake chamber. <Ref. to IN(H4SO)-7, REMOVAL, Air Intake Chamber.>
- 3) Remove the engine harness connector from the bracket.
- 4) Disconnect the connector from the variable valve lift diagnosis oil pressure switch.
- 5) Remove the variable valve lift diagnosis oil pressure switch.

- LH side



- RH side



B: INSTALLATION

Install in the reverse order of removal.

NOTE:

Apply liquid gasket to the variable valve lift diagnosis oil pressure switch threads.

Liquid gasket:

THREE BOND 1324 (Part No. 004403042) or equivalent

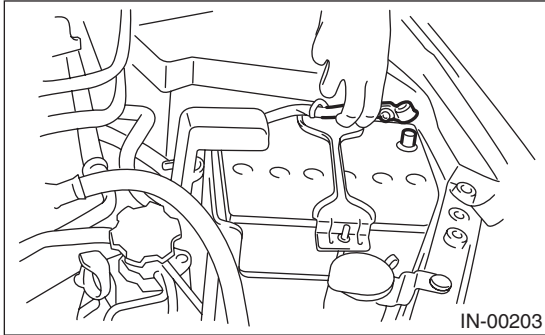
Tightening torque:

17 N·m (1.7 kgf-m, 12.5 ft-lb)

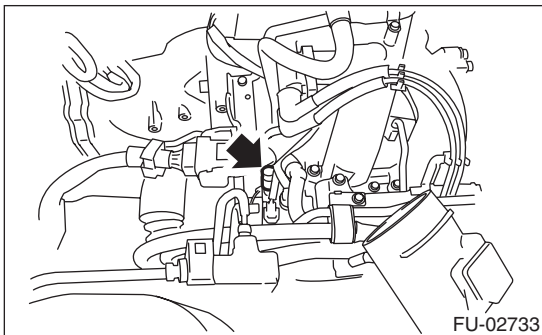
14. Oil Temperature Sensor

A: REMOVAL

- 1) Disconnect the ground cable from the battery.



- 2) Remove the air intake chamber. <Ref. to IN(H4SO)-7, REMOVAL, Air Intake Chamber.>
- 3) Remove the engine harness connector from the bracket.
- 4) Disconnect the connector from the oil temperature sensor.
- 5) Remove the oil temperature sensor.



B: INSTALLATION

Install in the reverse order of removal.

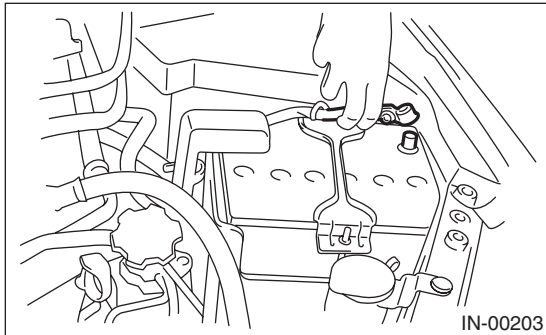
Tightening torque:

18 N·m (1.8 kgf·m, 13.3 ft·lb)

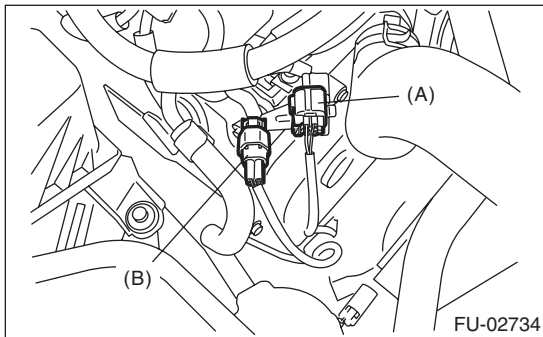
15. Front Oxygen (A/F) Sensor

A: REMOVAL

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



- 3) Remove the air intake duct. <Ref. to IN(H4SO)-8, REMOVAL, Air Intake Duct.>
- 4) Remove the clip fastening the harness and disconnect the front oxygen (A/F) sensor connector.



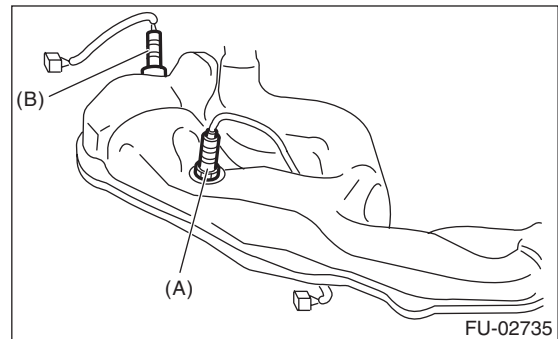
- (A) Front oxygen (A/F) sensor connector
- (B) Rear oxygen sensor connector

- 5) Lift up the vehicle.
- 6) Remove the under cover.
- 7) Apply spray-type lubricant to the threaded portion of front oxygen (A/F) sensor, and leave it for one minute or more.

- 8) Remove the front oxygen (A/F) sensor.

CAUTION:

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



- (A) Front oxygen (A/F) sensor
- (B) Rear oxygen sensor

Front Oxygen (A/F) Sensor

FUEL INJECTION (FUEL SYSTEMS)

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B: INSTALLATION

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

CAUTION:

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

Anti-seize compound:

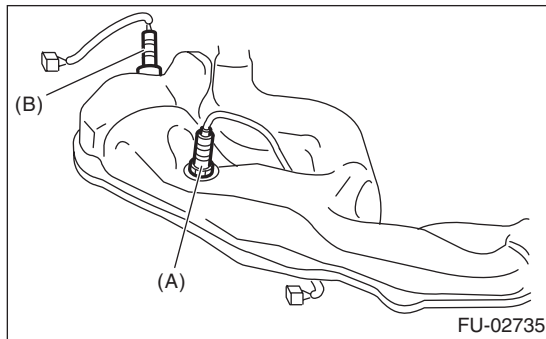
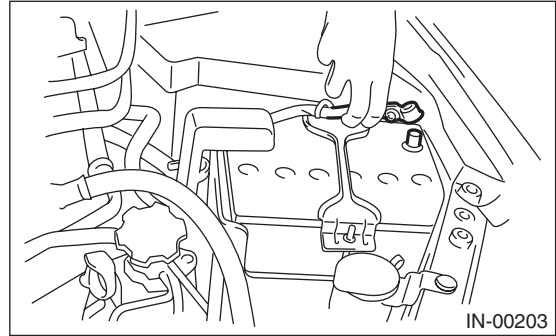
NEVER-SEEZ NSN, JET LUBE or equivalent

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

Tightening torque:

21 N-m (2.1 kgf-m, 15.5 ft-lb)

6) Connect the battery ground cable to battery.

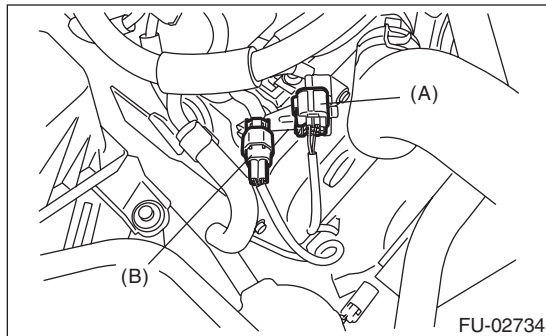


- (A) Front oxygen (A/F) sensor
- (B) Rear oxygen sensor

3) Install the under cover.

4) Lower the vehicle.

5) Connect the connector of front oxygen (A/F) sensor connector and fasten the harness with clips.



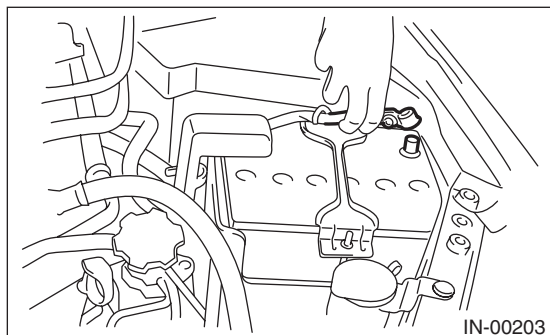
- (A) Front oxygen (A/F) sensor connector
- (B) Rear oxygen sensor connector

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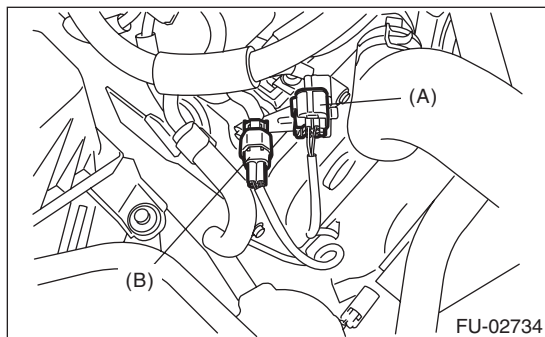
16.Rear Oxygen Sensor

A: REMOVAL

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



- 3) Remove the air intake duct. <Ref. to IN(H4SO)-8, REMOVAL, Air Intake Duct.>
- 4) Remove the clip fastening the harness and disconnect the rear oxygen (A/F) sensor connector.



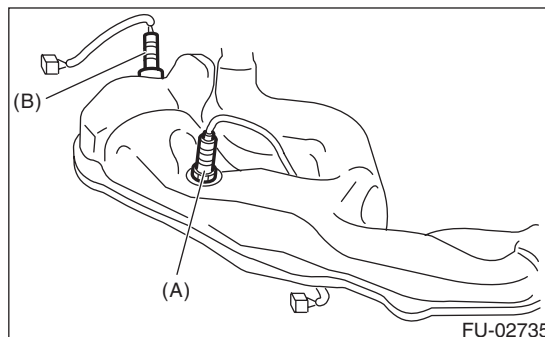
- (A) Front oxygen (A/F) sensor connector
- (B) Rear oxygen sensor connector

- 5) Lift up the vehicle.
- 6) Remove the under cover.
- 7) Apply spray-type lubricant to the threaded portion of rear oxygen sensor, and leave it for one minute or more.

- 8) Remove the rear oxygen sensor.

CAUTION:

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



- (A) Front oxygen (A/F) sensor
- (B) Rear oxygen sensor

Rear Oxygen Sensor

FUEL INJECTION (FUEL SYSTEMS)

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B: INSTALLATION

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

CAUTION:

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

Anti-seize compound:

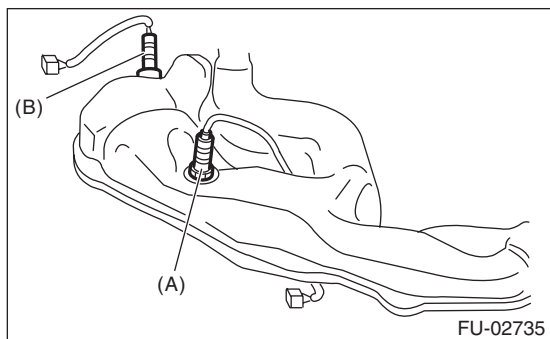
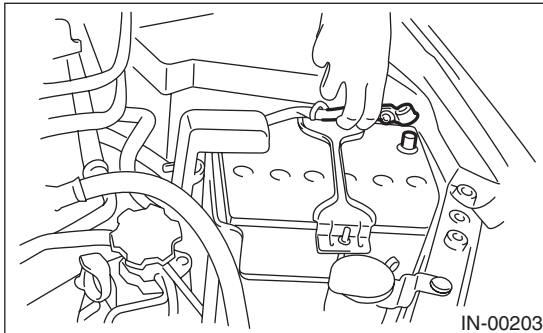
NEVER-SEEZ NSN, JET LUBE SS-30 or equivalent

2) Install the rear oxygen sensor.

Tightening torque:

21 N·m (2.1 kgf·m, 15.5 ft·lb)

6) Connect the battery ground cable to battery.



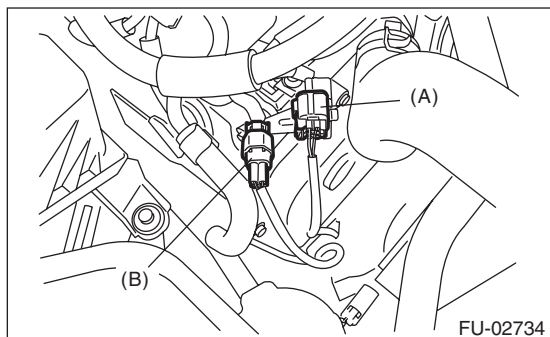
(A) Front oxygen (A/F) sensor

(B) Rear oxygen sensor

3) Install the under cover.

4) Lower the vehicle.

5) Connect the connector to rear oxygen sensor and mount the harness clips to the bracket for fastening.



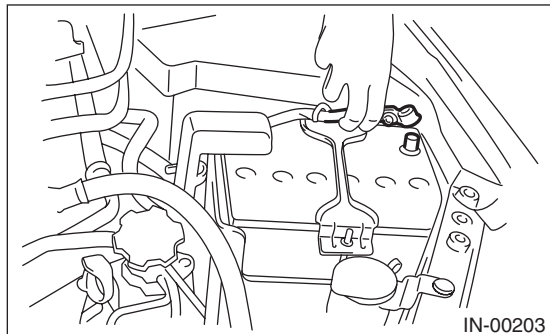
(A) Front oxygen (A/F) sensor connector

(B) Rear oxygen sensor connector

17.Engine Control Module (ECM)

A: REMOVAL

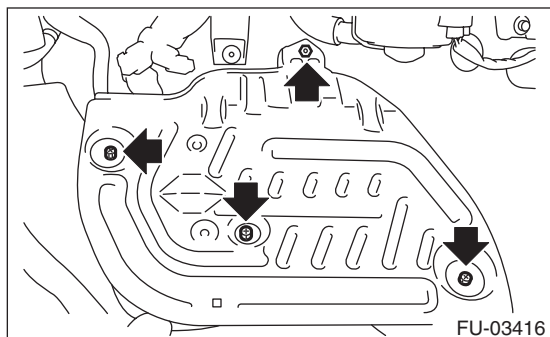
- 1) Disconnect the ground cable from the battery.



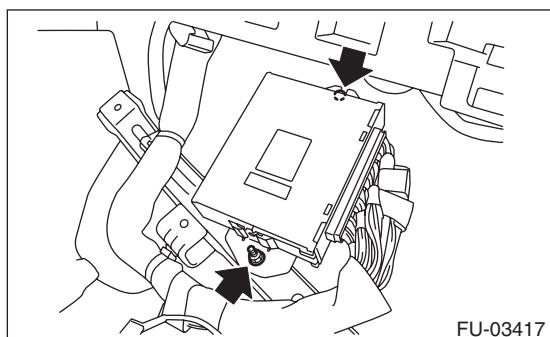
- 2) Remove the lower inner trim of passenger's side.

<Ref. to EI-53, REMOVAL, Lower Inner Trim.>

- 3) Detach the floor mat of passenger's seat.
- 4) Remove the protect cover.



- 5) Remove the bolts and nuts which hold the ECM to the bracket.



- 6) Disconnect the ECM connectors, and take out the ECM.

B: INSTALLATION

Install in the reverse order of removal.

CAUTION:

When the ECM on a model with immobilizer has been replaced, be sure to perform registration of the immobilizer. (Refer to the "IMMOBILIZER TEACHING OPERATION MANUAL".)

NOTE:

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

Tightening torque:

7.5 N·m (0.76 kgf-m, 5.5 ft-lb)

Main Relay

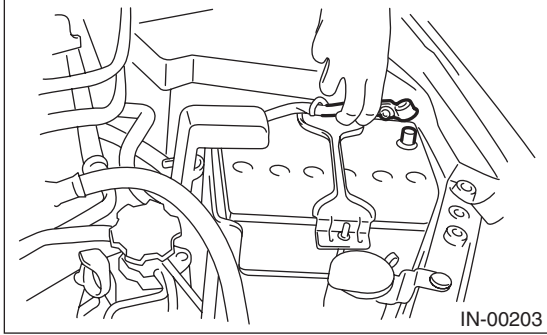
FUEL INJECTION (FUEL SYSTEMS)

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18.Main Relay

A: REMOVAL

1) Disconnect the ground cable from the battery.



2) Remove the main relay from the relay block on the back side of the glove box.



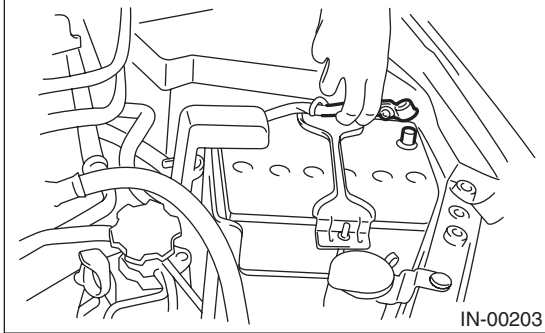
B: INSTALLATION

Install in the reverse order of removal.

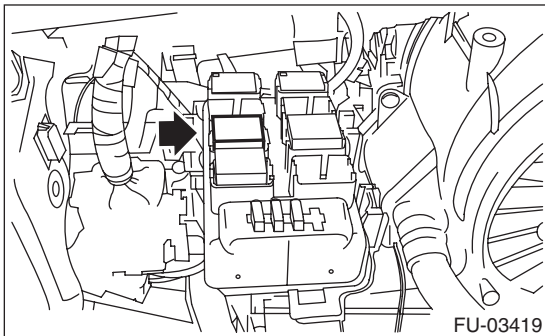
19. Fuel Pump Relay

A: REMOVAL

1) Disconnect the ground cable from the battery.



2) Remove the fuel pump relay from the relay block on the back side of the glove box.



B: INSTALLATION

Install in the reverse order of removal.

Electronic Throttle Control Relay

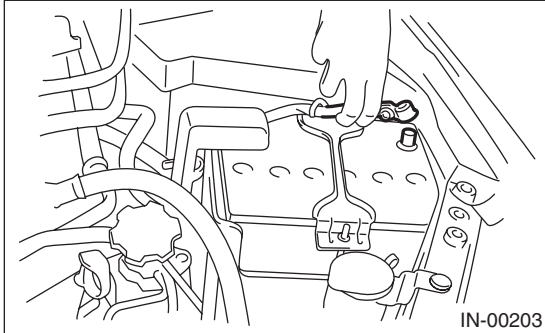
FUEL INJECTION (FUEL SYSTEMS)

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20. Electronic Throttle Control Relay

A: REMOVAL

- 1) Disconnect the ground cable from the battery.



- 2) Remove the electronic throttle control relay from the relay block on the back side of the glove box.



B: INSTALLATION

Install in the reverse order of removal.

21. Fuel

A: PROCEDURE

1. RELEASING OF FUEL PRESSURE

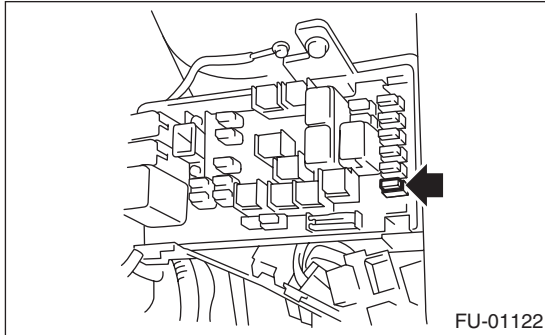
WARNING:

Place “NO OPEN FLAMES” signs near the working area.

CAUTION:

Be careful not to spill fuel.

1) Remove the fuse of fuel pump from main fuse box.



- 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 (WITH SUBARU SELECT MONITOR)

WARNING:

Place “NO OPEN FLAMES” signs near the working area.

CAUTION:

Be careful not to spill fuel.

NOTE:

- If the fuel pump cannot be actuated, refer to DRAINING FUEL (THROUGH THE FUEL FILLER HOSE). <Ref. to FU(H4SO)-44, DRAINING FUEL (THROUGH THE FUEL FILLER HOSE), PROCEDURE, Fuel.>

- Be careful not to let the battery run out.

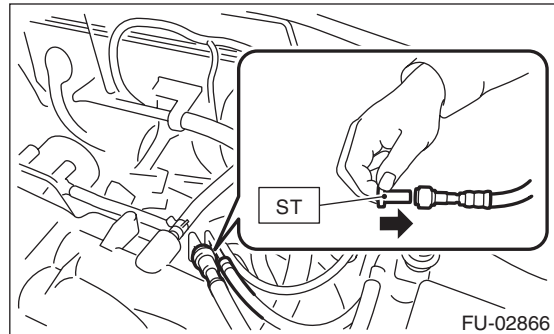
- 1) Release the fuel pressure. <Ref. to FU(H4SO)-43, RELEASING OF FUEL PRESSURE, PROCEDURE, Fuel.>

- 2) Attach ST to the fuel delivery pipe and push ST in the direction of arrow mark to disconnect the fuel delivery hose.

ST 42099AE000 QUICK CONNECTOR
RELEASE

CAUTION:

- **Be careful not to spill fuel.**
- **Catch the fuel from hoses using a container or cloth.**



- 3) Connect ST to the fuel delivery hose.
ST 18471AA000 FUEL PIPE ADAPTER
- 4) Connect the gasoline proof hose to ST and put the end of the hose in the container.
- 5) Drive the fuel pump and drain the fuel using Subaru Select Monitor. <Ref. to EN(H4SO)(diag)-55, FUEL PUMP CONTROL (ON/OFF DRIVE), OPERATION, System Operation Check Mode.>

CAUTION:

Be careful not to spill fuel.

FUEL INJECTION (FUEL SYSTEMS)

3. DRAINING FUEL (THROUGH THE FUEL FILLER HOSE)

• SEDAN MODEL

WARNING:

Place “NO OPEN FLAMES” signs near the working area.

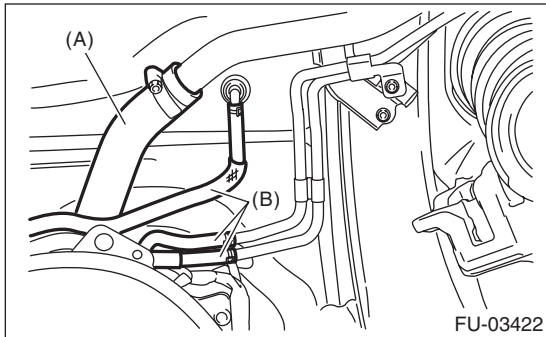
CAUTION:

- Be careful not to spill fuel.
- The fuel may remain in the fuel filler pipe. Drain the fuel from the fuel filler pipe through the fill opening using the gasoline proof pump and the gasoline proof hose (ø10 or less) before the operation.

- 1) Set the vehicle on a lift.
- 2) Lift up the vehicle.
- 3) Remove the rear exhaust pipe and muffler. <Ref. to EX(H4SO)-10, REMOVAL, Rear Exhaust Pipe.> <Ref. to EX(H4SO)-12, REMOVAL, Muffler.>
- 4) Remove the rear sub frame. <Ref. to RS-15, REMOVAL, Rear Sub Frame.>
- 5) Open the fuel filler flap lid, and remove the fuel filler cap.
- 6) Drain the fuel from the fuel filler pipe through the fill opening using the gasoline proof pump and the gasoline proof hose (ø10 or less).
- 7) Disconnect the fuel filler hose (A) from the fuel filler pipe assembly.

CAUTION:

- Be careful not to spill fuel.
- Catch the fuel from hoses using a container or cloth.



- (A) Fuel filler hose
(B) Evaporation hose

- 8) Set the container under the vehicle and insert the gasoline proof hose (ø10 or less) into the fuel filler hose to drain the fuel.

CAUTION:

Be careful not to spill fuel.

• WAGON MODEL

WARNING:

Place “NO OPEN FLAMES” signs near the working area.

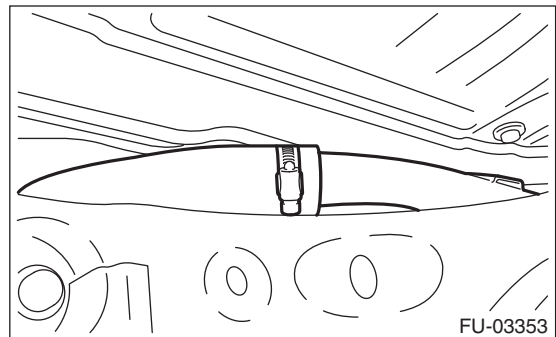
CAUTION:

- Be careful not to spill fuel.
- The fuel may remain in the fuel filler pipe. Drain the fuel from the fuel filler pipe through the fill opening using the gasoline proof pump and the gasoline proof hose (ø10 or less) before the operation.

- 1) Set the vehicle on a lift.
- 2) Lift up the vehicle.
- 3) Remove the rear exhaust pipe and muffler. <Ref. to EX(H4SO)-10, REMOVAL, Rear Exhaust Pipe.> <Ref. to EX(H4SO)-12, REMOVAL, Muffler.>
- 4) Open the fuel filler flap lid, and remove the fuel filler cap.
- 5) Drain the fuel from the fuel filler pipe through the fill opening using the gasoline proof pump and the gasoline proof hose (ø10 or less).
- 6) Disconnect the fuel filler hose from the fuel filler pipe assembly.

CAUTION:

- Be careful not to spill fuel.
- Catch the fuel from hoses using a container or cloth.



- 7) Set the container under the vehicle and insert the gasoline proof hose (ø10 or less) into the fuel filler hose to drain the fuel.

CAUTION:

Be careful not to spill fuel.

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22. Fuel Tank

A: REMOVAL

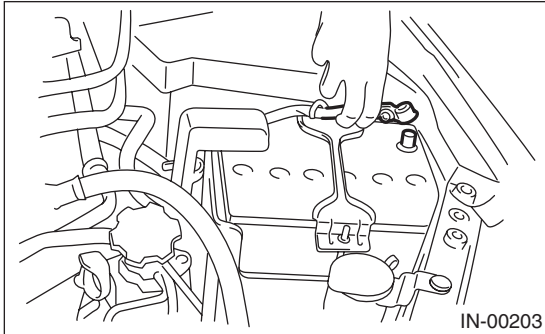
WARNING:

Place "NO OPEN FLAMES" signs near the working area.

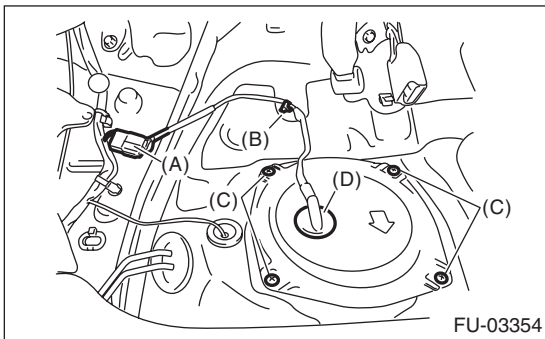
CAUTION:

Be careful not to spill fuel.

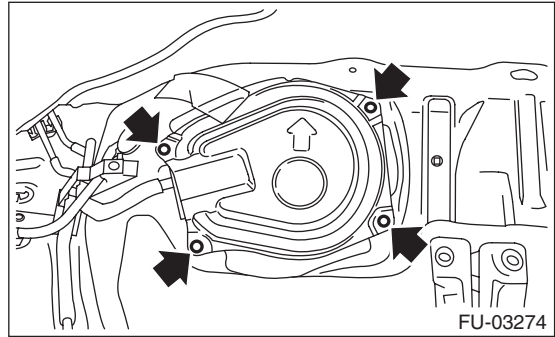
- 1) Set the vehicle on a lift.
- 2) Release the fuel pressure. <Ref. to FU(H4SO)-43, RELEASING OF FUEL PRESSURE, PROCEDURE, Fuel.>
- 3) Drain fuel from fuel tank. <Ref. to FU(H4SO)-43, DRAINING FUEL (WITH SUBARU SELECT MONITOR), PROCEDURE, Fuel.>
- 4) Disconnect the ground cable from the battery.



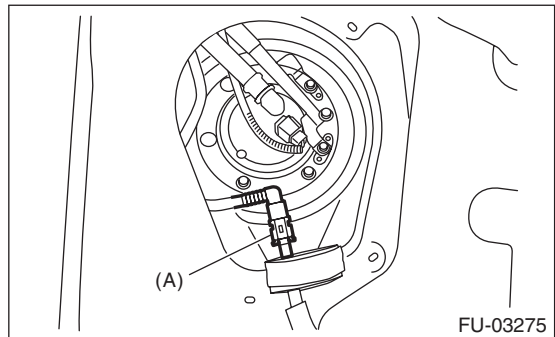
- 5) Remove the rear seat.
- 6) Remove the service hole cover of fuel pump.
 - (1) Disconnect fuel pump connector (A), and remove clip (B).
 - (2) Remove the bolt (C).
 - (3) Push the grommet (D) down and remove the service hole cover.



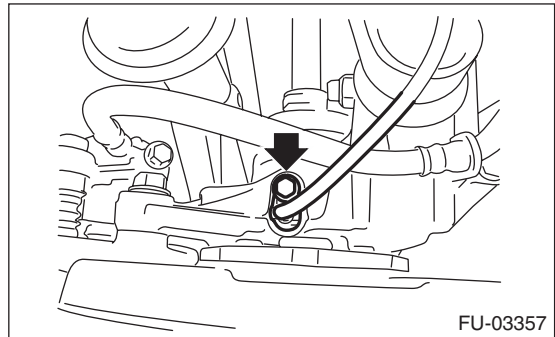
- 7) Remove the service hole cover of fuel sub level sensor.



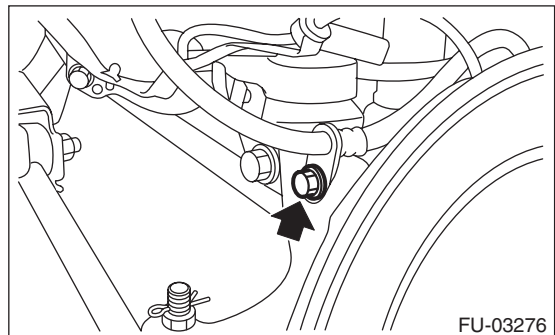
- 8) Disconnect the quick connector on the fuel delivery tube (A). <Ref. to FU(H4SO)-64, REMOVAL, Fuel Delivery and Evaporation Lines.>



- 9) Remove the rear wheels.
- 10) Lift up the vehicle.
- 11) Remove the rear ABS wheel speed sensor from the rear housing.



- 12) Remove the bolt holding the rear brake hose bracket.

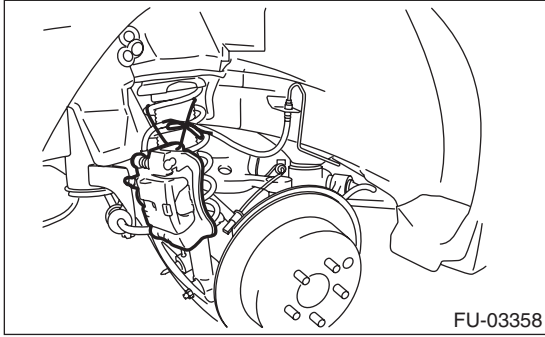


Fuel Tank

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FUEL INJECTION (FUEL SYSTEMS)

13) Remove the rear brake caliper and tie it to the body side of the vehicle.



14) Remove the parking brake cable from the parking brake assembly. <Ref. to PB-6, REMOVAL, Parking Brake Assembly (Rear Disc Brake).>

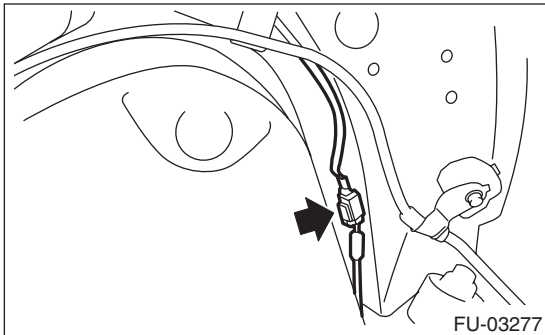
15) Remove the rear exhaust pipe.

<Ref. to EX(H4SO)-10, REMOVAL, Rear Exhaust Pipe.>

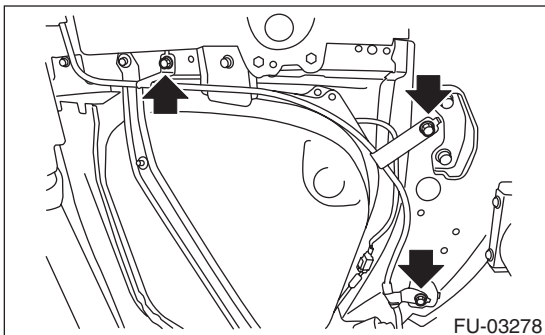
16) Remove the propeller shaft. <Ref. to DS-10, REMOVAL, Propeller Shaft.>

17) Remove the heat shield cover and fuel tank protector.

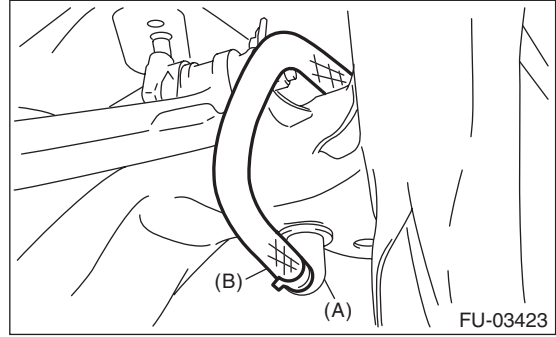
18) Disconnect the connector from the rear ABS wheel speed sensor.



19) Remove the bolts securing the parking brake cable clamp.



20) Disconnect drain hose (B) from the canister drain connector (A).



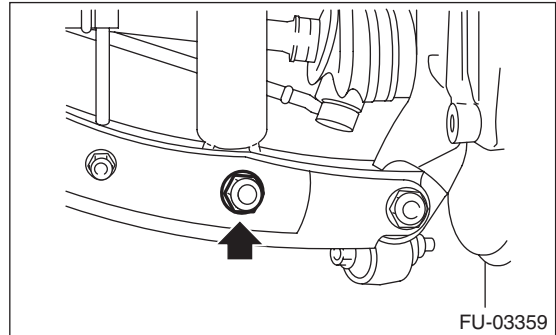
21) Remove the rear suspension assembly.

WARNING:

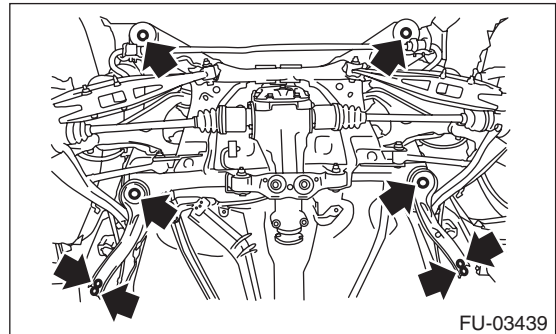
A helper is required to perform this work.

(1) Support the rear differential with the transmission jack.

(2) Remove the bolts which hold the rear shock absorber to the rear suspension arm.



(3) Remove the bolts which secure the rear suspension assembly to the body.



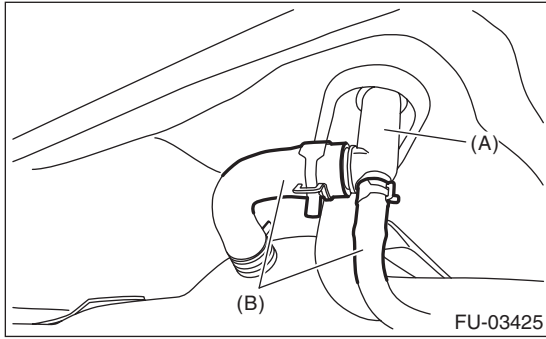
(4) Remove the rear suspension assembly.

Fuel Tank

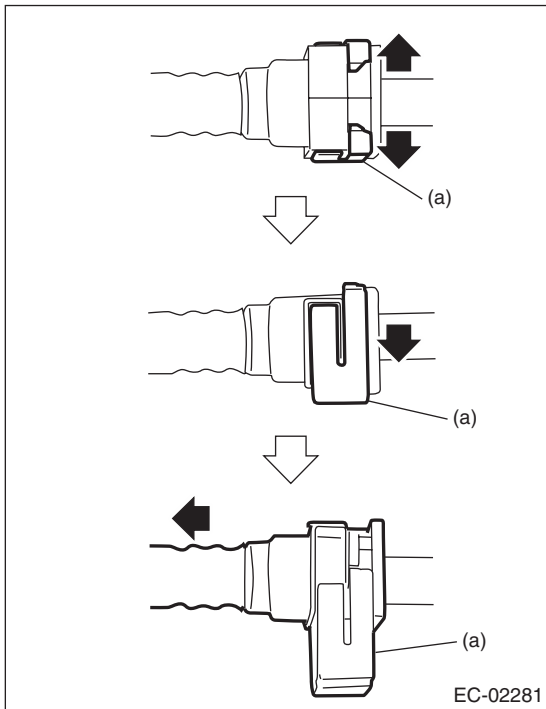
FUEL INJECTION (FUEL SYSTEMS)

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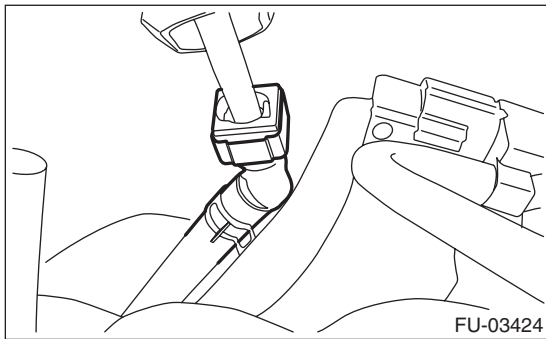
22) Disconnect evaporation hose (B) from connector (A).



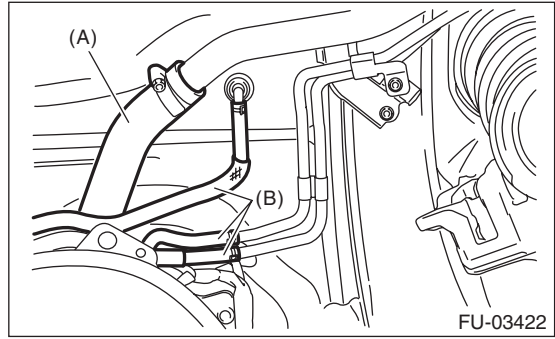
23) Disconnect the quick connector of the evaporation hose from the evaporation pipe as shown in the figure.



(a) Retainer



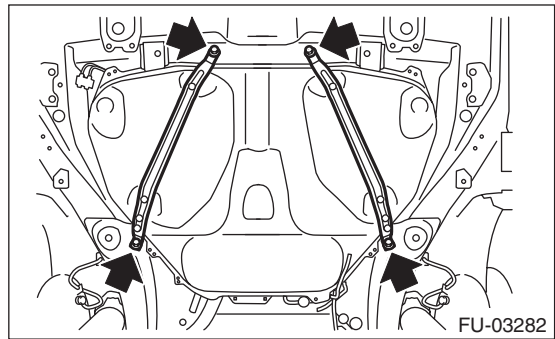
24) Disconnect the fuel filler hose (A) and evaporation hose (B) from the fuel filler pipe assembly.



25) Support the fuel tank with a transmission jack, remove the bolts from the fuel tank band, and remove the fuel tank from the vehicle.

WARNING:

A helper is required to perform this work.

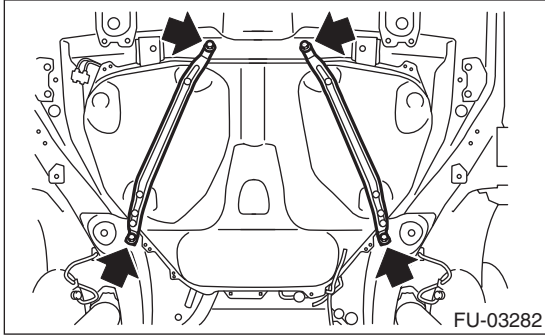


B: INSTALLATION

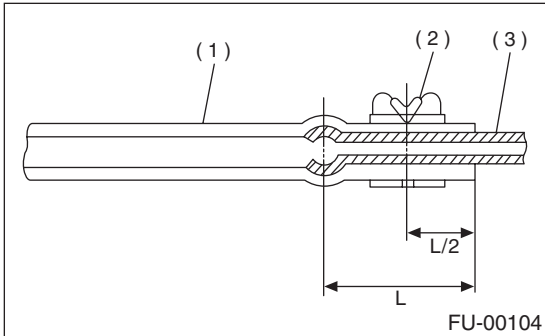
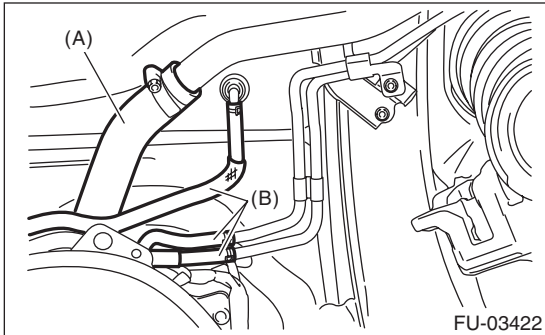
1) Support the fuel tank with a transmission jack, set the fuel tank in place, and temporarily tighten the bolts of the fuel tank band.

WARNING:

A helper is required to perform this work.



2) Securely insert the fuel filler hose (A) and evaporation hose (B) into the specified position, then attach the clamp and clip as shown in the figure.

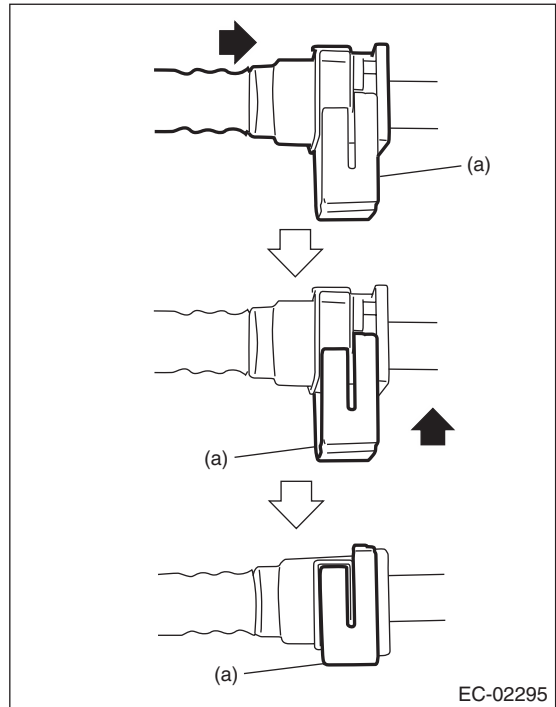


- (1) Hose
- (2) Clip or clamp
- (3) Pipe

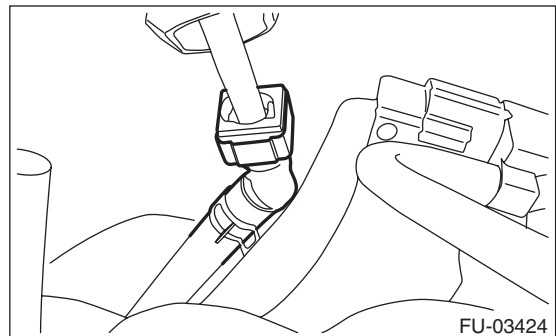
3) Connect the quick connector of the evaporation hose to the evaporation pipe.

CAUTION:

- Check that there is no damage or dust on the quick connector. If necessary, clean seal surface of pipe.
- When connecting the quick connector, insert the pipe all the way in securely, then operate the push lock.
- If it is not possible to perform the push lock operation of the retainer, recheck whether the pipe is securely inserted.
- Confirm that the quick connector is securely connected.

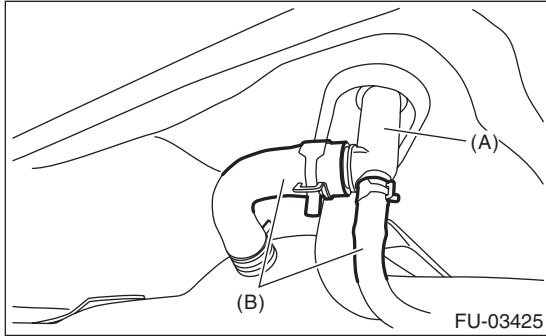


(a) Retainer

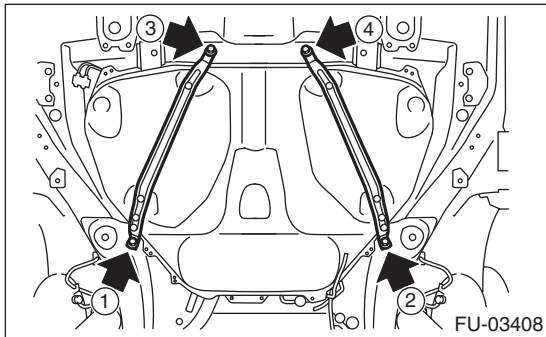


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4) Connect evaporation hose (B) to connector (A).



5) Tighten the fuel tank band bolts in the order shown in the figure.



Tightening torque:

33 N·m (3.4 kgf·m, 24.3 ft·lb)

6) Install the rear suspension assembly.

WARNING:

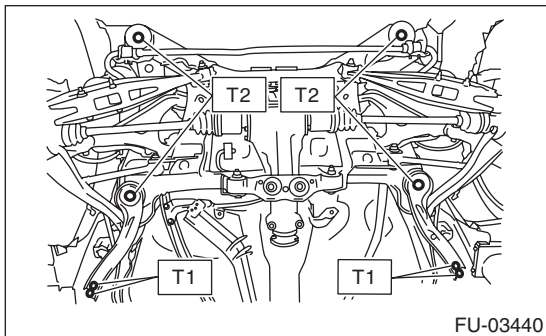
A helper is required to perform this work.

- (1) Support the rear differential with the transmission jack.
- (2) Support the rear suspension assembly, and tighten the bolts which secure the rear suspension assembly to the body.

Tightening torque:

T1: 70 N·m (7.1 kgf·m, 51.6 ft·lb)

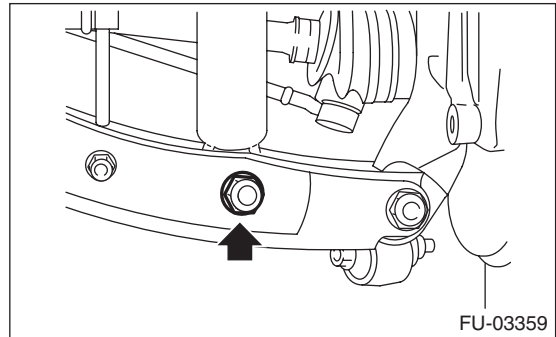
T2: 200 N·m (20.4 kgf·m, 147.5 ft·lb)



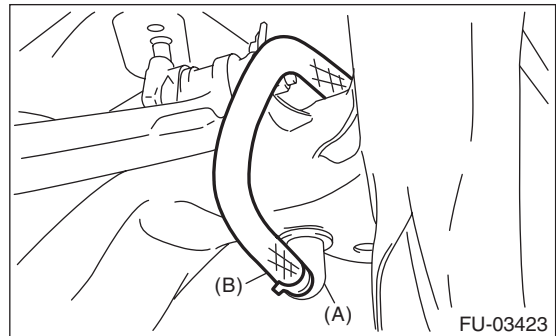
(3) Tighten the bolts which hold the rear shock absorber to the rear suspension arm.

Tightening torque:

120 N·m (12.2 kgf·m, 88.5 ft·lb)



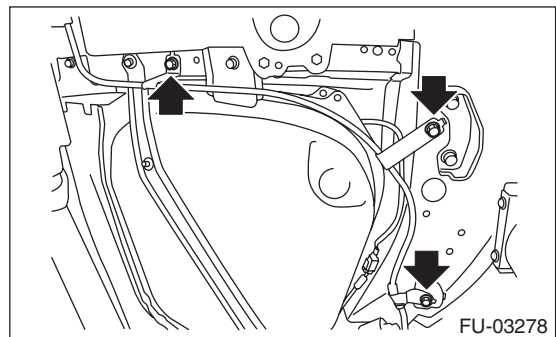
7) Connect drain hose (B) to canister drain connector (A).



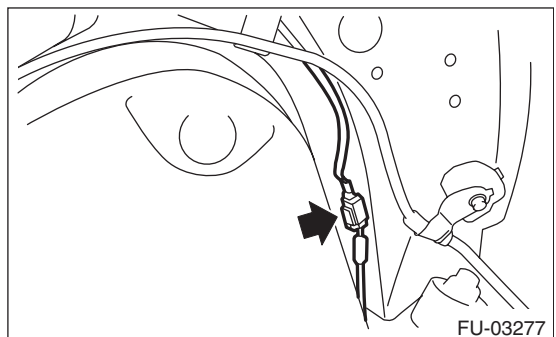
8) Tighten the bolts holding the parking brake cable clamp.

Tightening torque:

18 N·m (1.8 kgf·m, 13.3 ft·lb)



9) Connect the connector to the rear ABS wheel speed sensor.



Fuel Tank

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FUEL INJECTION (FUEL SYSTEMS)

- 10) Install the heat shield cover.
- 11) Install the fuel tank protector.

Tightening torque:

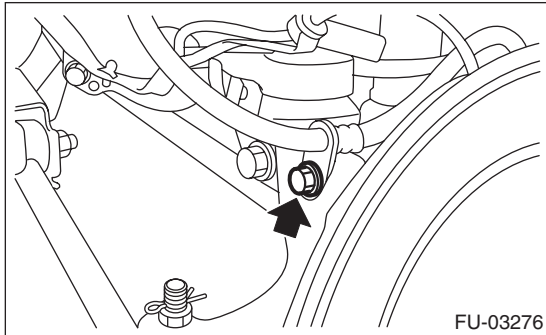
Nut: 9 N·m (0.9 kgf-m, 6.6 ft-lb)

Bolt: 18 N·m (1.8 kgf-m, 12.9 ft-lb)

- 12) Install the propeller shaft. <Ref. to DS-11, INSTALLATION, Propeller Shaft.>
- 13) Install the rear exhaust pipe. <Ref. to EX(H4SO)-10, INSTALLATION, Rear Exhaust Pipe.>
- 14) Lower the vehicle.
- 15) Connect the parking brake cable to the parking brake assembly. <Ref. to PB-7, INSTALLATION, Parking Brake Assembly (Rear Disc Brake).>
- 16) Install the rear brake caliper.
- 17) Tighten the bolts which hold the rear brake hose bracket.

Tightening torque:

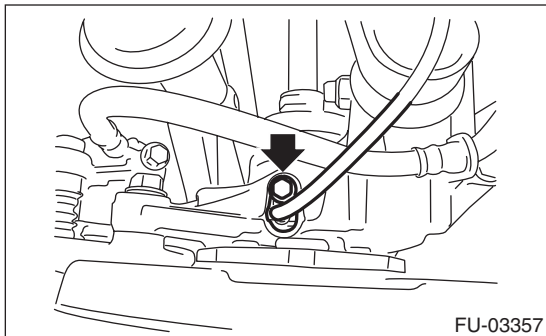
33 N·m (3.4 kgf-m, 24.3 ft-lb)



- 18) Attach the rear ABS vehicle speed sensor to the rear housing.

Tightening torque:

7.5 N·m (0.76 kgf-m, 5.5 ft-lb)



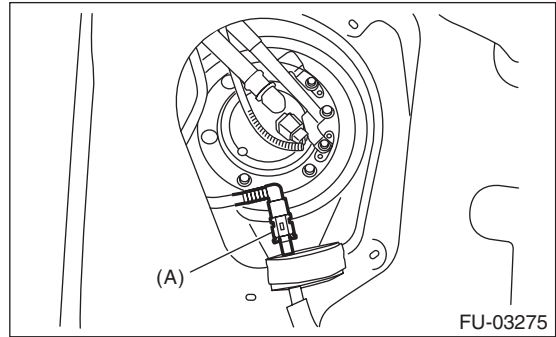
- 19) Install the rear wheels.

Tightening torque:

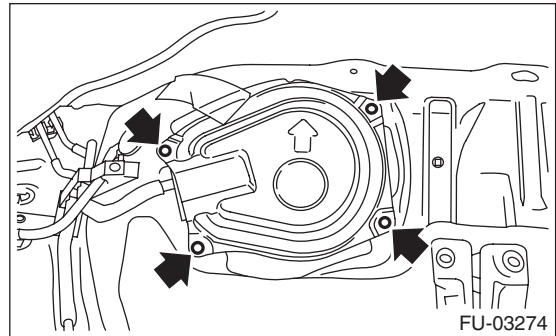
100 N·m (10.2 kgf-m, 73.8 ft-lb)

- 20) Connect quick connector of the fuel delivery tube (A).

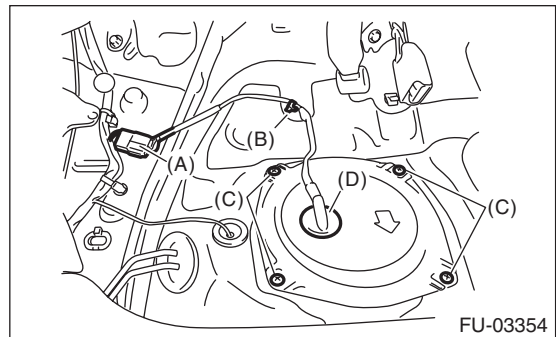
<Ref. to FU(H4SO)-66, INSTALLATION, Fuel Delivery and Evaporation Lines.>



- 21) Install the service hole cover of fuel sub level sensor.



- 22) Attach the service hole cover of the fuel pump, and secure the connector and clip.

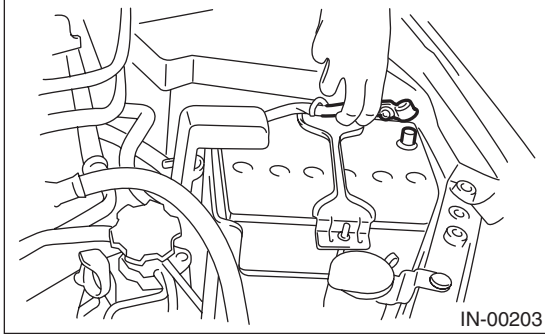


- (A) Connector
- (B) Clip
- (C) Bolt
- (D) Grommet

- 23) Install the rear seat.

- 24) Install the fuse of fuel pump to main fuse box.

25) Connect the ground cable to the battery.



26) Inspect the wheel alignment and adjust if necessary.

C: INSPECTION

- 1) Check that the fuel tank does not have holes, cracks or is damaged in any way.
- 2) Make sure that the fuel pipe and fuel hose are not cracked and that the connections are tight.

Fuel Filler Pipe

FUEL INJECTION (FUEL SYSTEMS)

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23. Fuel Filler Pipe

A: REMOVAL

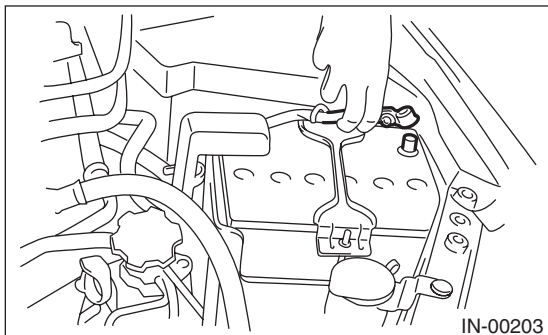
WARNING:

Place "NO OPEN FLAMES" signs near the working area.

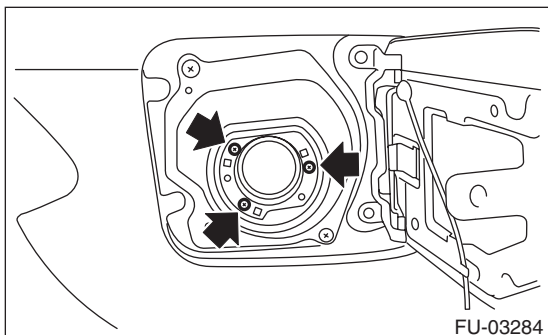
CAUTION:

Be careful not to spill fuel.

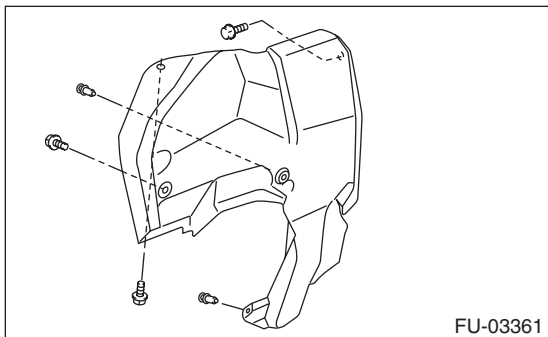
- 1) Set the vehicle on a lift.
- 2) Disconnect the ground cable from the battery.



- 3) Open the fuel filler flap lid, and remove the filler cap.
- 4) Remove the screws which secure gasket.

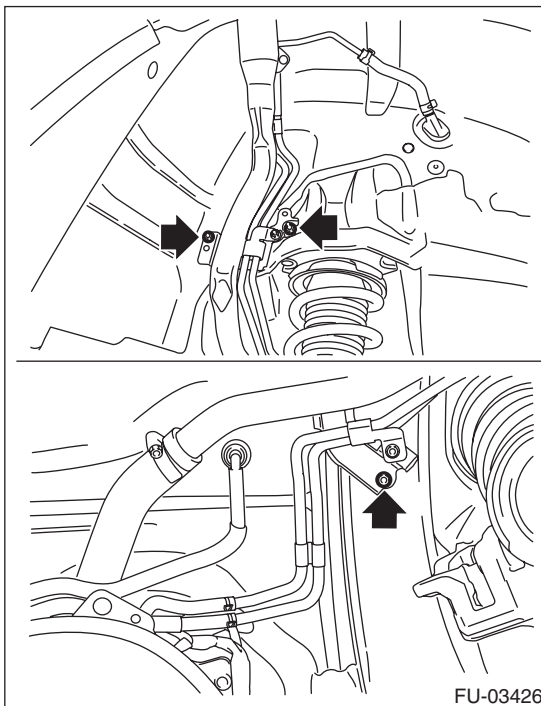


- 5) Remove the rear wheel RH.
- 6) Lift up the vehicle.
- 7) Drain fuel from fuel tank. <Ref. to FU(H4SO)-43, DRAINING FUEL (WITH SUBARU SELECT MONITOR), PROCEDURE, Fuel.>
- 8) Remove the fuel filler pipe protector.

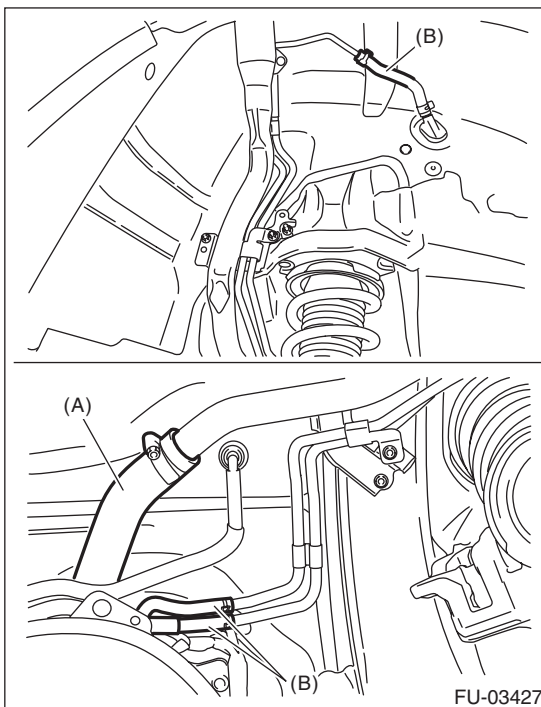


- 9) Remove the rear sub frame. <Ref. to RS-15, REMOVAL, Rear Sub Frame.>

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



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



- 12) Remove the fuel filler pipe to the underside of the vehicle.

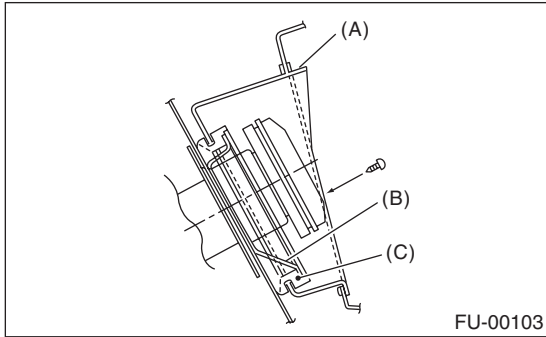
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B: INSTALLATION

- 1) Open the fuel filler flap lid.
- 2) Set the fuel saucer (A) with rubber seal (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:

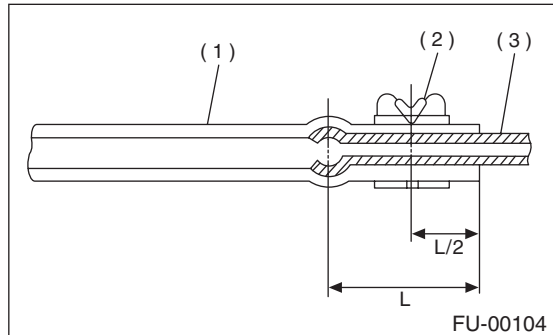
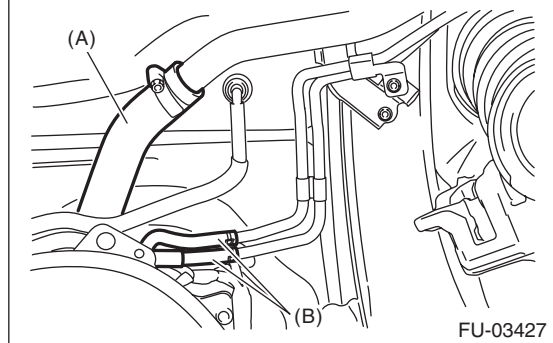
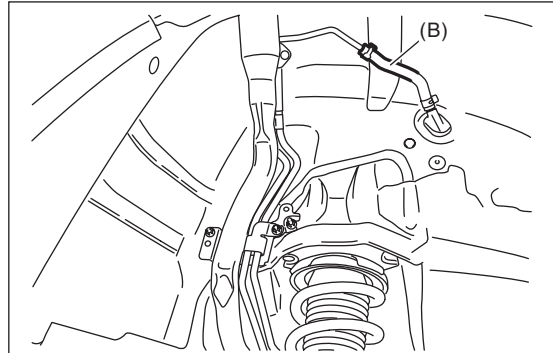
If the edges of rubber seal are folded toward inside, straighten it with a flat tip screwdriver.



- 4) Securely insert the fuel filler hose (A) and evaporation hose (B) to the specified position, then tighten the clamp.

Tightening torque:

2.5 N·m (0.3 kgf-m, 1.8 ft-lb)



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

Fuel Filler Pipe

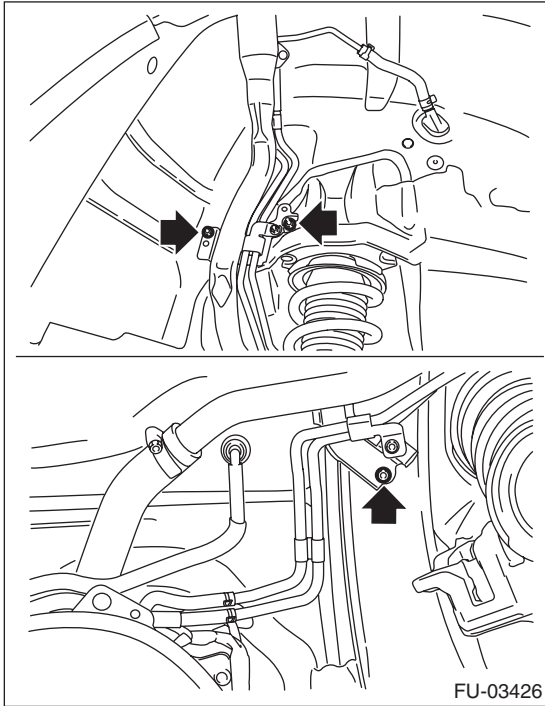
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FUEL INJECTION (FUEL SYSTEMS)

5) Tighten the bolts which hold fuel filler pipe bracket on the body.

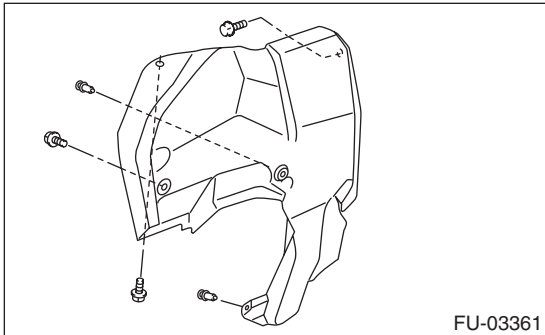
Tightening torque:

7.5 N·m (0.76 kgf-m, 5.5 ft-lb)



6) Install the rear sub frame. <Ref. to RS-16, INSTALLATION, Rear Sub Frame.>

7) Install the fuel filler pipe protector.



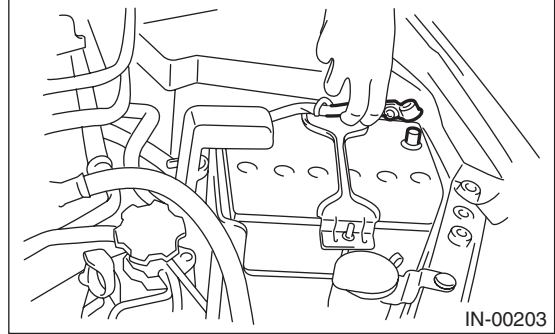
8) Lower the vehicle.

9) Install the rear wheel RH.

Tightening torque:

100 N·m (10.2 kgf-m, 73.8 ft-lb)

10) Connect the battery ground cable to battery.



11) Inspect the wheel alignment and adjust if necessary.

C: INSPECTION

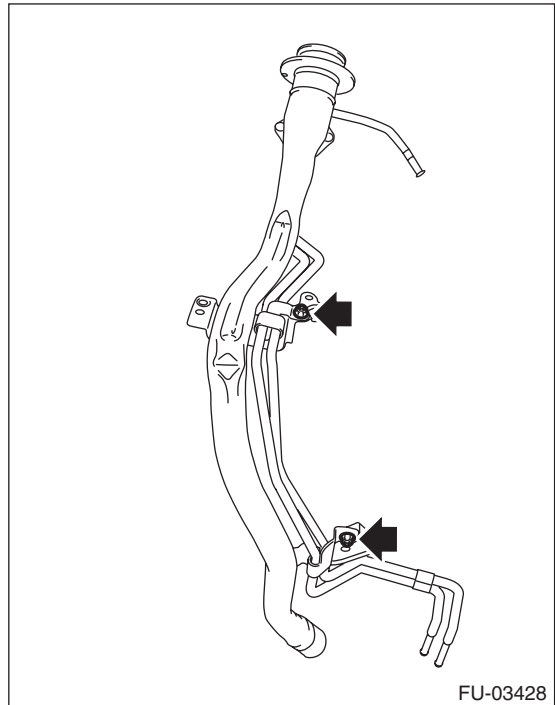
1) Check that the fuel tank does not have holes, cracks or is damaged in any way.

2) Make sure that the fuel hose is not cracked and that the connections are tight.

D: DISASSEMBLY

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

2) Remove the nut which holds the evaporation pipe assembly to the fuel filler pipe.

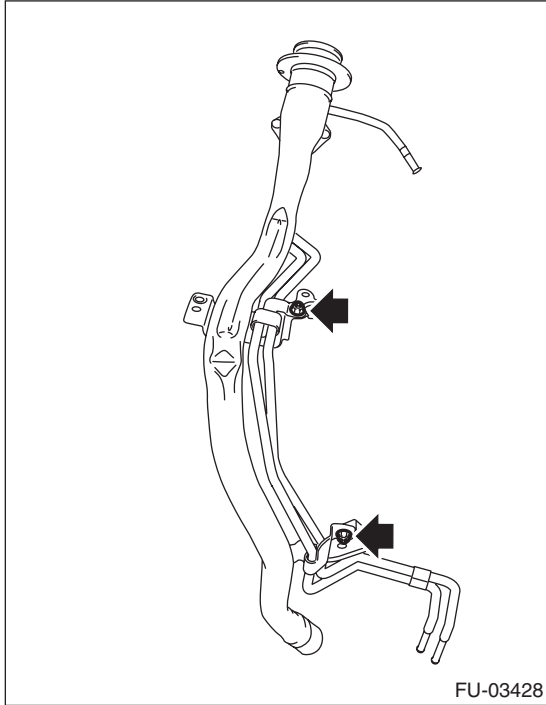


E: ASSEMBLY

1) Tighten the nuts which secure the evaporation pipe assembly to the fuel filler pipe.

Tightening torque:

7.5 N·m (0.76 kgf-m, 5.5 ft-lb)



FU-03428

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

24. Fuel Pump

A: REMOVAL

WARNING:

Place "NO OPEN FLAMES" signs near the working area.

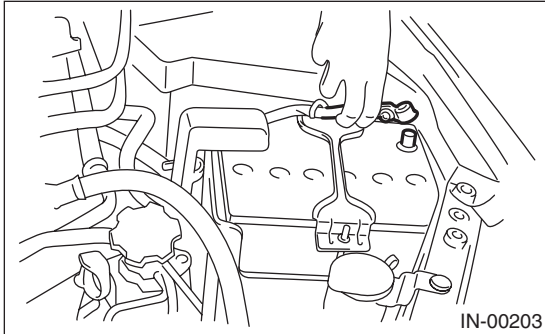
CAUTION:

- Be careful not to spill fuel.
- When the fuel gauge pointer is at two third or more, the fuel may spill out. Be sure to drain the fuel before the operation.

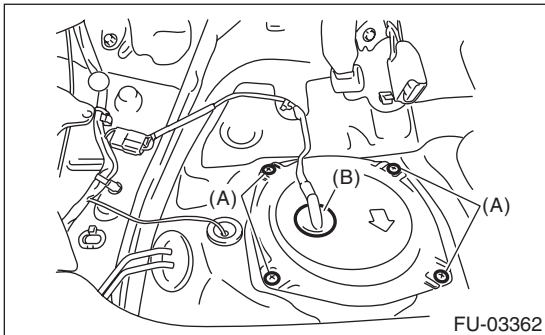
NOTE:

Fuel pump assembly consists of fuel pump, fuel filter and fuel level sensor.

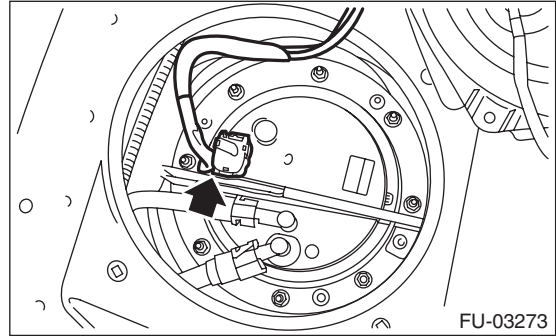
- 1) Release the fuel pressure. <Ref. to FU(H4SO)-43, RELEASING OF FUEL PRESSURE, PROCEDURE, Fuel.>
- 2) Drain fuel. <Ref. to FU(H4SO)-43, DRAINING FUEL (WITH SUBARU SELECT MONITOR), PROCEDURE, Fuel.>
- 3) Disconnect the ground cable from the battery.



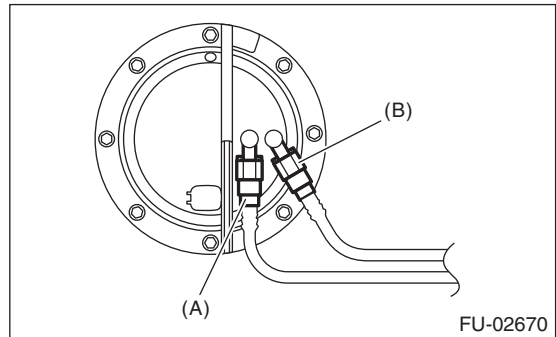
- 4) Remove the rear seat.
- 5) Remove the service hole cover.
 - (1) Remove the bolt (A).
 - (2) Push the grommet (B) down and remove the service hole cover.



- 6) Disconnect the connector from fuel pump.



- 7) Disconnect the quick connector, then disconnect the fuel delivery tube and jet pump tube. <Ref. to FU(H4SO)-64, REMOVAL, Fuel Delivery and Evaporation Lines.>
- 8) Remove the nuts which install fuel pump assembly onto fuel tank.



- (A) Fuel delivery tube
(B) Jet pump tube

- 9) Remove the fuel pump assembly from the fuel tank.

B: INSTALLATION

Install in the reverse order of removal while being careful of the following.

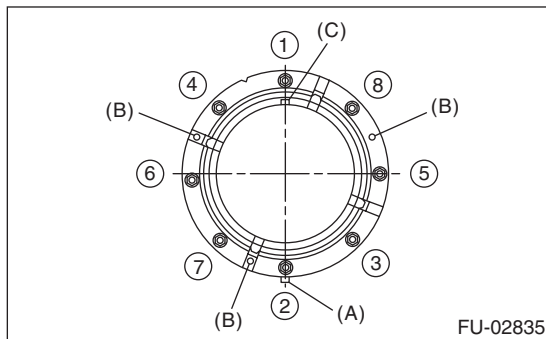
- Make sure the sealing portion is free from fuel or foreign matter before installation.
- When assembling, point the protrusion of the gasket (A) towards the front of the vehicle.
- Insert the protrusion (B) of the gasket into the upper plate. (3 locations)
- Align the protrusion (C) of the fuel pump assembly to the cut out in the upper plate.
- Tighten the nuts to the specified torque in the order as shown in the figure.

NOTE:

Use a new gasket and retainer.

Tightening torque:

4.4 N·m (0.45 kgf-m, 3.2 ft-lb)

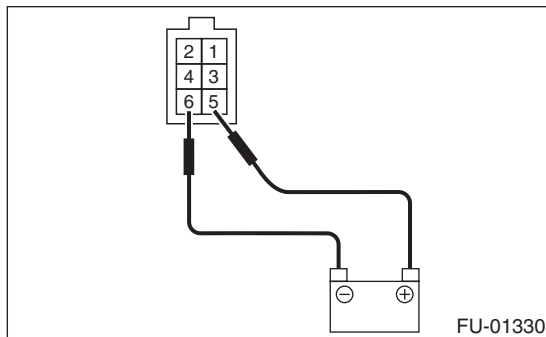


C: INSPECTION

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 fuel completely.**
- **Keep the battery as far apart from fuel pump as possible.**
- **Be sure to perform the ON/OFF operation on the battery side.**
- **Do not run the fuel pump for a long time under non-load condition.**



25. Fuel Level Sensor

A: REMOVAL

WARNING:

Place “NO OPEN FLAMES” signs near the working area.

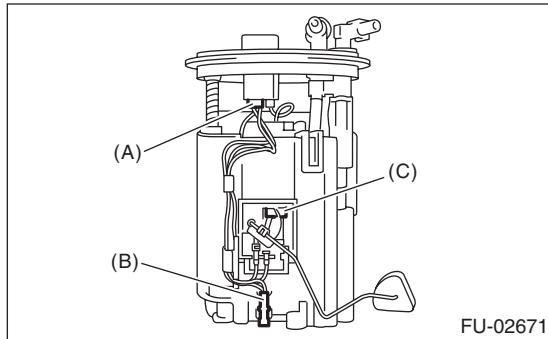
CAUTION:

Be careful not to spill fuel.

NOTE:

The fuel level sensor is built in fuel pump assembly.

- 1) Remove the fuel pump assembly. <Ref. to FU(H4SO)-56, REMOVAL, Fuel Pump.>
- 2) Disconnect the connector from fuel pump bracket.
- 3) Remove the fuel level sensor and fuel temperature sensor.



- (A) Connector
- (B) Fuel temperature sensor
- (C) Fuel level sensor

B: INSTALLATION

Install in the reverse order of removal.

Tightening torque:

4.4 N·m (0.45 kgf·m, 3.2 ft·lb)

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26. Fuel Sub Level Sensor

A: REMOVAL

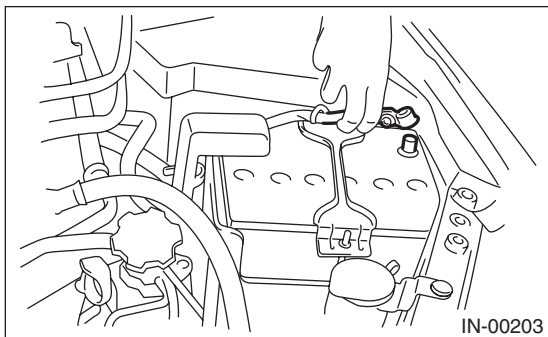
WARNING:

Place "NO OPEN FLAMES" signs near the working area.

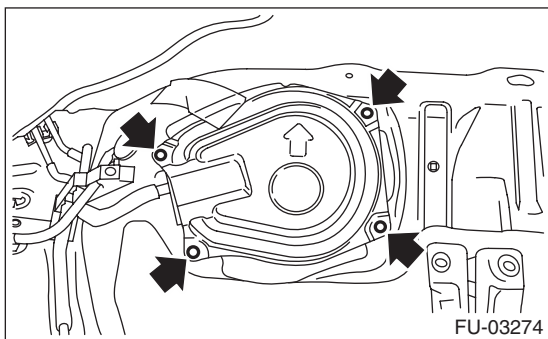
CAUTION:

- Be careful not to spill fuel.
- When the fuel gauge pointer is at two third or more, the fuel may spill out. Be sure to drain the fuel before the operation.

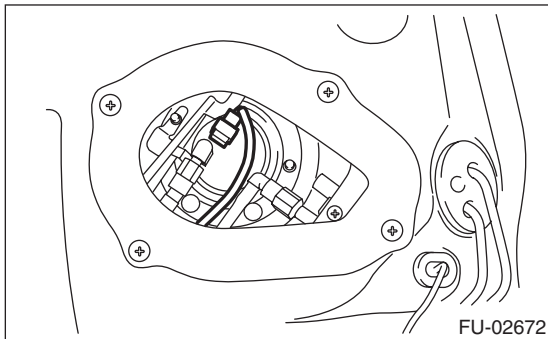
- 1) Release the fuel pressure. <Ref. to FU(H4SO)-43, RELEASING OF FUEL PRESSURE, PROCEDURE, Fuel.>
- 2) Drain fuel. <Ref. to FU(H4SO)-43, DRAINING FUEL (WITH SUBARU SELECT MONITOR), PROCEDURE, Fuel.>
- 3) Disconnect the ground cable from the battery.



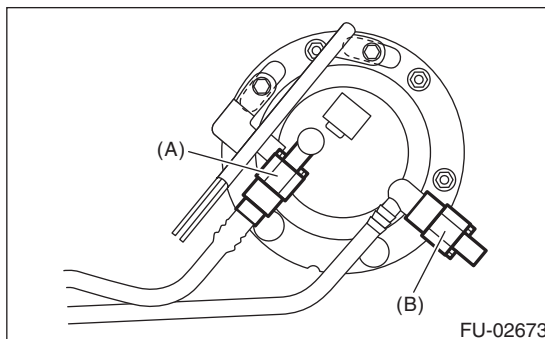
- 4) Remove the rear seat.
- 5) Remove the service hole cover.



- 6) Disconnect the connector from the fuel sub level sensor.



- 7) Disconnect the quick connector, then disconnect the fuel delivery tube and jet pump tube. <Ref. to FU(H4SO)-64, REMOVAL, Fuel Delivery and Evaporation Lines.>
- 8) Remove the nuts and bolts which install fuel sub level sensor on fuel tank.



- (A) Jet pump tube
- (B) Fuel delivery tube

- 9) Remove the fuel sub level sensor.

Fuel Sub Level Sensor

FUEL INJECTION (FUEL SYSTEMS)

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B: INSTALLATION

Install in the reverse order of removal while being careful of the following.

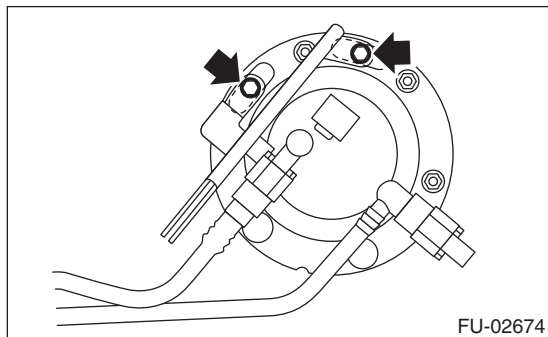
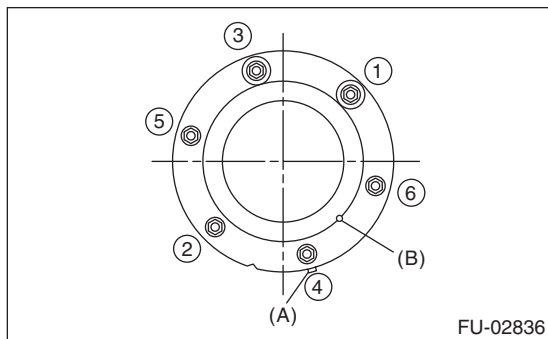
- Make sure the sealing portion is free from fuel or foreign matter before installation.
- Align protrusion (A) of the gasket to the position shown in the following figure.
- Align protrusion (B) of the fuel sub level sensor to the cut out in the fuel sublevel sensor upper plate.
- Tighten the nuts and bolts to the specified torque in the order as shown in the figure.

NOTE:

Use a new gasket and retainer.

Tightening torque:

4.4 N·m (0.45 kgf·m, 3.2 ft·lb)



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27. Fuel Filter

A: SPECIFICATION

Fuel filter forms a single unit with fuel pump.
Refer to "Fuel Pump" for removal and installation.
<Ref. to FU(H4SO)-56, REMOVAL, Fuel Pump.>
<Ref. to FU(H4SO)-57, INSTALLATION, Fuel Pump.>

28. Fuel Damper Valve

A: REMOVAL

WARNING:

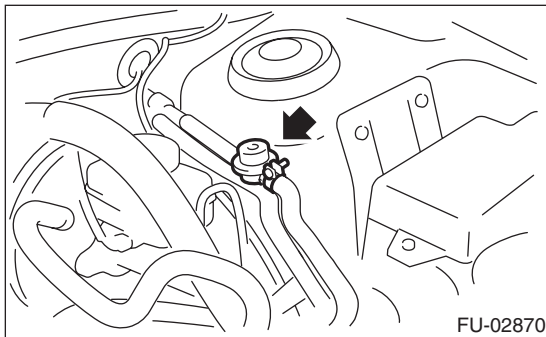
Place “NO OPEN FLAMES” signs near the working area.

CAUTION:

- Be careful not to spill fuel.
- Catch the fuel from hoses using a container or cloth.

1) Release the fuel pressure. <Ref. to FU(H4SO)-43, RELEASING OF FUEL PRESSURE, PROCEDURE, Fuel.>

2) Remove the fuel damper valve from the fuel delivery hose.



B: INSTALLATION

Install in the reverse order of removal.

Tightening torque:

1.25 N·m (0.13 kgf-m, 0.94 ft-lb)

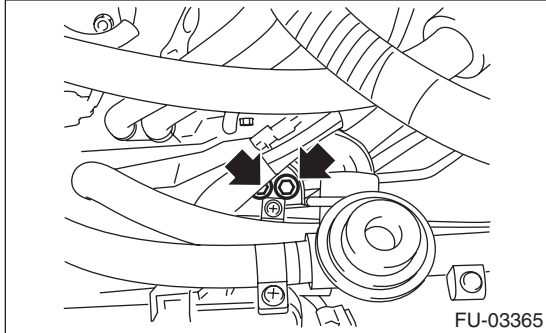
29.Purge Damper Valve

A: REMOVAL

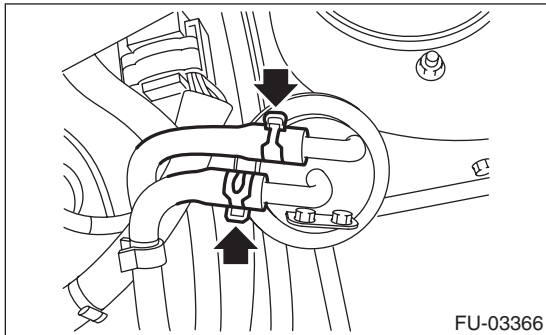
WARNING:

Place "NO OPEN FLAMES" signs near the working area.

1) Remove the purge damper valve from the purge damper valve stay.



2) Disconnect the evaporation hose from the purge damper valve.



B: INSTALLATION

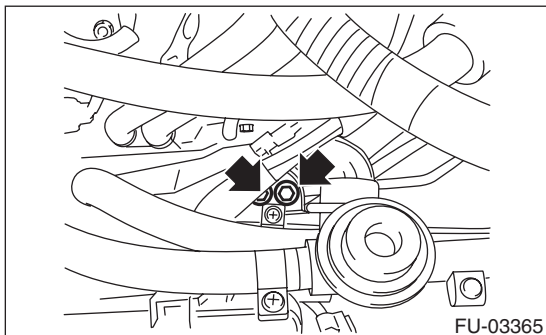
CAUTION:

If there is damage on the evaporation hose, replace with a new hose.

Install in the reverse order of removal.

Tightening torque:

8 N·m (0.8 kgf·m, 5.9 ft·lb)



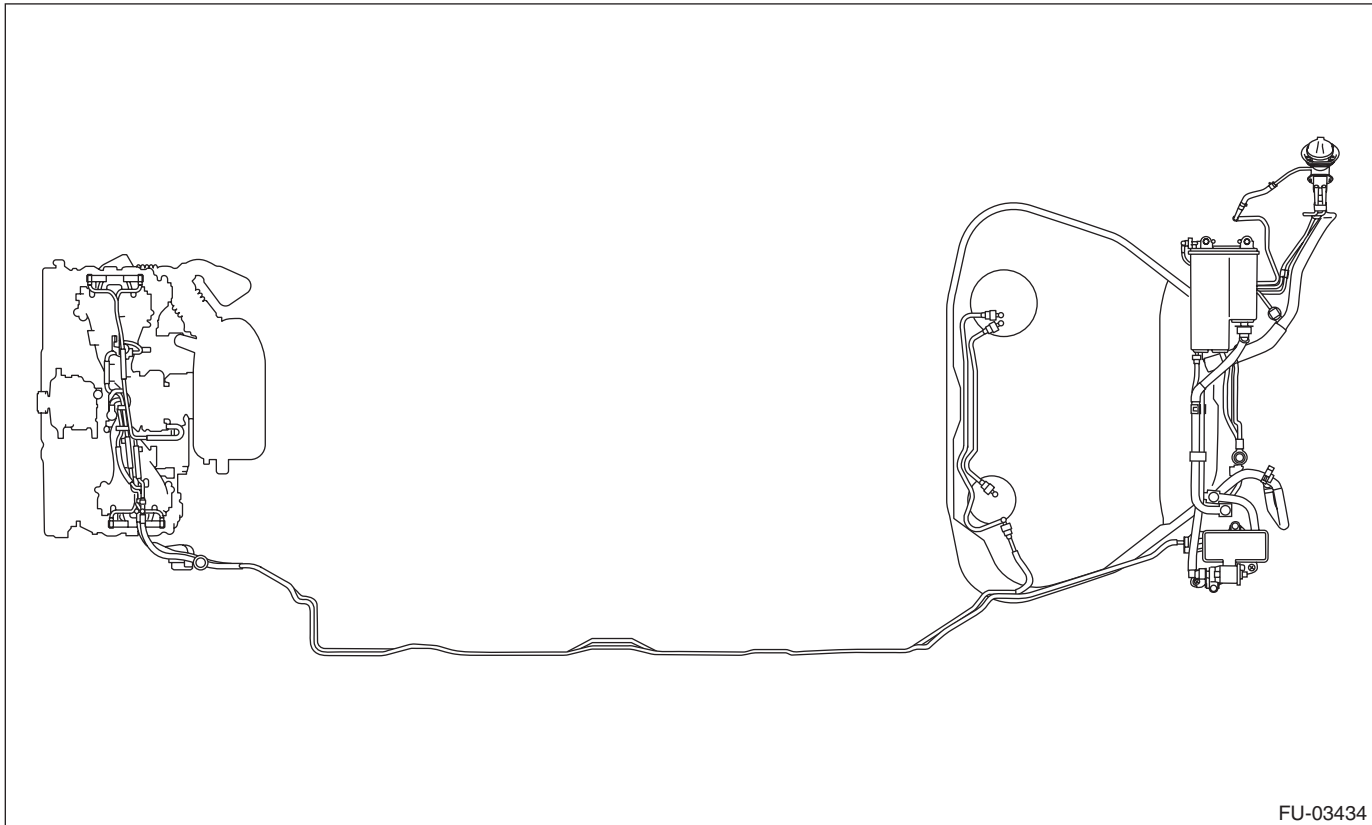
Fuel Delivery and Evaporation Lines

FUEL INJECTION (FUEL SYSTEMS)

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30. Fuel Delivery and Evaporation Lines

A: REMOVAL



FU-03434

WARNING:
Place "NO OPEN FLAMES" signs near the working area.

CAUTION:
Be careful not to spill fuel.

Fuel Delivery and Evaporation Lines

FUEL INJECTION (FUEL SYSTEMS)

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- 1) Set the vehicle on a lift.
- 2) Release the fuel pressure. <Ref. to FU(H4SO)-43, 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-64, REMOVAL, Floor Mat.>
- 5) In the engine compartment, disconnect the fuel delivery hoses and evaporation hose.

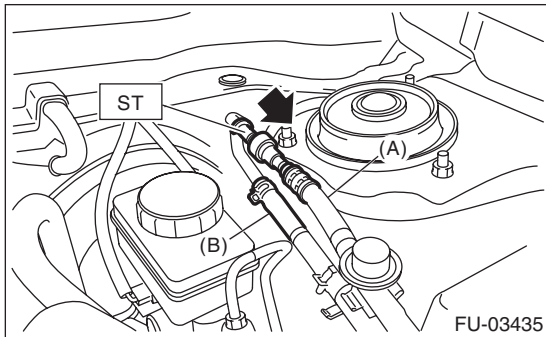
(1) Disconnect the quick connector of the fuel delivery line by pushing the ST in the direction of the arrow.

ST 42099FE000 QUICK CONNECTOR RELEASE

(2) Remove the clip and disconnect the evaporation hose from the pipe.

CAUTION:

- Be careful not to spill fuel.
- Catch the fuel from hoses using a container or cloth.

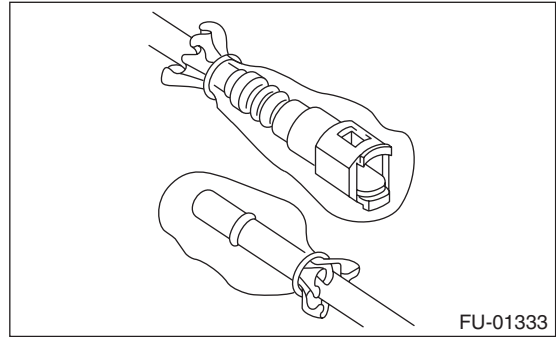


- (A) Fuel delivery hose
(B) Evaporation hose

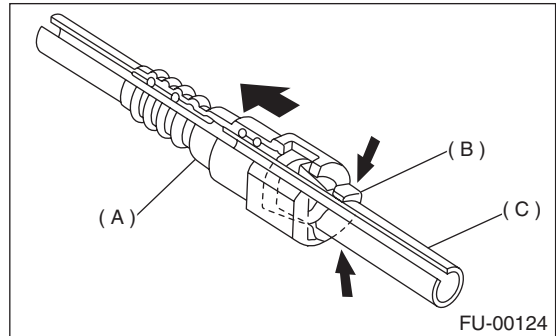
- 6) Remove the canister. <Ref. to EC(H4SO)-5, REMOVAL, Canister.>
- 7) Remove the fuel tank. <Ref. to FU(H4SO)-45, REMOVAL, Fuel Tank.>
- 8) Remove the fuel pipe assembly.
- 9) Disconnect the quick connector, then disconnect the fuel delivery tube and jet pump tube.

(1) Clean the pipe and connector, if they are covered with dust.

- (2) To prevent from damaging or entering foreign matter, wrap the pipes and connectors with plastic bag etc.



- (3) Hold the connector (A) and push the retainer (B) down.
- (4) Pull out the connector (A) from the retainer (B).



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

Fuel Delivery and Evaporation Lines

FUEL INJECTION (FUEL SYSTEMS)

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B: INSTALLATION

Install in the reverse order of removal while being careful of the following.

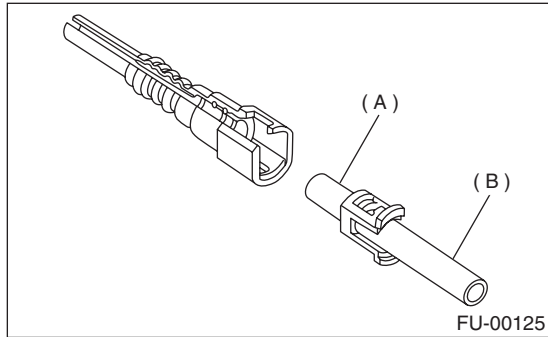
1. CONNECTING THE FUEL LINE QUICK CONNECTOR.

CAUTION:

Make sure there is no damage or dust on the connections. If necessary, clean seal surface of pipe.

NOTE:

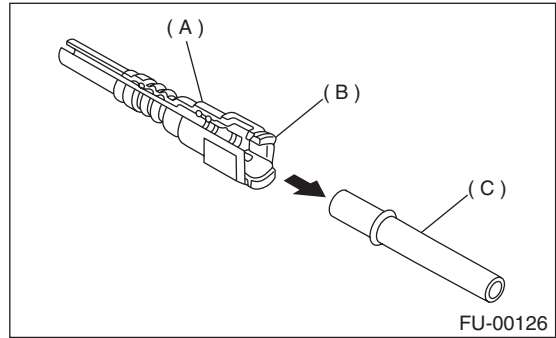
Use a new retainer.



- (A) Seal surface
- (B) Pipe

1) Set the new retainer (B) to connector (A).

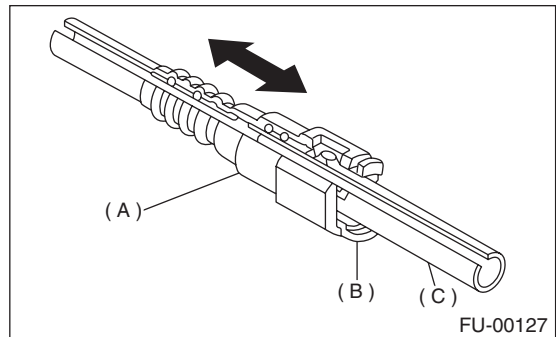
2) Push the pipe into the connector completely.



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

CAUTION:

- Pull the connector to ensure it is connected securely.
- Make sure the two retainer claws are engaged in their mating positions in the connector.
- Be sure to inspect hoses and their connections for any leakage of fuel.



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

2. CONNECTING THE FUEL DELIVERY HOSE.

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 amount to be inserted is specified.

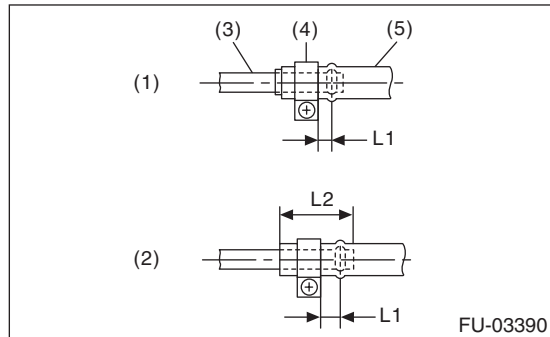
Type B: When the amount to be inserted is not specified.

L1: 2.5±1.5 mm (0.098±0.059 in)

L2: 22.5±2.5 mm (0.886±0.098 in)

CAUTION:

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

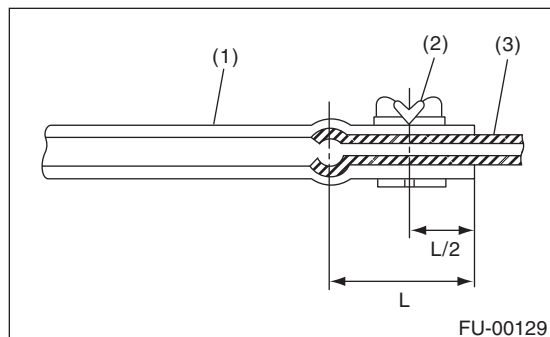


- (1) Type A
- (2) Type B
- (3) Pipe
- (4) Clamp
- (5) Hose

3. EVAPORATION HOSE CONNECTION.

Insert the evaporation hose 15 to 20 mm (0.59 to 0.79 in) when connecting to the pipe.

L = 17.5±2.5 mm (0.689±0.098 in)



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

Fuel System Trouble in General

FUEL INJECTION (FUEL SYSTEMS)

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31. Fuel System Trouble in General

A: INSPECTION

Trouble and possible cause		Corrective action
1. Insufficient fuel supply to injector		
1)	Fuel pump does not operate.	
	○ Defective terminal contact	Inspect contact, especially ground, and tighten it securely.
	○ Trouble in electromagnetic or electronic circuit parts	Replace the faulty parts.
2)	Decline of fuel pump function	Replace the fuel pump.
3)	Clogged fuel filter	Replace the fuel filter.
4)	Clogged or bent fuel pipe or hose	Clean, correct or replace the fuel pipe or hose.
5)	Air is mixed in the fuel system.	Inspect or retighten each connection part.
6)	Clogged or bent air breather tube or pipe.	Clean, correct or replace the air breather tube or pipe.
7)	Damaged diaphragm of pressure regulator	Replace.
2. Leakage or blow out of fuel		
1)	Loose 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)	Clogged or bent air breather tube or air vent tube	Clean, correct or replace the air breather tube or air vent tube.
3. Gasoline smell inside of compartment		
1)	Loose joints at air breather tube, air vent tube and fuel filler pipe	Retighten.
2)	Fuel saucer gasket air tightness fault	Correct or replace the gasket.
3)	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. Fill the fuel tank fully to prevent this.
- In snow-covered areas, mountainous areas, skiing areas, etc. where ambient temperatures drop below 0°C (32°F) throughout the winter season, use a water removing agent in the fuel system to prevent freezing fuel system and accumulating water.
- When water is accumulated in fuel filter, fill the water removing agent in the fuel tank.
- Before using water removing agent, follow the cautions noted on the bottle.