FUEL INJECTION
(FUEL SYTEMS)

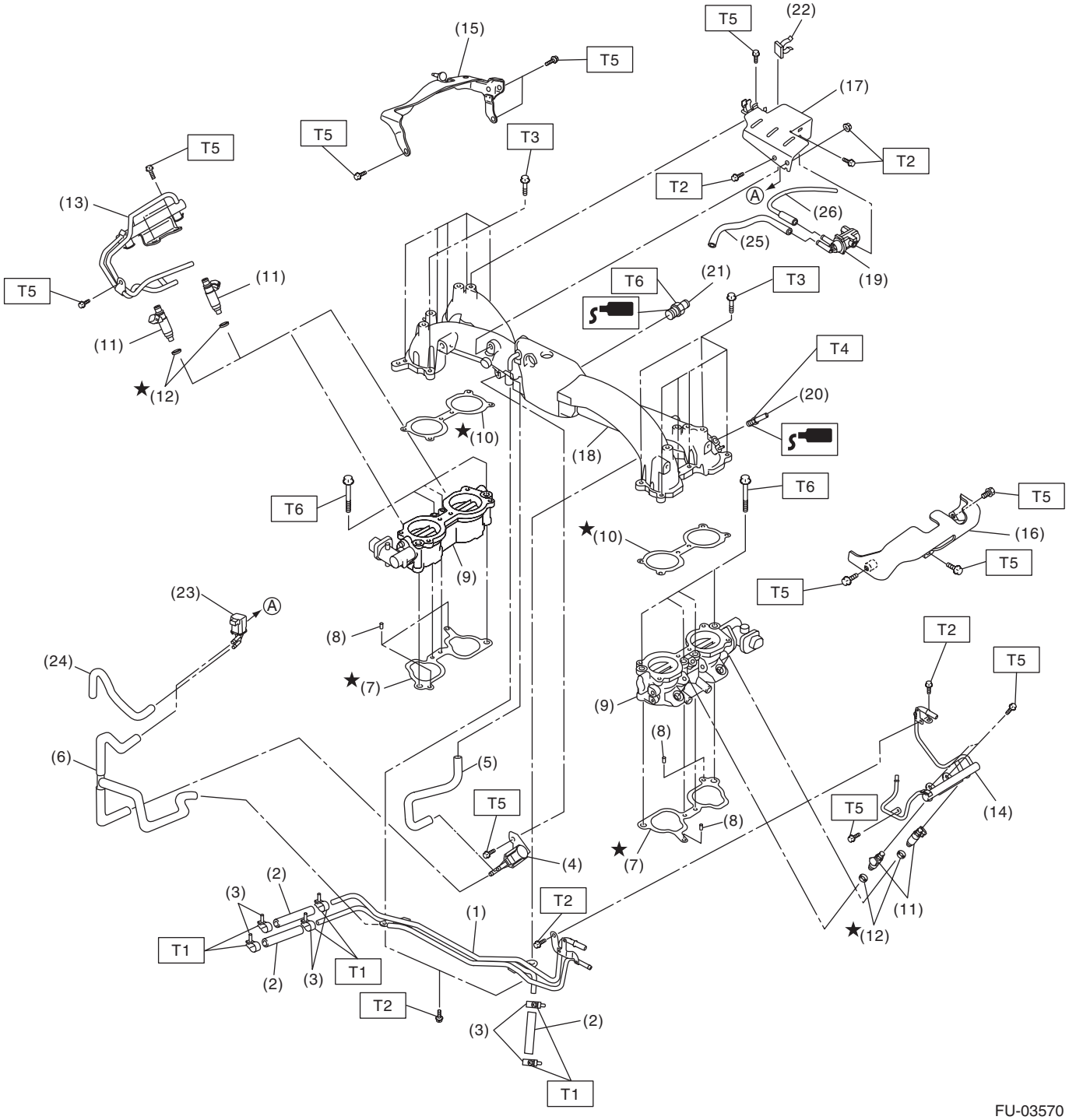
1. General Description

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	900 kPa (9.18 kg/cm^2, 130.5 psi) or less
	Discharge rate	175 ℓ (46.2 US gal, 38.5 Imp gal)/h or more [12 V at 300 kPa (3.06 kg/cm^2, 43.5 psi)]
Fuel filter		Intank type

B: COMPONENT

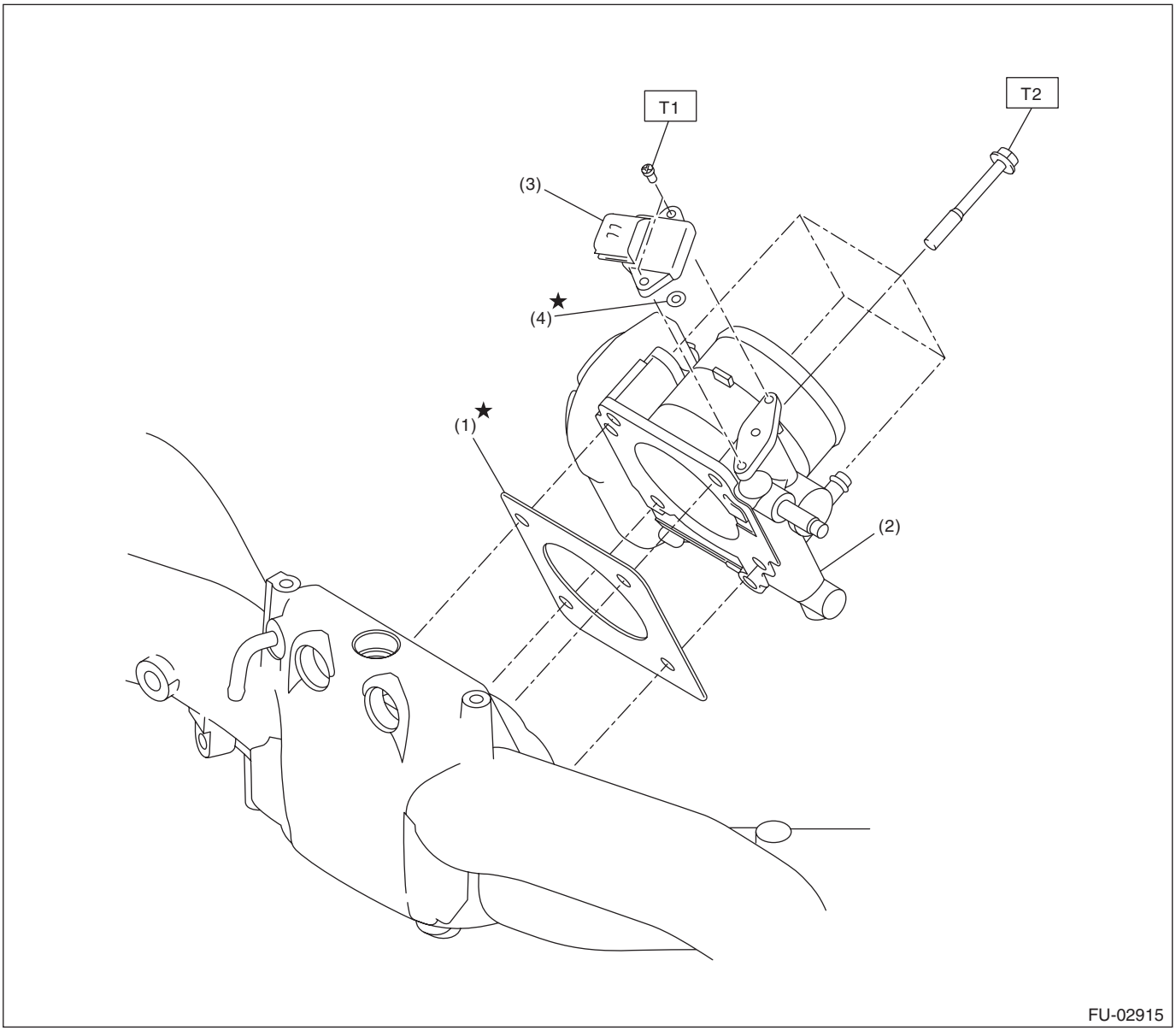
1. INTAKE MANIFOLD



(1) Fuel pipe ASSY
(2) Fuel hose
(3) Clamp
(4) Purge control solenoid valve 1
(5) Vacuum hose A
(6) Vacuum control hose
(7) Intake manifold gasket
(8) Guide pin
(9) Tumble generator valve ASSY
(10) Tumble generator valve gasket
(11) Fuel injector
(12) O-ring
(13) Fuel injector pipe RH
(14) Fuel injector pipe LH
(15) Fuel pipe protector RH
(16) Fuel pipe protector LH
(17) Solenoid valve bracket
(18) Intake manifold
(19) Wastegate control solenoid valve
(20) Nipple
(21) Nipple
(22) Clip
(23) Purge control solenoid valve 2
(24) Vacuum hose
(25) Vacuum hose
(26) Air control hose

Tightening torque:N·m (kgf-m, ft-lb)	
T1:	***1.25 (0.1, 0.9)***
T2:	***6.4 (0.7, 4.7)***
T3:	***8.25 (0.8, 6.1)***
T4:	***17 (1.7, 12.5)***
T5:	***19 (1.9, 14.0)***
T6:	***25 (2.5, 18.4)***

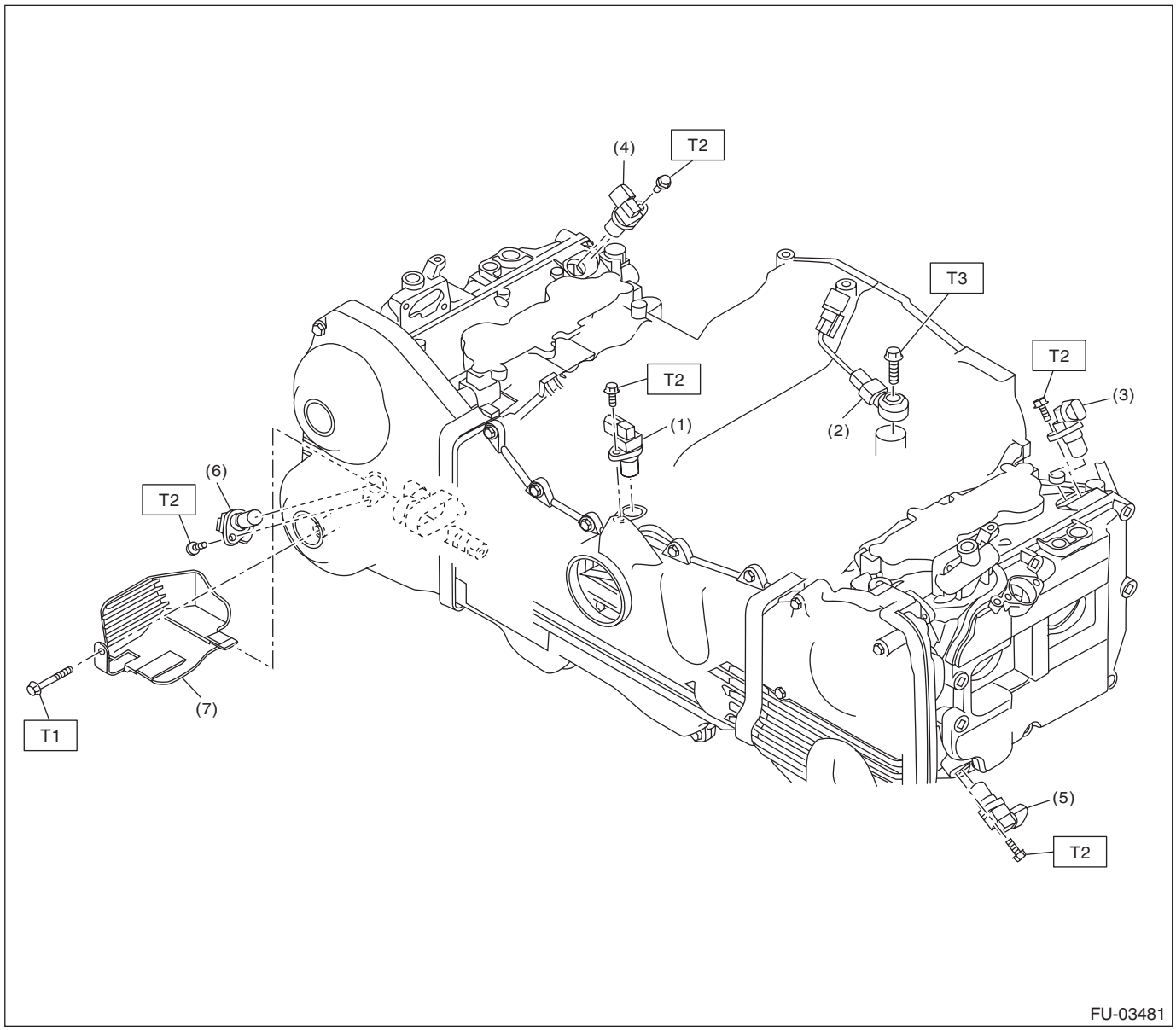
2. AIR INTAKE SYSTEM



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

Tightening torque:N·m (kgf-m, ft-lb)
T1: 1.6 (0.2, 1.2)
T2: 8 (0.8, 5.9)

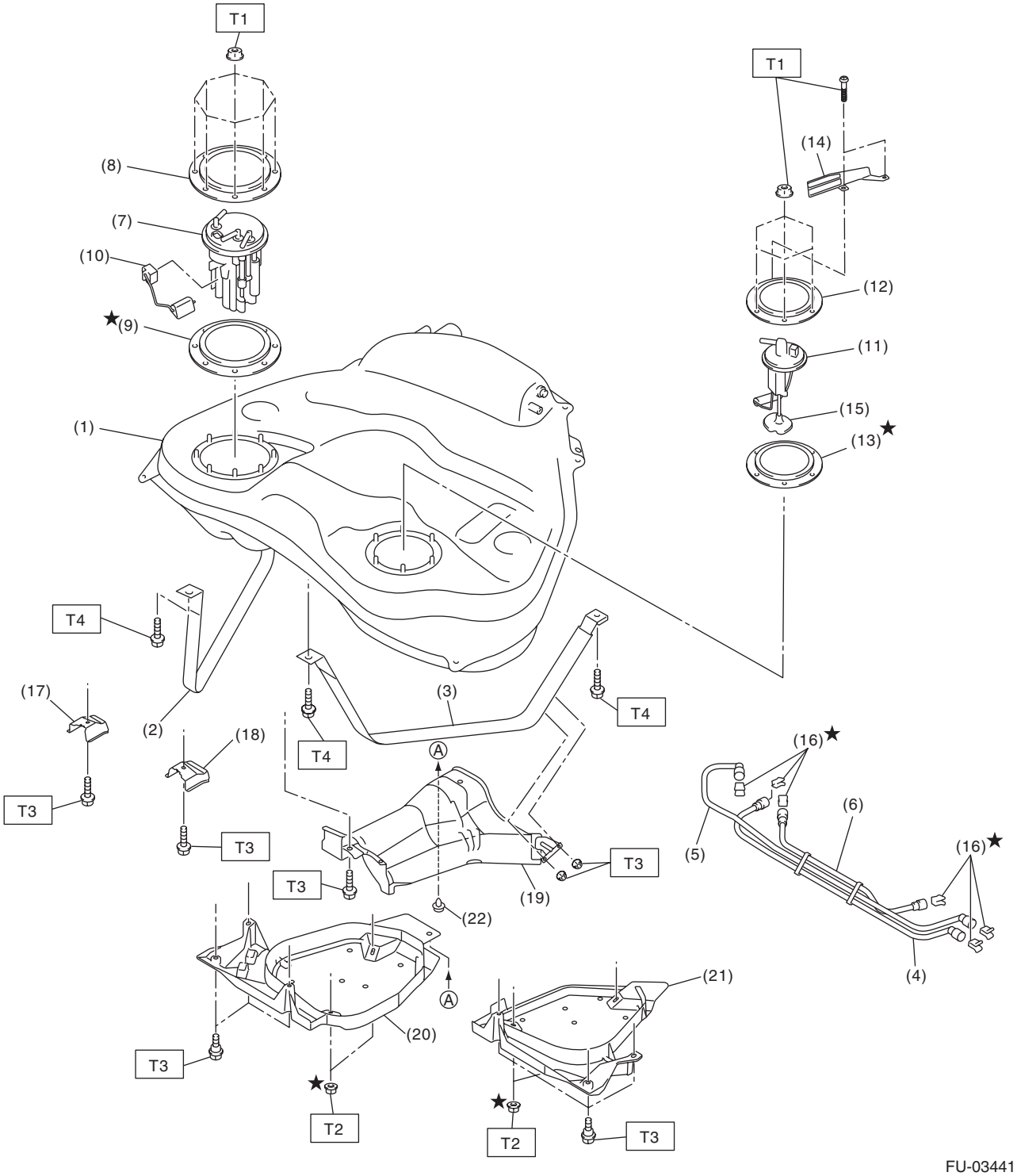
3. CRANKSHAFT POSITION, CAMSHAFT POSITION AND KNOCK SENSORS



(1) Crankshaft position sensor
(2) Knock sensor
(3) Intake camshaft position sensor LH
(4) Intake camshaft position sensor RH
(5) Exhaust camshaft position sensor LH
(6) Exhaust camshaft position sensor RH
(7) Engine harness cover

Tightening torque:N·m (kgf-m, ft-lb)
T1: 5 (0.5, 3.7)
T2: 6.4 (0.7, 4.7)
T3: 24 (2.4, 17.7)

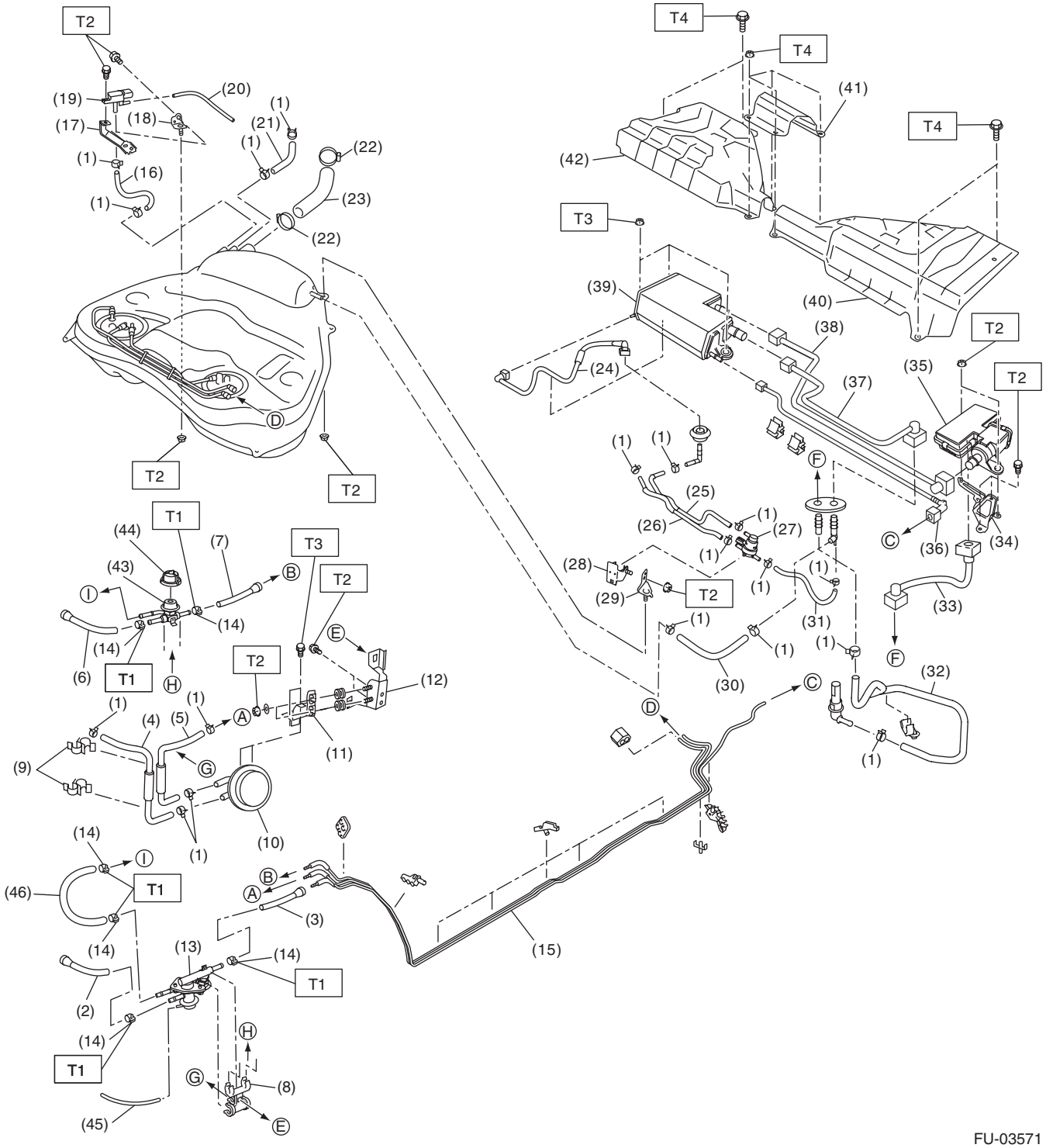
4. FUEL TANK



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

Tightening torque:N·m (kgf-m, ft-lb)
T1: 4.4 (0.4, 3.2)
T2: 9 (0.9, 6.6)
T3: 18 (1.8, 13.3)
T4: 33 (3.4, 24.3)

5. FUEL LINE

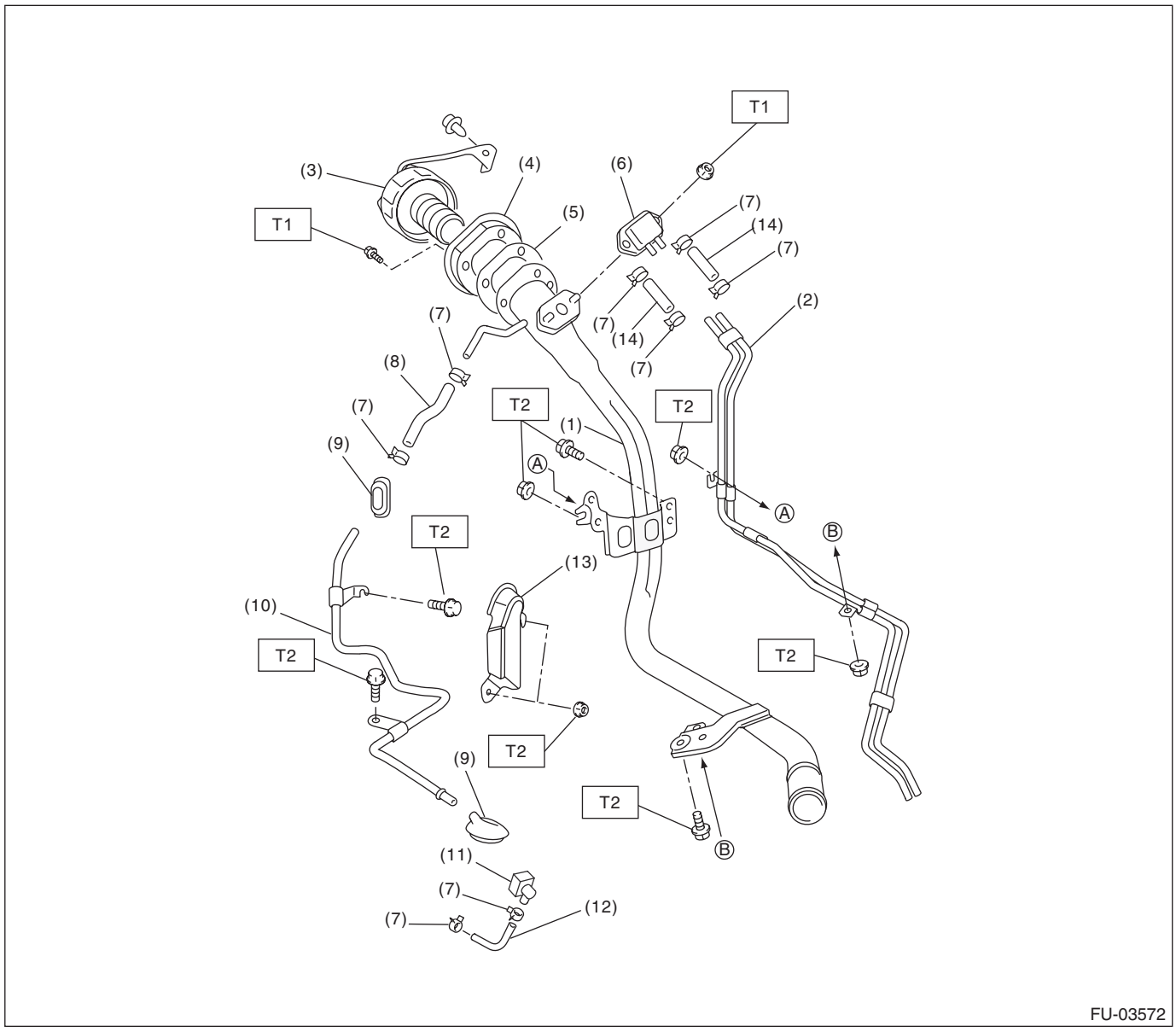


FU-03571

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

Tightening torque:N·m (kgf-m, ft-lb)
T1: 1.25 (0.1, 0.9)
T2: 7.5 (0.8, 5.5)
T3: 8 (0.8, 5.9)
T4: 18 (1.8, 13.3)

6. FUEL PIPE



FU-03572

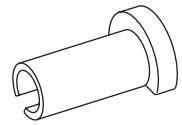
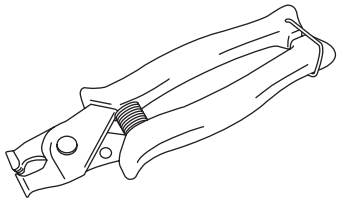
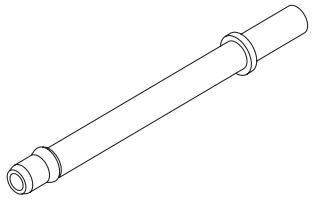
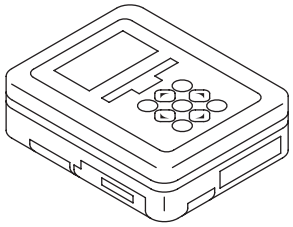
(1) Fuel filler pipe ASSY
(2) Evaporation pipe A
(3) Fuel filler cap
(4) Filler ring
(5) Filler pipe gasket
(6) Shut valve
(7) Clip
(8) Evaporation hose A
(9) Grommet
(10) Evaporation pipe B
(11) Quick connector
(12) Evaporation hose B
(13) Evaporation pipe protector
(14) Evaporation hose C

Tightening torque:N·m (kgf-m, ft-lb)
T1: 4.4 (0.4, 3.2)
T2: 7.5 (0.8, 5.5)

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.

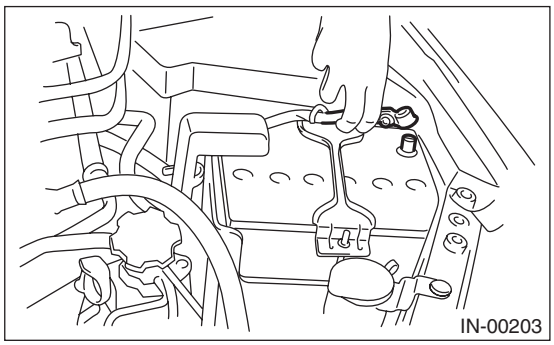
D: PREPARATION TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST42099AE000	42099AE000	QUICK CONNECTOR RELEASE	Used for disconnecting quick connector in the engine compartment.
 ST18353AA000	18353AA000	CLAMP PLIERS	• Used for removing and installing the PCV hose. • This is a general tool made by the French company CAILLAU.(code) 54.0.000.205 To make this easier to obtain in the same way as genuine Subaru parts, it has been provided with a tool number as an ST.
 ST18471AA000	18471AA000 (Newly adopted tool)	FUEL PIPE ADAPTER	Used for extracting fuel.
 ST1B021XU0	1B021XU0	SUBARU SELECT MONITOR III KIT	Used for extracting fuel.

2. Throttle Body

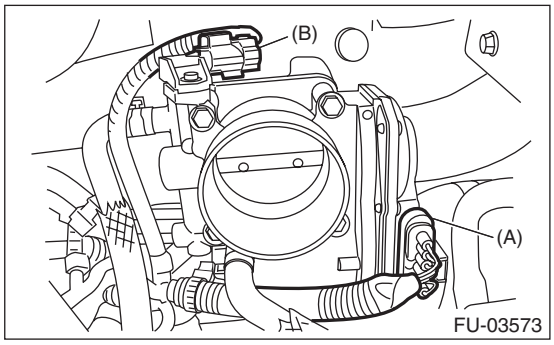
A: REMOVAL

1) Disconnect the ground cable from the battery.

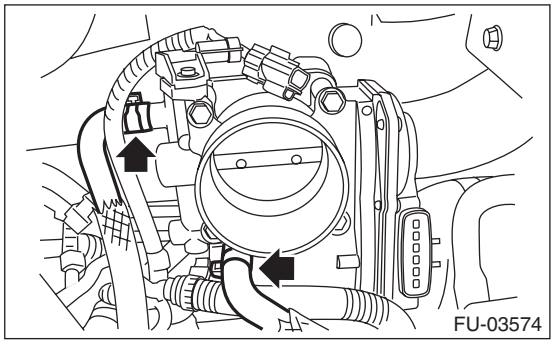


2) Remove the intercooler. <Ref. to IN(STI)-11, REMOVAL, Intercooler.>

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



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



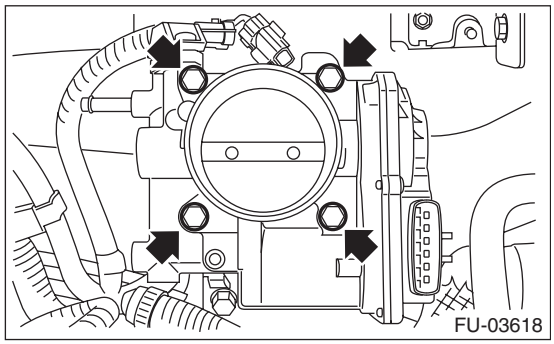
5) Remove the bolts which secure the throttle body to the intake manifold, and remove the throttle body.

B: INSTALLATION

Install in the reverse order of removal.

NOTE:
Use a new gasket.

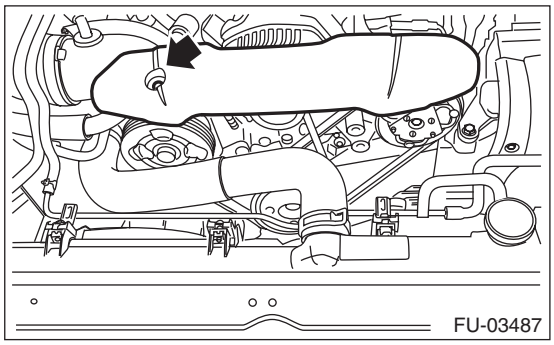
Tightening torque:
8 N·m (0.8 kgf-m, 5.9 ft-lb)



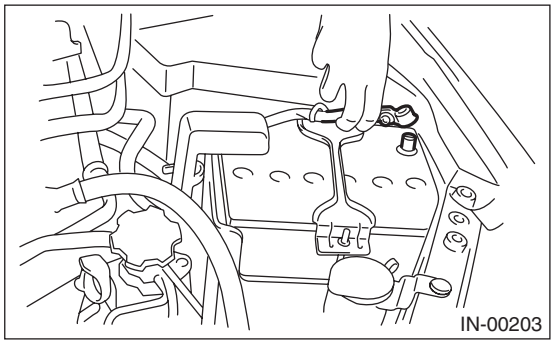
3. Intake Manifold

A: REMOVAL

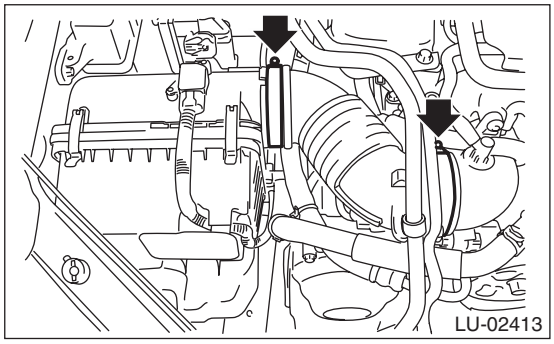
1) Set the vehicle on a lift.
2) Remove the V-belt covers.



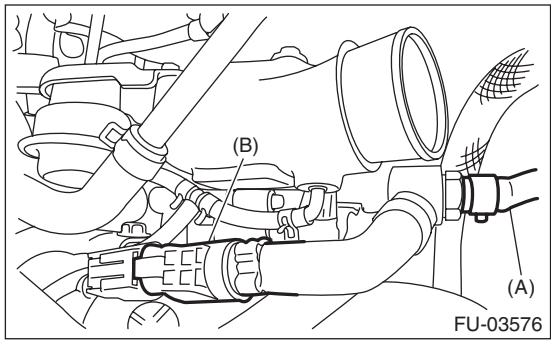
3) Remove the air intake duct. <Ref. to IN(STI)-9, REMOVAL, Air Intake Duct.>
4) Collect the refrigerant from the A/C system. <Ref. to AC-15, PROCEDURE, Refrigerant Recovery Procedure.>
5) Release the fuel pressure. <Ref. to FU(STI)-54, RELEASING OF FUEL PRESSURE, PROCEDURE, Fuel.>
6) Disconnect the ground cable from the battery.



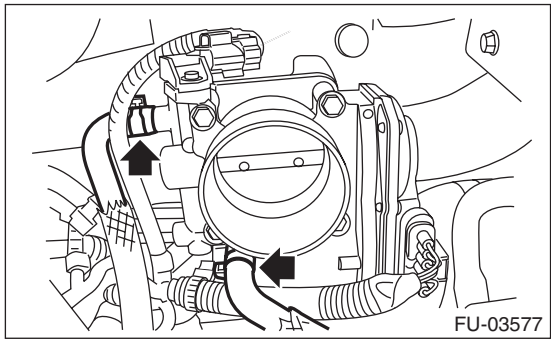
7) Open the fuel filler lid, and remove the fuel filler cap.
8) Lift up the vehicle
9) Remove the under cover.
10) Drain approximately 3.0 ℓ (3.2 US qt, 2.6 Imp qt) of coolant. <Ref. to CO(STI)-13, DRAINING OF ENGINE COOLANT, REPLACEMENT, Engine Coolant.>
11) Remove the air intake boot.



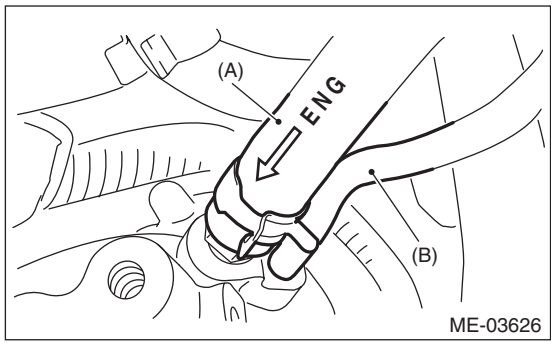
12) Remove the intercooler. <Ref. to IN(STI)-11, REMOVAL, Intercooler.>
13) Remove the generator. <Ref. to SC(STI)-13, REMOVAL, Generator.>
14) Remove the coolant filler tank. <Ref. to CO(STI)-28, REMOVAL, Coolant Filler Tank.>
15) Disconnect the A/C pressure hoses from A/C compressor.
16) Disconnect the vacuum hose (A) from the PCV hose assembly and the PCV hose assembly connector (B) from the intake duct.



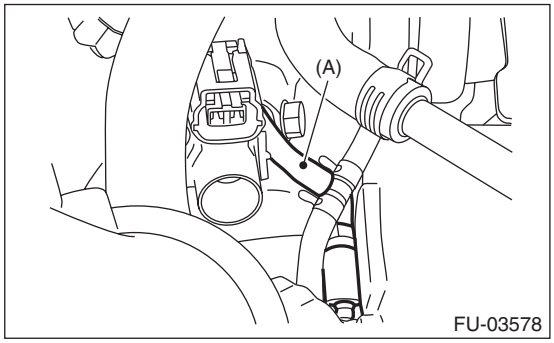
17) Disconnect the engine coolant hoses from the throttle body.



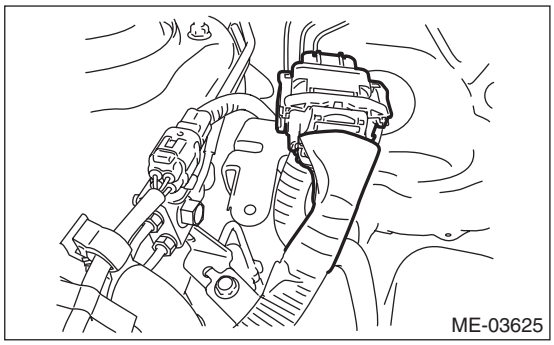
18) Disconnect the brake booster vacuum hose (A) and pressure regulator vacuum hose (B) from the intake manifold.



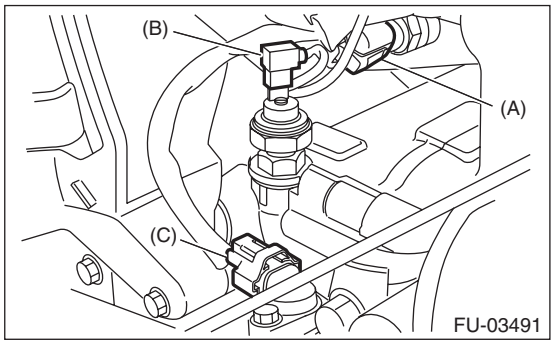
19) Disconnect the air control hose (A) from the waste gate actuator, and loosen the clamp which holds the turbocharger to the intake duct.



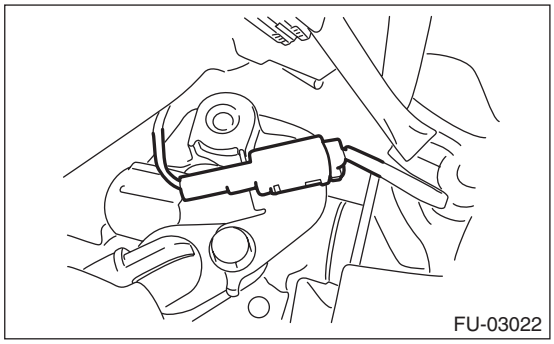
20) Disconnect the engine harness connectors from the bulk head harness connector.



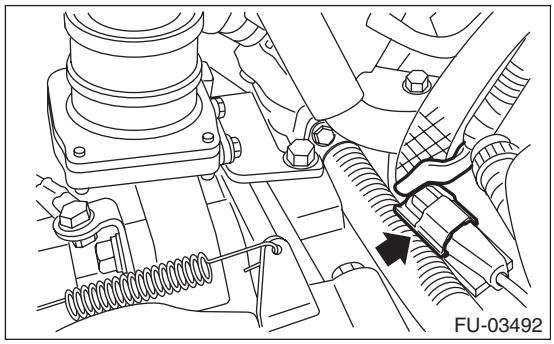
21) Disconnect the connectors from the engine coolant temperature sensor (A), oil pressure switch (B) and crankshaft position sensor (C).



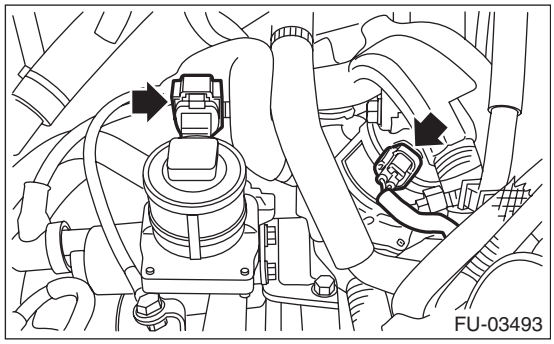
22) Disconnect the connector from power steering pump switch.



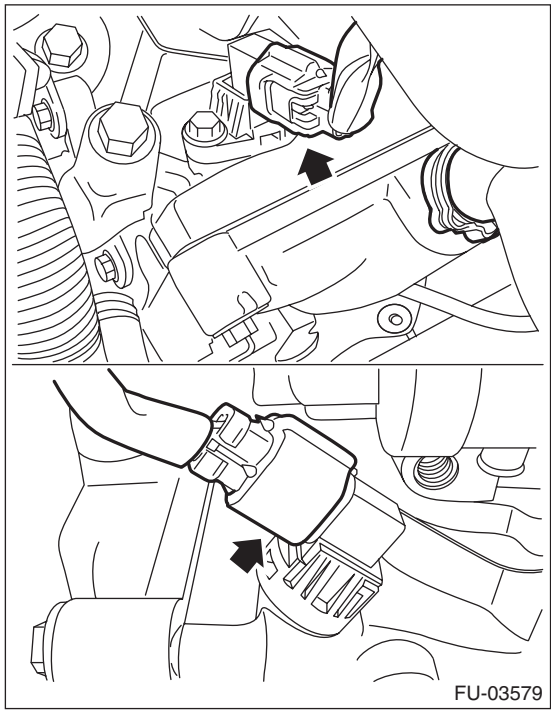
23) Disconnect the knock sensor connector.



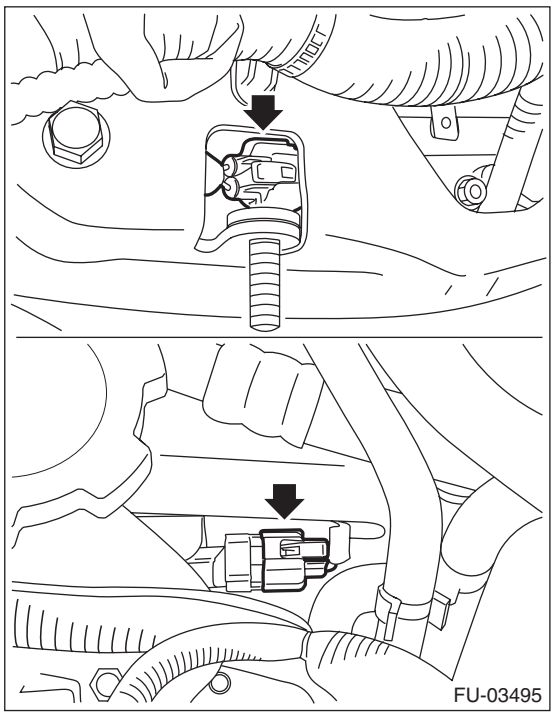
24) Disconnect the connector from the secondary air combination valve.



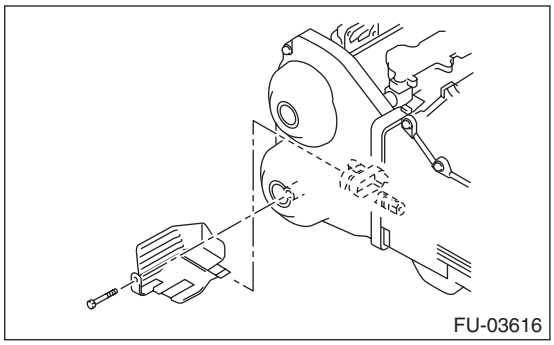
25) Disconnect the connector from the intake camshaft position sensor.



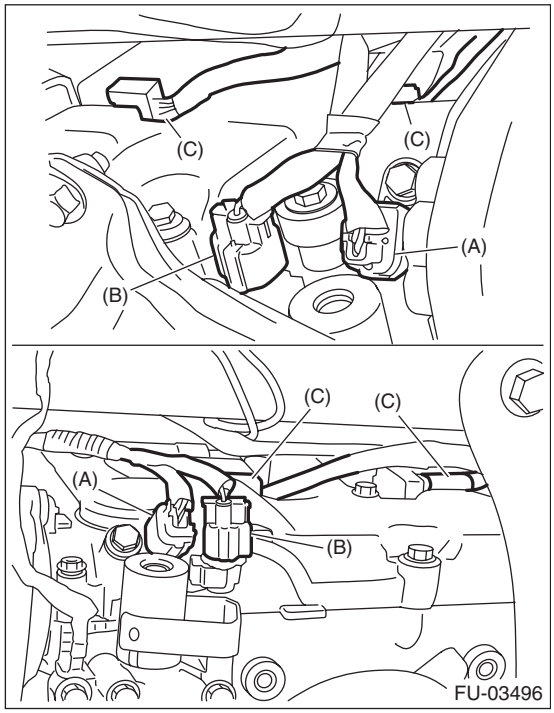
26) Disconnect the connector from the intake oil flow control solenoid valve.



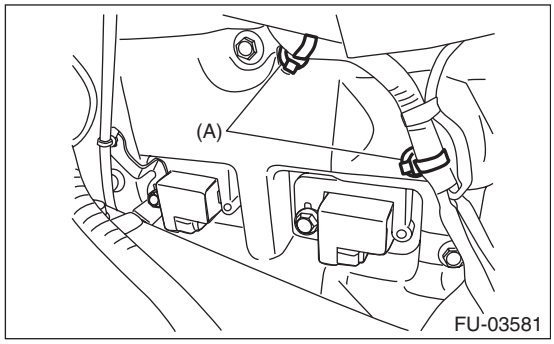
27) Remove the engine harness cover. (Right side only)



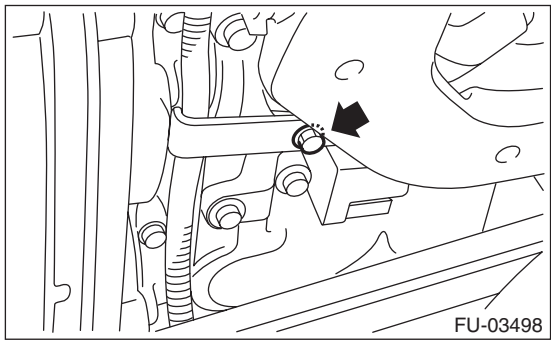
28) Disconnect the connectors from the exhaust camshaft position sensor (A), exhaust oil flow control solenoid valve (B), and ignition coil (C).



29) Remove the engine harness fixed by clip (A) from the rocker cover. (Right side only)



30) Remove the bolt and the engine harness holding the air duct. (Left side only)

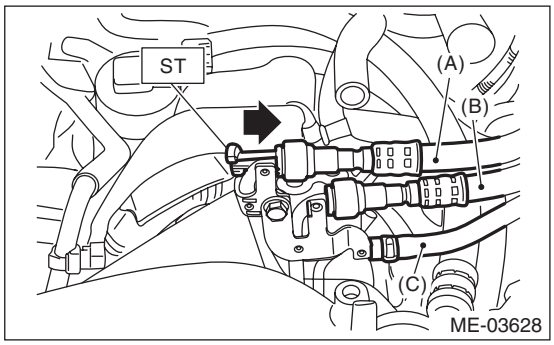


31) Disconnect the fuel delivery hose, fuel return hose, and evaporation hose.
(1) Disconnect the quick connector on the fuel delivery hose and fuel return hose by pushing the ST in the direction of the arrow.

ST 42099AE000 QUICK CONNECTOR RELEASE

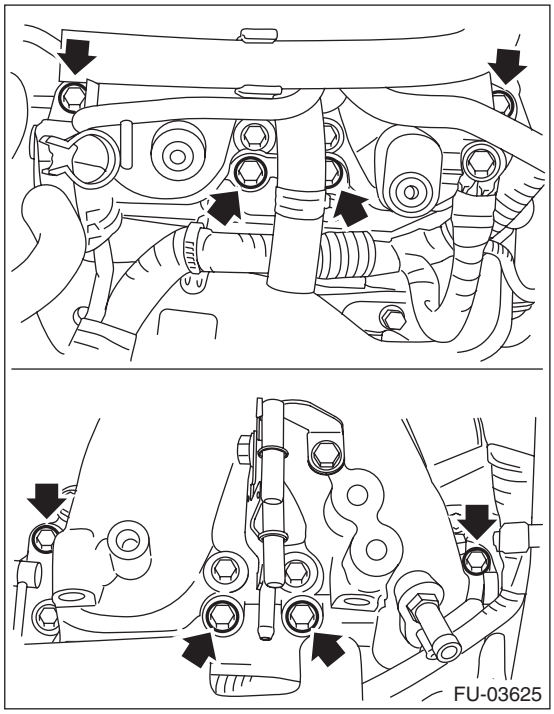
(2) Remove the clip and disconnect the evaporation hose from the fuel pipe.

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



(A) Fuel delivery hose
(B) Fuel return hose
(C) Evaporation hose

32) Remove the bolts which hold the tumble generator valve assembly onto the cylinder head.



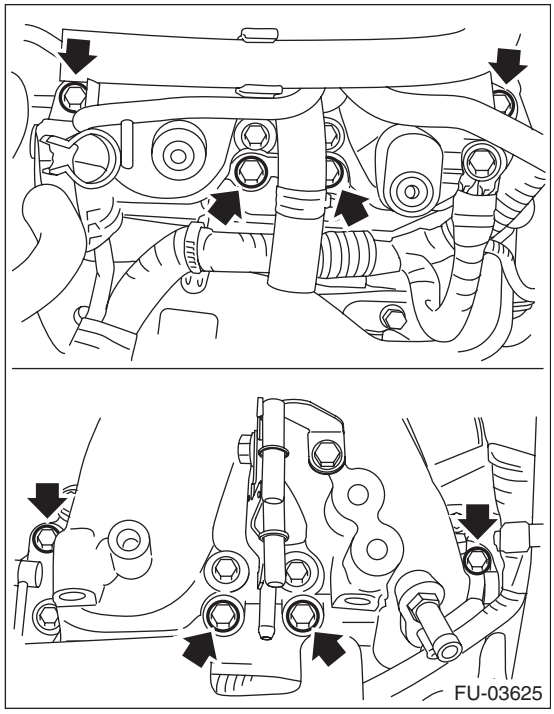
33) Remove the intake manifold.

B: INSTALLATION

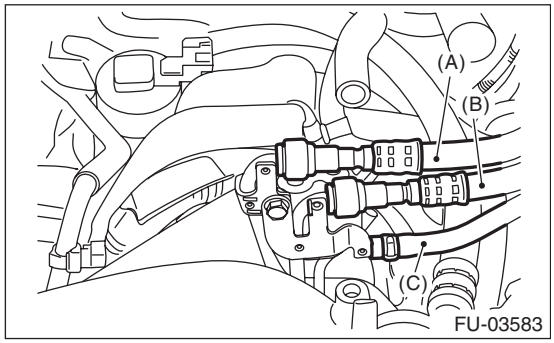
1) Install the intake manifold onto cylinder heads.

NOTE:
Use a new gasket.

Tightening torque:
25 N·m (2.5 kgf-m, 18.4 ft-lb)

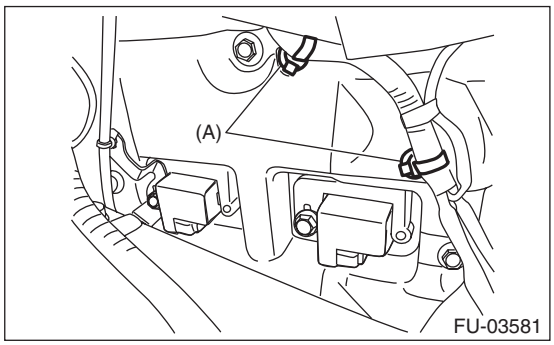


2) Connect the fuel delivery hose, fuel return hose, and evaporation hose.



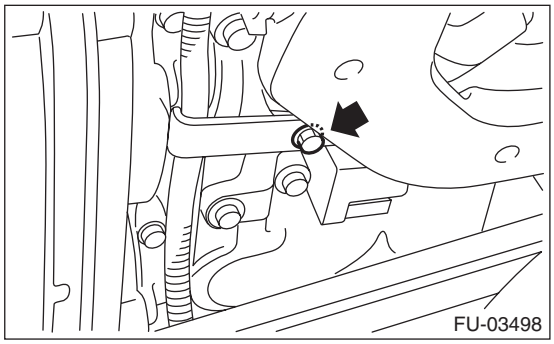
(A) Fuel delivery hose
(B) Fuel return hose
(C) Evaporation hose

3) Fix the engine harness to the rocker cover with clips (A). (Right side only)

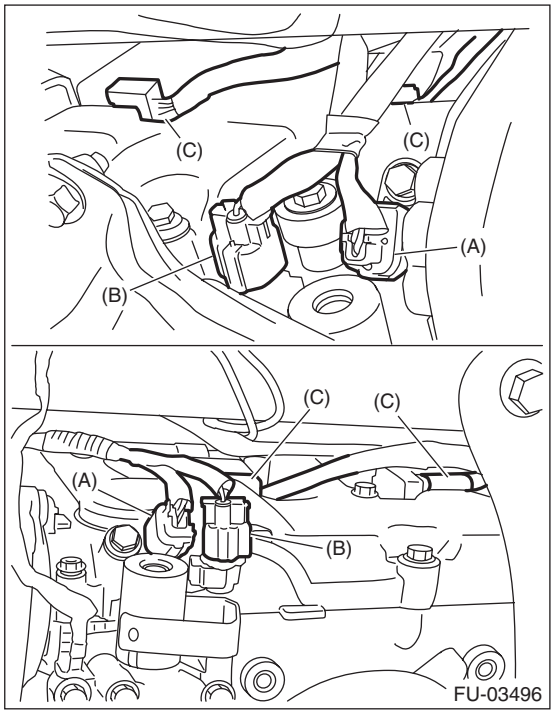


4) Fix the engine harness with the air duct. (Left side only)

Tightening torque:
9 N·m (0.9 kgf-m, 6.6 ft-lb)

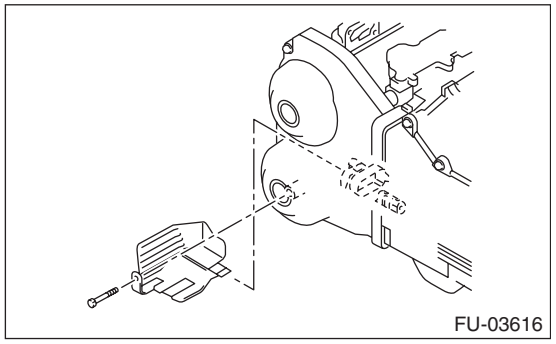


5) Connect the connectors to the exhaust camshaft position sensor (A), exhaust oil flow control solenoid valve (B), and ignition coil (C).

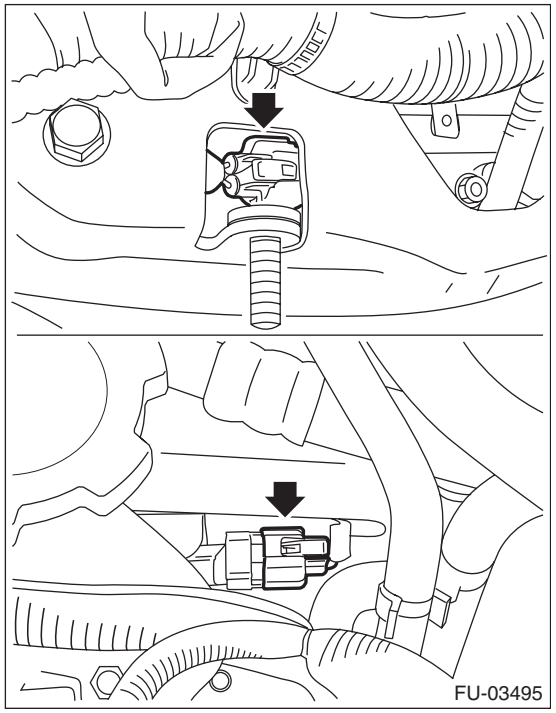


6) Install the engine harness cover. (Right side only)

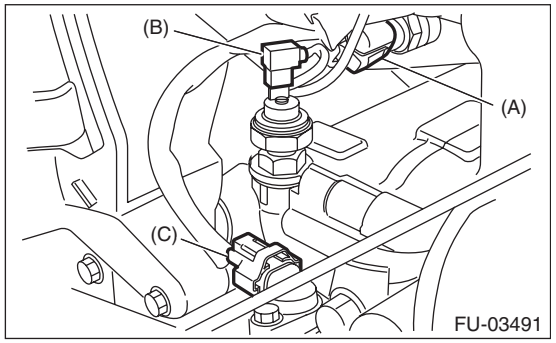
Tightening torque:
5 N·m (0.5 kgf-m, 3.7 ft-lb)



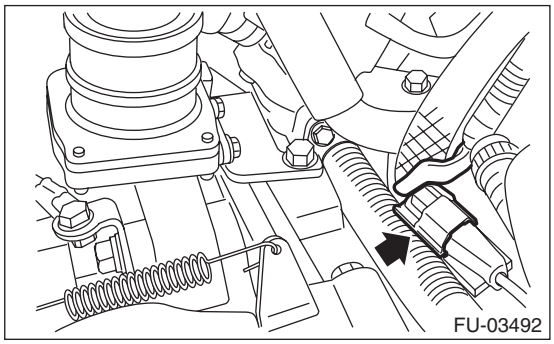
7) Connect the connector to the intake oil flow control solenoid valve.



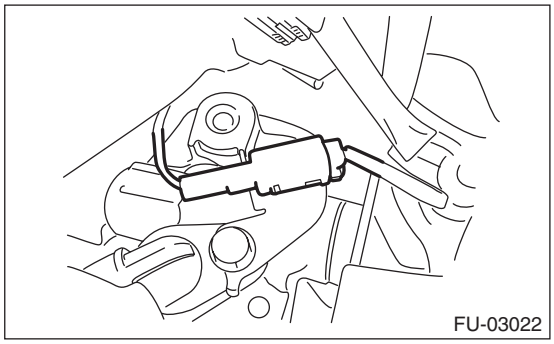
8) Connect the connector to the engine coolant temperature sensor (A), oil pressure switch (B) and crankshaft position sensor (C).



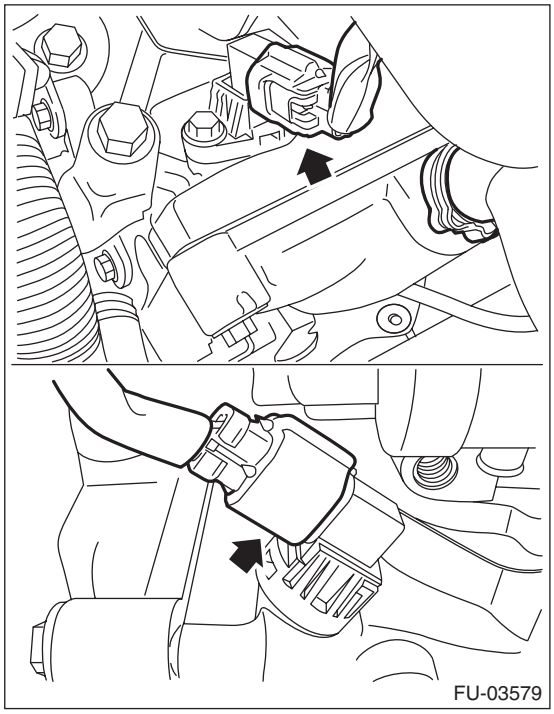
9) Connect the connector to the knock sensor.



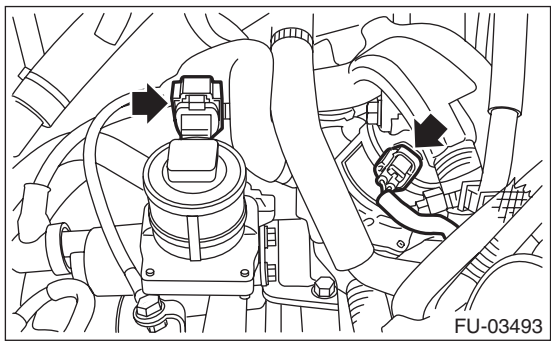
10) Connect the connector to the power steering pump switch.



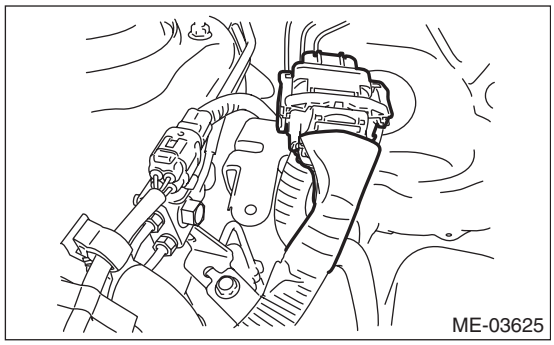
11) Connect the connector to the intake camshaft position sensor.



12) Connect the connector to the secondary air combination valve.

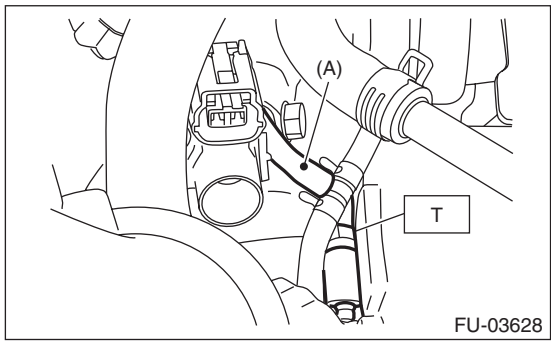


13) Connect the engine harness connectors to the bulkhead harness connectors.

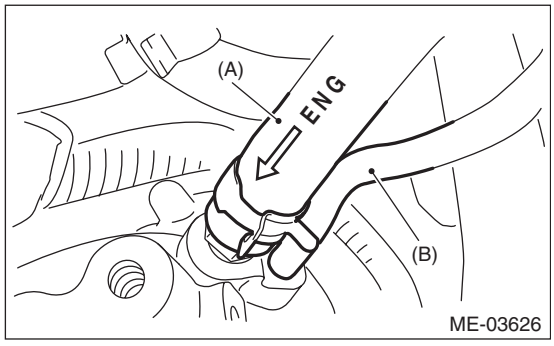


14) Connect the air control hose (A) to the waste gate actuator, and tighten the clamp which holds the turbocharger to the intake duct.

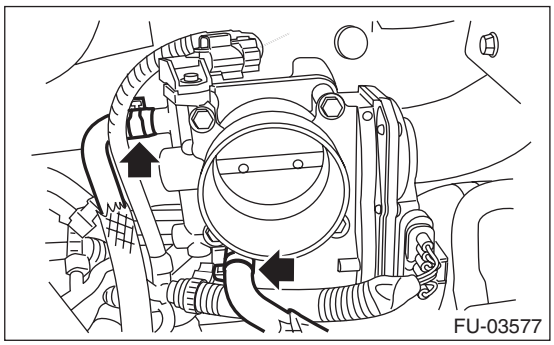
Tightening torque:
T: 3 N·m (0.3 kgf-m, 2.2 ft-lb)



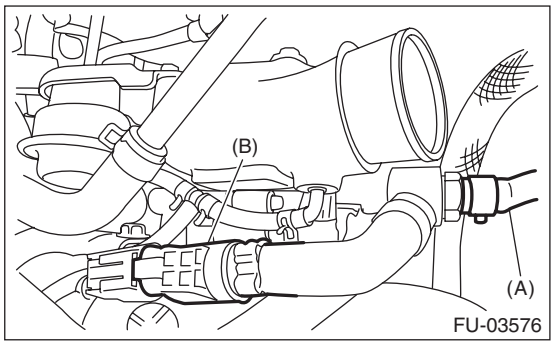
15) Connect the brake booster vacuum hose (A) and pressure regulator vacuum hose (B) to the intake manifold.



16) Connect the engine coolant hoses to throttle body.

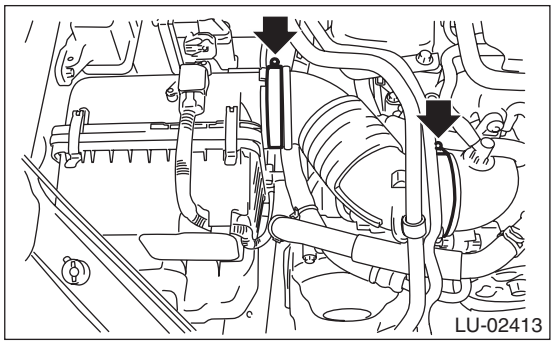


17) Connect the vacuum hose (A) to the PCV hose assembly and the PCV hose assembly connector (B) to the intake duct.

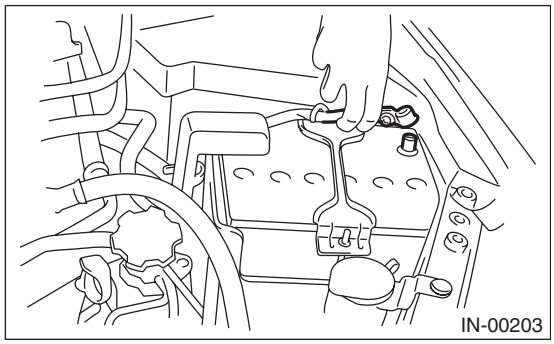


18) Install the coolant filler tank. <Ref. to CO(STI)-28, INSTALLATION, Coolant Filler Tank.>
19) Install the generator. <Ref. to SC(STI)-13, INSTALLATION, Generator.>
20) Install the intercooler. <Ref. to IN(STI)-12, INSTALLATION, Intercooler.>
21) Install the air intake boot.

Tightening torque:
2.5 N·m (0.3 kgf-m, 1.8 ft-lb)

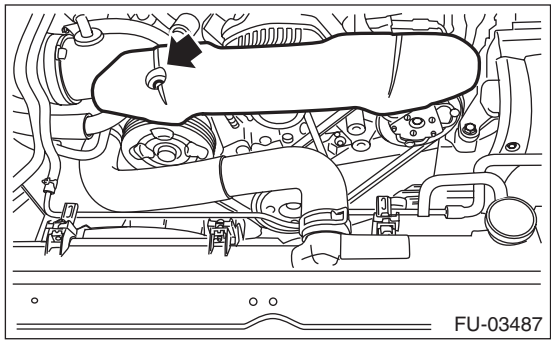


22) Connect the ground cable to the battery.



23) Lift up the vehicle
24) Install the under cover.
25) Install the V-belt cover.

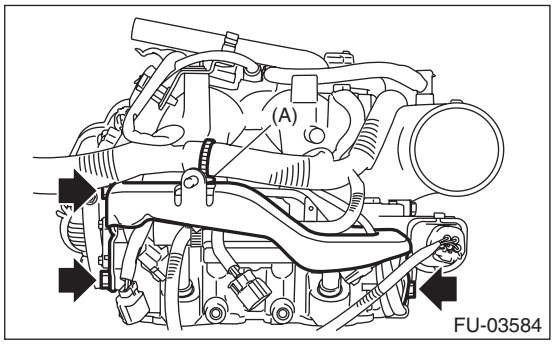
Tightening torque:
13 N·m (1.3 kgf-m, 9.6 ft-lb)



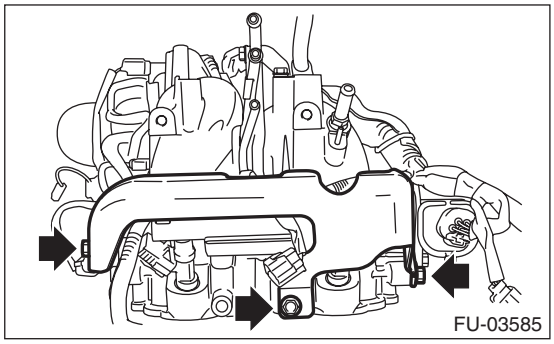
26) Install the air intake duct. <Ref. to IN(STI)-9, INSTALLATION, Air Intake Duct.>
27) Fill engine coolant. <Ref. to CO(STI)-13, FILLING OF ENGINE COOLANT, REPLACEMENT, Engine Coolant.>
28) Charge the A/C system with refrigerant. <Ref. to AC-16, PROCEDURE, Refrigerant Charging Procedure.>

C: DISASSEMBLY

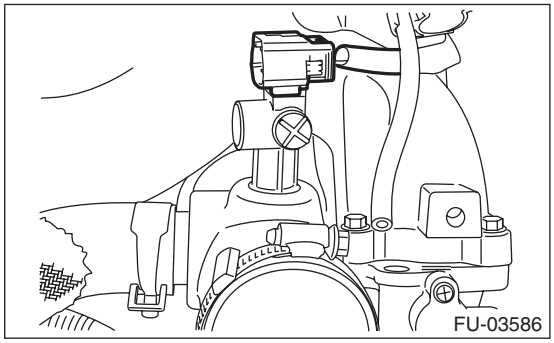
1) Remove clamp (A) holding the fuel pipe protector RH to the engine harness, and remove the fuel pipe protector RH.



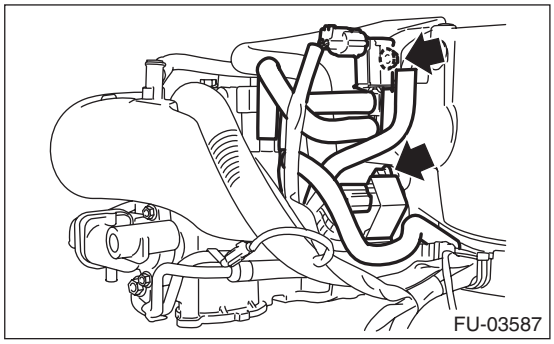
2) Remove the fuel pipe protector LH.



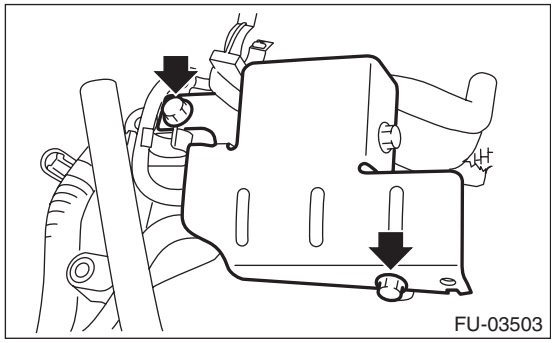
3) Remove the connector from the intake duct.



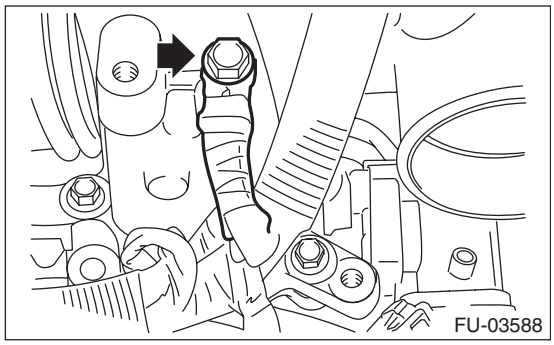
4) Remove purge control solenoid valve 1 (A) and purge control solenoid valve 2 (B).



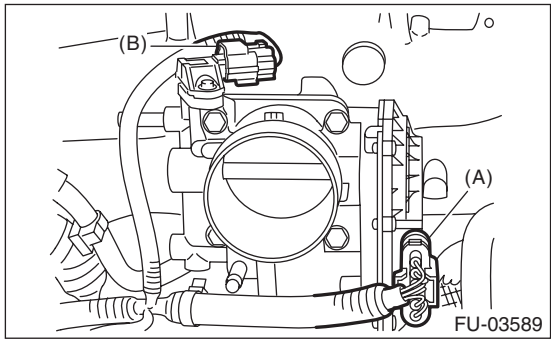
5) Remove the solenoid valve bracket together with the wastegate control solenoid valve.



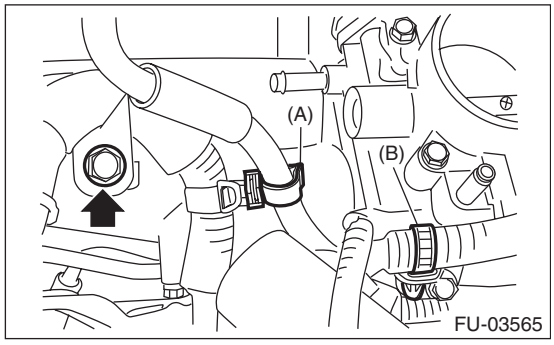
6) Remove the engine ground terminals from the intake manifold.



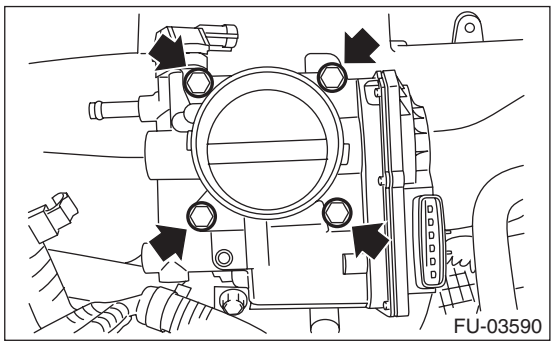
7) Disconnect the connectors from the throttle position sensor (A) and manifold pressure sensor (B).



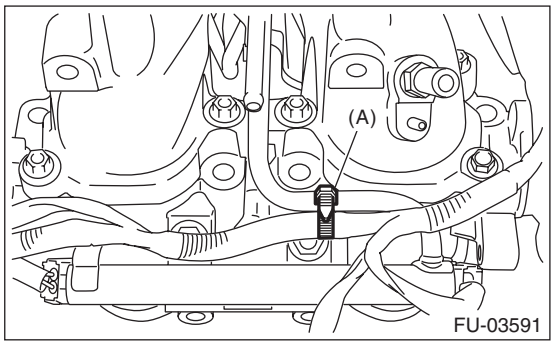
8) Remove clip (A) holding the engine harness and vacuum hose, clip (B) holding the engine harness to the engine harness stay, and the bolt holding the engine harness to the intake manifold.

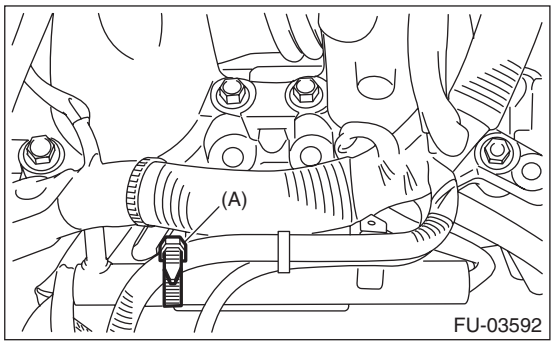


9) Remove the throttle body from the intake manifold.

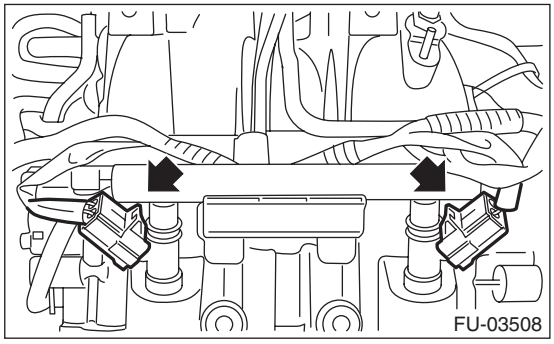


10) Remove the harness band (A) holding the engine harness to the fuel injector pipe.

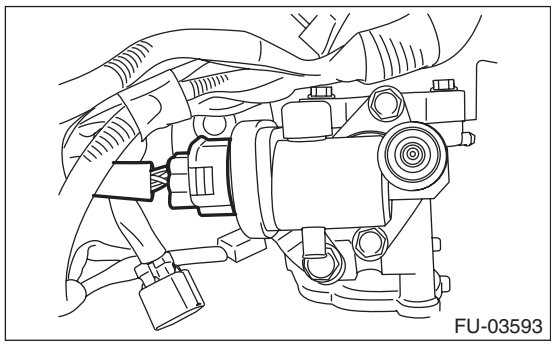




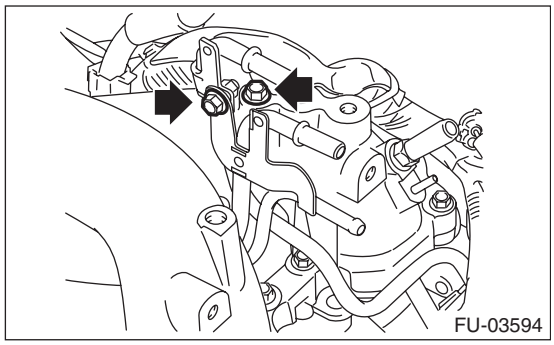
11) Disconnect the connector from fuel injector.



12) Disconnect the connector from the tumble generator valve assembly.

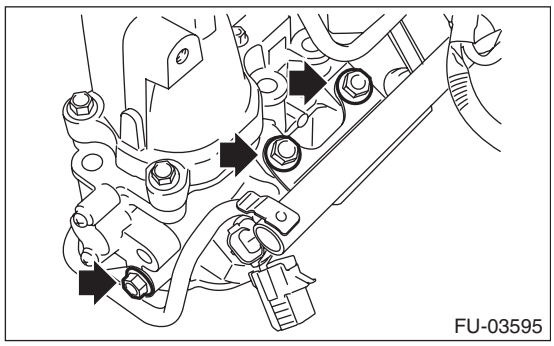


13) Remove the two bolts holding the fuel injector pipe LH to the intake manifold.

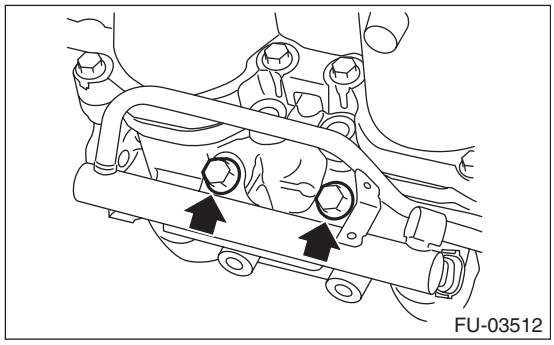


14) Remove the bolt which holds fuel injector pipe onto intake manifold.

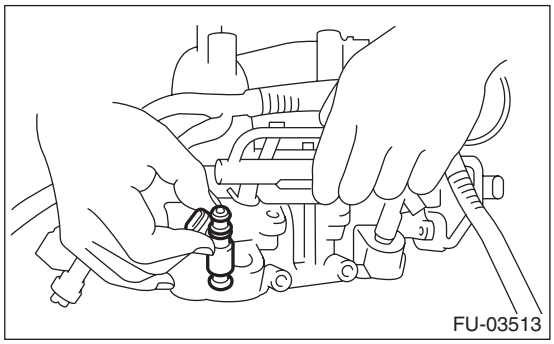
- LH side



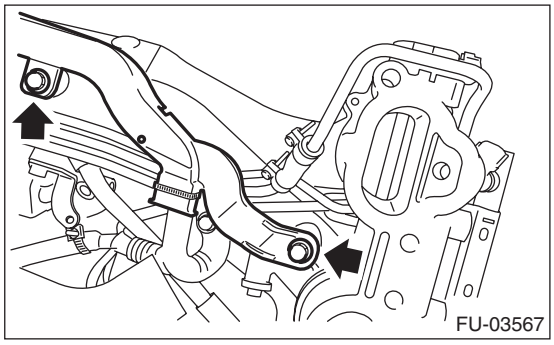
- RH side



15) Remove the fuel injector.

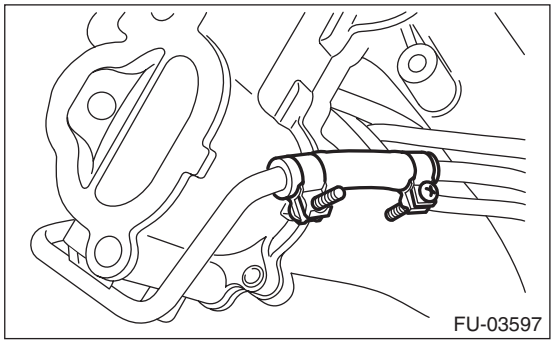


16) Remove the harness brackets holding the engine harness to the intake manifold.

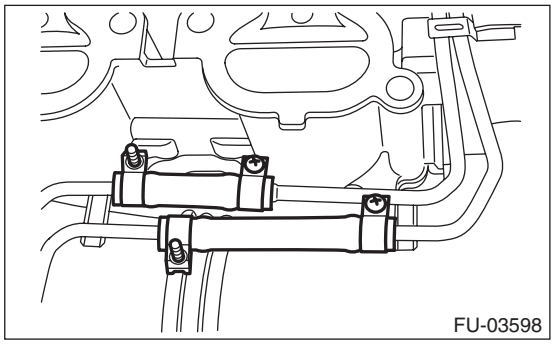


17) Remove the engine harness from intake manifold.

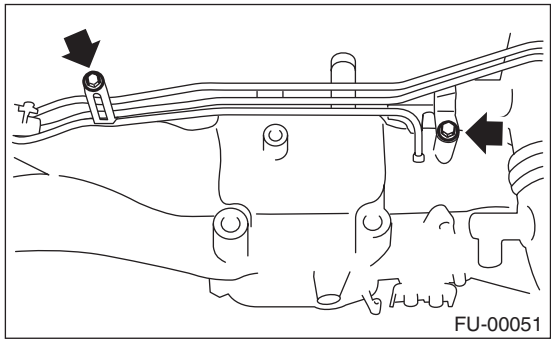
18) LH: Loosen the clamp holding the fuel hose to the fuel injector pipe LH, and remove the fuel injector pipe LH.



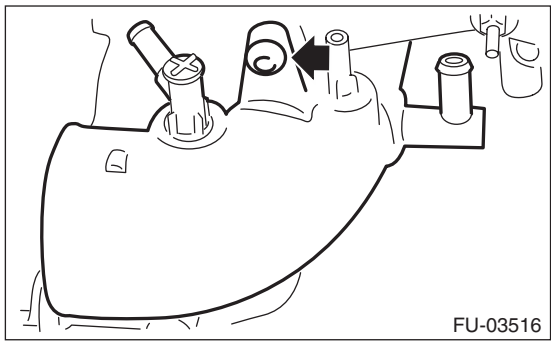
19) RH: Loosen the clamp holding the fuel hose to the fuel injector pipe RH, and remove the fuel injector pipe RH.



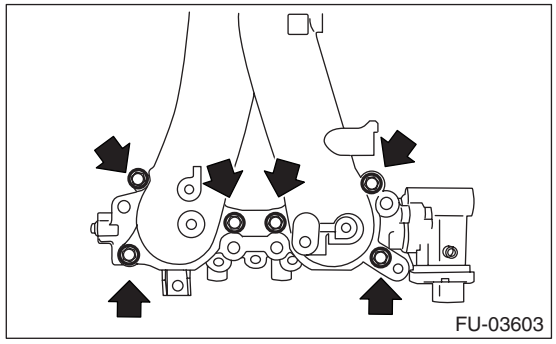
20) Remove the bolts holding the fuel pipe assembly to the intake manifold, and remove the fuel pipe assembly.



21) Remove the intake duct from intake manifold.



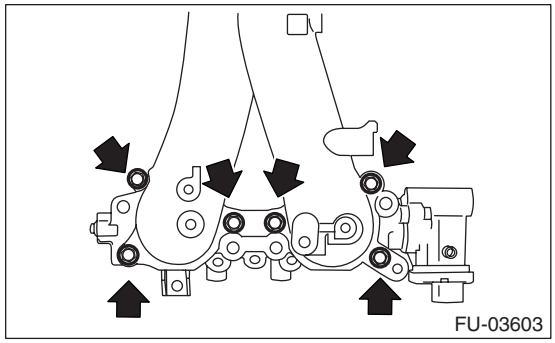
22) Remove the tumble generator assembly from the intake manifold.



D: ASSEMBLY

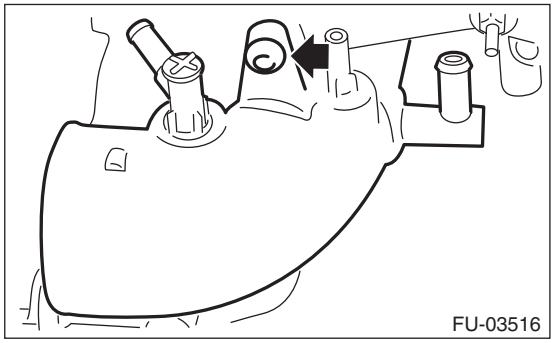
NOTE:
Use a new gasket.
1) Install the tumble generator valve assembly onto intake manifold.

Tightening torque:
8.25 N·m (0.8 kgf-m, 6.1 ft-lb)



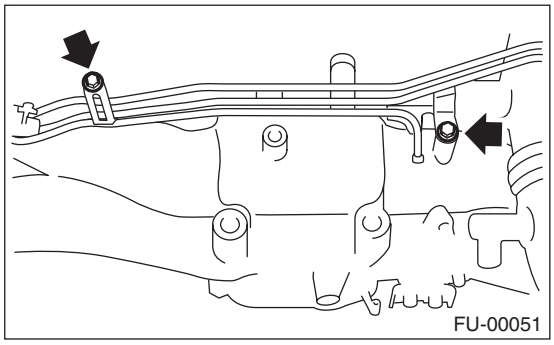
2) Install the air intake duct to the intake manifold.

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



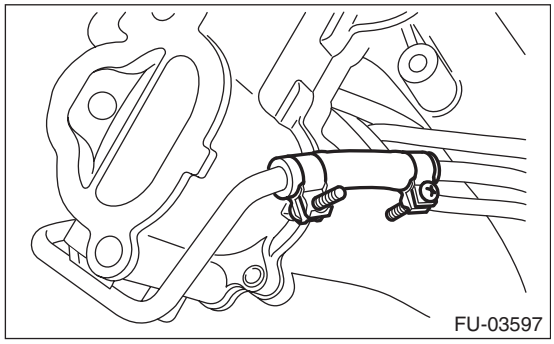
3) Install the fuel pipe assembly to the intake manifold.

Tightening torque:
6.4 N·m (0.7 kgf-m, 4.7 ft-lb)



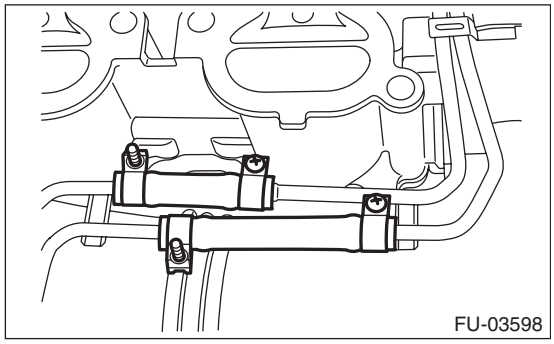
4) Install the fuel injector pipe LH.
5) LH: Connect the fuel hose to the fuel injector pipe LH and tighten the clamp screws.

Tightening torque:
1.25 N·m (0.1 kgf-m, 0.9 ft-lb)



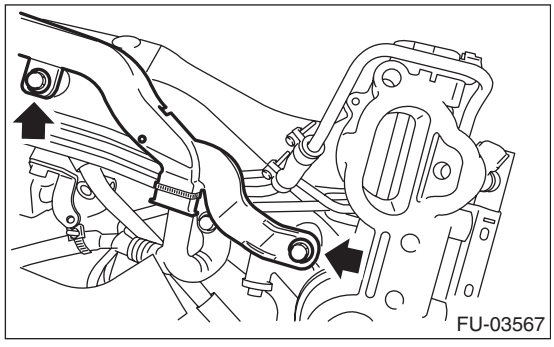
6) Install the fuel injector pipe RH.
7) RH: Connect the fuel hose to the fuel injector pipe RH and tighten the clamp screws.

Tightening torque:
1.25 N·m (0.1 kgf-m, 0.9 ft-lb)

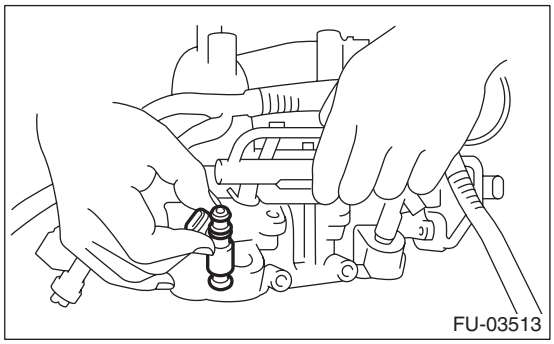


8) Install the engine harness to the intake manifold.
9) Attach the harness brackets holding the engine harness to the intake manifold.

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



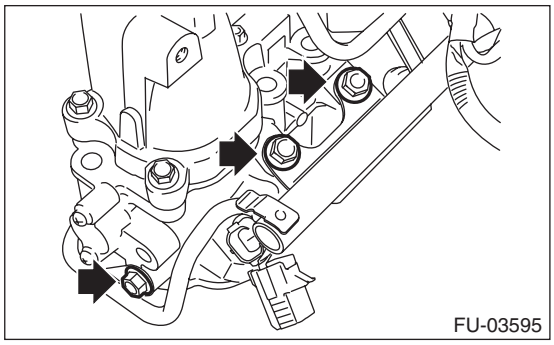
10) Install the fuel injector.



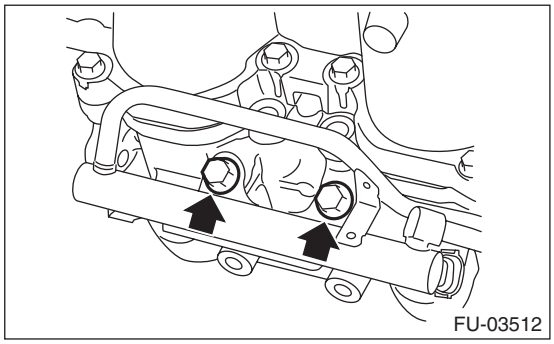
11) Tighten the bolts which secure fuel injector pipe onto intake manifold.

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

- LH side

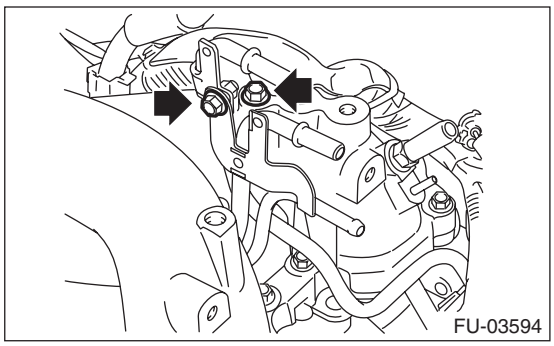


- RH side

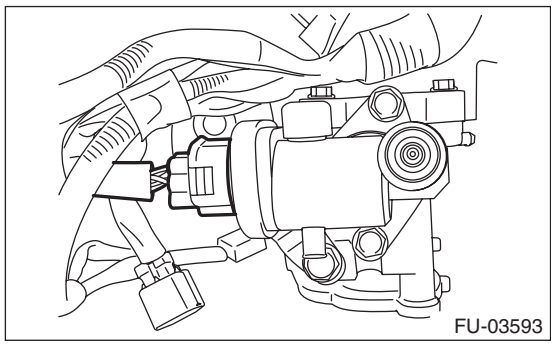


12) Tighten the two installation bolts holding the fuel pipes (LH) to the intake manifold.

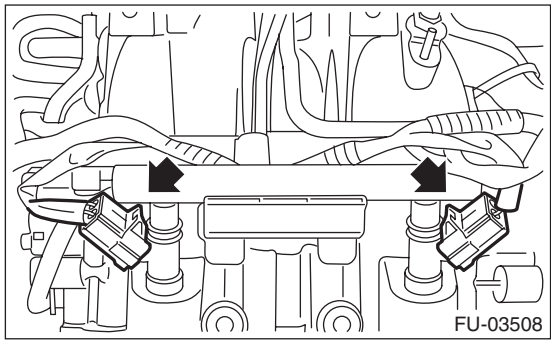
Tightening torque:
6.4 N·m (0.7 kgf-m, 4.7 ft-lb)



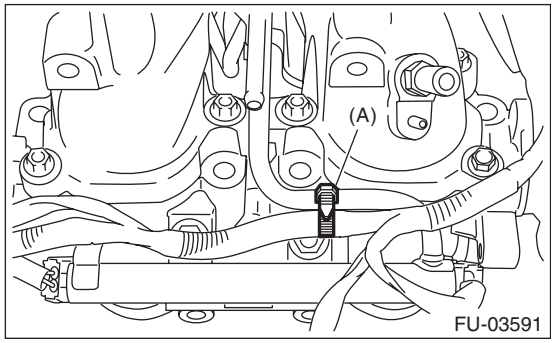
13) Connect the connector to the tumble generator valve assembly.

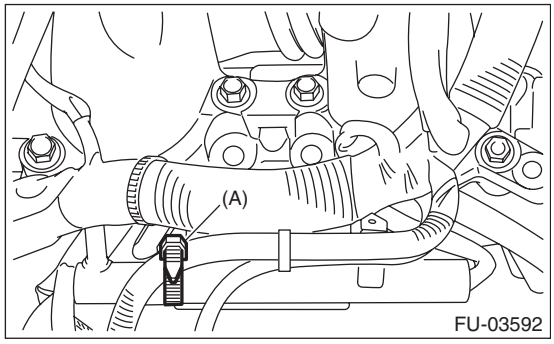


14) Connect the connectors to the fuel injector.



15) Secure the engine harness to the fuel injector pipe with the harness band (A).

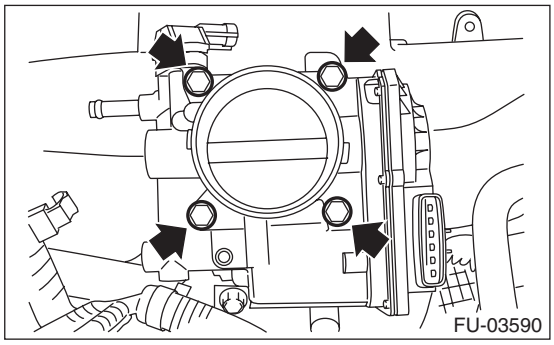




16) Install the throttle body to intake manifold.

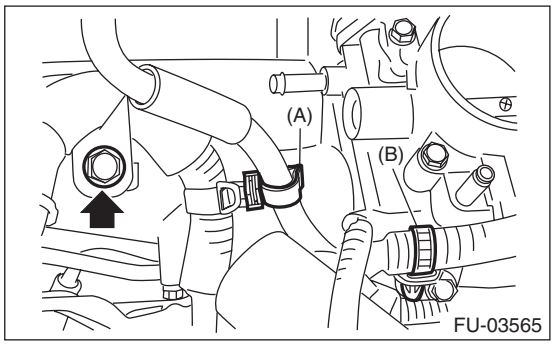
NOTE:
Use a new gasket.

Tightening torque:
8 N·m (0.8 kgf-m, 5.9 ft-lb)

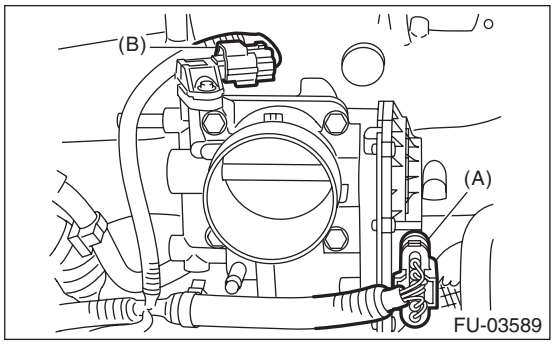


17) Secure the engine harness and vacuum hose using the clip (A), and secure the engine harness to the engine harness stay using the clip (B), and install the engine harness to the intake manifold.

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

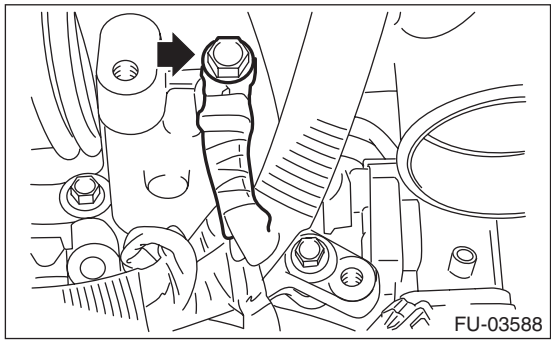


18) Connect the connectors to the throttle position sensor (A) and manifold pressure sensor (B).



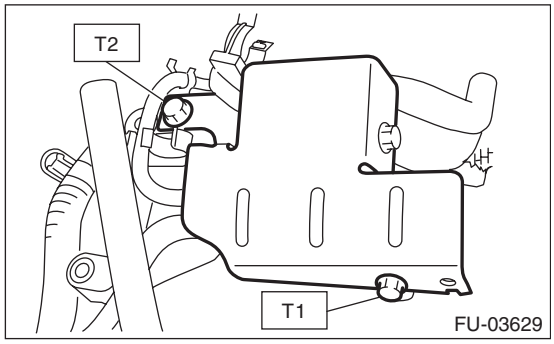
19) Install the engine ground terminal to the intake manifold.

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



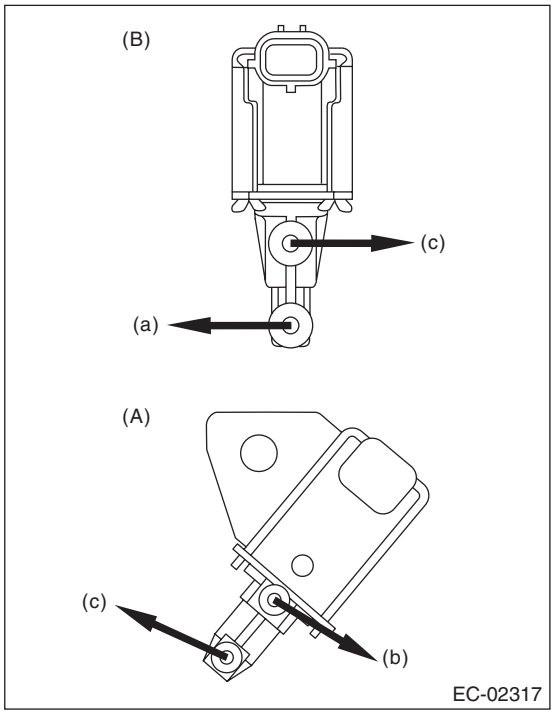
20) Install the solenoid valve bracket together with the wastegate control solenoid valve.

Tightening torque:
T1: 6.4 N·m (0.7 kgf-m, 4.7 ft-lb)
T2: 19 N·m (1.9 kgf-m, 14.0 ft-lb)



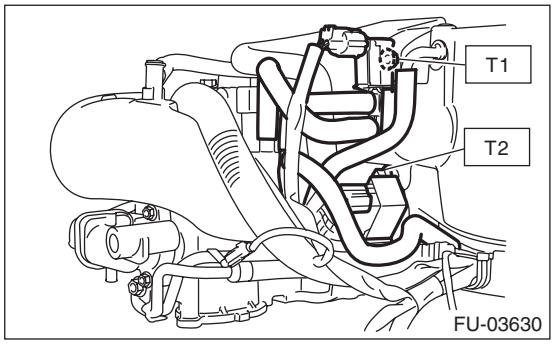
21) Install purge control solenoid valve 1 (A) and purge control solenoid valve 2 (B).

NOTE:
Connect the evaporation hose as shown in the figure.

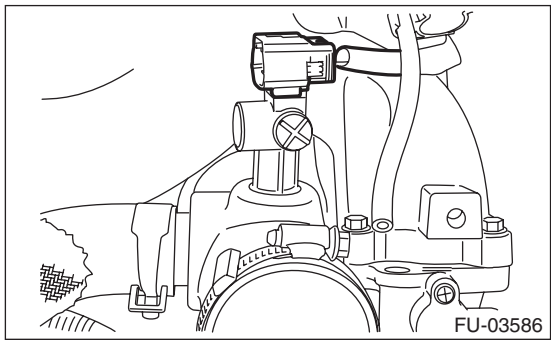


(A) Purge control solenoid valve 1
(B) Purge control solenoid valve 2
(a) To intake duct
(b) To intake manifold
(c) To branching pipe → fuel pipe

Tightening torque:
T1: 6.4 N·m (0.7 kgf-m, 4.7 ft-lb)
T2: 19 N·m (1.9 kgf-m, 14.0 ft-lb)

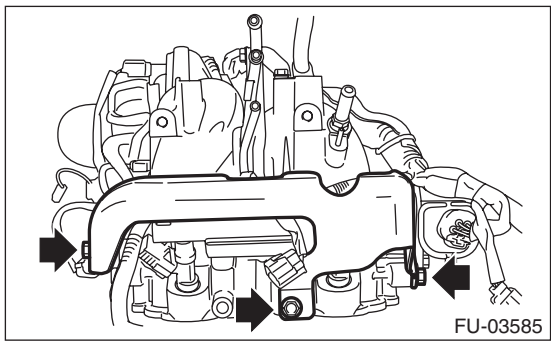


22) Install the connector to the intake duct.



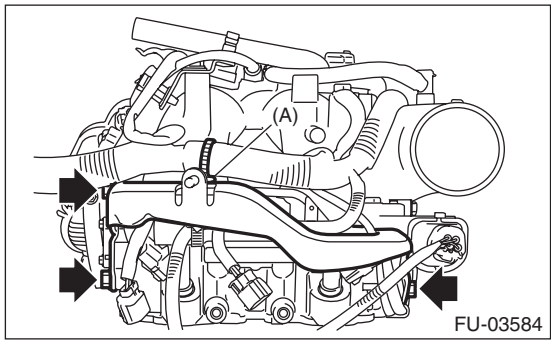
23) Install the fuel pipe protector LH.

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



24) Install the fuel pipe protector RH, and secure the engine harness to the fuel pipe protector RH using the clip (A).

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



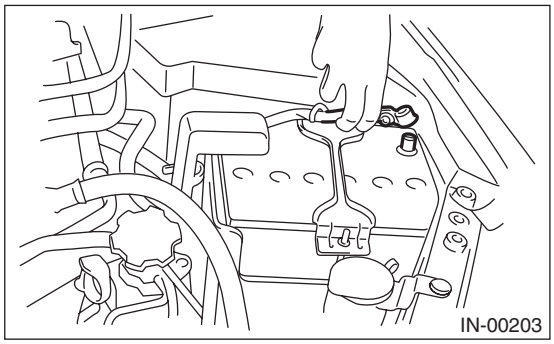
E: INSPECTION

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

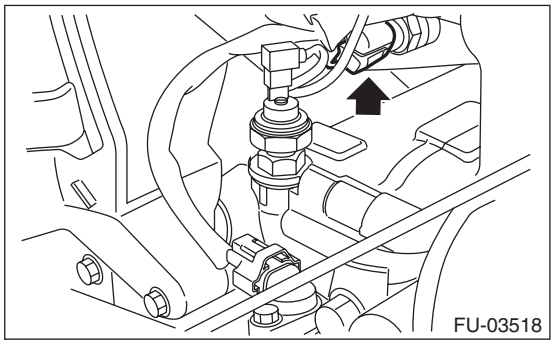
4. Engine Coolant Temperature Sensor

A: REMOVAL

1) Disconnect the ground cable from the battery.



2) Remove the generator. <Ref. to SC(STI)-13, REMOVAL, Generator.>
3) Drain engine coolant. <Ref. to CO(STI)-13, DRAINING OF ENGINE COOLANT, REPLACEMENT, Engine Coolant.>
4) Disconnect the connectors from the engine coolant temperature sensor.



5) Remove the engine coolant temperature sensor.

B: INSTALLATION

Install in the reverse order of removal.

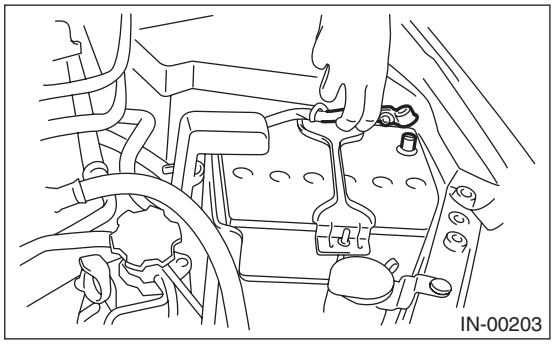
NOTE:
Use a new gasket.

Tightening torque:
18 N·m (1.8 kgf-m, 13.3 ft-lb)

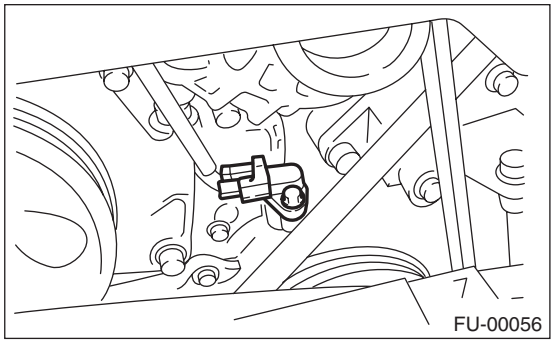
5. Crankshaft Position Sensor

A: REMOVAL

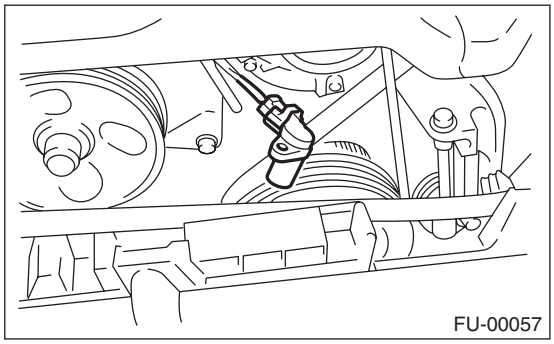
1) Disconnect the ground cable from the battery.



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



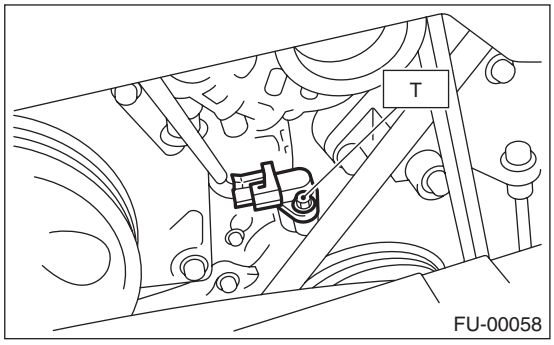
3) Remove the crankshaft position sensor, and then disconnect the connector from it.



B: INSTALLATION

Install in the reverse order of removal.

Tightening torque:
T: 6.4 N·m (0.7 kgf-m, 4.7 ft-lb)



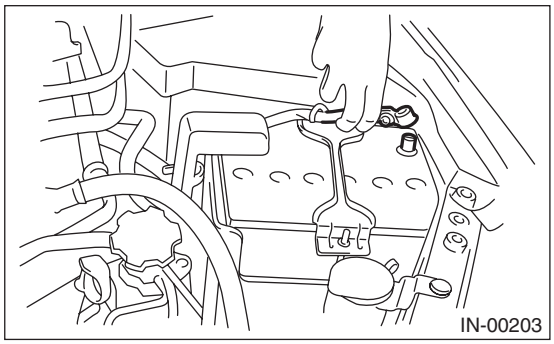
6. Camshaft Position Sensor

A: REMOVAL

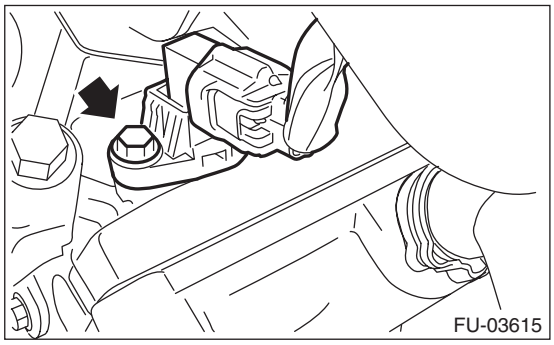
1. INTAKE SIDE

• Camshaft position sensor RH

1) Disconnect the ground cable from the battery.

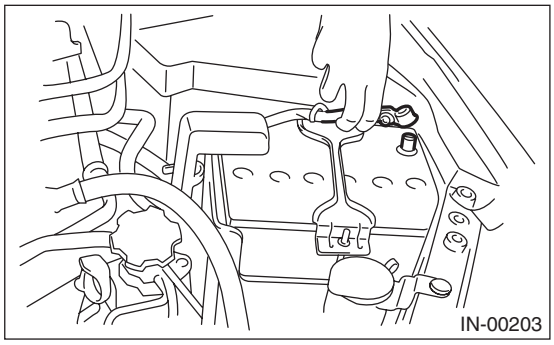


2) Disconnect the connector from camshaft position sensor RH.
3) Remove the camshaft position sensor RH from the rear side of the cylinder head.



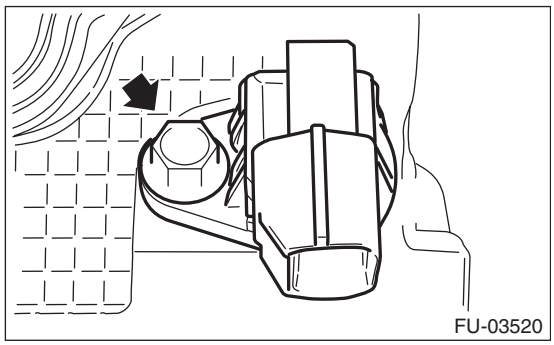
• Camshaft position sensor LH

1) Disconnect the ground cable from the battery.



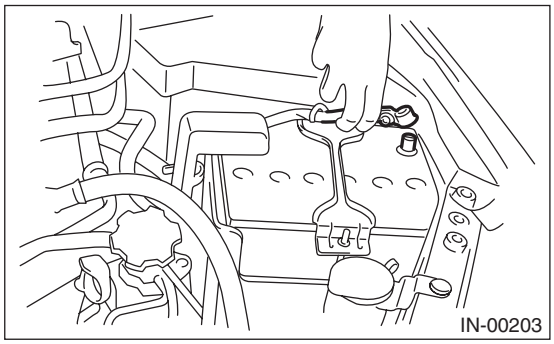
2) Remove the intake manifold. <Ref. to FU(STI)-15, REMOVAL, Intake Manifold.>

3) Remove the camshaft position sensor LH from the rear side of the cylinder head.

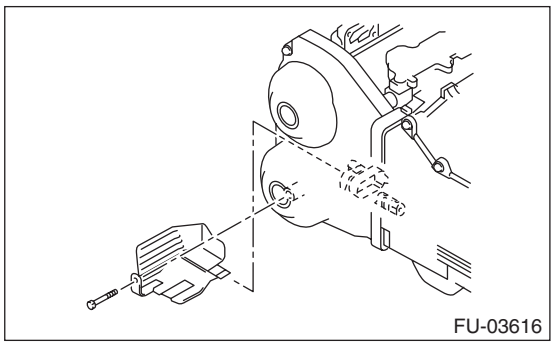


2. EXHAUST SIDE

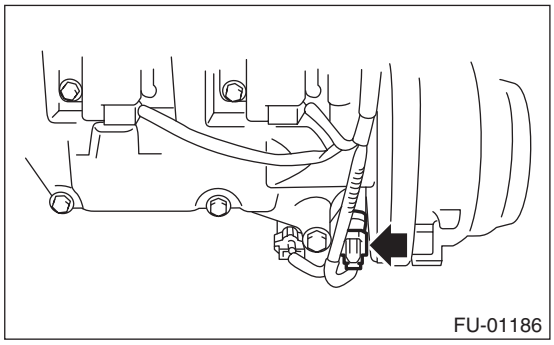
1) Set the vehicle on a lift.
2) Disconnect the ground cable from the battery.



3) Lift up the vehicle
4) Remove the under cover.
5) Remove the engine harness cover. (Right side only)



6) Disconnect the connector from camshaft position sensor RH.
7) Remove the camshaft position sensor RH from the underside of the cylinder head.



8) Remove the cam shaft position sensor LH in the same way as RH.

B: INSTALLATION

1. INTAKE SIDE

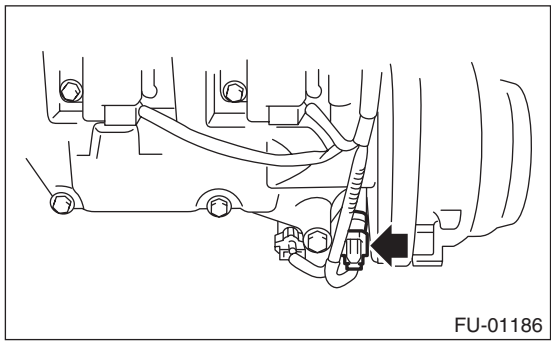
Install in the reverse order of removal.

Tightening torque:
6.4 N·m (0.7 kgf-m, 4.7 ft-lb)

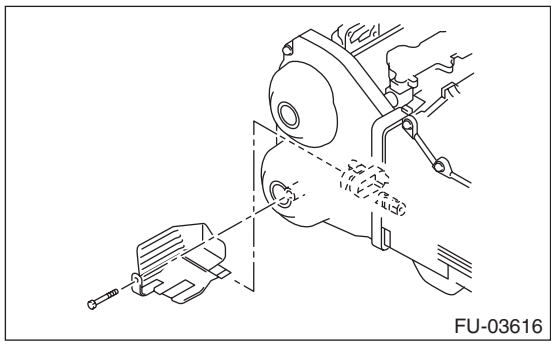
2. EXHAUST SIDE

Install in the reverse order of removal.

Tightening torque:
6.4 N·m (0.7 kgf-m, 4.7 ft-lb)



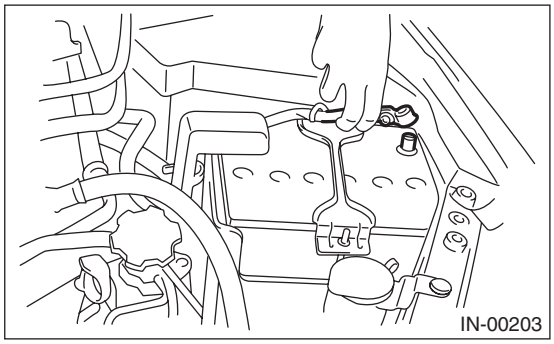
Tightening torque:
5 N·m (0.5 kgf-m, 3.7 ft-lb)



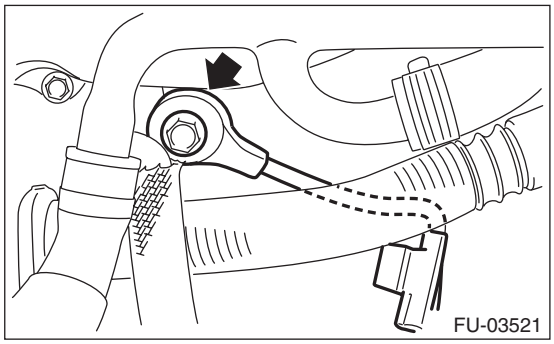
7. Knock Sensor

A: REMOVAL

1) Disconnect the ground cable from the battery.



2) Remove the intercooler. <Ref. to IN(STI)-11, REMOVAL, Intercooler.>
3) Remove the intake manifold. <Ref. to FU(STI)-15, REMOVAL, Intake Manifold.>
4) Remove the secondary air combination valve RH. <Ref. to EC(STI)-23, REMOVAL, Secondary Air Combination Valve.>
5) Remove the knock sensor from the cylinder block.

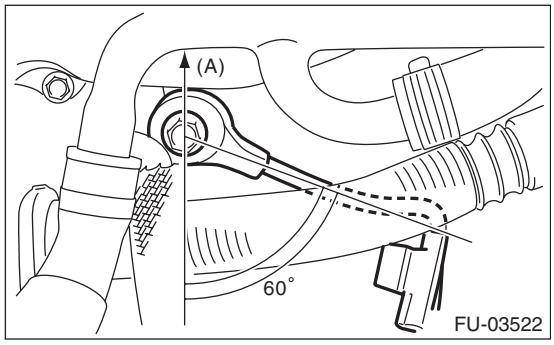


B: INSTALLATION

1) Install the knock sensor to the cylinder block.

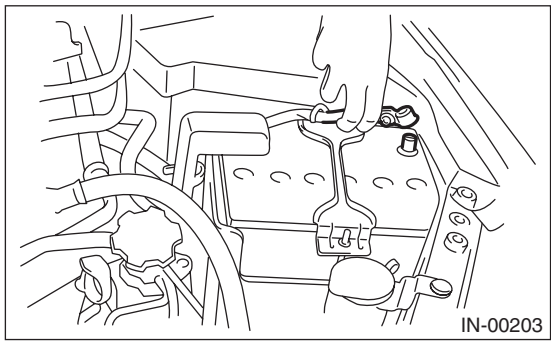
NOTE:
The portion of the knock sensor cord that is pulled out must be positioned at a 60° angle relative to the engine rear.

Tightening torque:
24 N·m (2.4 kgf-m, 17.7 ft-lb)



(A) Front side

2) Install the secondary air combination valve RH. <Ref. to EC(STI)-24, SECONDARY AIR COMBINATION VALVE RH, INSTALLATION, Secondary Air Combination Valve.>
3) Install the intake manifold. <Ref. to FU(STI)-18, INSTALLATION, Intake Manifold.>
4) Install the intercooler. <Ref. to IN(STI)-12, INSTALLATION, Intercooler.>
5) Connect the ground cable to the battery.



8. Throttle Position Sensor

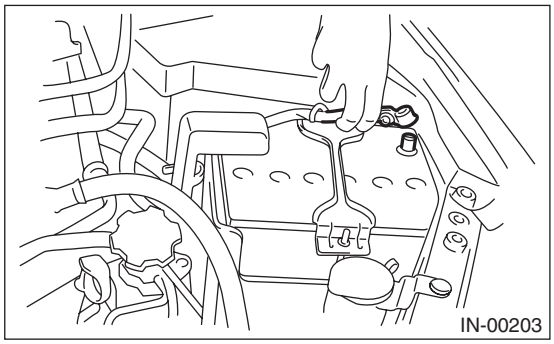
A: SPECIFICATION

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(STI)-14, REMOVAL, Throttle Body.> <Ref. to FU(STI)-14, INSTALLATION, Throttle Body.>

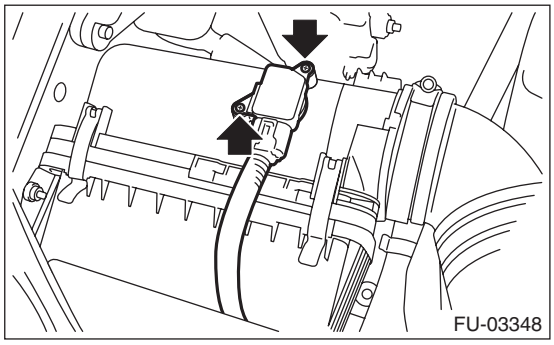
9. Mass Air Flow and Intake Air Temperature Sensor

A: REMOVAL

1) Disconnect the ground cable from the battery.



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



B: INSTALLATION

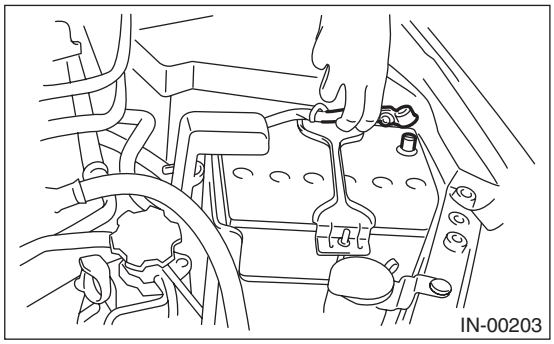
Install in the reverse order of removal.

Tightening torque:
1 N·m (0.1 kgf-m, 0.7 ft-lb)

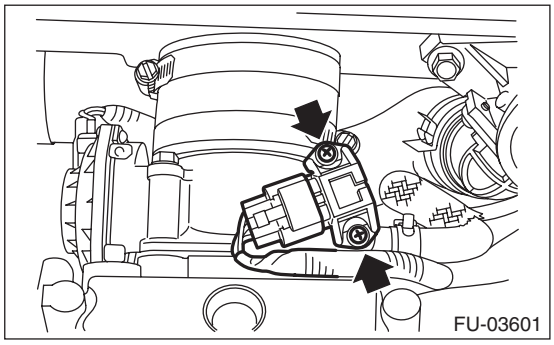
10.Manifold Absolute Pressure Sensor

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.

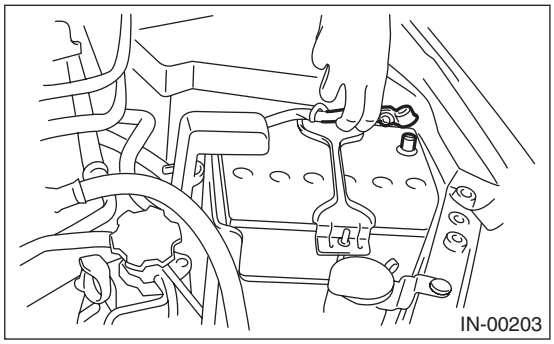
Tightening torque:
1.6 N·m (0.2 kgf-m, 1.2 ft-lb)

11.Fuel Injector

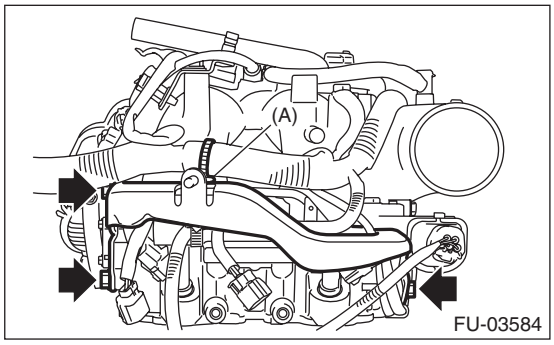
A: REMOVAL

1. RH SIDE

1) Release the fuel pressure. <Ref. to FU(STI)-54, RELEASING OF FUEL PRESSURE, PROCEDURE, Fuel.>
2) Disconnect the ground cable from the battery.

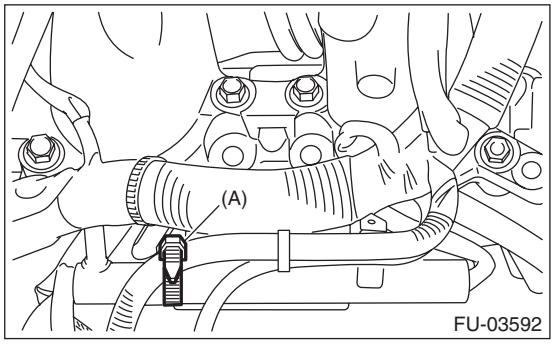

IN-00203

3) Open the fuel filler lid, and remove the fuel filler cap.
4) Remove the intake manifold. <Ref. to FU(STI)-15, REMOVAL, Intake Manifold.>
5) Remove clamp (A) holding the fuel pipe protector RH to the engine harness, and remove the fuel pipe protector RH.



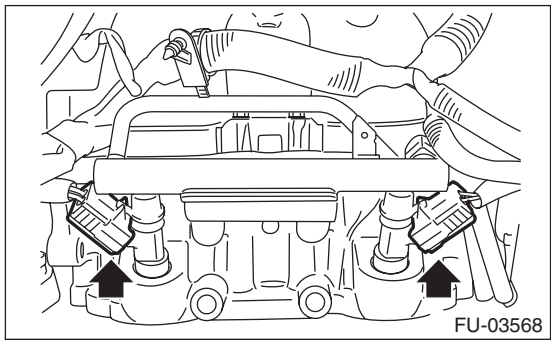
FU-03584

6) Remove the harness band (A) holding the engine harness to the fuel injector pipe.

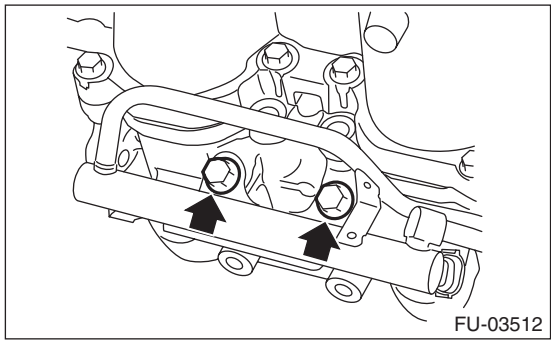


FU-03592

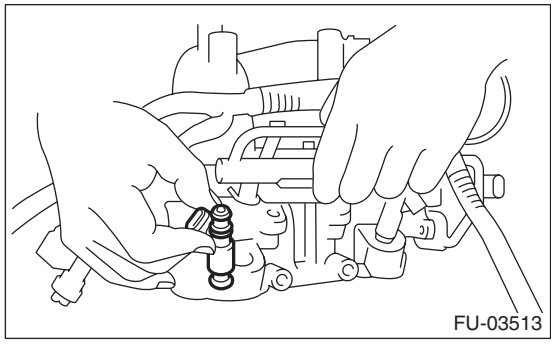
7) Disconnect the connector from fuel injector.


FU-03568

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

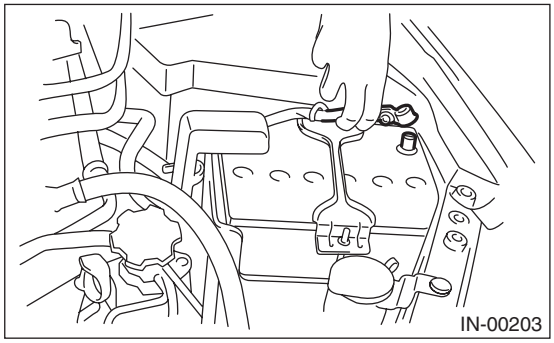

FU-03512

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

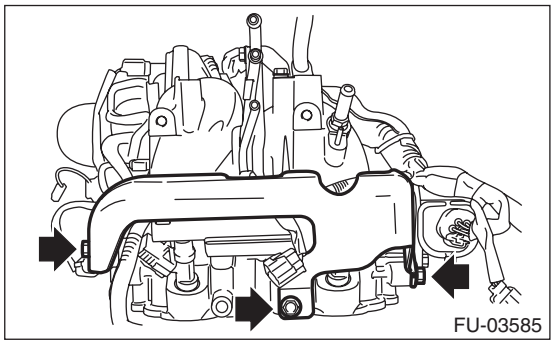

FU-03513

2. LH SIDE

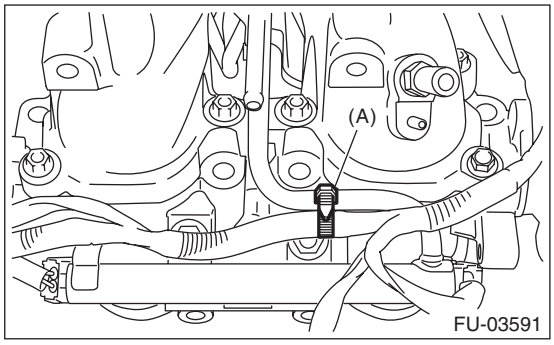
1) Release the fuel pressure. <Ref. to FU(STI)-54, RELEASING OF FUEL PRESSURE, PROCEDURE, Fuel.>
2) Disconnect the ground cable from the battery.



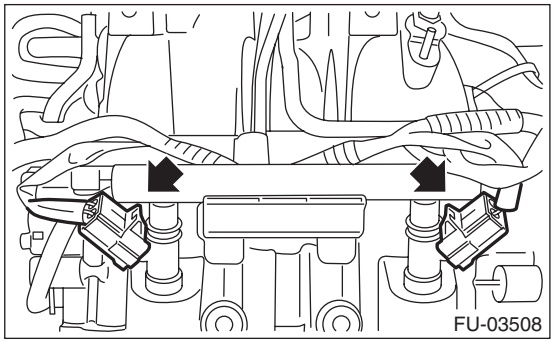
3) Open the fuel filler lid, and remove the fuel filler cap.
4) Remove the intake manifold. <Ref. to FU(STI)-15, REMOVAL, Intake Manifold.>
5) Remove the fuel pipe protector LH.



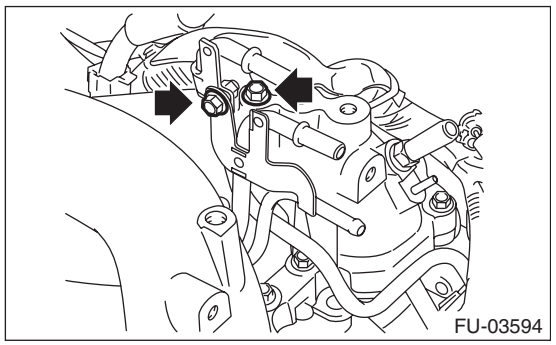
6) Remove the harness band (A) holding the engine harness to the fuel injector pipe.

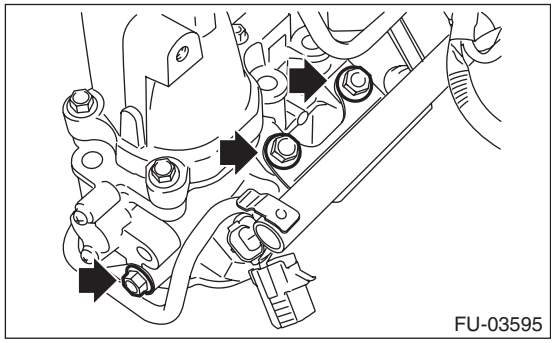


7) Disconnect the connector from fuel injector.

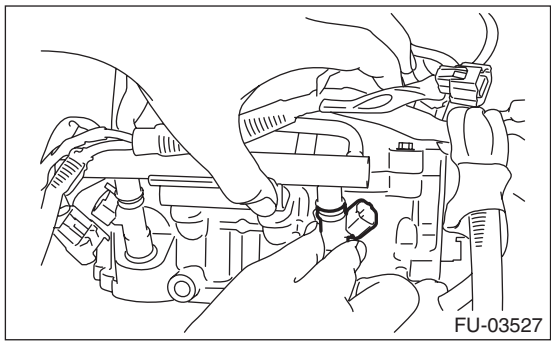


8) Remove the bolt which holds fuel injector pipe onto intake manifold.





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

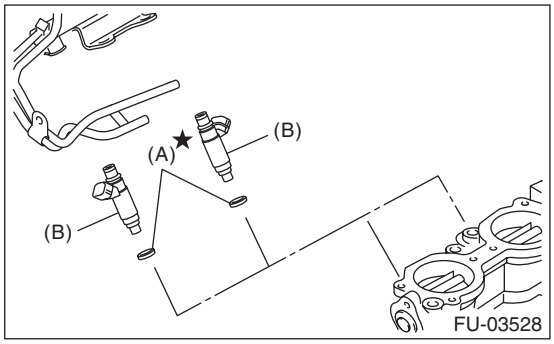


B: INSTALLATION

1. RH SIDE

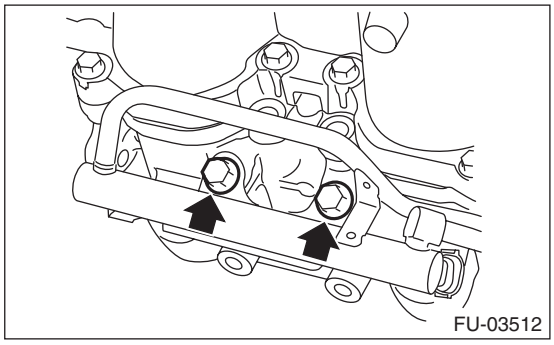
Install in the reverse order of removal.

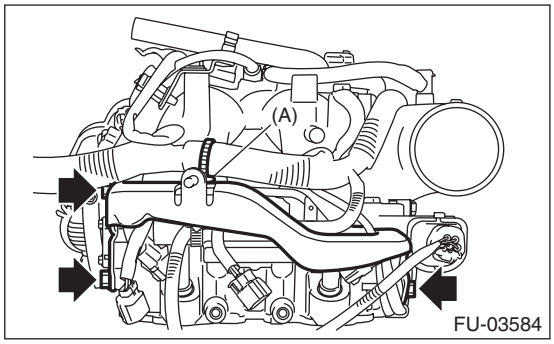
NOTE:
Use new O-rings.



(A) O-ring
(B) Fuel injector

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

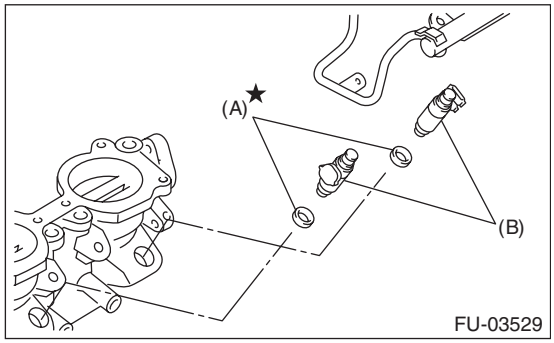




2. LH SIDE

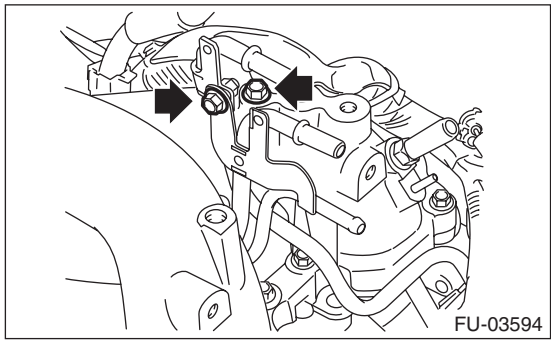
Install in the reverse order of removal.

NOTE:
Use new O-rings.

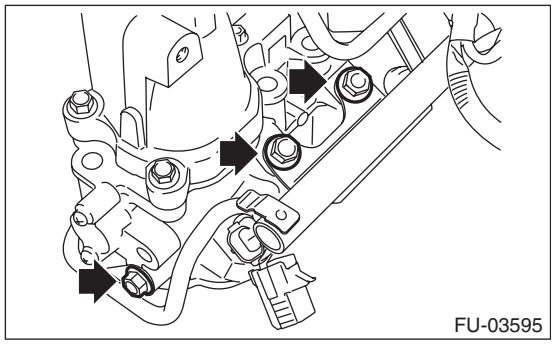


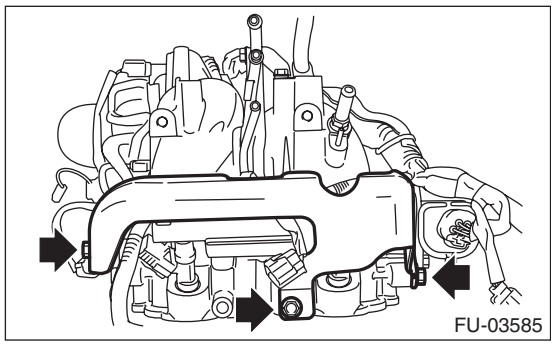
(A) O-ring
(B) Fuel injector

Tightening torque:
6.4 N·m (0.7 kgf-m, 4.7 ft-lb)



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

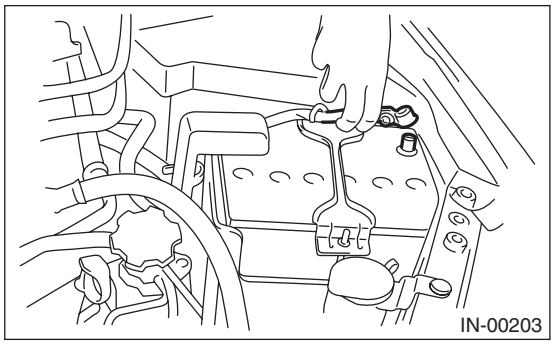




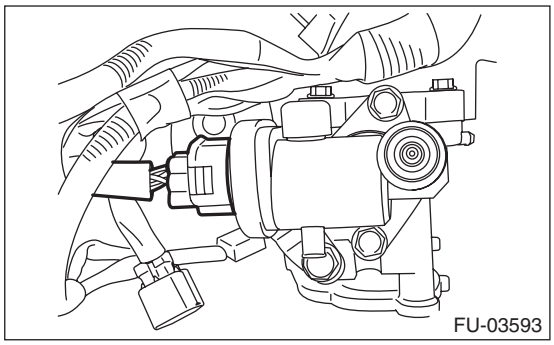
12. Tumble Generator Valve Assembly

A: REMOVAL

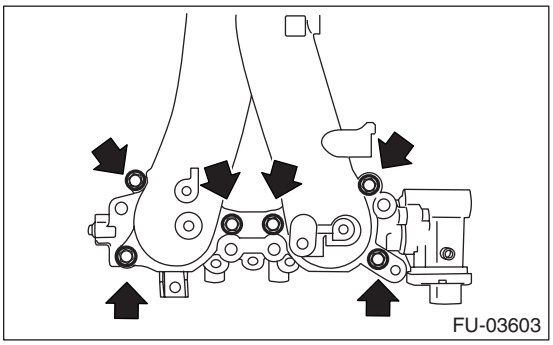
1) Release the fuel pressure. <Ref. to FU(STI)-54, RELEASING OF FUEL PRESSURE, PROCEDURE, Fuel.>
2) Disconnect the ground cable from the battery.



3) Open the fuel filler lid, and remove the fuel filler cap.
4) Remove the intake manifold.
<Ref. to FU(STI)-15, REMOVAL, Intake Manifold.>
5) Disconnect the connector from the tumble generator valve assembly.



6) Remove the fuel injector.
<Ref. to FU(STI)-37, REMOVAL, Fuel Injector.>
7) Remove the tumble generator valve body from intake manifold.

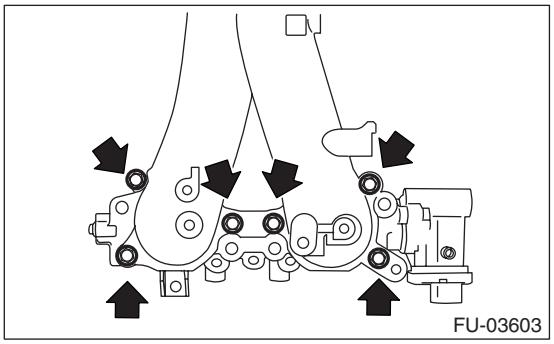


B: INSTALLATION

Install in the reverse order of removal.

NOTE:
Use a new gasket.

Tightening torque:
8.25 N·m (0.8 kgf-m, 6.1 ft-lb)



13. Tumble Generator Valve Actuator

A: SPECIFICATION

The tumble generator valve assembly cannot be disassembled.
Refer to “Tumble Generator Valve Assembly” for removal and installation procedures. <Ref. to FU(STI)-40, REMOVAL, Tumble Generator Valve Assembly.> <Ref. to FU(STI)-40, INSTALLATION, Tumble Generator Valve Assembly.>

14.Oil Flow Control Solenoid Valve

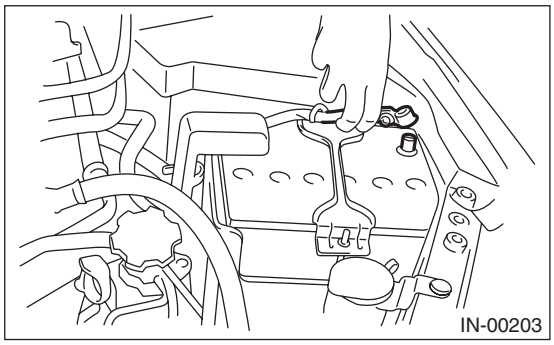
A: REMOVAL

1. INTAKE SIDE

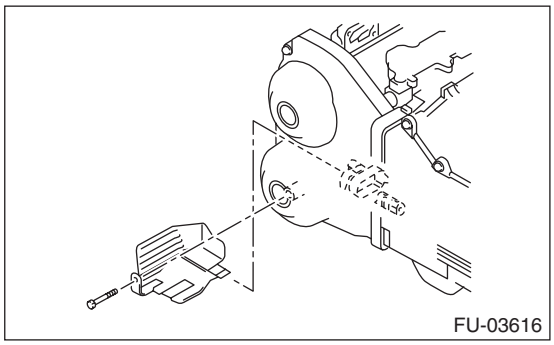
Oil flow control solenoid valve is a unit with camshaft cap.
Refer to “Camshaft” for removal procedures. <Ref. to ME(STI)-59, REMOVAL, Camshaft.>

2. EXHAUST SIDE

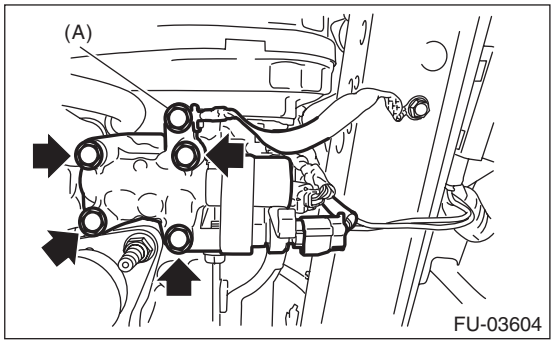
1) Set the vehicle on a lift.
2) Disconnect the ground cable from the battery.



3) Lift up the vehicle
4) Remove the under cover.
5) Remove the front exhaust pipe. (Right side only) <Ref. to EX(STI)-5, REMOVAL, Front Exhaust Pipe.>
6) Remove the engine harness cover. (Right side only)



7) Disconnect the ground cable (A). (Left side only)
8) Disconnect the connector from the oil flow control solenoid valve, and remove the oil flow control solenoid valve from the cylinder head.



B: INSTALLATION

1. INTAKE SIDE

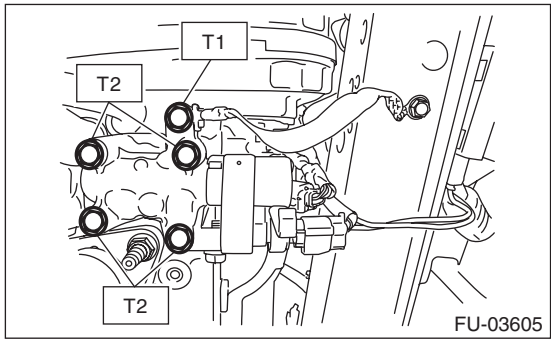
Refer to “Camshaft” for installation procedure. <Ref. to ME(STI)-60, INSTALLATION, Camshaft.>

2. EXHAUST SIDE

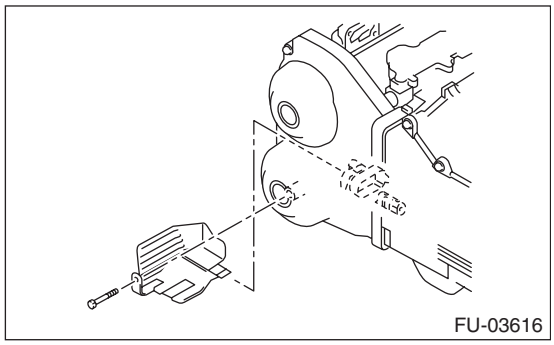
Install in the reverse order of removal.

NOTE:
Use a new gasket.

Tightening torque:
T1: 7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
T2: 10 N·m (1.0 kgf-m, 7.4 ft-lb)



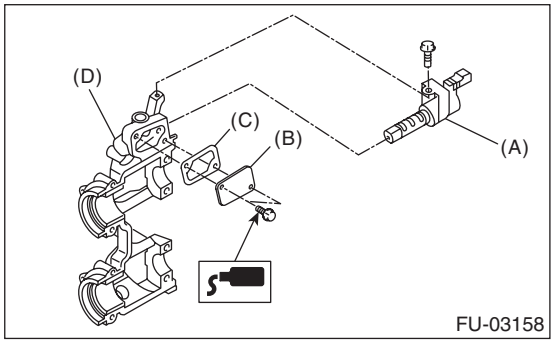
Tightening torque:
5 N·m (0.5 kgf-m, 3.7 ft-lb)



C: DISASSEMBLY

1. INTAKE SIDE

1) Remove the two mounting bolts and remove the oil return cover and gasket.
2) Remove the mounting bolt and remove the oil flow control solenoid valve.



(A) Oil flow control solenoid valve
(B) Oil return cover
(C) Gasket
(D) Camshaft cap

2. EXHAUST SIDE

The oil flow control solenoid valve on the exhaust side cannot be disassembled.

D: ASSEMBLY

1. INTAKE SIDE

1) Install the oil flow control solenoid valve.

Tightening torque:
8 N·m (0.8 kgf-m, 5.9 ft-lb)

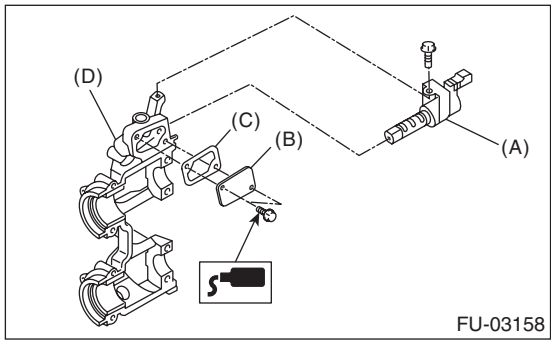
2) Apply liquid gasket to the two bolts which secure the oil return cover.

Liquid gasket:
THREE BOND 1324 (Part No. 004403042) or equivalent

3) Attach the oil return cover and gasket.

Tightening torque:
8 N·m (0.8 kgf-m, 5.9 ft-lb)

NOTE:
Use a new gasket.



(A) Oil flow control solenoid valve
(B) Oil return cover
(C) Gasket
(D) Camshaft cap

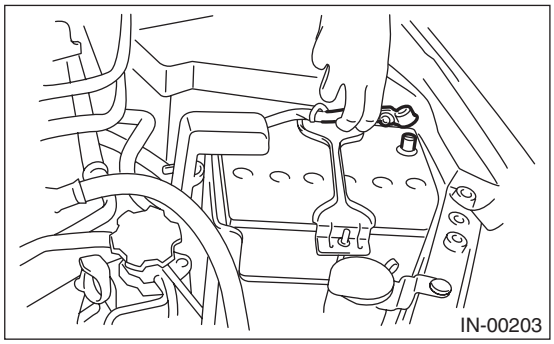
2. EXHAUST SIDE

The oil flow control solenoid valve on the exhaust side cannot be disassembled.

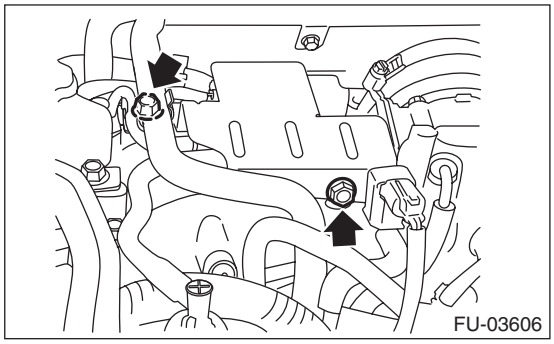
15. Wastegate Control Solenoid Valve

A: REMOVAL

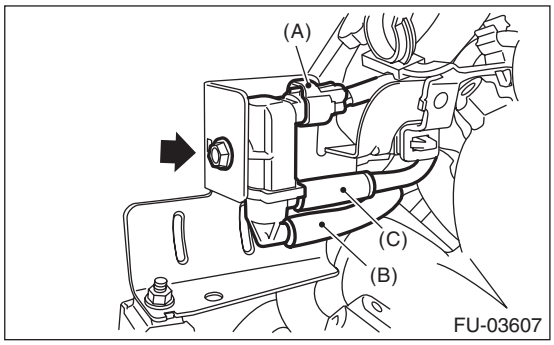
1) Disconnect the ground cable from the battery.



2) Remove the bolts holding the solenoid valve bracket to the intake manifold.



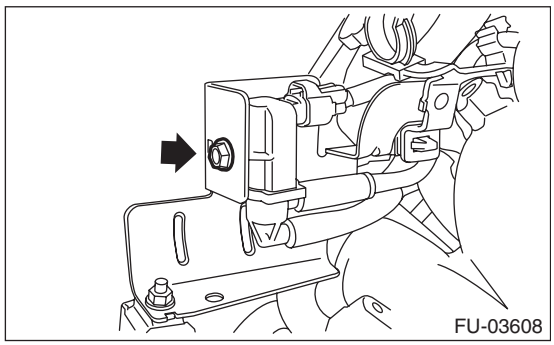
3) Disconnect the connector from the wastegate control solenoid valve (A).
4) Disconnect the vacuum hose (B) and air control hose (C) from the wastegate control solenoid valve.
5) Remove the wastegate control solenoid valve from the bracket.



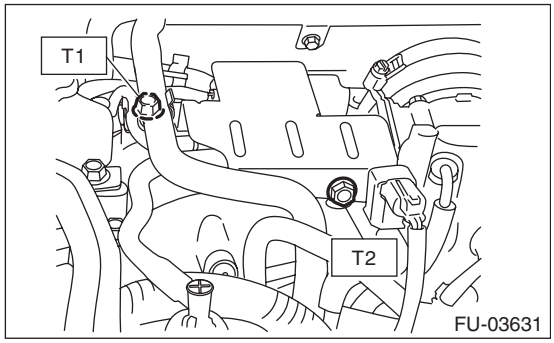
B: INSTALLATION

Install in the reverse order of removal.

Tightening torque:
6.4 N·m (0.7 kgf-m, 4.7 ft-lb)



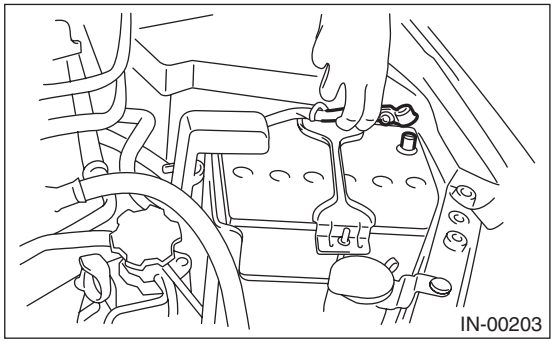
Tightening torque:
T1: 6.4 N·m (0.7 kgf-m, 4.7 ft-lb)
T2: 19 N·m (1.9 kgf-m, 14.0 ft-lb)



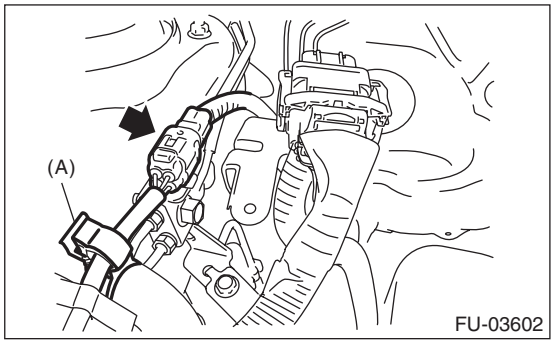
16.Front Oxygen (A/F) Sensor

A: REMOVAL

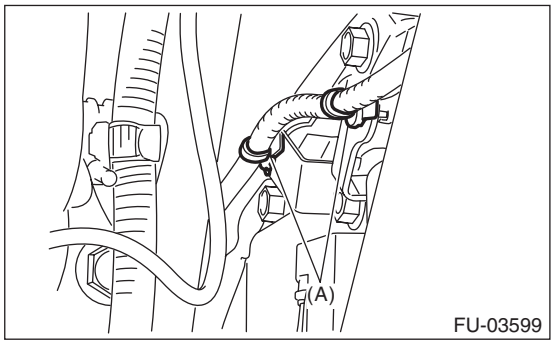
1) Set the vehicle on a lift.
2) Disconnect the ground cable from the battery.



3) Disconnect the connector from the front oxygen (A/F) sensor, and remove the clip (A) holding the return hose and front oxygen (A/F) sensor harness.

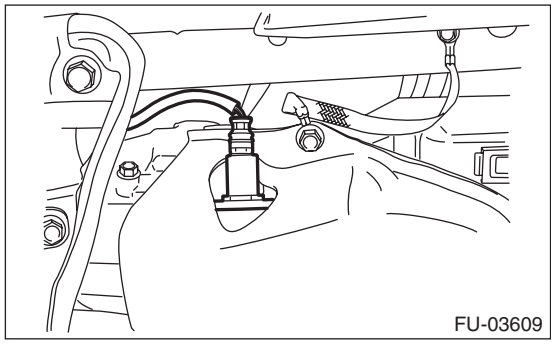


4) Remove the clips (A) holding the front oxygen (A/F) sensor harness to the engine harness stay.



5) Lift up the vehicle
6) Remove the under cover.
7) Apply spray-type lubricant or equivalent 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 oxygen (A/F) sensor, wait until exhaust pipe cools, otherwise it will damage the exhaust pipe.



B: INSTALLATION

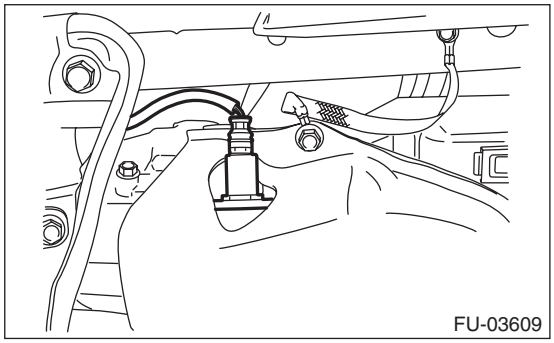
1) Before installing front oxygen (A/F) sensor, apply anti-seize compound only to the threaded portion of front oxygen (A/F) sensor to make the next removal easier.

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

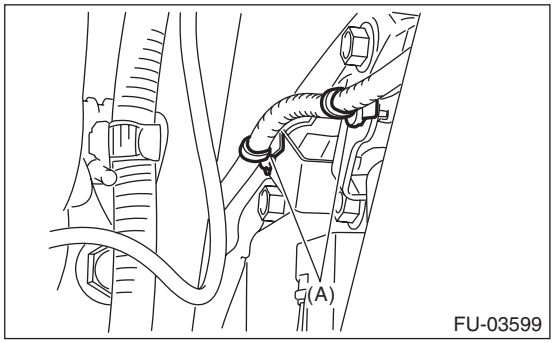
Anti-seize compound:
NEVER-SEEZ NSN, JET LUBE SS-30 or equivalent

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

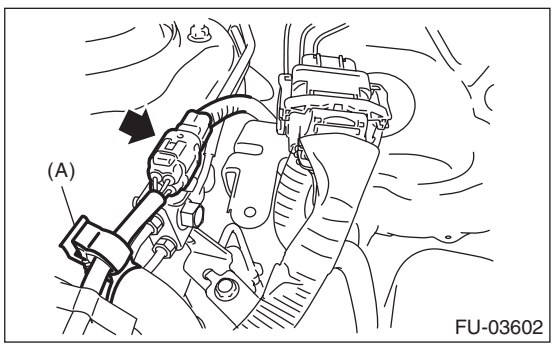
Tightening torque:
30 N·m (3.1 kgf-m, 22.1 ft-lb)



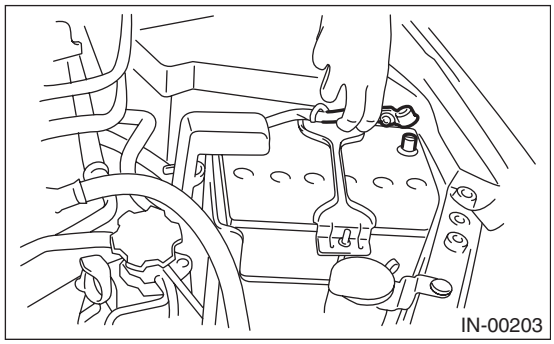
3) Install the under cover.
4) Lower the vehicle.
5) Secure the front oxygen (A/F) sensor harness to the engine harness stay using the clips (A).



6) Connect the connector to the front oxygen (A/F) sensor, and secure the return hose and front oxygen (A/F) sensor harness using the clip (A).



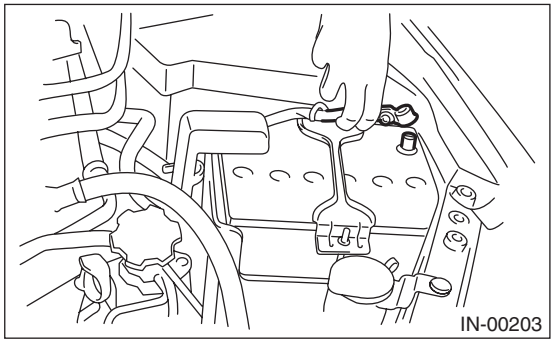
7) Connect the ground cable to the battery.



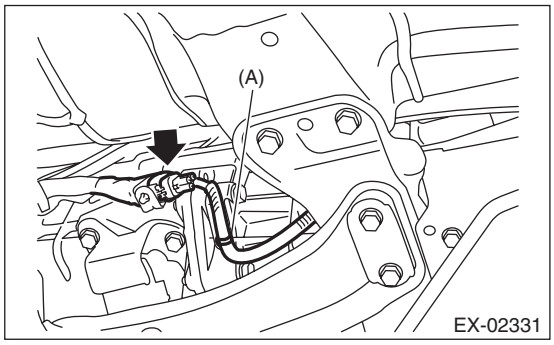
17.Rear Oxygen Sensor

A: REMOVAL

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

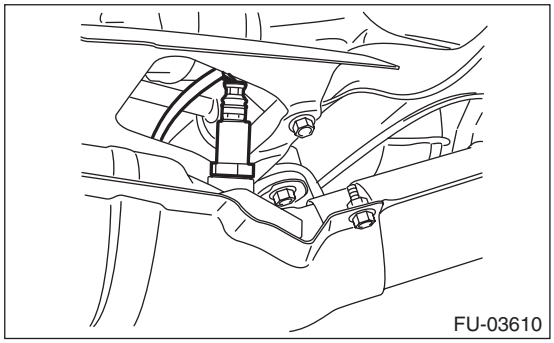


3) Lift up the vehicle
4) Remove the under cover.
5) Disconnect the connector from the rear oxygen (A/F) sensor, and remove the clip (A) holding the rear oxygen (A/F) sensor harness.



6) Apply spray-type lubricant or equivalent to the threaded portion of rear oxygen sensor, and leave it for one minute or more.
7) Remove the rear oxygen sensor.

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



B: INSTALLATION

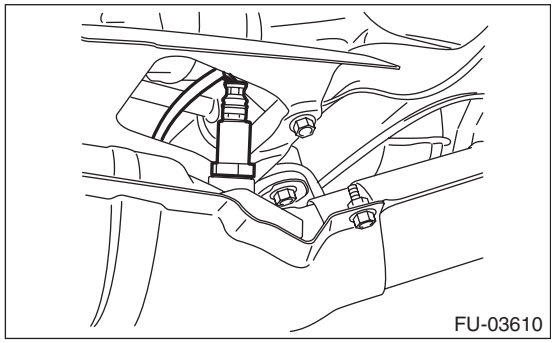
1) Before installing rear oxygen sensor, apply the anti-seize compound only to the threaded portion of rear oxygen sensor to make the next removal easier.

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

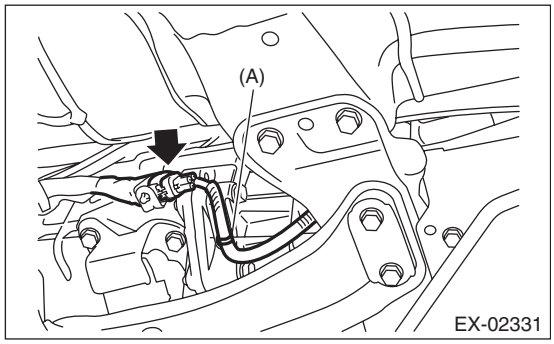
Anti-seize compound:
NEVER-SEEZ NSN, JET LUBE SS-30 or equivalent

2) Install the rear oxygen sensor.

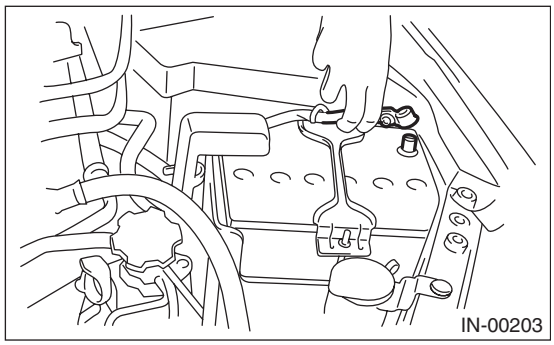
Tightening torque:
21 N·m (2.1 kgf-m, 15.5 ft-lb)



3) Connect the connector to the rear oxygen (A/F) sensor, and install the clip (A) holding the rear oxygen (A/F) sensor harness.



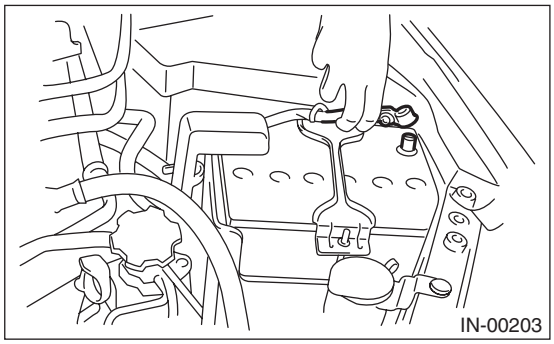
4) Install the under cover.
5) Lower the vehicle.
6) Connect the ground cable to the battery.



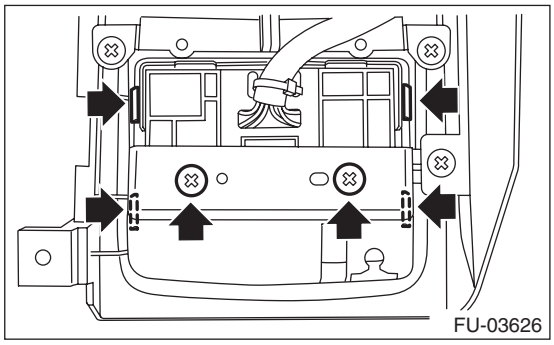
18.SI-DRIVE (Subaru Intelligent Drive) Selector

A: REMOVAL

1) Disconnect the ground cable from the battery.



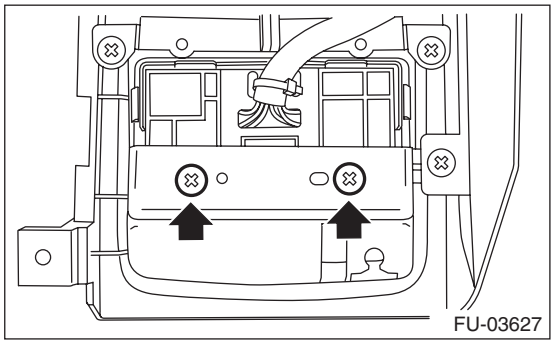
2) Remove the console box. <Ref. to EI-43, REMOVAL, Console Box.>
3) Remove the multi-selector switch connector from the console box.
4) Remove the screws and tabs holding the multi-selector switch to the console box and the multi-selector switch.



B: INSTALLATION

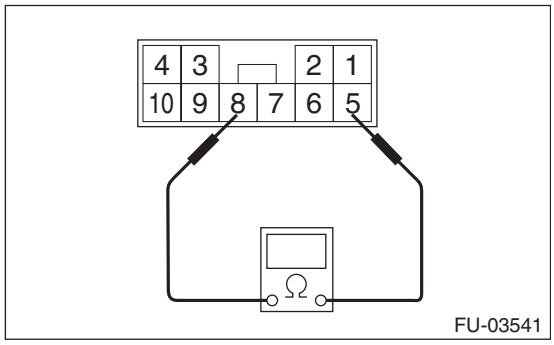
Install in the reverse order of removal.

Tightening torque:
1.5 N·m (0.2 kgf-m, 1.1 ft-lb)



C: INSPECTION

Measure the resistance between terminals of the SI-DRIVE selector.

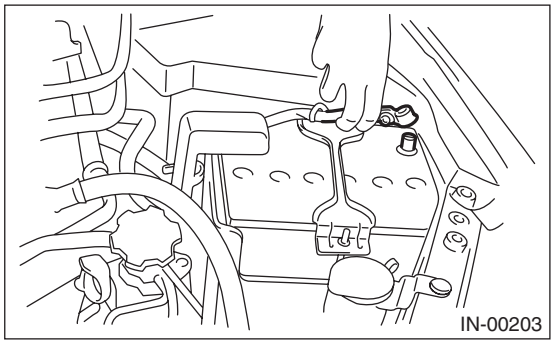


Switch position	Terminal No.	Standard value
Sport (When turning the SI-DRIVE selector to the left)	5 and 8	Less than 1 Ω
Intelligent (When pressing the SI-DRIVE selector)		Approx. 1 kΩ
Sport Sharp (When turning the SI-DRIVE selector to the right)		Approx. 3.67 kΩ

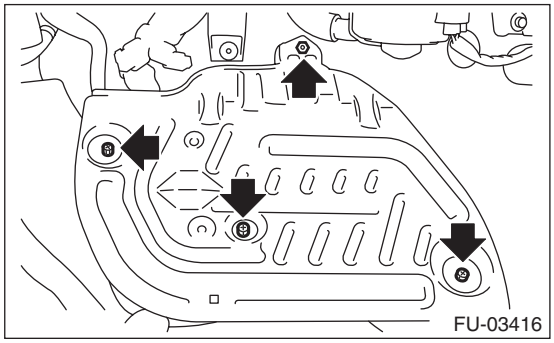
19.Engine Control Module (ECM)

A: REMOVAL

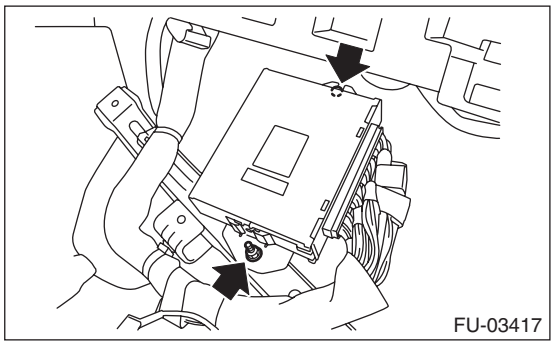
1) Disconnect the ground cable from the battery.



2) Remove the lower inner trim of passenger's side. <Ref. to EI-49, 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 "PC application help for Subaru Select Monitor".)

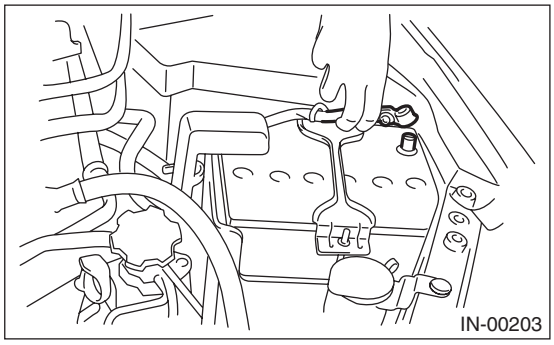
NOTE:
When replacing the ECM, be careful not to use the wrong spec. ECM to avoid any damage on the fuel injection system.

Tightening torque:
7.5 N·m (0.8 kgf-m, 5.5 ft-lb)

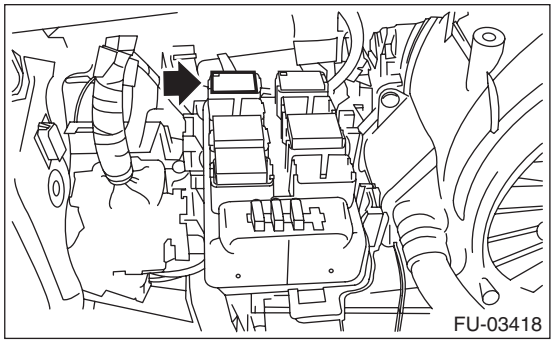
20.Main Relay

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.



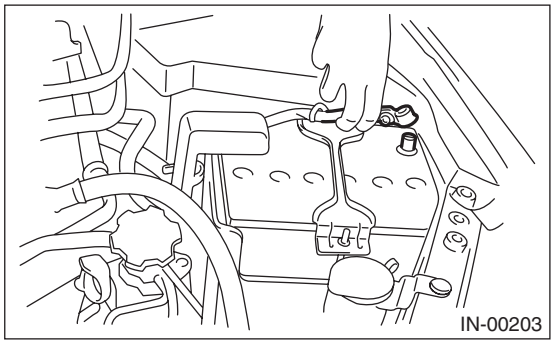
B: INSTALLATION

Install in the reverse order of removal.

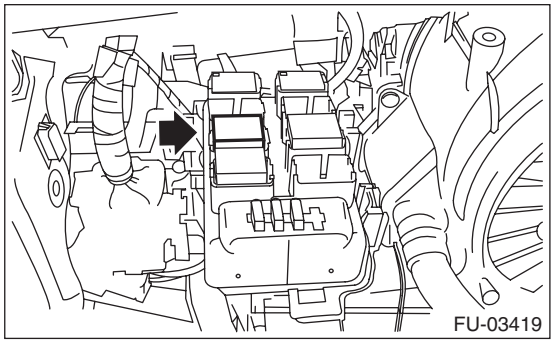
21.Fuel Pump Relay

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.



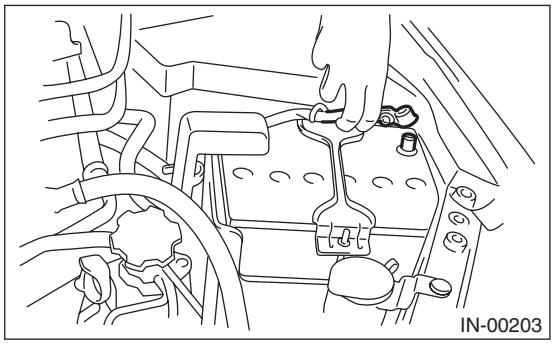
B: INSTALLATION

Install in the reverse order of removal.

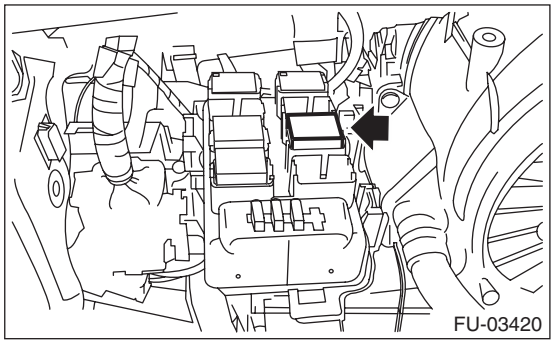
22. Electronic Throttle Control Relay

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.



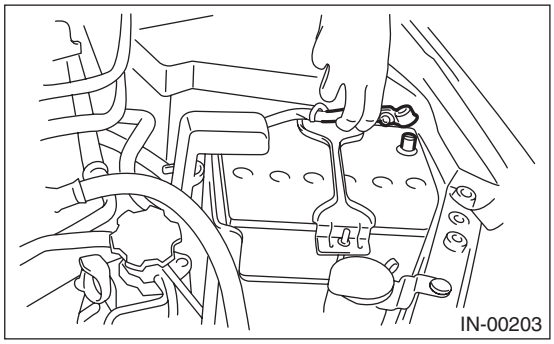
B: INSTALLATION

Install in the reverse order of removal.

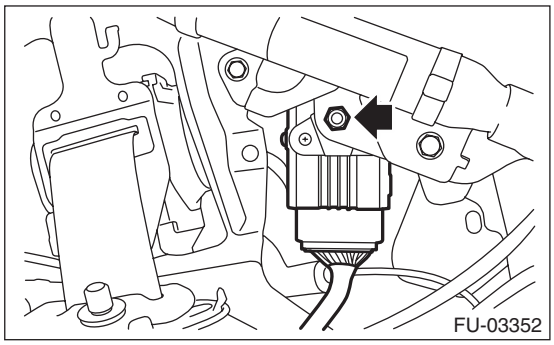
23.Fuel Pump Control Unit

A: REMOVAL

1) Disconnect the ground cable from the battery.



2) Remove the rear quarter trim of the right side. <Ref. to EI-51, REMOVAL, Rear Quarter Trim.>
3) Remove the fuel pump control unit.



4) Disconnect the connector from fuel pump control unit.

B: INSTALLATION

Install in the reverse order of removal.

Tightening torque:
5 N·m (0.5 kgf-m, 3.7 ft-lb)

24.Fuel

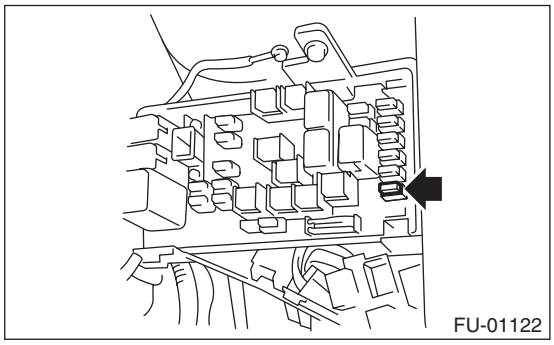
A: PROCEDURE

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.

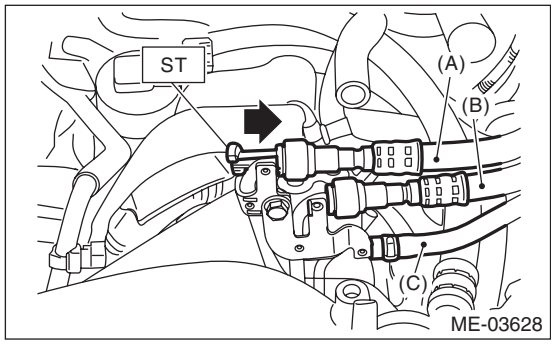
CAUTION:
Be careful not to spill fuel.

NOTE:
• If the fuel pump cannot be actuated, refer to DRAINING FUEL (THROUGH THE FUEL FILLER HOSE). <Ref. to FU(STI)-55, 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(STI)-54, 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.



(A) Fuel delivery hose
(B) Evaporation hose
(C) Fuel return hose

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(STI)(diag)-57, FUEL PUMP CONTROL (ON/OFF DRIVE), OPERATION, System Operation Check Mode.>

CAUTION:
Be careful not to spill fuel.

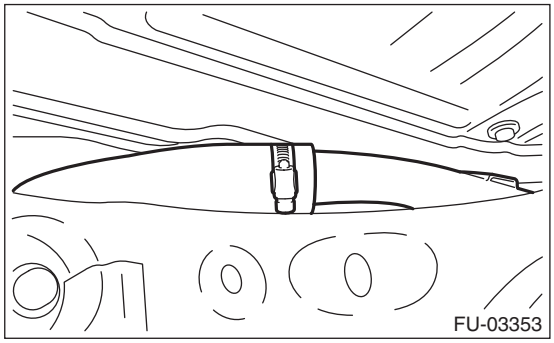
3. DRAINING FUEL (THROUGH THE FUEL FILLER HOSE)

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(STI)-12, REMOVAL, Rear Exhaust Pipe.> <Ref. to EX(STI)-14, REMOVAL, Muffler.>
4) Open the fuel filler 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.

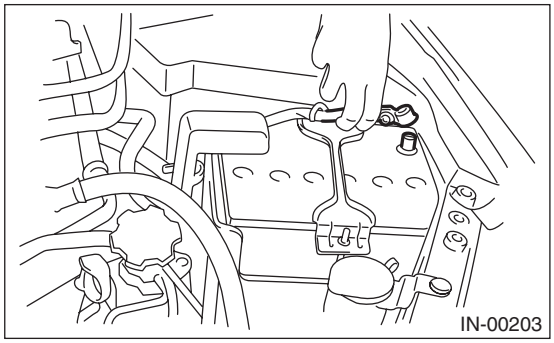
25.Fuel Tank

A: REMOVAL

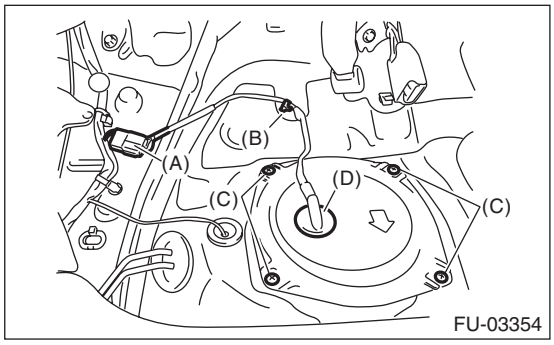
WARNING:
Place "NO OPEN FLAMES" signs near the working area.

CAUTION:
Be careful not to spill fuel.

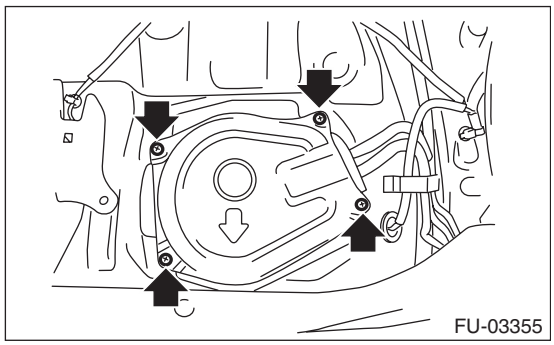
1) Set the vehicle on a lift.
2) Release the fuel pressure. <Ref. to FU(STI)-54, RELEASING OF FUEL PRESSURE, PROCEDURE, Fuel.>
3) Drain fuel from fuel tank.
<Ref. to FU(STI)-54, DRAINING FUEL (WITH SUBARU SELECT MONITOR), PROCEDURE, Fuel.>
4) Disconnect the battery ground cable from the battery.



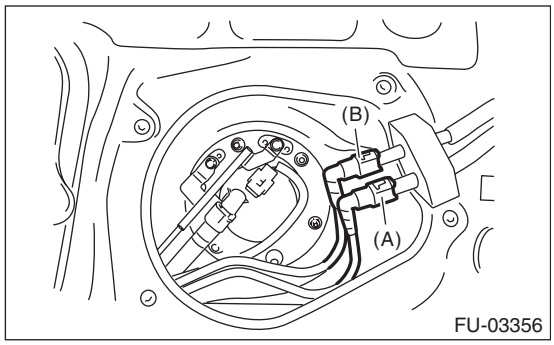
5) Remove the rear seat.
6) Remove the service hole cover of fuel pump.
(1) Disconnect fuel pump connector (A), and remove clip (B).
(2) Remove the bolt (C).
(3) Push the grommet (D) down and remove the service hole cover.



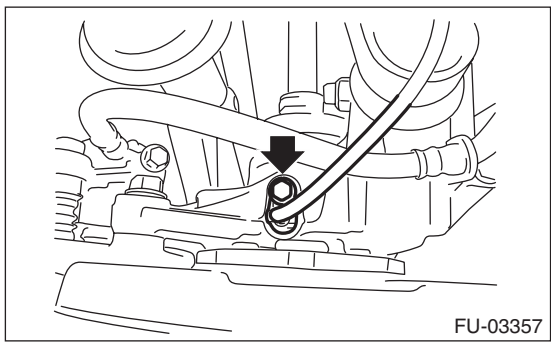
7) Remove the service hole cover of fuel sub level sensor.



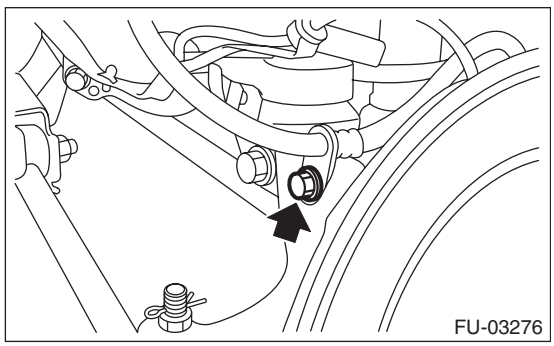
8) Disconnect the quick connector of fuel delivery tube (A) and fuel return tube (B). <Ref. to FU(STI)-76, REMOVAL, Fuel Delivery, Return and Evaporation Lines.>



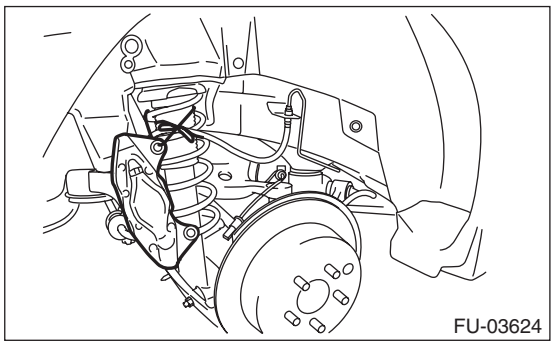
9) Remove the rear wheels.
10) Lift up the vehicle.
11) Remove the rear ABS wheel speed sensor from the rear housing.



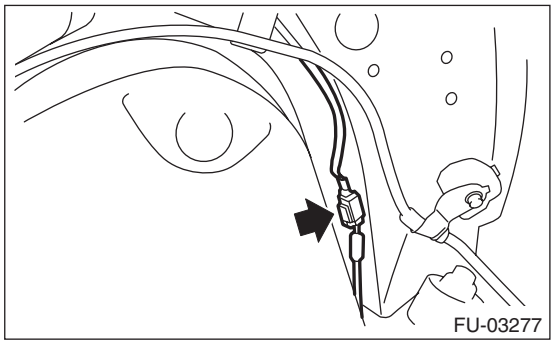
12) Remove the bolt holding the rear brake hose bracket.



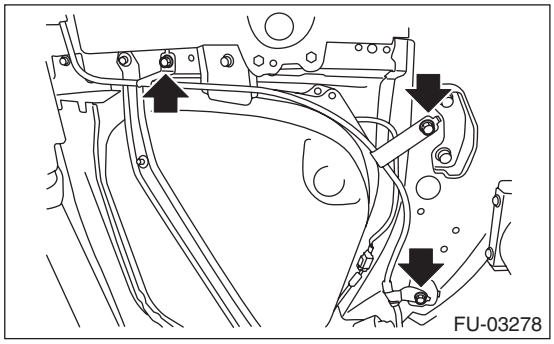
13) Remove the rear brake caliper and tie it to the body side of the vehicle.


FU-03624

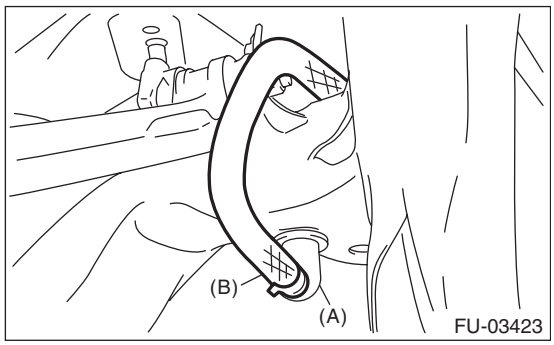
14) Remove the parking brake cable from the parking brake assembly. <Ref. to PB-6, REMOVAL, Parking Brake Assembly (Rear Disc Brake).>
15) Remove the rear exhaust pipe.
<Ref. to EX(STI)-12, REMOVAL, Rear Exhaust Pipe.>
16) Remove the propeller shaft. <Ref. to DS-10, REMOVAL, Propeller Shaft.>
17) Remove the heat shield cover and fuel tank protector.
18) Disconnect the connector from the rear ABS wheel speed sensor.


FU-03277

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


FU-03278

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

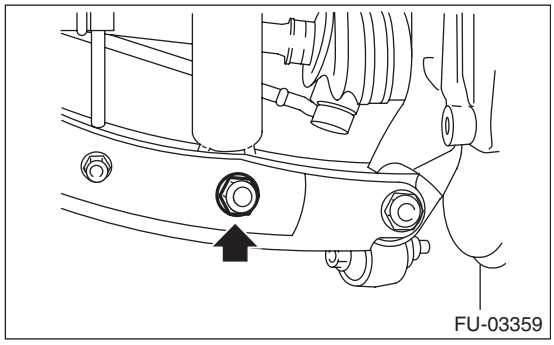


FU-03423

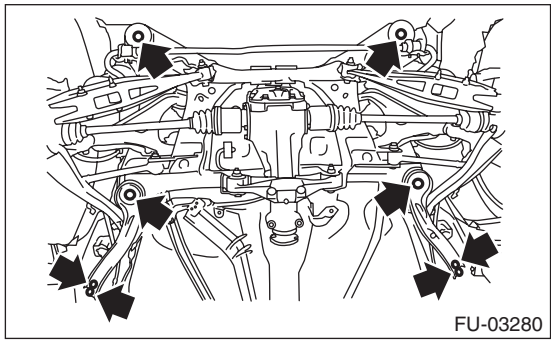
21) Remove the rear suspension assembly.

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.

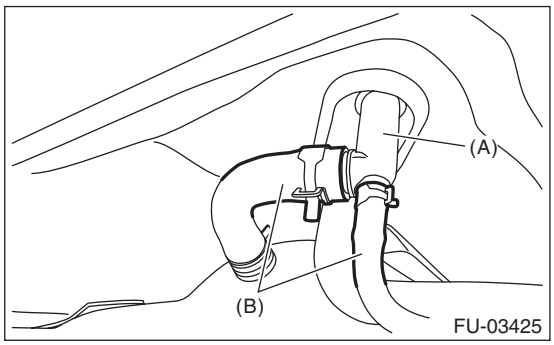

FU-03359

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

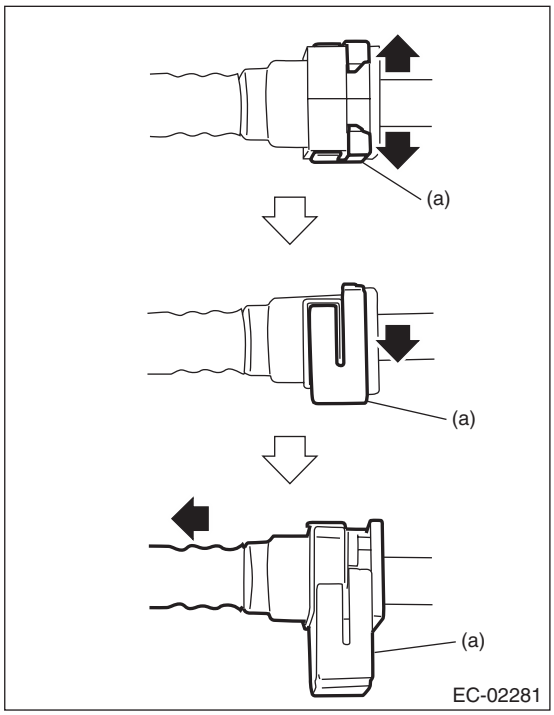

FU-03280

(4) Remove the rear suspension assembly.

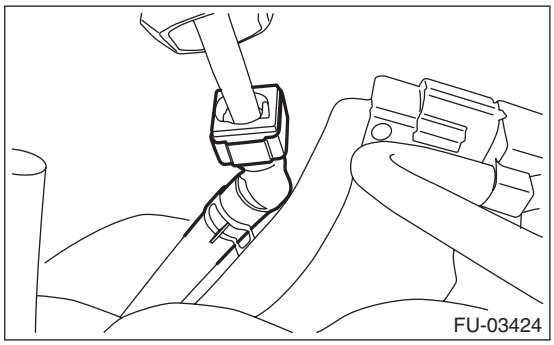
22) Disconnect evaporation hose (B) from connector (A).



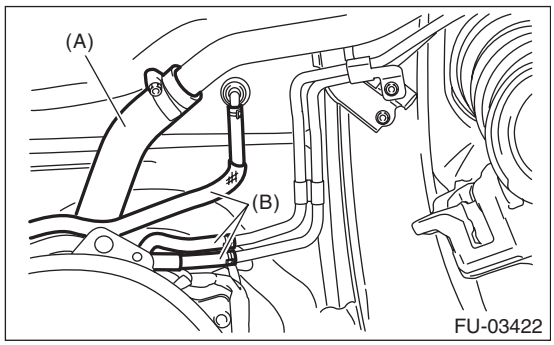
23) Disconnect the quick connector of the evaporation hose from the evaporation pipe as shown in the figure.



(a) Retainer

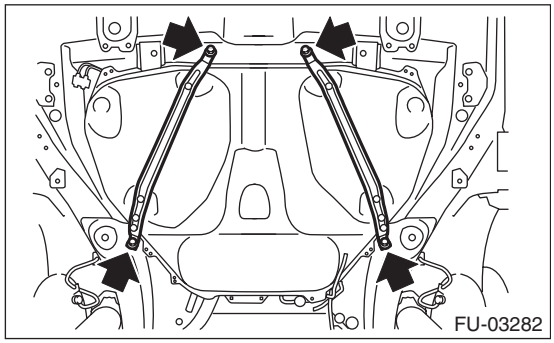


24) Disconnect the fuel filler hose (A) and evaporation hose (B).



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.

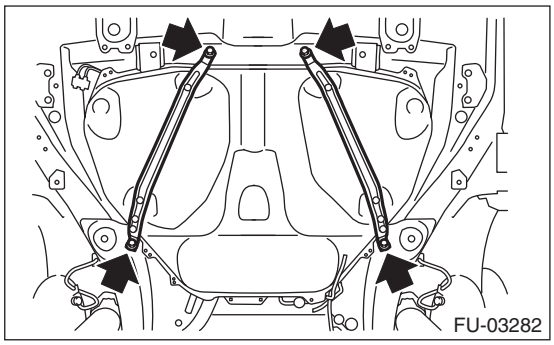
WARNING:
- **A helper is required to perform this work.**
- **Fuel may remain in the fuel tank. This will cause the left and right sides to be unbalanced. Be careful not to drop the fuel tank when removing.**



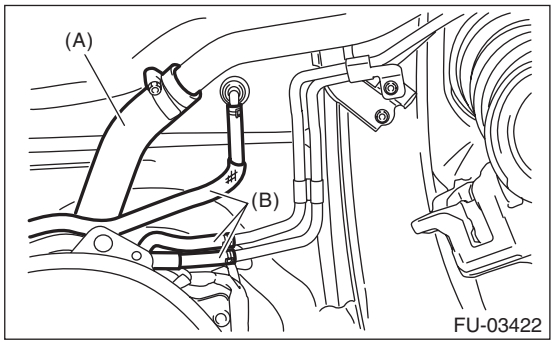
B: INSTALLATION

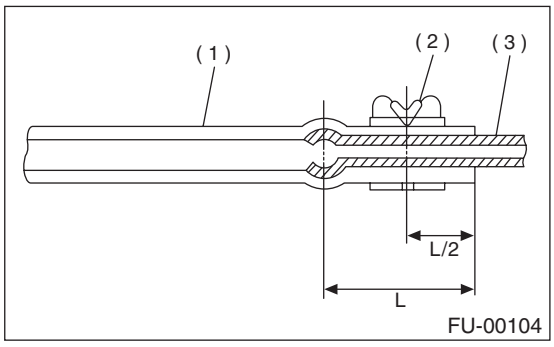
1) Support the fuel tank with a transmission jack, set the fuel tank in place, and temporarily tighten the bolts of the fuel tank band.

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 or clip as shown in the figure.

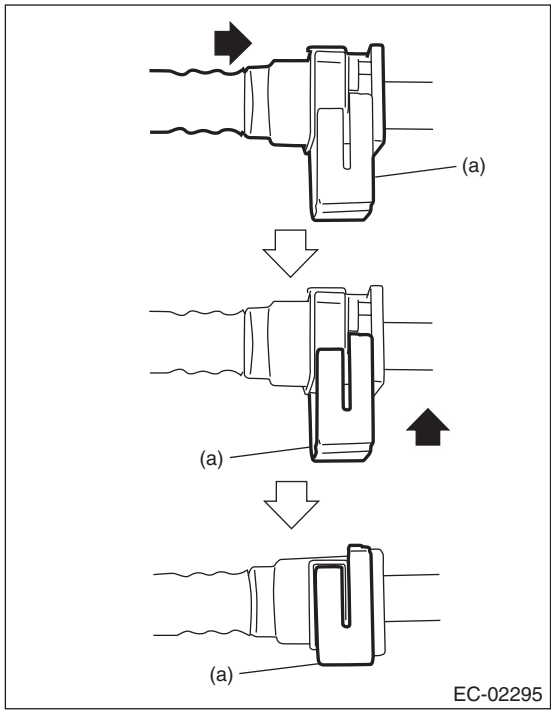




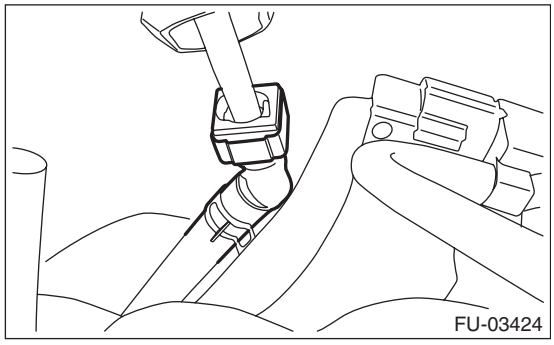
(1) Hose
(2) Clip or clamp
(3) Pipe

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

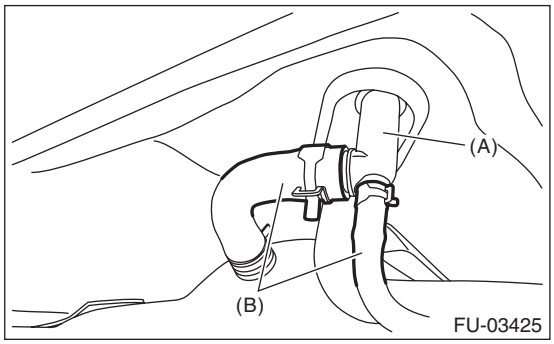
CAUTION:
• Check that there is no damage or dust on the quick connector. If necessary, clean seal surface of pipe.
• When connecting the quick connector, insert the pipe all the way in securely, then operate the push lock.
• If it is not possible to perform the push lock operation of the retainer, recheck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



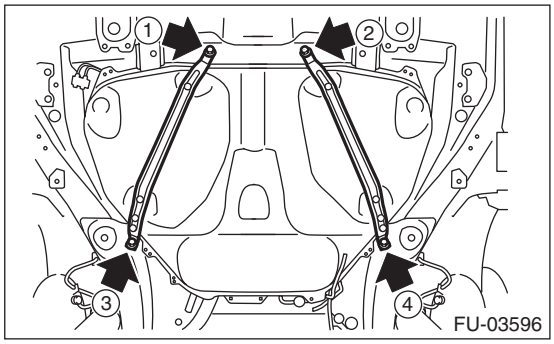
(a) Retainer



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



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



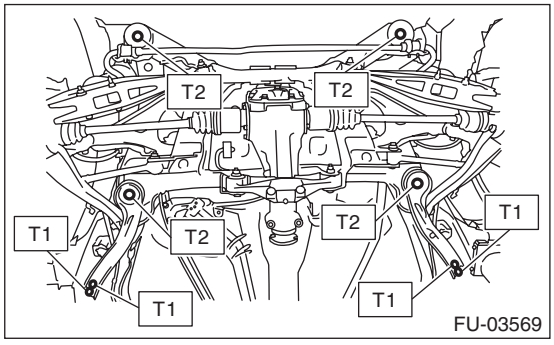
Tightening torque:
33 N·m (3.4 kgf-m, 24.3 ft-lb)

6) Install the rear suspension assembly.

WARNING:
A helper is required to perform this work.

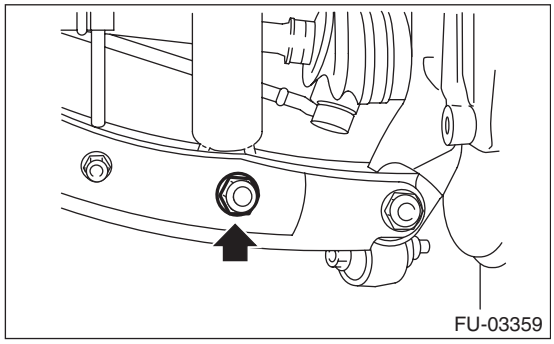
(1) Support the rear differential with the transmission jack.
(2) Support the rear suspension assembly, and tighten the bolts which secure the rear suspension assembly to the body.

Tightening torque:
T1: 70 N·m (7.1 kgf-m, 51.6 ft-lb)
T2: 145 N·m (14.8 kgf-m, 106.9 ft-lb)

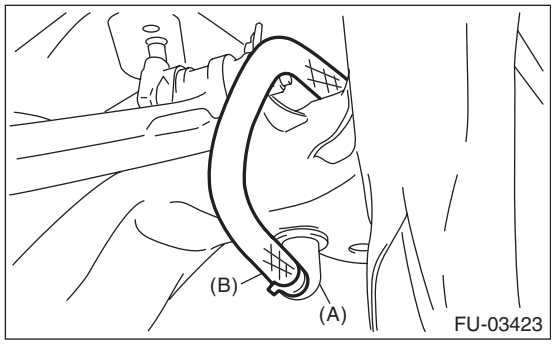


(3) Tighten the bolts which hold the rear shock absorber to the rear suspension arm.

Tightening torque:
120 N·m (12.2 kgf-m, 88.5 ft-lb)

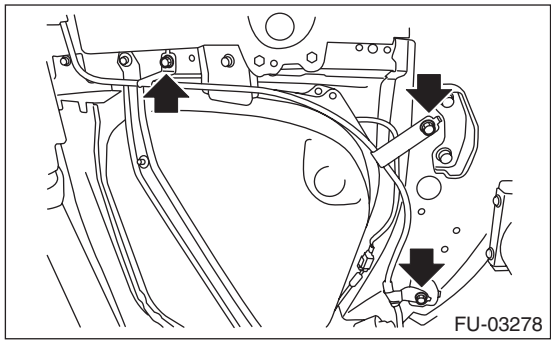


7) Connect drain hose (B) to canister drain connector (A).

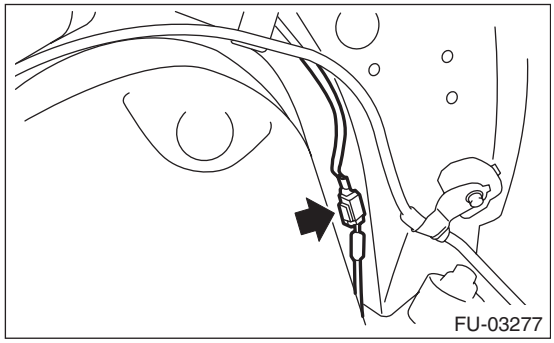


8) Tighten the bolts holding the parking brake cable clamp.

Tightening torque:
18 N·m (1.8 kgf-m, 13.3 ft-lb)



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



10) Install the heat shield cover.

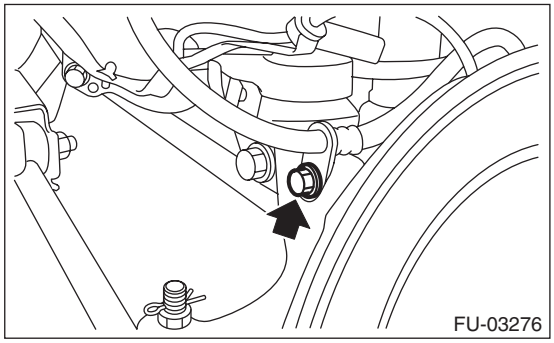
Tightening torque:
18 N·m (1.8 kgf-m, 13.3 ft-lb)

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, 13.3 ft-lb)

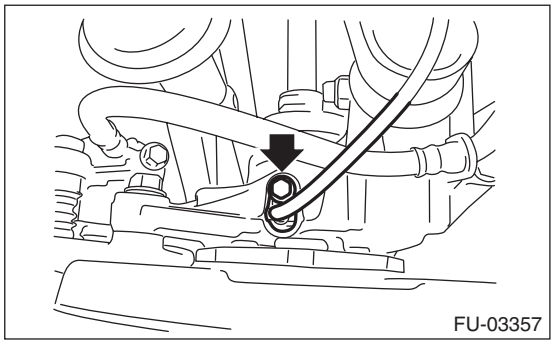
12) Install the propeller shaft. <Ref. to DS-11, INSTALLATION, Propeller Shaft.>
13) Install the rear exhaust pipe. <Ref. to EX(STI)-12, INSTALLATION, Rear Exhaust Pipe.>
14) Lower the vehicle.
15) Connect the parking brake cable to the parking brake assembly. <Ref. to PB-7, INSTALLATION, Parking Brake Assembly (Rear Disc Brake).>
16) Install the rear brake caliper. <Ref. to BR-19, INSTALLATION, Rear Disc Brake Assembly.>
17) Tighten the bolts which hold the rear brake hose bracket.

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


FU-03276

18) Attach the rear ABS wheel speed sensor to the rear housing.

Tightening torque:
7.5 N·m (0.8 kgf-m, 5.5 ft-lb)

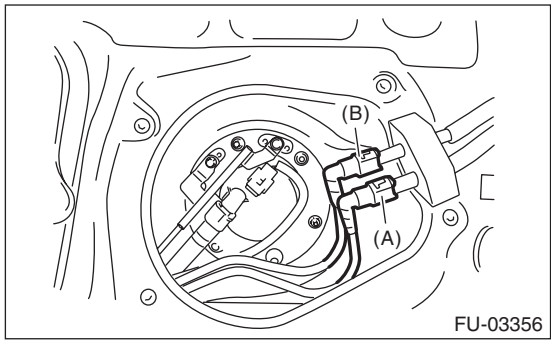

FU-03357

19) Install the rear wheels.

Tightening torque:
100 N·m (10.2 kgf-m, 73.8 ft-lb)

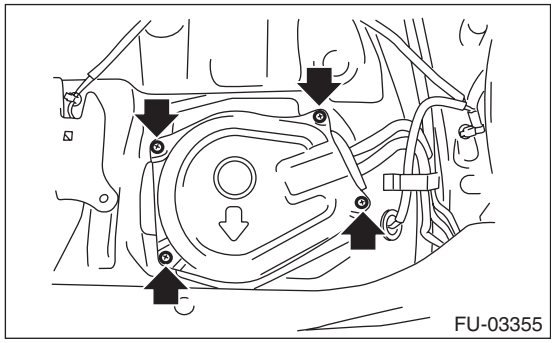
20) Connect the quick connector of fuel delivery tube (A) and fuel return tube (B). <Ref. to FU(STI)-78, INSTALLATION, Fuel Delivery, Return and Evaporation Lines.>

NOTE:
When connecting, be careful not to reverse the delivery side and return side.

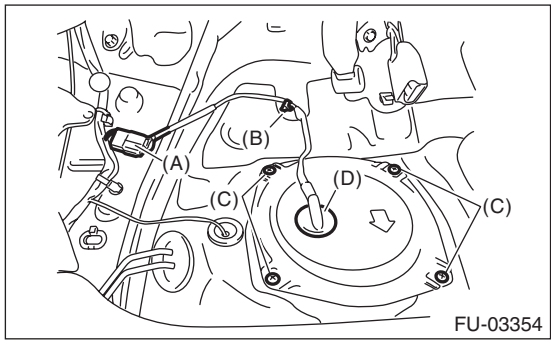


FU-03356

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


FU-03355

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

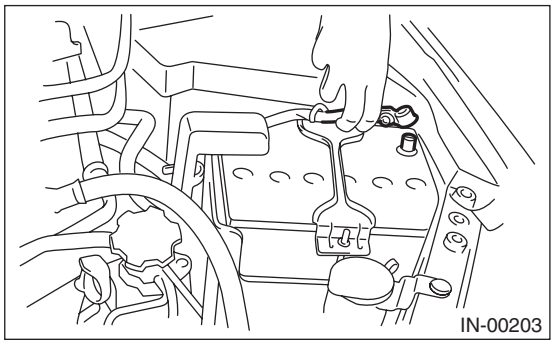


FU-03354

(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.

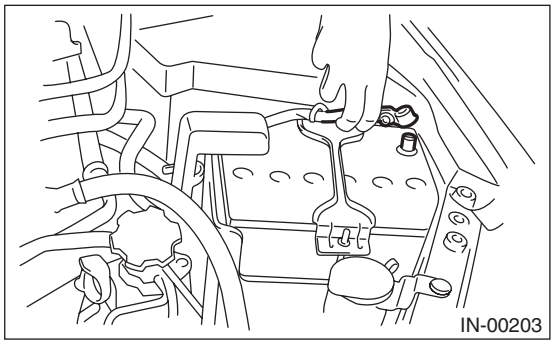
26.Fuel Filler Pipe

A: REMOVAL

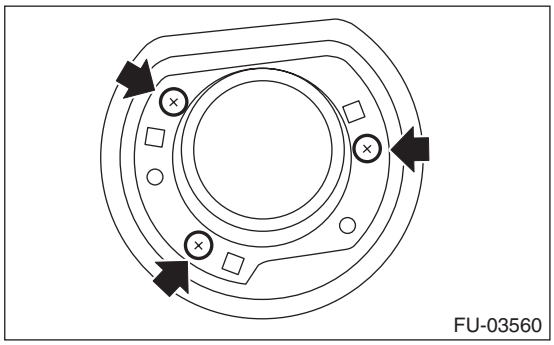
WARNING:
Place "NO OPEN FLAMES" signs near the working area.

CAUTION:
Be careful not to spill fuel.

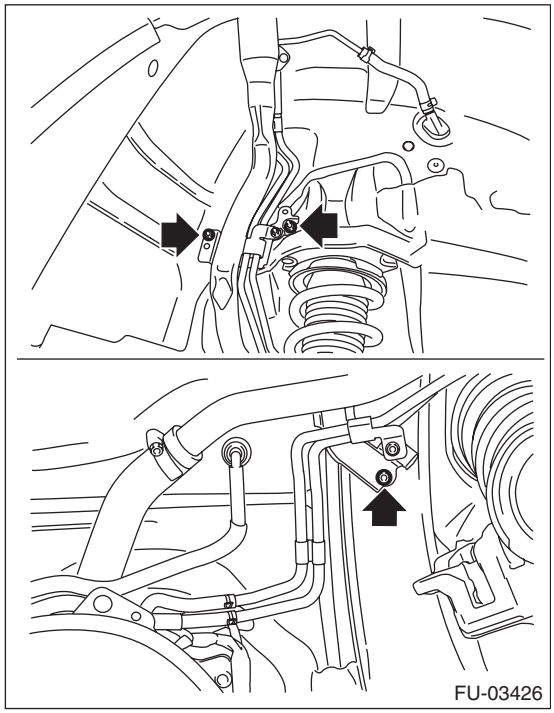
1) Set the vehicle on a lift.
2) Release the fuel pressure. <Ref. to FU(STI)-54, RELEASING OF FUEL PRESSURE, PROCEDURE, Fuel.>
3) Drain fuel from fuel tank. <Ref. to FU(STI)-54, DRAINING FUEL (WITH SUBARU SELECT MONITOR), PROCEDURE, Fuel.>
4) Disconnect the ground cable from the battery.


IN-00203

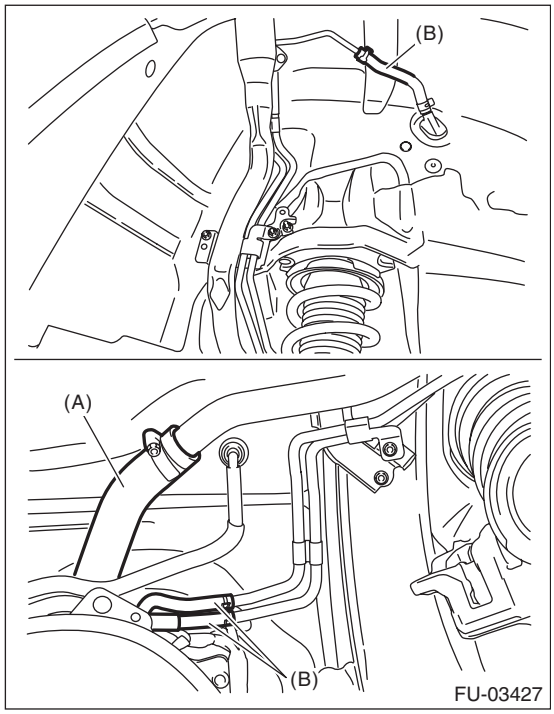
5) Open the fuel filler lid, and remove the fuel filler cap.
6) Remove the screws which secure gasket.


FU-03560

7) Remove the rear wheel RH.
8) Lift up the vehicle.
9) Remove the mud guard. <Ref. to EI-25, REMOVAL, Mud Guard.>
10) Remove the rear sub frame. <Ref. to RS-16, REMOVAL, Rear Sub Frame.>
11) Remove the bolts which hold fuel filler pipe bracket on the body.


FU-03426

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



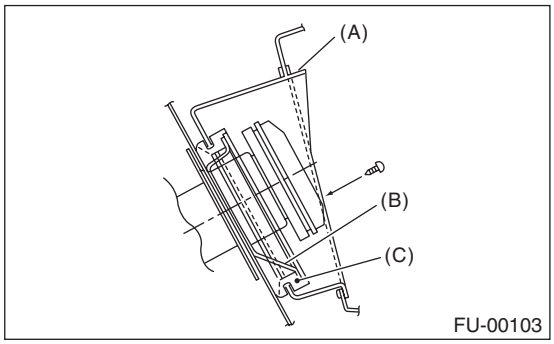
FU-03427

13) Remove the fuel filler pipe to the underside of the vehicle.

B: INSTALLATION

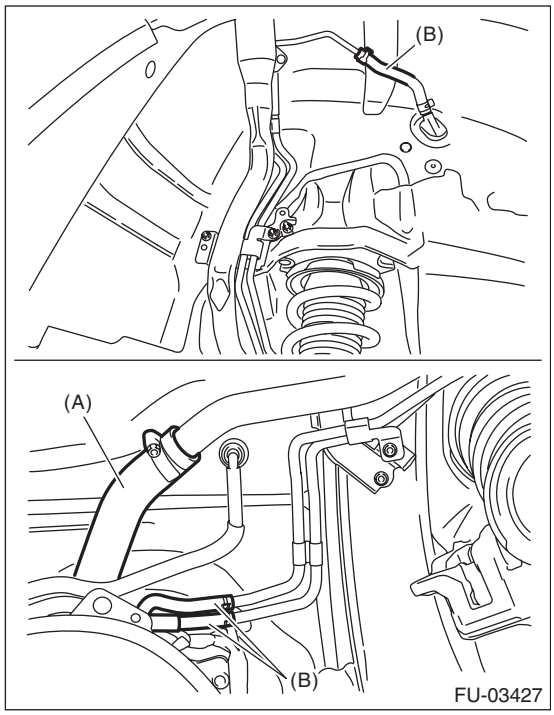
1) Open the fuel filler lid.
2) Set the fuel saucer (A) with rubber seal (C), and insert the fuel filler pipe into hole from the inner side of apron.
3) Align the holes in fuel filler pipe neck and set the cup (B), and tighten the screws.

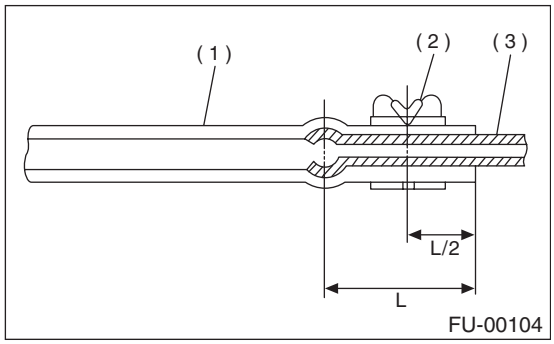
NOTE:
If the edges of rubber seal are folded toward inside, straighten it with a flat tip screwdriver.



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)

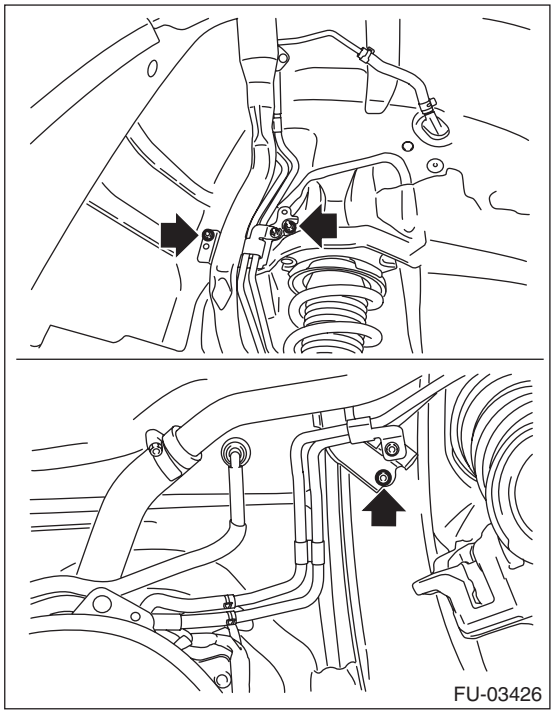




(1) Hose
(2) Clip or clamp
(3) Pipe

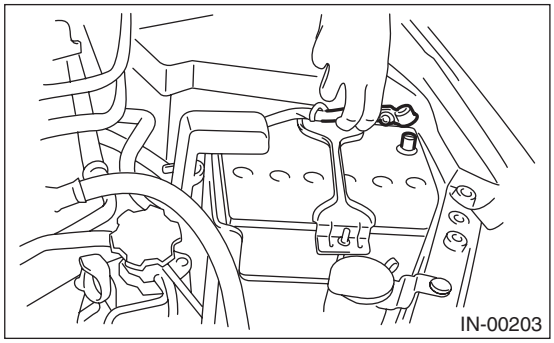
5) Tighten the bolts which hold fuel filler pipe bracket on the body.

Tightening torque:
7.5 N·m (0.8 kgf-m, 5.5 ft-lb)



6) Install the rear sub frame. <Ref. to RS-17, INSTALLATION, Rear Sub Frame.>
7) Install the mud guard. <Ref. to EI-25, INSTALLATION, Mud Guard.>
8) Lower the vehicle.
9) Install the rear wheel RH.

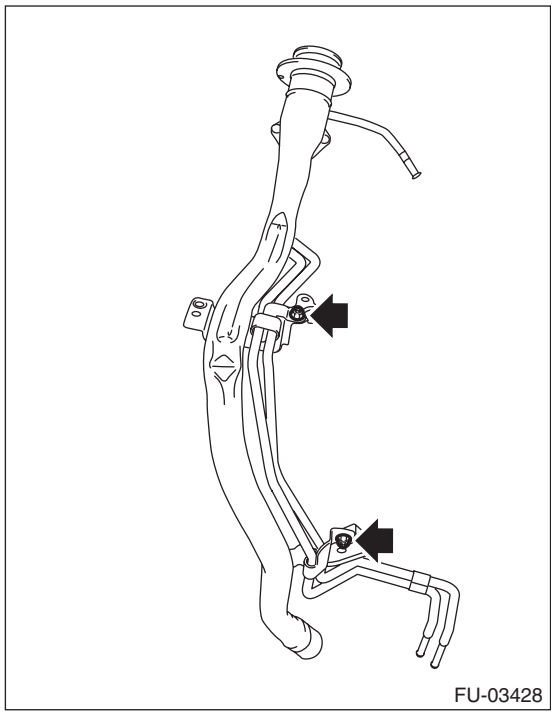
Tightening torque:
100 N·m (10.2 kgf-m, 73.8 ft-lb)
10) Connect the ground cable to the battery.



11) Inspect the wheel alignment and adjust if necessary.

C: DISASSEMBLY

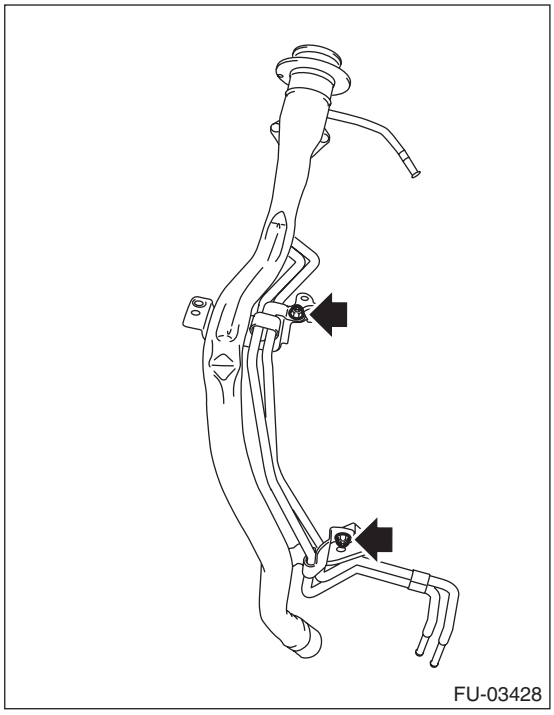
1) Remove the shut valve from the fuel filler pipe. <Ref. to EC(STI)-19, REMOVAL, Shut Valve.>
2) Remove the nut which holds the evaporation pipe assembly to the fuel filler pipe.



D: ASSEMBLY

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

Tightening torque:
7.5 N·m (0.8 kgf-m, 5.5 ft-lb)



2) Install the shut valve to the fuel filler pipe. <Ref. to EC(STI)-19, INSTALLATION, Shut Valve.>

E: 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.

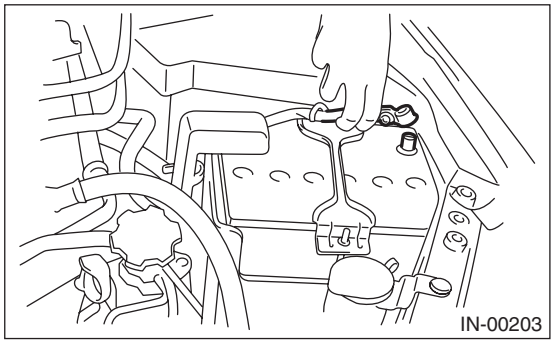
27.Fuel Pump

A: REMOVAL

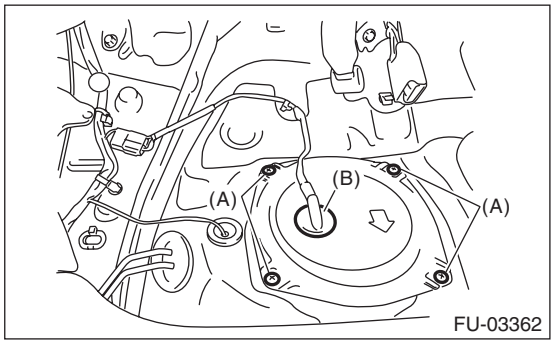
WARNING:
Place "NO OPEN FLAMES" signs near the working area.

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(STI)-54, RELEASING OF FUEL PRESSURE, PROCEDURE, Fuel.>
2) Drain fuel. <Ref. to FU(STI)-54, DRAINING FUEL (WITH SUBARU SELECT MONITOR), PROCEDURE, Fuel.>
3) Disconnect the ground cable from the battery.

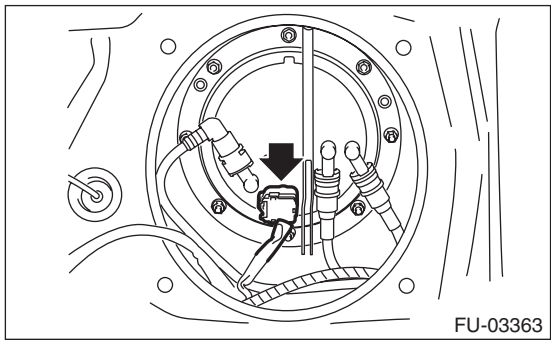

IN-00203

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.

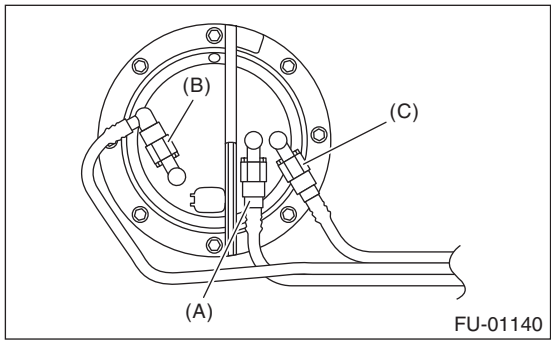


FU-03362

6) Disconnect the connector from fuel pump.


FU-03363

7) Disconnect the quick connector, then disconnect the fuel delivery tube, fuel return tube, and jet pump tube. <Ref. to FU(STI)-76, REMOVAL, Fuel Delivery, Return and Evaporation Lines.>
8) Remove the nuts which install fuel pump assembly onto fuel tank.



FU-01140

(A) Fuel delivery tube
(B) Fuel return tube
(C) Fuel jet pump tube

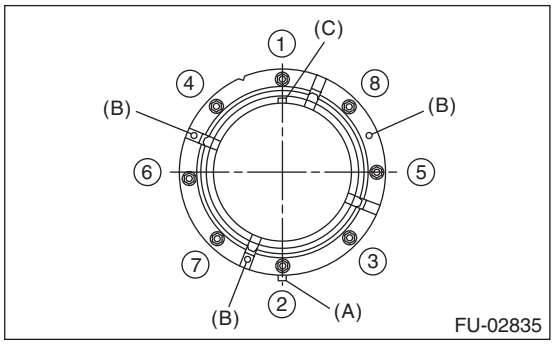
9) Remove the fuel pump assembly from the fuel tank.

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.

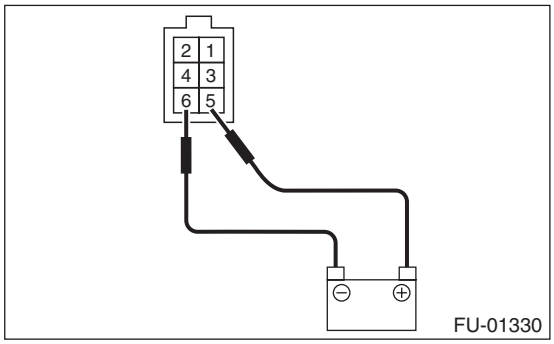
Tightening torque:
4.4 N·m (0.4 kgf-m, 3.2 ft-lb)



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.**



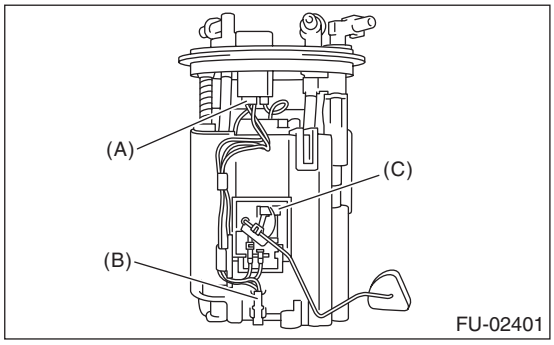
28.Fuel Level Sensor

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.**

NOTE:
The fuel level sensor is built in fuel pump assembly.
1) Remove the fuel pump assembly. <Ref. to FU(STI)-67, REMOVAL, Fuel Pump.>
2) Disconnect the connector from fuel pump bracket.
3) Remove the fuel temperature sensor.
4) Remove the fuel level sensor.



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

B: INSTALLATION

Install in the reverse order of removal.

NOTE:
Use a new gasket.

Tightening torque:
4.4 N·m (0.4 kgf-m, 3.2 ft-lb)

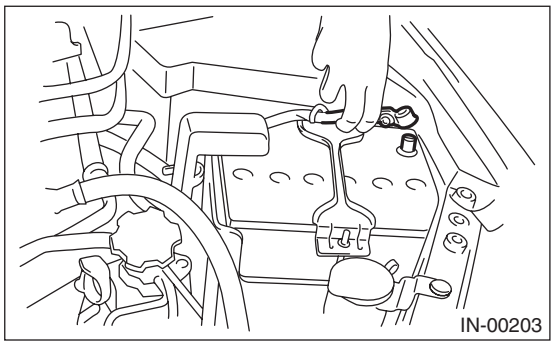
29.Fuel Sub Level Sensor

A: REMOVAL

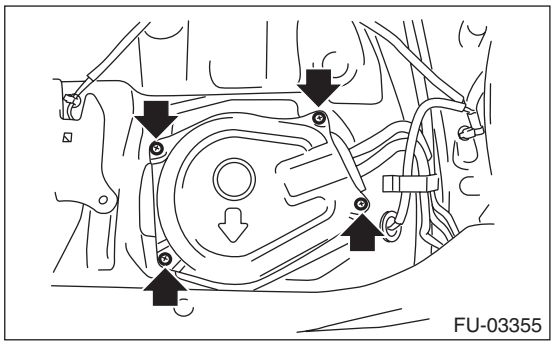
WARNING:
Place "NO OPEN FLAMES" signs near the working area.

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.**

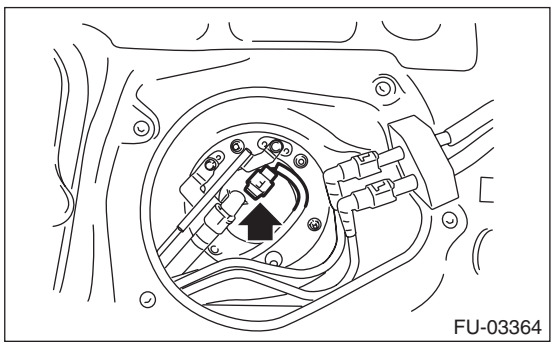
1) Release the fuel pressure. <Ref. to FU(STI)-54, RELEASING OF FUEL PRESSURE, PROCEDURE, Fuel.>
2) Drain fuel. <Ref. to FU(STI)-54, DRAINING FUEL (WITH SUBARU SELECT MONITOR), PROCEDURE, Fuel.>
3) Disconnect the ground cable from the battery.


IN-00203

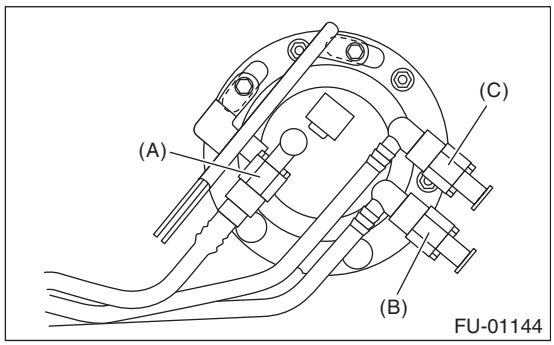
4) Remove the rear seat.
5) Remove the service hole cover.


FU-03355

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


FU-03364

7) Disconnect the quick connector, then disconnect the fuel delivery tube, fuel return tube, and jet pump tube. <Ref. to FU(STI)-76, REMOVAL, Fuel Delivery, Return and Evaporation Lines.>
8) Remove the nuts and bolts which install fuel sub level sensor on fuel tank.



FU-01144

(A) Jet pump tube
(B) Fuel delivery tube
(C) Fuel return tube

9) Remove the fuel sub level sensor.

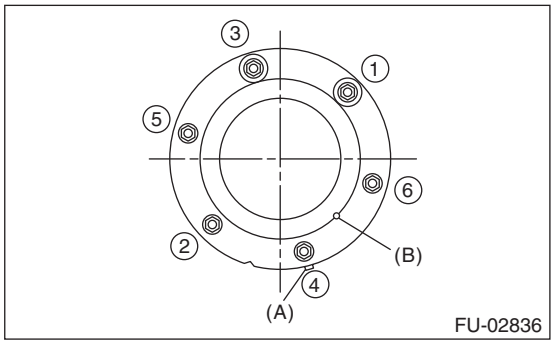
B: INSTALLATION

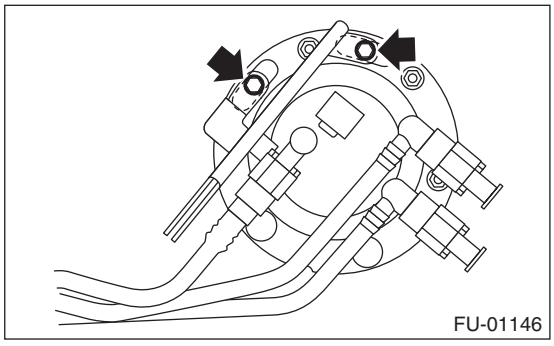
Install in the reverse order of removal while being careful of the following.

- 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 (0.4 kgf-m, 3.2 ft-lb)





30.Fuel Filter

A: SPECIFICATION

Fuel filter forms a single unit with fuel pump.
Refer to “Fuel Pump” for removal and installation. <Ref. to FU(STI)-67, REMOVAL, Fuel Pump.> <Ref. to FU(STI)-68, INSTALLATION, Fuel Pump.>

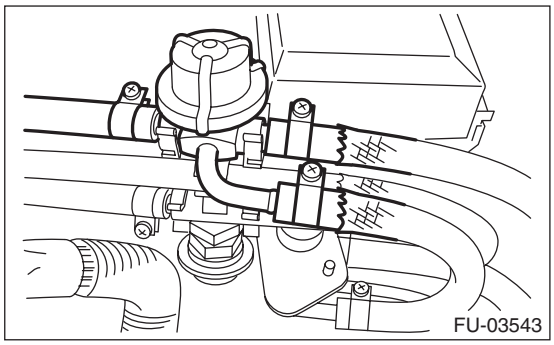
31.Pulsation Damper

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(STI)-54, RELEASING OF FUEL PRESSURE, PROCEDURE, Fuel.>
2) Disconnect the fuel hose from the pulsation damper and remove the pulsation damper.


FU-03543

B: INSTALLATION

CAUTION:
If fuel hoses or clamps are damaged, replace them with new parts.
Install in the reverse order of removal.

Tightening torque:
1.25 N·m (0.1 kgf-m, 0.9 ft-lb)

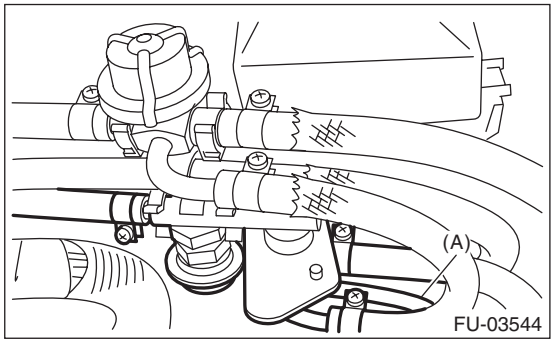
32. Pressure Regulator & Damper Assembly

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(STI)-54, RELEASING OF FUEL PRESSURE, PROCEDURE, Fuel.>
2) Disconnect the pressure regulator vacuum hose (A) from the pressure regulator and damper assembly.
3) Disconnect the fuel hose from the pressure regulator and damper assembly, and remove the pressure regulator and damper assembly.



B: INSTALLATION

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

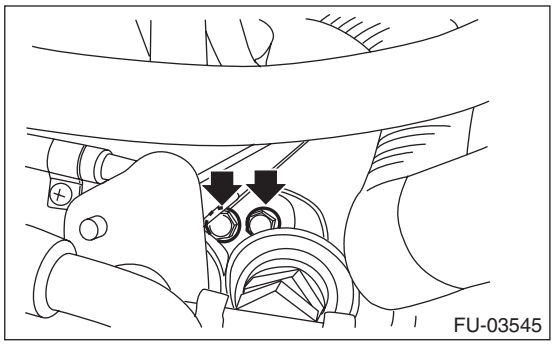
Install in the reverse order of removal.

Tightening torque:
1.25 N·m (0.1 kgf-m, 0.9 ft-lb)

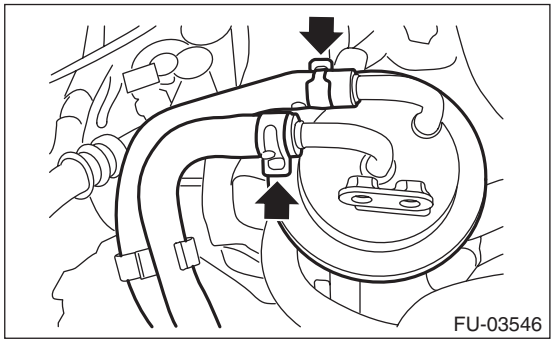
33.Purge Damper

A: REMOVAL

WARNING:
Place "NO OPEN FLAMES" signs near the working area.
1) Remove the purge damper from the purge damper bracket.



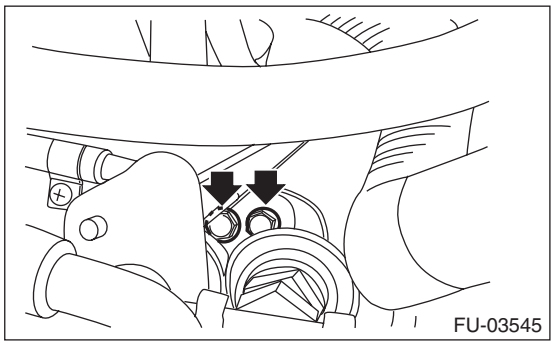
2) Disconnect the evaporator hose from the purge damper and remove the purge damper.



B: INSTALLATION

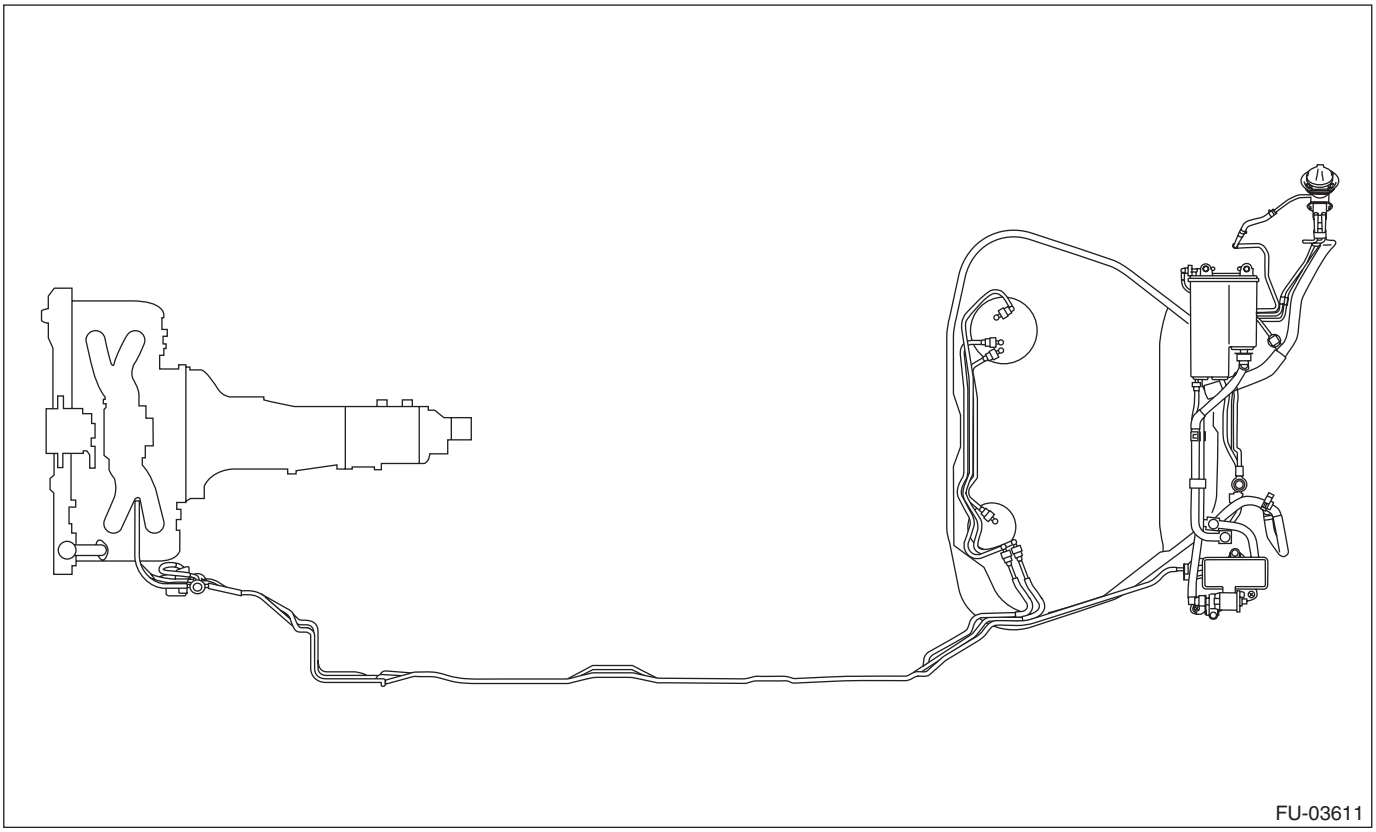
CAUTION:
If there is damage on the evaporation hose, replace with a new hose.
Install in the reverse order of removal.

Tightening torque:
8 N·m (0.8 kgf-m, 5.9 ft-lb)



34.Fuel Delivery, Return and Evaporation Lines

A: REMOVAL



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

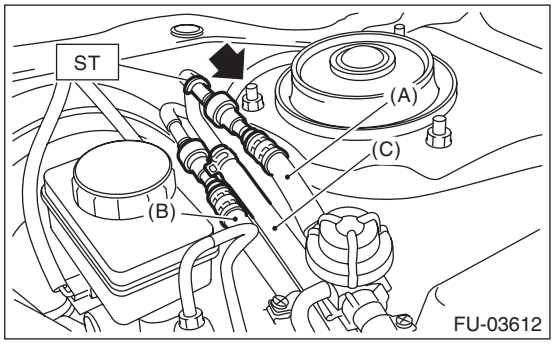
CAUTION:
Be careful not to spill fuel.

1) Set the vehicle on a lift.
2) Release the fuel pressure. <Ref. to FU(STI)-54, RELEASING OF FUEL PRESSURE, PROCEDURE, Fuel.>
3) Open the fuel filler lid, and remove the fuel filler cap.
4) Remove the floor mat. <Ref. to EI-57, REMOVAL, Floor Mat.>
5) In the engine compartment, disconnect the fuel delivery hose, fuel return hose and evaporation hose.
(1) Disconnect the quick connectors on the fuel delivery and fuel return lines by pushing the ST in the direction of the arrow.

ST 42099AE000 QUICK CONNECTOR RELEASE

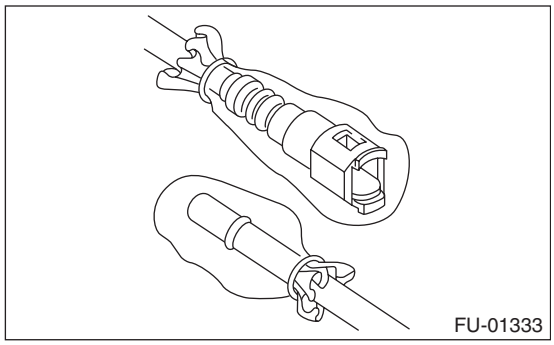
(2) Remove the clip and disconnect the evaporation hose from the fuel pipe.

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

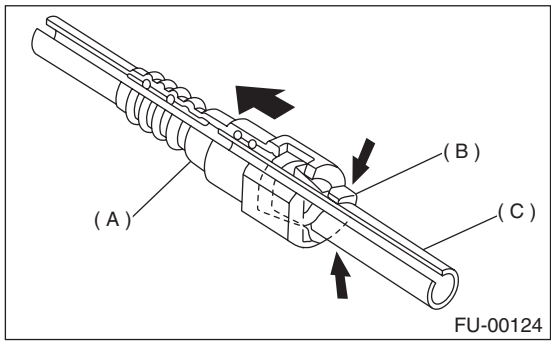


(A) Fuel delivery hose
(B) Fuel return hose
(C) Evaporation hose

6) Remove the canister. <Ref. to EC(STI)-7, REMOVAL, Canister.>
7) Remove the fuel tank. <Ref. to FU(STI)-56, REMOVAL, Fuel Tank.>
8) Remove the fuel pipe assembly.
9) Disconnect the quick connector, then disconnect the fuel delivery tube, fuel return 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

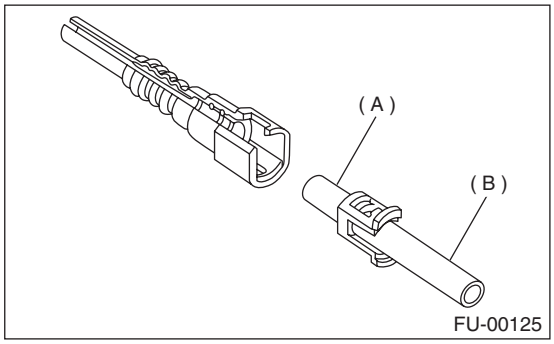
B: INSTALLATION

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

1. CONNECTING THE FUEL LINE QUICK CONNECTOR

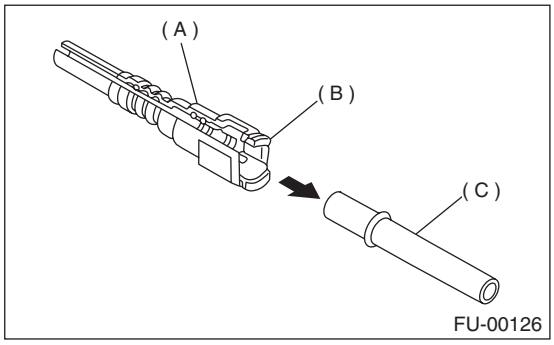
CAUTION:
Make sure there is no damage or dust on the connections. If necessary, clean seal surface of pipe.

NOTE:
Use a new retainer.



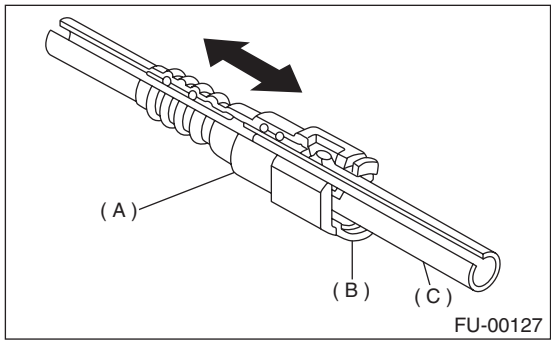
(A) Seal surface
(B) Pipe

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

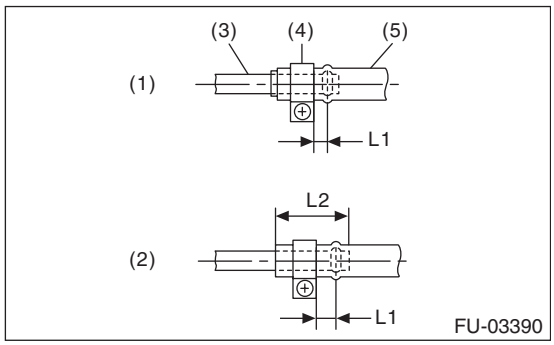
2. CONNECT FUEL DELIVERY HOSE AND FUEL RETURN HOSE

Connect the fuel delivery hose and fuel return 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.

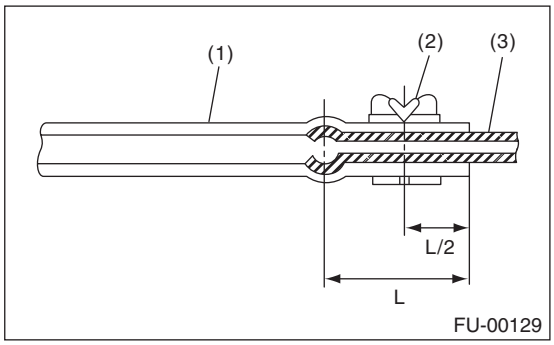


(1) Type A
(2) Type B
(3) Pipe
(4) Clamp
(5) Hose

3. EVAPORATION HOSE CONNECTION

Connect the evaporation hose to the pipe with an overlap of 15 to 20 mm (0.59 to 0.79 in).

L = 17.5±2.5 mm (0.689±0.098 in)



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

C: INSPECTION

1) Make sure that there are no cracks on the fuel pipes and fuel hoses.
2) Make sure the fuel pipe and fuel hose connections are tightened firmly.

35.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 pump.
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.