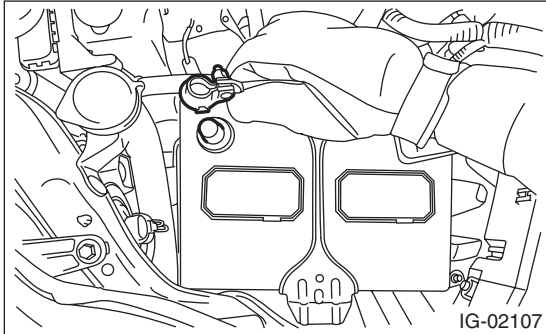


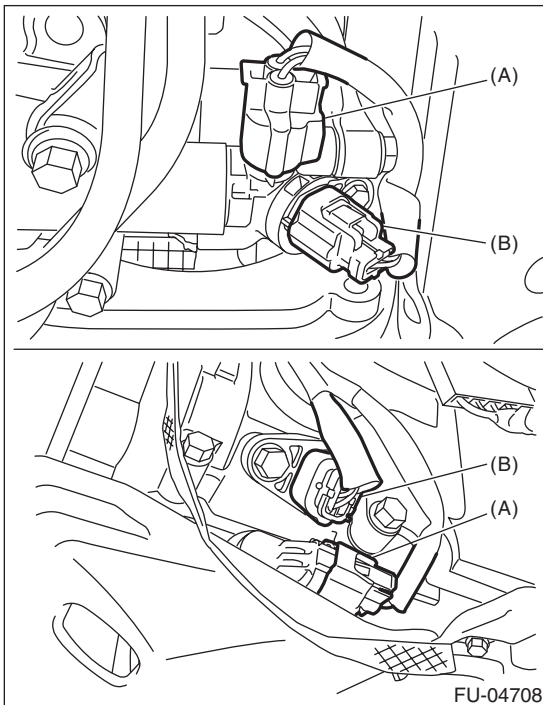
## 3. Intake Manifold

### A: REMOVAL

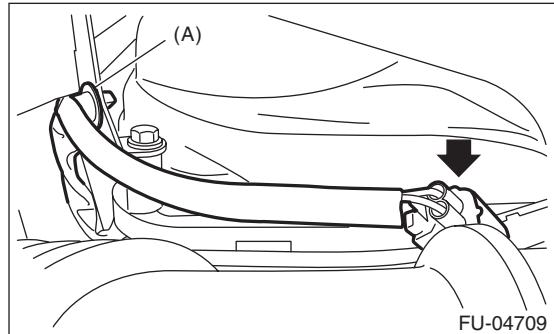
- 1) Remove the collector cover.
- 2) Collect the refrigerant from A/C system. <Ref. to AC-20, PROCEDURE, Refrigerant Recovery Procedure.>
- 3) Release the fuel pressure. <Ref. to FU(H4DOTC)-66, RELEASING OF FUEL PRESSURE, PROCEDURE, Fuel.>
- 4) Disconnect the ground cable from battery.



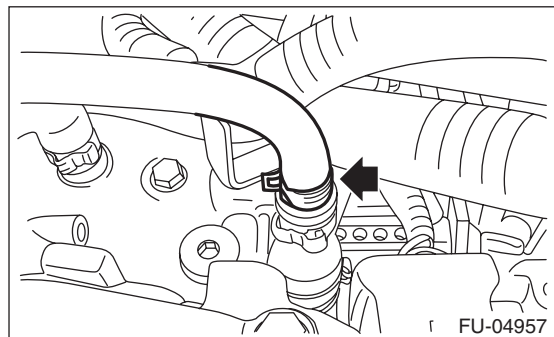
- 5) Open the fuel filler lid and remove the fuel filler cap.
- 6) Lift up the vehicle.
- 7) Remove the under cover. <Ref. to EI-35, REMOVAL, Front Under Cover.>
- 8) Drain approximately 2.0 ℓ (2.1 US qt, 1.8 Imp qt) of coolant. <Ref. to CO(H4DOTC)-14, DRAINING OF ENGINE COOLANT, REPLACEMENT, Engine Coolant.>
- 9) Disconnect the connectors from exhaust oil flow control solenoid valve (A) and exhaust camshaft position sensor (B).



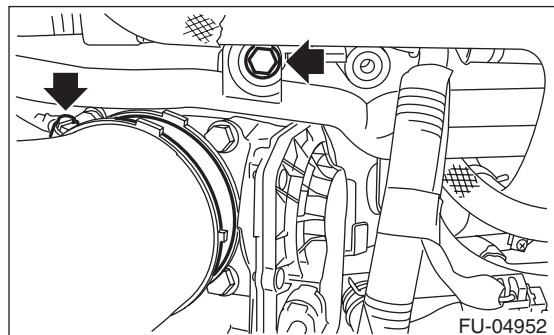
- 10) Disconnect the connectors from wastegate control solenoid valve, and remove the clip (A) which secure the engine harness.



- 11) Lower the vehicle.
- 12) Remove the air intake duct. <Ref. to IN(H4DOTC)-12, REMOVAL, Air Intake Duct.>
- 13) Remove the intercooler. <Ref. to IN(H4DOTC)-17, REMOVAL, Intercooler.>
- 14) Disconnect the A/C pressure hoses from A/C compressor. <Ref. to AC-68, REMOVAL, Hose and Pipe.>
- 15) Disconnect the vacuum hose from the PCV valve.



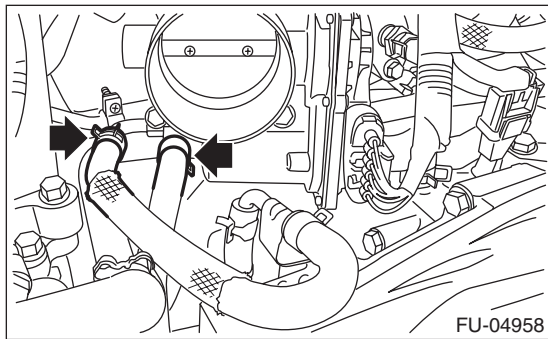
- 16) Remove the bolts which secure the engine harness and PCV pipe to the intake manifold, and remove the intake duct from the throttle body.



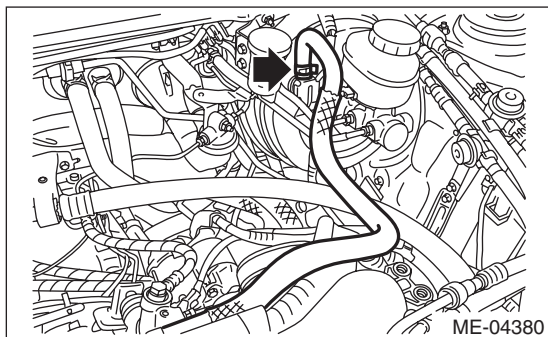
## Intake Manifold

### FUEL INJECTION (FUEL SYSTEMS)

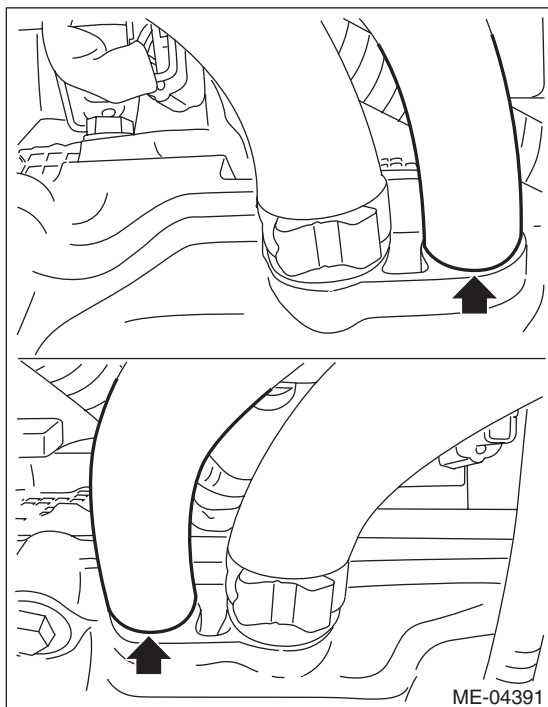
17) Disconnect the preheater hose from throttle body.



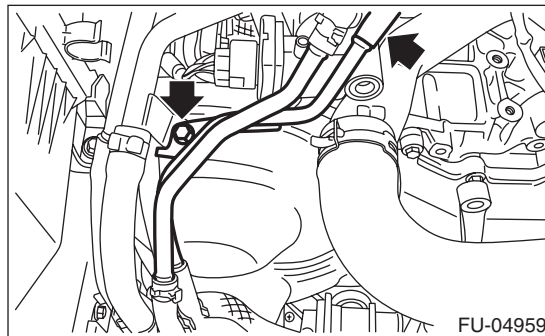
18) Disconnect the brake booster vacuum hose.



19) Disconnect the vacuum hose from rocker cover.

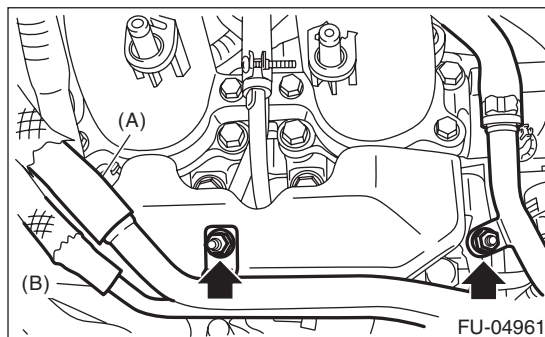


20) Disconnect the vacuum hose from blow-by pipe, and remove the bolt securing the blow-by pipe to the intake manifold protector RH.

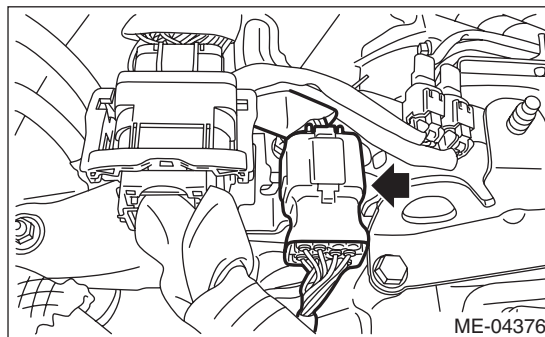


21) Disconnect vacuum hose (A) and vacuum control hose (B) from the PCV pipe.

22) Remove the nut securing the PCV pipe to the intake manifold protector RH, and move the PCV pipe in the forward direction of the vehicle.



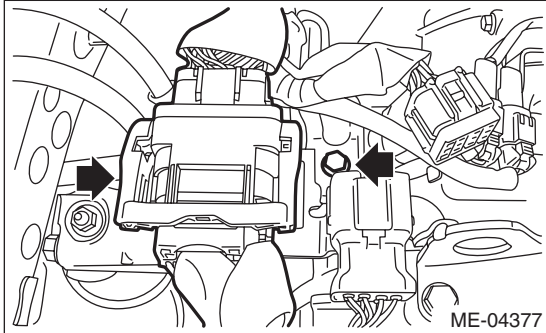
23) Disconnect the bulkhead harness connector from the engine harness connector (brown).



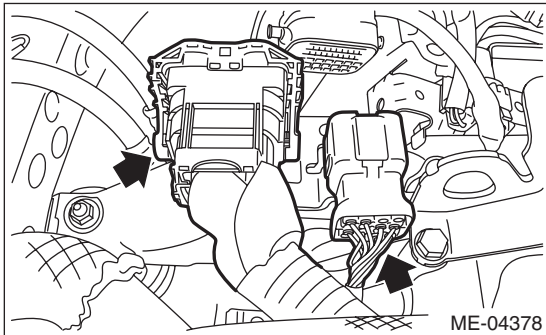
# Intake Manifold

## FUEL INJECTION (FUEL SYSTEMS)

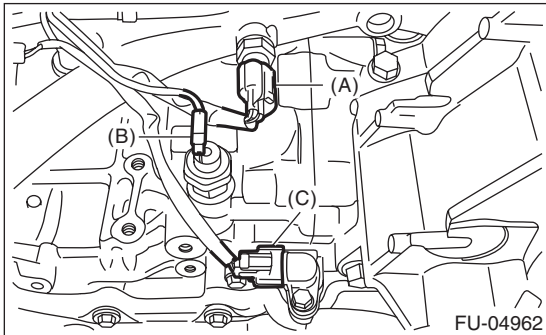
24) Remove the bolt securing the bulkhead harness connector bracket, and disconnect the bulkhead harness connector from the engine harness connector (black).



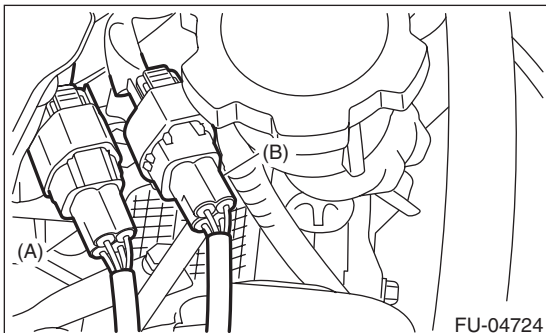
25) Remove the engine harness connector from the engine rear hanger.



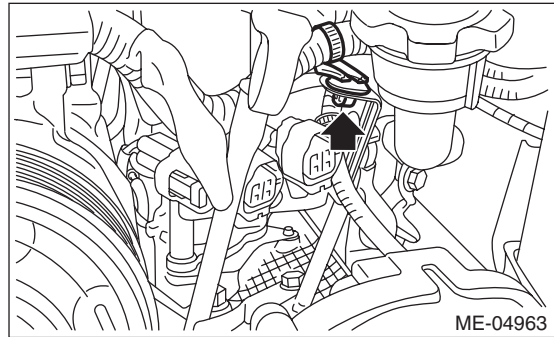
26) Disconnect the connectors from the engine coolant temperature sensor (A), oil pressure switch (B) and crankshaft position sensor (C).



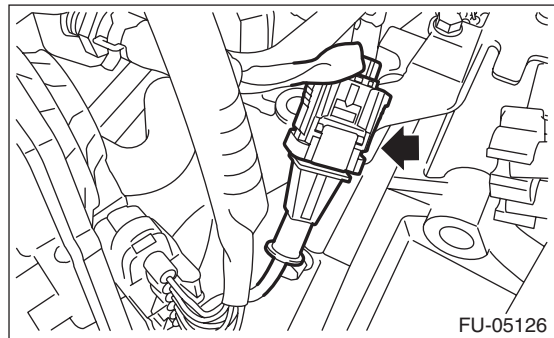
27) Disconnect the connectors from front oxygen (A/F) sensor (A) and rear oxygen sensor (B).



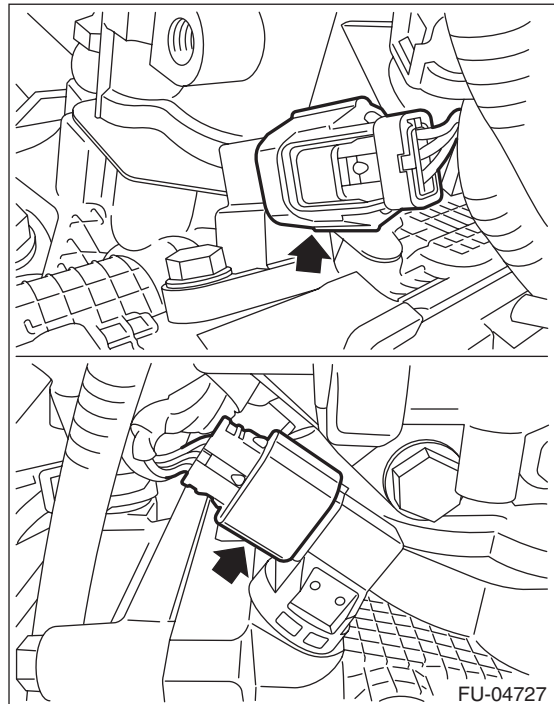
28) Remove the clip which secure the generator cord to the intake manifold protector LH.



29) Disconnect the connector from the knock sensor.



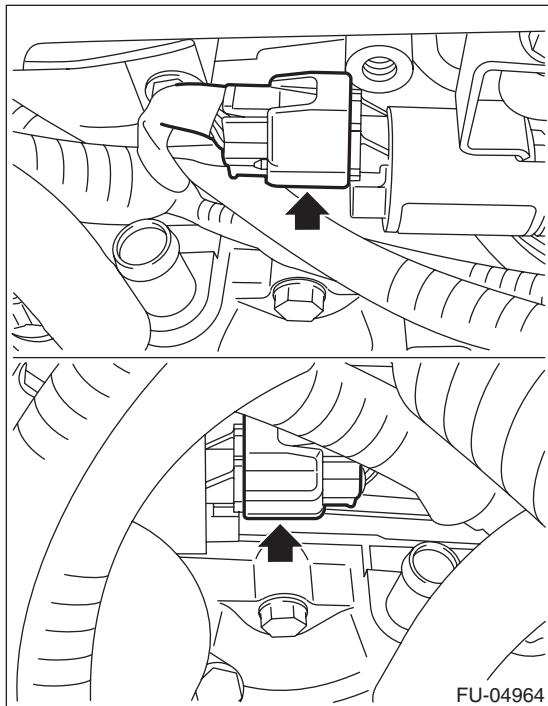
30) Disconnect the connector from the intake camshaft position sensor.



## Intake Manifold

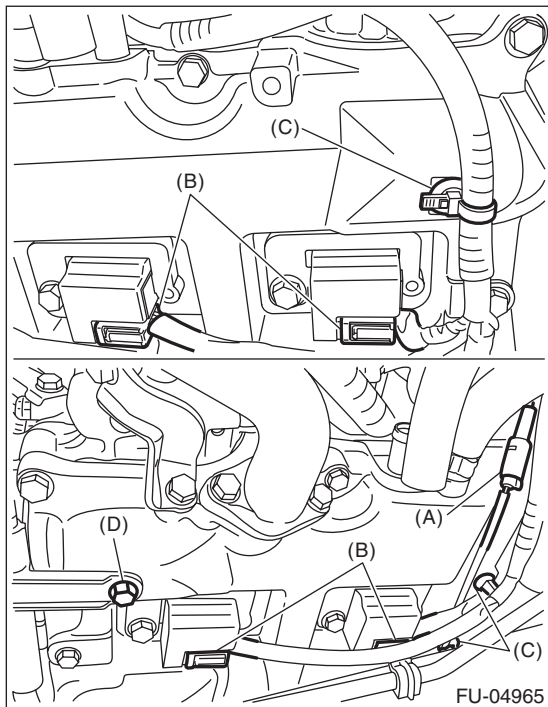
### FUEL INJECTION (FUEL SYSTEMS)

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



32) Disconnect the connector (A) from oil level switch.

33) Disconnect the connector (B) from ignition coil, and remove the clips (C) and bolt (D) securing the engine harness or oil level switch harness to the rocker cover.

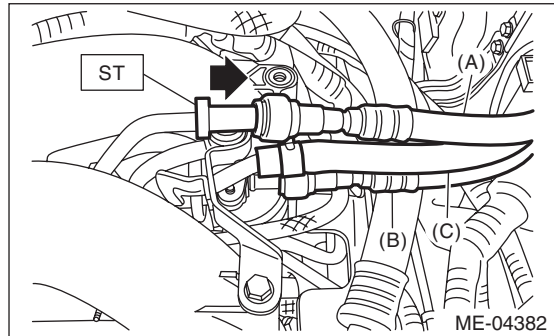


34) Attach ST to the fuel delivery pipe and push ST in the direction of arrow mark to disconnect the fuel delivery hose.

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) Fuel return hose

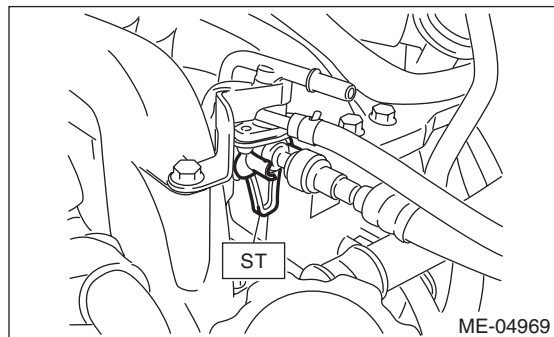
(C) Evaporation hose

35) Disconnect the fuel return hose using the ST.  
ST 18371AA000 CONNECTOR REMOVER

#### CAUTION:

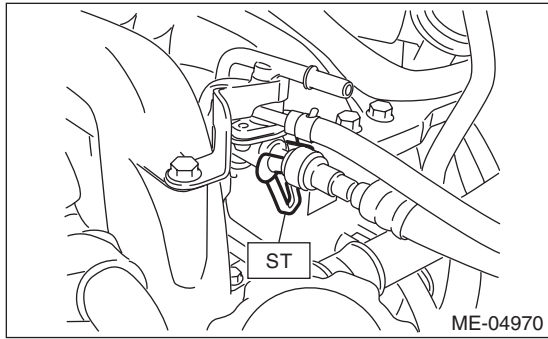
- Be careful not to spill fuel.
- Catch the fuel from hoses using a container or cloth.

(1) Attach ST to the fuel return pipe as shown in the figure.

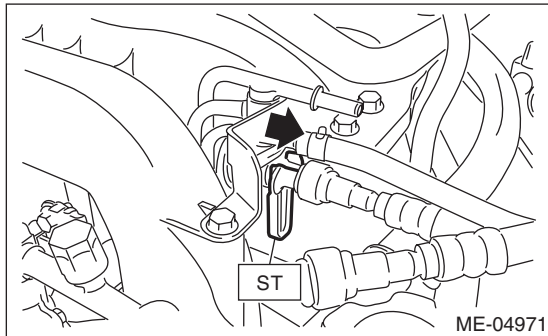




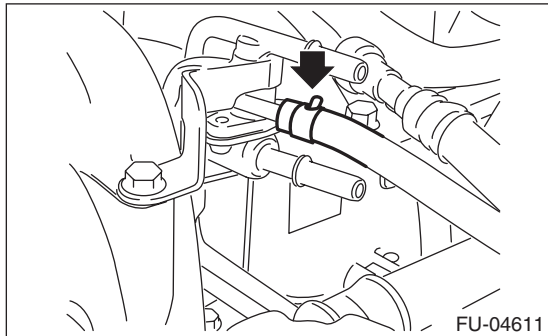
(2) Insert the front side of ST into the quick connector.



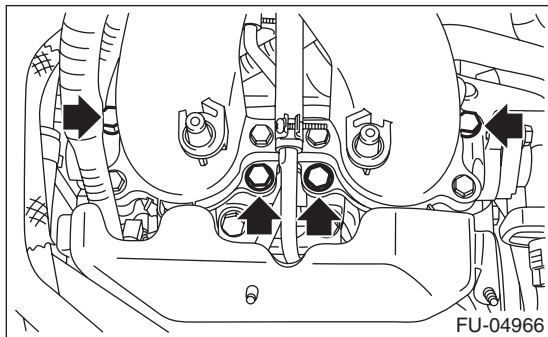
(3) Insert the back side of ST into the quick connector and push ST in the direction of arrow mark to disconnect the fuel return hose.



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



37) Remove the intake manifold from cylinder head.



## B: INSTALLATION

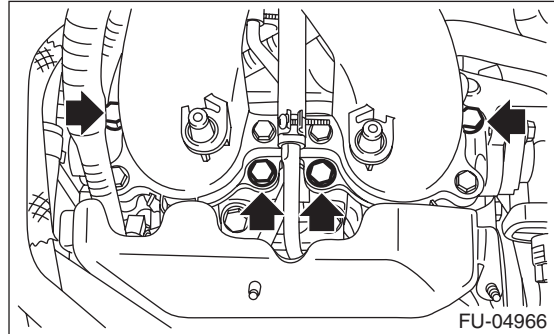
1) Install the intake manifold onto cylinder heads.

NOTE:

Use a new gasket.

**Tightening torque:**

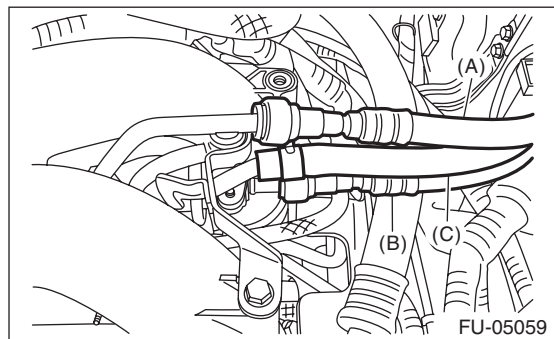
**25 N·m (2.5 kgf-m, 18.4 ft-lb)**



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

NOTE:

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



(A) Fuel delivery hose

(B) Fuel return hose

(C) Evaporation hose

3) Connect the connector (A) from oil level switch.

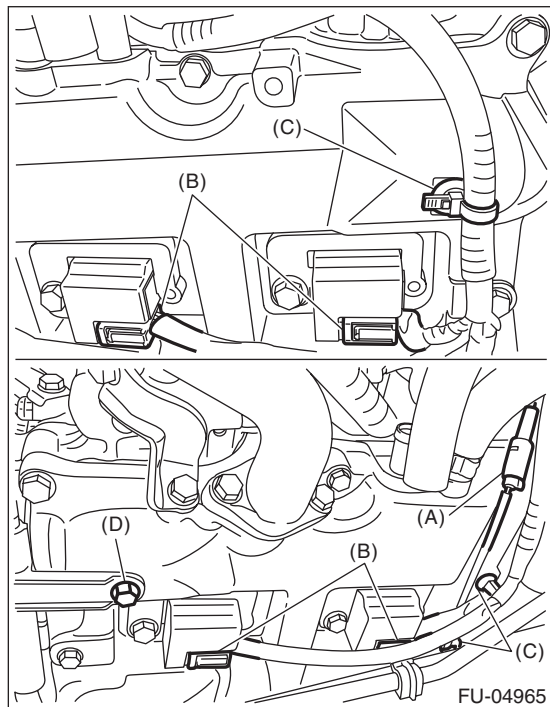
## Intake Manifold

### FUEL INJECTION (FUEL SYSTEMS)

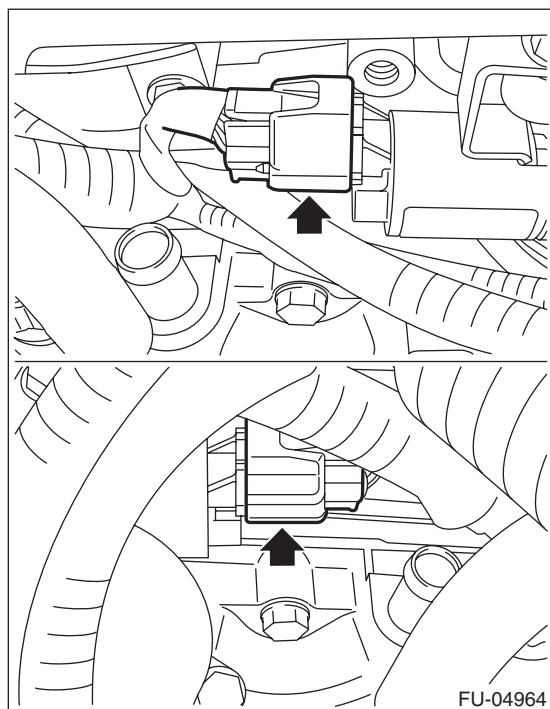
4) Connect the connector (B) to ignition coil, and secure the engine harness or oil level switch harness to the rocker cover with clips (C) and bolt (D).

**Tightening torque:**

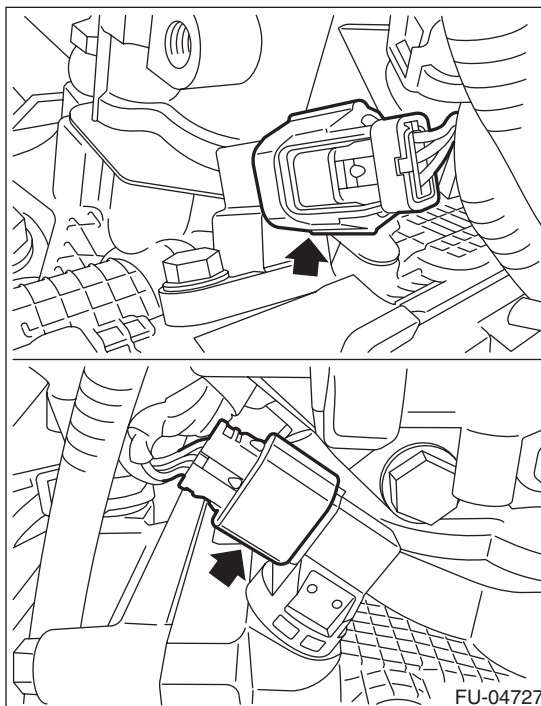
**6.4 N·m (0.7 kgf-m, 4.7 ft-lb)**



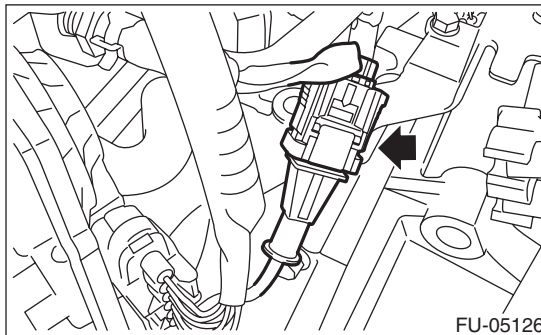
5) Connect the connector to the intake oil flow control solenoid valve.



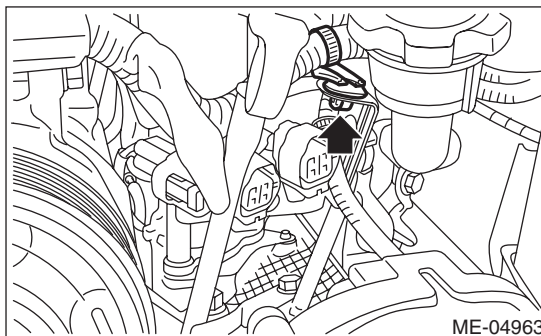
6) Connect the connector to the intake camshaft position sensor.



7) Connect the connector to the knock sensor.



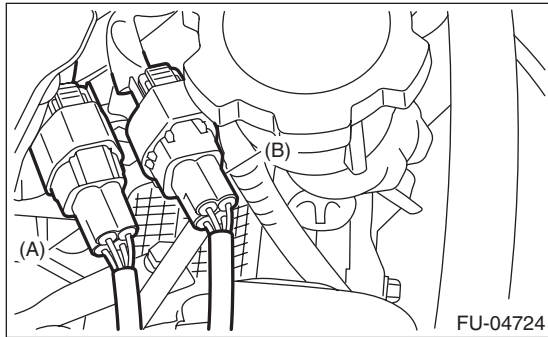
8) Secure the generator cord to the intake manifold protector LH with a clip.



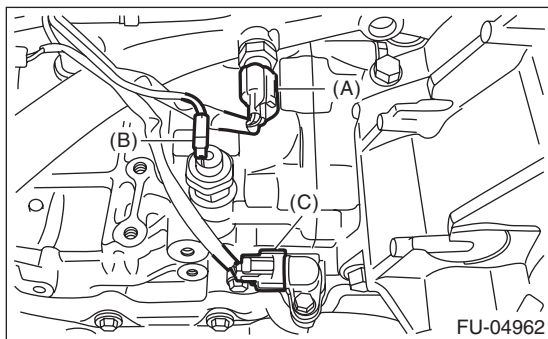
# Intake Manifold

## FUEL INJECTION (FUEL SYSTEMS)

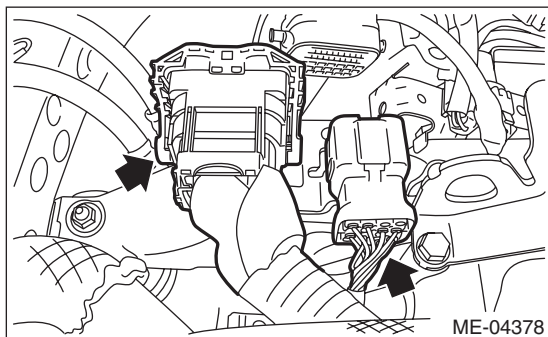
- 9) Connect the connectors to front oxygen (A/F) sensor (A) and rear oxygen sensor (B).



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

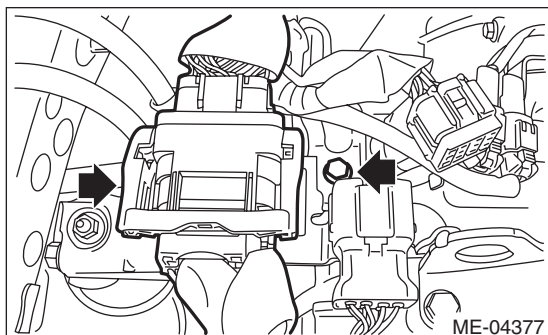


- 11) Install the engine harness connector to the engine rear hanger.

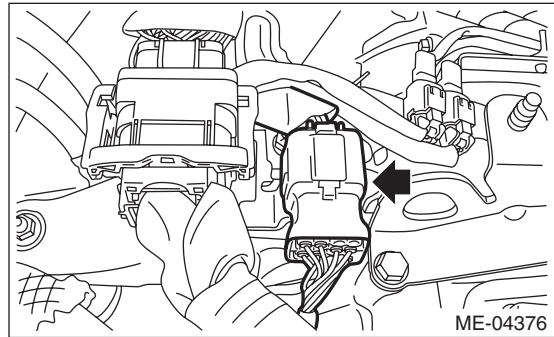


- 12) Connect the bulkhead harness connector to the engine harness connector (black), and install the bolt securing the bulkhead harness connector bracket.

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

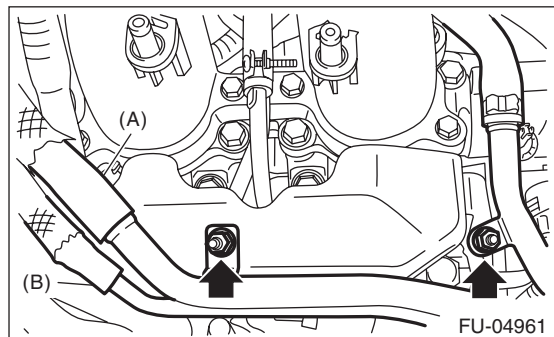


- 13) Connect the bulkhead harness connector to the engine harness connector (brown).



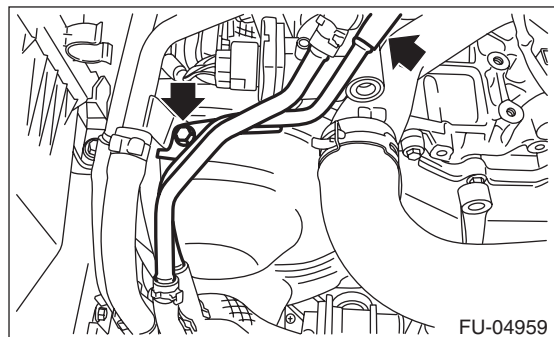
- 14) Install the nuts securing the PCV pipe to the intake manifold protector RH, and connect the vacuum hose (A) and vacuum control hose (B) to the PCV pipe.

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



- 15) Install the blow-by pipe to the intake manifold protector RH, and connect vacuum hose to the blow-by pipe.

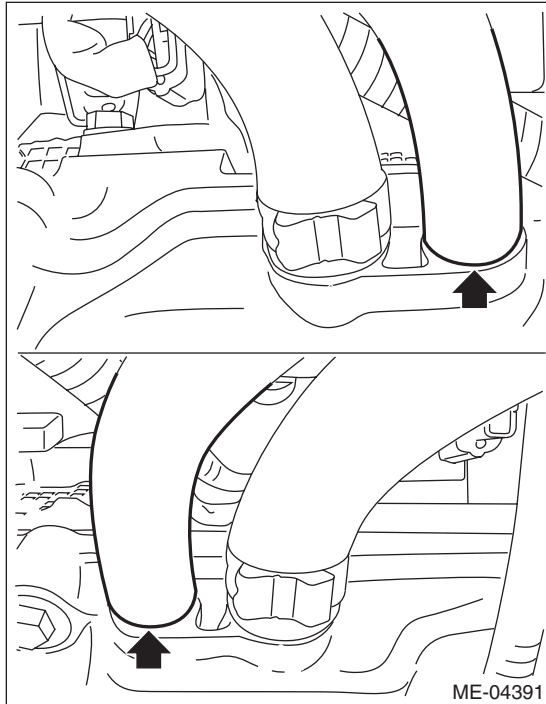
**Tightening torque:**  
**6.4 N·m (0.7 kgf-m, 4.7 ft-lb)**



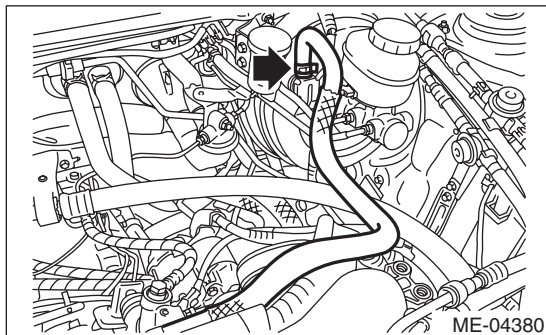
## Intake Manifold

### FUEL INJECTION (FUEL SYSTEMS)

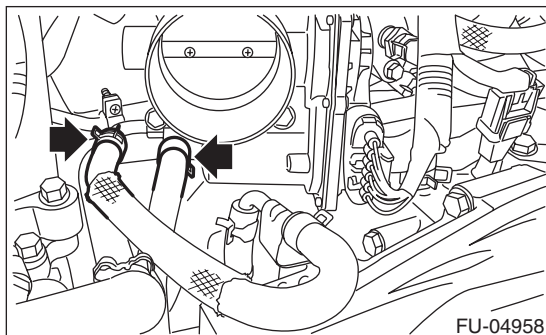
- 16) Connect the vacuum hose to the rocker cover.



- 17) Connect the brake booster vacuum hose.



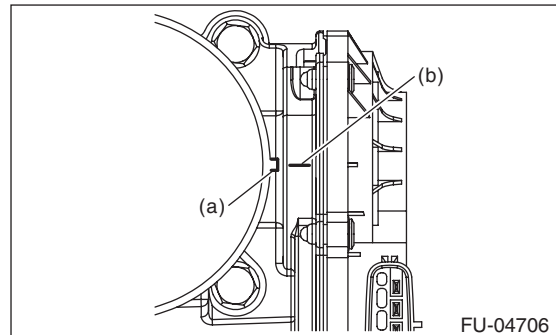
- 18) Connect the preheater hoses to the throttle body.



- 19) Install the intake duct to the throttle body, and install the bolts which secure the engine harness and PCV pipe to the intake manifold.

#### NOTE:

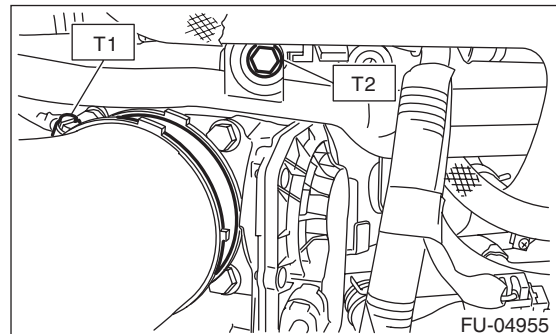
When installing the intake duct to the throttle body, align the protrusion (a) on the intake duct to the installation position mark (b) on the throttle body to install.



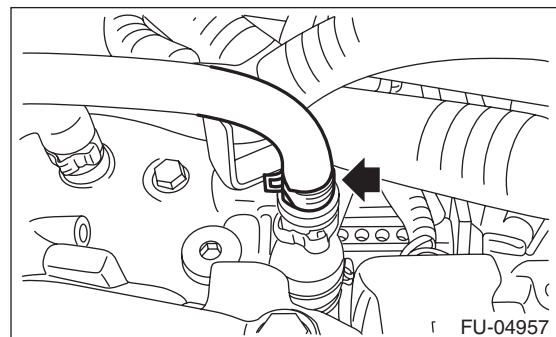
#### Tightening torque:

**T1: 3 N·m (0.3 kgf-m, 2.2 ft-lb)**

**T2: 6.4 N·m (0.7 kgf-m, 4.7 ft-lb)**



- 20) Connect the vacuum hose to PCV valve.



- 21) Install the A/C pressure hoses to A/C compressor. <Ref. to AC-68, INSTALLATION, Hose and Pipe.>

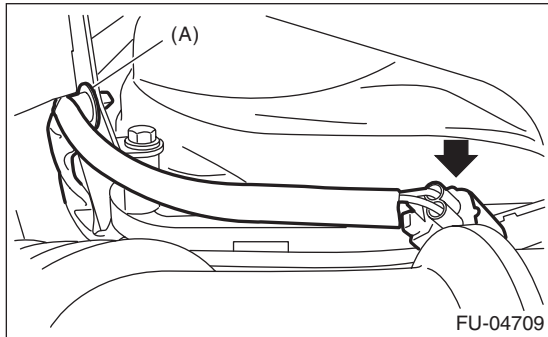
- 22) Install the intercooler. <Ref. to IN(H4DOTC)-18, INSTALLATION, Intercooler.>

- 23) Install the air intake duct. <Ref. to IN(H4DOTC)-12, INSTALLATION, Air Intake Duct.>

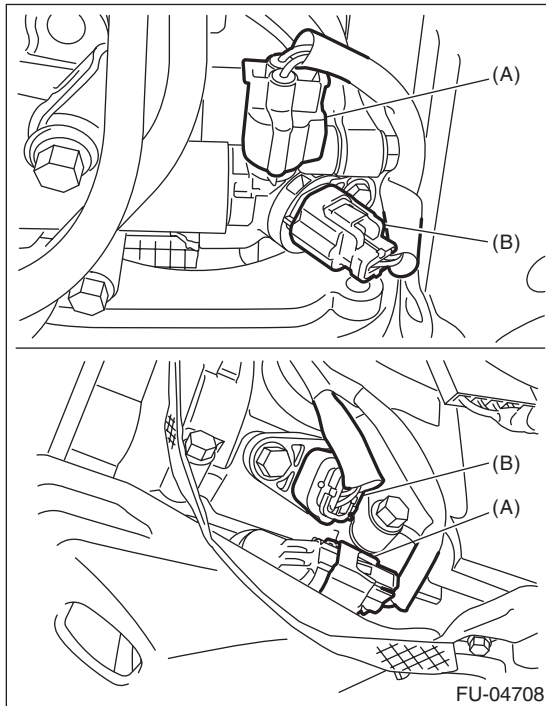


24) Lift up the vehicle.

25) Connect the connectors to the wastegate control solenoid valve, and secure the engine harness with clip (A).



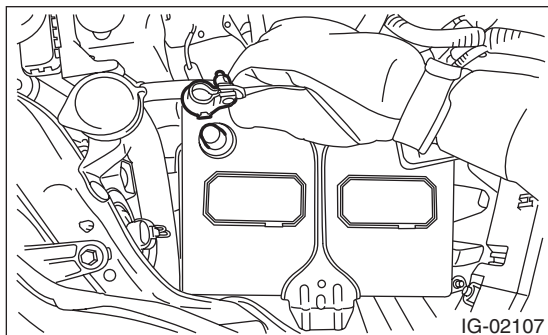
26) Connect the connectors to exhaust oil flow control solenoid valve (A) and exhaust camshaft position sensor (B).



27) Install the under cover. <Ref. to EI-35, INSTALLATION, Front Under Cover.>

28) Lower the vehicle.

29) Connect the battery ground terminal.



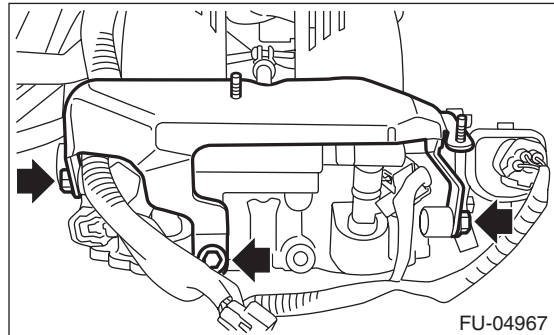
30) Fill engine coolant. <Ref. to CO(H4DOTC)-14, FILLING OF ENGINE COOLANT, REPLACEMENT, Engine Coolant.>

31) Charge the A/C system with refrigerant. <Ref. to AC-21, PROCEDURE, Refrigerant Charging Procedure.>

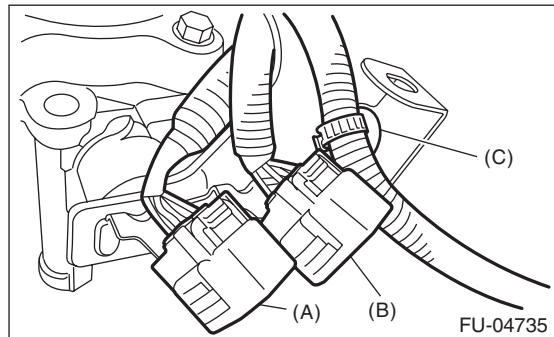
32) Install the collector cover.

## C: DISASSEMBLY

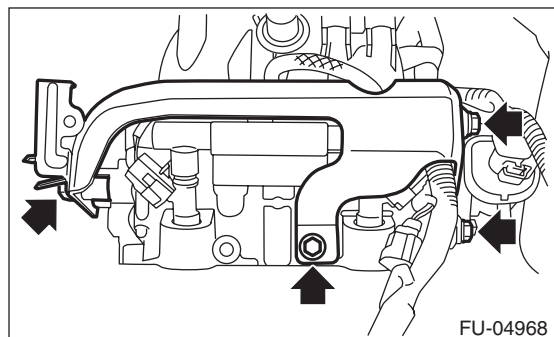
1) Remove the intake manifold protector RH from intake manifold.



2) Disconnect front oxygen (A/F) sensor connector (A) and rear oxygen sensor connector (B) from the intake manifold protector LH, and also remove clip (C) which holds the engine harness.



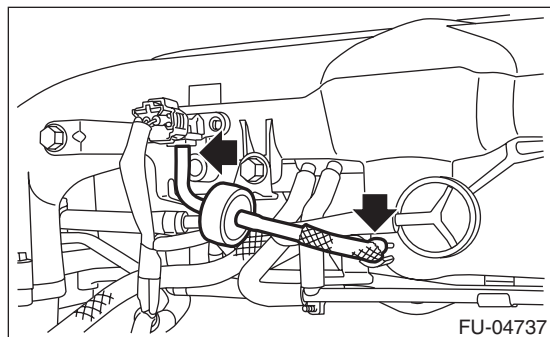
3) Remove the engine ground terminal from the intake manifold protector LH, and remove the intake manifold protector LH from the intake manifold.



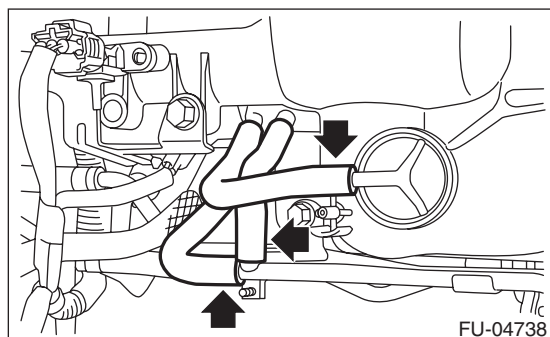
## Intake Manifold

### FUEL INJECTION (FUEL SYSTEMS)

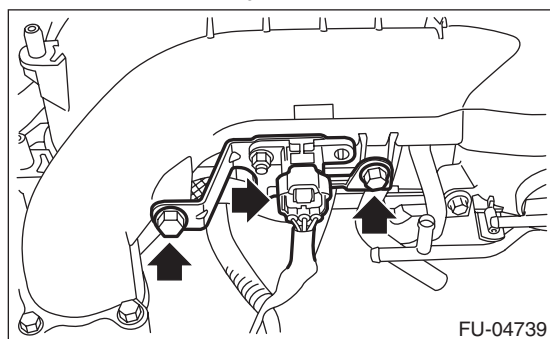
4) Remove the filter assembly.



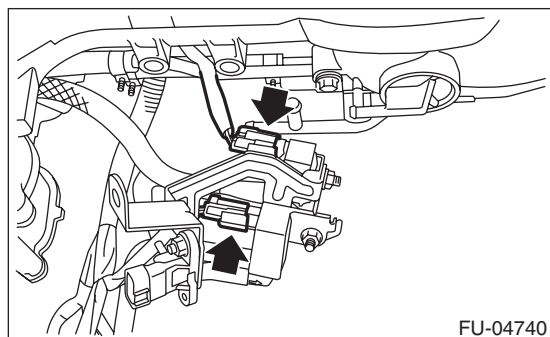
5) Disconnect the vacuum hose from the intake manifold and fuel delivery pipe.



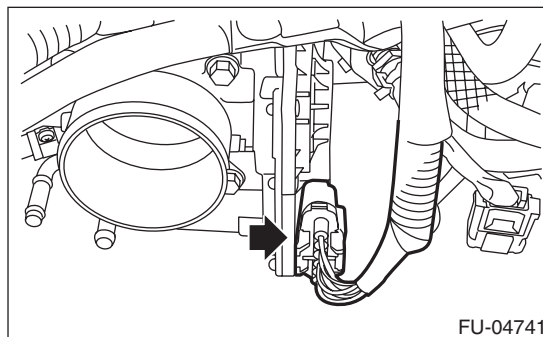
6) Disconnect the connector from the manifold absolute pressure sensor, and remove the solenoid valve bracket assembly from the intake manifold.



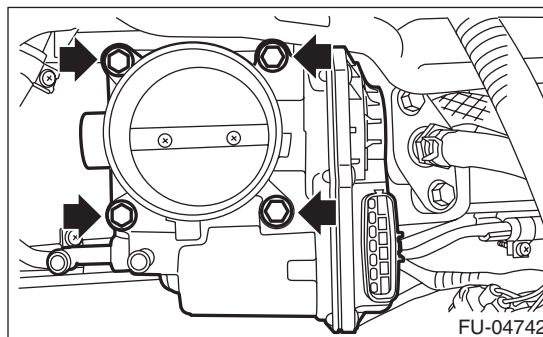
7) Disconnect the connectors from the purge control solenoid valves 1 and 2.



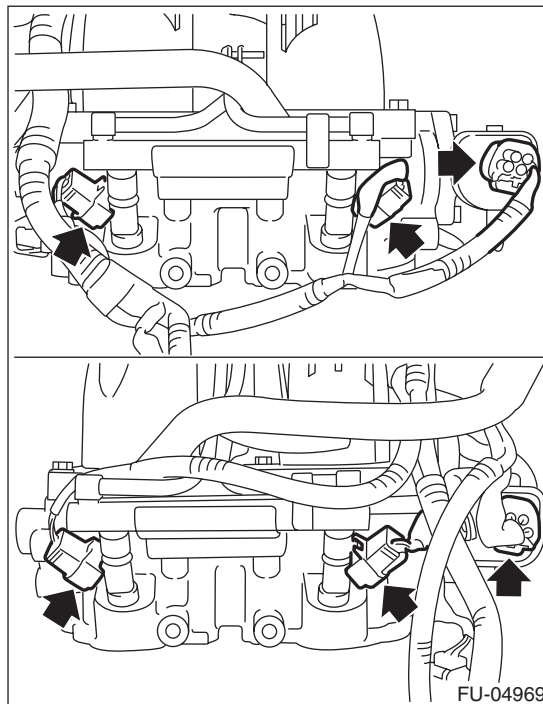
8) Disconnect the connectors from the throttle position sensor.



9) Remove the throttle body from the intake manifold.



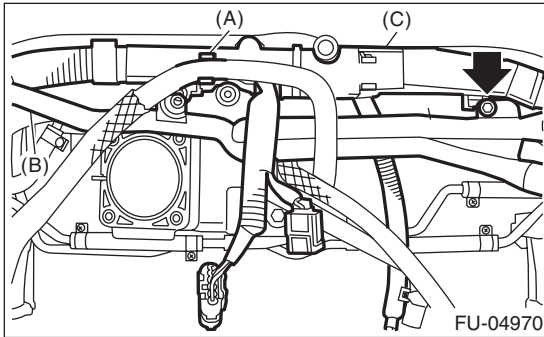
10) Disconnect the connector from the fuel injector and tumble generator valve assembly.



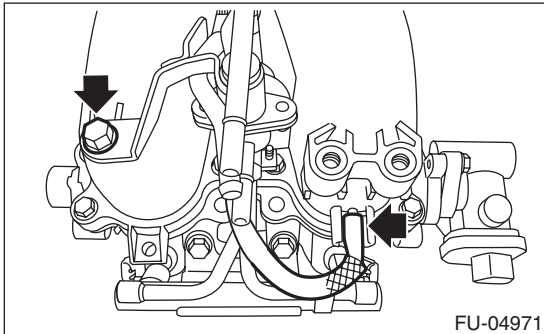
# Intake Manifold

## FUEL INJECTION (FUEL SYSTEMS)

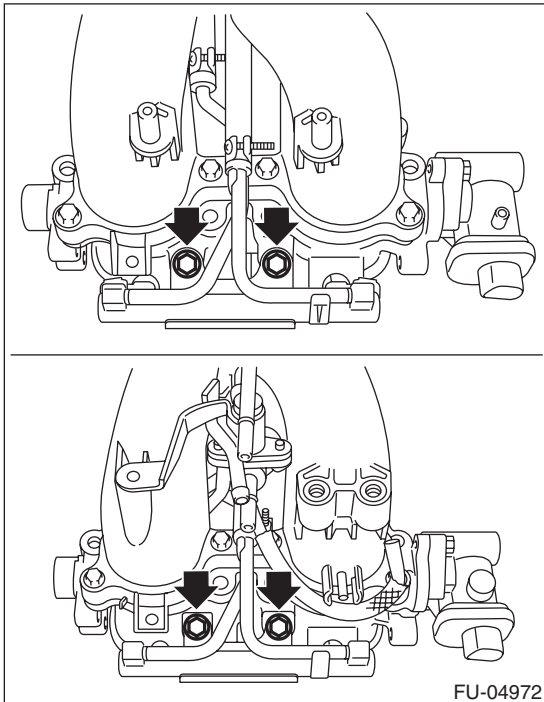
11) Remove the brake booster vacuum hose from the clip (A), and remove PCV pipe (B) and engine harness (C) from the intake manifold.



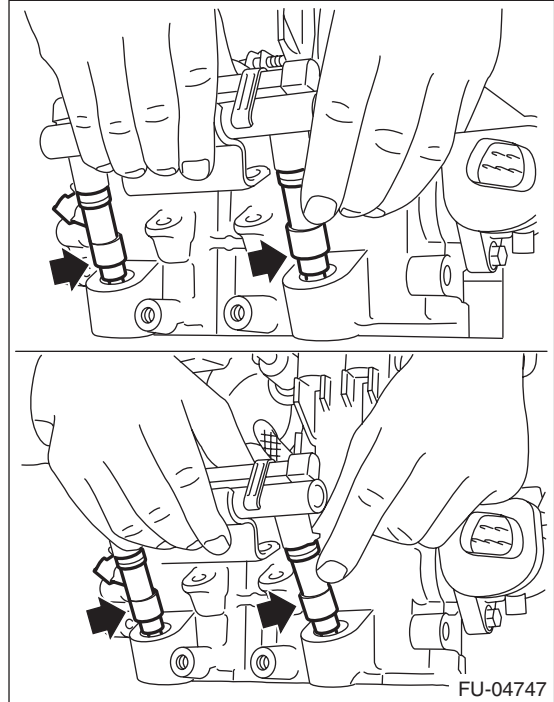
12) Remove the bolts which secure the fuel delivery pipe assembly to the intake manifold, and disconnect the pressure regulator vacuum hose from the intake manifold.



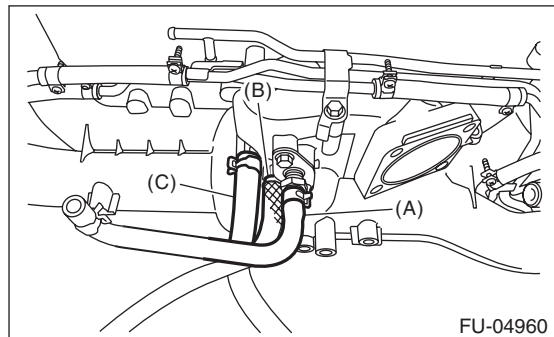
13) Remove the bolts which hold fuel pipe onto intake manifold.



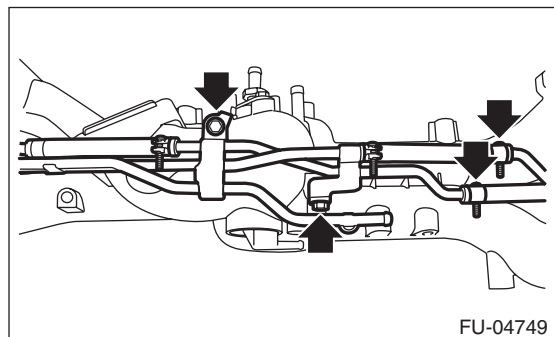
14) Remove the fuel injector.



15) Disconnect vacuum hose (A), vacuum control hose (B) and brake booster vacuum hose (C) from the intake manifold.



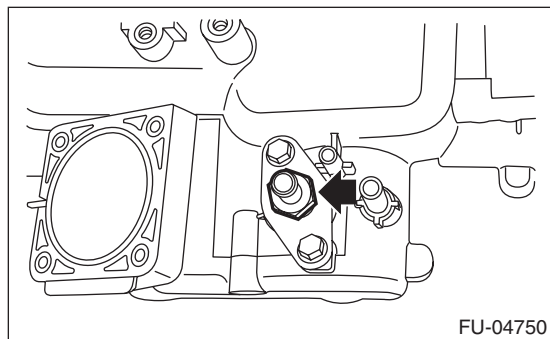
16) Remove the bolts which secure the fuel delivery pipe to the intake manifold, loosen the clamps which hold the fuel hose to the fuel delivery pipe, and remove the fuel delivery pipe and fuel pipe.



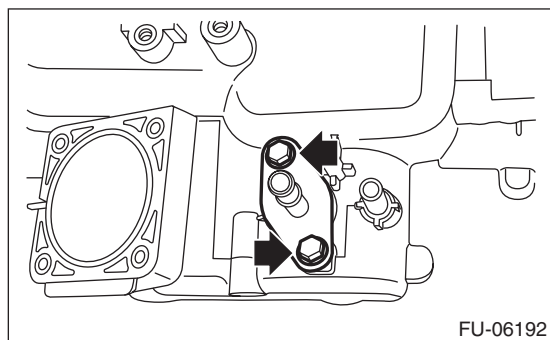
## Intake Manifold

### FUEL INJECTION (FUEL SYSTEMS)

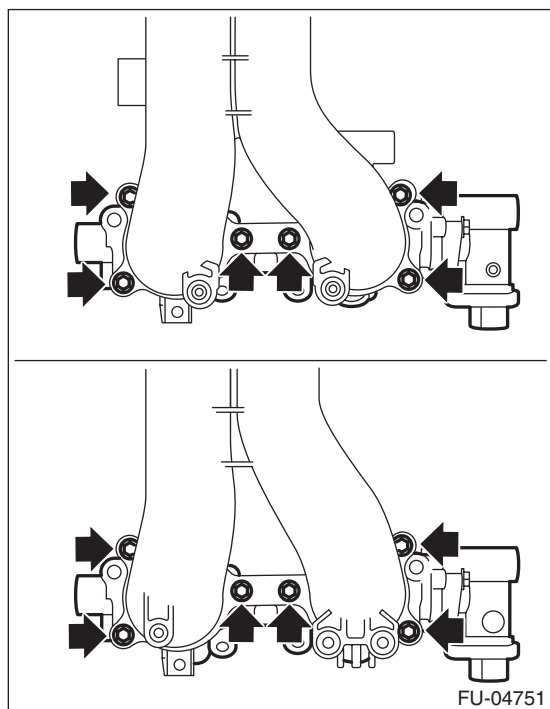
- 17) Remove the nipple from the intake manifold.  
(except for model with integrated plate)



- 18) Remove the nipple from the intake manifold.  
(model with integrated plate)



- 19) Remove the tumble generator valve assembly from the intake manifold.



## D: ASSEMBLY

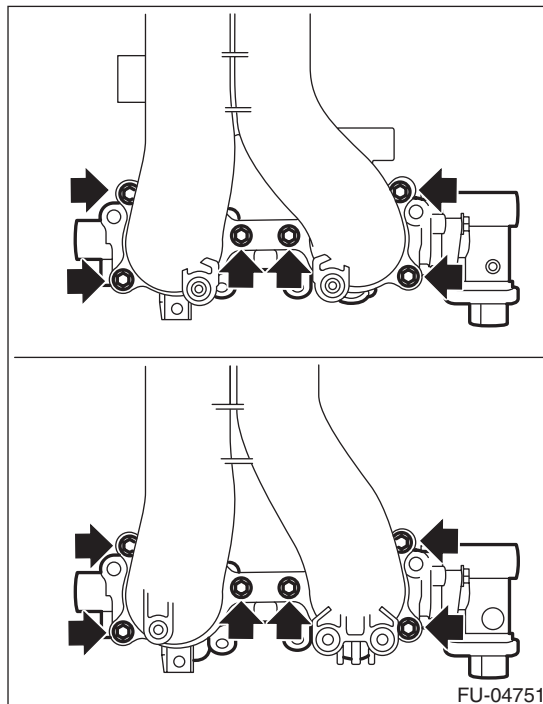
- 1) Install the tumble generator valve assembly onto intake manifold.

NOTE:

Use new O-rings.

**Tightening torque:**

**8.3 N·m (0.8 kgf-m, 6.1 ft-lb)**



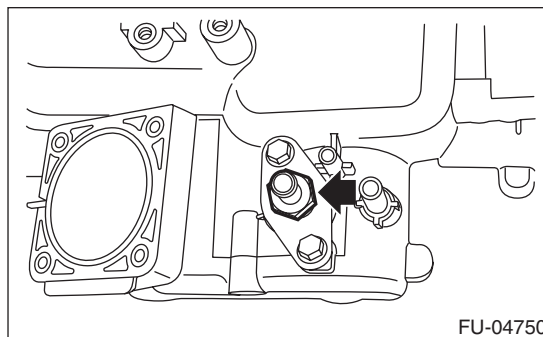
- 2) Apply liquid gasket to the nipple threads, and install the nipple to the intake manifold. (except for model with integrated plate)

**Liquid gasket:**

**THREE BOND 1105 (Part No. 004403010) or equivalent**

**Tightening torque:**

**23 N·m (2.3 kgf-m, 17.0 ft-lb)**





# Intake Manifold

## FUEL INJECTION (FUEL SYSTEMS)

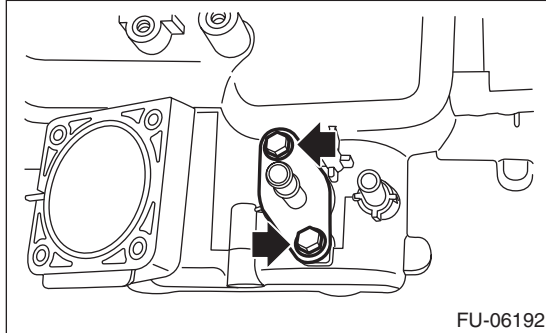
3) Install the nipple to the intake manifold. (model with integrated plate)

NOTE:

Use new O-rings.

**Tightening torque:**

**7.8 N·m (0.8 kgf-m, 5.8 ft-lb)**

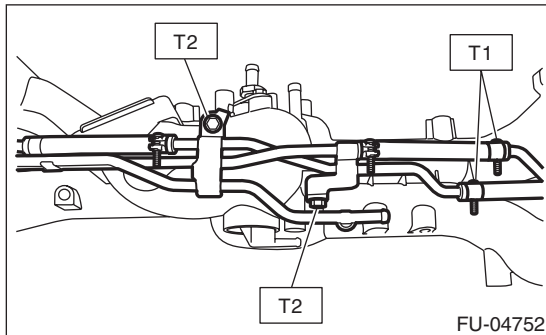


4) Set the fuel delivery pipe and fuel pipe, tighten the clamps which hold the fuel hose to the fuel delivery pipe, and install the fuel delivery pipe to the intake manifold.

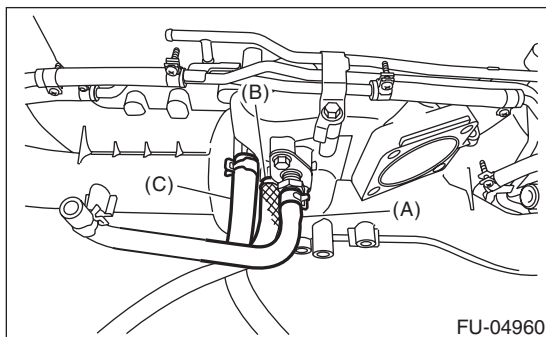
**Tightening torque:**

**T1: 1.25 N·m (0.1 kgf-m, 0.9 ft-lb)**

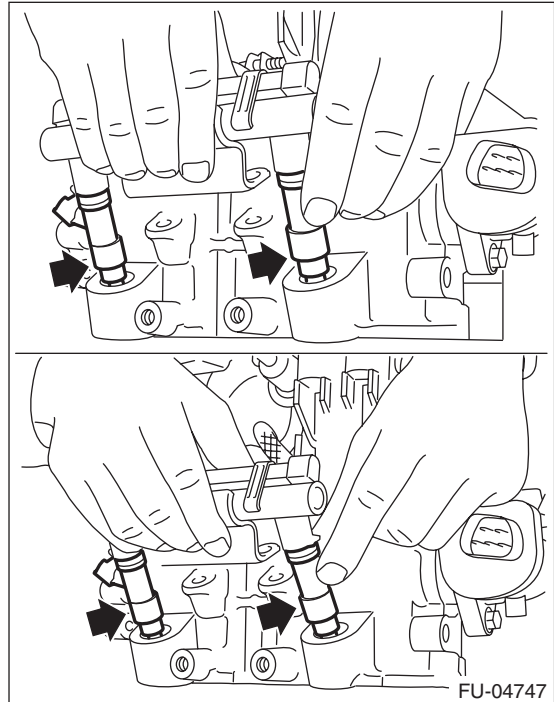
**T2: 6.4 N·m (0.7 kgf-m, 4.7 ft-lb)**



5) Connect vacuum hose (A), vacuum control hose (B) and brake booster vacuum hose (C) to the intake manifold.



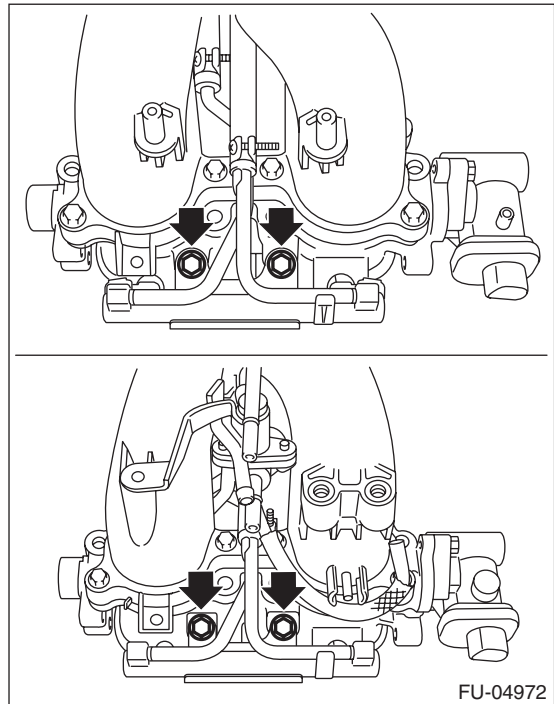
6) Install the fuel injector.



7) Install the bolts which secure fuel pipe to the intake manifold.

**Tightening torque:**

**19 N·m (1.9 kgf-m, 14.0 ft-lb)**



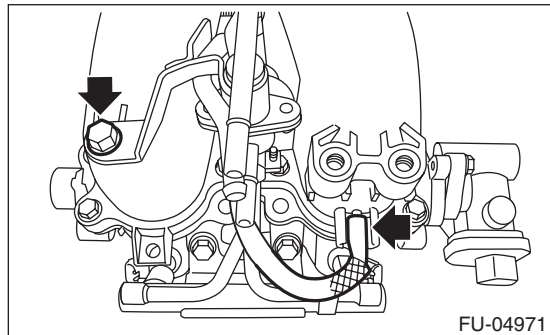
## Intake Manifold

### FUEL INJECTION (FUEL SYSTEMS)

8) Install the bolts which secure fuel delivery pipe to the intake manifold, and connect the pressure regulator vacuum hose to the intake manifold.

**Tightening torque:**

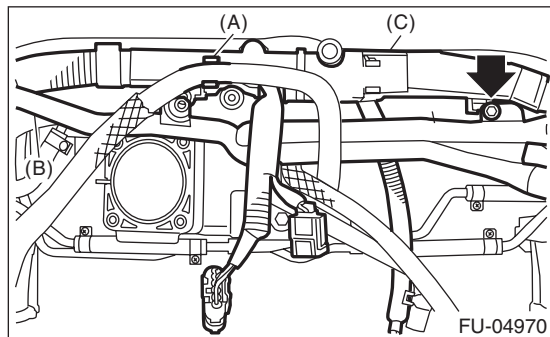
**6.4 N·m (0.7 kgf-m, 4.7 ft-lb)**



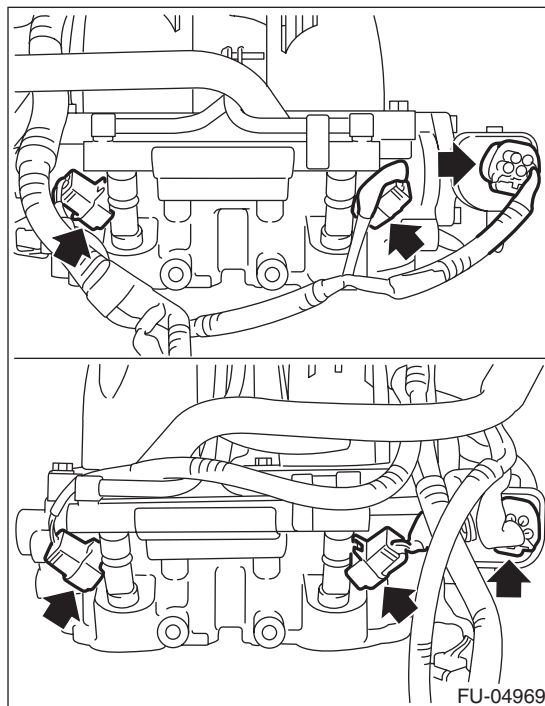
9) Install PCV pipe (B) and engine harness (C) to the intake manifold, and install the brake booster vacuum hose to the clip (A).

**Tightening torque:**

**6.4 N·m (0.7 kgf-m, 4.7 ft-lb)**



10) Connect the connector to the fuel injector and the tumble generator valve assembly.



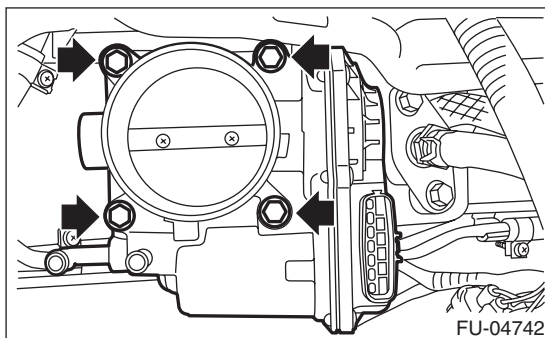
11) Install the throttle body to the intake manifold.

**NOTE:**

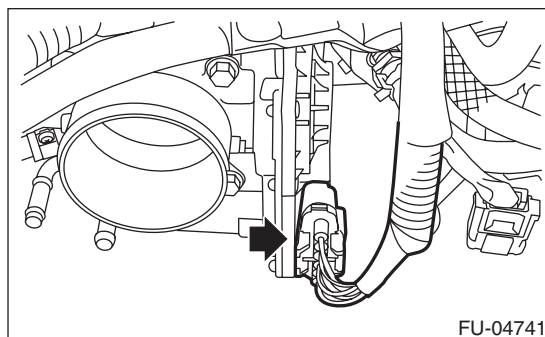
Use new O-rings.

**Tightening torque:**

**8 N·m (0.8 kgf-m, 5.9 ft-lb)**



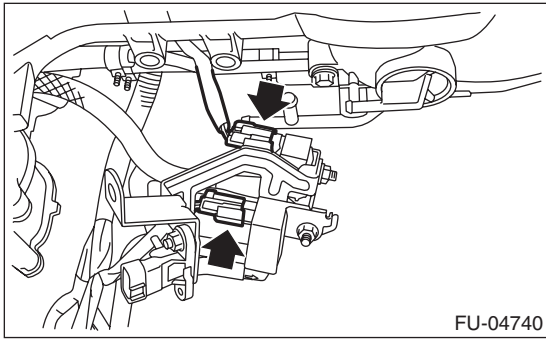
12) Connect the connector to the throttle position sensor.



# Intake Manifold

## FUEL INJECTION (FUEL SYSTEMS)

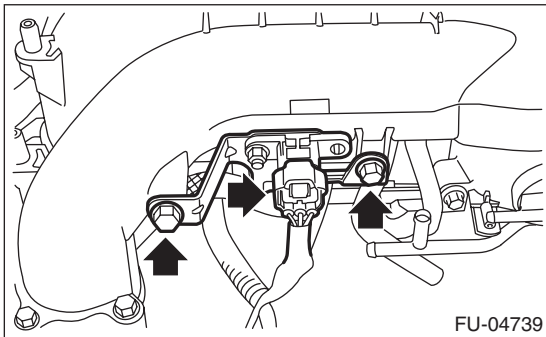
13) Connect the connectors to the purge control solenoid valves 1 and 2.



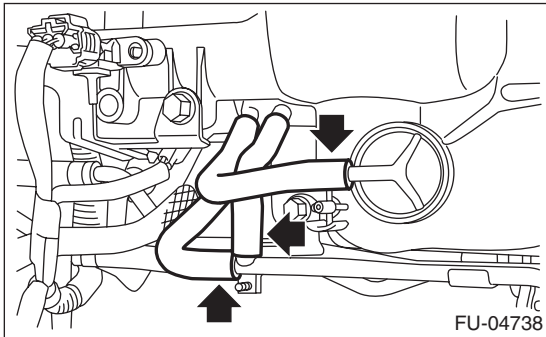
14) Install the solenoid valve bracket assembly to the intake manifold, and connect the connector to the manifold absolute pressure sensor.

### **Tightening torque:**

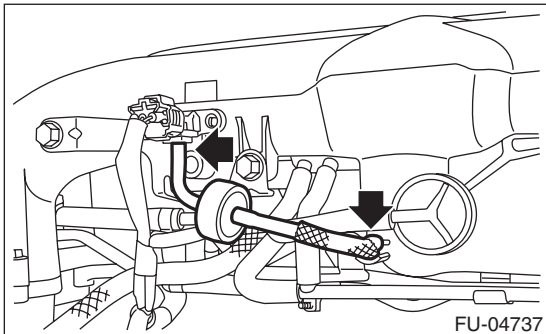
**19 N·m (1.9 kgf-m, 14.0 ft-lb)**



15) Connect the vacuum hose to the intake manifold and fuel delivery pipe.



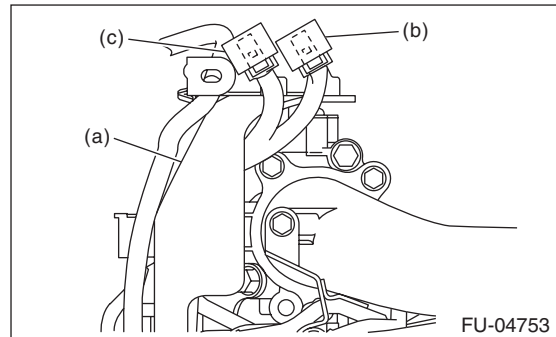
16) Install the filter assembly.



17) Install the intake manifold protector LH to the intake manifold, and install the engine ground terminal to the intake manifold protector.

### **NOTE:**

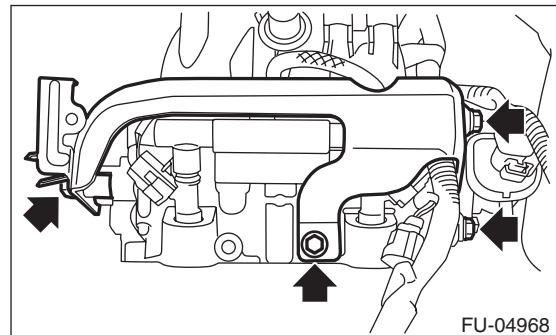
Route the from front oxygen (A/F) sensor connector and rear oxygen sensor connector inside the intake manifold protector, as shown in the figure.



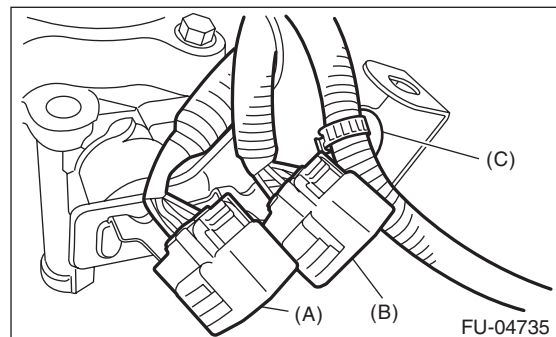
- (a) Intake manifold protector
- (b) Front oxygen (A/F) sensor connector
- (c) Rear oxygen sensor connector

### **Tightening torque:**

**19 N·m (1.9 kgf-m, 14.0 ft-lb)**



18) Install front oxygen (A/F) sensor connector (A) and rear oxygen sensor connector (B) to the intake manifold protector LH, and also install clip (C) which holds the engine harness.



## Intake Manifold

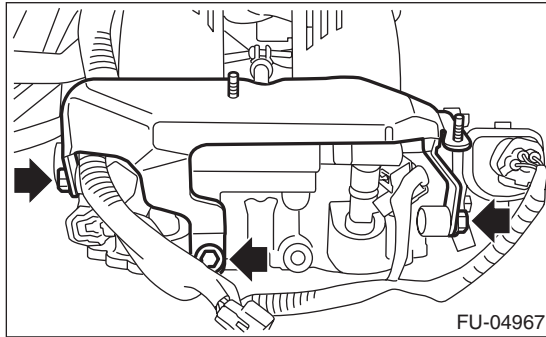
### FUEL INJECTION (FUEL SYSTEMS)

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19) Install the intake manifold protector RH to the intake manifold.

**Tightening torque:**

**19 N·m (1.9 kgf-m, 14.0 ft-lb)**



### E: INSPECTION

- 1) Check that the intake manifold and fuel pipe have no deformation, cracks and other damages.
- 2) Check that the hose has no cracks, damage or loose part.