

**ENGINE2 SECTION**

This service manual has been prepared to provide SUBARU service personnel with the necessary information and data for the correct maintenance and repair of SUBARU vehicles.

This manual includes the procedures for maintenance, disassembling, reassembling, inspection and adjustment of components and diagnostics for guidance of experienced mechanics.

Please peruse and utilize this manual fully to ensure complete repair work for satisfying our customers by keeping their vehicle in optimum condition. When replacement of parts during repair work is needed, be sure to use SUBARU genuine parts.

All information, illustration and specifications contained in this manual are based on the latest product information available at the time of publication approval.

|                                                         |                       |
|---------------------------------------------------------|-----------------------|
| <b>FUEL INJECTION (FUEL SYSTEMS)</b>                    | <b>FU(SOHCw/oOBD)</b> |
| <b>EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)</b> | <b>EC(SOHCw/oOBD)</b> |
| <b>EXHAUST</b>                                          | <b>EX(SOHCw/oOBD)</b> |
| <b>IGNITION</b>                                         | <b>IG(SOHCw/oOBD)</b> |
| <b>ENGINE (DIAGNOSTICS)</b>                             | <b>EN(SOHCw/oOBD)</b> |
| <b>FUEL INJECTION (FUEL SYSTEMS)</b>                    | <b>FU(DOHC TURBO)</b> |
| <b>EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)</b> | <b>EC(DOHC TURBO)</b> |
| <b>INTAKE (INDUCTION)</b>                               | <b>IN(DOHC TURBO)</b> |
| <b>MECHANICAL</b>                                       | <b>ME(DOHC TURBO)</b> |
| <b>EXHAUST</b>                                          | <b>EX(DOHC TURBO)</b> |
| <b>IGNITION</b>                                         | <b>IG(DOHC TURBO)</b> |
| <b>ENGINE (DIAGNOSTICS)</b>                             | <b>EN(DOHC TURBO)</b> |

# FUEL INJECTION (FUEL SYSTEMS)

# *FU(SOHCw/oOBD)*

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# GENERAL DESCRIPTION

Fuel Injection (Fuel Systems)

## 1. General Description S165001

### A: SPECIFICATIONS S165001E49

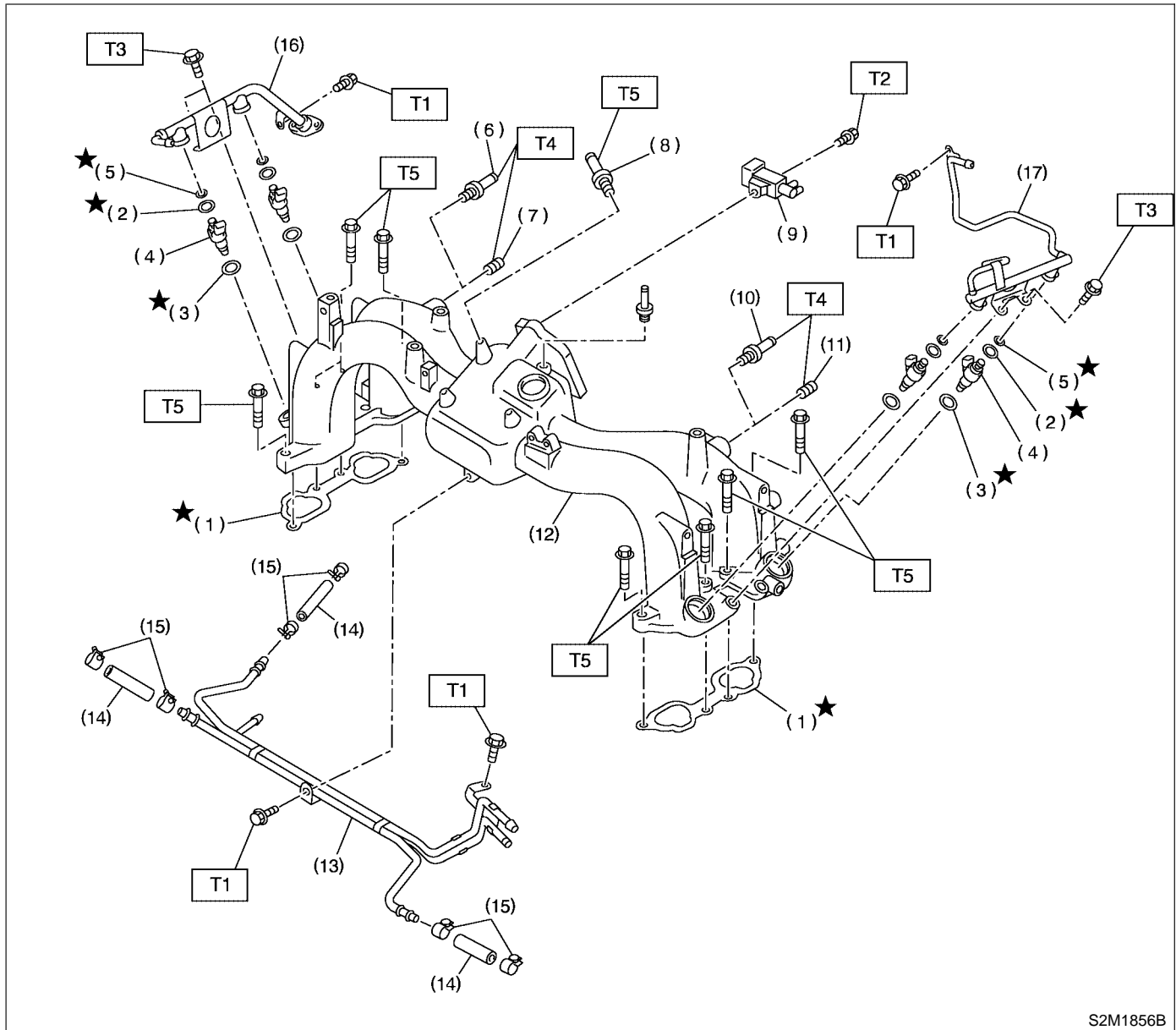
|             |                            |                                                                                                        |
|-------------|----------------------------|--------------------------------------------------------------------------------------------------------|
| Model       |                            |                                                                                                        |
| Fuel tank   | Capacity                   | 60 ℓ (15.9 US gal, 13.2 Imp gal)                                                                       |
|             | Location                   | Under rear seat                                                                                        |
| Fuel pump   | Type                       | Impeller                                                                                               |
|             | Shutoff discharge pressure | 373 — 677 kPa (3.8 — 6.9 kg/cm <sup>2</sup> , 54 — 98 psi)                                             |
|             | Discharge flow             | More than 65 ℓ (17.2 US gal, 14.3 Imp gal)/h<br>[12 V at 300 kPa (3.06 kg/cm <sup>2</sup> , 43.5 psi)] |
| Fuel filter |                            | Cartridge type                                                                                         |

## B: COMPONENT

S165001A05

### 1. INTAKE MANIFOLD

S165001A0501



S2M1856B

- |                                  |                            |
|----------------------------------|----------------------------|
| (1) Intake manifold gasket       | (10) Nipple (LHD models)   |
| (2) Insulator A                  | (11) Plug (RHD models)     |
| (3) Insulator B                  | (12) Intake manifold       |
| (4) Fuel injector                | (13) Fuel pipe ASSY        |
| (5) O-ring                       | (14) Fuel hose             |
| (6) Nipple (RHD models)          | (15) Clip                  |
| (7) Plug (LHD models)            | (16) Fuel injector pipe RH |
| (8) PCV valve                    | (17) Fuel injector pipe LH |
| (9) Purge control solenoid valve |                            |

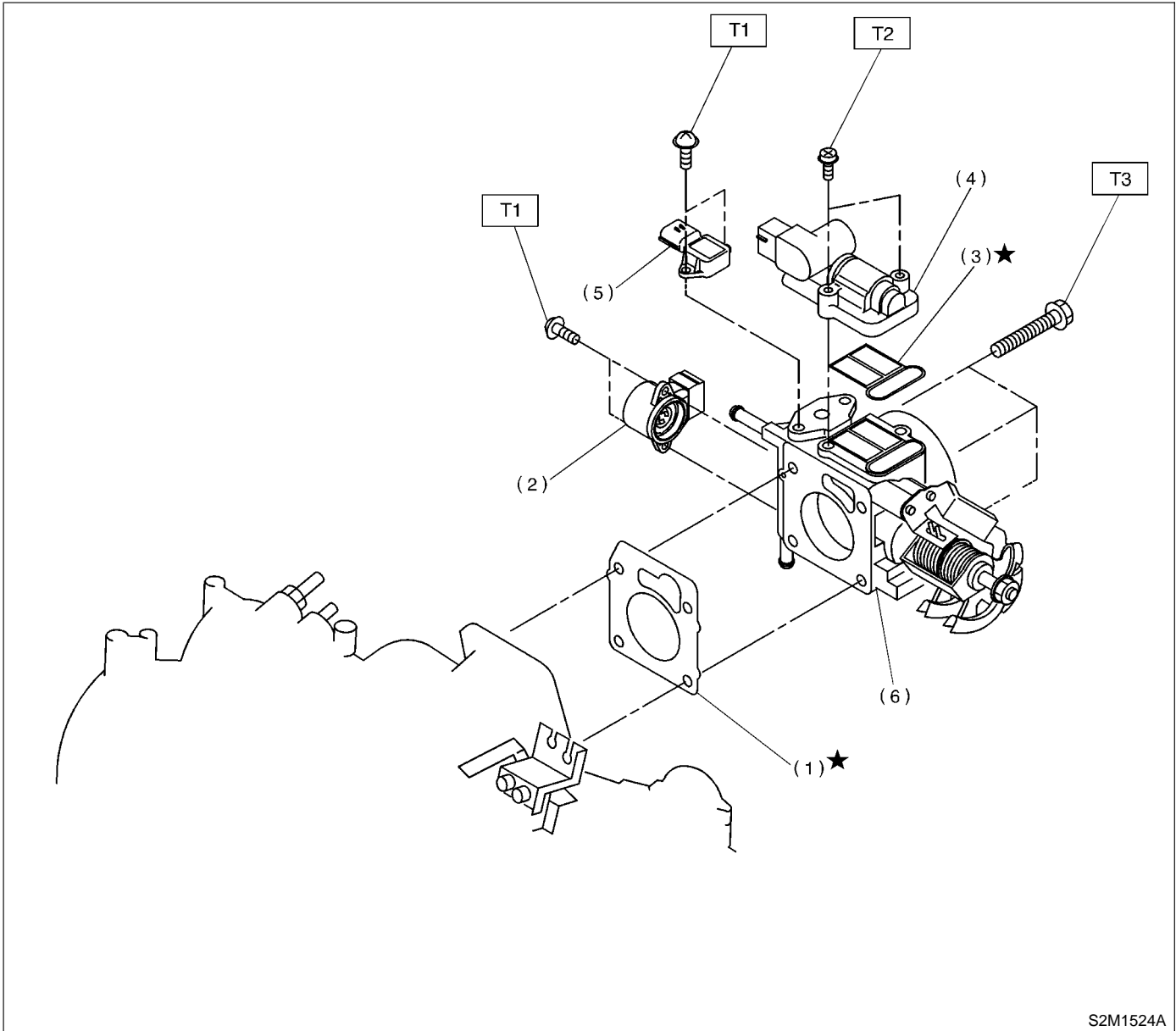
**Tightening torque: N·m (kgf·m, ft·lb)**

- T1: 4.9 (0.5, 3.6)**  
**T2: 15.7 (1.6, 11.6)**  
**T3: 19 (1.9, 13.7)**  
**T4: 17 (1.7, 12)**  
**T5: 25 (2.5, 18.1)**

# GENERAL DESCRIPTION

Fuel Injection (Fuel Systems)

## 2. AIR INTAKE SYSTEM S165001A0502



- (1) Gasket
- (2) Throttle position sensor
- (3) Gasket
- (4) Idle air control solenoid valve
- (5) Pressure sensor
- (6) Throttle body

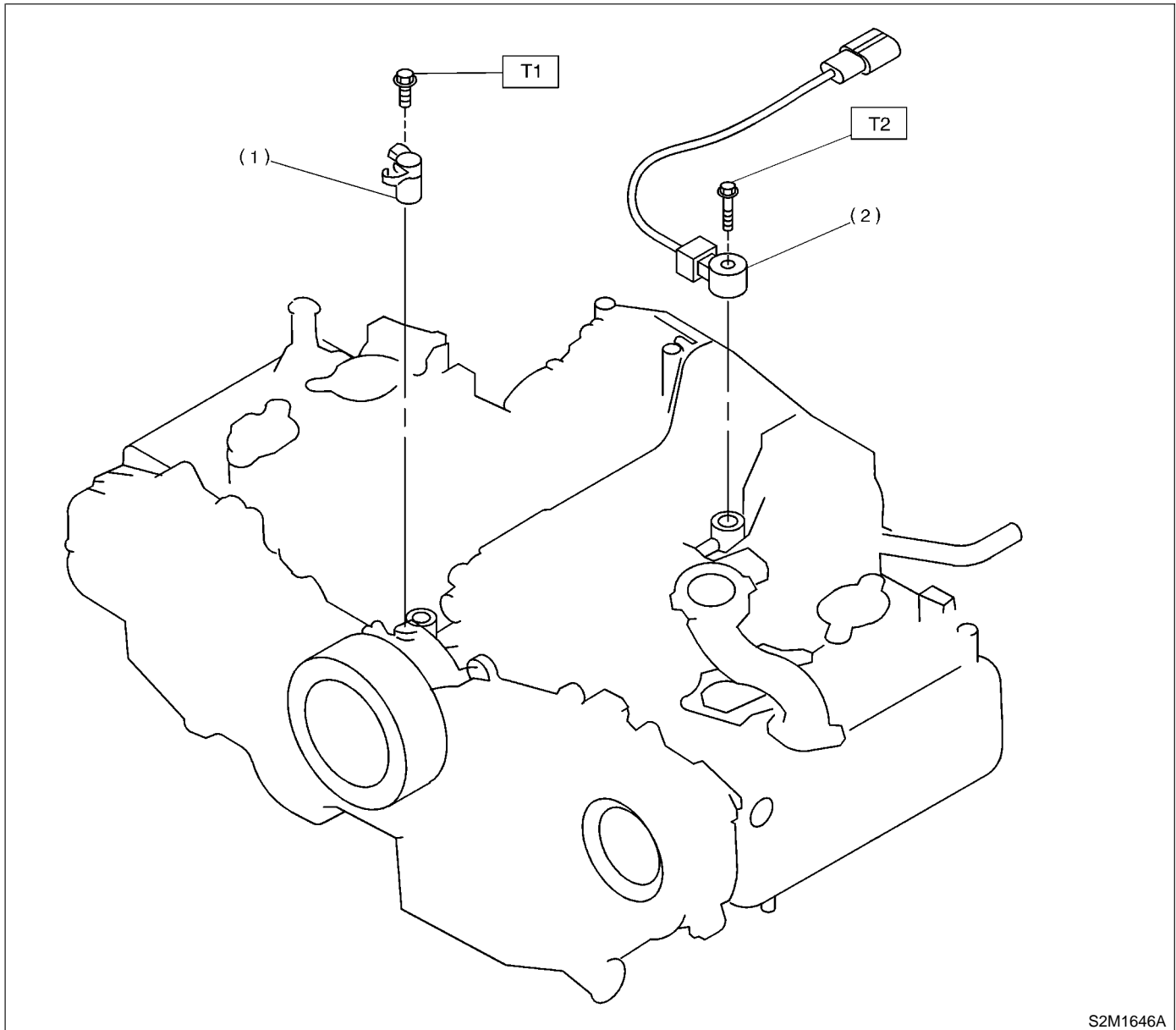
**Tightening torque: N·m (kgf-m, ft-lb)**

**T1: 2.0 (0.2, 1.4)**

**T2: 3.4 (0.35, 2.5)**

**T3: 22 (2.2, 15.9)**

## 3. CRANKSHAFT POSITION, CAMSHAFT POSITION AND KNOCK SENSORS S165001A0503



S2M1646A

(1) Crankshaft position sensor

(2) Knock sensor

**Tightening torque: N·m (kgf·m, ft·lb)**

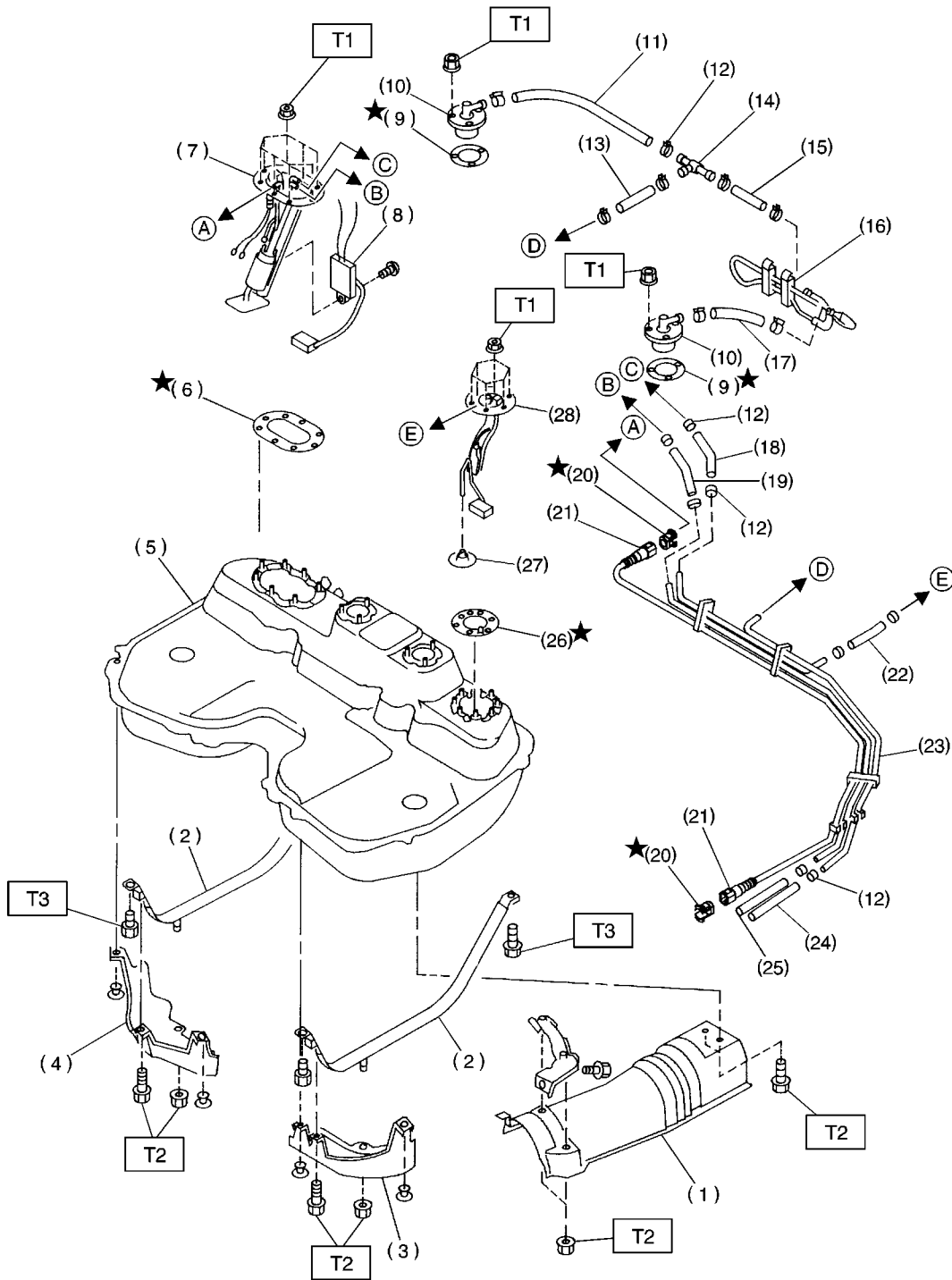
**T1: 6.4 (0.65, 4.7)**

**T2: 24 (2.4, 17)**

# GENERAL DESCRIPTION

Fuel Injection (Fuel Systems)

## 4. FUEL TANK S165001A0504



S2M0634A

# GENERAL DESCRIPTION

Fuel Injection (Fuel Systems)

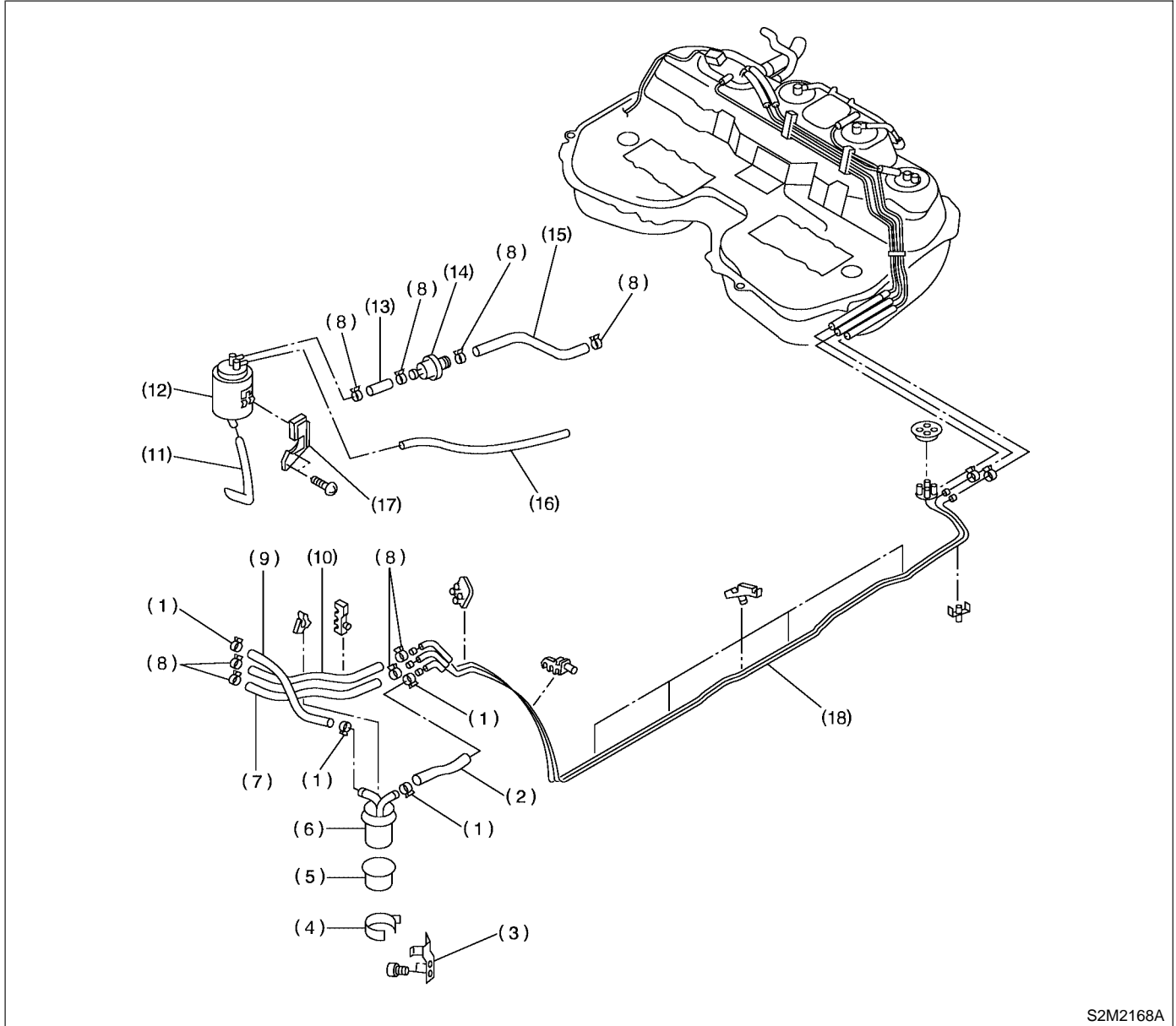
- 
- |                           |                            |                                                     |
|---------------------------|----------------------------|-----------------------------------------------------|
| (1) Heat sealed cover     | (13) Evaporation hose C    | (25) Fuel return hose B                             |
| (2) Fuel tank band        | (14) Joint pipe            | (26) Fuel sub level sensor gasket                   |
| (3) Protector LH          | (15) Evaporation hose B    | (27) Jet pump filter                                |
| (4) Protector RH          | (16) Evaporation pipe ASSY | (28) Fuel sub level sensor                          |
| (5) Fuel tank             | (17) Evaporation hose D    |                                                     |
| (6) Fuel pump gasket      | (18) Jet pump hose A       | <b><i>Tightening torque: N·m (kgf-m, ft-lb)</i></b> |
| (7) Fuel pump ASSY        | (19) Fuel return tube      | <b><i>T1: 4.4 (0.45, 3.3)</i></b>                   |
| (8) Fuel level sensor     | (20) Retainer              | <b><i>T2: 7.4 (0.75, 5.4)</i></b>                   |
| (9) Fuel cut valve gasket | (21) Quick connector       | <b><i>T3: 33 (3.4, 25)</i></b>                      |
| (10) Fuel cut valve       | (22) Jet pump hose B       |                                                     |
| (11) Evaporation hose A   | (23) Fuel pipe ASSY        |                                                     |
| (12) Clip                 | (24) Evaporation hose E    |                                                     |
-



# GENERAL DESCRIPTION

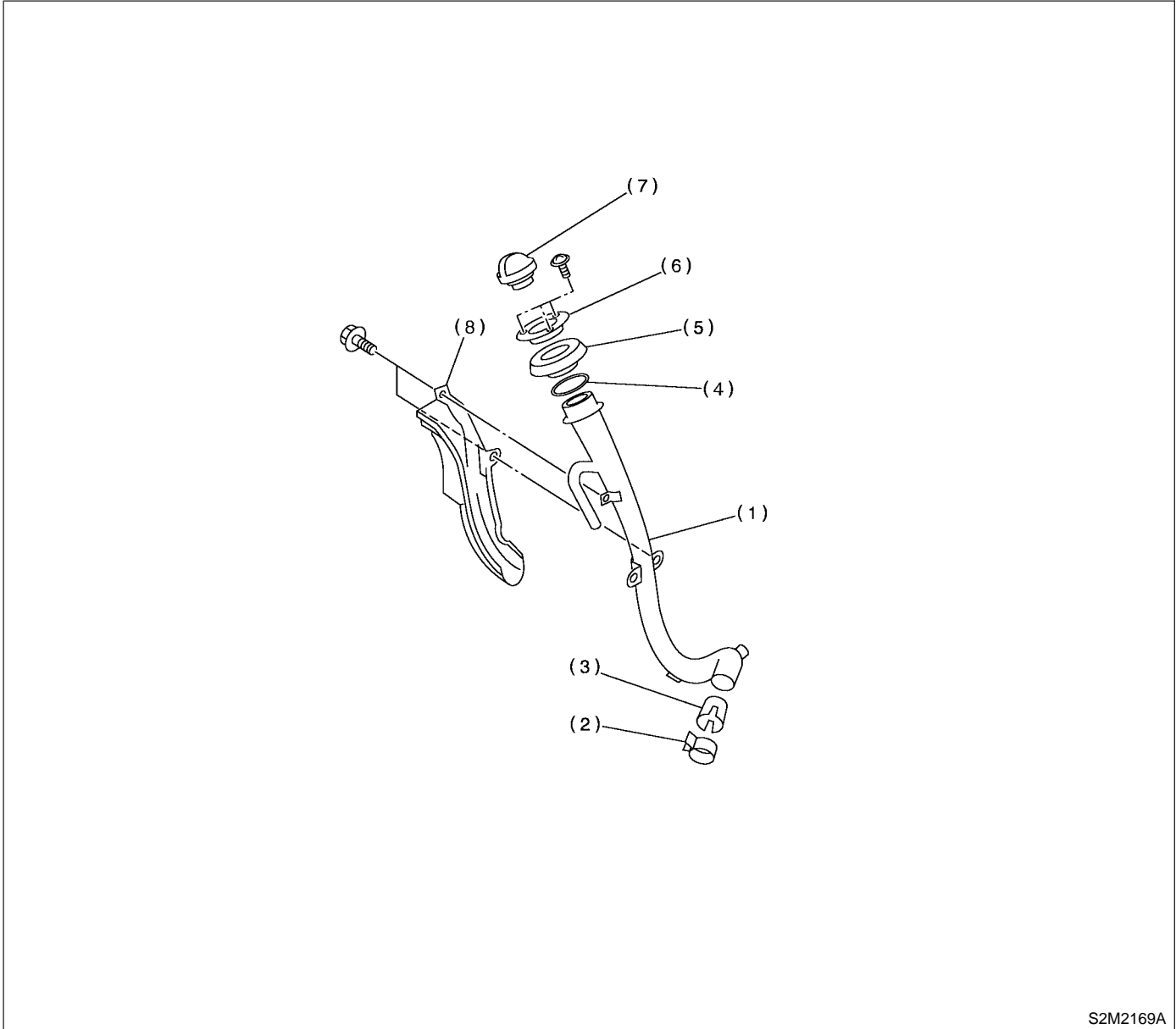
Fuel Injection (Fuel Systems)

## 5. FUEL LINE S165001A0505



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

## 6. FUEL FILLER PIPE S165001A0506



S2M2169A

- (1) Fuel filler pipe ASSY
- (2) Clamp
- (3) Fuel filler valve

- (4) Filler pipe packing
- (5) Filler ring A
- (6) Filler ring B

- (7) Filler cap
- (8) Filler pipe protector

# GENERAL DESCRIPTION

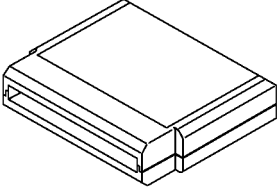

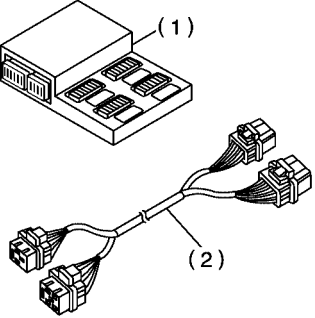
## Fuel Injection (Fuel Systems)

### C: CAUTION S165001A03

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

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

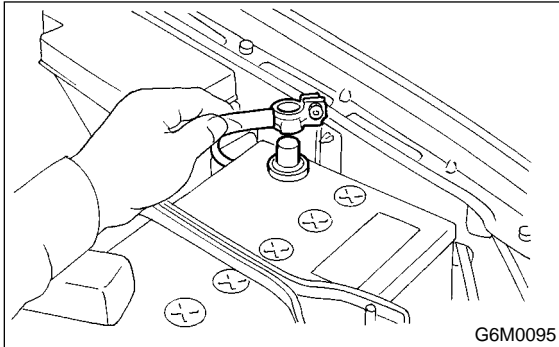
### D: PREPARATION TOOL S165001A17

| ILLUSTRATION                                                                                                                    | TOOL NUMBER                        | DESCRIPTION        | REMARKS                                                                                                                                                                                                                                                                            |
|---------------------------------------------------------------------------------------------------------------------------------|------------------------------------|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  <p style="text-align: center;">B2M3876</p>    | 24082AA150<br>(Newly adopted tool) | CARTRIDGE          | Troubleshooting for electrical systems.                                                                                                                                                                                                                                            |
|  <p style="text-align: center;">B2M3877</p>  | 22771AA030                         | SELECT MONITOR KIT | Troubleshooting for electrical systems. <ul style="list-style-type: none"> <li>● English: 22771AA030 (Without printer)</li> <li>● German: 22771AA070 (Without printer)</li> <li>● French: 22771AA080 (Without printer)</li> <li>● Spanish: 22771AA090 (Without printer)</li> </ul> |
|  <p style="text-align: center;">S2M2170A</p> | 498307600                          | CHECK BOARD KIT    | Troubleshooting for engine electrical system. <ul style="list-style-type: none"> <li>(1) CHECK BOARD: 498307610</li> <li>(2) CHECK BOARD ADAPTER: 498307620</li> </ul>                                                                                                             |

## 2. Throttle Body S165010

### A: REMOVAL S165010A18

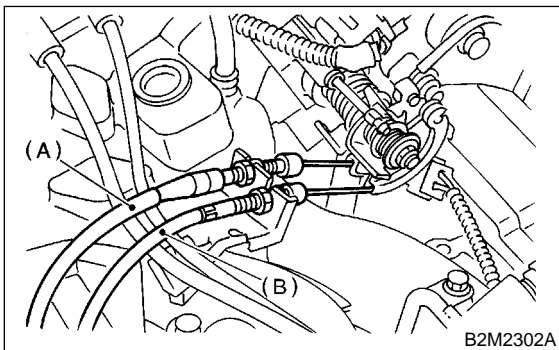
- 1) Disconnect battery ground cable.



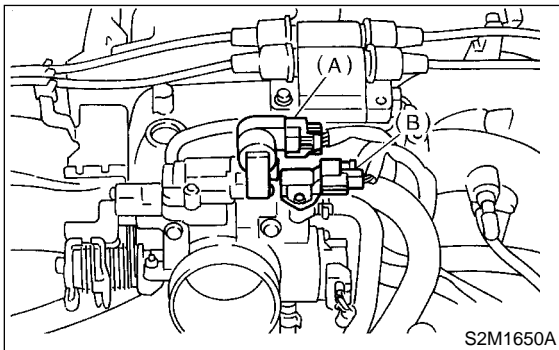
- 2) Remove air cleaner case. <Ref. to IN(SOHC)-7, REMOVAL, Air Cleaner Case.>

- 3) Disconnect accelerator cable (A).

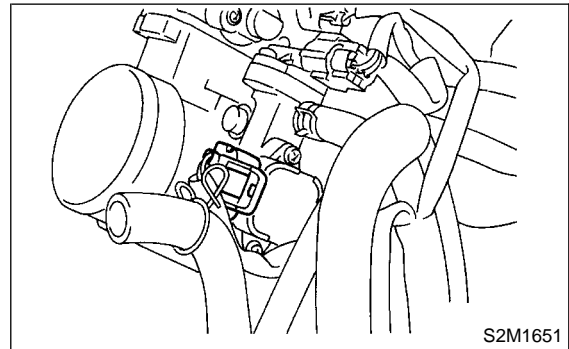
- 4) Disconnect cruise control cable (B). (With cruise control model)



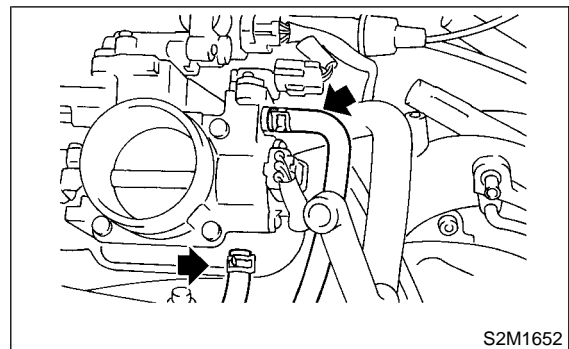
- 5) Disconnect connectors from idle air control solenoid valve (A) and intake manifold pressure sensor (B).



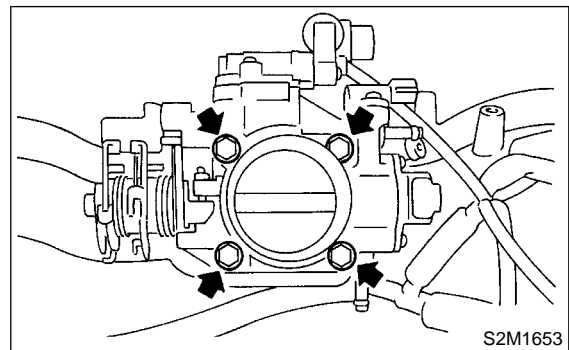
- 6) Disconnect connector from throttle position sensor.



- 7) Disconnect engine coolant hoses from throttle body.



- 8) Remove bolts which install throttle body to intake manifold.



### B: INSTALLATION S165010A11

Install in the reverse order of removal.

NOTE:

Always use a new gasket.

**Tightening torque:**

**Throttle body;**

**22 N·m (2.2 kgf-m, 15.9 ft-lb)**

**Air cleaner case;**

**6.4 N·m (0.65 kgf-m, 4.7 ft-lb)**

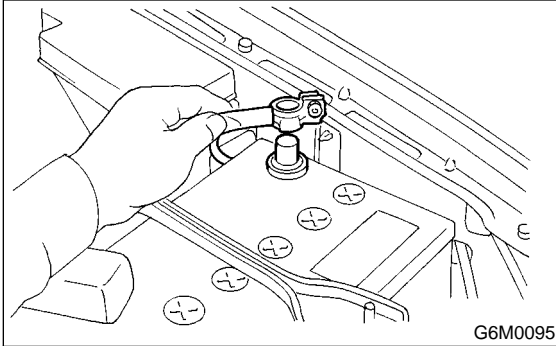
# INTAKE MANIFOLD

Fuel Injection (Fuel Systems)

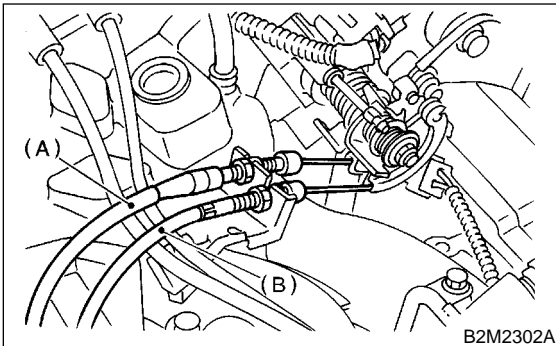
## 3. Intake Manifold S165034

### A: REMOVAL S165034A18

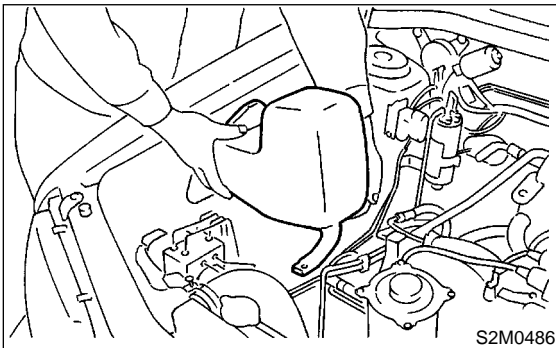
- 1) Release fuel pressure. <Ref. to FU(SOHCw/oOBD)-41, RELEASING OF FUEL PRESSURE, OPERATION, Fuel.>
- 2) Open fuel flap lid, and remove fuel filler cap.
- 3) Disconnect battery ground cable.



- 4) Remove air cleaner case and air intake duct. <Ref. to IN(SOHC)-7, REMOVAL, Air Cleaner Case.> and <Ref. to IN(SOHC)-8, REMOVAL, Air Intake Duct.>
- 5) Disconnect accelerator cable (A).
- 6) Disconnect cruise control cable (B). (With cruise control model)



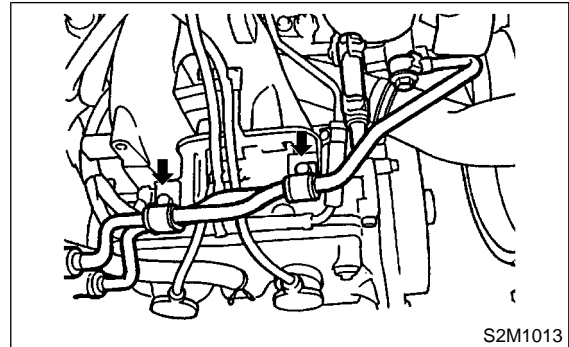
- 7) Remove power steering pump from bracket.  
(1) Remove resonator chamber.



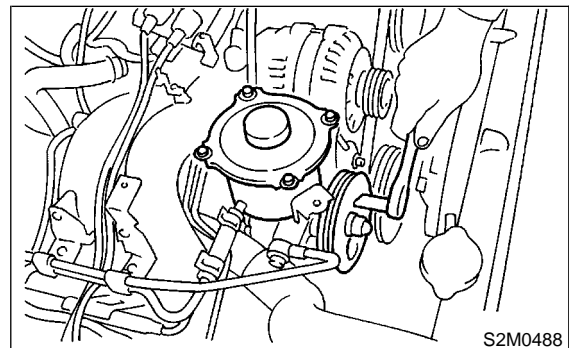
- (2) Remove V-belts.  
<Ref. to ME(SOHC)-42, REMOVAL, V-belt.>

- (3) Remove bolts which secure power steering pipe brackets to intake manifold.

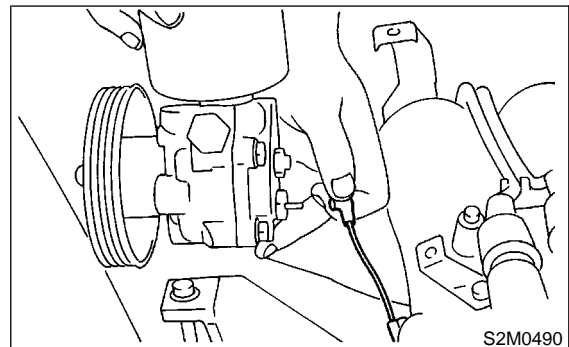
**CAUTION:**  
Do not disconnect power steering hose.



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



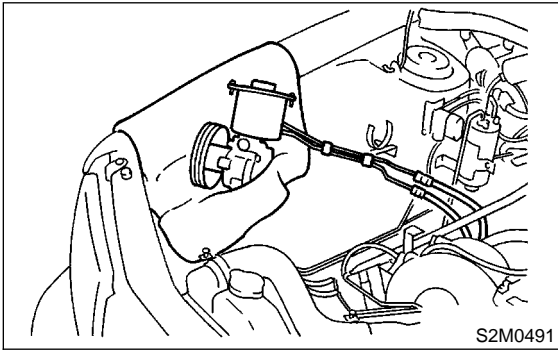
- (5) Disconnect terminal from power steering pump switch.



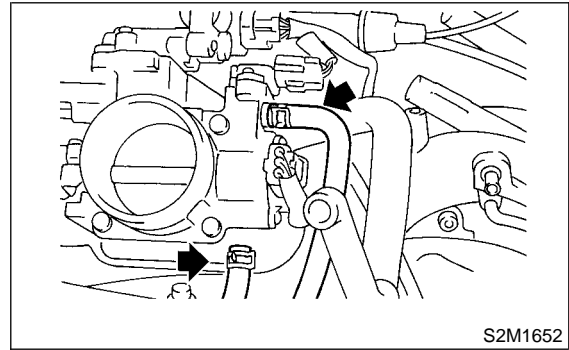
# INTAKE MANIFOLD

Fuel Injection (Fuel Systems)

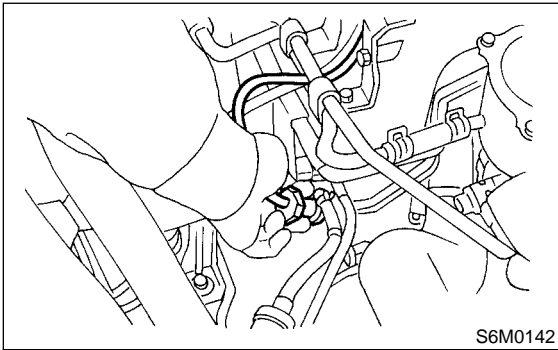
(6) Place power steering pump on the right side wheel apron.



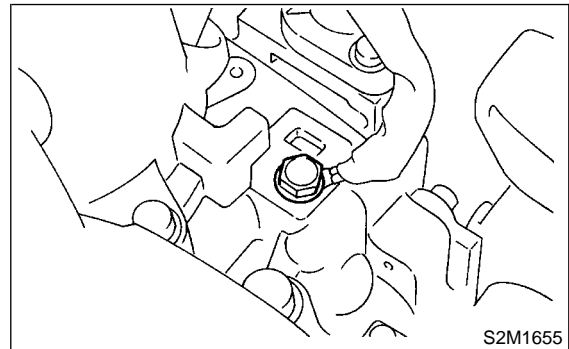
11) Disconnect engine coolant hose from throttle body.



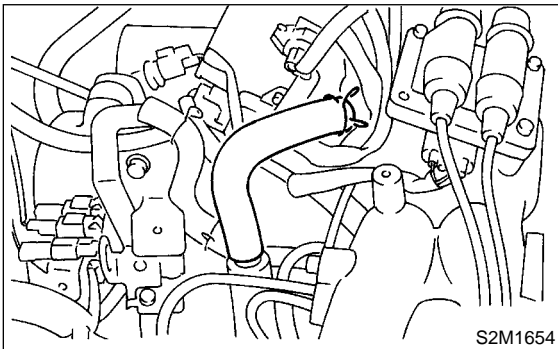
8) Disconnect spark plug cords from spark plugs.



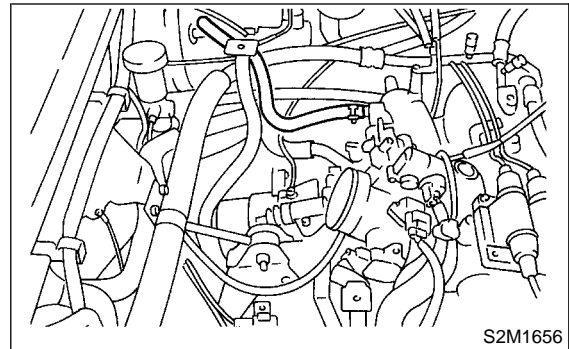
12) Remove bolt which installs ground terminal onto cylinder head.



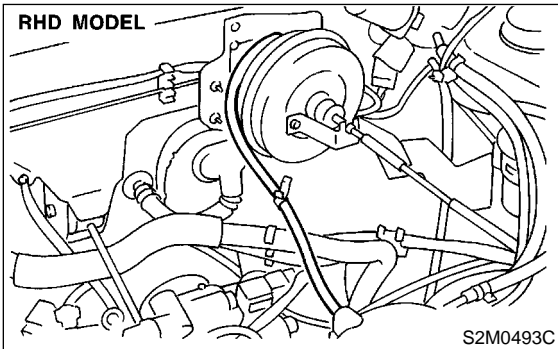
9) Disconnect PCV hose from intake manifold.



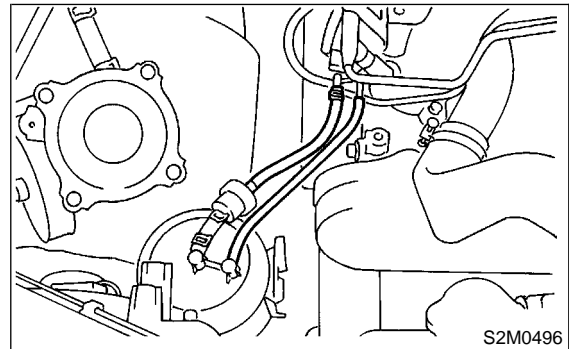
13) Disconnect brake booster hose.



10) Disconnect vacuum hose to cruise control diaphragm. (With cruise control models)



14) Disconnect canister hoses from pipes.

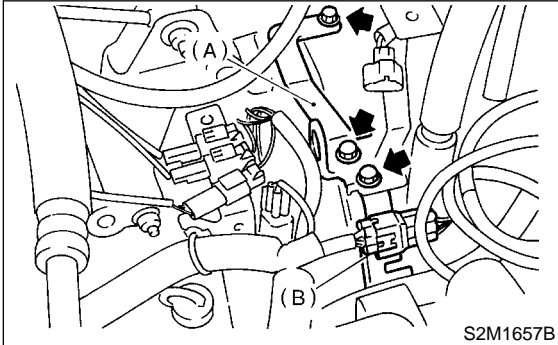


# INTAKE MANIFOLD

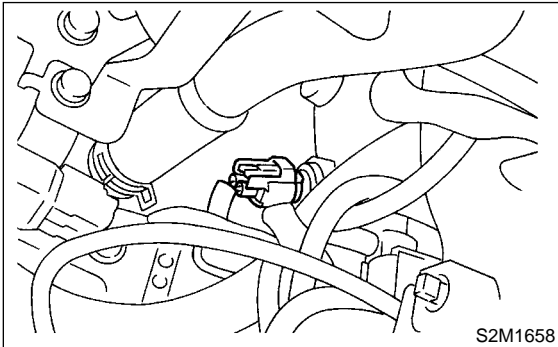
## Fuel Injection (Fuel Systems)

15) Remove air cleaner case stay RH and engine harness bracket (A), and disconnect engine harness connectors (B) from bulkhead harness connectors.

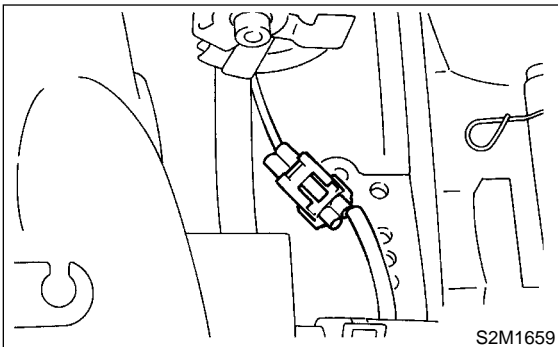
16) Pull out engine harness connector from bracket.



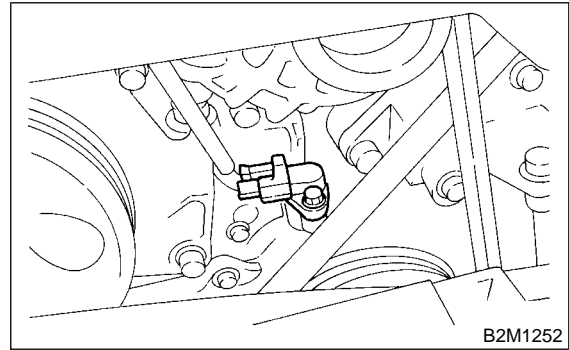
17) Disconnect connector from engine coolant temperature sensor.



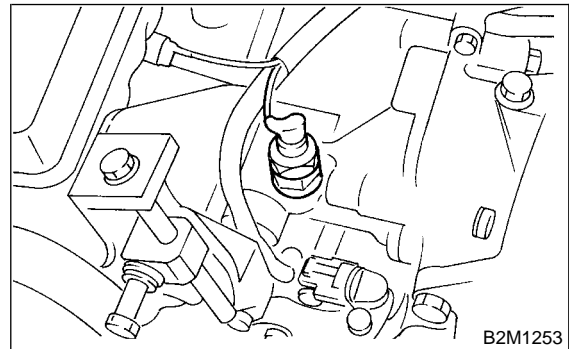
18) Disconnect knock sensor connector.



19) Disconnect connector from crankshaft position sensor.

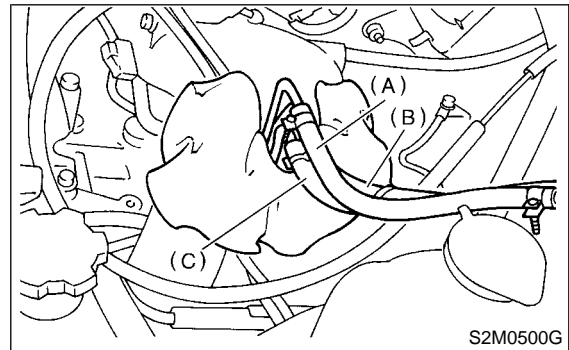


20) Disconnect connector from oil pressure switch.



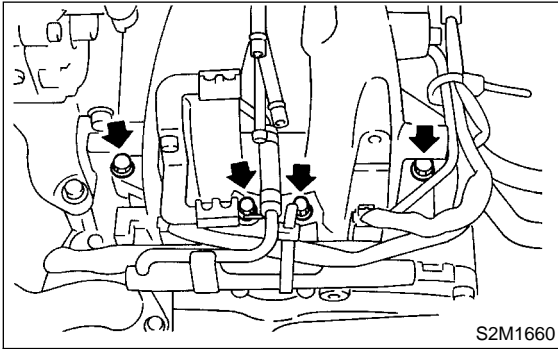
21) Disconnect fuel hoses from fuel pipes.

**WARNING:**  
Catch fuel from hoses in a container.

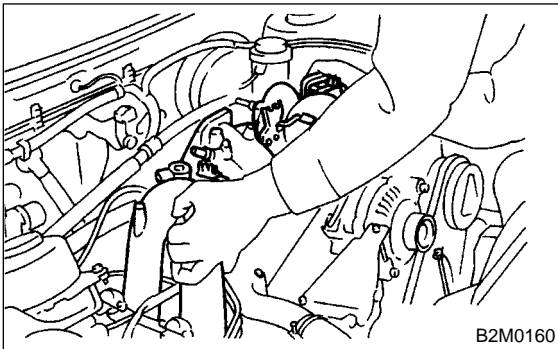


- (A) Fuel delivery hose
- (B) Return hose
- (C) Evaporation hose

22) Remove bolts which hold intake manifold onto cylinder heads.



23) Remove intake manifold.



## B: INSTALLATION S165034A11

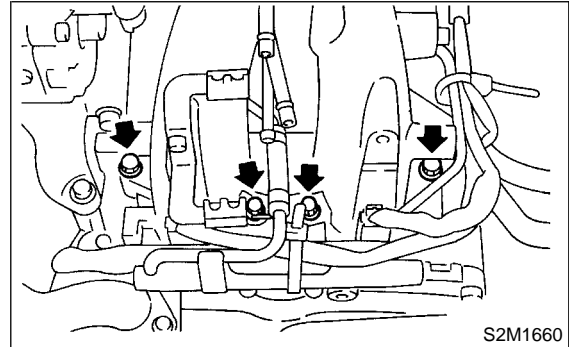
1) Install intake manifold onto cylinder heads.

NOTE:

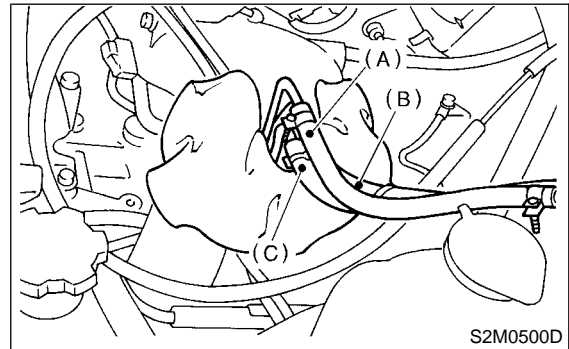
Always use new gaskets.

**Tightening torque:**

**25 N·m (2.5 kgf·m, 18.1 ft·lb)**



2) Connect fuel hoses.

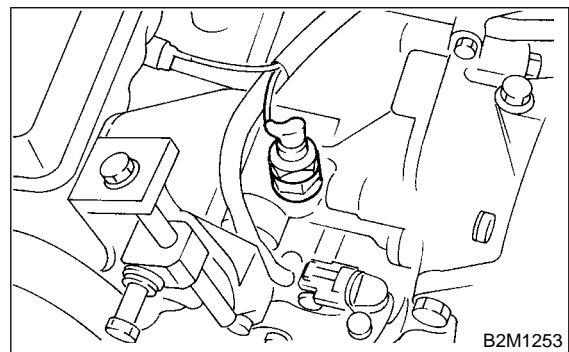


(A) Fuel delivery hose

(B) Fuel return hose

(C) Evaporation hose

3) Connect connector to oil pressure switch.

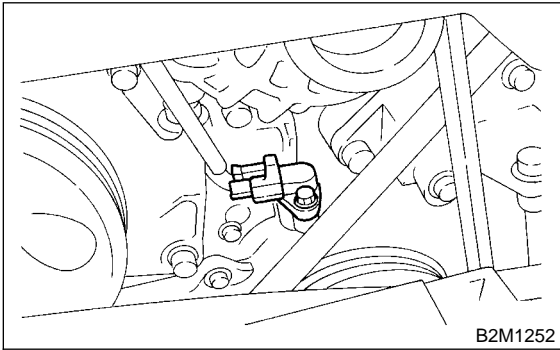




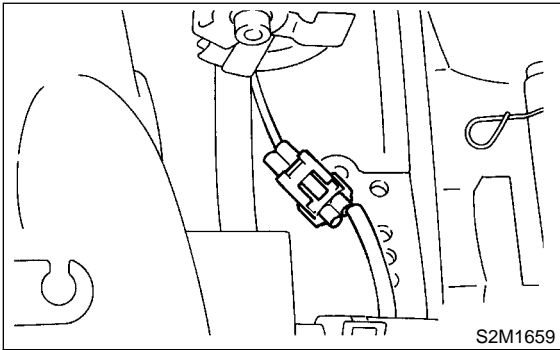
# INTAKE MANIFOLD

## Fuel Injection (Fuel Systems)

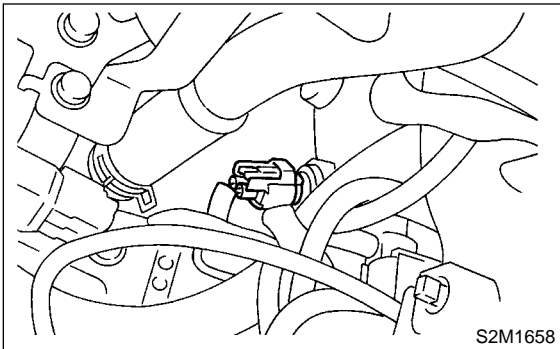
4) Connect connector to crankshaft position sensor.



5) Connect knock sensor connector.

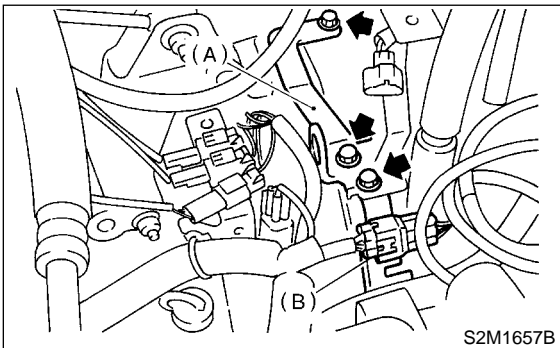


6) Connect connectors to engine coolant temperature sensor.

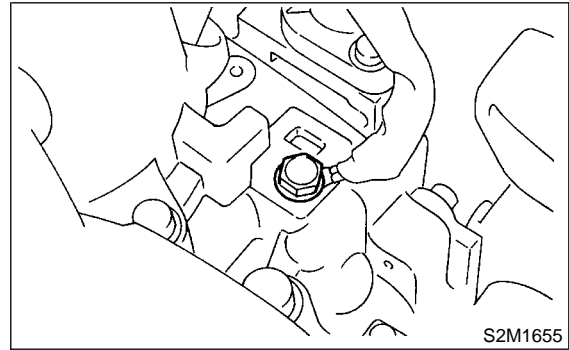


7) Hold engine harness connector onto bracket.

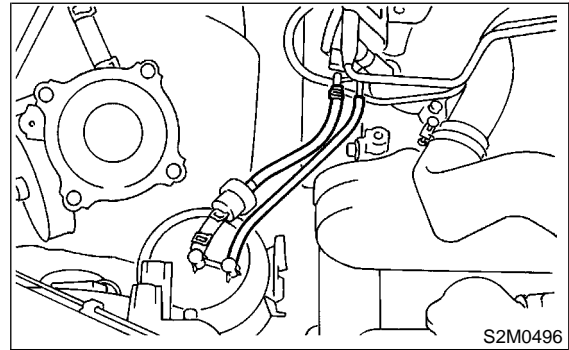
8) Install air cleaner case stay RH and engine harness bracket (A), and connect engine harness connectors (B) to bulkhead connectors.



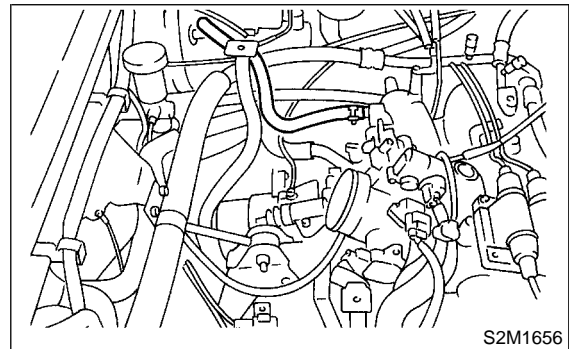
9) Tighten bolt which installs engine harness ground terminal.



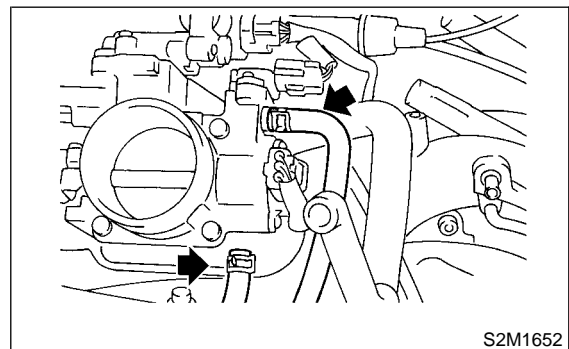
10) Connect canister hoses to pipes.



11) Connect brake booster hose.



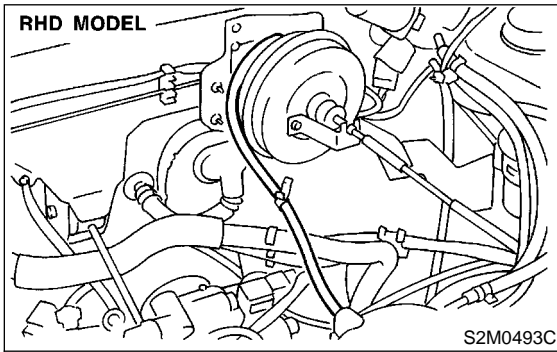
12) Connect engine coolant hose to throttle body.



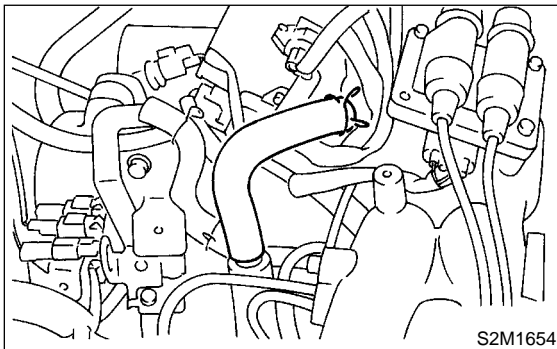
# INTAKE MANIFOLD

Fuel Injection (Fuel Systems)

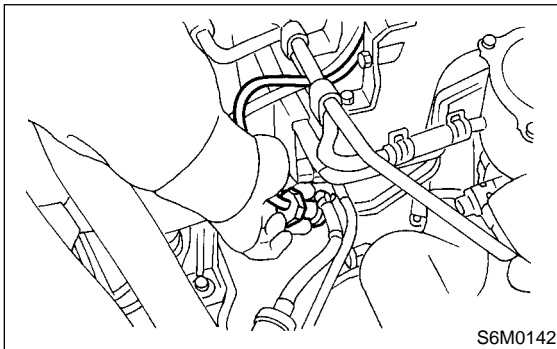
- 13) Connect vacuum hose to cruise control diaphragm. (With cruise control models)



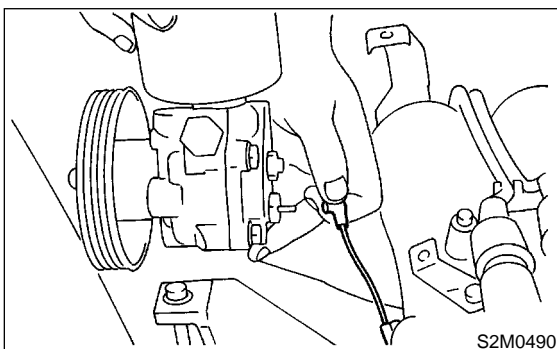
- 14) Connect PCV hose to intake manifold.



- 15) Connect spark plug cords to spark plugs.

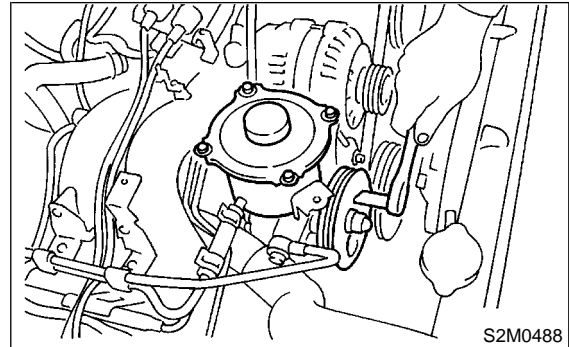


- 16) Install power steering pump on bracket.  
(1) Connect terminal to power steering pump switch.

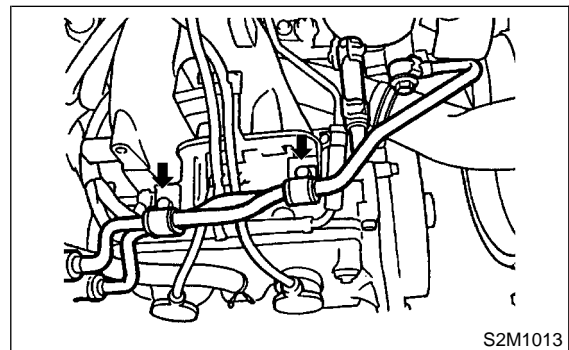


- (2) Tighten bolts which install power steering pump on bracket.

**Tightening torque:**  
**20.1 N·m (2.05 kgf-m, 14.8 ft-lb)**



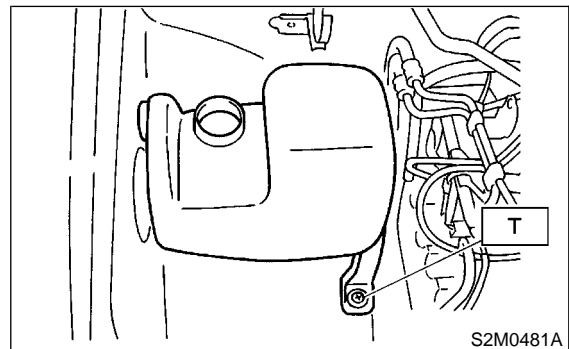
- (3) Install power steering pipe brackets on right side intake manifold.



- (4) Install power steering pump drive V-belt.  
<Ref. to ME(SOHC)-42, INSTALLATION, V-belt.>

- (5) Install resonator chamber.

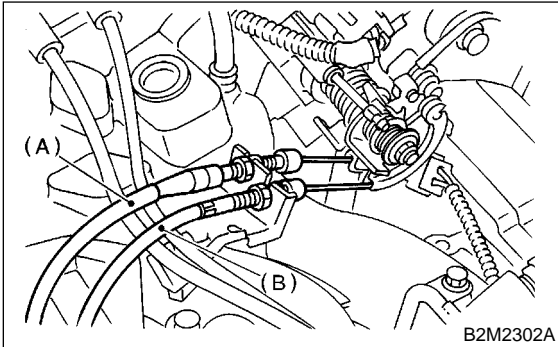
**Tightening torque:**  
**T: 33 N·m (3.4 kgf-m, 25 ft-lb)**



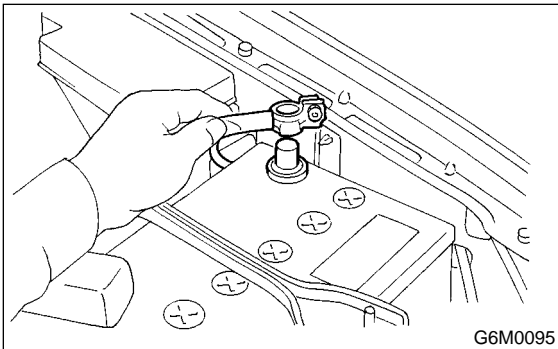
# INTAKE MANIFOLD

## Fuel Injection (Fuel Systems)

- 17) Connect accelerator cable (A).
- 18) Connect cruise control cable (B). (With cruise control models)

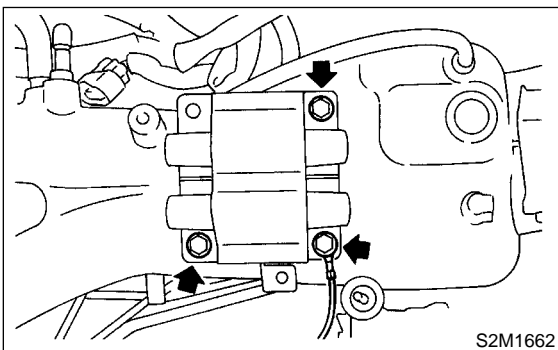


- 19) Install air cleaner case and air intake duct. <Ref. to IN(SOHC)-7, INSTALLATION, Air Cleaner Case.> and <Ref. to N(SOHC)-8, INSTALLATION, Air Intake Duct.>
- 20) Connect connector to fuel pump relay. <Ref. to FU(SOHCw/oOBD)-40, INSTALLATION, Fuel Pump Relay.>
- 21) Connect battery ground cable.

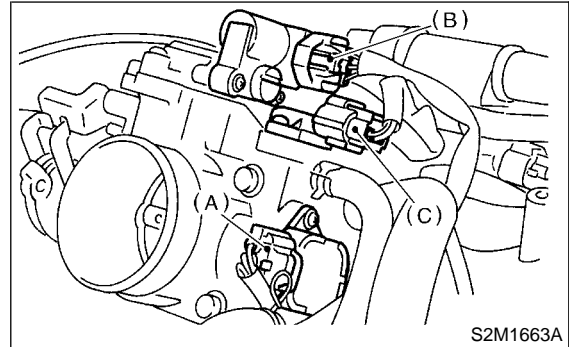


## C: DISASSEMBLY S165034A06

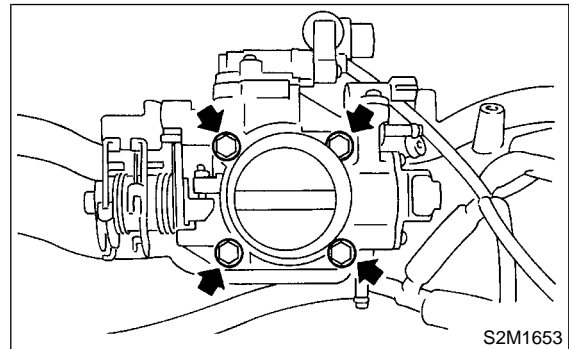
- 1) Disconnect connector from ignition coil and ignitor assembly.
- 2) Remove ignition coil and ignitor assembly.



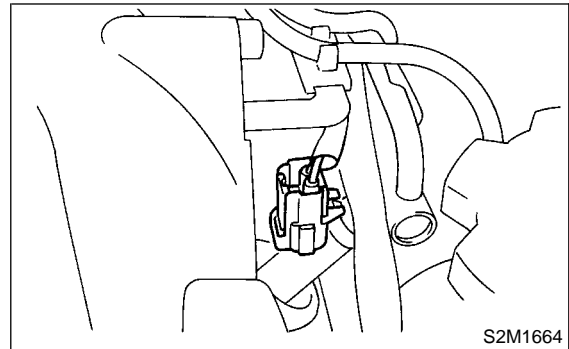
- 3) Disconnect connectors from throttle position sensor (A), idle air control solenoid valve (B) and pressure sensor (C).



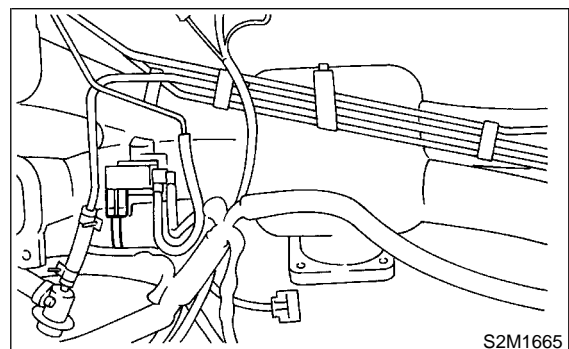
- 4) Remove throttle body.



- 5) Disconnect connectors from fuel injectors.



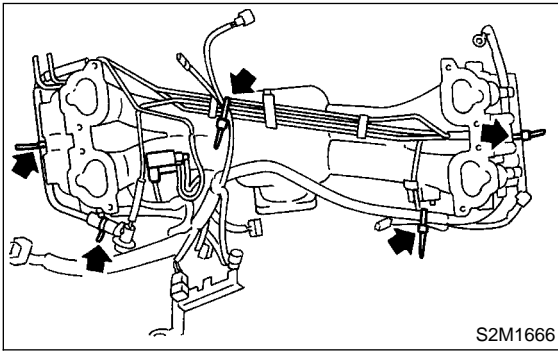
- 6) Disconnect connector from purge control solenoid valve.



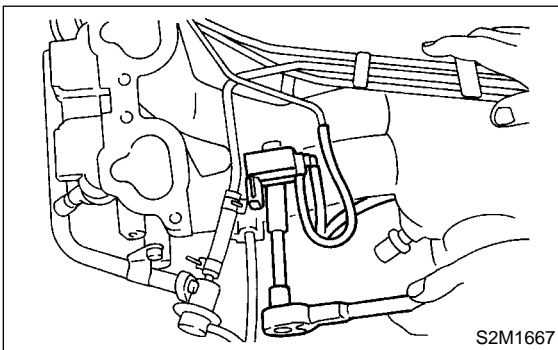
# INTAKE MANIFOLD

Fuel Injection (Fuel Systems)

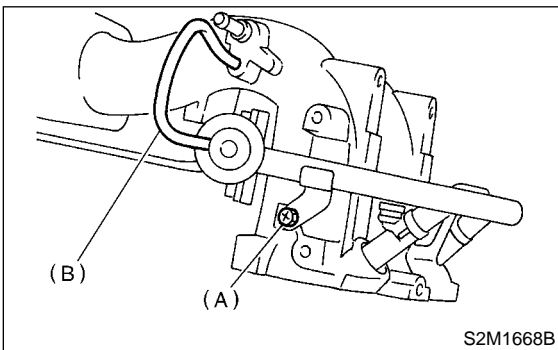
7) Remove harness bands which hold engine harness onto intake manifold.



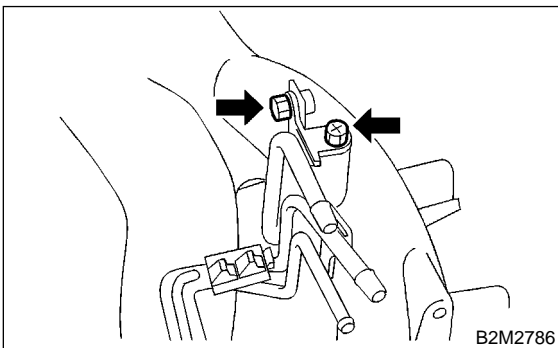
8) Remove engine harness from intake manifold.  
9) Remove purge control solenoid valve.



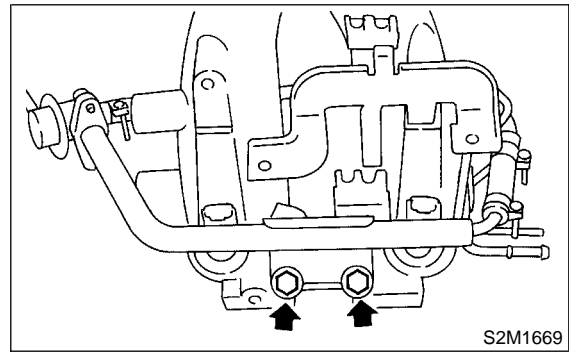
10) Disconnect pressure regulator vacuum hose (B) from intake manifold.  
11) Remove bolt (A) which installs injector pipe on intake manifold.



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

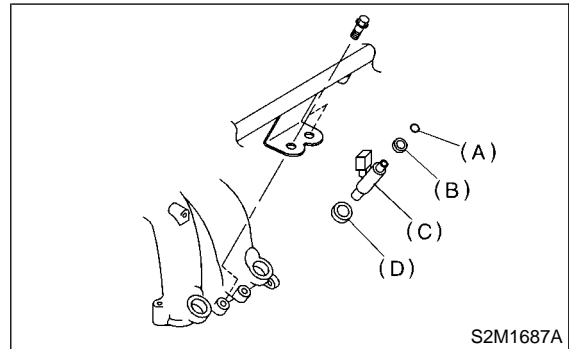


13) Remove the four bolts which install injector pipe on intake manifold.



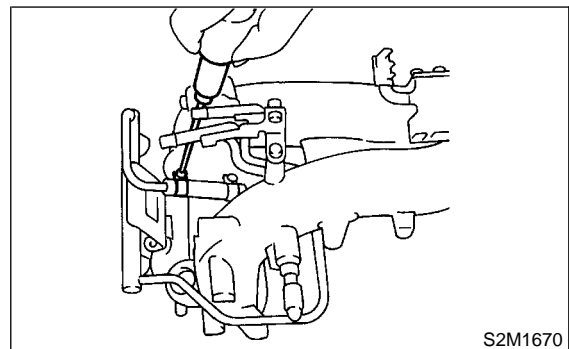
14) Remove fuel injectors.

**CAUTION:**  
Replace O-rings and insulators with new ones.



- (A) O-ring
- (B) Insulator A
- (C) Fuel injector
- (D) Insulator B

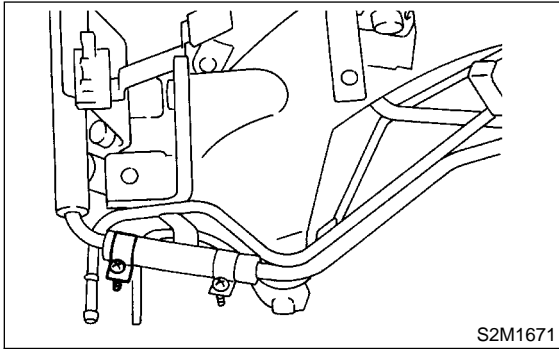
15) Loosen clamp which holds front left side fuel hose to injector pipe and remove the pipe from clamp.



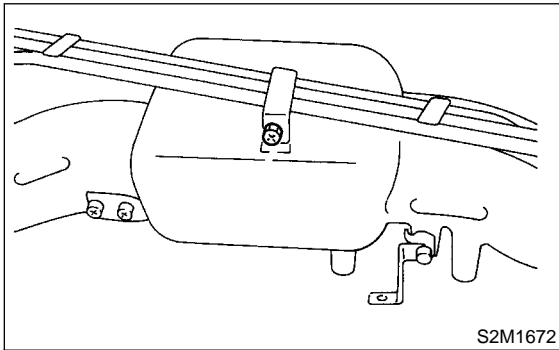
# INTAKE MANIFOLD

## Fuel Injection (Fuel Systems)

16) Loosen clamp which holds front right side fuel hose to injector pipe and remove the pipe from clamp.



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



18) Remove fuel injector pipe.

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

## D: ASSEMBLY S165034A02

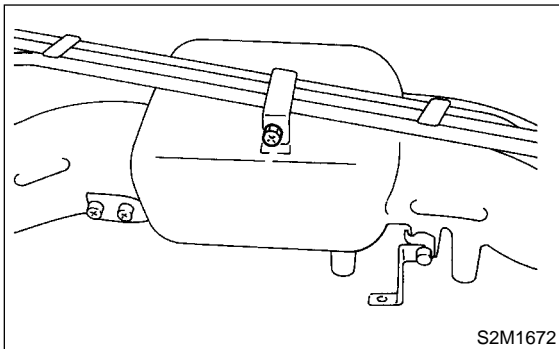
1) Install fuel pipe assembly, pressure regulator, etc. to intake manifold.

2) Install fuel injector pipe.

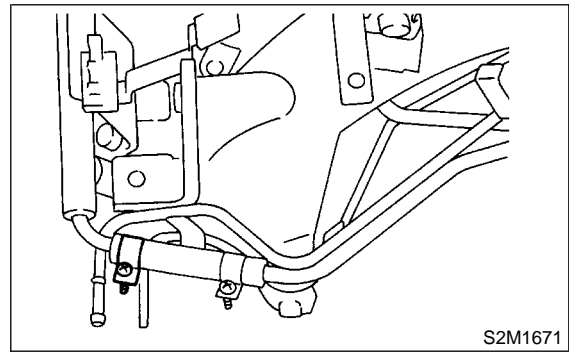
3) Tighten the bolt which installs fuel pipes on intake manifold.

### **Tightening torque:**

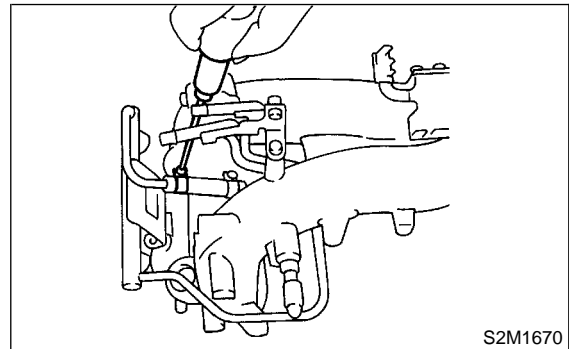
**4.9 N·m (0.5 kgf·m, 3.6 ft·lb)**



4) Connect right side fuel hose to injector pipe, and tighten clamp screw.



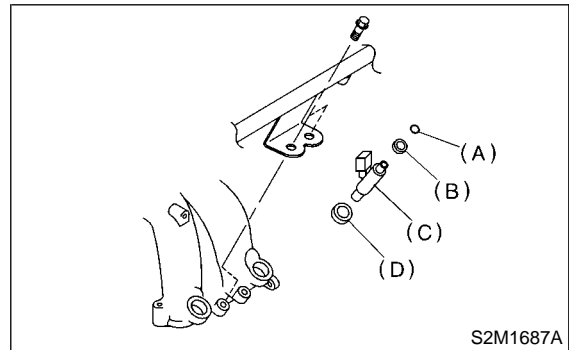
5) Connect left side fuel hose to injector pipe, and tighten clamp screw.



6) Install fuel injectors.

### **NOTE:**

Always use new O-rings and insulators.



- (A) O-ring
- (B) Insulator A
- (C) Fuel injector
- (D) Insulator B

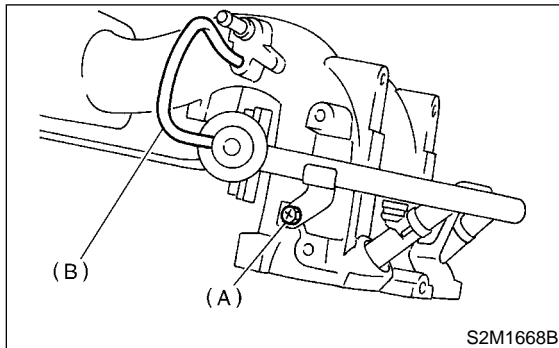
# INTAKE MANIFOLD

Fuel Injection (Fuel Systems)

7) Tighten bolt (A) which installs injector pipe on intake manifold and connect pressure regulator vacuum hose (B).

**Tightening torque:**

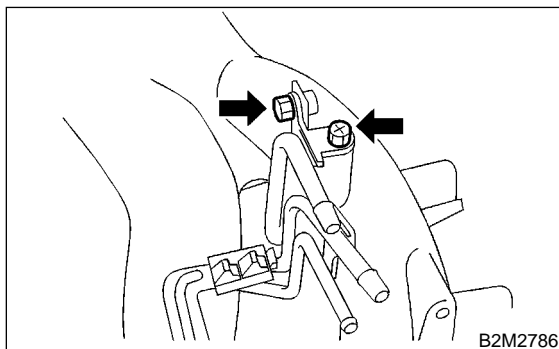
**4.9 N·m (0.5 kgf-m, 3.6 ft-lb)**



8) Tighten the two bolts which install fuel pipes on the left side of intake manifold.

**Tightening torque:**

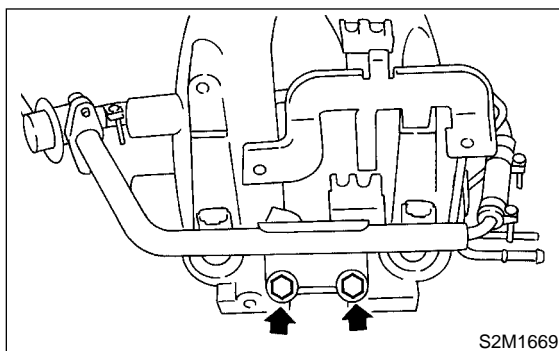
**4.9 N·m (0.5 kgf-m, 3.6 ft-lb)**



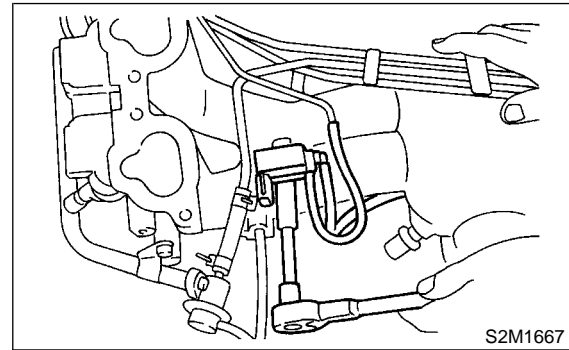
9) Tighten the four bolts which install injector pipe on intake manifold.

**Tightening torque:**

**19 N·m (1.9 kgf-m, 13.7 ft-lb)**



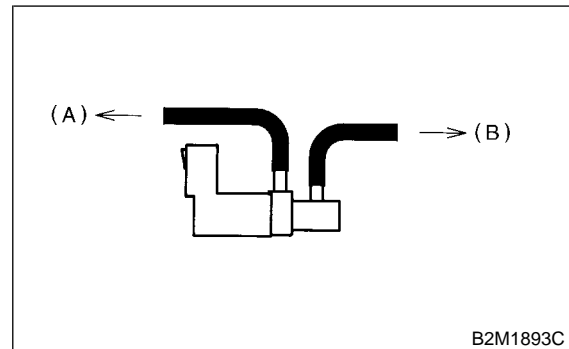
10) Install purge control solenoid valve.



11) Connect hoses to purge control solenoid valve.

**CAUTION:**

**Carefully connect the evaporation hoses.**

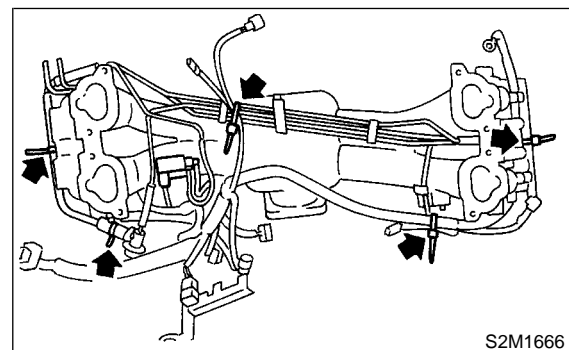


(A) To fuel pipe  
(B) To intake manifold

12) Install engine harness onto intake manifold.

13) Connect connectors and pipes to fuel injectors and purge control solenoid valve.

14) Hold engine harness by harness bands.



# INTAKE MANIFOLD

Fuel Injection (Fuel Systems)

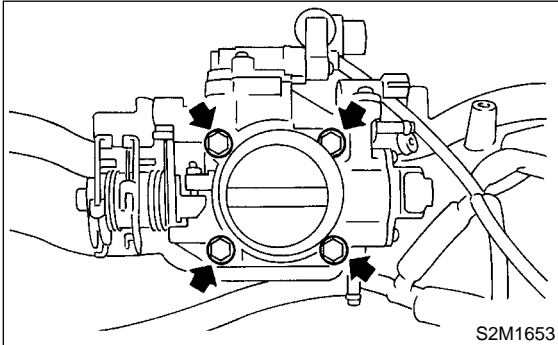
15) Assemble throttle body to intake manifold.

NOTE:

Replace gasket with a new one.

**Tightening torque:**

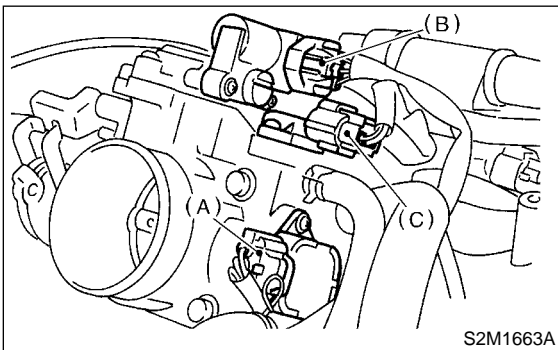
**22 N·m (2.2 kgf·m, 15.9 ft·lb)**



## E: INSPECTION S165034A10

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

16) Connect connectors to throttle position sensor (A), idle air control solenoid valve (B) and pressure sensor (C).



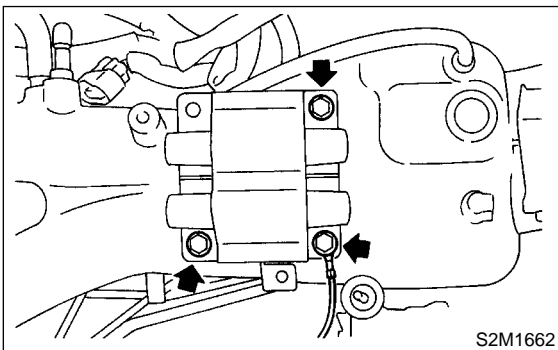
17) Install ignition coil and ignitor assembly.

**Tightening torque:**

**6.4 N·m (0.65 kgf·m, 4.7 ft·lb)**

NOTE:

Do not forget to install ground terminal on ignition coil and ignitor assembly.



18) Connect connector to ignition coil and ignitor assembly.

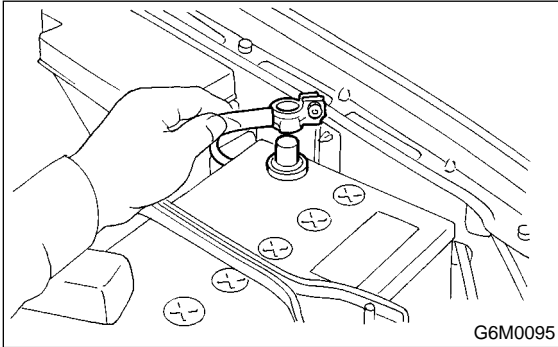
## 4. Engine Coolant Temperature Sensor

S165047

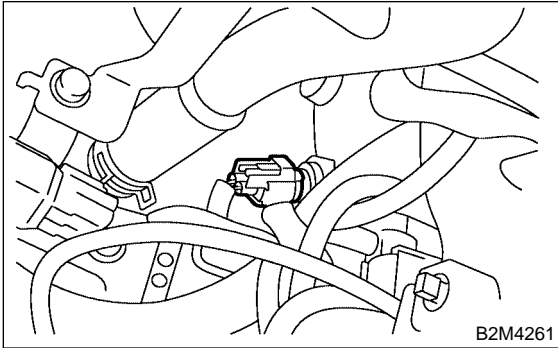
### A: REMOVAL

S165047A18

- 1) Disconnect battery ground cable.



- 2) Remove air intake duct and air cleaner case.  
<Ref. to IN(SOHC)-8, REMOVAL, Air Intake Duct.>  
and <Ref. to IN(SOHC)-7, REMOVAL, Air Cleaner Case.>
- 3) Disconnect connector from engine coolant temperature sensor.



- 4) Remove engine coolant temperature sensor.

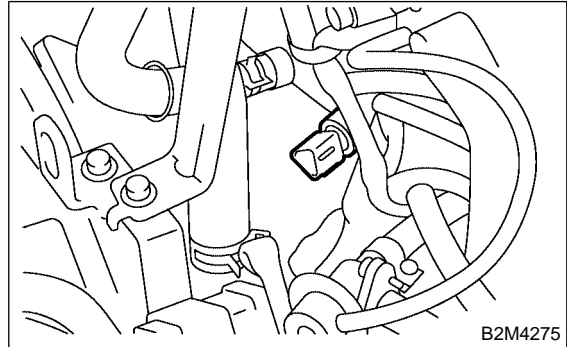
### B: INSTALLATION

S165047A11

Install in the reverse order of removal.

**Tightening torque:**

**18 N·m (1.8 kgf-m, 13 ft-lb)**





# CRANKSHAFT POSITION SENSOR

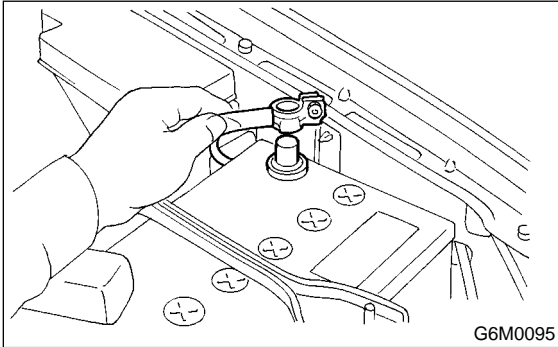
Fuel Injection (Fuel Systems)

## 5. Crankshaft Position Sensor

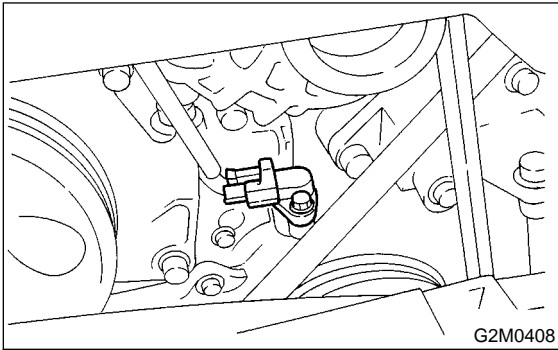
S165043

### A: REMOVAL S165043A18

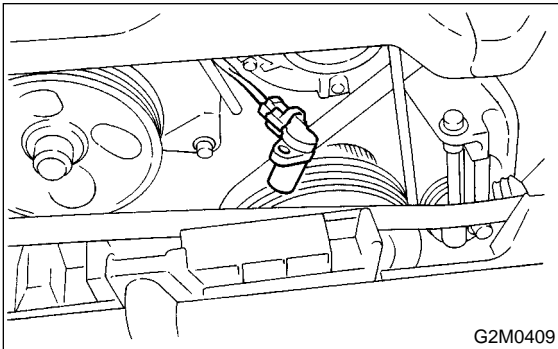
- 1) Disconnect battery ground cable.



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



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

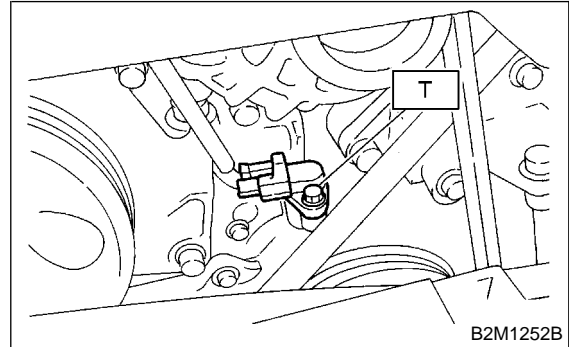


### B: INSTALLATION S165043A11

Install in the reverse order of removal.

**Tightening torque:**

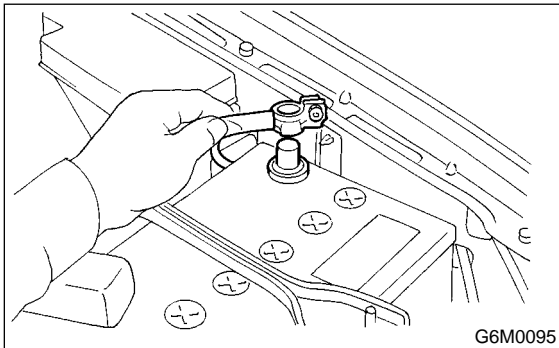
**T: 6.4 N·m (0.65 kgf·m, 4.7 ft·lb)**



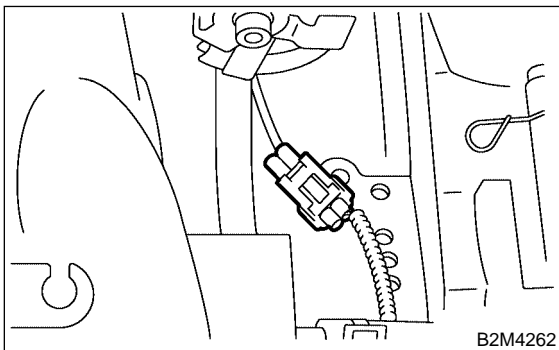
## 6. Knock Sensor S165042

### A: REMOVAL S165042A18

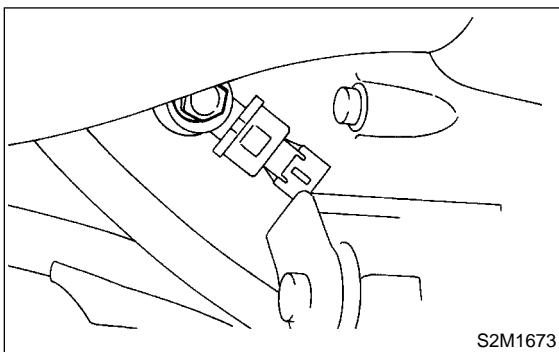
- 1) Disconnect battery ground cable from battery ground terminal.



- 2) Remove air cleaner case.  
<Ref. to IN(SOHC)-7, REMOVAL, Air Cleaner Case.>
- 3) Disconnect knock sensor connector.



- 4) Remove knock sensor from cylinder block.



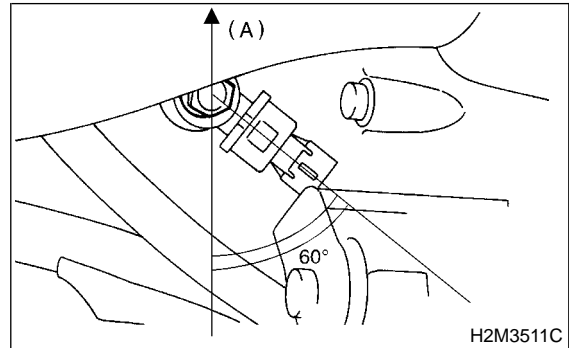
### B: INSTALLATION S165042A11

- 1) Install knock sensor to cylinder block.

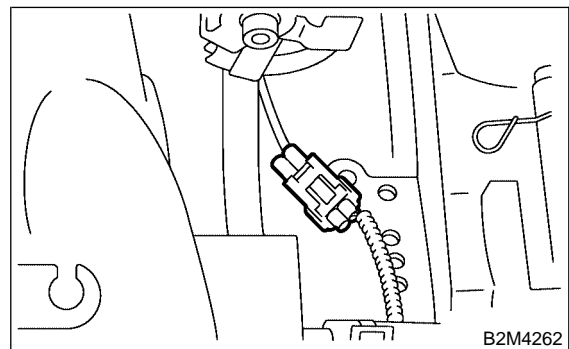
**Tightening torque:**  
**24 N·m (2.4 kgf-m, 17.4 ft-lb)**

**NOTE:**

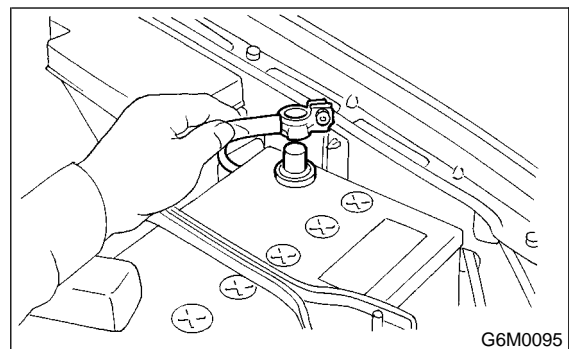
The extraction area of the knock sensor cord must be positioned at a 60° angle relative to the engine rear.



- 2) Connect knock sensor connector.



- 3) Install air cleaner case.  
<Ref. to IN(SOHC)-7, INSTALLATION, Air Cleaner Case.>
- 4) Connect battery ground cable.



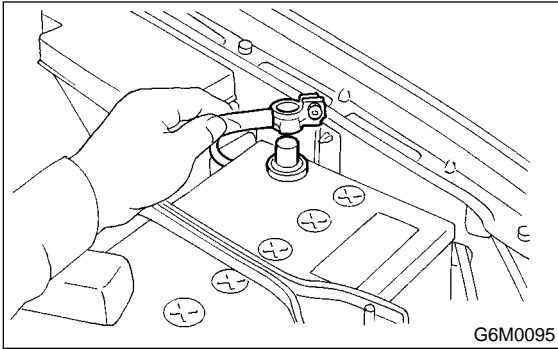
# THROTTLE POSITION SENSOR

Fuel Injection (Fuel Systems)

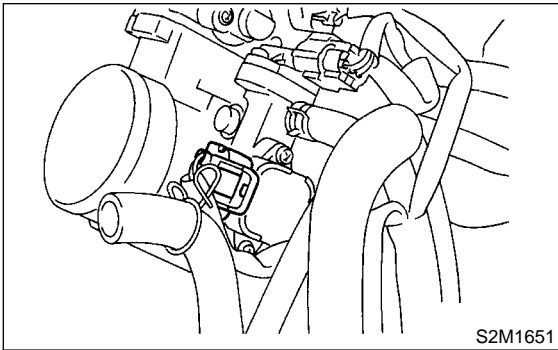
## 7. Throttle Position Sensor S165039

### A: REMOVAL S165039A18

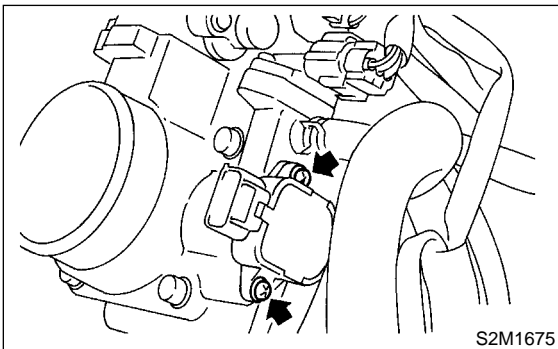
- 1) Disconnect battery ground cable.



- 2) Disconnect connector from throttle position sensor.



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



### B: INSTALLATION S165039A11

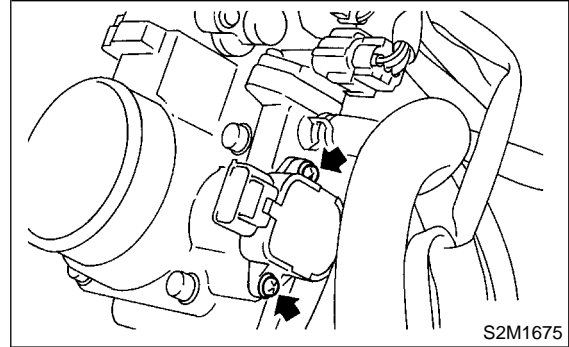
Install in the reverse order of removal.

**Tightening torque:**

**1.6 N·m (0.16 kgf·m, 1.2 ft·lb)**

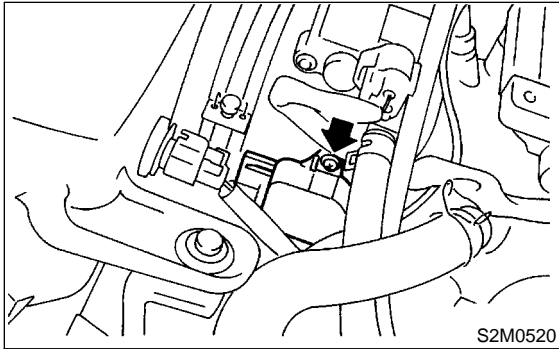
**CAUTION:**

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

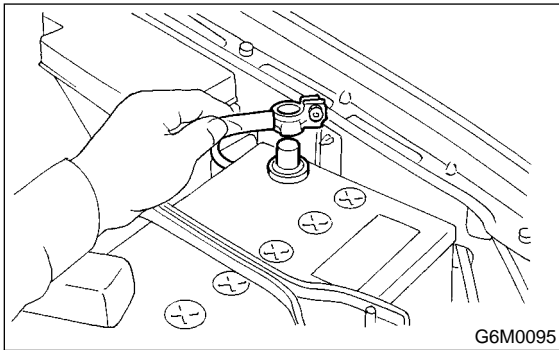


## C: ADJUSTMENT S165039A01

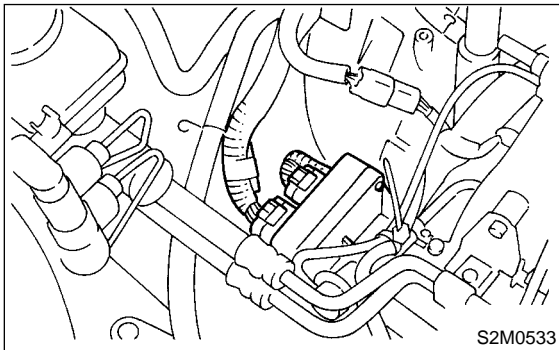
- 1) Turn ignition switch to OFF.
- 2) Loosen throttle position sensor holding screws.



- 3) When using voltage meter;
  - (1) Disconnect battery ground cable.



- (2) Disconnect connectors from ECM.

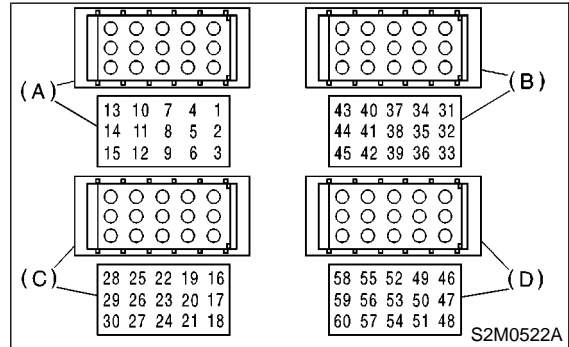


- (3) Set ST to ECM.  
ST 498307600 CHECK BOARD KIT
- (4) Connect battery ground cable.
- (5) Turn ignition switch to ON.

- (6) Adjust throttle position sensor so that signal voltage on CHECK BOARD may be in specification.

### Terminal / Specified voltage

(C) No. 23 — (C) No. 24 / 0.45 — 0.55 V  
[Fully closed.]



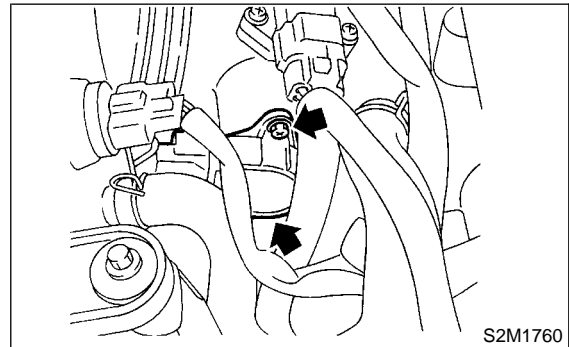
- (7) Tighten throttle position sensor holding screws.

### Tightening torque:

1.6 N·m (0.16 kgf·m, 1.2 ft·lb)

### CAUTION:

When removing ST from ECM, disconnect battery ground cable.

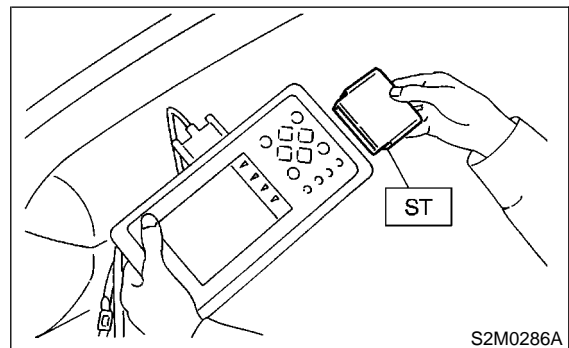


- 4) When using Subaru Select Monitor;

### NOTE:

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

- (1) Insert the cartridge to Subaru Select Monitor. <Ref. to FU(SOHCw/oOBD)-10, PREPARATION, General Description.>



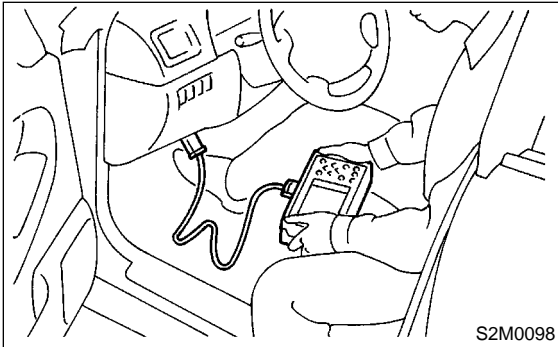
# THROTTLE POSITION SENSOR

## Fuel Injection (Fuel Systems)

---

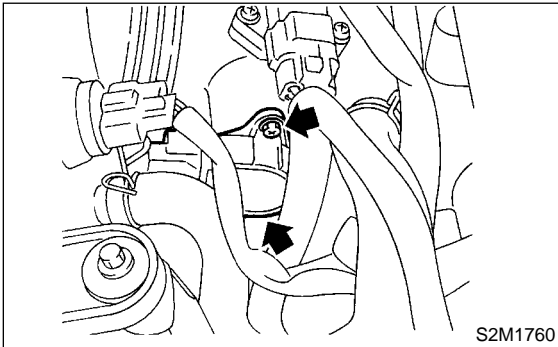
- (2) Connect Subaru Select Monitor to the data link connector.
- (3) Turn ignition switch to ON, and Subaru Select Monitor switch to ON.
- (4) Select {2. Each System Check} in Main Menu.
- (5) Select {Engine Control System} in Selection Menu.
- (6) Select {1. Current Data Display & Save} in Engine Diagnosis.
- (7) Select {1.12 Data Display} in Data Display Menu.
- (8) Adjust throttle position sensor to the proper position to match with the following specifications.

**Condition: Throttle fully closed**  
**Throttle opening angle 0.00%**  
**Throttle sensor voltage 0.50 V**



- (9) Tighten throttle position sensor holding screws.

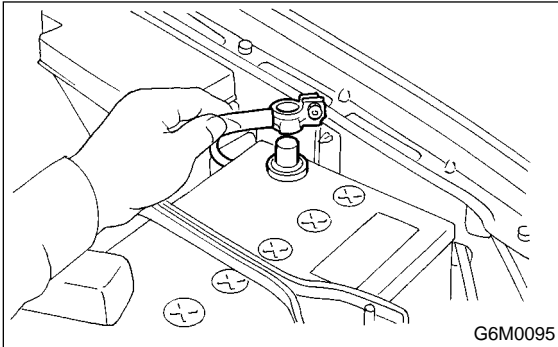
**Tightening torque:**  
**1.6 N·m (0.16 kgf·m, 1.2 ft·lb)**



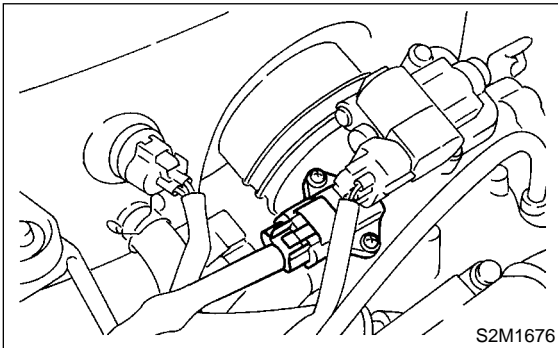
## 8. Pressure Sensor S165765

### A: REMOVAL S165765A18

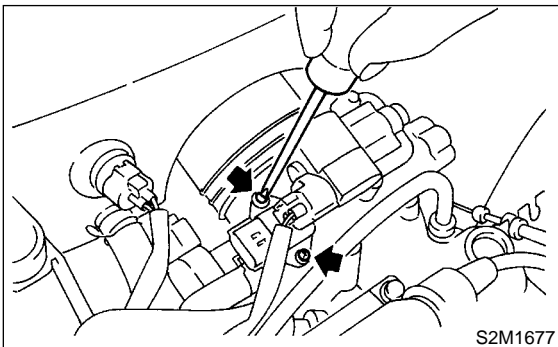
- 1) Disconnect battery ground cable.



- 2) Disconnect connector from pressure sensor.



- 3) Remove pressure sensor from throttle body.

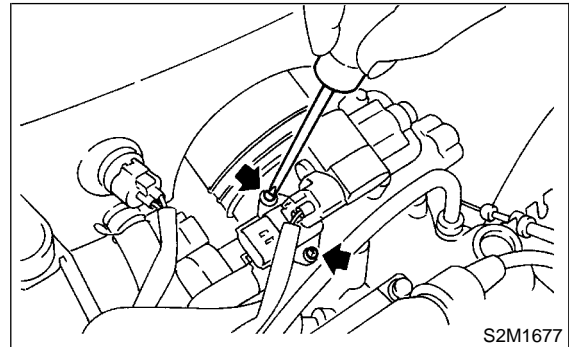


### B: INSTALLATION S165765A11

Install in the reverse order of removal.

**Tightening torque:**

**2.0 N·m (0.2 kgf-m, 1.4 ft-lb)**



# INTAKE AIR TEMPERATURE SENSOR

Fuel Injection (Fuel Systems)

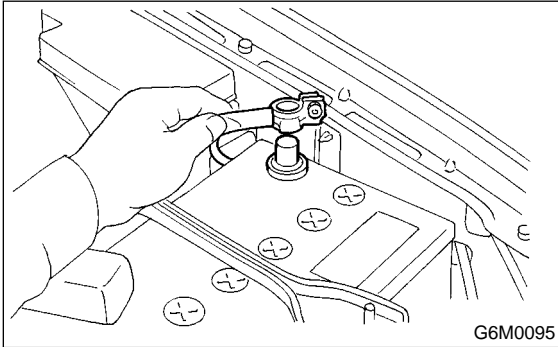
## 9. Intake Air Temperature Sensor

S165569

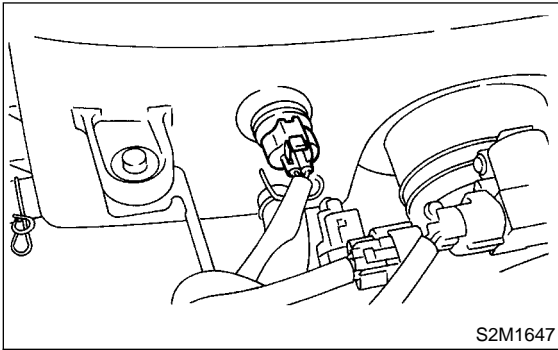
### A: REMOVAL

S165569A18

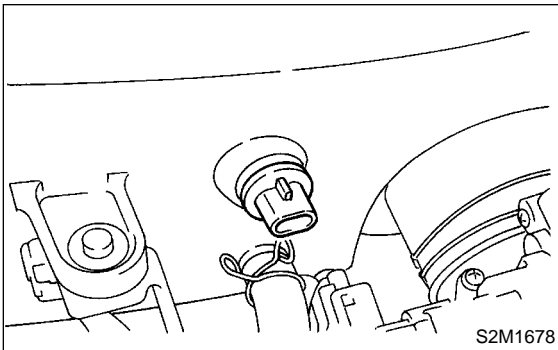
- 1) Disconnect battery ground cable.



- 2) Disconnect connector from intake air temperature sensor.



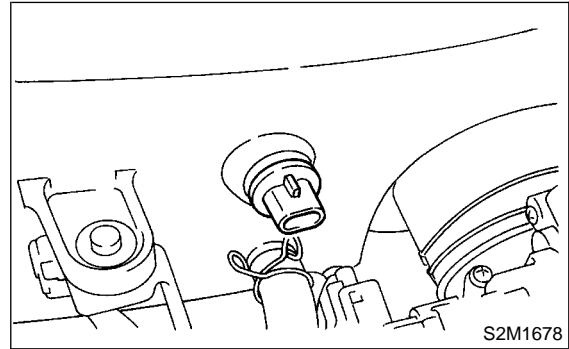
- 3) Remove intake air temperature sensor from air cleaner case.



### B: INSTALLATION

S165569A11

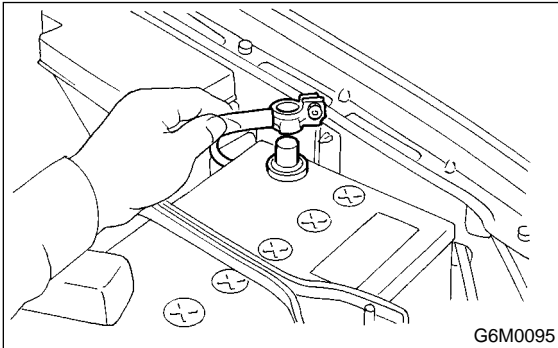
Install in the reverse order of removal.



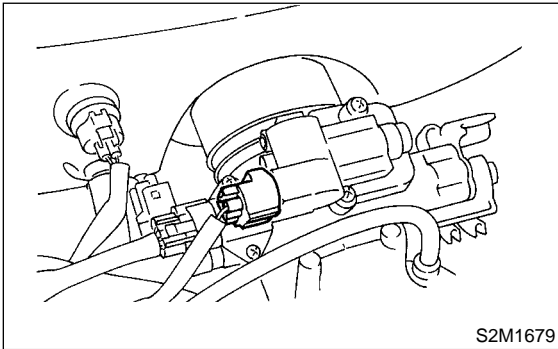
## 10. Idle Air Control Solenoid Valve S165056

### A: REMOVAL S165056A18

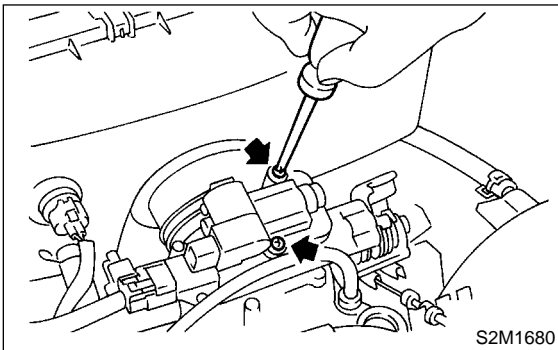
- 1) Disconnect battery ground cable.



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



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

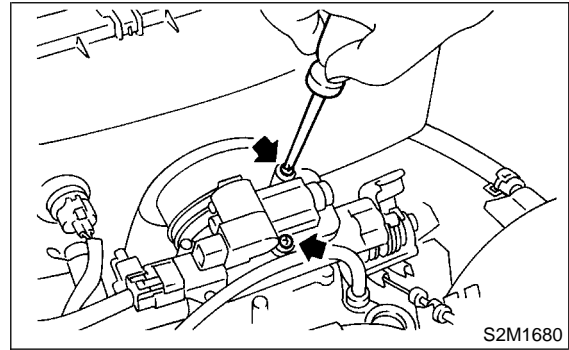


### B: INSTALLATION S165056A11

Install in the reverse order of removal.

**NOTE:**  
Always use new gasket.

**Tightening torque:**  
**1.6 N·m (0.16 kgf-m, 1.2 ft-lb)**





# FUEL INJECTOR

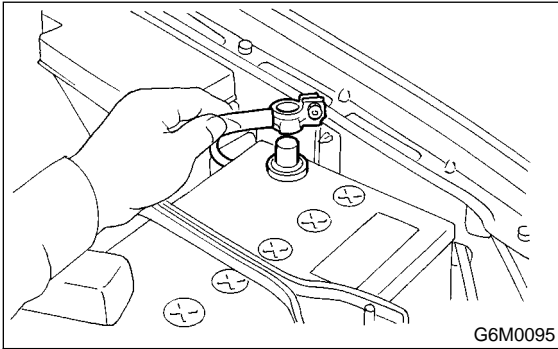
Fuel Injection (Fuel Systems)

## 11. Fuel Injector S165051

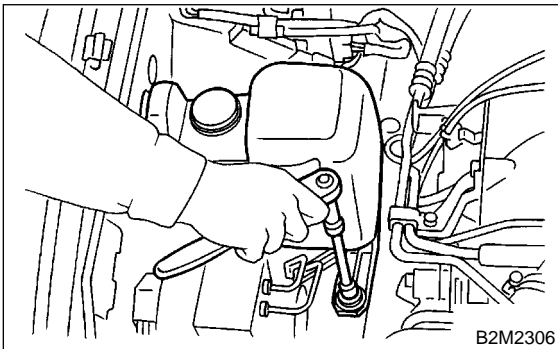
### A: REMOVAL S165051A18

#### 1. RH SIDE S165051A1801

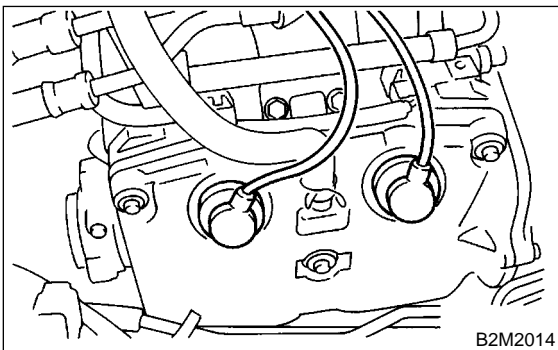
- 1) Release fuel pressure.  
<Ref. to FU(SOHCw/oOBD)-41, RELEASING OF FUEL PRESSURE, OPERATION, Fuel.>
- 2) Open fuel flap lid, and remove fuel filler cap.
- 3) Disconnect battery ground cable.



- 4) Remove air intake duct and air cleaner case.  
<Ref. to IN(SOHC)-8, REMOVAL, Air Intake Duct.> and <Ref. to IN(SOHC)-7, REMOVAL, Air Cleaner Case.>
- 5) Remove resonator chamber.



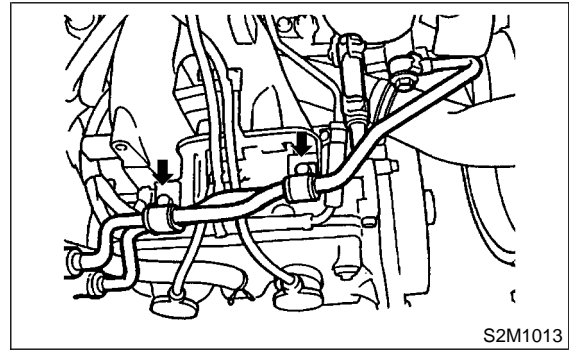
- 6) Remove spark plug cords from spark plugs (#1 and #3 cylinders).



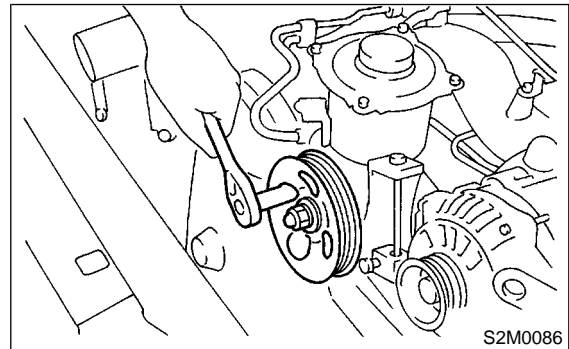
- 7) Remove power steering pump and tank from brackets.

- (1) Remove V-belt.  
<Ref. to ME(SOHC)-42, REMOVAL, V-belt.>

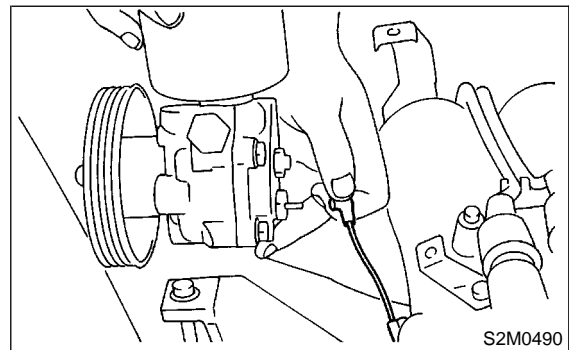
- (2) Remove bolts which hold power steering pipe brackets to intake manifold.



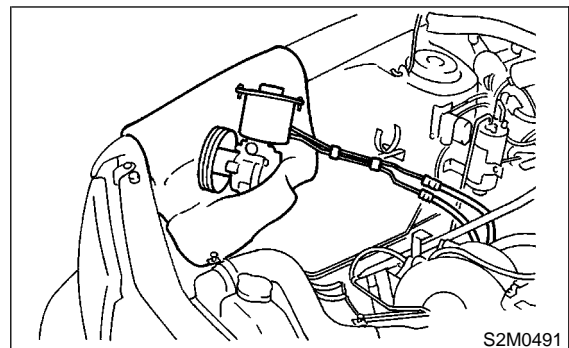
- (3) Remove bolts which secure power steering pump to bracket.



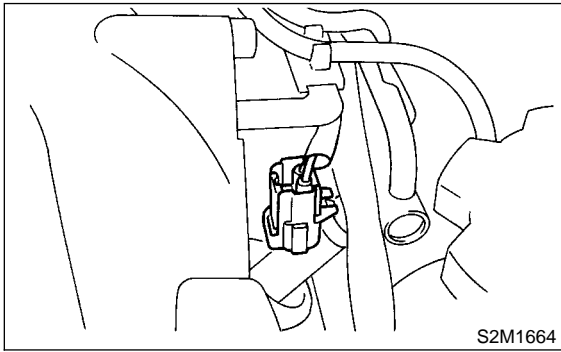
- (4) Disconnect connector from power steering pump switch.



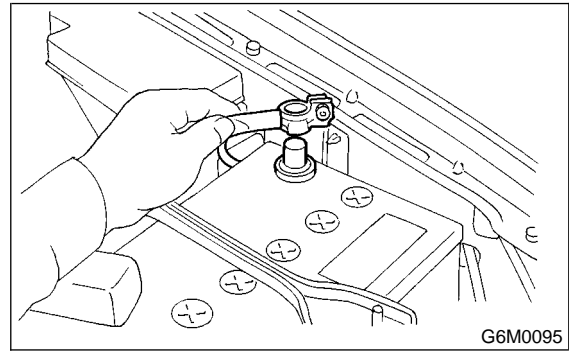
- (5) Place power steering pump and tank on the right side wheel apron.



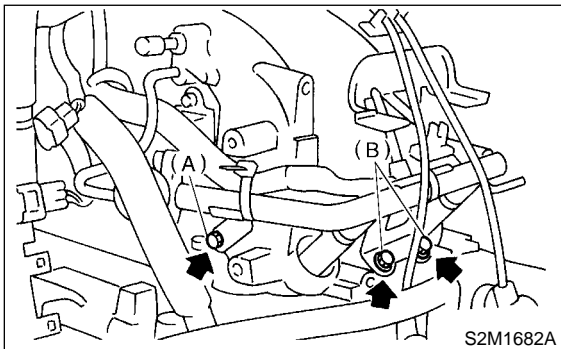
8) Disconnect connector from fuel injector.



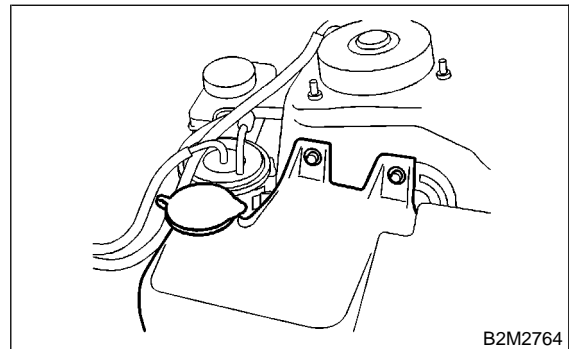
3) Disconnect battery ground cable.



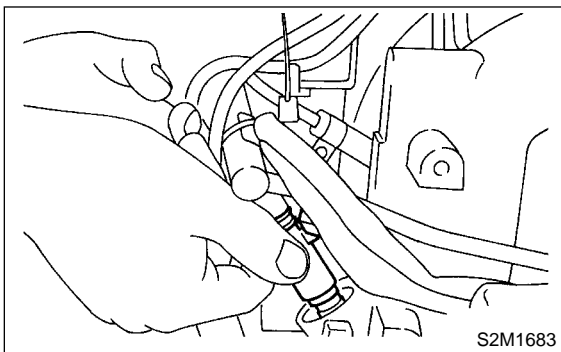
9) Remove bolts (A) and (B) which install injector pipe to intake manifold.



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

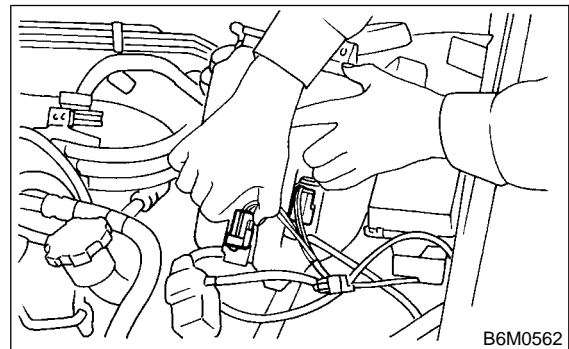


10) Pull up injector pipe, and remove fuel injectors from intake manifold.



5) Disconnect connector from front window washer motor.

6) Disconnect connector from rear gate glass washer motor.



## 2. LH SIDE S165051A1802

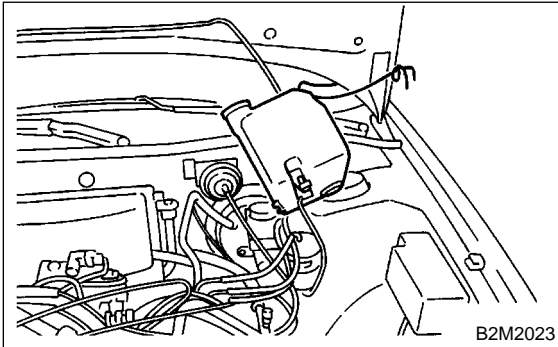
1) Release fuel pressure. <Ref. to FU(SOHCw/oOBD)-41, RELEASING OF FUEL PRESSURE, OPERATION, Fuel.>

2) Open fuel flap lid, and remove fuel filler cap.

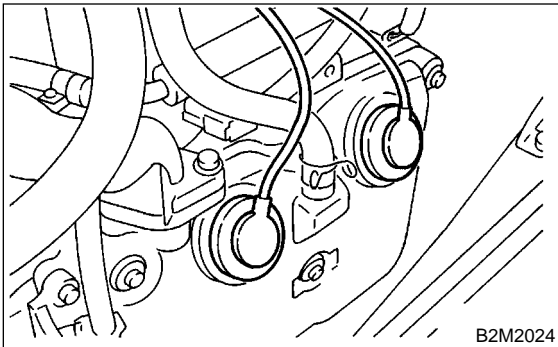
# FUEL INJECTOR

## Fuel Injection (Fuel Systems)

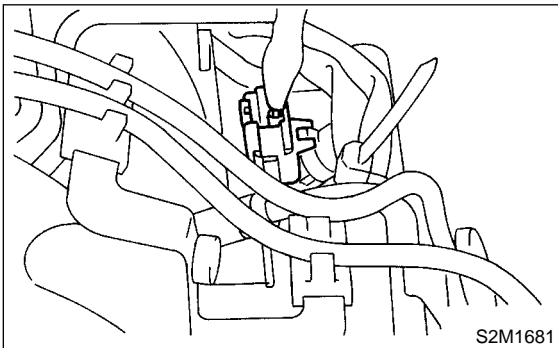
- 7) Disconnect rear window glass washer hose from washer motor, then plug connection with a suitable cap.
- 8) Move washer tank, and secure it away from working area.



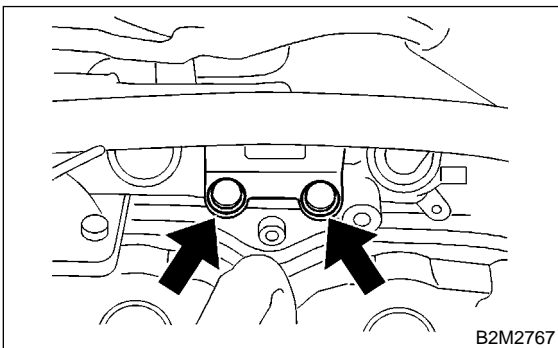
- 9) Remove spark plug cords from spark plugs (#2 and #4 cylinders).



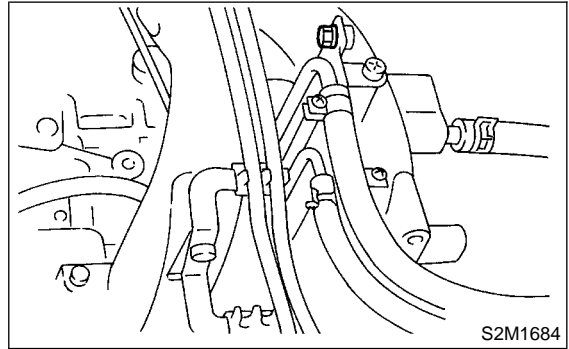
- 10) Disconnect connector from fuel injector.



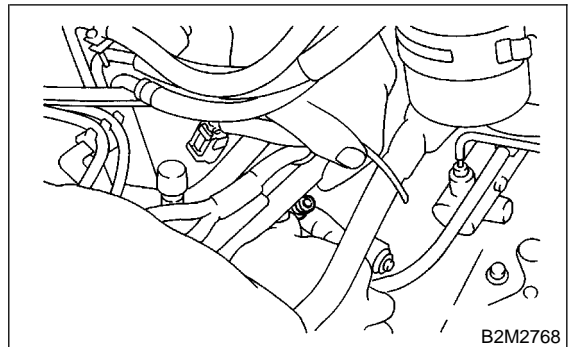
- 11) Remove bolt which installs injector pipe to intake manifold.



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



- 13) Pull up injector pipe, and remove fuel injectors from intake manifold.



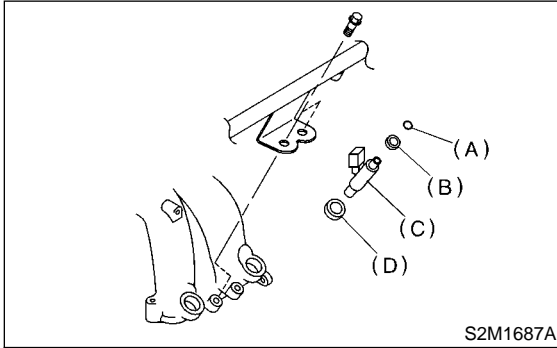
## B: INSTALLATION S165051A11

### 1. RH SIDE S165051A1101

Install in the reverse order of removal.

NOTE:

Replace O-rings with new ones.

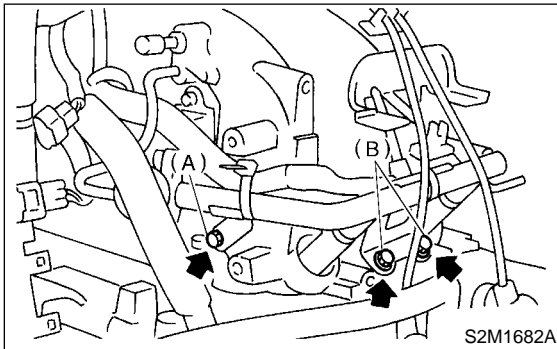


- (A) O-ring
- (B) Insulator A
- (C) Fuel injector
- (D) Insulator B

**Tightening torque:**

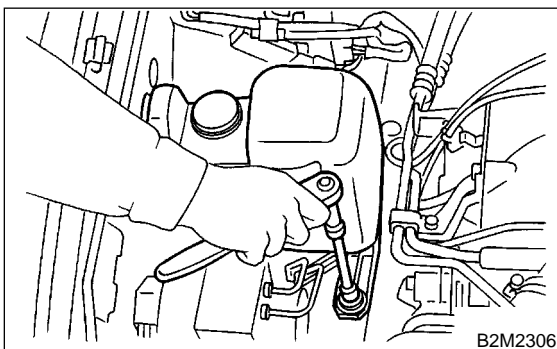
**Bolt (A) 4.9 N·m (0.50 kgf·m, 3.6 ft·lb)**

**Bolt (B) 19 N·m (1.9 kgf·m, 13.7 ft·lb)**



**Tightening torque:**

**32 N·m (3.3 kgf·m, 23.9 ft·lb)**

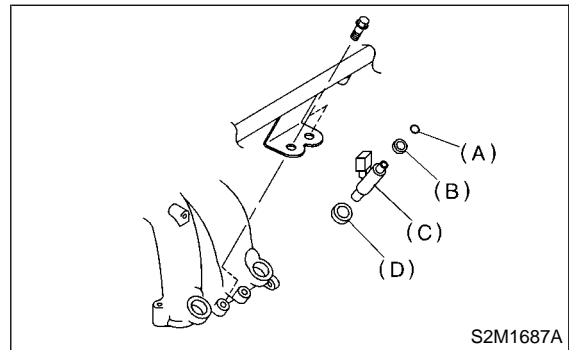


### 2. LH SIDE S165051A1102

Install in the reverse order of removal.

NOTE:

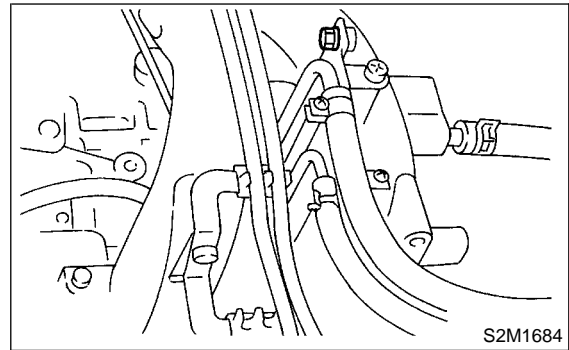
Replace O-rings with new ones.



- (A) O-ring
- (B) Insulator A
- (C) Fuel injector
- (D) Insulator B

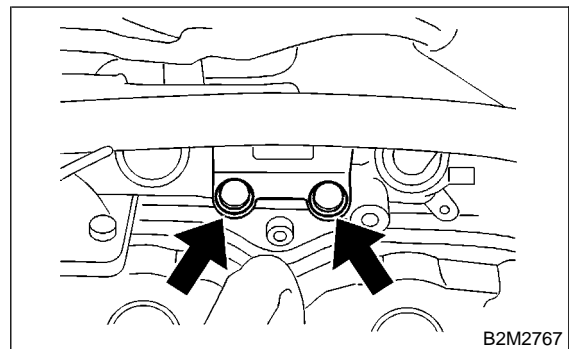
**Tightening torque:**

**4.9 N·m (0.50 kgf·m, 3.6 ft·lb)**



**Tightening torque:**

**19 N·m (1.9 kgf·m, 13.7 ft·lb)**



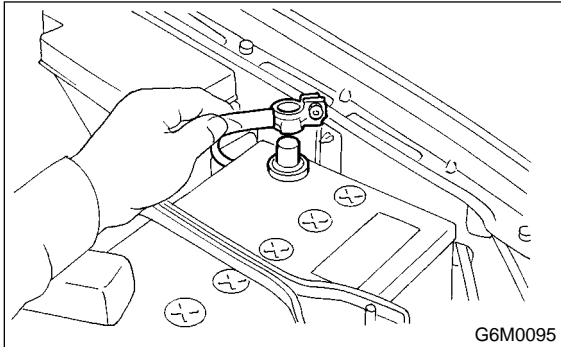
# OXYGEN SENSOR

Fuel Injection (Fuel Systems)

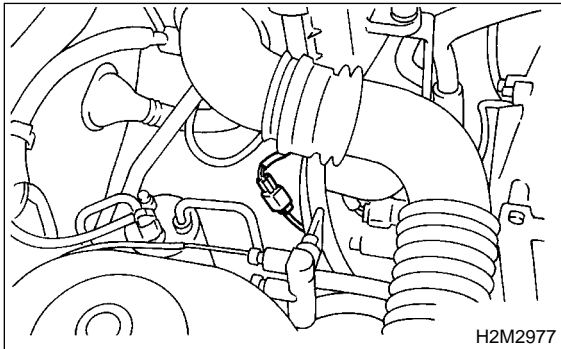
## 12. Oxygen Sensor S165712

### A: REMOVAL S165712A18

- 1) Disconnect battery ground cable.



- 2) Disconnect connector from oxygen sensor.



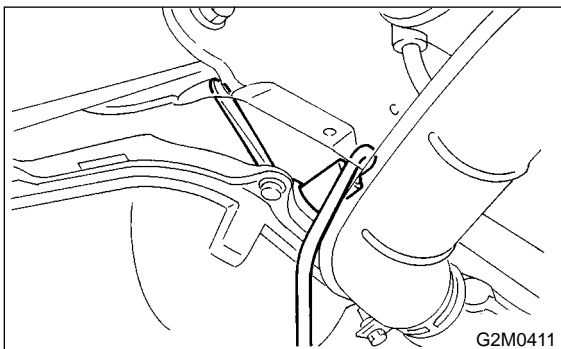
- 3) Lift-up the vehicle.
- 4) Apply SUBARU CRC or its equivalent to threaded portion of oxygen sensor, and leave it for one minute or more.

**SUBARU CRC (Part No. 004301003)**

- 5) Remove oxygen sensor.

#### CAUTION:

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



### B: INSTALLATION S165712A11

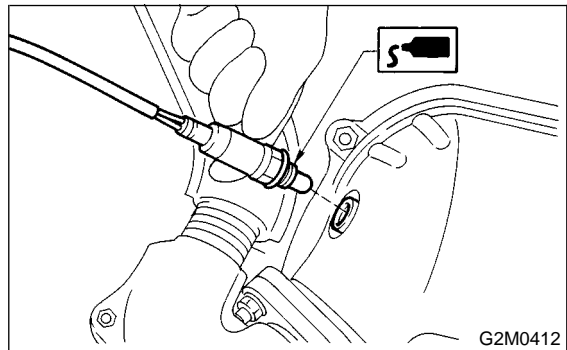
- 1) Before installing oxygen sensor, apply anti-seize compound only to threaded portion of oxygen sensor to make the next removal easier.

**Anti-seize compound:**

**SS-30 by JET LUBE**

#### CAUTION:

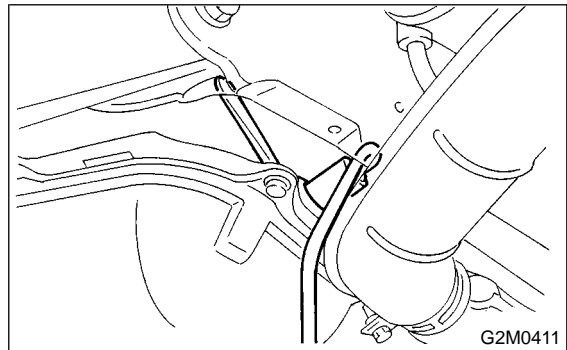
Never apply anti-seize compound to protector of oxygen sensor.



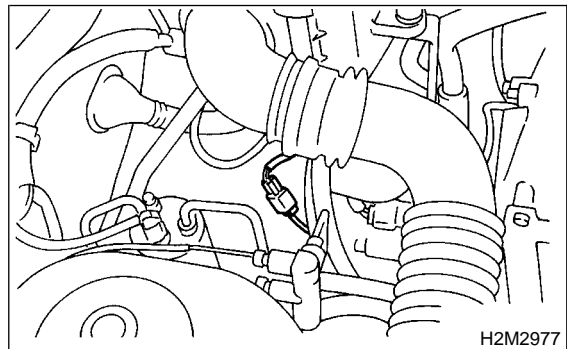
- 2) Install oxygen sensor.

**Tightening torque:**

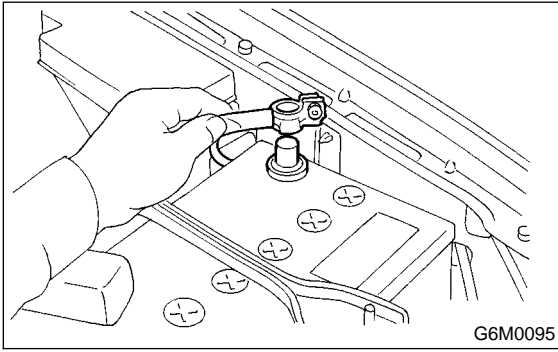
**21 N·m (2.1 kgf·m, 15.2 ft·lb)**



- 3) Lower the vehicle.
- 4) Connect connector of oxygen sensor.



5) Connect battery ground cable.



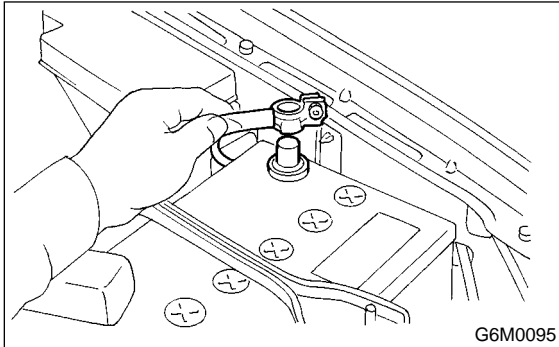
# ENGINE CONTROL MODULE

Fuel Injection (Fuel Systems)

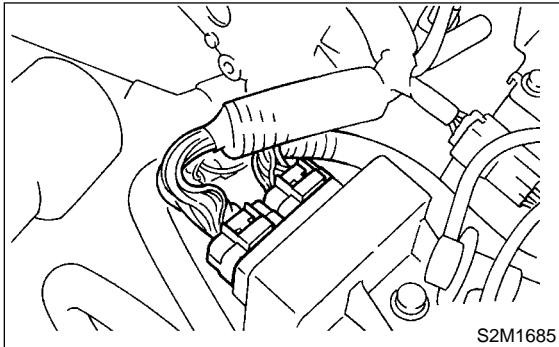
## 13. Engine Control Module S165049

### A: REMOVAL S165049A18

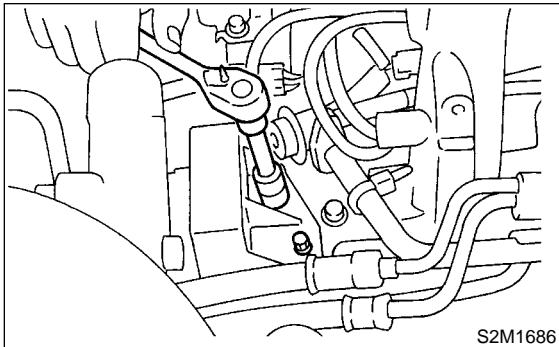
- 1) Disconnect battery ground cable.



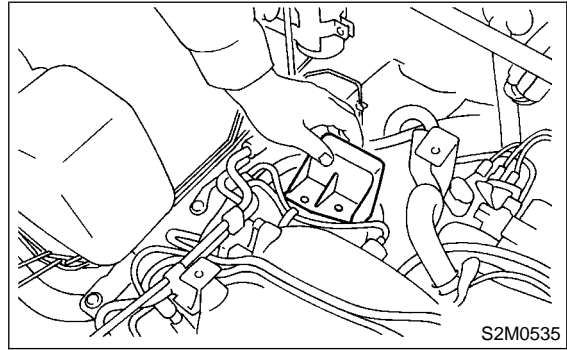
- 2) Remove air intake duct.  
<Ref. to IN(SOHC)-8, REMOVAL, Air Intake Duct.>
- 3) Disconnect the two connectors from ECM.



- 4) Remove bolts which install ECM on right side cylinder head.



- 5) Take off ECM from engine compartment.

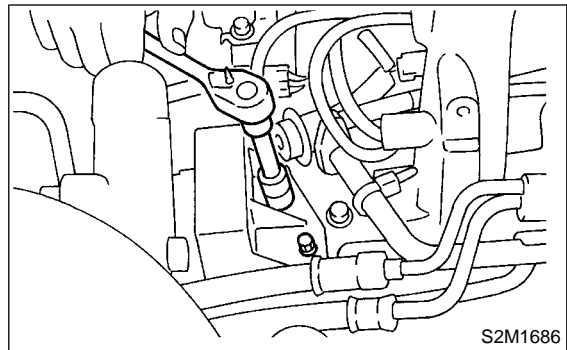


### B: INSTALLATION S165049A11

Install in the reverse order of removal.

**Tightening torque:**

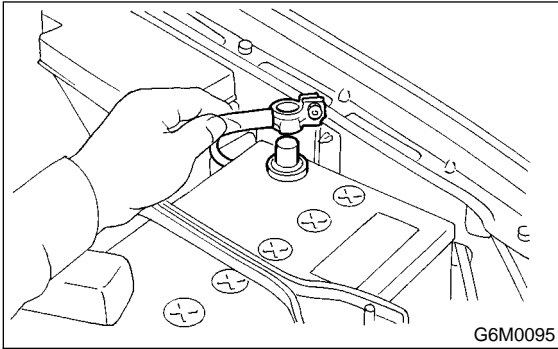
**23 N·m (2.3 kgf·m, 16.6 ft·lb)**



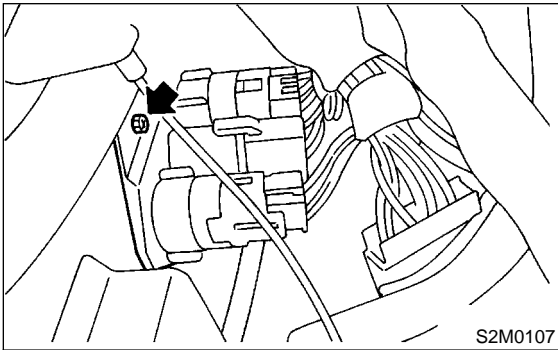
## 14. Main Relay S165050

### A: REMOVAL S165050A18

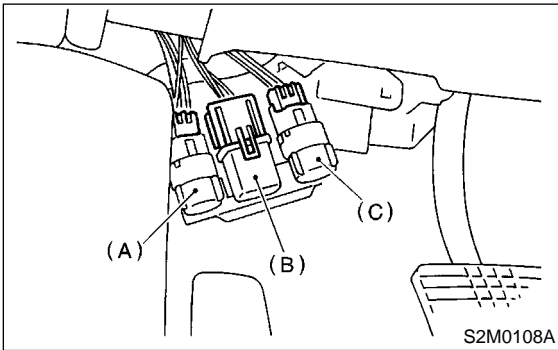
1) Disconnect battery ground cable.



2) Remove bolt which holds bracket of main relay and fuel pump relay.

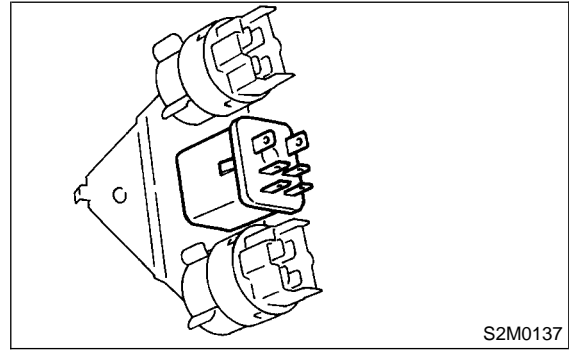


3) Disconnect connectors from relays.



- (A) Blower fan motor relay
- (B) Main relay
- (C) Fuel pump relay

4) Remove main relay from mounting bracket.



### B: INSTALLATION S165050A11

Install in the reverse order of removal.



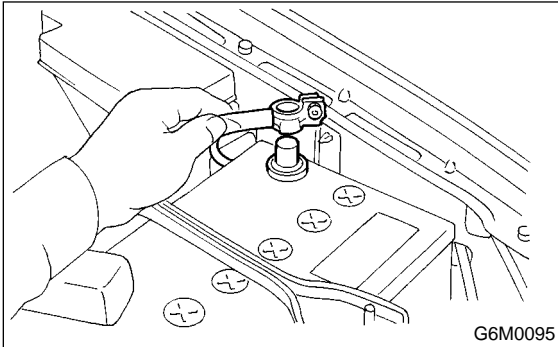
# FUEL PUMP RELAY

Fuel Injection (Fuel Systems)

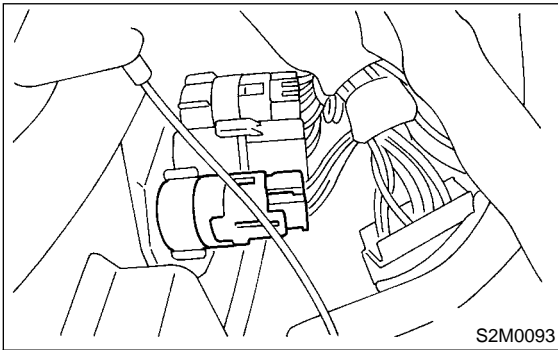
## 15. Fuel Pump Relay S165048

### A: REMOVAL S165048A18

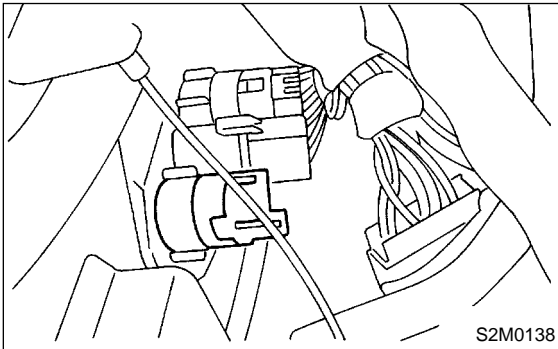
- 1) Disconnect battery ground cable.



- 2) Disconnect connector from fuel pump relay.



- 3) Remove fuel pump relay from mounting bracket.



### B: INSTALLATION S165048A11

Install in the reverse order of removal.

### 16. Fuel S165052

#### A: OPERATION S165052A16

##### 1. RELEASING OF FUEL PRESSURE

S165052A1601

###### WARNING:

- Place "No fire" signs near the working area.
- Disconnect ground terminal from battery.

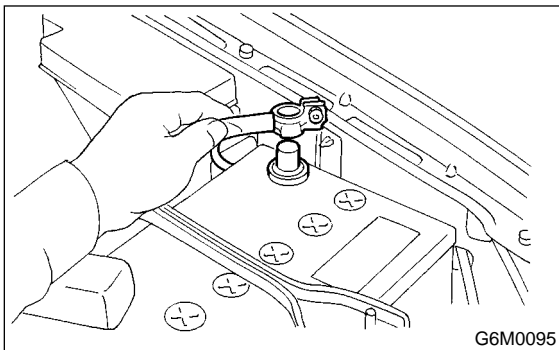
- 1) Disconnect connector from fuel pump relay.  
<Ref. to FU(SOHCw/oOBD)-40, REMOVAL, Fuel Pump Relay.>
- 2) Start the engine, and run it until it stalls.
- 3) After the engine stalls, crank it for five more seconds.
- 4) Turn ignition switch OFF.

##### 2. DRAINING OF FUEL S165052A1602

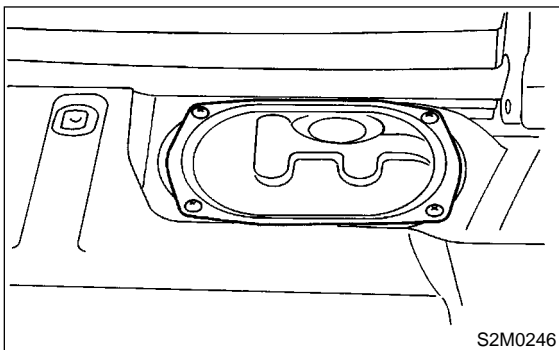
###### WARNING:

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

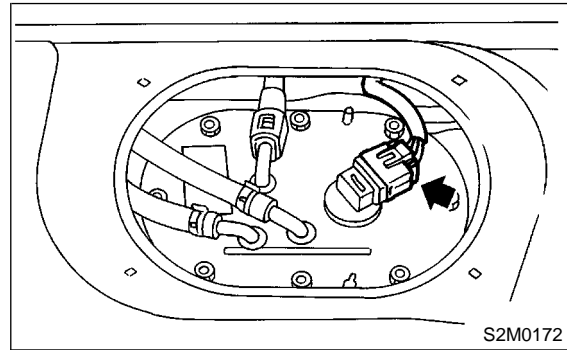
- 1) Release fuel pressure. <Ref. to FU(SOHCw/oOBD)-41, RELEASING OF FUEL PRESSURE, OPERATION, Fuel.>
- 2) Open fuel flap lid, and remove fuel filler cap.
- 3) Disconnect battery ground cable.



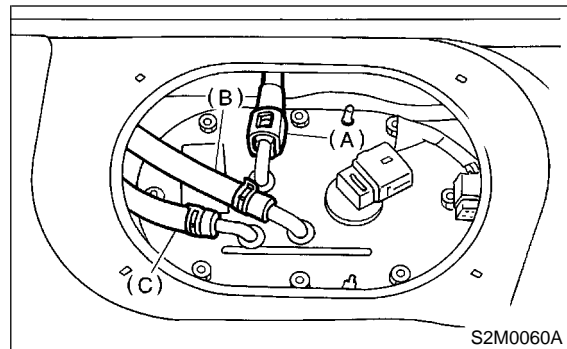
- 4) Remove the floor box located just behind the rear seats.
- 5) Remove access hole lid.



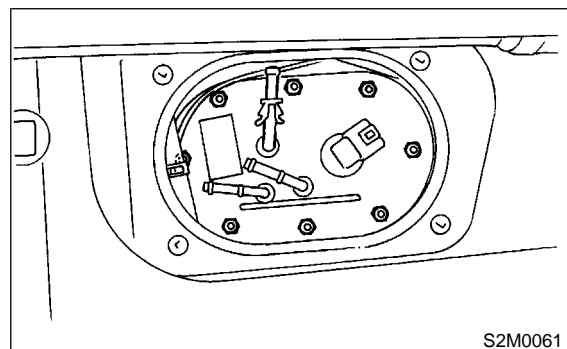
- 6) Disconnect connector from fuel pump.



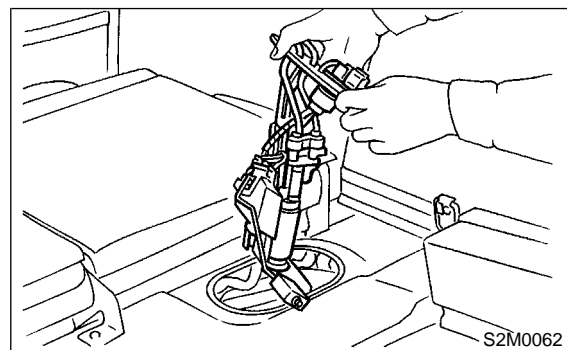
- 7) Disconnect quick connector, and then disconnect fuel delivery hose (A). <Ref. to FU(SOHCw/oOBD)-56, REMOVAL, Fuel Delivery, Return and Evaporation Lines.>
- 8) Move clips, and then disconnect fuel return hose (B) and jet pump hose (C).



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



- 10) Take off fuel pump from fuel tank.



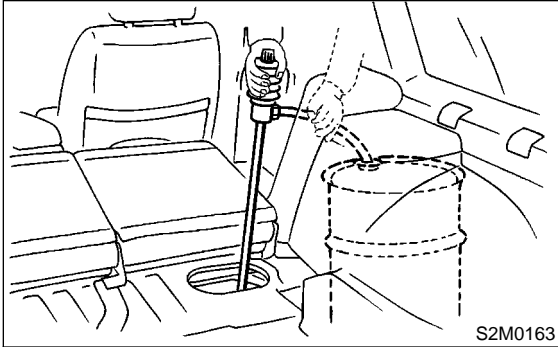
# FUEL

## Fuel Injection (Fuel Systems)

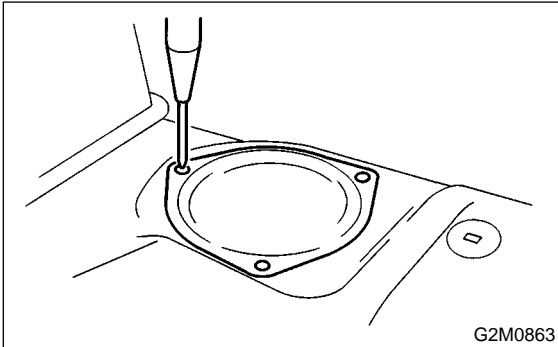
11) Drain fuel from fuel tank by using a hand pump.

**WARNING:**

**Do not use a motor pump when draining fuel.**

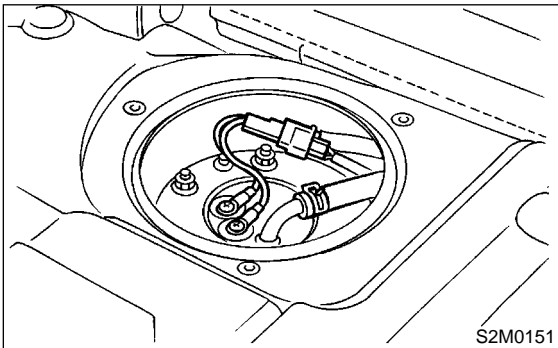


12) Remove service hole cover.

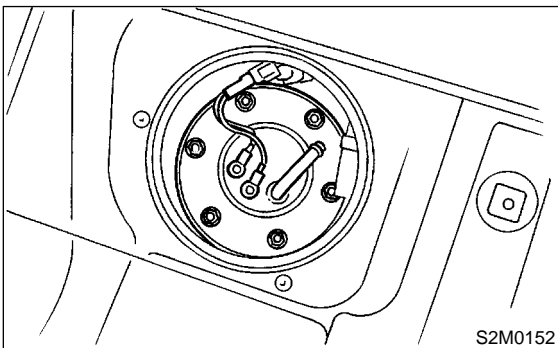


13) Disconnect connector from fuel sub meter.

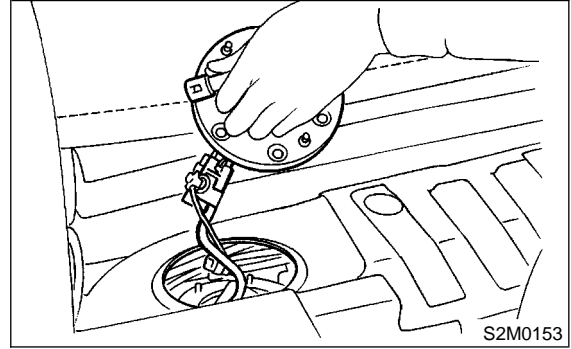
14) Disconnect fuel jet pump hose.



15) Remove bolts which install fuel sub meter unit on fuel tank.



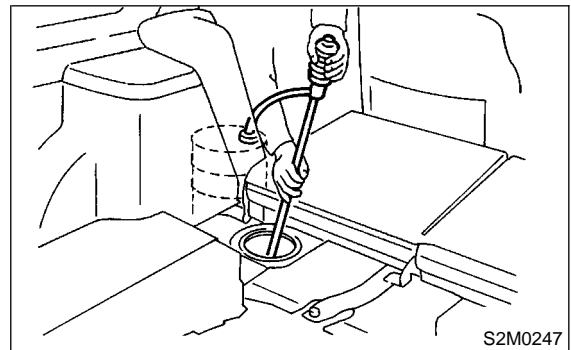
16) Remove fuel sub meter unit.



17) Drain fuel from there.

**WARNING:**

**Do not use a motor pump when draining fuel.**

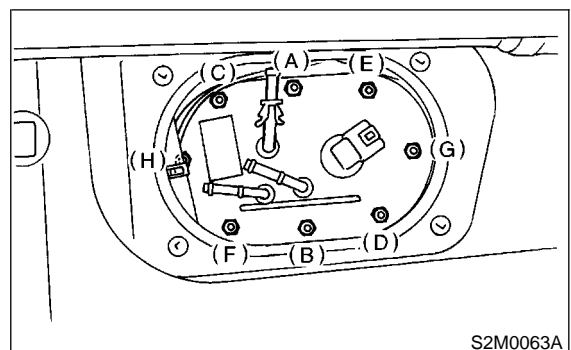


18) After draining fuel, reinstall fuel pump and fuel sub meter unit.

Tighten nuts of fuel pump in alphabetical sequence shown in figure to specified torque.

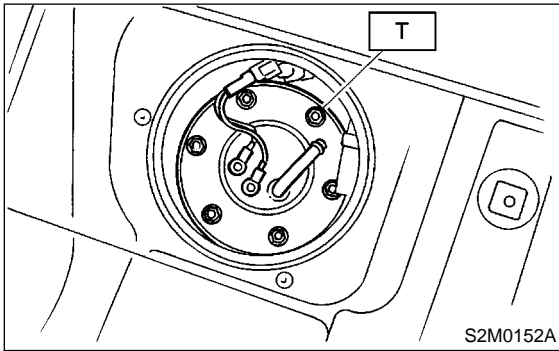
**Tightening torque:**

**4.4 N·m (0.45 kgf·m, 3.3 ft·lb)**



**Tightening torque:**

**T: 4.4 N·m (0.45 kgf-m, 3.3 ft-lb)**



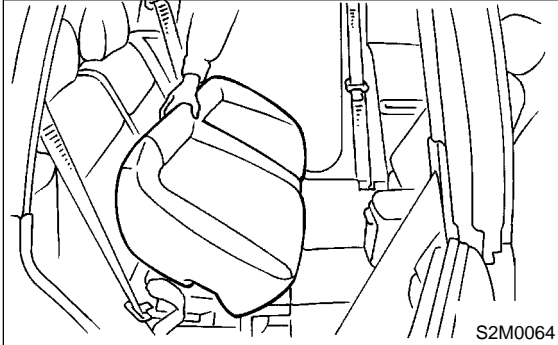
# FUEL TANK

Fuel Injection (Fuel Systems)

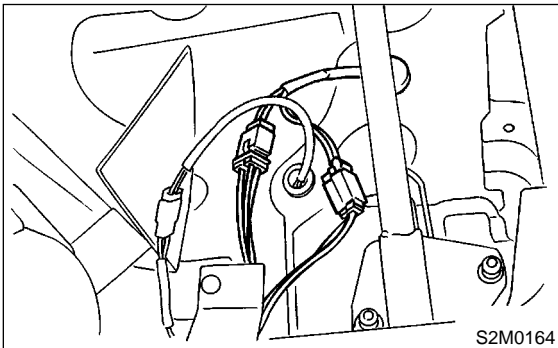
## 17. Fuel Tank S165053

### A: REMOVAL S165053A18

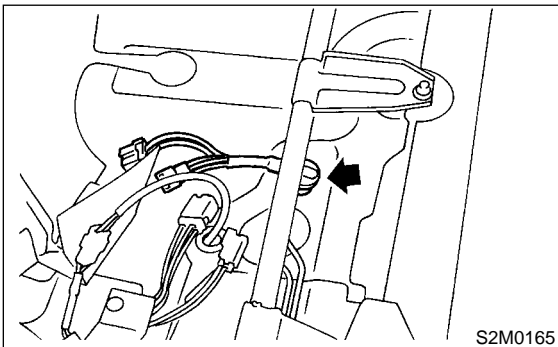
- 1) Set vehicle on the lift.
- 2) Release fuel pressure. <Ref. to FU(SOHCw/oOBD)-41, RELEASING OF FUEL PRESSURE, OPERATION, Fuel.>
- 3) Drain fuel from fuel tank. <Ref. to FU(SOHCw/oOBD)-41, DRAINING OF FUEL, OPERATION, Fuel.>
- 4) Remove rear seat cushion, and turn up cover.



- 5) Disconnect connector of fuel tank cord from rear harness.



- 6) Push grommet which holds fuel tank cord on floor panel into under the body.



- 7) Lift-up the vehicle.

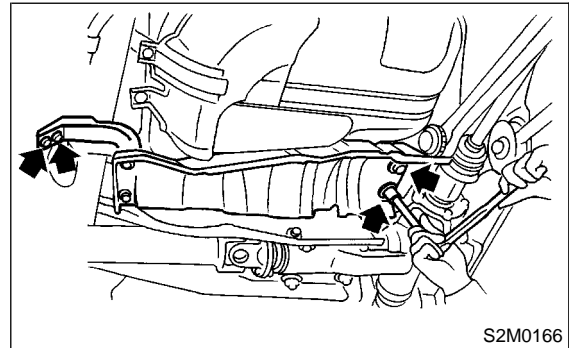
- 8) Remove rear exhaust pipe. <Ref. to EX(SOHCw/oOBD)-10, REMOVAL Rear Exhaust Pipe.>

#### NOTE:

To facilitate the removal of parts, apply a coat of SUBARU CRC to matching area of rubber cushions in advance.

**SUBARU CRC (Part No. 004301003)**

- 9) Remove heat sealed cover.



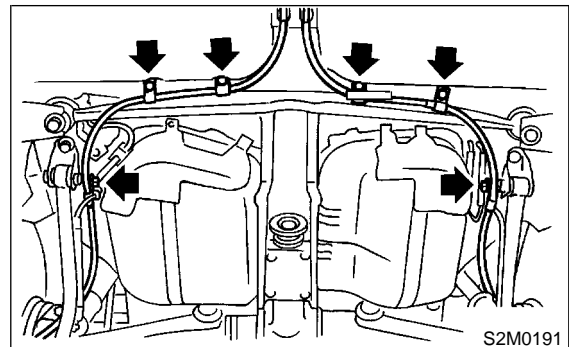
- 10) Remove muffler assembly. <Ref. to EX(SOHCw/oOBD)-12, REMOVAL Muffler.>

#### NOTE:

To facilitate the removal of parts, apply a coat of SUBARU CRC to matching area of rubber cushions in advance.

**SUBARU CRC (Part No. 004301003)**

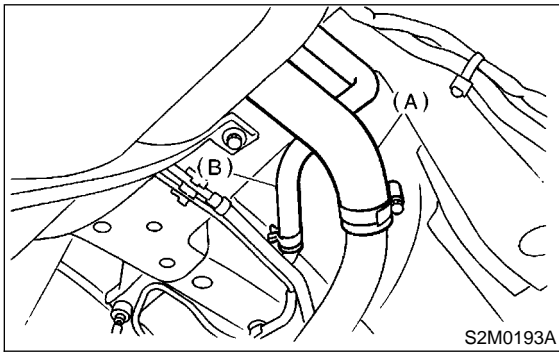
- 11) Remove bolts which hold parking brake cable holding bracket.



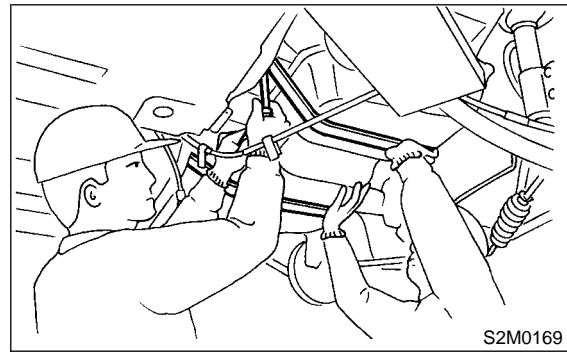
- 12) Remove rear differential assembly. <Ref. to DI-25, REMOVAL, Rear Differential for T-type.> and <Ref. to DI-42, REMOVAL, Rear Differential for VA-type.>

- 13) Remove rear crossmember. <Ref. to RS-20, REMOVAL, Rear Crossmember.>

- 14) Loosen clamp, and disconnect fuel filler hose (A) and air vent hose (B) from fuel filler pipe.

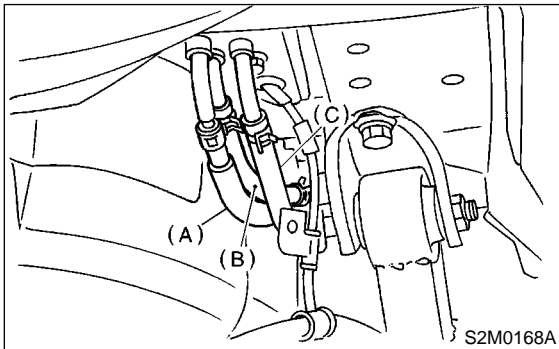


- 2) Set fuel tank, and temporarily tighten bolts for installing fuel tank bands.

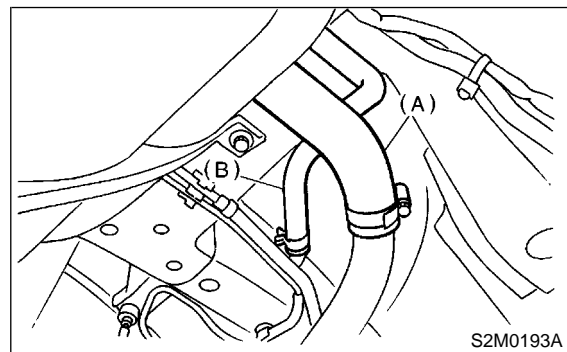


- 15) Move clips, and disconnect fuel return hose (B) and evaporation hose (C).

- 16) Disconnect quick connector, and then disconnect fuel delivery hose (A). <Ref. to FU(SOHCw/oOBD)-56, REMOVAL, Fuel Delivery, Return and Evaporation Lines.>



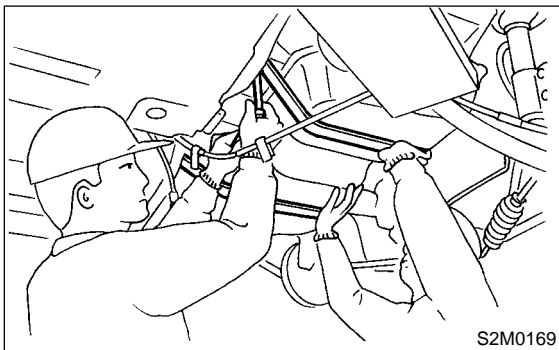
- 3) Connect fuel filler hose (A) and air vent hose (B).



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

**WARNING:**

**A helper is required to perform this work.**

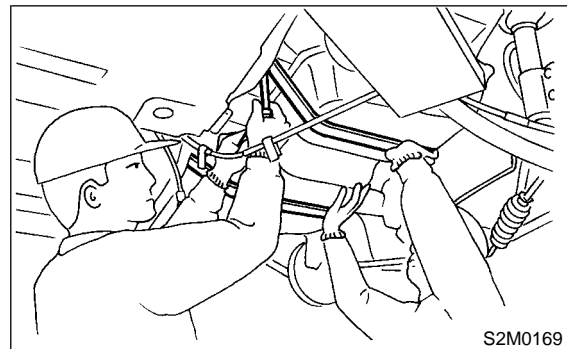


- 4) Connect fuel hoses, and hold them with clips and quick connector. <Ref. to FU(SOHCw/oOBD)-57, INSTALLATION, Fuel Delivery, Return and Evaporation Lines.>

- 5) Tighten band mounting bolts.

**Tightening torque:**

**33 N·m (3.4 kgf·m, 25 ft·lb)**



**B: INSTALLATION** S165053A11

- 1) While a helper holds fuel tank, push fuel tank harness into access hole with grommet.

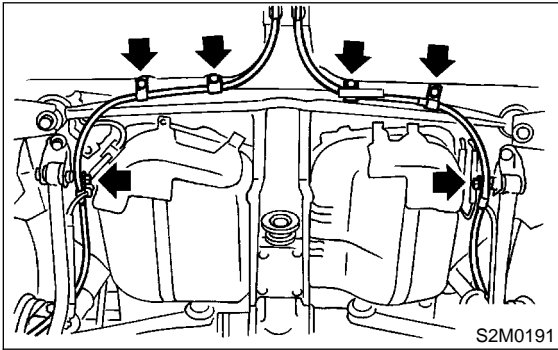
- 6) Install rear crossmember. <Ref. to RS-20, INSTALLATION, Rear Crossmember.>

- 7) Install rear differential assembly. <Ref. to DI-27, INSTALLATION, Rear Differential for T-type.> and <Ref. to DI-43, INSTALLATION Rear Differential for VA-type.>

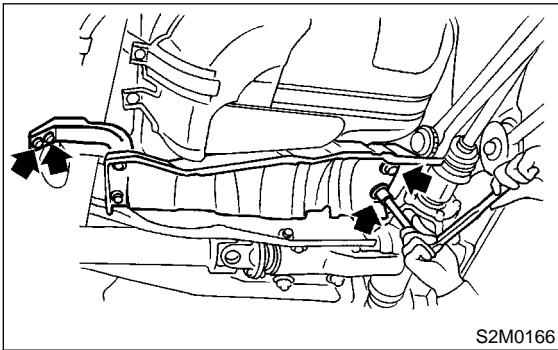
# FUEL TANK

## Fuel Injection (Fuel Systems)

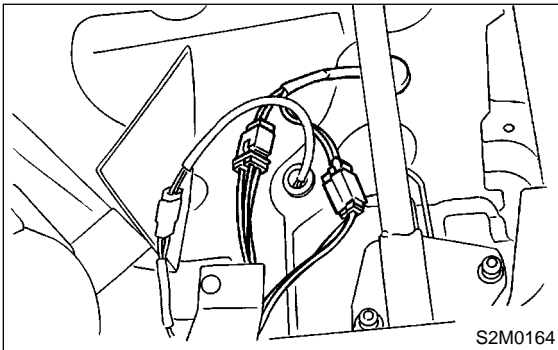
8) Install bolts which hold parking brake holding bracket.



9) Install muffler assembly. <Ref. to EX(SOHCw/oOBD)-12, INSTALLATION, Muffler.>  
10) Install heat sealed cover.

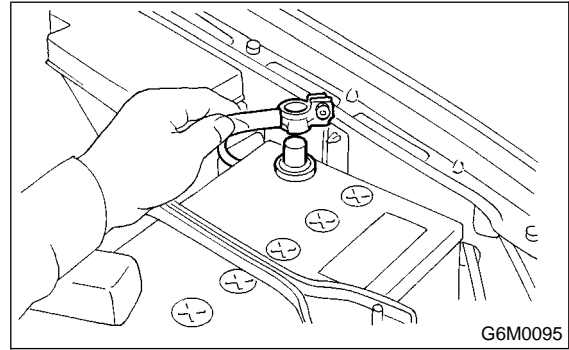


11) Install rear exhaust pipe. <Ref. to EX(SOHCw/oOBD)-10, INSTALLATION, Rear Exhaust Pipe.>  
12) Lower the vehicle.  
13) Connect connectors to fuel tank harness, and plug access hole with grommet.



14) Install rear seat cushion.  
15) Install fuel filler cap.  
16) Connect connector to fuel pump relay.  
<Ref. to FU(SOHCw/oOBD)-40, INSTALLATION, Fuel Pump Relay.>

17) Connect battery ground cable.



## C: INSPECTION S165053A10

- 1) Make sure there are no cracks, holes, or other damage on the fuel tank.
- 2) Make sure that the fuel hoses and fuel pipes are not cracked and that connections are tight.

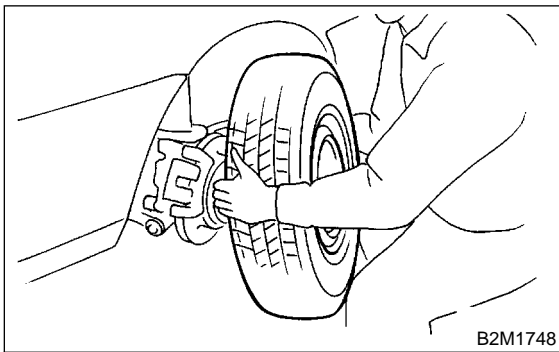
## 18. Fuel Filler Pipe S165022

### A: REMOVAL S165022A18

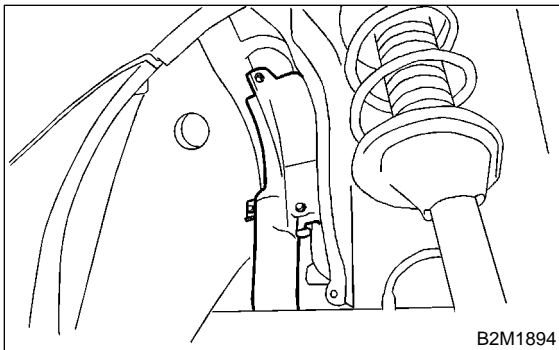
**WARNING:**

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

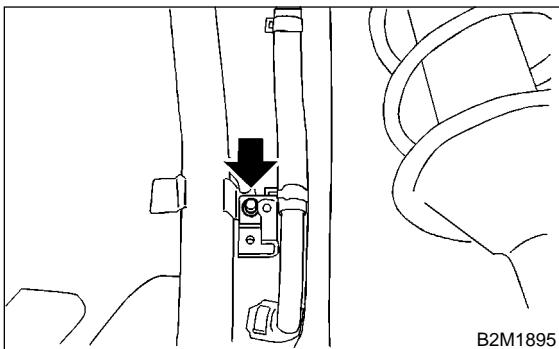
- 1) Set the vehicle on the lift.
- 2) Drain fuel from fuel tank. <Ref. to FU(SOHCw/oBD)-41, RELEASING OF FUEL PRESSURE, OPERATION, Fuel.>
- 3) Remove screws holding packing in place.
- 4) Remove wheel nuts of rear right side.
- 5) Lift-up the vehicle.
- 6) Remove rear right side wheel.



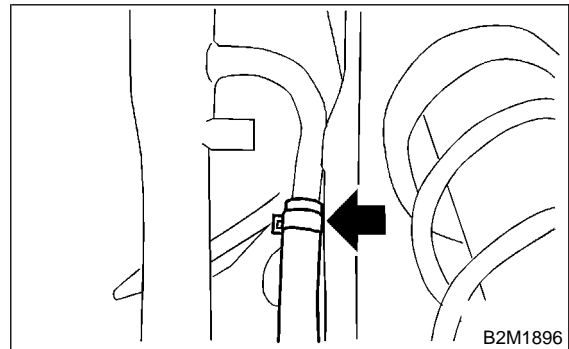
- 7) Remove fuel filler pipe protector.



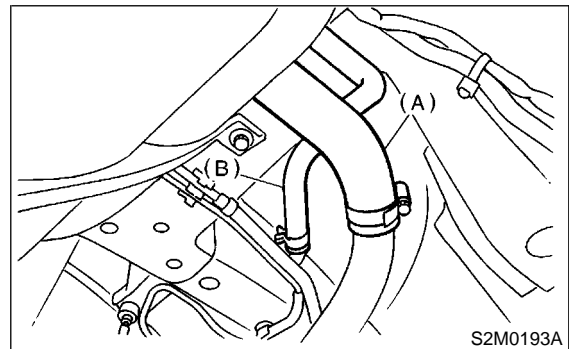
- 8) Remove bolts which hold fuel filler pipe bracket on body.



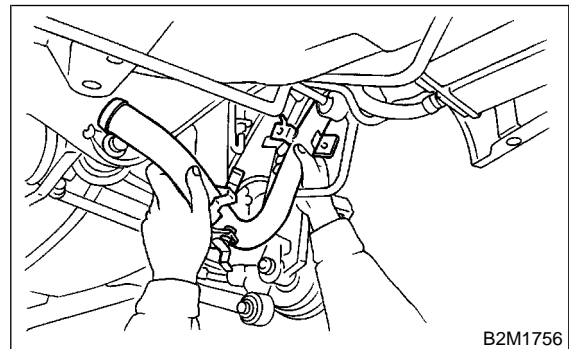
- 9) Move clip, and disconnect air vent hose from air vent pipe.



- 10) Loosen clamp, and separate fuel filler hose (A) from fuel filler pipe.
- 11) Move clip, and separate air vent hose (B).



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



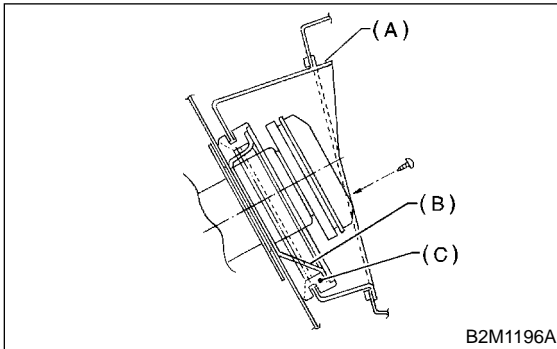


# FUEL FILLER PIPE

Fuel Injection (Fuel Systems)

## B: INSTALLATION S165022A11

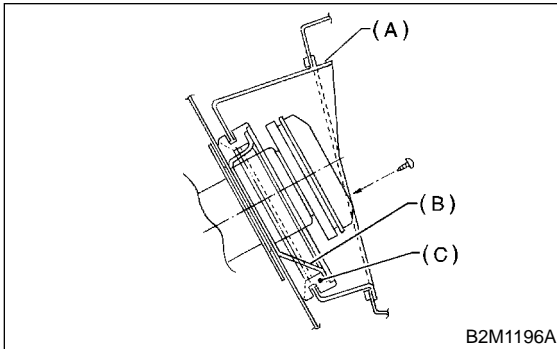
- 1) Hold fuel filler flap open.
- 2) Set fuel saucer (A) with rubber packing (C), and insert fuel filler pipe into hole from the inner side of apron.



- 3) Align holes in fuel filler pipe neck and set cup (B), and tighten screws.

### NOTE:

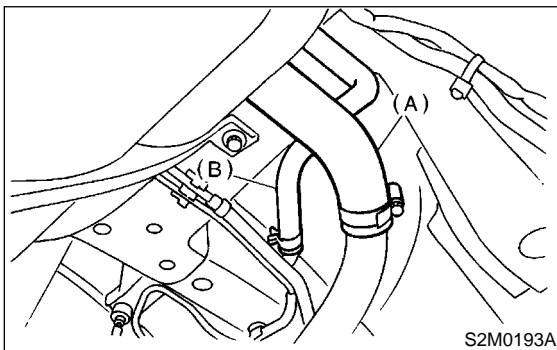
If edges of rubber packing are folded toward the inside, straighten it with a screwdriver.



- 4) Insert fuel filler hose (A) approximately 25 to 30 mm (0.98 to 1.18 in) over the lower end of fuel filler pipe and tighten clamp.

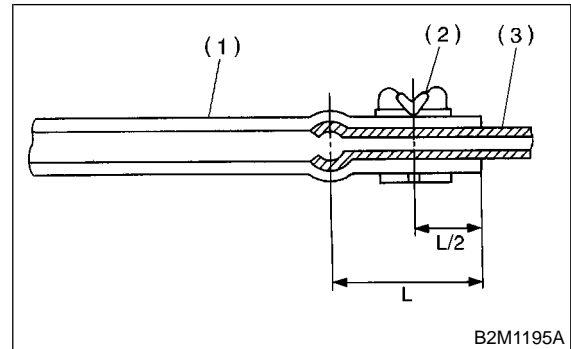
### CAUTION:

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



- 5) Insert air vent hose approximately 25 to 30 mm (0.98 to 1.18 in) into the lower end of air vent pipe and hold clip.

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

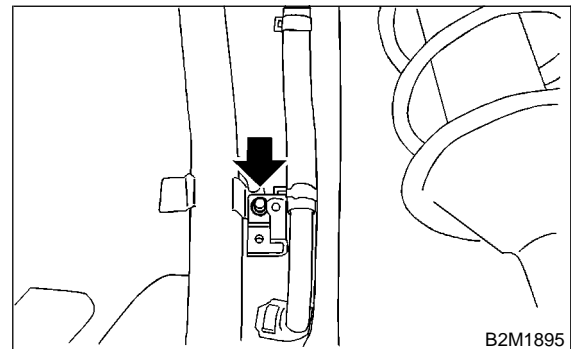


- (1) Hose
- (2) Clip
- (3) Pipe

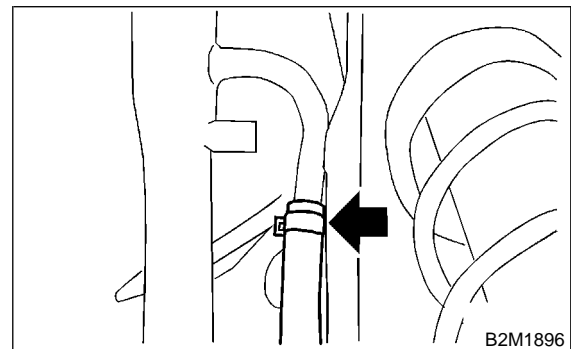
- 6) Tighten bolt which holds fuel filler pipe bracket on body.

### Tightening torque:

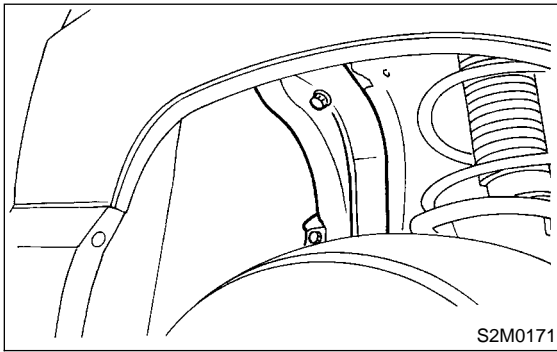
$22.6 \text{ N}\cdot\text{m} (2.3 \text{ kgf}\cdot\text{m}, 16.6 \text{ ft}\cdot\text{lb})$



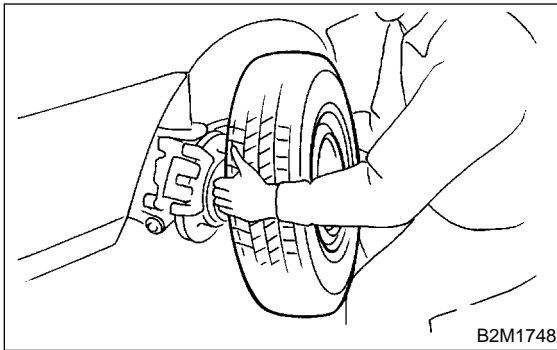
- 7) Connect air vent hose to air vent pipe.



8) Install fuel filler pipe protector.



9) Install rear right wheel.

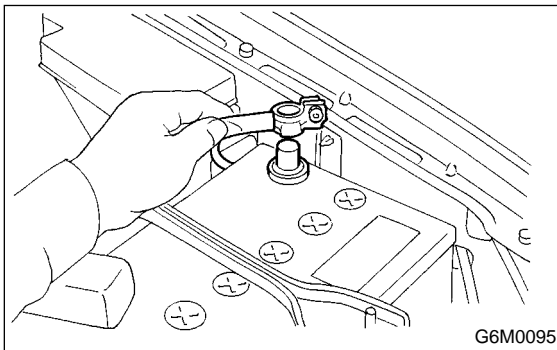


10) Lower the vehicle.

11) Tighten wheel nuts.

12) Connect connector to fuel pump relay.  
<Ref. to FU(SOHCw/oOBD)-40, INSTALLATION,  
Fuel Pump Relay.>

13) Connect battery ground terminal.



# FUEL PUMP

Fuel Injection (Fuel Systems)

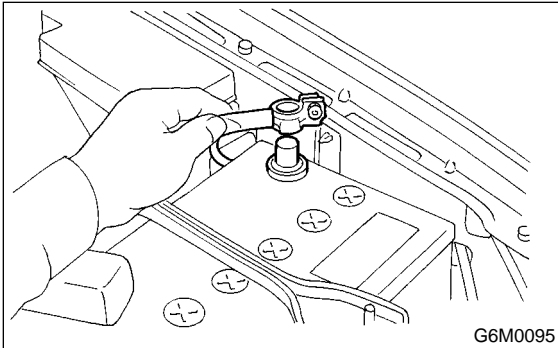
## 19. Fuel Pump S165025

### A: REMOVAL S165025A18

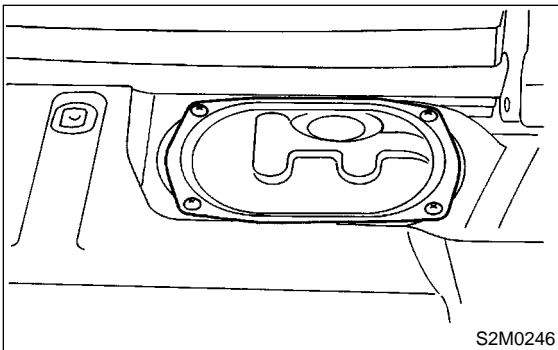
#### WARNING:

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

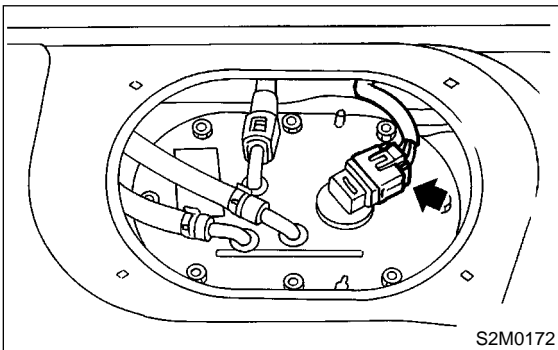
- 1) Release fuel pressure. <Ref. to FU(SOHCw/oOBD)-41, RELEASING OF FUEL PRESSURE, OPERATION, Fuel.>
- 2) Open fuel filler flap lid, and remove fuel filler cap.
- 3) Disconnect battery ground cable.



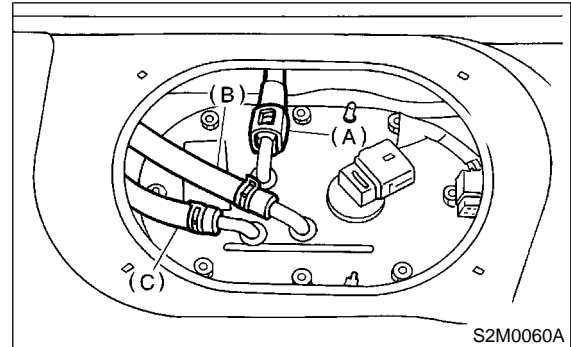
- 4) Remove the floor box located just behind the rear seats.
- 5) Remove access hole lid.



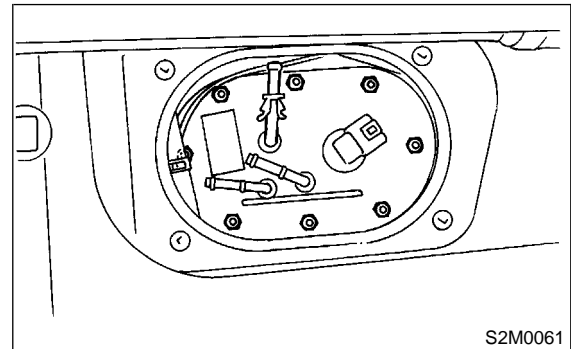
- 6) Disconnect connector from fuel pump.



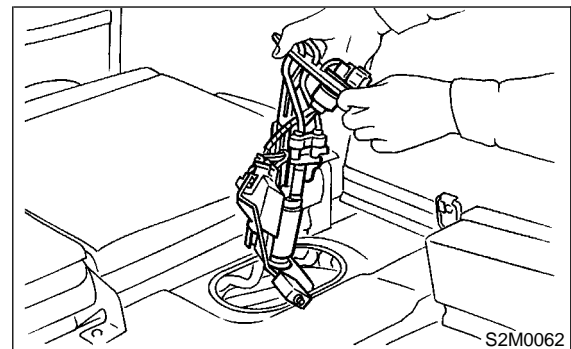
- 7) Move clips, and then disconnect fuel delivery hose (A), return hose (B) and jet pump hose (C).
- 8) Disconnect quick connector, and then disconnect fuel delivery hose (A). <Ref. to FU(SOHCw/oOBD)-56, REMOVAL, Fuel Delivery, Return and Evaporation Lines.>



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



- 10) Take off fuel pump from fuel tank.



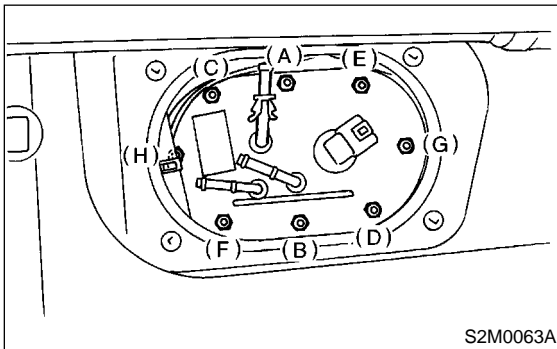
## B: INSTALLATION S165025A11

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

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

### **Tightening torque:**

**4.4 N·m (0.45 kgf·m, 3.3 ft·lb)**

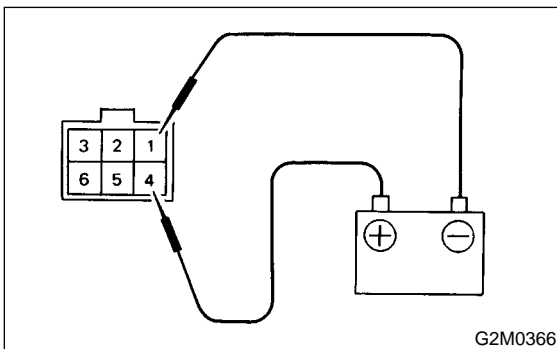


## C: INSPECTION S165025A10

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

### **WARNING:**

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



# FUEL LEVEL SENSOR

Fuel Injection (Fuel Systems)

## 20. Fuel Level Sensor S165026

### A: REMOVAL S165026A18

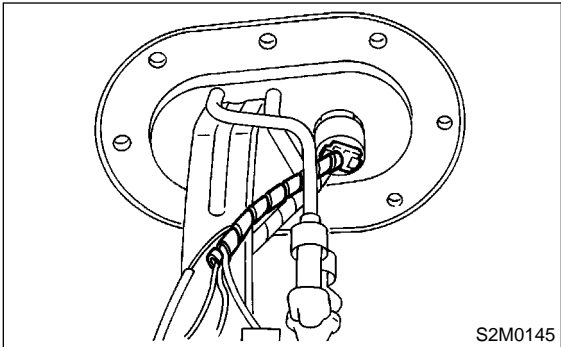
#### WARNING:

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

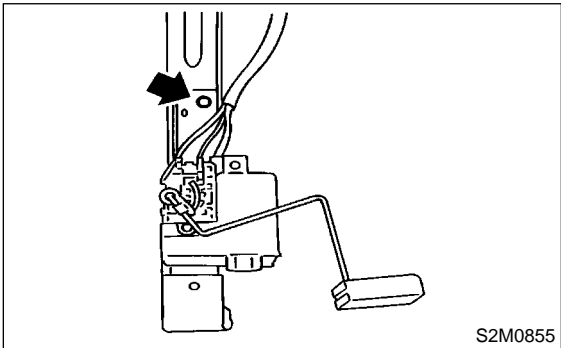
#### NOTE:

Fuel level sensor is built in fuel pump assembly.

- 1) Remove fuel pump assembly. <Ref. to FU(SOHCw/oOBD)-50, REMOVAL, Fuel Pump.>
- 2) Disconnect connector from fuel pump bracket.



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



### B: INSTALLATION S165026A11

Install in the reverse order of removal.

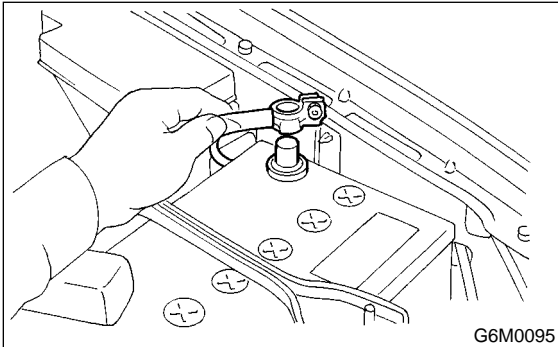
## 21. Fuel Sub Level Sensor S165023

### A: REMOVAL S165023A18

**WARNING:**

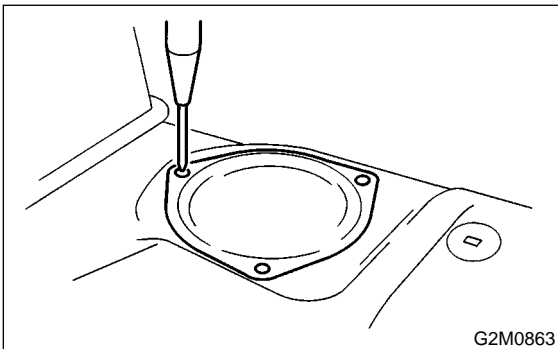
- Place “NO FIRE” signs near the working area.
- Be careful not to spill fuel on the floor.

1) Disconnect battery ground cable.



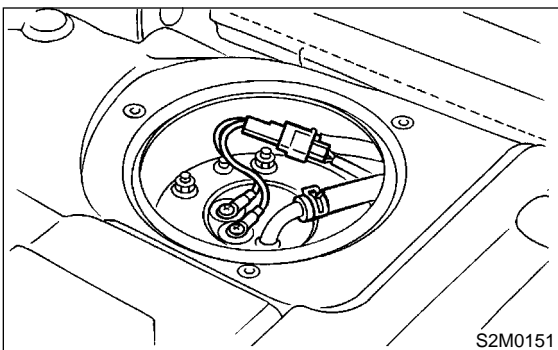
2) Remove the floor box located just behind the rear seats.

3) Remove service hole cover.

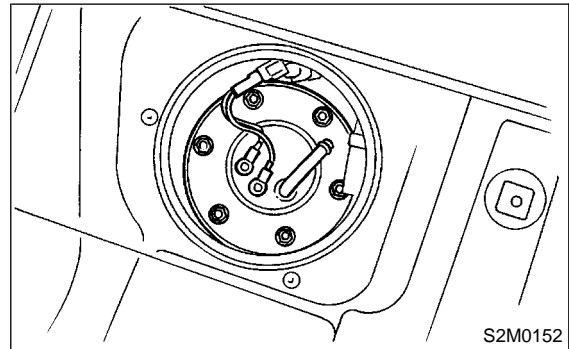


4) Disconnect connector from fuel sub meter.

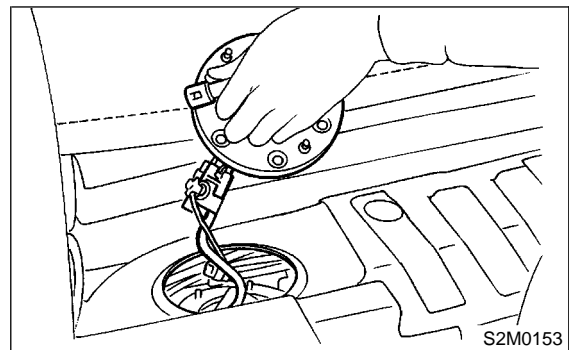
5) Disconnect fuel jet pump hose.



6) Remove bolts which install fuel sub meter unit on fuel tank.



7) Remove fuel sub meter unit.

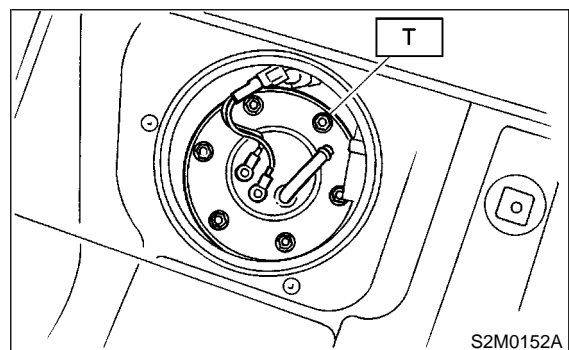


### B: INSTALLATION S165023A11

Install in the reverse order of removal.

**Tightening torque:**

**T: 4.4 N·m (0.45 kgf·m, 3.3 ft·lb)**



# FUEL FILTER

Fuel Injection (Fuel Systems)

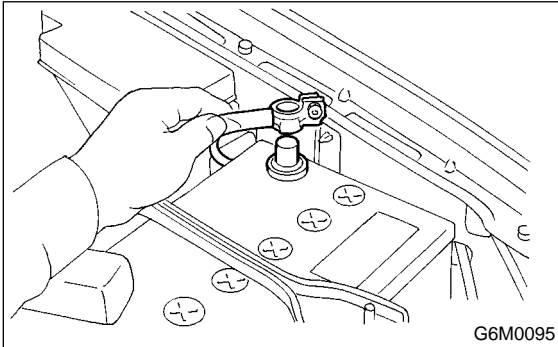
## 22. Fuel Filter S165027

### A: REMOVAL S165027A18

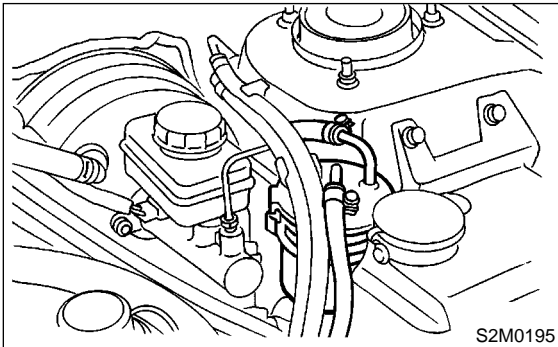
#### WARNING:

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

- 1) Release fuel pressure. <Ref. to FU(SOHCw/oOBD)-41, RELEASING OF FUEL PRESSURE, OPERATION, Fuel.>
- 2) Open fuel flap lid, and remove fuel filler cap.
- 3) Disconnect battery ground cable.



- 4) Disconnect fuel hoses from fuel filter.



- 5) Remove filter from holder.

### B: INSTALLATION S165027A11

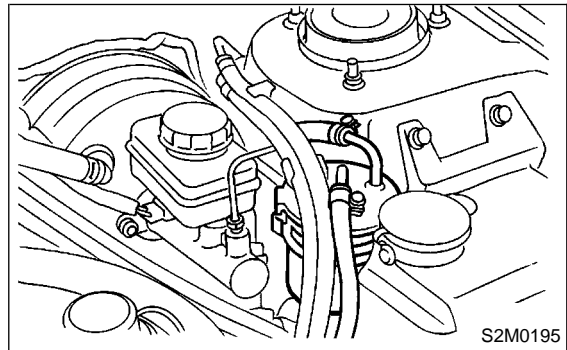
#### CAUTION:

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

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

#### Tightening torque:

**1 N·m (0.1 kgf-m, 0.7 ft-lb)**



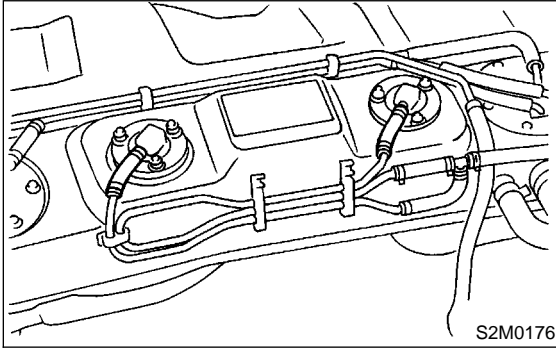
### C: INSPECTION S165027A10

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

## 23. Fuel Cut Valve S165021

### A: REMOVAL S165021A18

- 1) Remove fuel tank. <Ref. to FU(SOHCw/oOBD)-44, REMOVAL, Fuel Tank.>
- 2) Move clip and disconnect evaporation hose from fuel cut valve.



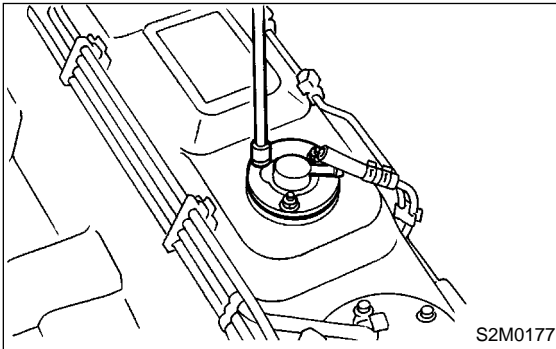
- 3) Remove bolts which install fuel cut valve.

### B: INSTALLATION S165021A11

Install in the reverse order of removal.

#### **Tightening torque:**

**4.4 N·m (0.45 kgf-m, 3.3 ft-lb)**





# FUEL DELIVERY, RETURN AND EVAPORATION LINES

Fuel Injection (Fuel Systems)

## 24. Fuel Delivery, Return and Evaporation Lines

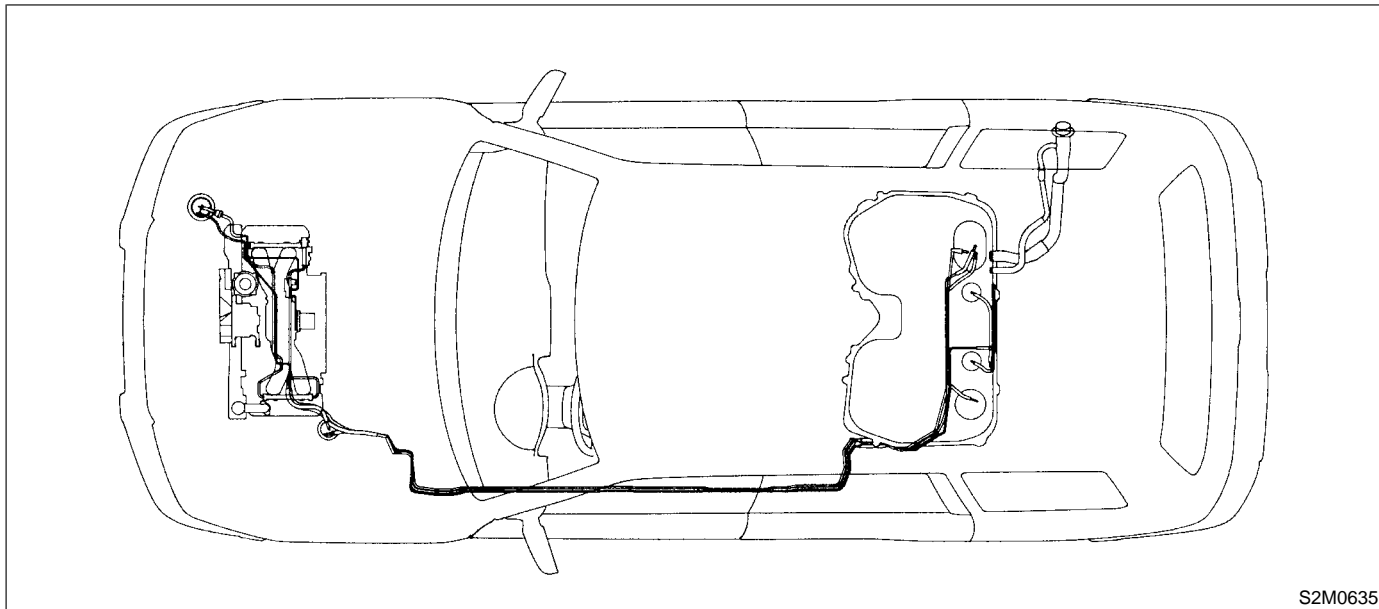
S165019

### A: REMOVAL

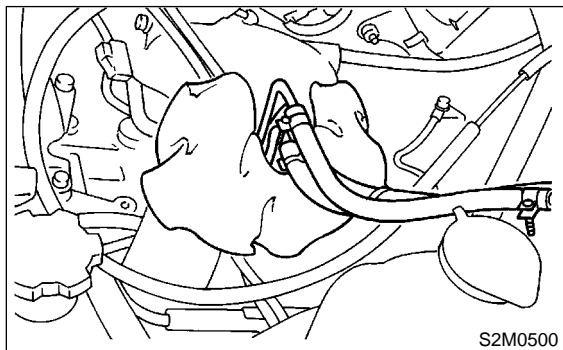
S165019A18

1) Release fuel pressure. <Ref. to FU(SOHCw/oOBD)-41, RELEASING OF FUEL PRESSURE, OPERATION, Fuel.>

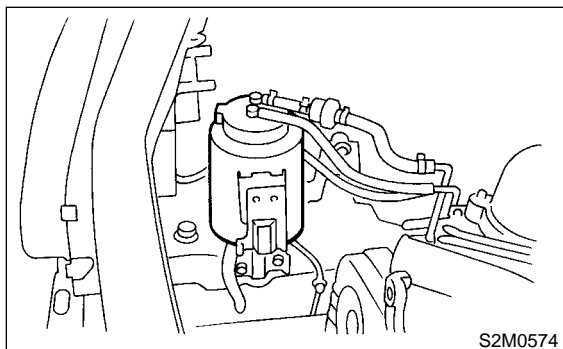
- 2) Open fuel filler flap lid and remove fuel filler cap.
- 3) Remove inner trim, insulator and rear seat.
- 4) Remove fuel delivery pipes and hoses, fuel return pipes and hoses, evaporation pipes and hoses.



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



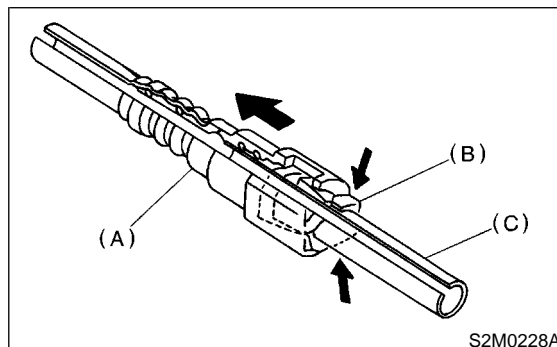
6) In the engine compartment, detach canister hose from canister.



7) Separate quick connector on fuel delivery and return line.

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

**CAUTION:**  
Replace retainer with new ones.



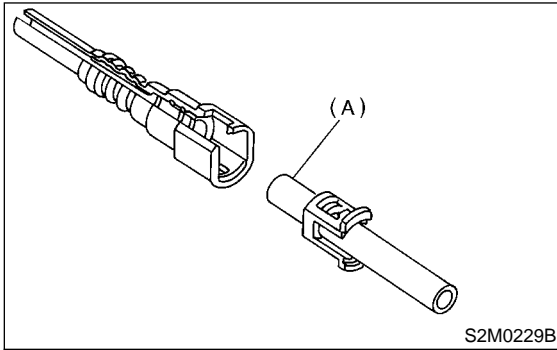
- (A) Connector
- (B) Retainer
- (C) Pipe

## B: INSTALLATION S165019A11

1) Connect quick connector on fuel delivery and return line.

### CAUTION:

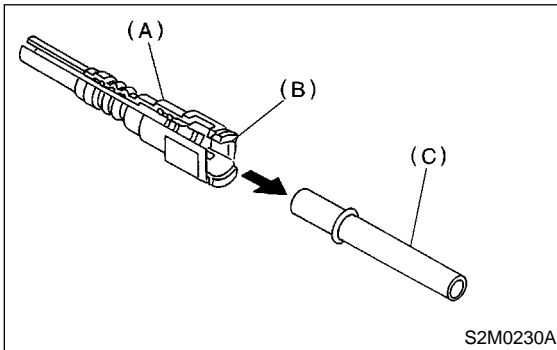
- Always use a new retainer.
- Make sure that the connected portion is not damaged or has dust. If necessary, clean seal surface of pipe (A).



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

### NOTE:

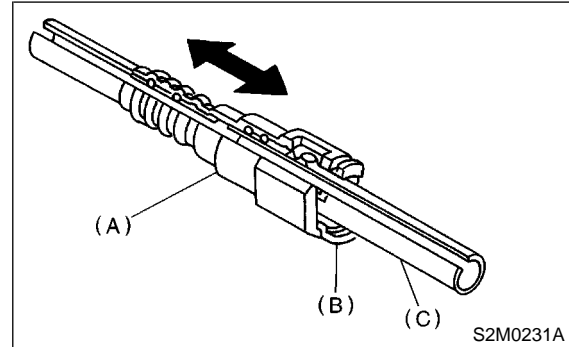
At this time, two clicking sounds are heard.



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

### CAUTION:

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



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

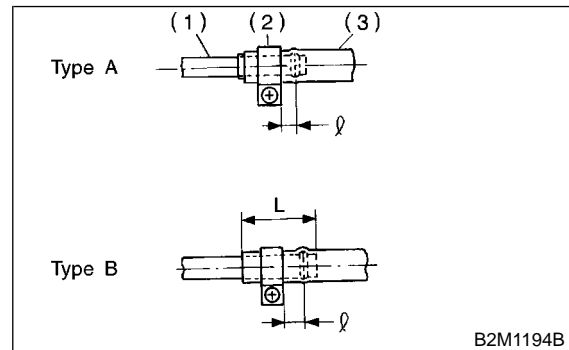
2) Connect fuel delivery hose to pipe with an overlap of 20 to 25 mm (0.79 to 0.98 in).

Type A: When fitting length is specified.

Type B: When fitting length is not specified.

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

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



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

# FUEL DELIVERY, RETURN AND EVAPORATION LINES

Fuel Injection (Fuel Systems)

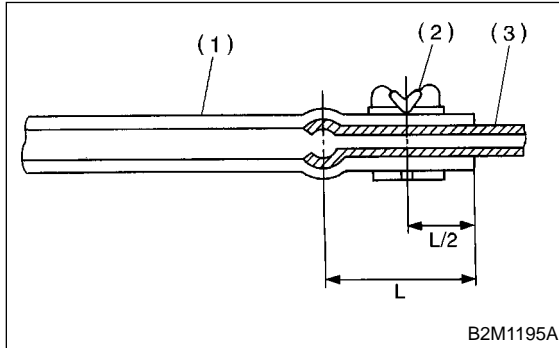
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3) Connect evaporation hose to pipe by approx. 15 mm (0.59 in) from hose end.

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

## CAUTION:

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



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

## C: INSPECTION S165019A10

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

## 25. Fuel System Trouble in General

S165571

### A: INSPECTION

S165571A10

| Trouble and possible cause                         |                                                                               | Corrective action                                             |
|----------------------------------------------------|-------------------------------------------------------------------------------|---------------------------------------------------------------|
| <b>1. Insufficient fuel supply to the injector</b> |                                                                               |                                                               |
| 1)                                                 | Fuel pump will not operate.                                                   |                                                               |
|                                                    | <input type="radio"/> Defective terminal contact.                             | Inspect connections, especially ground, and tighten securely. |
|                                                    | <input type="radio"/> Trouble in electromagnetic or electronic circuit parts. | Replace fuel pump.                                            |
| 2)                                                 | Lowering of fuel pump function.                                               | Replace fuel pump.                                            |
| 3)                                                 | Clogged dust or water in the fuel filter.                                     | Replace fuel filter, clean or replace fuel tank.              |
| 4)                                                 | Clogged or bent fuel pipe or hose.                                            | Clean, correct or replace fuel pipe or hose.                  |
| 5)                                                 | Air is mixed in the fuel system.                                              | Inspect or retighten each connection part.                    |
| 6)                                                 | Clogged or bent breather tube or pipe.                                        | Clean, correct or replace air breather tube or pipe.          |
| 7)                                                 | Damaged diaphragm of pressure regulator.                                      | Replace.                                                      |
| <b>2. Leakage or blow out fuel</b>                 |                                                                               |                                                               |
| 1)                                                 | Loosened joints of the fuel pipe.                                             | Retightening.                                                 |
| 2)                                                 | Cracked fuel pipe, hose and fuel tank.                                        | Replace.                                                      |
| 3)                                                 | Defective welding part on the fuel tank.                                      | Replace.                                                      |
| 4)                                                 | Defective drain packing of the fuel tank.                                     | Replace.                                                      |
| 5)                                                 | Clogged or bent air breather tube or air vent tube.                           | Clean, correct or replace air breather tube or air vent tube. |
| <b>3. Gasoline smell inside of compartment</b>     |                                                                               |                                                               |
| 1)                                                 | Loose joints at air breather tube, air vent tube and fuel filler pipe.        | Retightening.                                                 |
| 2)                                                 | Defective packing air tightness on the fuel saucer.                           | Correct or replace packing.                                   |
| 3)                                                 | Cracked fuel separator.                                                       | Replace separator.                                            |
| 4)                                                 | Inoperative fuel pump modulator or circuit.                                   | Replace.                                                      |
| <b>4. Defective fuel meter indicator</b>           |                                                                               |                                                               |
| 1)                                                 | Defective operation of fuel level sensor.                                     | Replace.                                                      |
| 2)                                                 | Defective operation of fuel meter.                                            | Replace.                                                      |
| <b>5. Noise</b>                                    |                                                                               |                                                               |
| 1)                                                 | Large operation noise or vibration of fuel pump.                              | Replace.                                                      |

**NOTE:**

- When the vehicle is left unattended for an extended period of time, water may accumulate in the fuel tank.

To prevent water condensation.

(1) Top off the fuel tank or drain the fuel completely.

(2) Drain water condensation from the fuel filter.

- Refilling the fuel tank.

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

- Protecting the fuel system against freezing and water condensation.

(1) Cold areas

In snow-covered areas, mountainous areas, skiing areas, etc. where ambient temperatures drop below 0°C (32°F) throughout the winter season, use an anti-freeze solution in the cool-

ing system. Refueling will also complement the effect of anti-freeze solution each time the fuel level drops to about one-half. After the winter season, drain water which may have accumulated in the fuel filter and fuel tank in the manner same as that described under Affected areas below.

(2) Affected areas

When water condensation is noticed in the fuel filter, drain water from both the fuel filter and fuel tank or use a water removing agent (or anti-freeze solution) in the fuel tank.

- Observe the instructions, notes, etc., indicated on the label affixed to the anti-freeze solution (water removing agent) container before use.

# FUEL SYSTEM TROUBLE IN GENERAL

Fuel Injection (Fuel Systems)

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**MEMO:**