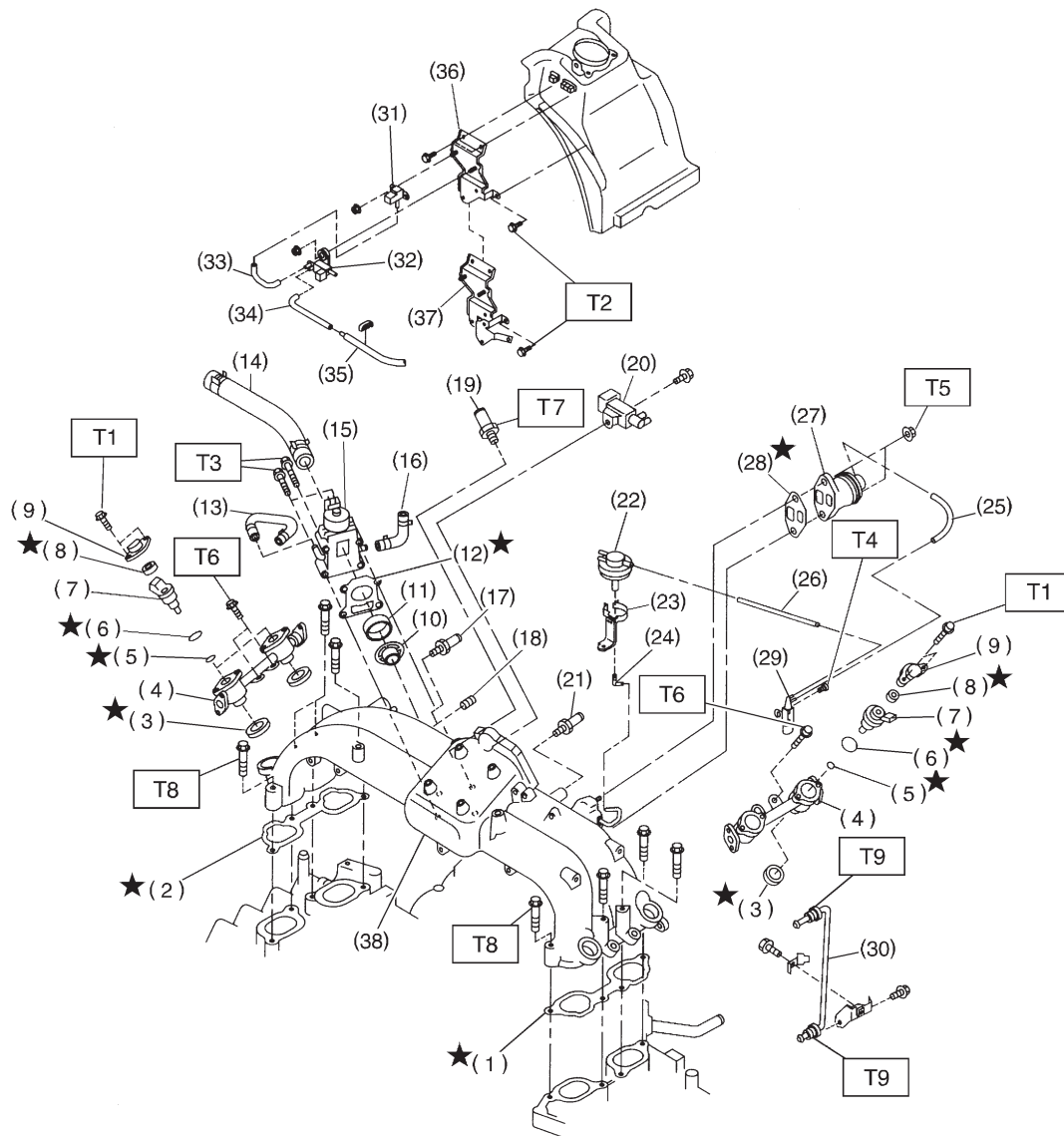


FUEL INJECTION SYSTEM **2-7**

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1. Intake Manifold

A: 2200 cc MODEL



B2M1031B

(1) Intake manifold gasket LH	(21) Nipple	(35) Vacuum hose C
(2) Intake manifold gasket RH	(22) BPT (Except MT vehicles)	(36) Bracket (Except Canada spec. vehicles)
(3) Fuel injector pipe insulator	(23) BPT holder bracket (Except MT vehicles)	(37) Bracket (For Canada spec. vehicles)
(4) Fuel injector pipe	(24) Back pressure hose (Except MT vehicles)	(38) Intake manifold
(5) O-ring A	(25) EGR vacuum hose A (Except MT vehicles)	
(6) O-ring B	(26) EGR vacuum hose B (Except MT vehicles)	
(7) Fuel injector	(27) EGR valve (Except MT vehicles)	
(8) Insulator	(28) Gasket (Except MT vehicles)	
(9) Fuel injector cap	(29) EGR solenoid valve (Except MT vehicles)	
(10) Plate	(30) EGR pipe (Except MT vehicles)	
(11) Sealing	(31) Pressure sensor	
(12) Gasket	(32) Pressure sources switching solenoid valve	
(13) Engine coolant hose B	(33) Vacuum hose A	
(14) Air by-pass hose	(34) Vacuum hose B	
(15) Idle air control solenoid valve		
(16) Engine coolant hose A		
(17) Nipple (AT vehicles)		
(18) Plug		
(19) PCV valve		
(20) Purge control solenoid valve		

Tightening torque: N·m (kg-m, ft-lb)

T1: 3.4±0.5 (0.35±0.05, 2.5±0.4)

T2: 4.9±0.5 (0.5±0.05, 3.6±0.4)

T3: 6.4±0.5 (0.65±0.05, 4.7±0.4)

T4: 16±1.5 (1.6±0.15, 11.6±1.1)

T5: 19±1.5 (1.9±0.15, 13.7±1.1)

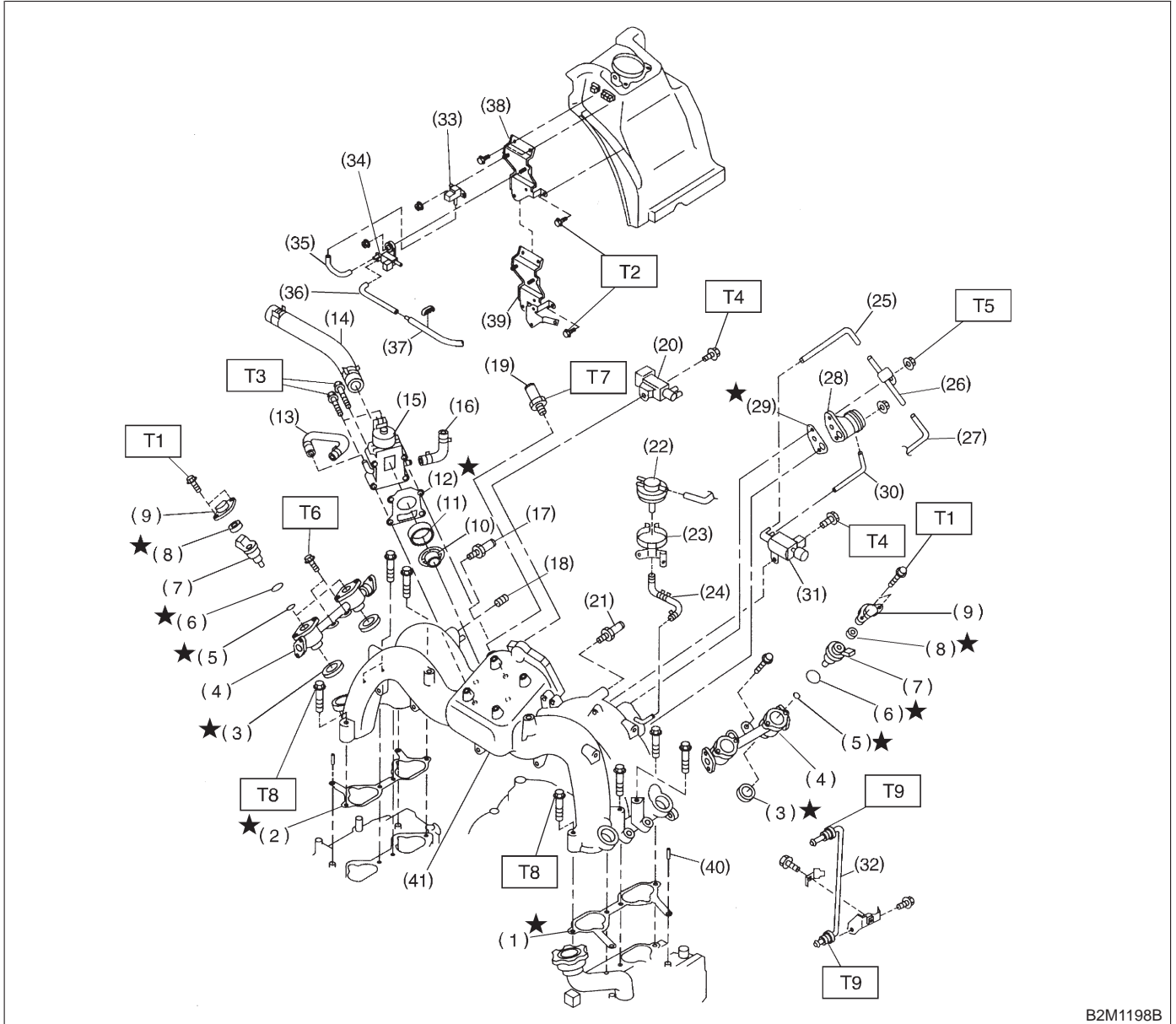
T6: 19±2 (1.9±0.2, 13.7±1.4)

T7: 23±3 (2.3±0.3, 16.6±2.2)

T8: 25±2 (2.5±0.2, 18.1±1.4)

T9: 34±2 (3.5±0.2, 25.3±1.4)

B: 2500 cc MODEL



B2M1198B

(1) Intake manifold gasket LH	(20) Purge control solenoid valve	(38) Bracket (Except Canada spec. vehicles)
(2) Intake manifold gasket RH	(21) Nipple	(39) Bracket (For Canada spec. vehicles)
(3) Fuel injector pipe insulator	(22) BPT	(40) Collar
(4) Fuel injector pipe	(23) BPT holder bracket	(41) Intake manifold
(5) O-ring A	(24) Back pressure hose	
(6) O-ring B	(25) EGR vacuum hose A	
(7) Fuel injector	(26) EGR vacuum pipe	
(8) Insulator	(27) EGR vacuum hose C	
(9) Fuel injector cap	(28) EGR valve	
(10) Plate	(29) Gasket	
(11) Sealing	(30) EGR vacuum hose B	
(12) Gasket	(31) EGR solenoid valve	
(13) Engine coolant hose B	(32) EGR pipe	
(14) Air by-pass hose	(33) Pressure sensor	
(15) Idle air control solenoid valve	(34) Pressure sources switching solenoid valve	
(16) Engine coolant hose A	(35) Vacuum hose A	
(17) Nipple (AT vehicles)	(36) Vacuum hose B	
(18) Plug	(37) Vacuum hose C	
(19) PCV valve		

Tightening torque: N·m (kg-m, ft-lb)

T1: 3.4±0.5 (0.35±0.05, 2.5±0.4)

T2: 4.9±0.5 (0.5±0.05, 3.6±0.4)

T3: 6.4±0.5 (0.65±0.05, 4.7±0.4)

T4: 16±1.5 (1.6±0.15, 11.6±1.1)

T5: 19±1.5 (1.9±0.15, 13.7±1.1)

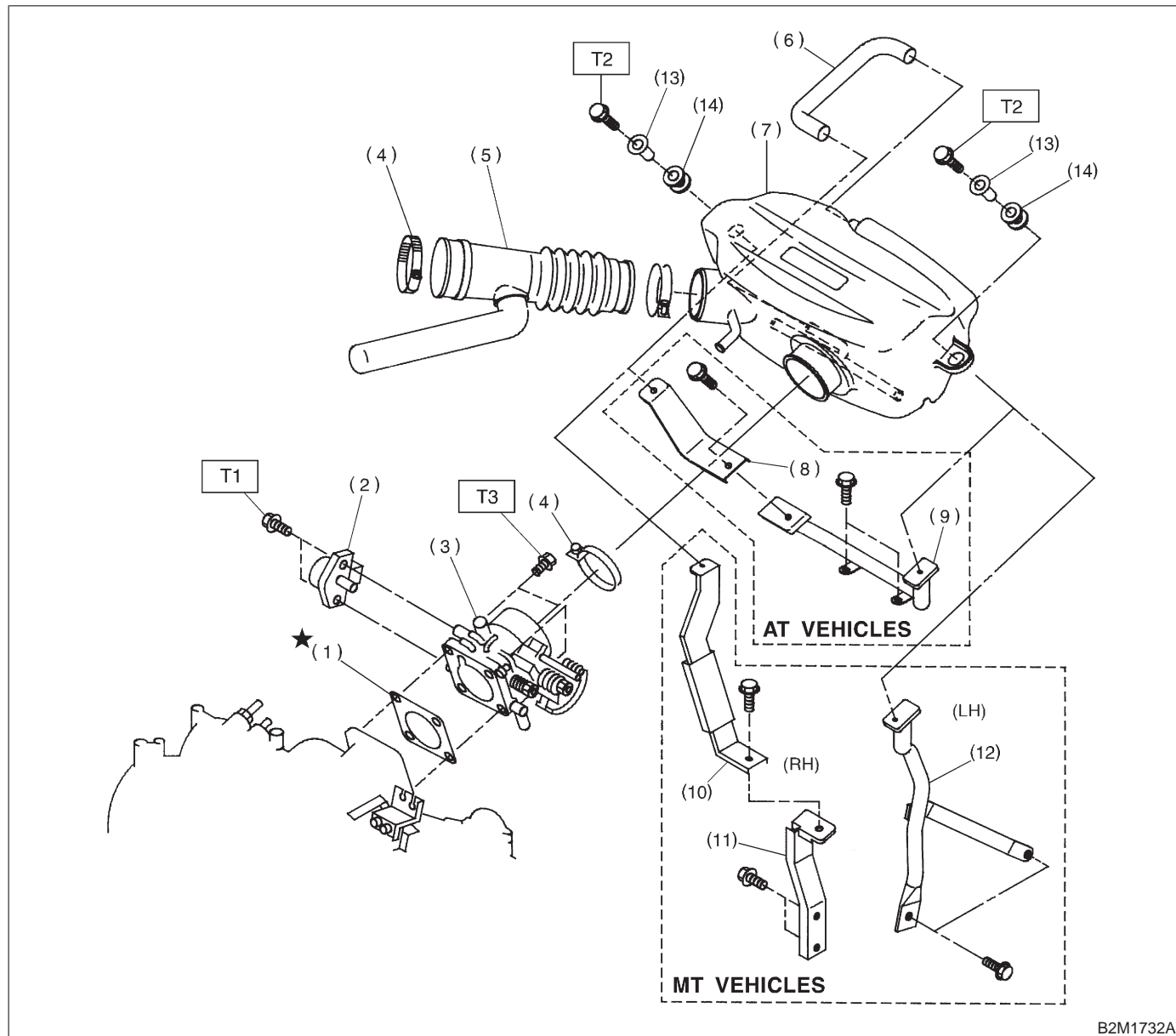
T6: 19±2 (1.9±0.2, 13.7±1.4)

T7: 23±3 (2.3±0.3, 16.6±2.2)

T8: 25±2 (2.5±0.2, 18.1±1.4)

T9: 34±2 (3.5±0.2, 25.3±1.4)

2. Air Intake System



B2M1732A

- | | |
|------------------------------|---------------------------|
| (1) Gasket | (8) Stay A (AT vehicles) |
| (2) Throttle position sensor | (9) Stay B (AT vehicles) |
| (3) Throttle body | (10) Stay C (MT vehicles) |
| (4) Clamp | (11) Stay D (MT vehicles) |
| (5) Air intake duct | (12) Spacer |
| (6) By-pass hose | (13) Bush |
| (7) Air intake chamber | |

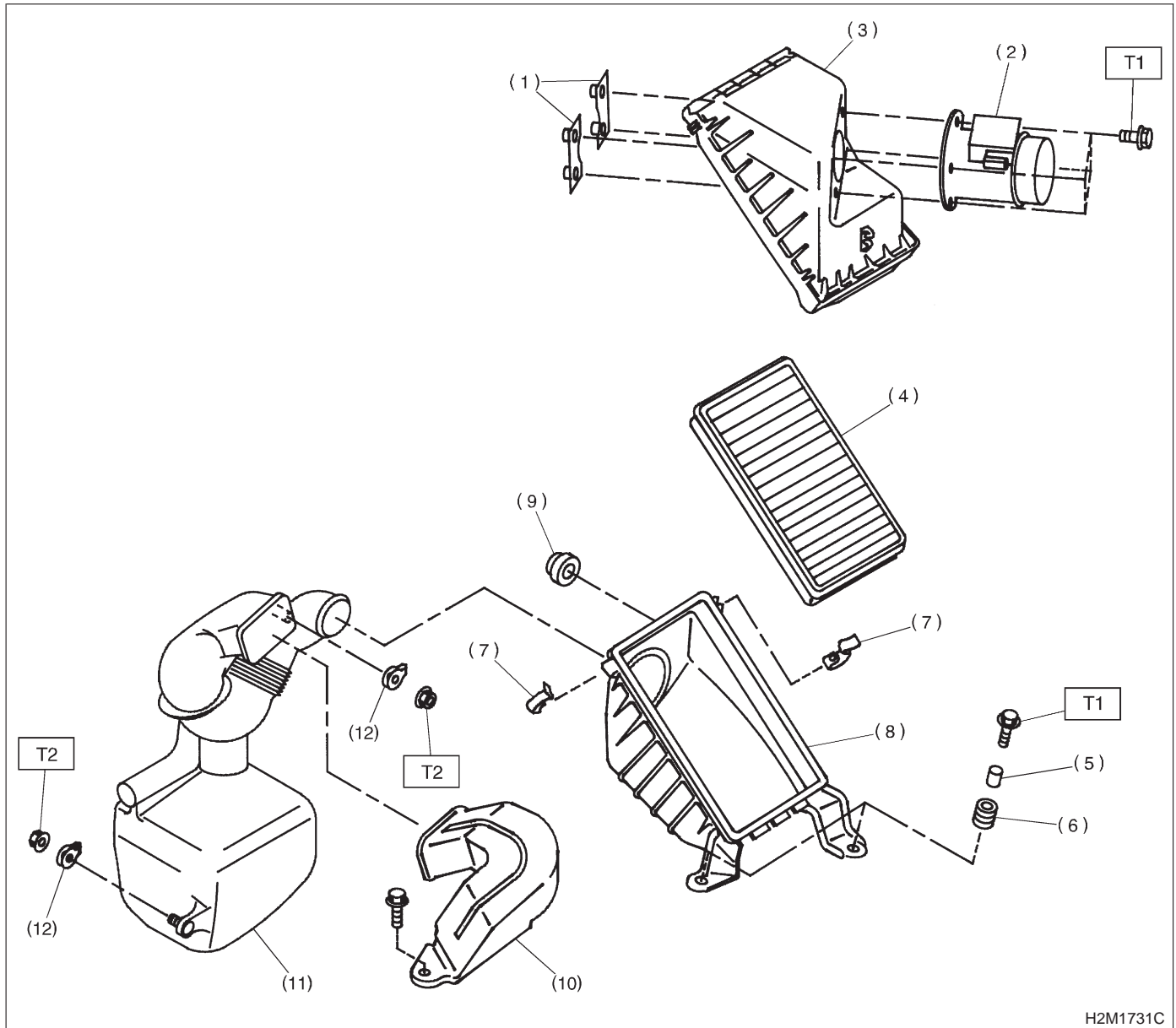
Tightening torque: N·m (kg·m, ft·lb)

T1: 2.2±0.2 (0.22±0.02, 1.6±0.1)

T2: 4.9±0.5 (0.5±0.05, 3.6±0.4)

T3: 22±2 (2.2±0.2, 15.9±1.4)

3. Air Cleaner



H2M1731C

- | | |
|----------------------------------|-----------------------------|
| (1) Mass air flow sensor bracket | (7) Clip |
| (2) Mass air flow sensor ASSY | (8) Air cleaner case |
| (3) Air cleaner upper cover | (9) Cushion rubber |
| (4) Air cleaner element | (10) Air intake duct |
| (5) Spacer | (11) Resonator chamber ASSY |
| (6) Bush | (12) Clip |

Tightening torque: N·m (kg·m, ft·lb)

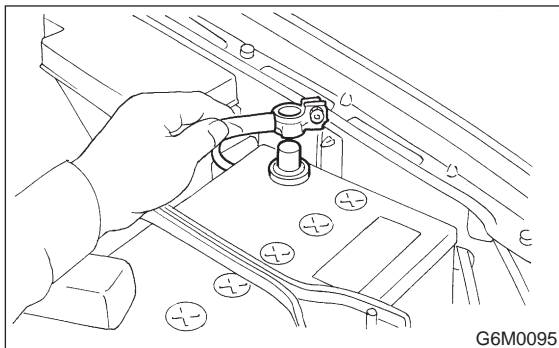
T1: 7.4±2.0 (0.75±0.2, 5.4±1.4)

T2: 33±10 (3.4±1.0, 25±7)

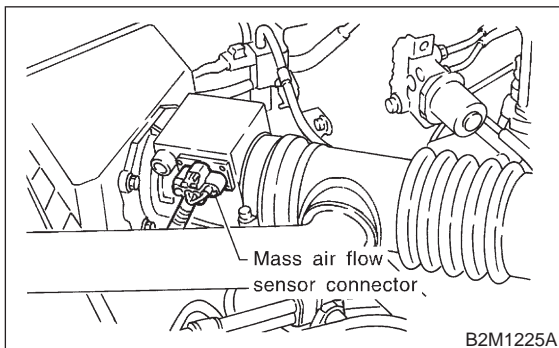
1. Air Cleaner and Air Intake Duct

A: REMOVAL AND INSTALLATION

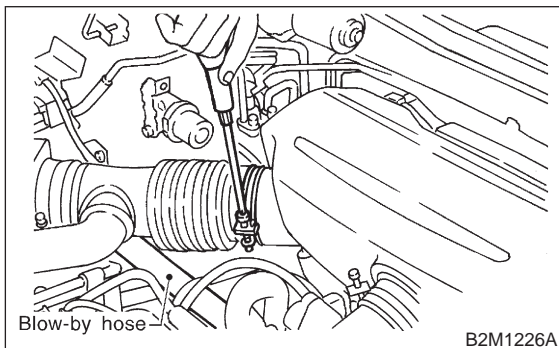
- 1) Disconnect battery ground cable.



- 2) Disconnect connector from mass air flow sensor.

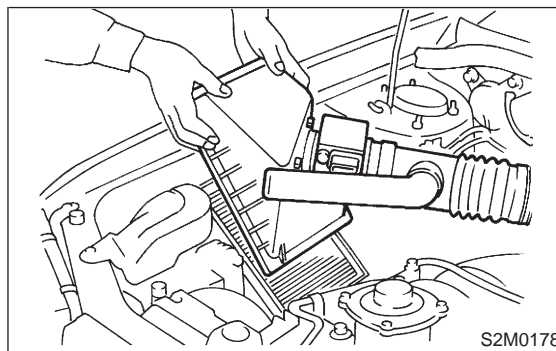


- 3) Loosen clamp which connects air intake duct to air intake chamber.

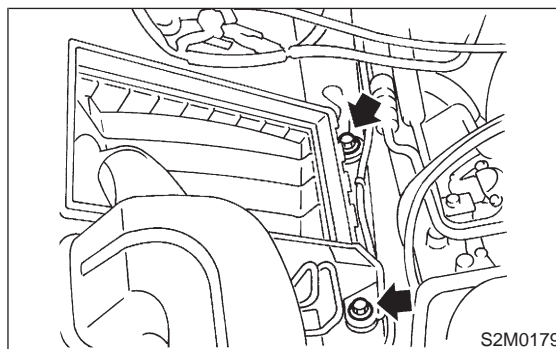


- 4) Remove two clips of air cleaner upper cover.
5) Disconnect blow-by hose from air intake duct.

- 6) Remove air intake duct and air cleaner upper cover as a unit.



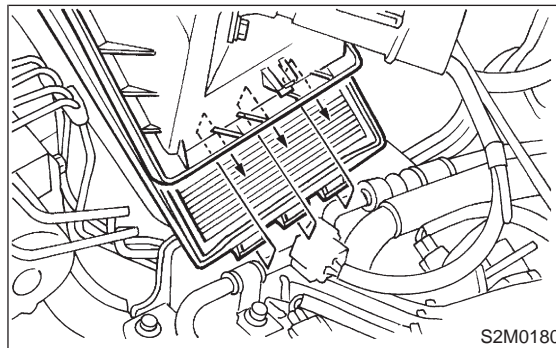
- 7) Remove air cleaner element.
8) Remove air cleaner lower case.



- 9) Installation is in the reverse order of removal.

CAUTION:

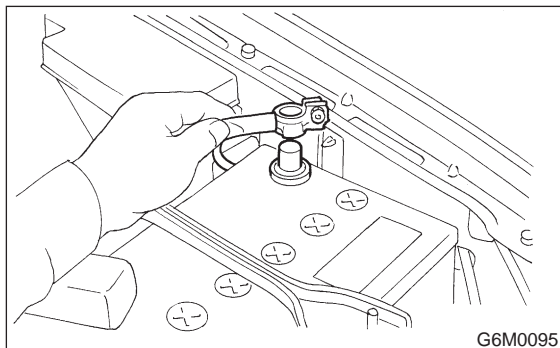
Before installing air cleaner upper cover, align holes with protruding portions of air cleaner lower case, then secure upper cover to lower case.



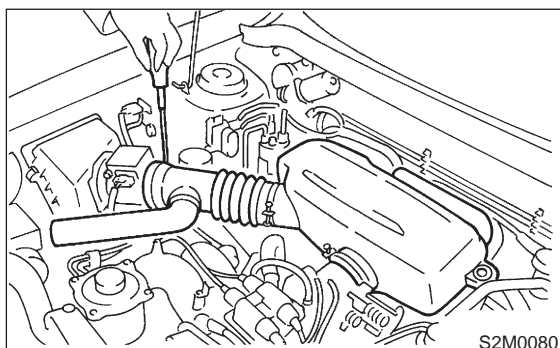
2. Mass Air Flow Sensor

A: REMOVAL AND INSTALLATION

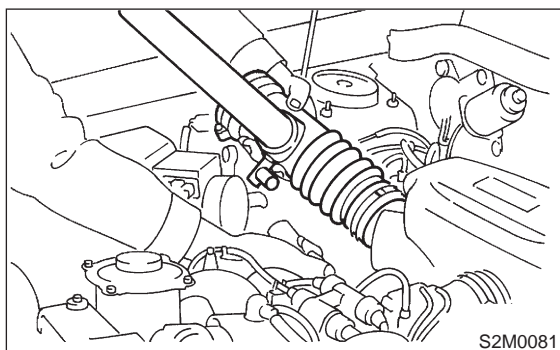
- 1) Disconnect battery ground cable.



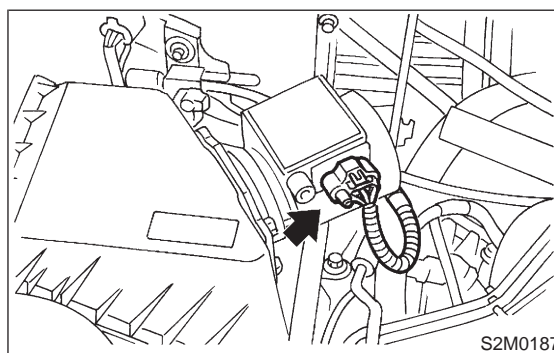
- 2) Loosen clamps which connect air intake duct to air intake chamber and mass air flow sensor.



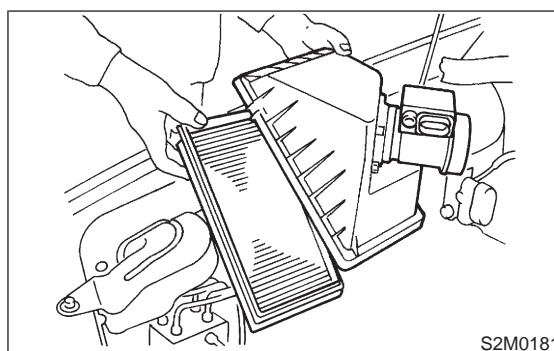
- 3) Disconnect blow-by hose from air intake duct.
4) Remove air intake duct.



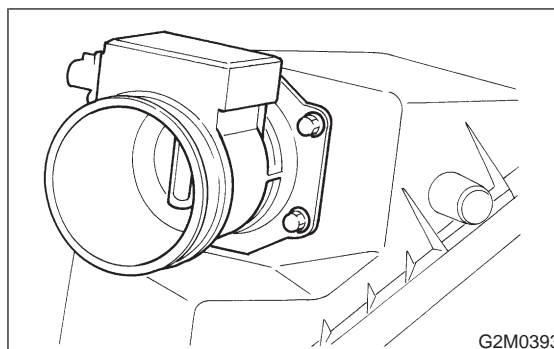
- 5) Disconnect connector from mass air flow sensor.



- 6) Remove two clips, then remove air cleaner upper cover.



- 7) Remove mass air flow sensor from air cleaner upper cover.



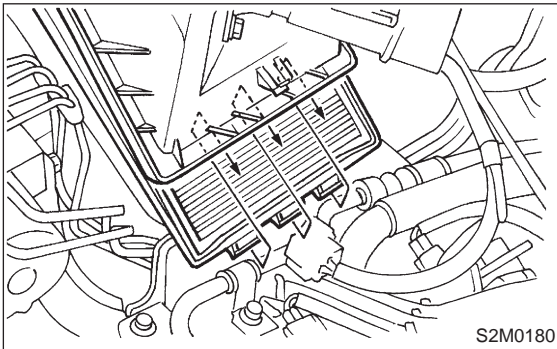
8) Installation is in the reverse order of removal.

Tightening torque:

$7.4 \pm 2.0 \text{ N}\cdot\text{m}$ ($0.75 \pm 0.2 \text{ kg}\cdot\text{m}$, $5.4 \pm 1.4 \text{ ft}\cdot\text{lb}$)

CAUTION:

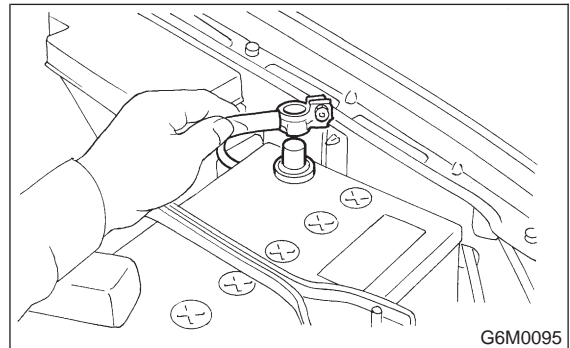
Before installing air cleaner upper cover, align holes with protruding portions of air cleaner lower case, then secure upper cover to lower case.



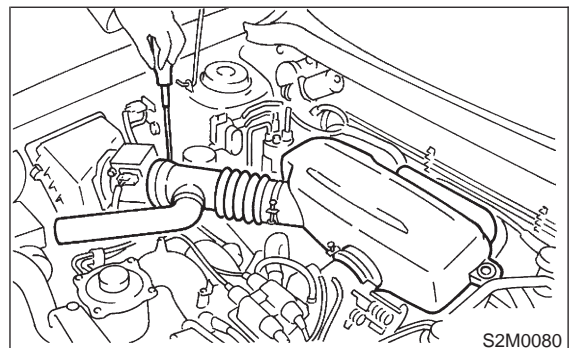
3. Throttle Body

A: REMOVAL AND INSTALLATION

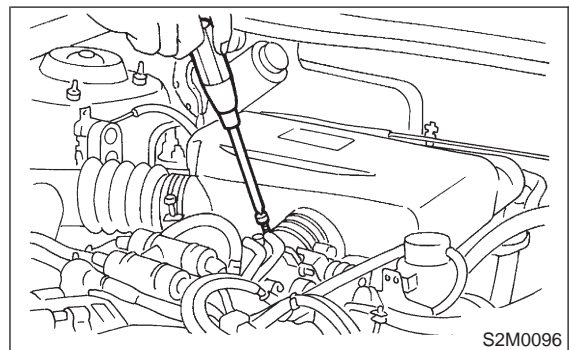
1) Disconnect battery ground cable.



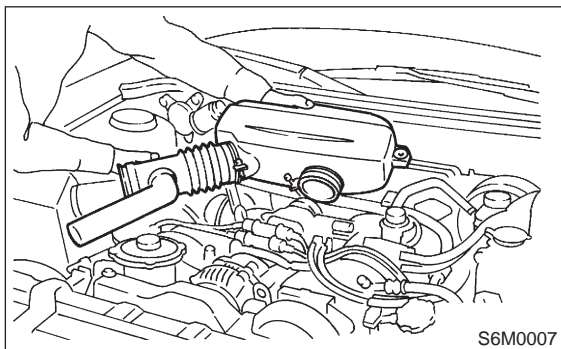
2) Loosen clamps which connect air intake duct to air intake chamber and mass air flow sensor.



3) Loosen clamp which connects air intake chamber to throttle body.

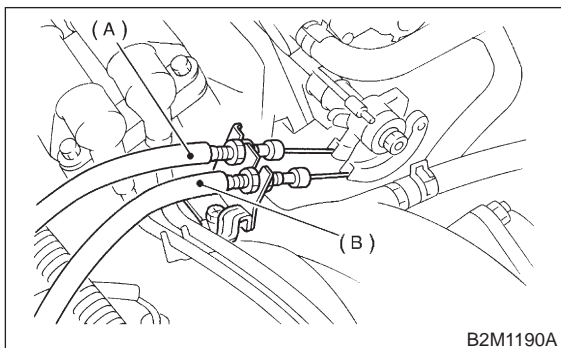


4) Disconnect blow-by hose and air hoses, and remove air intake chamber and air intake duct as a unit.

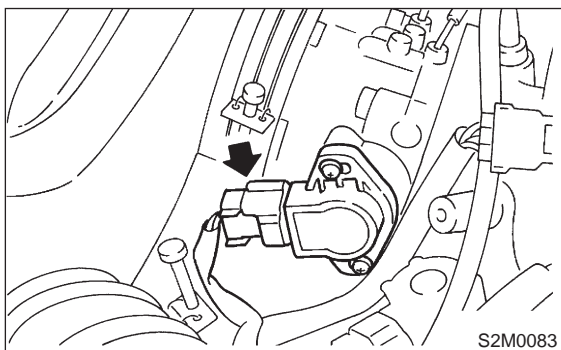


5) Disconnect accelerator cable (A).

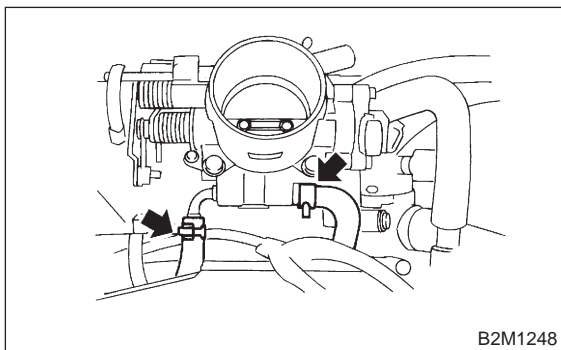
6) Disconnect cruise control cable (B). (With cruise control model)



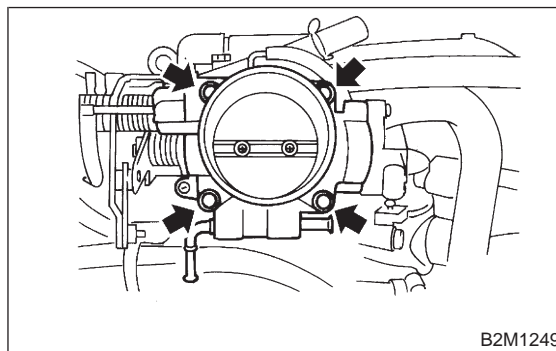
7) Disconnect connector from throttle position sensor.



8) Disconnect engine coolant hoses from throttle body.



9) Remove bolts which install throttle body to intake manifold.



10) Installation is in the reverse order of removal.

CAUTION:

- Always use a new gasket.
- Before installing air cleaner upper cover, align holes with protruding portions of air cleaner lower case, then secure upper cover to lower case.

Tightening torque:

Throttle body:

22 ± 2 N·m (2.2 ± 0.2 kg-m, 15.9 ± 1.4 ft-lb)

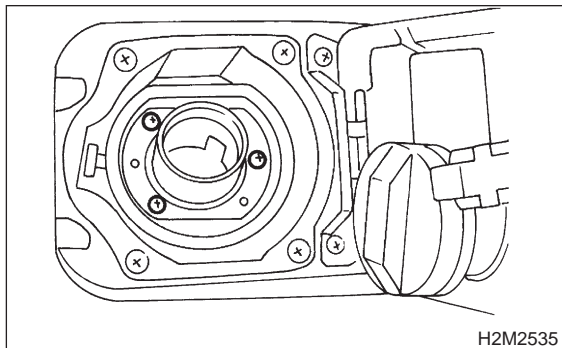
Air intake chamber:

4.9 ± 0.5 N·m (0.5 ± 0.05 kg-m, 3.6 ± 0.4 ft-lb)

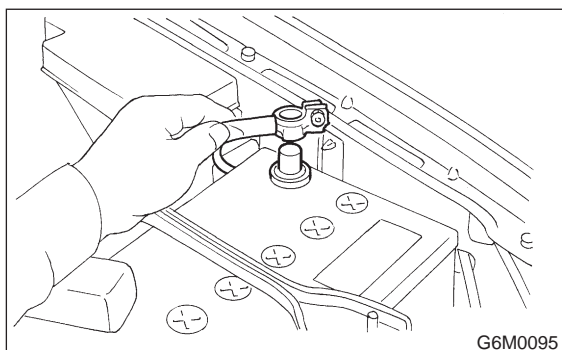
4. Intake Manifold

A: REMOVAL

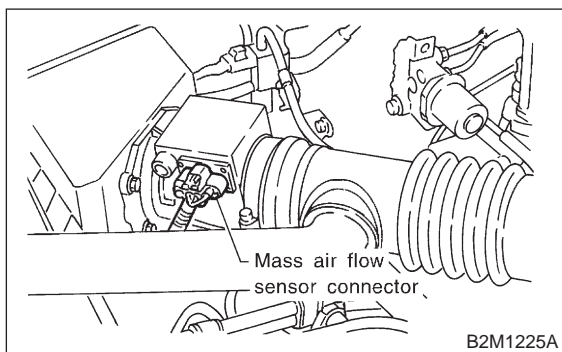
- 1) Release fuel pressure. <Ref. to 2-8 [W1B0].>
- 2) Open fuel flap lid, and remove fuel filler cap.



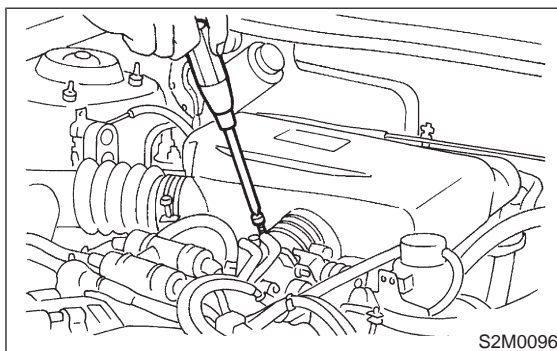
- 3) Disconnect battery ground cable.



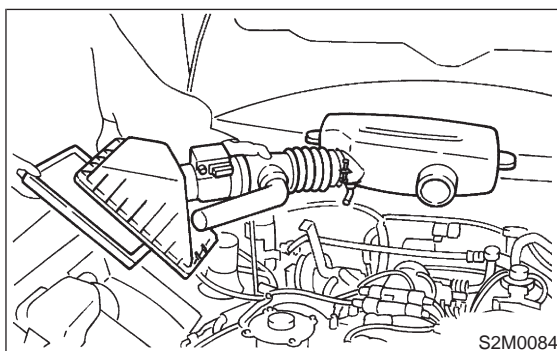
- 4) Disconnect connector from mass air flow sensor.



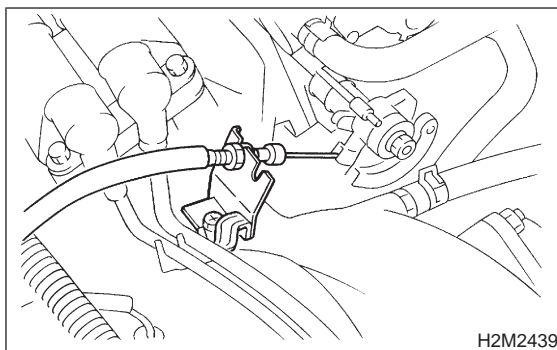
- 5) Loosen clamp which connects air intake chamber to throttle body.



- 6) Remove two clips of air cleaner upper cover.
- 7) Disconnect blow-by hose from air intake duct.
- 8) Disconnect air hoses, and remove air intake chamber.
- 9) Remove air intake duct, air cleaner upper cover and air intake chamber as a unit.
- 10) Remove air cleaner element.

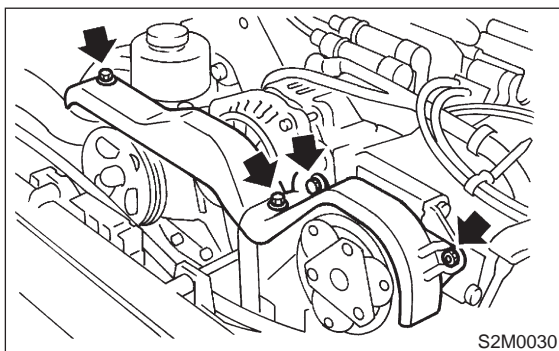


- 11) Disconnect accelerator cable.

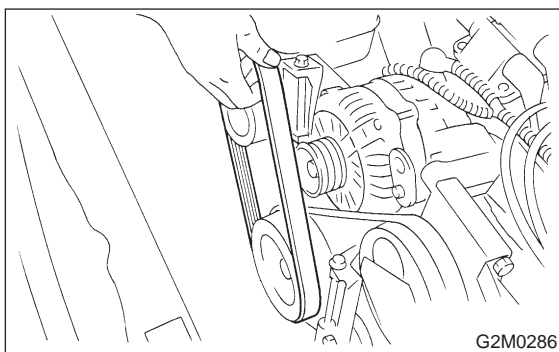


12) Remove power steering pump from bracket.

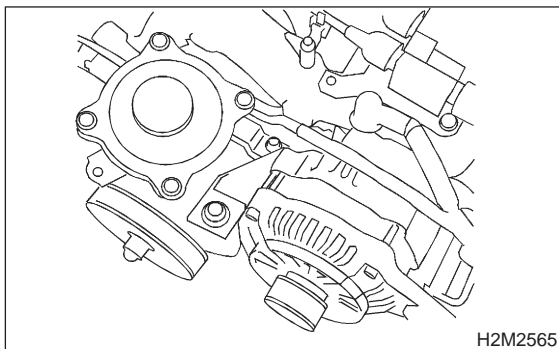
(1) Remove V-belt covers.



(2) Loosen lock bolt and slider bolt, and remove power steering pump drive V-belt.



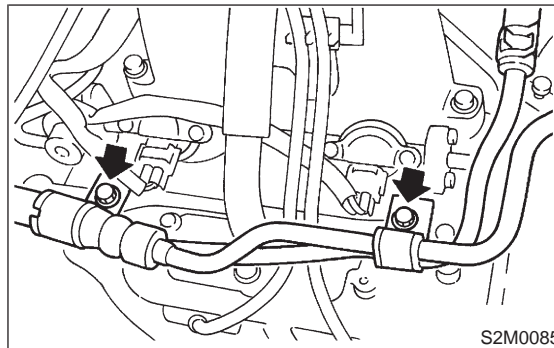
(3) Remove bolt which installs power steering pump stiffener on cylinder block.



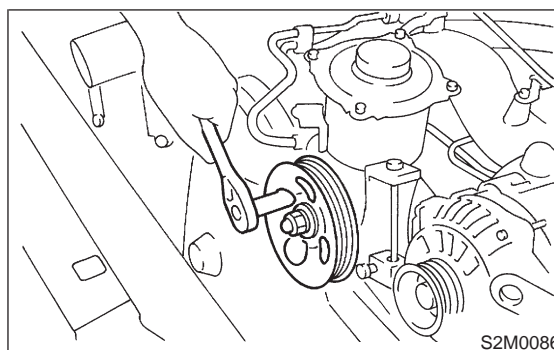
(4) Remove bolts which secure power steering pipe brackets to intake manifold.

NOTE:

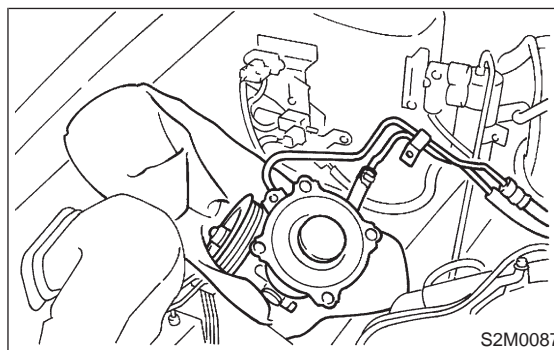
Do not disconnect power steering hose.



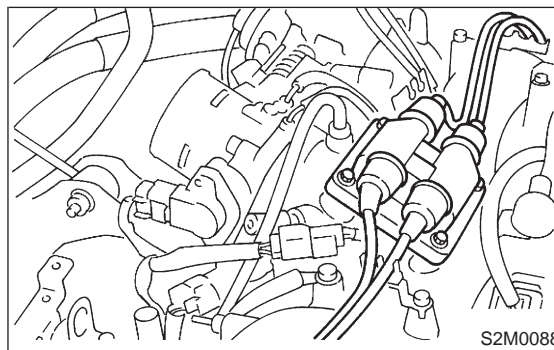
(5) Remove bolts which install power steering pump to bracket.



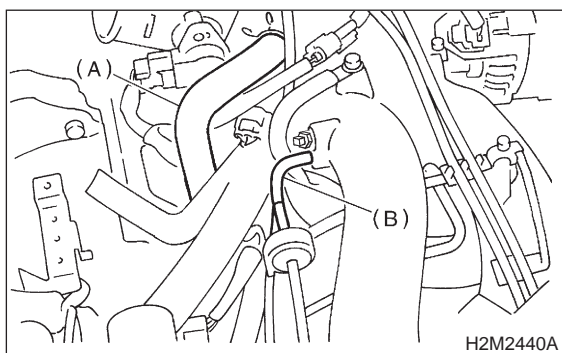
(6) Place power steering pump on the right side wheel apron.



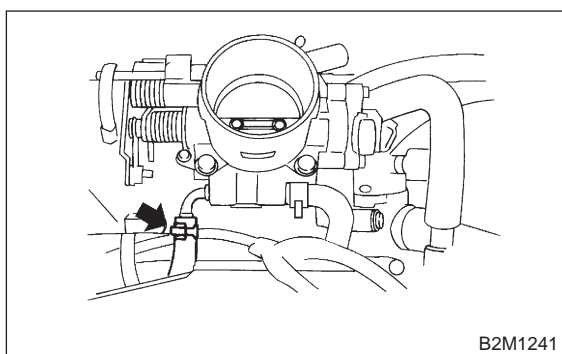
13) Disconnect spark plug cords from ignition coil.



- 14) Disconnect PCV hose (A) and vacuum hose (B) from intake manifold.

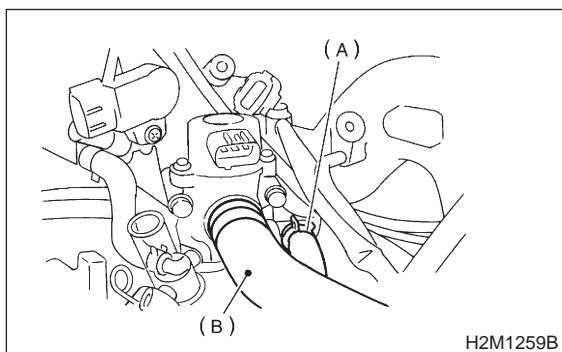


- 15) Disconnect engine coolant hose from throttle body.

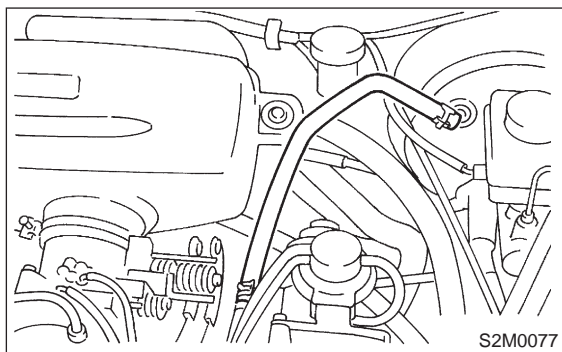


- 16) Disconnect engine coolant hose (A) from idle air control solenoid valve.

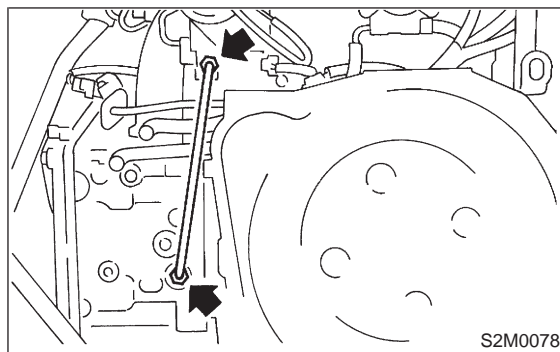
- 17) Disconnect air by-pass hose (B) from idle air control solenoid valve.



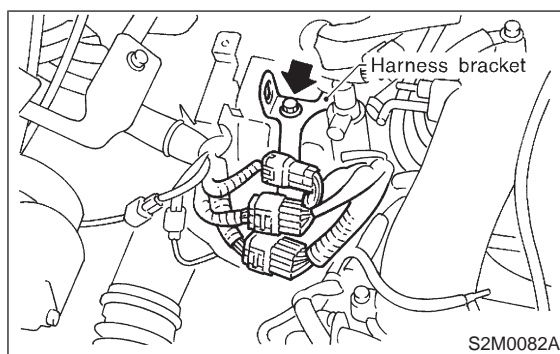
- 18) Disconnect brake booster hose.



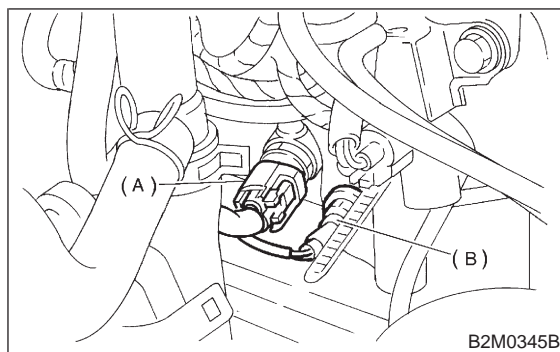
- 19) Remove EGR pipe.



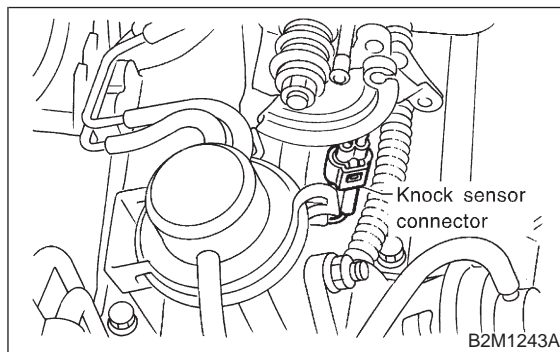
- 20) Remove engine harness bracket from transmission housing, and disconnect engine harness connectors from bulkhead harness connectors.



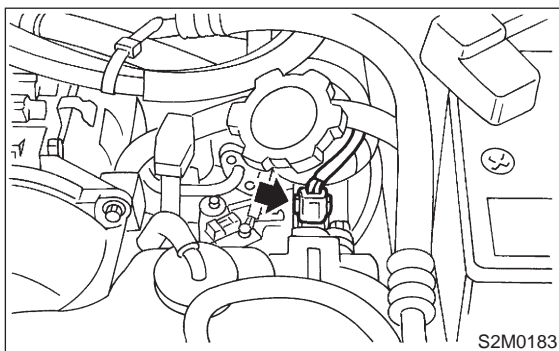
- 21) Disconnect connectors from engine coolant temperature sensor (A) and thermometer (B).



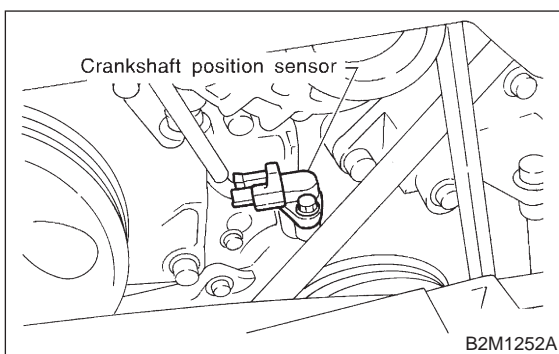
- 22) Disconnect knock sensor connector.



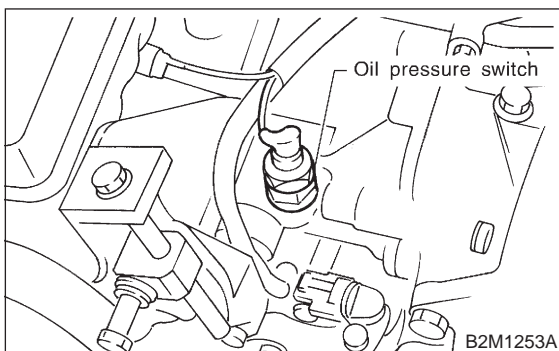
- 23) Disconnect connector from camshaft position sensor.



- 24) Disconnect connector from crankshaft position sensor.

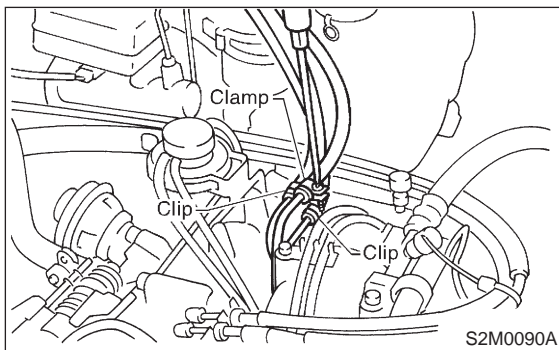


- 25) Disconnect connector from oil pressure switch.

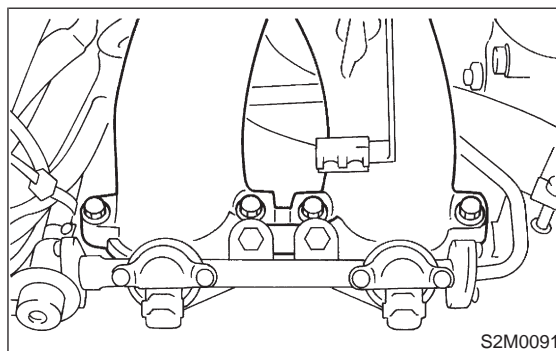


- 26) Disconnect fuel hoses from fuel pipes.

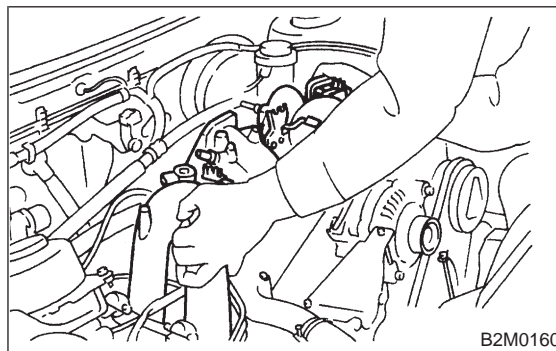
WARNING:
Catch fuel from hoses in a container.



- 27) Remove bolts which hold intake manifold onto cylinder heads.



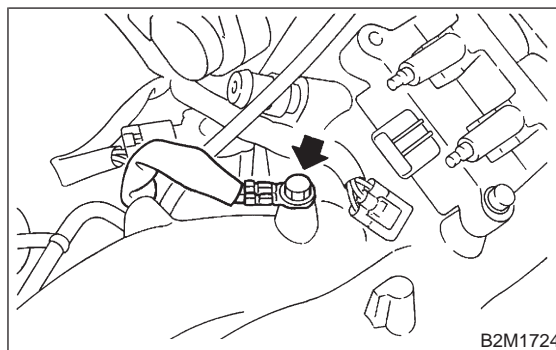
- 28) Remove intake manifold.



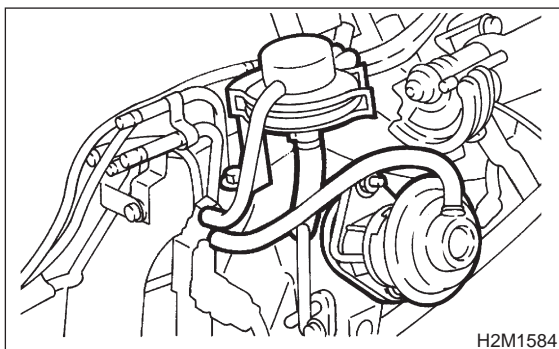
B: DISASSEMBLY

1. 2200 cc MODEL

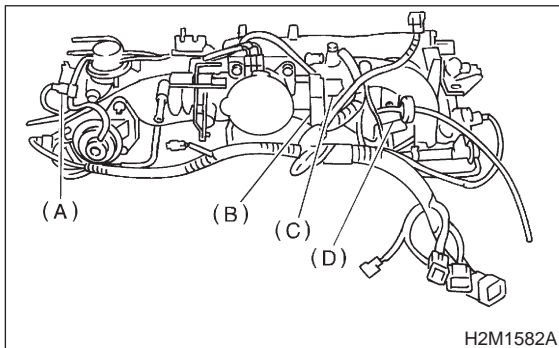
- 1) Disconnect engine ground terminal from intake manifold.



- 2) Disconnect EGR vacuum hose from EGR valve. (AT vehicles)
- 3) Disconnect back pressure hose from pipe. (AT vehicles)
- 4) Disconnect BPT hoses from EGR solenoid valve and intake manifold. (AT vehicles)
- 5) Remove BPT with BTP holder bracket. (AT vehicles)
- 6) Remove EGR valve. (AT vehicles)

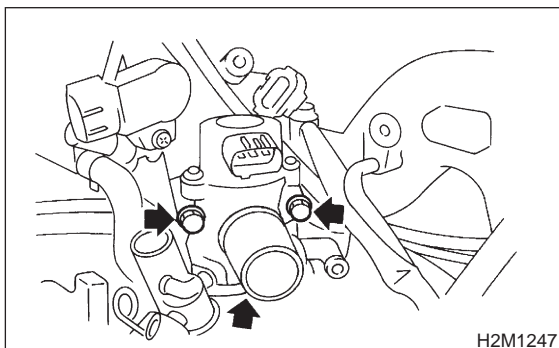


- 7) Disconnect connectors from throttle position sensor, ignition coil, fuel injectors, idle air control solenoid valve, purge control solenoid valve and EGR solenoid valve. (AT vehicles)
- 8) Remove engine harness from intake manifold.

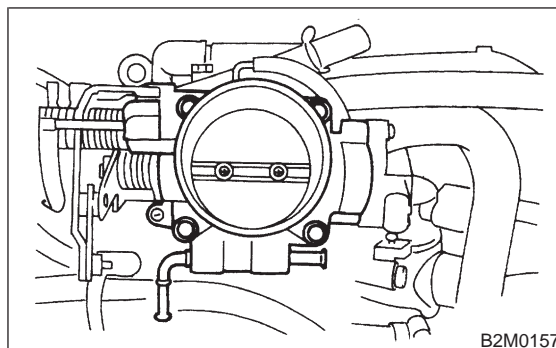


- (A) EGR solenoid valve (AT vehicles)
- (B) Throttle position sensor
- (C) Idle air control solenoid valve
- (D) Purge control solenoid valve

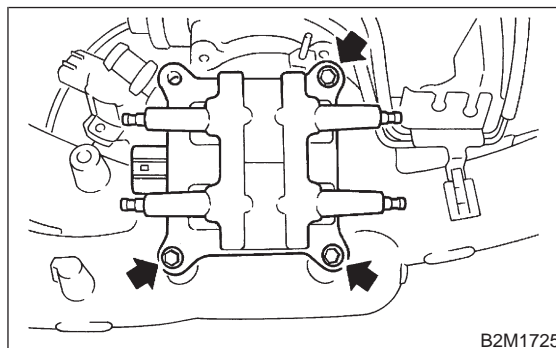
- 9) Remove idle air control solenoid valve from intake manifold.



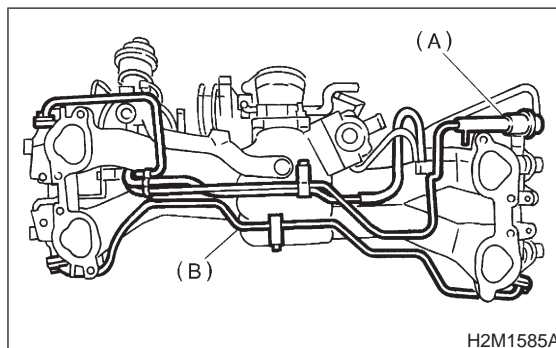
- 10) Remove throttle body from intake manifold.



- 11) Remove ignition coil.

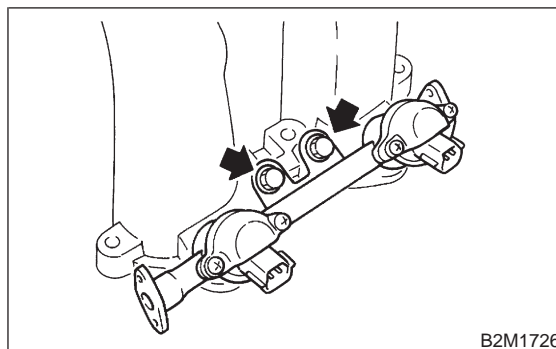


- 12) Remove fuel pipes, etc. from intake manifold.



- (A) Pressure regulator
- (B) Fuel pipe ASSY

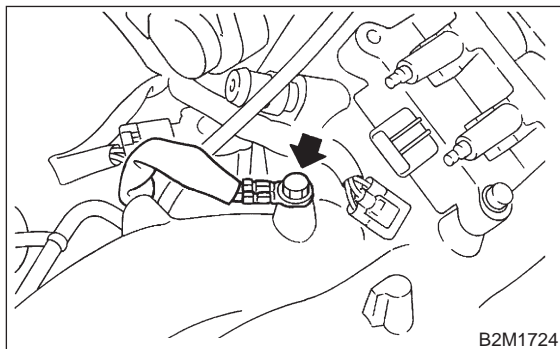
- 13) Remove fuel injector pipes.



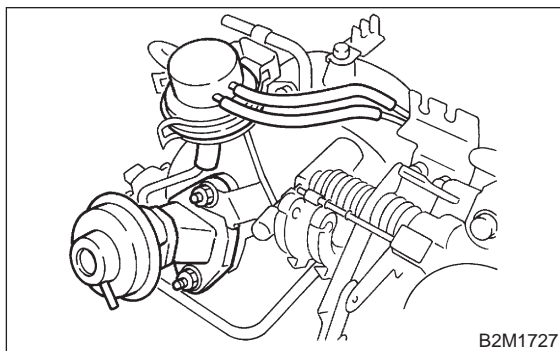
- 14) Remove EGR solenoid valve (AT vehicles) and purge control solenoid valve.

2. 2500 cc MODEL

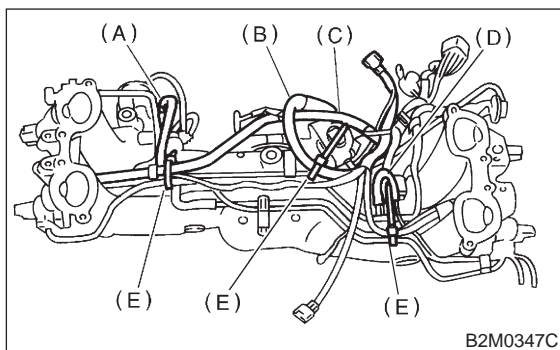
- 1) Disconnect engine ground terminal from intake manifold.



- 2) Disconnect EGR vacuum hose from EGR valve.
- 3) Disconnect back pressure hose from pipe.
- 4) Disconnect BPT hoses from EGR solenoid valve and intake manifold.
- 5) Remove BPT with BTP holder bracket.
- 6) Remove EGR valve.



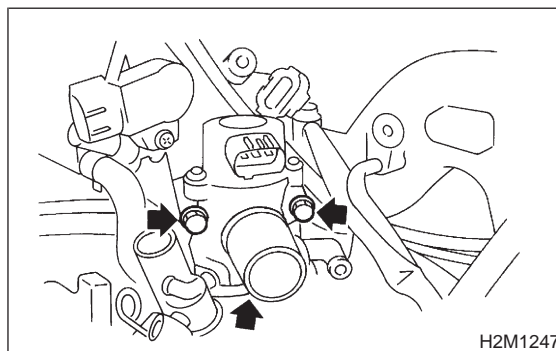
- 7) Disconnect connectors from throttle position sensor, ignition coil, fuel injectors, idle air control solenoid valve, purge control solenoid valve and EGR solenoid valve.



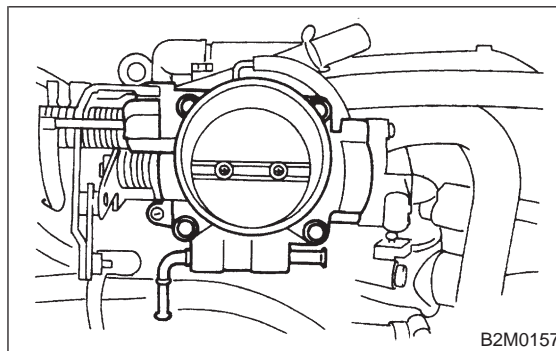
- (A) EGR solenoid valve
- (B) Throttle position sensor
- (C) Idle air control solenoid valve
- (D) Purge control solenoid valve
- (E) Harness band

- 8) Remove engine harness from intake manifold.

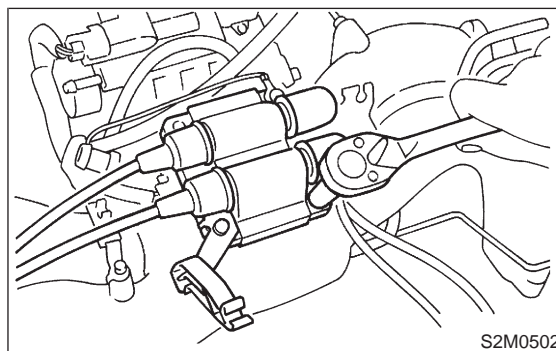
- 9) Remove idle air control solenoid valve from intake manifold.



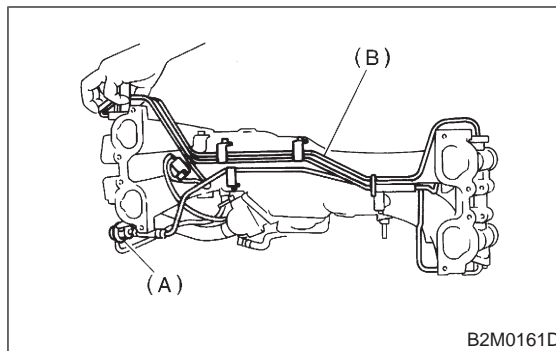
- 10) Remove throttle body from intake manifold.



- 11) Remove ignition coil.

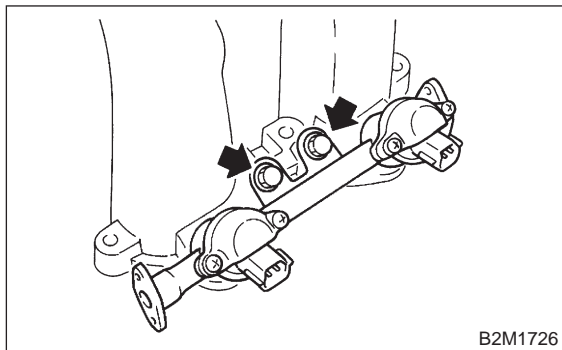


- 12) Remove fuel pipes, etc. from intake manifold.



- (A) Pressure regulator
- (B) Fuel pipe ASSY

13) Remove fuel injector pipes.

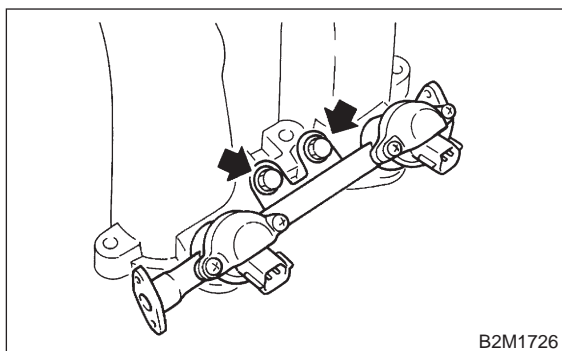


14) Remove EGR solenoid valve and purge control solenoid valve.

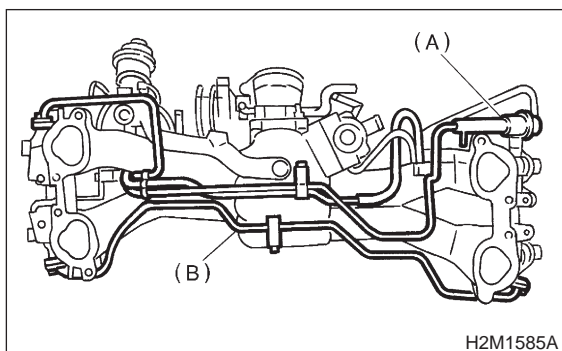
C: ASSEMBLY

1. 2200 cc MODEL

- 1) Install EGR solenoid valve (AT vehicles) and purge control solenoid valve.
- 2) Install fuel injector pipes.

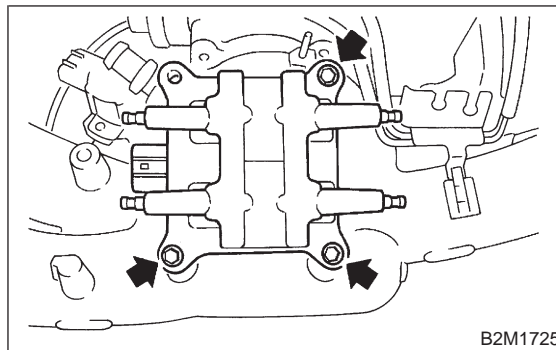


3) Assemble fuel pipes, etc. to intake manifold.



- (A) Pressure regulator
(B) Fuel pipe ASSY

4) Install ignition coil.



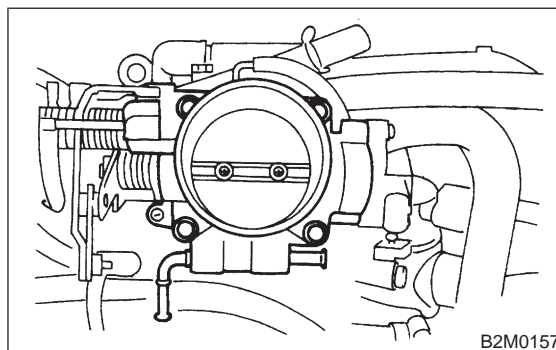
5) Assemble throttle body to intake manifold.

CAUTION:

Replace gasket with a new one.

Tightening torque:

$22 \pm 2 \text{ N}\cdot\text{m}$ ($2.2 \pm 0.2 \text{ kg}\cdot\text{m}$, $15.9 \pm 1.4 \text{ ft}\cdot\text{lb}$)



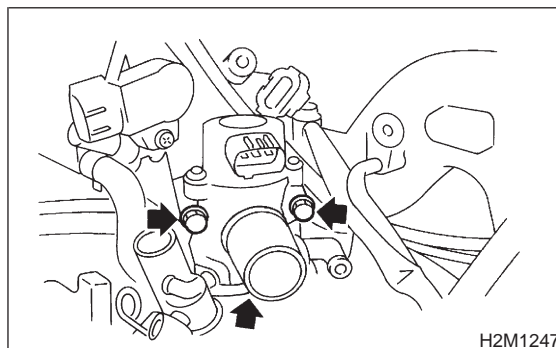
6) Install idle air control solenoid valve to intake manifold.

CAUTION:

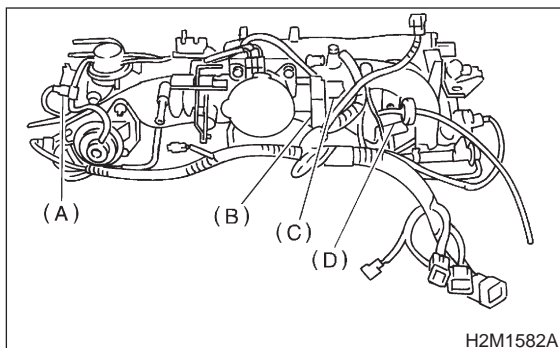
Replace gasket with a new one.

Tightening torque:

$6.4 \pm 0.5 \text{ N}\cdot\text{m}$ ($0.65 \pm 0.05 \text{ kg}\cdot\text{m}$, $4.7 \pm 0.4 \text{ ft}\cdot\text{lb}$)



- 7) Install engine harness onto intake manifold.
- 8) Connect connectors to throttle position sensor, ignition coil, fuel injectors, idle air control solenoid valve, purge control solenoid valve and EGR solenoid valve. (AT vehicles)



- (A) EGR solenoid valve (AT vehicles)
- (B) Throttle position sensor
- (C) Idle air control solenoid valve
- (D) Purge control solenoid valve

- 9) Install EGR valve. (AT vehicles)

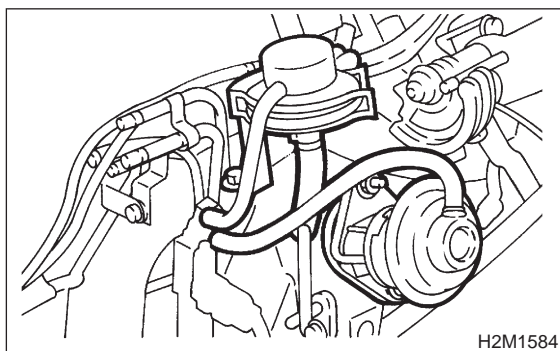
CAUTION:

Replace gasket with a new one.

Tightening torque:

$19 \pm 1.5 \text{ N}\cdot\text{m}$ ($1.9 \pm 0.15 \text{ kg}\cdot\text{m}$, $13.7 \pm 1.1 \text{ ft}\cdot\text{lb}$)

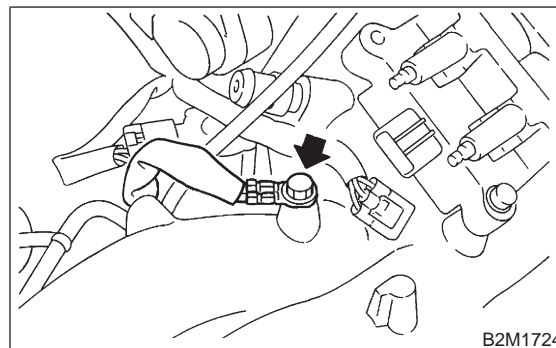
- 10) Install BPT with BPT holder bracket. (AT vehicles)
- 11) Connect BPT hoses from EGR solenoid valve and intake manifold. (AT vehicles)
- 12) Connect back pressure hose from pipe. (AT vehicles)
- 13) Connect EGR vacuum hose from EGR valve. (AT vehicles)



- 14) Connect engine ground terminal to intake manifold.

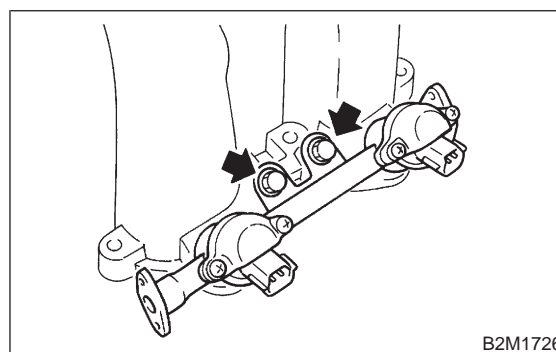
Tightening torque:

$19 \pm 1.5 \text{ N}\cdot\text{m}$ ($1.9 \pm 0.15 \text{ kg}\cdot\text{m}$, $13.7 \pm 1.1 \text{ ft}\cdot\text{lb}$)

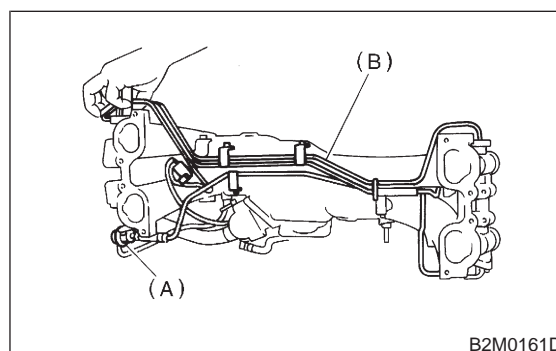


2. 2500 cc MODEL

- 1) Install EGR solenoid valve and purge control solenoid valve.
- 2) Install fuel injector pipes.

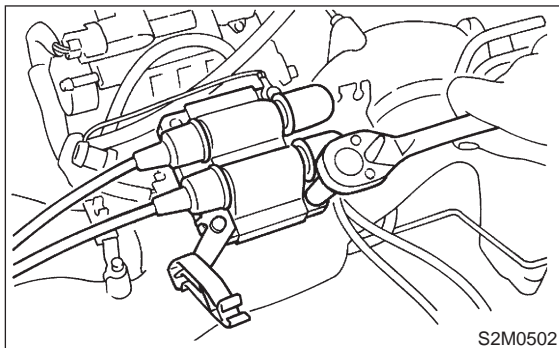


- 3) Assemble fuel pipes, etc. to intake manifold.



- (A) Pressure regulator
- (B) Fuel pipe ASSY

- 4) Install ignition coil.



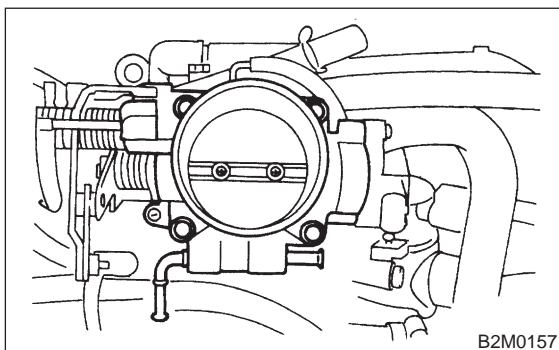
- 5) Assemble throttle body to intake manifold.

CAUTION:

Replace gasket with a new one.

Tightening torque:

22 ± 2 N·m (2.2 ± 0.2 kg·m, 15.9 ± 1.4 ft·lb)



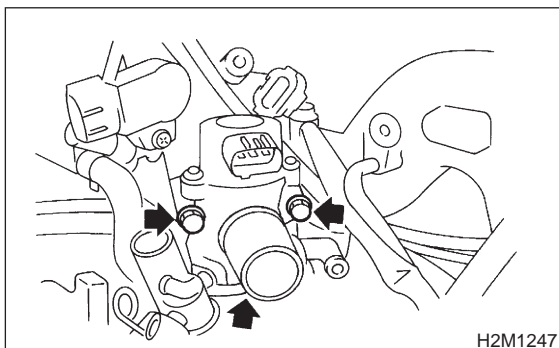
- 6) Install idle air control solenoid valve to intake manifold.

CAUTION:

Replace gasket with a new one.

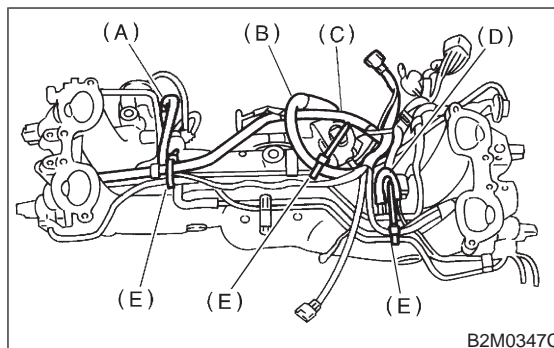
Tightening torque:

6.4 ± 0.5 N·m (0.65 ± 0.05 kg·m, 4.7 ± 0.4 ft·lb)



- 7) Install engine harness onto intake manifold.

- 8) Connect connectors to throttle position sensor, ignition coil, fuel injectors, idle air control solenoid valve, purge control solenoid valve and EGR solenoid valve.



- (A) EGR solenoid valve
- (B) Throttle position sensor
- (C) Idle air control solenoid valve
- (D) Purge control solenoid valve
- (E) Harness band

- 9) Install EGR valve.

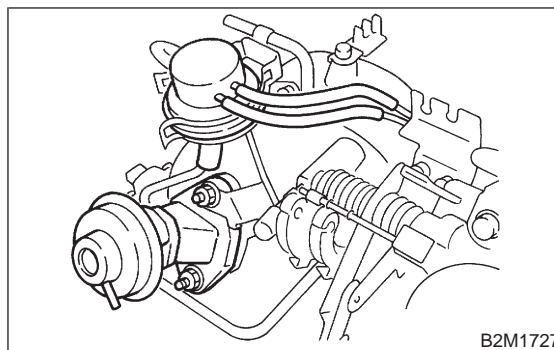
CAUTION:

Replace gasket with a new one.

Tightening torque:

19 ± 1.5 N·m (1.9 ± 0.15 kg·m, 13.7 ± 1.1 ft·lb)

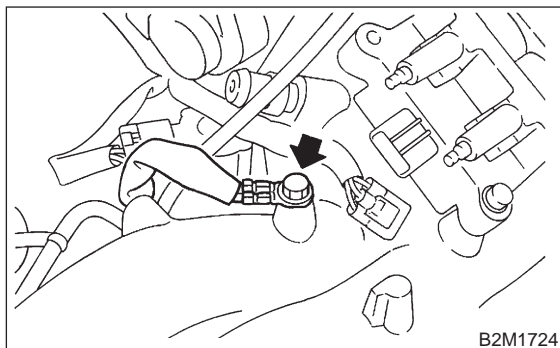
- 10) Install BPT with BPT holder bracket.
- 11) Connect BPT hoses from EGR solenoid valve and intake manifold.
- 12) Connect back pressure hose from pipe.
- 13) Connect EGR vacuum hose from EGR valve.



14) Connect engine ground terminal to intake manifold.

Tightening torque:

$19 \pm 1.5 \text{ N}\cdot\text{m}$ ($1.9 \pm 0.15 \text{ kg}\cdot\text{m}$, $13.7 \pm 1.1 \text{ ft}\cdot\text{lb}$)



D: INSTALLATION

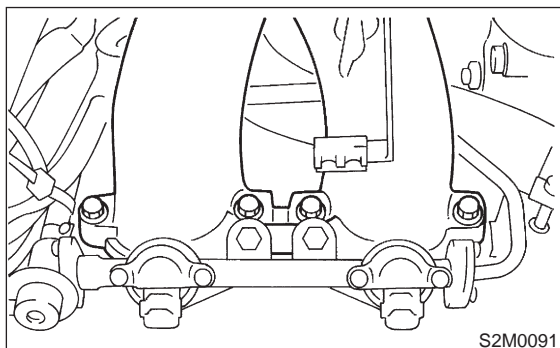
1) Install intake manifold onto cylinder heads.

CAUTION:

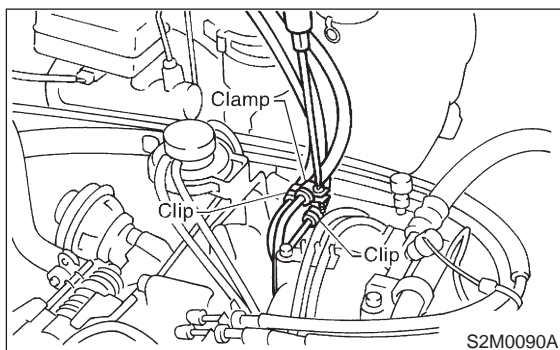
Always use new gaskets.

Tightening torque:

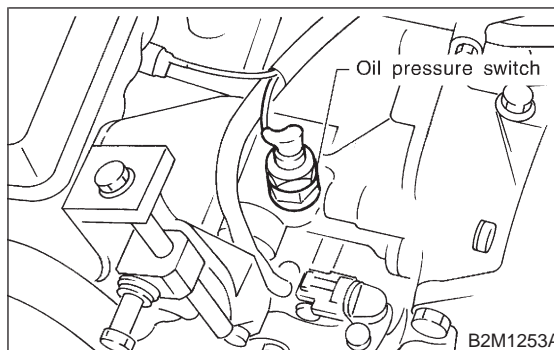
$25 \pm 2 \text{ N}\cdot\text{m}$ ($2.5 \pm 0.2 \text{ kg}\cdot\text{m}$, $18.1 \pm 1.4 \text{ ft}\cdot\text{lb}$)



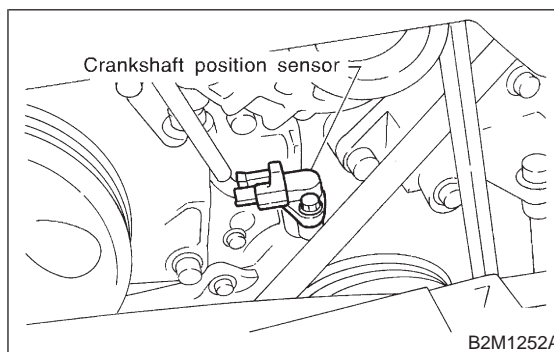
2) Connect fuel hoses.



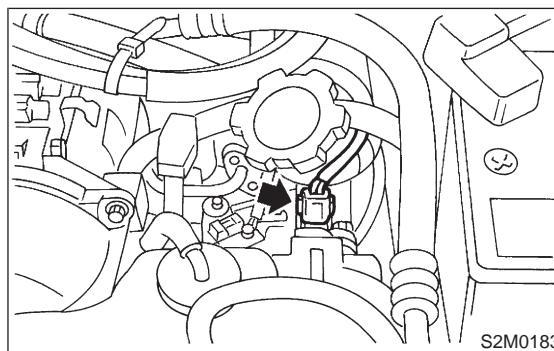
3) Connect connector to oil pressure switch.



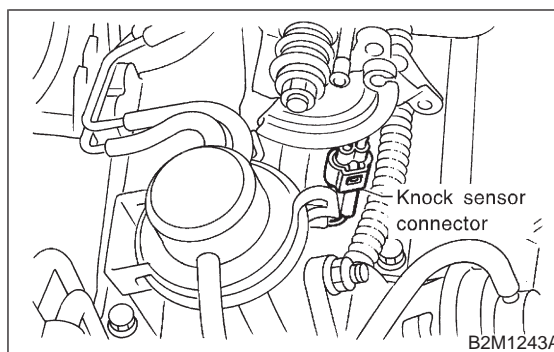
4) Connect connector to crankshaft position sensor.



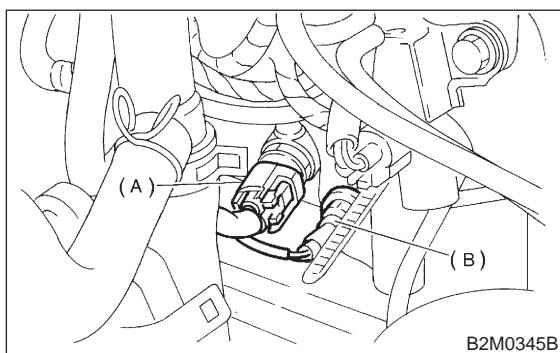
5) Connect connector to camshaft position sensor.



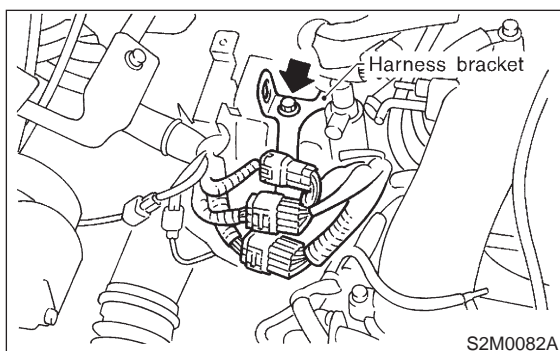
6) Connect knock sensor connector.



- 7) Connect connectors to engine coolant temperature sensor (A) and thermometer (B).



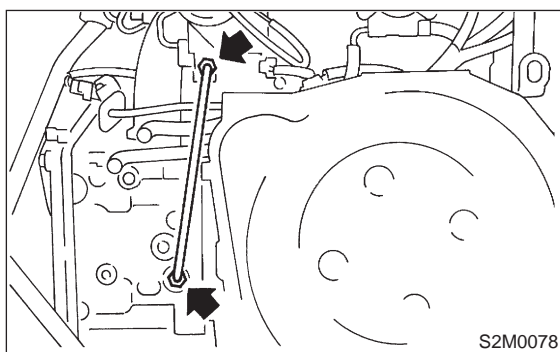
- 8) Install engine harness bracket, and connect engine harness connectors to bulkhead connectors.



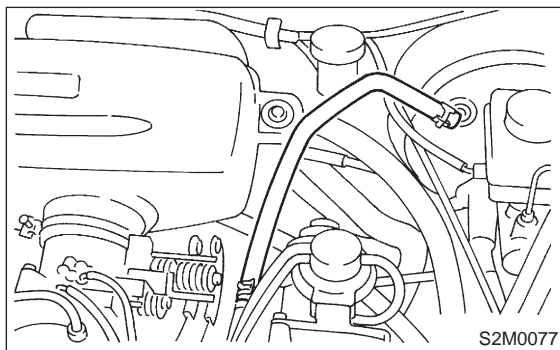
- 9) Install EGR pipe.

Tightening torque:

$34 \pm 2 \text{ N}\cdot\text{m}$ ($3.5 \pm 0.2 \text{ kg}\cdot\text{m}$, $25.3 \pm 1.4 \text{ ft}\cdot\text{lb}$)

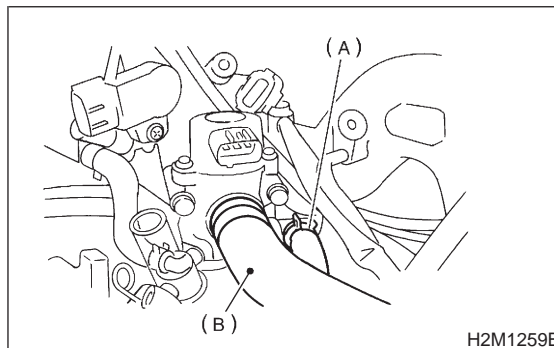


- 10) Connect brake booster hose.

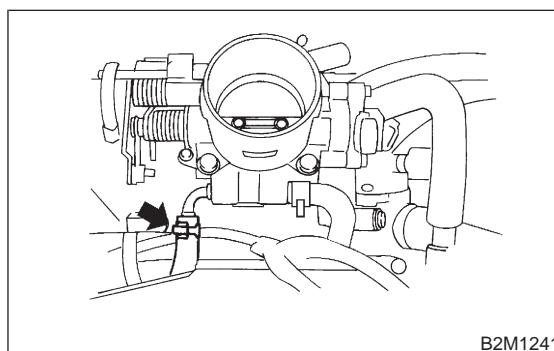


- 11) Connect engine coolant hose (A) to idle air control solenoid valve.

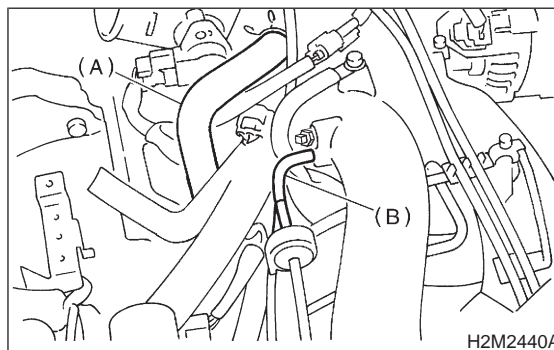
- 12) Connect air by-pass hose (B) to idle air control solenoid valve.



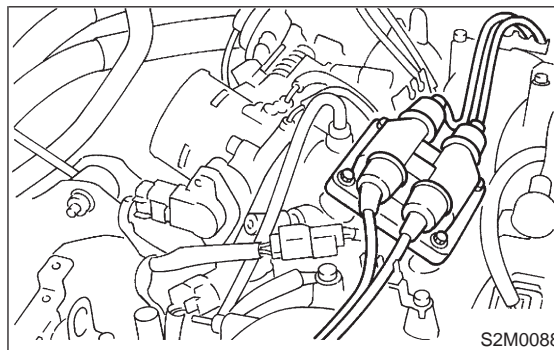
- 13) Connect engine coolant hose to throttle body.



- 14) Connect PCV hose (A) and vacuum hose (B) to intake manifold.



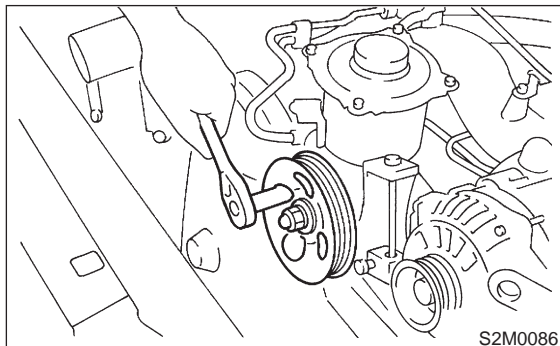
- 15) Connect spark plug cords to ignition coil.



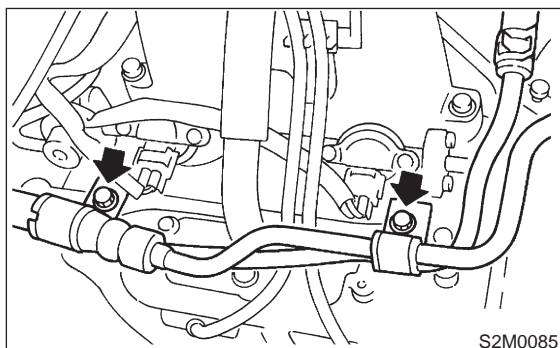
- 16) Install power steering pump on bracket.
(1) Install power steering pump on bracket, and tighten bolts.

Tightening torque:

20.1 ± 2.5 N·m (2.05 ± 0.25 kg·m, 14.8 ± 1.8 ft·lb)



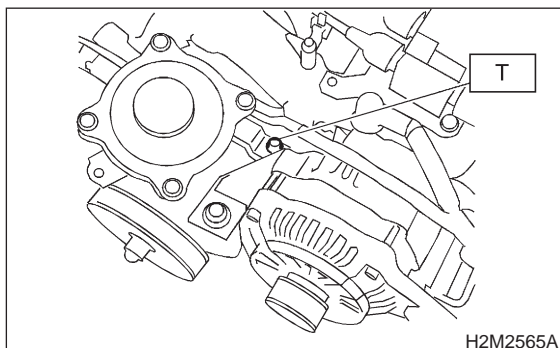
- (2) Install power steering pipe brackets on right side intake manifold.



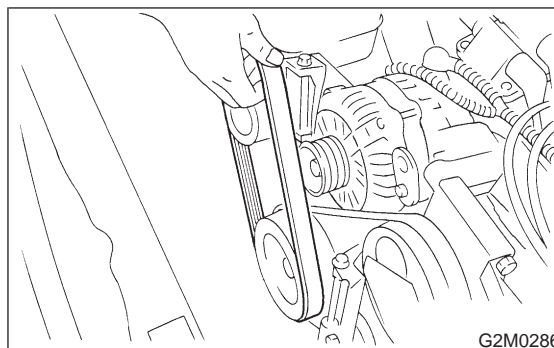
- (3) Tighten bolt which installs power steering pump stiffener on cylinder block.

Tightening torque:

$T: 22 \pm 2$ N·m (2.2 ± 0.2 kg·m, 15.9 ± 1.4 ft·lb)

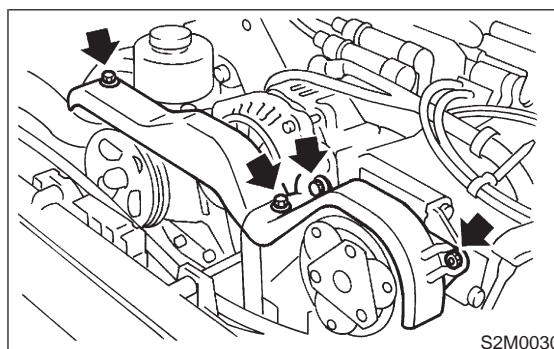


- (4) Install power steering pump drive V-belt.

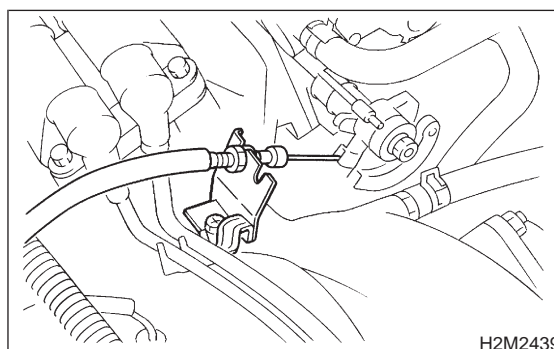


- (5) Adjust V-belt. <Ref. to 1-5 [G200].>

- (6) Install V-belt covers.

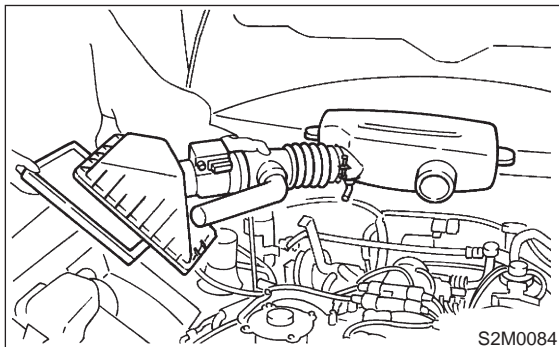


- 17) Connect accelerator cable.

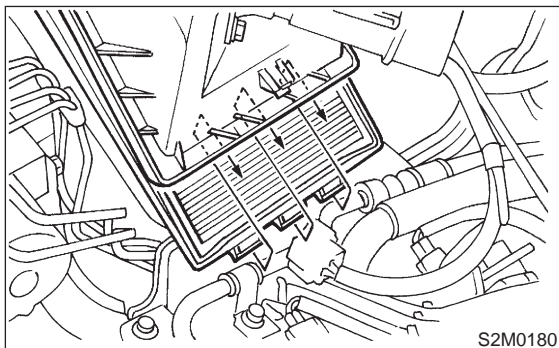


4. Intake Manifold

- 18) Install air cleaner element.
 19) Install air cleaner upper cover, air intake duct and air intake chamber as a unit.

**CAUTION:**

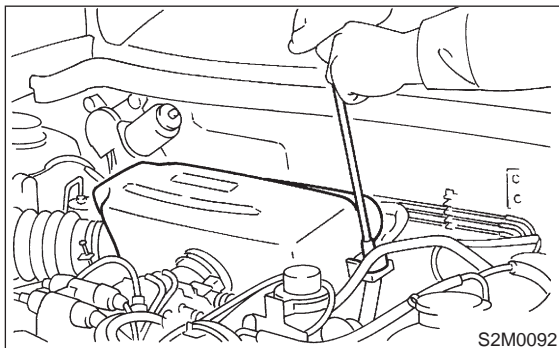
Before installing air cleaner upper cover, align holes with protruding portions of air cleaner lower case, then secure upper cover to lower case.



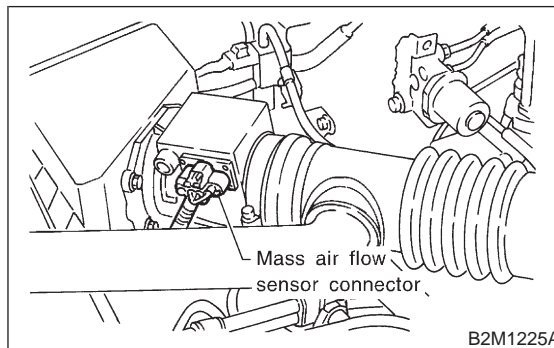
- 20) Tighten bolts which install air intake chamber to stays.

Tightening torque:

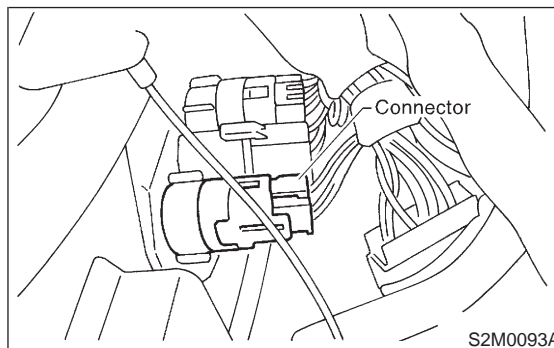
$4.9 \pm 0.5 \text{ N}\cdot\text{m}$ ($0.5 \pm 0.05 \text{ kg}\cdot\text{m}$, $3.6 \pm 0.4 \text{ ft}\cdot\text{lb}$)



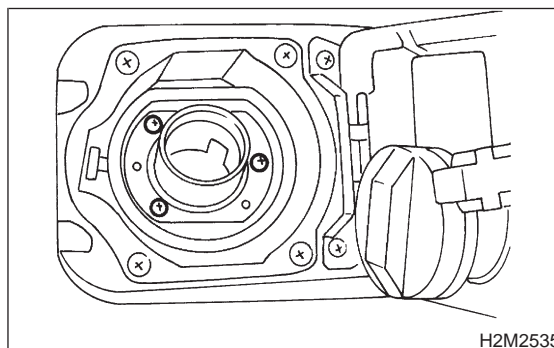
- 21) Connect connector to mass air flow sensor.



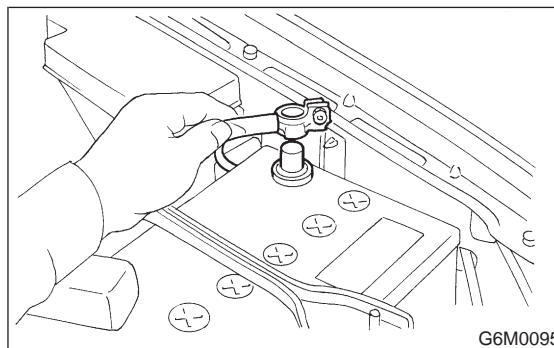
- 22) Connect connector to fuel pump relay.



- 23) Install fuel filler cap.



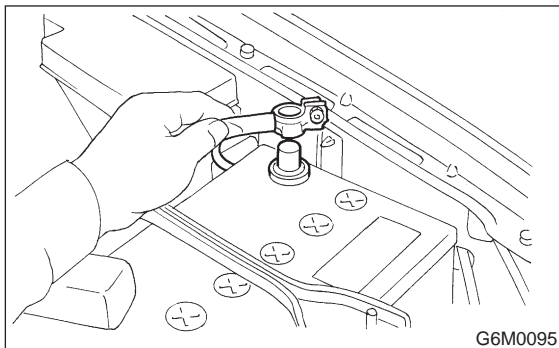
- 24) Connect battery ground cable.



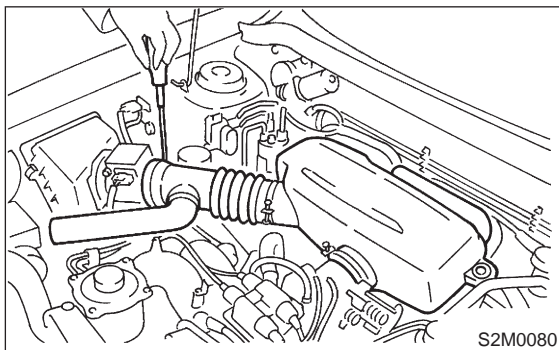
5. Engine Coolant Temperature Sensor

A: REMOVAL AND INSTALLATION

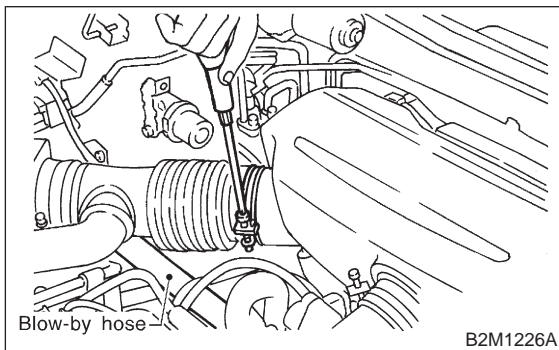
- 1) Disconnect battery ground cable.



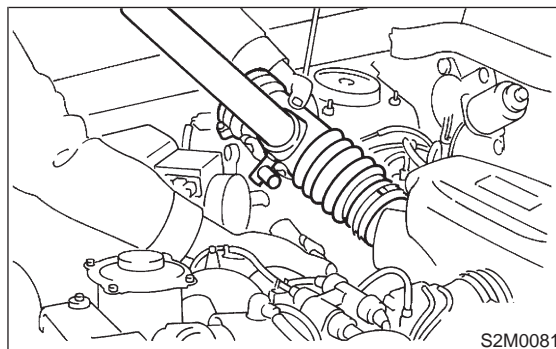
- 2) Loosen clamp which connects air intake duct to mass air flow sensor.



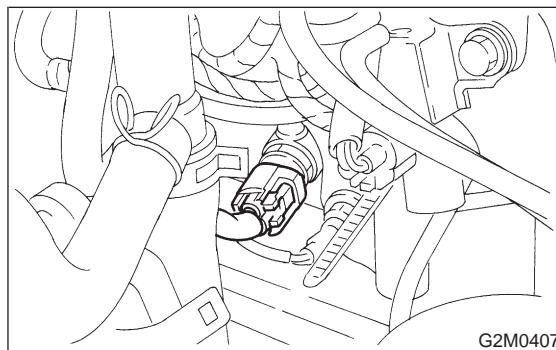
- 3) Loosen clamp which connects air intake duct to air intake chamber.



- 4) Disconnect emission hoses from air intake duct.
5) Remove air intake duct.



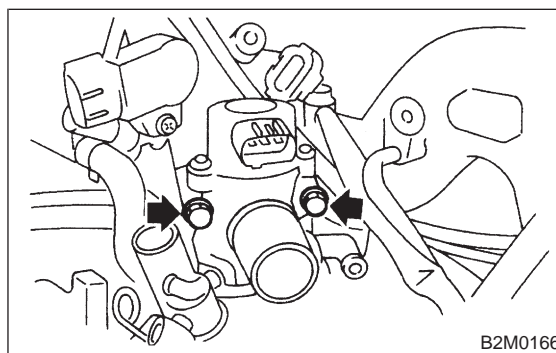
- 6) Disconnect connector from engine coolant temperature sensor.



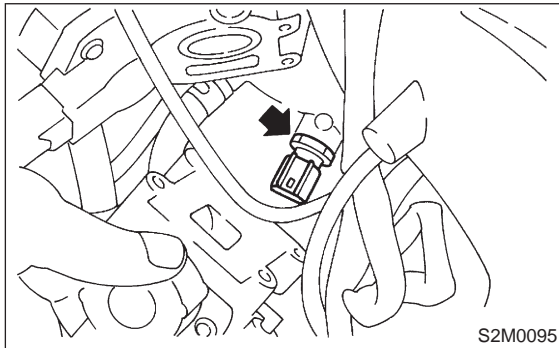
- 7) Remove bolts which install idle air control solenoid valve, and move it. <Ref. to 2-7 [W12A0].>

NOTE:

At this time, do not disconnect engine coolant hoses from idle air control solenoid valve.



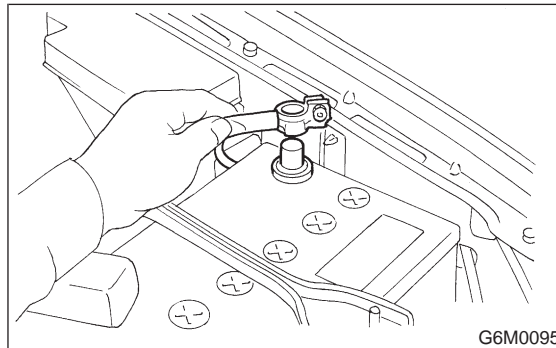
- 8) Remove engine coolant temperature sensor.
- 9) Installation is in the reverse order of removal.

Tightening torque: **$25 \pm 3 \text{ N}\cdot\text{m}$ ($2.5 \pm 0.3 \text{ kg}\cdot\text{m}$, $18.1 \pm 2.2 \text{ ft}\cdot\text{lb}$)**

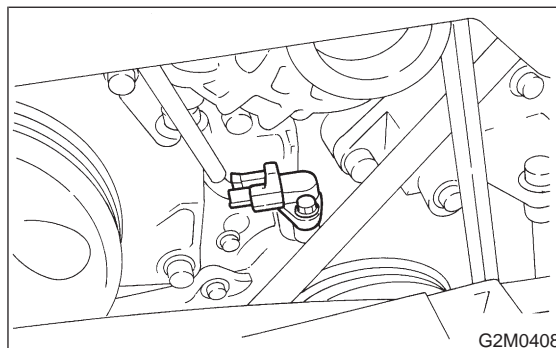
6. Crankshaft Position Sensor

A: REMOVAL AND INSTALLATION

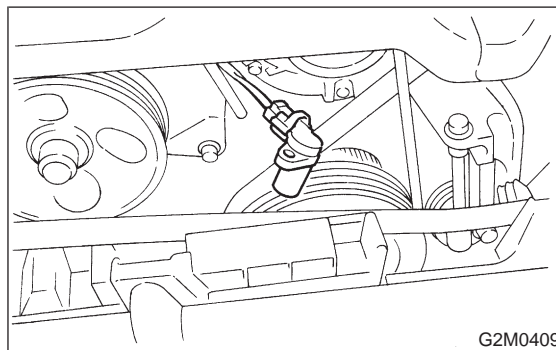
- 1) Disconnect battery ground cable.



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



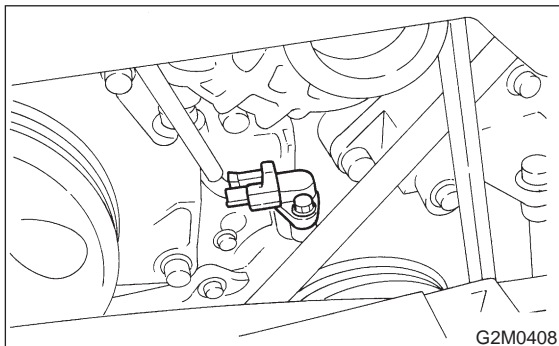
- 3) Remove crankshaft position sensor, and disconnect connector from it.



4) Installation is in the reverse order of removal.

Tightening torque:

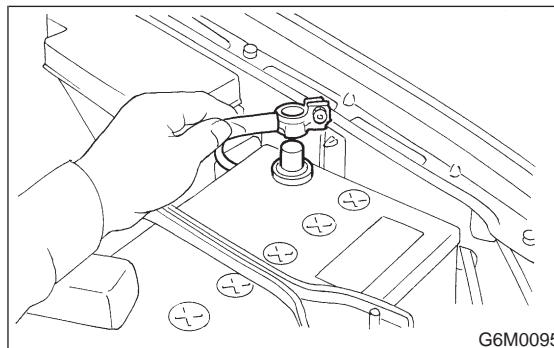
$6.4 \pm 0.5 \text{ N}\cdot\text{m}$ ($0.65 \pm 0.05 \text{ kg}\cdot\text{m}$, $4.7 \pm 0.4 \text{ ft}\cdot\text{lb}$)



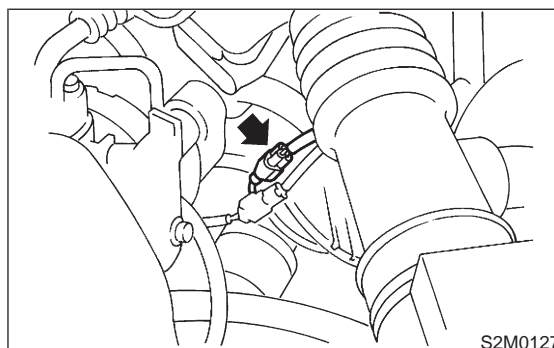
7. Front Oxygen Sensor

A: REMOVAL

1) Disconnect battery ground cable.



2) Disconnect connector from front oxygen sensor.



3) Lift-up the vehicle.

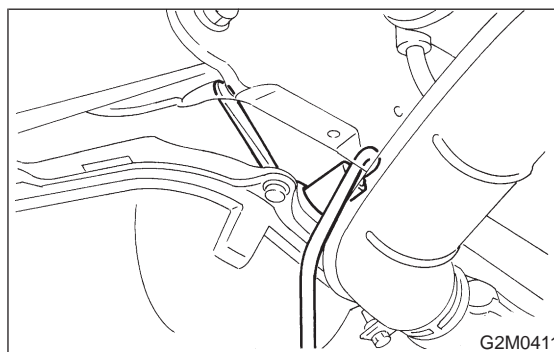
4) Apply SUBARU CRC or its equivalent to threaded portion of front oxygen sensor, and leave it for one minute or more.

SUBARU CRC (Part No. 004301003)

5) Remove front oxygen sensor.

CAUTION:

When removing oxygen sensor, do not force oxygen sensor especially when exhaust pipe is cold, otherwise it will damage exhaust pipe.

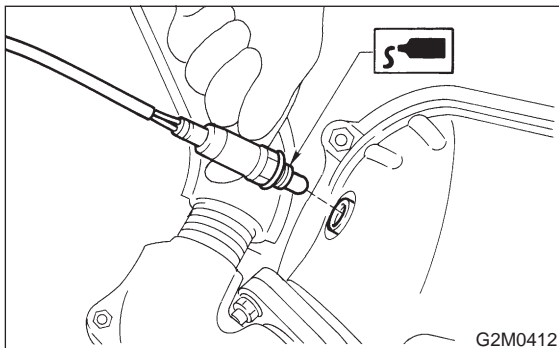


B: INSTALLATION

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

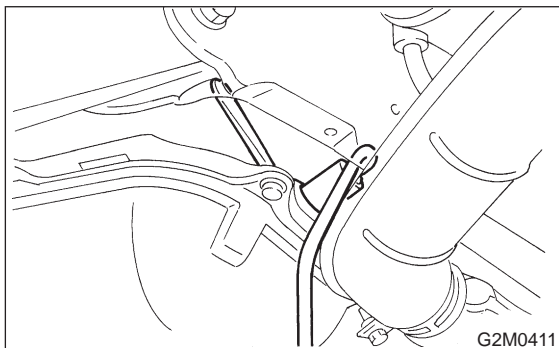
Anti-seize compound:
SS-30 by JET LUBE

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



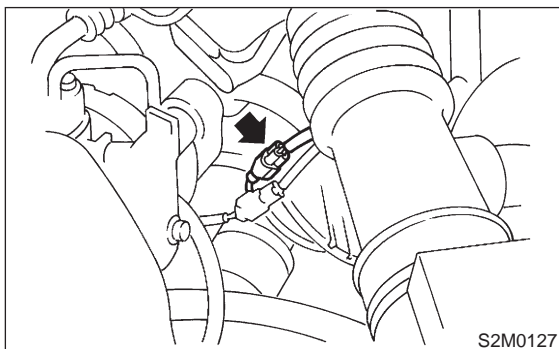
2) Install front oxygen sensor.

Tightening torque:
 21 ± 3 N·m (2.1 ± 0.3 kg·m, 15.2 ± 2.2 ft·lb)

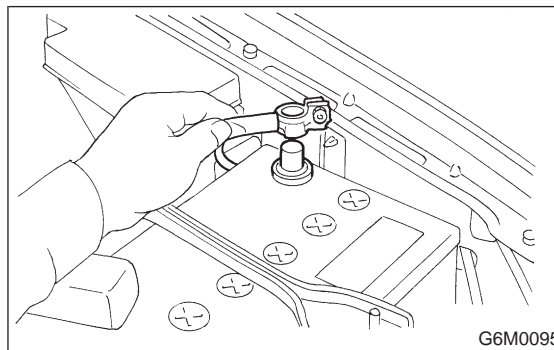


3) Lower the vehicle.

4) Connect connector of front oxygen sensor.



5) Connect battery ground cable.

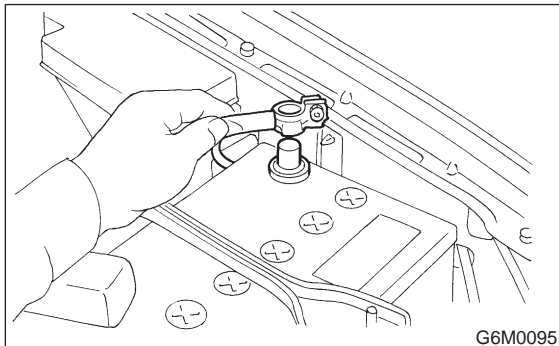


8. Rear Oxygen Sensor

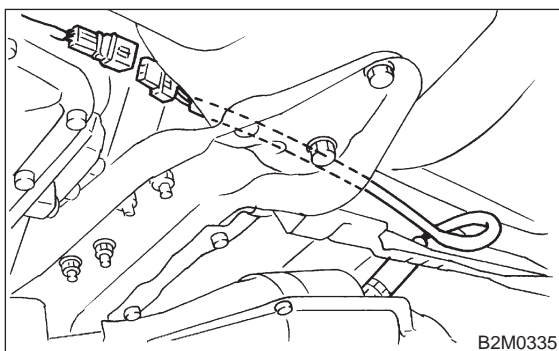
A: REMOVAL

1. EXCEPT CALIFORNIA SPEC. VEHICLES

- 1) Disconnect battery ground cable.



- 2) Lift-up the vehicle.
- 3) Disconnect connector from rear oxygen sensor.



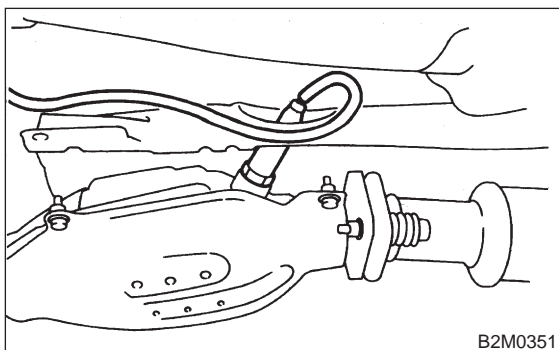
- 4) Apply SUBARU CRC or its equivalent to threaded portion of rear oxygen sensor, and leave it for one minute or more.

SUBARU CRC (Part No. 004301003)

- 5) Remove rear oxygen sensor.

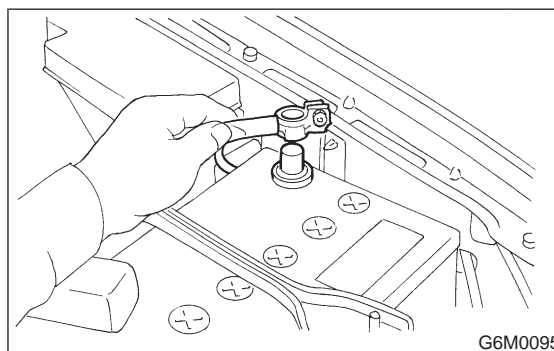
CAUTION:

When removing rear oxygen sensor, do not force rear oxygen sensor especially when exhaust pipe is cold, otherwise it will damage exhaust pipe.

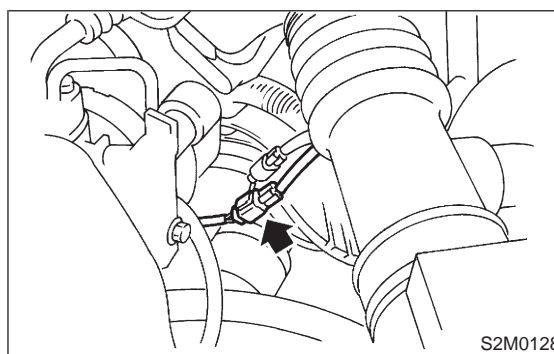


2. CALIFORNIA SPEC. VEHICLES

- 1) Disconnect battery ground cable.



- 2) Disconnect connector from rear oxygen sensor.



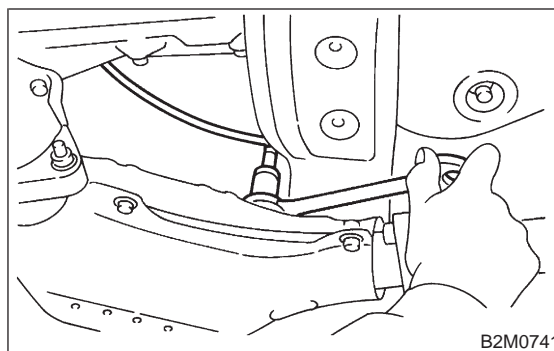
- 3) Lift-up the vehicle.
- 4) Apply SUBARU CRC or its equivalent to threaded portion of rear oxygen sensor, and leave it for one minute or more.

SUBARU CRC (Part No. 004301003)

- 5) Remove rear oxygen sensor.

CAUTION:

When removing rear oxygen sensor, do not force rear oxygen sensor especially when exhaust pipe is cold, otherwise it will damage exhaust pipe.

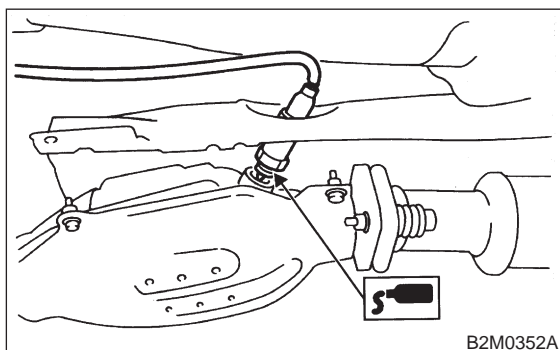


B: INSTALLATION**1. EXCEPT CALIFORNIA SPEC. VEHICLES**

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

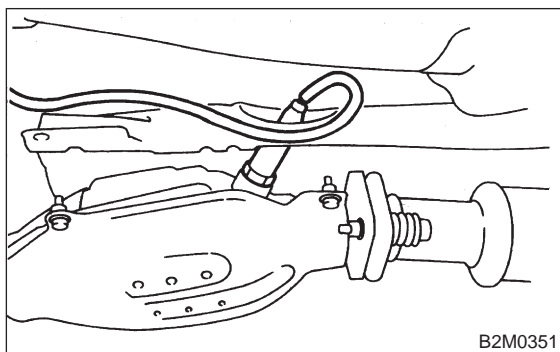
Anti-seize compound:
SS-30 by JET LUBE

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

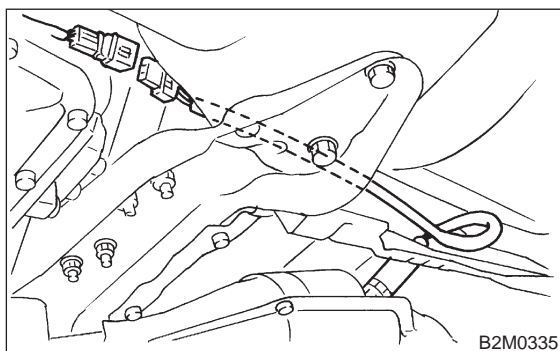


2) Install rear oxygen sensor.

Tightening torque:
 21 ± 3 N-m (2.1 ± 0.3 kg-m, 15.2 ± 2.2 ft-lb)

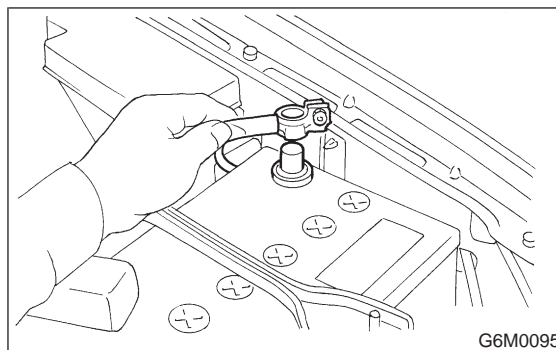


3) Connect connector of rear oxygen sensor.



4) Lower the vehicle.

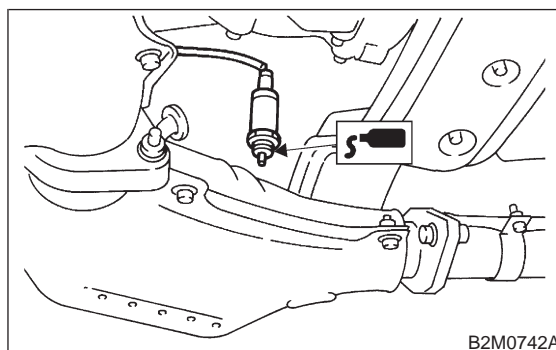
5) Connect battery ground cable.

**2. CALIFORNIA SPEC. VEHICLES**

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

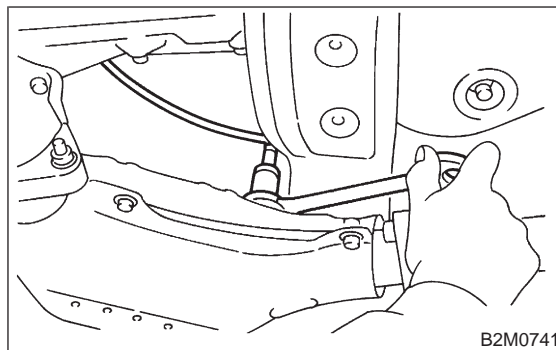
Anti-seize compound:
SS-30 by JET LUBE

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

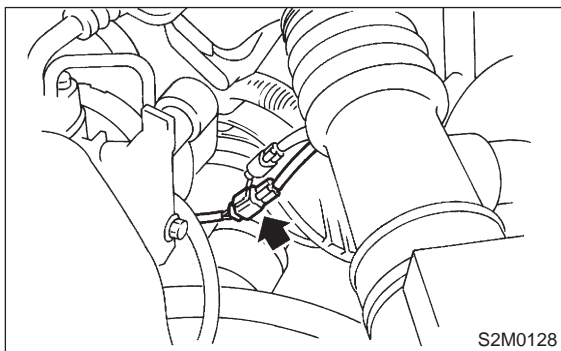


2) Install rear oxygen sensor.

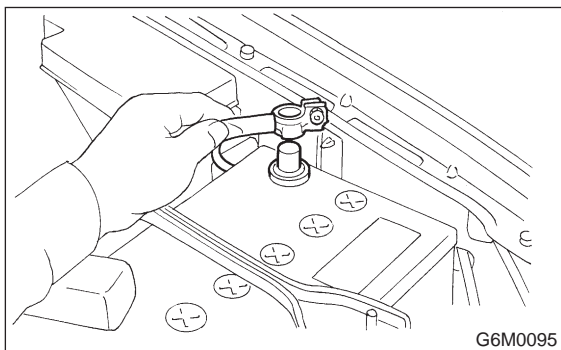
Tightening torque:
 21 ± 3 N-m (2.1 ± 0.3 kg-m, 15.2 ± 2.2 ft-lb)



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



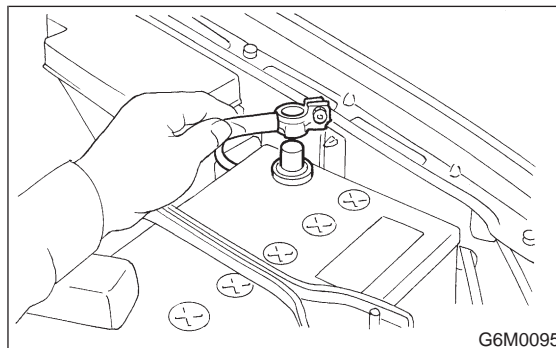
- 5) Connect battery ground cable.



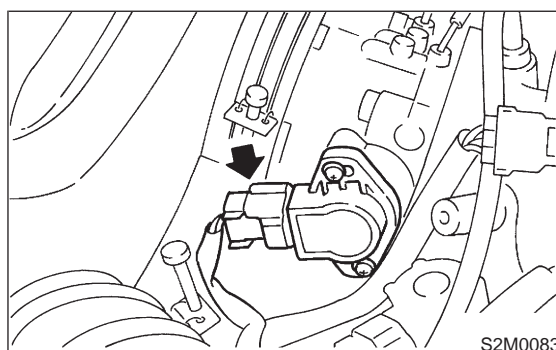
9. Throttle Position Sensor

A: REMOVAL AND INSTALLATION

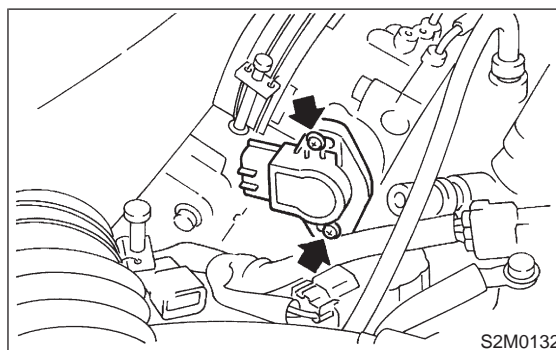
- 1) Disconnect battery ground cable.



- 2) Disconnect connector from throttle position sensor.



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



9. Throttle Position Sensor

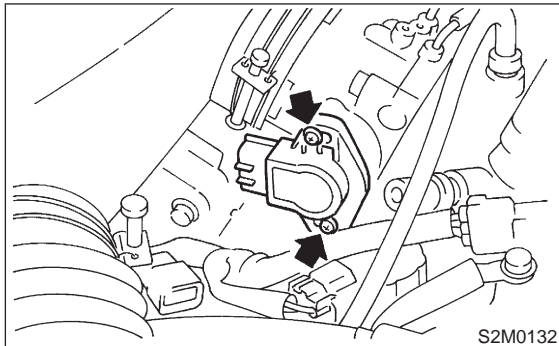
4) Installation is in the reverse order of removal.

Tightening torque:

$2.2 \pm 0.2 \text{ N}\cdot\text{m}$ ($0.22 \pm 0.02 \text{ kg}\cdot\text{m}$, $1.6 \pm 0.1 \text{ ft}\cdot\text{lb}$)

CAUTION:

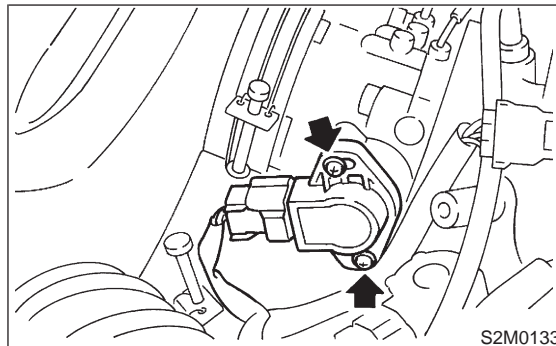
When installing throttle position sensor, adjust to the specified data.



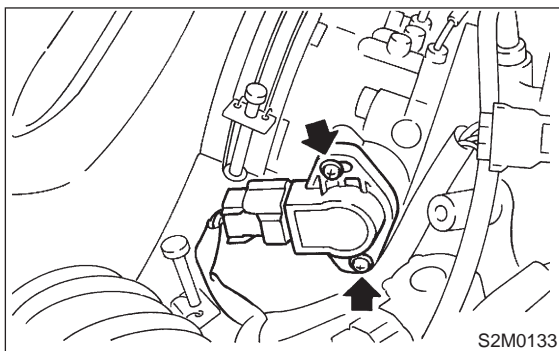
(4) Tighten throttle position sensor holding screws.

Tightening torque:

$2.2 \pm 0.2 \text{ N}\cdot\text{m}$ ($0.22 \pm 0.02 \text{ kg}\cdot\text{m}$, $1.6 \pm 0.1 \text{ ft}\cdot\text{lb}$)

**B: ADJUSTMENT**

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



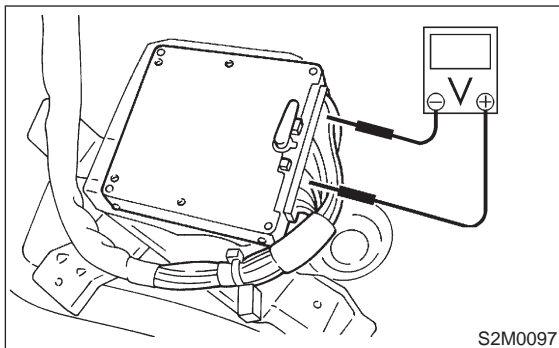
- 3) When using voltage meter;
 - (1) Take out ECM.
 - (2) Turn ignition switch to ON.
 - (3) Adjust throttle position sensor so that signal voltage to ECM may be in specification.

Connector & terminal / Specified voltage

(B84) No. 6 — (B84) No. 20 / 0.45 — 0.55

V

[Fully closed.]



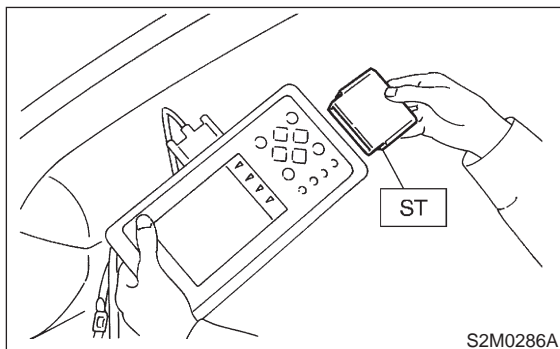
4) When using SUBARU SELECT MONITOR;

NOTE:

For detailed operation procedures, refer to the SUBARU SELECT MONITOR OPERATION MANUAL.

(1) Insert the cartridge to SUBARU SELECT MONITOR.

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(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 {EGI/EMPI} in Selection Menu.

(6) Select {1. Current Data Display & Save} in EGI/EMPI Diagnosis.

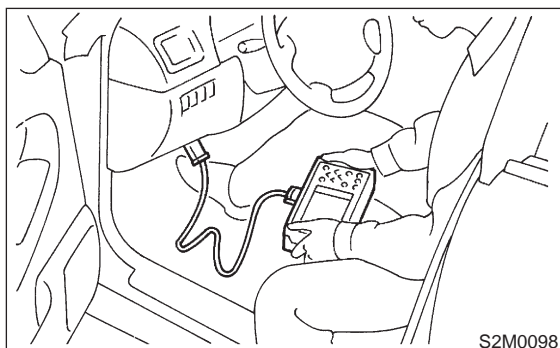
(7) Select {1.12 Data Display} in Data Display Menu.

(8) Adjust throttle position sensor to the following specifications.

Condition: Throttle fully closed

Throttle opening angle 0.00%

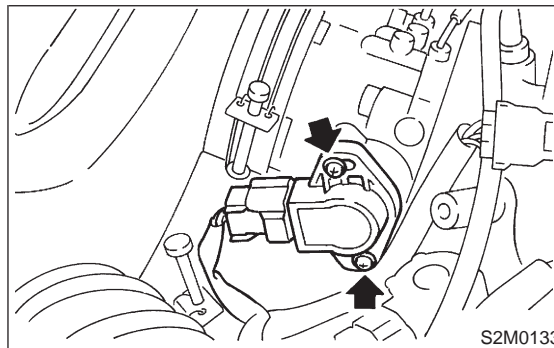
Throttle sensor voltage 0.50 V



(9) Tighten throttle position sensor holding screws.

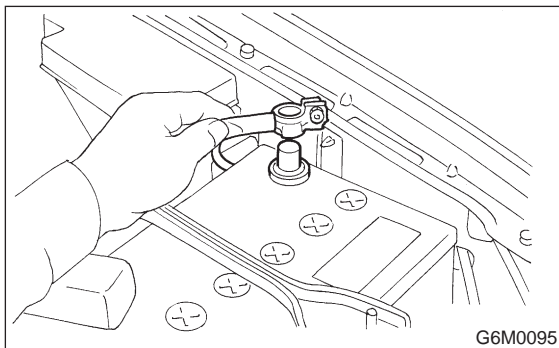
Tightening torque:

$2.2 \pm 0.2 \text{ N}\cdot\text{m}$ ($0.22 \pm 0.02 \text{ kg}\cdot\text{m}$, $1.6 \pm 0.1 \text{ ft}\cdot\text{lb}$)

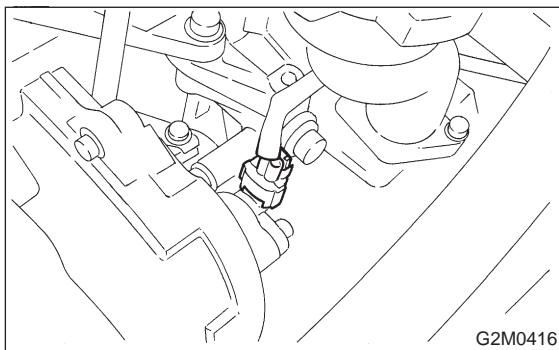


10. Camshaft Position Sensor**A: REMOVAL AND INSTALLATION**

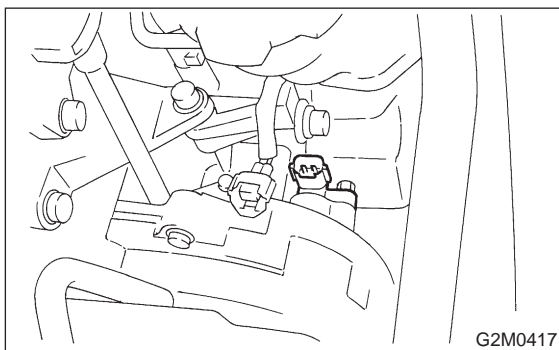
- 1) Disconnect battery ground cable.



- 2) Disconnect connector from camshaft position sensor.



- 3) Remove camshaft position sensor from camshaft support LH.



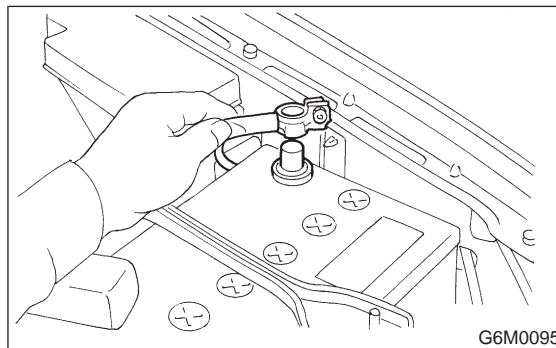
- 4) Installation is in the reverse order of removal.

Tightening torque:

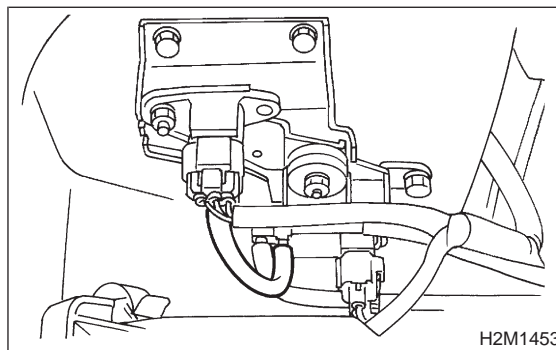
$6.4 \pm 0.5 \text{ N}\cdot\text{m}$ ($0.65 \pm 0.05 \text{ kg}\cdot\text{m}$, $4.7 \pm 0.4 \text{ ft}\cdot\text{lb}$)

11. Pressure Sensor**A: REMOVAL AND INSTALLATION**

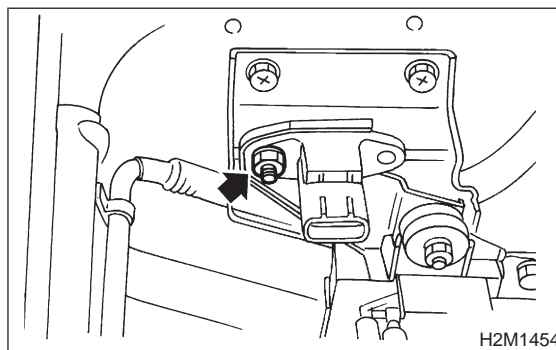
- 1) Disconnect battery ground cable.



- 2) Disconnect connector from pressure sensor.
- 3) Disconnect hose from pressure sensor.



- 4) Remove pressure sensor from bracket.



- 5) Installation is in the reverse order of removal.

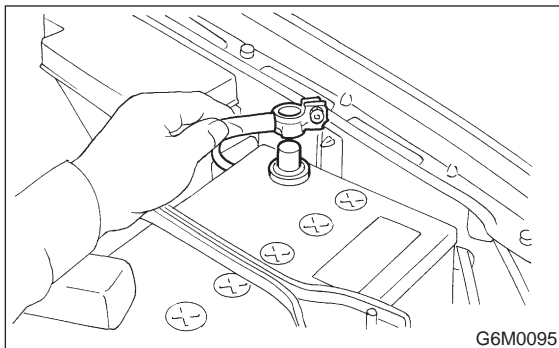
Tightening torque:

$6.4 \pm 0.5 \text{ N}\cdot\text{m}$ ($0.65 \pm 0.05 \text{ kg}\cdot\text{m}$, $4.7 \pm 0.4 \text{ ft}\cdot\text{lb}$)

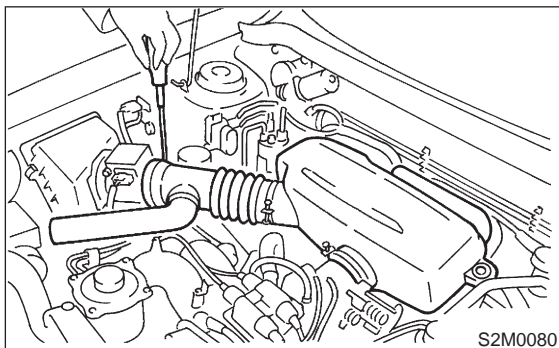
12. Idle Air Control Solenoid Valve

A: REMOVAL AND INSTALLATION

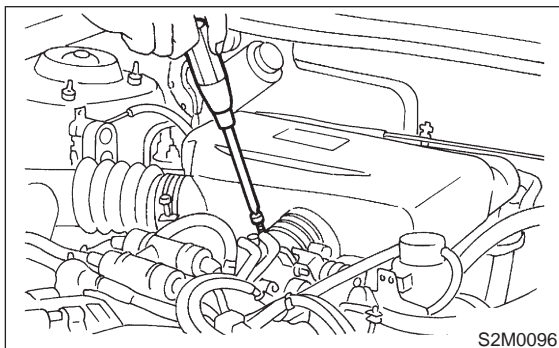
- 1) Disconnect battery ground cable.



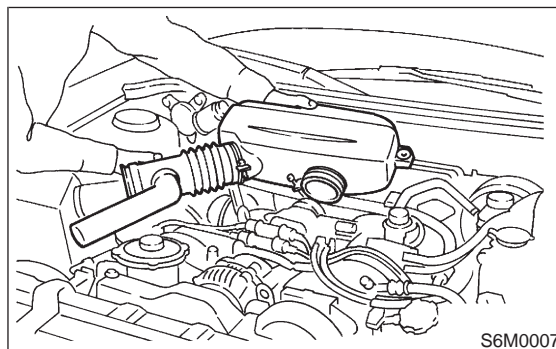
- 2) Loosen clamp which connects air intake duct to mass air flow sensor.



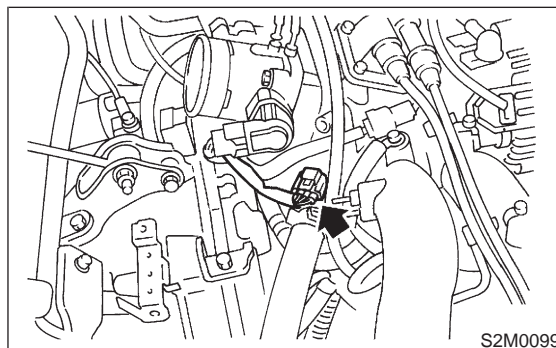
- 3) Loosen clamp which connects air intake chamber to throttle body.



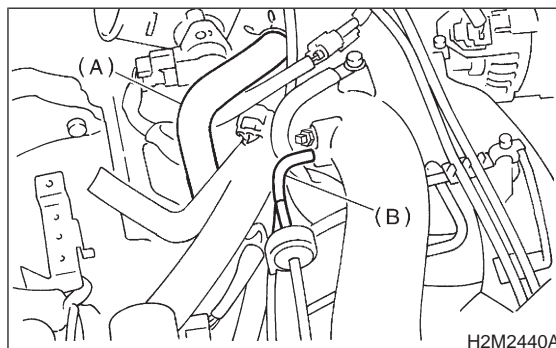
- 4) Disconnect blow-by hose and air hose, and remove air intake chamber and air intake duct as a unit.



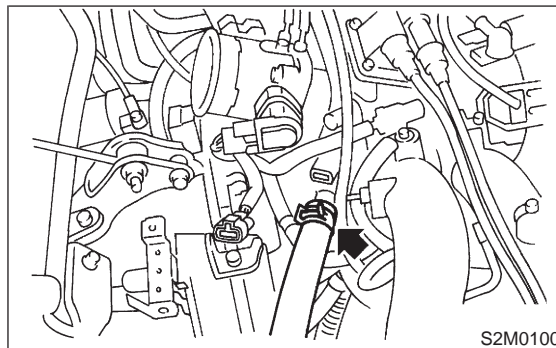
- 5) Disconnect connector from idle air control solenoid valve.



- 6) Disconnect PCV hose (A) and pressure regulator vacuum hose (B).

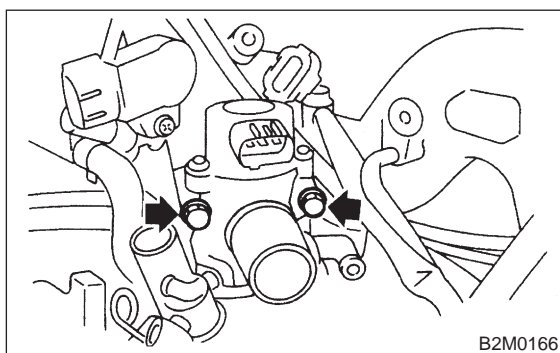


- 7) Disconnect air by-pass hose from idle air control solenoid valve.

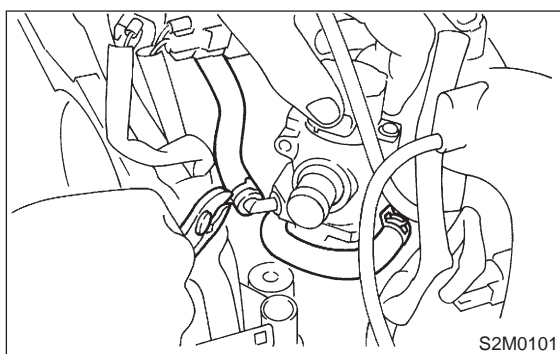


12. Idle Air Control Solenoid Valve

- 8) Remove bolts which install idle air control solenoid valve to throttle body.



- 9) Disconnect engine coolant hoses from idle air control solenoid valve, and take them off.



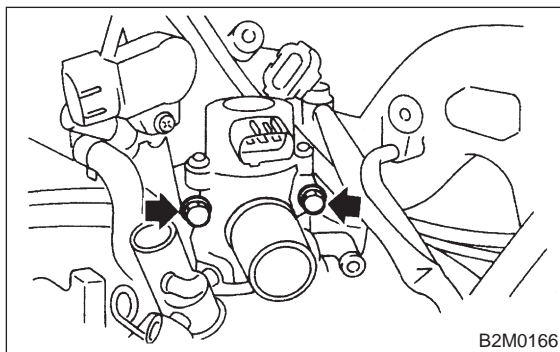
- 10) Installation is in the reverse order of removal.

CAUTION:

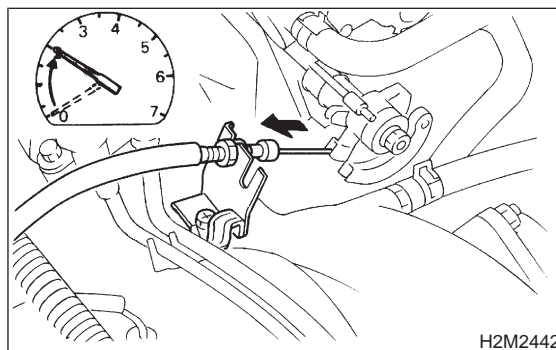
Replace gasket with a new one.

Tightening torque:

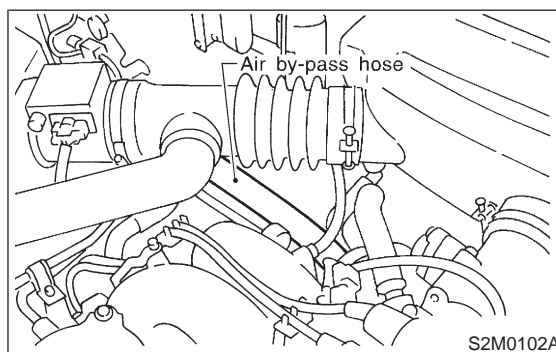
$6.4 \pm 0.5 \text{ N-m}$ ($0.65 \pm 0.05 \text{ kg-m}$, $4.7 \pm 0.4 \text{ ft-lb}$)

**B: CLEANING**

- 1) Start and warm-up the engine until radiator fan operates.
2) Hold throttle valve so that engine speed is at 2,000 rpm.



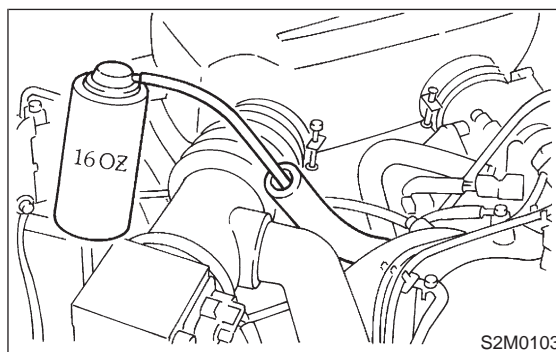
- 3) Disconnect air by-pass hose from air intake duct.



- 4) Slowly pour one can (16 oz) of cleaner into by-pass air hole.

Cleaner:

Part No. 1050002 GM Top Engine Cleaner
Part No. X66-A AC Delco Carburetor
Tune-up Conditioner

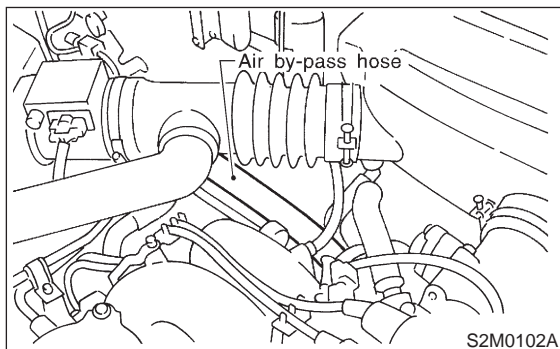


- 5) Leave the engine running for five minutes.

NOTE:

White smoke comes out of the muffler until the cleaner is used up.

- 6) Stop the engine.
- 7) Release the throttle valve.
- 8) Connect air by-pass hose to air intake duct.



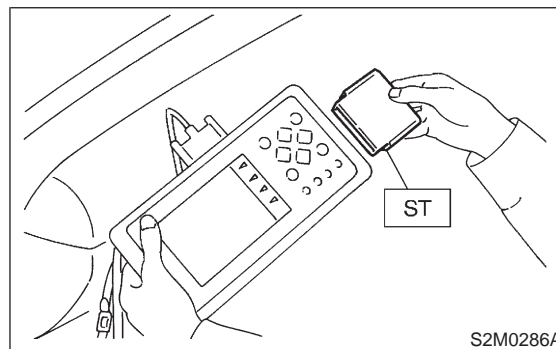
- 9) Check duty ratio of idle air control solenoid valve using SUBARU SELECT MONITOR.

NOTE:

For detailed operation procedures, refer to the SUBARU SELECT MONITOR OPERATION MANUAL.

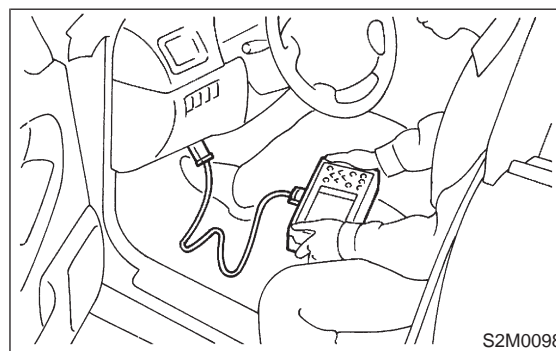
- (1) Insert the cartridge to SUBARU SELECT MONITOR.

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- (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 {EGI/EMPI} in Selection Menu.
- (6) Select {1. Current Data Display & Save} in EGI/EMPI Diagnosis.
- (7) Select {1.12 Data Display} in Data Display Menu.
- (8) Adjust throttle position sensor to the following specification.

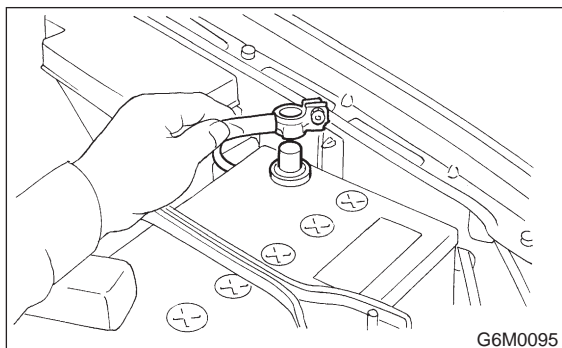
ISC valve duty ratio: 25 — 40%



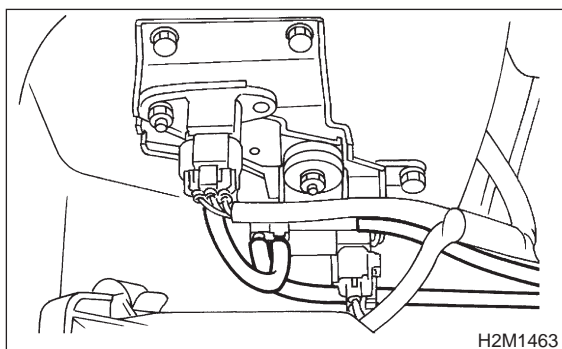
13. Pressure Sources Switching Solenoid Valve

A: REMOVAL AND INSTALLATION

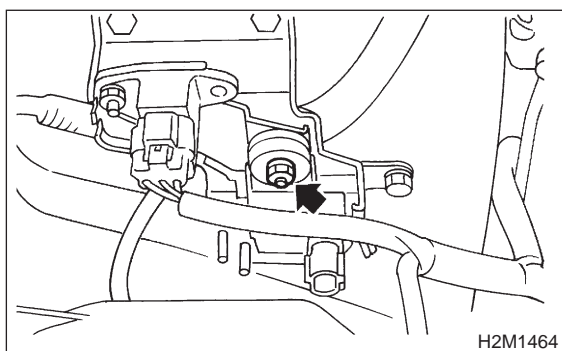
- 1) Disconnect battery ground cable.



- 2) Disconnect connector from pressure sources switching solenoid valve.
- 3) Disconnect hoses from pressure sources switching solenoid valve.



- 4) Remove pressure sources switching solenoid valve from bracket.



- 5) Installation is in the reverse order of removal.

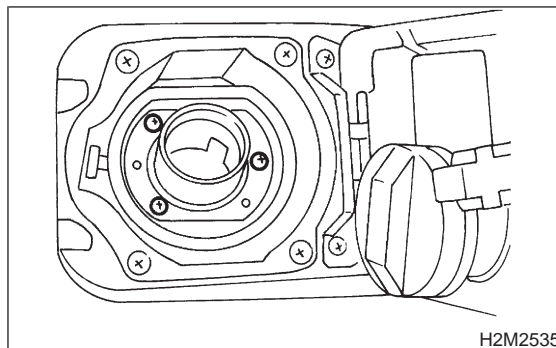
Tightening torque:

6.4 ± 0.5 N·m (0.65 ± 0.05 kg·m, 4.7 ± 0.4 ft·lb)

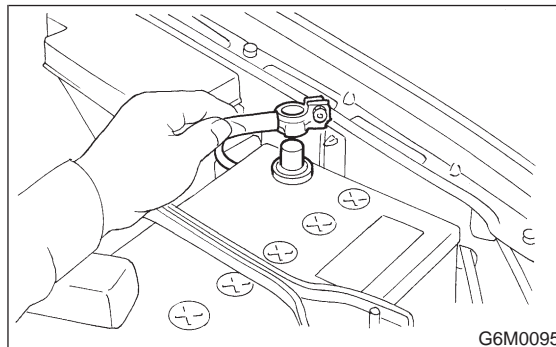
14. Fuel Injector

A: REMOVAL AND INSTALLATION

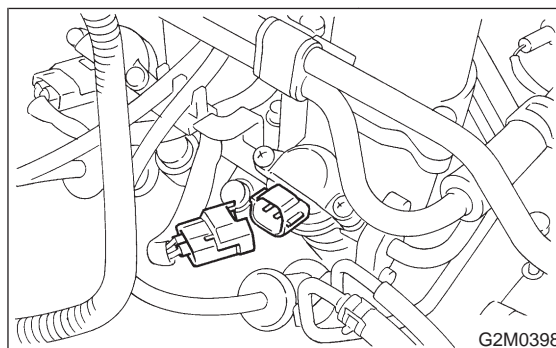
- 1) Release fuel pressure.
<Ref. to 2-8 [W1B0].>
- 2) Open fuel flap lid, and remove fuel filler cap.



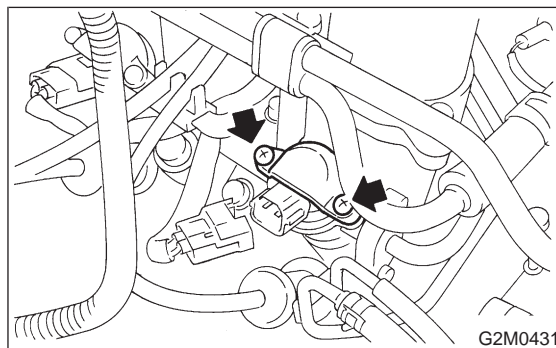
- 3) Disconnect battery ground cable.



- 4) Disconnect connector from fuel injector.



- 5) Remove fuel injector from fuel pipe assembly.



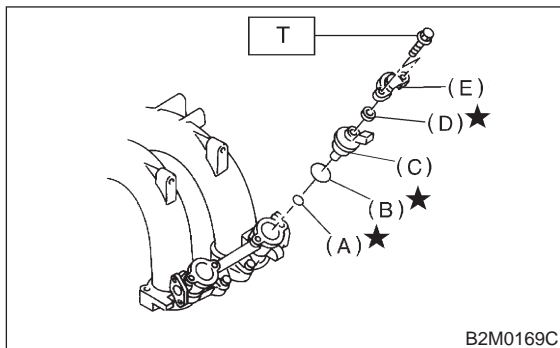
6) Installation is in the reverse order of removal.

CAUTION:

Replace O-rings and insulator.

Tightening torque:

T: 3.4 ± 0.5 N·m (0.35 ± 0.05 kg·m, 2.5 ± 0.4 ft·lb)

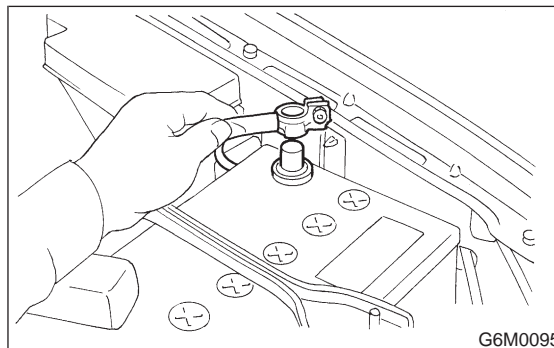


- (A) O-ring B
- (B) O-ring A
- (C) Fuel injector
- (D) Insulator
- (E) Fuel injector cup
- ★: Replacement part

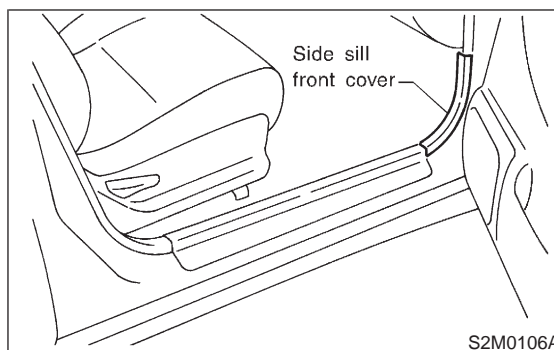
15. Engine Control Module

A: REMOVAL AND INSTALLATION

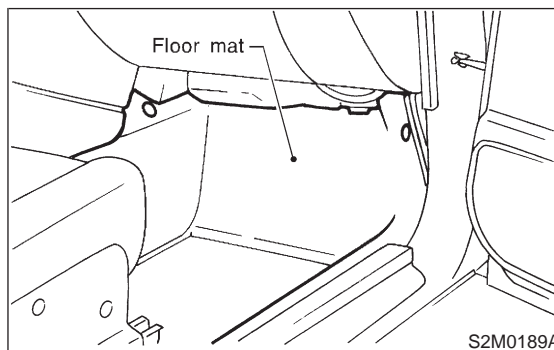
1) Disconnect battery ground cable.



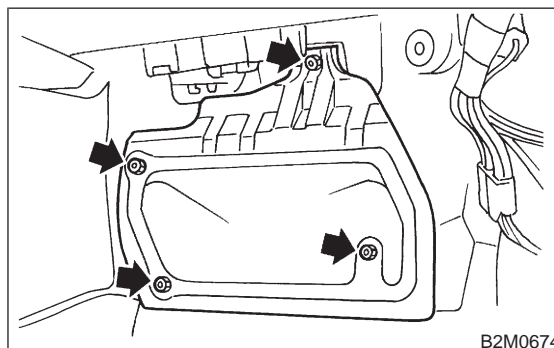
2) Remove side sill front cover.



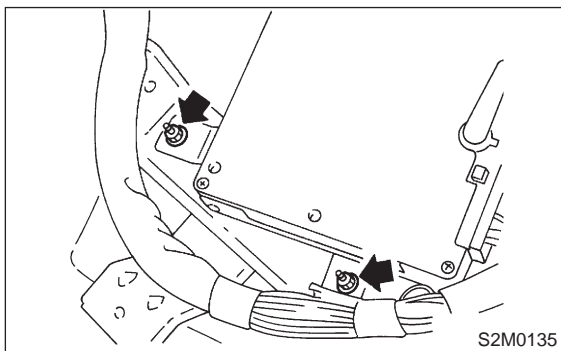
3) Detach floor mat of front passenger seat.



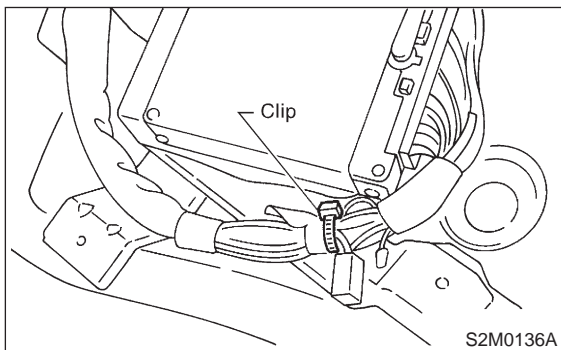
4) Remove protect cover.



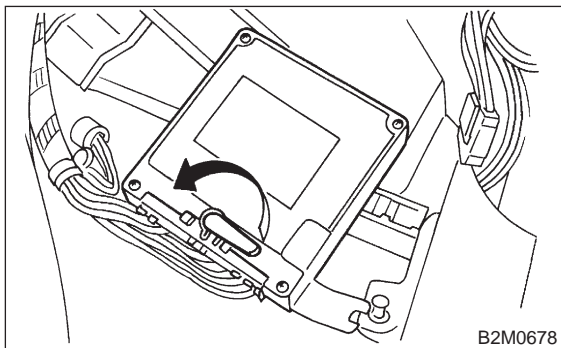
- 5) Remove vinyl cover and nuts which attach ECM to bracket.



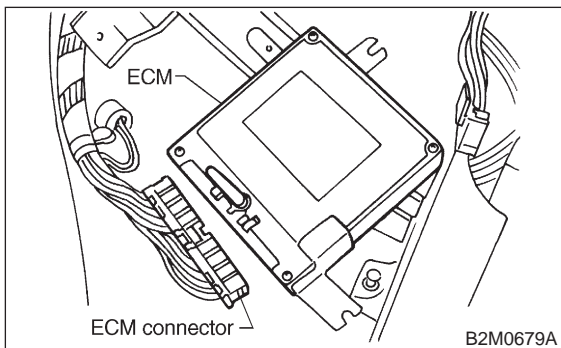
- 6) Detach clip from bracket.



- 7) Disconnect ECM connector.



- 8) Take out ECM.

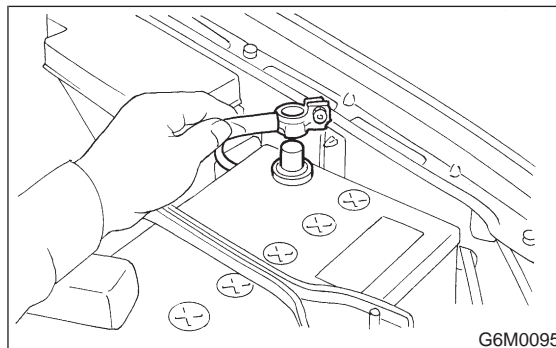


- 9) Installation is in the reverse order of removal.

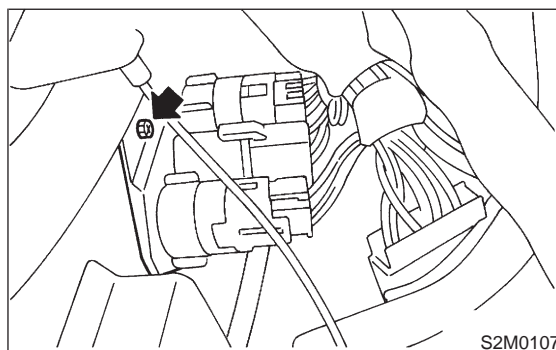
16. Main Relay

A: REMOVAL AND INSTALLATION

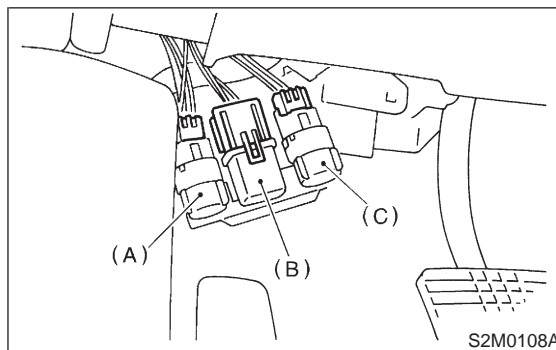
- 1) Disconnect battery ground cable.



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

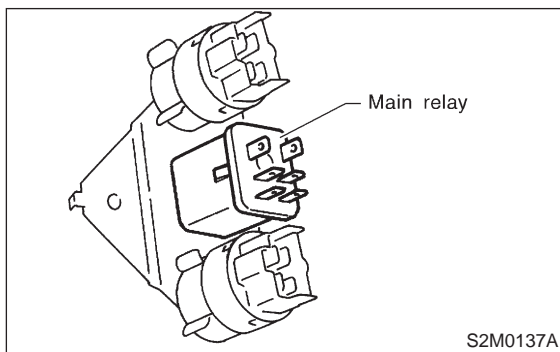


- 3) Disconnect connectors from relays.



- (A) Rear accessory power supply relay
(B) Main relay
(C) Fuel pump relay

- 4) Remove main relay from mounting bracket.

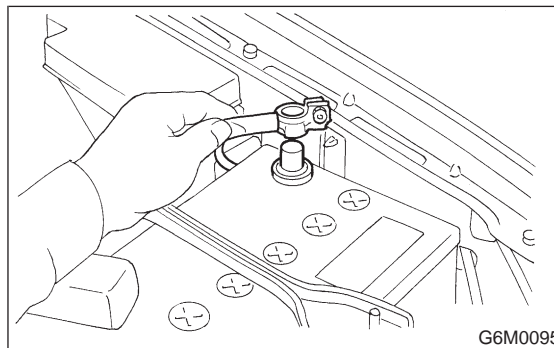


- 5) Installation is in the reverse order of removal.

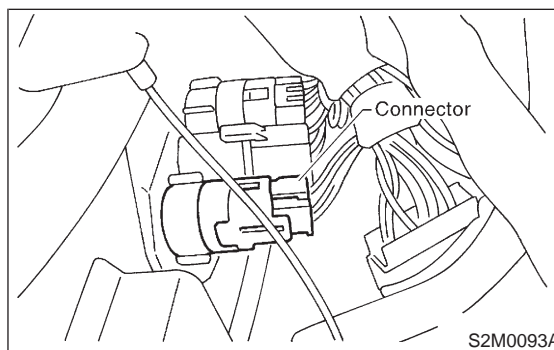
17. Fuel Pump Relay

A: REMOVAL AND INSTALLATION

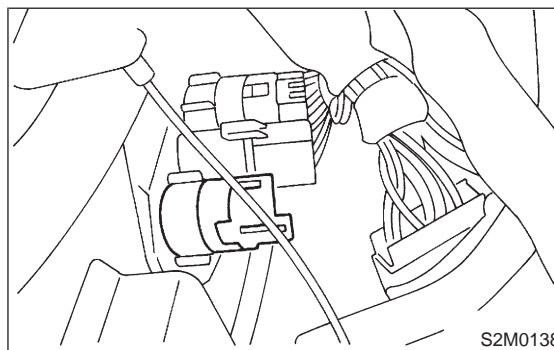
- 1) Disconnect battery ground cable.



- 2) Disconnect connector from fuel pump relay.



- 3) Remove fuel pump relay from mounting bracket.

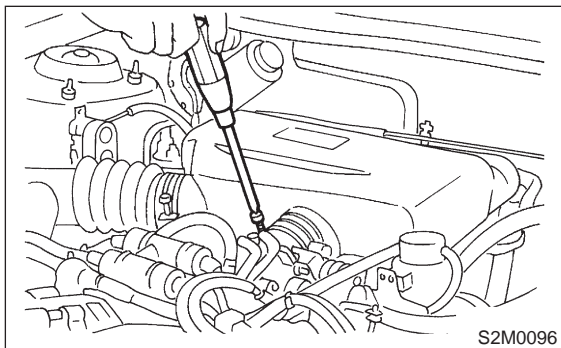


- 4) Installation is in the reverse order of removal.

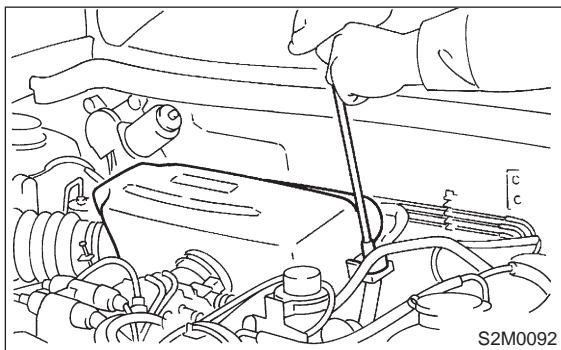
18. Air Intake Chamber

A: REMOVAL AND INSTALLATION

- 1) Loosen clamps which connect air intake chamber to throttle body and air intake duct.



- 2) Disconnect air hoses from air intake chamber.
- 3) Remove bolts which secure air intake chamber to stays.



- 4) Remove air intake chamber.
- 5) Installation is in the reverse order of removal.

Tightening torque:

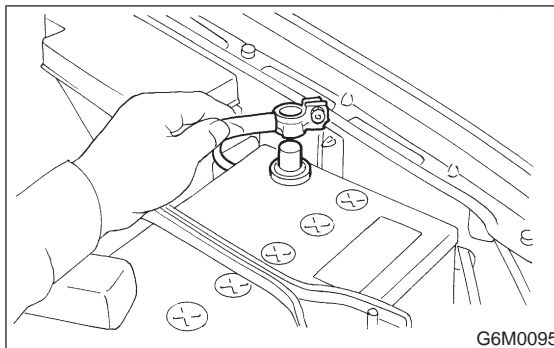
$4.9 \pm 0.5 \text{ N}\cdot\text{m}$ ($0.5 \pm 0.05 \text{ kg}\cdot\text{m}$, $3.6 \pm 0.4 \text{ ft}\cdot\text{lb}$)

19. Knock Sensor

A: REMOVAL

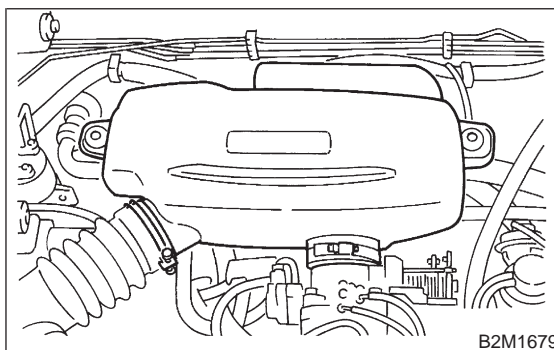
1. 2200 cc MODEL

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

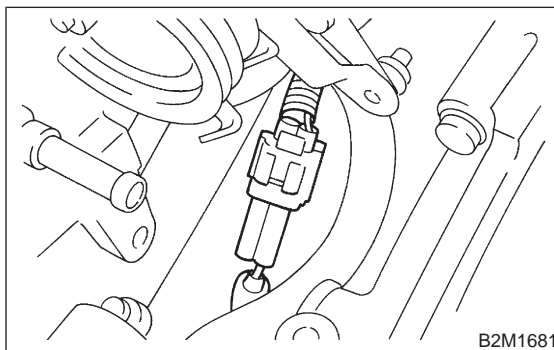


- 2) Remove air intake chamber.

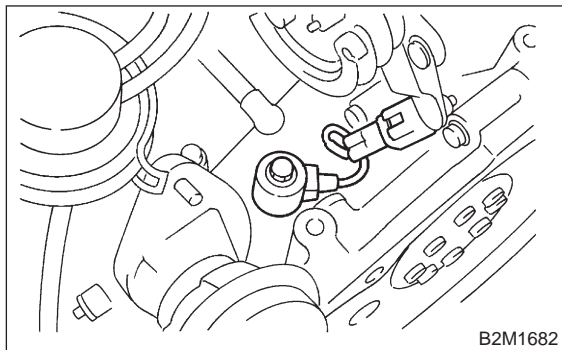
<Ref. to 2-7 [W18A0].>



- 3) Disconnect knock sensor connector.

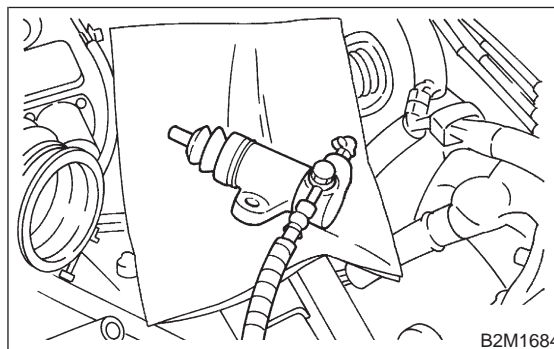


- 4) Remove knock sensor from cylinder block.



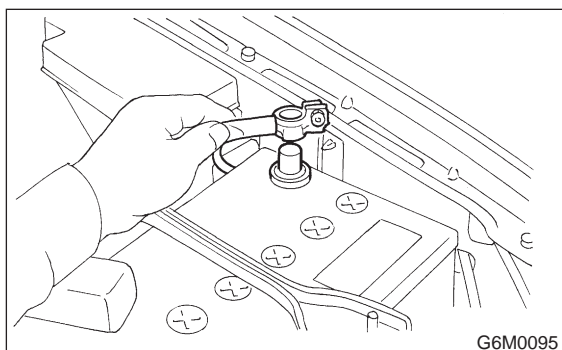
NOTE:

Place the operating cylinder where it will not interfere with the work in process.

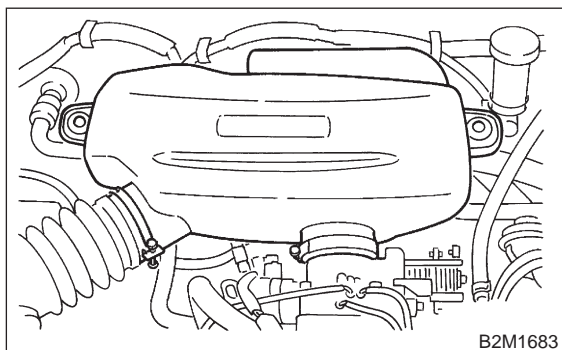


2. 2500 cc MODEL

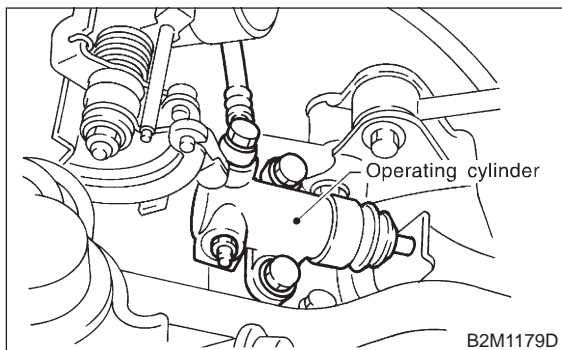
- 1) Disconnect battery ground cable from battery ground terminal.



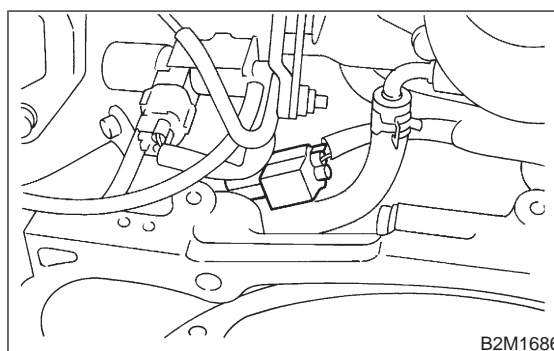
- 2) Remove air intake chamber.
<Ref. to 2-7 [W18A0].>



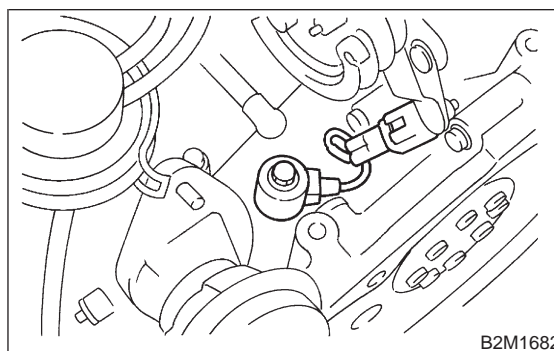
- 3) Remove operating cylinder. (MT vehicle only)
<Ref. to 2-10 [W5A0].>



- 4) Disconnect knock sensor connector.



- 5) Remove knock sensor from cylinder block.



B: INSTALLATION

1. 2200 cc MODEL

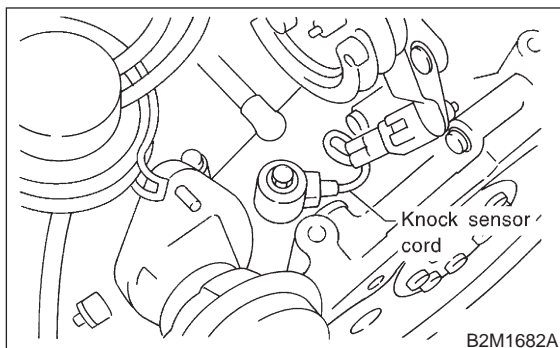
- 1) Install knock sensor to cylinder block.

Tightening torque:

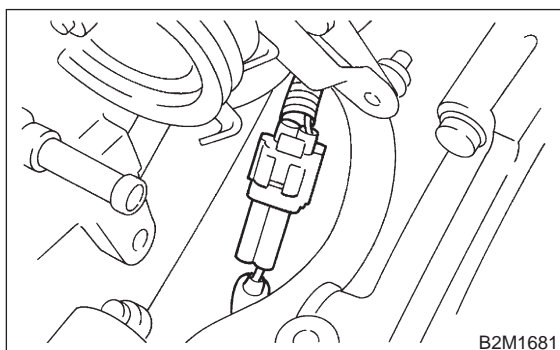
23.5 ± 2.9 N·m (2.4 ± 0.3 kg·m, 17.3 ± 2.1 ft·lb)

NOTE:

The extraction area of the knock sensor cord must be positioned at a 45° angle relative to the engine rear.

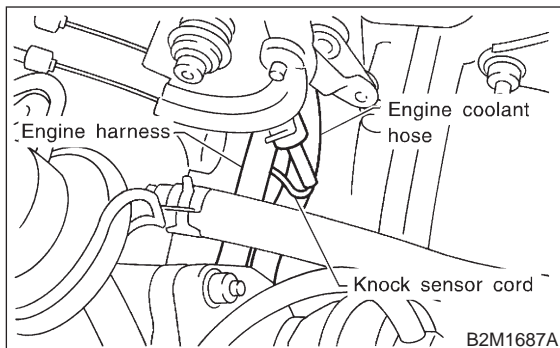


- 2) Connect knock sensor connector.

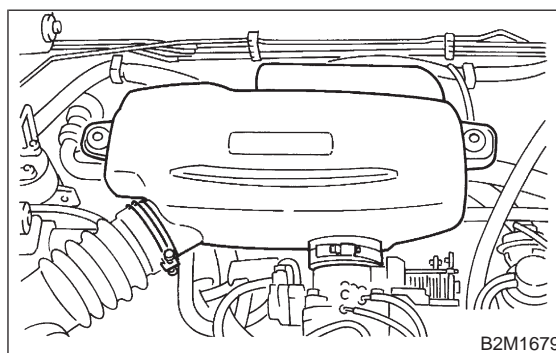


NOTE:

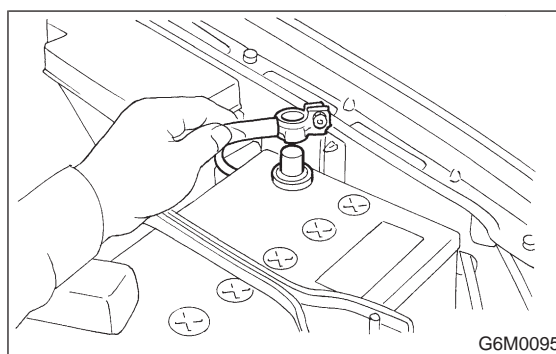
The knock sensor cord must pass between the engine harness and engine coolant hose.



- 3) Install air intake chamber. <Ref. to 2-7 [W18A0].>



- 4) Connect battery ground cable to battery ground terminal.



2. 2500 cc MODEL

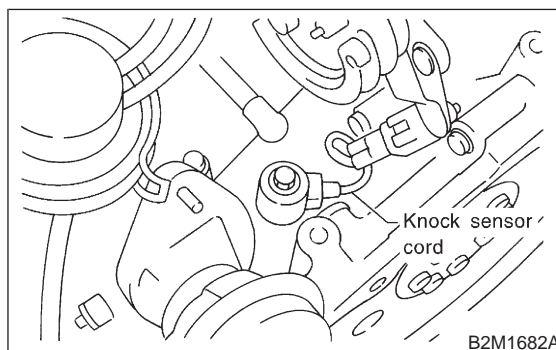
- 1) Install knock sensor to cylinder block.

Tightening torque:

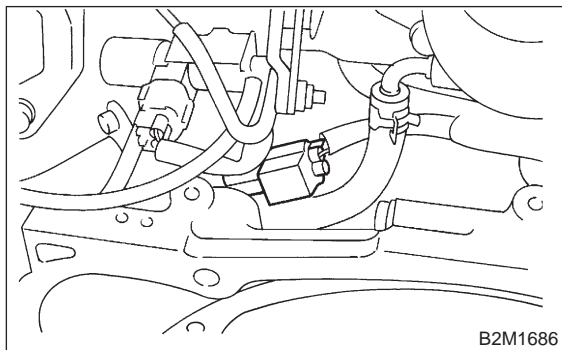
23.5 ± 2.9 N·m (2.4 ± 0.3 kg·m, 17.3 ± 2.1 ft·lb)

NOTE:

The extraction area of the knock sensor cord must be positioned at a 45° angle relative to the engine rear.

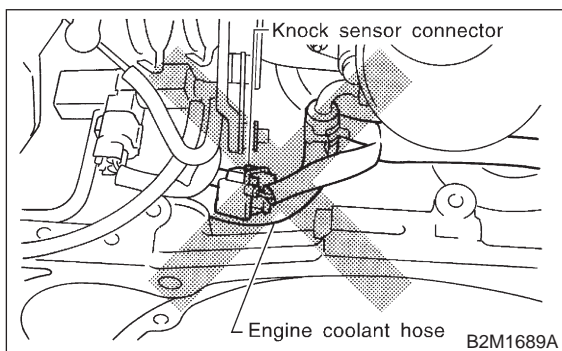
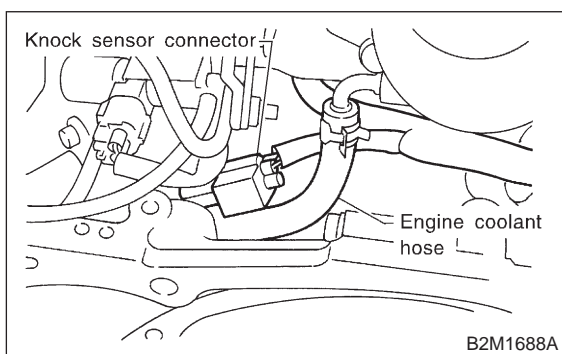


2) Connect knock sensor connector.



NOTE:

The connector must be connected to the engine front end of the engine coolant hose.



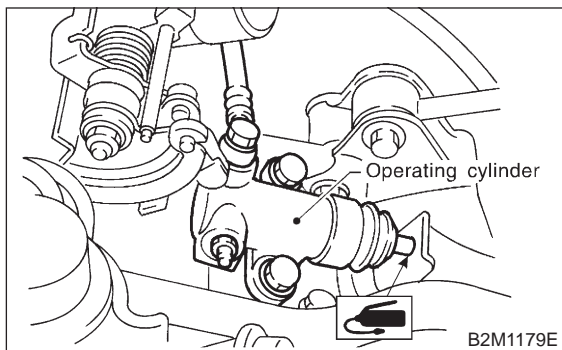
3) Install operating cylinder. (MT vehicle only)

Tightening torque:

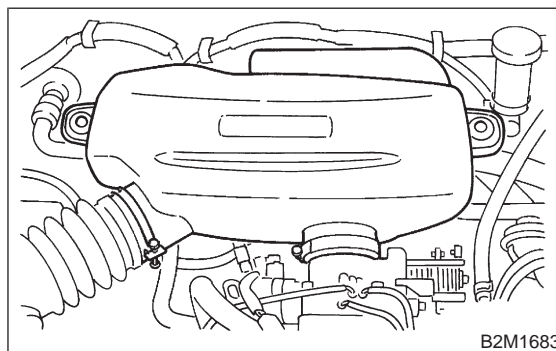
$37 \pm 3 \text{ N}\cdot\text{m}$ ($3.8 \pm 0.3 \text{ kg}\cdot\text{m}$, $27.3 \pm 2.2 \text{ ft}\cdot\text{lb}$)

NOTE:

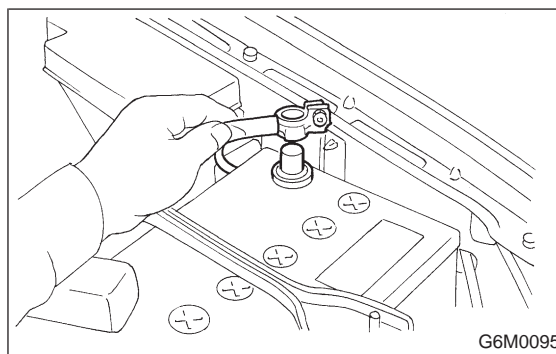
Apply grease to contact point of release lever and operating cylinder rod. <Ref. to 2-10 [W5A0].>



4) Install air intake chamber. <Ref. to 2-7 [W18A0].>



5) Connect battery ground cable to battery ground terminal.



MEMO: