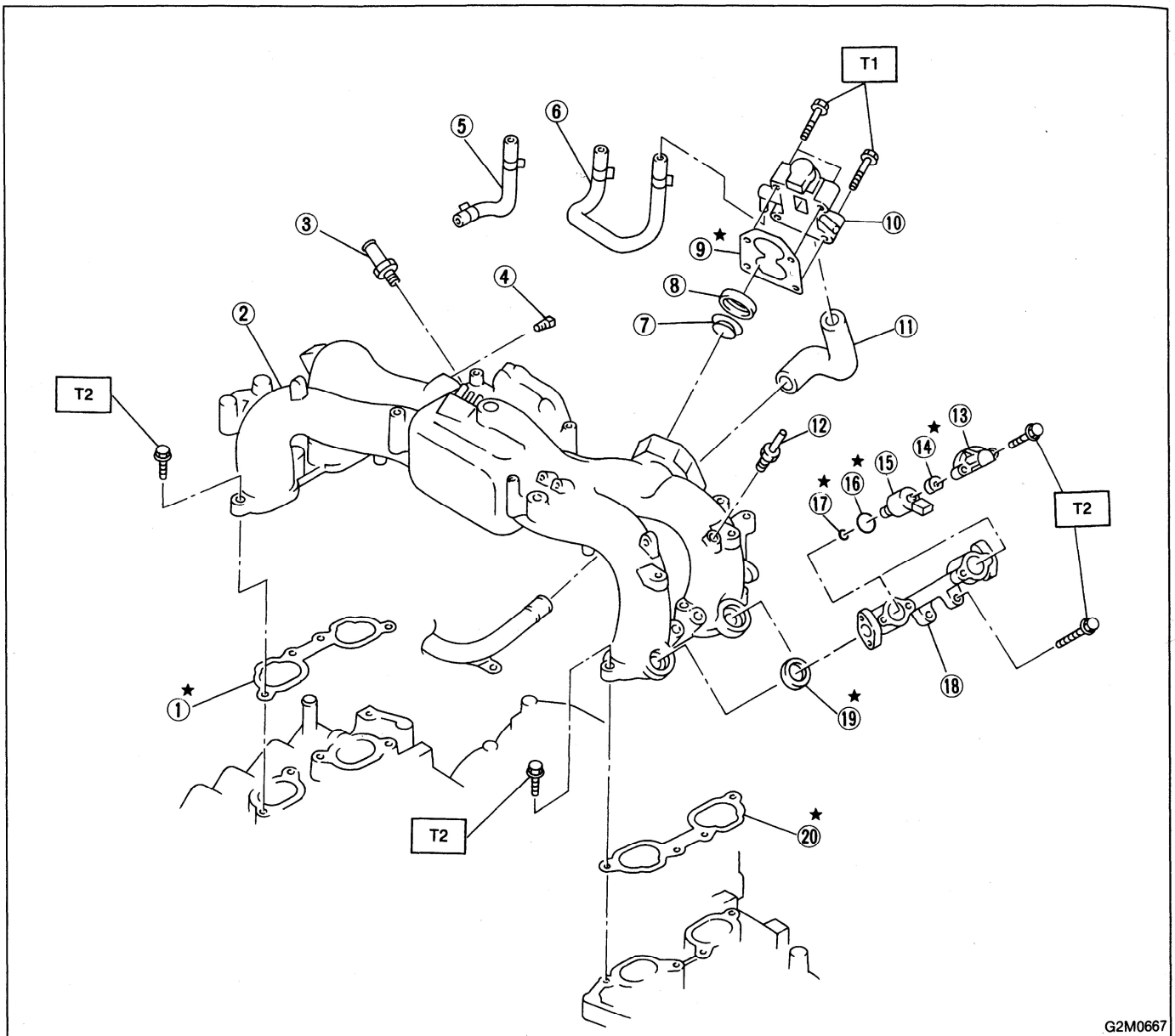


FUEL INJECTION SYSTEM

[MFI-TURBO] 2-7b

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1. Collector Chamber and Intake Manifold



G2M0667

- ① Intake manifold gasket LH
- ② Intake manifold
- ③ PCV valve
- ④ Plug
- ⑤ Engine coolant hose A
- ⑥ Engine coolant hose B
- ⑦ Air control valve 2
- ⑧ Air control valve spring
- ⑨ Gasket
- ⑩ Idle air control solenoid valve
- ⑪ Engine coolant hose C
- ⑫ Nipple
- ⑬ Fuel injector cap

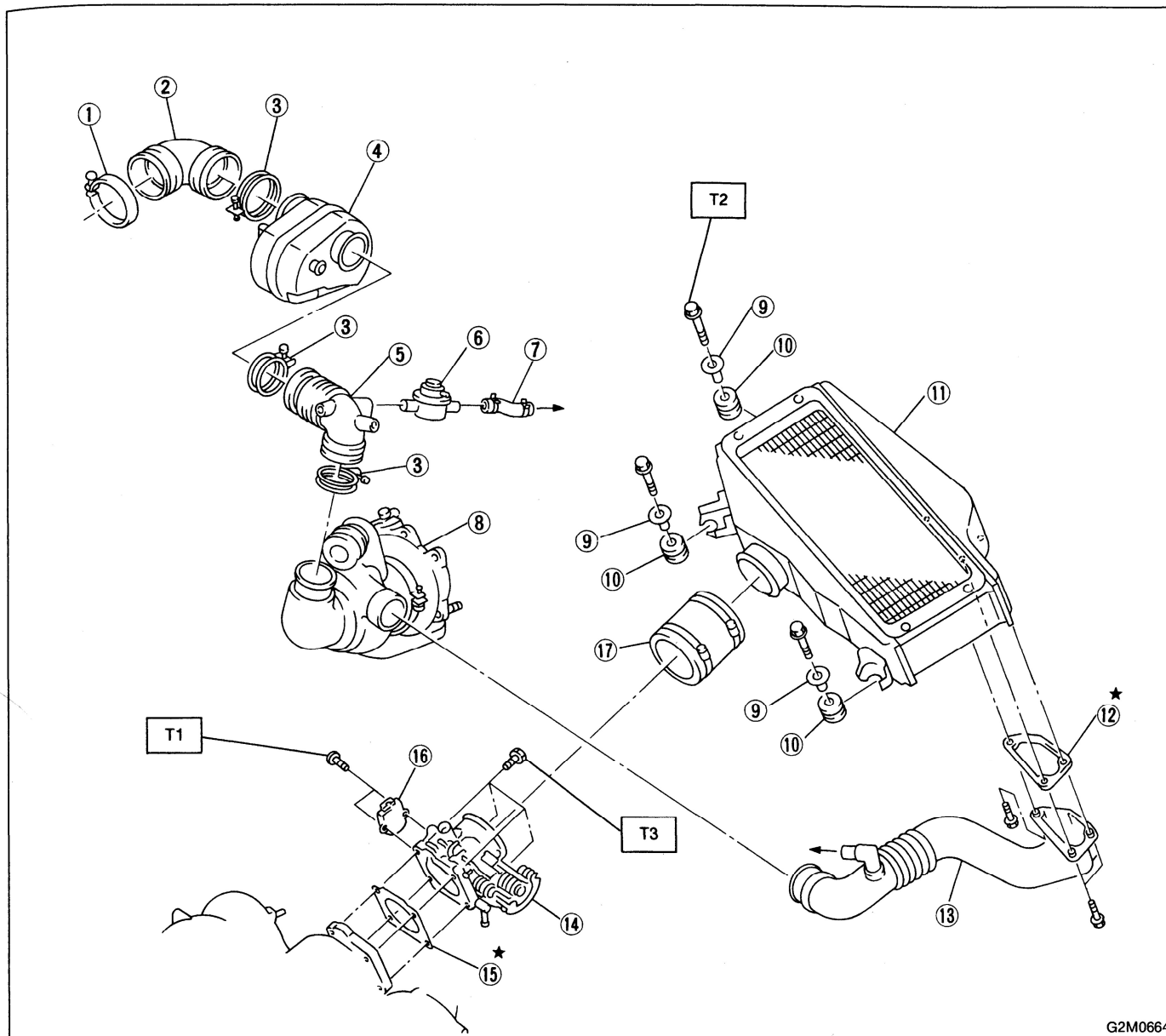
- ⑭ Insulator
- ⑮ Fuel injector
- ⑯ O-ring A
- ⑰ O-ring B
- ⑱ Fuel injector pipe
- ⑲ Washer
- ⑳ Intake manifold gasket LH

Tightening torque: N·m (kg-m, ft-lb)

T1: 6 — 7 (0.6 — 0.7, 4.3 — 5.1)

T2: 19 — 23 (1.9 — 2.3, 14 — 17)

2. Air Intake System



G2M0664

- ① Clip
- ② Air intake boot
- ③ Clip
- ④ Resonator chamber
- ⑤ Air intake duct A
- ⑥ Air by-pass valve
- ⑦ Air by-pass hose
- ⑧ Turbocharger unit
- ⑨ Spacer
- ⑩ Cushion
- ⑪ Intercooler
- ⑫ Gasket

- ⑬ Air intake duct B
- ⑭ Throttle body
- ⑮ Gasket
- ⑯ Throttle position sensor
- ⑰ Connection rubber

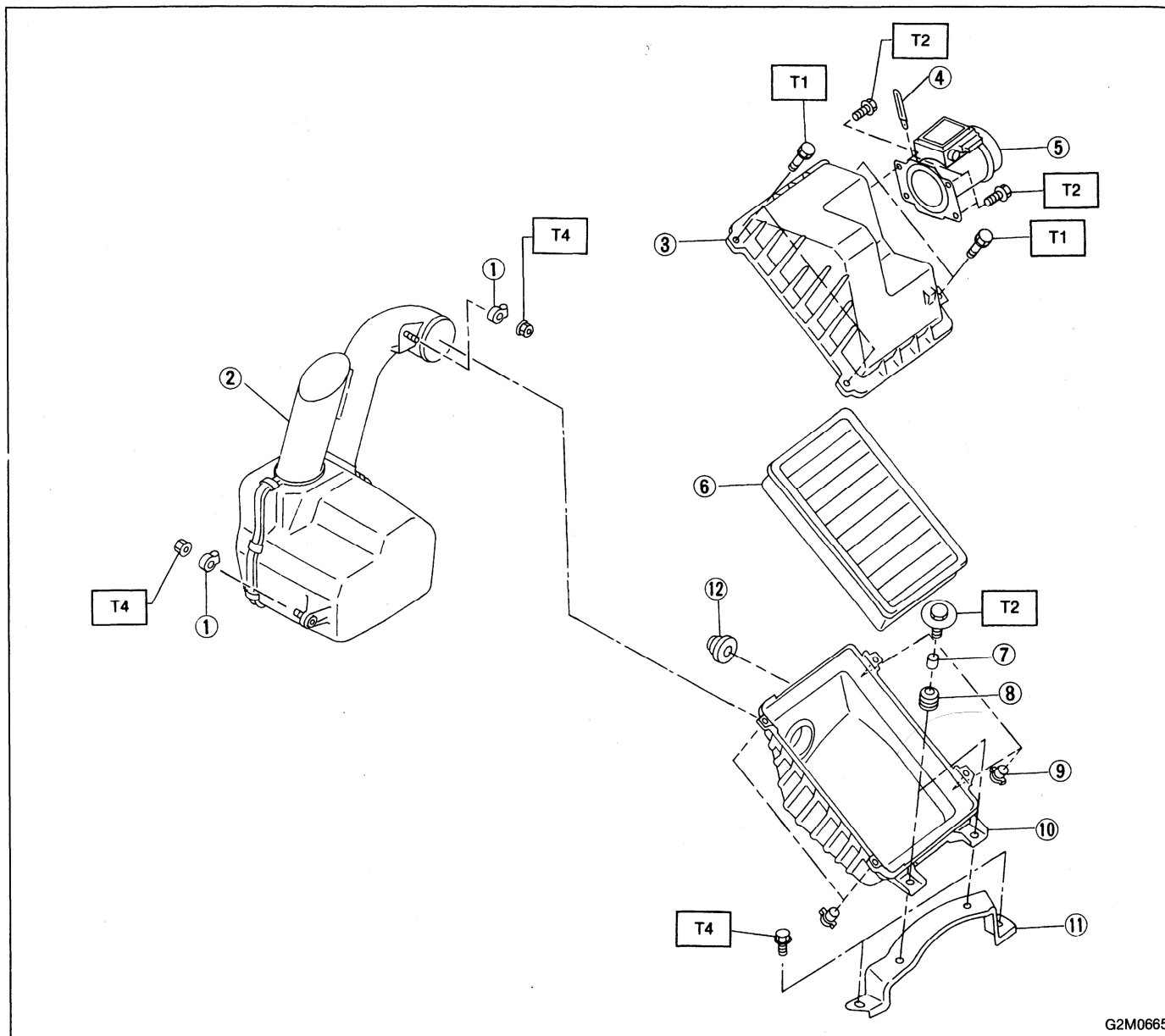
Tightening torque: N·m (kg-m, ft-lb)

T1: 2.0 — 2.4 (0.20 — 0.24, 1.4 — 1.7)

T2: 16 — 20 (1.6 — 2.0, 12 — 14)

T3: 23 — 26 (2.3 — 2.7, 17 — 20)

3. Air Cleaner



G2M0665

- ① Spring cushion
- ② Resonator ASSY
- ③ Air cleaner upper cover
- ④ Clip
- ⑤ Mass air flow sensor
- ⑥ Air cleaner element
- ⑦ Spacer
- ⑧ Bush
- ⑨ Spacer
- ⑩ Air cleaner lower cover

- ⑪ Air cleaner bracket
- ⑫ Cushion rubber

Tightening torque: N·m (kg·m, ft·lb)

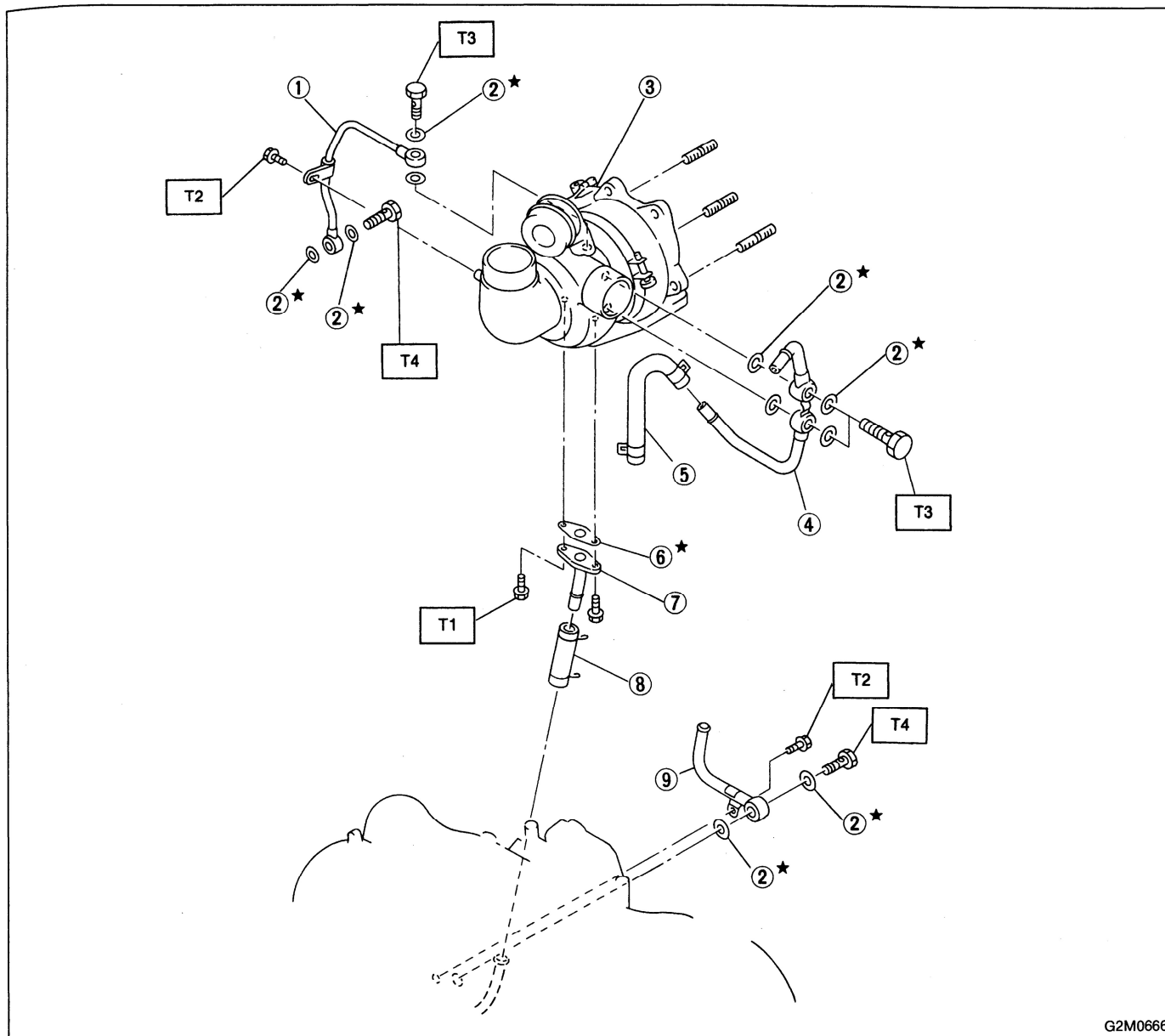
T1: 2.5 — 4.4 (0.25 — 0.45, 1.8 — 3.3)

T2: 4.4 — 7.4 (0.45 — 0.75, 3.3 — 5.4)

T3: 6.4 — 8.3 (0.65 — 0.85, 4.7 — 6.1)

T4: 27 — 37 (2.8 — 3.8, 20 — 27)

4. Turbocharger Unit



G2M0666

- ① Oil inlet pipe
- ② Metal gasket
- ③ Turbocharger
- ④ Engine coolant pipe A
- ⑤ Engine coolant hose
- ⑥ Gasket
- ⑦ Oil outlet pipe
- ⑧ Oil outlet hose

- ⑨ Engine coolant pipe B

Tightening torque: N·m (kg-m, ft-lb)

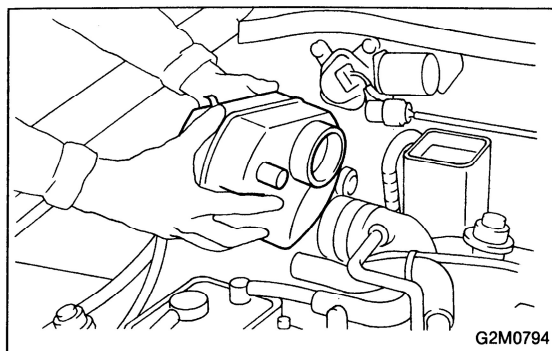
T1: 2.5 — 4.4 (0.25 — 0.45, 1.8 — 3.3)

T2: 4.4 — 5.4 (0.45 — 0.55, 3.3 — 4.0)

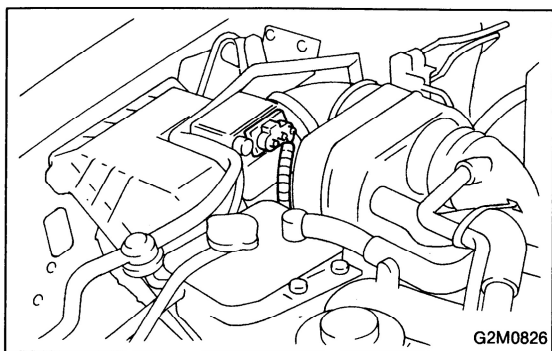
T3: 15 — 18 (1.5 — 1.8, 11 — 13)

T4: 22 — 25 (2.2 — 2.5, 16 — 18)

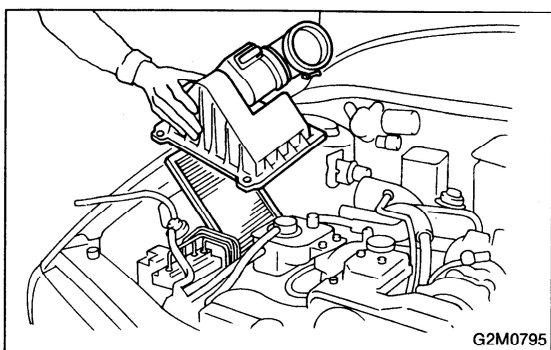
1. Air Cleaner and Air Intake Duct

**1. Air Cleaner and Air Intake Duct****A: REMOVAL AND INSTALLATION**

1) Remove resonator chamber.

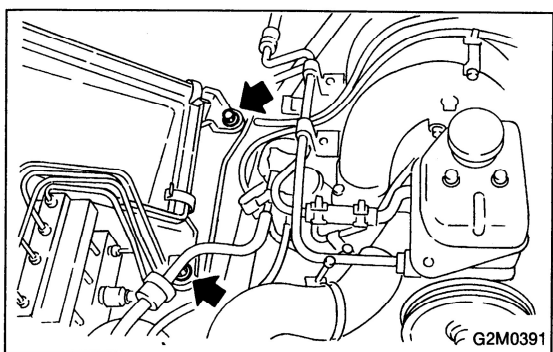


2) Disconnect connector from mass air flow sensor.



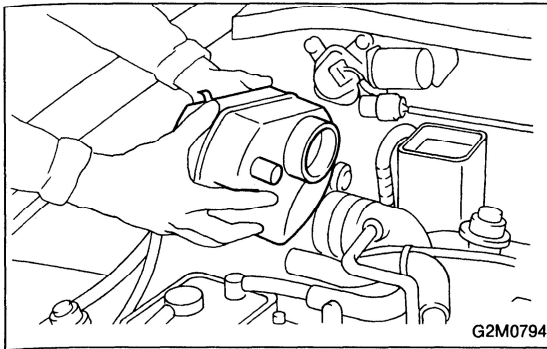
3) Remove clip of air cleaner upper cover.

4) Remove air cleaner element.



5) Remove air cleaner lower case.

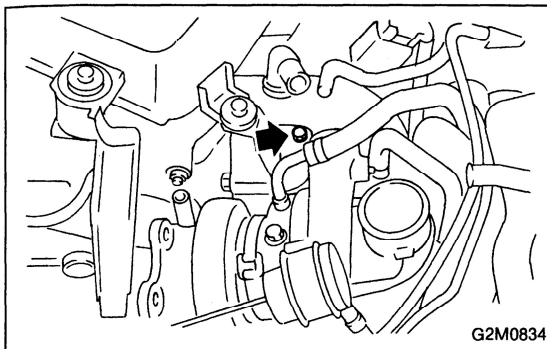
6) Installation is in the reverse order of removal.



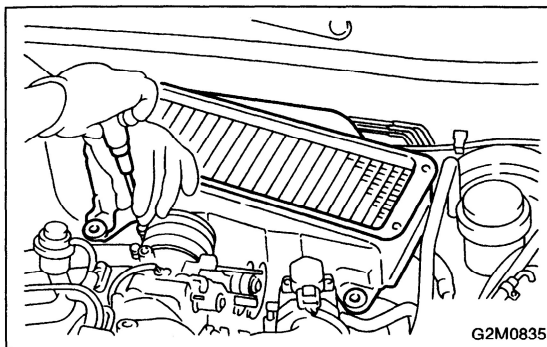
2. Intercooler

A: REMOVAL AND INSTALLATION

1) Remove resonator chamber and air intake duct.

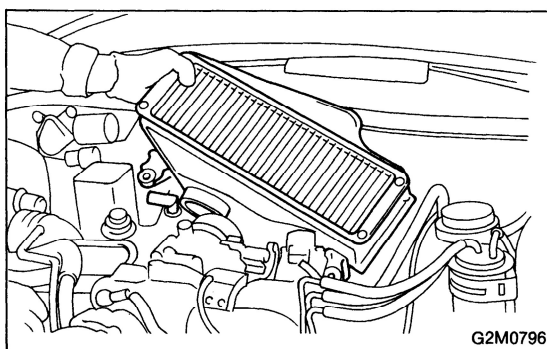


2) Separate intercooler air duct from turbocharger.

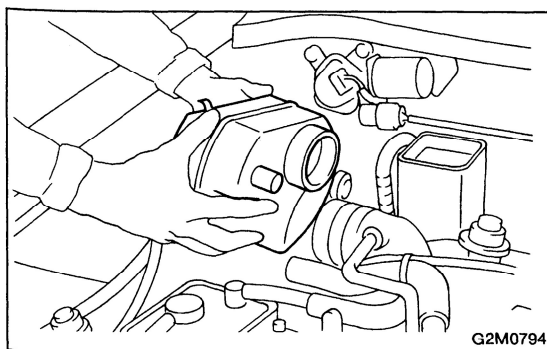


3) Remove bolts which install intercooler to bracket.

4) Separate intercooler from throttle body, and remove it.



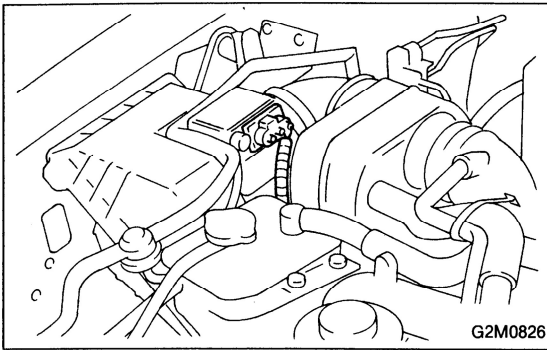
5) Installation is in the reverse order of removal procedure.



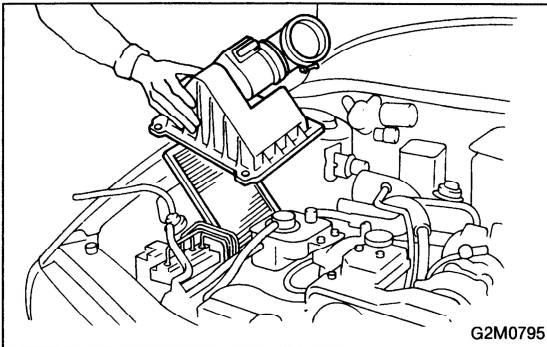
3. Mass Air Flow Sensor

A: REMOVAL AND INSTALLATION

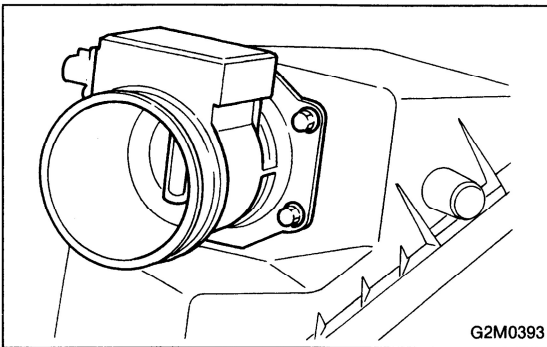
1) Remove resonator chamber.



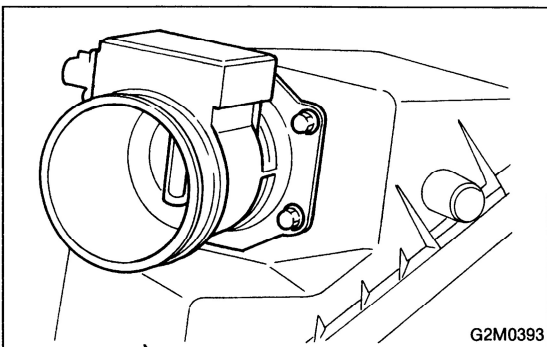
2) Disconnect connector from mass air flow sensor.



3) Remove air cleaner upper cover.



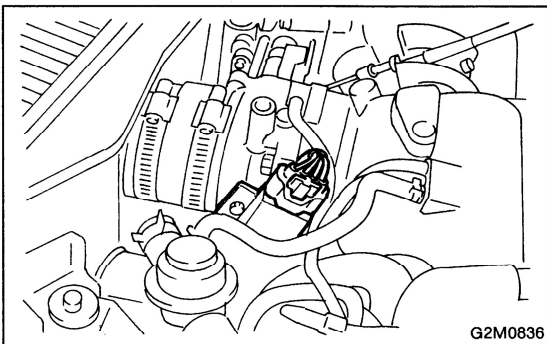
4) Remove mass air flow sensor from air cleaner upper cover.



5) Installation is in the reverse order of removal.

Tightening torque:

4.4 — 7.4 N·m (0.45 — 0.75 kg-m, 3.3 — 5.4 ft-lb)



4. Throttle Body

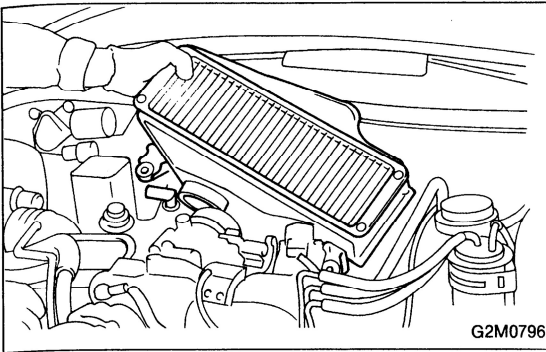
A: REMOVAL AND INSTALLATION

1) Disconnect connector from throttle position sensor.

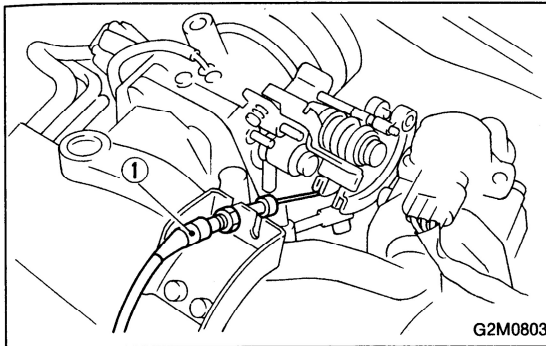
SERVICE PROCEDURE

[W5A0] 2-7b

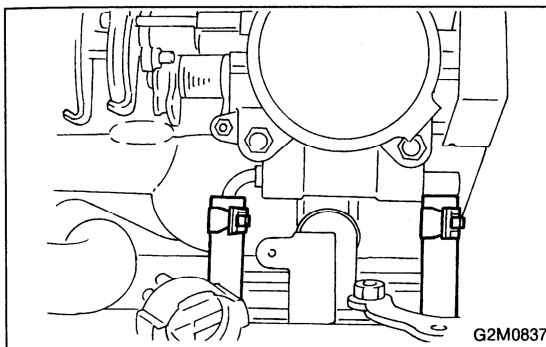
4. Throttle Body - 5. Collector Chamber and Intake Manifold



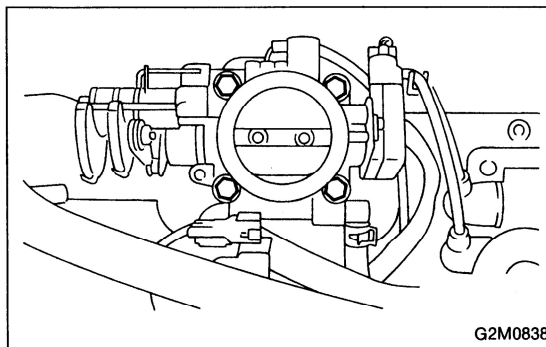
2) Remove intercooler.



3) Disconnect accelerator cable ①.



4) Disconnect engine coolant hose from throttle body.

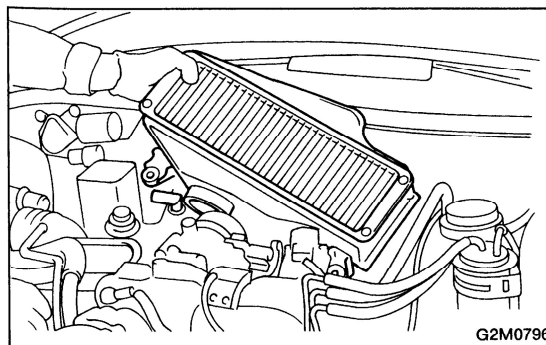


5) Remove bolts which install throttle body to collector chamber.

6) Installation is in the reverse order of removal procedure.

Tightening torque:

28 — 34 N·m (2.9 — 3.5 kg-m, 21 — 25 ft-lb)

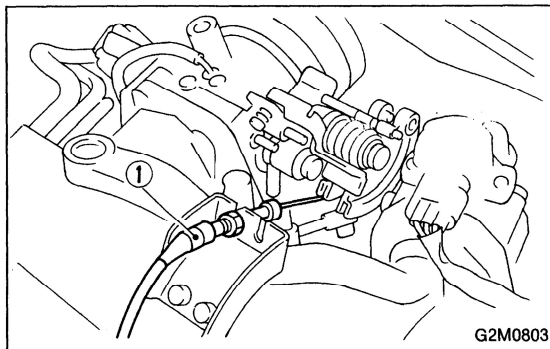


5. Collector Chamber and Intake Manifold

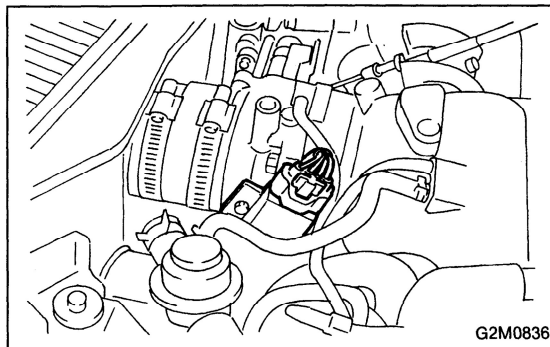
A: REMOVAL

- 1) Release fuel pressure. <Ref. to 2-8 [W1A0].>
- 2) Remove intercooler.

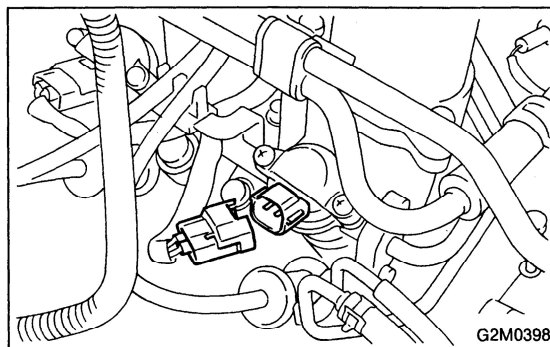
5. Collector Chamber and Intake Manifold



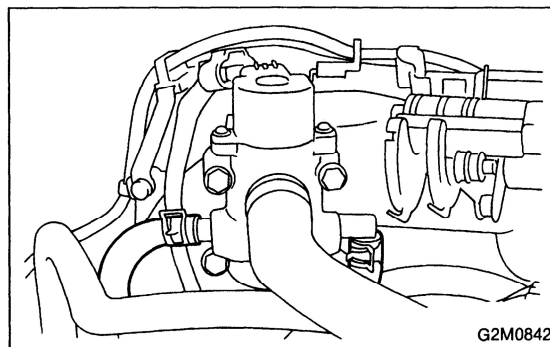
3) Disconnect accelerator cable ①.



4) Disconnect connector from throttle position sensor.

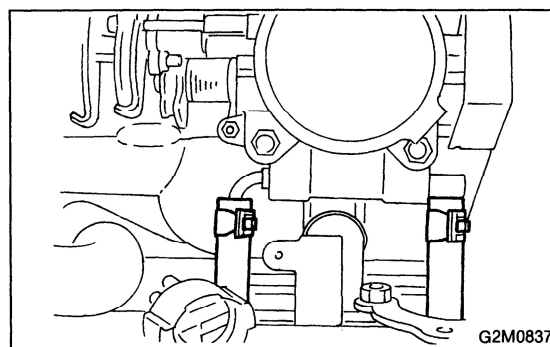


5) Disconnect connectors from fuel injectors.

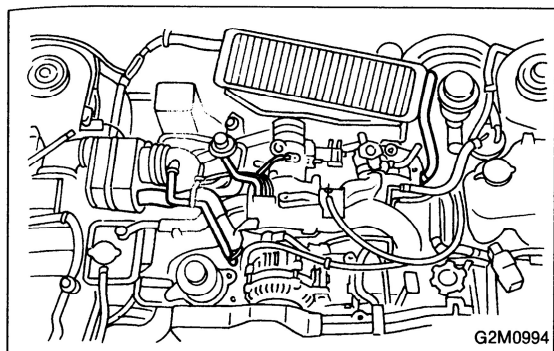


6) Disconnect engine coolant hose from idle air control solenoid valve.

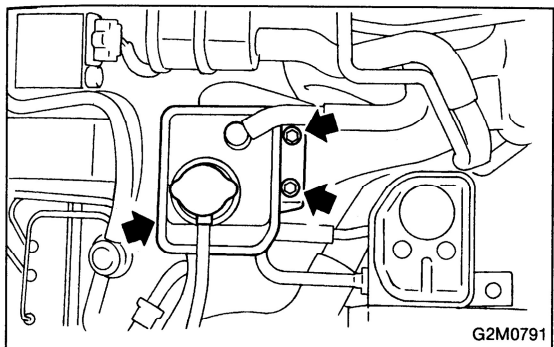
7) Disconnect air inlet hose.



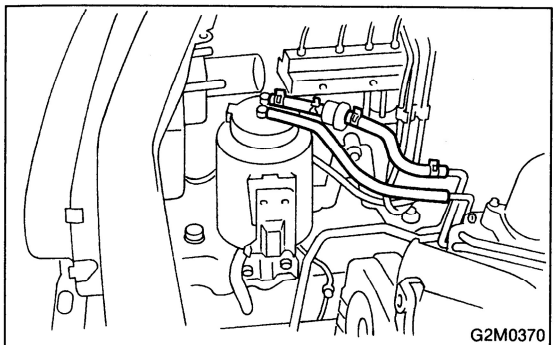
8) Disconnect engine coolant hoses from throttle body.



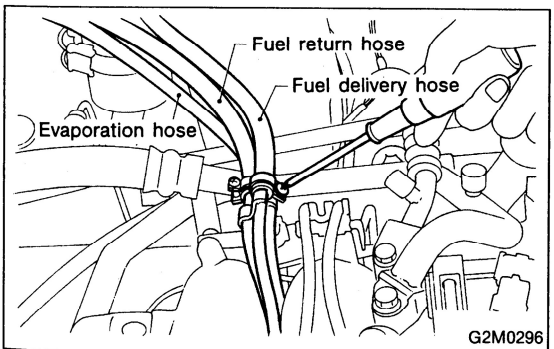
- 9) Disconnect brake booster hose.
- 10) Disconnect air by-pass hoses from intake manifold.
- 11) Disconnect emission hoses from intake manifold.



- 12) Remove coolant filler tank.

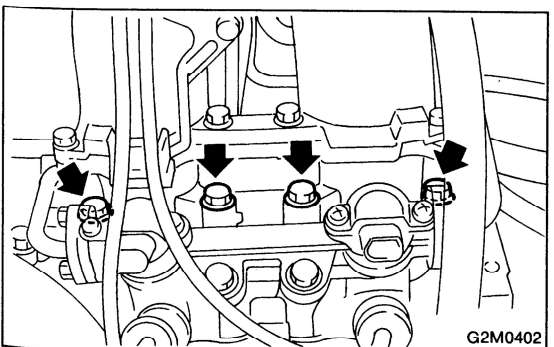


- 13) Disconnect canister hose from pipe.



- 14) Disconnect fuel hoses from pipes.

WARNING:
Catch fuel from hoses in a container.

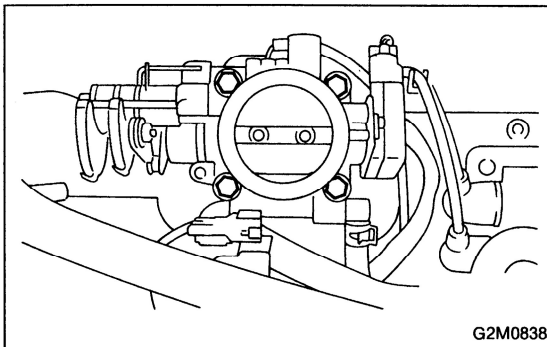


- 15) Remove bolts which hold power steering pipe bracket onto intake manifold.
- 16) Remove bolts which hold intake manifold onto cylinder heads.

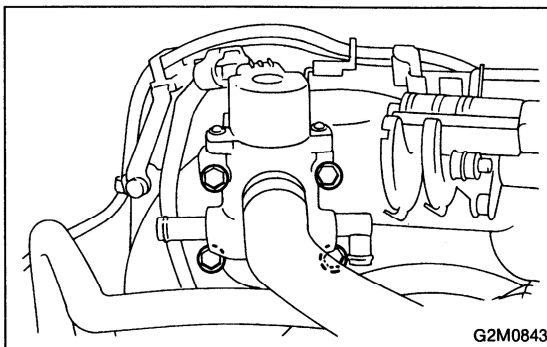
5. Collector Chamber and Intake Manifold

17) Disconnect connector from purge control solenoid valve on inner side of collector chamber.

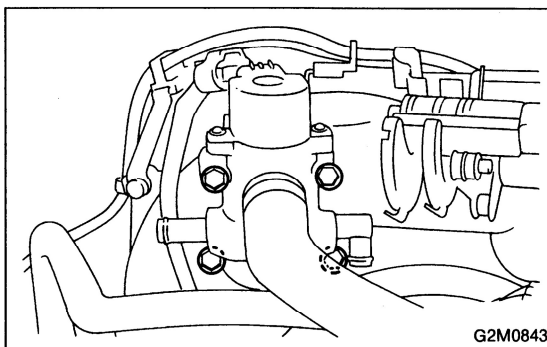
18) Remove collector chamber and intake manifold.

**B: DISASSEMBLY**

1) Remove throttle body.



2) Remove idle air control solenoid valve.

**C: ASSEMBLY**

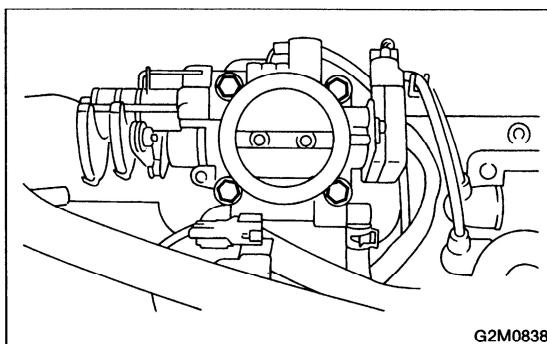
1) Assemble idle air control solenoid valve.

CAUTION:

Replace gaskets with new ones.

Tightening torque:

6 — 7 N·m (0.6 — 0.7 kg-m, 4.3 — 5.1 ft-lb)



2) Assemble throttle body.

CAUTION:

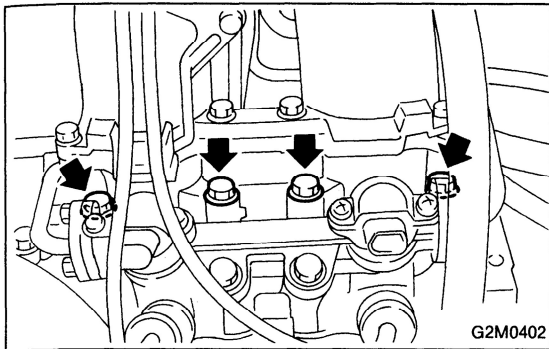
Replace gasket with a new one.

Tightening torque:

14 — 24 N·m (1.4 — 2.4 kg-m, 10 — 17 ft-lb)

D: INSTALLATION

- 1) Connect connector to purge control solenoid valve on inner side of collector chamber.



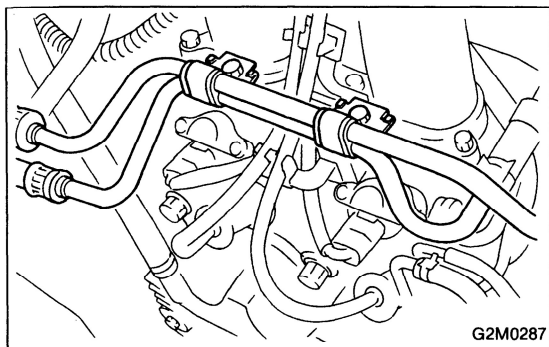
- 2) Install intake manifold and collector chamber onto cylinder heads.

CAUTION:

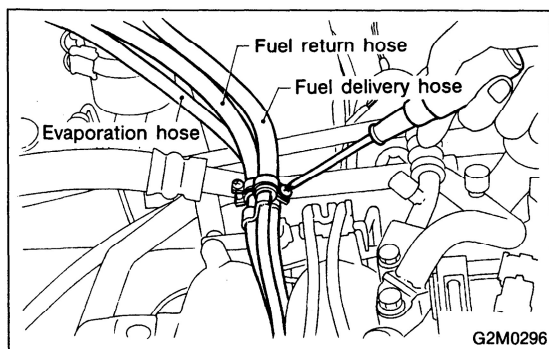
Always use new gaskets.

Tightening torque:

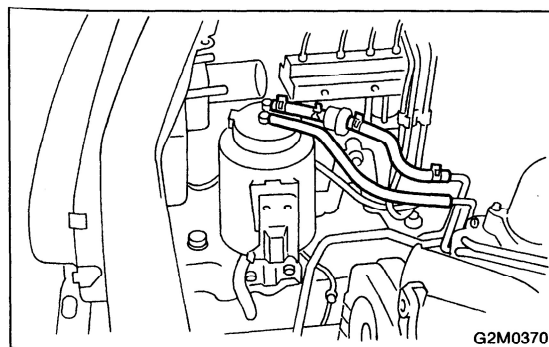
20 — 34 N·m (2.0 — 3.5 kg-m, 14 — 25 ft-lb)



- 3) Install power steering pipe bracket onto intake manifold.



- 4) Connect fuel hoses.

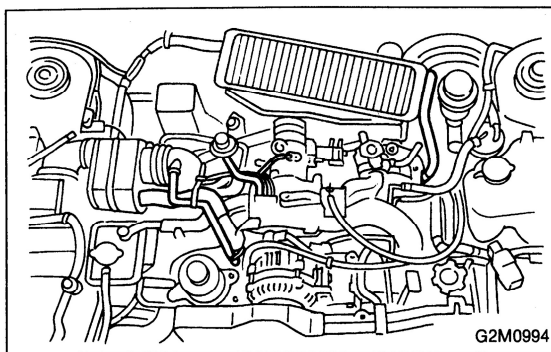


- 5) Connect canister hoses.

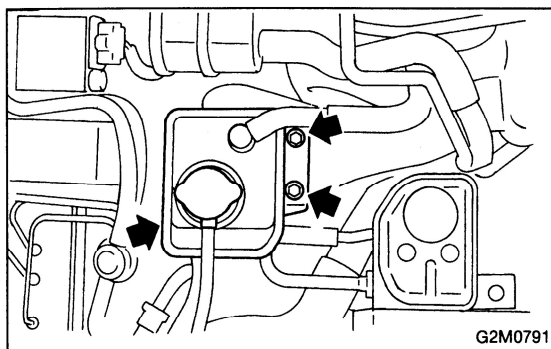
2-7b [W5D0]

SERVICE PROCEDURE

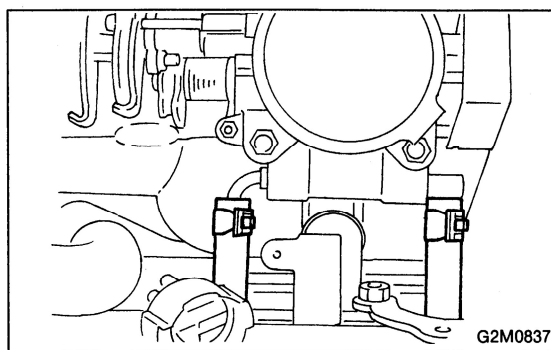
5. Collector Chamber and Intake Manifold



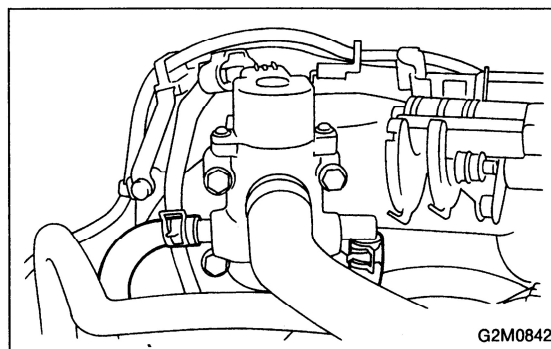
- 6) Connect brake booster vacuum hose.
- 7) Connect air by-pass hoses.
- 8) Connect emission hoses.



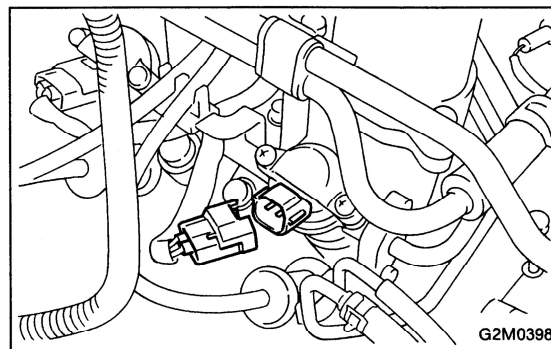
- 9) Install engine coolant filler tank.



- 10) Connect engine coolant hoses to throttle body.



- 11) Connect engine coolant hose to idle air control solenoid valve.
- 12) Connect air inlet hose.

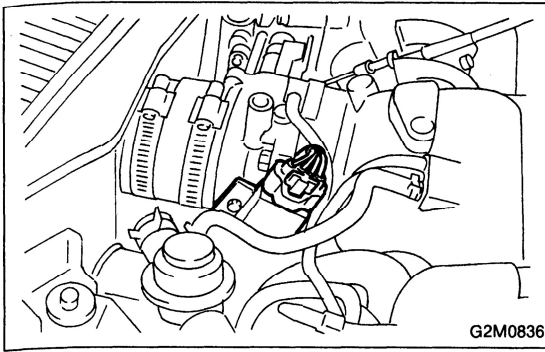


- 13) Connect connectors to fuel injectors.

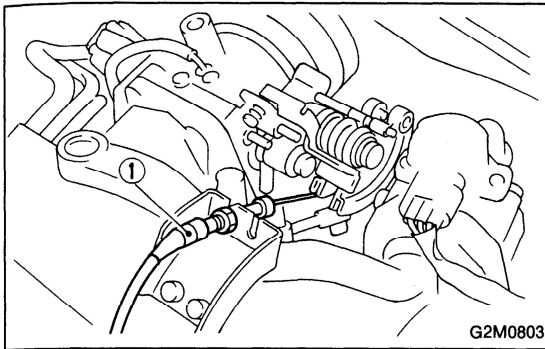
SERVICE PROCEDURE

[W6A0] 2-7b

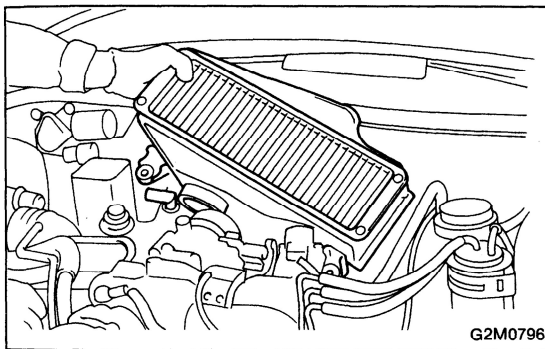
5. Collector Chamber and Intake Manifold - 6. Engine Coolant Temperature Sensor



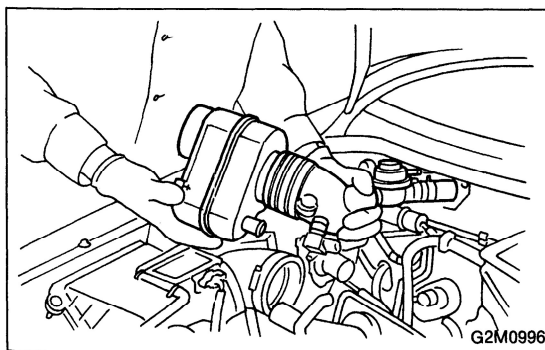
14) Connect connector to throttle position sensor.



15) Connect accelerator cable ①.



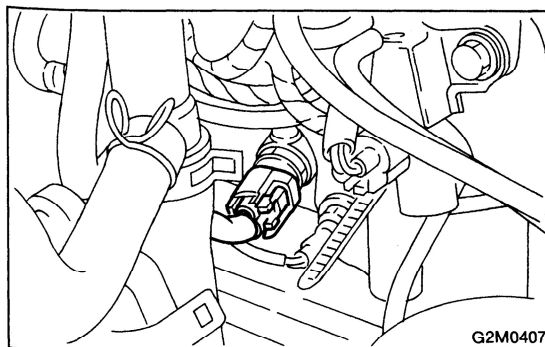
16) Install intercooler.



6. Engine Coolant Temperature Sensor

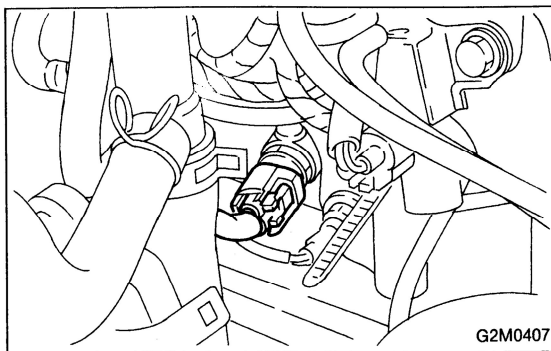
A: REMOVAL AND INSTALLATION

1) Remove resonator chamber and air inlet duct A.



2) Disconnect connector from engine coolant temperature sensor.

3) Remove engine coolant temperature sensor.

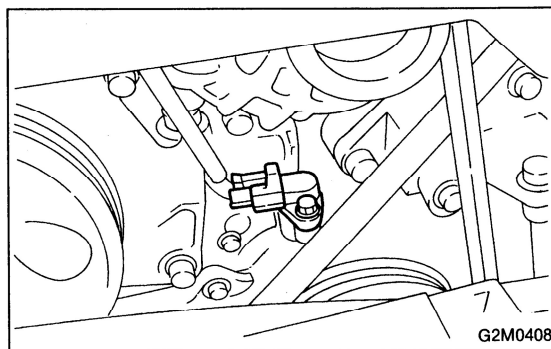


G2M0407

4) Installation is in the reverse order of removal.

Tightening torque:

22 — 27 N·m (2.2 — 2.8 kg-m, 16 — 20 ft-lb)

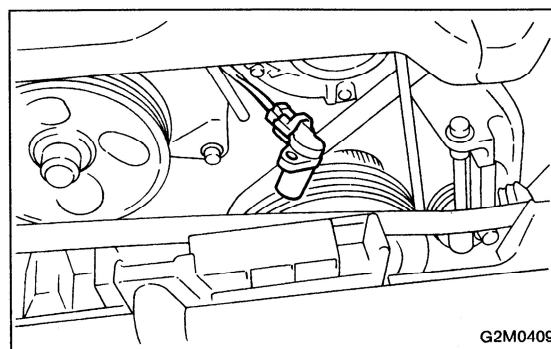


G2M0408

7. Crankshaft Position Sensor

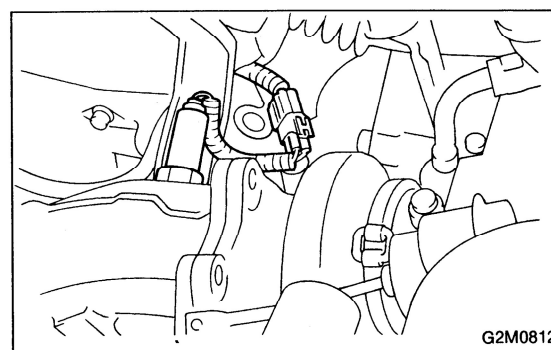
A: REMOVAL AND INSTALLATION

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



G2M0409

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

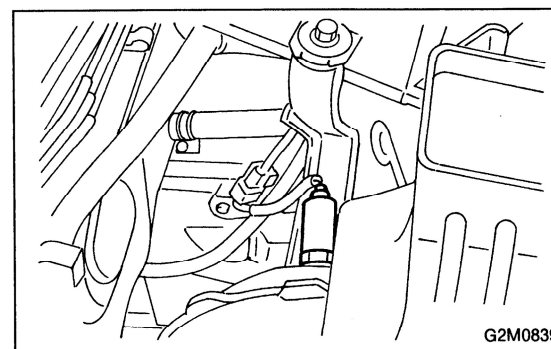


G2M0812

8. Oxygen Sensor

A: REMOVAL

1) Disconnect connector from oxygen sensor.



G2M0839

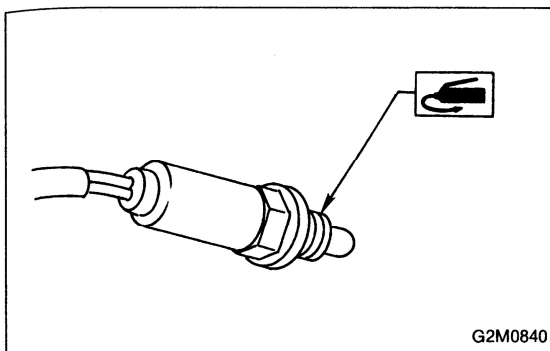
2) Apply SUBARU CRC or its equivalent to threaded portion of oxygen sensor, and leave it for one minute or more.

SUBARU CRC (Part No. 004301003)

3) Remove oxygen sensor.

CAUTION:

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



B: INSTALLATION

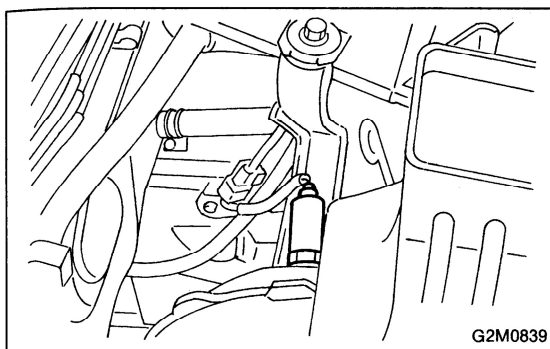
1) Before installing oxygen sensor, apply anti-seize compound only to threaded portion of oxygen sensor to make the next removal easier.

Anti-seize compound:

SS-30 by JET LUBE

CAUTION:

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

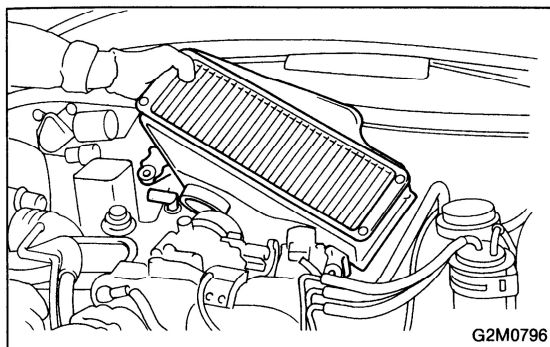


2) Install oxygen sensor.

Tightening torque:

41 — 47 N·m (4.2 — 4.8 kg-m, 30 — 35 ft-lb)

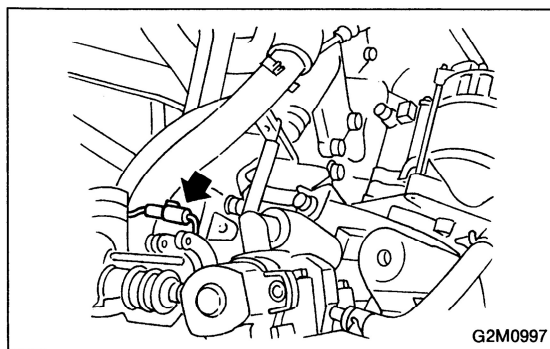
3) Connect connector of oxygen sensor.



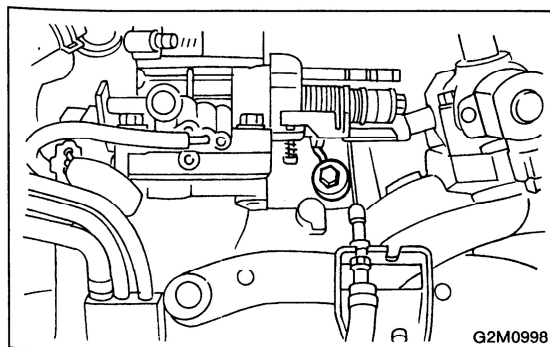
9. Knock Sensor

A: REMOVAL AND INSTALLATION

1) Remove intercooler.

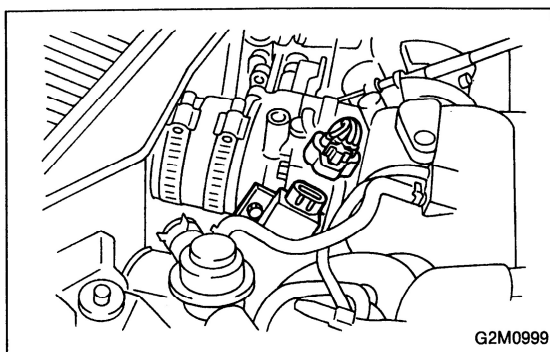


2) Disconnect connector from knock sensor.



3) Remove knock sensor on cylinder block.

4) Installation is in the reverse order of removal.



10. Throttle Position Sensor

A: REMOVAL AND INSTALLATION

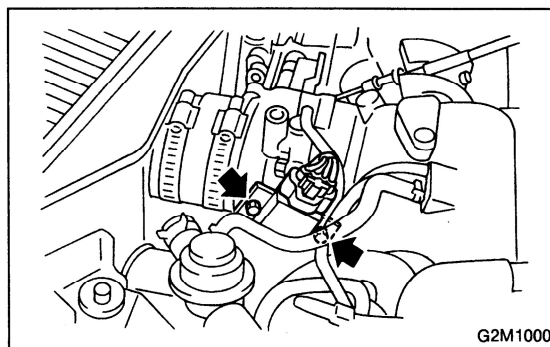
- 1) Disconnect connector from throttle position sensor.
- 2) Remove throttle position sensor holding screws, and remove it.
- 3) Installation is in the reverse order of removal.

Tightening torque:

2.0 — 2.4 N·m (0.20 — 0.24 kg-m, 1.4 — 1.7 ft-lb)

CAUTION:

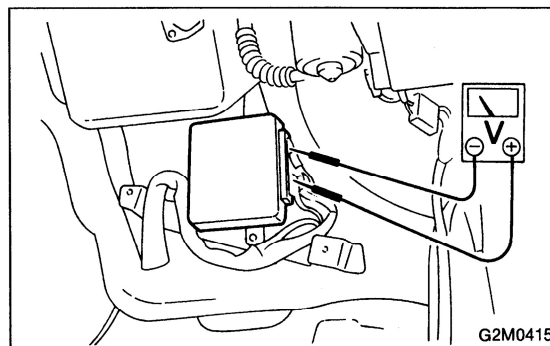
When installing throttle position sensor, adjust to the specified data.



B: ADJUSTMENT

1. THROTTLE POSITION SENSOR

- 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 to specified voltage between ECM connector terminal.

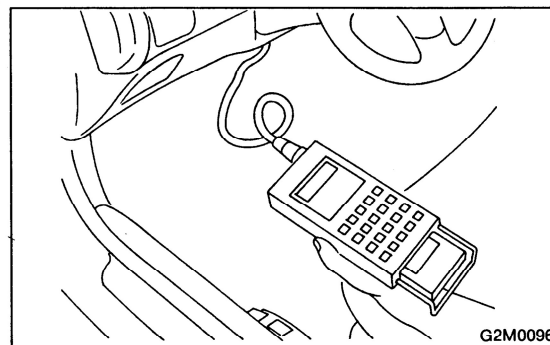
Connector & Terminal / Specified voltage

LHD (B108) No. 2 — (B108) No. 1 / 4.5 — 5.5 V

RHD (B95) No. 2 — (B95) No. 1 / 4.5 — 5.5 V

[Fully closed.]

- (4) Tighten throttle position sensor holding screws.

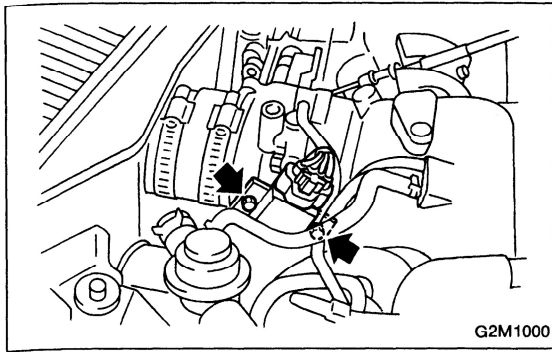


- 4) When using the Select Monitor;
 - (1) Attach Select Monitor.
 - (2) Turn ignition switch to ON.
 - (3) Select mode "F10".
 - (4) Adjust throttle position sensor to specified data.

Condition / Specified data.

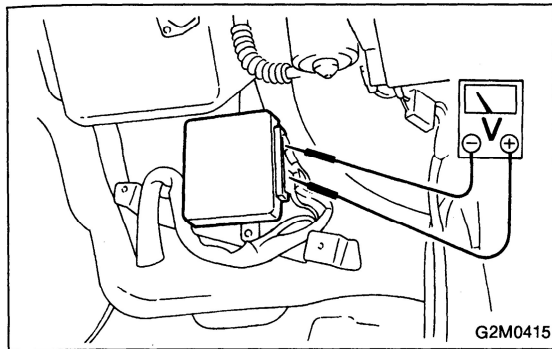
Throttle fully closed. / 4.7 V

- (5) Tighten throttle position sensor holding screws.



2. IDLE SWITCH

- 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 to specified voltage between ECM connector terminal.

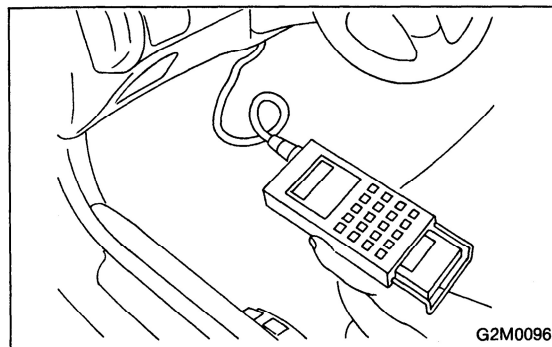
Connector & Terminal / Specified voltage

LHD (B109) No. 6 — Body / 0 V

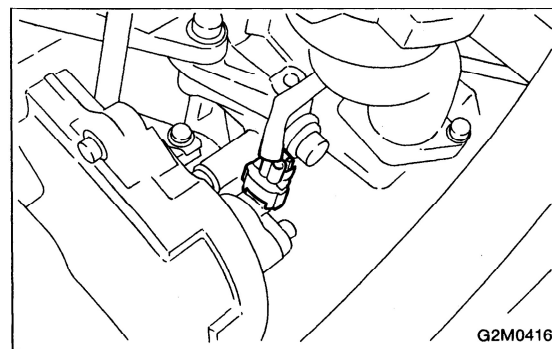
RHD (B96) No. 6 — Body / 0 V

[Fully closed.]

- (4) Tighten throttle position sensor holding screws.



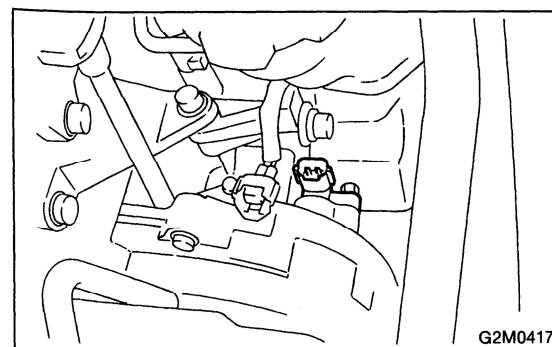
- 4) When using the Select Monitor;
 - (1) Attach Select Monitor.
 - (2) Turn ignition switch to ON.
 - (3) Select mode "FA1".
 - (4) Make sure that No. 1 LED is turned ON when throttle valve is fully closed.
 - (5) Tighten throttle position sensor holding screws.



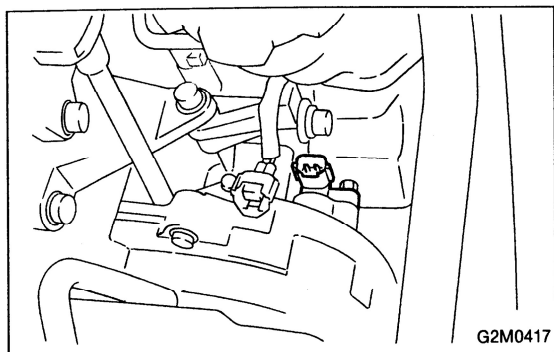
11. Camshaft Position Sensor

A: REMOVAL AND INSTALLATION

- 1) Disconnect connector from camshaft position sensor.



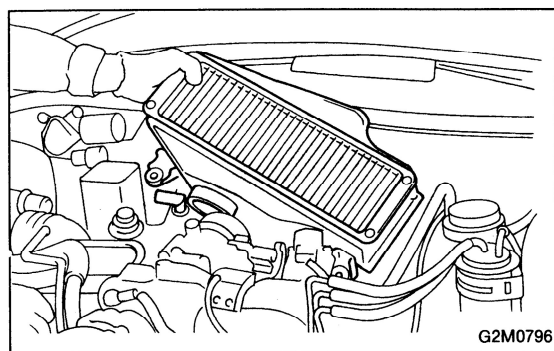
- 2) Remove camshaft position sensor from camshaft support LH.



3) Installation is in the reverse order of removal.

Tightening torque:

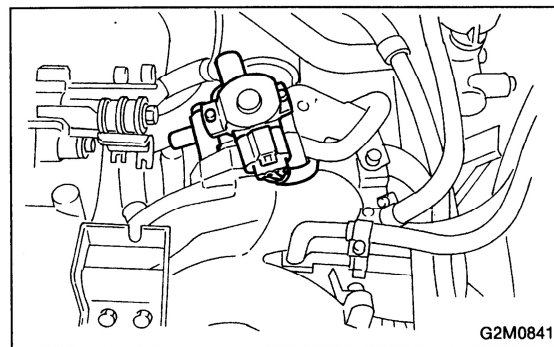
49 N·m (5.0 kg-m, 36 ft-lb)



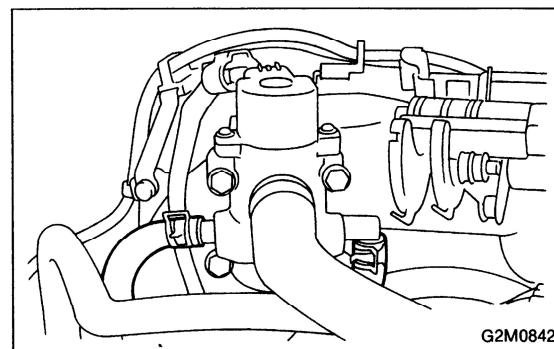
12. Idle Air Control Solenoid Valve

A: REMOVAL AND INSTALLATION

1) Remove intercooler.

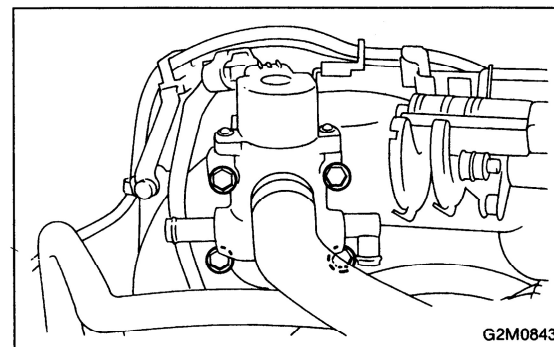


2) Disconnect connector from idle air control solenoid valve.



3) Disconnect engine coolant hose from idle air control solenoid valve.

4) Disconnect air inlet hose.



5) Remove bolts which install idle air control solenoid valve to collector chamber.

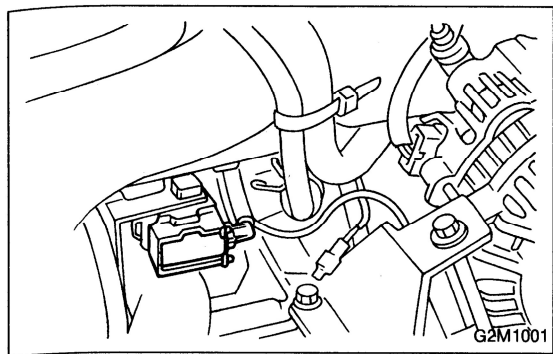
6) Installation is in the reverse order of removal procedure.

CAUTION:

Replace gasket with a new one.

Tightening torque:

6 — 7 N·m (0.6 — 0.7 kg-m, 4.3 — 5.1 ft-lb)



13. Purge Control Solenoid Valve

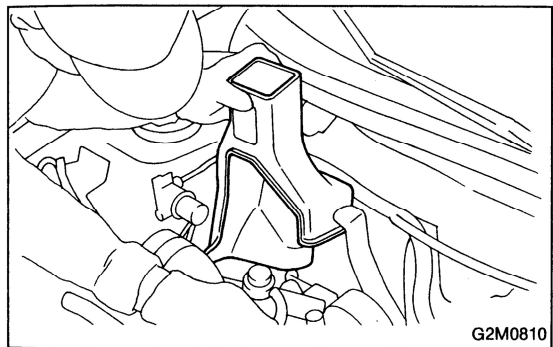
A: REMOVAL AND INSTALLATION

1) Remove bolt which installs bracket of purge control solenoid valve onto collector chamber.

2) Take out purge control solenoid valve with bracket through the bottom of the collector chamber.

3) Disconnect connector and hoses from purge control solenoid valve.

4) Installation is in the reverse order of removal.

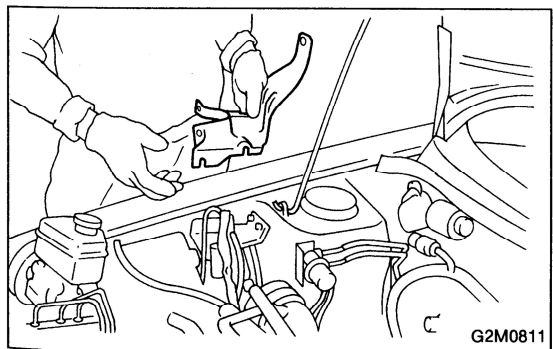


14. Turbocharger Unit

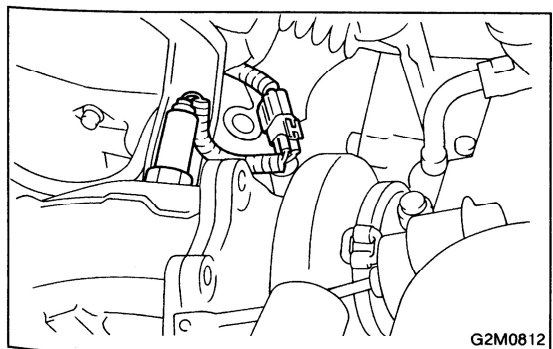
A: REMOVAL

1) Remove intercooler.

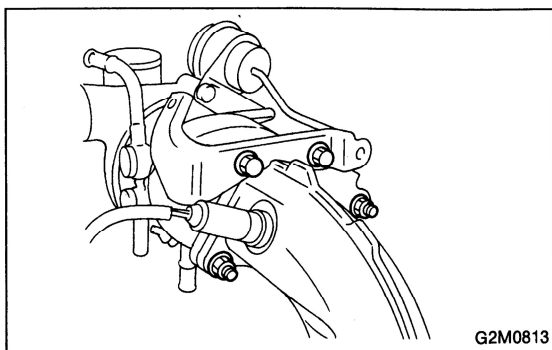
2) Remove turbocharger cooling duct.



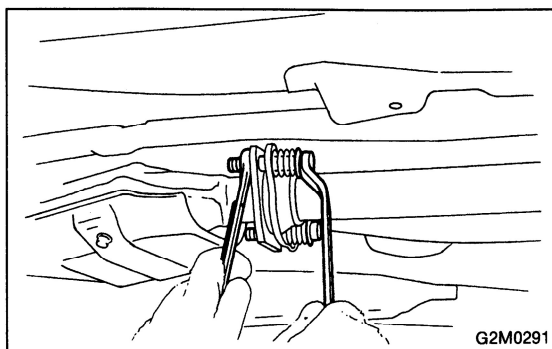
3) Remove turbocharger lower cover.



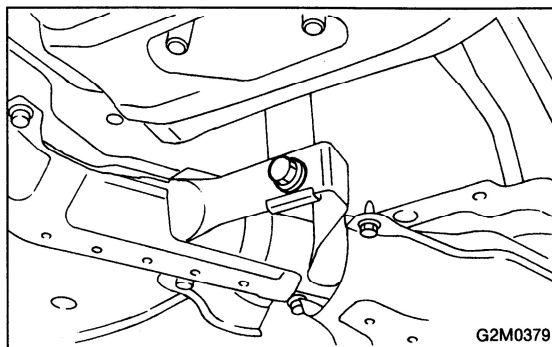
4) Disconnect connector from oxygen sensor.



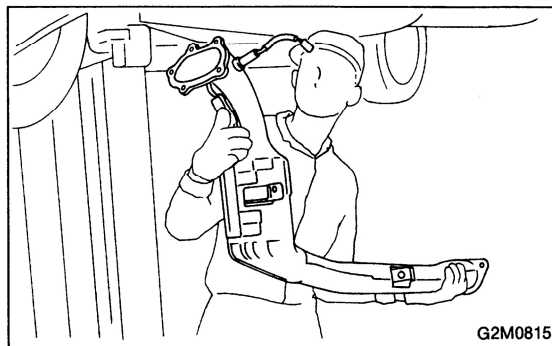
5) Remove nuts and bolts which install center exhaust pipe to turbocharger.



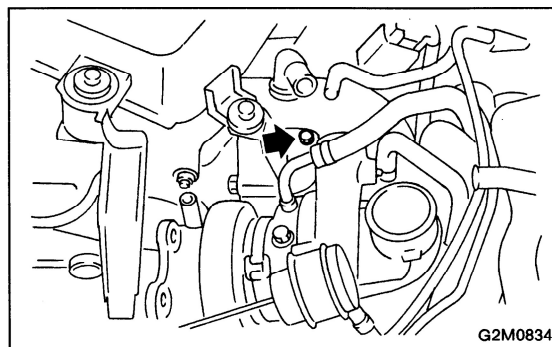
6) Lift-up the vehicle.
7) Separate center exhaust pipe from rear exhaust pipe.



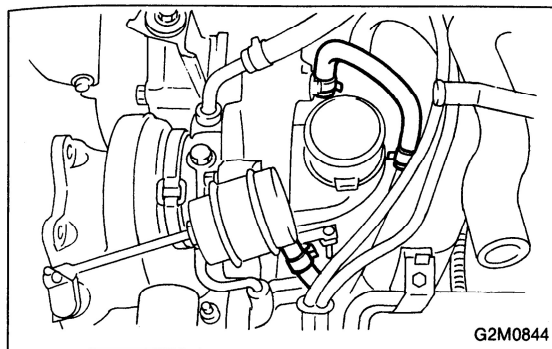
8) Remove bolt which installs center exhaust pipe to bracket.



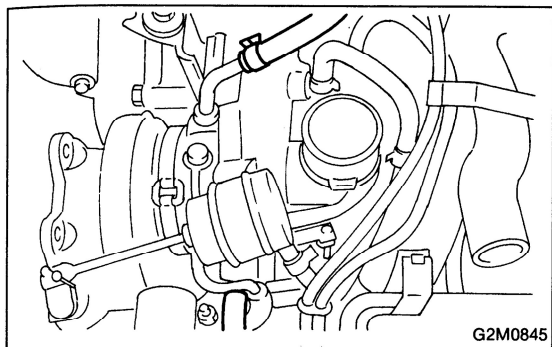
9) Remove center exhaust pipe.



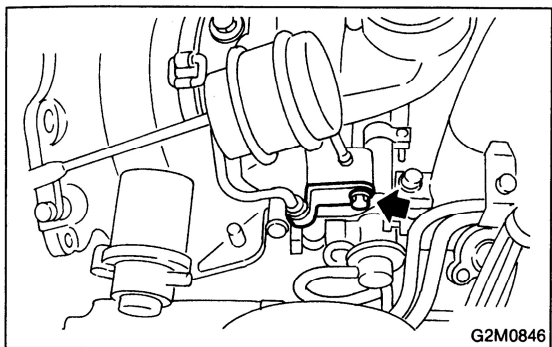
10) Lower the vehicle.
11) Separate intercooler air duct from turbocharger.



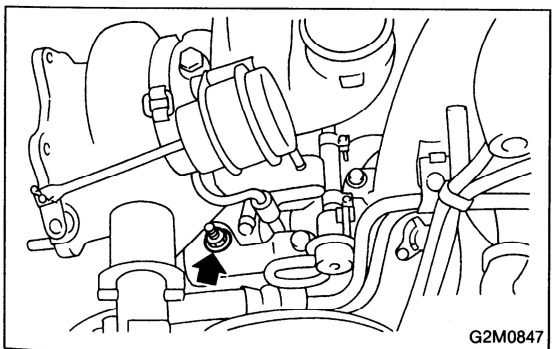
12) Disconnect hoses of pressure control line from turbocharger unit.



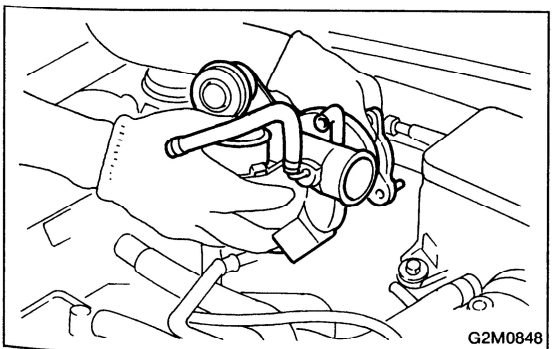
13) Disconnect engine coolant hose and engine oil hose.



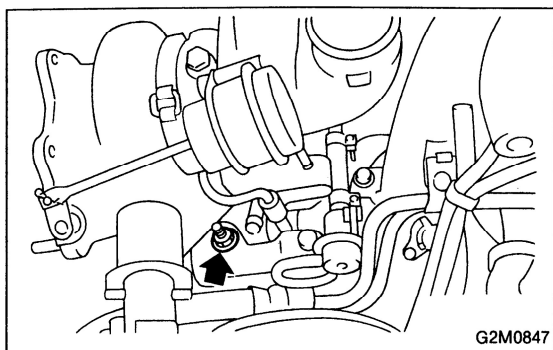
14) Remove bolt which installs oil pipe bracket onto turbocharger unit.



15) Remove nuts which install turbocharger unit on turbo joint pipe.



16) Remove turbocharger unit.



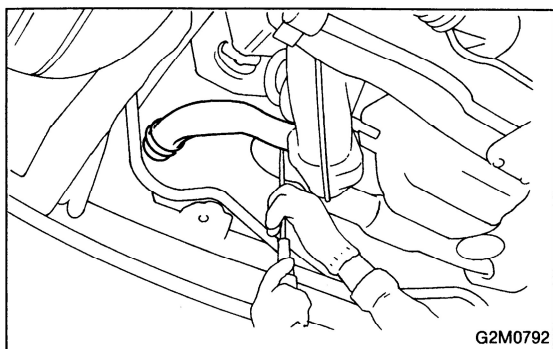
17) Installation is in the reverse order of removal procedure.

CAUTION:

- When installing turbocharger unit, connect engine coolant outlet hose to turbocharger unit.
- Replace gasket with a new one.

Tightening torque:

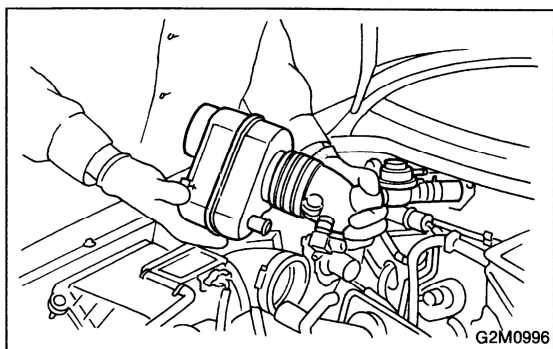
$29 \pm 3 \text{ N}\cdot\text{m}$ ($3.0 \pm 0.3 \text{ kg}\cdot\text{m}$, $22 \pm 2.2 \text{ ft}\cdot\text{lb}$)



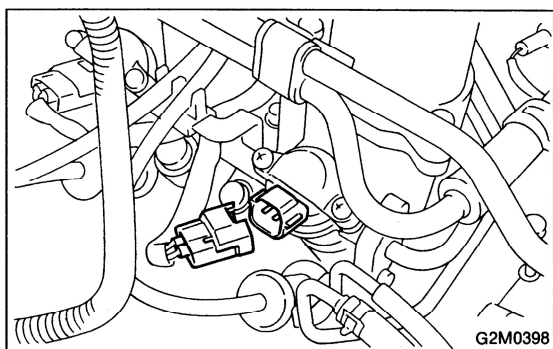
15. Fuel Injector

A: REMOVAL AND INSTALLATION

1) When removing the #1 fuel injector, remove coolant filler tank.

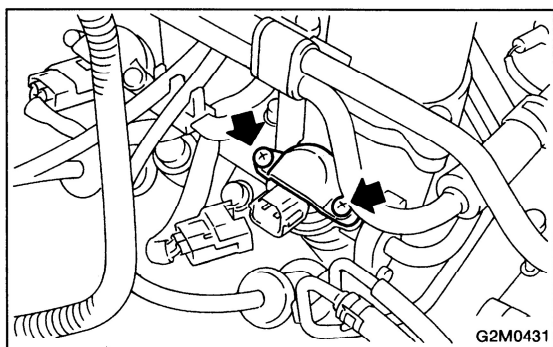


2) When removing the #3 fuel injector, remove resonator chamber and air inlet duct A.

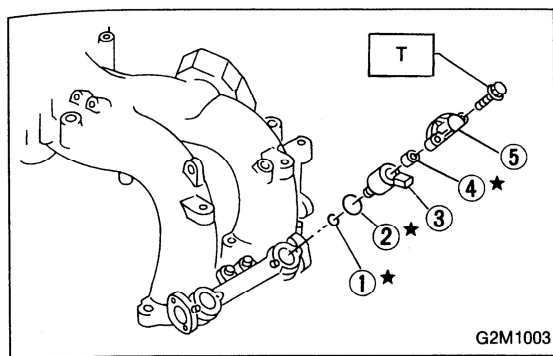


3) Release fuel pressure.

4) Disconnect connector from fuel injector.



5) Remove fuel injector from fuel pipe assembly.



6) Installation is in the reverse order of removal.

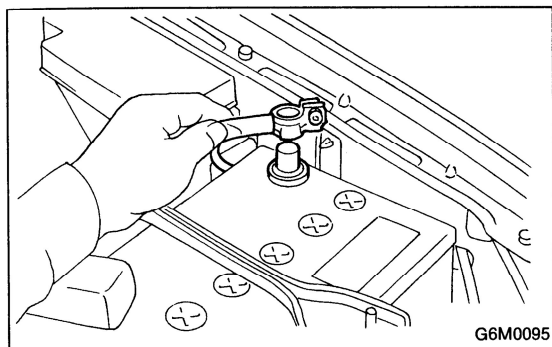
CAUTION:

Replace O-rings and insulator.

Tightening torque:

T: 2.1 — 2.9 N·m (0.21 — 0.30 kg-m, 1.5 — 2.2 ft-lb)

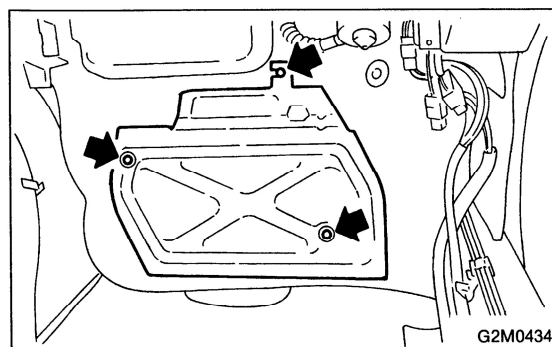
- ① O-ring B
- ② O-ring A
- ③ Fuel injector
- ④ Insulator
- ⑤ Fuel injector cup



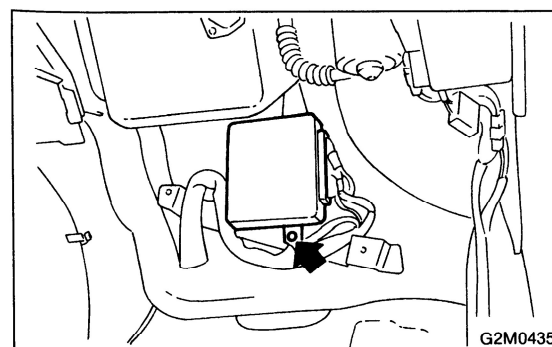
16. Engine Control Module

A: REMOVAL AND INSTALLATION

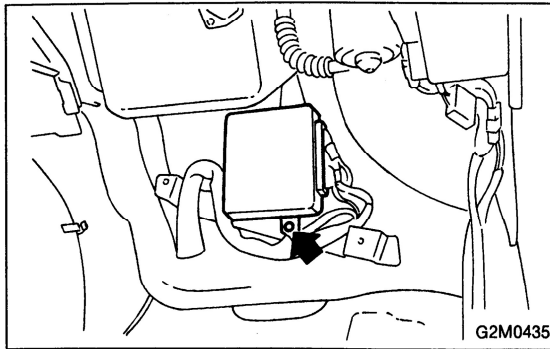
1) Disconnect battery ground cable.



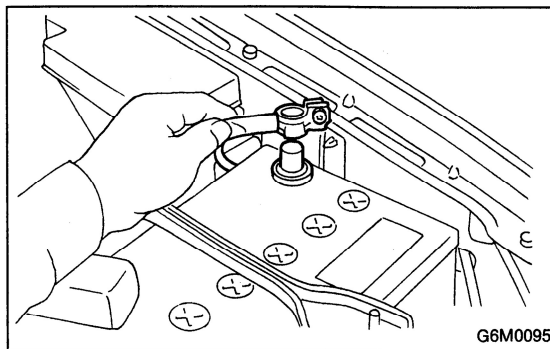
- 2) Detach floor mat of front passenger seat.
- 3) Remove protect cover.



- 4) Remove nuts which install ECM onto body.
- 5) Take out ECM and disconnect connector from it.



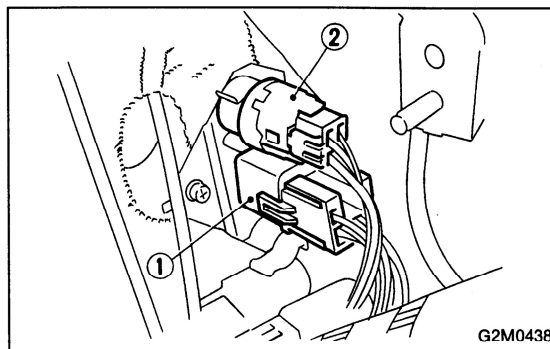
6) Installation is in the reverse order of removal.



17. Main Relay and Fuel Pump Relay

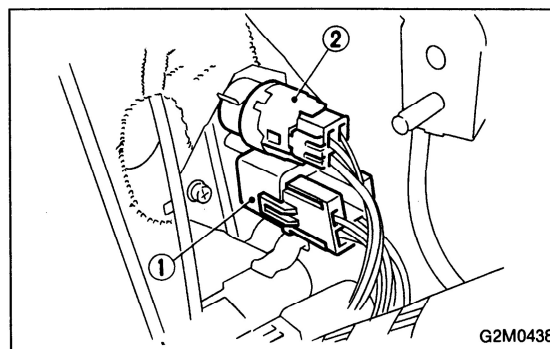
A: REMOVAL AND INSTALLATION

1) Disconnect battery ground cable.



2) Remove screw which installs bracket of main relay ① and fuel pump relay ②.

3) Disconnect connectors from main relay and fuel pump relay.



4) Installation is in the reverse order of removal.

① Main relay

② Fuel pump relay