

SFI SYSTEM PRECAUTION

SF027-08

1. **BEFORE WORKING ON THE FUEL SYSTEM, DISCONNECT THE NEGATIVE (-) TERMINAL CABLE FROM THE BATTERY**

HINT:

Any diagnostic trouble code retained by the computer will be erased when the negative (-) terminal cable is removed from the battery. Therefore, if necessary, read the diagnosis before removing the negative (-) terminal cable from the battery.

2. **DO NOT SMOKE OR WORK NEAR AN OPEN FLAME WHEN WORKING ON THE FUEL SYSTEM**
3. **KEEP GASOLINE AWAY FROM RUBBER OR LEATHER PARTS**
4. **MAINTENANCE PRECAUTIONS**
 - (a) In event of engine misfire, these precautions should be taken.
 - (1) Check proper connection to battery terminals, etc.
 - (2) After repair work, check that the ignition coil terminals and all other ignition system lines are reconnected securely.
 - (3) When cleaning the engine compartment, be especially careful to protect the electrical system from water.
 - (b) Precautions when handling oxygen sensor.
 - (1) Do not allow oxygen sensor to drop or hit against an object.
 - (2) Do not allow the sensor to come into contact with water.

If vehicle is Equipped with Mobile Radio System (HAM, CB, etc.)

If the vehicle is equipped with a mobile communication system, refer to the precaution in the IN section.

5. AIR INDUCTION SYSTEM

- (a) Separation of the engine oil dipstick, oil filler cap, PCV hose, etc. may cause the engine to run out of turn.
- (b) Disconnection, looseness or cracks in the parts of the air induction system between the throttle body and cylinder head will allow air suction and cause the engine to run out of turn.

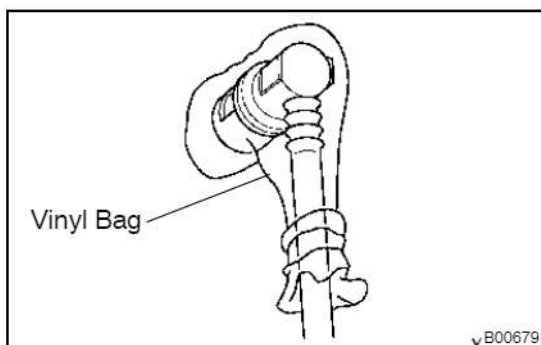
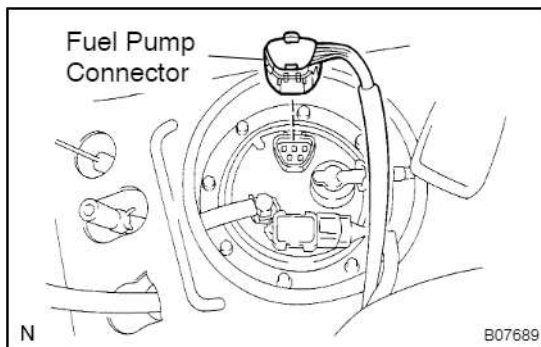
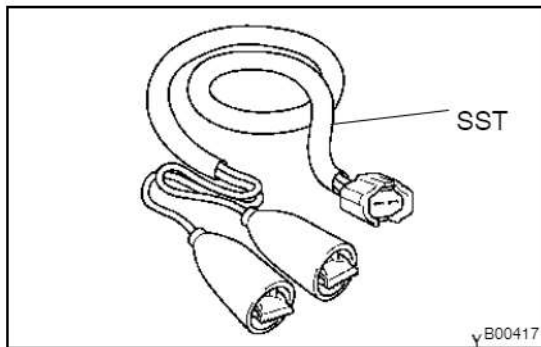
6. ELECTRONIC CONTROL SYSTEM

- (a) Before removing SFI wiring connectors, terminals, etc., first disconnect the power by either turning the ignition switch to LOCK or disconnecting the negative (-) terminal cable from the battery.

HINT:

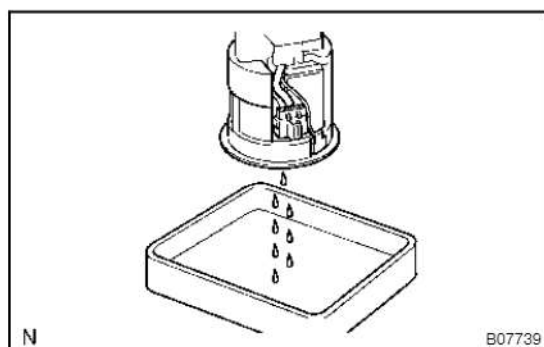
Always check the diagnostic trouble code before disconnecting the negative (-) terminal cable from the battery.

- (b) When installing the battery, be especially careful not to incorrectly connect the positive (+) and negative (-) cables.
- (c) Do not permit parts to receive a severe impact during removal or installation. Handle all SFI parts carefully, especially the ECM.
- (d) Be careful during troubleshooting as there are numerous transistor circuit, and even slight terminal contact can cause further troubles.
- (e) Do not open the ECM cover.
- (f) When inspecting during rainy weather, take care to prevent entry of water. Also, when washing the engine compartment, prevent water from getting on the SFI parts and wiring connectors.
- (g) Parts should be replaced as an assembly.
- (h) Care should be taken when pulling out and inserting wiring connectors.
 - (1) Release the lock and pull out the connector, pulling on the connectors.
 - (2) Fully insert the connector and check that it is locked.
- (i) Use SST for inspection or test of the injector or its wiring connector.
SST 09842-30080

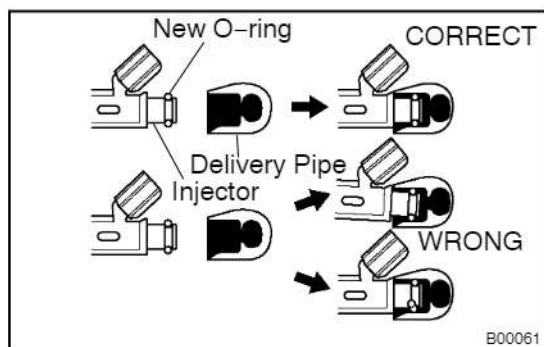


7. FUEL SYSTEM

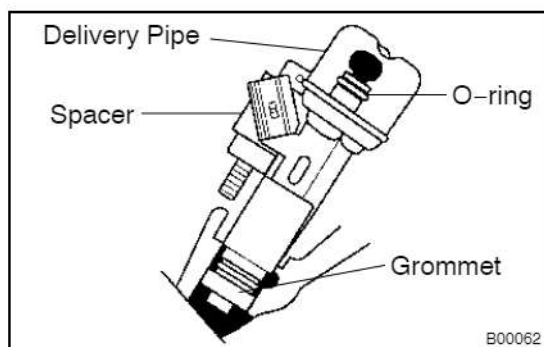
- (a) When disconnecting the high fuel pressure line, a large amount of gasoline will spill out, so observe these procedures.
 - (1) Disconnect the fuel pump connector.
 - (2) Start the engine. After the engine has stopped on its own, turn the ignition switch to LOCK.
 - (3) Disconnect the fuel tube (See page SF-11).
 - (4) Drain the fuel remained inside the fuel tube.
 - (5) Prevent the disconnected fuel tube from damaging and mixing foreign objects by covering them with a vinyl bag.



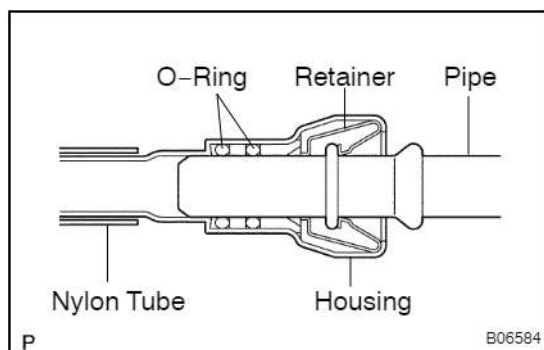
- (6) Put a container under the connection.



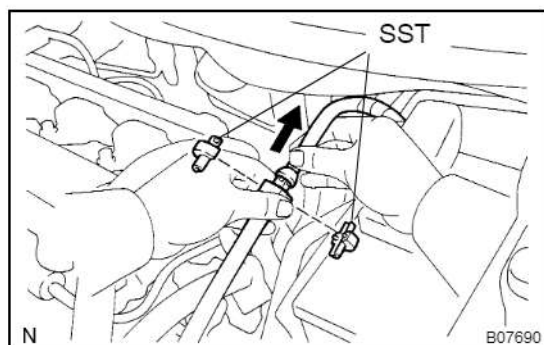
- (b) Observe these precautions when removing and installing the injector.
- (1) Never reuse the O-ring.
 - (2) When placing a new O-ring on the injector, take care not to damage it in any way.
 - (3) Coat a new O-ring with spindle oil or gasoline before installing never use engine, gear or brake oil.



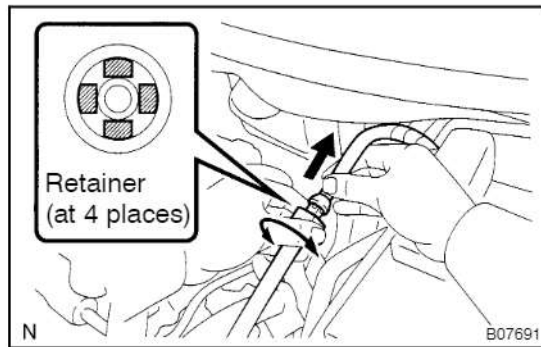
- (c) Install the injector to the delivery pipe and cylinder head, as shown in the illustration. Before installing the injector, must apply spindle oil or gasoline on the place where a delivery pipe or a cylinder head touches on O-ring of the injector.



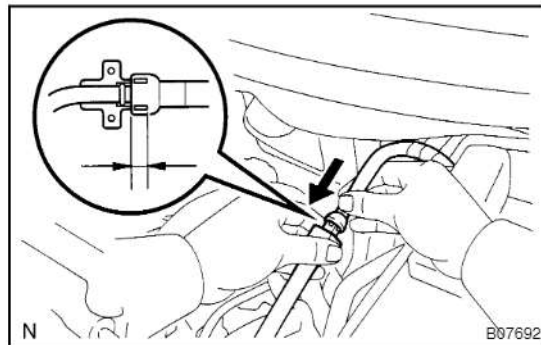
- (d) Observe these precautions when disconnecting the fuel delivery pipe. The structure of the metallic connector is shown as left.
- (1) Remove the fuel pipe clamp.



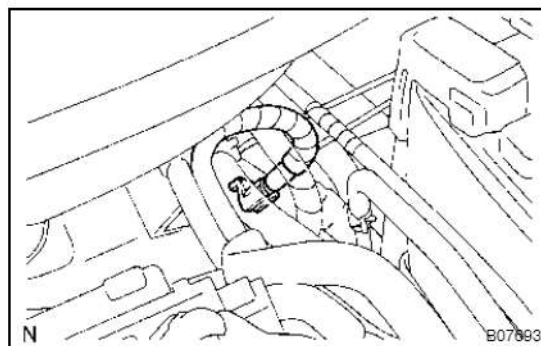
- (2) Get the metallic connector of the fuel tube assembly, pull it out towards the rear and hold it as it is.
 - (3) Assemble SST to the connection as shown.
- SST 09268-21010



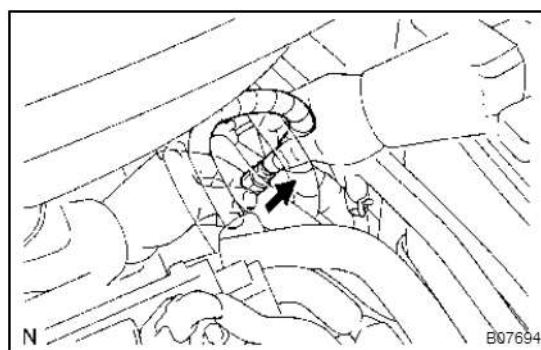
- (4) Turn SST, align the retainers inside the connector with SST chamfered parts and insert SST into the connector.



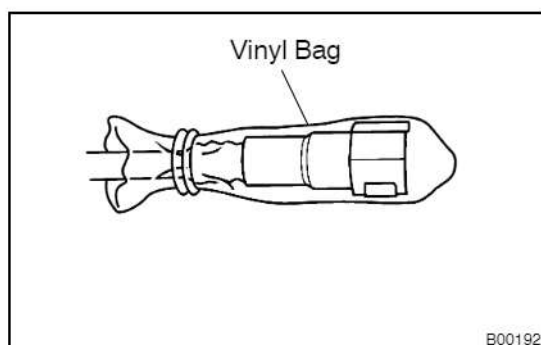
- (5) Hold SST as it at step 4, push the connector towards SST to put the retainers on SST chamfered parts.
(6) Slide SST and the connector together towards the fuel tube assembly.



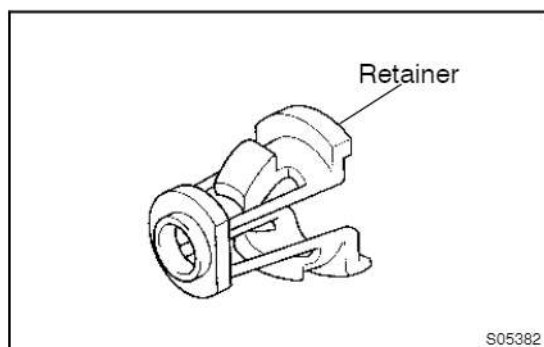
- (e) Observe these precautions when disconnecting the fuel tube connector (quick type).
(1) Remove the fuel pipe clamp.
(2) Check if there is any dirt like mud on the pipe and around the connector before disconnecting them and clean the dirt away.



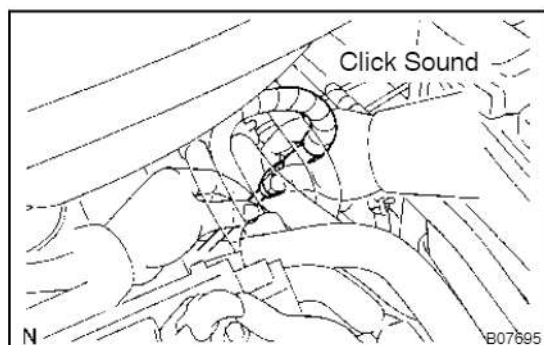
- (3) Be sure to disconnect with hands.
(4) When the connector and the pipe are stuck, pinch the retainer between the hands, push and pull the connector to free to disconnect and pull it out. Do not use any tool at this time.
(5) Inspect if there is any dirt or the likes on the seal surface of the disconnected pipe and clean it away.



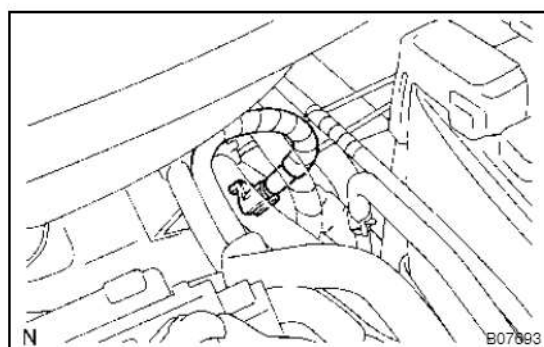
- (6) Prevent the disconnected pipe and connector from damaging and mixing foreign objects by covering them with a vinyl bag.



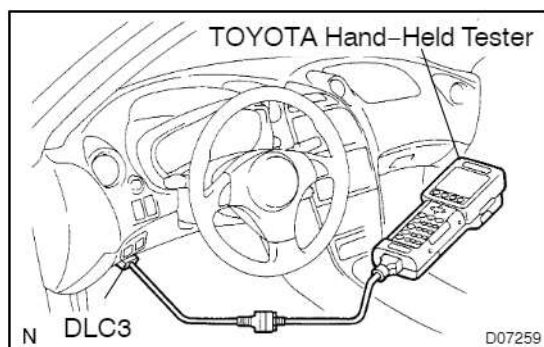
- (f) Observe these precautions when connecting the fuel tube connector (quick type).
- (1) Do not reuse the retainer removed from the pipe.
 - (2) Must use hands without using tools when to remove the retainer from the pipe.
 - (3) Check if there is any damage or foreign objects on the connected part of the pipe.



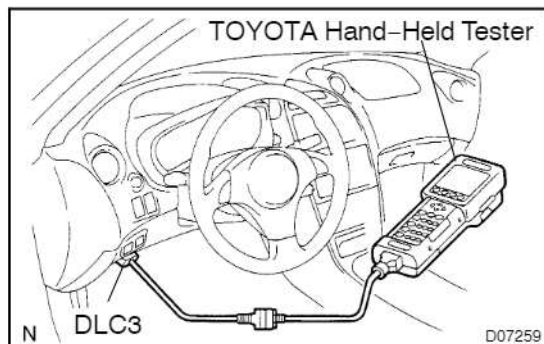
- (4) Match the axis of the connector with axis of the pipe, and push in the connector until retainer makes a "click" sound. In case that the connections is tight, apply little amount of new engine oil on the tip of the pipe.
- (5) After having finished the connection, check if the pipe and the connector are securely connected by pulling them.



- (6) Install the fuel pipe clamp.
 - (7) Check if there is any fuel leakage.
- (g) Observe these precautions when handling nylon tube.
- (1) Pay attention not to turn the connected part of the nylon tube and the quick connector with force when connecting them.
 - (2) Pay attention not to kink the nylon tube.
 - (3) Do not remove the nylon tube.
 - (4) Must not close the piping with the nylon tube by bending it.



- (h) Check that there are no fuel leaks after doing maintenance anywhere on the fuel system.
- (1) Connect the TOYOTA hand-held tester to the DLC3.
 - (2) Turn the ignition switch ON and push TOYOTA hand-held tester main switch ON.
 - (3) Select the active test mode on the TOYOTA hand-held tester.
 - (4) Please refer to the TOYOTA hand-held tester operator's manual for further details.
 - (5) If you have no TOYOTA hand-held tester, connect the positive (+) and negative (-) leads from the battery to the fuel pump connector. (See page SF-6)
 - (6) Check that there are no leaks from any part of the fuel system.
 - (7) Turn the ignition switch to LOCK.
 - (8) Disconnect the TOYOTA hand-held tester from the DLC3.



FUEL PUMP ON-VEHICLE INSPECTION

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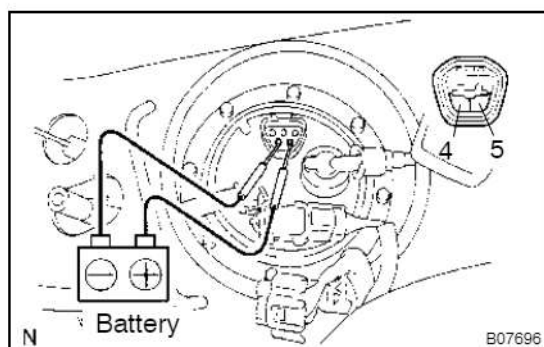
1. CHECK FUEL PUMP OPERATION

- (a) Connect the TOYOTA hand-held tester to the DLC3.
- (b) Turn the ignition switch ON and TOYOTA hand-held tester main switch ON.

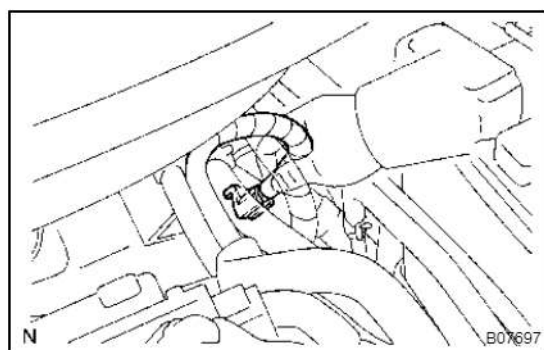
NOTICE:

Do not start the engine.

- (c) Select the active test mode on the TOYOTA hand-held tester.
- (d) Please refer to the TOYOTA hand-held tester operator's manual for further details.



- (e) If you have no TOYOTA hand-held tester, connect the positive (+) lead from the battery to terminal 4 of the connector, and the negative (-) lead to terminal 5.

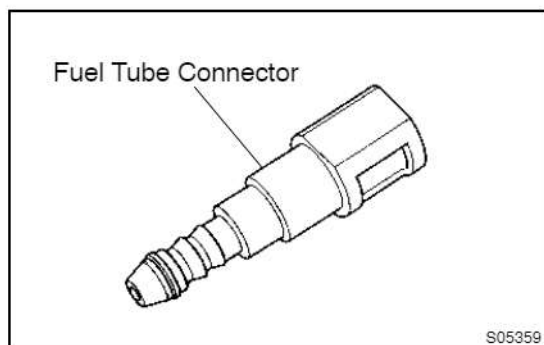


- (f) Check that there is pressure in the fuel inlet pipe from the fuel line.

HINT:

If there is fuel pressure, you will hear the sound of fuel flowing. If there is no pressure, check these parts, Fusible link, Fuses, EFI Main relay, Fuel pump, ECM, and Witting connector.

- (g) Turn the ignition switch to LOCK.
- (h) Disconnect the TOYOTA hand-held tester from the DLC3.



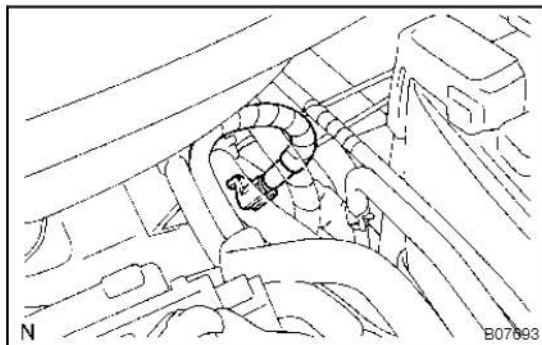
2. CHECK FUEL PRESSURE

- (a) Check the battery positive voltage is above 12 V.
- (b) Disconnect the negative (-) terminal cable from the battery.
- (c) Purchase the new fuel tube and take out the fuel tube connector from its pipe.

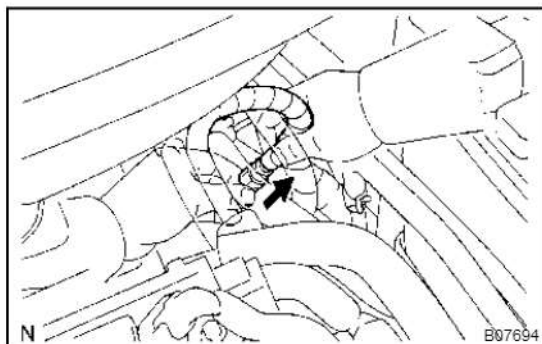
Part No.:

1ZZ-FE: 23901-22100

2ZZ-GE: 23271-88600



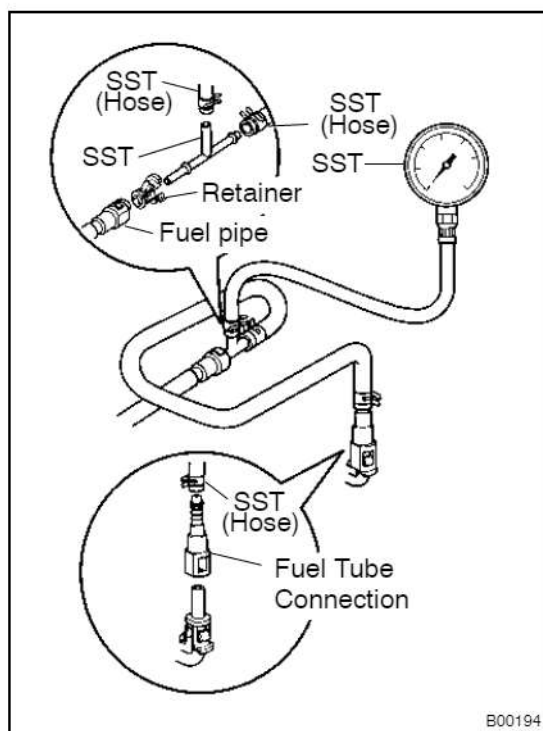
- (d) Remove the fuel pipe clamp.



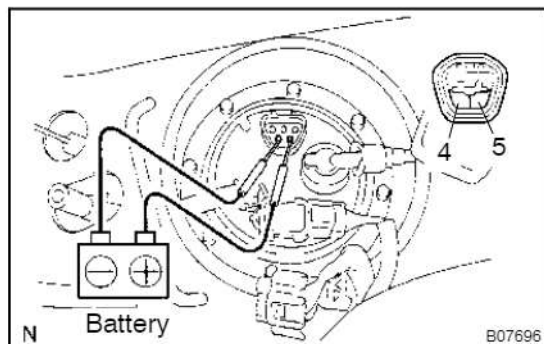
- (e) Disconnect the fuel tube (fuel tube connector) from the fuel pipe.

CAUTION:

- Perform disconnecting operations of the fuel tube connector (quick type) after observing the precautions.
- As there is retained pressure in the fuel pipe line, prevent it from splashing inside the engine compartment.



- (f) Install SST (pressure gauge) as shown in the illustration by using SST and fuel tube connector.
SST 09268-41047 (95336-08070), 09268-45014 (09268-41200, 09268-41220, 09268-41250)
- (g) Wipe off any splattered gasoline.
- (h) Reconnect the negative (-) terminal cable to the battery.



- (i) Connect the TOYOTA hand-held tester to the DLC3. If you have no TOYOTA hand-held tester, connect the positive (+) lead from the battery to terminal 4 of the connector, and the negative (-) lead to terminal 5.

- (j) Measure the fuel pressure.

Fuel pressure:

301 – 347 kPa (3.1 – 3.5 kgf/cm², 44 – 50 psi)

If pressure is high, replace the fuel pressure regulator.

If pressure is low, check the Fuel hoses and connections, Fuel pump, Fuel filter, and Fuel pressure regulator.

- (k) Disconnect the TOYOTA hand-held tester from the DLC3.

- (l) Start the engine.

- (m) Measure the fuel pressure at idle.

Fuel pressure:

301 – 347 kPa (3.1 – 3.5 kgf/cm², 44 – 50 psi)

- (n) Stop the engine.

- (o) Check that the fuel pressure remains as specified for 5 minutes after the engine has stopped.

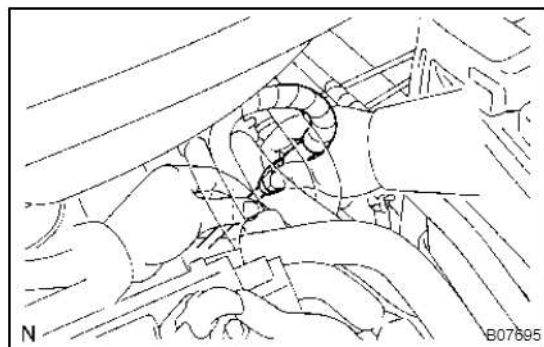
Fuel pressure:

147 kPa (1.5 kgf/cm², 21 psi) or more

If pressure is not as specified, check the fuel pump, pressure regulator and/or injectors.

- (p) After checking fuel pressure, disconnect the negative (-) terminal cable from the battery and carefully, remove the SST and fuel tube connector to prevent gasoline from splashing.

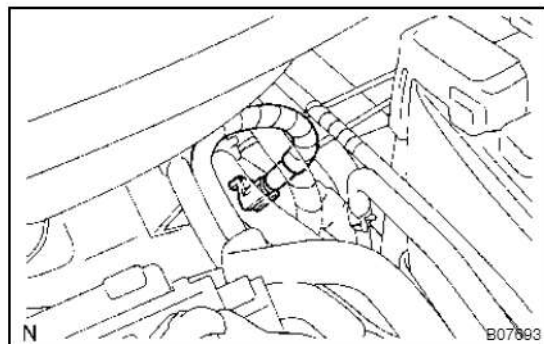
SST 09268-41047 (95336-08070), 09268-45014 (09268-41200, 09268-41220, 09268-41250)



- (q) Reconnect the fuel tube (fuel tube connector).

CAUTION:

Perform connecting operations of the fuel tube connector (quick type) after observing the precautions.



- (r) Install the fuel pipe clamp.

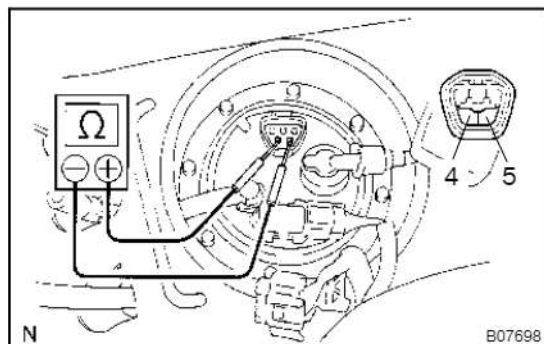
- (s) Reconnect the negative (-) terminal cable to the battery.

- (t) Check for fuel leakage.

3. REMOVE REAR SEAT CUSHION

4. REMOVE FLOOR SERVICE HOLE COVER

5. DISCONNECT FUEL PUMP & SENDER GAUGE CONNECTOR

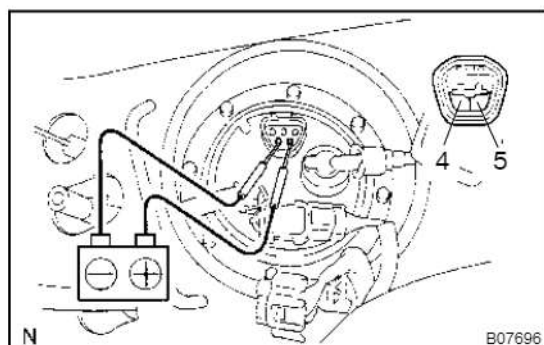


6. INSPECT FUEL PUMP RESISTANCE

Using an ohmmeter, measure the resistance between terminals 4 and 5.

Resistance: 0.2 – 3.0 Ω at 20°C (68 °F)

If the resistance is not as specified, replace the fuel pump.



7. INSPECT FUEL PUMP OPERATION

Connect the positive (+) lead from the battery to terminal 4 of the connector and the negative (-) terminal 5. Check that the pump operates.

NOTICE:

- These tests must be done quickly (within 10 seconds) to prevent the coil burning out.
- Keep fuel pump as far away from the battery as possible.
- Always do the switching at the battery side.

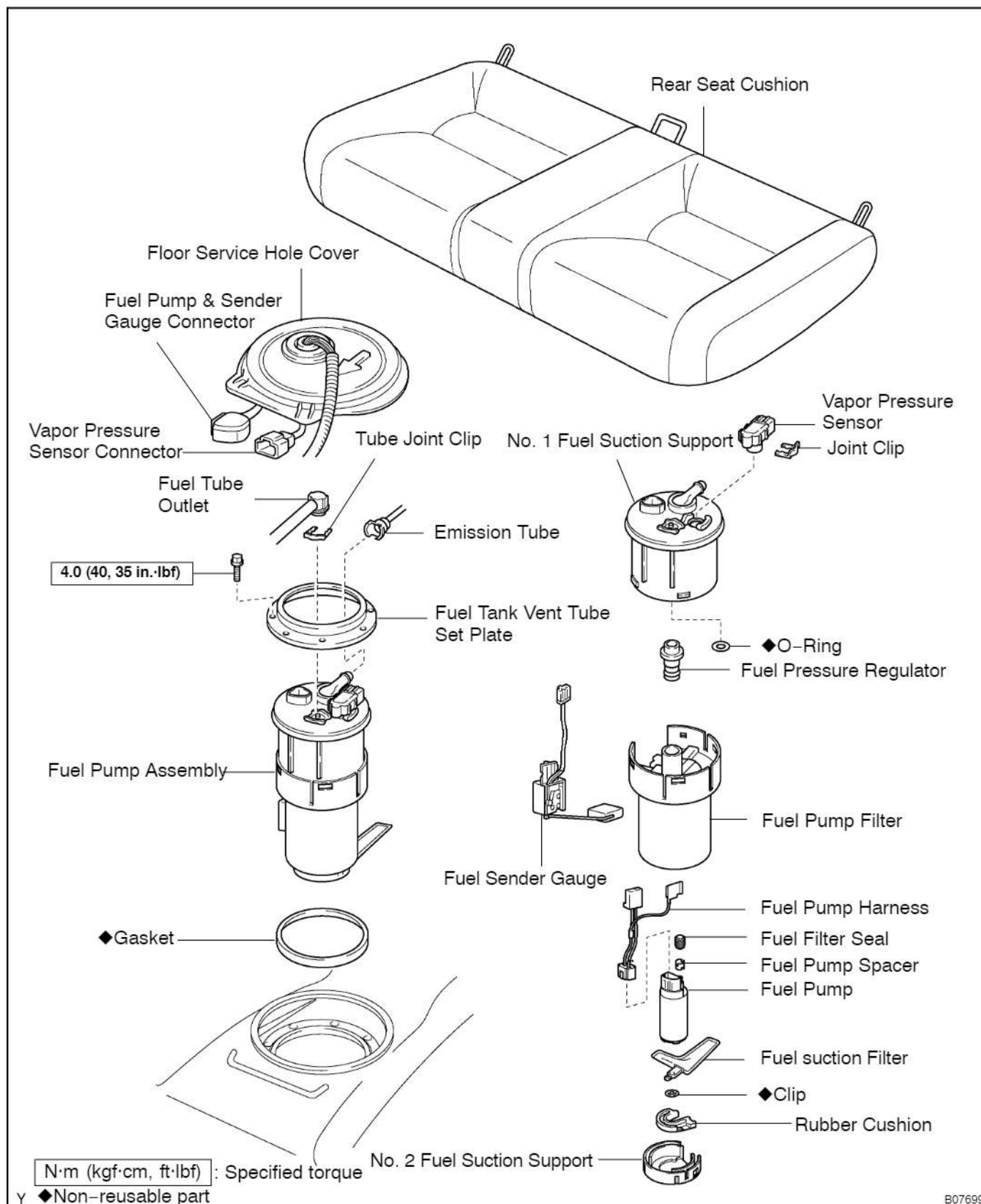
If operation is not as specified, replace the fuel pump or lead wire.

8. RECONNECT FUEL PUMP & SENDER GAUGE CONNECTOR

9. REINSTALL FLOOR SERVICE HOLE COVER

10. REINSTALL REAR SEAT CUSHION

COMPONENTS



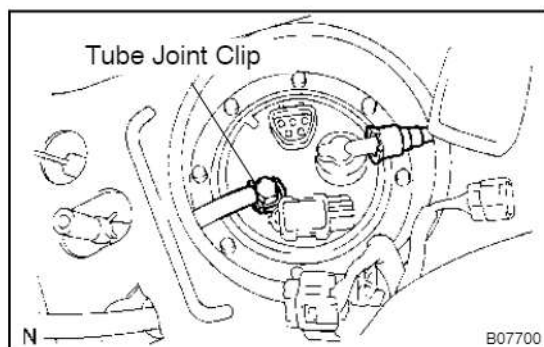
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REMOVAL

CAUTION:

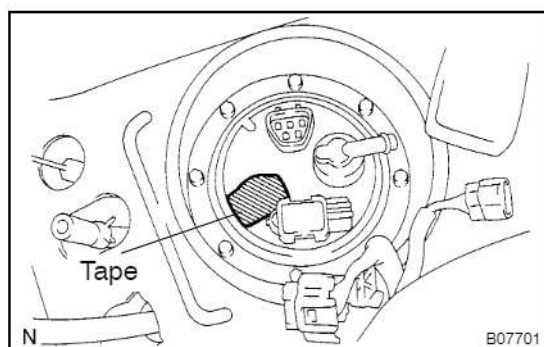
Do not smoke or work near an open flame when working on the fuel pump.

1. REMOVE REAR SEAT CUSHION
2. REMOVE FLOOR SERVICE HOLE COVER
3. DISCONNECT FUEL PUMP & SENDER GAUGE CONNECTOR AND VAPOR PRESSURE SENSOR CONNECTOR

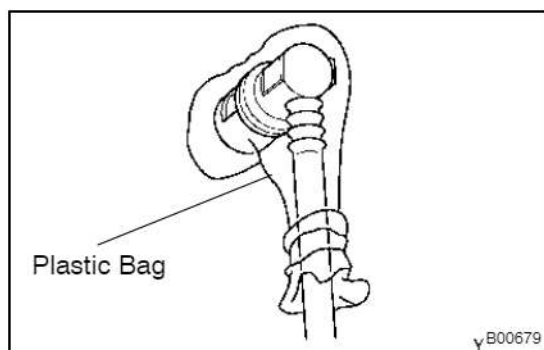


4. DISCONNECT FUEL TUBE AND EMISSION TUBE

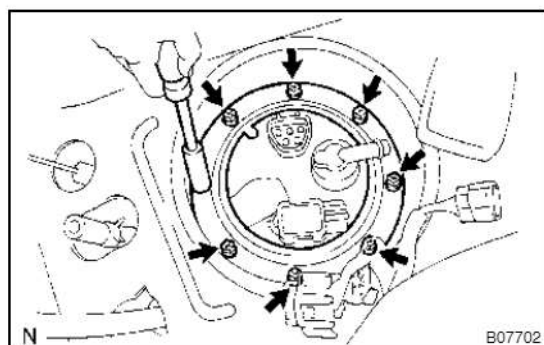
- (a) Wash away the mud, dust and the likes on the fuel suction plate with water.
- (b) Pull off the tube joint clip from the No. 1 fuel suction plate.
- (c) Disconnect the fuel tube from the fuel pump assembly.
- (d) Disconnect the emission tube from the fuel pump assembly.



- (e) Attach the tape in order to protect the port portion from the dust.



- (f) Protect the disconnected fuel tube from damage and foreign material by covering it with a plastic bag.

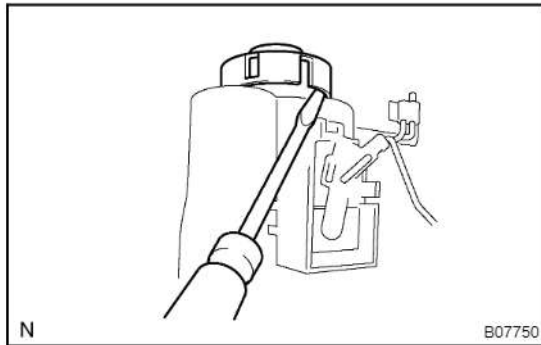


5. REMOVE FUEL PUMP ASSEMBLY FROM FUEL TANK

- (a) Remove the 8 bolts and fuel tank vent tube set plate.
- (b) Pull out the fuel pump assembly.

NOTICE:

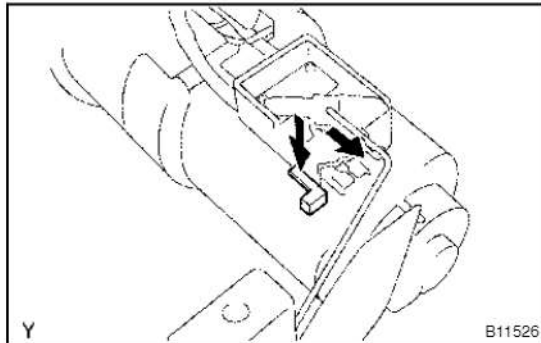
- Do not damage the fuel pump filter.
 - Be careful that the arm of the sender gauge should not bent.
- (c) Remove the gasket from the pump assembly.



DISASSEMBLY

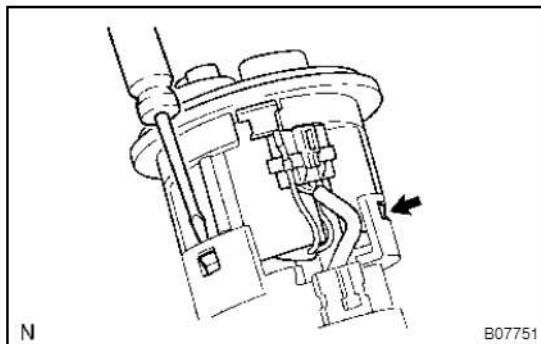
1. REMOVE NO. 2 FUEL SUCTION SUPPORT

- Using a small screwdriver, remove the No. 2 fuel suction support.
- Remove the rubber cushion.



2. REMOVE NO. 1 FUEL SUCTION SUPPORT

- Disconnect the fuel sender gauge connector and earth plate.
- While pressing the lock of the fuel pump filter, slide the fuel sender gauge and remove it.



- Using a small screwdriver, remove the No. 1 fuel suction support.

NOTICE:

Do not damage the fuel suction support and fuel suction plate.

- Disconnect the fuel pump harness from the No. 1 fuel suction support and fuel pump.

3. REMOVE VAPOR PRESSURE SENSOR

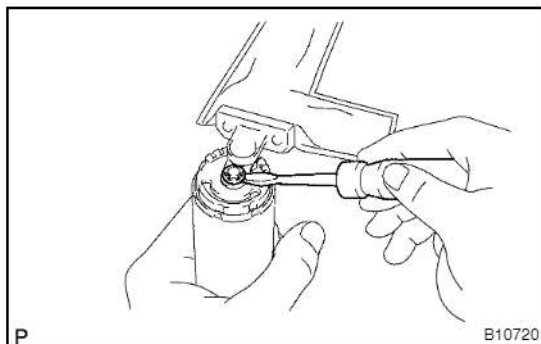
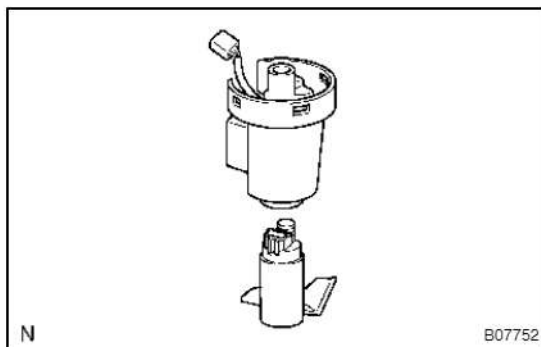
Pull off the joint clip and remove the vapor pressure sensor from No. 1 fuel suction support.

4. REMOVE FUEL PUMP

Remove the pump from the fuel filter.

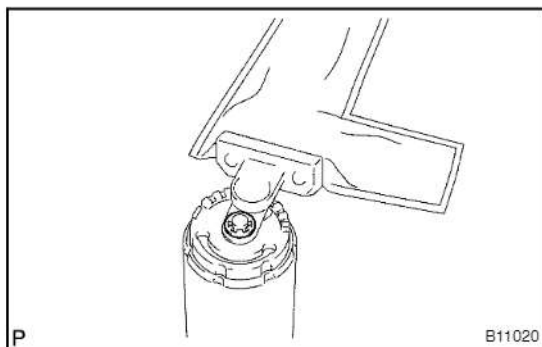
5. REMOVE FUEL PRESSURE REGULATOR

Pull out the fuel pressure regulator and O-ring from the fuel filter.



6. REMOVE FUEL SUCTION FILTER

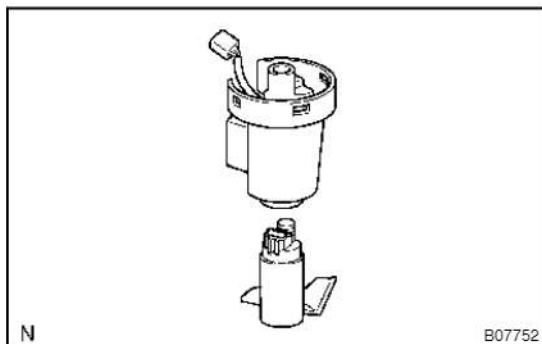
- Using a small screwdriver, pry out the clip.
- Pull out the suction filter.



REASSEMBLY

1. INSTALL FUEL SUCTION FILTER

Install the suction filter with a new clip.



2. INSTALL FUEL PUMP

Connect the fuel pump to the fuel filter.

3. INSTALL FUEL PRESSURE REGULATOR

- (a) Install the O-ring to the pressure regulator.

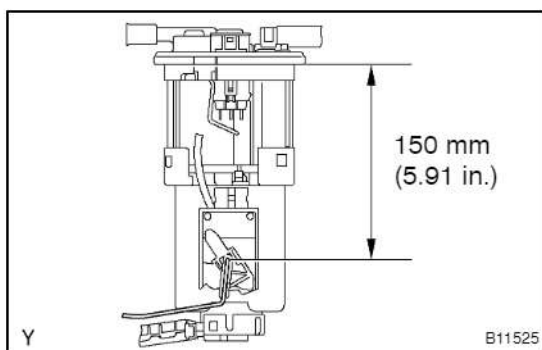
HINT:

Apply a light coat of gasoline to a new O-ring, and install it to the pressure regulator.

- (b) Connect the pressure regulator to the fuel filter.

4. INSTALL NO. 1 FUEL SUCTION SUPPORT

- (a) Connect the fuel pump harness to the No. 1 fuel suction support and fuel pump.
(b) Install the No. 1 fuel suction support to the fuel filter.



- (c) Install the fuel sender gauge to the fuel pump filter so that the distance between the No.1 fuel suction support and the float fulcrum of the fuel sender gauge is 150 mm (5.91 in.).

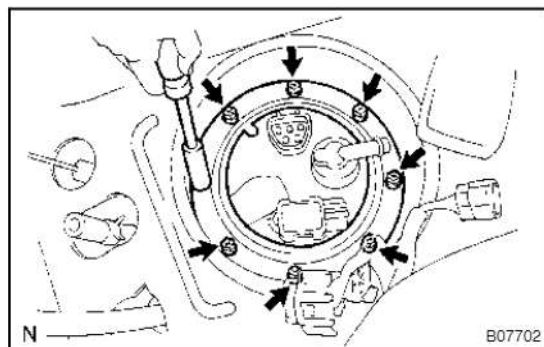
- (d) Connect the fuel sender gauge connector and earth plate.

5. INSTALL NO. 2 FUEL SUCTION SUPPORT

- (a) Install the rubber cushion.
(b) Install the No. 2 fuel suction support to the No. 1 fuel suction support.

6. INSTALL VAPOR PRESSURE SENSOR

Install the vapor pressure sensor and connect the joint clip to the No. 1 fuel suction support.



INSTALLATION

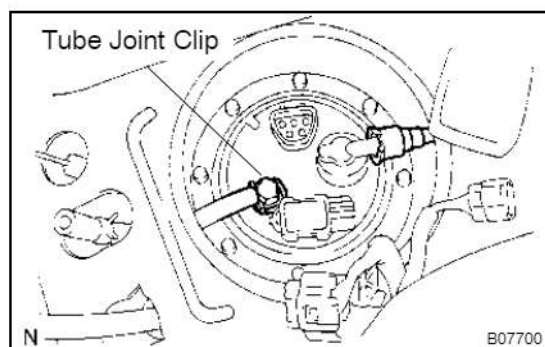
1. INSTALL FUEL PUMP ASSEMBLY

- Install the new gasket to the fuel pump assembly.
- Install the fuel pump assembly to the fuel tank.

NOTICE:

- Do not damage the fuel pump filter.
 - Be careful that the arm of the sender gauge should not bent.
- Install the 8 bolts and fuel tank vent tube set plate from the fuel tank.

Torque: 4.0 N·m (40 kgf·cm, 35 in·lbf)



2. CONNECT FUEL TUBE

- Clean up around the fuel tube.
- Connect the fuel tube and emission tube to the fuel pump assembly.
- Connect the tube joint clip to the fuel suction plate.

3. CONNECT FUEL PUMP AND SENDER GAUGE CONNECTOR AND VAPOR PRESSURE SENSOR CONNECTOR

HINT:

Start the engine, check for fuel leakage.

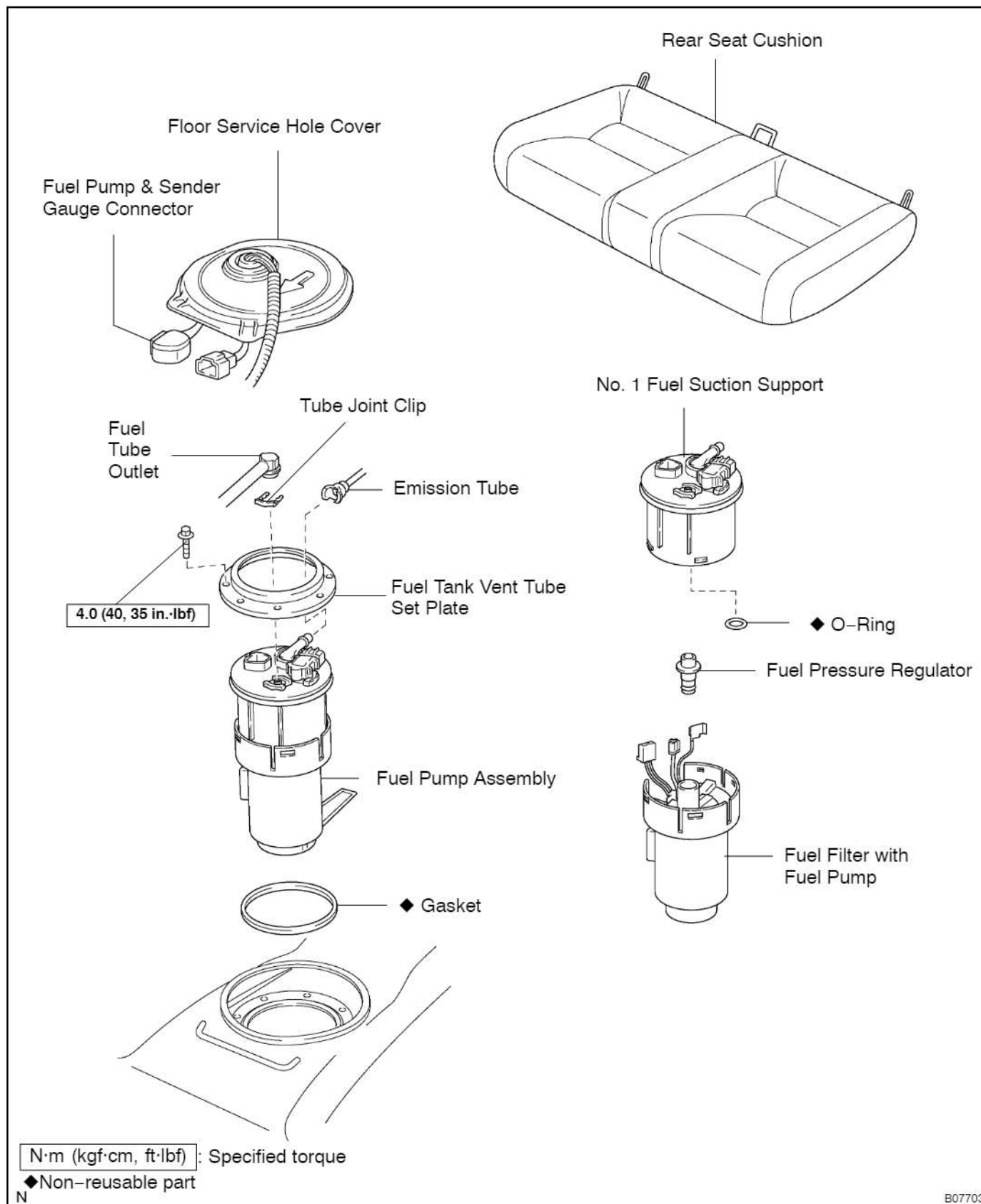
4. INSTALL FLOOR SERVICE HOLE COVER

- Install the service hole cover.
- Install the floor carpet.

5. INSTALL REAR SEAT CUSHION

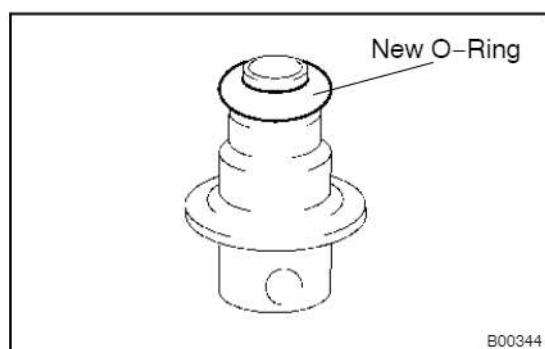
FUEL PRESSURE REGULATOR COMPONENTS

SF09E-12



REMOVAL

1. REMOVE FUEL PUMP ASSEMBLY FROM FUEL TANK (See page SF-11)
2. REMOVE NO. 1 FUEL SUCTION SUPPORT (See page SF-12)
3. REMOVE FUEL PRESSURE REGULATOR
 - (a) Pull out the pressure regulator.
 - (b) Remove the O-ring from the pressure regulator.



INSTALLATION

1. INSTALL FUEL PRESSURE REGULATOR

- (a) Install the O-ring to the pressure regulator.

HINT:

Apply a light coat of gasoline to a new O-ring, and install it to the pressure regulator.

- (b) Connect the pressure regulator from the fuel filter.

2. INSTALL NO. 1 FUEL SUCTION SUPPORT

(See page SF-13)

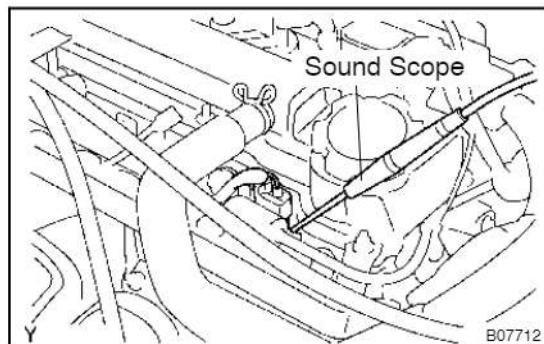
3. INSTALL FUEL PUMP ASSEMBLY TO FUEL TANK

(See page SF-14)

INJECTOR ON-VEHICLE INSPECTION

9F150-10

1. REMOVE NO. 2 CYLINDER HEAD COVER



2. CHECK OPERATION SOUND FROM EACH INJECTOR

- Connect the PCV hose to cylinder head cover.
- With the engine running or cranking, use a sound scope to check that there is normal operating noise in proportion to engine speed.
- If you have no sound scope, you can check the injector transmission operation with your finger.

If no sound or unusual sound is heard, check the wiring connector, injector signal from the ECM.

- Disconnect the PCV hose from cylinder head cover.

3. INSPECT INJECTOR RESISTANCE

- Disconnect the injector connector.
- Using an ohmmeter, measure the resistance between the terminals.

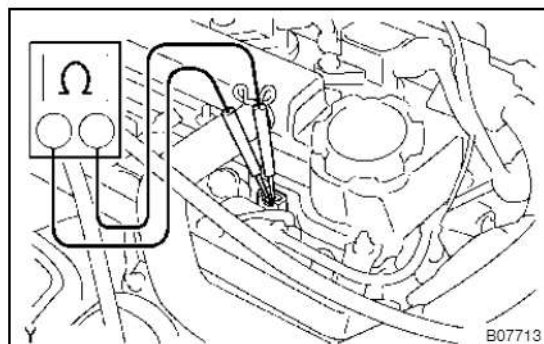
Resistance: 13.4 – 14.2 Ω at 20°C (68°F)

If the resistance is not as specified, replace the injector.

- Reconnect the injector connector.

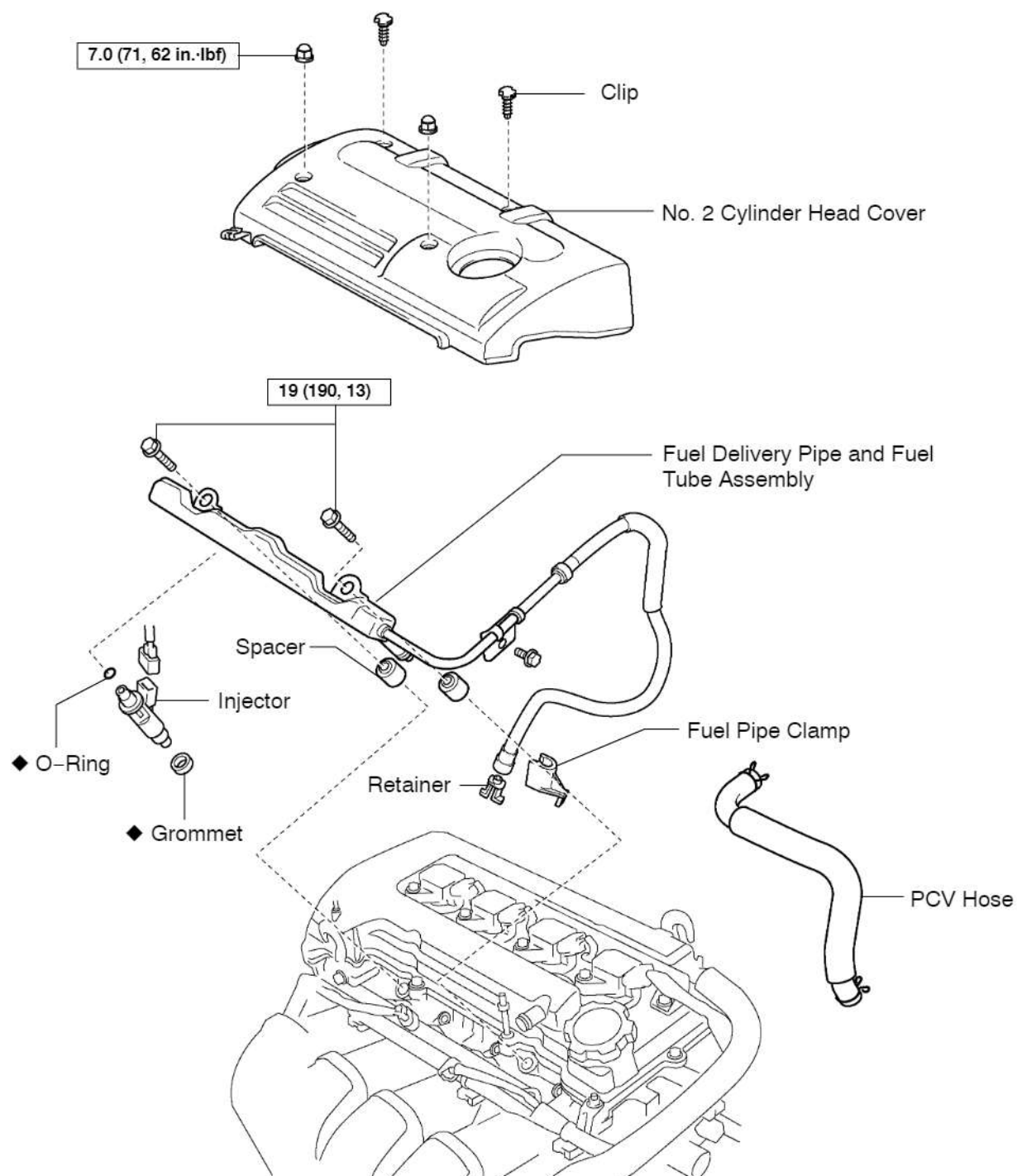
4. INSTALL WIRE HARNESS PROTECTOR COVER

- Install the wire harness protector cover with bolt and 2 nuts.
- Connect the PCV hose to cylinder head cover.



COMPONENTS

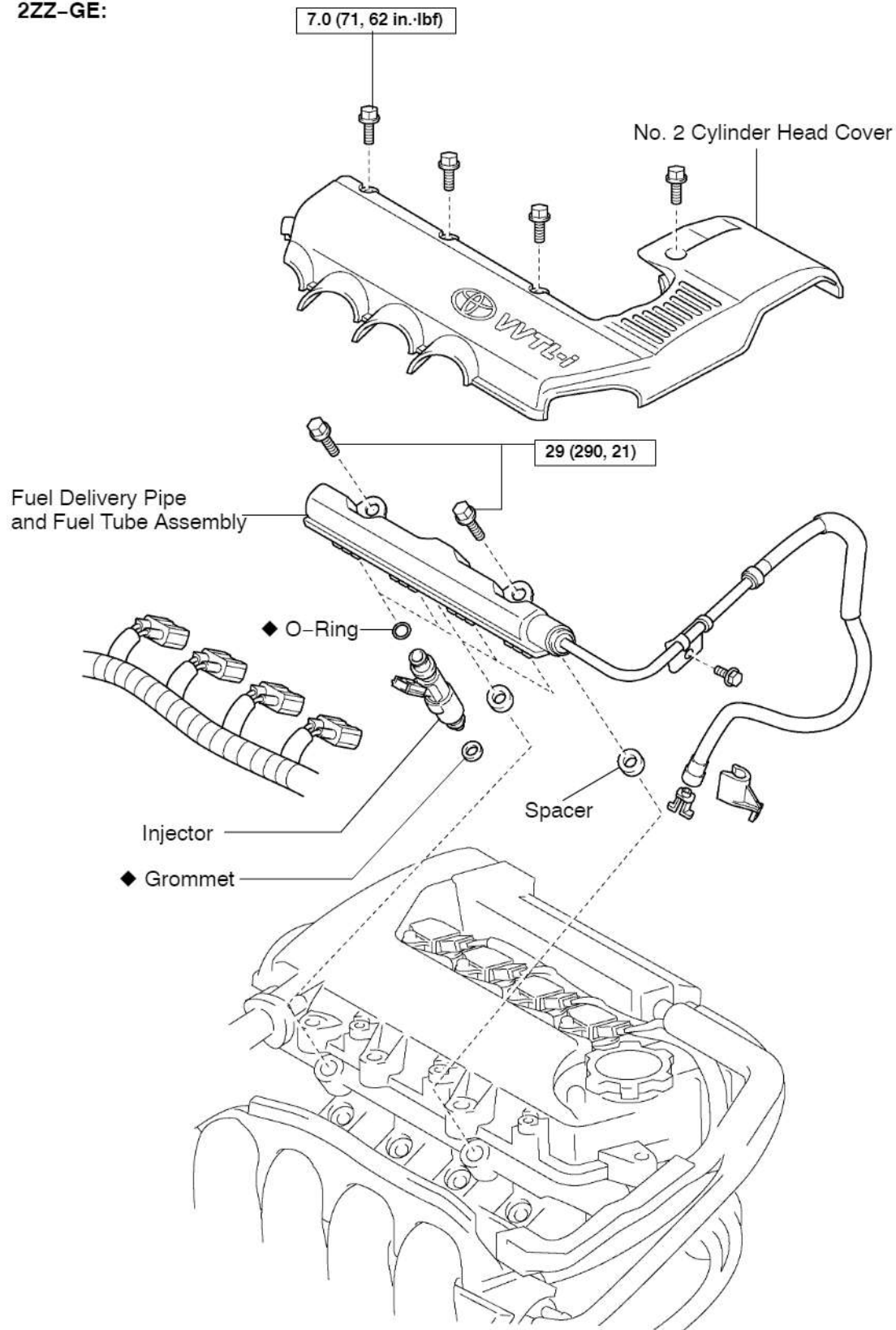
1ZZ-FE:



N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non-reusable part

B09173

2ZZ-GE:

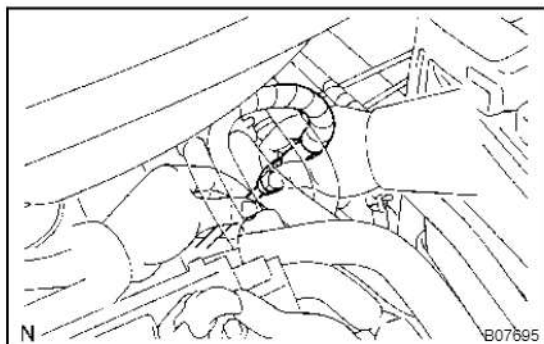
N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non-reusable part

B07714

REMOVAL

1. REMOVE NO. 2 CYLINDER HEAD COVER
2. 1ZZ-FE:
REMOVE PCV HOSE

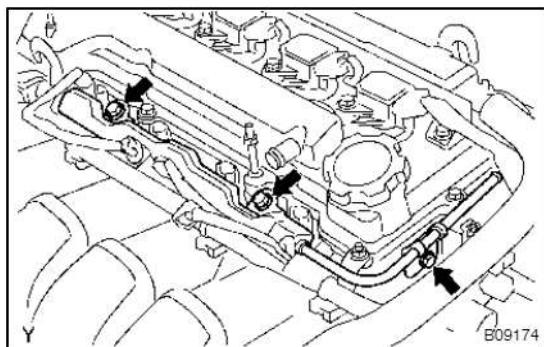


3. DISCONNECT FUEL TUBE

- (a) Remove the fuel pipe clamp.
- (b) Disconnect the fuel tube (fuel tube connector) from the fuel pipe.

CAUTION:

- Perform disconnecting operations of the fuel tube connector (quick type) after observing the precautions.
- As there is retained pressure in the fuel pipe line, prevent it from splashing inside the engine compartment.

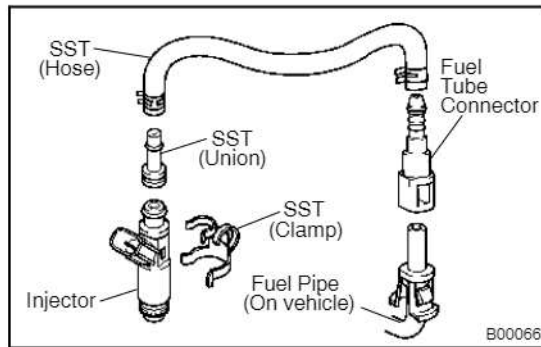


4. REMOVE DELIVERY PIPE AND INJECTORS

NOTICE:

Be careful not to drop the injectors when removing the delivery pipe.

- (a) Disconnect the 4 injector connectors from injector.
- (b) Remove the 3 bolts and delivery pipe together with the 4 injectors and fuel pipe.
- (c) Remove the 2 spacers from the cylinder head.
- (d) Pull out the 4 injectors from the delivery pipe.
- (e) Remove the O-ring and grommet from each injector.

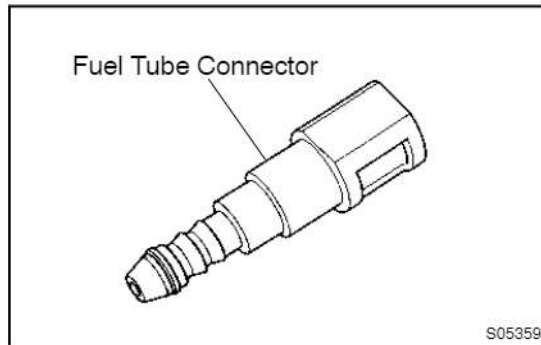


INSPECTION

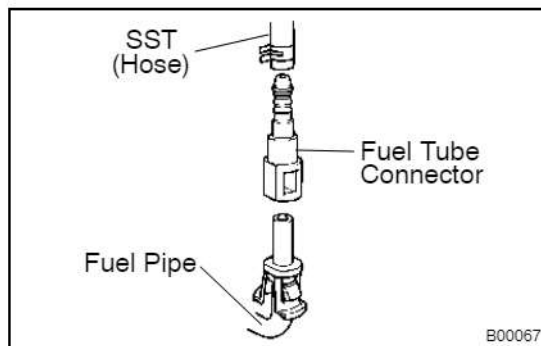
1. INSPECT INJECTOR INSPECTION

CAUTION:

Keep injector clear of sparks during the test.



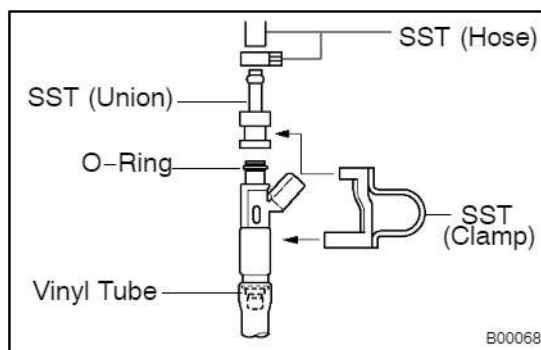
- (a) Purchase the new fuel tube and take out the fuel tube connector from its pipe.
Part No. 23901-22010



- (b) Connect SST (hose) and fuel tube connector to the fuel pipe.
SST 09268-41047

CAUTION:

Perform connecting operations of the fuel tube connector (quick type) after observing the precautions.

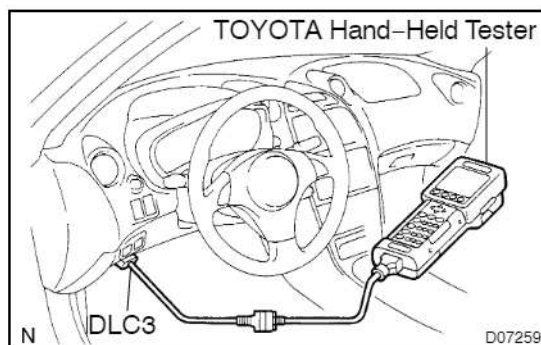


- (c) Install the grommet and O-ring to the injector.
(d) Connect SST (union and hose) to the injector, and hold the injector to prevent gasoline from splashing out.
SST 09268-41047

- (e) Put the injector into a graduated cylinder.

HINT:

Install a suitable vinyl tube onto the injector to prevent gasoline from splashing out.



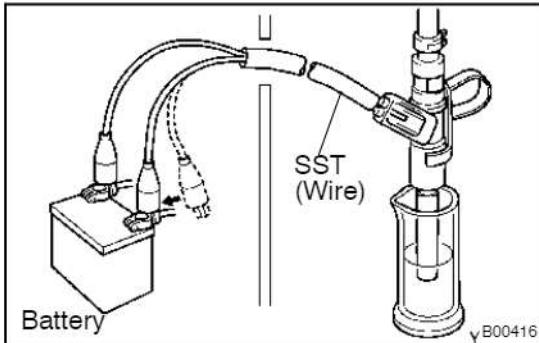
- (f) Connect the TOYOTA hand-held tester to the DLC3.
(g) Turn the ignition switch ON and TOYOTA hand-held tester main switch ON.

NOTICE:

Do not start the engine.

- (h) Select the active test mode on the TOYOTA hand-held tester.
(i) Please refer to the TOYOTA hand-held tester operator's manual for further details.

- (j) If you have no TOYOTA hand-held tester, connect the positive (+) and negative (-) leads from the battery to the fuel pump connector (See page SF-18).



- (k) Connect SST (wire) to the injector and battery for 15 seconds, and measure the injection volume with a graduated cylinder. Test each injector 2 or 3 times.

SST 09842-30080

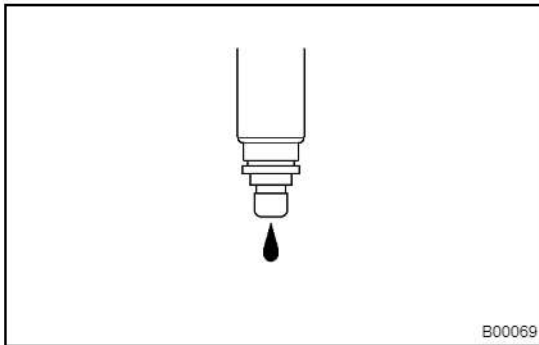
Volume:

47 – 58 cm³ (2.7 – 3.3 cu in.) per 15 sec.

Difference between each injector:

10 cm³ (0.6 cu in.) or less

If the injection volume is not as specified, replace the injector.



2. INSPECT LEAKAGE

- (a) In the condition above, disconnect the test probes of SST (wire) from the battery and check the fuel leakage from the injector.

SST 09842-30080

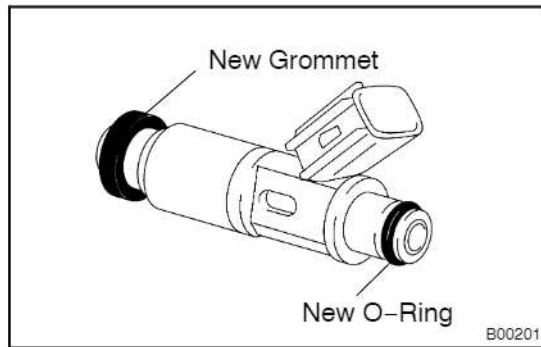
Fuel drop:

1 drop or less per 12 minutes

- (b) Turn the ignition switch to LOCK.
 (c) Disconnect the negative (-) terminal cable from the battery.
 (d) Remove the SST and fuel tube connector.
 SST 09268-41047

CAUTION:

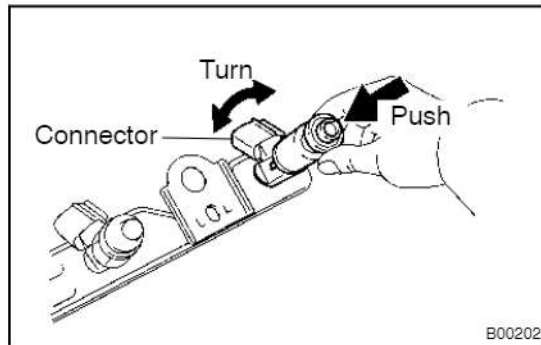
- **Perform disconnecting operations of the fuel tube connector (quick type) after observing the precautions.**
 - **As there is retained pressure in the fuel pipe line, prevent it from splashing inside the engine compartment.**
- (e) Disconnect the TOYOTA hand-held tester from the DLC3.



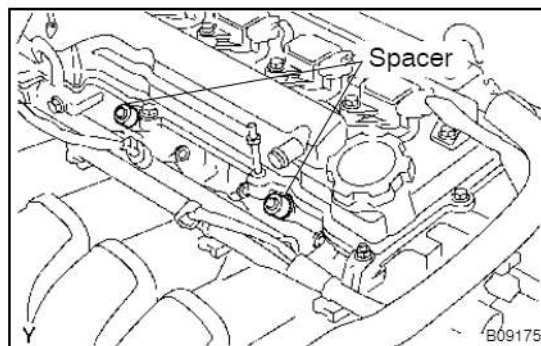
INSTALLATION

1. INSTALL INJECTORS AND DELIVERY PIPES

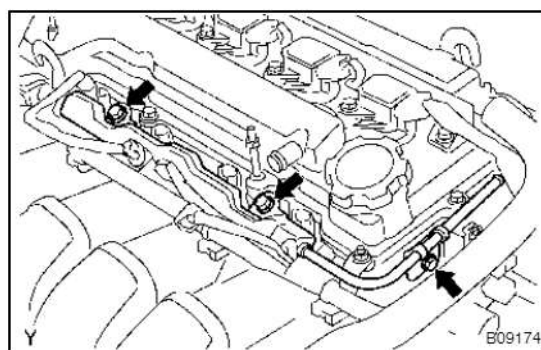
- Install the grommet to each injector.
- Apply a light coat of spindle oil or gasoline to new O-ring and install them to each injector.



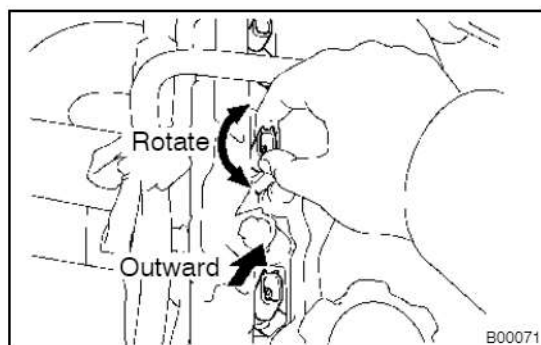
- Apply a light coat of spindle oil or gasoline on the place where a delivery pipe touches on O-ring.
- While turning the injector clockwise and counterclockwise, push it to the delivery pipes. Install the 4 injectors.
- Position the injector connector outward.



- Place the 2 spacers in position on the cylinder head.
- Apply a light coat of spindle oil or gasoline on the place where a cylinder head touches an O-ring of the injector.
- Place the delivery pipe and fuel pipe together with the 4 injectors in position on the cylinder head.



- Temporarily install the 2 bolts holding the delivery pipe to the cylinder head.
- Temporarily install the bolt holding the fuel pipe to the cylinder head.

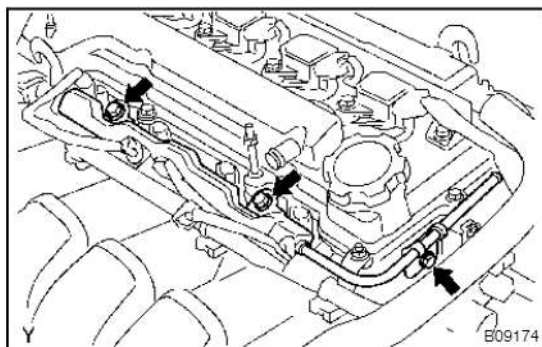


- Check that the injectors rotate smoothly.

HINT:

If injectors do not rotate smoothly, the probable cause is incorrect installation of O-ring. Replace the O-ring.

- Position the injector connector outward.



- (m) Tighten the 2 bolts holding the delivery pipe to the cylinder head.

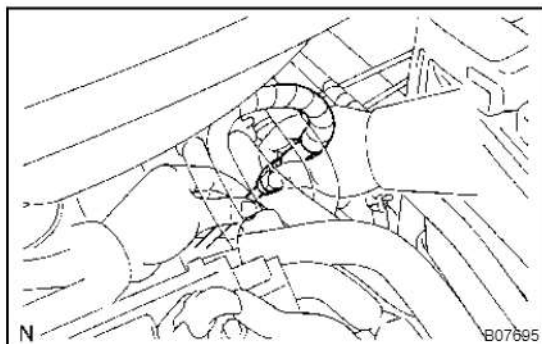
Torque:

1ZZ-FE: 19 N·m (190 kgf·cm, 14 ft·lbf)

2ZZ-GE: 29 N·m (290 kgf·cm, 21 ft·lbf)

- (n) Tighten the bolt holding the fuel pipe to the cylinder head.

Torque: 9 N·m (92 kgf·cm, 7 ft·lbf)



2. CONNECT FUEL TUBE

- (a) Connect the fuel tube (fuel tube connector) to the fuel pipe.

CAUTION:

Perform connecting operations of the connector (quick type) after observing the precautions.

- (b) Install the fuel pipe clamp.

3. INSTALL NO. 2 CYLINDER HEAD COVER

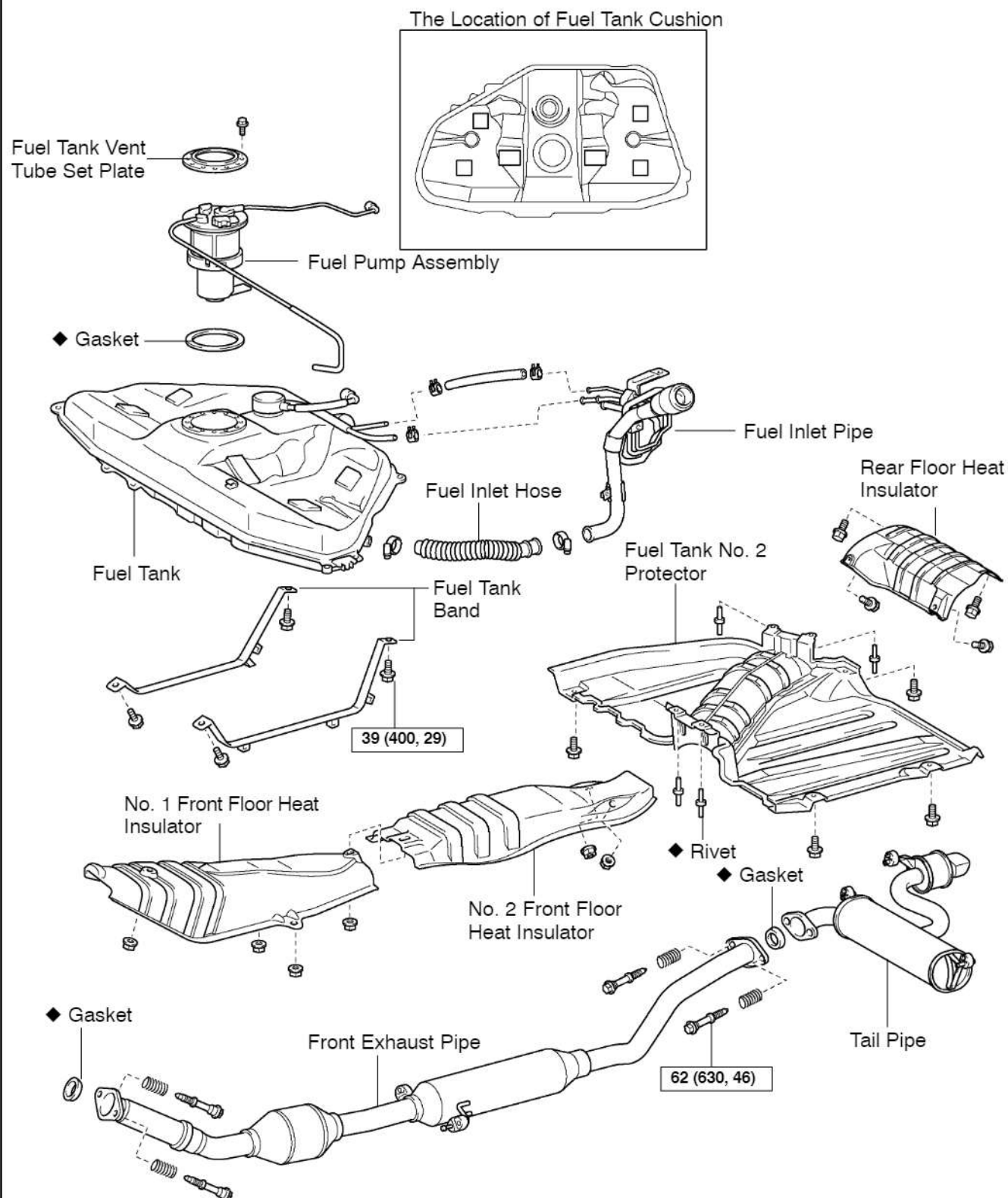
FUEL TANK AND LINE

SF09M-08

PRECAUTION

- Always use new gaskets when replacing the fuel tank or component parts.
- Apply the proper torque to all parts tightened.

COMPONENTS

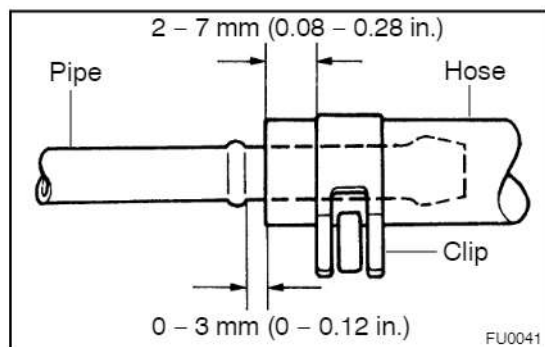
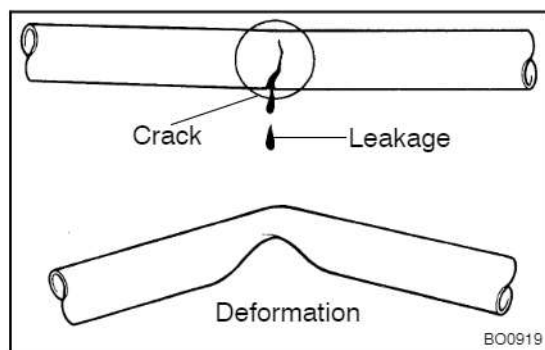


Y

N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non-reusable part
2005 CELICA (RM1131U)

B07704



INSPECTION

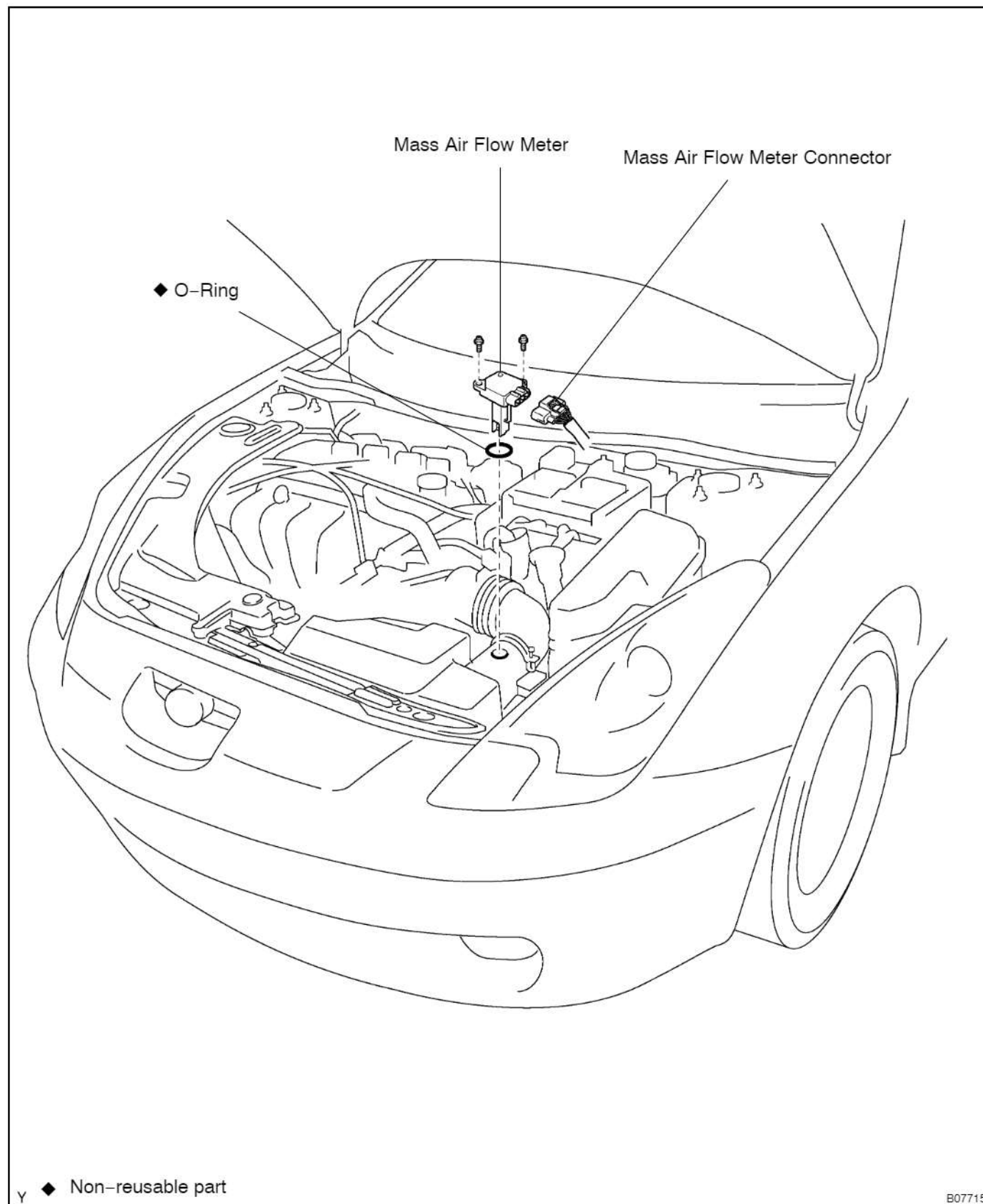
INSPECT FUEL TANK AND LINE

- Check the fuel lines for cracks or leakage, and all connections for deformation.
- Check the fuel tank for deformation, cracks fuel leakage or tank band looseness.
- Check the filter neck for damage or fuel leakage.
- Hose and tube connections are as shown in the illustration.

If a problem is found, repair or replace the part as necessary.

MASS AIR FLOW (MAF) METER COMPONENTS

SF07P-13

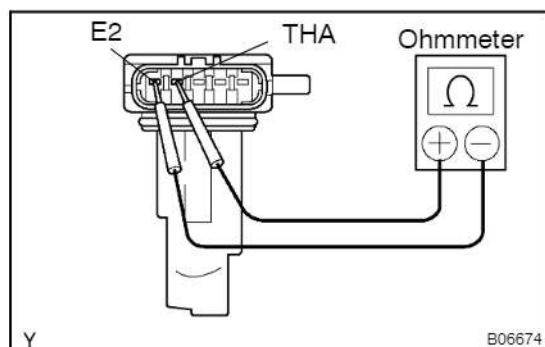


B07715

REMOVAL

REMOVE AIR FLOW METER

Remove the 2 screws, air flow meter and O-ring.



INSPECTION

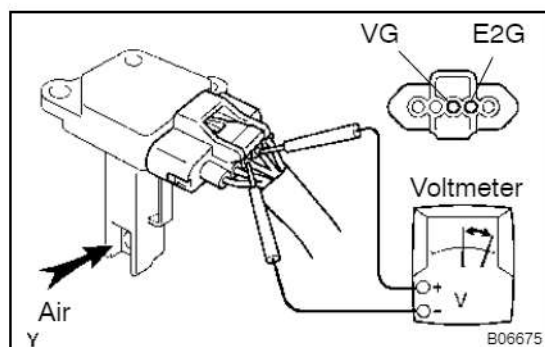
1. INSPECT MAF METER RESISTANCE

Using an ohmmeter, measure the resistance between terminals THA and E2.

Resistance:

Terminals	Resistance	Temperature
THA - E2	13.6 - 18.4 k Ω	-20°C (-4°F)
THA - E2	2.21 - 2.69 k Ω	20°C (68°F)
THA - E2	0.49 - 0.67 k Ω	60°C (140°F)

If the resistance is not as specified, replace the MAF meter.



2. INSPECT MAF METER OPERATION

- Connect the MAF meter connector.
- Turn the ignition switch to ON.
- Using a voltmeter, connect the positive (+) tester probe to terminal VG, and negative (-) tester probe to terminal E2G.
- Blow air into the MAF meter, and check that the voltage fluctuates.

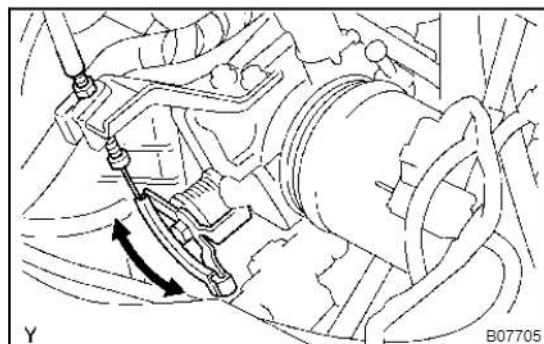
If operation is not as specified, replace the MAF meter.

- Turn the ignition switch LOCK.
- Disconnect the MAF meter connector.

INSTALLATION

INSTALL AIR FLOW METER

Install the air flow meter and a new O-ring with 2 screws.

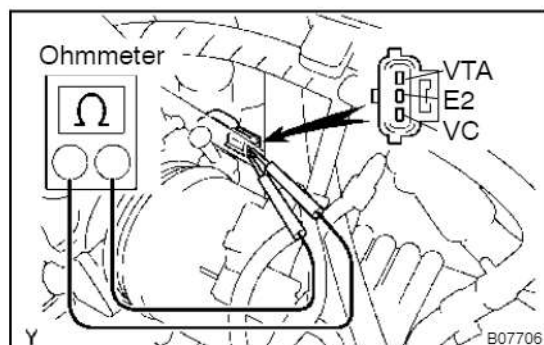


THROTTLE BODY (1ZZ-FE) ON-VEHICLE INSPECTION

SF05P-24

1. INSPECT THROTTLE BODY

Check that the throttle linkage moves smoothly.



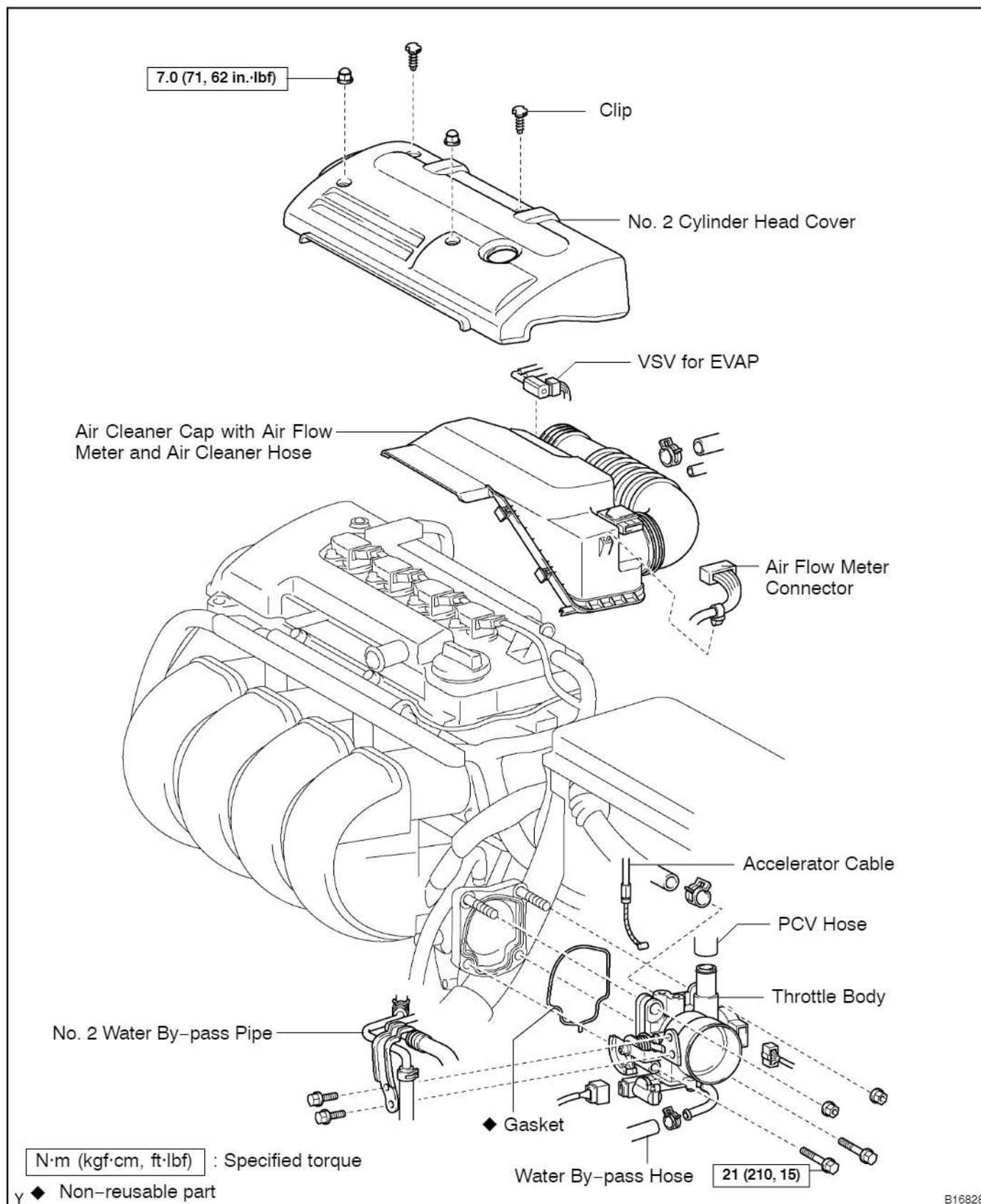
2. INSPECT THROTTLE POSITION SENSOR

- Remove the air cleaner assembly with air flow meter.
- Disconnect the throttle position sensor connector.
- Using an ohmmeter, measure the resistance between each terminal.

Clearance between lever and stop screw	Between terminals	Resistance
0 mm (0 in.)	VTA - E2	0.2 - 5.7 k Ω
Throttle valve fully open	VTA - E2	2.0 - 10.2 k Ω
-	VC - E2	2.5 - 5.9 k Ω

- Reconnect the throttle position sensor connector.
- Reinstall the air cleaner assembly with air flow meter.

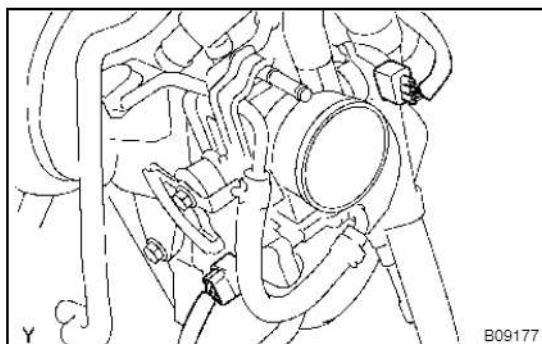
COMPONENTS



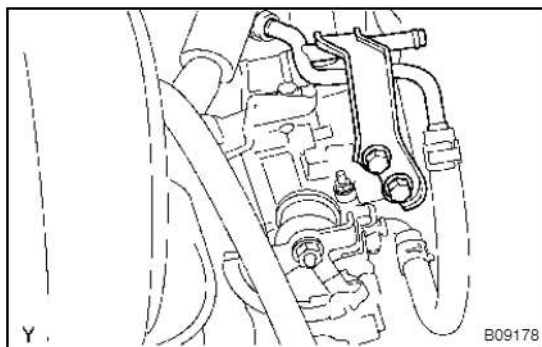
B16828

REMOVAL

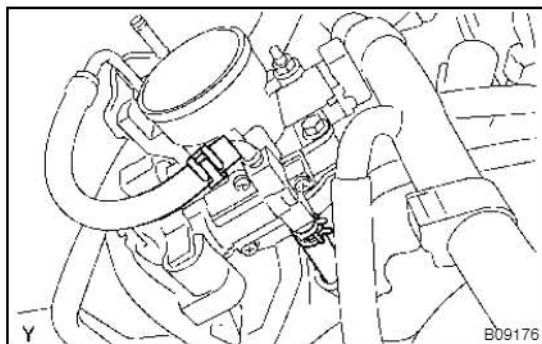
1. **DRAIN ENGINE COOLANT**
2. **DISCONNECT ACCELERATOR CABLE**
3. **REMOVE NO. 2 CYLINDER HEAD COVER**
4. **REMOVE AIR CLEANER HOSE AND CAP WITH MAF METER**
 - (a) Disconnect the VSV for EVAP.
 - (b) Disconnect the 2 air hoses from air cleaner cap.
 - (c) Loosen the air cleaner hose clamp bolt.
 - (d) Disconnect the mass air flow meter connector.
 - (e) Disconnect the 3 air cleaner cap clips.
 - (f) Disconnect the air cleaner hose from the throttle body, and remove the air cleaner cap together with the air cleaner hose.



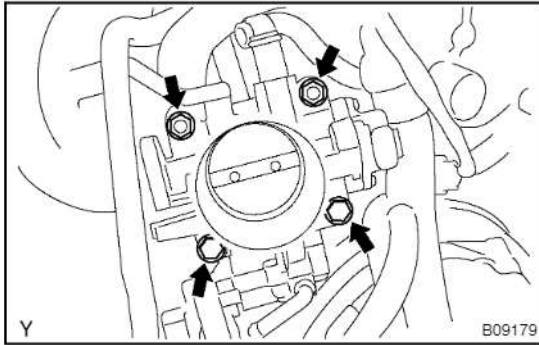
5. **REMOVE THROTTLE BODY**
 - (a) Disconnect the throttle position sensor connector.
 - (b) Disconnect the IAC valve connector.
 - (c) Disconnect the PCV hose from throttle body.



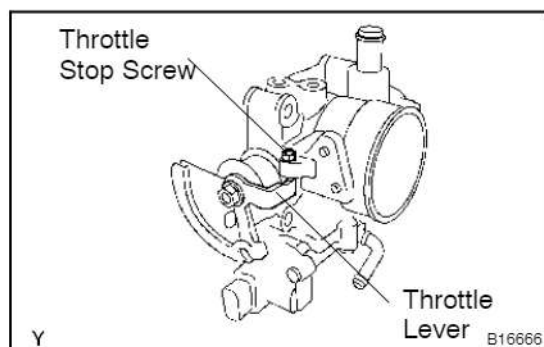
- (d) Remove the 2 bolts and disconnect the No. 2 water by-pass pipe.



- (e) Disconnect the 2 water by-pass hoses.



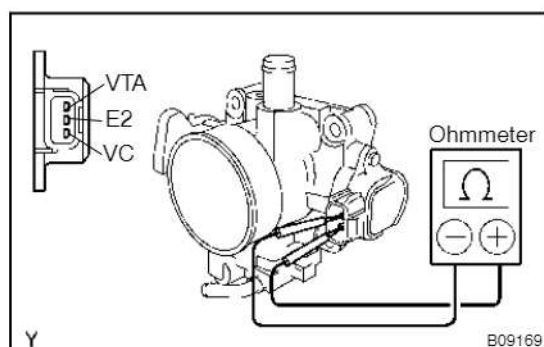
- (f) Remove the 2 bolts, 2 nuts and throttle body from the intake manifold.
- (g) Remove the throttle body gasket.



INSPECTION

1. INSPECT THROTTLE VALVE

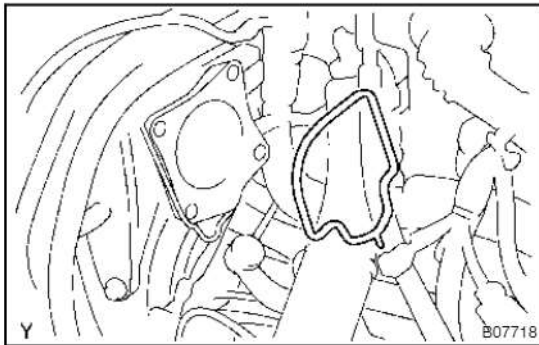
Check that there is no clearance between the throttle stop screw and throttle lever when the closed throttle position.



2. INSPECT THROTTLE POSITION SENSOR

Using an ohmmeter, measure the resistance between each terminal.

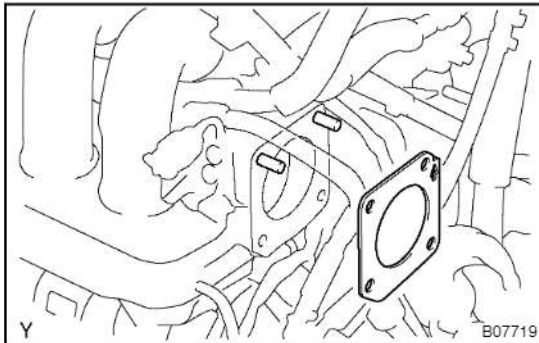
Clearance between lever and stop screw	Between terminals	Resistance
0 mm (0 in.)	VTA - E2	0.2 - 5.7 k Ω
Throttle valve fully open	VTA - E2	2.0 - 10.2 k Ω
-	VC - E2	2.5 - 5.9 k Ω



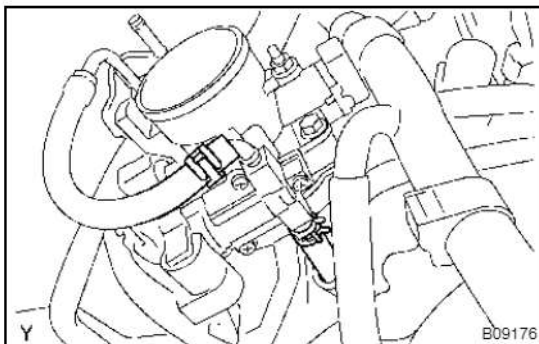
INSTALLATION

1. INSTALL THROTTLE BODY

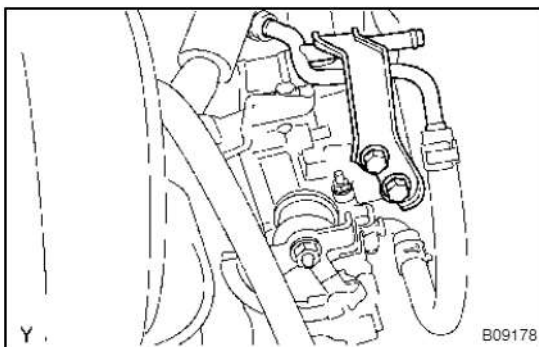
- (a) Install a new gasket on the intake manifold, as shown in the illustration.



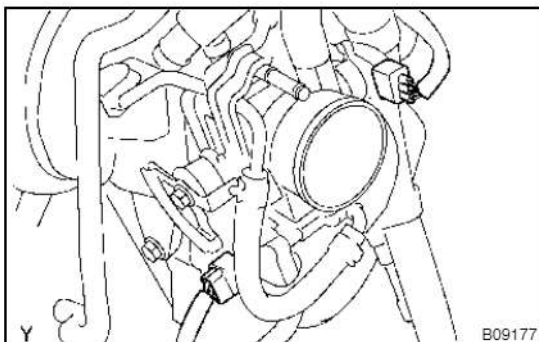
- (b) Install the throttle body with the 2 bolts and 2 nuts.
Torque: 21 N·m (210 kgf·cm, 15 ft·lbf)



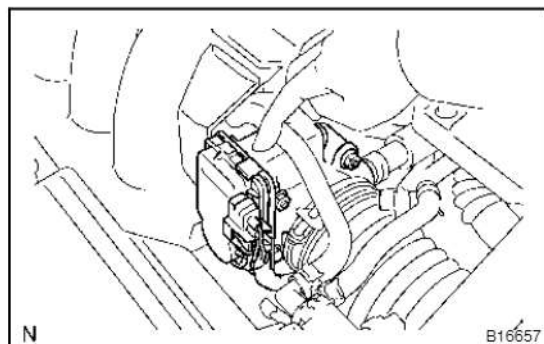
- (c) Connect the 2 water by-pass hoses to the throttle body.



- (d) Install the No. 2 water by-pass pipe with the 2 bolts.



- (e) Connect the IAC valve connector.
(f) Connect the throttle position sensor connector.
(g) Connect the PCV hose to throttle body.
- 2. INSTALL AIR CLEANER HOSE AND CAP WITH MAF METER**
- 3. INSTALL NO. 2 CYLINDER HEAD COVER**
- 4. FILL RADIATOR WITH ENGINE COOLANT**



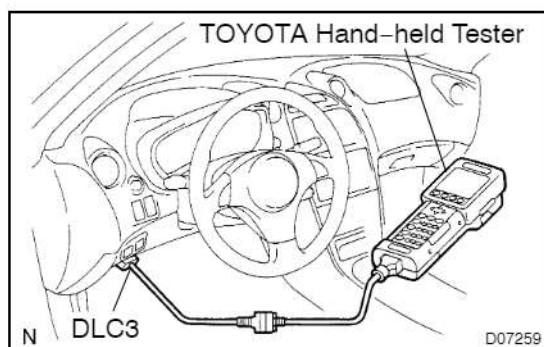
THROTTLE BODY (2ZZ-GE) ON-VEHICLE INSPECTION

FI02U-02

1. INSPECT SYSTEM OPERATION

- (a) Inspect the throttle control motor for operating sound.
 - (1) Turn the ignition switch to ON.
 - (2) When turning the accelerator pedal, check the running sound of the motor.

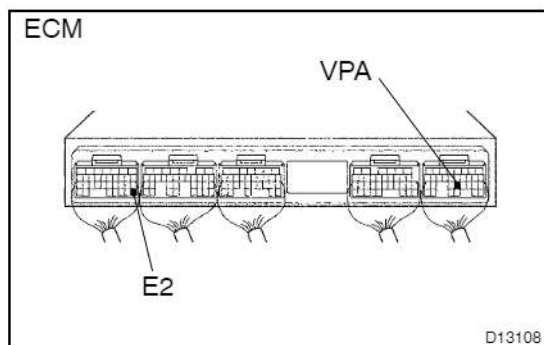
If operation is not as specified, check the throttle control motor (See step 3), wiring and ECM.



- (b) Inspect the accelerator pedal position sensor.
 - (1) Connect the TOYOTA hand-held tester to the DLC3.
 - (2) Turn the ignition switch to ON.
 - (3) Check that the MIL does not light up.
 - (4) When turning the accelerator pedal position sensor lever to the full-open position, check that the throttle valve opening percentage (THROTTLE POS) of the CURRENT DATA shows the standard value.

**Standard throttle valve opening percentage:
60% or more**

If operation is not as specified, check that the accelerator pedal position sensor (See page DI-391), wiring and ECM.



If you have no TOYOTA hand-held tester, measure voltage between terminals VPA and E2 of the ECM connector (See page DI-333).

- (c) Inspect the idle speed.
 - (1) Start the engine and check that the MIL does not light up.
 - (2) Allow the engine to warm up to normal operating temperature.

- (3) Turn the A/C conditioning ON to OFF, and check the idle speed.

Idle speed (Transmission in neutral):

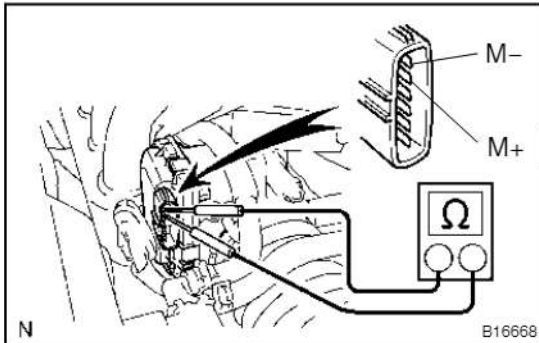
AT: 750 ± 50 rpm

MT: 800 ± 50 rpm

NOTICE:

Perform inspection under condition without electrical load.

- (d) After checking the above (b) to (d), perform the driving test and check that there is no sense of incongruity.



2. INSPECT THROTTLE CONTROL MOTOR

- (a) Disconnect the throttle control motor connector.
(b) Using an ohmmeter, measure the motor resistance between terminal 1 (M-) and 2 (M+).

Motor resistance: $0.3 - 100 \Omega$ at 20°C (68°F)

If the resistance is not as specified, replace the throttle body (See page SF-42).

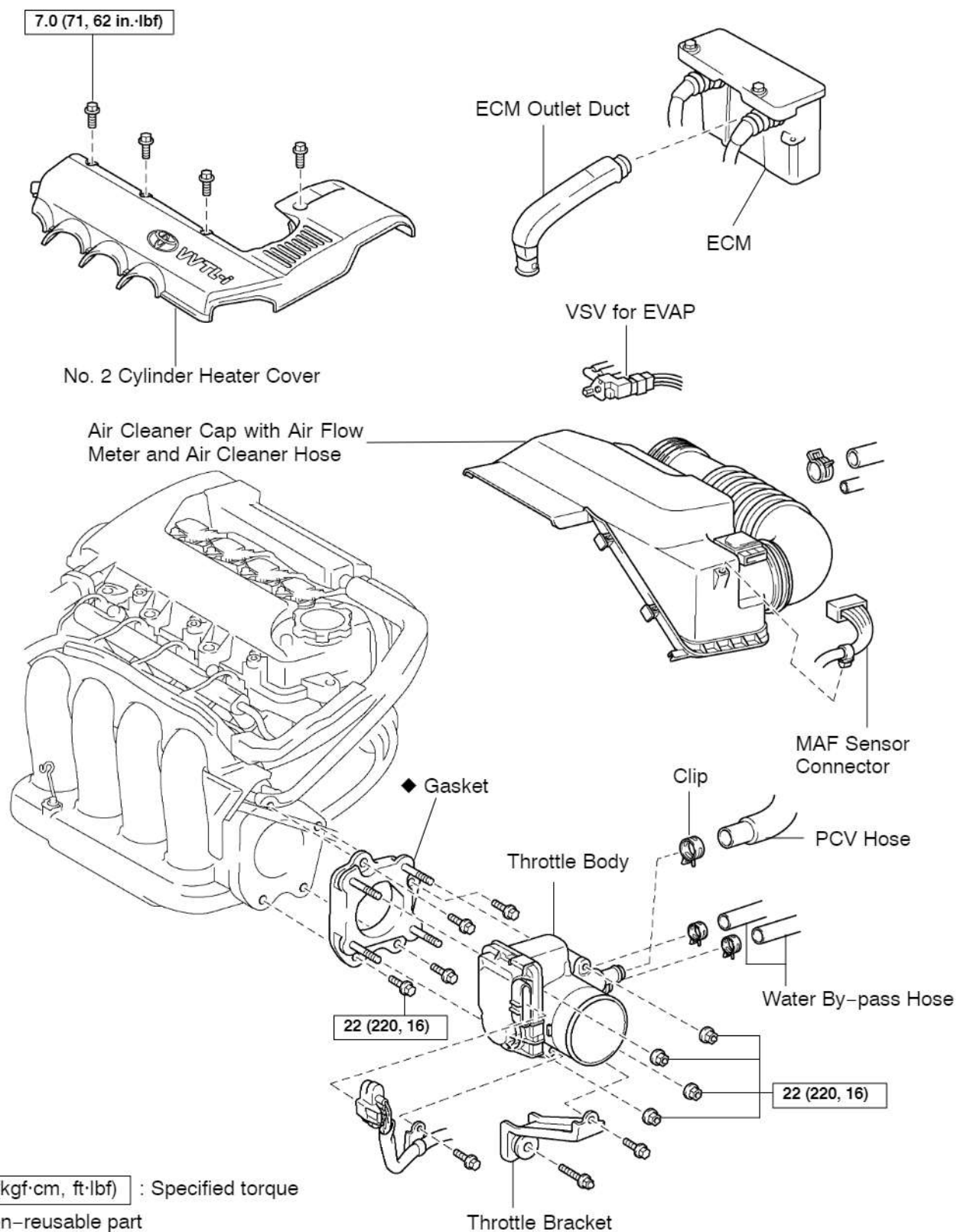
- (c) Reconnect the throttle control motor connector.

3. INSPECT THROTTLE POSITION SENSOR

(See page DI-597)

If necessary, replace the throttle position sensor (See page SF-76).

COMPONENTS

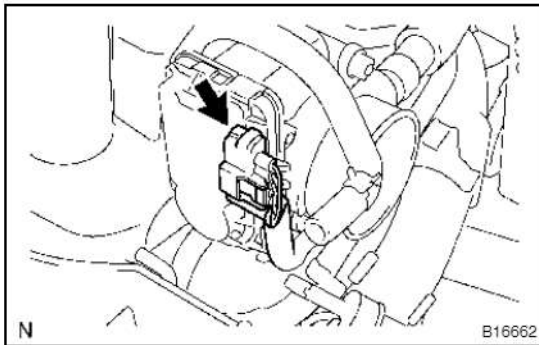


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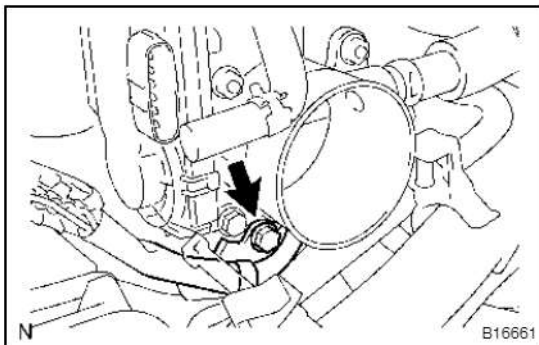
REMOVAL

1. **DISCONNECT BATTERY NEGATIVE TERMINAL**
2. **DRAIN ENGINE COOLANT**
3. **REMOVE NO.2 CYLINDER HEAD COVER**
4. **REMOVE AIR CLEANER HOSE AND CAP WITH MAF METER**
 - (a) Disconnect the VSV for EVAP.
 - (b) Disconnect the 2 air hoses from air cleaner cap.
 - (c) Loosen the air cleaner hose clamp bolt.
 - (d) Disconnect the mass air flow meter connector.
 - (e) Disconnect the 3 air cleaner cap clips.
 - (f) Disconnect the air cleaner hose from the throttle body, and remove the air cleaner cap together with the air cleaner hose.



5. **DISCONNECT THROTTLE BODY CONNECTOR**

Disconnect the throttle body connector.

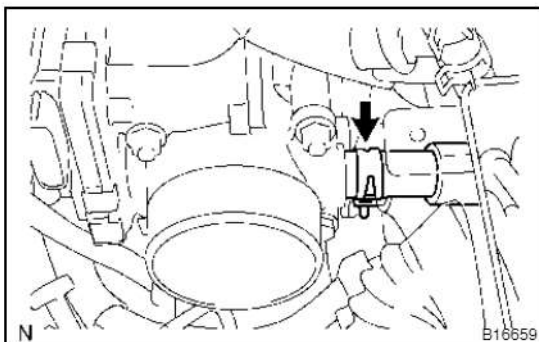


6. **DISCONNECT THROTTLE BODY WIRE HARNESS CLAMP**

Remove the bolt and disconnect the throttle body wire harness clamp from the throttle body.

7. **REMOVE THROTTLE BRACKET**

Remove the 2 bolts and throttle bracket from the throttle body.

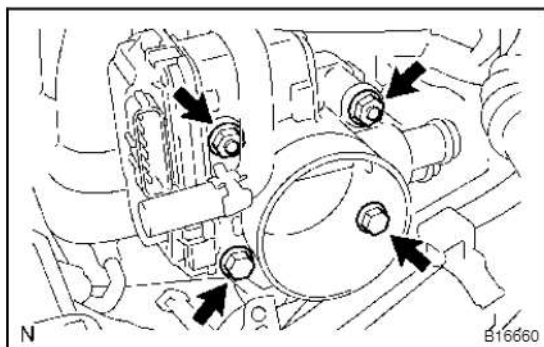


8. **DISCONNECT PCV HOSE**

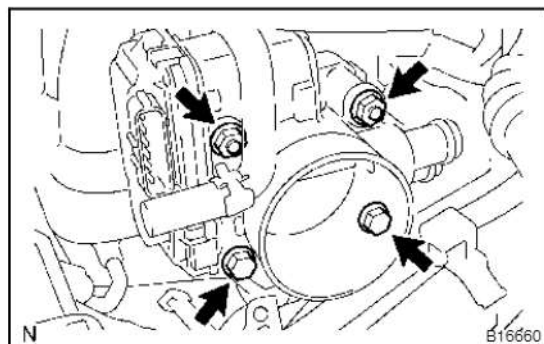
Slid the clip and disconnect the PCV hose.

9. **DISCONNECT 2 WATER BY-PASS HOSES**

Slid the clips and disconnect the 2 water by-pass hoses.

**10. REMOVE THROTTLE BODY**

- (a) Remove the 4 nuts and throttle body from the intake manifold.
- (b) Remove the 4 bolts and throttle body gasket.



INSTALLATION

1. INSTALL THROTTLE BODY

- (a) Install a new gasket on the intake manifold with the 4 bolts.

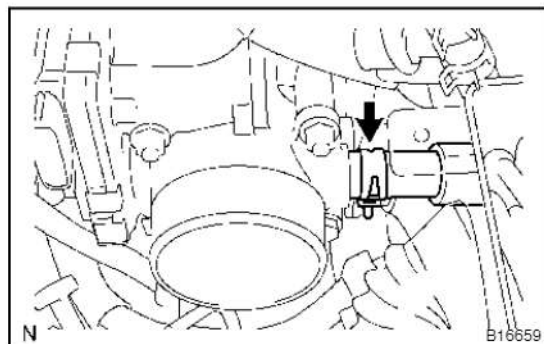
Torque: 22 N·m (220 kgf·cm, 16 ft·lbf)

- (b) Install the throttle body with the 4 nuts.

Torque: 22 N·m (220 kgf·cm, 16 ft·lbf)

2. CONNECT 2 WATER BYPASS HOSES

Connect the 2 water bypass hoses with the clips.

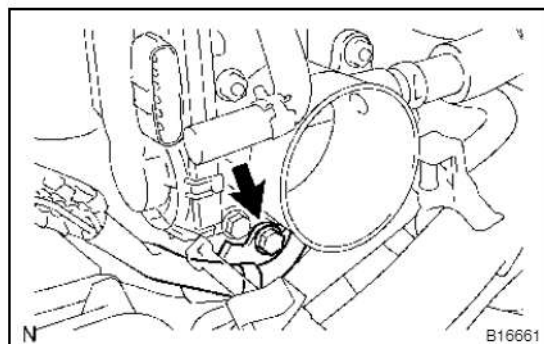


3. CONNECT PCV HOSE

Connect the PCV hose with the clip.

4. INSTALL THROTTLE BRACKET

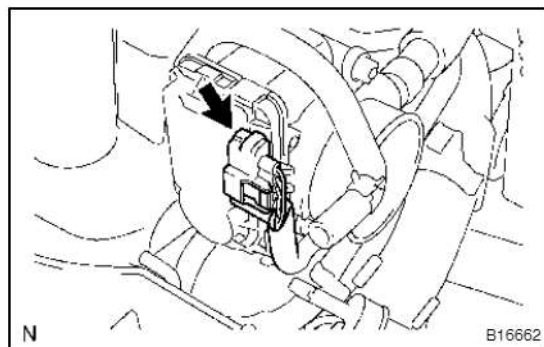
Install the throttle bracket with the 2 bolts.



5. CONNECT THROTTLE BODY WIRE HARNESS CLAMP

Connect the throttle body wire harness clamp with the bolt to the throttle body.

Torque: 5.0 N·m (51 kgf·cm, 44 in·lbf)



6. CONNECT THROTTLE BODY CONNECTOR

Connect the throttle body connector.

7. INSTALL AIR CLEANER HOSE AND CAP WITH MAF METER

8. INSTALL No.2 CYLINDER HEAD COVER

9. FILL RADIATOR WITH ENGINE COOLANT

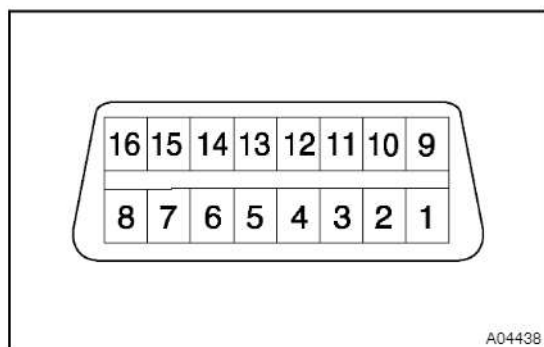
10. CONNECT BATTERY NEGATIVE TERMINAL

IDLE AIR CONTROL (IAC) VALVE ON-VEHICLE INSPECTION

9F09U-12

INSPECT IAC VALVE OPERATION

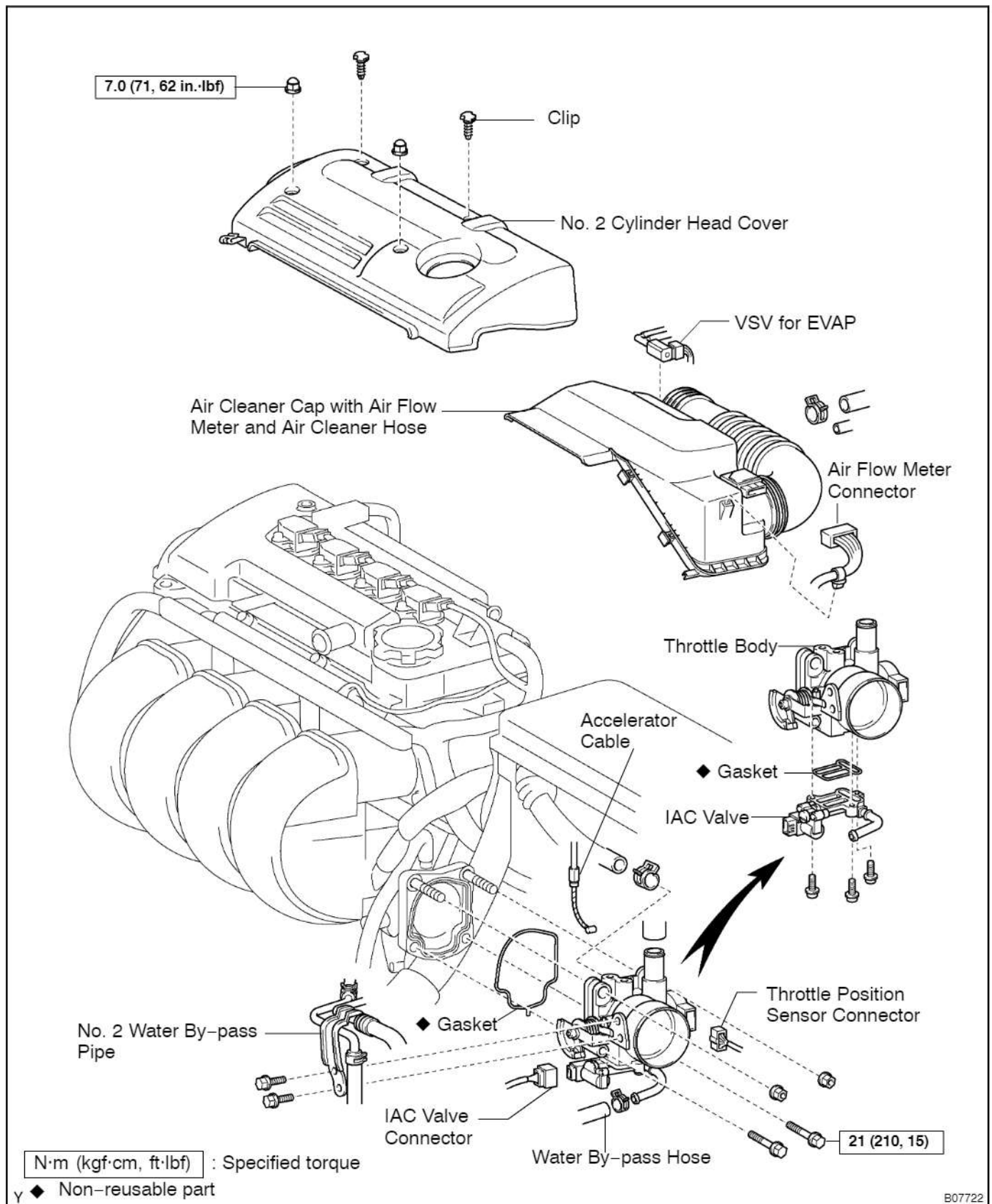
- (a) Initial conditions:
- Engine at normal operating temperature
 - Idle speed set correctly
 - Transmission in neutral
 - A/C switch OFF



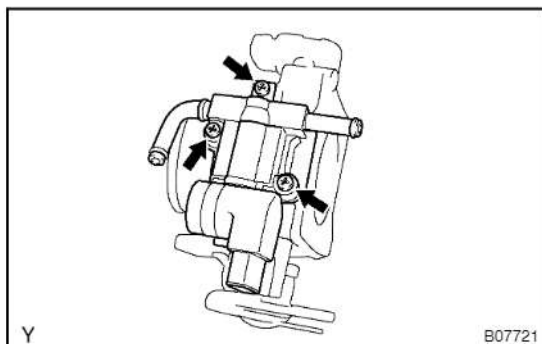
A04438

- (b) Using SST, connect terminals TC and CG of the DLC3.
SST 09843-18020
- (c) After engine speed are kept at 900 – 1,300 rpm for 5 seconds, check that they return to idle speed.
If the rpm operation is not as specified, check the IAC valve, wiring and ECM.
- (d) Remove the SST from the DLC3.
SST 09843-18020

COMPONENTS



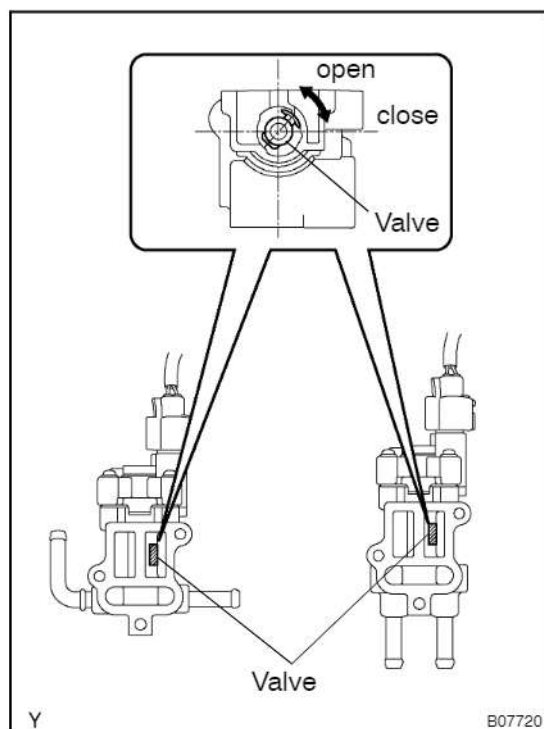
B07722



REMOVAL

1. REMOVE THROTTLE BODY
(See page SF-35)
2. REMOVE IAC VALVE

Remove the 4 screws, IAC valve and gasket.



INSPECTION

INSPECT IAC VALVE OPERATION

- Check that the IAC valve is half opened.
- Connect the IAC valve connector to the IAC valve.
- Disconnect the ECT sensor connector from the ECT sensor.
- Turn the ignition switch ON.
- Check that the IAC valve moves.

HINT:

Repeat connecting and disconnecting of IAC valve connector several times and check the operation of the valve.

If operation is not as specified, replace the IAC valve.

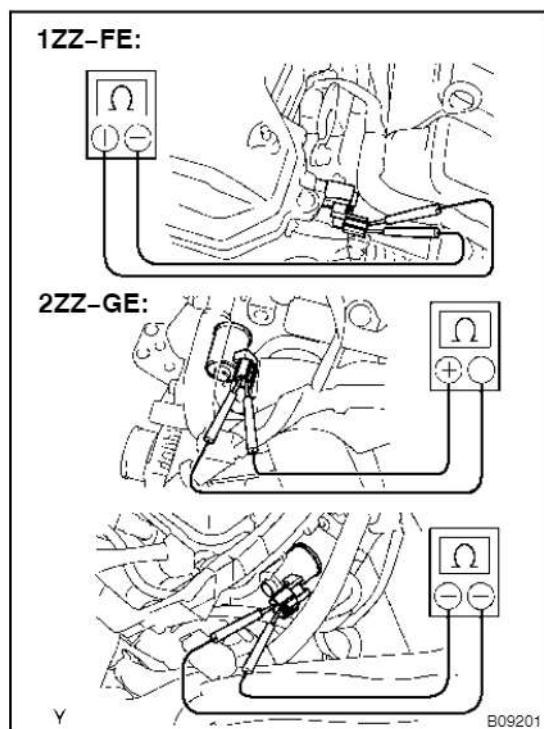
- Turn the ignition switch OFF.
- Connect the ECT sensor connector to the ECT sensor.
- Disconnect the IAC valve connector from the IAC valve.

INSTALLATION

Installation is in reverse order of removal (See page SF-47).

HINT:

Install the IAC valve with a new gasket.



CAMSHAFT TIMING OIL CONTROL VALVE

SFOSL-28

ON-VEHICLE INSPECTION

INSPECT OIL CONTROL VALVE RESISTANCE

- (a) Remove the No. 2 cylinder head cover.
- (b) 2ZZ-GE:
Disconnect the 2 PCV hoses.
- (c) Disconnect the oil control valve connector.
- (d) Using an ohmmeter, measure the resistance between the terminals.

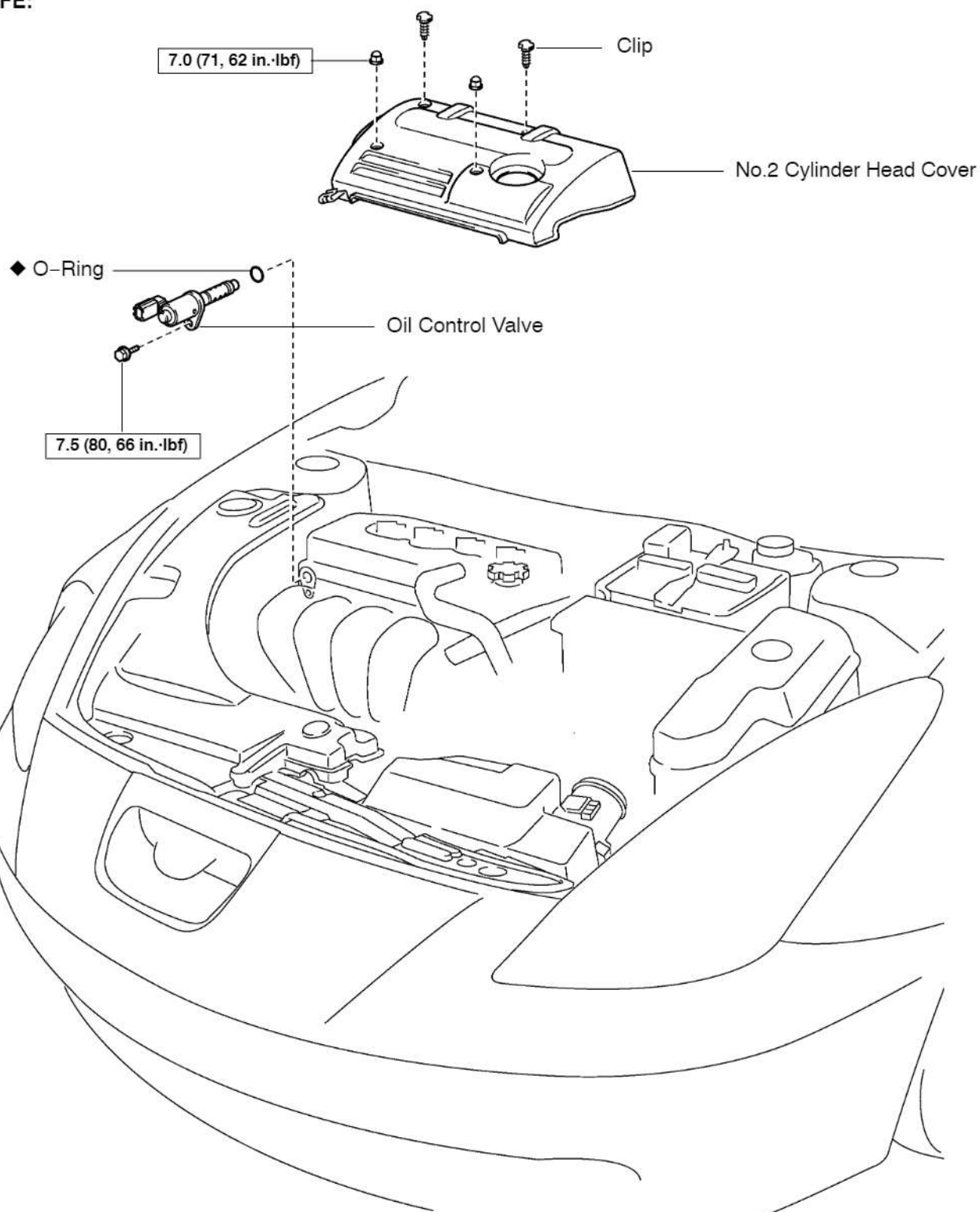
Resistance: 6.9 – 7.9 Ω at 20°C (68°F)

If the resistance is not as specified, replace the valve.

- (e) Reconnect the oil control valve connector.
- (f) Reinstall the V-bank cover.

COMPONENTS

1ZZ-FE:

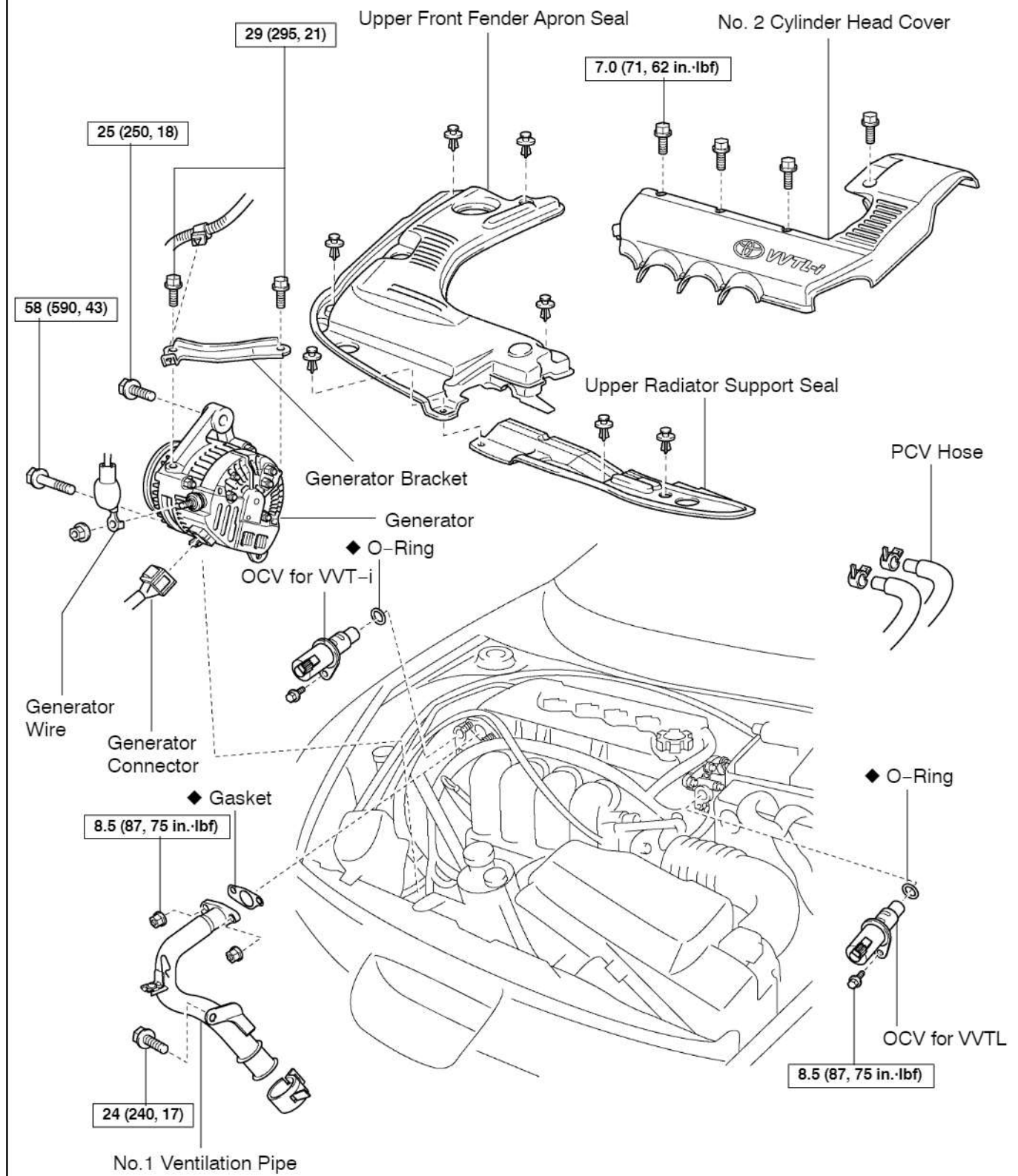


N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non-reusable part

B09200

2ZZ-GE:



Y

N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non-reusable part

B07724

REMOVAL

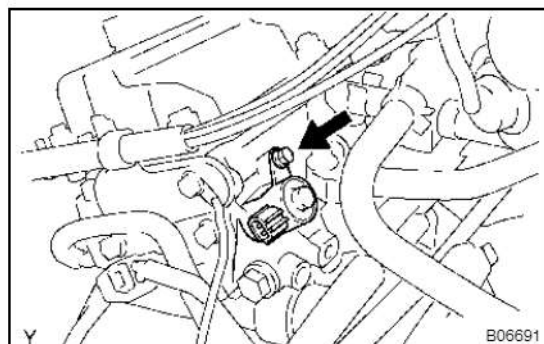
1. REMOVE NO. 2 CYLINDER HEAD COVER
2. 2ZZ-GE:
DISCONNECT 2 PCV HOSES, UPPER FRONT FENDER APRONS EAL AND UPPER RADIATOR SUPPORT SEAL
3. 2ZZ-GE:
REMOVE GENERATOR (See page CH-7)
4. 2ZZ-GE:
REMOVE NO. 1 VENTILATION PIPE

(a) Remove the 2 nuts, bolt and gasket.

HINT:

At the time of installation, please refer to the following items.
Use a new gasket.

(b) Remove the hose clamp and disconnect No.1 ventilation pipe.



5. 1ZZ-FE:
REMOVE CAMSHAFT TIMING OIL CONTROL VALVE

(a) Disconnect the oil control valve connector.

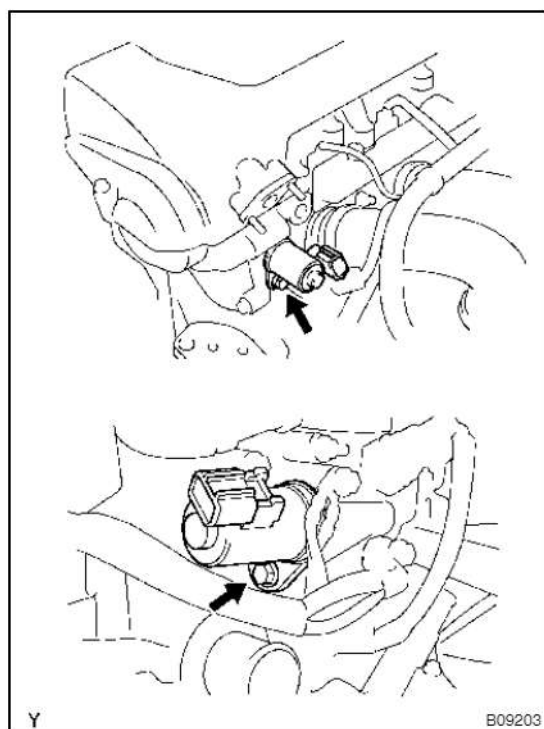
(b) Remove the bolt and oil control valve.

Torque: 7.5 N·m (80 kgf·cm, 66 in·lbf)

(c) Remove the O-ring from the oil control valve.

HINT:

At the time of installation, please refer to the following items.
Use a new O-ring.



6. 2ZZ-GE:
REMOVE 2 CAMSHAFT TIMING OIL CONTROL VALVES

(a) Disconnect the oil control valve connector.

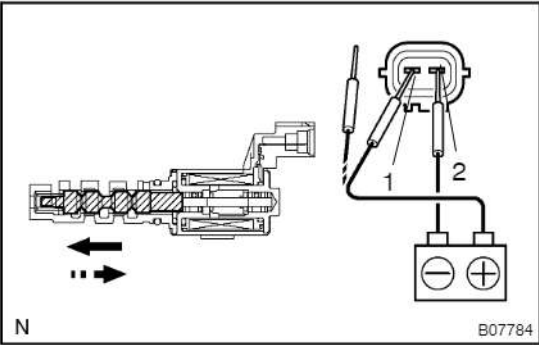
(b) Remove the 2 bolts and oil control valves.

Torque: 8.5 N·m (87 kgf·cm, 75 in·lbf)

(c) Remove the O-ring from the each oil control valve.

HINT:

At the time of installation, please refer to the following items.
Use a new O-ring.



INSPECTION

INSPECT CAMSHAFT OIL CONTROL VALVE OPERATION

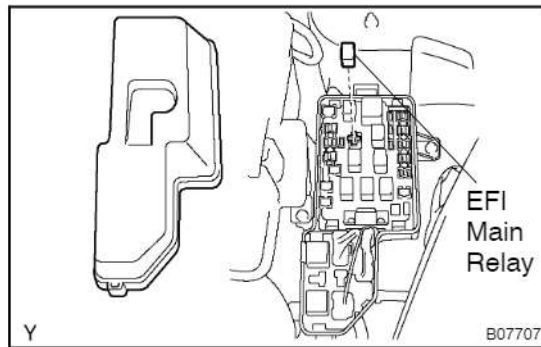
Connect the positive (+) lead from the battery to terminal 1 and negative (-) lead to terminal 2, and check the movement of the valve.

Battery positive voltage is applied	Valve moves in  direction
Battery positive voltage is cut off	Valve moves in  direction

If operation is not as specified, replace the valve.

INSTALLATION

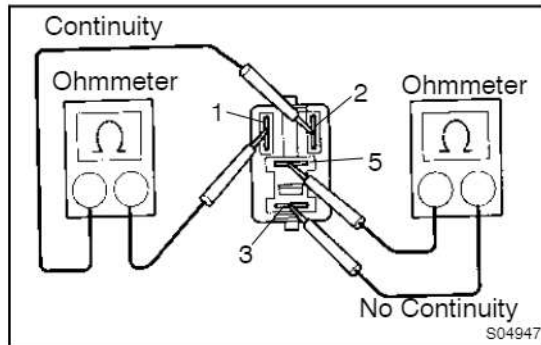
Installation is in the reverse order of removal. (See page SF-53)



EFI MAIN RELAY INSPECTION

9F09Z-28

1. REMOVE EFI MAIN RELAY (Marking: EFI)



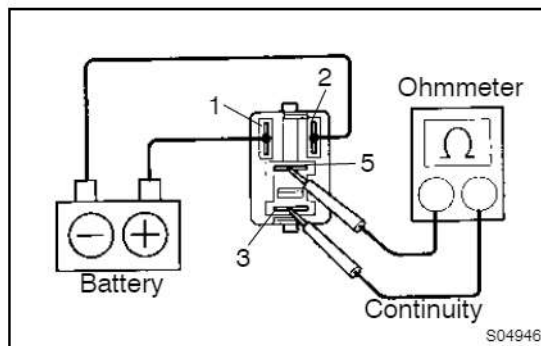
2. INSPECT EFI MAIN RELAY CONTINUITY

- (a) Using an ohmmeter, check that there is continuity between terminals 1 and 2.

If there is no continuity, replace the relay.

- (b) Check that there is no continuity between terminals 3 and 5.

If there is continuity, replace the relay.



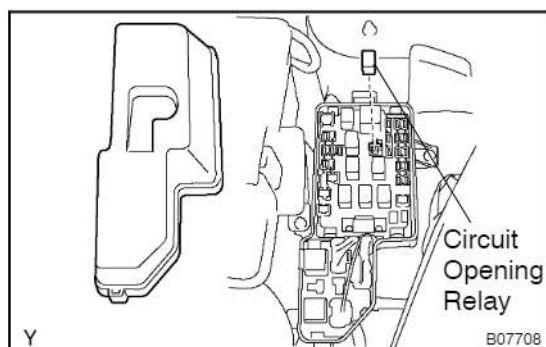
3. INSPECT EFI MAIN RELAY OPERATION

- (a) Apply battery voltage across terminals 1 and 2.

- (b) Using an ohmmeter, check that there is continuity between terminals 3 and 5.

If there is no continuity, replace the relay.

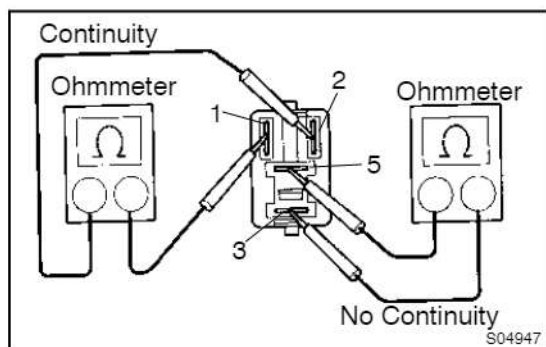
4. REINSTALL EFI MAIN RELAY



CIRCUIT OPENING RELAY INSPECTION

SF040-22

1. REMOVE CIRCUIT OPENING RELAY



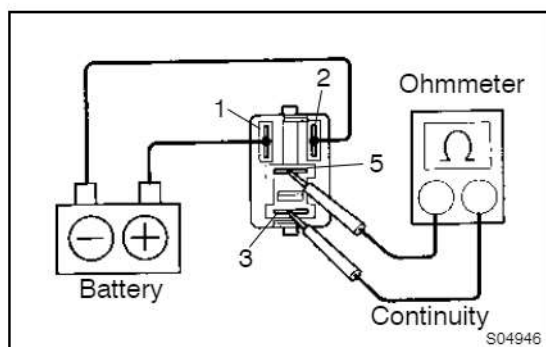
2. INSPECT CIRCUIT OPENING RELAY CONTINUITY

- (a) Using an ohmmeter, check that there is continuity between terminals 1 and 2.

If there is no continuity, replace the relay.

- (b) Check that there is no continuity between terminals 3 and 5.

If there is continuity, replace the relay.



3. INSPECT CIRCUIT OPENING RELAY OPERATION

- (a) Apply battery voltage across terminals 1 and 2.

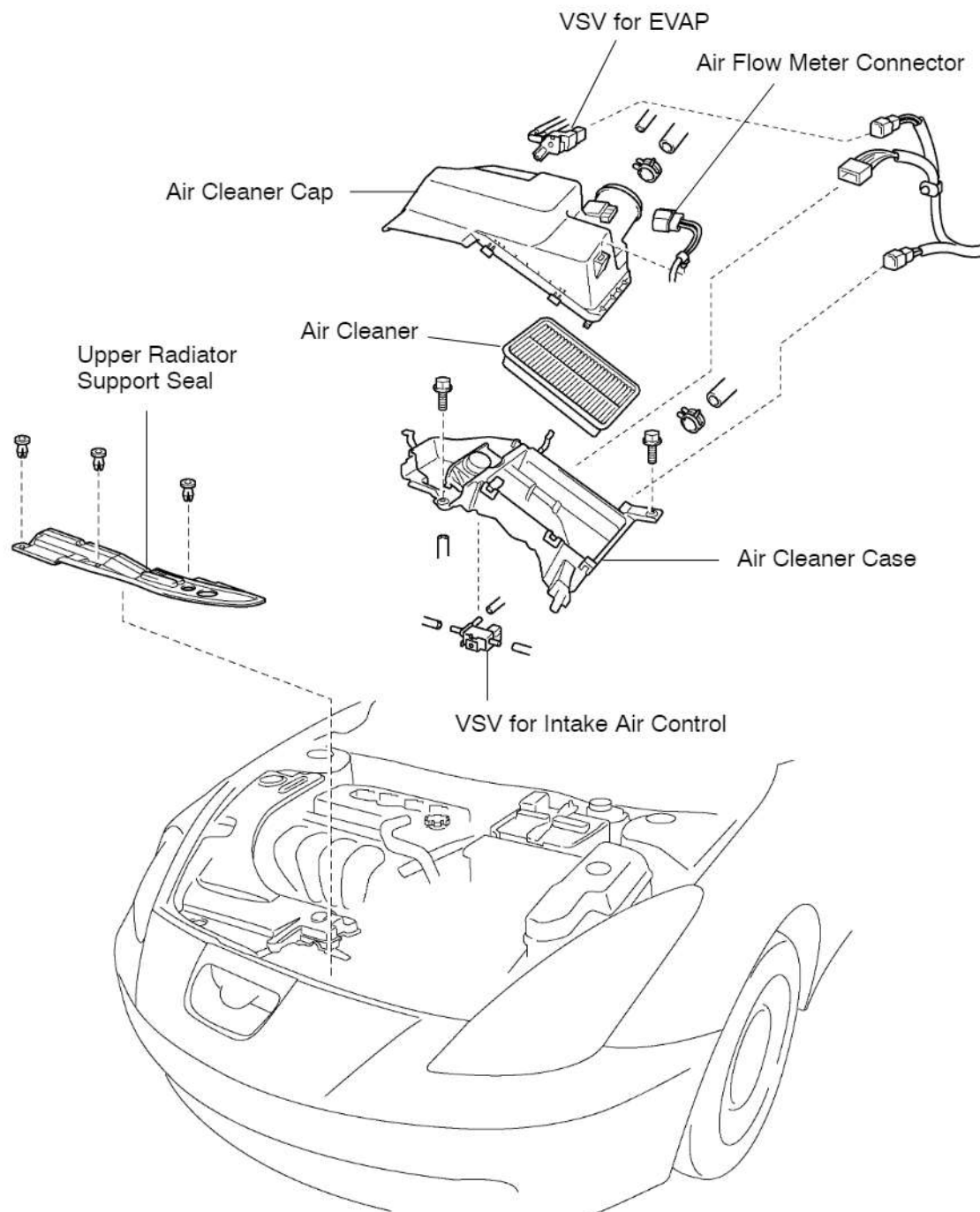
- (b) Using an ohmmeter, check that there is continuity between terminals 3 and 5.

If there is no continuity, replace the relay.

4. REINSTALL CIRCUIT OPENING RELAY

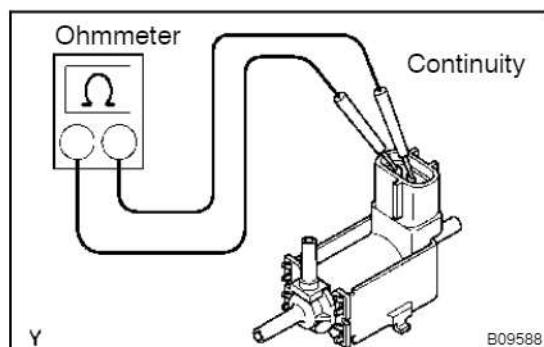
VSV FOR INTAKE AIR CONTROL VALVE COMPONENTS

SF018-11



Y

B09180



INSPECTION

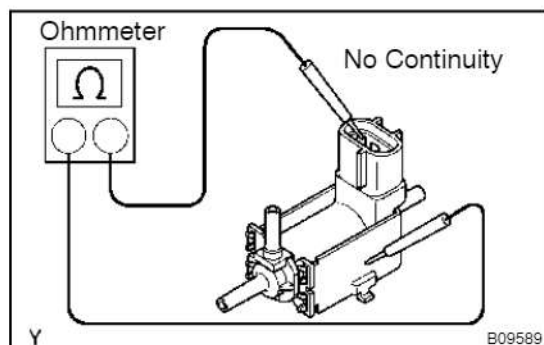
INSPECT VSV

- (a) Inspect the VSV for open circuit.

Using an ohmmeter, check that there is no continuity between the terminals.

Resistance: 37 – 44 Ω at 20°C (68°F)

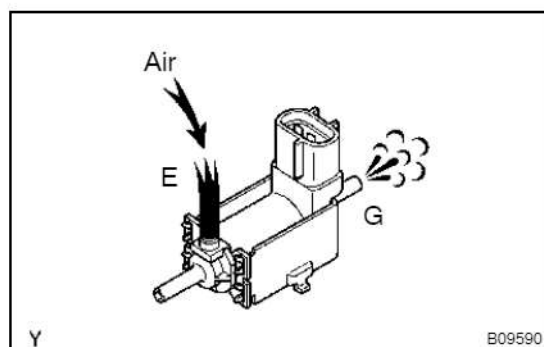
If there is no continuity, replace the VSV.



- (b) Inspect the VSV for ground.

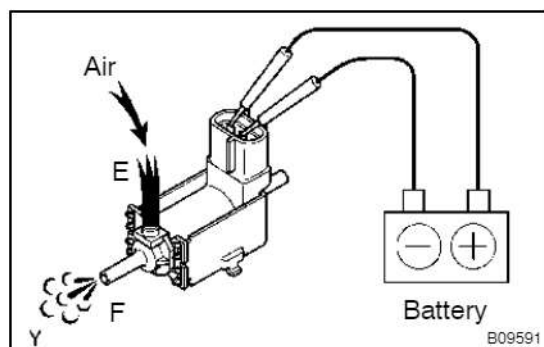
Using an ohmmeter, check that there is no continuity between each terminal and the body.

If there is continuity, replace the VSV.



- (c) Inspect the VSV operation.

- (1) Check that air flows from ports E to G.



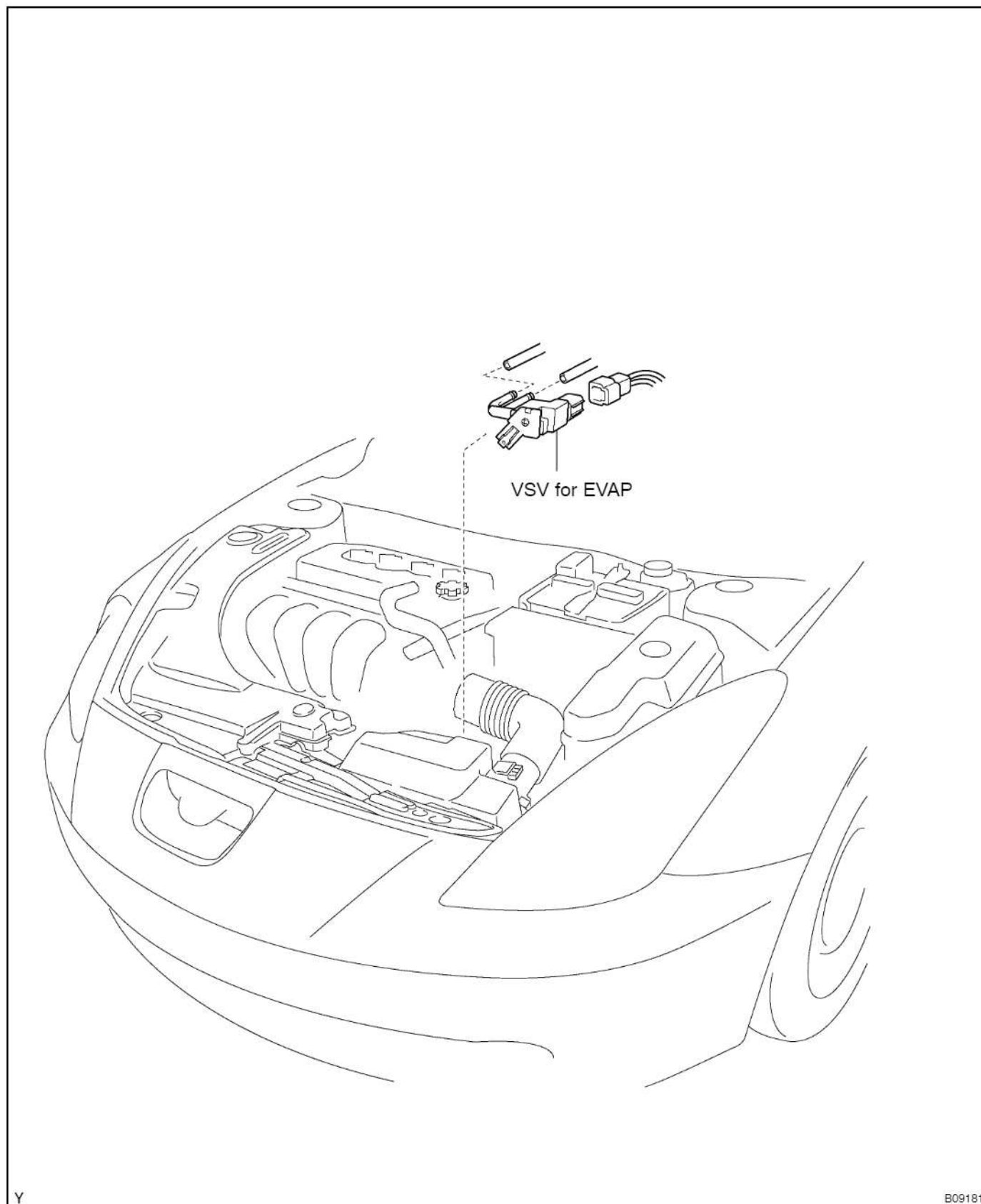
- (2) Apply battery positive voltage across the terminals.

- (3) Check that air flows from ports E to F.

If operation is not as specified, replace the VSV.

VSV FOR EVAPORATIVE EMISSION (EVAP) COMPONENTS

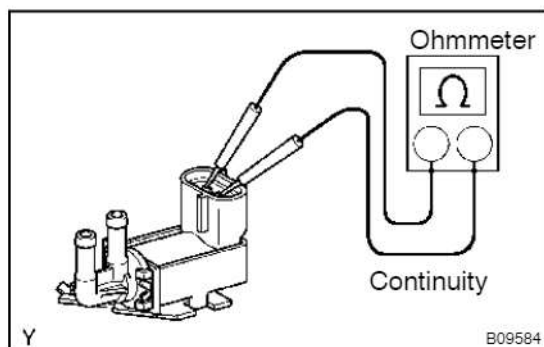
SF15W-07



INSPECTION

1. REMOVE VSV

- Disconnect the 2 EVAP hoses from the VSV.
- Disconnect the VSV connector.
- Remove the bolt and VSV.

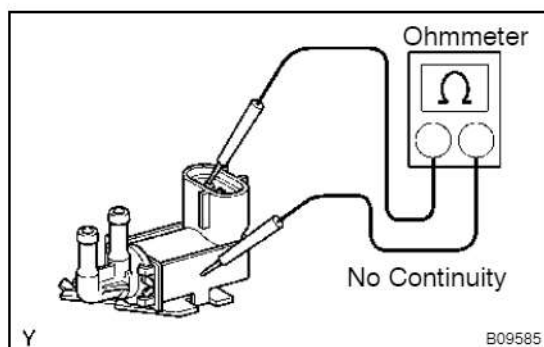


2. INSPECT VSV FOR OPEN CIRCUIT

Using an ohmmeter, check that there is continuity between the terminals.

Resistance: 27 – 33 Ω at 20°C (68°F)

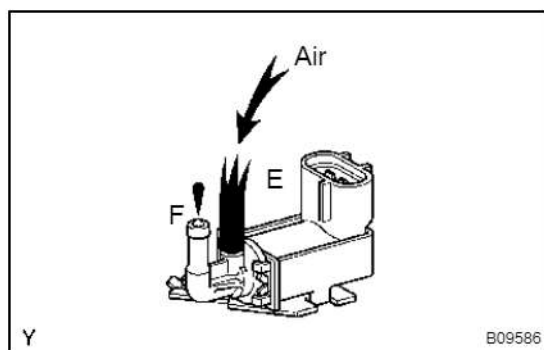
If there is no continuity, replace the VSV.



3. INSPECT VSV FOR GROUND

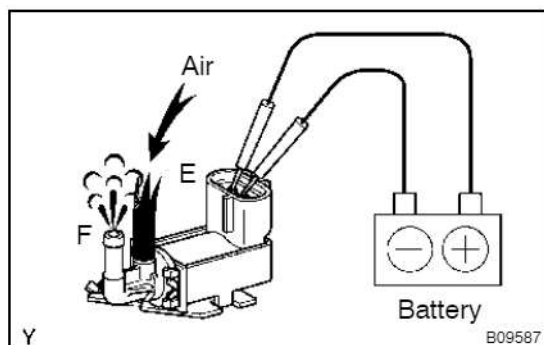
Using an ohmmeter, check that there is no continuity between each terminal and the body.

If there is continuity, replace the VSV.



4. INSPECT VSV OPERATION

- Check that air flows with difficulty from port E to port F.



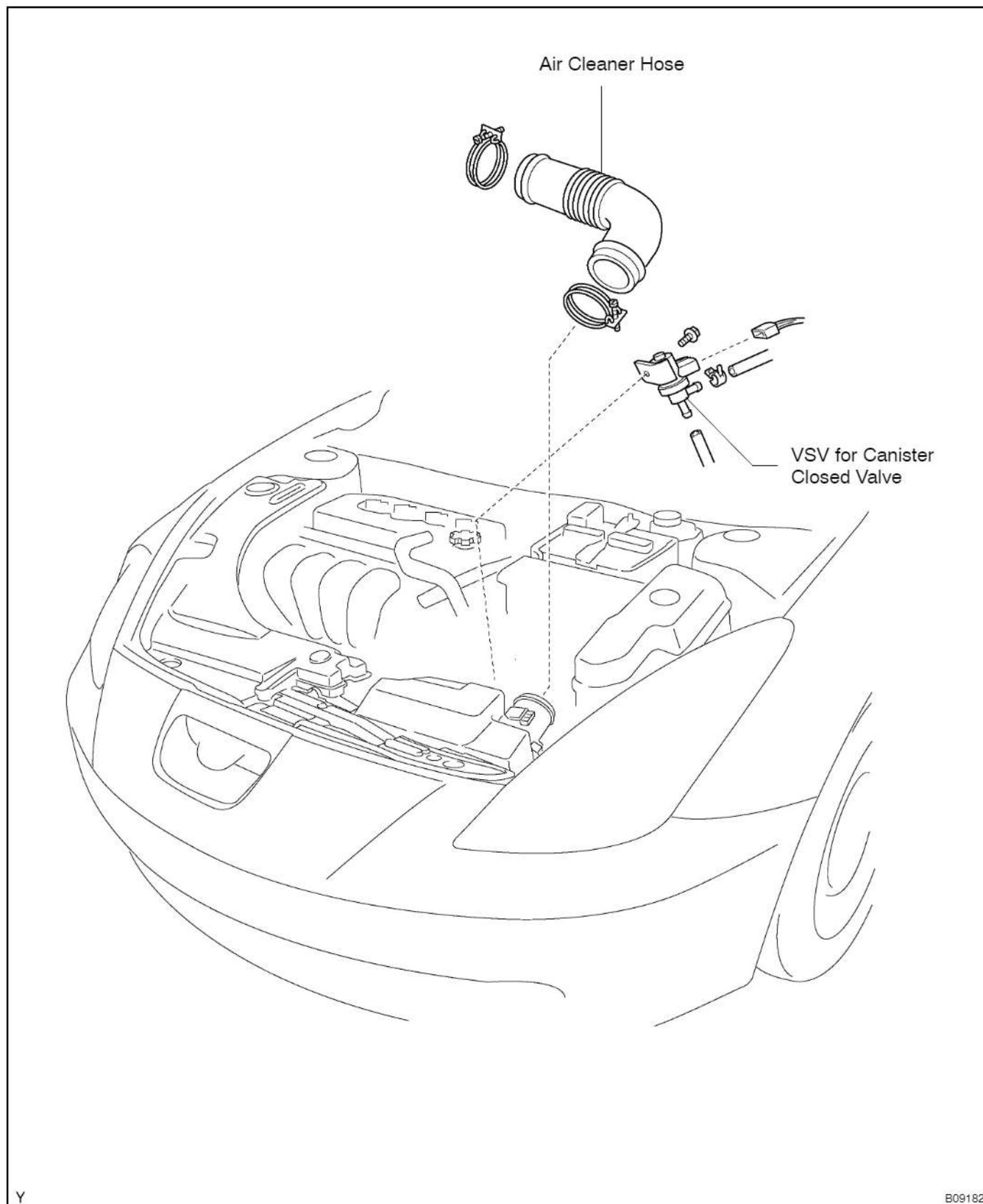
- Apply battery voltage across the terminals.
 - Check that air flows from port E to port F.
- If operation is not as specified, replace the VSV.

5. REINSTALL VSV

- Install the VSV with the bolt.
- Connect the VSV with the bolt.
- Connect the 2 EVAP hoses to the VSV.

VSV FOR CANISTER CLOSED VALVE (CCV) COMPONENTS

SF15Y-08

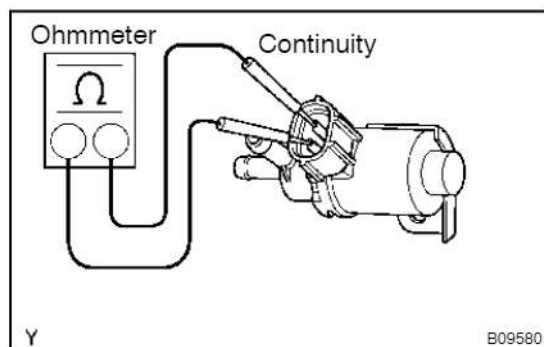


Y

B09182

INSPECTION

1. REMOVE VSV



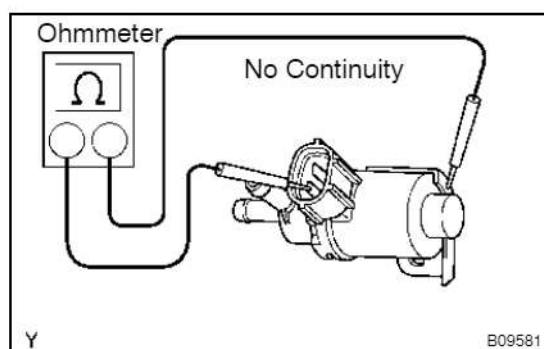
2. INSPECT VSV FOR OPEN CIRCUIT

Using an ohmmeter, check that there is continuity between the terminals.

Resistance:

At 20°C (68°F)	24 – 30 Ω
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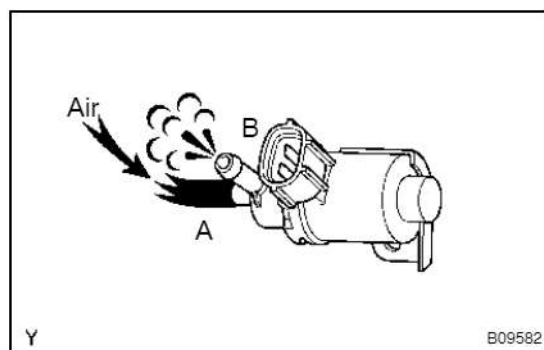
If there is no continuity, replace the VSV.



3. INSPECT VSV FOR GROUND

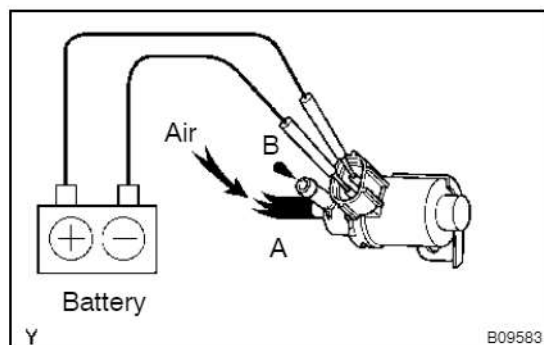
Using an ohmmeter, check that there is no continuity between each terminal and the body.

If there is no continuity, replace the VSV.



4. INSPECT VSV OPERATION

- (a) Check that air flows from ports A to B.



- (b) Apply battery positive voltage across the terminals.

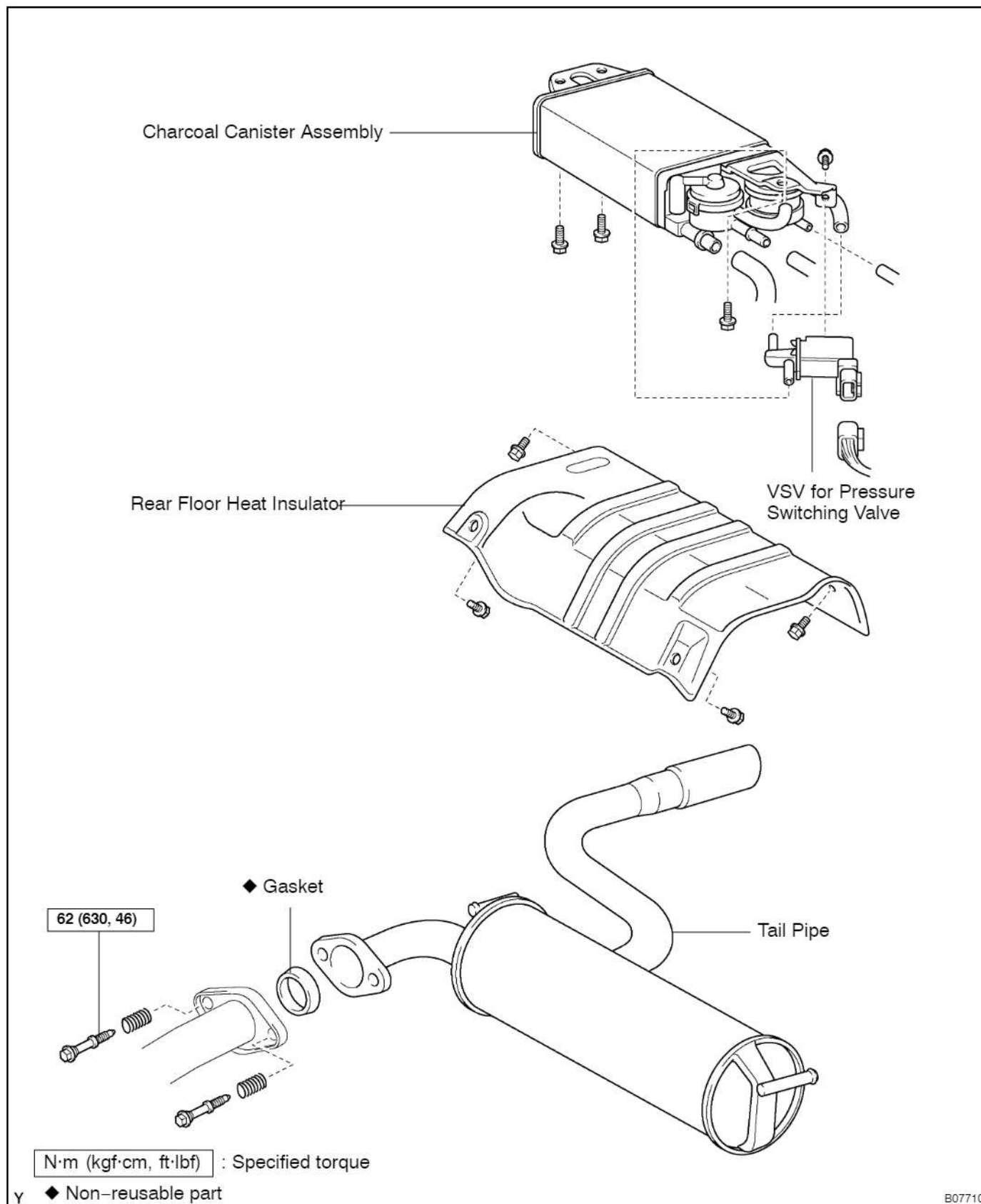
- (c) Check that air does not flow from ports A to B.

If operation is not as specified, replace the VSV.

5. REINSTALL VSV

VSV FOR PRESSURE SWITCHING VALVE COMPONENTS

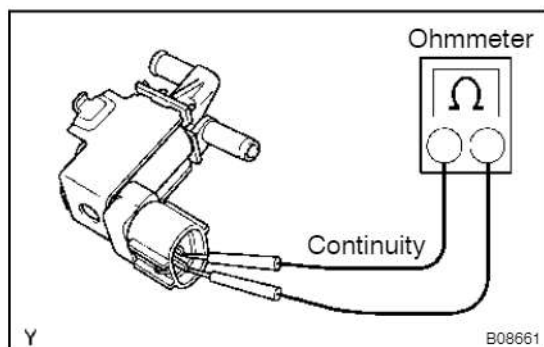
SF180-07



B07710

INSPECTION

1. REMOVE VSV



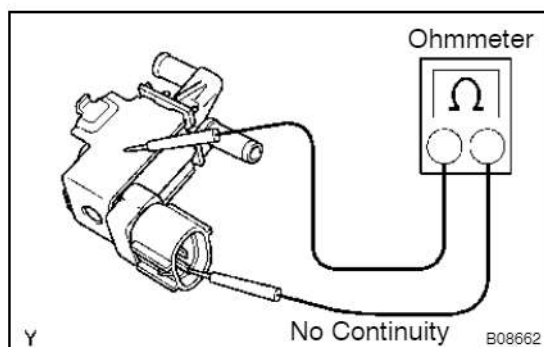
2. INSPECT VSV FOR OPEN CIRCUIT

Using an ohmmeter, check that there is continuity between the terminals.

Resistance:

At 20°C (68°F)	37 – 44 Ω
At 120°C (248°F)	51 – 62 Ω

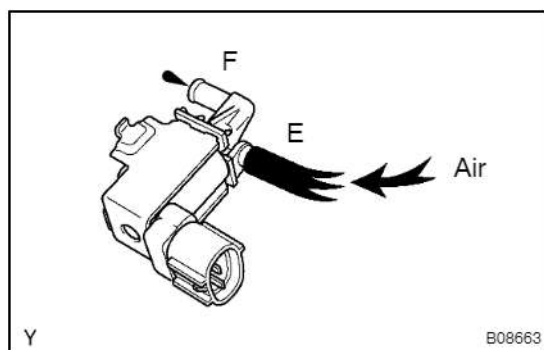
If there is no continuity, replace the VSV.



3. INSPECT VSV FOR GROUND

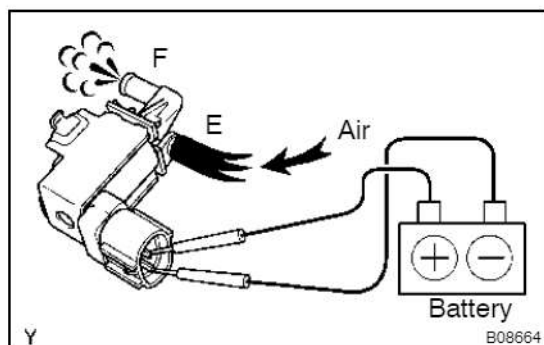
Using an ohmmeter, check that there is no continuity between each terminal and the body.

If there is no continuity, replace the VSV.



4. INSPECT VSV OPERATION

- (a) Check that air does not flow from ports E to F.



- (b) Apply battery positive voltage across the terminals.

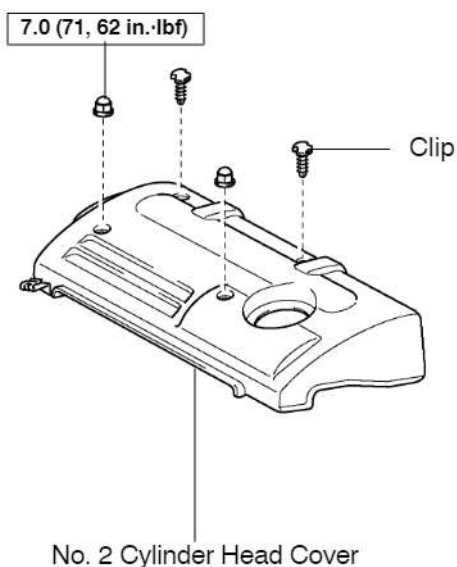
- (c) Check that air flows from ports E to F.

If operation is not as specified, replace the VSV.

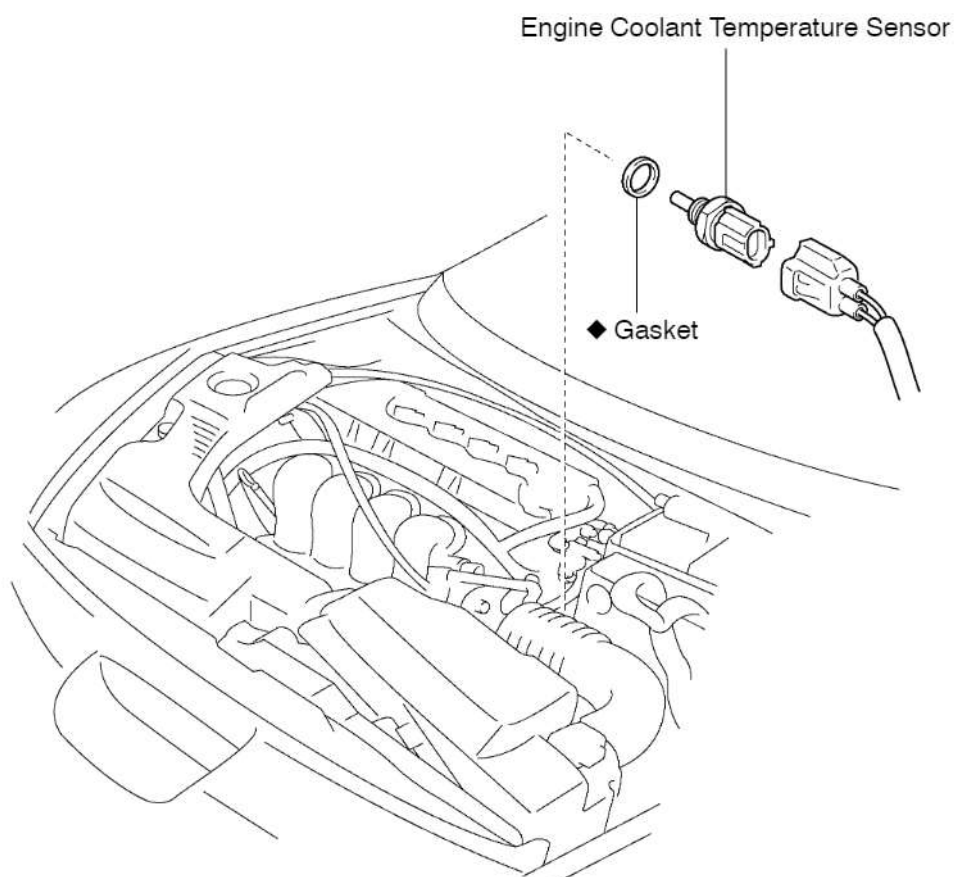
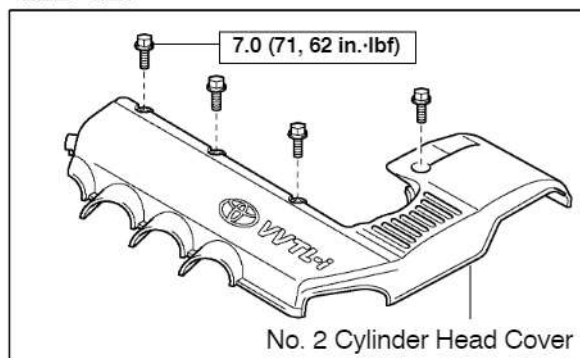
5. REINSTALL VSV

ENGINE COOLANT TEMPERATURE (ECT) SENSOR COMPONENTS

SF182-10



2ZZ-GE:



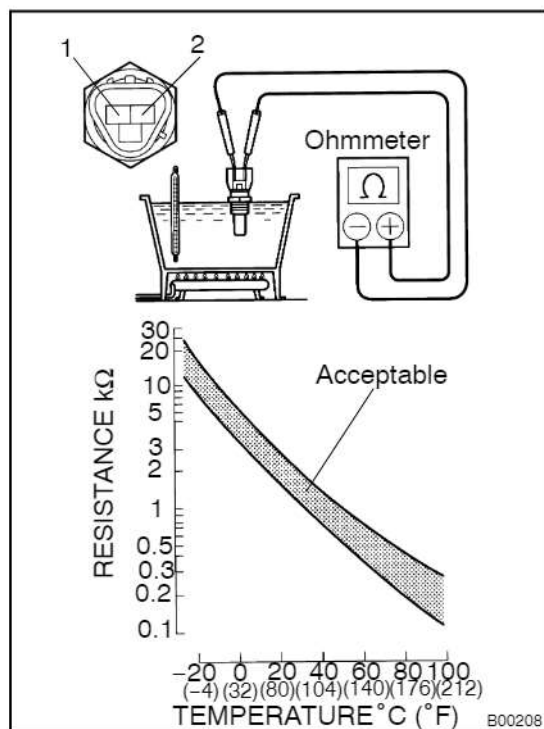
N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non-reusable part

B09183

INSPECTION

1. DRAIN ENGINE COOLANT
2. REMOVE NO.2 CYLINDER HEAD COVER
3. REMOVE ECT SENSOR



4. INSPECT ECT SENSOR RESISTANCE

Using an ohmmeter, measure the resistance between terminals 1 (E2) and 2 (THW).

Resistance: Refer to the graph

If the resistance is not as specified, replace the ECT sensor.

5. REINSTALL ECT SENSOR

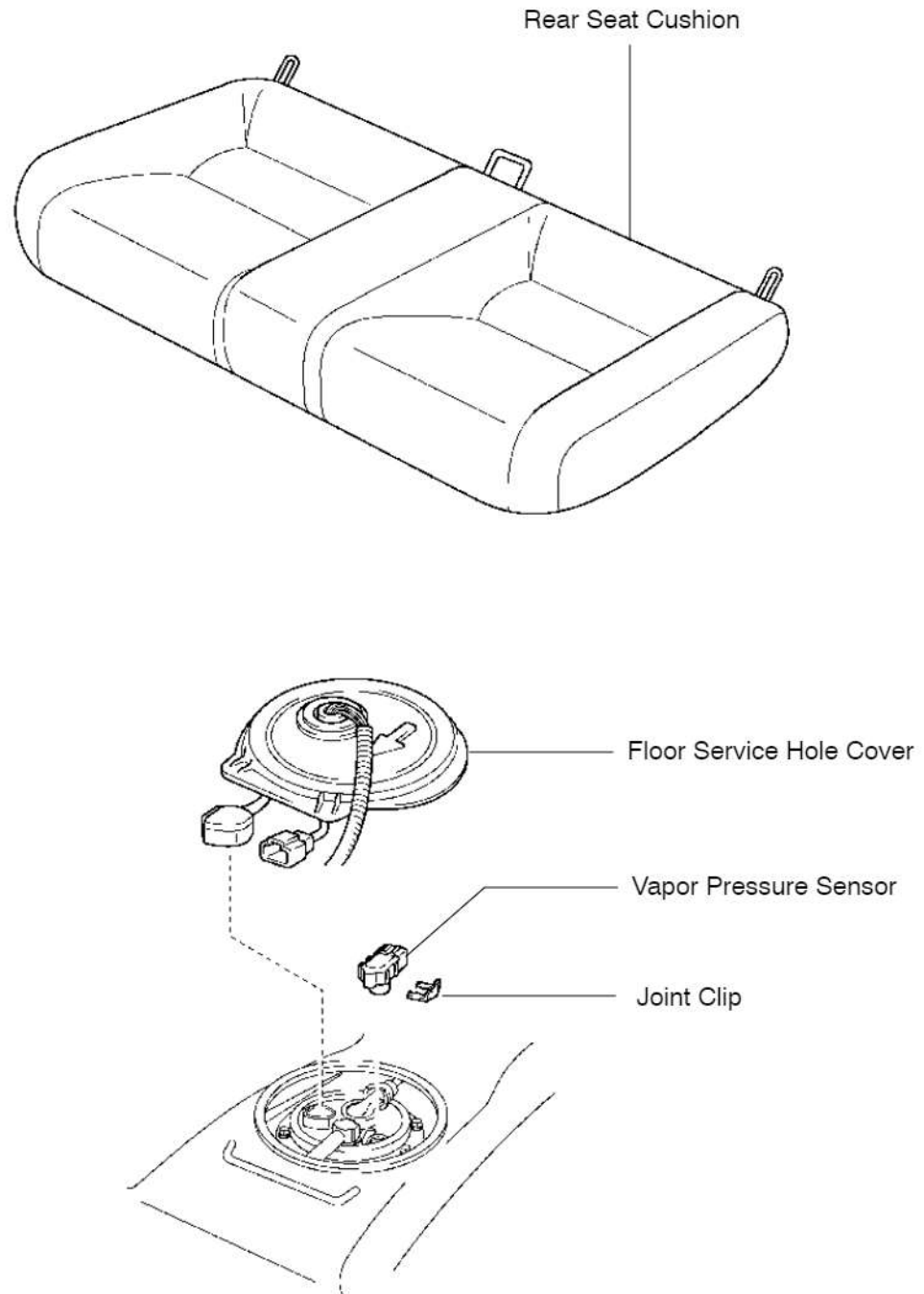
Install a new gasket to the ECT sensor.

6. REINSTALL NO.2 CYLINDER HEAD COVER

7. FILL RADIATOR WITH ENGINE COOLANT

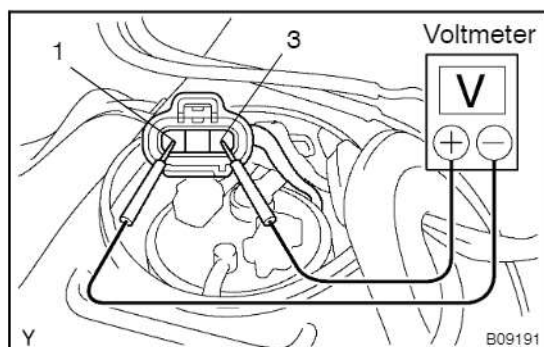
VAPOR PRESSURE SENSOR COMPONENTS

SF184-09



Y

B09184



INSPECTION

1. INSPECT POWER SOURCE VOLTAGE OF VAPOR PRESSURE SENSOR

- (a) Disconnect the vapor pressure sensor connector.

HINT:

Near the fuel tank.

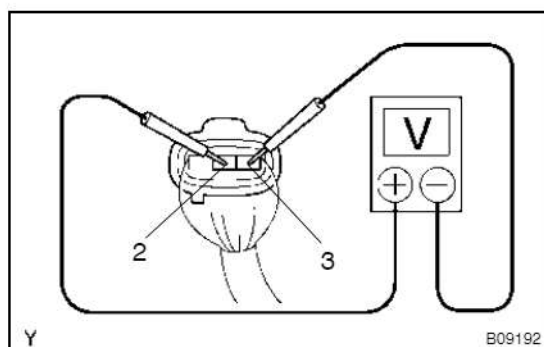
- (b) Turn the ignition switch ON.
 (c) Using a voltmeter, measure the voltage between connector terminals 1 and 3 of the wiring harness side.

Voltage: 4.5 – 5.5 V

- (d) Turn the ignition switch to LOCK.
 (e) Reconnect the vapor pressure sensor connector.

2. INSPECT POWER OUTPUT OF VAPOR PRESSURE SENSOR

- (a) Turn the ignition switch ON.
 (b) Remove the fuel tank cap.



- (c) Connect a voltmeter to terminals 2 and 3, and measure the output voltage.

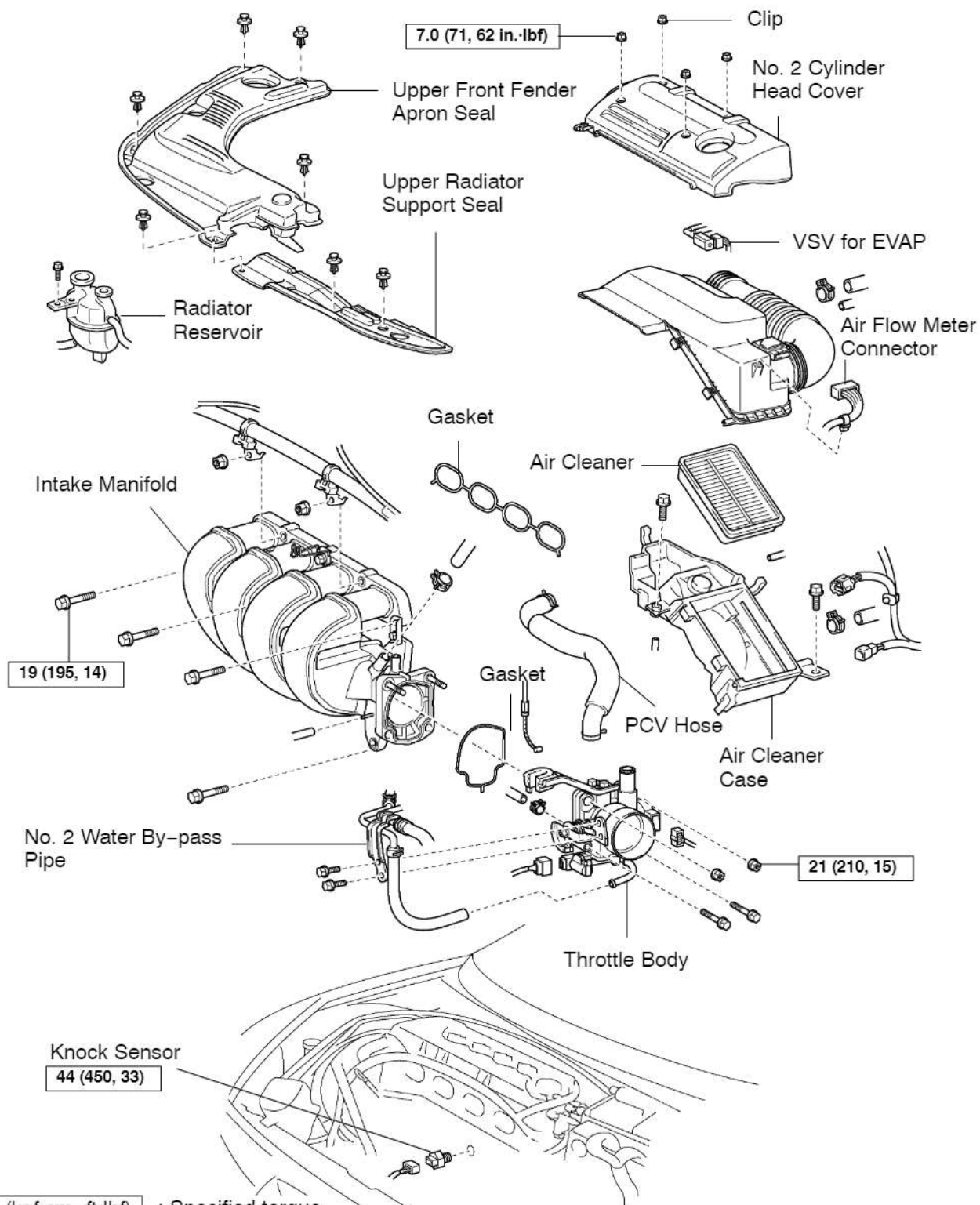
Voltage: 3.0 – 3.6 V

- (d) Reinstall the fuel tank cap.

KNOCK SENSOR COMPONENTS

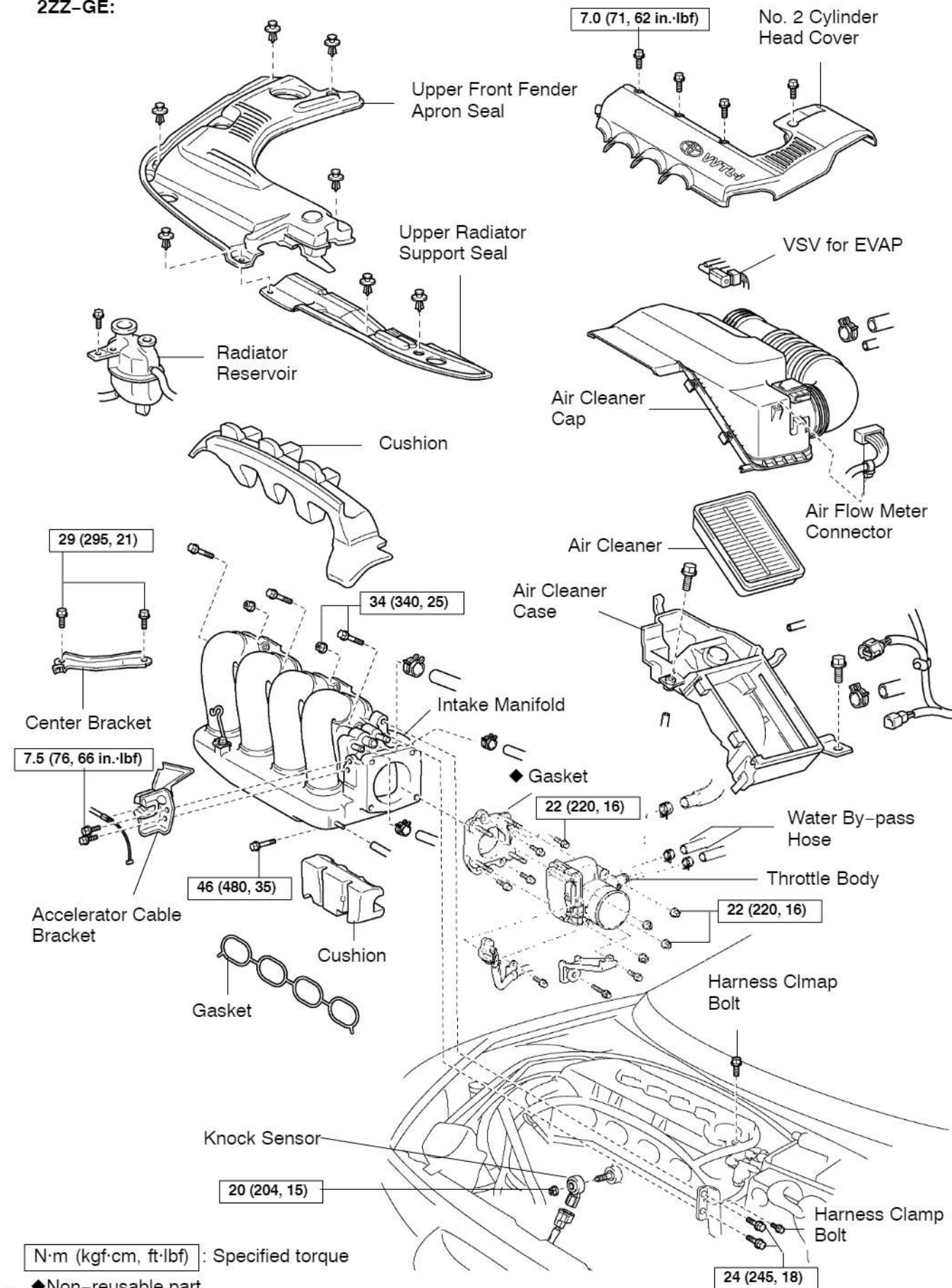
SF186-04

1ZZ-FE:



B09187

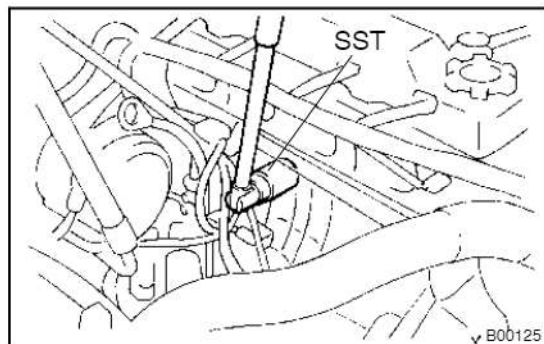
2ZZ-GE:



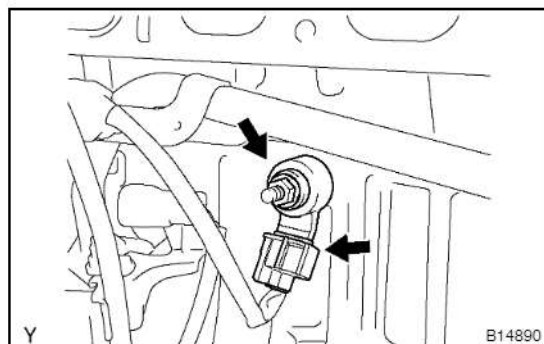
B16831

INSPECTION

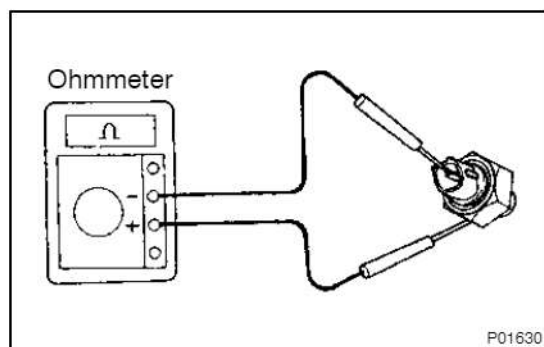
1. REMOVE THROTTLE BODY
(See page SF-35 or SF-42)
2. REMOVE RADIATOR RESERVOIR
(See page CO-17)
3. REMOVE INTAKE MANIFOLD
(See page EM-44)



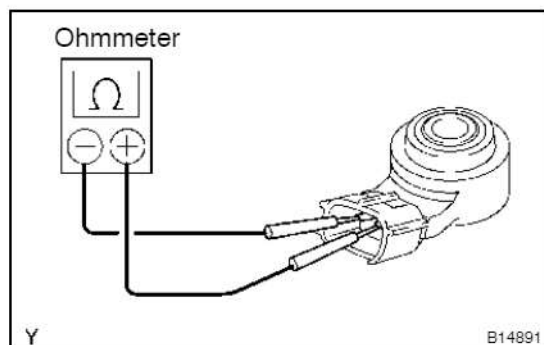
4. **1ZZ-FE:**
REMOVE KNOCK SENSOR
 - (a) Disconnect the knock sensor connector.
 - (b) Using SST, remove the knock sensor.
SST 09816-30010



5. **2ZZ-GE:**
REMOVE KNOCK SENSOR
 - (a) Disconnect the knock sensor connector.
 - (b) Remove the nut and knock sensor.



6. **1ZZ-FE:**
INSPECT KNOCK SENSOR
Using an ohmmeter, check that there is continuity between the terminal and body.
If there is continuity, replace the sensor.



7. **2ZZ-GE:**
INSPECT KNOCK SENSOR
Using an ohmmeter, measure the resistance between terminals.

Resistance: 120 – 280 kΩ at 20°C (68°F)

If the resistance is not specified, replace the sensor.

8. **1ZZ-FE:**
REINSTALL KNOCK SENSOR

- (a) Using SST, install the knock sensor.
SST 09816-30010

- (b) Connect the knock sensor connector.

9. 2ZZ-GE:

REINSTALL KNOCK SENSOR

- (a) Install the knock sensor with the nut.
- (b) Connect the knock sensor connector.

10. REINSTALL INTAKE MANIFOLD

(See page EM-67)

11. REINSTALL RADIATOR RESERVOIR

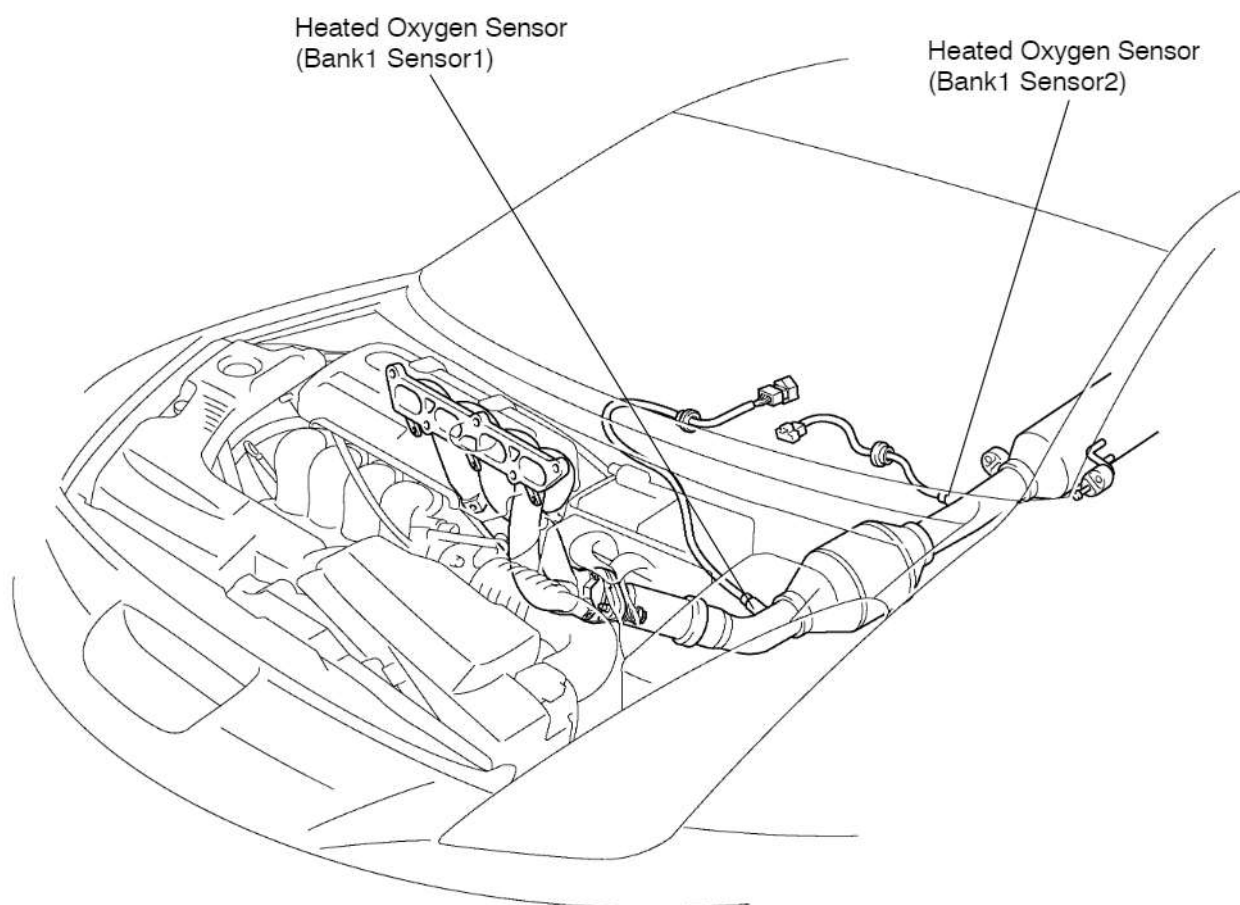
(See page CO-23)

12. REINSTALL THROTTLE BODY

(See page SF-35 or SF-42)

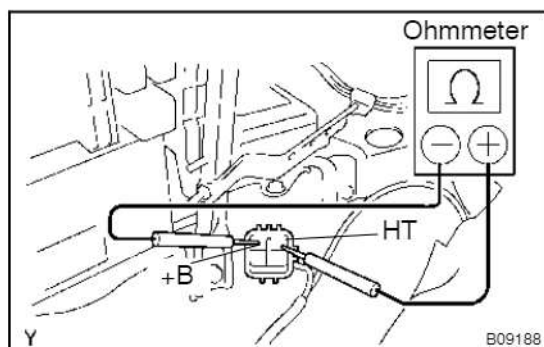
HEATED OXYGEN SENSOR COMPONENTS

SF167-09



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B09185



INSPECTION

1. INSPECT HEATER RESISTANCE OF HEATED OXYGEN SENSOR (Bank1 Sensor1)

- Disconnect the oxygen sensor connector.
- Using an ohmmeter, measure the resistance between the terminals +B and HT.

Resistance:

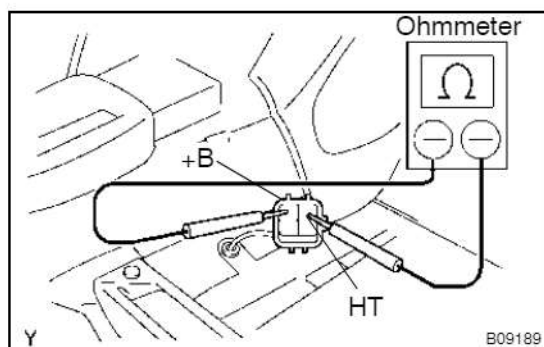
1ZZ-FE: 5 – 10 Ω at 20°C (68°F)

2ZZ-GE: 11 – 16 Ω at 20°C (68°F)

If the resistance is not as specified, replace the sensor.

Torque: 44 N·m (450 kgf·cm, 31 ft·lbf)

- Reconnect the oxygen sensor connector.



2. INSPECT HEATER RESISTANCE OF HEATED OXYGEN SENSOR (Bank1, Sensor2)

- Remove the passenger's seat.
- Take out the floor carpet.
- Disconnect the oxygen sensor connector.
- Using an ohmmeter, measure the resistance between the terminals +B and HT.

Resistance: 11 – 16 Ω at 20°C (68°F)

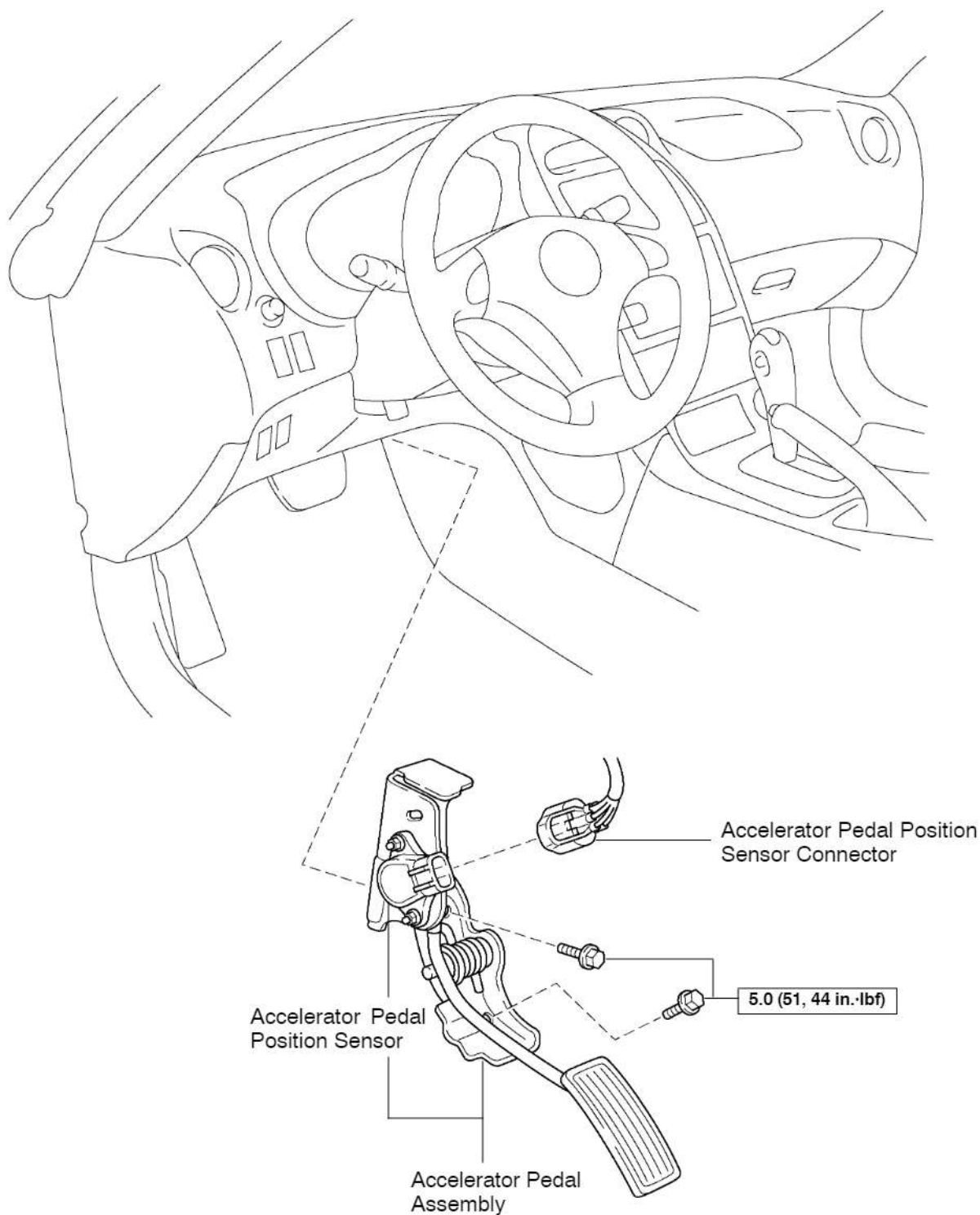
If the resistance is not as specified, replace the sensor.

Torque: 44 N·m (450 kgf·cm, 31 ft·lbf)

- Reconnect the oxygen sensor connector.
- Resistance the floor carpet.
- Reinstall the passenger's seat.

ACCELERATOR PEDAL POSITION SENSOR COMPONENTS

SF1V5-02



N N·m (kgf·cm, ft·lbf) : Specified torque

B16669

INSPECTION

INSPECT ACCELERATOR PEDAL POSITION SENSOR (See page DI-391)

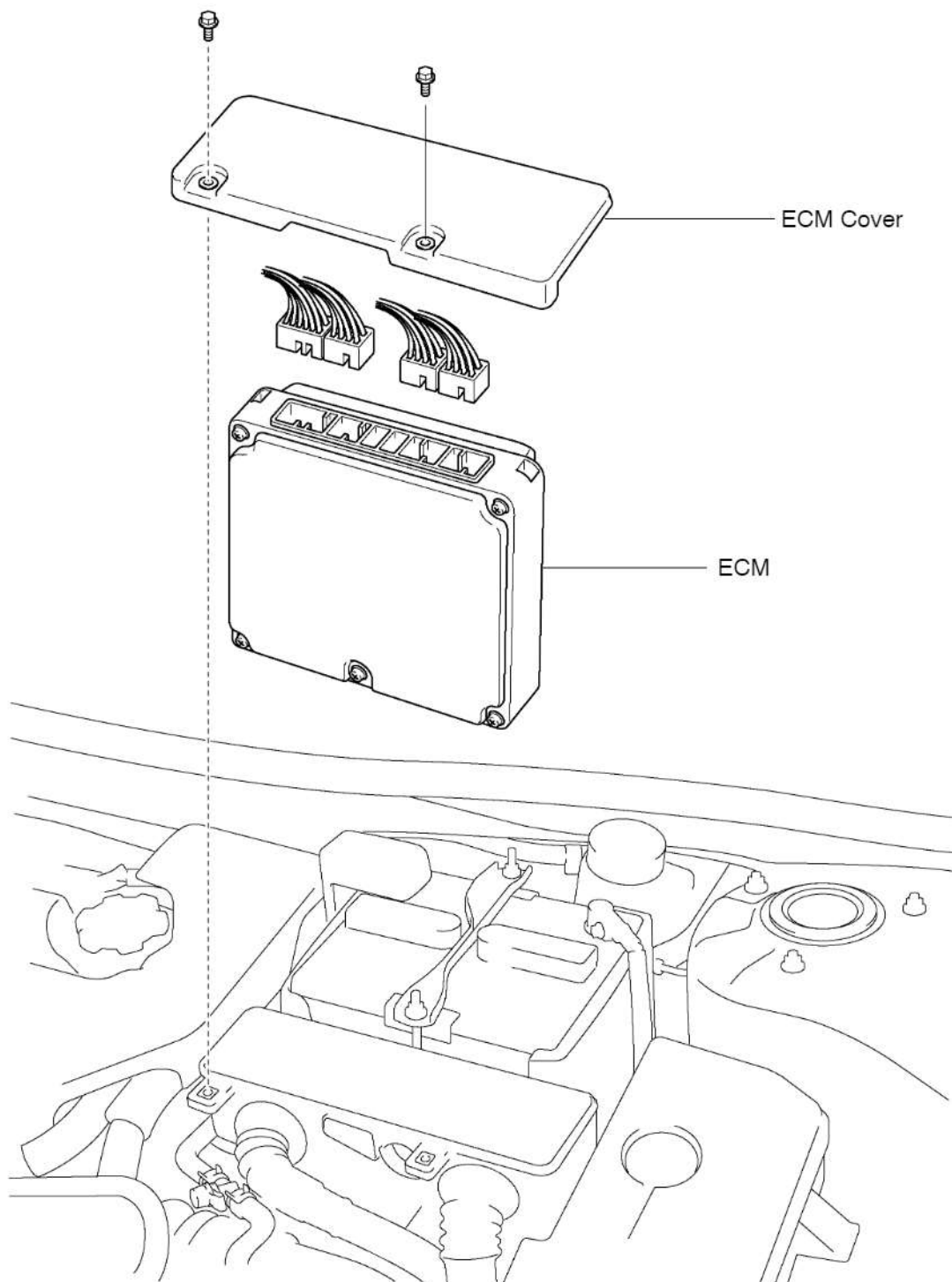
If necessary, replace the accelerator pedal assembly.

NOTICE:

- Be care not to give a shock to the accelerator pedal assembly.
- Be care not to disassemble the accelerator pedal assembly.

ENGINE CONTROL MODULE (ECM) COMPONENTS

SF00F-13



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B07709

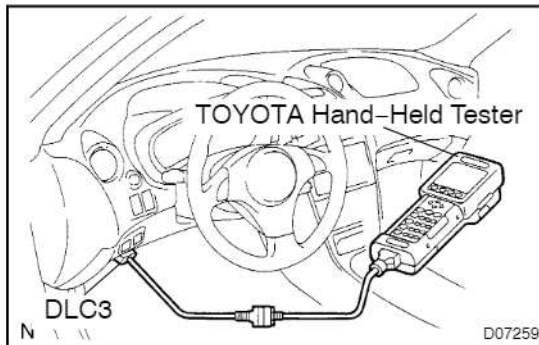
INSPECTION

1. REMOVE ECM
2. INSPECT ECM (See page DI-40 or DI-333)
3. REINSTALL ECM

FUEL CUT RPM INSPECTION

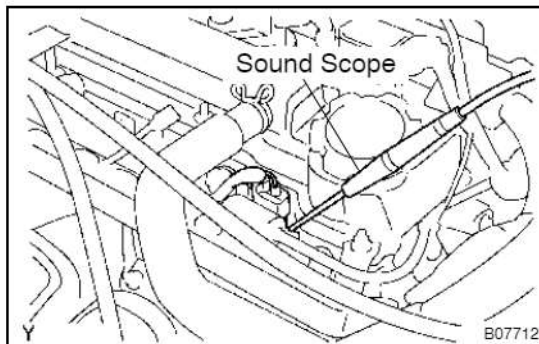
1. WARM UP ENGINE

Allow the engine to warm up to normal operating temperature.



2. CONNECT TOYOTA HAND-HELD TESTER OR OBD II SCAN TOOL

- Connect the TOYOTA hand-held tester or OBD II scan tool to the DLC3.
- Please refer to the TOYOTA hand-held tester or OBD II scan tool operator's manual for further details.



3. INSPECT FUEL CUT OFF RPM

- Increase the engine speed to at least 3,500 rpm.
- Use a sound scope to check for injector operating noise.
- Check that when the throttle lever is released injector, operation noise stops momentary and then resumes.

HINT:

Measure with the A/C OFF.

Fuel return rpm: 1,400 rpm

4. DISCONNECT TOYOTA HAND-HELD TESTER OR OBD II SCAN TOOL