

## FUEL PUMP ON-VEHICLE INSPECTION

SF19C-01

### 1. CHECK FUEL PUMP OPERATION

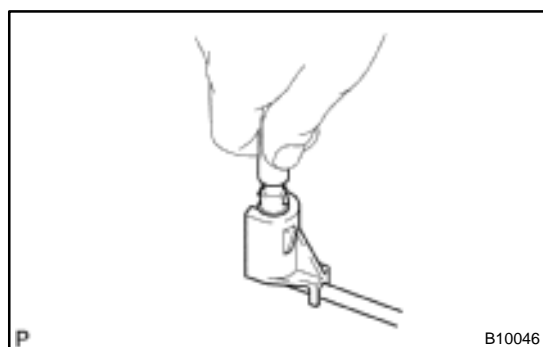
- (a) Connect a TOYOTA hand-held tester to the DLC3.
  - (1) Connect the TOYOTA hand-held tester to the DLC3.
  - (2) Turn the ignition switch ON and push the TOYOTA hand-held tester main switch ON.

#### NOTICE:

**Do not start the engine.**

- (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.

If you have no TOYOTA hand-held tester, connect the positive (+) and negative (-) leads from the battery to the fuel pump connector (See step 3).

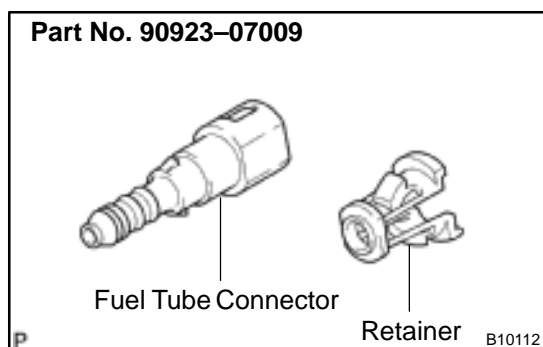


- (b) Check that there is pressure in the fuel inlet tube from the fuel line.

#### HINT:

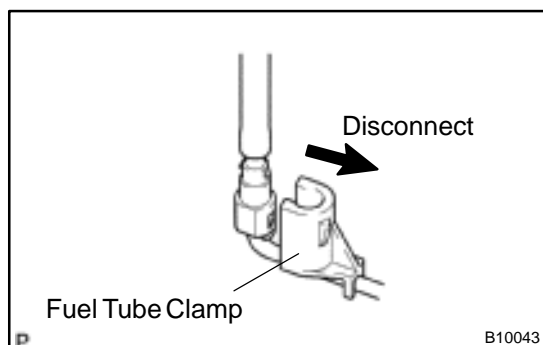
If there is fuel pressure, you will hear the sound of fuel flowing. If there is no pressure, check the fusible link, fuses, EFI Main relay, fuel pump, ECM and wiring connector.

- (c) Turn the ignition switch OFF.
- (d) Disconnect the TOYOTA hand-held tester from the DLC3.

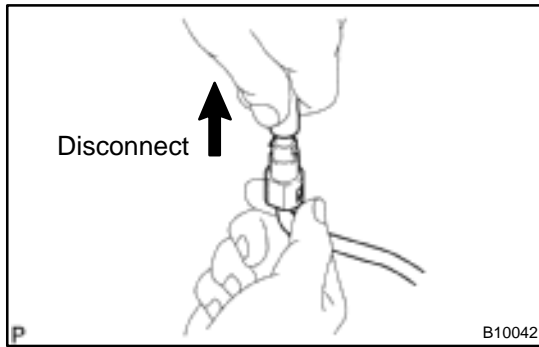


### 2. CHECK FUEL PRESSURE

- (a) Check the battery positive voltage is above 12 V.
- (b) Disconnect the negative (-) terminal cable from the battery.
- (c) Purchase a new fuel tube connector. Part No. 90923-07009



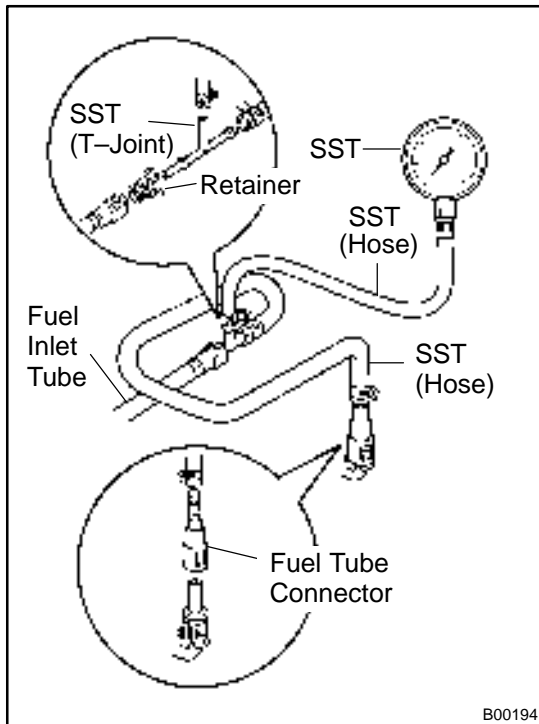
- (d) Disconnect the fuel tube clamp from the fuel tube connector.



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

**CAUTION:**

- **Disconnect the fuel tube connector (quick type) observing the precaution (See page SF-1).**
- **As there is retained pressure in the fuel 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, 09268-45014 (09268-41250)
- (g) Wipe off any splattered gasoline.
- (h) Reconnect the negative (-) terminal cable to the battery.
- (i) Connect the TOYOTA hand-held tester or OBDII scan tool to the DLC3 (See step 1).
- (j) Measure the fuel pressure.

**Fuel pressure:**

**301 – 347 kPa (3.1 – 3.5 kgf/cm<sup>2</sup>, 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 or OBDII scan tool from the DLC3.
- (l) Start the engine.
- (m) Measure the fuel pressure at idle.

**Fuel pressure:**

**301 – 347 kPa (3.1 – 3.5 kgf/cm<sup>2</sup>, 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/cm<sup>2</sup>, 21 psi) or more**

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

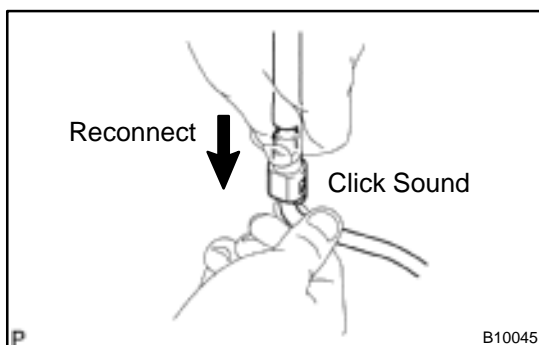
- (p) After checking fuel pressure, disconnect the negative (-) terminal cable from the battery and carefully, remove the SST and fuel tube connector to prevent gasoline from splashing.

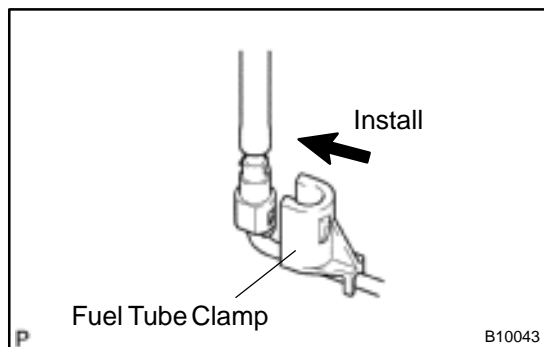
SST 09268-41047, 09268-45014

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

**CAUTION:**

**Connect the fuel tube connector (quick type) observing the precaution (See page SF-1).**

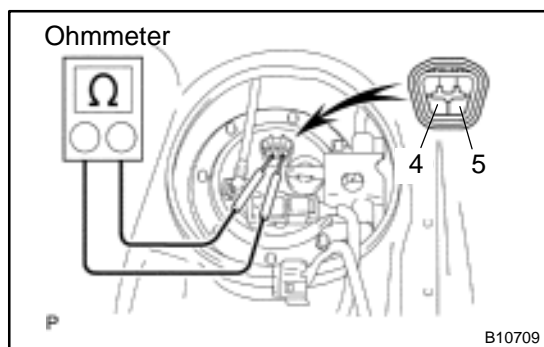




- (r) Install the fuel tube clamp to the fuel tube connector.
- (s) Reconnect the negative (-) terminal cable to the battery.
- (t) Check for fuel leaks (See page SF-1).

### 3. INSPECT FUEL PUMP

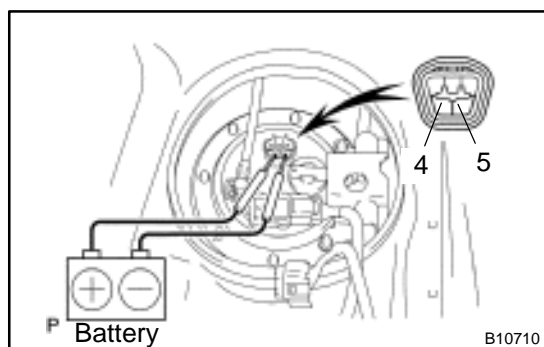
- (a) Remove the luggage compartment.
- (b) Remove the floor service hole cover.
- (c) Disconnect the fuel pump & sender gauge connector.



- (d) 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.



- (e) Inspect the 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.

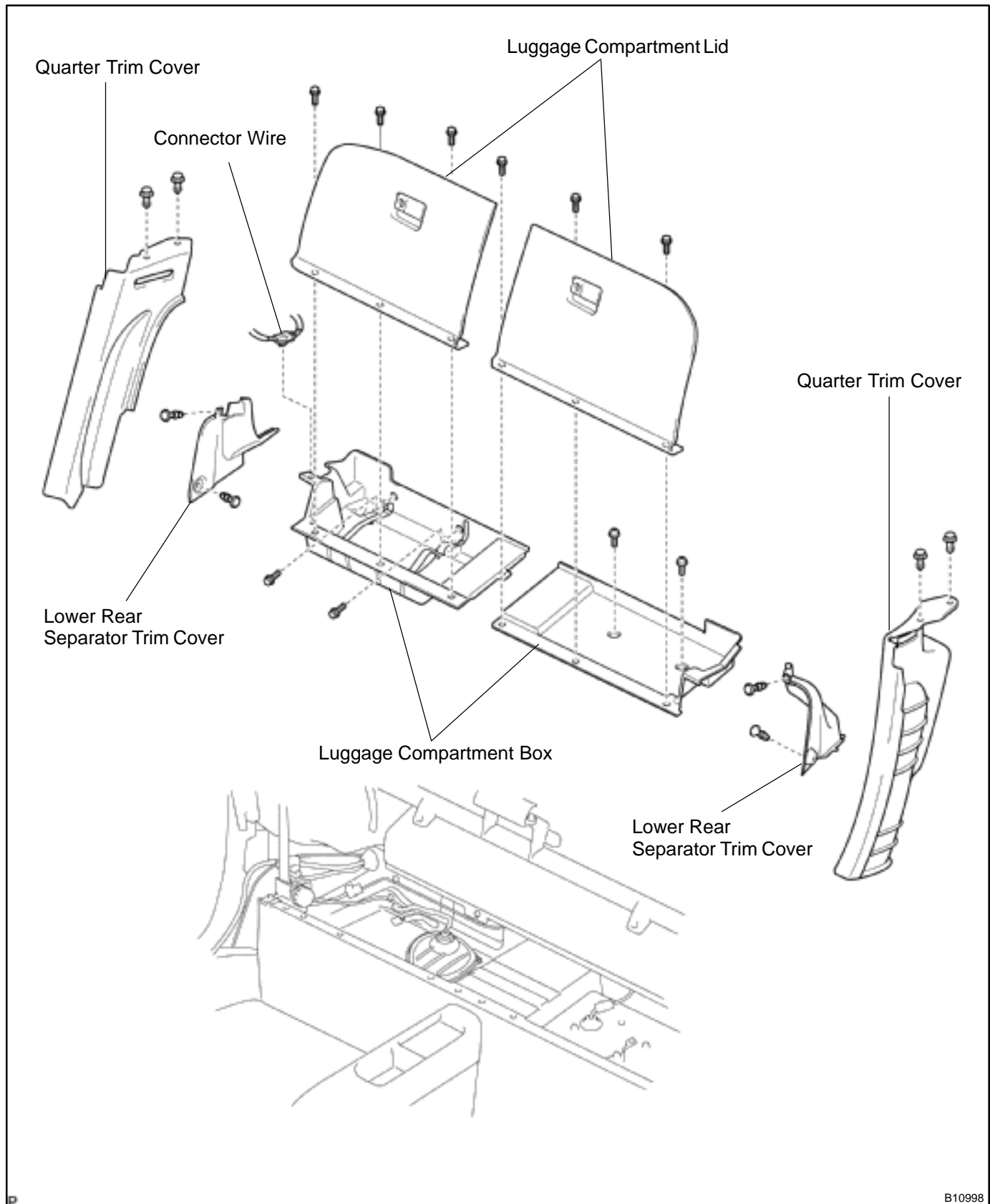
#### NOTICE:

- **These tests must be done quickly (within 10 seconds) to prevent the coil from burning out.**
- **Keep the 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.

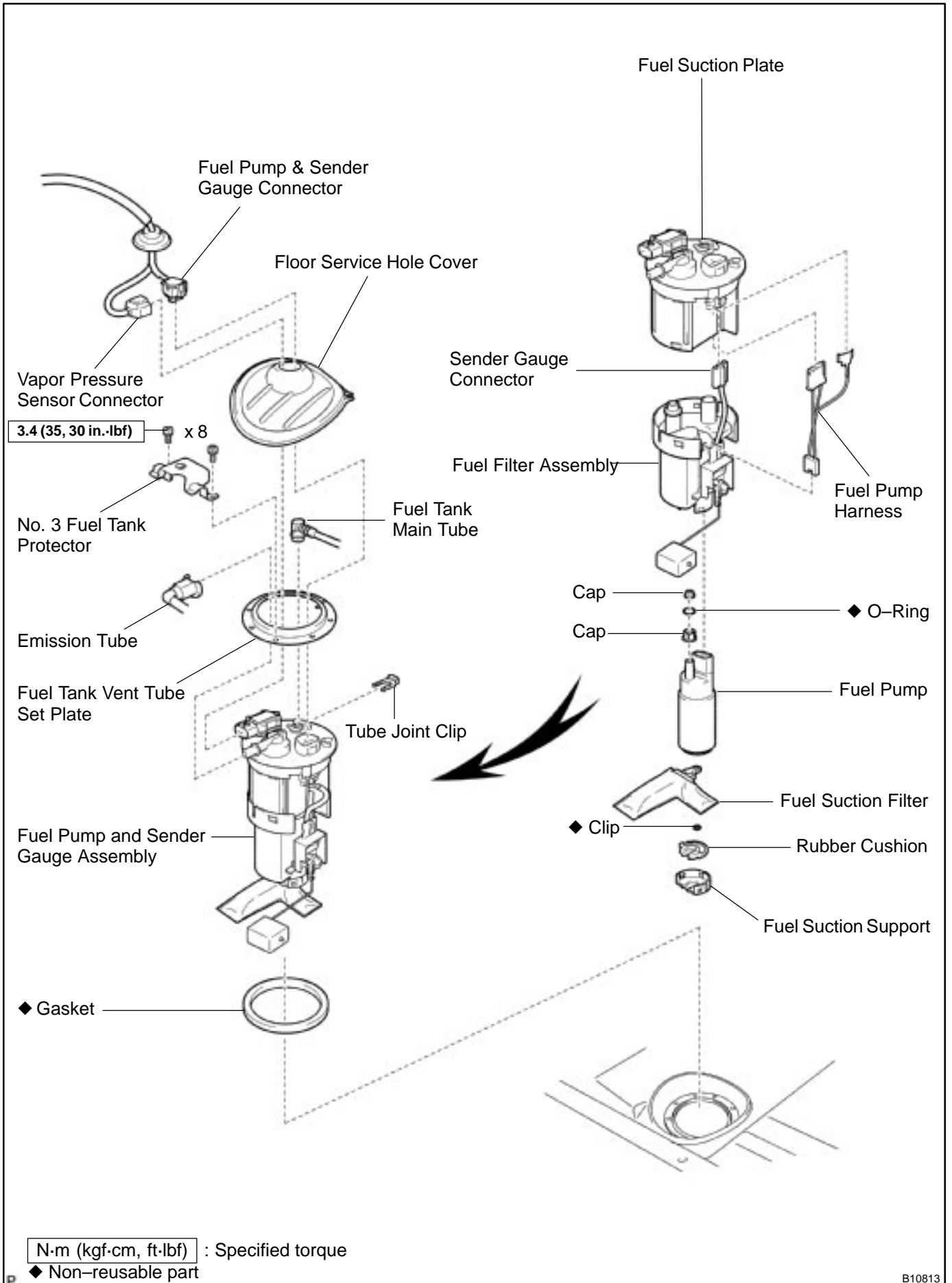
- (f) Reconnect the fuel pump & sender gauge connector.
- (g) Reinstall the floor service hole cover.
- (h) Reinstall the luggage compartment.

# COMPONENTS



P

B10998



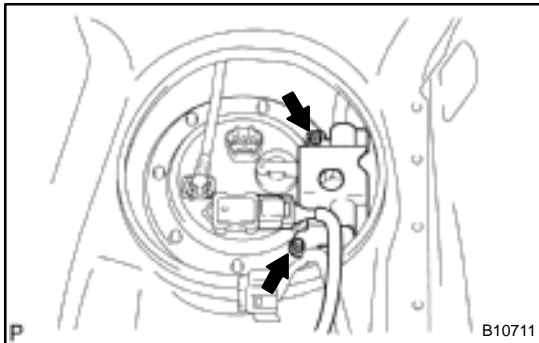
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## REMOVAL

### CAUTION:

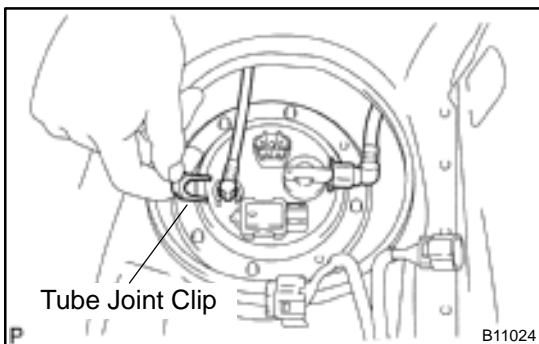
Do not smoke or work near an open flame when working on the fuel pump.

1. REMOVE LUGGAGE COMPARTMENT BOX (See page [BO-72](#))
2. REMOVE FLOOR SERVICE HOLE COVER
3. DISCONNECT FUEL PUMP & SENDER GAUGE CONNECTOR



4. DISCONNECT VAPOR PRESSURE SENSOR CONNECTOR

- (a) Remove the 2 bolts and No. 3 fuel tank protector.
- (b) Disconnect the sensor connector.

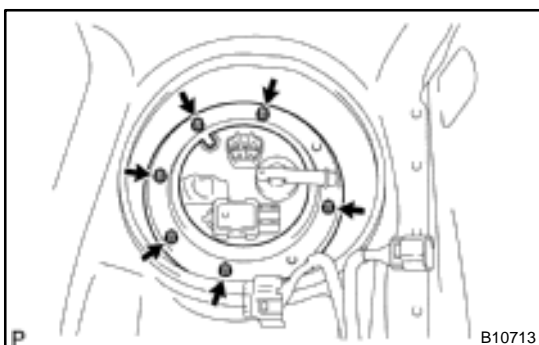


5. DISCONNECT FUEL TANK MAIN TUBE AND EMISSION TUBE

### CAUTION:

- Disconnect the fuel tube connector (quick type) observing the precaution (See page [SF-1](#)).
- As there is retained pressure in the fuel line, prevent it from splashing inside the luggage compartment.

- (a) Remove the tube joint clip and disconnect the main tube.
- (b) Disconnect the emission tube.



6. REMOVE FUEL PUMP AND SENDER GAUGE ASSEMBLY FROM FUEL TANK

- (a) Remove the 6 bolts and fuel tank vent tube set plate.
- (b) Remove the fuel pump and sender gauge assembly.

### NOTICE:

- Do not damage the fuel suction filter.
- Be careful that the arm of the sender gauge should not bent.

- (c) Remove the gasket from the pump and sender gauge assembly.

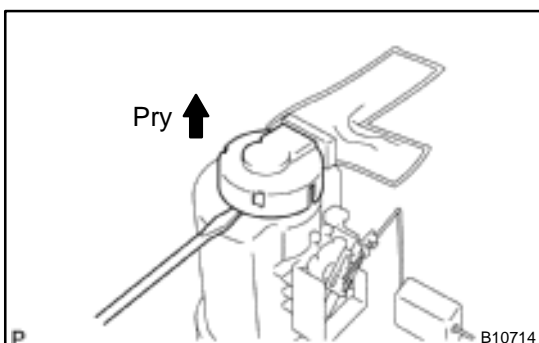
7. REMOVE FUEL SUCTION SUPPORT

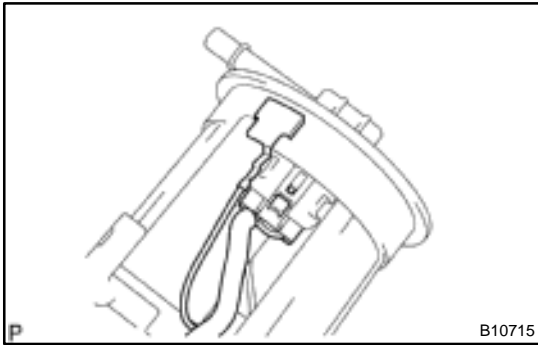
- (a) Using a screwdriver, pry out the fuel suction support.

### NOTICE:

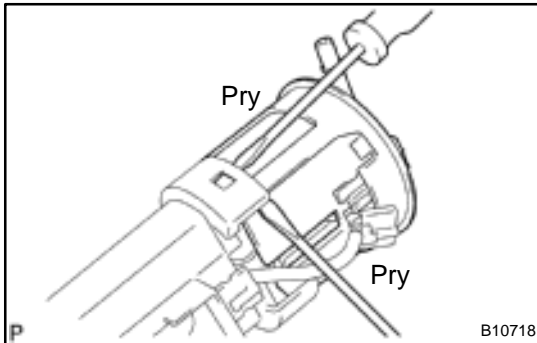
Be careful not to damage the suction support.

- (b) Remove the rubber cushion.



**8. REMOVE FUEL SUCTION PLATE**

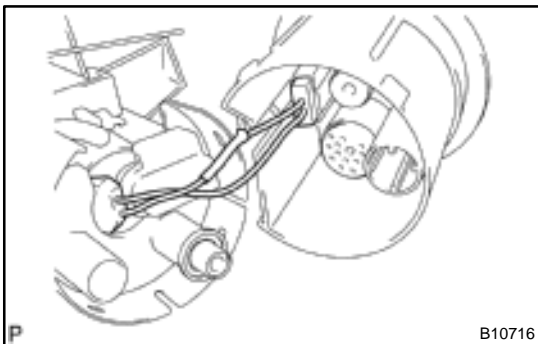
- (a) Disconnect the fuel sender gauge connector and ground plate.



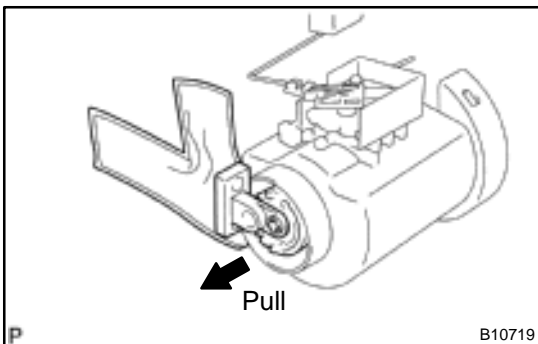
- (b) Using 2 screwdrivers, pry out the fuel suction plate.

**NOTICE:**

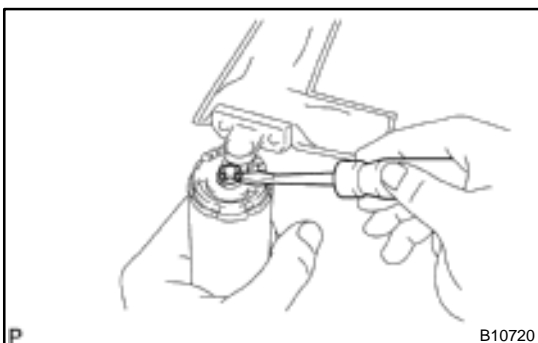
**Be careful not to damage the suction support and suction plate.**



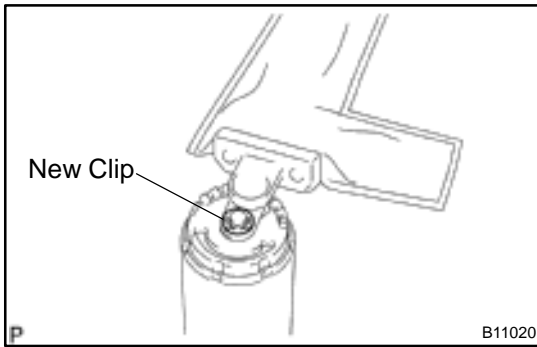
- (c) Remove the fuel pump harness.

**9. REMOVE FUEL PUMP**

Pull out the fuel pump.

**10. REMOVE FUEL SUCTION FILTER FROM FUEL PUMP**

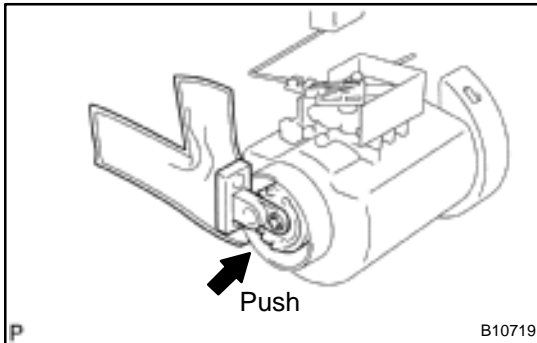
- (a) Using a small screwdriver, pry out the clip.  
 (b) Pull out the suction filter.



## INSTALLATION

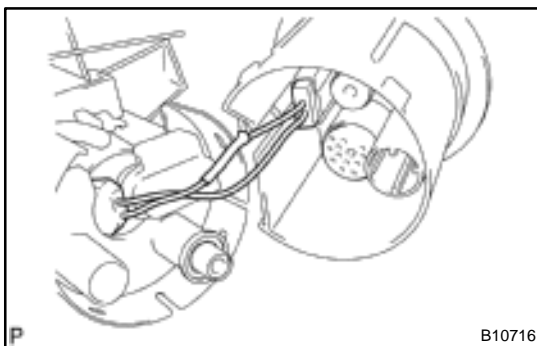
### 1. INSTALL FUEL SUCTION FILTER

Install the suction filter with a new clip.



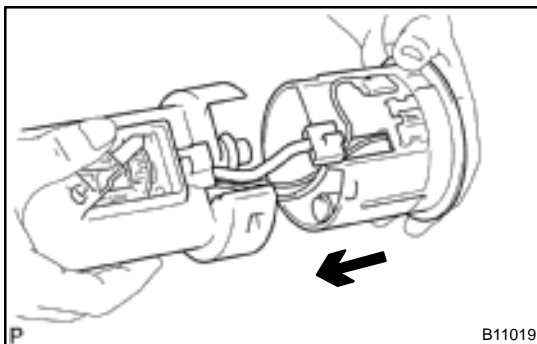
### 2. INSTALL FUEL PUMP

Push into the fuel pump.

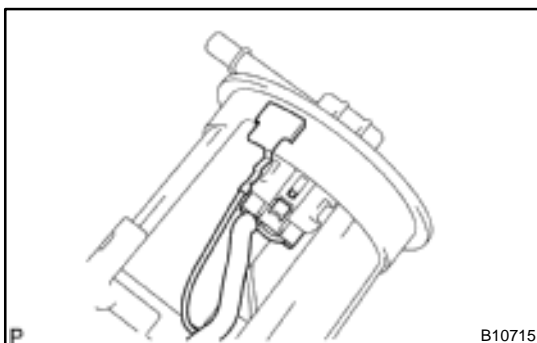


### 3. INSTALL FUEL SUCTION PLATE

(a) Connect the fuel pump harness.

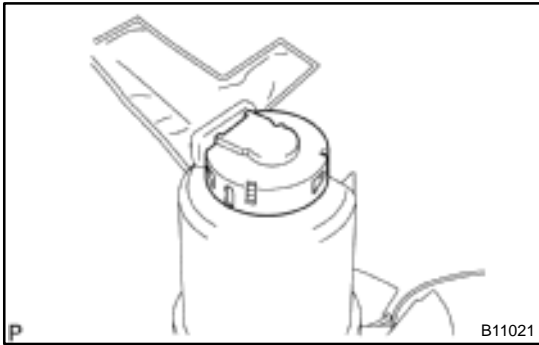


(b) Install the fuel suction plate to the fuel filter assembly.



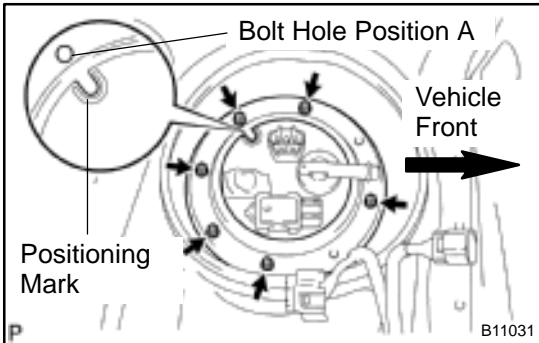
(c) Connect the fuel sender gauge connector and ground plate.





**4. INSTALL FUEL SUCTION SUPPORT**

- (a) Install the rubber cushion.
- (b) Install the fuel suction support to the fuel filter assembly.

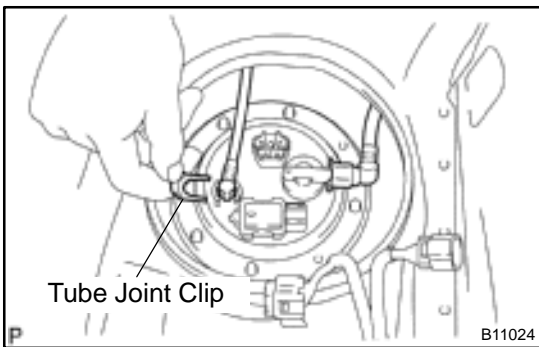


**5. INSTALL FUEL PUMP AND SENDER GAUGE ASSEMBLY TO FUEL TANK**

- (a) Install a new gasket to the fuel pump and sender gauge assembly.
- (b) Insert the fuel pump assembly into the fuel tank.

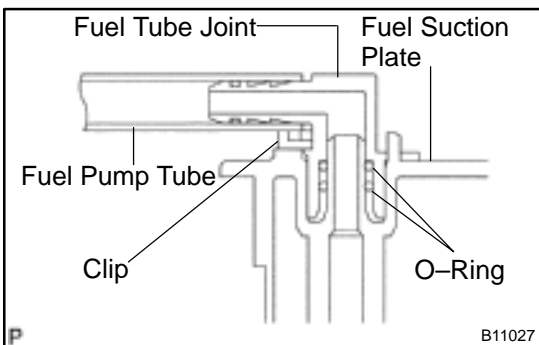
**NOTICE:**

- Do not damage the fuel suction filter.
  - Be careful that the arm of the sender gauge should not bent.
- (c) Align the positioning mark of the set plate with bolt hole position A.
  - (d) Install the fuel tank vent tube set plate with the 6 bolts.  
**Torque: 3.4 N·m (35 kgf·cm, 30 in.-lbf)**



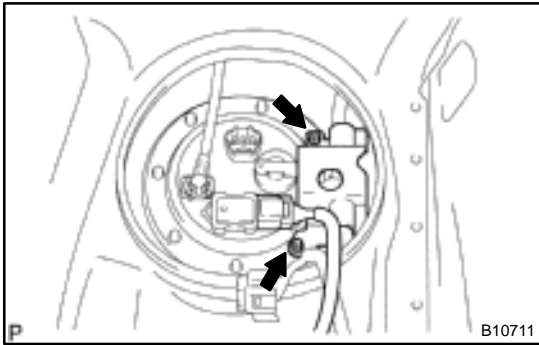
**6. CONNECT FUEL TANK MAIN TUBE AND EMISSION TUBE**

- (a) Connect the main tube with the tube joint clip.
- (b) Connect the emission tube to the fuel pump assembly.



**NOTICE:**

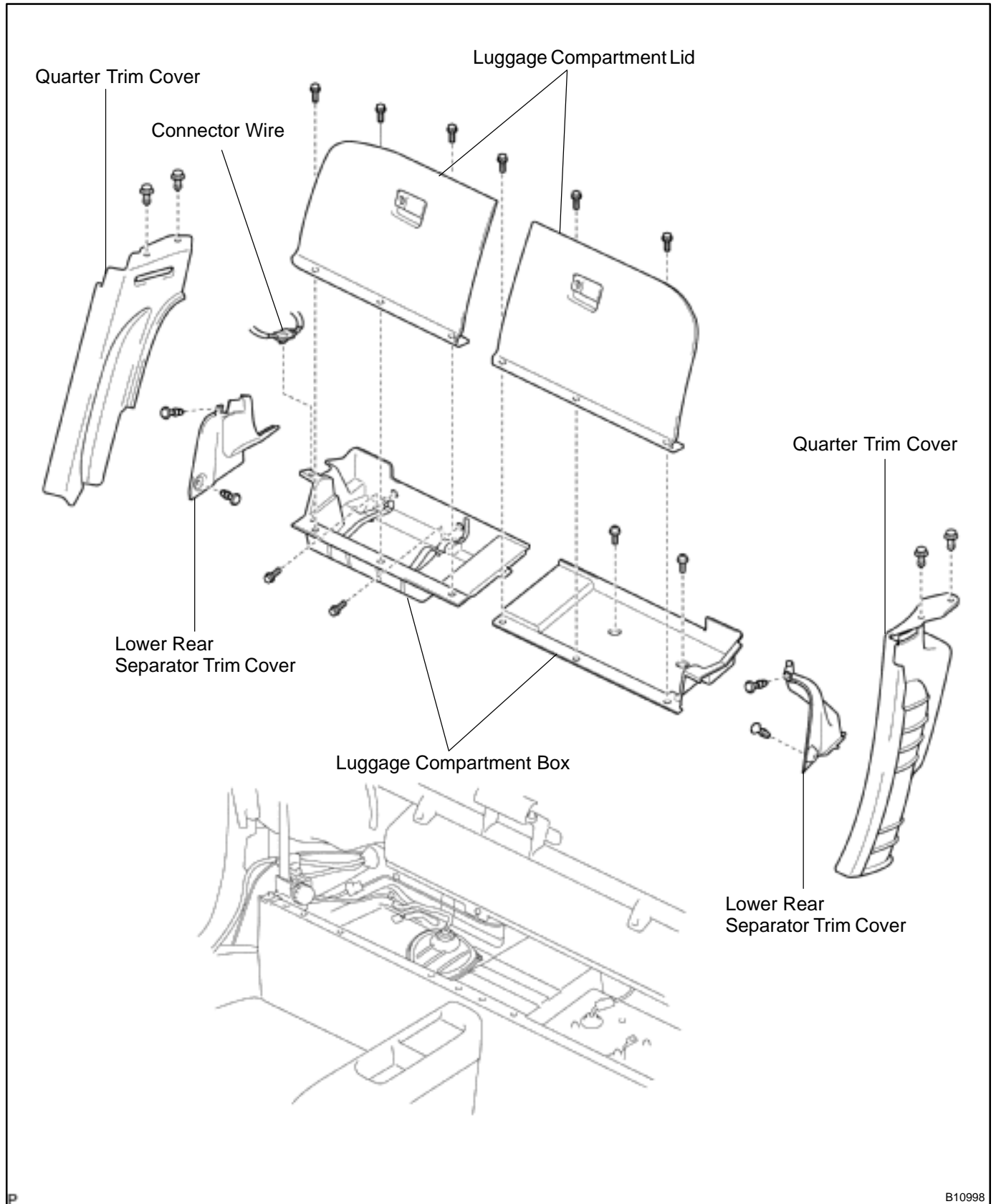
- Check that the connector is inserted fully and securely.
- Check that the clip of the tube joint is on the collar of the connector.
- After the installation of the clip of the tube joint, check that the connector is not pulled off.

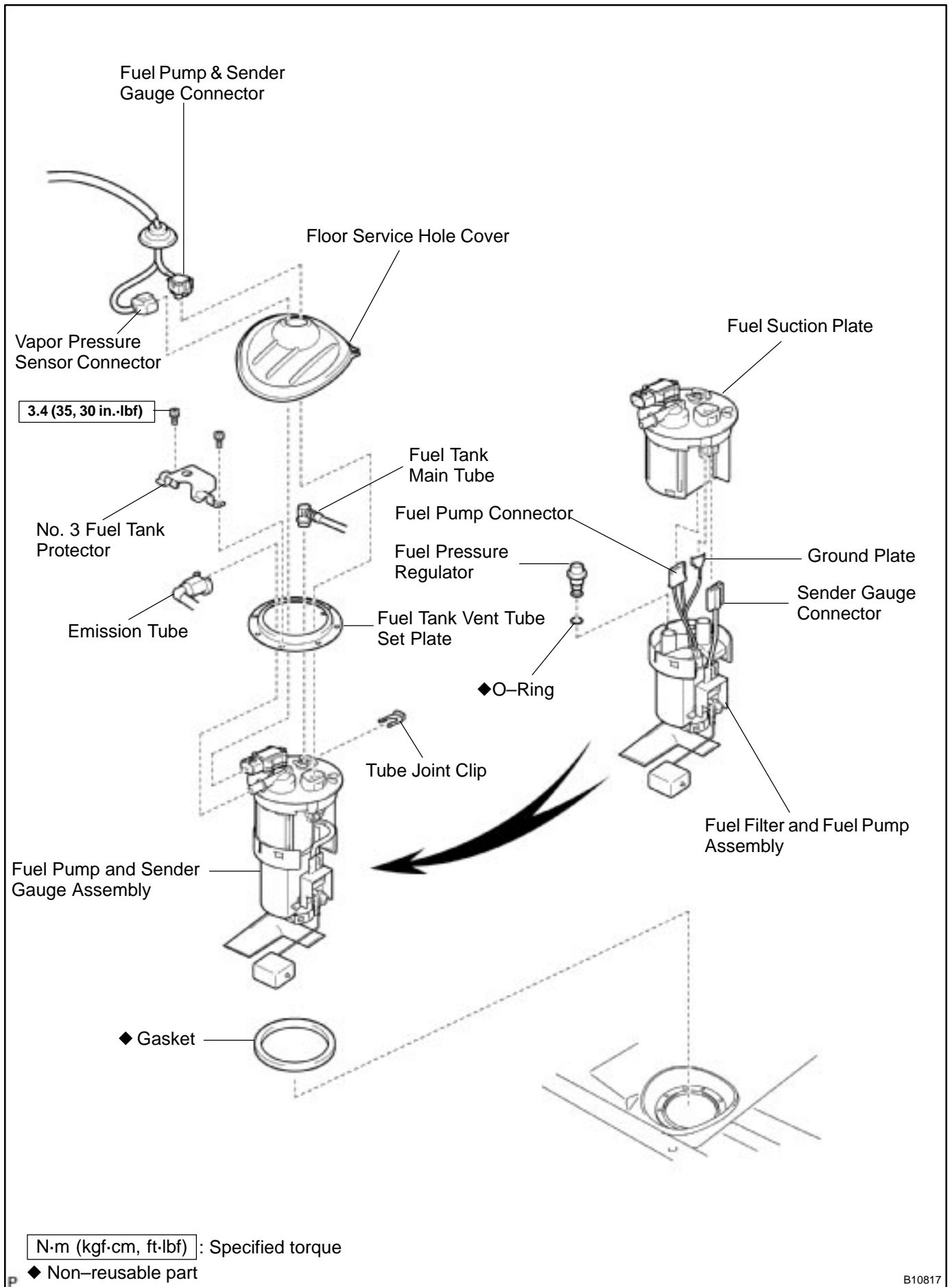


7. **CONNECT VAPOR PRESSURE SENSOR CONNECTOR**
  - (a) Connect the sensor connector.
  - (b) Install the No. 3 fuel tank protector with the 2 bolts.
8. **CONNECT FUEL PUMP & SENDER GAUGE CONNECTOR**
9. **CHECK FOR FUEL LEAKS (See page [SF-1](#))**
10. **INSTALL FLOOR SERVICE HOLE COVER**
11. **INSTALL LUGGAGE COMPARTMENT BOX (See page [BO-86](#))**

# FUEL PRESSURE REGULATOR COMPONENTS

SF19G-01

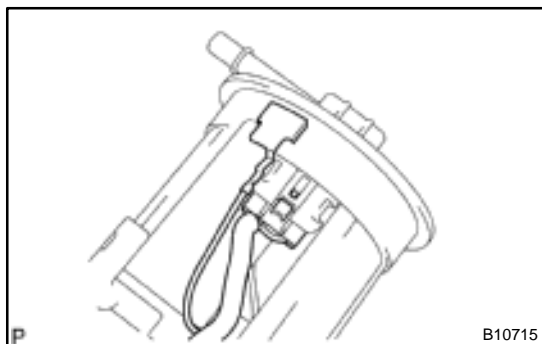




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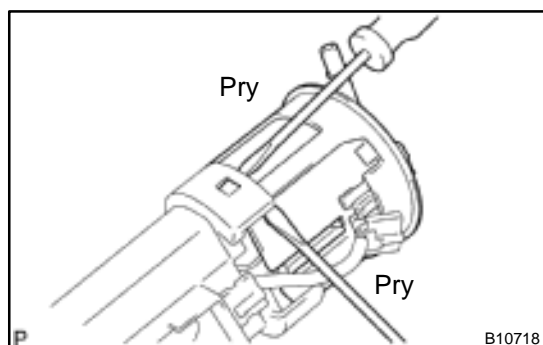
## REMOVAL

1. REMOVE FUEL PUMP AND SENDER GAUGE ASSEMBLY FROM FUEL TANK (See page [SF-12](#))



2. REMOVE FUEL SUCTION PLATE

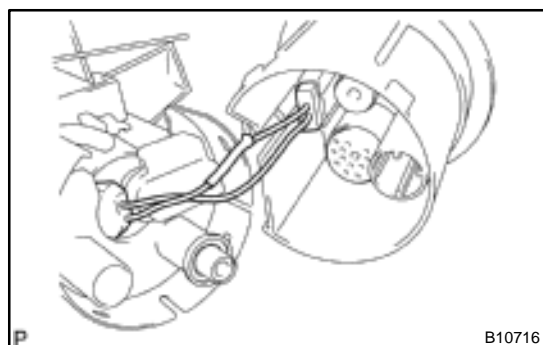
- (a) Disconnect the fuel sender gauge connector and ground plate.



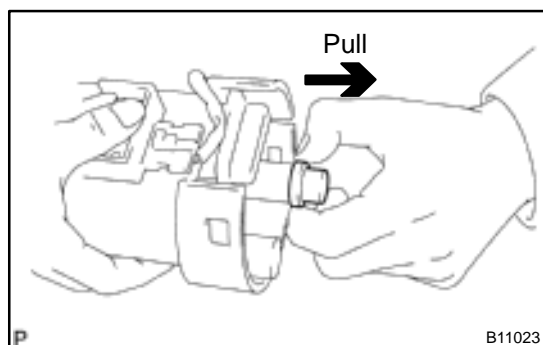
- (b) Using 2 screwdrivers, pry out the fuel suction plate.

**NOTICE:**

**Be careful not to damage the suction support and fuel suction plate.**

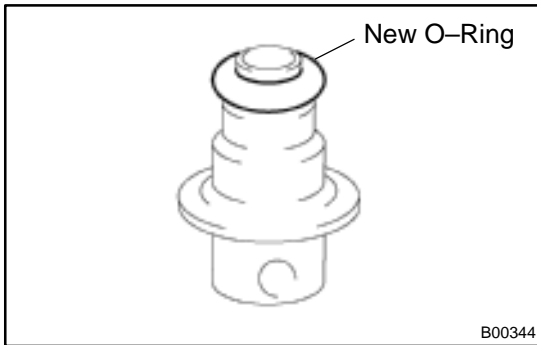


- (c) Disconnect the fuel pump connector.



3. REMOVE FUEL PRESSURE REGULATOR

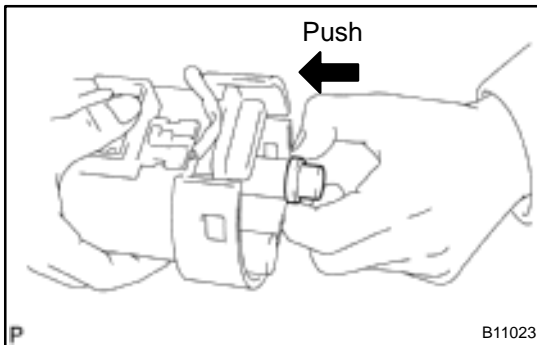
- (a) Pull out the pressure regulator.
- (b) Remove the O-ring from the pressure regulator.



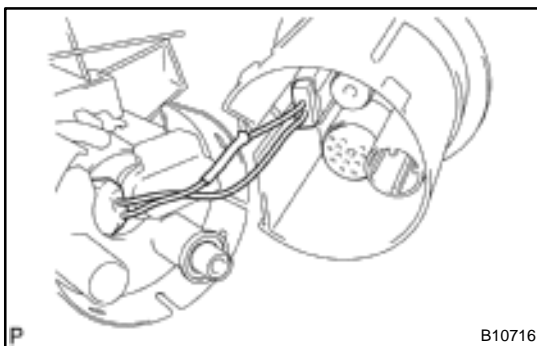
## INSTALLATION

### 1. INSTALL FUEL PRESSURE REGULATOR

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

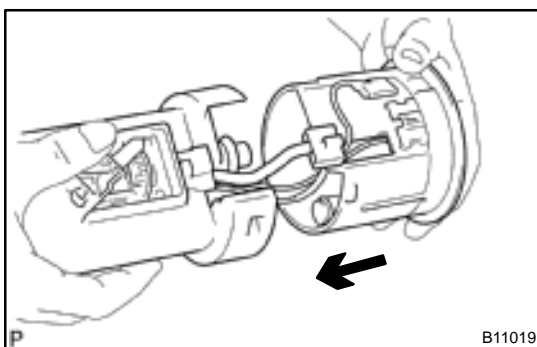


- (b) Apply a light coat of gasoline to the O-ring, and push in the pressure regulator.

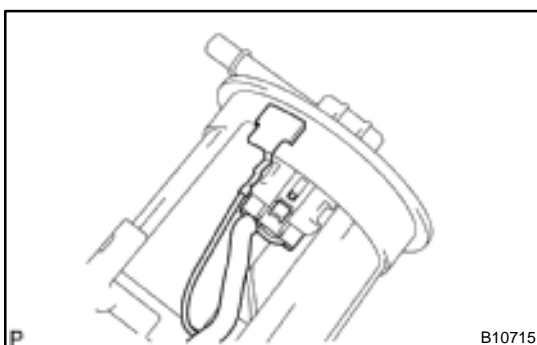


### 2. INSTALL FUEL SUCTION PLATE

- (a) Connect the fuel pump connector.



- (b) Install the fuel suction plate to the fuel filter and fuel pump assembly.



- (c) Connect the fuel sender gauge connector and ground plate.

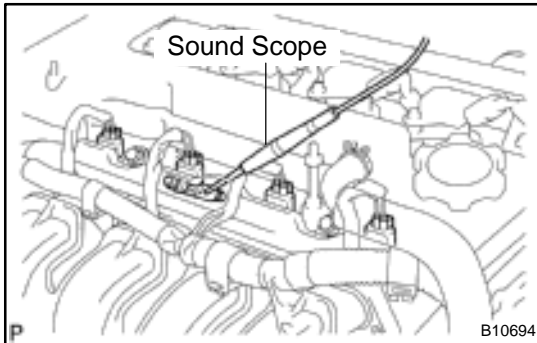
### 3. INSTALL FUEL PUMP AND SENDER GAUGE ASSEMBLY TO FUEL TANK (See page [SF-14](#))

# INJECTOR

## ON-VEHICLE INSPECTION

SF150-02

1. REMOVE SUSPENSION UPPER BRACE
2. REMOVE NO. 2 CYLINDER HEAD COVER

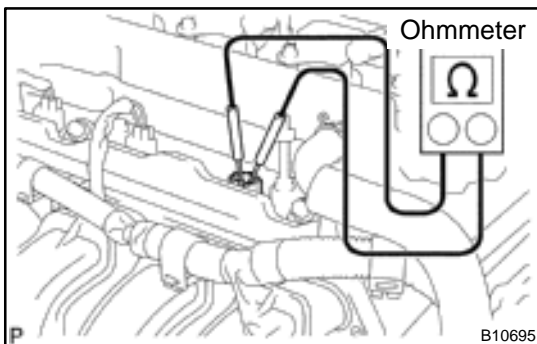


### 3. INSPECT INJECTOR OPERATION

Check operation sound from each injector.

- (1) With the engine running or cranking, use a sound scope to check that there is normal operating noise in proportion to engine speed.
- (2) If you have no sound scope, you can check the injector operating vibration with your finger.

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



### 4. INSPECT INJECTOR RESISTANCE

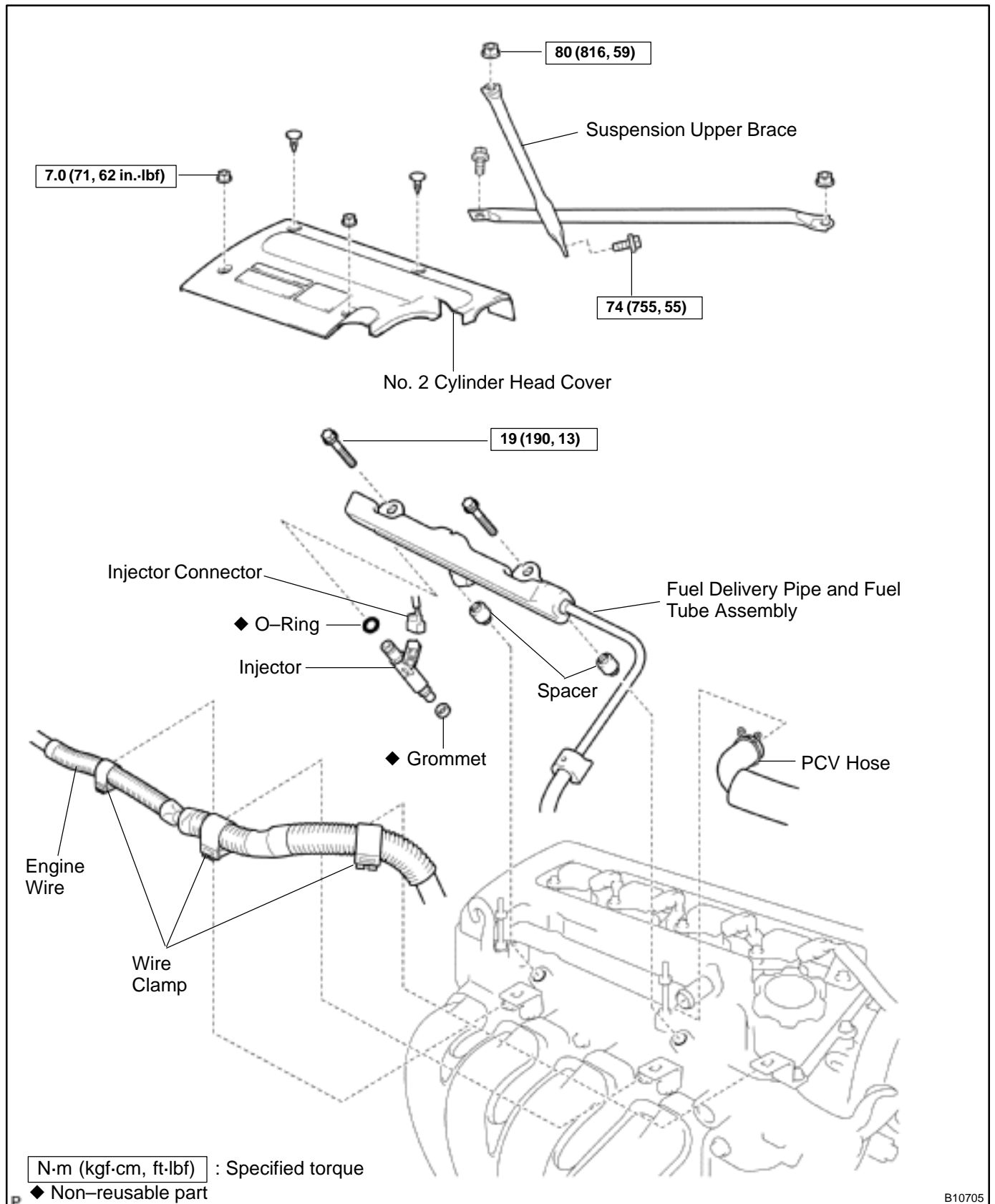
- (a) Disconnect the injector connector.
- (b) Using an ohmmeter, measure the resistance between the terminals.

**Resistance: 13.4 – 14.2  $\Omega$  at 20°C (68°F)**

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

- (c) Reconnect the injector connector.
5. REINSTALL NO. 2 CYLINDER HEAD COVER
6. REINSTALL SUSPENSION UPPER BRACE

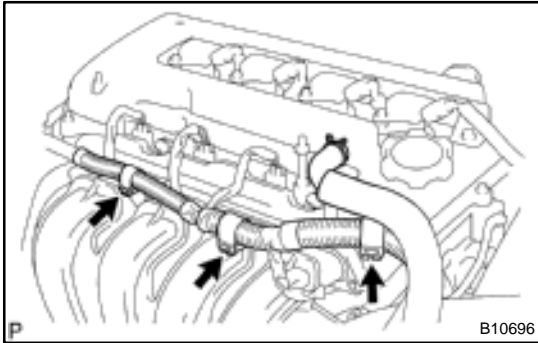
# COMPONENTS





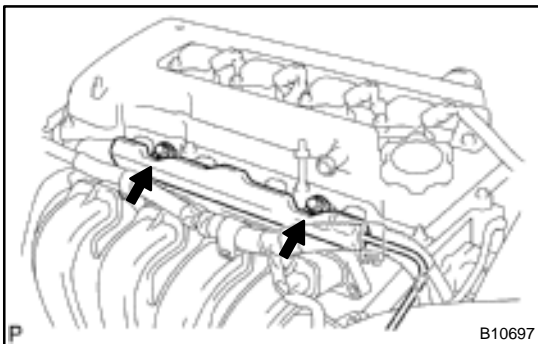
## REMOVAL

1. REMOVE SUSPENSION UPPER BRACE
2. REMOVE NO. 2 CYLINDER HEAD COVER
3. DISCONNECT PCV HOSE



### 4. DISCONNECT WIRE HARNESS CLAMPS

Disconnect the wire harness 3 clamps from the clamp brackets.



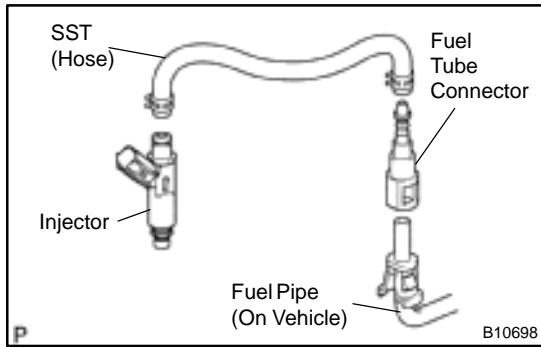
### 5. REMOVE INJECTORS

- (a) Disconnect the 4 injector connectors.
- (b) Remove the 2 bolts holding the delivery pipe to the cylinder head.
- (c) Disconnect the delivery pipe together with the 4 injectors from the cylinder head.

#### NOTICE:

**Be careful not to drop the injectors when disconnecting the delivery pipe.**

- (d) Remove the 2 spacers and 4 grommets.
- (e) Pull out the 4 injectors from the delivery pipe.
- (f) Remove the O-ring from each injector.

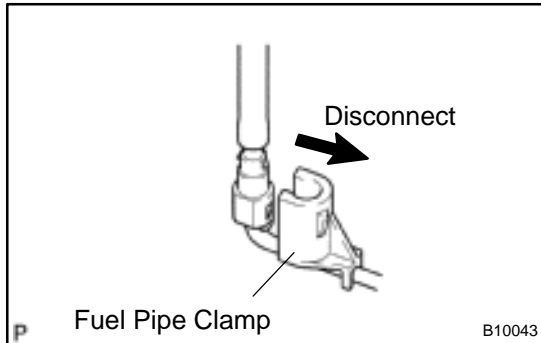


## INSPECTION

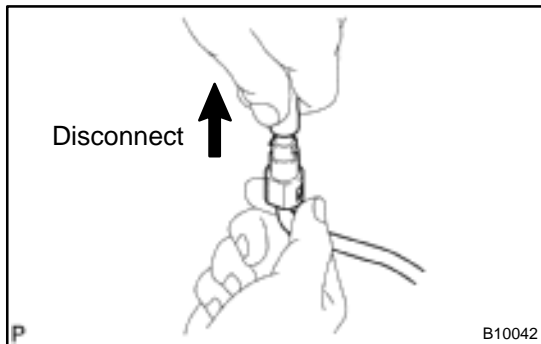
### 1. INSPECT INJECTOR INSPECTION

#### CAUTION:

Keep injector clear of sparks during the test.



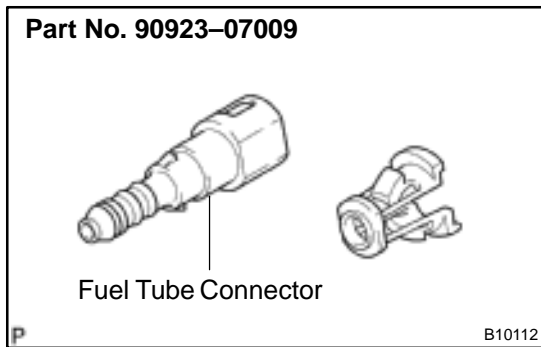
- (a) Disconnect the fuel pipe clamp from the fuel tube connector.



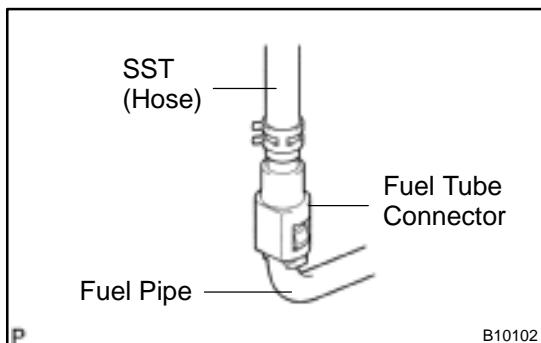
- (b) Disconnect the fuel inlet tube (fuel tube connector) from the fuel pipe.

#### CAUTION:

- **Disconnect the fuel tube connector (quick type) observing the precaution (See page SF-1).**
- **As there is retained pressure in the fuel line, prevent it from splashing inside the engine compartment.**



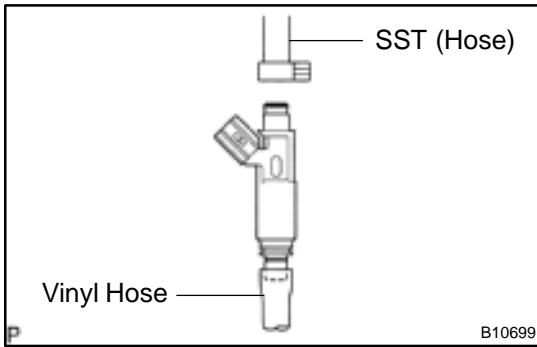
- (c) Purchase a new fuel tube connector.  
Part No. 90923-07009



- (d) Connect SST (hose) and fuel tube connector to the fuel pipe.  
SST 09268-41047 (90467-13001, 95336-08070)

#### CAUTION:

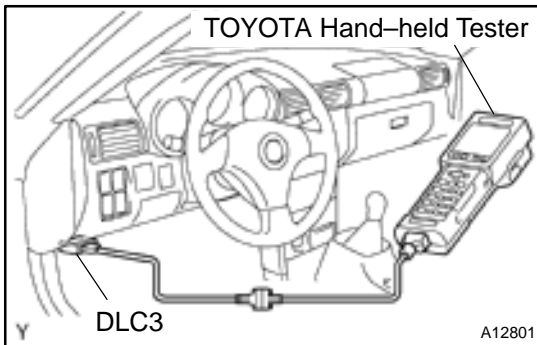
**Connect the fuel tube connector (quick type) observing the precautions (See page SF-1).**



- (e) Connect SST (hose) to the injector.  
SST 09268-41407 (90467-13001, 95336-08070)
- (f) Put the injector into a graduated cylinder.

**CAUTION:**

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



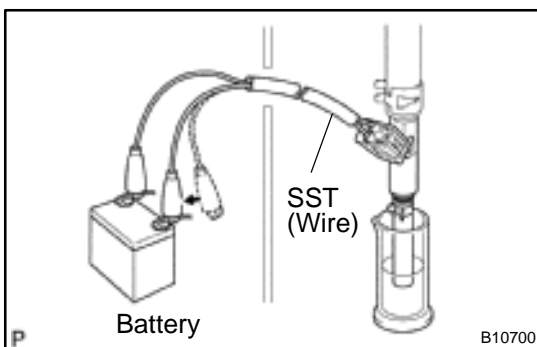
- (g) Connect a TOYOTA hand-held tester to the DLC3.
- (1) Connect the TOYOTA hand-held tester to the DLC3.
  - (2) Connect the battery negative (-) terminal cable to the battery.
  - (3) Turn the ignition switch ON and push the TOYOTA hand-held tester main switch ON.

**NOTICE:**

**Do not start the engine.**

- (4) Select the ACTIVE TEST mode on the TOYOTA hand-held tester.
- (5) Please refer to the TOYOTA hand-held tester operator's manual for further details.

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-7).



- (h) 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

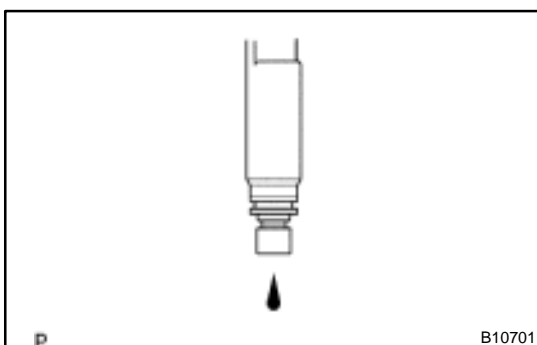
**Injection volume:**

**60 – 73 cm<sup>3</sup> (3.2 – 3.9 cu in.) per 15 seconds**

**Difference between each injector:**

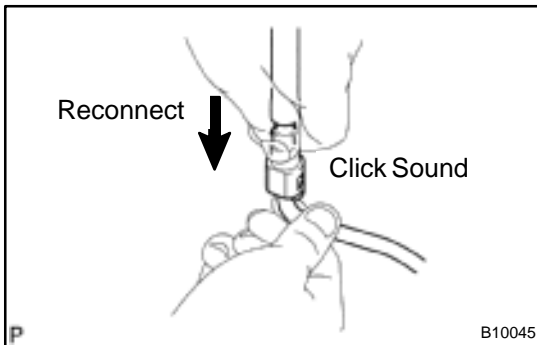
**13 cm<sup>3</sup> (0.7 cu in.) or less**

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

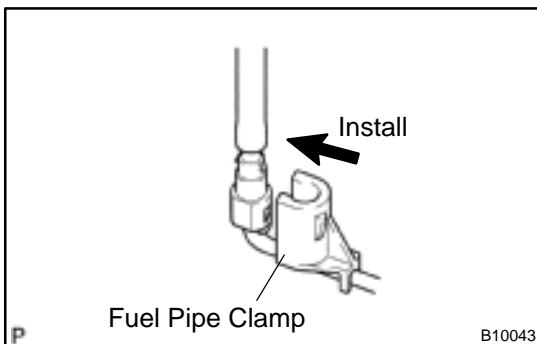
**2. INSPECT LEAKAGE**

- (a) In the condition above, disconnect the tester 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 OFF.
- (c) Disconnect the negative (-) terminal cable from the battery.

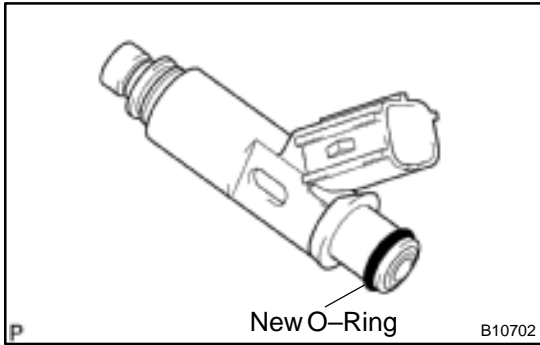
- (d) Remove the SST and fuel tube connector.  
SST 09268-41047 (90467-13001, 95336-08070)
- (e) Disconnect the TOYOTA hand-held tester from the DLC3.



- (f) Reconnect the fuel inlet tube (fuel tube connector).  
**CAUTION:**  
Connect the fuel tube connector (quick type) observing the precaution (See page SF-1).



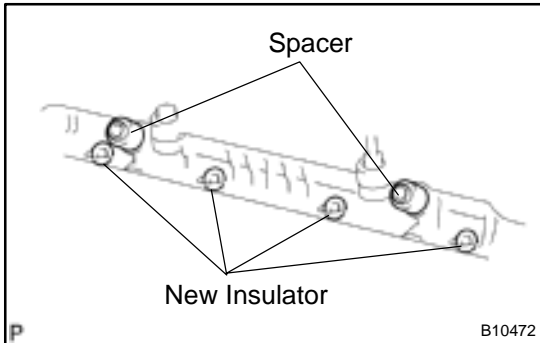
- (g) Install the fuel pipe clamp to the fuel tube connector.



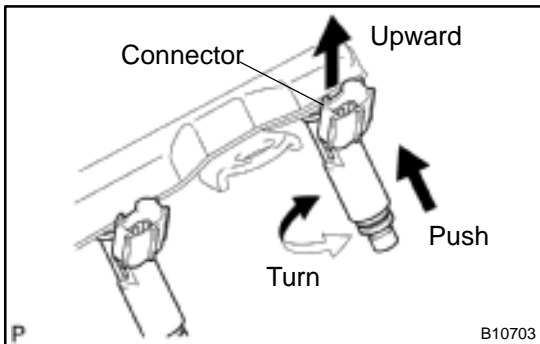
## INSTALLATION

### 1. INSTALL INJECTORS AND DELIVERY PIPES

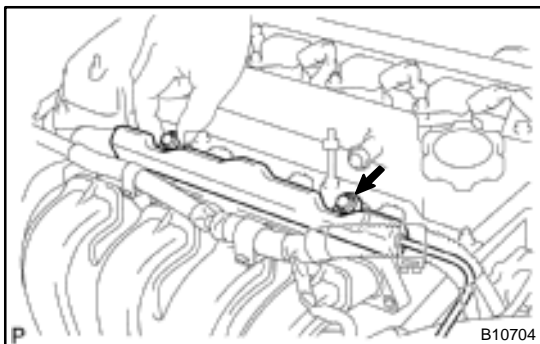
- (a) Apply a light coat of spindle oil or gasoline onto a new O-ring, and install it to each injector.



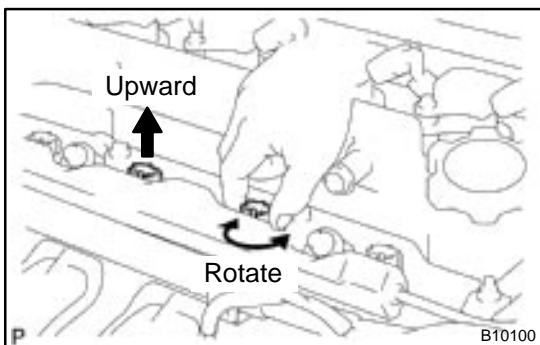
- (b) Install the 2 spacers and 4 new insulators to the cylinder head.



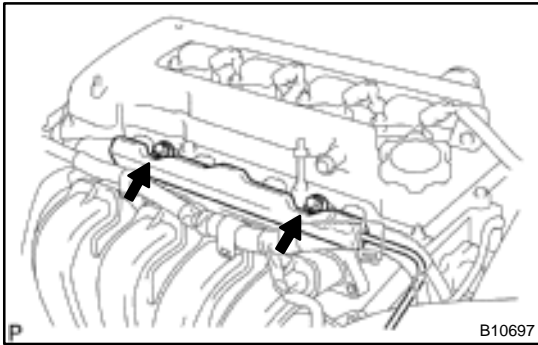
- (c) Apply a light coat of spindle oil or gasoline on the place where a delivery pipe touches the O-ring.
- (d) While turning the injector clockwise and counterclockwise, push it to the delivery pipes. Install the 4 injectors.
- (e) Position the injector connector upward.



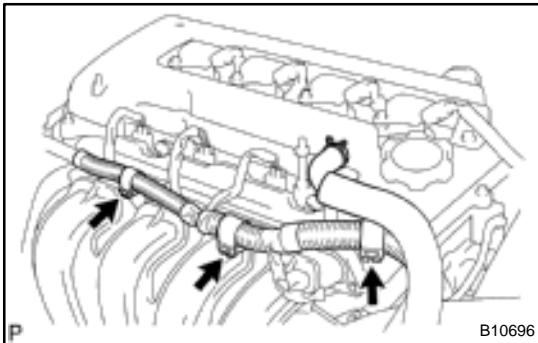
- (f) Attach the delivery pipe together with the 4 injectors to the cylinder head.
- (g) Temporarily install the 2 bolts holding the delivery pipe to the cylinder head.



- (h) 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.
- (i) Position the injector connector upward.



- (j) Tighten the 2 bolts holding the delivery pipe to the cylinder head.  
**Torque: 19 N·m (190 kgf-cm, 13 ft-lbf)**
- (k) Connect the 4 injector connectors.



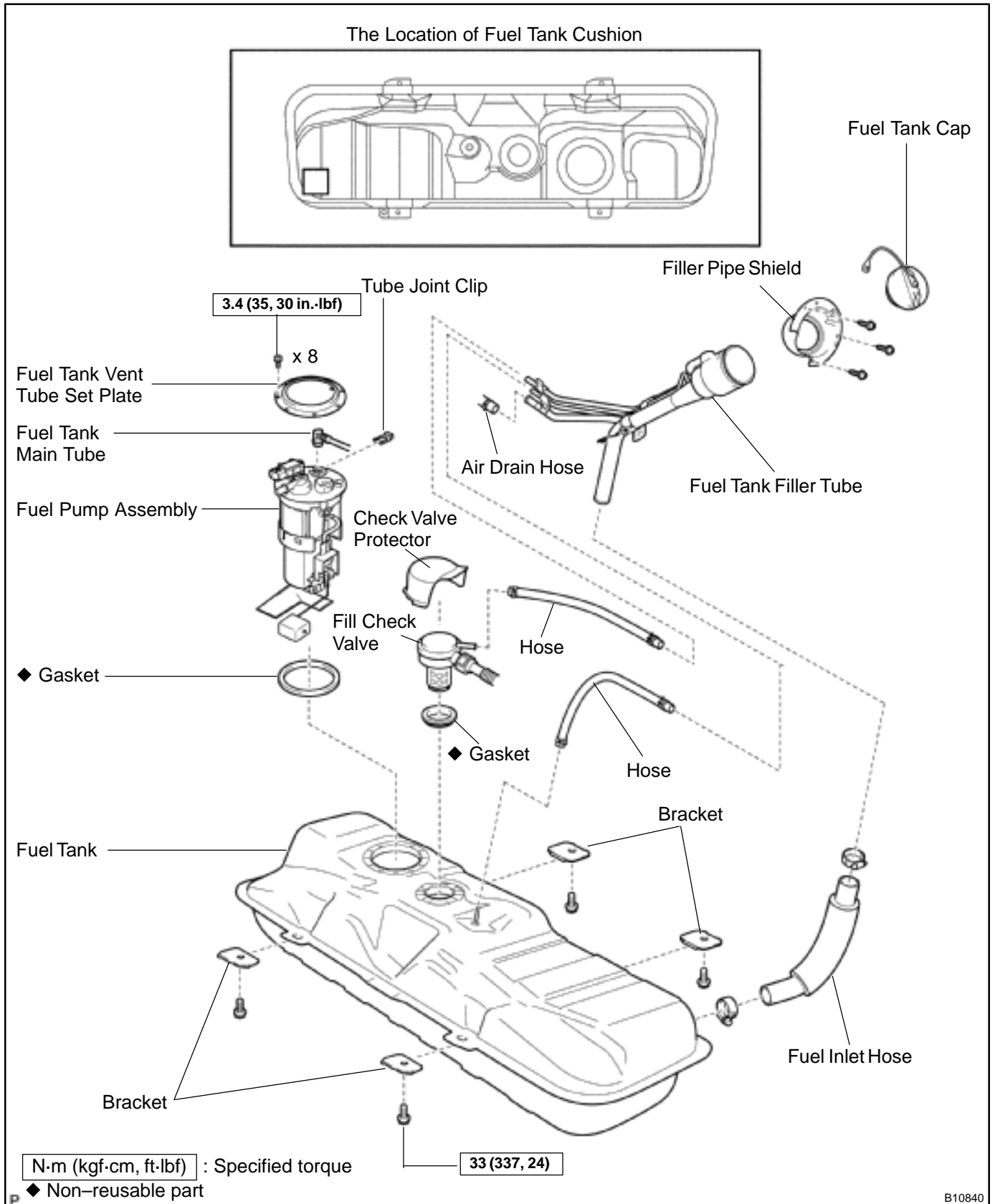
- 2. CONNECT WIRE HARNESS CLAMPS**  
Connect the 3 wire harness clamps to the clamp brackets.
- 3. CONNECT PCV HOSE**
- 4. INSTALL NO. 2 CYLINDER HEAD COVER**
- 5. INSTALL SUSPENSION UPPER BRACE**

# FUEL TANK AND LINE COMPONENTS

SF09N-06

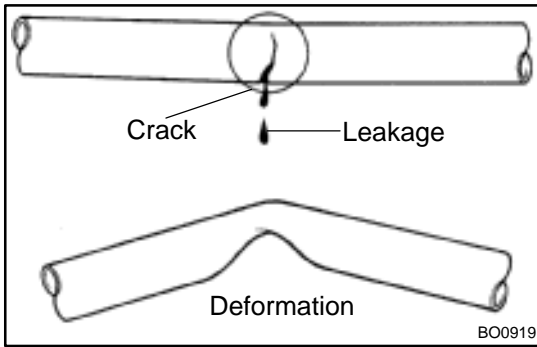
**CAUTION:**

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



2000MR2 (RM760U)

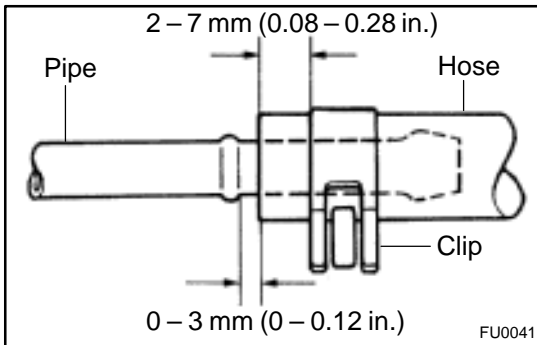
B10840



## INSPECTION

### INSPECT FUEL TANK AND LINE

- (a) Check the fuel lines for cracks or leakage, and all connections for deformation.
- (b) Check the fuel tank for deformation, cracks fuel leakage or tank band looseness.
- (c) Check the filter neck for damage or fuel leakage.



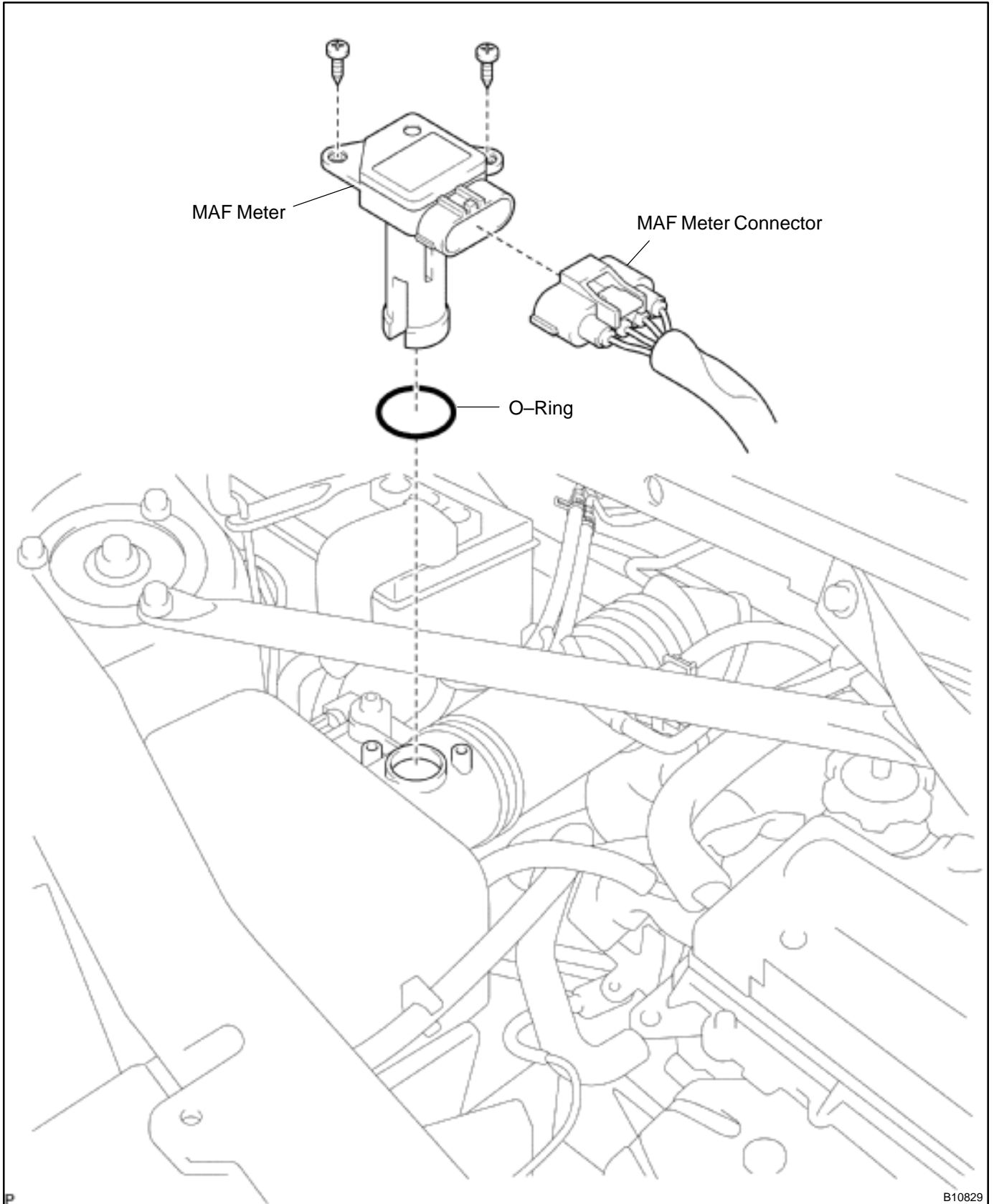
- (d) Hose and tube connections are as shown in the illustration.

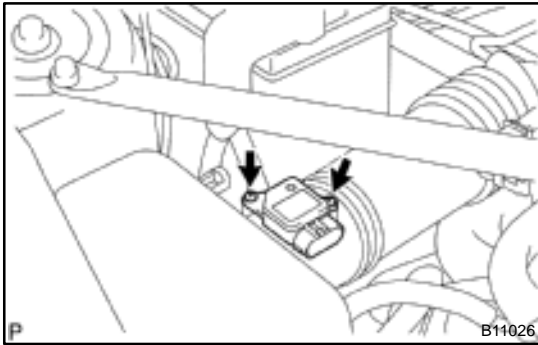
If a problem is found, repair or replace the part as necessary.



# MASS AIR FLOW (MAF) METER COMPONENTS

SF07P-06

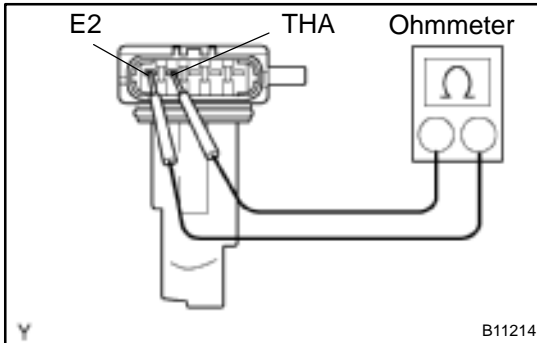




## INSPECTION

1. **DISCONNECT MAF METER CONNECTOR**
2. **REMOVE MAF METER**

Remove the 2 screws and MAF meter.

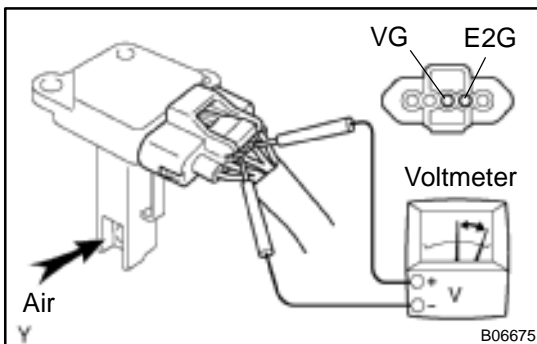


### 3. INSPECT MAF METER

- (a) Using an ohmmeter, measure the resistance between terminals THA and E2.

Temperature	Resistance
-20°C (-4°F)	13.6 - 18.4 kΩ
20°C (68°F)	2.21 - 2.69 kΩ
60°C (140°F)	0.49 - 0.67 kΩ

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



- (b) Inspect operation.

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

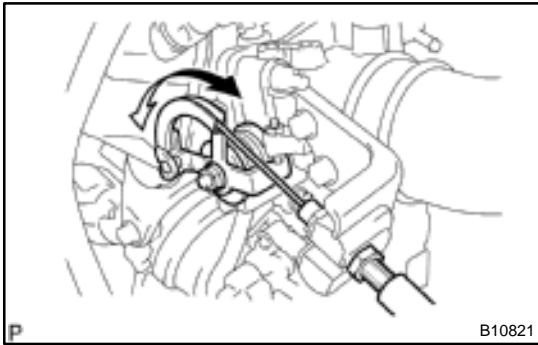
If operation is not as specified, replace the MAF meter.

- (6) Turn the ignition switch OFF.
- (7) Disconnect the negative (-) terminal cable to the battery.
- (8) Disconnect the MAF meter connector.

### 4. REINSTALL MAF METER

Install the MAF meter with the 2 screws.

### 5. RECONNECT MAF METER CONNECTOR

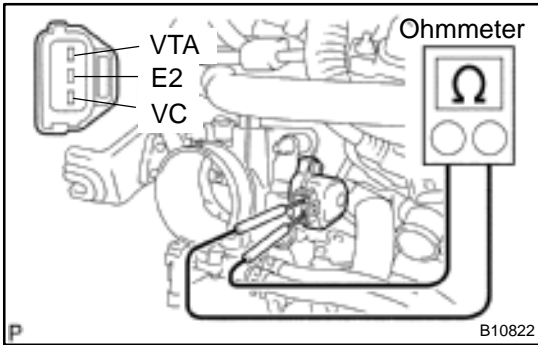


# THROTTLE BODY ON-VEHICLE INSPECTION

SF09P-09

## 1. INSPECT THROTTLE BODY

Check that the throttle linkage moves smoothly.



## 2. INSPECT THROTTLE POSITION SENSOR

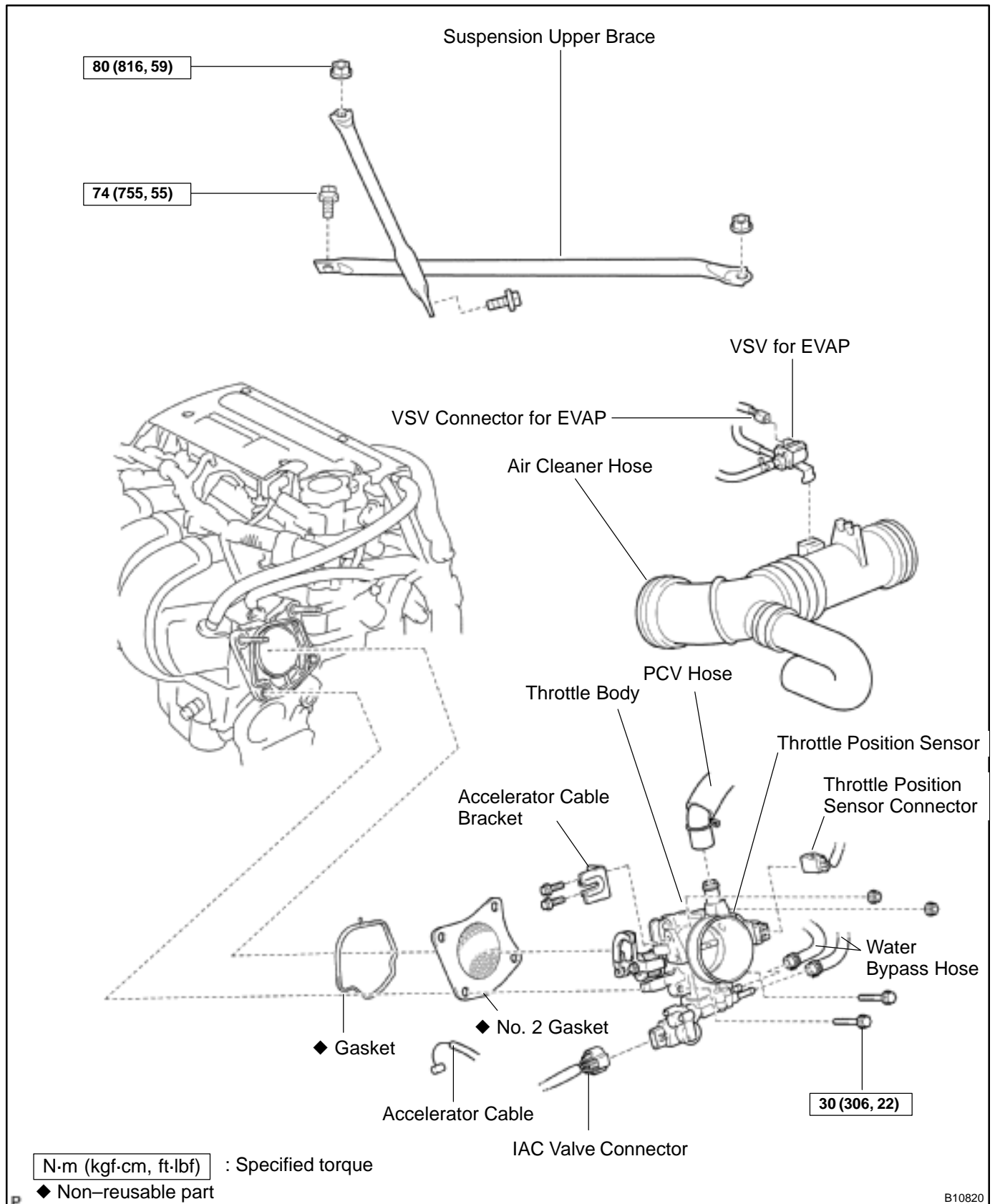
(a) Disconnect the sensor connector.

(b) 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 kΩ
Throttle valve fully open	VTA - E2	2.0 - 10.2 kΩ
-	VC - E2	2.5 - 5.9 kΩ

(c) Reconnect the sensor connector.

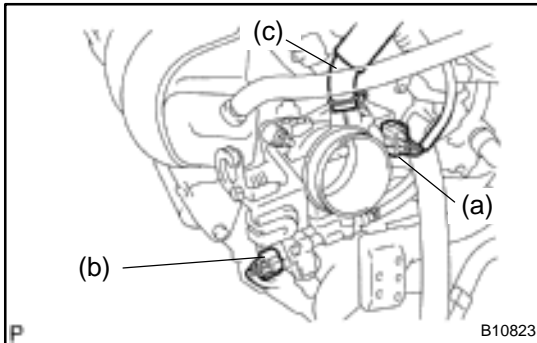
# COMPONENTS



B10820

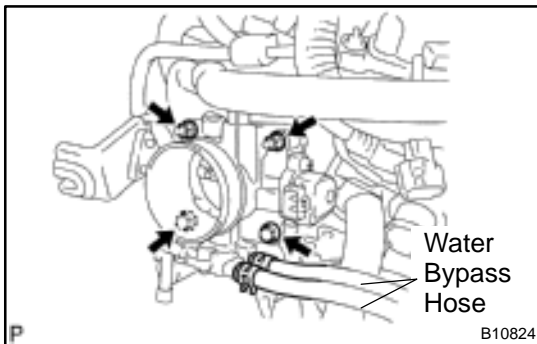
## REMOVAL

1. DRAIN ENGINE COOLANT
2. REMOVE SUSPENSION UPPER BRACE
3. DISCONNECT VSV FOR EVAP FROM AIR CLEANER HOSE
4. REMOVE AIR CLEANER HOSE
5. DISCONNECT ACCELERATOR CABLE

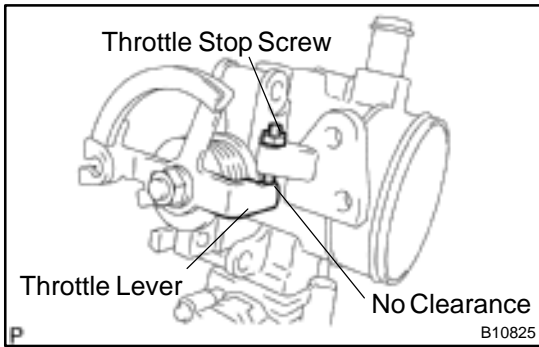


### 6. REMOVE THROTTLE BODY

- (a) Disconnect the throttle position sensor connector.
- (b) Disconnect the IAC valve connector.
- (c) Disconnect the PCV hose from the throttle body.



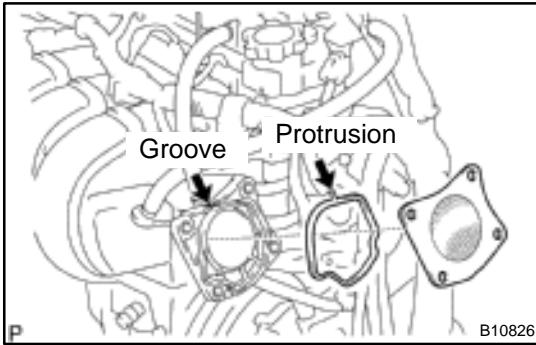
- (d) Disconnect the 2 water bypass hoses from the throttle body.
- (e) Remove the 2 bolts, 2 nuts, throttle body and 2 gaskets from the intake manifold.
- (f) Remove the 2 bolts and accelerator cable bracket from the throttle body.



## INSPECTION

### INSPECT THROTTLE VALVE

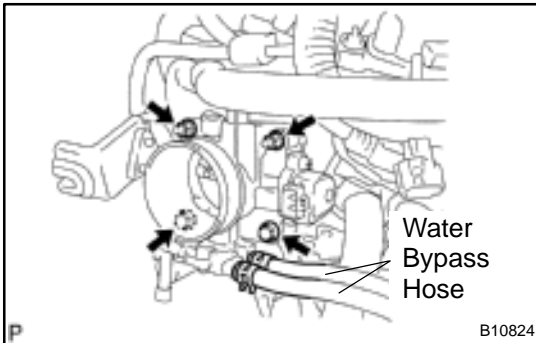
Check that there is no clearance between the throttle stop screw and throttle lever when the throttle valve is fully closed.



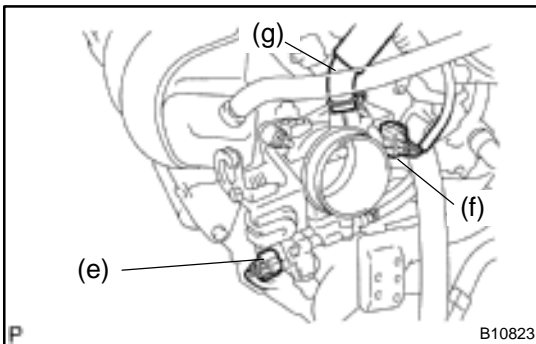
## INSTALLATION

### 1. INSTALL THROTTLE BODY

- (a) Install 2 new gaskets to the intake manifold as shown in the illustration.
- (b) Install the accelerator cable bracket to the throttle body with the 2 bolts.



- (c) Install the throttle body with the 2 bolts and 2 nuts bolts.  
**Torque: 30 N·m (306 kgf·cm, 22 ft·lbf)**
- (d) Connect the 2 water bypass hoses to the throttle body.



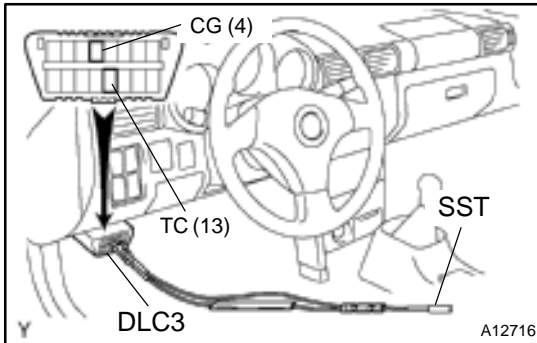
- (e) Connect the IAC valve connector.
  - (f) Connect the throttle position sensor connector.
  - (g) Connect the PCV hose to the throttle body.
2. **CONNECT ACCELERATOR CABLE**
  3. **INSTALL AIR CLEANER HOSE**
  4. **INSTALL VSV FOR EVAP**
  5. **INSTALL SUSPENSION UPPER BRACE**
  6. **FILL RADIATOR WITH ENGINE COOLANT**

# IDLE AIR CONTROL (IAC) VALVE ON-VEHICLE INSPECTION

SF09U-05

## INSPECT IAC VALVE OPERATION

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



- (b) Using SST, connect terminals TC (13) and CG (4) of the DLC3.

SST 09843-18040

- (c) After the engine speed is kept at 1,000 – 1,500 rpm for 5 seconds, check that it returns to idle speed.

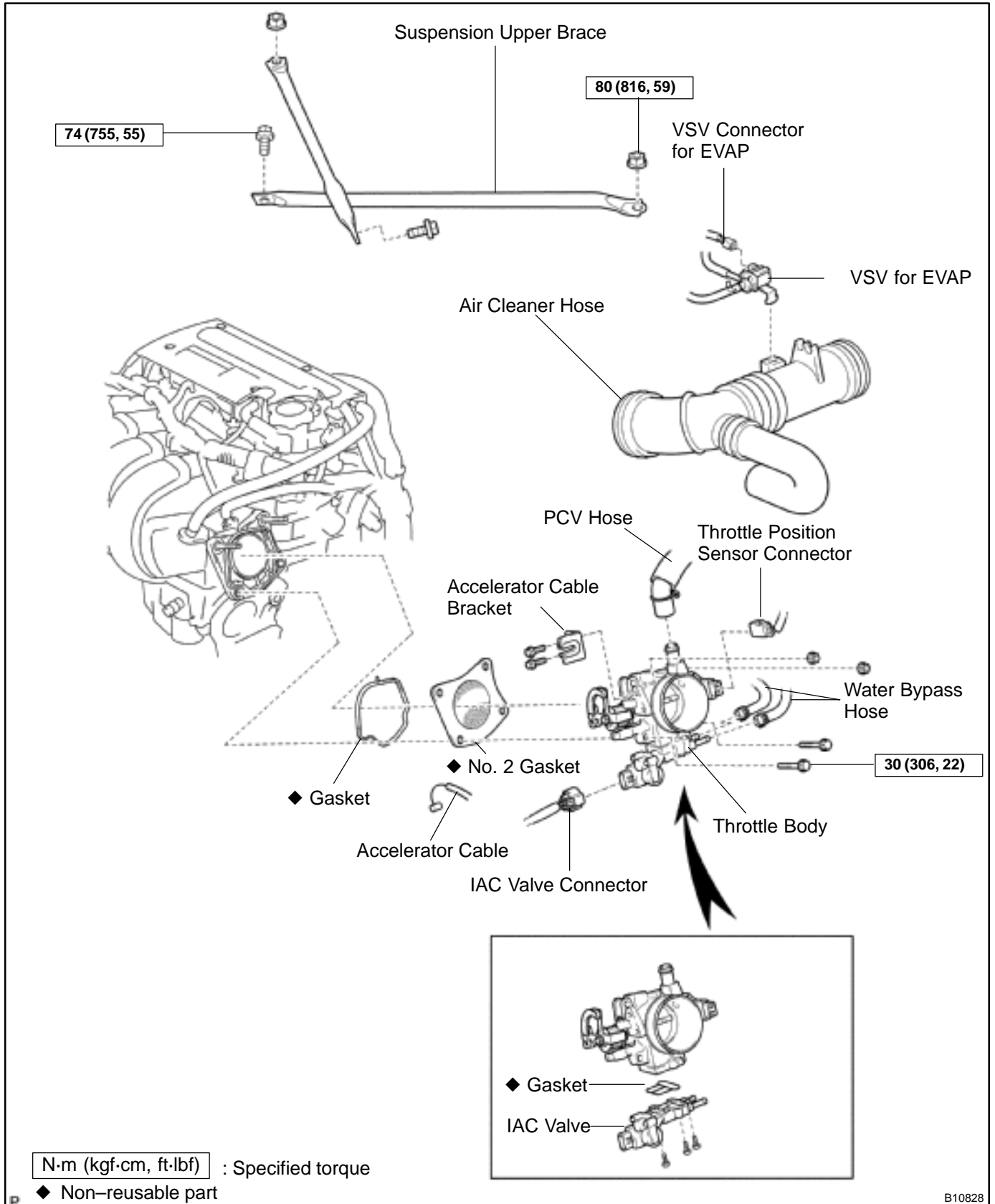
If the engine speed operation is not as specified, check the IAC valve, wiring and ECM.

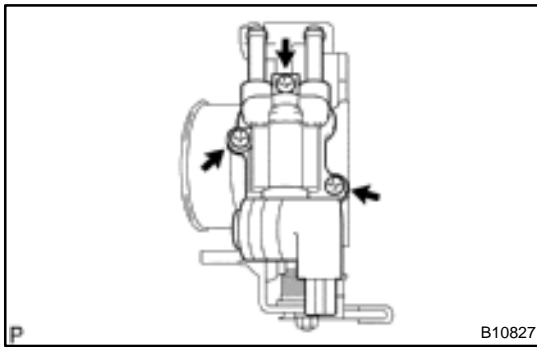
- (d) Remove the SST from the DLC3.

SST 09843-18040



# COMPONENTS



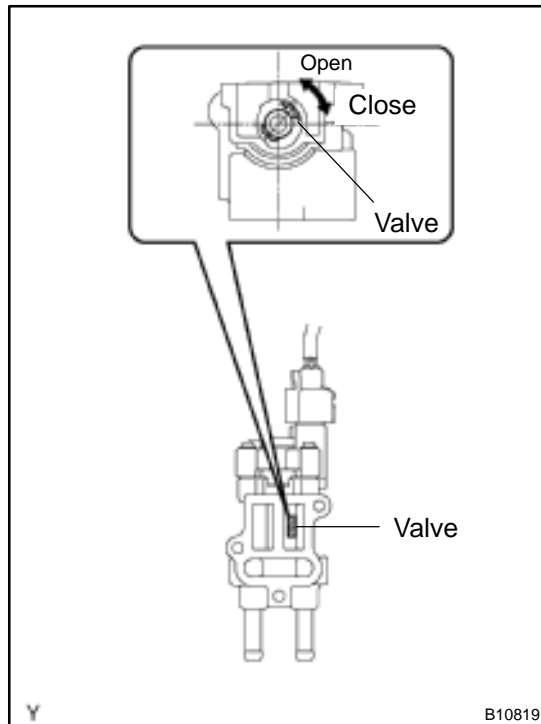


## INSPECTION

**1. REMOVE THROTTLE BODY (See page SF-35)**

**2. REMOVE IAC VALVE**

Remove the 3 screws, IAC valve and gasket.



**3. INSPECT IAC VALVE OPERATION**

(a) Check that the IAC valve is half-opened.

(b) Connect the IAC valve connector.

(c) Turn the ignition switch ON.

(d) Check that the IAC valve operates in the sequence, half open, fully close, fully open and then half open, within 0.5 seconds.

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

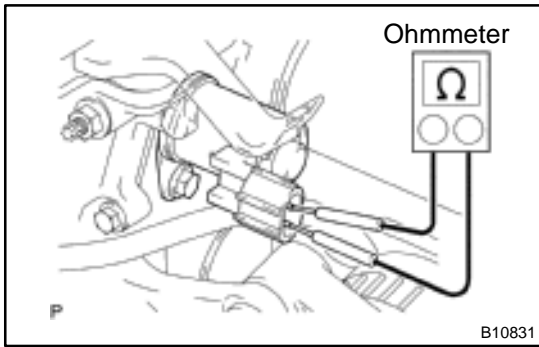
(e) Turn the ignition switch OFF.

(f) Disconnect the IAC valve connector.

**4. REINSTALL IAC VALVE**

Install a new gasket and the IAC valve with the 3 screws.

**5. REINSTALL THROTTLE BODY (See page SF-37)**



## CAMSHAFT TIMING OIL CONTROL VALVE

SF0SL-10

### ON-VEHICLE INSPECTION

#### INSPECT CAMSHAFT TIMING OIL CONTROL VALVE (OCV) RESISTANCE

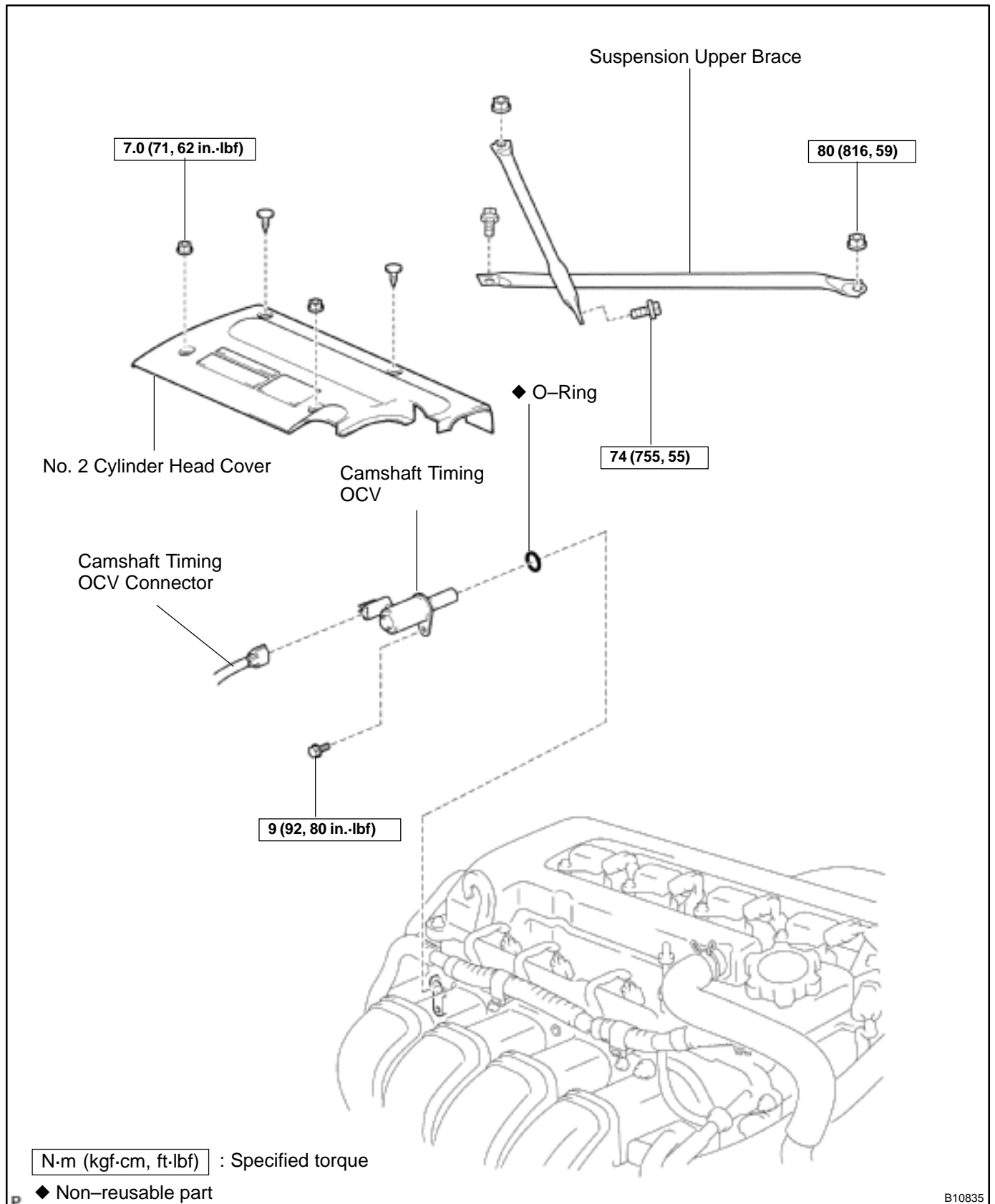
- Disconnect the ocv connector.
- Using an ohmmeter, measure the resistance between the terminals.

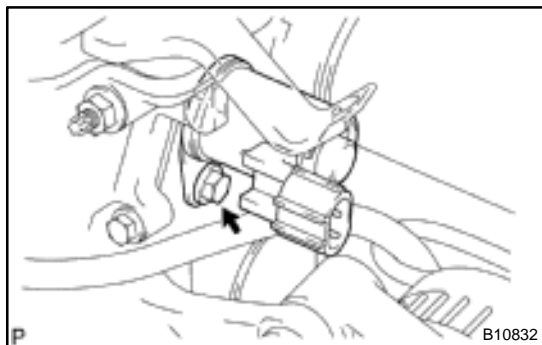
**Resistance: 6.9 – 7.9  $\Omega$  at 20°C (68°F)**

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

- Reconnect the ocv connector.

# COMPONENTS

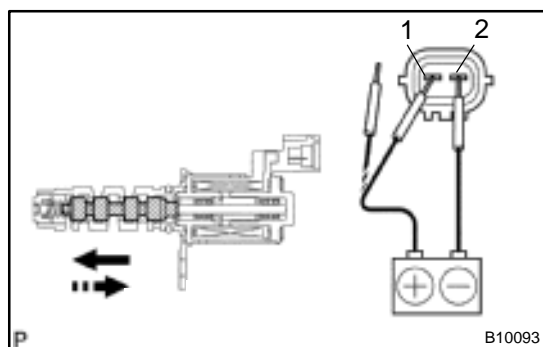




## INSPECTION



### 1. REMOVE CAMSHAFT TIMING OIL CONTROL VALVE (OCV)

- Remove the suspension upper brace.
- Remove the No. 2 cylinder head cover.
- Disconnect the ocv connector.
- Remove the bolt and ocv.
- Remove the O-ring from the ocv.



### 2. INSPECT CAMSHAFT TIMING OIL CONTROL VALVE (OCV) 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

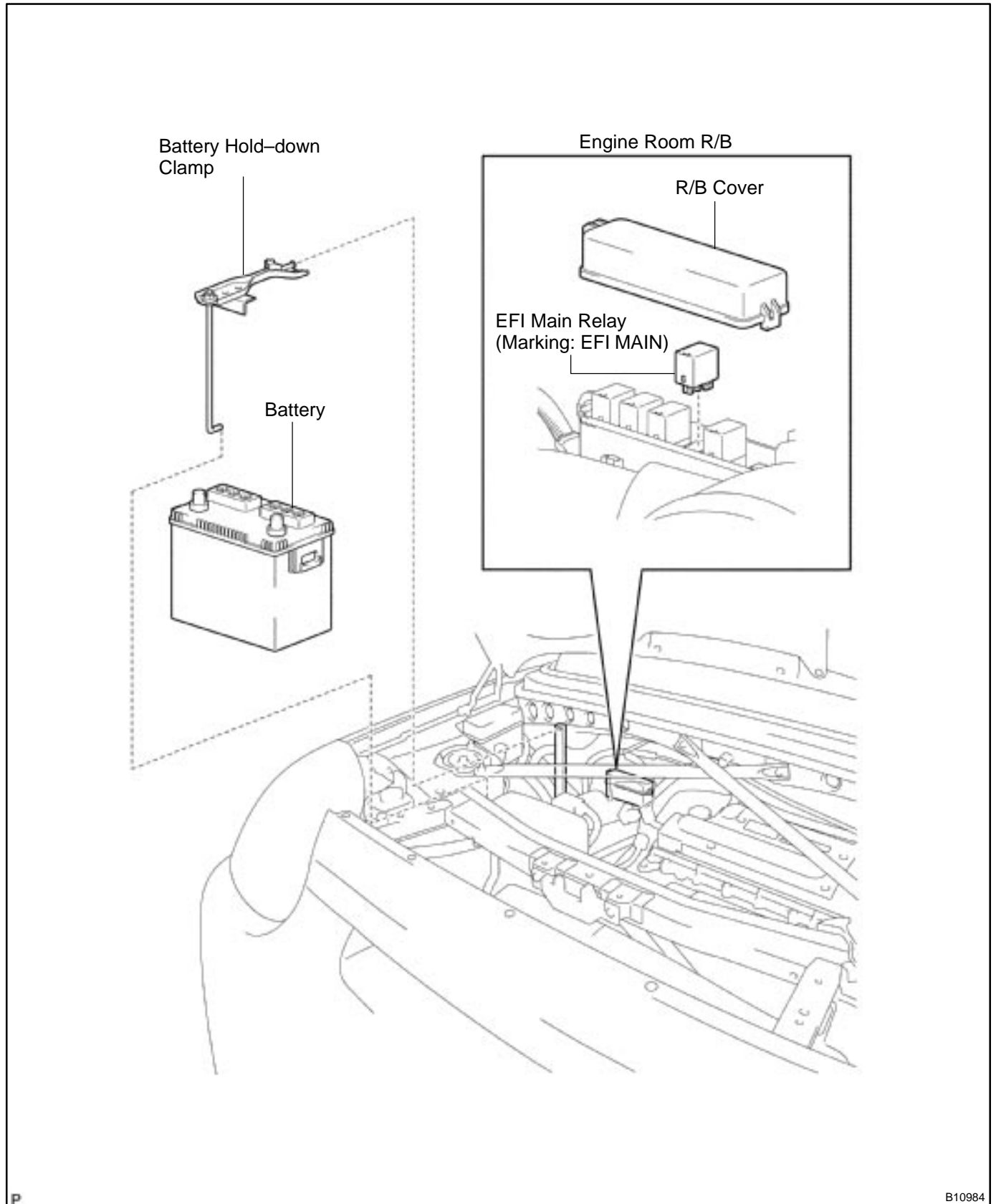
If operation is not as specified, replace the ocv.

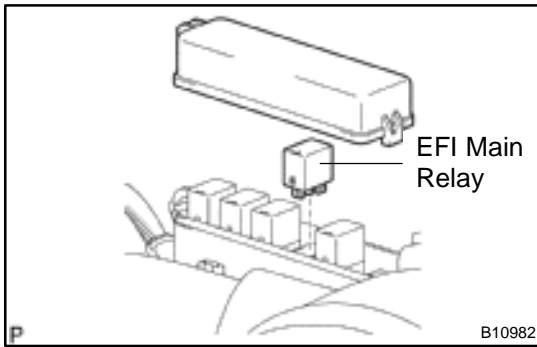
### 3. REINSTALL CAMSHAFT OIL CONTROL VALVE

- Install a new O-ring to the ocv.
- Install the ocv with the bolt.  
**Torque: 9 N·m (92 kgf·cm, 80 in.-lbf)**
- Connect the ocv connector.
- Install the No. 2 cylinder head cover.
- Install the suspension upper brace.

# EFI MAIN RELAY COMPONENTS

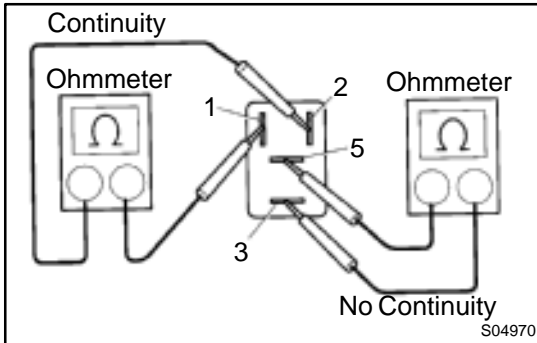
SF19T-01





## INSPECTION

### 1. REMOVE EFI MAIN RELAY (Marking: EFI MAIN)



### 2. INSPECT EFI MAIN RELAY

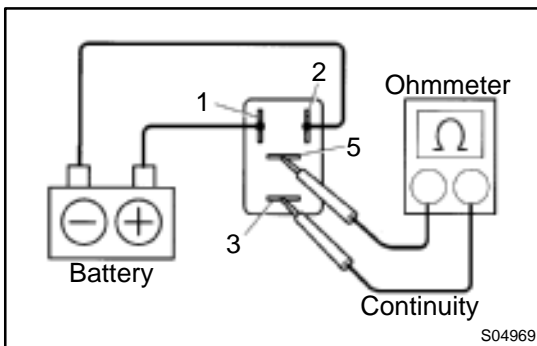
#### (a) Inspect the relay continuity.

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

If there is no continuity, replace the relay.

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

If there is continuity, replace the relay.



#### (b) Inspect the relay operation.

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

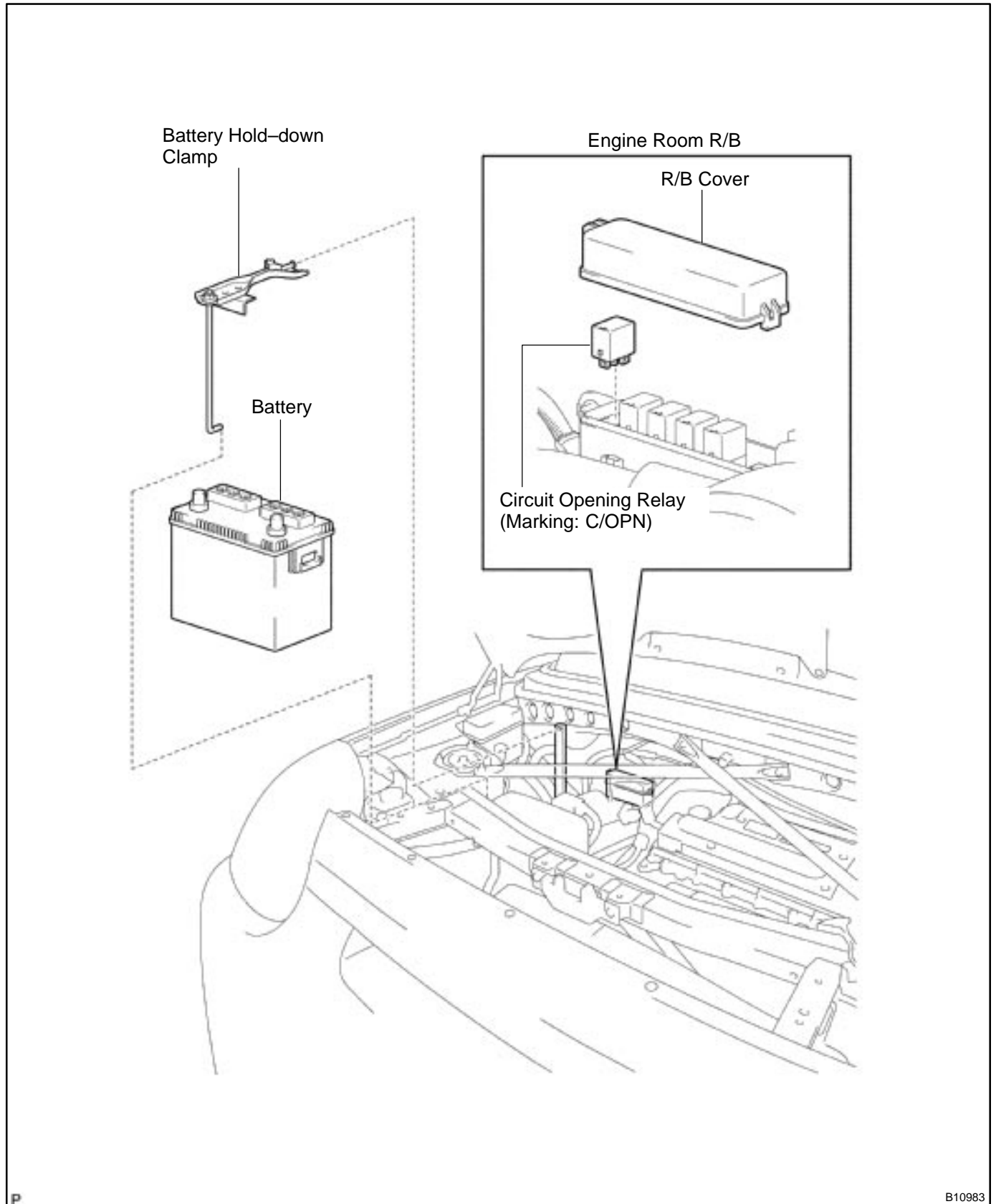
- (2) Using an ohmmeter, check that there is continuity between terminals 3 and 5.

If there is no continuity, replace the relay.

### 3. REINSTALL EFI MAIN RELAY

# CIRCUIT OPENING RELAY COMPONENTS

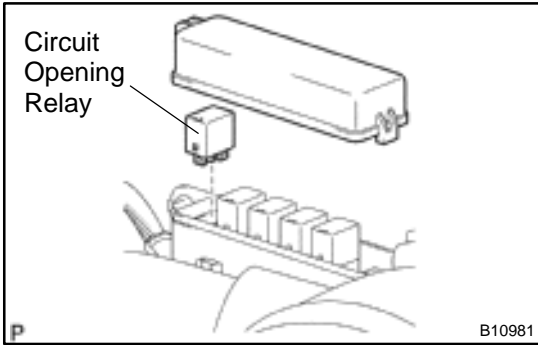
SF19U-01



P

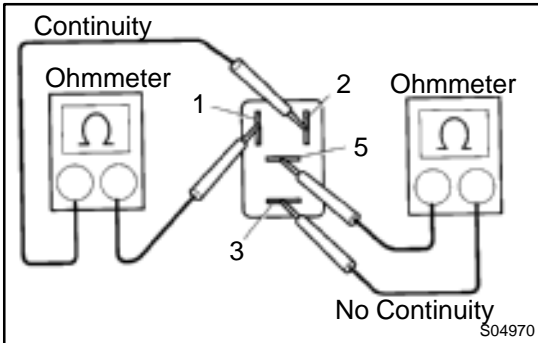
B10983





## INSPECTION

### 1. REMOVE CIRCUIT OPENING RELAY (Marking: C/OPN)

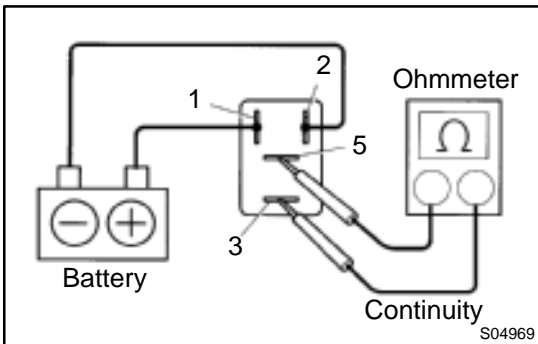


### 2. INSPECT CIRCUIT OPENING RELAY

- (a) Inspect the relay continuity.
  - (1) Using an ohmmeter, check that there is continuity between terminals 1 and 2.
  - (2) Check that there is no continuity between terminals 3 and 5.

If there is no continuity, replace the relay.

If there is continuity, replace the relay.



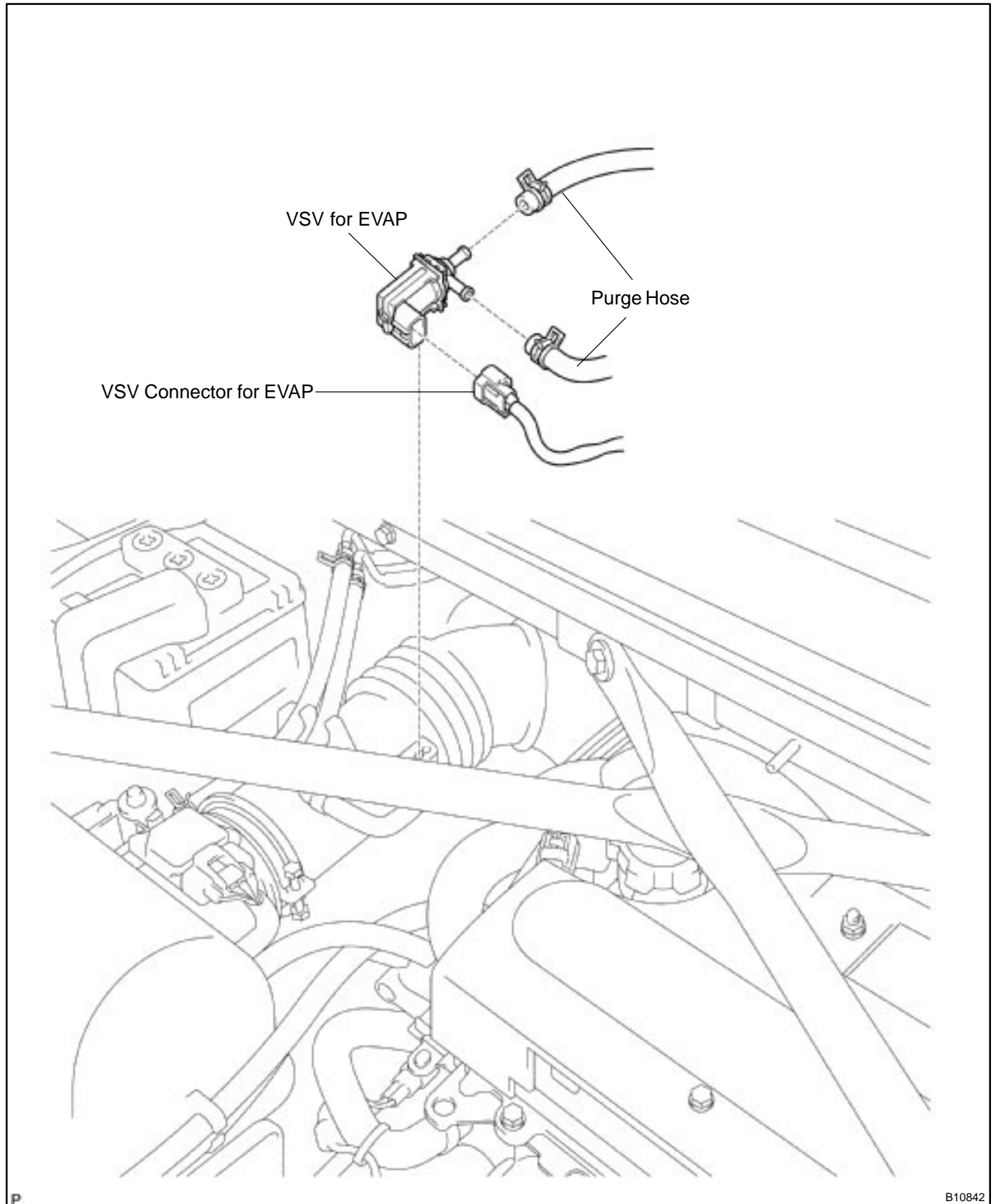
- (b) Inspect the relay operation.
  - (1) Apply battery positive voltage across terminals 1 and 2.
  - (2) Using an ohmmeter, check that there is continuity between terminals 3 and 5.

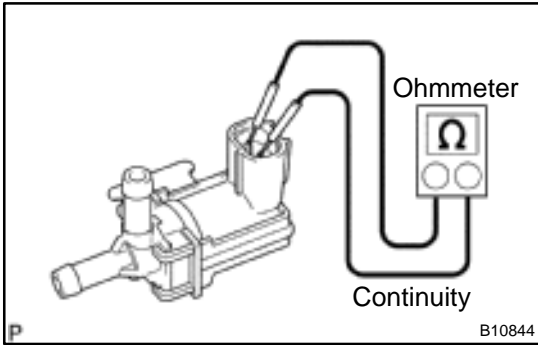
If there is no continuity, replace the relay.

### 3. REINSTALL CIRCUIT OPENING RELAY

# VSV FOR EVAPORATIVE EMISSION (EVAP) COMPONENTS

SF15W-02





## INSPECTION

### 1. REMOVE VSV

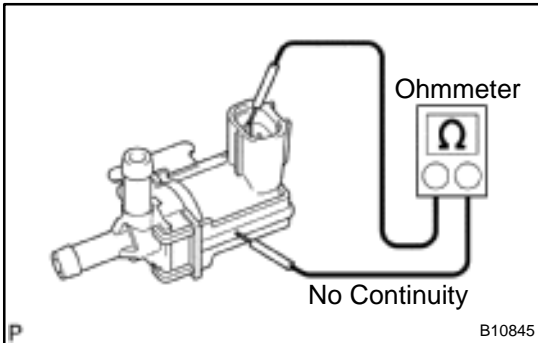
### 2. INSPECT VSV

(a) Inspect the VSV for open circuit.

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

**Resistance: 27 – 33 Ω at 20°C (68°F)**

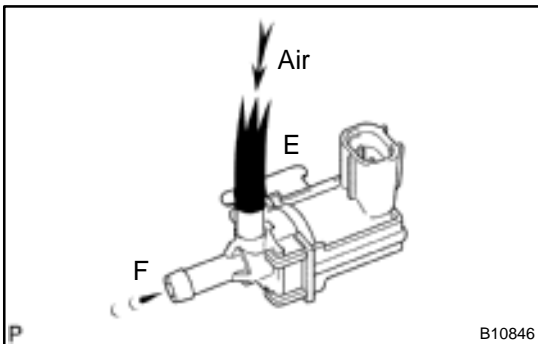
If there is no continuity, replace the VSV.



(b) Inspect the VSV for ground.

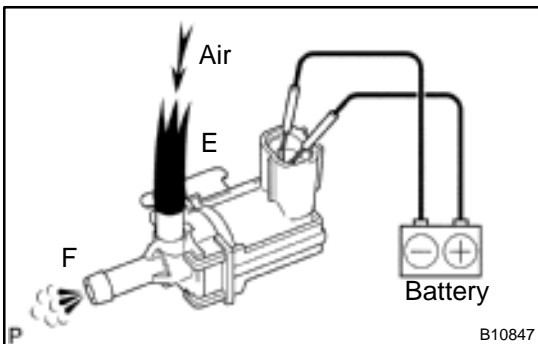
Using an ohmmeter, check that there is no continuity between each terminal and the body.

If there is continuity, replace the VSV.



(c) Inspect the VSV operation.

(1) Check that air flows with a little difficulty from ports E to F.



(2) Apply battery positive voltage across the terminals.

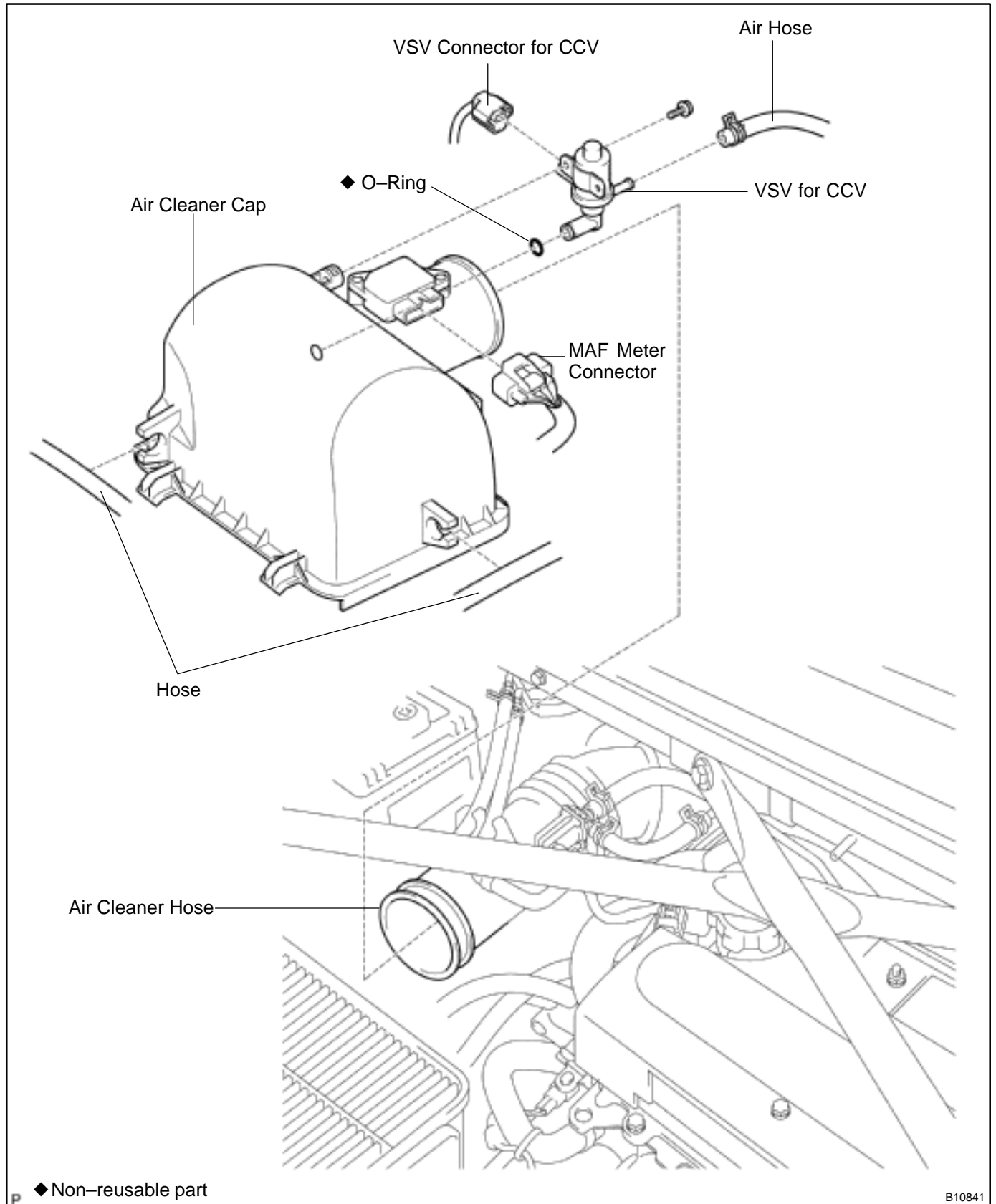
(3) Check that air flows from ports E to F.

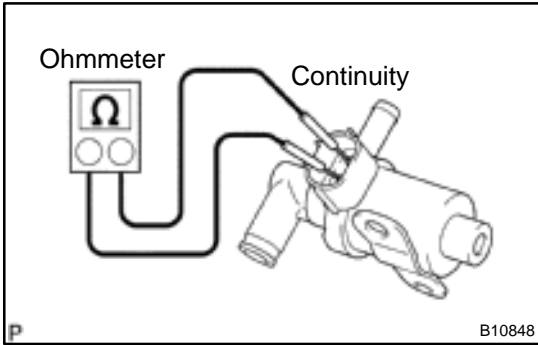
If operation is not as specified, replace the VSV.

### 3. REINSTALL VSV

# VSV FOR CANISTER CLOSED VALVE (CCV) COMPONENTS

SF15Y-02





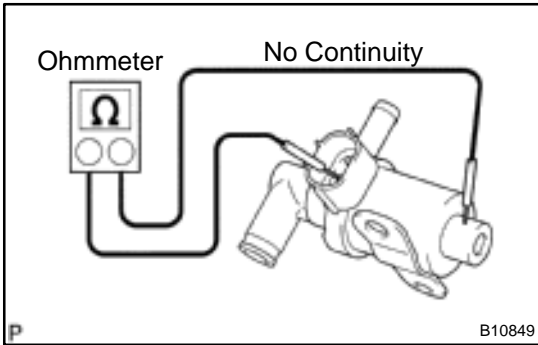
**INSPECTION**

1. REMOVE VSV
2. INSPECT VSV

(a) Inspect the VSV for open circuit.  
Using an ohmmeter, check that there is continuity between the terminals.

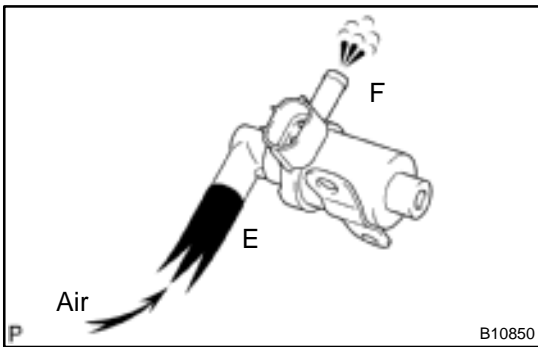
**Resistance: 25 – 30 Ω at 20°C (68°F)**

If there is no continuity, replace the VSV.

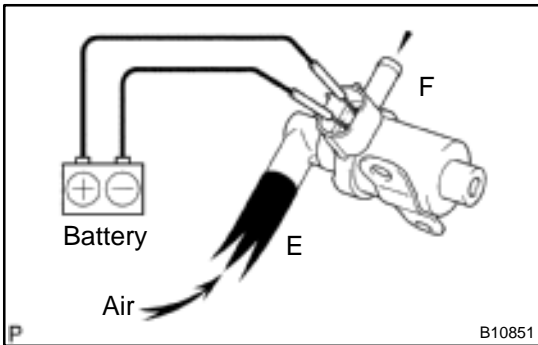


(b) Inspect the VSV for ground.  
Using an ohmmeter, check that there is no continuity between each terminal and the body.

If there is no continuity, replace the VSV.



- (c) Inspect the VSV for operation.
- (1) Check that air flows from ports E to F.



(2) Apply battery positive voltage across the terminals.

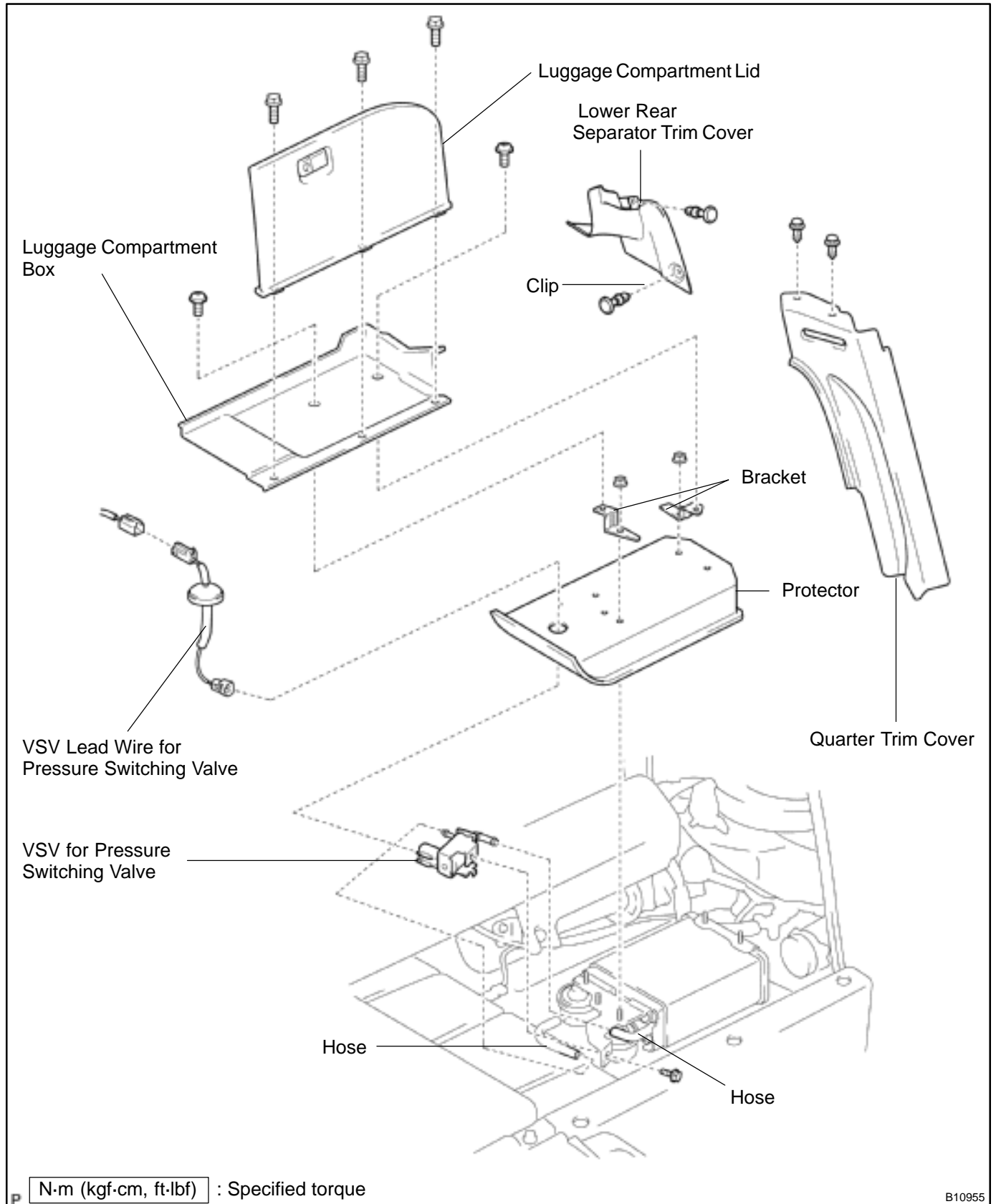
(3) Check that air does not flow from ports E to F.

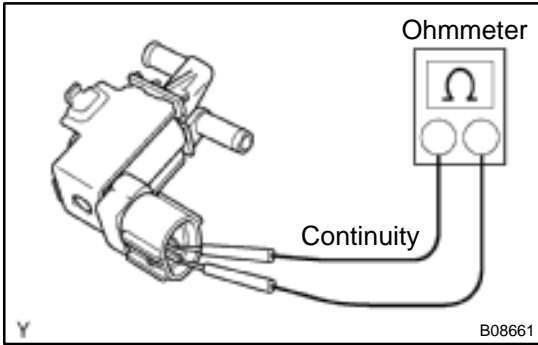
If operation is not as specified, replace the VSV.

3. REINSTALL VSV

# VSV FOR PRESSURE SWITCHING VALVE COMPONENTS

SF160-02





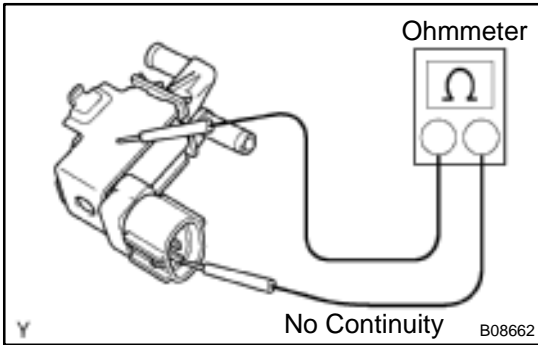
**INSPECTION**

- 1. REMOVE VSV
- 2. INSPECT VSV

(a) Inspect the VSV for open circuit.  
Using an ohmmeter, check that there is continuity between the terminals.

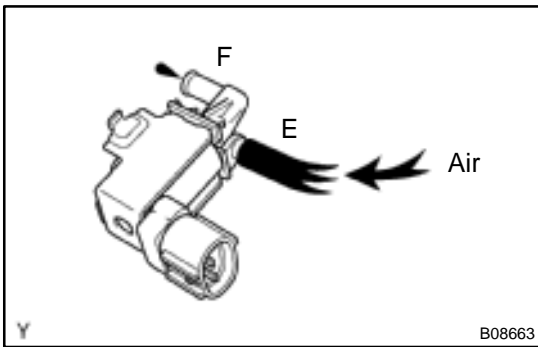
**Resistance: 30 – 36 Ω at 20°C (68°F)**

If there is no continuity, replace the VSV.

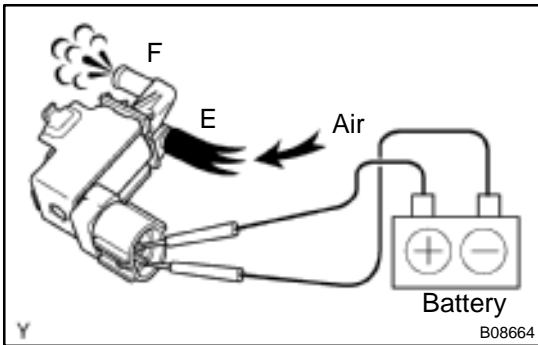


(b) Inspect the VSV for ground.  
Using an ohmmeter, check that there is no continuity between each terminal and the body.

If there is no continuity, replace the VSV.



- (c) Inspect the VSV operation.
  - (1) Check that air does not flow from ports E to F.



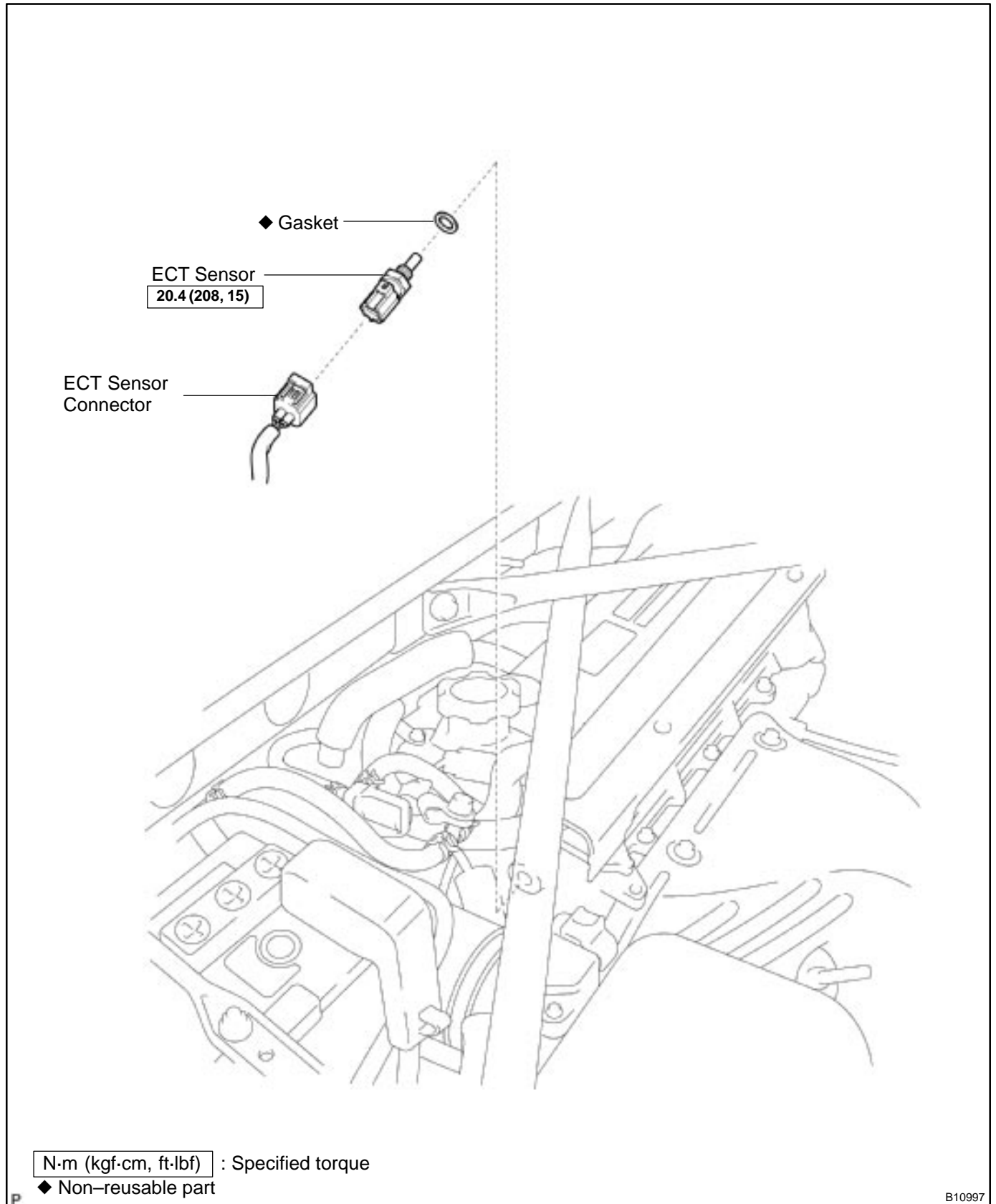
- (2) Apply battery positive voltage across the terminals.
- (3) Check that air flows from ports E to F.

If operation is not as specified, replace the VSV.

- 3. REINSTALL VSV

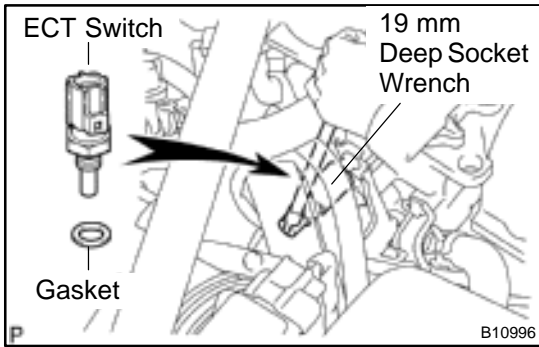
# ENGINE COOLANT TEMPERATURE (ECT) SENSOR COMPONENTS

SF162-02



B10997





# ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION

SF19V-01

1. **DRAIN ENGINE COOLANT**
2. **REMOVE ECT SENSOR**
  - (a) Disconnect the sensor connector.
  - (b) Using a 19 mm deep socket wrench, remove the sensor and gasket.

### 3. INSPECT ECT SENSOR

Using an ohmmeter, measure the resistance between terminals.

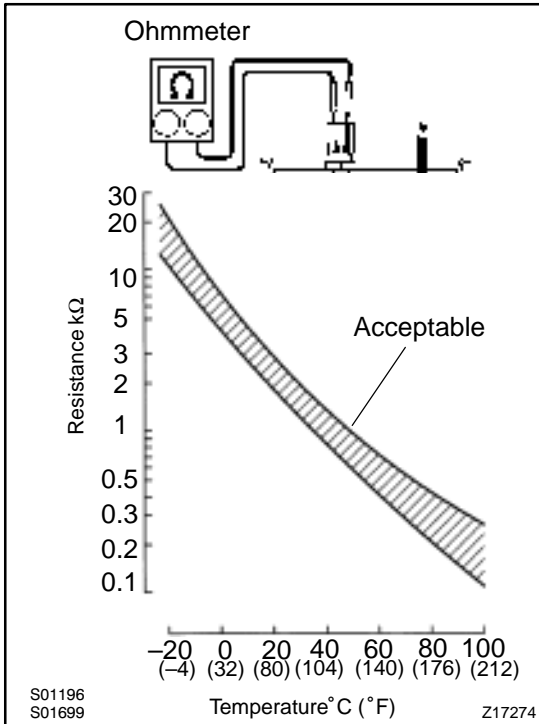
**Resistance: Refer to the graph**

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

### 4. REINSTALL ECT SENSOR

- (a) Install a new gasket to the sensor.
  - (b) Using a 19 mm deep socket wrench, install the sensor.
- Torque: 20.4 N·m (208 kgf·cm, 15 ft·lbf)**
- (c) Connect the sensor connector.

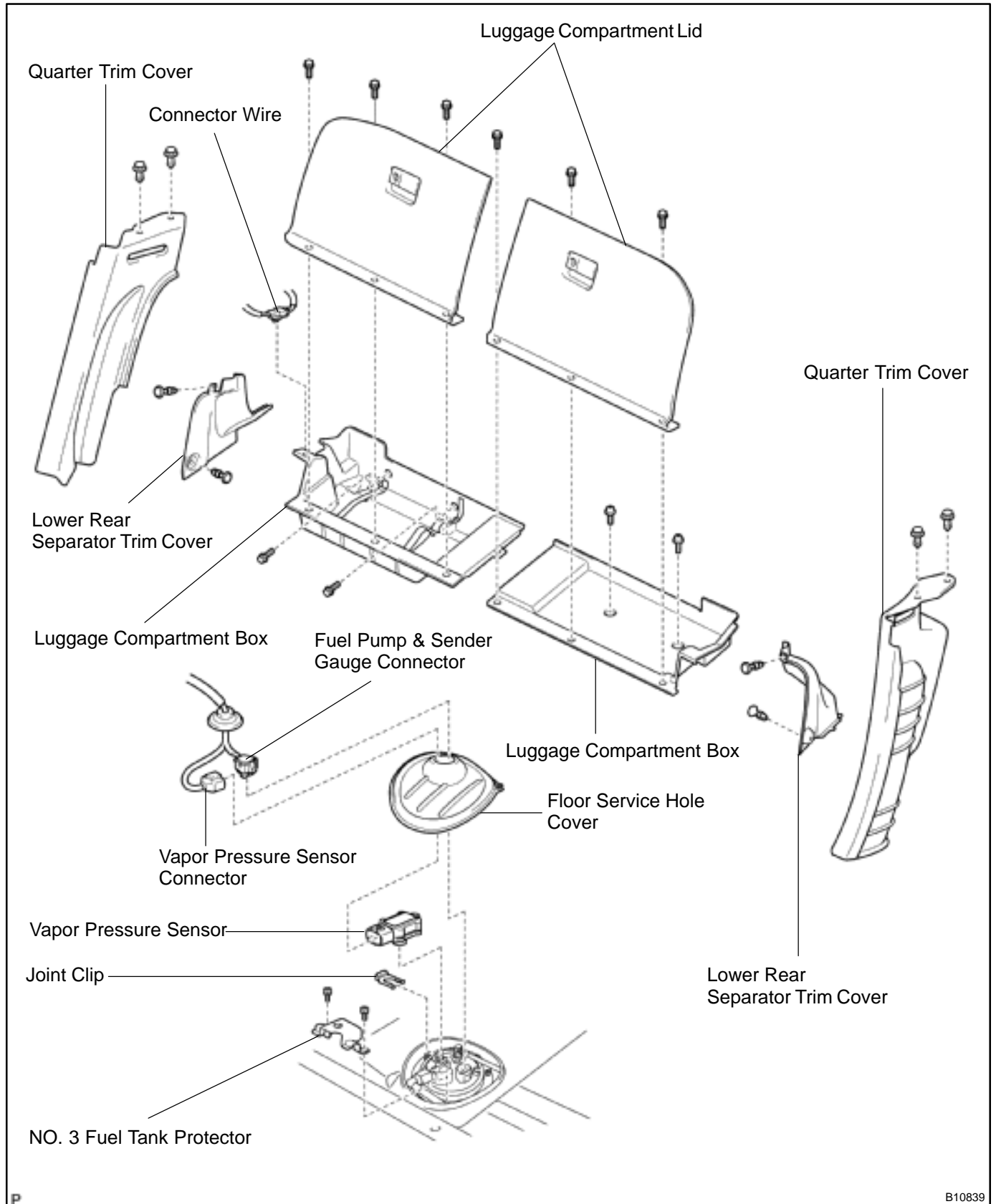
### 5. REFILL WITH ENGINE COOLANT



Z17274

# VAPOR PRESSURE SENSOR COMPONENTS

SF164-02



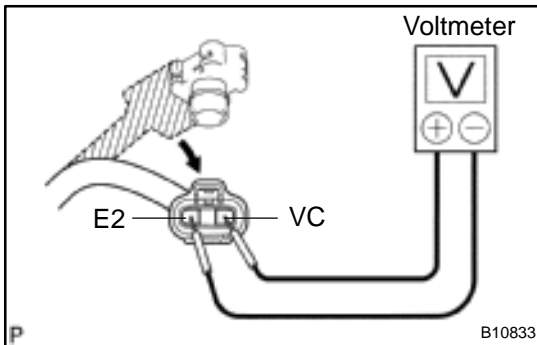
P

B10839

## INSPECTION

1. REMOVE LUGGAGE COMPARTMENT BOX
2. REMOVE FLOOR SERVICE HOLE COVER
3. REMOVE VAPOR PRESSURE SENSOR

- (a) Remove the 2 bolts and No. 3 fuel tank protector.
- (b) Disconnect the vapor pressure sensor connector.
- (c) Remove the clip and vapor pressure sensor.

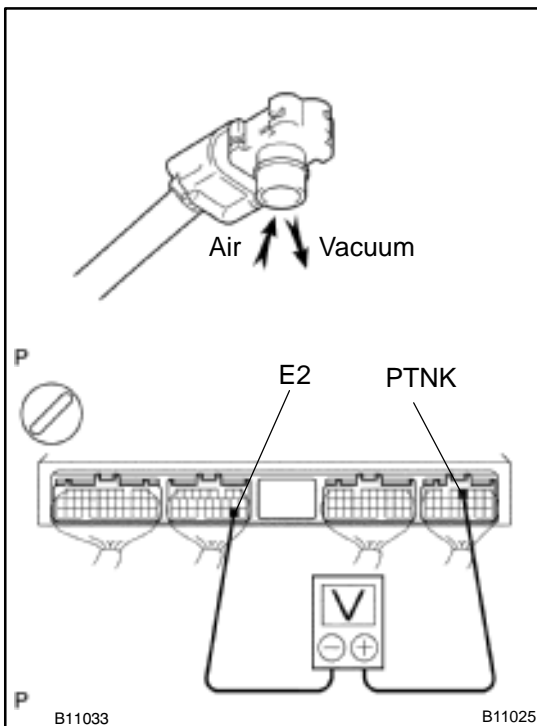


### 4. INSPECT VAPOR PRESSURE SENSOR

- (a) Turn the ignition switch ON.
- (b) Using a voltmeter, measure the voltage between connector terminals VC and E2 of the wiring harness side.

**Voltage: 4.5 – 5.5 V**

- (c) Turn the ignition switch OFF.



### 5. INSPECT POWER OUTPUT OF VAPOR PRESSURE SENSOR

- (a) Connect the vapor pressure sensor connector.
- (b) Turn the ignition switch ON.
- (c) Connect a voltmeter to terminals PTNK and E2 of the ECM, and measure the output voltage under the following conditions:

- (1) Apply vacuum (2.0 kPa (15 mmHg, 0.59 in.Hg)) to the vapor pressure sensor.

**Voltage: 1.3 – 2.1 V**

- (2) Release the vacuum from the vapor pressure sensor.

**Voltage: 3.0 – 3.6 V**

- (3) Apply pressure (1.5 kPa (15 gf/cm<sup>2</sup>, 0.22 psi)) to the vapor pressure sensor.

**Voltage: 4.2 – 4.8 V**

- (d) Turn the ignition switch OFF.

### 6. REINSTALL VAPOR PRESSURE SENSOR

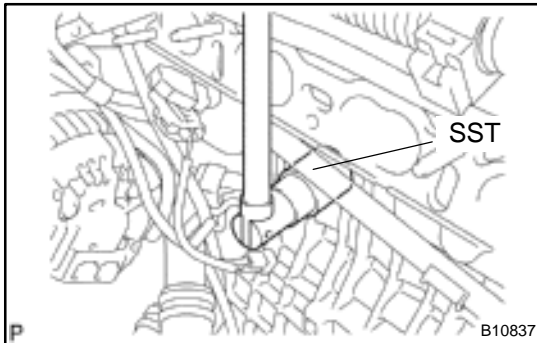
- (a) Reinstall the vapor pressure sensor and clip.
- (b) Reconnect the vapor pressure sensor connector.
- (c) Reinstall the 2 bolts and No. 3 fuel tank protector.

### 7. REINSTALL FLOOR SERVICE HOLE COVER

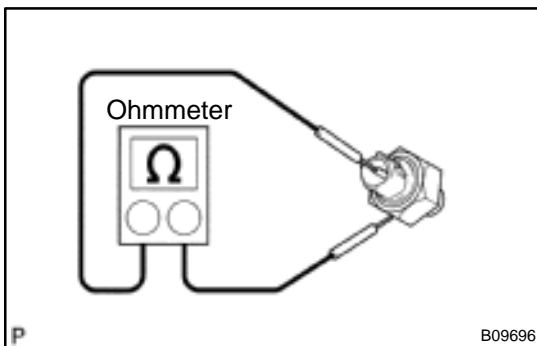
### 8. REINSTALL LUGGAGE COMPARTMENT BOX

## INSPECTION

1. REMOVE ENGINE FROM VEHICLE (See page [EM-54](#))
2. REMOVE INTAKE MANIFOLD AND THROTTLE BODY ASSEMBLY (See page [EM-29](#))



3. REMOVE KNOCK SENSOR
  - (a) Disconnect the knock sensor connector.
  - (b) Using SST, remove the sensor.  
SST 09817-16011

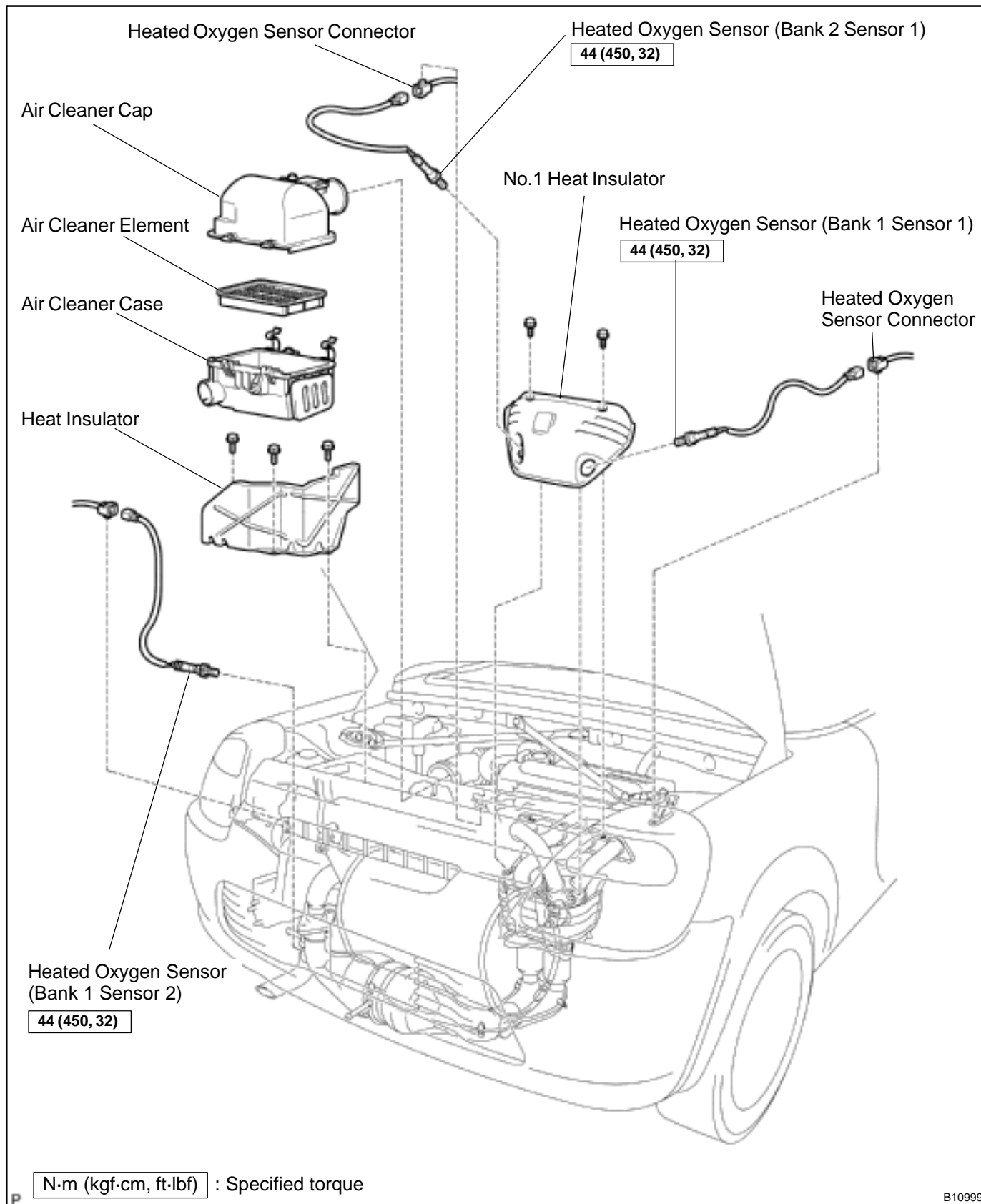


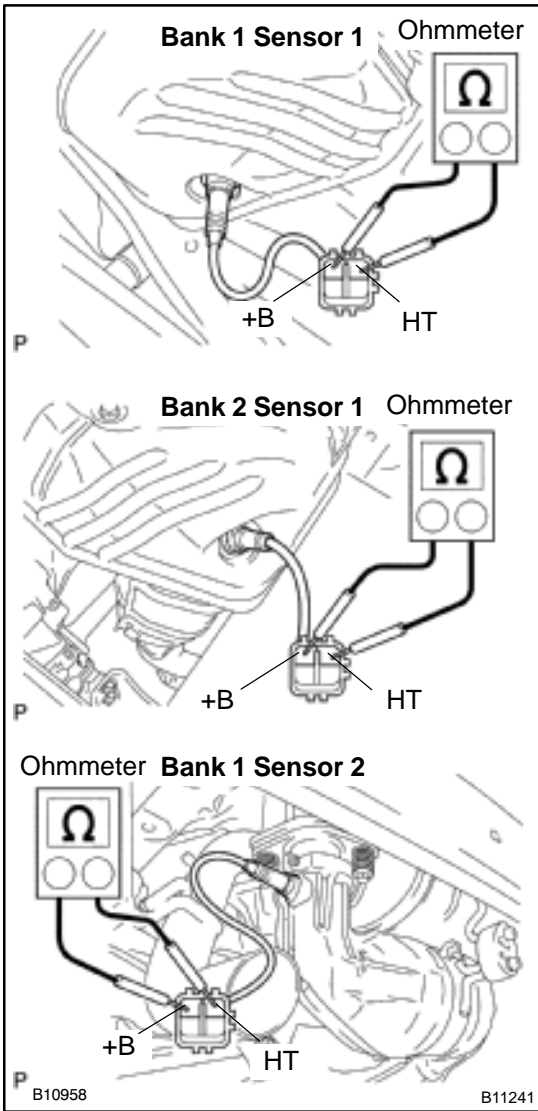
4. INSPECT KNOCK SENSOR
 

Using an ohmmeter, check that there is no continuity between the terminal and body.  
If there is continuity, replace the sensor.
5. REINSTALL KNOCK SENSOR
  - (a) Using SST, install the sensor.  
SST 09817-16011  
**Torque: 39 N·m (398 kgf·cm, 29 ft·lbf)**
  - (b) Connect the sensor connector.
6. REINSTALL INTAKE MANIFOLD AND THROTTLE BODY ASSEMBLY (See page [EM-46](#))
7. INSTALL ENGINE TO VEHICLE (See page [EM-59](#))

# HEATED OXYGEN SENSOR COMPONENTS

SF167-02





## INSPECTION

### INSPECT HEATER RESISTANCE OF OXYGEN SENSOR

- (a) Disconnect the sensor connector.
- (b) Using an ohmmeter, measure the resistance between terminals +B and HT.

Temperature	Resistance
at 20°C (68°F)	11 – 16 Ω
at 800°C (1,472°F)	23 – 32 Ω

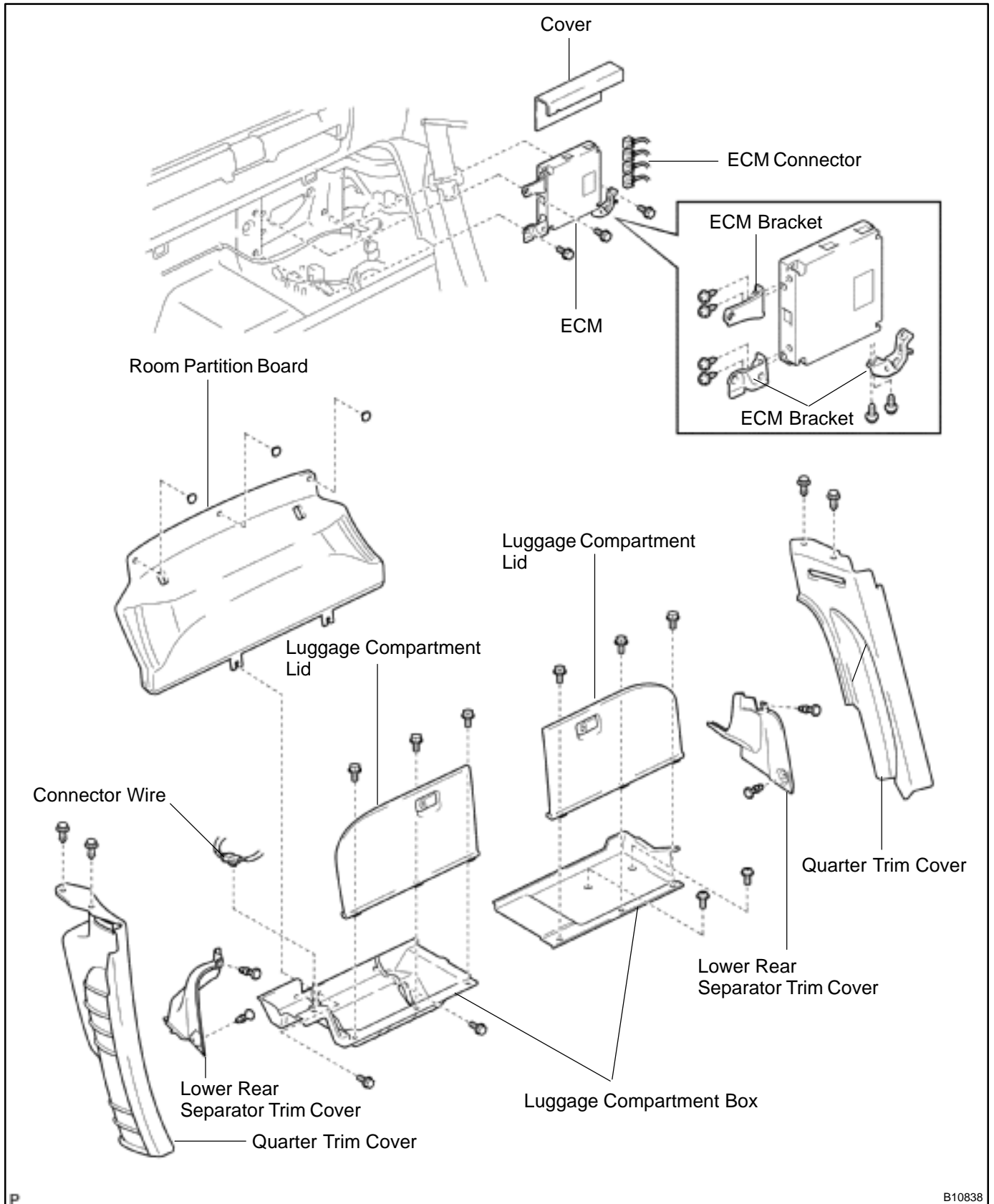
If the resistance is not as specified, replace the sensor.

**Torque: 44 N·m (450 kgf-cm, 32 ft-lbf)**

- (c) Reconnect the sensor connector.

# ENGINE CONTROL MODULE (ECM) COMPONENTS

SF00F-03



B10838

# INSPECTION

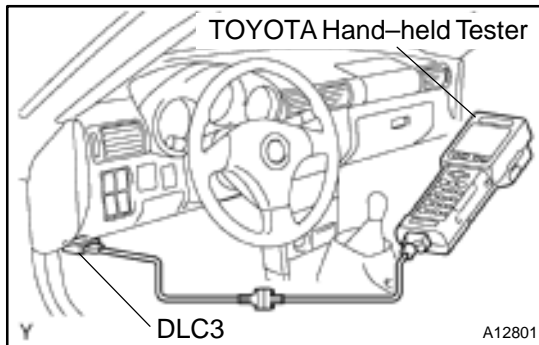
INSPECT ECM (See page [DI-19](#))



# FUEL CUT RPM INSPECTION

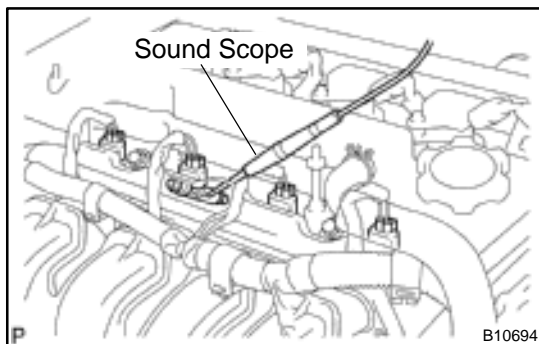
## 1. WARM UP ENGINE

Allow the engine to warm up to normal operating temperature.



## 2. CONNECT TOYOTA HAND-HELD TESTER OR OBDII SCAN TOOL TO DLC3

- (a) Connect a TOYOTA hand-held tester or OBDII scan tool to the DLC3.
- (b) Please refer to the TOYOTA hand-held tester or OBDII scan tool operator's manual for further details.



## 3. INSPECT FUEL CUTOFF RPM

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

HINT:

Measure with the A/C OFF.

**Fuel return rpm: 1,400 rpm**

## 4. DISCONNECT TOYOTA HAND-HELD TESTER OR OBDII SCAN TOOL FROM DLC3