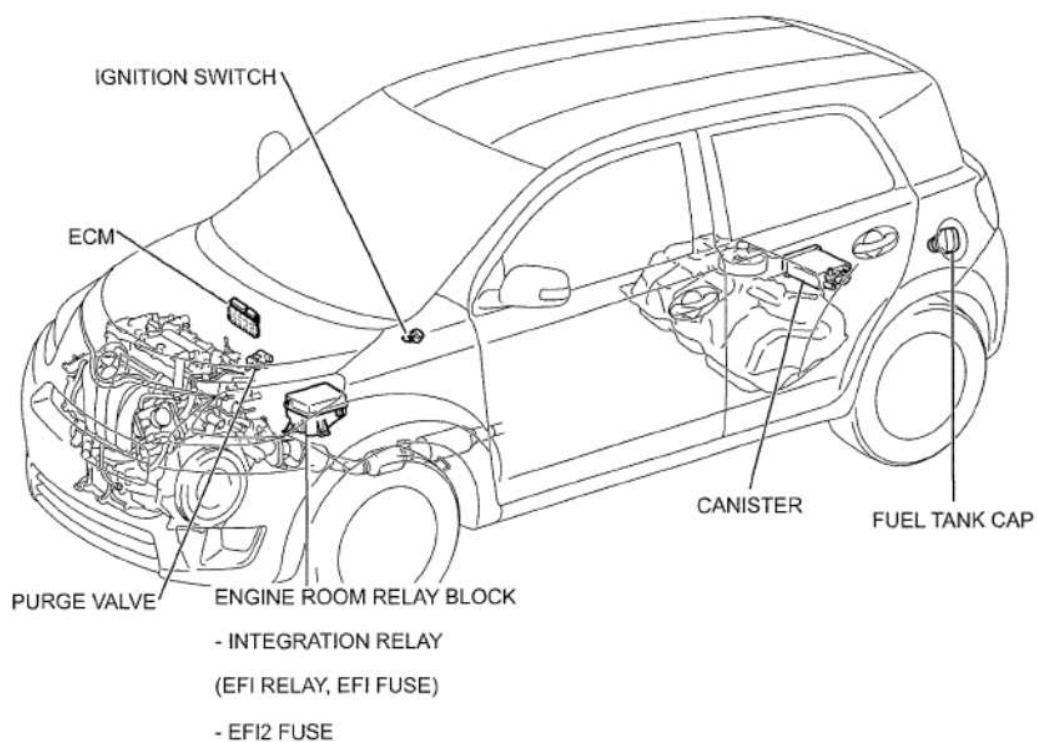


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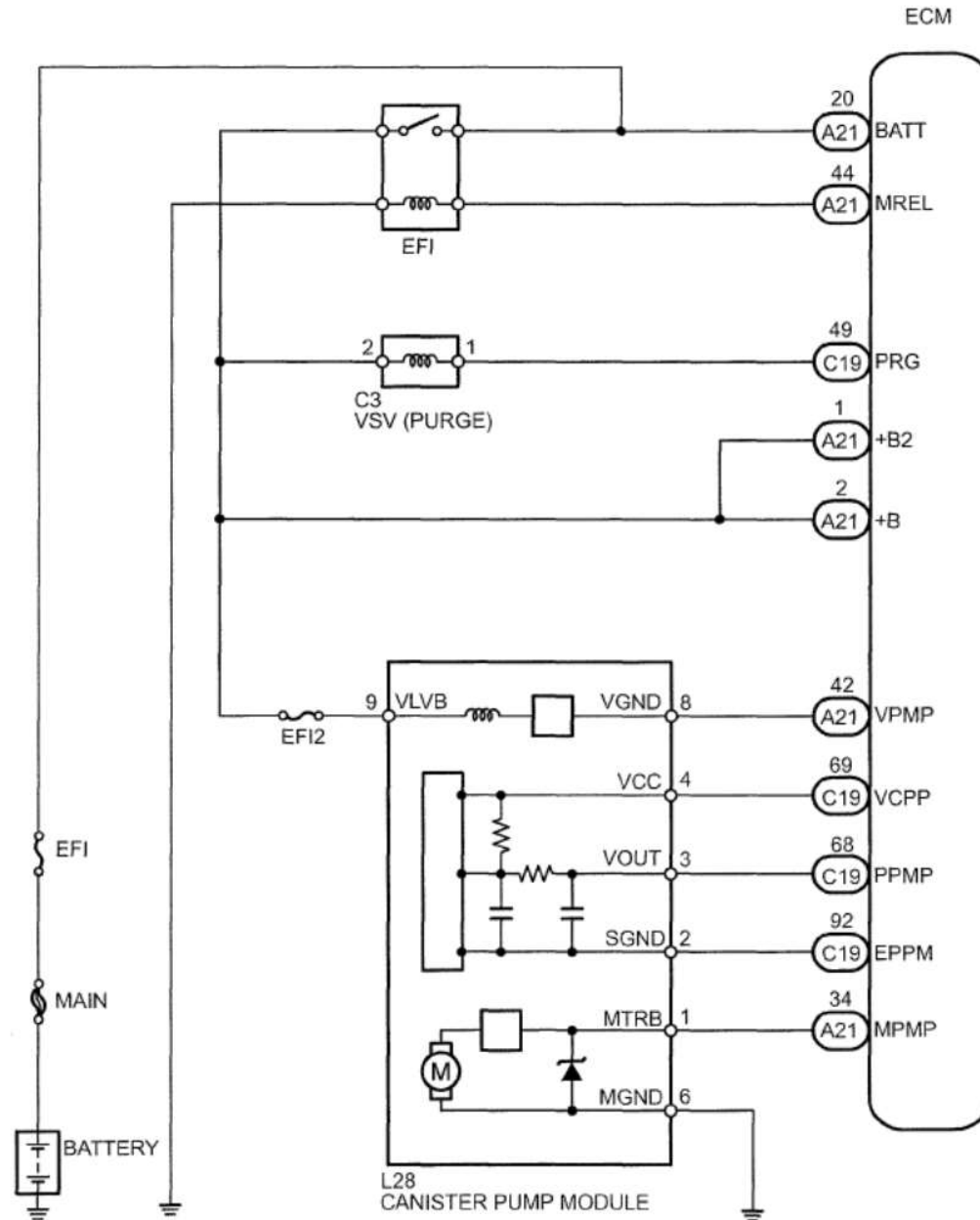
2008 ENGINE**2ZR-FE Emission Control - xD****EMISSION CONTROL SYSTEM****PARTS LOCATION**

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Fig. 1: Identifying Emission Control System Parts Location
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

SYSTEM DIAGRAM

2008 Scion xD**2008 ENGINE 2ZR-FE Emission Control - xD**

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Fig. 2: Emission Control System Diagram

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

ON-VEHICLE INSPECTION**1. CHECK FUEL CUT-OFF RPM**

- Increase the engine speed to at least 3,500 rpm.
- Use a sound scope to check for injector operating sounds.

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- c. Check that the injector operating sounds stop momentarily and then resume when the accelerator pedal is released.

2. VISUALLY INSPECT HOSES, CONNECTIONS AND GASKETS

- a. Check that there are no cracks, leakage or scratches on the hoses, connections or gaskets.

NOTE:

- Removing the oil level gauge, oil filter cap or PCV hose may cause the engine to malfunction or stall.
- Disconnections, looseness or cracks in the parts of the air induction system between the intake system and cylinder head will allow air suction and cause the engine to run improperly.



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Fig. 3: Identifying Hoses Cracks And Leakage
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

If the result is not as specified, replace parts as necessary.

3. CHECK LINE AND CONNECTORS

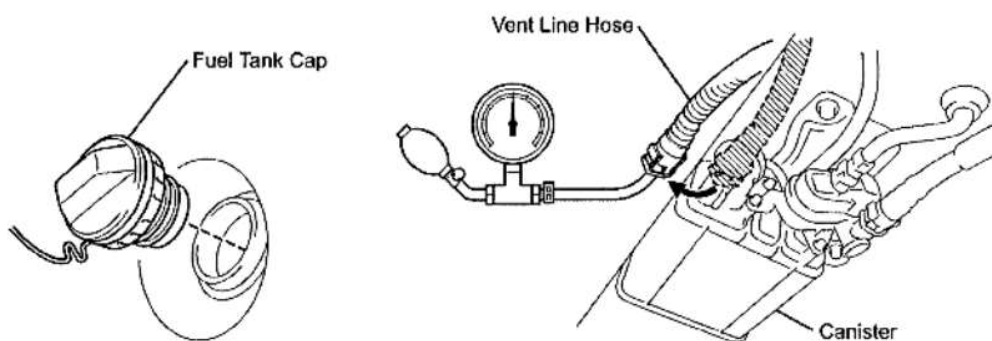
- a. Visually check for loose connections, sharp bends and damage.

4. CHECK FUEL TANK ASSEMBLY

- a. Visually check for deformation, cracks and fuel leaks.

5. CHECK FUEL TANK AND VENT LINE

- a. Disconnect the vent line hose from the canister.



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Fig. 4: Disconnecting Vent Line Hose To Canister
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Connect the pressure gauge to the vent line hose.
- c. Apply 4 kPa (0.04 kgf/cm² , 30 mmHg) of pressure to the fuel tank vent line.

HINT:

Perform this inspection with the fuel tank less than 90% full. When the fuel tank is full, the fuel cutoff valve closes and pressure is released through the 1.5 mm orifice. As a result, when the fuel tank cap is removed, the pressure does not decrease smoothly.

- d. Check that the fuel tank pressure is maintained for some time, and does not decrease immediately.

HINT:

If the pressure decreases immediately, one of the following may apply:

- The fuel tank cap is not completely tightened.
 - The fuel tank cap is damaged.
 - Air is leaking from the vent line.
 - The fuel tank is damaged.
- e. When the fuel tank cap is removed, check that the pressure is released smoothly.

HINT:

If the pressure does not drop, replace the fuel tank assembly.

- f. Reconnect the vent line tube to the canister.

6. CHECK AIR INLET LINE

- a. Disconnect the air inlet line hose from the canister.
- b. Check that air flows freely into the air inlet line.

HINT:

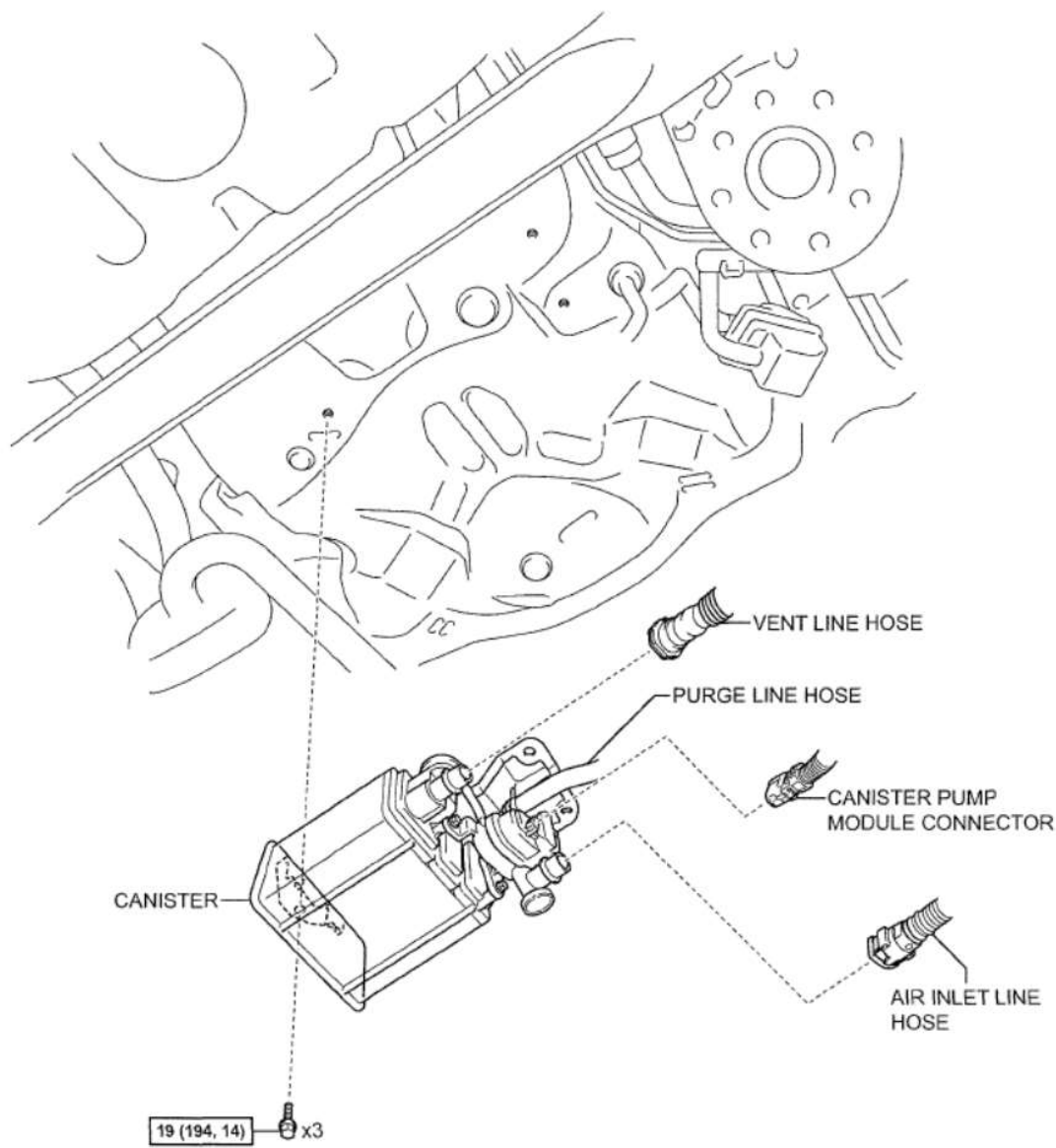
If air does not flow freely into the air inlet line, repair or replace it.

- c. Reconnect the air inlet line hose to the canister.

CANISTER**COMPONENTS**

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2008 ENGINE 2ZR-FE Emission Control - xD



N*m (kgf*cm, ft*lb) : Specified torque

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Fig. 5: Identifying Canister Components With Torque Specification
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL

1. REMOVE CANISTER

- Disconnect the vent line hose from the canister.

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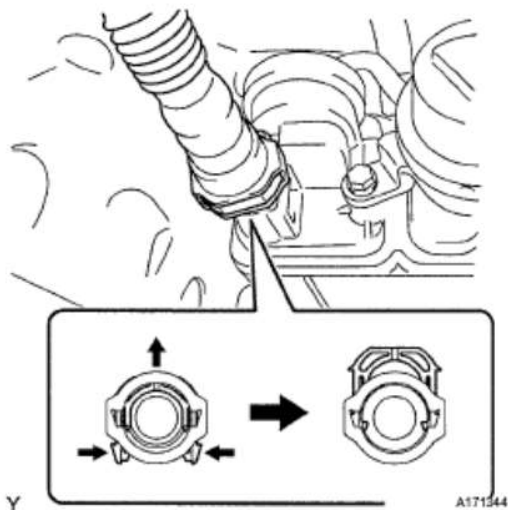


Fig. 6: Identifying Vent Line Hose Of Canister
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Disconnect the purge line hose.

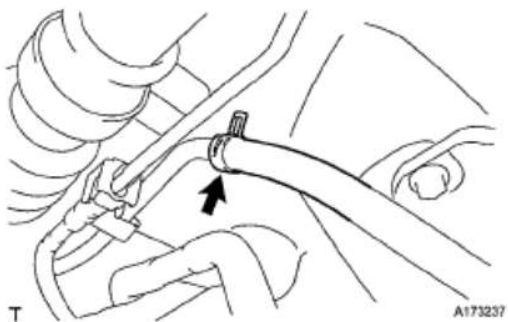


Fig. 7: Locating Purge Line Hose
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Disconnect the connector.

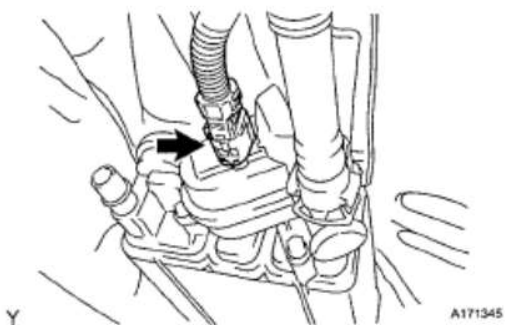


Fig. 8: Locating Connector

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Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- d. Disconnect the air inlet line hose.

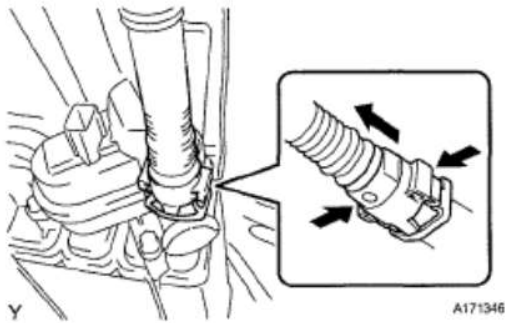


Fig. 9: Locating Air Inlet Line Hose

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- e. Remove the 3 bolts and the canister assembly.

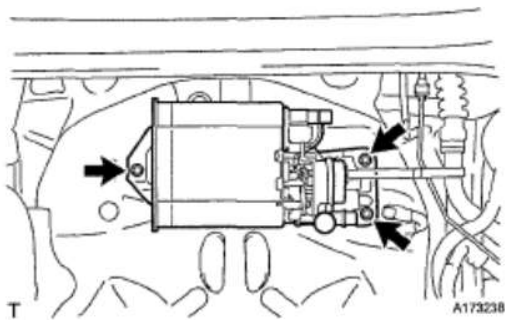


Fig. 10: Locating Canister Assembly Bolts

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION

1. INSPECT CANISTER

- a. Visually check the canister for cracks and damage. If cracks or damage are found, replace the canister.

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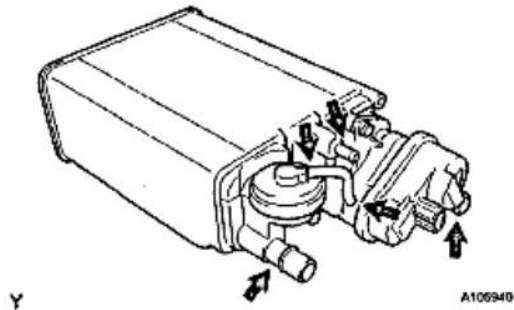


Fig. 11: Locating Canister

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

b. Check the canister operation.

1. While holding the purge port closed, blow air at 0.39 kPa (0.004 kgf/cm², 3 mmHg) into the vent port, and check that air flows from the air inlet port.

If the result is not as specified, replace the canister.

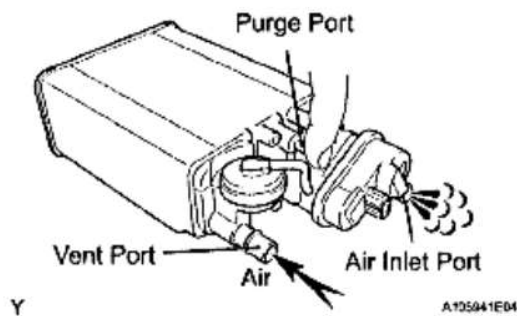
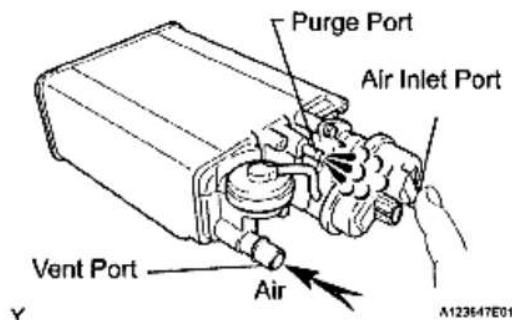


Fig. 12: Checking Canister Operation

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. While holding the air inlet port closed, blow air at 0.39 kPa (0.004 kgf/cm², 3 mmHg) into the vent port, and check that air flows from the purge port.

If the result is not as specified, replace the canister.



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Fig. 13: Blowing Air Into Vent Part

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. While holding the air inlet port closed, apply vacuum at 3.43 kPa (0.035 kgf/cm², 25.7 mmHg) into the vent port, and check that air is sucked into the purge port.

If the result is not as specified, replace the canister.

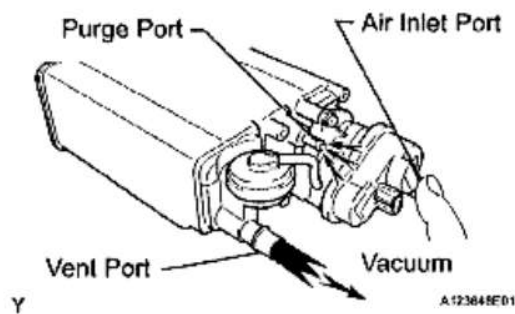


Fig. 14: Holding Air Inlet Port

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Check the air tightness.

1. While holding the vent and air inlet ports closed, apply vacuum at 3.43 kPa (0.035 kgf/cm², 25.7 mmHg) into the purge port, and check that the vacuum is maintained for 1 minute.

If the result is not as specified, replace the canister.

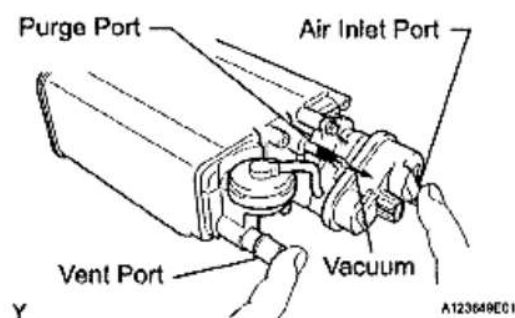


Fig. 15: Checking Air Tightness

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- d. Check the diaphragm.

1. Remove the air hose between ports A and B.
2. While holding the vent, purge and air inlet ports closed, apply vacuum at 1.42 kPa (0.014 kgf/cm², 10.6 mmHg) into port A, and check that air is not sucked into port B.

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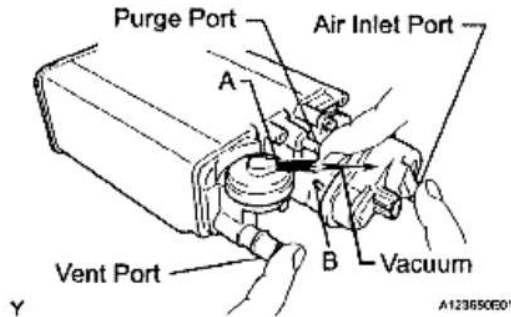


Fig. 16: Identifying Air Hose Between Ports A And B
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. While holding the vent, purge and air inlet ports closed, apply vacuum at 1.42 kPa (0.014 kgf/cm², 10.6 mmHg) into port A, and measure how long it takes for the vacuum to drop.

Vacuum drop time:

10 seconds or more

If the result is not as specified, replace the canister.

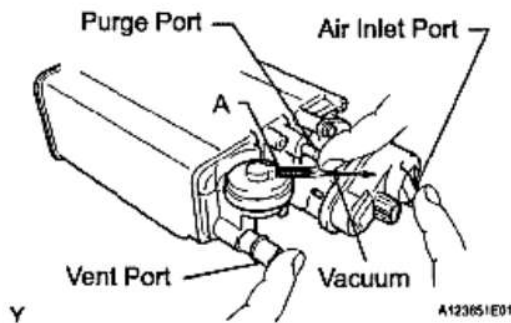


Fig. 17: Checking Air Inlet Ports
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- e. Check the leak detection pump.
 1. Check that air flows from port A to ports B and C.

If the result is not as specified, replace the canister.

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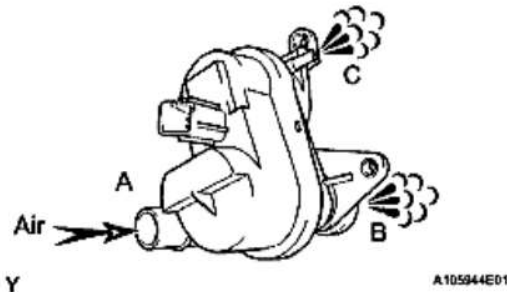


Fig. 18: Checking Leak Detection Pump

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. Connect the positive (+) lead of the battery to terminal 7 and the negative (-) lead to terminal 6.

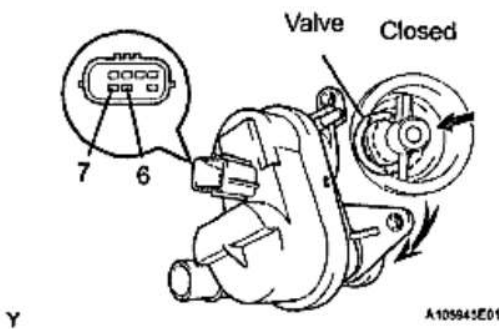


Fig. 19: Connecting Positive Lead Battery To Terminal 7 And Negative Lead To Terminal 6

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. Check that the valve is closed.

If the result is not as specified, replace the canister.

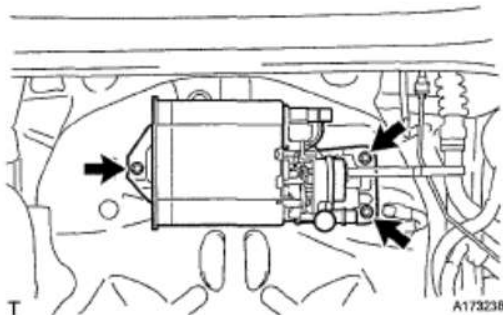
4. Install the canister pump module.

INSTALLATION

1. INSTALL CANISTER

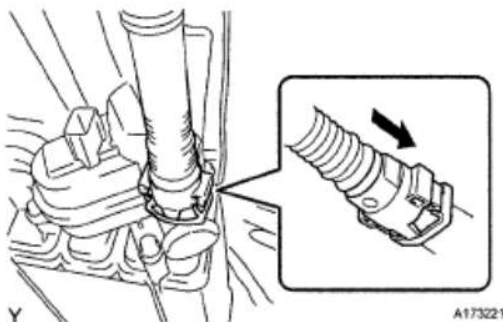
- a. Install the canister with the 3 bolts.

Torque: 19 N*m (194 kgf*cm, 14 ft.*lbf)

2008 Scion xD**2008 ENGINE 2ZR-FE Emission Control - xD****Fig. 20: Locating Canister With Bolts**

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Connect the air inlet line hose.

**Fig. 21: Connecting Air Inlet Line Hose**

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Connect the connector.

**Fig. 22: Locating Connector**

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- d. Connect the purge line hose.

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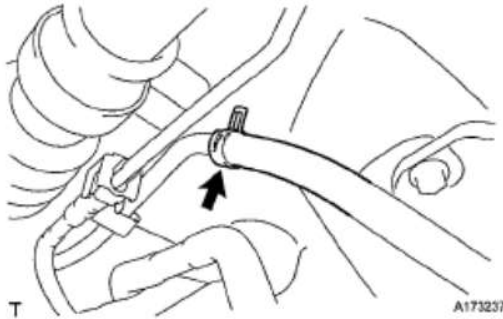


Fig. 23: Locating Purge Line Hose

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- e. Connect the vent line hose.

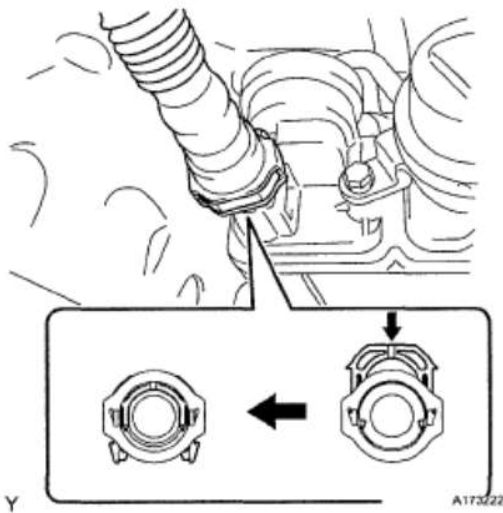
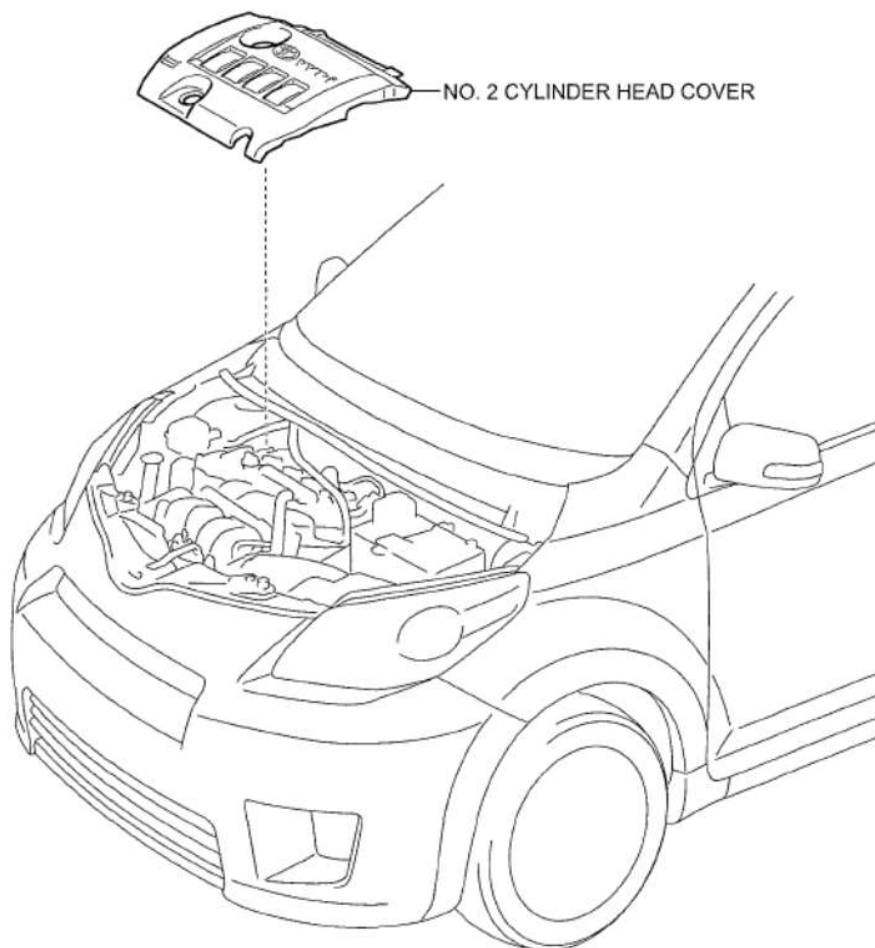


Fig. 24: Connecting Vent Line Hose

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

PURGE VALVE

COMPONENTS

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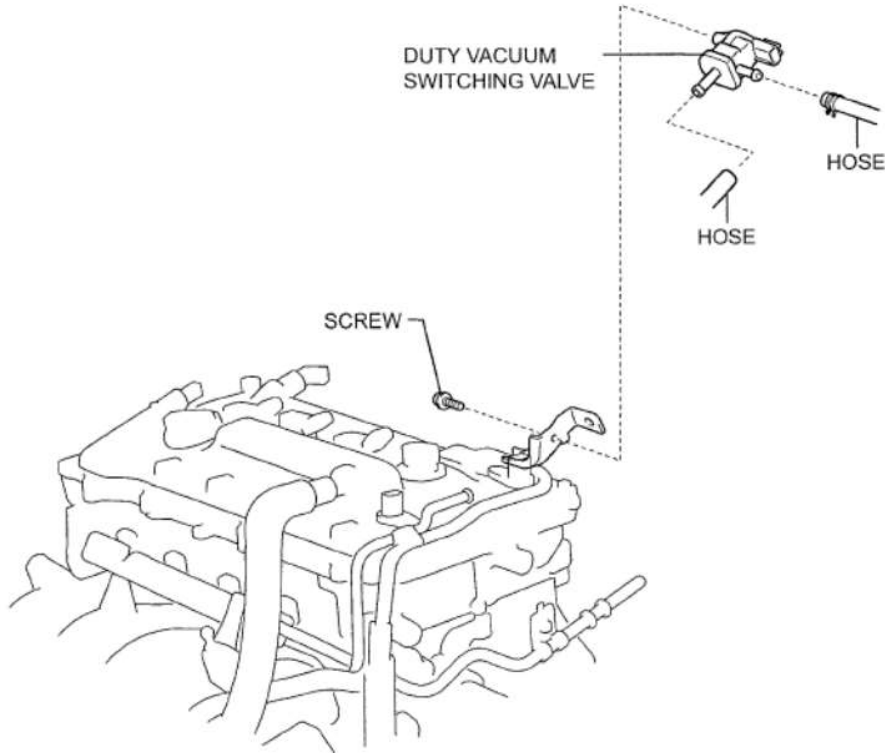
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Fig. 25: Identifying Purge Valve Components (1 Of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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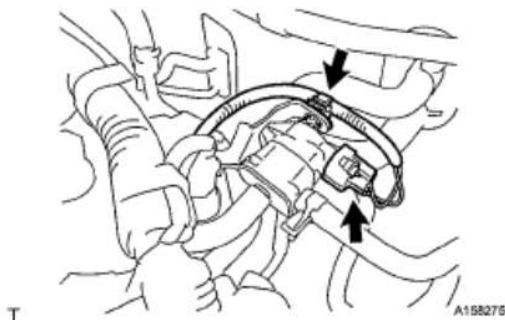


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Fig. 26: Identifying Purge Valve Components (2 Of 2)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL

1. **REMOVE NO. 2 CYLINDER HEAD COVER** (See **REMOVAL**)
2. **REMOVE DUTY VACUUM SWITCHING VALVE**
 - a. Disconnect the duty vacuum switching valve connector and wire harness clamp.



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Fig. 27: Locating Wire Harness Clamp Connector
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Disconnect the 2 hoses and remove the duty vacuum switching valve.

NOTE: Do not drop the duty vacuum switching valve during its removal.

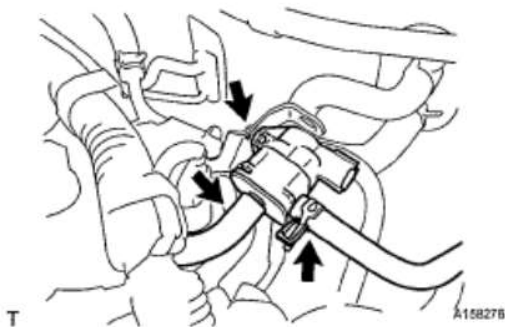


Fig. 28: Locating Duty Vacuum Switching Valve And Hoses
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Remove the screw.

INSPECTION

1. INSPECT DUTY VACUUM SWITCHING VALVE

- a. Measure the resistance according to the value(s) in the table below.

Standard resistance

RESISTANCE REFERENCE

Tester Connection	Condition	Specified Condition
1 - 2	20°C (68°F)	23 to 26 ohms

If the result is not as specified, replace the duty vacuum switching valve.

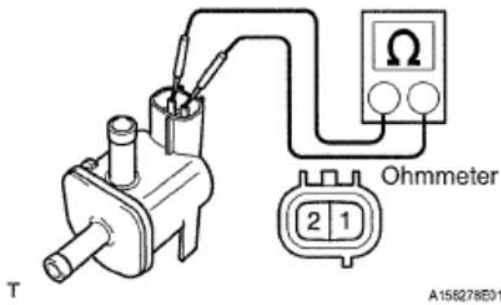


Fig. 29: Measuring Resistance Duty Vacuum Switching Valve

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Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Check the operation.
 1. Check that air does not flow from port E to F.

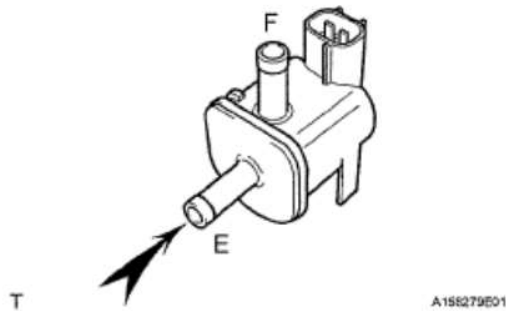


Fig. 30: Checking Air Flow From Port E To F
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. Apply battery voltage across the terminals.
3. Check that air flows from port E to F.

If the operation is not as specified, replace the duty vacuum switching valve.

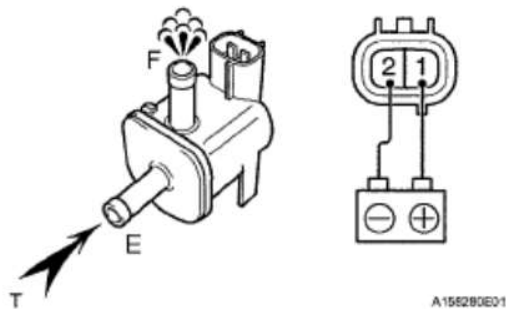


Fig. 31: Checking Air Flow From Port E To F
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSTALLATION

1. **INSTALL DUTY VACUUM SWITCHING VALVE**
 - a. Install the duty vacuum switching valve with the screw.
 - b. Connect the 2 hoses to the duty vacuum switching valve.

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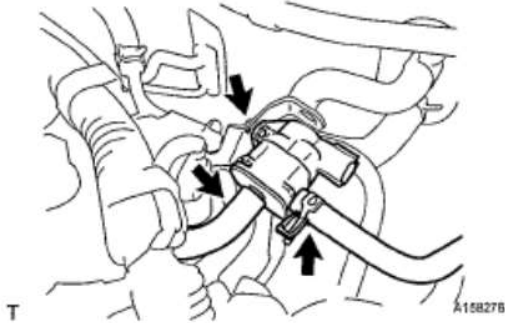


Fig. 32: Locating Duty Vacuum Switching Valve And Hoses
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Connect the duty vacuum switching valve connector and wire harness clamp.

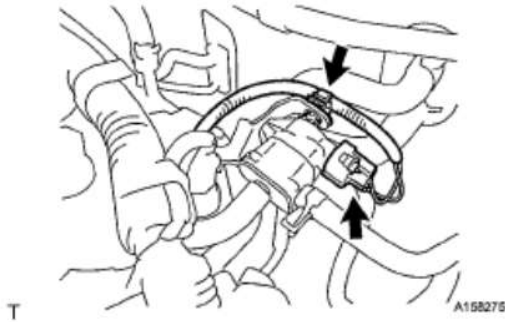


Fig. 33: Locating Duty Vacuum Switching Valve Connector And Wire Harness Clamp
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. INSTALL NO. 2 CYLINDER HEAD COVER (See INSTALLATION)

FUEL TANK CAP

ON-VEHICLE INSPECTION

1. INSPECT FUEL TANK CAP ASSEMBLY

- a. Check that there is no deformation or damage to the fuel tank cap or gasket. If necessary, replace the fuel tank cap assembly.

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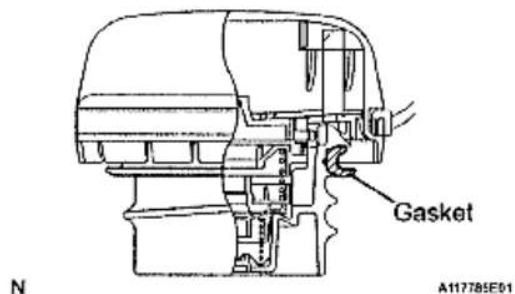


Fig. 34: Identifying Fuel Tank Cap Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

PCV VALVE**COMPONENTS**

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2008 ENGINE 2ZR-FE Emission Control - xD

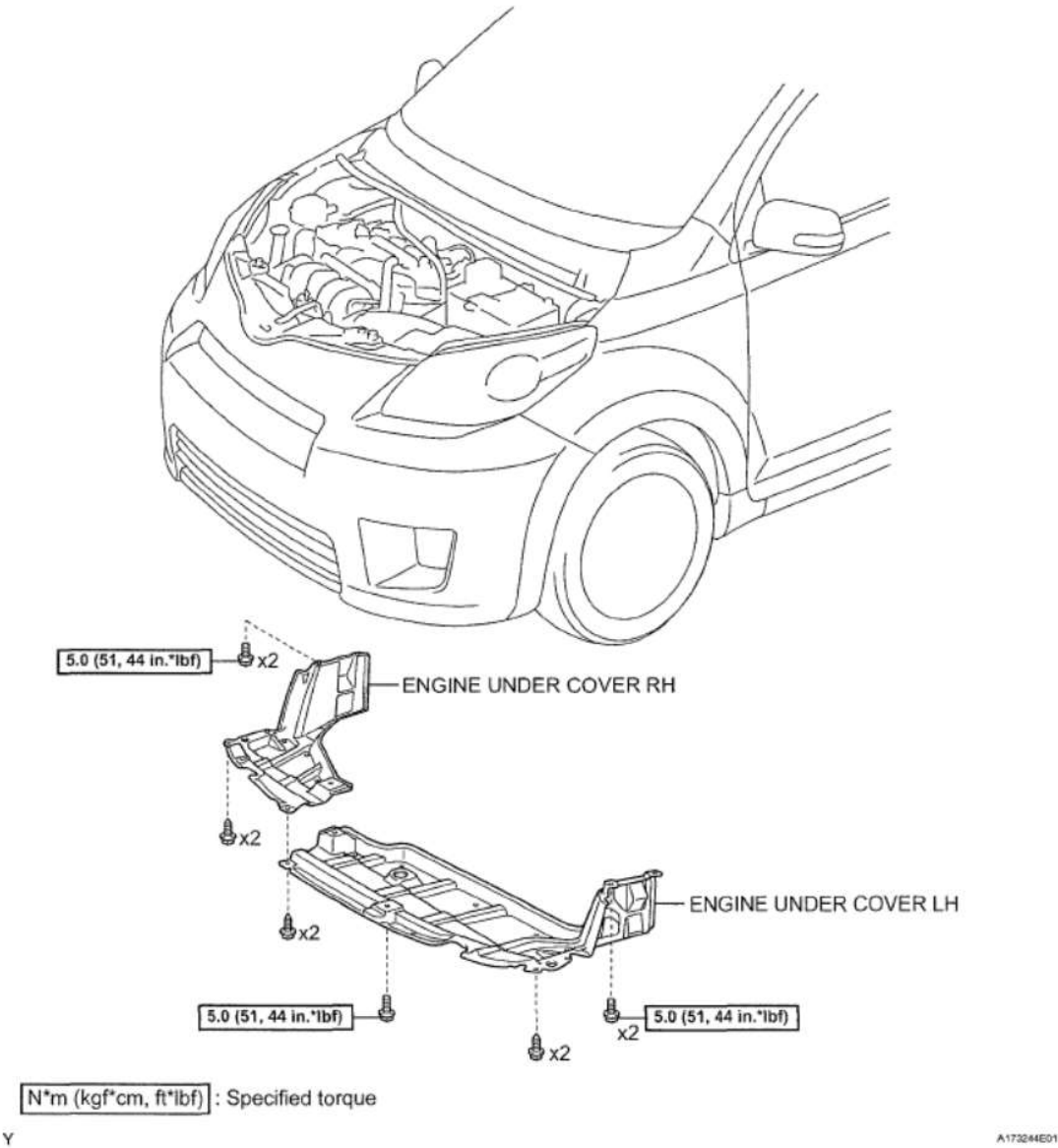


Fig. 35: Identifying PCV Valve Components With Torque Specifications (1 Of 5)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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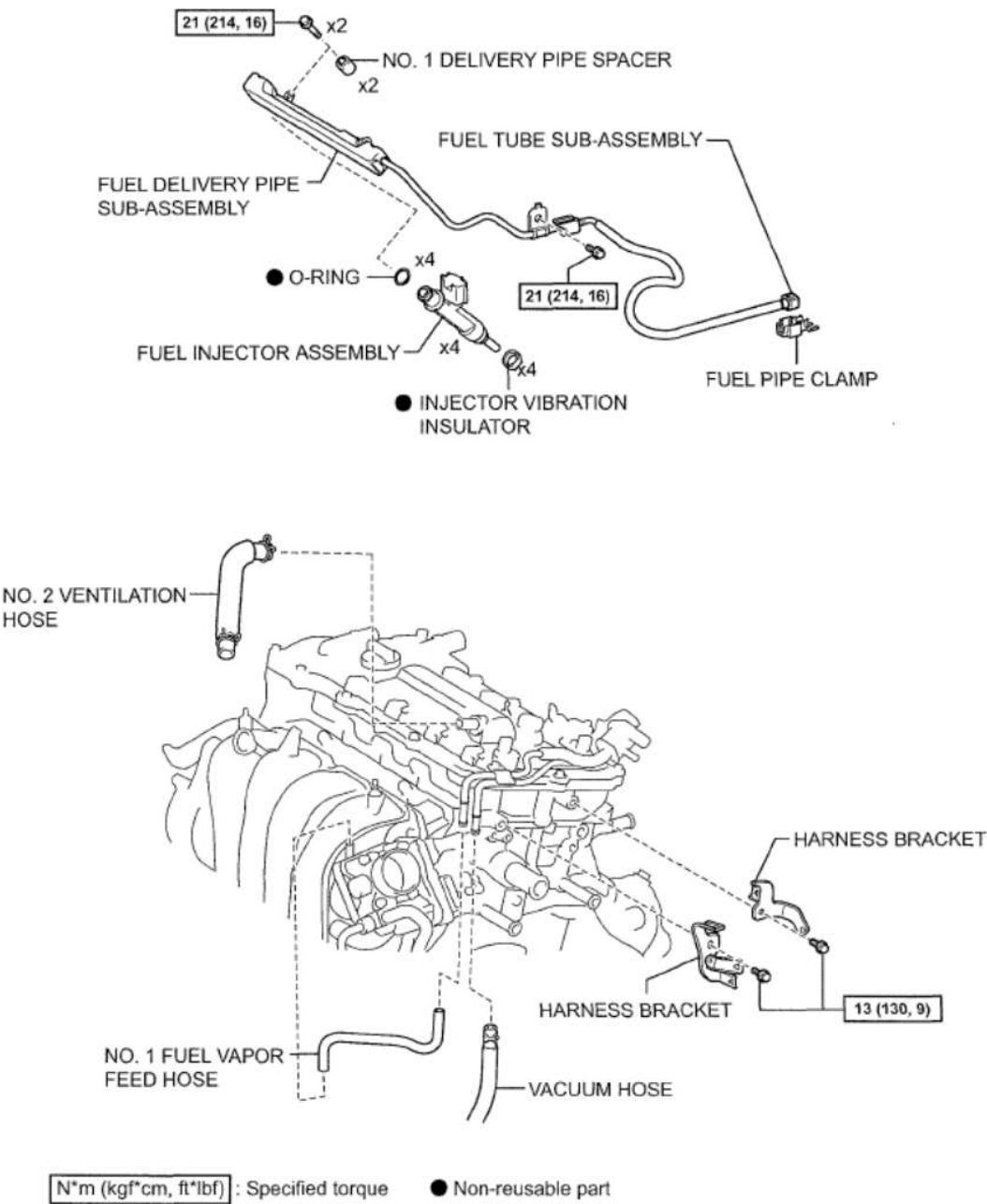
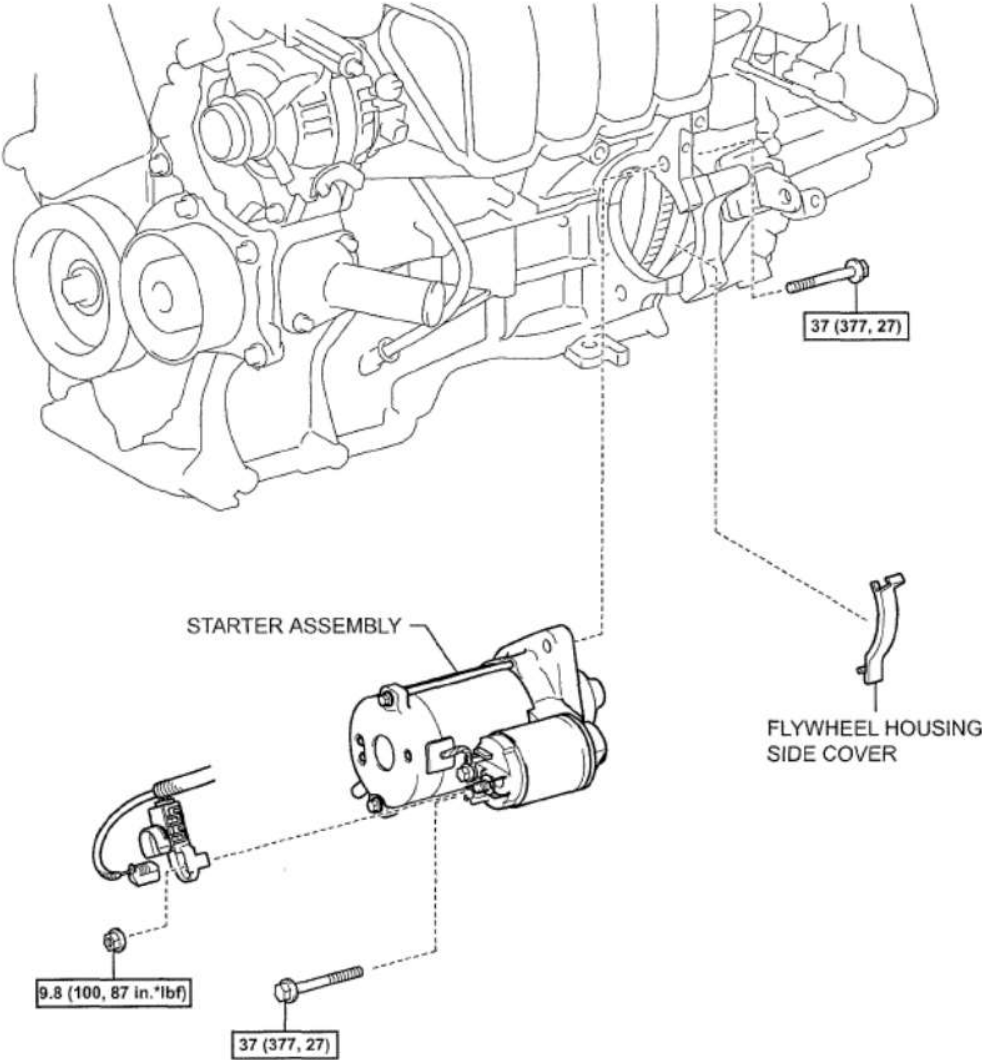


Fig. 36: Identifying PCV Valve Components With Torque Specifications (2 Of 5)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

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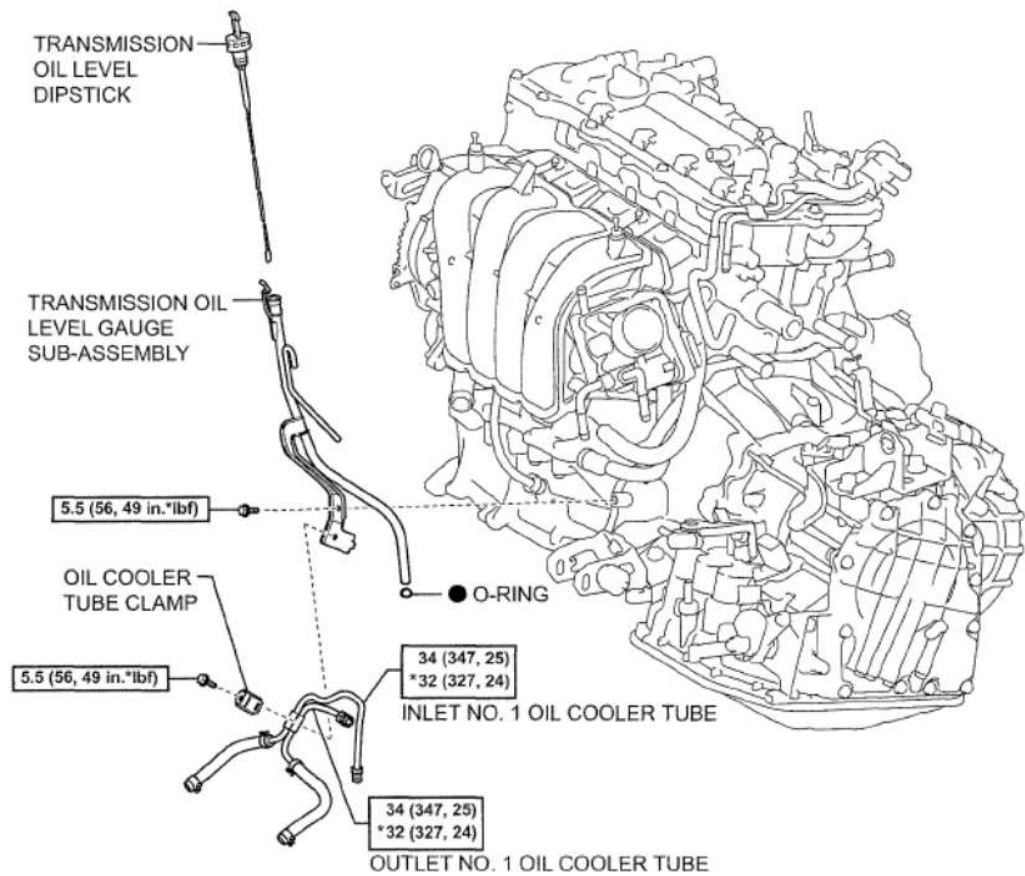
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Fig. 37: Identifying PCV Valve Components With Torque Specifications (3 Of 5)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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2008 ENGINE 2ZR-FE Emission Control - xD

for Automatic Transaxle:



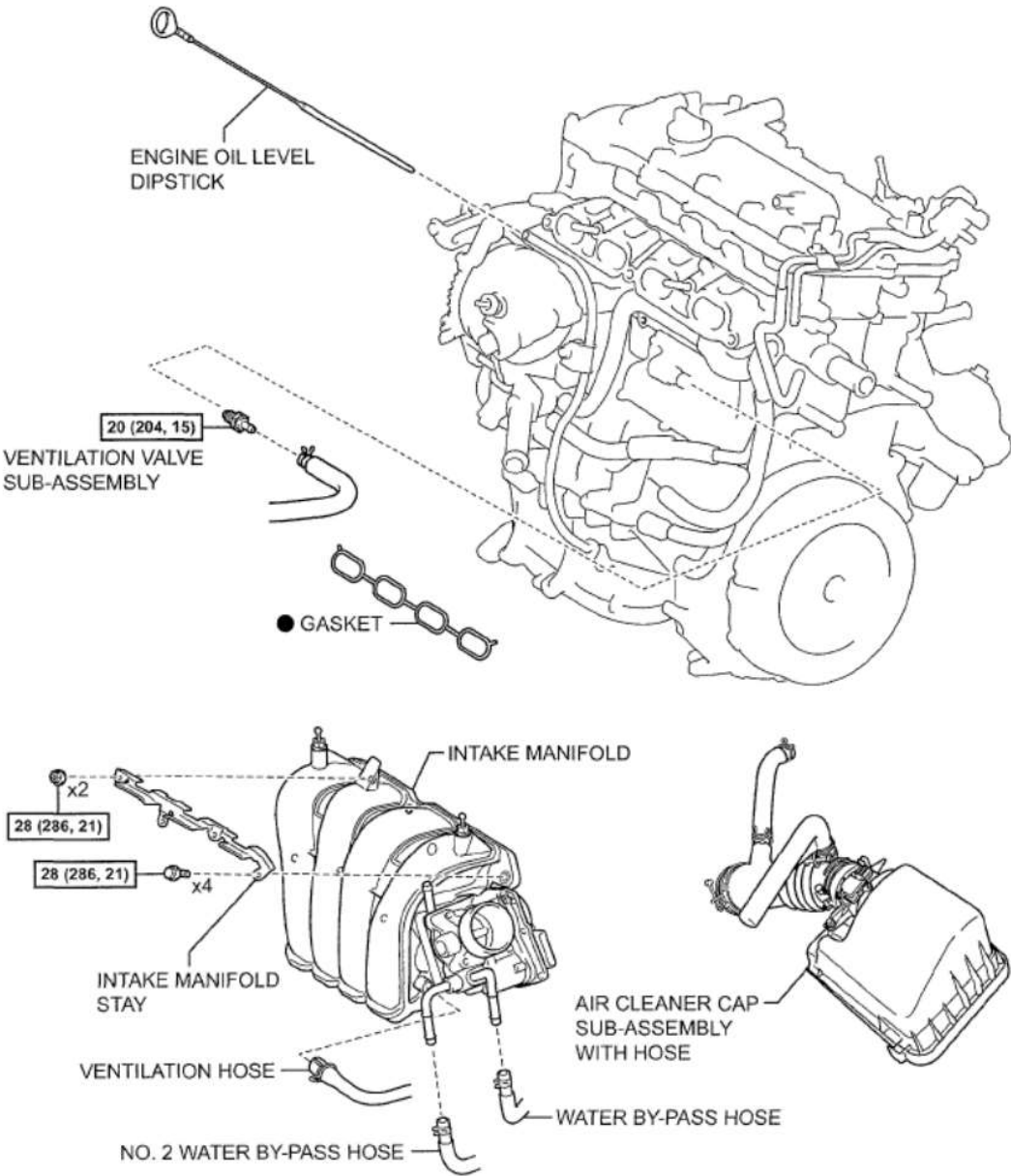
N*m (kgf*cm, ft*lbf) : Specified torque * with union nut wrench ● Non-reusable part

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Fig. 38: Identifying PCV Valve Components With Torque Specifications (4 Of 5)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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2008 ENGINE 2ZR-FE Emission Control - xD



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

● Non-reusable part

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Fig. 39: Identifying PCV Valve Components With Torque Specifications (5 Of 5)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL

2008 Scion xD**2008 ENGINE 2ZR-FE Emission Control - xD****1. DISCHARGE FUEL SYSTEM PRESSURE**

(See **PRECAUTION**)

2. **DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL**
3. **REMOVE ENGINE UNDER COVER LH**
4. **REMOVE ENGINE UNDER COVER RH**
5. **DRAIN ENGINE COOLANT** (See **REPLACEMENT**)
6. **REMOVE NO. 2 CYLINDER HEAD COVER** (See **REMOVAL**)
7. **REMOVE AIR CLEANER CAP SUB-ASSEMBLY WITH HOSE** (See **REMOVAL**)
8. **SEPARATE ENGINE WIRE HARNESS** (See **REMOVAL**)
9. **REMOVE HARNESS BRACKET** (See **REMOVAL**)
10. **DISCONNECT NO. 1 FUEL VAPOR FEED HOSE** (See **REMOVAL**)
11. **DISCONNECT NO. 1 VACUUM TRANSMITTING HOSE** (See **REMOVAL**)
12. **REMOVE VACUUM HOSE** (See **REMOVAL**)
13. **REMOVE FUEL PIPE CLAMP** (See **REMOVAL**)
14. **DISCONNECT FUEL TUBE SUB-ASSEMBLY** (See **REMOVAL**)
15. **REMOVE FUEL DELIVERY PIPE SUB-ASSEMBLY** (See **REMOVAL**)
16. **REMOVE NO. 1 DELIVERY PIPE SPACER** (See **REMOVAL**)
17. **REMOVE INJECTOR VIBRATION INSULATOR** (See **REMOVAL**)
18. **REMOVE STARTER ASSEMBLY** (See **REMOVAL**)
19. **REMOVE OIL COOLER TUBE** (for Automatic Transaxle) (See **REMOVAL**)
20. **REMOVE TRANSMISSION OIL LEVEL GAUGE SUB-ASSEMBLY** (for Automatic Transaxle) (See **REMOVAL**)
21. **REMOVE ENGINE OIL LEVEL DIPSTICK**
22. **REMOVE INTAKE MANIFOLD** (See **REMOVAL**)
23. **REMOVE VENTILATION VALVE SUB-ASSEMBLY**
 - a. Disconnect the ventilation hose.

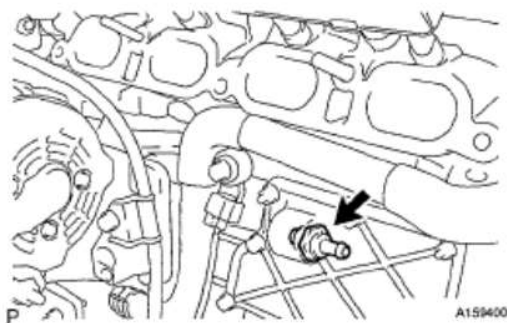


Fig. 40: Locating Ventilation Valve Sub-Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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2008 ENGINE 2ZR-FE Emission Control - xD

- b. Remove the ventilation valve sub-assembly.

INSPECTION

1. INSPECT VENTILATION VALVE SUB-ASSEMBLY

- a. Install a clean hose into the ventilation valve.
- b. Inspect the ventilation valve operation.
 1. Blow air into the ventilation case side, and check that air passes through easily.

NOTE: Do not suck air through the valve. Petroleum substances inside the valve are hazardous to your health.

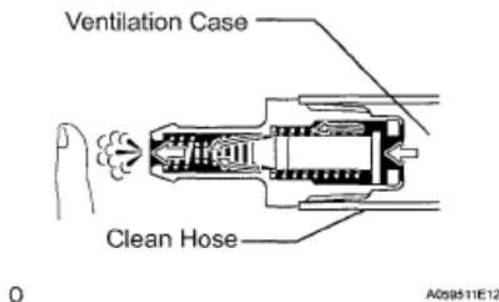


Fig. 41: Blowing Air Into Ventilation Case Side
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. Blow air into the intake manifold side, and check that air passes through with difficulty. If the result is not as specified, replace the ventilation valve.

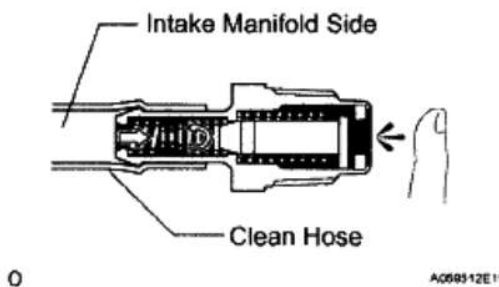


Fig. 42: Blowing Air Into Intake Manifold Side
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Remove the clean hose from the ventilation valve.

INSTALLATION

1. INSTALL VENTILATION VALVE SUB-ASSEMBLY

- a. Apply adhesive to 2 or 3 threads of the ventilation valve.

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Adhesive:

Toyota Genuine Adhesive 1324, Three Bond 1324 or equivalent

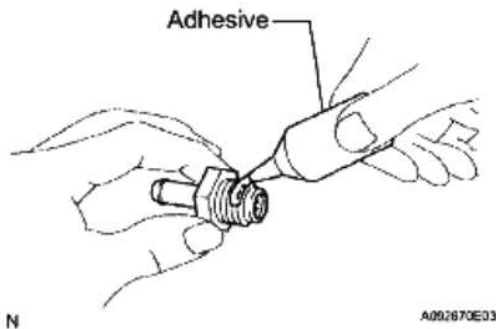


Fig. 43: Applying Adhesive To 2 Or 3 Threads Of Ventilation Valve
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Install the ventilation valve.

Torque: 20 N*m (204 kgf*cm, 15 ft.*lbf)

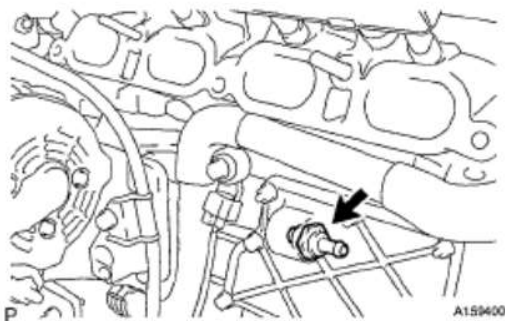


Fig. 44: Locating Ventilation Valve Sub-Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Connect the ventilation hose.

2. **INSTALL INTAKE MANIFOLD** (See INSTALLATION)
3. **INSTALL ENGINE OIL LEVEL DIPSTICK**
4. **INSTALL TRANSMISSION OIL LEVEL GAUGE SUB-ASSEMBLY** (for Automatic Transaxle)
(See INSTALLATION)
5. **INSTALL OIL COOLER TUBE** (for Automatic Transaxle) (See INSTALLATION)
6. **INSTALL STARTER ASSEMBLY** (See INSTALLATION)
7. **INSTALL INJECTOR VIBRATION INSULATOR** (See INSTALLATION)
8. **INSTALL NO. 1 DELIVERY PIPE SPACER** (See INSTALLATION)
9. **INSTALL FUEL DELIVERY PIPE SUB-ASSEMBLY** (See INSTALLATION)

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10. **CONNECT FUEL TUBE SUB-ASSEMBLY** (See INSTALLATION)
11. **INSTALL FUEL PIPE CLAMP** (See INSTALLATION)
12. **CONNECT VACUUM HOSE** (See INSTALLATION)
13. **CONNECT NO. 1 FUEL VAPOR FEED HOSE** (See INSTALLATION)
14. **INSTALL HARNESS BRACKET** (See INSTALLATION)
15. **INSTALL ENGINE WIRE HARNESS** (See INSTALLATION)
16. **INSTALL AIR CLEANER CAP SUB-ASSEMBLY WITH HOSE** (See INSTALLATION)
17. **CONNECT CABLE TO NEGATIVE BATTERY TERMINAL**

Torque: 5.4 N*m (55 kgf*cm, 48 in.*lbf)

18. **ADD ENGINE COOLANT** (See REPLACEMENT)
19. **INSPECT FOR COOLANT LEAK** (See ON-VEHICLE INSPECTION)
20. **INSPECT FOR FUEL LEAK**

(See PRECAUTION)

21. **INSTALL NO. 2 CYLINDER HEAD COVER** (See INSTALLATION)
22. **INSTALL ENGINE UNDER COVER RH**

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

23. **INSTALL ENGINE UNDER COVER LH**

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