

# EMISSION CONTROL SYSTEM

EC02E-04

## PURPOSE

The emission control systems are installed to reduce the amount of CO, HC and NO<sub>x</sub> exhausted from the engine (3 and 4), to prevent the atmospheric release of blow-by gas-containing HC (1) and evaporated fuel containing HC being released from the fuel tank (2).

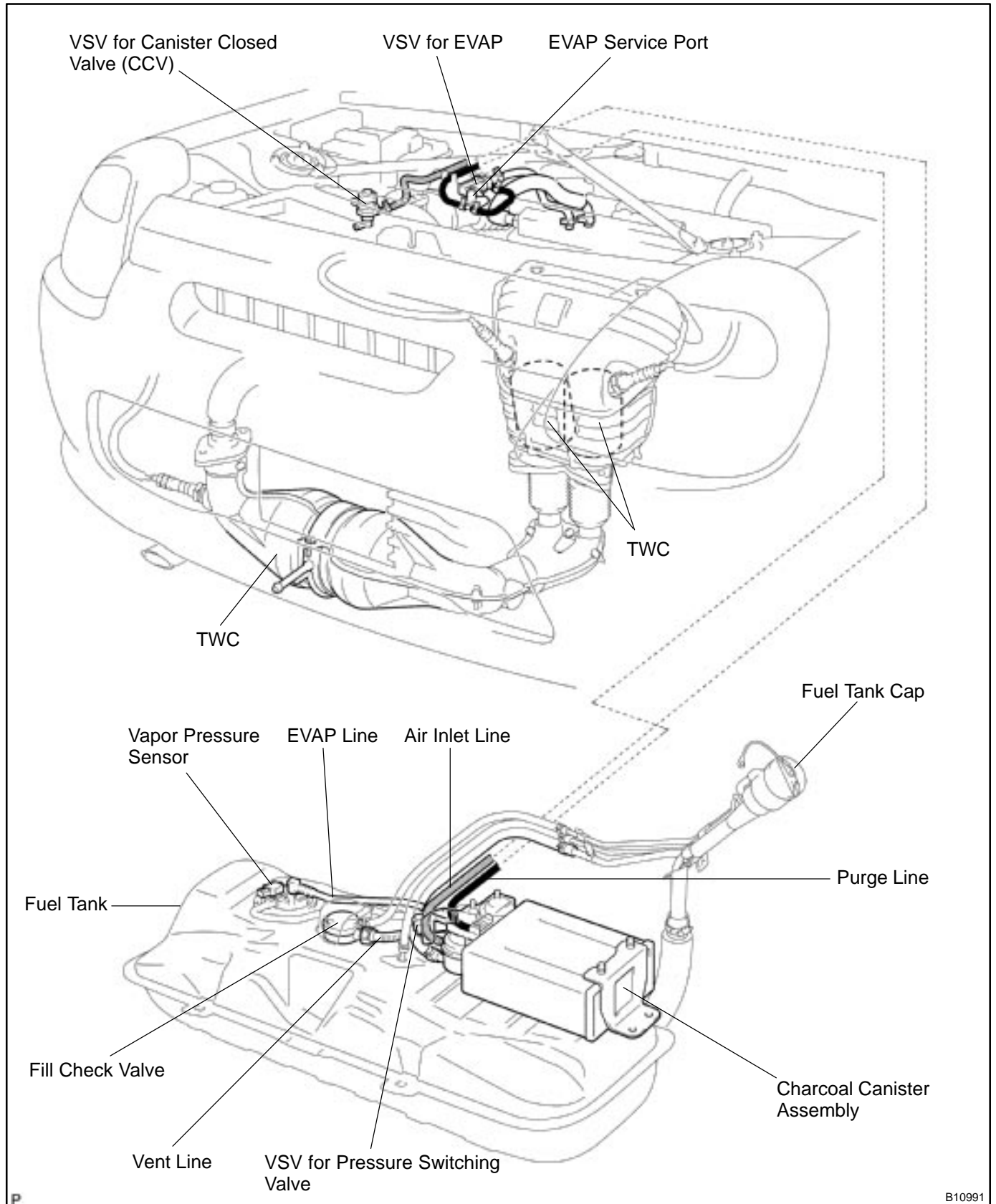
The function of each system is shown in the following table.

System	Abbreviation	Function
4. Positive Crankcase Ventilation	PCV	Reduces HC
5. Evaporative Emission Control	EVAP	Reduces evaporated HC
6. Three-Way Catalytic Converter	TWC	Reduces HC, CO and NO <sub>x</sub>
7. Sequential Multiport Fuel Injection*	SFI	Injects a precisely timed, optimum amount of fuel for reduced exhaust emissions

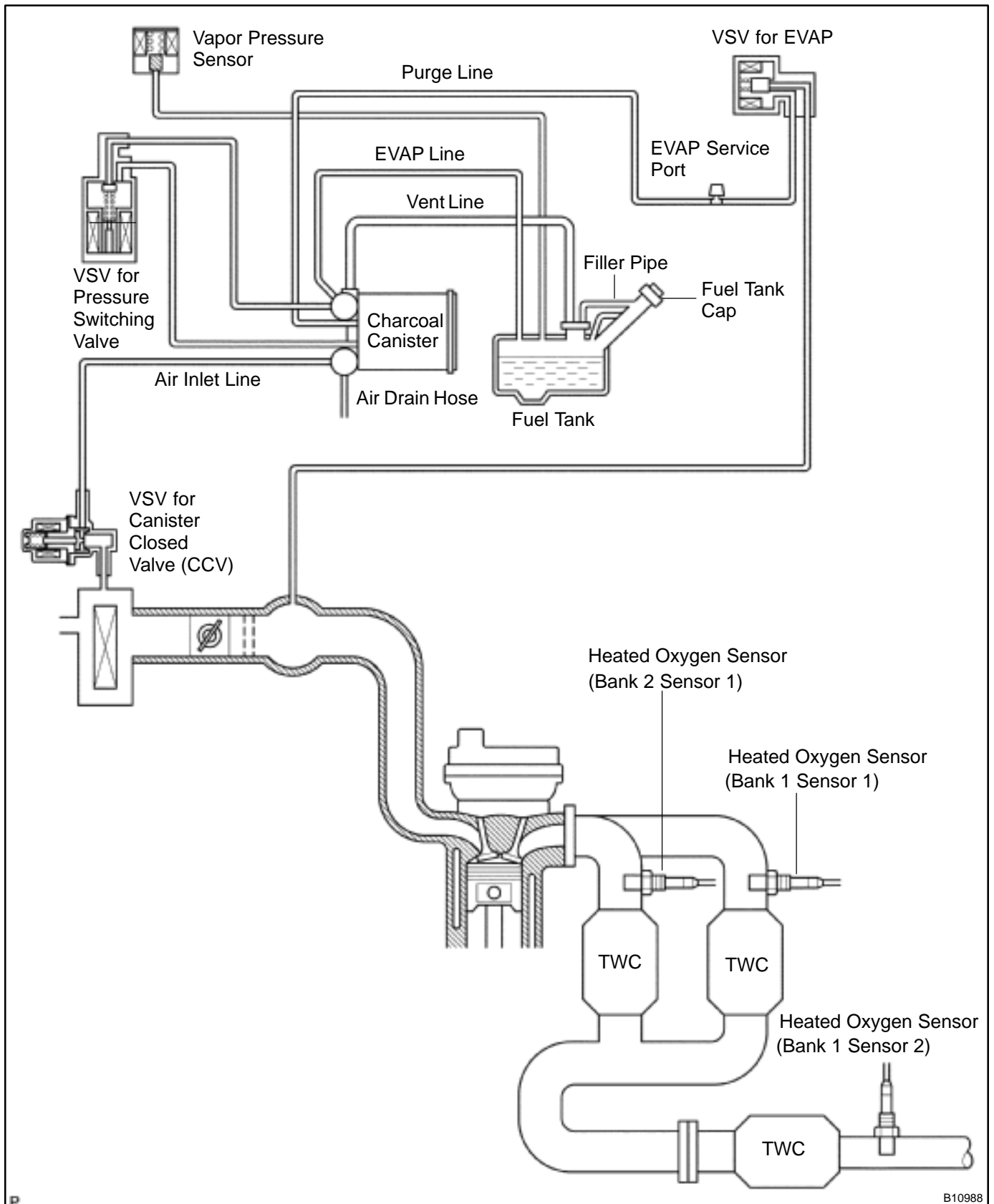
Remark: \*For inspection and repair of the SFI system, refer to the SFI section of this manual.

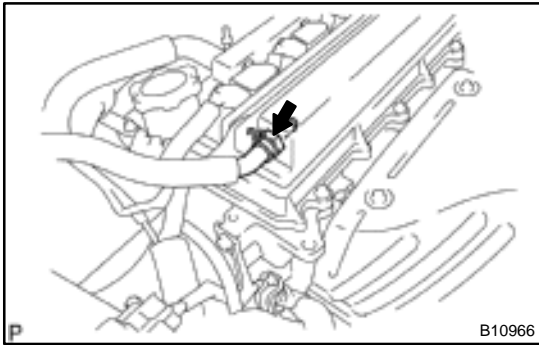
# PARTS LAYOUT AND SCHEMATIC DRAWING LOCATION

EC02F-11



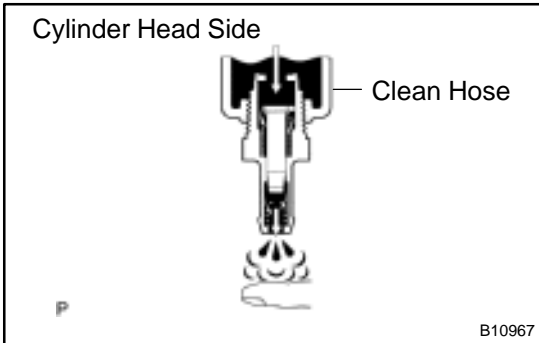
**DRAWING**





# POSITIVE CRANKCASE VENTILATION (PCV) SYSTEM INSPECTION

1. **REMOVE PCV VALVE**
  - (a) Disconnect the PCV hose from the PCV valve.
  - (b) Remove the PCV valve.

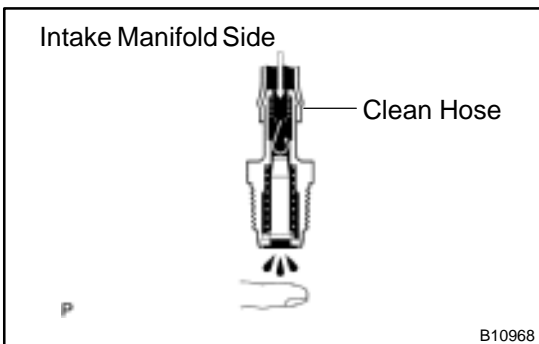


2. **INSTALL CLEAN HOSE TO PCV VALVE**
3. **INSPECT PCV VALVE OPERATION**

- (a) Blow air into the cylinder head side, and check that air passes through easily.

**CAUTION:**

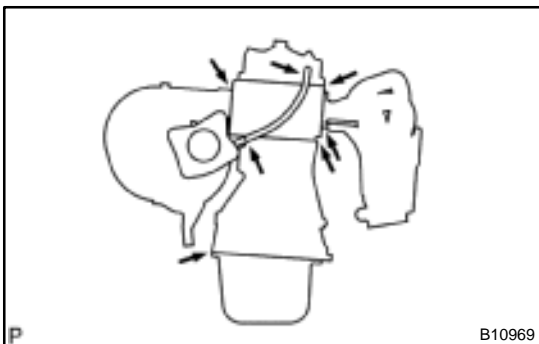
**Do not suck air through the valve. Petroleum substances inside the valve are harmful.**



- (b) Blow air into the intake manifold side, and check that it has a little difficulty for the air to pass through.

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

4. **REMOVE CLEAN HOSE FROM PCV VALVE**
5. **REINSTALL PCV VALVE**

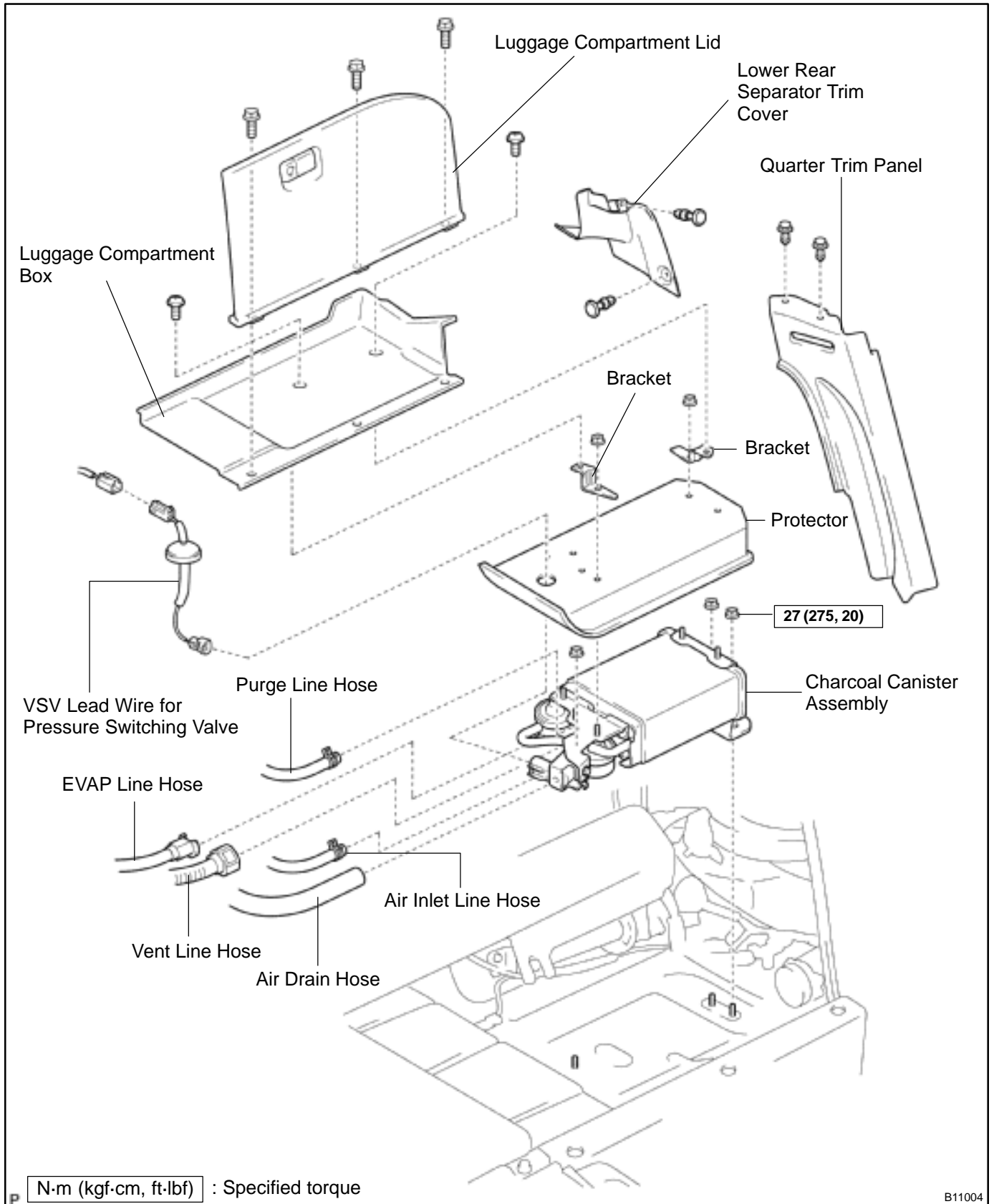


6. **INSPECT HOSES, CONNECTIONS AND GASKETS**

Visually check for cracks, leaks or damage.

# EVAPORATIVE EMISSION (EVAP) CONTROL SYSTEM COMPONENTS

EC021-07



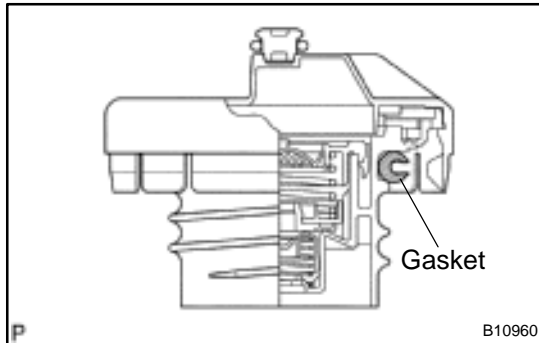
## INSPECTION

### 1. INSPECT LINES AND CONNECTORS

Visually check for loose connections, sharp bends or damage.

### 2. INSPECT FUEL TANK FILLER PIPE

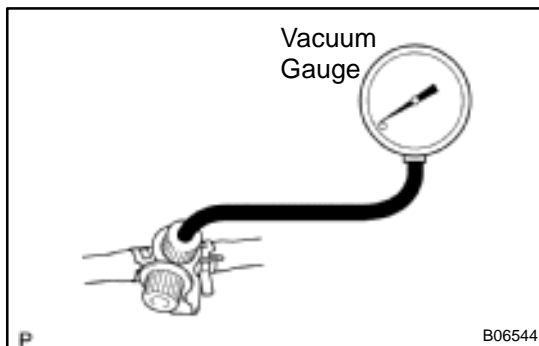
Visually check for deformation, cracks or fuel leakage.



### 3. INSPECT FUEL TANK CAP

Visually check if the cap and/or gasket are deformed or damaged.

If necessary, repair or replace the cap.

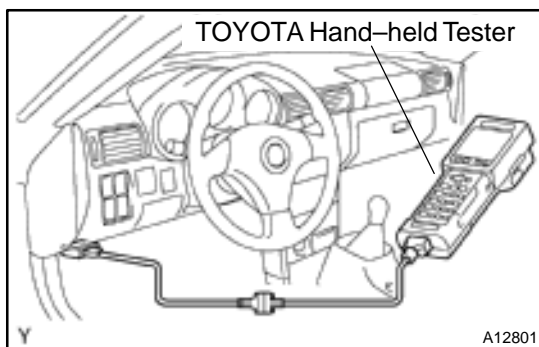


### 4. INSPECT EVAP SYSTEM LINE

(a) Warm up the engine and stop the engine.

Allow the engine to warm up to normal operating temperature.

(b) Install a vacuum gauge (EVAP control system test equipment vacuum gauge) to the EVAP service port on the purge line.



(c) When using the TOYOTA hand-held tester:

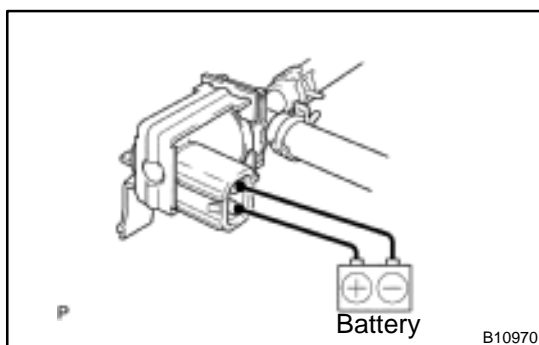
Forced driving of the VSV for the EVAP.

(1) Connect a TOYOTA hand-held tester to the DLC3.

(2) Start the engine.

(3) Push the TOYOTA hand-held tester main switch ON.

(4) Use the ACTIVE TEST mode on the TOYOTA hand-held tester to operate the VSV for the EVAP.



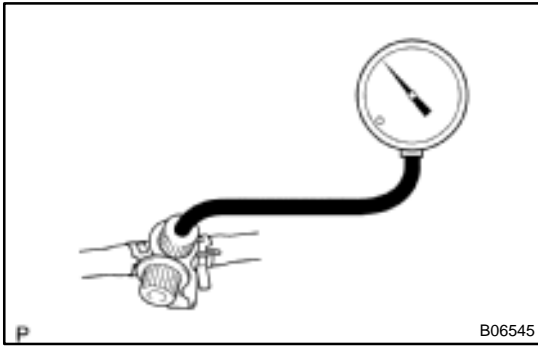
(d) When not using the TOYOTA hand-held tester:

Forced driving of the VSV for the EVAP.

(1) Disconnect the VSV connector for the EVAP.

(2) Connect the positive (+) and negative (-) leads from the battery to the VSV terminals for the EVAP.

(3) Start the engine.

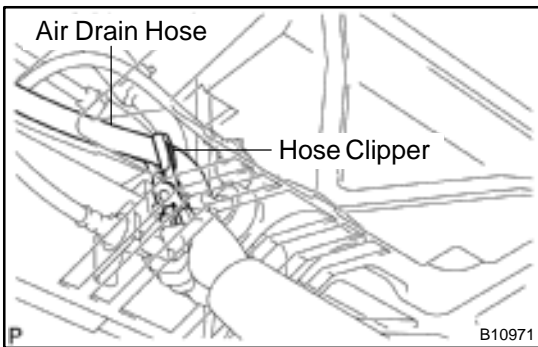


- (e) Check the vacuum at idle.  
**Vacuum:**  
**Maintain at 0.368 – 3.678 in.Hg (5 – 50 in.Aq) for over 5 seconds**

**HINT:**

If the vacuum does not change, it can be concluded that the hose connecting the VSV to the service port has come loose or is blocked, or the VSV is malfunctioning.

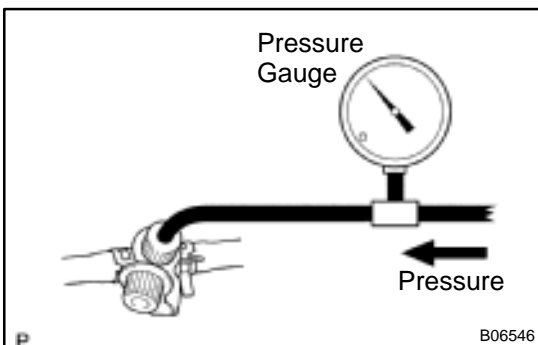
- (f) When using the TOYOTA hand-held tester:  
 Forced driving of the VSV for the EVAP.
  - (1) Stop the engine.
  - (2) Disconnect the TOYOTA hand-held tester from the DLC3.
- (g) When not using the TOYOTA hand-held tester:  
 Forced driving of the VSV for the EVAP.
  - (1) Stop the engine.
  - (2) Disconnect the positive (+) and negative (-) leads from the battery, and from the VSV terminals for the EVAP.
  - (3) Connect the VSV connector for the EVAP.
- (h) Disconnect the vacuum gauge from the EVAP service port on the purge line.
- (i) Connect a pressure gauge to the EVAP service port on the purge line.



- (j) Check the pressure.
  - (1) Close off the air drain hose at the marked position of the canister with a hose clipper or similar instrument.

**HINT:**

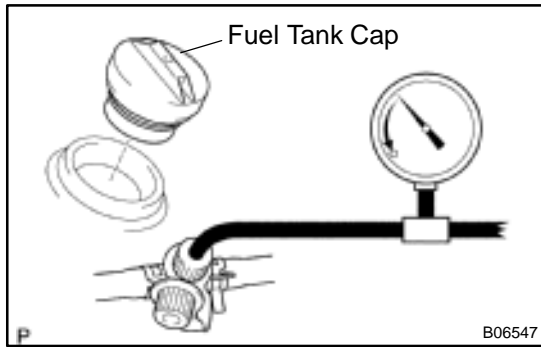
Insert the hose clipper through the clearance of the front engine under cover and pinch the white marked portion of the air drain hose.



- (2) Increase the pressure (13.5 – 15.5 in.Aq) from the EVAP service port.  
**Pressure:**  
**2 minutes after the pressure is increased, the gauge should be over 7.7 – 8.8 in.Aq.**

**HINT:**

If more pressure can not be applied, you can concluded that the hose connecting the VSV – canister – fuel tank has slipped off or the VSV is open.

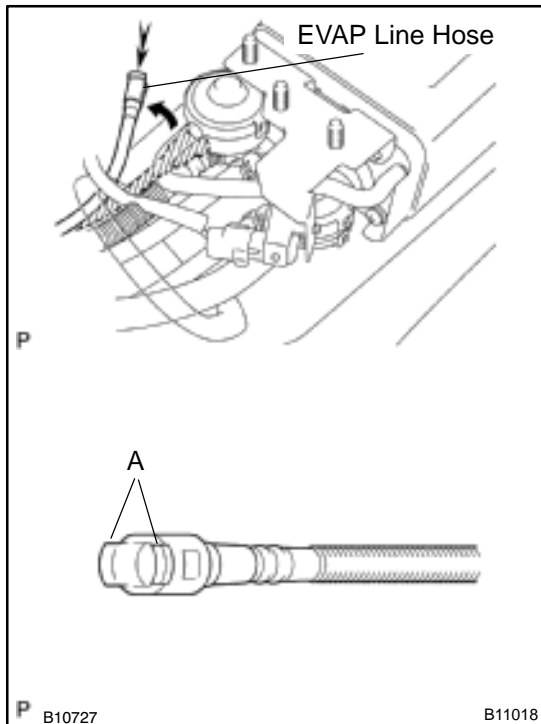


- (3) Check if the pressure decreases when the fuel tank cap is removed while increasing pressure.

**HINT:**

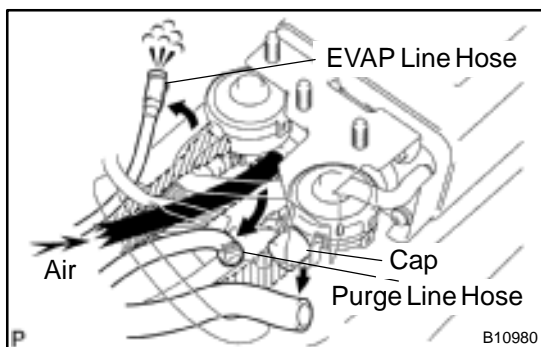
If the pressure does not decrease when the filler cap is removed, then it can be concluded that the hose connecting the service port to the fuel tank is blocked, etc.

- (k) Disconnect the pressure gauge from the EVAP service port on the purge line.



**5. CHECK AIRTIGHTNESS IN FUEL TANK AND FILLER PIPE**

- (a) Disconnect the EVAP line hose from the charcoal canister.
    - (1) Pinch portion A.
    - (2) Pull out the connector.
  - (b) Pressurize the internal fuel tank at 4 kPa (41 gf/cm<sup>2</sup>, 0.58 psi).
  - (c) Check that the internal pressure of the fuel tank can be maintained for 1 minute.
  - (d) Check the connected portions of each hose and pipe.
  - (e) Check the installed parts on the fuel tank.
- If there is no abnormality, replace the fuel tank and filler pipe.
- (f) Reconnect the EVAP line hose to the charcoal canister.



**6. INSPECT FUEL CUTOFF VALVE AND FILL CHECK VALVE**

- (a) Disconnect the purge line hose and EVAP line hose from the charcoal canister.
- (b) Disconnect the drain hose from the charcoal canister and plug the cap to the drain port.
- (c) Pressurize the purge port at 4 kPa (41 gf/cm<sup>2</sup>, 0.58 psi) and check that it is ventilated through the EVAP line hose.

**HINT:**

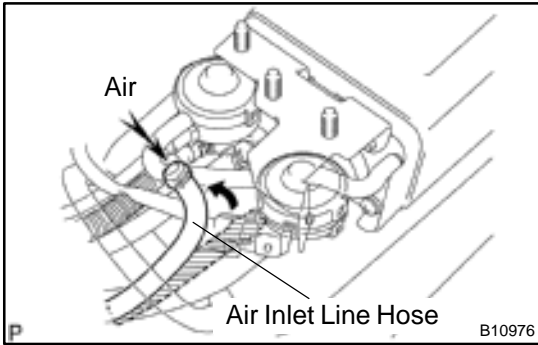
In the condition that the fuel is full, as the float valve of the fill check valve is closed and has no ventilation, it is necessary to check the fuel amount (volume).

- (d) Check if there is anything stuck in the vent line hose and EVAP line hose.

If there is nothing stuck in them, replace the fuel cutoff valve and fill check valve.

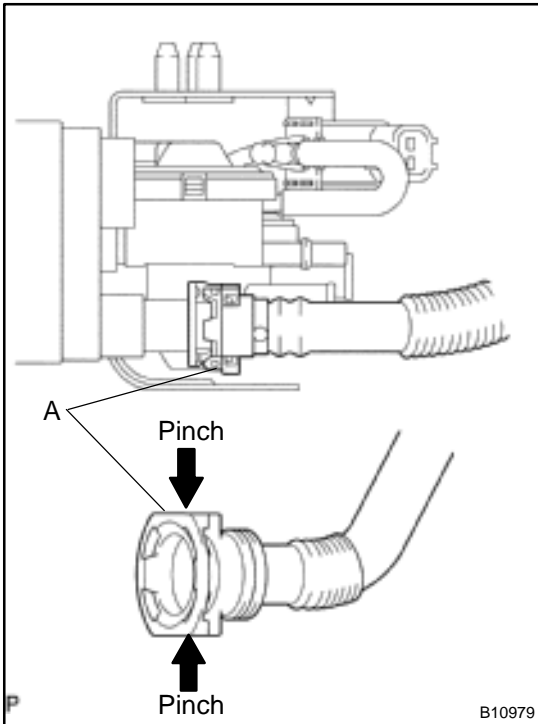
- (e) Reconnect the purge line hose and EVAP line hose to the charcoal canister.





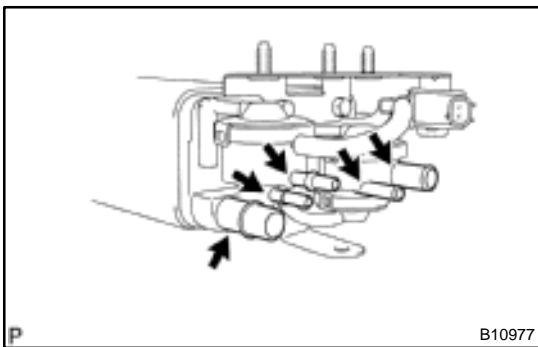
**7. CHECK AIR INLET LINE**

- (a) Disconnect the air inlet line hose from the charcoal canister.
- (b) Check that there is ventilation in the air inlet line.
- (c) Reconnect the air inlet line hose to the charcoal canister.



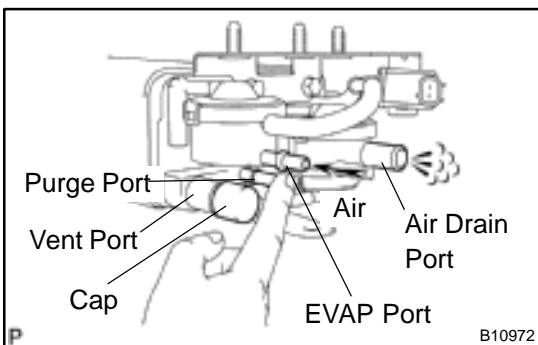
**8. REMOVE CHARCOAL CANISTER ASSEMBLY**

- (a) Disconnect the VSV connector.
- (b) Disconnect the purge line hose, EVAP line hose and air inlet line hose from the charcoal canister.
- (c) Disconnect the vent line hose from charcoal canister.
  - (1) Push the connector deep inside.
  - (2) Pinch portion A.
  - (3) Pull out the connector.
- (d) Remove the 3 nuts and charcoal canister assembly.

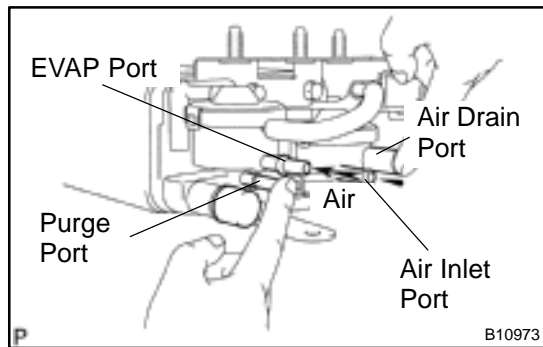


**9. INSPECT CHARCOAL CANISTER**

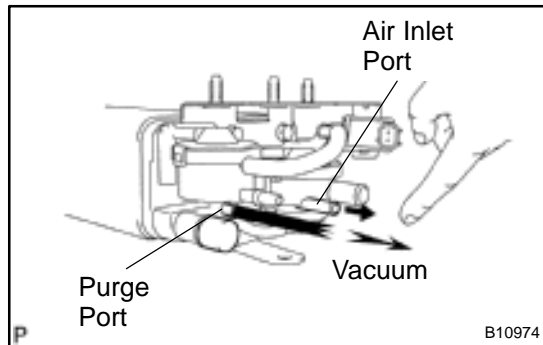
- (a) Visually check the charcoal canister for cracks or damage.



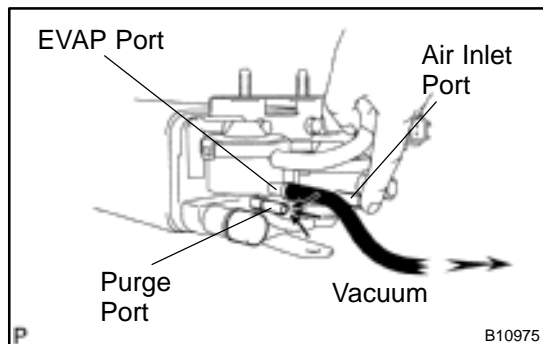
- (b) Inspect the charcoal canister operation.
  - (1) Plug the vent port with a cap.
  - (2) While holding the purge port closed, blow air (1.76 kPa, 18 gf/cm<sup>2</sup>, 0.26 psi) into the EVAP port and check that air flows from the air drain port.



- (3) While holding the purge port with the air drain port closed, blow air (1.76 kPa, 18 gf/cm<sup>2</sup>, 0.26 psi) into the EVAP port and check that air does not flow from the air inlet port.



- (4) Apply vacuum (3.43 kPa, 25.7 mmHg, 1.01 in.Hg) to the purge port, check that the vacuum does not decrease when the air inlet port is closed, and check that the vacuum decreases when the air inlet port is released.



- (5) With the air inlet port closed, apply vacuum (3.43 kPa, 25.7 mmHg, 1.01 in.Hg) to the EVAP port and check that air flows into the purge port.

If a problem is found, replace the charcoal canister.

- (6) Remove the cap from the vent port.

10. **INSPECT VSV FOR EVAP (See page SF-49)**
11. **INSPECT VSV FOR CANISTER CLOSED VALVE (CCV) (See page SF-51)**
12. **INSPECT VSV FOR PRESSURE SWITCHING VALVE (See page SF-53)**
13. **INSPECT VAPOR PRESSURE SENSOR (See page SF-57)**
14. **REINSTALL CHARCOAL CANISTER ASSEMBLY**

# THREE-WAY CATALYTIC CONVERTER (TWC) SYSTEM

## ON-VEHICLE INSPECTION

EC03H-04

### 1. INSPECT EXHAUST PIPE ASSEMBLY

- (a) Check the connections for looseness or damage.
- (b) Check the clamps for wear, cracks or damage.

### 2. INSPECT TWC

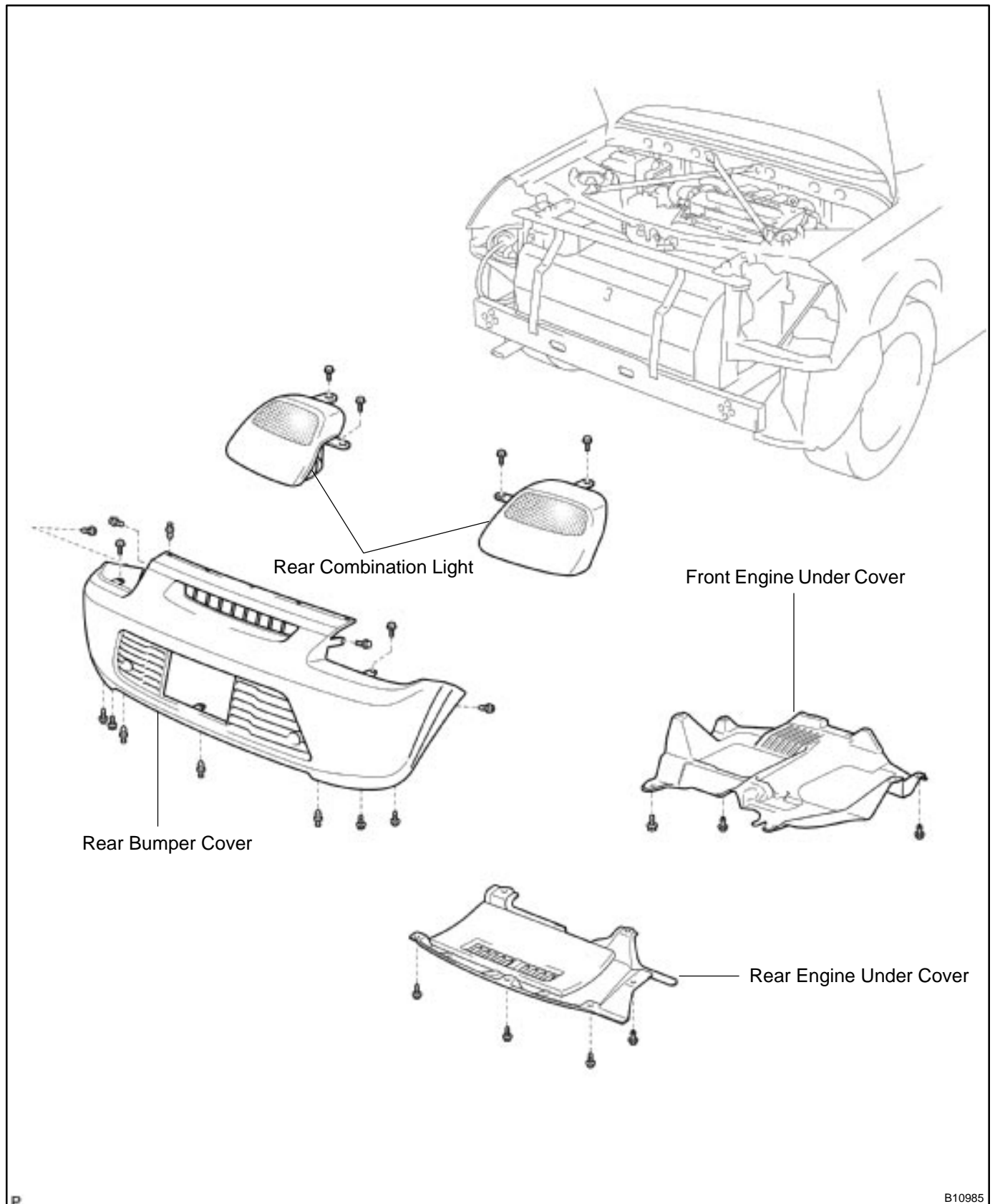
Check for dents or damage.

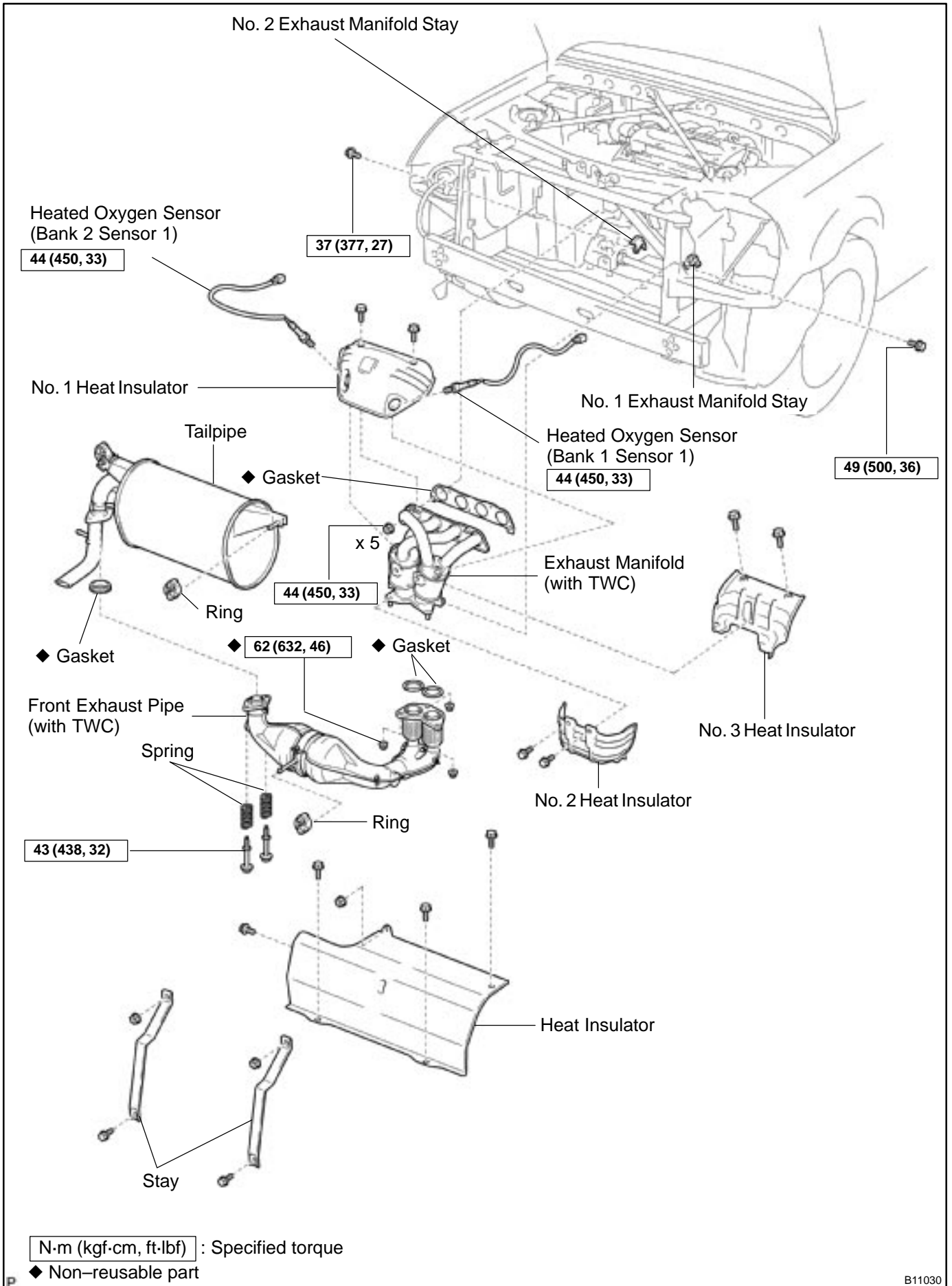
If any part of the protector is damaged or dented to the extent that it contacts the TWC, repair or replace it.

### 3. INSPECT HEAT INSULATOR

- (a) Check the heat insulator for damage.
- (b) Check for adequate clearance between the catalytic converter and heat insulator.

# COMPONENTS





B11030