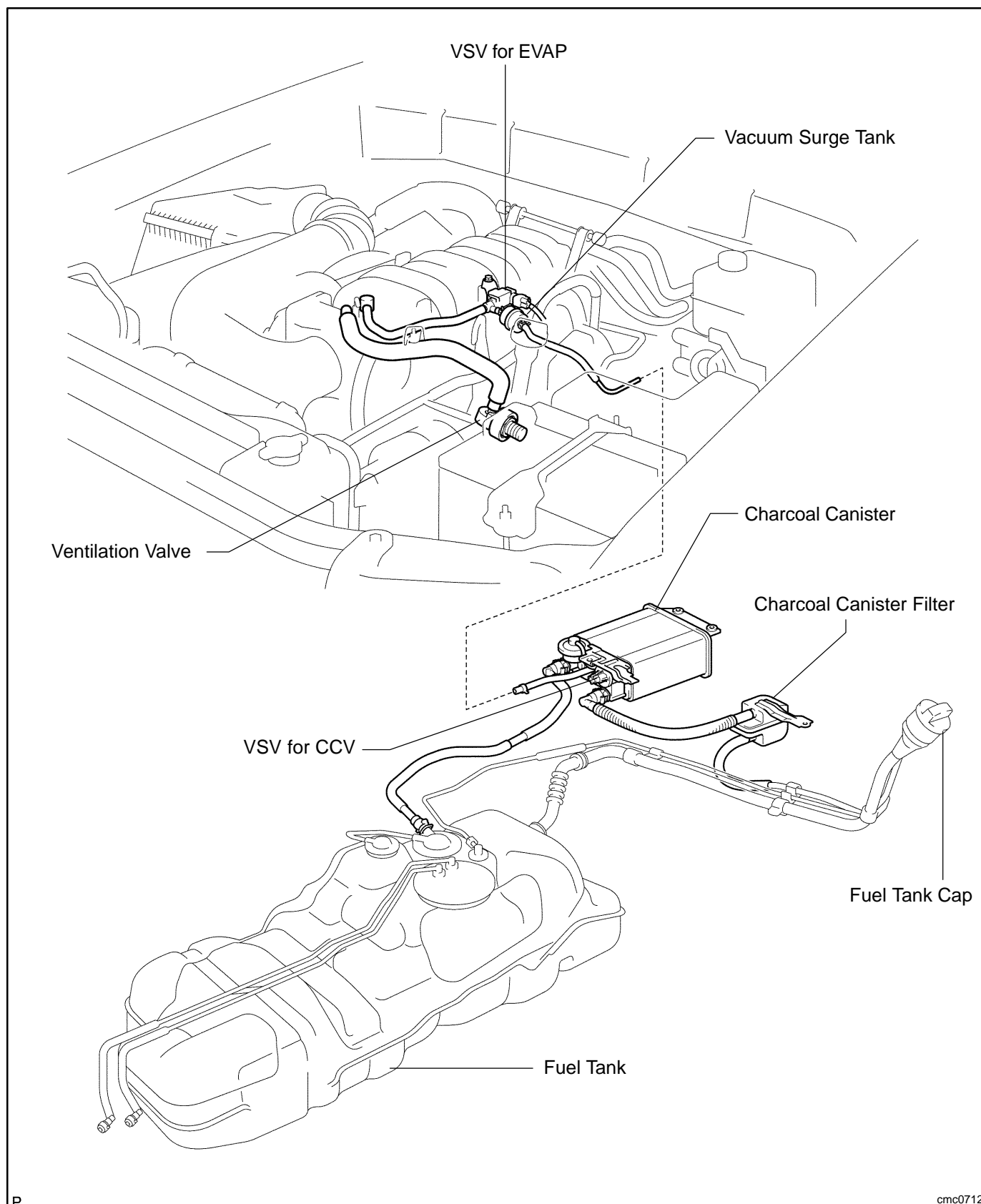
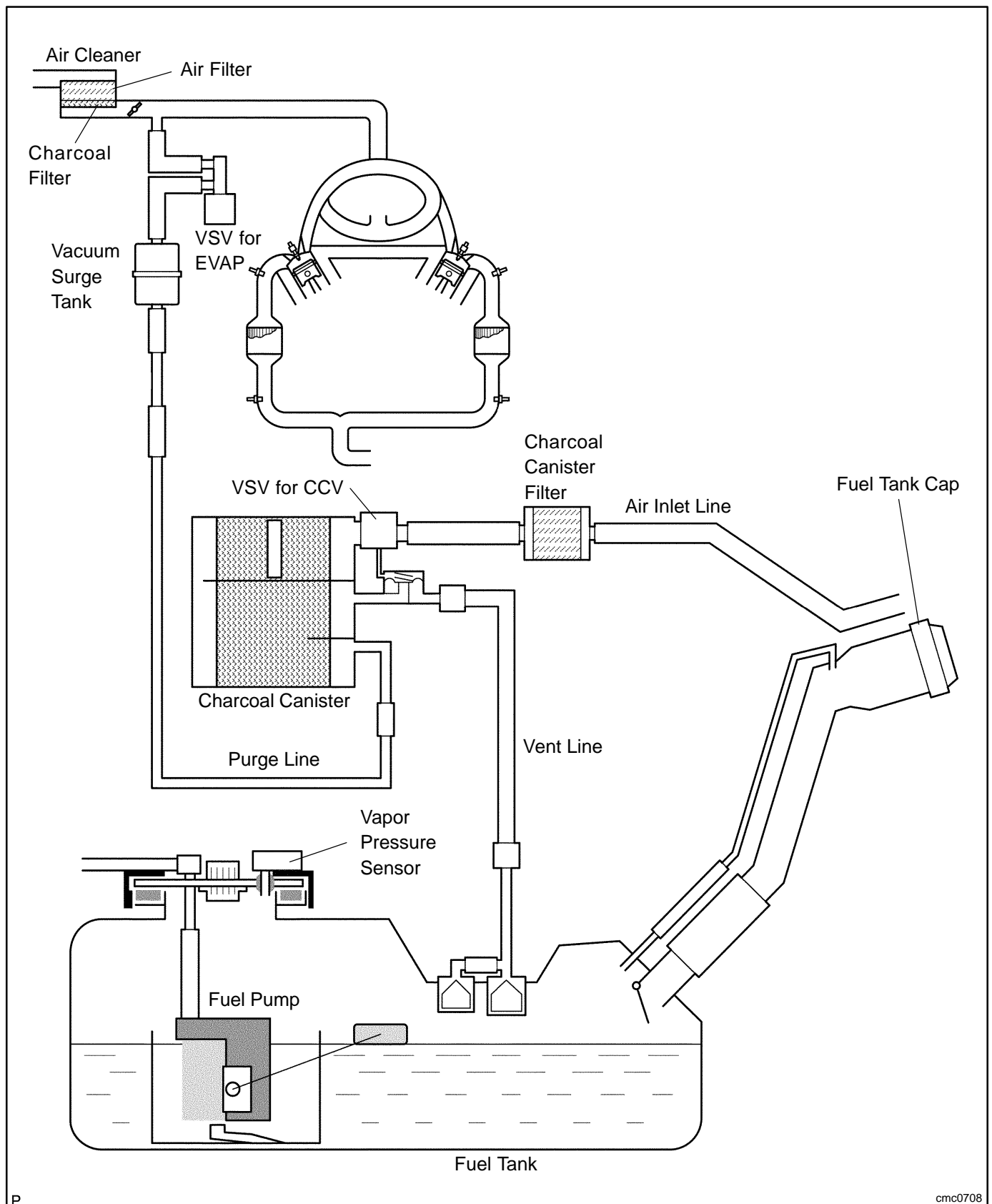


## EMISSION CONTROL SYSTEM (2UZ-FE)(From November, 2004)

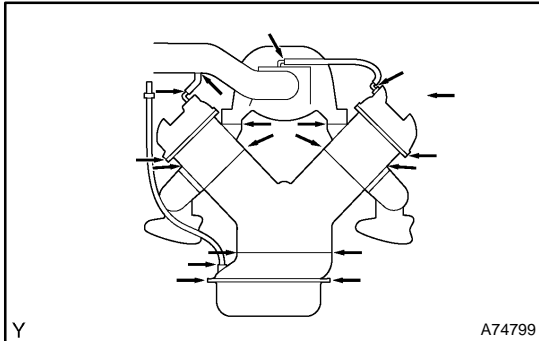
1205X-05

### LOCATION





## ON-VEHICLE INSPECTION

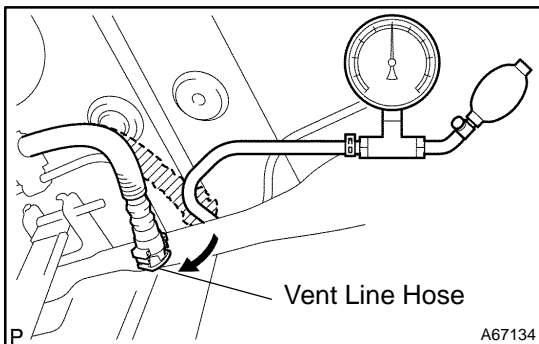


### 1. VISUALLY INSPECT HOSES, CONNECTIONS AND GASKETS

- (a) Check for cracks, leaks or damage.

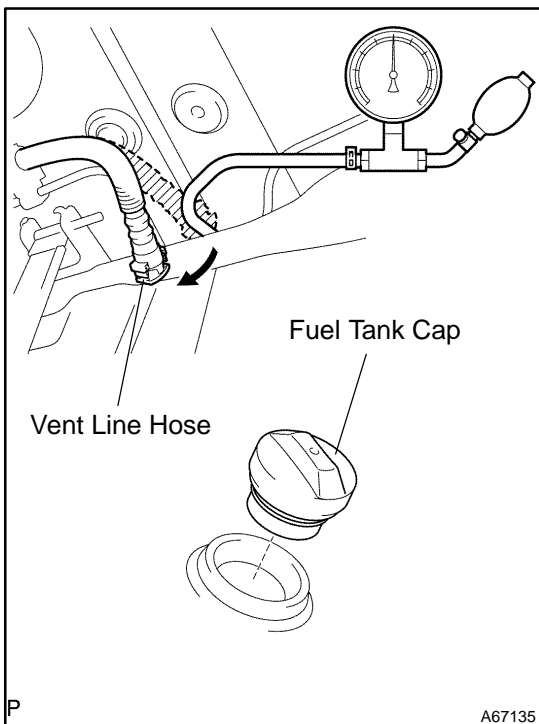
#### HINT:

Separation of the engine oil dipstick, oil filler cap, PCV hose, etc. may cause an engine failure or engine malfunctions. Disconnection, looseness or cracks in the parts of the air induction system between the throttle body and cylinder head will allow air suction and cause an engine failure or engine malfunctions.



### 2. CHECK AIR TIGHTNESS IN FUEL TANK AND FILLER PIPE

- (a) Disconnect the vent line hose from the fuel tank (See page 11-16).
- (b) Apply pressure to the fuel tank and make the internal pressure of the air pressure 4 kPa (41 gf/cm<sup>2</sup>, 0.58 psi).
- (c) Check that the internal pressure of the fuel tank is maintained for 1 minute.
- (d) Check the connections for 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 vent line hose to the fuel tank.



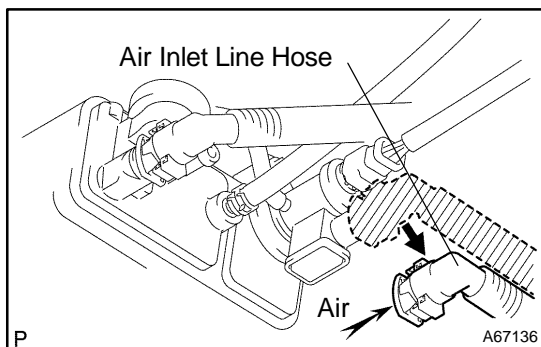
### 3. INSPECT FUEL CUTOFF VALVE AND FILL CHECK VALVE

- (a) Disconnect the vent line hose from the fuel tank (See page 11-16).
- (b) Apply 4 kPa (41 gf/cm<sup>2</sup>, 0.58 psi) to the vent port of the fuel tank.

#### HINT:

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

- (c) Remove the fuel tank cap, and check that the pressure inside the tank drops.
- If pressure does not drop, replace the fuel tank assembly.
- (d) Reconnect the vent line hose to the fuel tank.

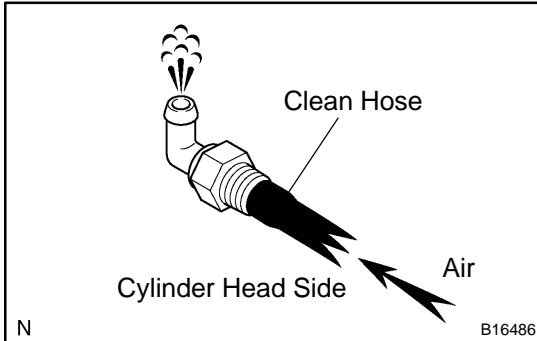
**4. CHECK AIR INLET LINE**

- (a) Disconnect the air inlet line hose from the charcoal canister (See page [12-12](#)).
- (b) Check that there is ventilation in the air inlet line.
- (c) Reconnect the air inlet line hose to the charcoal canister.

– MEMO –

– MEMO –

## INSPECTION

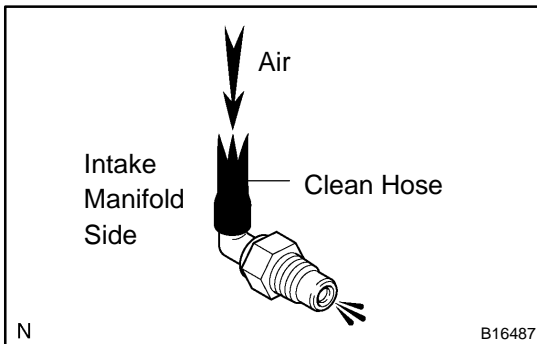


### 1. INSPECT VENTILATION VALVE SUB-ASSY

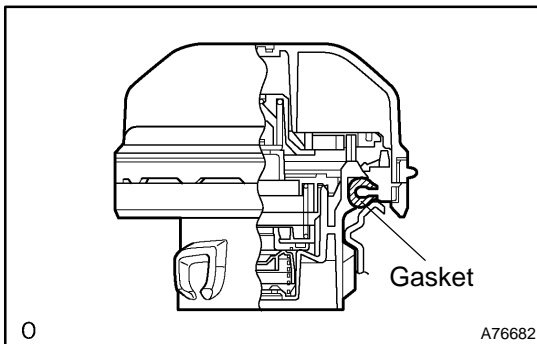
- (a) Install a clean hose to the ventilation valve.
- (b) Inspect the ventilation valve operation.
  - (1) Blow air into the cylinder head side, and check that air passes through smoothly.

#### CAUTION:

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

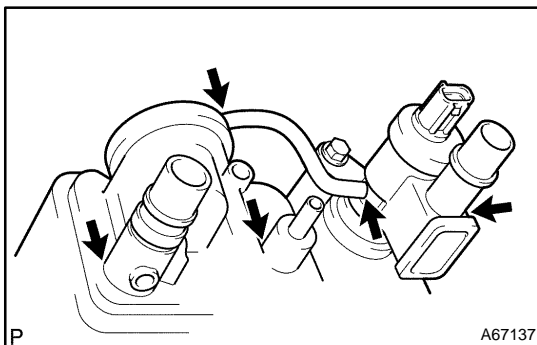


- (2) Blow air into the intake manifold side, and check that air does not pass through smoothly.
- If operation is not as specified, replace the ventilation valve.
- (c) Remove the clean hose from the ventilation valve.



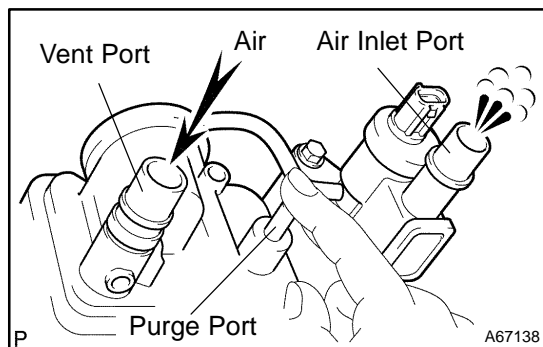
### 2. INSPECT FUEL TANK CAP ASSY

- (a) Visually check if the cap and/or gasket are deformed or damaged.

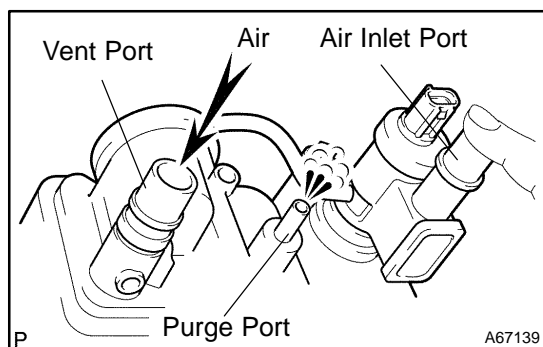


### 3. INSPECT CHARCOAL CANISTER ASSY

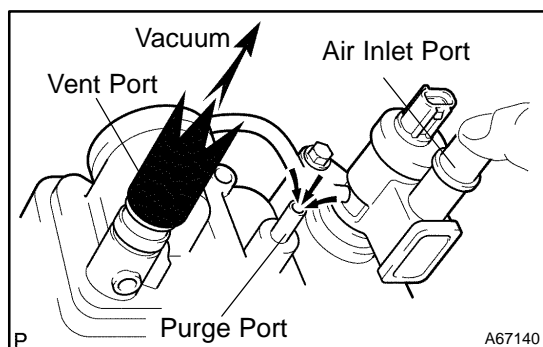
- (a) Visually check the charcoal canister for cracks or damage.



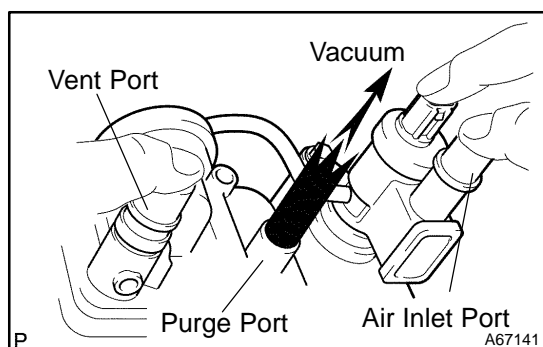
- (b) Inspect the charcoal canister operation.
- (1) Blow air (0.39 kPa, 4.0 gf/cm<sup>2</sup>, 0.06 psi) into the vent port with the purge port closed, and check that the air flows from the air inlet port.



- (2) Blow air (0.39 kPa, 4.0 gf/cm<sup>2</sup>, 0.06 psi) into the vent port with the air inlet port closed, and check that air flows from the purge port.



- (3) Apply vacuum (3.43 kPa, 25.7 mmHg, 1.01 in.Hg) to the vent port with the air inlet port closed, and check that air is sucked in from the purge port.
- If operation is not as specified, replace the charcoal canister.

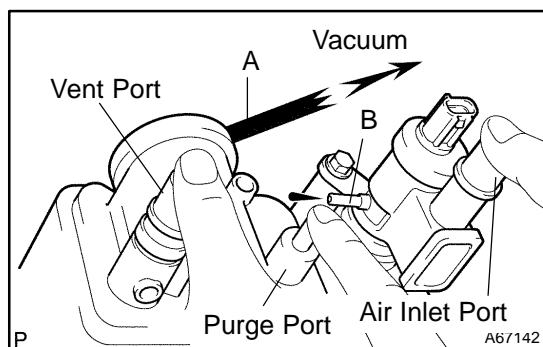


- (c) Inspect the air tightness.
- (1) Apply vacuum (3.43 kPa, 25.7 mmHg, 1.01 in.Hg) to the purge port with the vent and air inlet ports closed, and check that the vacuum is sustained for 1 minute.

**HINT:**

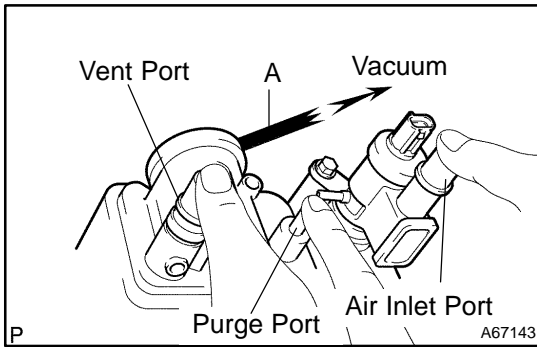
In order to maintain air tightness, the checked should be performed with the CCV terminal port held closed by hand.

If operation is not as specified, replace the charcoal canister.



- (d) Inspect the diaphragm.
- (1) Remove the air hose between ports A and B.
  - (2) Apply vacuum (1.42 kPa, 11 mmHg, 0.42 in.Hg) into port A with the vent, purge and air inlet ports closed, and check that air is sucked in from port B.



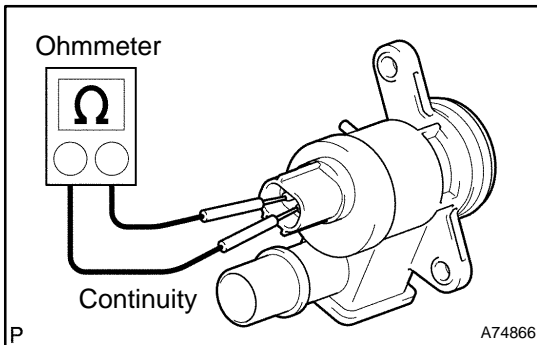


- (3) Apply vacuum (1.42 kPa, 11 mmHg, 0.42 in.Hg) into port A with the vent, purge and air inlet ports closed, and measure how long it takes for the vacuum to drop.

**Vacuum drop time: 10 sec. or more**

If operation is not as specified, replace the charcoal canister.

- (4) Reinstall the air hose between ports A and B.



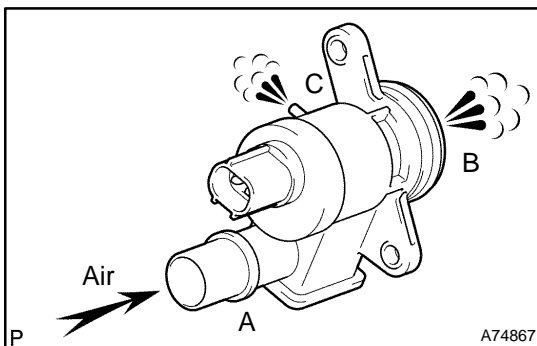
- (e) Inspect VSV for open circuit.

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

**Resistance:**

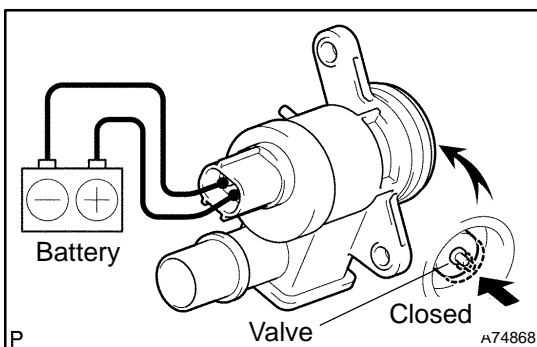
20 °C (68 °F)	25 – 30 Ω
100 °C (212 °F)	32 – 42 Ω

If there is no continuity, replace the charcoal canister.



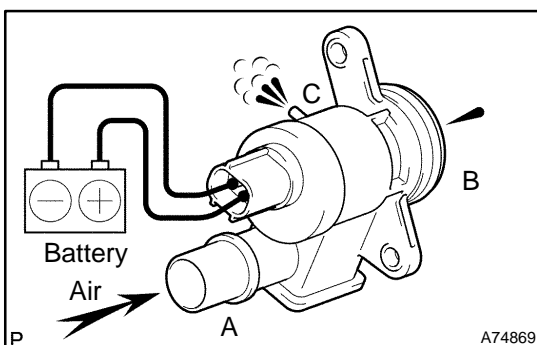
- (f) Inspect VSV operation.

- (1) Check that air flows from ports A to B and C.



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

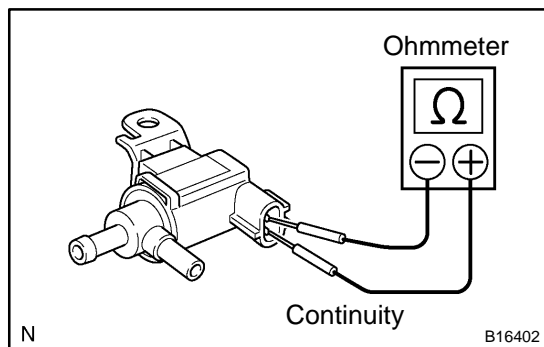
- (3) Check that the valve is closed.



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

- (5) Check that air flows from ports A to C.

If the operation is not as specified, replace the charcoal canister.



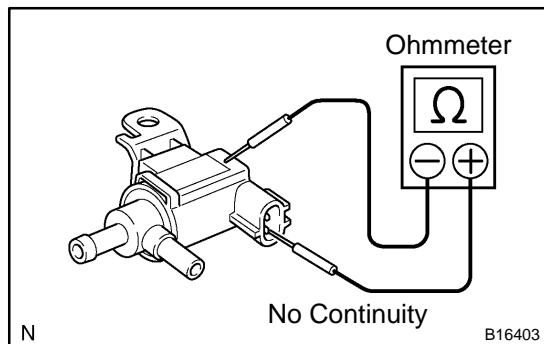
#### 4. INSPECT VACUUM SWITCHING VALVE ASSY NO.1

(a) Inspect the VSV for open circuit.

- (1) Using an ohmmeter, check resistance between the terminals.

**Resistance: 26 – 30  $\Omega$  at 20 °C (68 °F)**

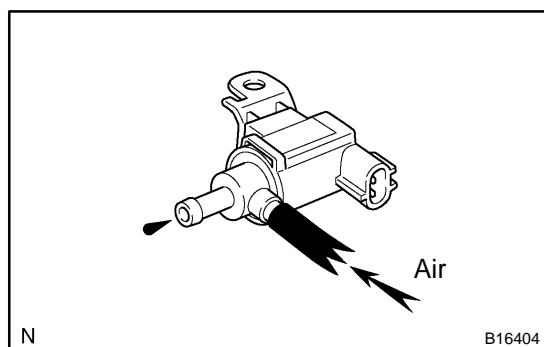
If the resistance is not as specified, replace the VSV.



(b) Inspect the VSV for ground.

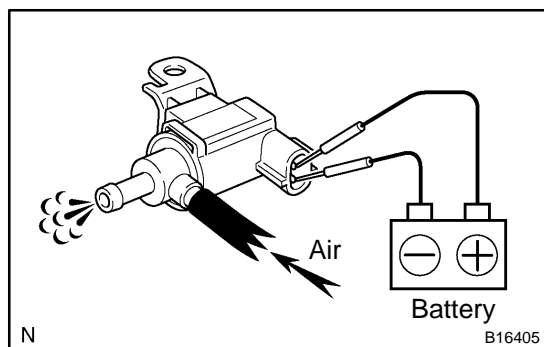
- (1) Using an ohmmeter, check that there is no continuity between each terminal and the body.

If there is continuity, replace the VSV.



(c) Inspect the VSV operation.

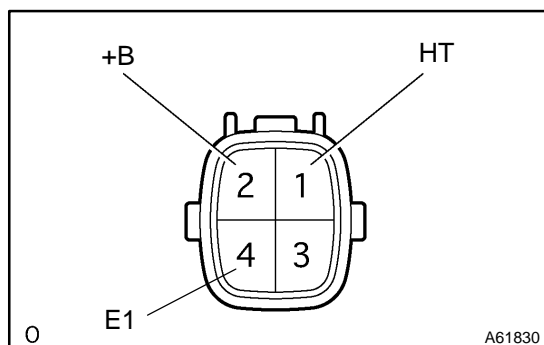
- (1) Check that air does not flow from ports.



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

- (3) Check that air flows from ports.

If operation is not as specified, replace the VSV.



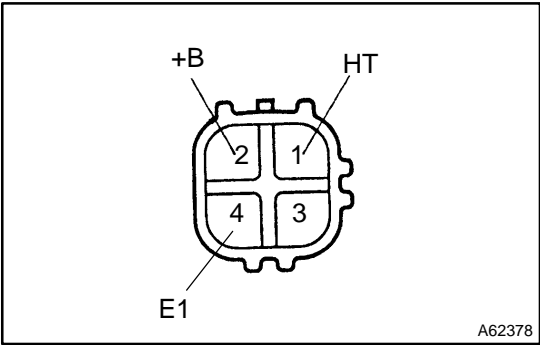
#### 5. INSPECT HEATED OXYGEN SENSOR (BANK1,BANK2 OXYGEN SENSOR)

(a) Using an ohmmeter, measure resistance between the terminals.

**Resistance:**

Terminal No.	Resistance
1 (HT) $\leftrightarrow$ 2 (+B)	11 – 16 $\Omega$ at 20 °C (68 °F)
1 (HT) $\leftrightarrow$ 4 (E1)	No Continuity

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



**6. INSPECT HEATED OXYGEN SENSOR (BANK1,BANK2 OXYGEN SENSOR NO.2)**

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

**Resistance:**

Terminal No.	Resistance
1 (HT) ⇔ 2 (+B)	11 – 16 Ω at 20 °C (68 °F)
1 (HT) ⇔ 4 (E1)	No Continuity

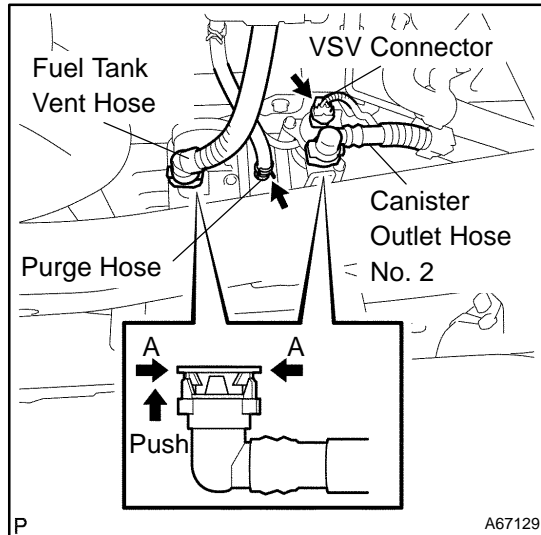
If the resistance is not as specified, replace the sensor.

# CHARCOAL CANISTER ASSY (2UZ-FE)

## REPLACEMENT

12060-05

### 1. REMOVE SPARE TIRE



### 2. REMOVE CHARCOAL CANISTER ASSY

- (a) Disconnect the fuel tank vent hose from the charcoal canister.
  - (1) Deeply push the connector inside.
  - (2) Pinch portion A.
  - (3) Pull out the connector.
- (b) Disconnect the canister outlet hose No. 2 from the charcoal canister.
  - (1) Deeply push the connector inside.
  - (2) Pinch portion A.
  - (3) Pull out the connector.
- (c) Disconnect the VSV connector from the CCV.
- (d) Disconnect the purge line hose from the charcoal canister.
- (e) Remove the 3 bolts and the charcoal canister from the body.

### 3. INSTALL CHARCOAL CANISTER ASSY

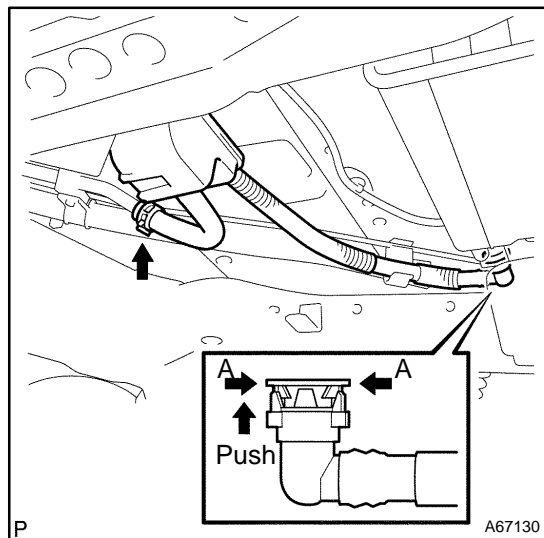
- (a) Install the charcoal canister with the 3 bolts.  
**Torque: 20 N·m (204 kgf·cm, 15 ft·lbf)**
- (b) Connect the purge line hose to the charcoal canister.
- (c) Connect the VSV connector to the CCV.
- (d) Connect the canister outlet hose No. 2 to the charcoal canister.
- (e) Connect the fuel tank hose to the charcoal canister.

# CHARCOAL CANISTER FILTER SUB-ASSY (2UZ-FE)

## REPLACEMENT

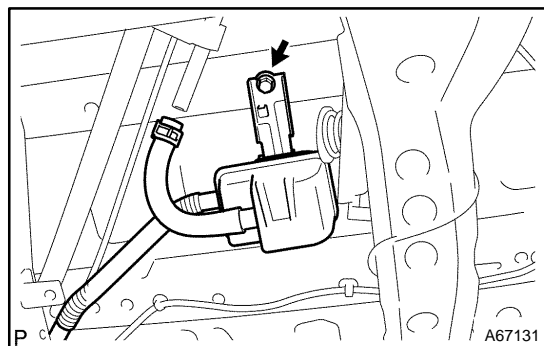
12061-05

### 1. REMOVE SPARE TIRE



### 2. REMOVE CHARCOAL CANISTER FILTER SUB-ASSY

- (a) Disconnect the canister outlet hose No. 2 from the charcoal canister.
  - (1) Deeply push the connector inside.
  - (2) Pinch portion A.
  - (3) Pull out the connector.
- (b) Disconnect the canister outlet hose from the fuel tank filler pipe.



- (c) Remove a bolt and the charcoal canister filter.

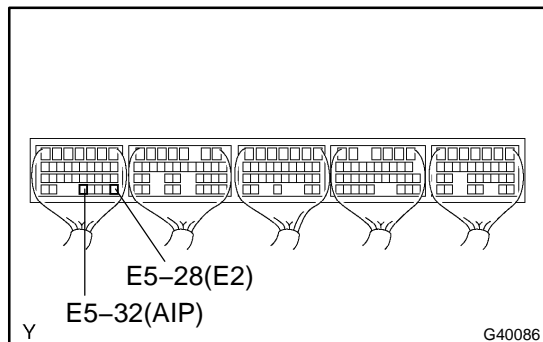
### 3. INSTALL CHARCOAL CANISTER FILTER SUB-ASSY

- (a) Install the charcoal canister with a bolt.  
**Torque: 20 N·m (204 kgf·cm, 15 ft·lbf)**
- (b) Connect the canister outlet hose to the fuel tank filler pipe.
- (c) Connect the canister outlet hose No. 2 to the charcoal canister.

# SECONDARY AIR INJECTION SYSTEM (2UZ-FE)(From November, 2004)

## ON-VEHICLE INSPECTION

120JB-01

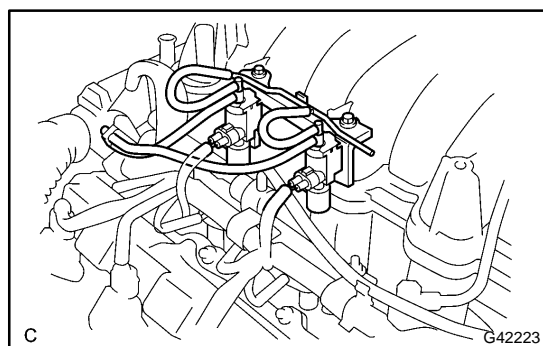


### 1. INSPECT PRESSURE SENSOR

- Turn the ignition switch to the ON position.
- Measure the voltage between terminals E5-32(AIP) and E5-28(E2) of the ECM connector.

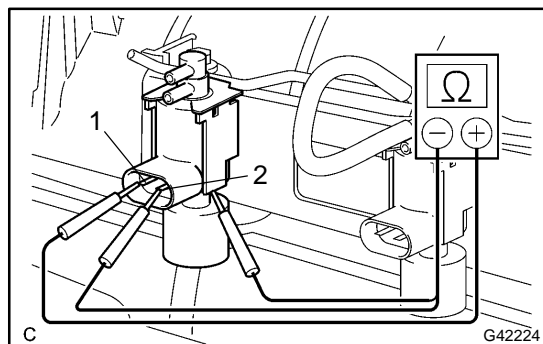
**Voltage: 1.0 to 2.2 V**

If the voltage is not as specified, replace the pressure sensor, wire harness or ECM.



### 2. INSPECT VSV FOR AIR INJECTION SYSTEM

- Disconnect the connector from the VSV.
- Disconnect the 2 vacuum hoses from the VSV.

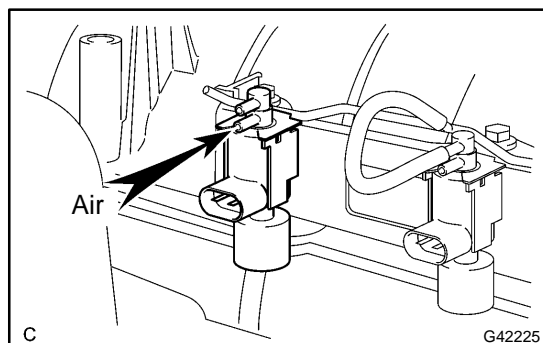


- Using an ohmmeter, measure the resistance between the terminals.

**Standard:**

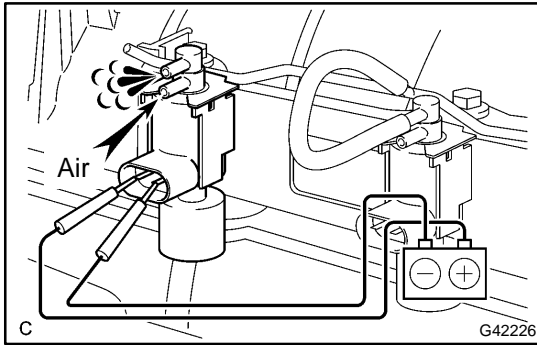
Tester Connection	Specified Condition
1 – 2	33 to 39 $\Omega$ at 20°C (68°F)
1 – Body ground	10 M $\Omega$ or higher
2 – Body ground	10 M $\Omega$ or higher

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



- Check that air does not flow from the port as shown in the illustration.

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



- (e) Apply positive battery between the terminals, and check that air flows from the port.

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

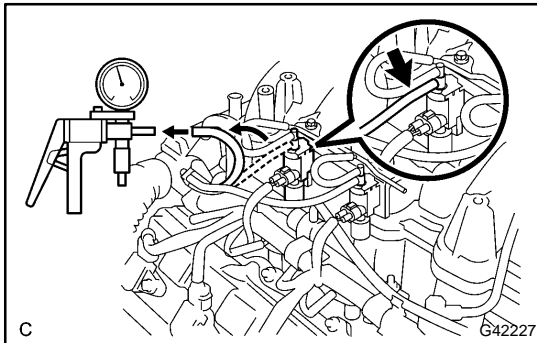
- (f) Connect the 2 vacuum hoses to the VSV.

**NOTICE:**

**Be sure to connect the vacuum hoses correctly.**

- (g) Connect the connector to the VSV.

- (h) Perform procedures (a) to (g) for the other VSV.

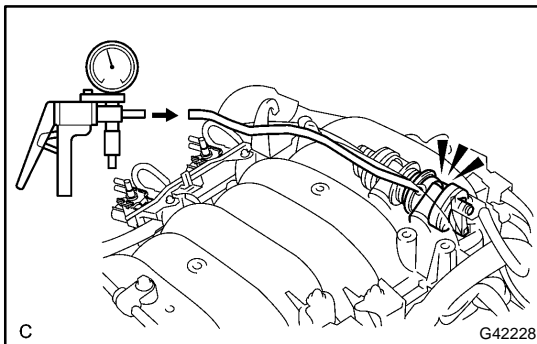


**3. INSPECT NO.2 AIR SWITCHING VALVE**

- (a) Disconnect the vacuum hose from the VSV for the air injection system.

- (b) Apply vacuum (30 kPa (306 gf/cm<sup>2</sup>, 4.35 psi)) to the vacuum hose, and check that the vacuum does not decrease.

If operation is not as specified, replace the No.2 air switching valve.

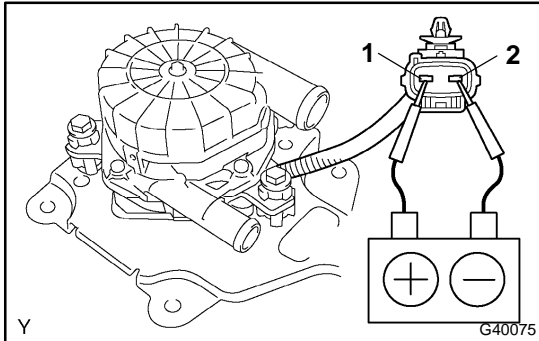


- (c) Release the vacuum, and check that an operation sound is emitted from the No.2 air switching valve.

If operation is not as specified, replace the No.2 air switching valve.

- (d) Perform procedures (a) to (c) for the other No.2 air switching valve.

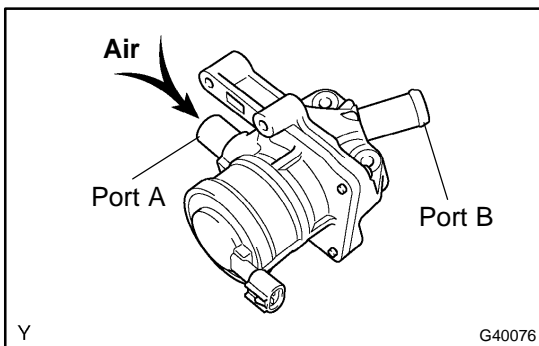
## INSPECTION



### 1. AIR PUMP ASSY

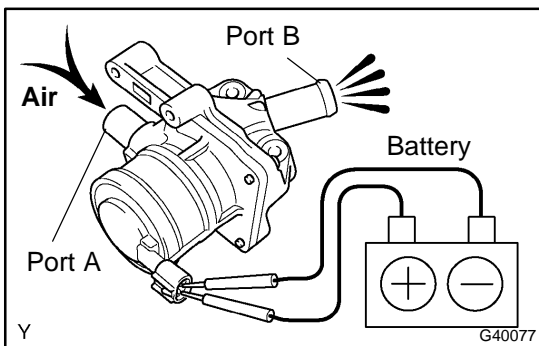
- (a) Connect the positive (+) lead from the battery to terminal 1 and the negative (-) lead to terminal 2, and check that air flows.

If operation is not as specified, replace the air pump.



### 2. AIR SWITCHING VALVE

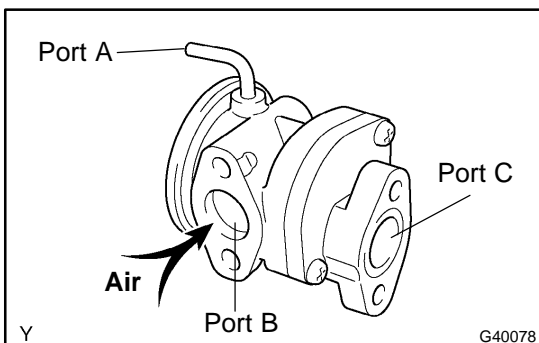
- (a) Blow air into port A and check that air is not discharged from port B.



- (b) Apply positive battery between the terminals.

- (c) Blow air into port A and check that air is discharged from port B.

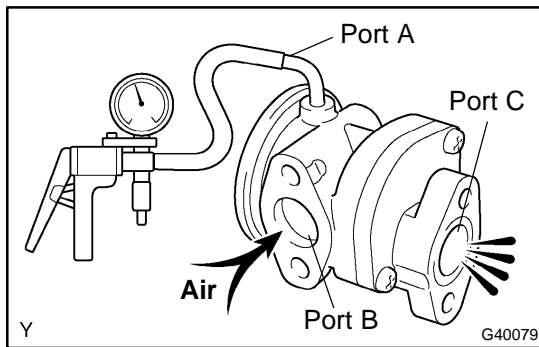
If operation is not as specified, replace the air switching valve.



### 3. AIR SWITCHING VALVE NO.2

- (a) Blow air into port B and check that air is not discharged from port C.





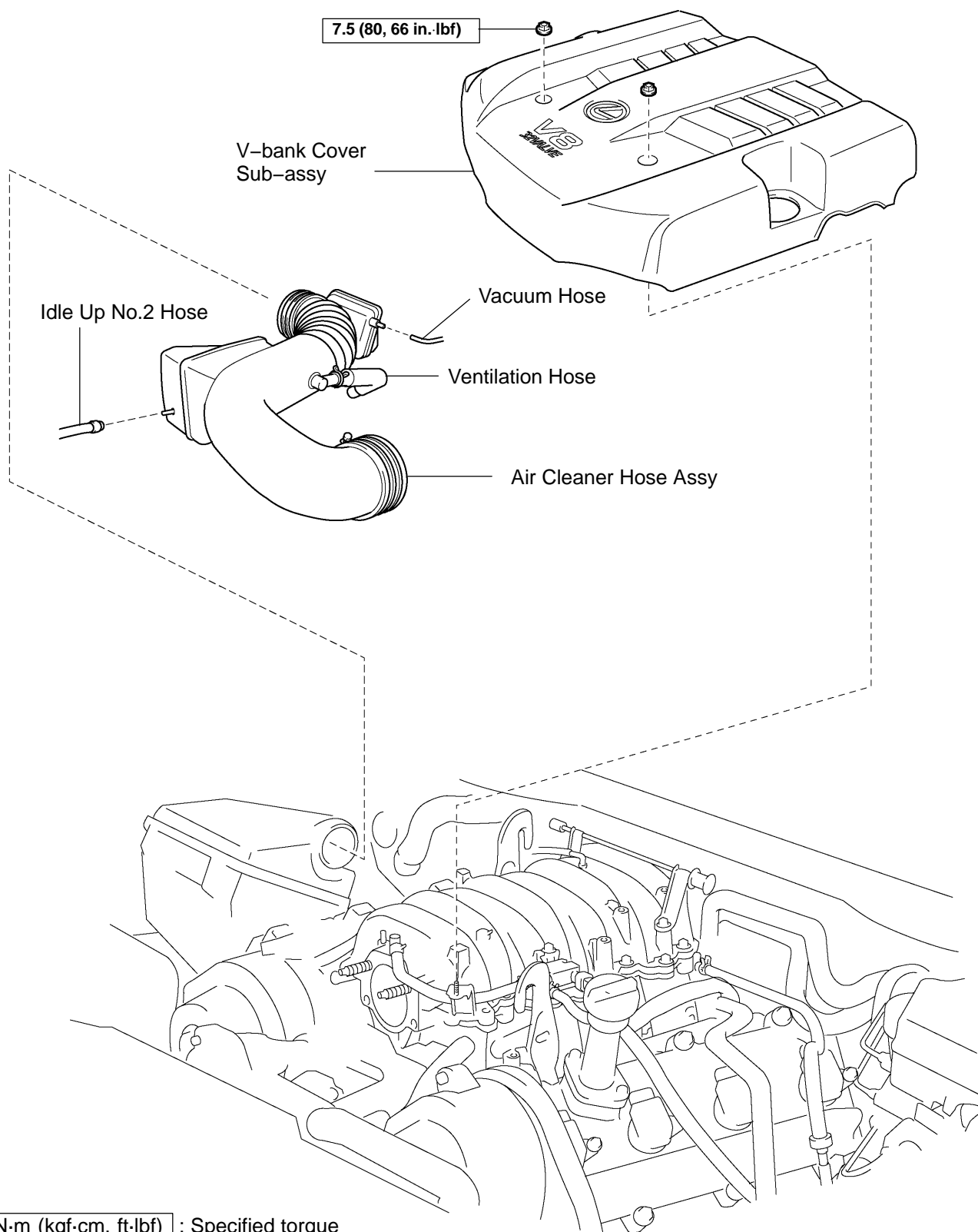
- (b) Apply vacuum (30 kPa (306 gf/cm<sup>2</sup>, 4.35 psi)) to port A, blow air into port B and check that air is discharged from port C.

If operation is not as specified, replace the No.2 air switching valve.

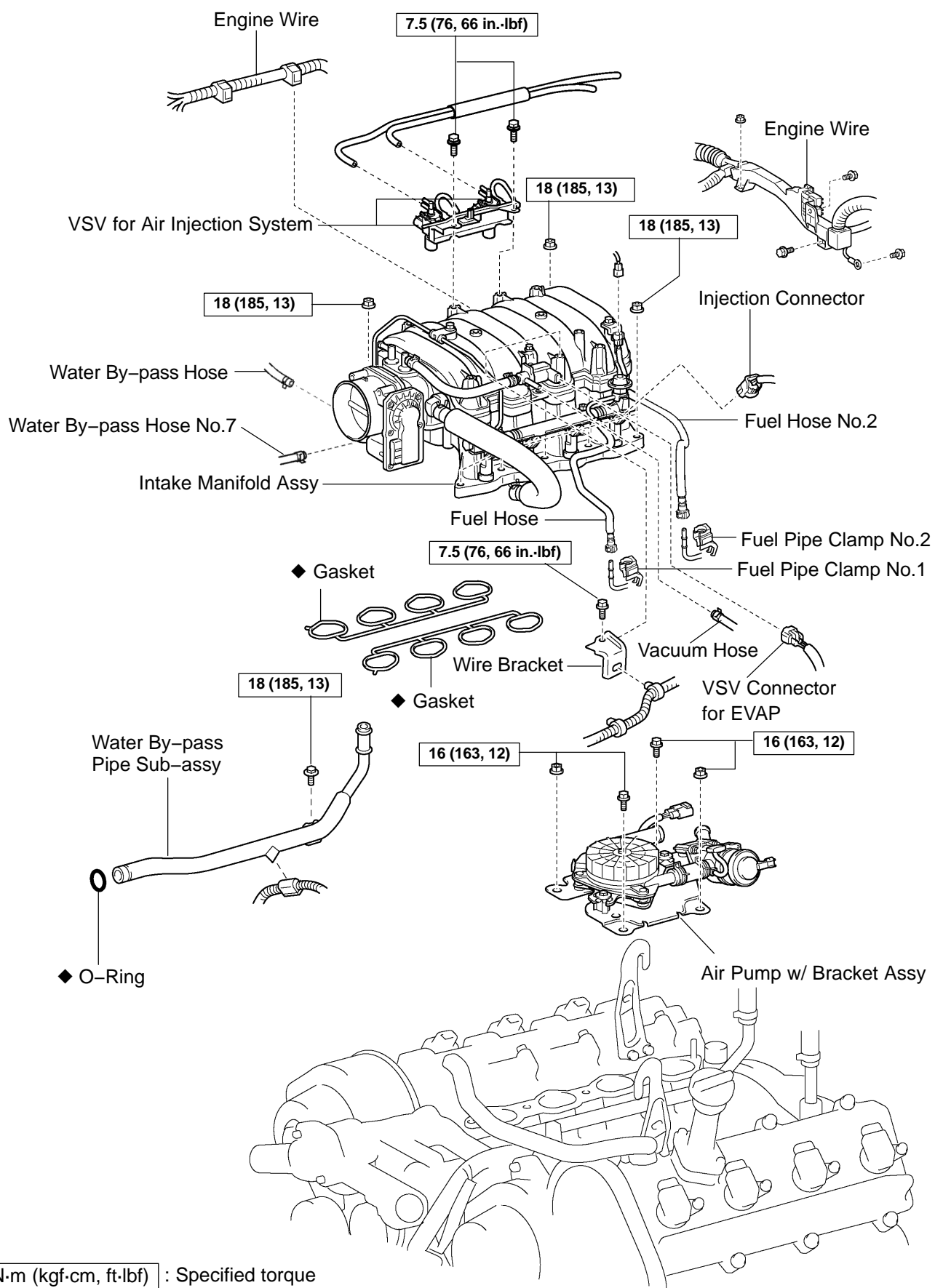
# AIR PUMP ASSY (2UZ-FE)(From November, 2004)

## COMPONENTS

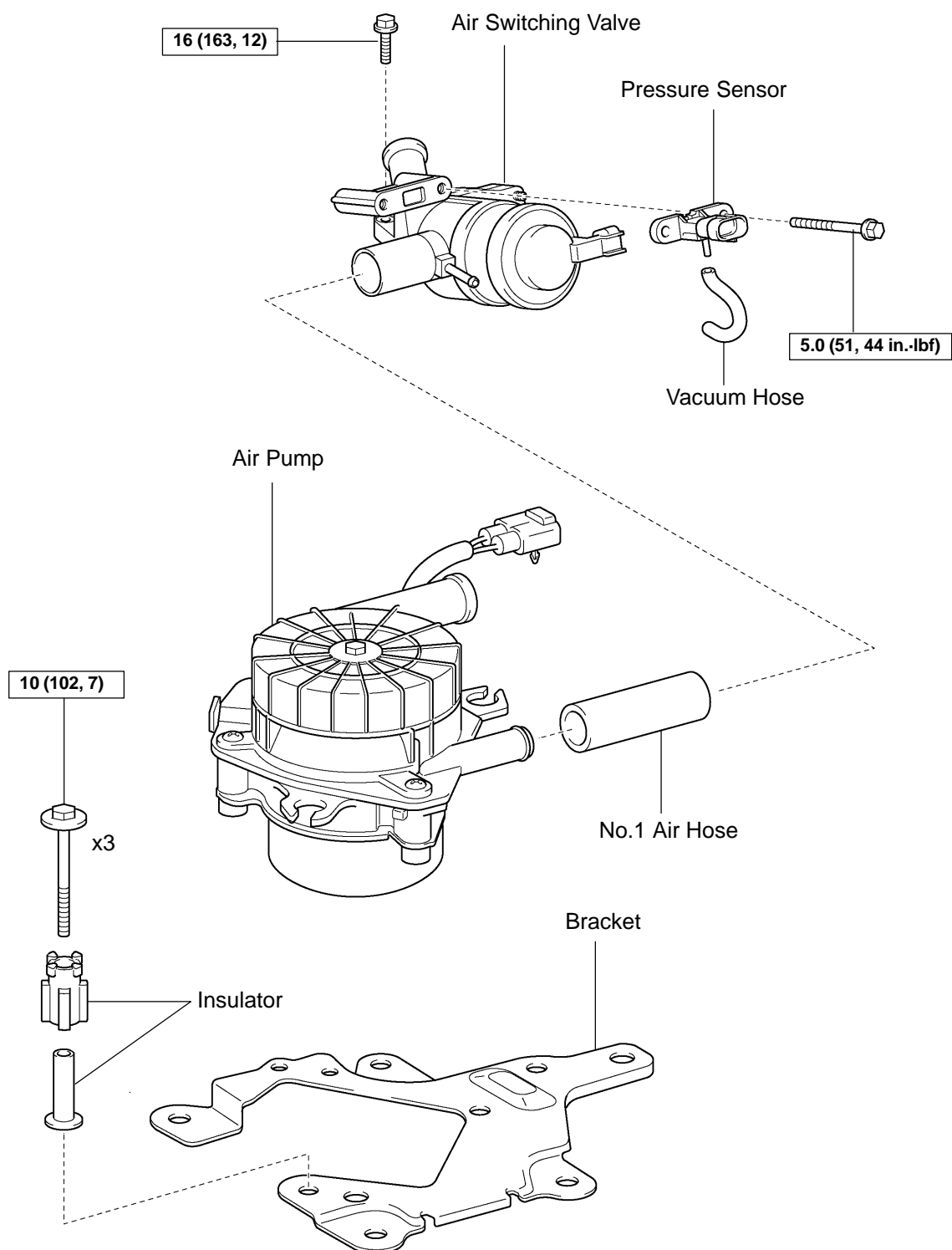
120JD-01



cmc0695



G40146

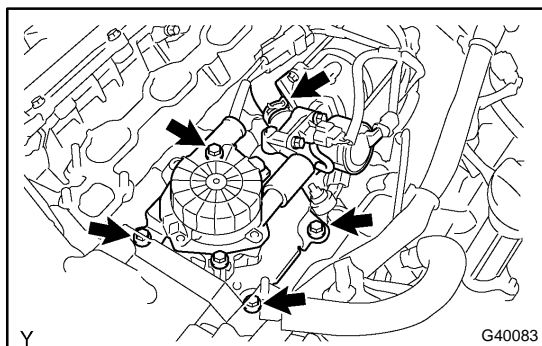


Y N·m (kgf·cm, ft·lbf) : Specified torque

G40082

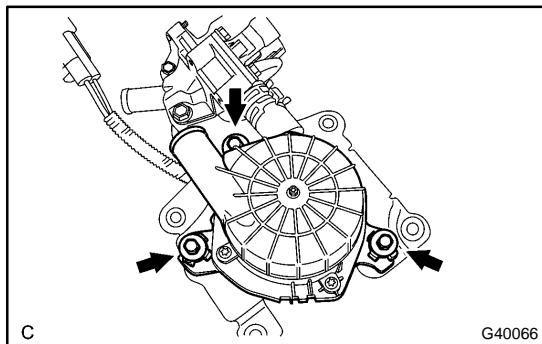
## REPLACEMENT

1. PREVENT GASOLINE FROM SPILLING OUT (SEE PAGE 11-1)
2. DRAIN ENGINE COOLANT (SEE PAGE 16-5)
3. REMOVE V-BANK COVER SUB-ASSY (SEE PAGE 10-7)
4. REMOVE AIR CLEANER HOSE ASSY (SEE PAGE 10-7)
5. DISCONNECT FUEL HOSE (SEE PAGE 11-12)
6. DISCONNECT FUEL HOSE NO.2 (SEE PAGE 14-22)
7. DISCONNECT CONNECTORS FROM INTAKE MANIFOLD (SEE PAGE 10-10)
8. DISCONNECT HOSES FROM INTAKE MANIFOLD (SEE PAGE 10-10)
9. REMOVE INTAKE MANIFOLD ASSY (SEE PAGE 10-10)
10. REMOVE WATER BY-PASS PIPE SUB-ASSY (SEE PAGE 14-22)



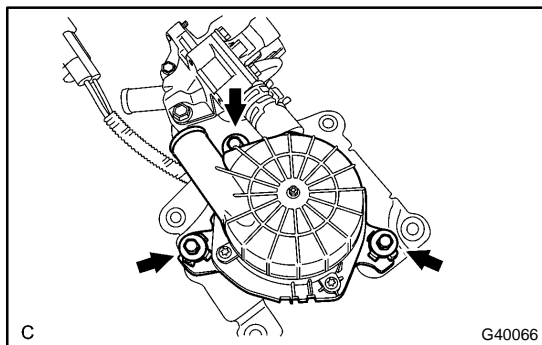
### 11. REMOVE AIR PUMP ASSY W/ BRACKET

- (a) Disconnect the air hose No.2 from the air switching valve.
- (b) Disconnect the air switching valve connector.
- (c) Disconnect the pressure sensor connector for the air injection system.
- (d) Remove the 4 bolts and air pump w/ bracket assy.



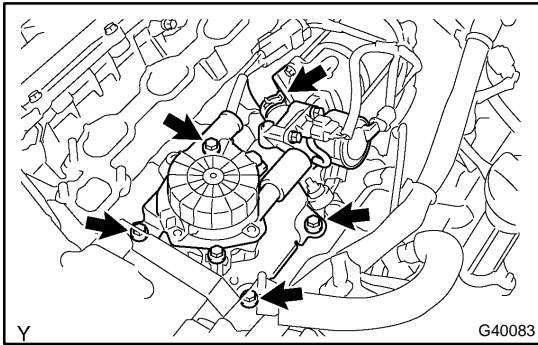
### 12. REMOVE AIR PUMP ASSY

- (a) Remove the 3 bolts and air pump assy.
- (b) Remove the 3 insulators from the air pump assy.



### 13. INSTALL AIR PUMP ASSY

- (a) Install the 3 insulators to the air pump assy.
  - (b) Install the air pump assy with the 3 bolts.
- Torque: 10 N·m (102 kgf·cm, 7 ft·lbf)**

**14. INSTALL AIR PUMP ASSY W/ BRACKET**

- (a) Install the air pump assy with the 4 bolts.  
**Torque: 16 N·m (163 kgf·cm, 12 ft·lbf)**
- (b) Connect the pressure sensor connector for the air injection system.
- (c) Connect the air switching valve connector.
- (d) Connect the air hose No.2 to the air switching valve.

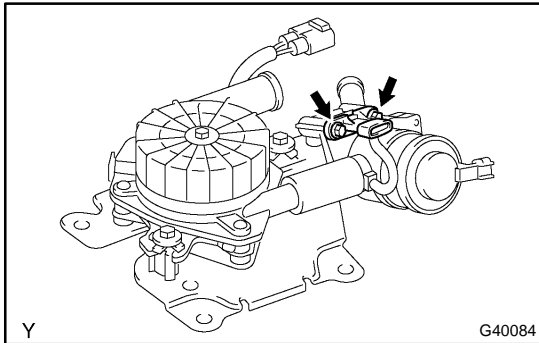
- 15. INSTALL WATER BY-PASS PIPE SUB-ASSY (SEE PAGE 14-22)
- 16. INSTALL INTAKE MANIFOLD ASSY (SEE PAGE 10-10)
- 17. CONNECT HOSES FROM INTAKE MANIFOLD (SEE PAGE 10-10)
- 18. CONNECT CONNECTORS FROM INTAKE MANIFOLD (SEE PAGE 10-10)
- 19. INSTALL FUEL HOSE NO.2 (SEE PAGE 14-22)
- 20. INSTALL FUEL HOSE (SEE PAGE 11-12)
- 21. INSTALL AIR CLEANER HOSE ASSY (SEE PAGE 10-7)
- 22. INSTALL V-BANK COVER SUB-ASSY (SEE PAGE 10-7)
- 23. ADD ENGINE COOLANT (SEE PAGE 16-5)
- 24. CHECK FOR ENGINE COOLANT LEAKS (SEE PAGE 16-1)
- 25. CHECK FOR FUEL LEAKS (SEE PAGE 11-6)

# AIR SWITCHING VALVE (2UZ-FE)(From November, 2004)

## REPLACEMENT

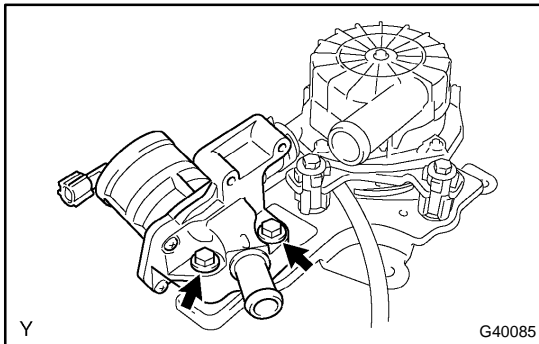
120JF-01

1. PREVENT GASOLINE FROM SPILLING OUT (SEE PAGE 11-1)
2. DRAIN ENGINE COOLANT (SEE PAGE 16-5)
3. REMOVE V-BANK COVER SUB-ASSY (SEE PAGE 10-7)
4. REMOVE AIR CLEANER HOSE ASSY (SEE PAGE 10-7)
5. DISCONNECT FUEL HOSE (SEE PAGE 11-12)
6. DISCONNECT FUEL HOSE NO.2 (SEE PAGE 14-22)
7. DISCONNECT CONNECTORS FROM INTAKE MANIFOLD (SEE PAGE 10-10)
8. DISCONNECT HOSES FROM INTAKE MANIFOLD (SEE PAGE 10-10)
9. REMOVE INTAKE MANIFOLD ASSY (SEE PAGE 10-10)
10. REMOVE WATER BY-PASS PIPE SUB-ASSY (SEE PAGE 14-22)
11. REMOVE AIR PUMP ASSY W/ BRACKET (SEE PAGE 12-21)



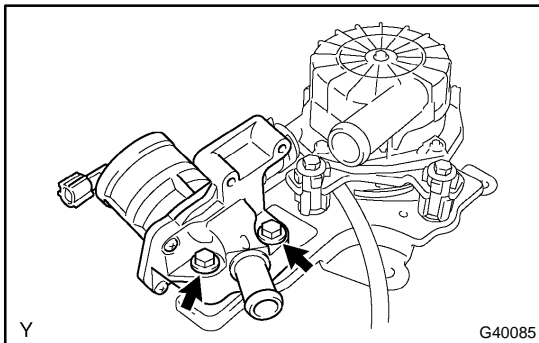
### 12. REMOVE PRESSURE SENSOR

- (a) Remove the vacuum hose from the pressure sensor and air switching valve.
- (b) Remove the 2 bolts and pressure sensor from the air switching valve.



### 13. REMOVE AIR SWITCHING VALVE

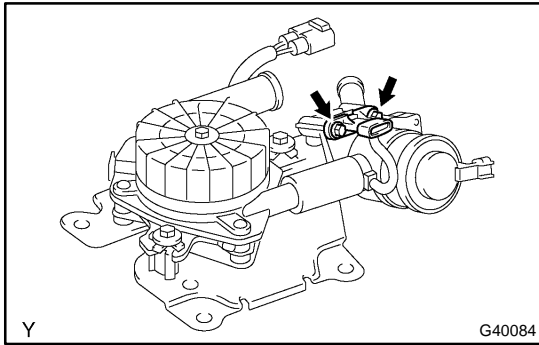
- (a) Remove the 2 bolts and air switching valve from the air pump bracket.
- (b) Remove the No.1 air hose from the air switching valve and air pump.



### 14. INSTALL AIR SWITCHING VALVE

- (a) Install the No.1 air hose to the air switching valve and air pump.
- (b) Install the air switching valve with the 2 bolts to the air pump bracket.

**Torque: 16 N·m (163 kgf·cm, 12 ft·lbf)**

**15. INSTALL PRESSURE SENSOR**

- (a) Install the pressure sensor with the 2 bolts to the air switching valve.

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

- (b) Install the vacuum hose to the pressure sensor and air switching valve.

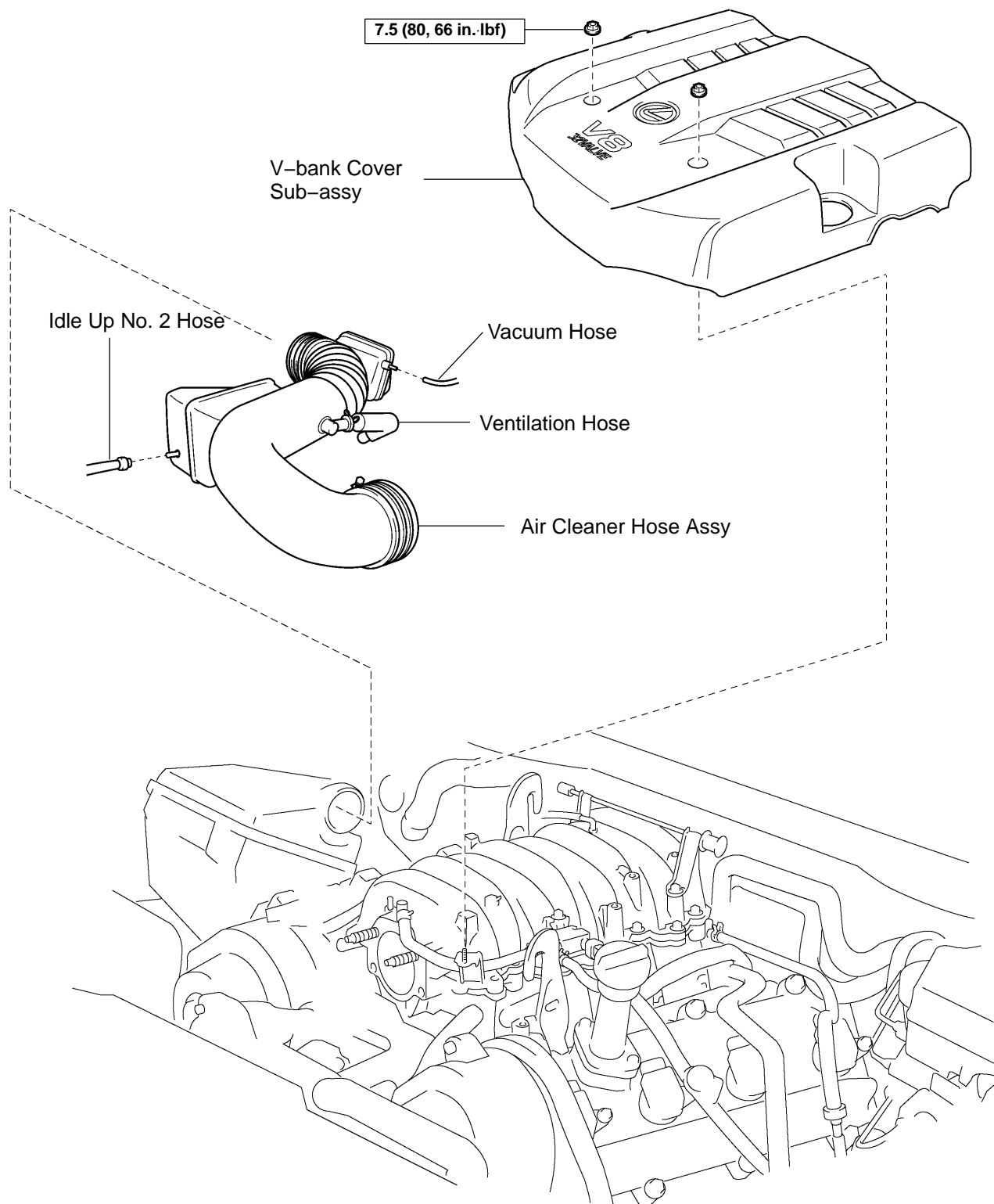
- 16. INSTALL AIR PUMP ASSY W/ BRACKET (SEE PAGE 12-21)
- 17. INSTALL WATER BY-PASS PIPE SUB-ASSY (SEE PAGE 14-22)
- 18. INSTALL INTAKE MANIFOLD ASSY (SEE PAGE 10-10)
- 19. CONNECT HOSES FROM INTAKE MANIFOLD (SEE PAGE 10-10)
- 20. CONNECT CONNECTORS FROM INTAKE MANIFOLD (SEE PAGE 10-10)
- 21. INSTALL FUEL HOSE NO.2 (SEE PAGE 14-22)
- 22. INSTALL FUEL HOSE (SEE PAGE 11-12)
- 23. INSTALL AIR CLEANER HOSE ASSY (SEE PAGE 10-7)
- 24. INSTALL V-BANK COVER SUB-ASSY (SEE PAGE 10-7)
- 25. ADD ENGINE COOLANT (SEE PAGE 16-5)
- 26. CHECK FOR ENGINE COOLANT LEAKS (SEE PAGE 16-1)
- 27. CHECK FOR FUEL LEAKS (SEE PAGE 11-6)



# AIR SWITCHING VALVE NO.2 (2UZ-FE)(From November, 2004)

## COMPONENTS

120JG-01



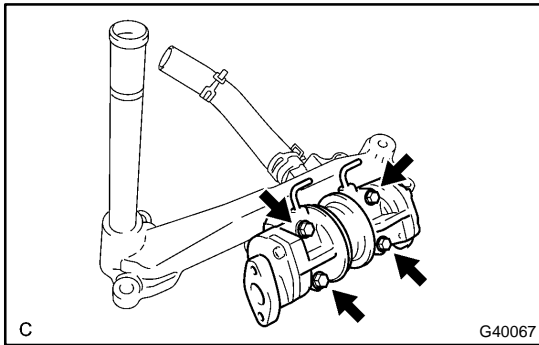
γ N·m (kgf·cm, ft·lbf) : Specified torque

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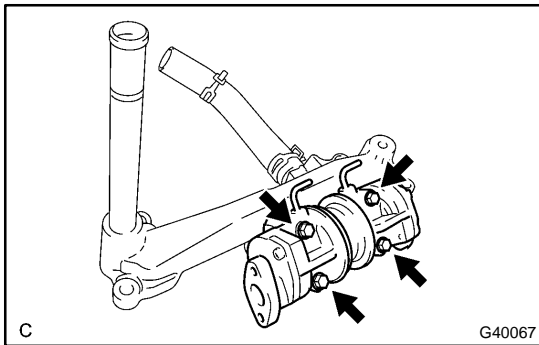


## REPLACEMENT

1. PREVENT GASOLINE FROM SPILLING OUT (SEE PAGE 11-1)
2. DRAIN ENGINE COOLANT (SEE PAGE 16-5)
3. REMOVE V-BANK COVER SUB-ASSY (SEE PAGE 10-7)
4. REMOVE AIR CLEANER HOSE ASSY (SEE PAGE 10-7)
5. DISCONNECT FUEL HOSE (SEE PAGE 11-12)
6. DISCONNECT FUEL HOSE NO.2 (SEE PAGE 14-22)
7. DISCONNECT CONNECTORS FROM INTAKE MANIFOLD (SEE PAGE 10-10)
8. DISCONNECT HOSES FROM INTAKE MANIFOLD (SEE PAGE 10-10)
9. REMOVE INTAKE MANIFOLD ASSY (SEE PAGE 10-10)
10. REMOVE AIR TUBE NO.2
  - (a) Remove the 4 nuts and 2 gaskets, and disconnect the air tube No.2.
11. REMOVE AIR TUBE NO.3
  - (a) Remove the 4 nuts and 2 gaskets, and disconnect the air tube No.3.
12. REMOVE WATER BY-PASS JOINT RR (SEE PAGE 14-22)



13. REMOVE AIR SWITCHING VALVE NO.2
  - (a) Remove the 2 vacuum hoses from the No.2 air switching valves.
  - (b) Remove the 4 bolts, 2 gaskets and the 2 No.2 air switching valves from the water by-pass joint rear.



14. INSTALL AIR SWITCHING VALVE NO.2
  - (a) Install 2 new gaskets and the 2 No.2 air switching valves with the 4 bolts to the water by-pass joint rear.  
**Torque: 10 N·m (102 kgf·cm, 7 ft·lbf)**
  - (b) Connect the 2 vacuum hoses to the No.2 air switching valves.

15. INSTALL WATER BY-PASS JOINT RR (SEE PAGE 14-22)
16. INSTALL AIR TUBE NO.3
  - (a) Install the 4 nuts and 2 new gaskets, and connect the air tube No.3.  
**Torque: 10 N·m (102 kgf·cm, 7 ft·lbf)**
17. INSTALL AIR TUBE NO.2
  - (a) Install the 4 nuts and 2 new gaskets, and connect the air tube No.2.  
**Torque: 10 N·m (102 kgf·cm, 7 ft·lbf)**
18. INSTALL INTAKE MANIFOLD ASSY (SEE PAGE 10-10)
19. CONNECT HOSES FROM INTAKE MANIFOLD (SEE PAGE 10-10)
20. CONNECT CONNECTORS FROM INTAKE MANIFOLD (SEE PAGE 10-10)

21. INSTALL FUEL HOSE NO.2 (SEE PAGE 14-22)
22. INSTALL FUEL HOSE (SEE PAGE 11-12)
23. INSTALL AIR CLEANER HOSE ASSY (SEE PAGE 10-7)
24. INSTALL V-BANK COVER SUB-ASSY (SEE PAGE 10-7)
25. ADD ENGINE COOLANT (SEE PAGE 16-5)
26. CHECK FOR ENGINE COOLANT LEAKS (SEE PAGE 16-1)
27. CHECK FOR FUEL LEAKS (SEE PAGE 11-6)