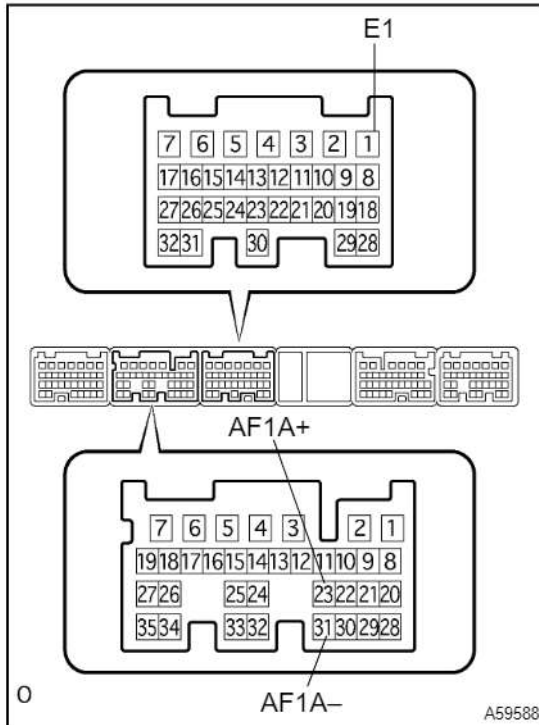


EMISSION CONTROL SYSTEM (2AZ-FE)

ON-VEHICLE INSPECTION

12032-02



1. INSPECT AIR-FUEL RATIO COMPENSATION SYSTEM

- (a) Measure voltage between terminals of the engine ECM.
Standard voltage:

Terminal	Condition	Voltage
AF1A+ $\leftrightarrow$ E1	IG switch ON	3.3 V
AF1A- $\leftrightarrow$ E1	IG switch ON	3.0 V

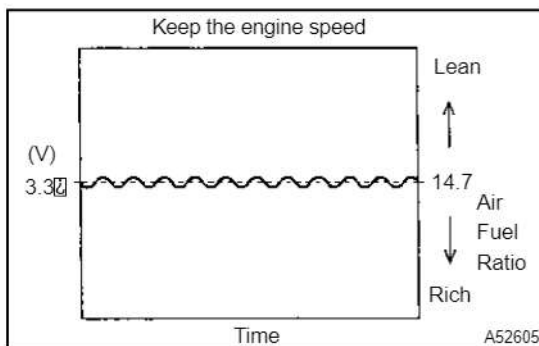
CAUTION:

Connect test leads from the back side of the connector with the ECM connected.

HINT:

Voltage between terminals of the engine ECM is kept constant regardless of the voltage of A/F sensor.

- (b) Connect the hand-held tester to the DLC3.
(c) Select "DATA MONITOR" – "A/FS B1 S1", "A/FS B2 S1" and "O2S B1 S2" to display the monitor.
(d) Warm up the A/F sensor with the engine speed at 2,500 r.p.m for approx. 2 minutes.



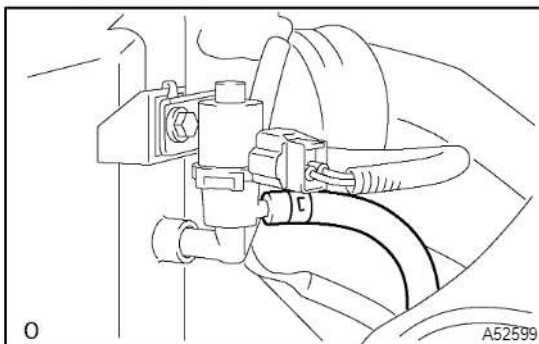
- (e) Keep the engine speed at 2,500 r.p.m and confirm that the displays of "A/FS B1 S1" and "A/FS B2 S1" are as shown in the illustration.

CAUTION:

- The illustration differs from the real display.
 - Only hand-held tester displays the waveform of A/F sensor.
- (f) Confirm that the display of "O2S B1 S2" changes between 0V to 1V with the engine speed at 2,500 r.p.m.

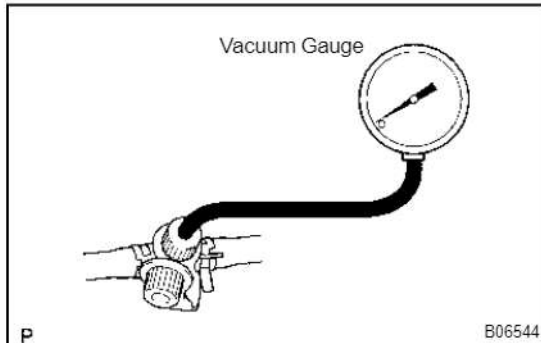
2. INSPECT FUEL CUT OFF RPM

- (a) Increase the engine speed to at least 3,500 r.p.m.
(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.



3. INSPECT EVAPORATIVE EMISSION CONTROL SYSTEM

- (a) After starting the engine, disconnect the vacuum hose shown in the illustration.
(b) Confirm vacuum occurs at the vsv port, when choosing "ACTIVE TEST" and "PURGE VSV" according to the display on hand-held tester.
(c) Finish "ACTIVE TEST", then connect the vacuum hose again.

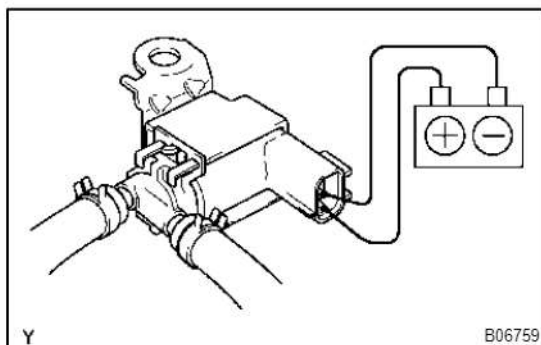


- (d) After going to "ECM DATA MONITOR" on the hand-held tester, choose "PURGE VSV" to check the operation of the purge VSV.
- (e) After warm up the engine and drive the vehicle, confirm the VSV turns on from off.

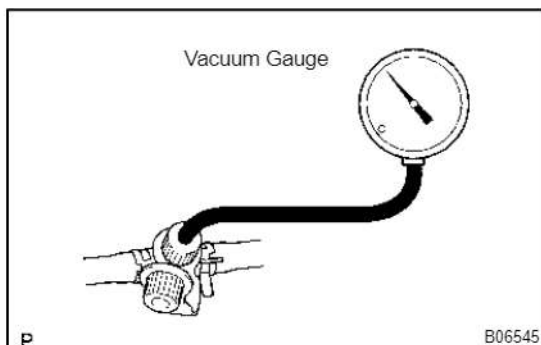
4. INSPECT EVAP SYSTEM LINE

- (a) Warm up 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) Hand-Held Tester:
Forced driving of the VSV for the EVAP.
 - (1) Connect a hand-held tester to the DLC3
 - (2) Start the engine.
 - (3) Push the hand-held tester main switch ON.
 - (4) Use the ACTIVE TEST mode on the hand-held tester to operate the VSV for the EVAP.



- (d) If you have no 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.



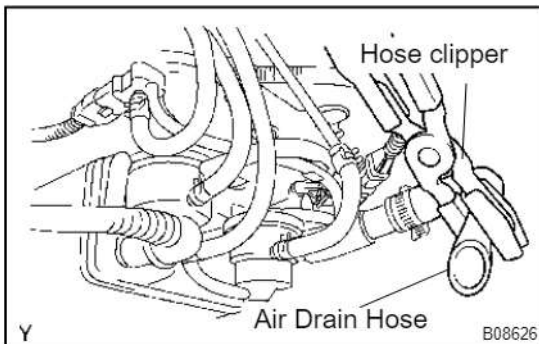
- (e) Check the vacuum at idle
Vacuum:
Maintain at 0.368 – 19.713 in.Hg (5 – 268 in.Aq) for over 5 seconds.

HINT:

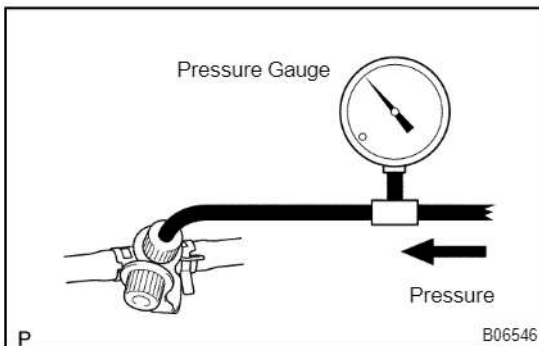
If the vacuum does not change, you can conclude that the hose connecting the VSV to the service port has come loose or is blocked, or the VSV is malfunctioning.

- (f) Hand-Held Tester:
Conclude forced driving of the VSV for the EVAP.
 - (1) Stop the engine.
 - (2) Disconnect the hand-held tester from the DLC3.

- (g) If you have no Hand-Held tester:
Conclude forced driving of the VSV for the EVAP.
 - (1) Stop the engine.
 - (2) Disconnect the positive (+) and negative (–) leads from the battery 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.



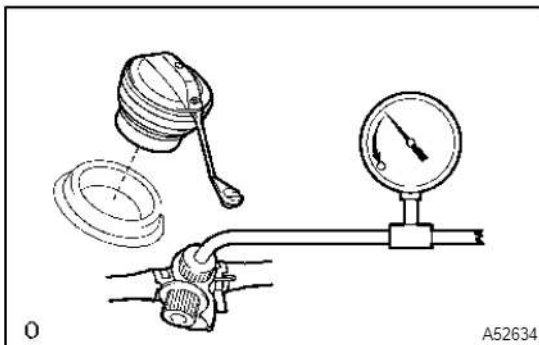
- (2) Add the pressure (13.5 – 15.5 in. Aq) from the EVAP service port.

Pressure:

2 minutes after the pressure is added, the gauge should be over 7.7 – 8.8 in.Aq.

HINT:

If you can not add pressure, you can conclude that the hose connecting the VSV – canister – fuel tank has slipped off or the VSV is open.

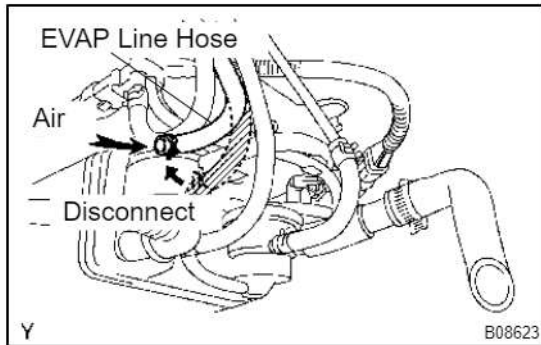


- (3) Check if the pressure decreases when the fuel tank cap is removed while adding pressure.

HINT:

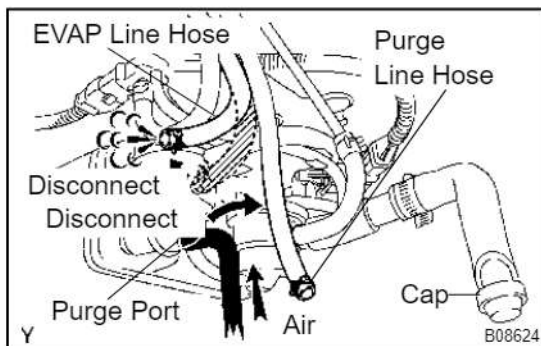
If the pressure does not decrease when the filler cap is removed, then you can conclude that the hose connecting the service port to the fuel tank is blocked, etc.

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



5. CHECK AIRTIGHTNESS IN FUEL TANK AND FILLER PIPE

- Disconnect the EVAP line hose from the charcoal canister side and then pressurize and make the internal pressure in the fuel tank 4 kPa (41 gf/cm², 0.58 psi).
 - Check that the internal pressure of the fuel tank can be hold for 1 minute.
 - Check the connected portions of each hose and pipe.
 - Check the installed parts on the fuel tank.
- If there is no abnormality, replace the fuel tank and filler pipe.
- Reconnect the EVAP line hose to the charcoal canister.



6. INSPECT FUEL CUT OFF VALVE AND FILL CHECK VALVE

- Disconnect the purge line hose and EVAP line hose from the charcoal canister.
- Plug the cap to the air drain hose.
- Pressurize 4 kPa (41 gf/cm², 0.58 psi) to the purge port and check that there is ventilation through the EVAP line hose.

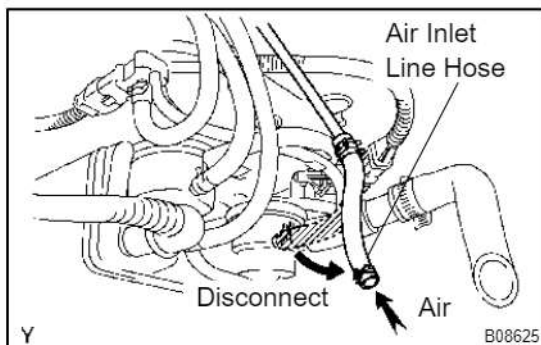
HINT:

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).

- Check if there is any stuck in the vent line hose and EVAP line hose.

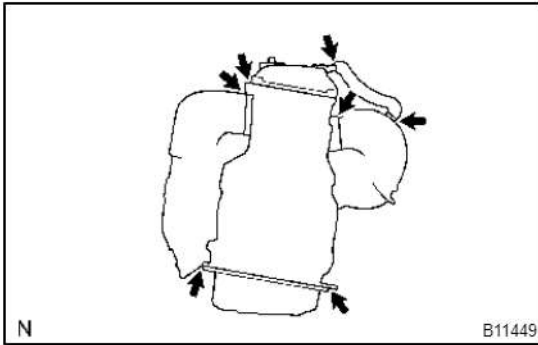
If there is no stuck in hoses, replace the fuel cut off valve and fill check valve.

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



7. CHECK AIR INLET LINE

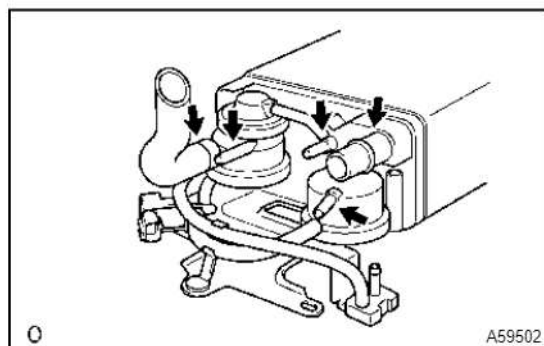
- Disconnect the air inlet line hose from the charcoal canister.
- Check that there is ventilation in the air inlet line.
- Reconnect the air inlet line hose to the charcoal canister.



8. VISUALLY INSPECT HOSES, CONNECTIONS AND GASKETS

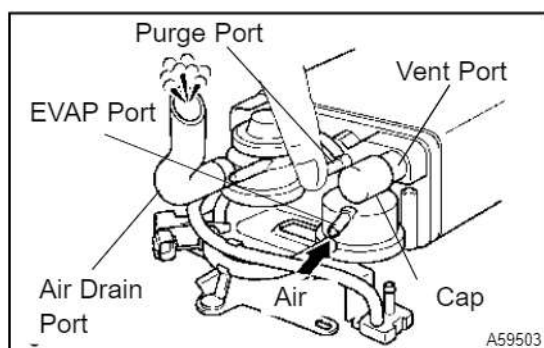
- (a) Check for cracks, leaks or damage.

INSPECTION

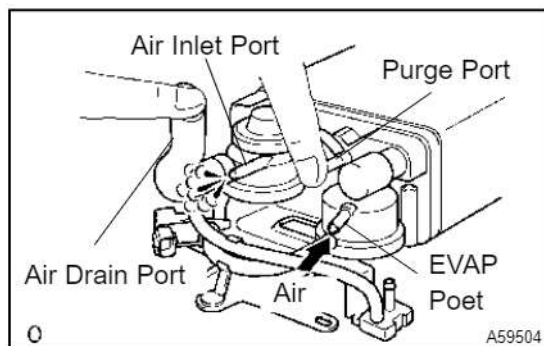


1. CHARCOAL CANISTER ASSY

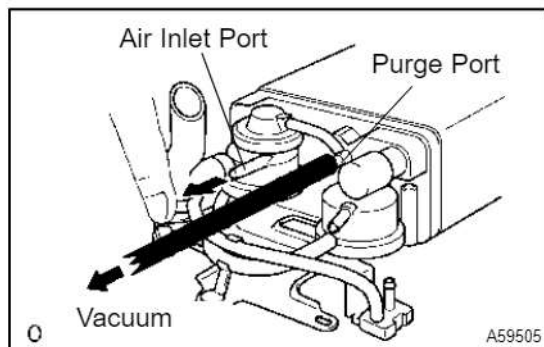
- (a) Visually check the charcoal canister for cracks or damage.



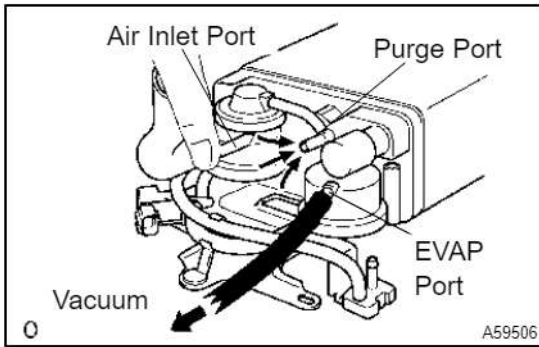
- (b) Inspect the charcoal canister operation.
- (1) Plug the vent port with the cap.
 - (2) While holding the purge port closed, blow air (1.76 kPa, 18 gf/cm², 0.26 psi) into the EVAP port and check that air flows from the air drain port.



- (3) While holding the purge port and the air drain port closed, blow air (1.76 kPa, 18 gf/cm², 0.26 psi) into the EVAP port and check that air does not flow from the air inlet port.



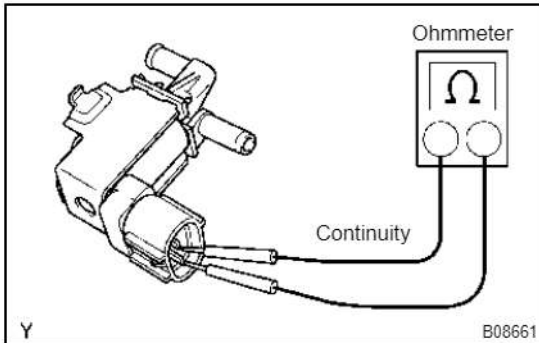
- (4) Apply vacuum (3.43 kPa, 25.7 mmHg, 1.01 in.Hg) to the purge port, check that the vacuum does not decrease when the air inlet port is closed, and check that the vacuum decreases when the air inlet port is released.



- (5) While holding 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 operation is not as specified, replace the charcoal canister.

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

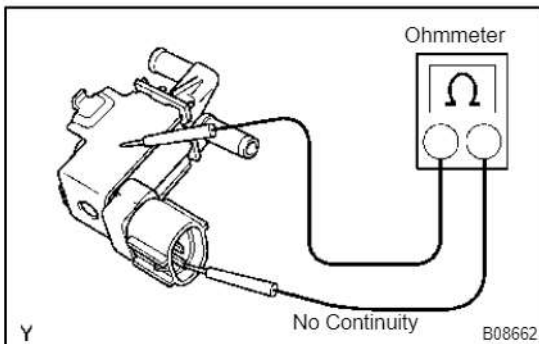


- (c) Inspect VSV for Pressure Switching Valve

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

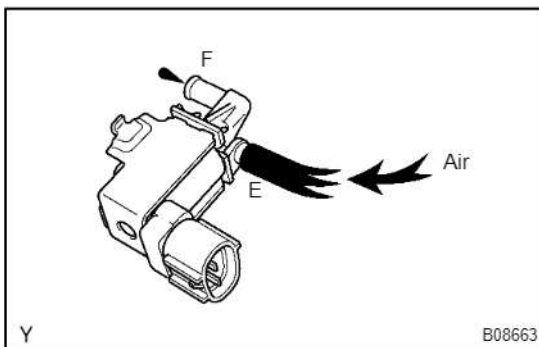
Resistance: 30 – 36 Ω at 20°C (68°F)

If there is no continuity, replace the VSV.

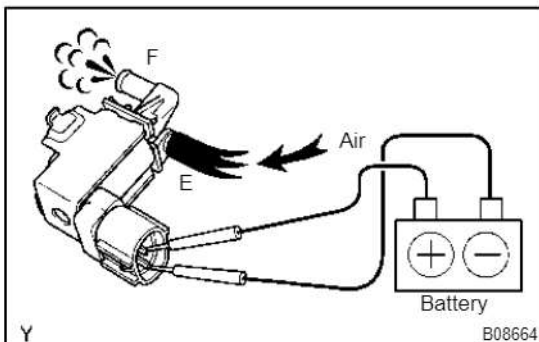


- (2) Using an ohmmeter, check that there is no continuity between each terminal and the body.

If there is continuity, replace the VSV.



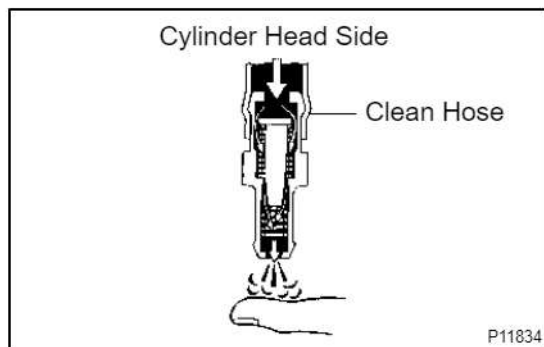
- (3) Check that air does not flow from ports E to F.



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

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

If operation is not as specified, replace the VSV.

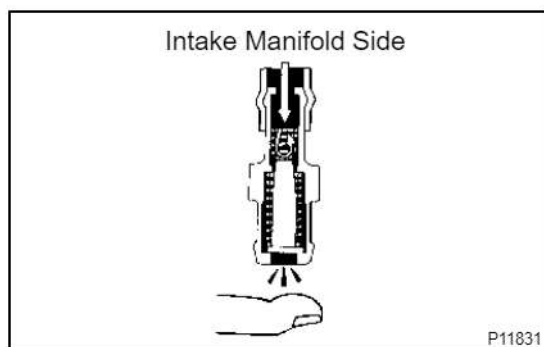


2. VENTILATION VALVE SUB-ASSY

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

CAUTION:

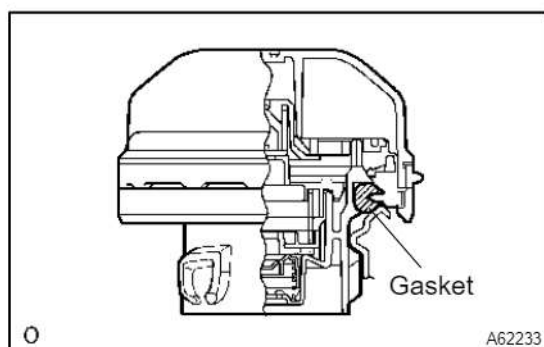
Do not suck air through the valve. Petroleum substances inside the valve air harmful.



- (2) Blow air into the intake manifold side, and check that air passes through with difficulty.

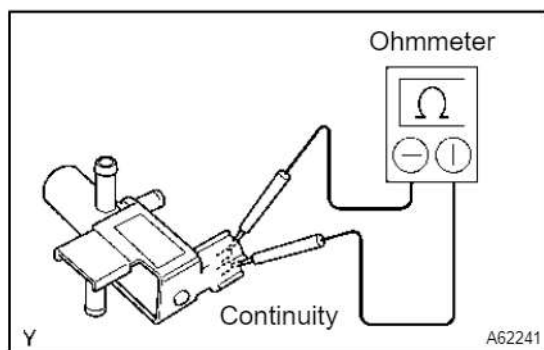
If operation is not as specified, replace the PCV valve.

- (c) Remove clean hose from the PCV valve.



3. FUEL TANK CAP ASSY

- (a) Visually check if cap and/or gasket are deformed or damaged.
- If necessary, repair or replace the cap.

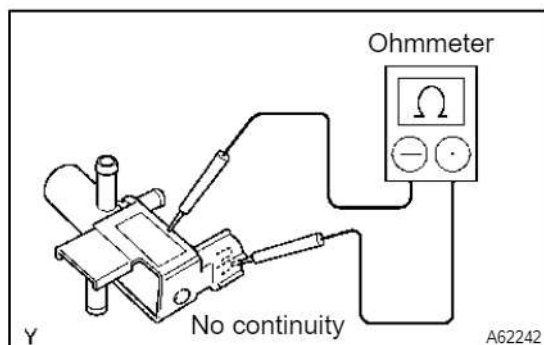


4. VACUUM SWITCHING VALVE ASSY NO.1

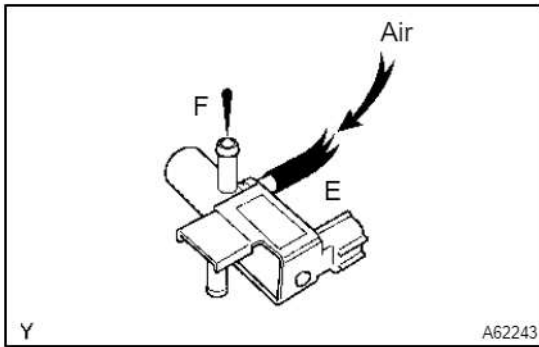
- (a) Inspect VSV for open circuit.
 - (1) Using an ohmmeter, check that there is continuity between the terminals.

Resistance: 30 – 34 Ω at 20°C (68°F)

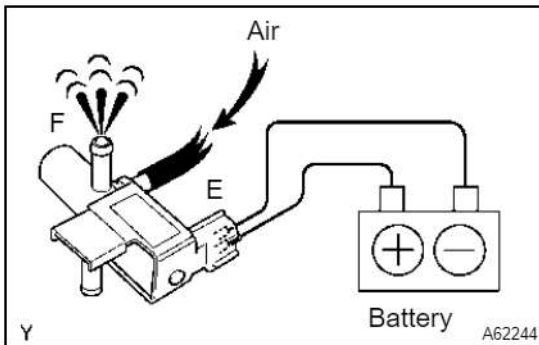
If there is no continuity, replace the VSV.



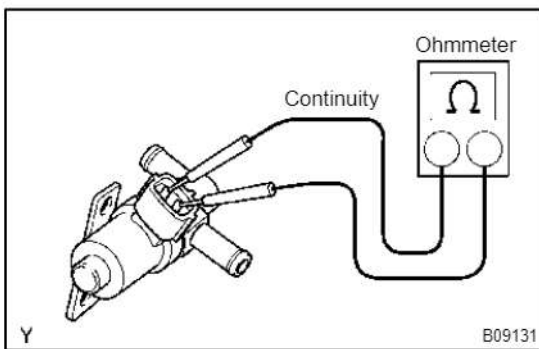
- (b) Inspect the VSV for ground.
 - (1) Using an ohmmeter, check that there is no continuity between each terminal and the body.
- If there is continuity, replace the VSV.



- (c) Inspect the VSV operation.
- (1) Check that air flows with a little difficulty from ports E to F.



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

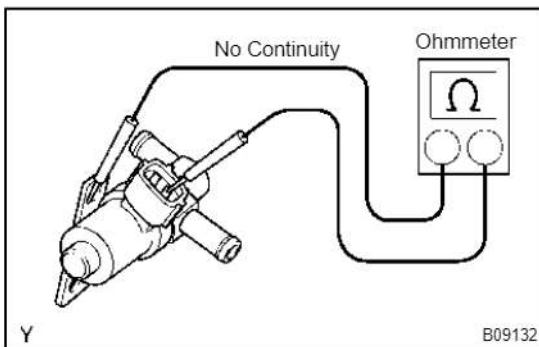


5. AIR CLEANER CAP SUB-ASSY

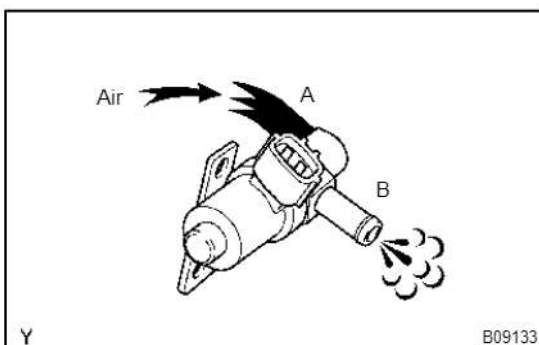
- (a) Inspect VSV for Canister Closed valve (CCV).
- (1) Using an ohmmeter, check that there is continuity between the terminals.

Resistance: 24 – 30 Ω at 20°C (68°F)

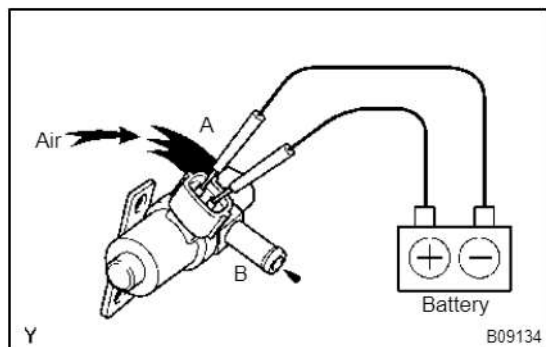
If there is no continuity, replace the VSV.



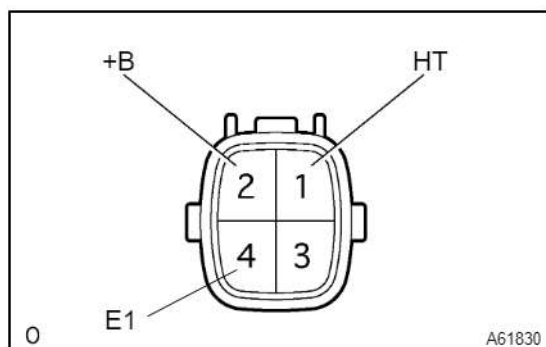
- (2) Using an ohmmeter, check that there is no continuity between each terminal and the body.
- If there is continuity, replace the VSV.



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



- (4) Apply battery positive voltage across the terminals.
 - (5) Check that air does not flow from ports A to B.
- If operation is not as specified, replace the VSV.



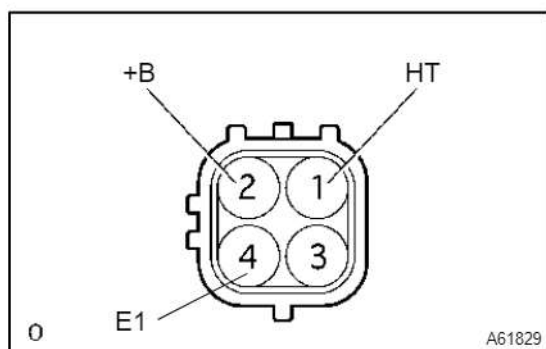
6. OXYGEN SENSOR

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

Resistance:

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

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



7. AIR FUEL RATIO SENSOR

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

Resistance:

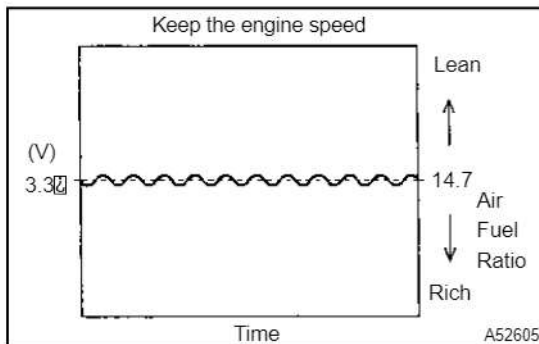
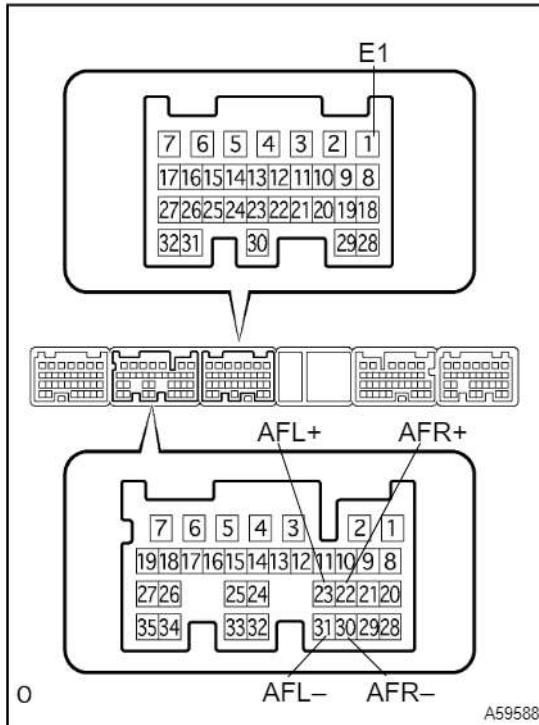
Terminal No.	Resistance
1 (HT) $\Rightarrow$ 2 (+B)	1.8 – 3.4 Ω at 20°C (68°F)
1 (HT) $\Rightarrow$ 4 (E1)	No Continuity

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

EMISSION CONTROL SYSTEM (1MZ-FE)

ON-VEHICLE INSPECTION

1202X-01



1. INSPECT AIR-FUEL RATIO COMPENSATION SYSTEM

- (a) Measure voltage between terminals of the engine ECM.
Standard voltage:

Terminal	Condition	Voltage
AFR+ ⇔ E1	IG switch ON	3.3V
AFR- ⇔ E1	IG switch ON	3.0V
AFL+ ⇔ E1	IG switch ON	3.3V
AFL- ⇔ E1	IG switch ON	3.0V

CAUTION:

Connect test leads from the back side of the connector with the ECM connected.

HINT:

Voltage between terminals of the engine ECM is kept constant regardless of the voltage of A/F sensor.

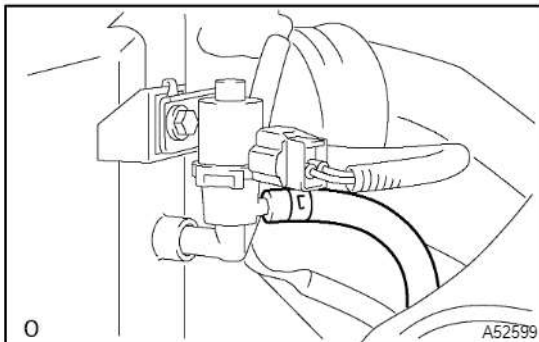
- (b) Connect the hand-held tester to the DLC3.
(c) Select "DATA MONITOR" – "A/FS B1 S1", "A/FS B2 S1" and "O2S B1 S2" to display the monitor.
(d) Warm up the A/F sensor with the engine speed at 2,500 r.p.m for approx. 2 minutes.
(e) Keep the engine speed at 2,500 r.p.m and confirm that the displays of "A/FS B1 S1" and "A/FS B2 S1" are as shown in the illustration.

CAUTION:

- The illustration differs from the real display.
 - Only hand-held tester displays the waveform of A/F sensor.
- (f) Confirm that the display of "O2S B1 S2" changes between 0V to 1V with the engine speed at 2,500 r.p.m.

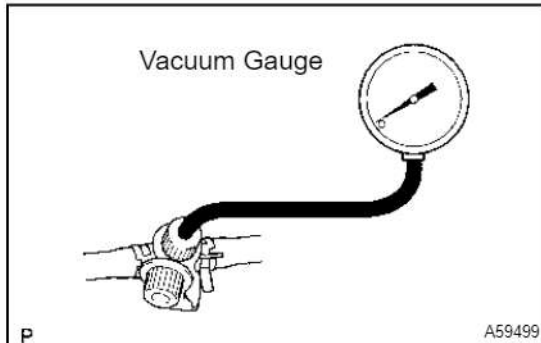
2. INSPECT FUEL CUT OFF RPM

- (a) Increase the engine speed to at least 3,500 r.p.m.
(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.



3. INSPECT EVAPORATIVE EMISSION CONTROL SYSTEM

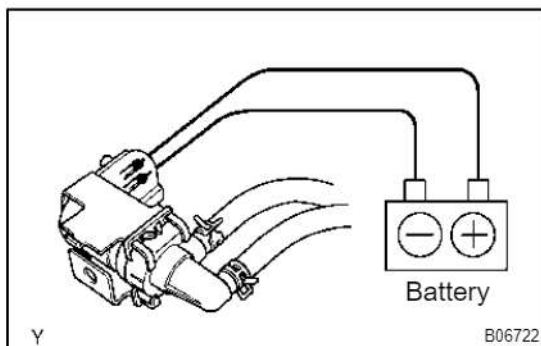
- (a) After starting the engine, disconnect the vacuum hose shown in the illustration.
(b) Confirm vacuum occurs at the vsv port, when choosing "ACTIVE TEST" and "PURGE VSV" according to the display on hand-held tester.
(c) Finish "ACTIVE TEST", then connect the vacuum hose again.



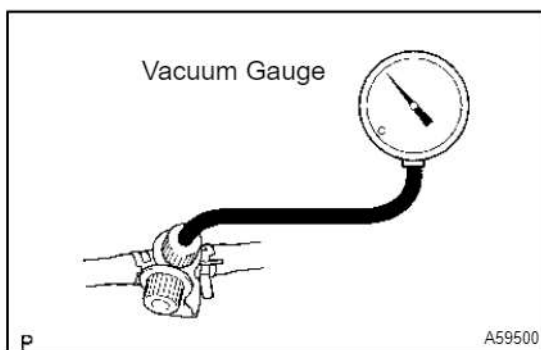
- (d) After going to "ECM DATA MONITOR" on the hand-held tester, choose "PURGE VSV" to check the operation of the purge VSV.
- (e) After warm up the engine and drive the vehicle, confirm the VSV turns on from off.

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) Hand-Held Tester:
Forced driving of the VSV for the EVAP.
 - (1) Connect a hand-held tester to the DLC3
 - (2) Start the engine.
 - (3) Push the hand-held tester main switch ON.
 - (4) Use the ACTIVE TEST mode on the hand-held tester to operate the VSV for the EVAP.



- (d) If you have no 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.



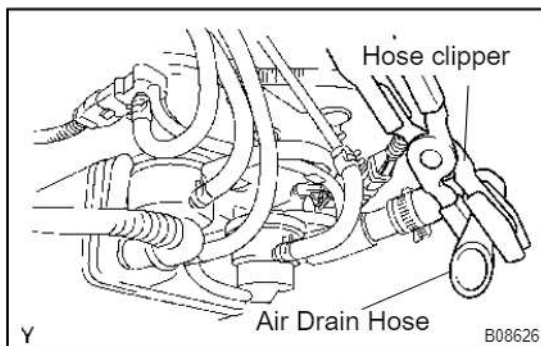
- (e) Check the vacuum at idle
Vacuum:
Maintain at 0.368 – 19.713 in.Hg (5 –268 in.Aq) for over 5 seconds.

HINT:

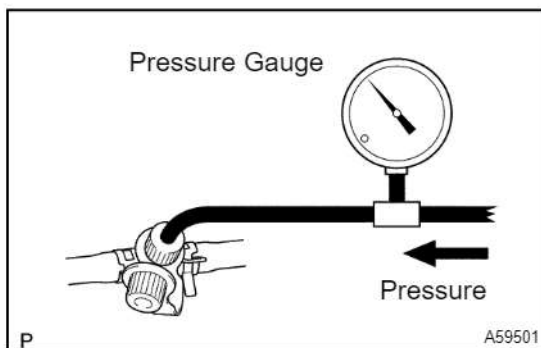
If the vacuum does not change, you can conclude that the hose connecting the VSV to the service port has come loose or is blocked, or the VSV is malfunctioning.

- (f) Hand-Held Tester:
Conclude forced driving of the VSV for the EVAP.
 - (1) Stop the engine.
 - (2) Disconnect the hand-held tester from the DLC3.

- (g) If you have no Hand-Held tester:
Conclude forced driving of the VSV for the EVAP.
 - (1) Stop the engine.
 - (2) Disconnect the positive (+) and negative (–) leads from the battery 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.



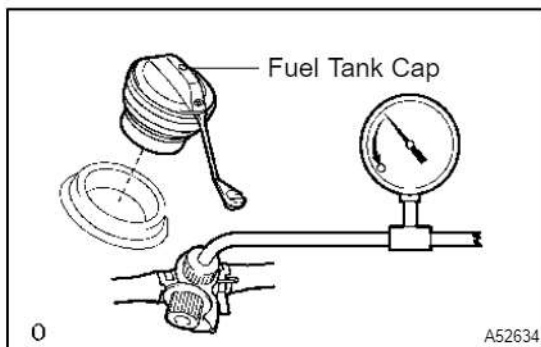
- (2) Add the pressure (13.5 – 15.5 in. Aq) from the EVAP service port.

Pressure:

2 minutes after the pressure is added, the gauge should be over 7.7 – 8.8 in.Aq.

HINT:

If you can not add pressure, you can conclude that the hose connecting the VSV – canister – fuel tank has slipped off or the VSV is open.

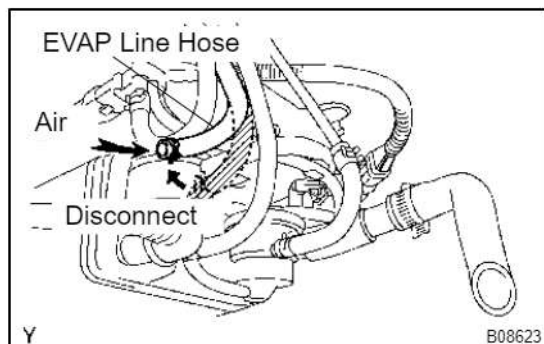


- (3) Check if the pressure decreases when the fuel tank cap is removed while adding pressure.

HINT:

If the pressure does not decrease when the filler cap is removed, then you can conclude 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.

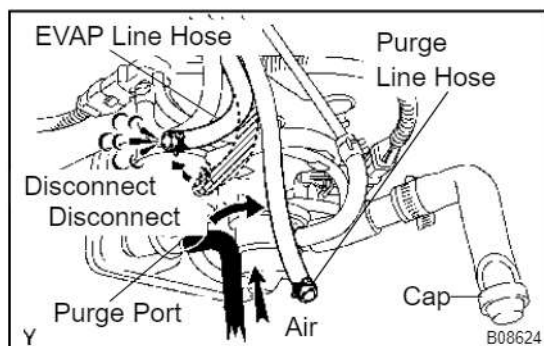


5. CHECK AIRTIGHTNESS IN FUEL TANK AND FILLER PIPE

- Disconnect the EVAP line hose from the charcoal canister side and then pressurize and make the internal pressure in the fuel tank 4 kPa (41 gf/cm², 0.58 psi).
- Check that the internal pressure of the fuel tank can be hold for 1 minute.
- Check the connected portions of each hose and pipe.
- Check the installed parts on the fuel tank.

If there is no abnormality, replace the fuel tank and filler pipe.

- Reconnect the EVAP line hose to the charcoal canister.



6. INSPECT FUEL CUT OFF VALVE AND FILL CHECK VALVE

- Disconnect the purge line hose and EVAP line hose from the charcoal canister.
- Plug the cap to the air drain hose.
- Pressurize 4 kPa (41 gf/cm², 0.58 psi) to the purge port and check that there is ventilation through the EVAP line hose.

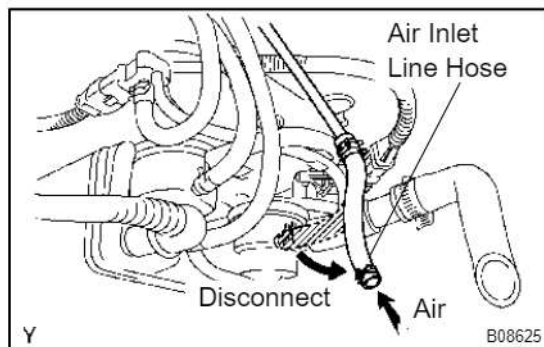
HINT:

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).

- Check if there is any stuck in the vent line hose and EVAP line hose.

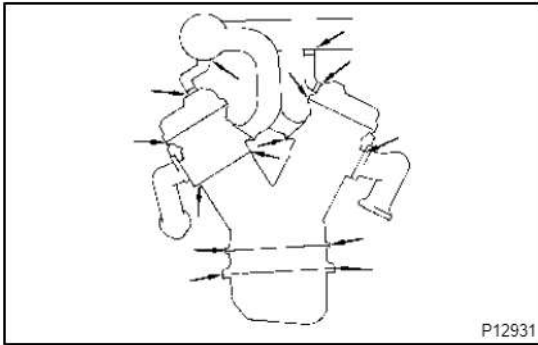
If there is no stuck in hoses, replace the fuel cut off valve and fill check valve.

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



7. CHECK AIR INLET LINE

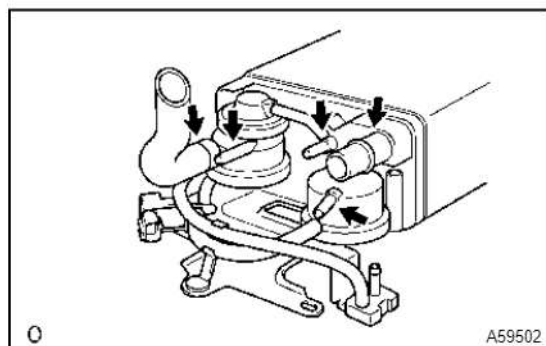
- Disconnect the air inlet line hose from the charcoal canister.
- Check that there is ventilation in the air inlet line.
- Reconnect the air inlet line hose to the charcoal canister.



8. VISUALLY INSPECT HOSES, CONNECTIONS AND GASKETS

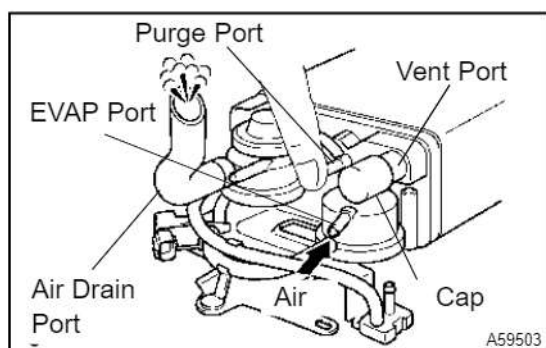
- (a) Check for cracks, leaks or damage.

INSPECTION

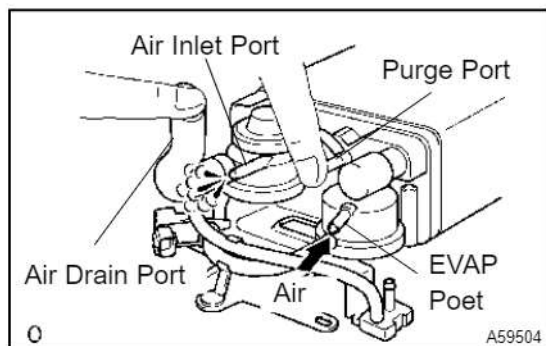


1. CHARCOAL CANISTER ASSY

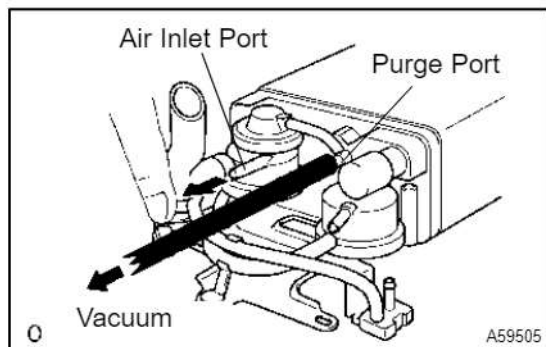
- (a) Visually check the charcoal canister for cracks or damage.



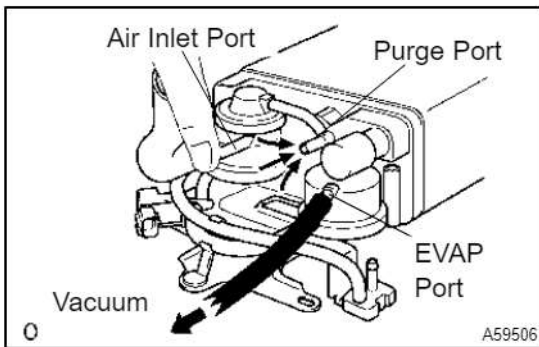
- (b) Inspect the charcoal canister operation.
- (1) Plug the vent port with the cap.
 - (2) While holding the purge port closed, blow air (1.76 kPa, 18 gf/cm², 0.26 psi) into the EVAP port and check that air flows from the air drain port.



- (3) While holding the purge port and the air drain port closed, blow air (1.76 kPa, 18 gf/cm², 0.26 psi) into the EVAP port and check that air does not flow from the air inlet port.



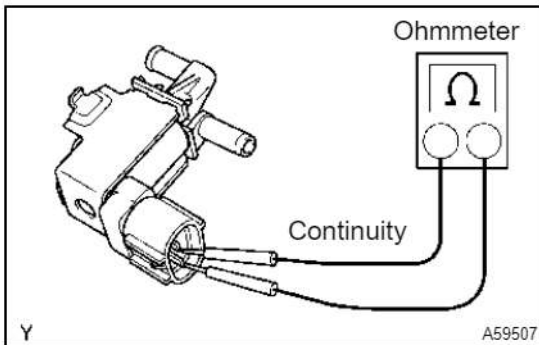
- (4) Apply vacuum (3.43 kPa, 25.7 mmHg, 1.01 in.Hg) to the purge port, check that the vacuum does not decrease when the air inlet port is closed, and check that the vacuum decreases when the air inlet port is released.



- (5) While holding 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 operation is not as specified, replace the charcoal canister.

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



- (c) Inspect VSV for pressure switching valve

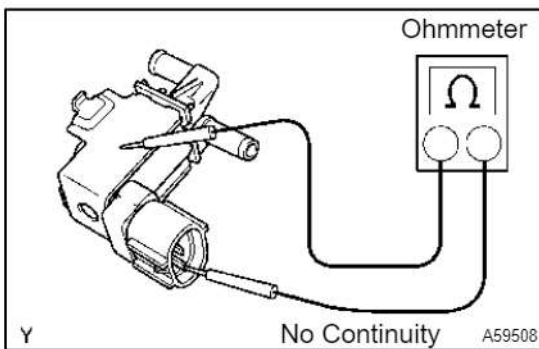
- (1) Using an ohmmeter, check that there is continuity between the terminals.

Resistance:

37 – 44 Ω at 20°C (68°F)

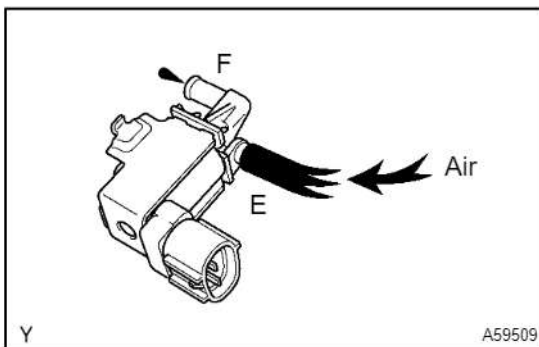
51 – 62 Ω at 120°C (248°F)

If there is no continuity, replace the VSV.

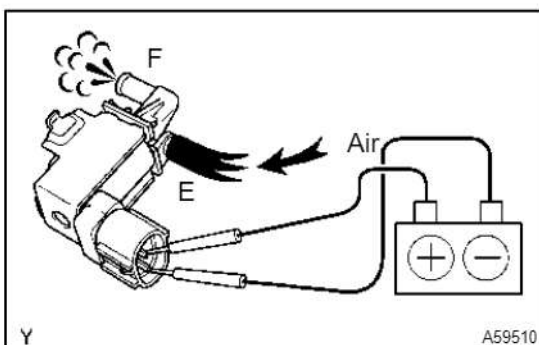


- (2) Using an ohmmeter, check that there is no continuity between each terminal and the body.

If there is continuity, replace the VSV.



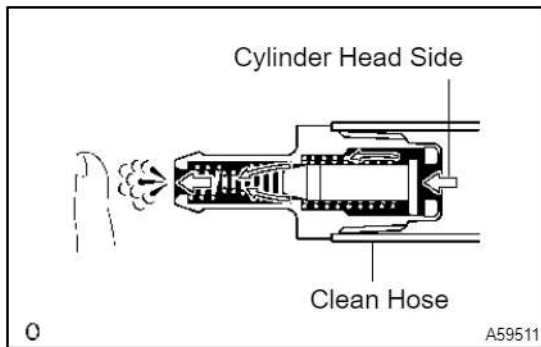
- (3) Check that air does not flow from ports E to F.



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

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

If operation is not as specified, replace the VSV.

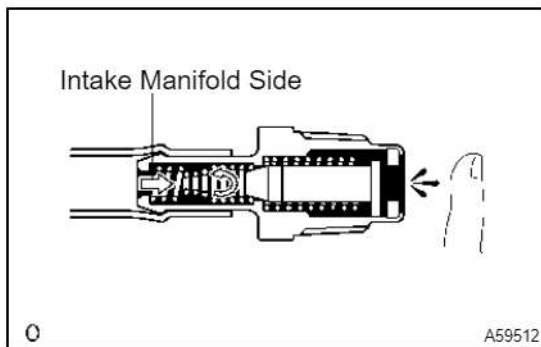


2. VENTILATION VALVE SUB-ASSY

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

CAUTION:

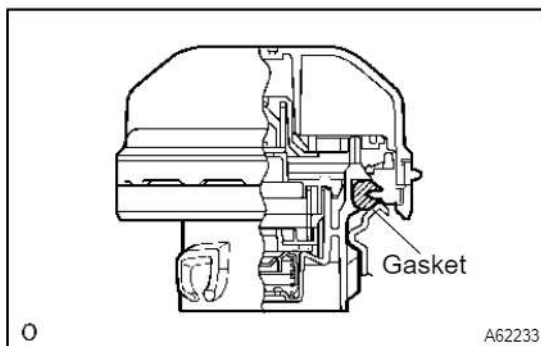
Do not suck air through the valve. Petroleum substances inside the valve air harmful.



- (2) Blow air into the intake manifold side, and check that air passes through with difficulty.

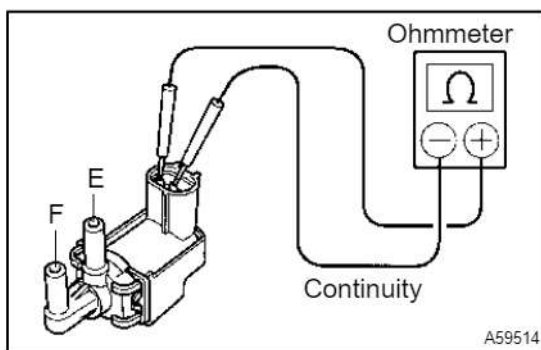
If operation is not as specified, replace the PCV valve.

- (c) Remove clean hose from the PCV valve.



3. FUEL TANK CAP ASSY

- (a) Visually check if cap and/or gasket are deformed or damaged.
- If necessary, repair or replace the cap.

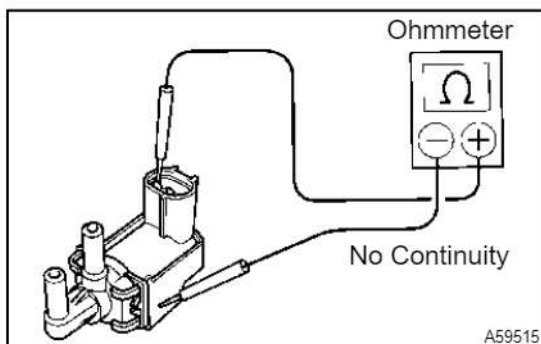


4. EMISSION CONTROL VALVE SET

- (a) Inspect VSV for EVAP.
 - (1) Using an ohmmeter, check that there is continuity between the terminals.

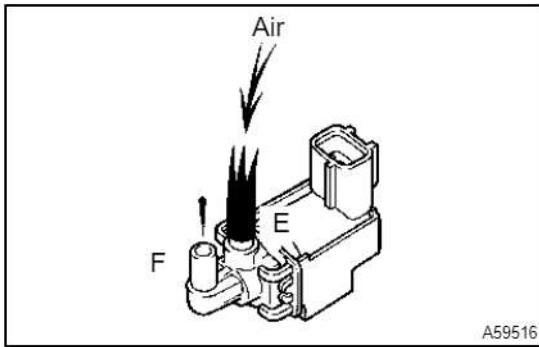
Resistance: 27 – 33 Ω at 20°C (68°F)

If there is no continuity, replace the VSV set.

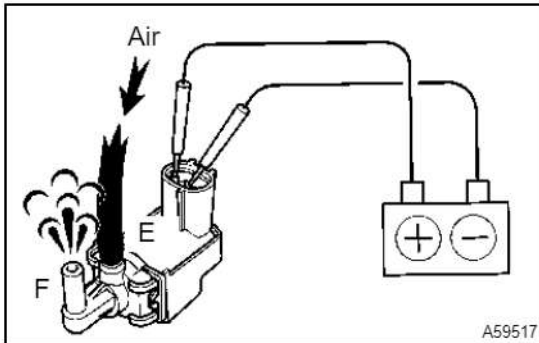


- (2) Using an ohmmeter, check that there is no continuity between each terminal and the body.

If there is continuity, replace the VSV set.



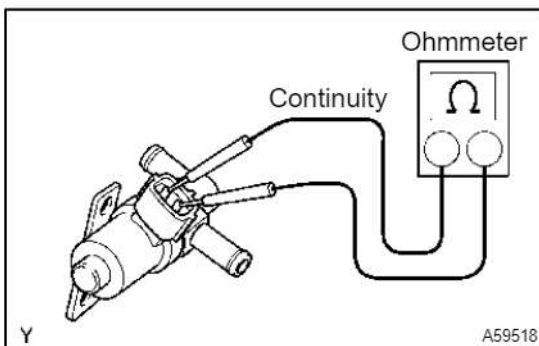
- (3) Check that air flows with difficulty from ports E to F.



- (4) Apply battery voltage across the terminals.

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

If operation is not as specified, replace the VSV set.



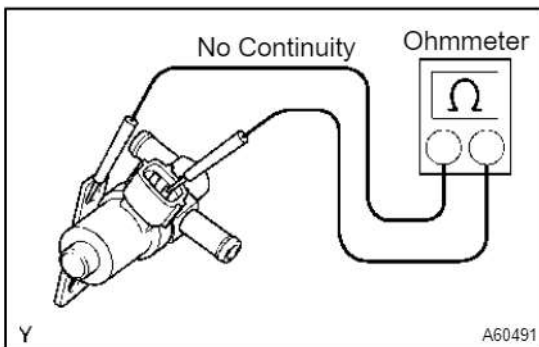
5. AIR CLEANER CAP SUB-ASSY

- (a) Inspect VSV for Canister Closed valve (CCV).

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

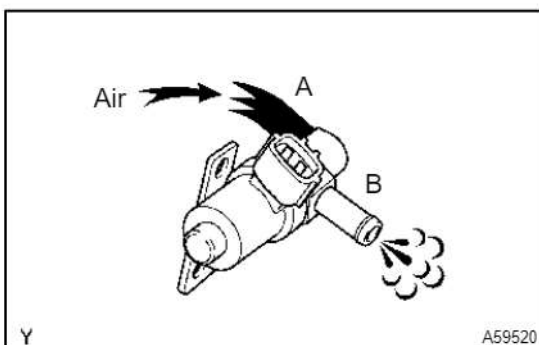
Resistance: 25 – 30 Ω at 20°C (68°F)

If there is no continuity, replace the VSV.

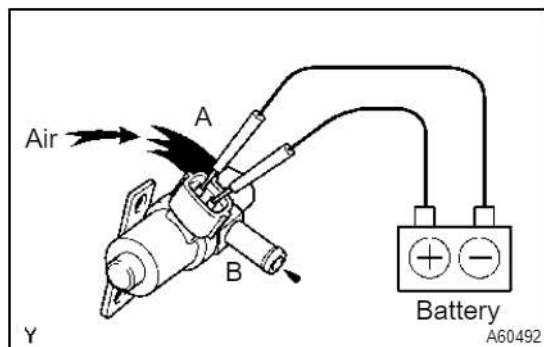


- (2) Using an ohmmeter, check that there is no continuity between each terminal and the body.

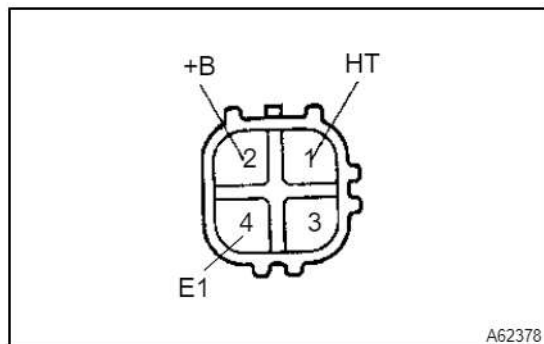
If there is continuity, replace the VSV.



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



- (4) Apply battery positive voltage across the terminals.
 - (5) Check that air does not flow from ports A to B.
- If operation is not as specified, replace the VSV.



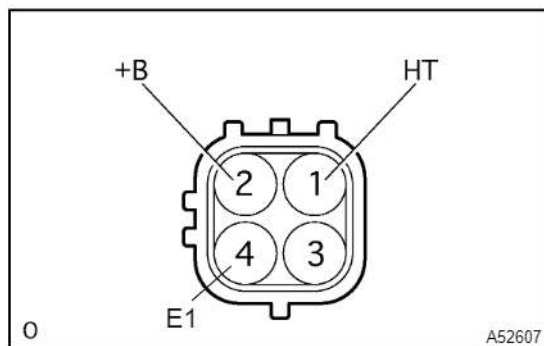
6. OXYGEN SENSOR OXYGEN NO.2 SENSOR

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

Resistance:

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

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



7. AIR FUEL RATIO SENSOR

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

Resistance:

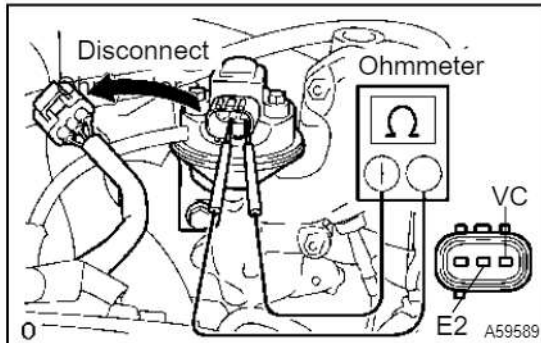
Terminal No.	Resistance
1 (HT) $\Rightarrow$ 2 (+B)	1.8 – 3.4 Ω at 20°C (68°F)
1 (HT) $\Rightarrow$ 4 (E1)	No Continuity

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

EGR SYSTEM (1MZ-FE)

ON-VEHICLE INSPECTION

12022-01



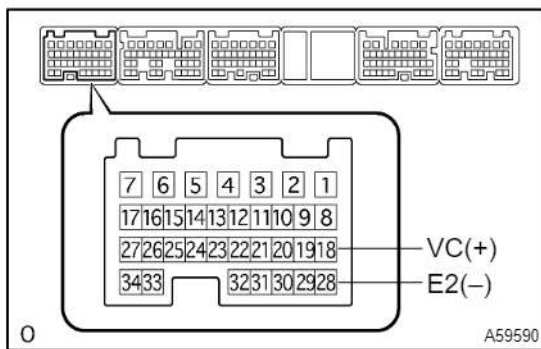
1. INSPECT EGR VALVE POSITION SENSOR

- (a) Inspect the resistance of the EGR valve position sensor.
 - (1) Disconnect the EGR valve position sensor connector.
 - (2) Using an ohmmeter, measure the resistance between the terminals VC and E2.

Resistance: 1.5 – 4.3 kΩ

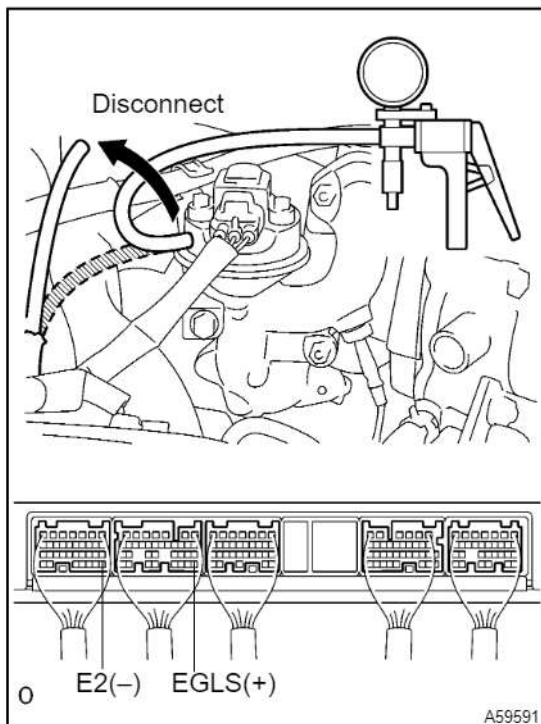
If the resistance is not as specified, replace the EGR valve position sensor.

- (3) Reconnect the EGR valve position sensor connector.



- (b) Inspect the power output voltage of the EGR valve position sensor.
 - (1) Disconnect the vacuum hose from the EGR valve.
 - (2) Turn the ignition switch ON.
 - (3) Connect a voltmeter to terminals VC and E2 of the ECM, and measure the power source voltage.

Voltage: 4.5 – 5.5V



- (4) Connect a voltmeter to terminals EGLS and E2 of the ECM, and measure the power outlet voltage under the following conditions.

- Using the MITYVAC (Hand-Held Vacuum Pump), apply a vacuum (17.3 kPa, 130mmHg, 5.1 in.Hg) to the EGR valve.

Voltage: 3.2 – 5.1 V

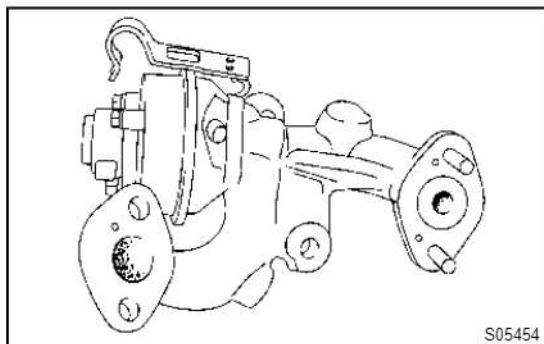
- Release the vacuum from the EGR valve.

Voltage: 0.4 – 1.6 V

If the voltage is not as specified, replace the EGR valve position sensor.

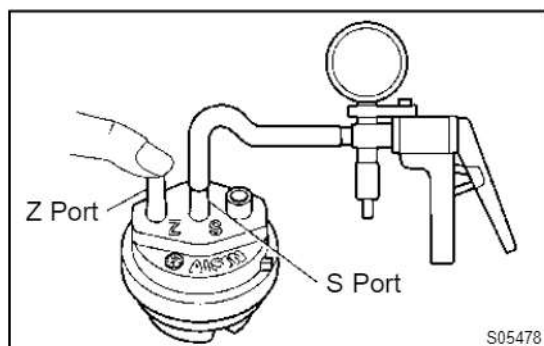
- (5) Reconnect the vacuum hose to the EGR valve.

INSPECTION



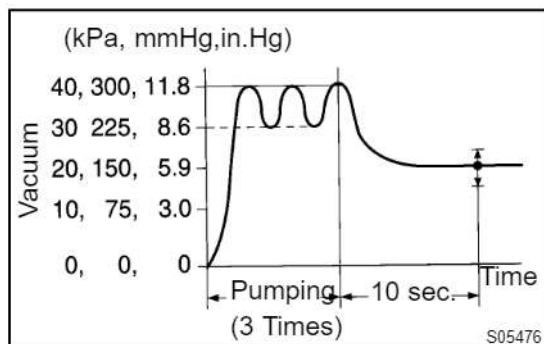
1. EGR VALVE ASSY

- (a) Check for sticking and heavy carbon deposits.
If a problem is found, replace the EGR valve.



2. VACUUM CONTROL VALVE

- (a) Connect the MITYVAC (Hand-Held Vacuum Pump) to port S of the VCV.
(b) Plug port Z completely with fingers.

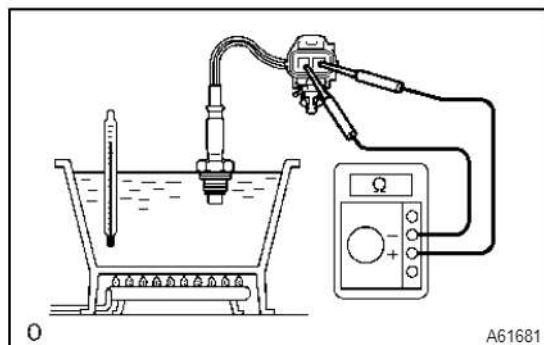


- (c) Perform pumping 3 times and apply vacuum as shown in the illustration.
(d) Stop the performing pumping and check the indicated value of the MITYVAC after about 10 seconds.

Standard value:

15 – 24 kPa (112 – 180 mmHg, 4.4 – 7.1 in.Hg)

If the indicated value is not as specified, replace the VCV.

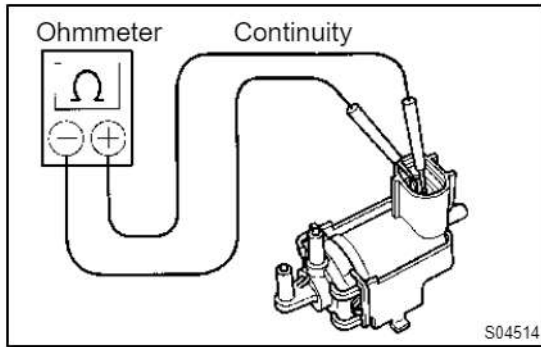


3. E.G.R GAS TEMPERATURE SENSOR

- (a) Resistance inspection
(1) using an ohmmeter, measure the resistance between the terminals.

Resistance:

At 50°C (122°F)	69.4 – 88.5 Ω
At 100°C (212°F)	11.89 – 14.37 Ω
At 150°C (302°F)	2.79 – 3.59 Ω

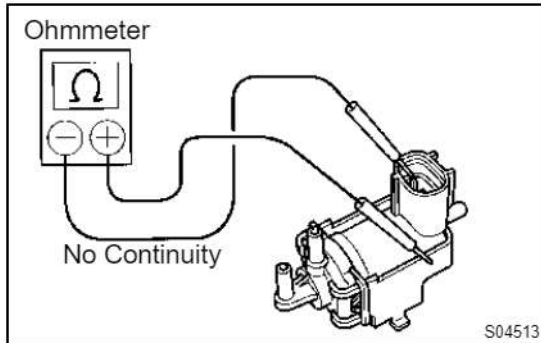


4. VACUUM SWITCHING VALVE NO.1

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

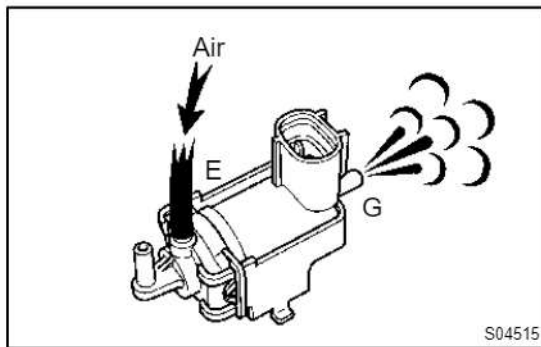
Resistance: 27 – 33 Ω at 20°C (68°F)

If there is no continuity, replace the VSV.

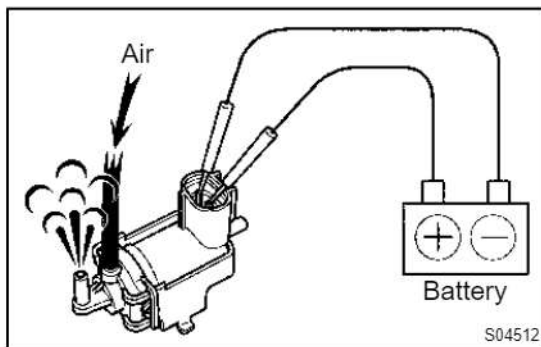


- (b) Inspect VSV for ground.
 (1) Using an ohmmeter, check that there is no continuity between each terminal and the body.

If there is continuity, replace the VSV.



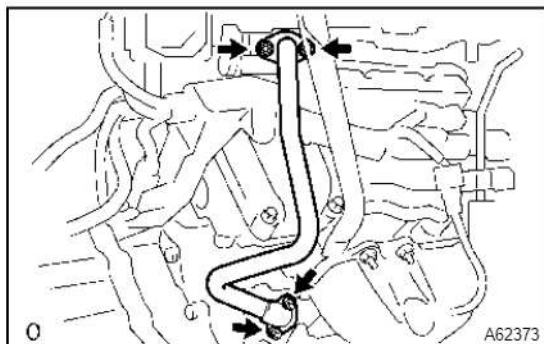
- (c) Inspect VSV operation.
 (1) Check that air flows from port E to port G.



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

EGR VALVE ASSY (1MZ-FE) REPLACEMENT

12031-01

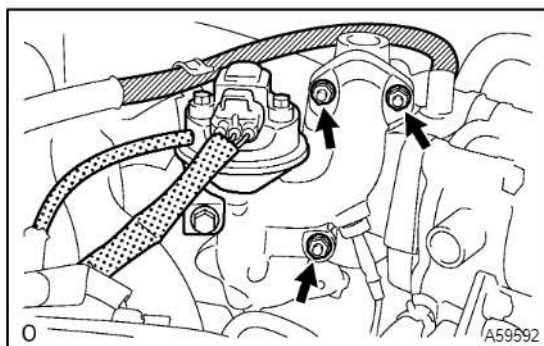


1. REMOVE EGR PIPE SUB-ASSY NO.2

- (a) Remove the 4 nuts, EGR pipe and 2 gaskets.

2. REMOVE EGR VALVE ASSY

- (a) Disconnect the EGR gas temperature sensor connector and clamp.
- (b) Disconnect the EVAP hose from the EGR valve hook.
- (c) Disconnect the vacuum hose from the EGR valve.
- (d) Disconnect the EGR valve position sensor connector.
- (e) Remove the 3 nuts, EGR valve and gasket.

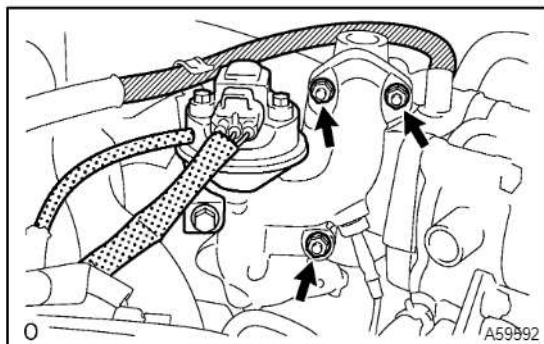


3. REMOVE E.G.R GAS TEMPERATURE SENSOR

4. REPLACE EGR VALVE ASSY

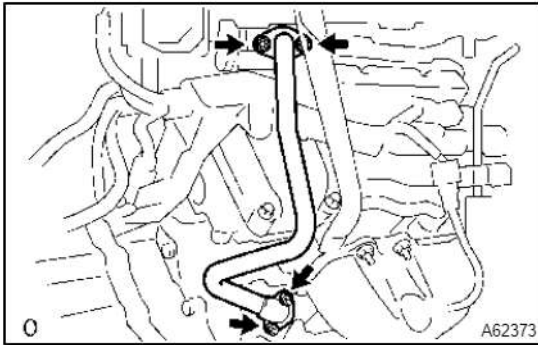
5. INSTALL E.G.R GAS TEMPERATURE SENSOR

Torque: 20 N·m (200 kgf·cm, 14 ft·lbf)



6. INSTALL EGR VALVE ASSY

- (a) Install a new gasket and the EGR valve with the 3 nuts.
Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)
- (b) Connect the EGR valve position sensor connector.
- (c) Connect the vacuum hose to the EGR valve.
- (d) Connect the EVAP hose to the EGR valve hook.
- (e) Connect the EGR gas temperature sensor connector and clamp.



7. INSTALL EGR PIPE SUB-ASSY NO.2

- (a) Install 2 new gaskets and the EGR pipe with the 4 nuts.
Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)