

EMISSION CONTROL SYSTEM

EC01H-05

PURPOSE

The emission control systems are installed to reduce the amount of CO, HC and NOx 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).

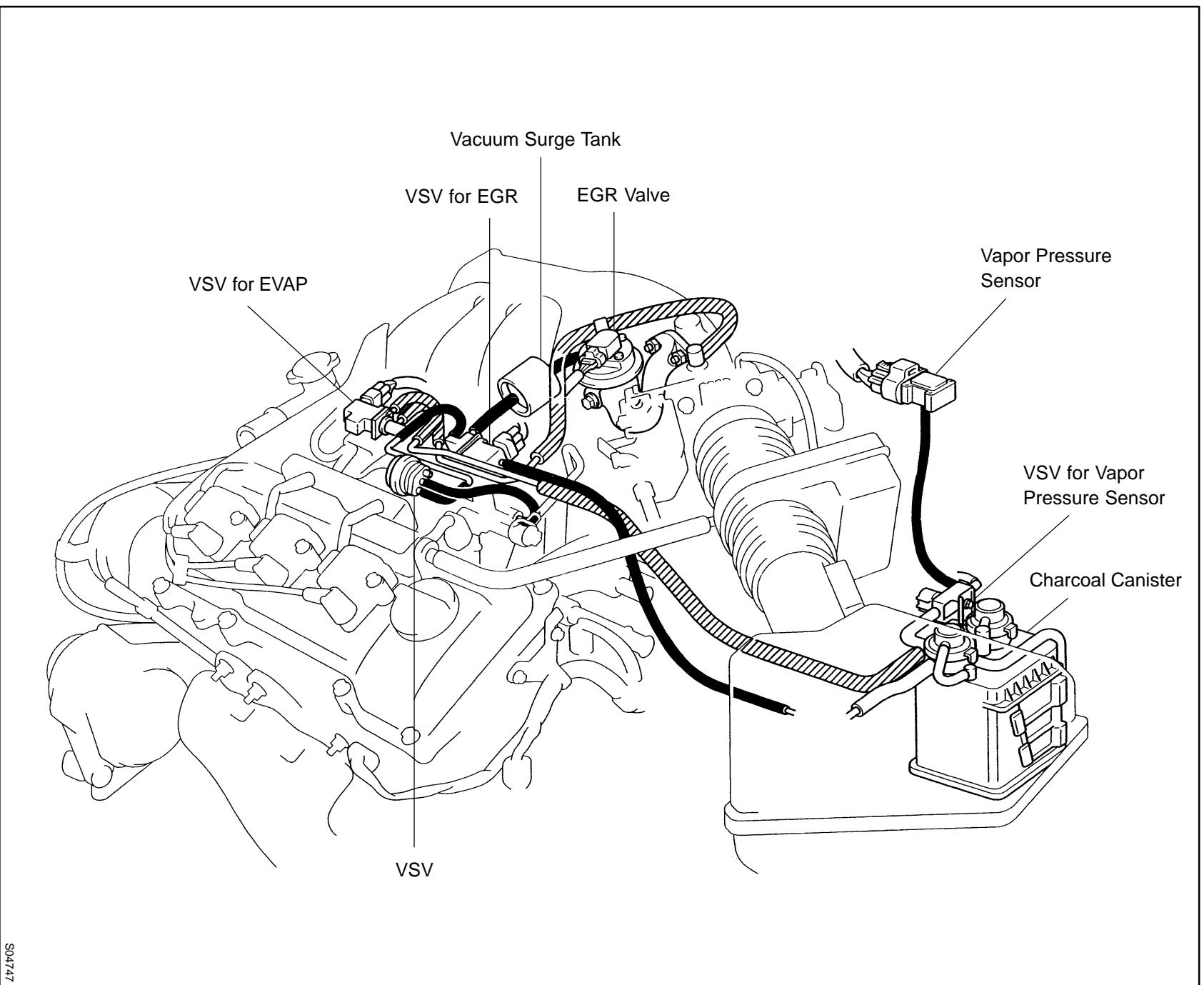
The function of each system is shown in these table.

System	Abbreviation	Function
(1) Positive Crankcase Ventilation	PCV	Reduces HC
(2) Evaporative Emission Control	EVAP	Reduces evaporated HC
(3) Exhaust Gas Recirculation	EGR	Reduces NOx
(4) Three-Way Catalytic Converter	TWC	Reduces HC, CO and NOx
(5) 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 SF section of this manual.

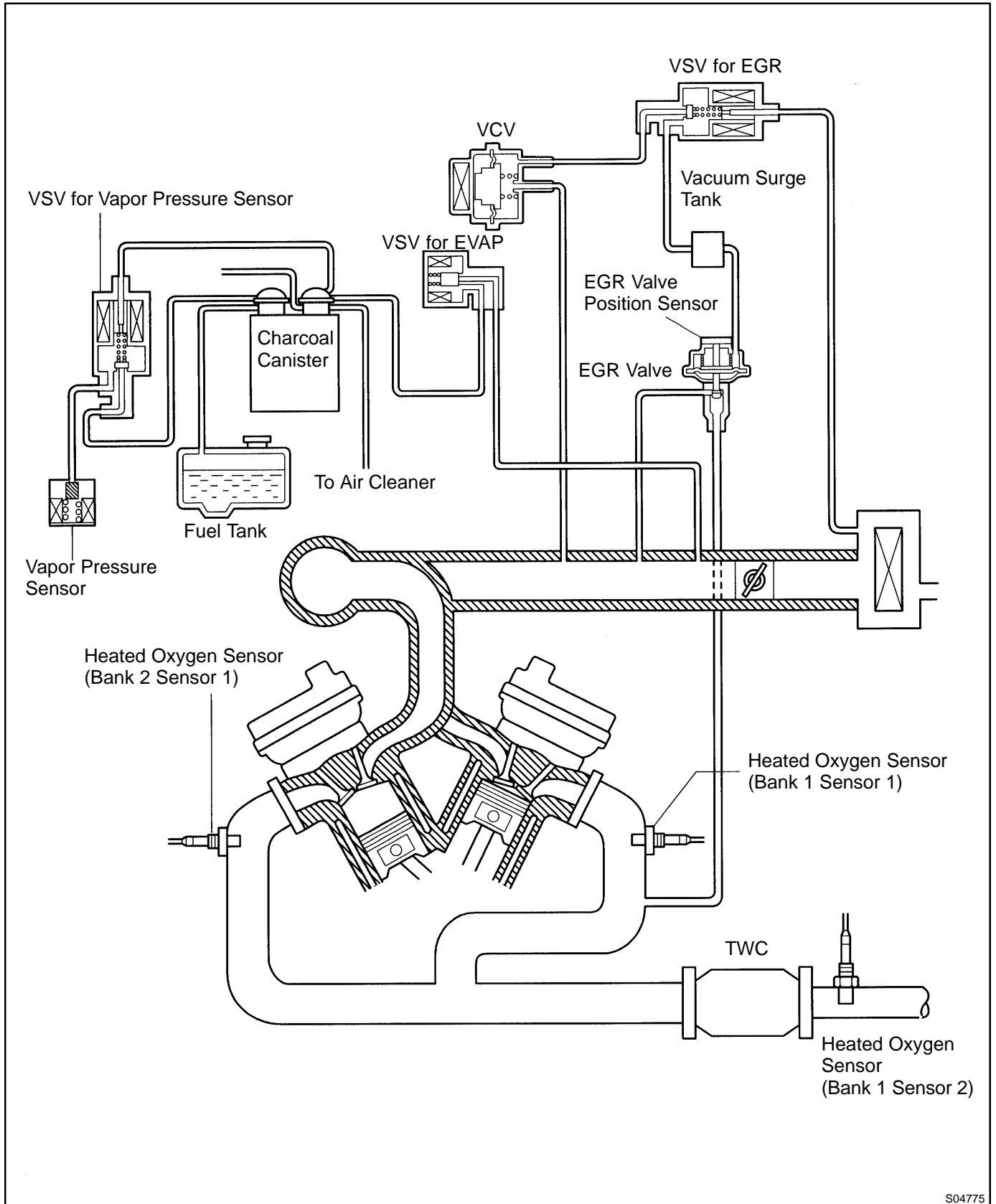
PARTS LAYOUT AND SCHEMATIC DRAWING LOCATION

EC01-01

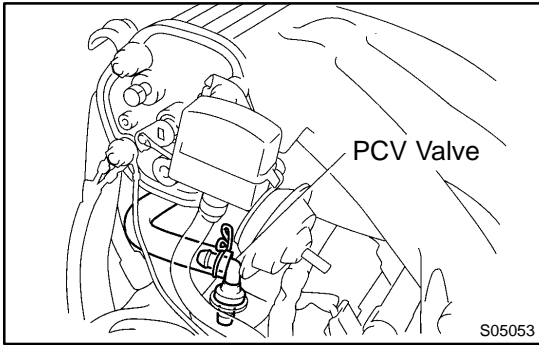


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DRAWING



S04775

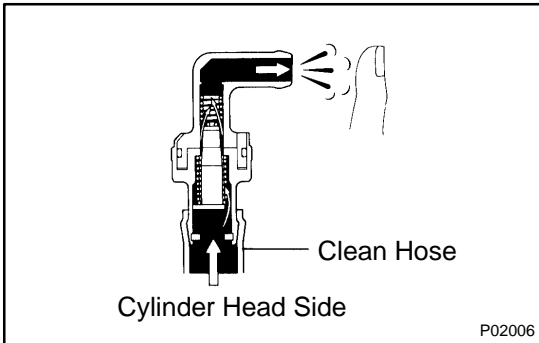


POSITIVE CRANKCASE VENTILATION (PCV) SYSTEM INSPECTION

EC01K-01

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

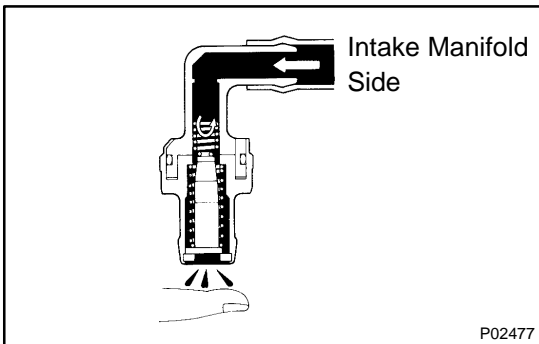
3. INSPECT PCV VALVE OPERATION

- (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.

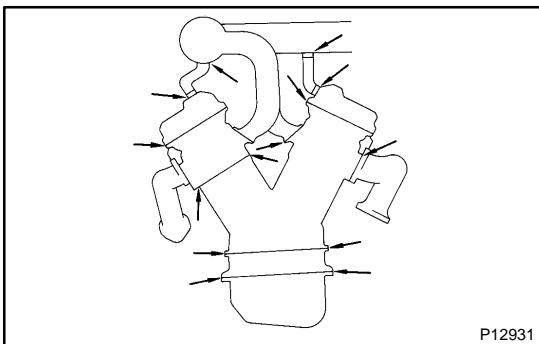


- (b) Blow air into the intake manifold side, and check that air passes through with difficulty.

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

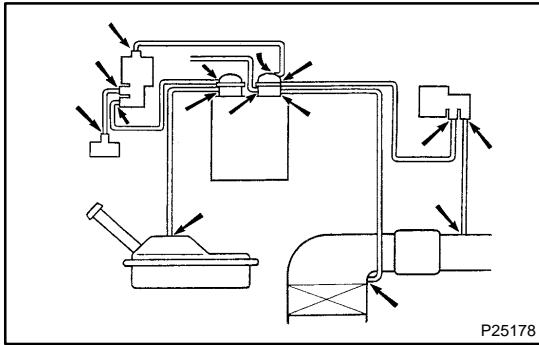
4. REMOVE CLEAN HOSE FROM PCV VALVE

5. REINSTALL PCV VALVE



6. VISUALLY INSPECT HOSES, CONNECTIONS AND GASKETS

Check for cracks, leaks or damage.



EVAPORATIVE EMISSION (EVAP) CONTROL SYSTEM INSPECTION

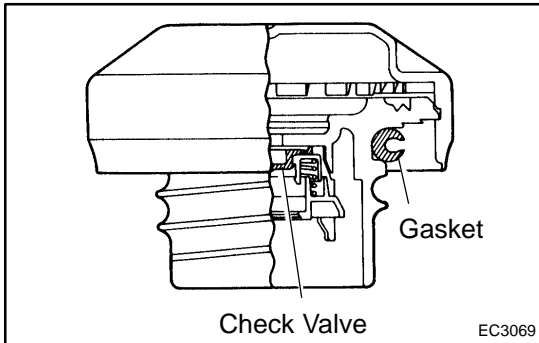
EC01L-01

1. VISUALLY INSPECT LINES AND CONNECTIONS

Look for loose connections, sharp bends or damage.

2. VISUALLY INSPECT FUEL TANK

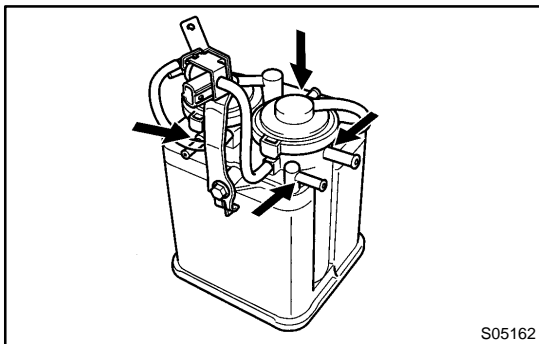
Look for deformation, cracks or fuel leakage.



3. VISUALLY INSPECT FUEL TANK CAP

Check if the cap and/or gasket are deformed or damaged.

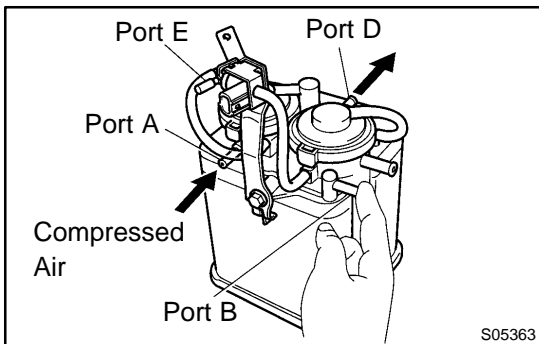
If necessary, repair or replace the cap.



4. REMOVE CHARCOAL CANISTER

5. VISUALLY INSPECT CHARCOAL CANISTER

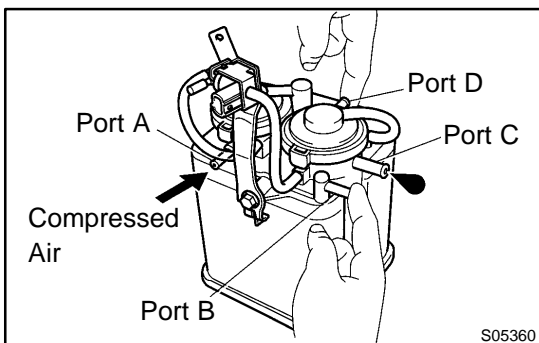
Look for cracks or damage.



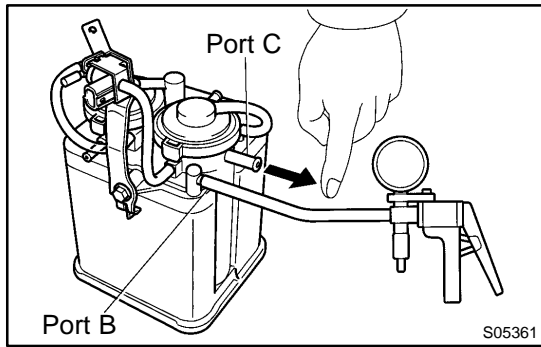
6. CHECK FOR CLOGGED FILTER, AND STUCK CHECK VALVE AND DIAPHRAGM

(a) Install the plug to port E.

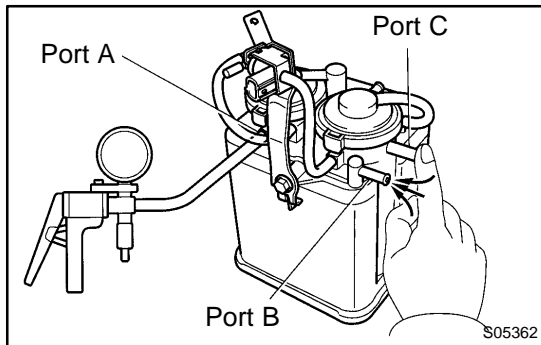
(b) While holding port B closed, blow air (1.76 kPa, 18 gf/cm², 0.26 psi) into port A and check that air flows from port D.



(c) While holding port B and port D closed, blow air (1.76 kPa, 18 gf/cm², 0.26 psi) into port A and check that air does not flow from port C.



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



- (e) While holding port C closed, apply vacuum (3.43 kPa, 25.7 mmHg, 1.01 in.Hg) to port A and check that air flows into port B.

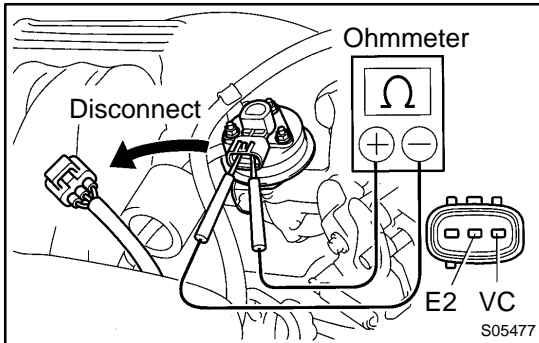
If a problem is found, replace the charcoal canister.

- (f) Remove the plug.
- 7. REMOVE VSV FOR EVAP**
- 8. INSPECT VSV FOR EVAP**
(See page [SF-52](#))
- 9. REINSTALL VSV FOR EVAP**
- 10. REMOVE VSV FOR VAPOR PRESSURE SENSOR**
- 11. INSPECT VSV FOR VAPOR PRESSURE SENSOR**
(See page [SF-56](#))
- 12. REINSTALL VSV FOR VAPOR PRESSURE SENSOR**
- 13. INSPECT VAPOR PRESSURE SENSOR**
(See page [SF-58](#))
- 14. REINSTALL CHARCOAL CANISTER**

EXHAUST GAS RECIRCULATION (EGR) SYSTEM INSPECTION

EC01M-02

1. INSPECT EGR SYSTEM (See page DI-118)



2. 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 ECU, and measure the power source voltage.

Voltage: 4.5 – 5.5 V

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

- Using the MITYVAC (Hand-Held Vacuum Pump), apply a vacuum (17.3 kPa, 130 mmHg, 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.

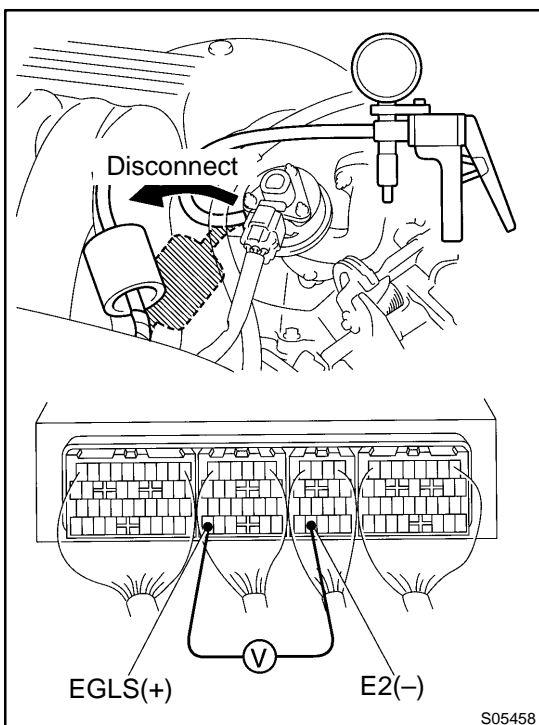
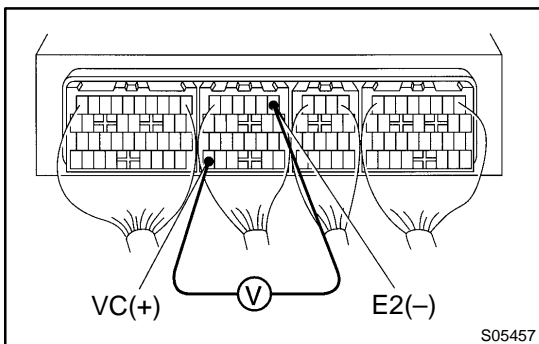
3. REMOVE EGR POSITION SENSOR

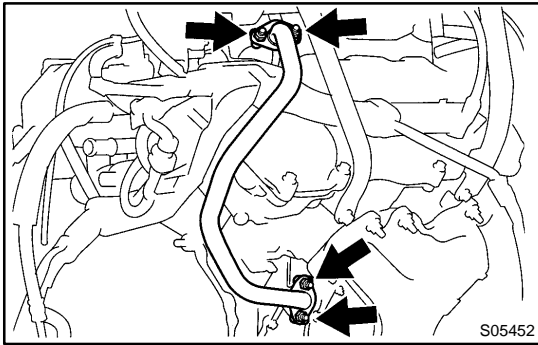
Remove the 3 nuts and EGR valve position sensor from the EGR valve.

Torque: 2 N·m (20 kgf·cm, 17 in.-lbf)

4. REINSTALL EGR POSITION SENSOR

Installation is the reverse order of removal.





5. REMOVE EGR VALVE

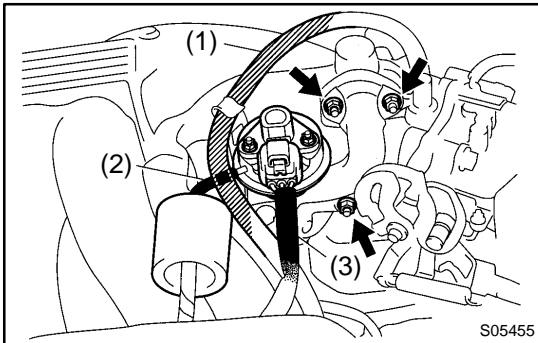
- (a) Remove the EGR pipe.
 - Remove the 4 nuts, EGR pipe and 2 gaskets.

HINT:

Install 2 new gaskets.

Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)

- (b) Disconnect the EGR gas temperature sensor connector and clamp.



- (c) Remove the EGR valve.

- (1) Disconnect these hoses and connector:
 - EVAP hose from EGR valve hook
 - Vacuum hose from EGR valve
 - EGR valve position sensor connector

- (2) Remove the 3 nuts, EGR valve and gasket.

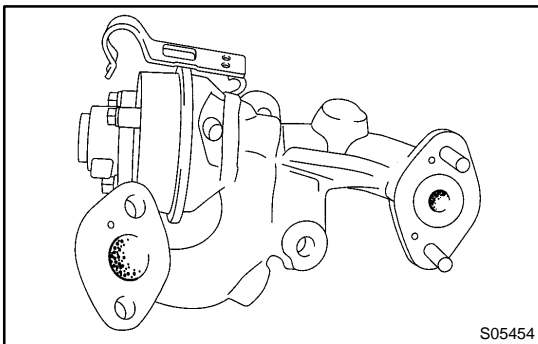
HINT:

Install a new gasket.

Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)

- (d) Remove the EGR gas temperature sensor.

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

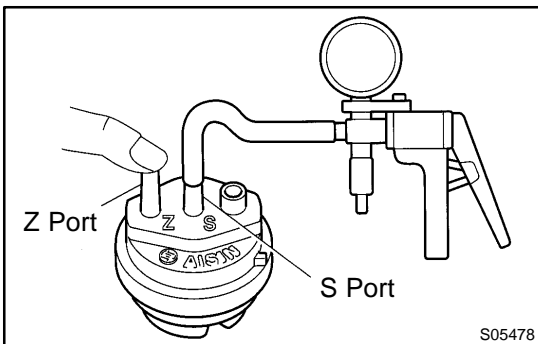


6. INSPECT EGR VALVE

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

7. REINSTALL EGR VALVE

Installation is the reverse order of removal.



8. REMOVE VCV

9. INSPECT VCV

- (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:

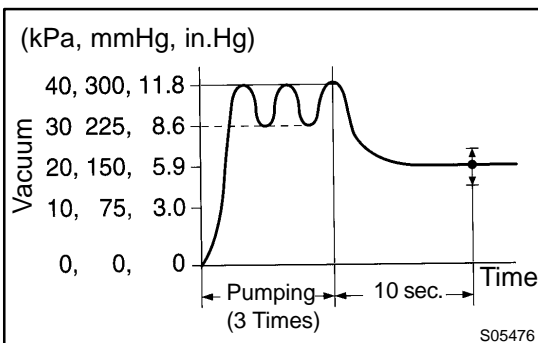
15 – 24 kPa (112 – 180 mmHg, 4.4 – 7.1 in.Hg)

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

10. REINSTALL VCV

11. INSPECT VSV FOR EGR

(See page [SF-50](#))



THREE-WAY CATALYTIC CONVERTER (TWC) SYSTEM INSPECTION

EC01P-01

1. CHECK TWC FOR DENTS OR DAMAGE

If any part of the protector is damaged or dented to the extent that it contacts the three-way catalytic converter, repair or replace it.

2. CHECK EXHAUST PIPE CONNECTIONS FOR LOOSENESS OR DAMAGE

3. CHECK EXHAUST PIPE CLAMPS FOR WEAKNESS, CRACKS OR DAMAGE

4. CHECK HEAT INSULATOR FOR DAMAGE

5. CHECK FOR ADEQUATE CLEARANCE BETWEEN CATALYTIC CONVERTER AND HEAT INSULATOR

THREE-WAY CATALYTIC CONVERTER (TWC) SYSTEM INSPECTION

EC01P-01

1. CHECK TWC FOR DENTS OR DAMAGE

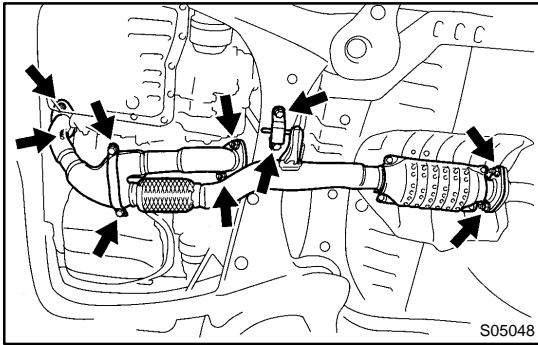
If any part of the protector is damaged or dented to the extent that it contacts the three-way catalytic converter, repair or replace it.

2. CHECK EXHAUST PIPE CONNECTIONS FOR LOOSENESS OR DAMAGE

3. CHECK EXHAUST PIPE CLAMPS FOR WEAKNESS, CRACKS OR DAMAGE

4. CHECK HEAT INSULATOR FOR DAMAGE

5. CHECK FOR ADEQUATE CLEARANCE BETWEEN CATALYTIC CONVERTER AND HEAT INSULATOR



REPLACEMENT

1. REMOVE CONVERTER

- (a) Jack up the vehicle.
- (b) Check that the converter is cool.
- (c) Remove the 2 bolts and exhaust pipe stay.
Torque: 33 N·m (330 kgf-cm, 24 ft-lbf)
- (d) Remove the 2 bolts, and disconnect the bracket.
Torque: 33 N·m (330 kgf-cm, 24 ft-lbf)
- (e) Remove the 2 bolts and 2 nuts holding the front exhaust pipe to the center exhaust pipe.
Torque: 56 N·m (570 kgf-cm, 41 ft-lbf)
- (f) Remove the 4 nuts holding the front exhaust pipe to the exhaust manifolds.
Torque: 62 N·m (630 kgf-cm, 46 ft-lbf)
- (g) Remove the front exhaust pipe (converter) and 3 gaskets.

HINT:

At the time of installation, please refer to the following items.
Install 3 new gaskets.

2. INSTALL CONVERTER

Installation is the reverse order of removal.