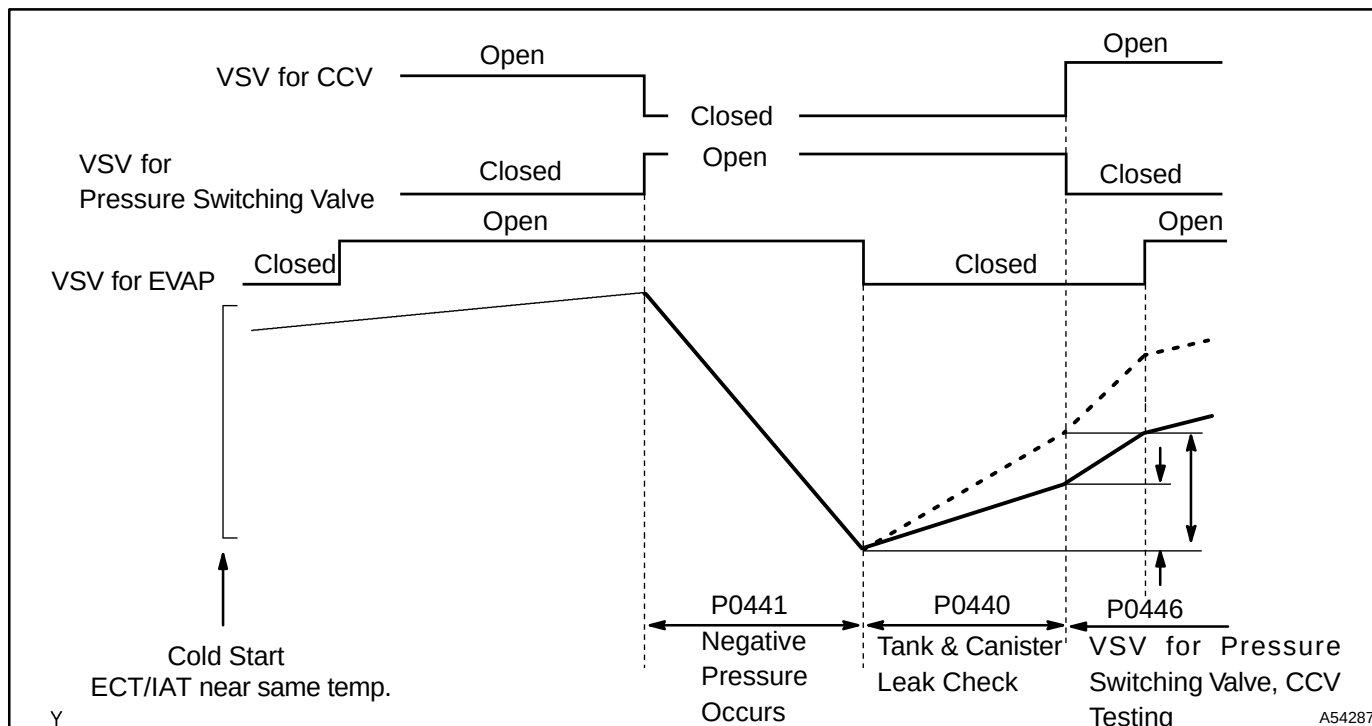


DTC	P0446	EVAPORATIVE EMISSION CONTROL SYSTEM VENT CONTROL MALFUNCTION
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DTCs P0441 and P0446 are recorded by the ECM when evaporative emissions leak from the components within the dotted line in Fig. 1 below, or when there is a malfunction in either the VSV for EVAP, the VSV for pressure switching valve, or in the vapor pressure sensor itself.





P0441:

The ECM closes the CCV and opens the VSV for pressure switching valve causing vacuum to increase in the entire EVAP system.

The ECM continues to operate the VSV for EVAP until the vacuum is increased to a specified point at which time the ECM closes the VSV for EVAP.

If the vacuum did not increase, or if the vacuum increased beyond the specified limit, the ECM judges the VSV for EVAP and related components to be faulty.

P0446:

When the vapor pressure rises to a specified point, the ECM opens the VSV for CCV. Pressure will increase rapidly because of the air allowed into the system. No increase or an increase below specified rate of pressure increase indicates a restriction on the air inlet side.

The ECM closes the VSV for pressure switching valve. This action blocks air entering the fuel tank side of system. The pressure rise on the fuel tank side is no longer as great.

If there was no change in pressure, the ECM will conclude the VSV for pressure switching valve did not close.

DTC No.	DTC Detecting Condition	Trouble Area
P0441	Pressure in charcoal canister and fuel tank does not drop during purge control (2 trip detection logic)	• Vacuum hose cracks, holed blocked, damaged or disconnected ((1), (2), (3), (4), (5), (6), (7), (8), (9), (10) and (11) in Fig. 1) • Fuel tank cap incorrectly installed • Open or short in vapor pressure sensor circuit • Vapor pressure sensor
	During purge cut-off, negative pressure incoming in the charcoal canister and fuel tank will not stop. (2 trip detection logic)	
P0446	When VSV for pressure switching valve is ON, ECM judges that there is no continuity between vapor pressure sensor, fuel tank and charcoal canister (2 trip detection logic)	• Open or short in VSV circuit for EVAP • VSV for EVAP • Open or short in VSV circuit for CCV • VSV for CCV • Open or short in VSV circuit for pressure switching valve • VSV for pressure switching valve • Fuel tank cracked, holed or damaged • Charcoal canister cracked, holed or damaged • Fuel tank over fill check valve cracked damaged • ECM
	When VSV for pressure switching valve is turned OFF, pressure in fuel tank is maintained at atmospheric pressure (2 trip detection logic)	
	When VSV for CCV is ON, pressure in charcoal canister and fuel tank is maintained at atmospheric pressure (2 trip detection logic)	

WIRING DIAGRAM

Refer to DTC P0440 on page 05-88 .

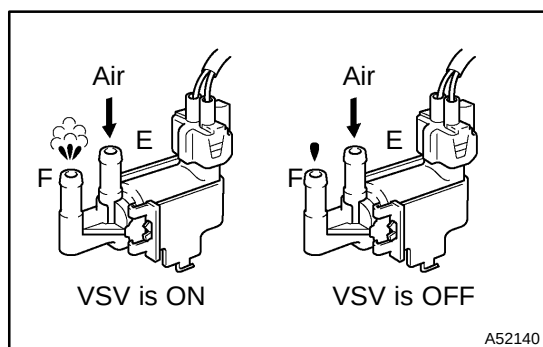
INSPECTION PROCEDURE

HINT:

- If DTC P0441, P0446, P0450 or P0451 is output after DTC P0440 or P0442, first troubleshoot DTC P0441, P0446, P0450 or P0451. If no malfunction is detected, troubleshoot DTC P0440 or P0442 next.
- Read freeze frame data using hand-held tester or OBD II scan tool. Because freeze frame records the engine conditions when the malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air-fuel ratio was lean or rich, etc. at the time of the malfunction.
- When the ENGINE RUN TIME in the freeze frame data is less than 200 seconds, carefully check the vapor pressure sensor.

Hand-held Tester:

1 PERFORM ACTIVE TEST BY HAND-HELD TESTER

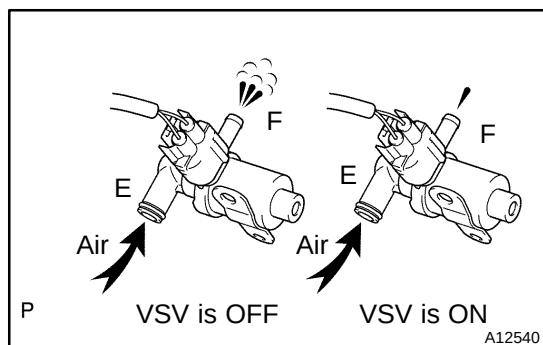


- Select the ACTIVE TEST mode on the hand-held tester.
- Disconnect the vacuum hose from the VSV for the EVAP.
- Start the engine.
- Select the item "EVAP VSV(ALONE)" in the ACTIVE TEST and operate the VSV for EVAP.
- When the VSV for the EVAP is operated by the hand-held tester, apply the disconnected hose to your finger to check the suction.

Result:

VSV is ON: Disconnected hose sucks.

VSV is OFF: Disconnected hose does not suck.

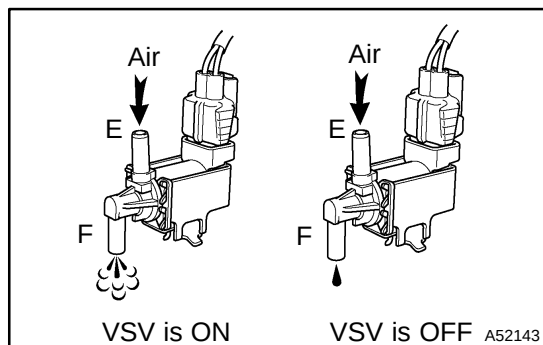


- Select the item "CAN CTRL VSV" in the ACTIVE TEST and operate the VSV for CCV.
- Check the VSV for CCV operation when it is operated by the hand-held tester.

Result:

VSV is ON: Disconnected hose sucks.

VSV is OFF: Disconnected hose does not suck.



- Select the item "TANK BYPASS VSV" in the ACTIVE TEST and operate the VSV for pressure switching valve.
- Check the VSV for pressure switching valve operation when it is operated by the hand-held tester.

Result:

VSV is ON: Disconnected hose sucks.

VSV is OFF: Disconnected hose does not suck.

NG

REPAIR OR REPLACE

OK

2 PERFORM ACTIVE TEST BY FOR EVAPORATIVE EMISSIONS LEAK

- (a) Connect the hand-held tester to the DLC3.
- (b) Select the "EVAP SYS CHECK" mode on the hand-held tester.
- (c) Perform "EVAP SYS CHECK".

DISPLAY:

A	B	C
Scan tool detects a leak on the fuel tank side.	Scan tool detects a leak on the canister side.	Scan tool does not detect a leak in the EVAP system.

B

Go to step 7

C

CHECK VACUUM HOSES

A

3 CHECK FUEL TANK CAP ASSY(TOYOTA GENUINE PARTS)

- (a) Replace to Toyota genuine parts.
- (b) After replace, perform "EVAP SYS CHECK" by hand-held tester. (Go to step 2.)

OK

Go to step 4

NG

REPLACE TO TOYOTA GENUINE PARTS

4 CHECK THAT FUEL TANK CAP IS CORRECTLY INSTALLED

- (a) Correctly install fuel tank cap.
- (b) After install, perform "EVAP SYS CHECK" by hand-held tester. (Go to step 2.)

OK

Go to step 5

NG

CORRECTLY INSTALL FUEL TANK CAP

5 INSPECT FUEL TANK CAP ASSY (See page 12-6)

- (a) Replace to fuel tank cap assy.
- (b) After replace, perform "EVAP SYS CHECK" by hand-held tester. (Go to step 2.)

OK

Go to step 6

NG

REPLACE FUEL TANK CAP ASSY

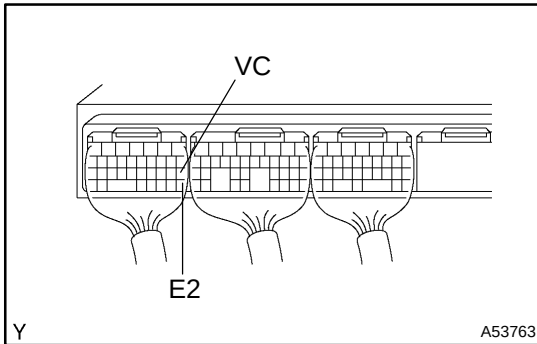
6 CHECK FUEL TANK INLET PIPE SUB-ASSY (FOR DAMAGE)

- (a) Remove the fuel tank cap.
- (b) Visually inspect the fuel inlet pipe for damage.
 - (1) Replace to fuel tank inlet pipe sub-assy.
 - (2) After replace, perform "EVAP SYS CHECK" by hand-held tester. (Go to step 2)
- (c) Repair or replace to fuel tank cap assy.
- (d) After repair or replace, perform "EVAP SYS CHECK" by hand-held tester. (Go to step 2)

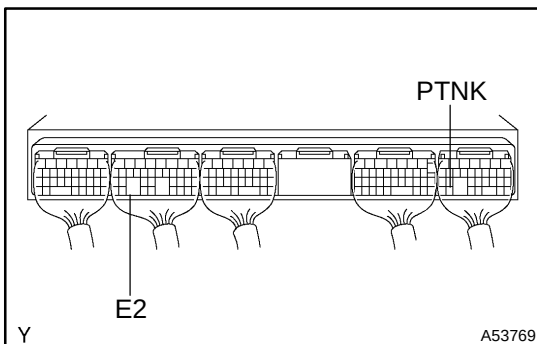
NG**REPLACE FUEL TANK INLET PIPE SUB-ASSY****OK****REPLACE VACUUM HOSES (VAPOR PRESSURE SENSOR - FUEL TANK, FUEL TANK - VSV FOR PRESSURE SWITCHING VALVE)****7 CHECK FUEL HOSE (VSV FOR PRESSURE SWITCHING VALVE - CHARCOAL CANISTER)****NG****REPAIR OR REPLACE****OK****8 CHECK EACH VSV CONNECTOR FOR LOOSENESS AND DISCONNECTION****NG****REPAIR OR CONNECT VSV AND SENSOR CONNECTOR****OK****9 CHECK VACUUM HOSES(8,9,10 AND 11 IN CIRCUIT DESCRIPTION)**

- (a) Check that the vacuum hose is connected correctly.
- (b) Check the vacuum hose for looseness and disconnection.
- (c) Check the vacuum hose for cracks, hole, damage and blockage.

NG**REPAIR OR REPLACE****OK**

10 INSPECT ECM(CHECK VOLTAGE)

- (a) Turn the ignition switch ON.
- (b) Measure voltage between terminals VC and E2 of the ECM connector.

Voltage: 4.5 - 5.5 V**NG****CHECK AND REPLACE ECM****OK****11 INSPECT ECM(CHECK VOLTAGE)**

- (a) Remove the fuel tank cap.
- (b) Turn the ignition switch ON.
- (c) Measure the voltage between terminals PTNK and E2 of the ECM connector.

Voltage: 3.0 - 3.6 V**OK****Go to step 13****NG****12 CHECK HARNESS AND CONNECTOR(VAPOR PRESSURE SENSOR - ECM)****NG****REPAIR OR REPLACE HARNESS AND CONNECTOR****OK****REPLACE VAPOR PRESSURE SENSOR ASSY**

13	CHECK VACUUM HOSES (INTAKE MANIFOLD - VSV FOR EVAP, VSV FOR EVAP - CHARCOAL CANISTER)
-----------	--

- (a) Check that the vacuum hose is connected correctly.
- (b) Check the vacuum hose for looseness and disconnection.
- (c) Check the vacuum hose for cracks, hole, damage and blockage.

NG	REPAIR OR REPLACE
-----------	--------------------------

OK

14	CHECK OPERATION OF VSV(FOR EVAP) (See Step 1)
-----------	--

OK	Go to step 15
-----------	----------------------

NG

CHECK VACUUM HOSES (8,9,10 AND 11 IN CIRCUIT DESCRIPTION)
--

15	CHECK HARNESS AND CONNECTOR (E.F.I. ECU RELAY - VSV FOR EVAP, VSV FOR EVPA - ECM)
-----------	--

NG	REPAIR OR REPLACE HARNESS AND CONNECTOR
-----------	--

OK

16	CHECK VACUUM HOSES(VSV FOR CCV - CHARCOAL CANISTER)
-----------	--

- (a) Check that the vacuum hose is connected correctly.
- (b) Check the vacuum hose for looseness and disconnection.
- (c) Check the vacuum hose for cracks, hole damage, and blockage.

NG	CORRECTLY INSTALL FUEL TANK CAP
-----------	--

OK

17	CHECK OPERATION OF VSV(FOR CCV) (See Step 1)
-----------	---

OK	Go to step 18
-----------	----------------------

NG

REPLACE VSV AND CHARCOAL CANISTER, AND THEN CLEAN VACUUM HOSE
--

18 CHECK HARNESS AND CONNECTOR(E.F.I. ECU RELAY - VSV FOR OCV, VSV FOR CCV - ECM)

NG

REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

19 CHECK OPERATION OF VSV(FOR PRESSURE SWITCHING VALVE) (See Step 1)

OK

Go to step 20

NG

REPLACE VSV AND CHARCOAL CANISTER, AND THEN CLEAN VACUUM HOSE

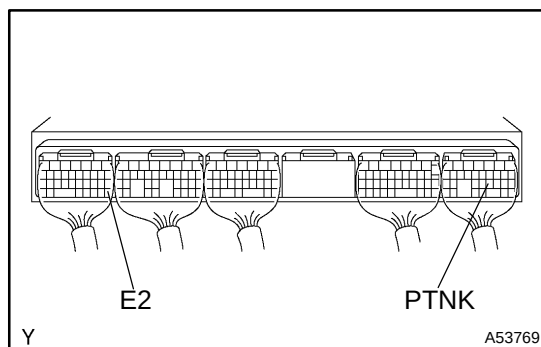
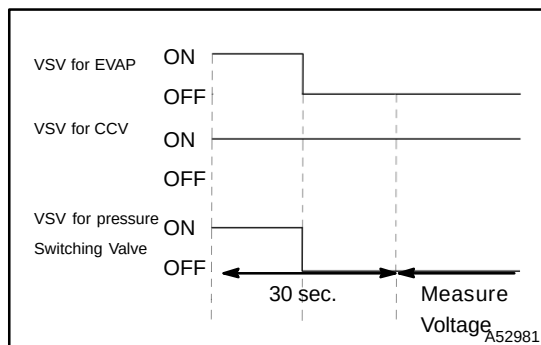
20 CHECK HARNESS AND CONNECTOR(E.F.I. ECU RELAY - VSV FOR PRESSURE SWITCHING VALVE,VSV FOR PRESSURE SWITCHING VALVE - ECM)

NG

REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

21 PERFORM ACTIVE TEST BY OBD II SCAN TOOL OR HAND-HELD TESTER(FUEL TANK ASSY)



- Connect the hand-held tester to the DLC3.
- Select the ACTIVE TEST mode on the hand-held tester.
- Start the engine.
- The VSV for the CCV is ON by the hand-held tester.
- The VSV for the EVAP and the VSV for the pressure switching valve are ON by the hand-held tester and hold the VSV for the EVAP until voltage between terminals PTNK and E2 becomes 1.2 V.
- Measure the voltage between terminals PTNK and E2 of the ECM connectors 30 sec. after switching the VSV for the EVAP and the VSV for the pressure switching valve from ON to OFF.

Voltage:

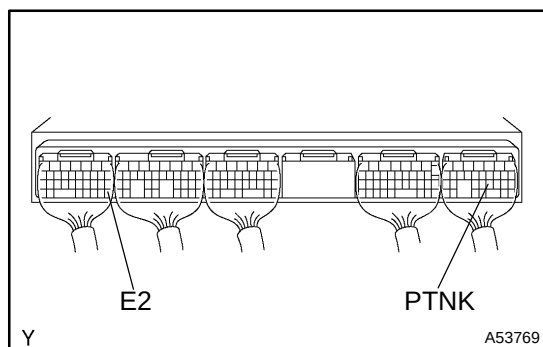
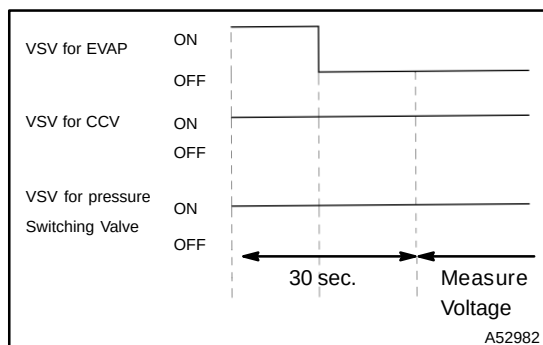
When there is no sharp change of the voltage with the voltage of more or less 1.2 V

NG

REPLACE FUEL TANK ASSY

OK

22 PERFORM ACTIVE TEST BY OBD II SCAN TOOL OR HAND-HELD TESTER(CHARCOAL CANISTER ASSY)



- Connect the hand-held tester to the DLC3.
- Select the ACTIVE TEST mode on the hand-held tester.
- Start the engine.
- The VSV for the CCV and the VSV for the pressure switching valve are ON by the hand-held tester.
- The VSV for the EVAP is ON by the hand-held tester and hold the VSV for the EVAP until voltage between terminals PTNK and E2 becomes 1.2 V.
- Measure the voltage between terminals PTNK and E2 of the ECM connectors 30 sec. after switching the VSV for the EVAP from ON to OFF.

Voltage:

When there is no sharp change of the voltage with the voltage of more or less 1.2 V

NG

REPLACE CHARCOAL CANISTER ASSY

OK

23 CHECK CHARCOAL CANISTER ASSY (See page 12-6)

NG

REPLACE CHARCOAL CANISTER ASSY

OK

24 CHECK FUEL TANK OVER FILL CHECK VALVE

NG

REPLACE VSV AND CHARCOAL CANISTER, AND THEN CLEAN VACUUM HOSE

OK

REPLACE CHARCOAL CANISTER ASSY

OBDII scan tool (excluding Hand-held Tester):

1 CHECK FOR EVAPORATIVE EMISSIONS LEAK

NG

REPAIR OR REPLACE

OK

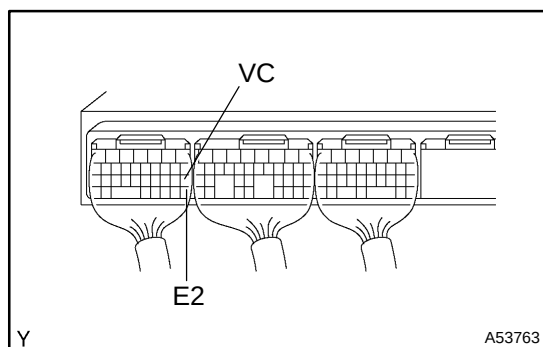
2 INSPECT FUEL TANK CAP ASSY(TOYOTA GENUINE PARTS)**NG** REPLACE TO TOYOTA GENUINE PARTS**OK****3 CHECK THAT FUEL TANK CAP IS CORRECTLY INSTALLED****NG** CORRECTLY INSTALL FUEL TANK CAP**OK****4 INSPECT FUEL TANK CAP ASSY (See page 12-6)****NG** REPLACE FUEL TANK CAP ASSY**OK****5 INSPECT FUEL TANK INLET PIPE SUB-ASSY(FOR DAMAGE)**

- (a) Remove the fuel tank cap.
(b) Visually inspect the fuel inlet pipe for damage.

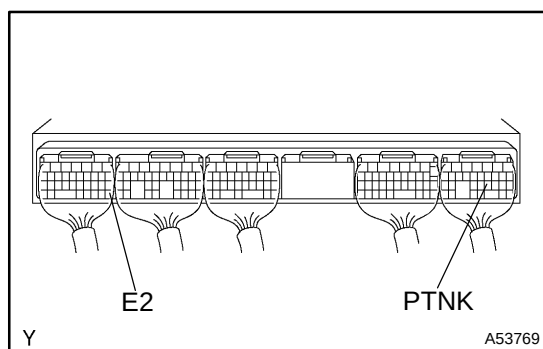
NG REPLACE FUEL TANK INLET PIPE SUB-ASSY**OK****6 CHECK VACUUM HOSES(VAPOR PRESSURE SENSOR - FUEL TANK,CHARCOAL CANISTER - VSV FOR PRESSURE SWITCHING VALVE)****NG** REPAIR OR CONNECT VSV AND SENSOR CONNECTOR**OK****7 CHECK FUEL HOSE(FUEL TANK - CHARCOAL CANISTER)****NG** REPAIR OR REPLACE**OK****8 CHECK EACH VSV CONNECTOR FOR LOOSENESS AND DISCONNECTION****NG** REPAIR OR CONNECT VSV AND SENSOR CONNECTOR**OK**

9 CHECK VACUUM HOSES(8,9,10 AND 11 IN CIRCUIT DESCRIPTION)

- (a) Check that the vacuum hose is connected correctly.
- (b) Check the vacuum hose for looseness and disconnection.
- (c) check the vacuum hose for cracks, hole, damage and blockage.

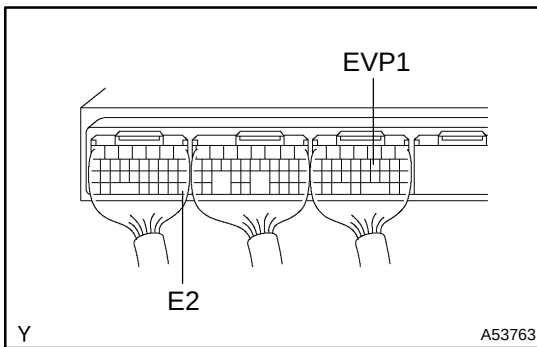
NG**CHECK FUEL TANK OVER FILL CHECK VALVE****OK****10 INSPECT ECM(VC - E2)**

- (a) Turn the ignition switch ON.
- (b) Measure voltage between terminals VC and E2 of the ECM connector.
Voltage: 4.5 - 5.5 V

NG**CHECK AND REPLACE ECM****OK****11 INSPECT ECM(PTNK - E2)**

- (a) Remove the fuel tank cap.
- (b) Turn the ignition switch ON.
- (c) Measure the voltage between terminals PTNK and E2 of the ECM connector.
Voltage: 3.0 - 3.6 V

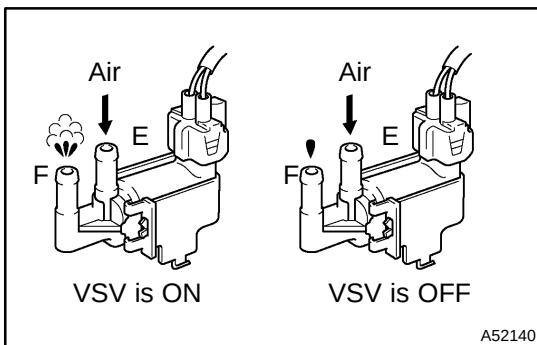
OK**Go to step 13****NG****12 CHECK HARNESS AND CONNECTOR(VAPOR PRESSURE SENSOR - ECM)****NG****REPAIR OR REPLACE HARNESS AND CONNECTOR****OK****REPLACE VAPOR PRESSURE SENSOR ASSY**

13 CHECK VSV (FOR EVAP)

- (a) Turn the ignition switch ON.
- (b) Check the VSV function.
 - (1) Connect between terminal EVP1 and E2 of the ECM connector (VSV ON).

VSV is ON:**Air from port E flows out through port F**

- (2) Disconnect between terminal EVP1 and E2 of the ECM connector (VSV OFF).

VSV is OFF:**Air does not flow port E to port F**

OK

Go to step 16

NG

14 CHECK OPERATION OF VSV(FOR EVAP) (See page 12-6)

OK

Go to step 15

NG

REPLACE VSV AND CHARCOAL CANISTER, AND THEN CLEAN VACUUM HOSE

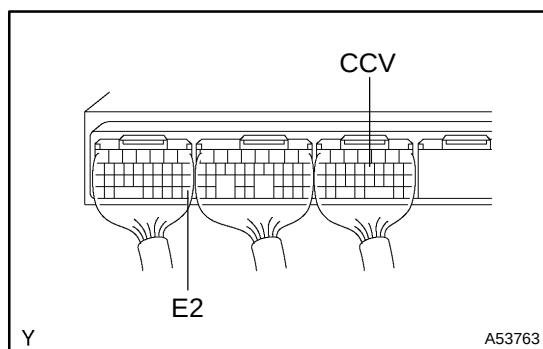
15 CHECK HARNESS AND CONNECTOR(E.F.I.ECU RELAY - VSV FOR EVAP, VSV FOR EVAP - ECM)

NG

REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

CHECK AND REPLACE ECM

16 CHECK VSV (FOR CCV)

- (a) Turn the ignition switch ON.
 (b) Check the VSV function.
 (1) Connect between terminal CCV and E2 of the ECM connector (VSV ON).

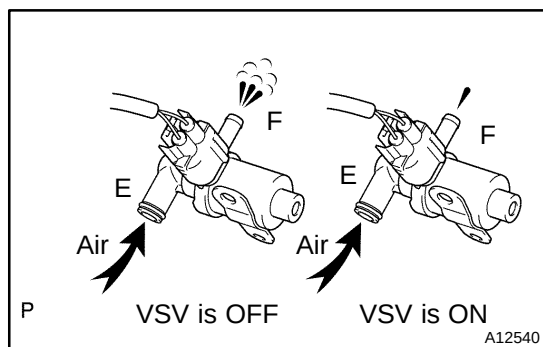
VSV is ON:

Air does not flow from port E to port F

- (2) Disconnect between terminal CCV and E2 of the ECM connector (VSV OFF).

VSV is OFF:

Air from port E flows out through port F



OK

Go to step 19

NG

17 CHECK OPERATION OF VSV(FOR CCV) (See page 12-6)

OK

Go to step 18

NG

REPLACE VSV AND CHARCOAL CANISTER, AND THEN CLEAN VACUUM HOSE

18 CHECK HARNESS AND CONNECTOR(E.F.I. ECU RELAY - VSV FOR CCV, VSV FOR CCV - ECM)

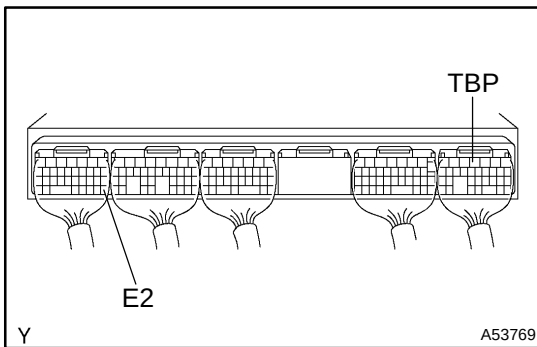
NG

REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

CHECK AND REPLACE ECM

19 CHECK VSV (FOR PRESSURE SWITCHING VALVE)

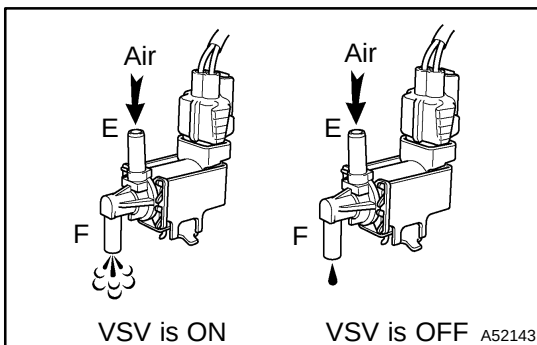


- (a) Turn the ignition switch ON.
- (b) Check the VSV function.
 - (1) Connect between terminal TBP and E2 of the ECM connector (VSV ON).

VSV is ON: Air from port E flows out through port F

- (2) Disconnect between terminal TBP and E2 of the ECM connector (VSV OFF).

VSV is OFF: Air does not flow from port E to port F



OK

Go to step 22

NG

20 CHECK OPERATION OF VSV(FOR PRESSURE SWITCHING VALVE) (See page 12-6)

OK

Go to step 21

NG

REPLACE VSV AND CHARCOAL CANISTER, AND THEN CLEAN VACUUM HOSE

21 CHECK HARNESS AND CONNECTOR(E.F.I. ECU RELAY - VSV FOR PRESSURE SWITCHING VALVE, VSV FOR PRESSURE SWITCHING VALVE - ECM)

NG

REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

CHECK AND REPLACE ECM

22 CHECK FUEL TANK OVER FILL CHECK VALVE**NG****REPLACE FUEL TANK OVER FILL CHECK VALVE OR FUEL TANK****OK****REPAIR OR REPLACE CHARCOAL CANISTER ASSY**