

DTC	P0441	EVAPORATIVE EMISSION CONTROL SYSTEM INCORRECT PURGE FLOW
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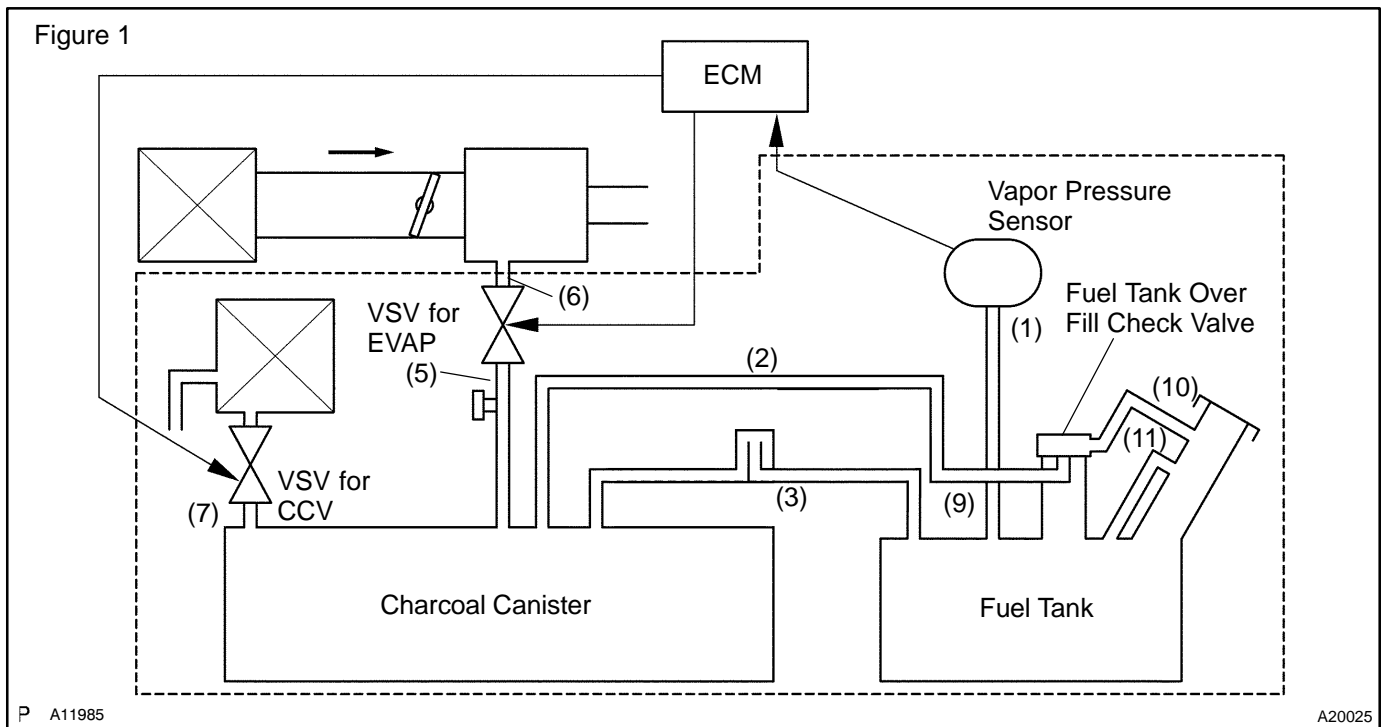
DTC	P0446	EVAPORATIVE EMISSION CONTROL SYSTEM VENT CONTROL MALFUNCTION
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CIRCUIT DESCRIPTION

The vapor pressure sensor, VSV for canister closed valve (CCV) are used to detect abnormalities in the evaporative emission control system.

The ECM decides whether there is an abnormality in the evaporative emission control system based on the vapor pressure sensor signal.

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 or in the vapor pressure sensor itself.

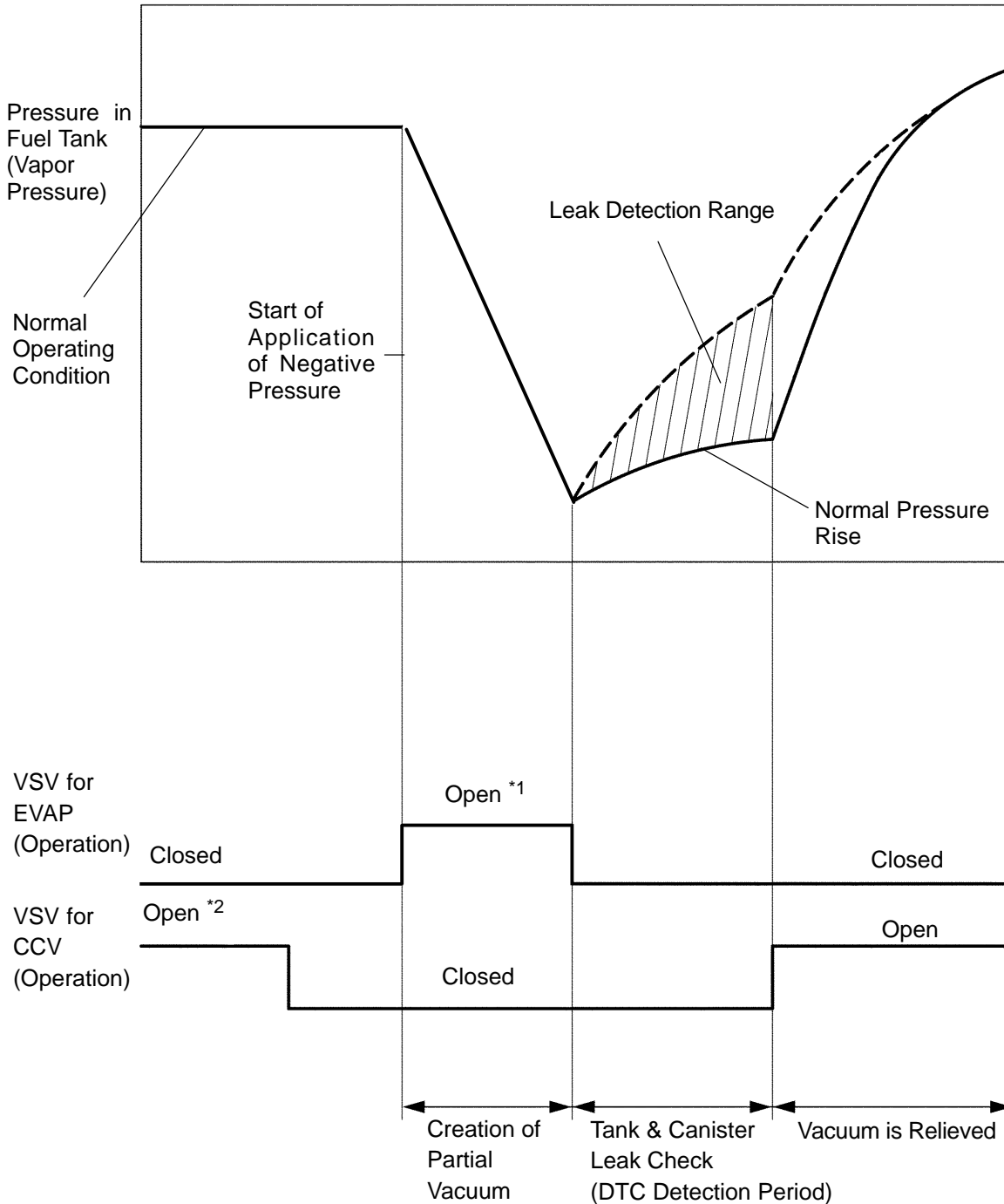


DTC No.	DTC Detection Condition	Trouble Area
P0441	Pressure in charcoal canister and fuel tank does not drop during purge control (2 trip detection logic)	<ul style="list-style-type: none"> • Vacuum hose has cracks, holes, or is blocked, damaged or disconnected • Fuel tank cap incorrectly installed • Fuel tank cap has cracks or is damaged • 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 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. After purge cut off operates, the fuel tank did not develop the proper high negative pressure. (Pressure is maintained at atmospheric pressure) (2 trip detection logic)	<ul style="list-style-type: none"> • Open or short in VSV circuit for EVAP • VSV for EVAP • Open or short in VSV circuit for CCV • VSV for CCV • Fuel tank has cracks, holes, or is damaged • Charcoal canister has cracks, holes, or is damaged • Fuel tank over fill check valve cracks, or is damaged • ECM

Leak Check

Initial Condition

- Cold Start
- Engine Coolant Temp./Intake Air Temp. Nearly Same



*1: VSV for EVAP is Open: ON

*2: VSV for CCV is Open: OFF

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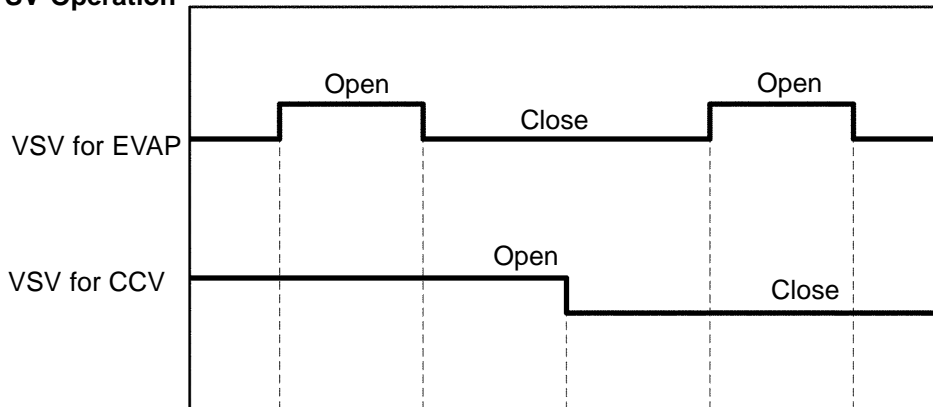
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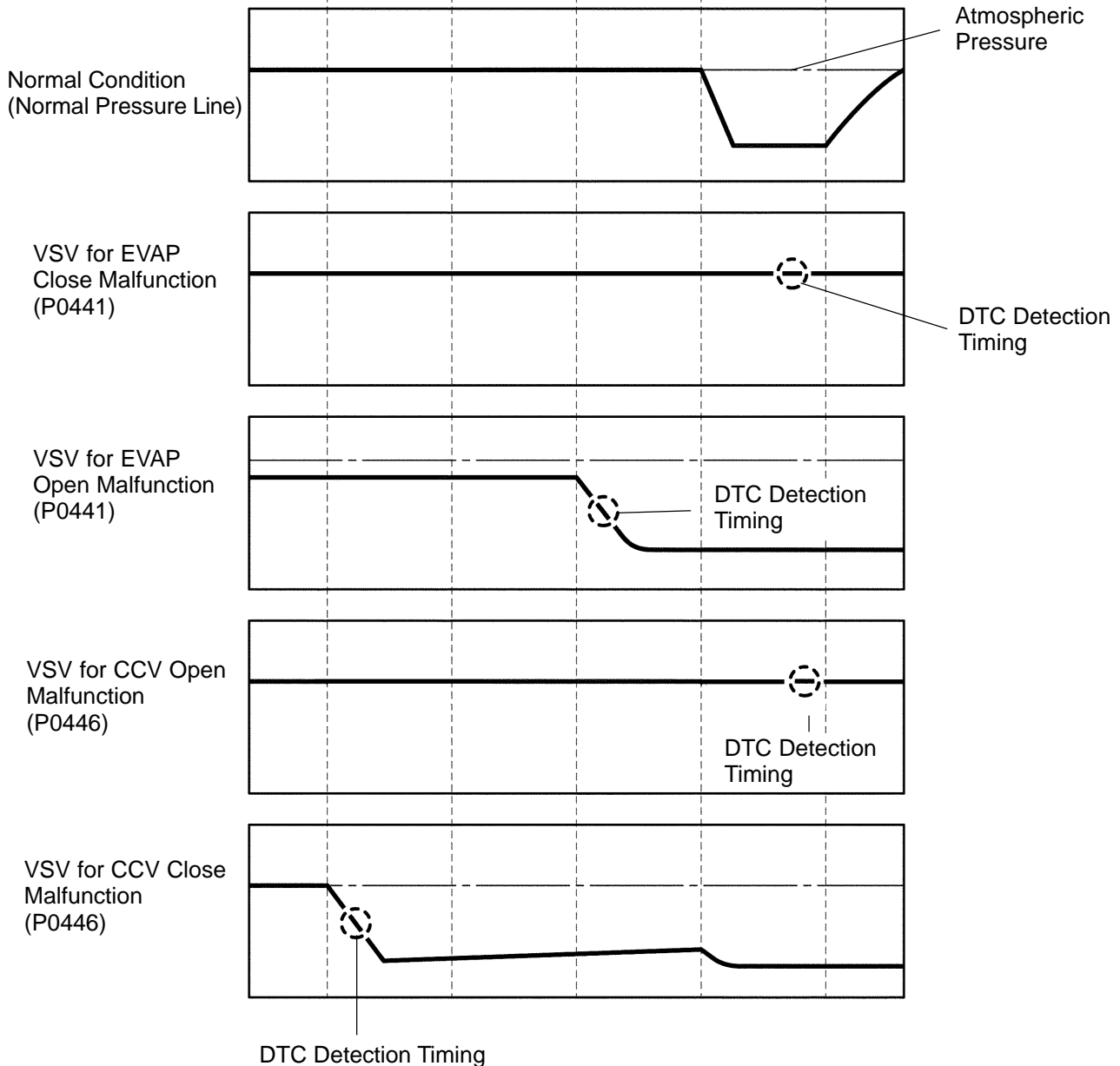
VSV Malfunction Condition and DTC Detection Timing

VSV for EVAP is Open: ON
 VSV for CCV is Open: OFF

VSV Operation



Pressure in Fuel Tank



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MONITOR DESCRIPTION

The ECM tests the evaporative emissions (EVAP) system using the fuel tank pressure sensor, the canister close valve (CCV), and the VSV for EVAP. The ECM closes the EVAP system and introduces a negative pressure (vacuum) into it. The ECM then monitors the internal pressure using the fuel tank pressure sensor.

P0441

The VSV for EVAP is used to purge the evaporative emissions from the fuel tank via canister into the intake manifold. Also, it creates a negative pressure inside the fuel tank in unison with the operation of the VSV for CCV and leak tests are performed using this vacuum.

Opening or closing malfunctions in the VSV for EVAP prompt the ECM to set DTC P0441.

The ECM checks for a VSV for EVAP "stuck closed" fault by commanding the VSV for EVAP to open with the VSV for CCV (vent) closed. The fuel tank should develop a high negative pressure. If it does not, the ECM determines that the VSV for EVAP remained closed. The ECM turns on the MIL and a DTC is set.

The ECM checks for a VSV for EVAP "stuck open" fault by commanding both valves (VSV for EVAP and VSV for CCV) to close at a time when the fuel tank is at atmospheric pressure. If the fuel tank develops a high negative pressure at this early stage of the test, the ECM determines that the VSV for EVAP is stuck OPEN. The ECM will turn on the MIL and DTC is set.

P0446

The VSV for CCV is open under normal operating conditions. When the VSV for EVAP is used to purge the evaporative emissions from the fuel tank into the intake manifold, fumes are drawn from the fuel tank into the charcoal canister. The VSV for CCV has an additional function that relieves the pressure when the pressure inside the fuel tank has rapidly increased. Finally, the VSV for CCV is used in unison with the VSV for EVAP to create a vacuum inside the fuel tank and leak tests are performed using this vacuum.

If the VSV for EVAP is stuck closed, or the negative pressure inside the fuel tank increased despite the CCV opening, the ECM illuminates the MIL and sets the DTC.

MONITOR STRATEGY

DTCs	P0441	VSV for EVAP malfunction
	P0446	Canister close valve stuck malfunction
Required sensors/components	Main	Vapor pressure sensor
	Sub	Engine coolant temperature sensor, intake air temperature sensor, vehicle speed sensor
Frequency of operation	Once per drive cycle	
Duration	P0441 : 90 sec P0446 : 10 sec	
MIL operation	2 drive cycles	
Sequence of operation	None	

TYPICAL ENABLING CONDITIONS

P0441

Item	Criteria	
	Minimum	Maximum
The monitor will run whenever the following DTCs are not present	See "List of Disable a Monitor" table (On page 05-24)	

The same as that for DTC 442.

P0446

Item	Criteria	
	Minimum	Maximum
The monitor will run whenever the following DTCs are not present	See "List of Disable a Monitor" table (On page 05-24)	

The same as that for DTC 442.

TYPICAL MALFUNCTION THRESHOLDS**P0441**

Detection Criteria	Threshold
A. Following conditions are met:	(a) and (b)
(a) Fuel tank pressure at the vacuum introduction start	-2.0 kPa (-15 mmHg) or more
(b) Difference between the fuel tank pressure at the vacuum introduction start and completion	Less than 0.5 kPa (4 mmHg)
B. Following conditions are met:	(a) and (b)
(a) Difference between the fuel tank pressures at the minimum before the leak check and at 14 seconds after the leak check	0.5 kPa or more (3.5 mmHg)
(b) Fuel tank pressure at 14 seconds after leak check	Less than - 3.7kPa (-28 mmHg)

P0446

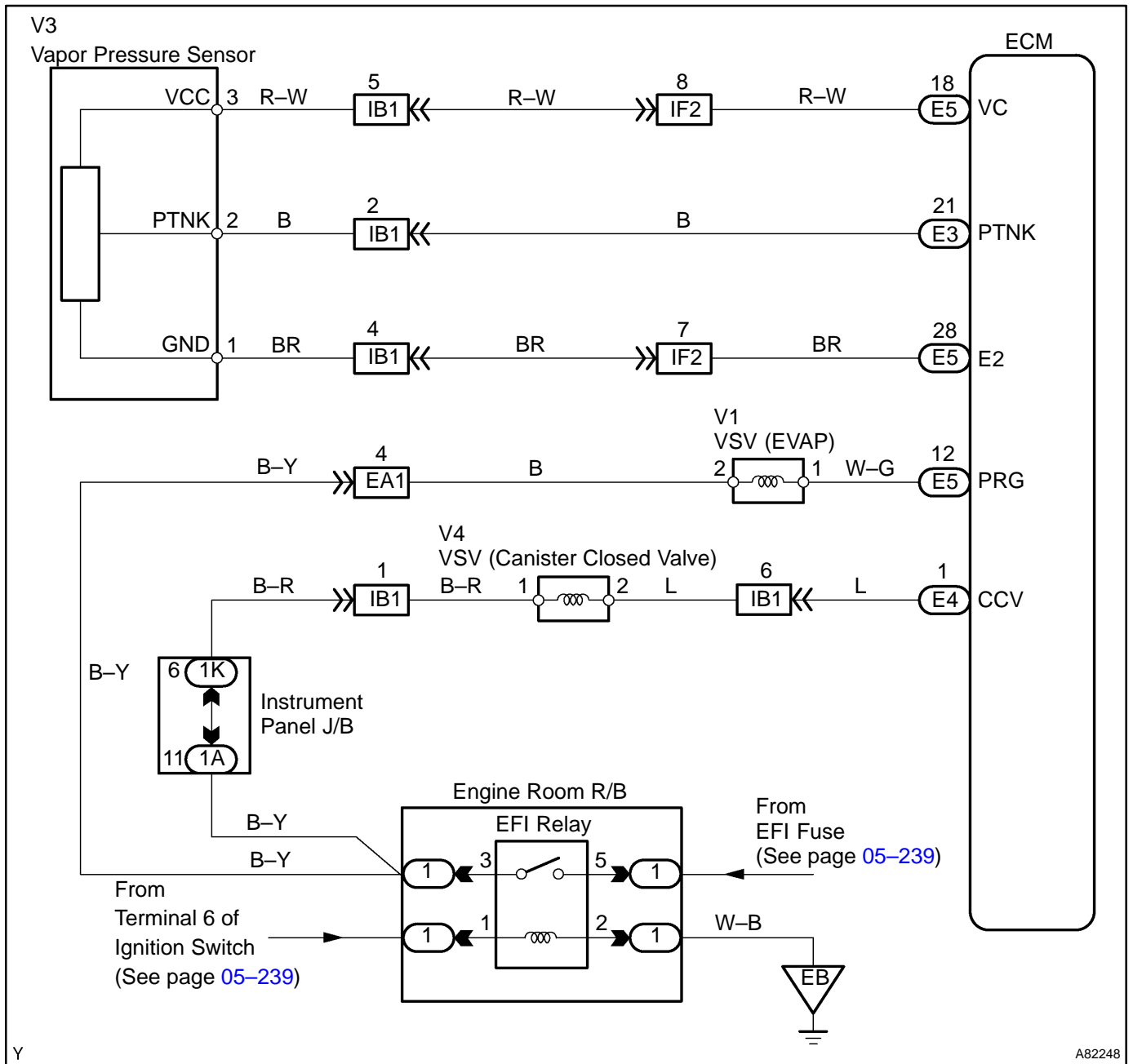
Detection criteria	Threshold
Either following condition is met:	1 or 2
1. VSV for EVAP monitoring	Stuck close malfunction
2. Fuel tank pressure movement canister close valve opening	Fuel tank pressure change at canister close valve opening

MONITOR RESULT (MODE 06 DATA)

Test ID	Comp ID	Description of Test Data	Description of Test Limit	Unit	Conversion Factor
\$02	\$81	VSV for EVAP closed malfunction: Tank pressure change value during vacuum introduction of the EVAP. System by VSV for EVAP when EVAP system is closed. VSV for EVAP open malfunction: Tank pressure change value when enclosing EVAP system (when closing canister close valve) while VSV for EVAP is not operated.	Malfunction criteria for the VSV for EVAP	mmHg	Multiply by 0.0916
	\$82	Tank pressure change value at switching over the VSV for EVAP (closed → open).	Malfunction criteria for canister close valve	mmHg	Multiply by 0.0458 minus 2.930
	\$03	Fuel tank pressure changes 5 seconds after the end the vacuum introduction cycle. Conditions: VSV for EVAP: Closed VSV for CCV: Closed	Malfunction criteria for vapor leak from the 0.040 inch hole	mmHg	Multiply by 0.0458
	\$04	Fuel tank pressure change 5 seconds after the end the vacuum introduction cycle. Conditions: VSV for EVAP: Closed VSV for CCV : Closed	Malfunction criteria for vapor leak from the 0.020 inch hole	mmHg	Multiply by 0.0458

Refer to page 05-26 for detailed information on CHECKING MONITOR STATUS.

WIRING DIAGRAM



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CONFIRMATION READINESS TEST

First Trip Procedure

- (a) The vehicle must be cold, and the ambient temperature must be approximately between 10 and 35°C (50 and 95°F).
- (b) The Intake Air Temperature (IAT) and the Engine Coolant Temperature (ECT) sensors have almost the same value.

READINESS TESTS	
MISFIRE MON	AVAIL
FUEL SYS MON	AVAIL
COMP MON	AVAIL
CAT EVAL	INCMPL
HTD CAT EVAL	N/A
EVAP EVAL	INCMPL
2nd AIR EVAL	N/A
A/C EVAL	N/A
O2S EVAL	INCMPL
O2S HTR EVAL	INCMPL
EGR EVAL	N/A

- (c) Clear the DTCs.
 - Disconnect the battery terminal or remove the EFI fuse for more than 60 seconds.
 - Readiness tests will show "INCMPL" (incomplete).
- (d) Drive the vehicle on a freeway. Write down the state of the Readiness Tests. They will change to COMPL as the EVAP evaluation monitors operate and if the system passes. This procedure may take approximately 20 minutes or more.

NOTICE:

Do not shut off the engine – the results will be invalid.

READINESS TESTS	
MISFIRE MON	AVAIL
FUEL SYS MON	AVAIL
COMP MON	AVAIL
CAT EVAL	COMPL
HTD CAT EVAL	N/A
EVAP EVAL	COMPL
2nd AIR EVAL	N/A
A/C EVAL	N/A
O2S EVAL	COMPL
O2S HTR EVAL	COMPL
EGR EVAL	N/A

Pass Condition – No Problem Found by the ECM

If the EVAP evaluation monitor shows "COMPL", go to the Non-Continuous Test screen.

NOTICE:

Do not shut off the engine – the results will be invalid.

NON-CONTINUOUS TESTS	
Time\$01 CID\$01	Pass
Time\$01 CID\$02	Pass
Time\$02 CID\$01	Pass
Time\$02 CID\$02	Pass
Time\$02 CID\$03	Pass
Time\$02 CID\$04	Pass
Time\$02 CID\$05	Pass
Time\$04 CID\$01	Pass
Time\$04 CID\$02	Pass
Time\$04 CID\$10	Pass
Time\$04 CID\$20	Pass
Time\$08 CID\$01	Pass

- To get there, go to Advanced OBD II, Onboard Tests, Non-continuous Tests.
- If all of the tests in the time \$02 category show "Pass", the EVAP evaluation monitor has operated and no problem was detected.

READINESS TESTS	
MISFIRE MON	AVAIL
FUEL SYS MON	AVAIL
COMP MON	AVAIL
CAT EVAL	COMPL
HTD CAT EVAL	N/A
EVAP EVAL	INCMPL
2nd AIR EVAL	N/A
A/C EVAL	N/A
O2S EVAL	COMPL
O2S HTR EVAL	COMPL
EGR EVAL	N/A

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Fail Condition – Problem Detected by the ECM

If the EVAP evaluation monitor shows INCMPL, go to the Non-Continuous Test screen.

NON-CONTINUOUS TESTS	
Time\$01 CID\$01	Pass
Time\$01 CID\$02	Pass
Time\$02 CID\$01	Fail
Time\$02 CID\$02	Fail
Time\$02 CID\$03	Fail
Time\$02 CID\$04	Fail
Time\$02 CID\$05	Fail
Time\$04 CID\$01	Pass
Time\$04 CID\$02	Pass
Time\$04 CID\$10	Pass
Time\$04 CID\$20	Pass
Time\$08 CID\$01	Pass

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- (1) If all Tests show "Pass", the following may have occurred.
 - The EVAP evaluation monitor did not operate.
 - The EVAP evaluation monitor did not finish.
 - The ECM withheld judgement.
- (2) If one or more of the tests in the time \$02 category show "Fail", the EVAP evaluation monitor did operate and the ECM detected a problem.

CONTINUOUS TESTS	
ECU: \$10 (Engine)	
Number of Tsts: 3	
P0441	EVAP Control System Incorrect Purge Flow
P0442	EVAP Emission Control System Leak Detected
P0446	EVAP Control System Vent Control Malfunction

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- (3) Go to Continuous Tests screen. This is the only place DTC's are listed for the first trip.

NOTICE:

The DTC listed may not be valid. A second trip is needed to confirm the DTC.

READINESS TESTS	
MISFIRE MON	AVAIL
FUEL SYS MON	AVAIL
COMP MON	AVAIL
CAT EVAL	COMPL
HTD CAT EVAL	N/A
EVAP EVAL	INCMPL
2nd AIR EVAL	N/A
A/C EVAL	N/A
O2S EVAL	COMPL
O2S HTR EVAL	COMPL
EGR EVAL	N/A

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Second Trip Procedure

- (e) The vehicle must be cold, and the ambient temperature must be approximately between 10 and 35°C (50 and 95°F).
- (f) Go to Readiness Tests screen.
- (g) Drive the vehicle on a freeway. Write down the state of EVAP evaluation monitor. This procedure may take approximately 20 minutes or more.

NOTICE:

Do not shut off the engine – the results will be invalid.

- (h) If Readiness Tests changes to "COMPL", the EVAP evaluation monitor has operated. Check for any stored DTC's.
 - If a DTC has stored, the problem has been detected and confirmed by the ECM.
 - If no DTC was found, the EVAP monitor operated but no problem was detected.

CONTINUOUS TESTS	
ECU: \$10 (Engine)	
Number of Tsts: 3	
P0441	EVAP Control System Incorrect Purge Flow
P0442	EVAP Emission Control System Leak Detected
P0446	EVAP Control System Vent Control Malfunction

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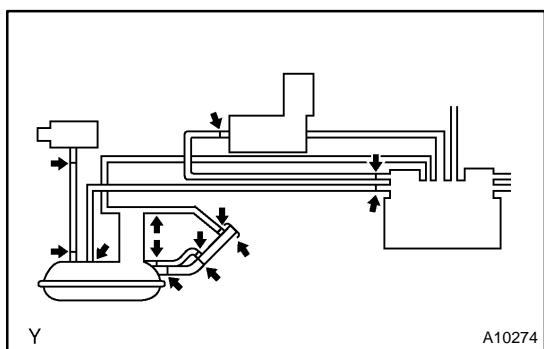
INSPECTION PROCEDURE

HINT:

- If DTC P0441, P0446 or P0451 is output with DTC P0442 or P0456, first troubleshoot DTC P0441, P0446 or P0451. If no malfunction is detected, troubleshoot DTC P0442 or P0456 next.
- Read freeze frame data using hand-held tester or the OBD II scan tool. 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 CHECK FOR EVAPORATIVE EMISSIONS LEAK



(a) Check if any hoses close to the fuel tank have been modified, and check if there are signs of any accident damage near the fuel tank or the charcoal canister.

(1) Check the following parts for cracks, deformation or loose connections:

- Fuel tank
- Charcoal canister
- Fuel tank filler pipe
- Hoses and tubes around the fuel tank and charcoal canister

NG REPAIR OR REPLACE

OK

2 INSPECT FUEL TANK CAP ASSY(CHECK THAT FUEL TANK IS GENUINE PARTS)

NG REPLACE TO 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 12-8)

NG REPLACE FUEL TANK CAP ASSY

OK

5 CHECK FILLER NECK FOR DAMAGE

NG → **REPLACE FUEL TANK INLET PIPE SUB-ASSY**

OK

6 CHECK HOSES AND TUBES(VAPOR PRESSURE SENSOR – FUEL TANK)

- (a) Check that the vacuum hoses are connected correctly.
- (b) Check that the vacuum hoses are not loose or disconnected.
- (c) Check the vacuum hoses and tubes for cracks, holes, damage, or blockage.

NG → **REPAIR OR REPLACE HOSES AND TUBES**

OK

7 CHECK HOSES AND TUBES(FUEL TANK – CHARCOAL CANISTER)

- (a) Check the connection between the fuel tank and fuel EVAP pipe, fuel EVAP pipe and under-floor fuel tube, and under-floor fuel tube and charcoal canister.
- (b) Check the hose and tube for cracks, hole and damage.

NG → **REPAIR OR REPLACE HOSES AND TUBES**

OK

8 CHECK EACH CONNECTOR FOR LOOSENESS AND DISCONNECTION(VSV FOR EVAP, VSV FOR CCV AND VAPOR PRESSURE SENSOR)

NG → **REPAIR OR CONNECT VSV AND SENSOR CONNECTOR**

OK

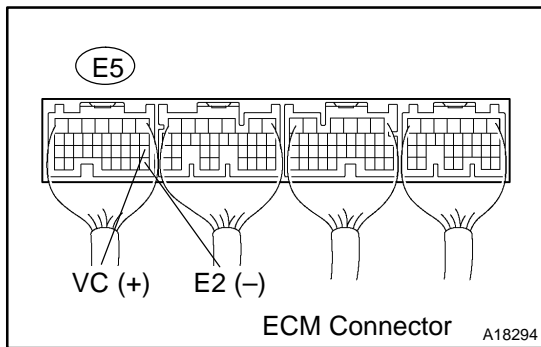
9 CHECK VACUUM HOSES((9), (10) AND (11) IN FIG. 1 IN CIRCUIT DESCRIPTION)

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

NG → **REPAIR OR REPLACE**

OK

10 INSPECT ECM(VC VOLTAGE)



- (a) Turn the ignition switch ON.
- (b) Measure the voltage between the specified terminals of the E5 ECM connector.

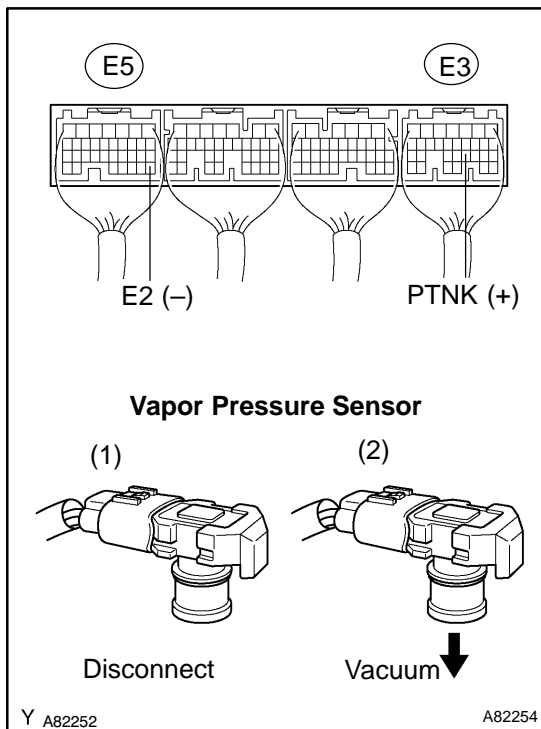
Standard:

Tester Connection	Specified Condition
VC (E5-18) – E2 (E5-28)	4.5 to 5.5 V

NG → **REPLACE ECM (See page 10-17)**

OK

11 INSPECT ECM(PTNK VOLTAGE)



- (a) Turn the ignition switch ON.
- (b) Measure the voltage between the specified terminals of the E3 and E5 ECM connectors.

- (1) Remove the vapor pressure sensor.

Standard (1):

Tester Connection	Specified Condition
PTNK (E3-21) – E2 (E5-28)	2.9 to 3.7 V

- (2) Using the MITYVAC (Hand-Held Vacuum Pump), apply a vacuum of 4.0 kPa (30 mmHg, 1.18 in.Hg) to the vapor pressure sensor.

NOTICE:

The vacuum applied to the vapor pressure sensor must be less than 66.7 kPa (500 mmHg, 19.7 in.Hg).

Standard (2):

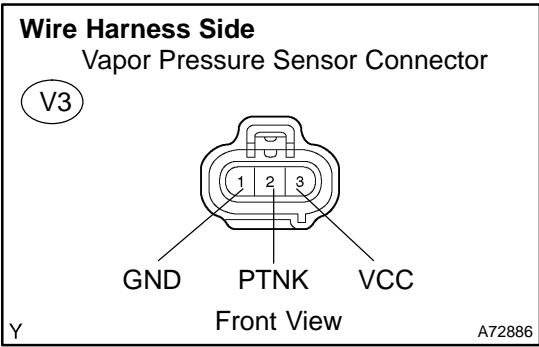
Tester Connection	Specified Condition
PTNK (E3-21) – E2 (E5-28)	0.5 V or less

- (3) Reinstall the vapor pressure sensor.

OK → **Go to step 13**

NG

12 CHECK HARNESS AND CONNECTOR(VAPOR PRESSURE SENSOR - ECM)



- (a) Disconnect the V3 vapor pressure sensor connector.
- (b) Disconnect the E3 and E5 ECM connectors.
- (c) Measure the resistance between the wire harness side connectors.

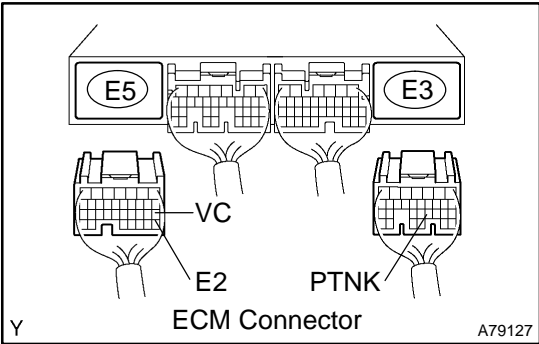
Standard (Check for open):

Tester Connection	Specified Condition
PTNK (V3-2) - PTNK (E3-21)	Below 1 Ω
GND (V3-1) - E2 (E5-28)	
VCC (V3-3) - VC (E5-18)	

Standard (Check for short):

Tester Connection	Specified Condition
PTNK (V3-2) or PTNK (E3-21) - Body ground	10 kΩ or higher
VCC (V3-3) or VC (E5-18) - Body ground	

- (d) Reconnect the vapor pressure sensor connector.
- (e) Reconnect the ECM connector.

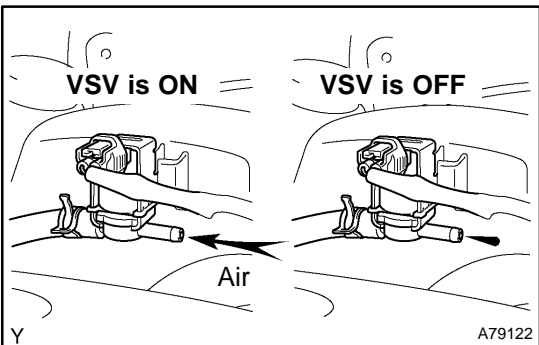


NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

REPLACE VAPOR PRESSURE SENSOR ASSY

13 PERFORM ACTIVE TEST BY HAND-HELD TESTER(VSV FOR EVAP PURGE FLOW)



- (a) Disconnect the vacuum hose of the VSV for EVAP from the charcoal canister.
- (b) Start the engine.
- (c) Select the item "DIAGNOSIS / ENHANCED OBD II / ACTIVE TEST / EVAP VSV" (press the right or left button).
- (d) When the VSV for EVAP is operated by the hand-held tester, check whether the disconnected hose applies suction to your finger.

Standard:

Tester operation	Specified condition
VSV is ON	Disconnected hose applies suction to your finger
VSV is OFF	Disconnected hose applies no suction to your finger

- (e) Reconnect the vacuum hose.

OK → **Go to step 17**

NG

14 CHECK VACUUM HOSES(INTAKE MANIFOLD – VSV FOR EVAP, VSV FOR EVAP – CHARCOAL CANISTER)

- (a) Check that the vacuum hoses are connected correctly.
- (b) Check that the vacuum hoses are not loose or disconnected.
- (c) Check the vacuum hoses and tubes for cracks, holes, damage, or blockage.

NG REPAIR OR REPLACE

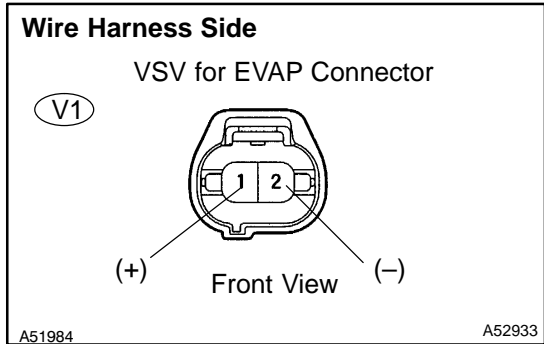
OK

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

NG REPLACE VSV AND CLEAN VACUUM HOSES, AND THEN CHECK CHARCOAL CANISTER

OK

16 CHECK HARNESS AND CONNECTOR(VSV FOR EVAP – ECM, VSV FOR EVAP – EFI RELAY)



- (a) Disconnect the V1 VSV for EVAP connector.
- (b) Turn the ignition switch ON.
- (c) Measure the voltage between the specified terminal of the V1 VSV for EVAP connector and body ground.

Standard :

Tester Connection	Specified Condition
VSV for EVAP (V1-1) – Body ground	9 to 14 V

- (d) Select the item "DIAGNOSIS / ENHANCED OBD II / ACTIVE TEST / EVAP VSV" (press the right or left button).
- (e) When the VSV for EVAP is operated by the hand-held tester, measure the voltage between the specified terminals of the V1 VSV for EVAP connector.

Standard :

Tester Operation	Tester Connection	Specified Condition
VSV is ON	VSV for EVAP: (V1-1) – (V1-2)	9 to 14 V
VSV is OFF	VSV for EVAP: (V1-1) – (V1-2)	0 V

- (f) Turn the ignition switch OFF.
- (g) Check the resistance in VSV for EVAP wire harness.

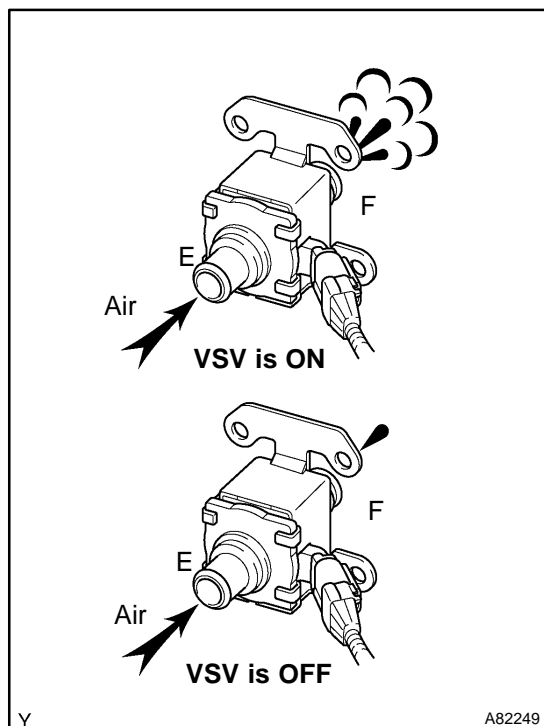
Standard :

Tester Connection	Specified Condition
VSV for EVAP (V1-1) – Body ground	10 Ω or higher
VSV for EVAP (V1-2) – Body ground	

- (h) Reconnect the VSV for EVAP connector.

NG REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

REPLACE ECM (See page 10-17)**17 | PERFORM ACTIVE TEST BY HAND-HELD TESTER(VSV FOR CCV)**

- Remove the VSV for CCV.
- Turn the ignition switch ON.
- Select the item "DIAGNOSIS / ENHANCED OBD II / ACTIVE TEST / CAN CTRL VSV" (press the right or left button).
- Check the VSV for CCV operation while operating it with the hand-held tester.

Standard:

Tester Operation	Specified Condition
VSV is ON	Air does not flow from ports E to F
VSV is OFF	Air from port E flows out through port F

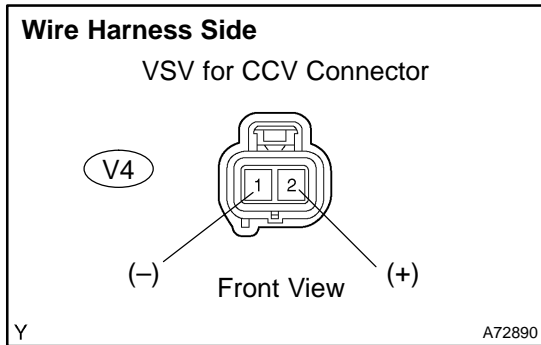
- Reinstall the VSV for CCV.

OK**Go to step 21****NG****18 | CHECK VACUUM HOSES(VSV FOR CCV - CHARCOAL CANISTER)**

- Check that the vacuum hoses are connected correctly.
- Check that the vacuum hoses are not loose or disconnected.
- Check the vacuum hoses and tubes for cracks, holes, damage, or blockage.

NG**REPAIR OR REPLACE****OK****19 | CHECK OPERATION OF VSV FOR CCV (See page 12-12)****NG****REPLACE VSV AND CLEAN VACUUM HOSES, AND THEN CHECK CHARCOAL CANISTER****OK**

20 CHECK HARNESS AND CONNECTOR(VSV FOR CCV – ECM, VSV FOR CCV – EFI RELAY)



- (a) Disconnect the V4 VSV for CCV connector.
- (b) Turn the ignition switch ON.
- (c) Measure the voltage between the specified terminal of the V4 VSV for CCV connector and body ground.

Standard :

Tester Connection	Specified Condition
VSV for CCV (V4-2) – Body ground	9 to 14 V

- (d) Select the item "DIAGNOSIS / ENHANCED OBD II / ACTIVE TEST / CAN CTRL VSV" (press the right or left button).
- (e) When the VSV for CCV is operated by the hand-held tester, measure the voltage between the specified terminals of the V4 VSV for CCV connector.

Standard :

Tester Operation	Tester Connection	Specified Condition
VSV is ON	VSV for CCV: (V4-1) – (V4-2)	9 to 14 V
VSV is OFF	VSV for CCV: (V4-1) – (V4-2)	0 V

- (f) Turn the ignition switch OFF.
- (g) Check the resistance in VSV for CCV wire harness.

Standard :

Tester Connection	Specified Condition
VSV for CCV (V4-1) – Body ground	10 Ω or higher
VSV for CCV (V4-2) – Body ground	

- (h) Reconnect the VSV for CCV connector.

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

REPLACE ECM (See page 10-17)

21 INSPECT FUEL TANK ASSY(CRACKS AND DAMAGE)

NG → **REPLACE FUEL TANK ASSY**

OK

22 INSPECT CHARCOAL CANISTER ASSY(CRACKS AND DAMAGE)

NG → **REPLACE CHARCOAL CANISTER ASSY**

OK

23 INSPECT CHARCOAL CANISTER ASSY (See page 12-12)

NG → **REPLACE CHARCOAL CANISTER ASSY**

OK

24 CHECK FUEL TANK OVER FILL CHECK VALVE

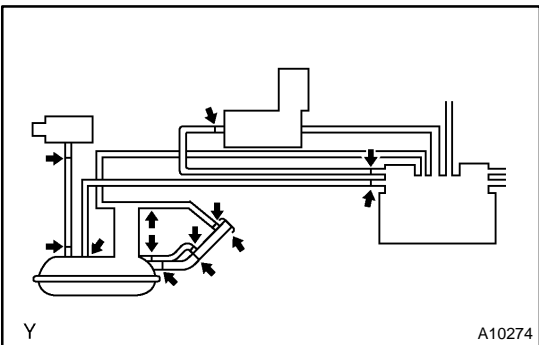
NG → **REPLACE FUEL TANK OVER FILL CHECK VALVE OR FUEL TANK**

OK

REPLACE ECM (See page 10-17)

OBD II scan tool (excluding hand-held tester):

1 CHECK FOR EVAPORATIVE EMISSIONS LEAK



(a) Check if any hoses close to the fuel tank have been modified, and check if there are signs of any accident damage near the fuel tank or the charcoal canister.

- (1) Check the following parts for cracks, deformation or loose connections:
- Fuel tank
 - Charcoal canister
 - Fuel tank filler pipe
 - Hoses and tubes around the fuel tank and charcoal canister

NG → **REPAIR OR REPLACE**

OK

2 INSPECT FUEL TANK CAP ASSY(CHECK THAT FUEL TANK IS GENUINE PARTS)

NG → **REPLACE TO 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 12-8)

NG → REPLACE FUEL TANK CAP ASSY

OK

5 CHECK FILLER NECK FOR DAMAGE

NG → REPLACE FUEL TANK INLET PIPE SUB-ASSY

OK

6 CHECK EACH CONNECTOR FOR LOOSENESS AND DISCONNECTION(VSV FOR EVAP, VSV FOR CCV AND VAPOR PRESSURE SENSOR)

NG → REPAIR OR CONNECT VSV AND SENSOR CONNECTOR

OK

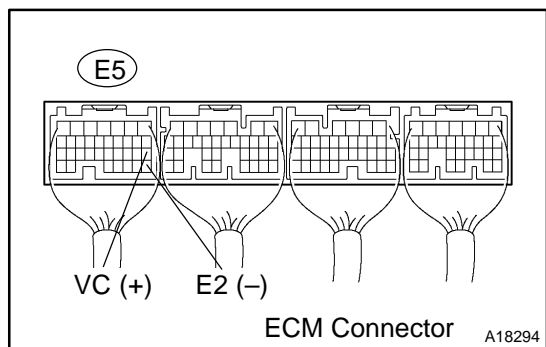
7 CHECK VACUUM HOSES((9), (10) AND (11) IN FIG. 1 CIRCUIT DESCRIPTION)

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

NG → REPAIR OR REPLACE

OK

8 INSPECT ECM(VC VOLTAGE)



- (a) Turn the ignition switch ON.
- (b) Measure the voltage between the specified terminals of the E5 ECM connector.

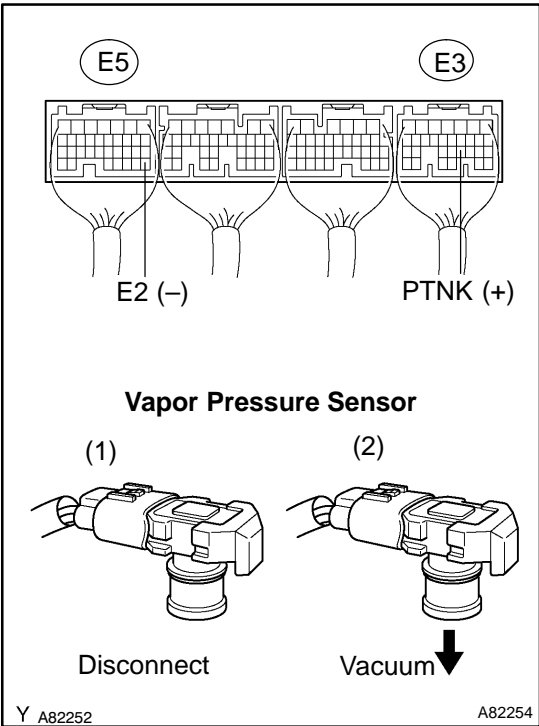
Standard:

Tester Connection	Specified Condition
VC (E5-18) – E2 (E5-28)	4.5 to 5.5 V

NG → REPLACE ECM (See page 10-17)

OK

9 INSPECT ECM(PTNK VOLTAGE)



- (a) Turn the ignition switch ON.
- (b) Measure the voltage between the specified terminals of the E3 and E5 ECM connectors.
 - (1) Remove the vapor pressure sensor.

Standard (1):

Tester Connection	Specified Condition
PTNK (E3-21) – E2 (E5-28)	2.9 to 3.7 V

- (2) Using the MITYVAC (Hand-Held Vacuum Pump), apply a vacuum of 4.0 kPa (30 mmHg, 1.18 in.Hg) to the vapor pressure sensor.

NOTICE:

The vacuum applied to the vapor pressure sensor must be less than 66.7 kPa (500 mmHg, 19.7 in.Hg).

Standard (2):

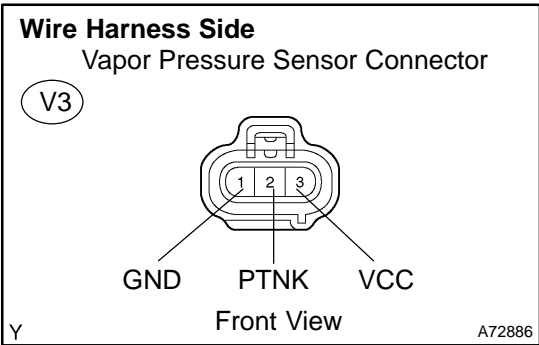
Tester Connection	Specified Condition
PTNK (E3-21) – E2 (E5-28)	0.5 V or less

- (3) Reinstall the vapor pressure sensor.

OK → Go to step 11

NG

10 CHECK HARNESS AND CONNECTOR(VAPOR PRESSURE SENSOR – ECM)



- (a) Disconnect the V3 vapor pressure sensor connector.
- (b) Disconnect the E3 and E5 ECM connectors.
- (c) Measure the resistance between the wire harness side connectors.

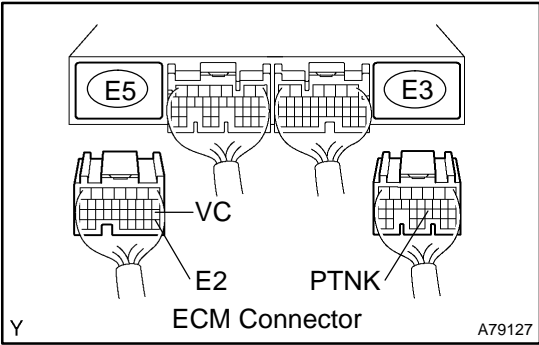
Standard (Check for open):

Tester Connection	Specified Condition
PTNK (V3-2) – PTNK (E3-21)	Below 1 Ω
GND (V3-1) – E2 (E5-28)	
VCC (V3-3) – VC (E5-18)	

Standard (Check for short):

Tester Connection	Specified Condition
PTNK (V3-2) or PTNK (E3-21) – Body ground	10 kΩ or higher
VCC (V3-3) or VC (E5-18) – Body ground	

- (d) Reconnect the vapor pressure sensor connector.
- (e) Reconnect the ECM connector.

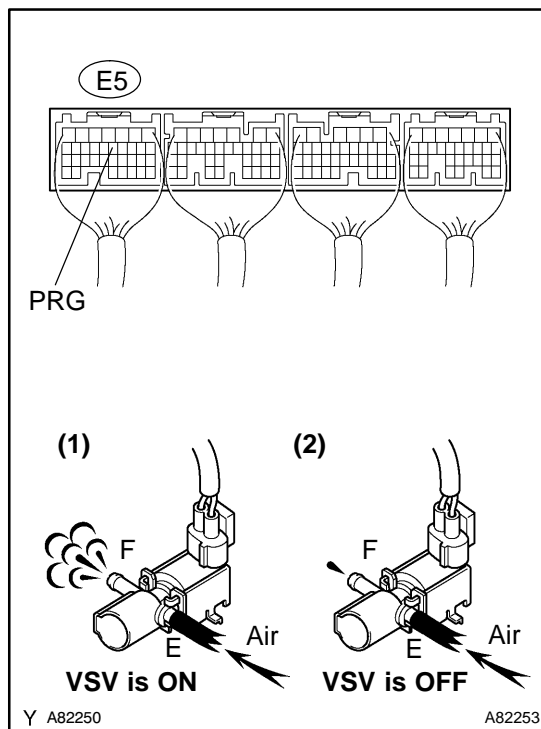


NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

REPLACE VAPOR PRESSURE SENSOR ASSY

11	INSPECT DUTY VACUUM SWITCHING VALVE(FUNCTION OF VSV FOR EVAP)
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- (a) Remove the VSV for EVAP.
- (b) Turn the ignition switch ON.
- (c) Check the VSV function.
 - (1) Connect terminal PRG (E5-12) of the ECM connector and the body ground (VSV for EVAP should be OPEN, i.e. ON).

Standard (1):**Air from port E flows out through port F.**

- (2) Disconnect between terminal PRG of the ECM connector and the body ground (VSV for EVAP should CLOSED, i.e. OFF).

Standard (2):**Air does not flow from port E to port F.**

- (d) Reinstall the VSV for EVAP.

OK	Go to step 14
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NG

12	CHECK OPERATION OF VSV FOR EVAP (See page 12-8)
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NG	REPLACE VSV AND CLEAN VACUUM HOSES, AND THEN CHECK CHARCOAL CANISTER
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OK

13 CHECK HARNESS AND CONNECTOR(VSV FOR EVAP – ECM, VSV FOR EVAP – EFI RELAY)

Wire Harness Side

VSV for EVAP Connector

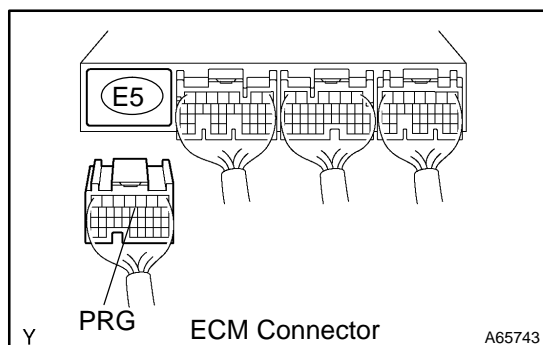
V1



Front View

A51984

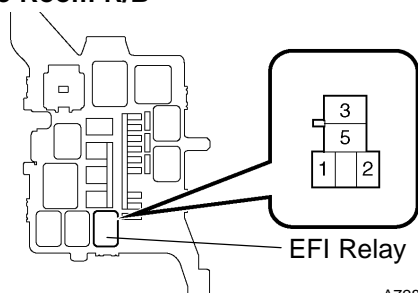
A52933



Y

A65743

Engine Room R/B



EFI Relay

Y

A72874

- (a) Check the harness and the connector between the VSV for EVAP connector and the ECM connector.
- (1) Disconnect the V1 VSV connector for EVAP connector.
 - (2) Disconnect the E5 ECM connector.
 - (3) Measure the resistance between the wire harness side connectors.

Standard (Check for open):

Tester Connection	Specified Condition
VSV for EVAP (V1-1) – PRG (E5-12)	Below 1 Ω

Standard (Check for short):

Tester Connection	Specified Condition
VSV for EVAP (V1-1) or PRG (E5-12) – Body ground	10 k Ω or higher

- (4) Reconnect the VSV for EVAP connector.
 - (5) Reconnect the ECM connector.
- (b) Check the harness and the connector between the VSV for EVAP connector and the EFI relay.
- (1) Disconnect the V1 VSV for EVAP connector.
 - (2) Remove the EFI relay from the engine room R/B.
 - (3) Measure the resistance between the wire harness side connectors.

Standard (Check for open):

Tester Connection	Specified Condition
VSV for EVAP (V1-2) – EFI relay (3)	Below 1 Ω

Standard (Check for short):

Tester Connection	Specified Condition
VSV for EVAP (V1-2) or EFI relay (3) – Body ground	10 k Ω or higher

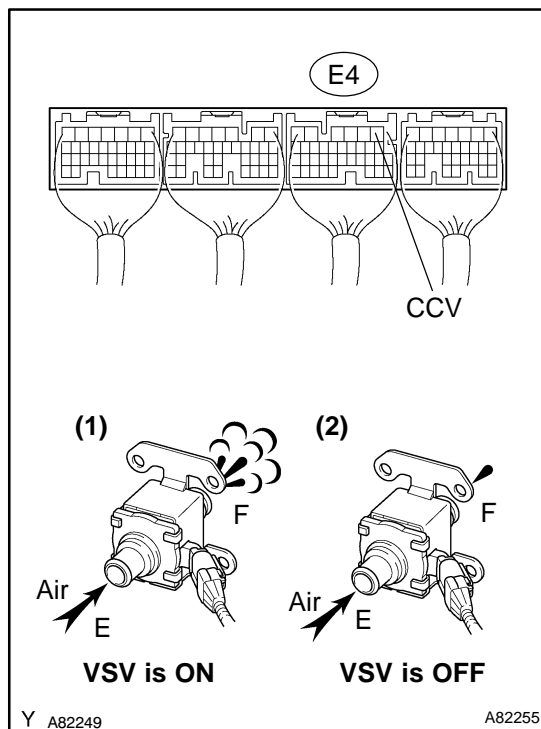
- (4) Reconnect the VSV for EVAP connector.
- (5) Reinstall the EFI relay.

NG

REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

REPLACE ECM (See page 10-17)

14 INSPECT VSV FOR CCV(FUNCTION OF VSV FOR CCV)


- (a) Remove the VSV for CCV.
- (b) Turn the ignition switch ON.
- (c) Check the VSV function.
 - (1) Connect terminal CCV (E4-1) of the ECM connector and the body ground (VSV for CCV should be CLOSED, i.e. ON).

Standard (1):

Air does not flow from port E to port F.

- (2) Disconnect between terminal CCV of the ECM connector and the body ground (VSV for CCV should be OPEN, i.e. OFF).

Standard (2):

Air from port E flows out through port F.

- (d) Reinstall the VSV for CCV.

OK Go to step 17

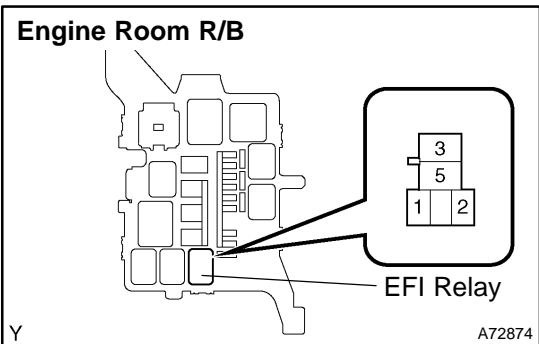
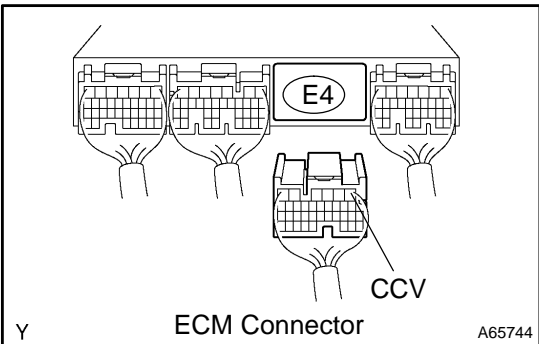
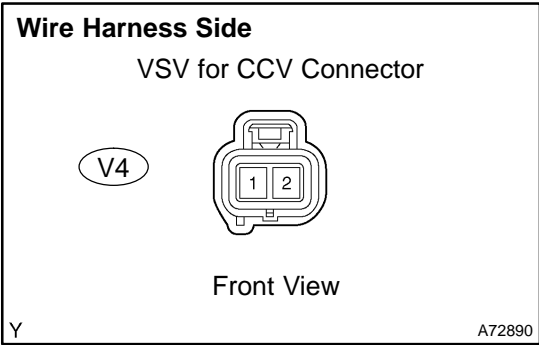
NG

15 CHECK OPERATION OF VSV FOR CCV (See page 12-8)

NG REPLACE VSV AND CLEAN VACUUM HOSES, AND THEN CHECK CHARCOAL CANISTER

OK

16 CHECK HARNESS AND CONNECTOR(VSV FOR CCV - ECM, VSV FOR CCV - EFI RELAY)



- (a) Check the harness and the connector between the VSV connector for CCV and the ECM connector.
- (1) Disconnect the V4 VSV connector for CCV.
 - (2) Disconnect the E4 ECM connector.
 - (3) Measure the resistance between the wire harness side connectors.

Standard (Check for open):

Tester Connection	Specified Condition
VSV for CCV (V4-2) - CCV (E4-1)	Below 1 Ω

Standard (Check for short):

Tester Connection	Specified Condition
VSV for CCV (V4-2) or CCV (E4-1) - Body ground	10 kΩ or higher

- (4) Reconnect the VSV for CCV connector.
 - (5) Reconnect the ECM connector.
- (b) Check the harness and the connector between the VSV for CCV connector and the EFI relay.
- (1) Disconnect the V4 VSV for CCV connector.
 - (2) Remove the EFI relay from the engine room R/B.
 - (3) Measure the resistance between the wire harness side connectors.

Standard (Check for open):

Tester Connection	Specified Condition
VSV for CCV (V4-1) - EFI relay (3)	Below 1 Ω

Standard (Check for short):

Tester Connection	Specified Condition
VSV for CCV (V4-1) or EFI relay (3) - Body ground	10 kΩ or higher

- (4) Reconnect the VSV for CCV connector.
- (5) Reinstall the EFI relay.

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

REPLACE ECM (See page 10-17)

17 CHECK FUEL TANK OVER FILL CHECK VALVE

NG → **REPLACE FUEL TANK OVER FILL CHECK VALVE OR FUEL TANK**

OK

CHECK AND REPLACE CHARCOAL CANISTER ASSY