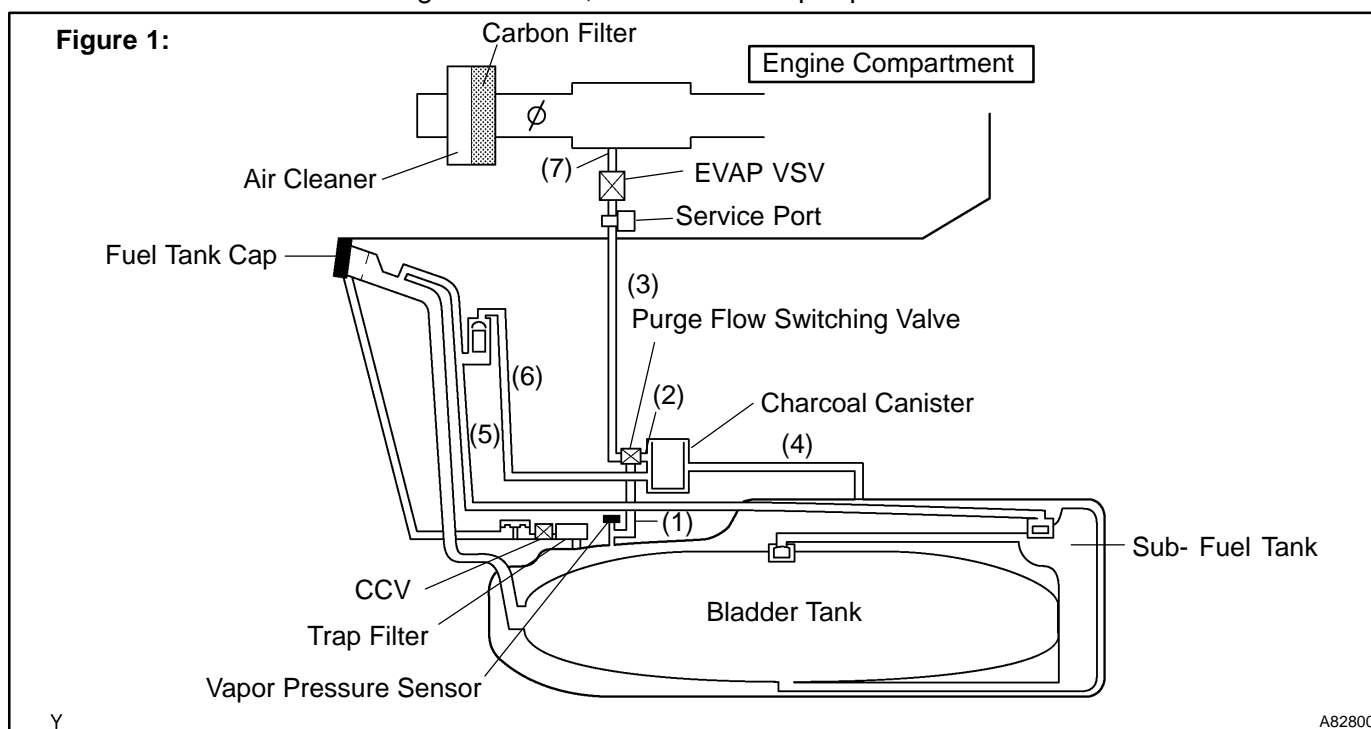


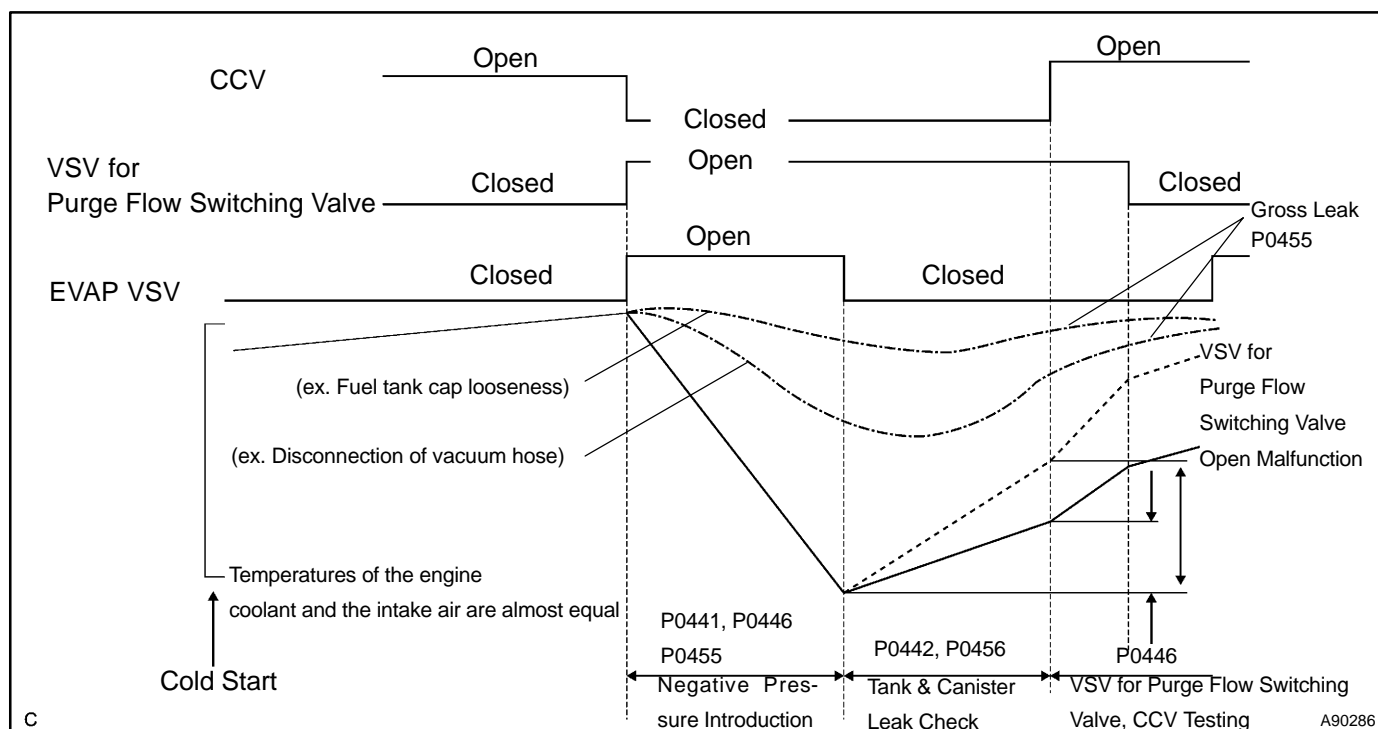
<b>DTC</b>	<b>P0442</b>	<b>EVAPORATIVE EMISSION CONTROL SYSTEM LEAK DETECTED (SMALL LEAK)</b>
<b>DTC</b>	<b>P0455</b>	<b>EVAPORATIVE EMISSION CONTROL SYSTEM LEAK DETECTED (GROSS LEAK)</b>
<b>DTC</b>	<b>P0456</b>	<b>EVAPORATIVE EMISSION CONTROL SYSTEM LEAK DETECTED (VERY SMALL LEAK)</b>

## CIRCUIT DESCRIPTION

The vapor pressure sensor and the VSV for the 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.

DTC P0442, P0455 or P0456 is recorded by the ECM when evaporative emissions leak from the components within the dotted line in figure 1 below, or when the vapor pressure sensor malfunctions.





DTC No.	DTC Detection Condition	Trouble Area
P0442	After negative pressure (vacuum) introduction is completed, if the pressure in the EVAP system sharply increases (small leak) (2 trip detection logic)	<ul style="list-style-type: none"> <li>Fuel tank cap is incorrectly installed</li> <li>Fuel tank cap is cracked or damaged</li> <li>Vacuum hose cracks is blocked, damaged or disconnected ((1), (2), (3), (4), (5), (6) and (7) in Fig. 1)</li> <li>Open or short in vapor pressure sensor circuit</li> <li>Vapor pressure sensor</li> <li>Open or short in EVAP VSV circuit</li> <li>EVAP VSV</li> <li>Open or short in CCV circuit</li> <li>CCV</li> <li>Open or short in VSV for purge flow switching valve circuit</li> <li>VSV for purge flow switching valve</li> <li>Fuel tank is cracked, or damaged</li> <li>Charcoal canister is cracked, or damaged</li> <li>Fuel tank over fill check valve is cracked or damaged</li> <li>ECM</li> </ul>
P0455	Following conditions are met: <ul style="list-style-type: none"> <li>While the negative pressure introduction is performed, if the fuel tank pressure does not reach standard level</li> <li>If the pressure in the EVAP system sharply increases during leak check</li> </ul>	<ul style="list-style-type: none"> <li>Same as DTC P0442</li> </ul>
P0456	If the pressure in the EVAP system slightly increases while the ECM performs a leak check (very small leak) (2 trip detection logic)	<ul style="list-style-type: none"> <li>Same as DTC P0442</li> </ul>

**HINT:**

Typical DTC output of each trouble part.

Trouble Part	Trouble Condition	Typical DTC Output (*1)
—	Small leak	P0442 and/or P0456
—	Medium leak (ex: Vacuum hose looseness)	P0442 and/or P0455
—	Large leak (ex: Fuel tank cap looseness)	P0441 and P0442 and P0446 and P0455 (*2)
EVAP VSV	Open malfunction	P0441
EVAP VSV	Close malfunction	P0441 and P0442 and P0446
CCV	Open malfunction	P0441 and P0442 and P0446 and P0455
CCV	Close malfunction	P0446
VSV for Purge flow Switching valve	Open malfunction	P0446
VSV for Purge flow Switching valve	Close malfunction	P0441 and P0442 and P0446

\*1: ECM may output some other DTCs combination.

\*2: Refer to DTCs P0441 and P0446 on page [05-230](#) .

## MONITOR DESCRIPTION

The evaporative emission system consists of the vapor pressure sensor, the canister close valve (CCV), the VSV for purge flow switching valve and the EVAP VSV (Purge VSV). These are used to detect malfunction in the system by ECM.

This test will run once per driving cycle when the ECM detects stable vapor pressure in the fuel tank. While the vehicle is being driven on rough or winding roads, the movement of the fuel in the tank will cause unstable fuel tank vapor pressure and the diagnostic test will not be executed.

The ECM performs the following steps:

- (a) Closes the canister close valve (CCV) (shuts the system).
- (b) Checks the stability of the fuel tank pressure. If the variation in the pressure is greater than the specified value, disables the diagnosis.
- (c) Opens the EVAP VSV to introduce negative pressure (vacuum) from the intake manifold into the fuel tank.
- (d) Closes the EVAP VSV to seal the fuel tank for storing the negative pressure.
- (e) Monitors the negative pressure in the fuel tank for:
  - (1) Rapid decrease, i.e. a large leak, 0.040 inch or more
  - (2) Decrease greater than the normal value

If the ECM detects either of above conditions, the ECM interprets this as a leak in the EVAP system.

The ECM will illuminate the MIL (2 trip detection logic) and set a DTC.

## MONITOR STRATEGY

Related DTCs	P0442: Small leak (0.040inch or more hole) detected P0455: Large leak detected P0456: Very small leak (0.020 inch or more hole)
Required sensors/components	Main: Vapor pressure sensor, EVAP VSV (purge VSV), CCV, Related: Engine coolant temperature sensor, Mass air flow meter
Frequency of operation	Once per driving cycle
Duration	60 seconds
MIL operation	2 driving cycles
Sequence of operation	None

## TYPICAL ENABLING CONDITIONS

The monitor will run whenever the following DTCs are not present	See page <a href="#">05-20</a>
Battery voltage	11 V or more
Altitude	Less than 2,400 m (8,000 ft)
Intake air temperature (IAT)	10 °C (50 °F) or more
Intake air temperature (IAT) at engine start	0.040 inch malfunction: Between 10 °C (50 °F) and 35 °C (92 °F) 0.020 inch malfunction: Between 10 °C (50 °F) and 32 °C (89.6 °F) Gross leak malfunction: Between 10 °C (50 °F) and 35 °C (92 °F)
Engine coolant temperature (ECT) at engine start	Between 10 °C (50 °F) and 35 °C (92 °F)
Intake air temperature at engine start compared with engine coolant temperature	Maximum of 7°C (12.6°F) lower or 11.1°C (19.9°F) higher
EVAP VSV and CCV	Not operated by scan tool
Time after engine start	Less than 60 minutes
Vehicle speed	Less than 130 km/h
Fuel slosh	No sloshing, i.e. fairly smooth road
MAF	No great change
Fuel tank pressure change	Minimal change

## TYPICAL MALFUNCTION THRESHOLDS

### P0442: 0.040 inch malfunction detection

Fuel tank pressure changing value for 5 seconds from -2.0 kPa (-15 mmHg) point	Increases 0.187 kPa (1.4 mmHg) or more
Fuel tank pressure changing value for 5 seconds from -2.6 kPa (-20 mmHg) point	Increases 0.187 kPa (1.4 mmHg) or more

### P0455: gross leak

Fuel tank pressure changing value for 5 seconds from -2.0 kPa (-15 mmHg) point	Increases more than 0.187 kPa (1.4 mmHg)
Fuel tank pressure changing value for 5 seconds from -2.6 kPa (-20 mmHg) point	Increases more than 0.187 kPa (1.4 mmHg)
Fuel tank pressure minimum value	More than -2.4 kPa (18 mmHg)

### P0456: 0.020 inch malfunction detection

Fuel tank pressure changing value for 5 seconds from -2.3 kPa (-17 mmHg) point	Increases more than 0.0533 kPa (0.4 mmHg)
Fuel tank pressure changing value for 5 seconds from -2.6 kPa (-20 mmHg) point	Increases more than 0.0533 kPa (0.4 mmHg)

## MONITOR RESULT

The detailed information is described in "CHECKING MONITOR STATUS" (see page 05-26 ).

- MID (Monitor Identification) is assigned to each component/system.
- TID (Test Identification) is assigned to each test component.
- Scaling is used to calculate the test value indicated on generic OBD scan tools.

### EVAP - Bladder Tank System

MID	TID	Scaling	Description of Test Value
\$3B	\$C1	Multiply by 0.001 (kPa)	Test value of 0.02 inch leak: Determined by fuel tank pressure change
\$3C	\$C2	Multiply by 0.001 (kPa)	Test value of 0.04 inch leak: Determined by fuel tank pressure change
\$3D	\$C7	Multiply by 0.001 (kPa)	Test value of canister closed valve (CCV): Determined by fuel tank pressure change at switching over CCV
	\$C8	Multiply by 0.001 (kPa)	Test value of bypass VSV (VSV for bypass valve): Determined by fuel tank pressure change at switching over bypass VSV
	\$D4	Multiply by 0.001 (kPa)	Test value of EVAP VSV stuck closed: Determined by fuel tank pressure change during vacuum introduction
	\$D5	Multiply by 0.1 (seconds)	Test value of EVAP VSV stuck open: Determined by abnormal state continuation time

## INSPECTION PROCEDURE

### HINT:

- When using the hand-held tester, follow the procedures under the title "Hand-held tester " (see below).
- When using the OBD II scan tool, follow the procedures under the title "OBD II scan tool (excluding hand-held tester)" (see the procedures after the "Hand-held tester" procedures).
- Always troubleshoot DTCs P0441 (purge flow), P0446 (CCV), P0451, P0452 and P0453 (evaporative pressure sensor) before troubleshooting DTCs P0442 or P0456.
- Ask the customer the following questions:
  - 1) When the MIL came on, if the fuel tank cap was loose and if it was then tightened.
  - 2) When refueling, if the fuel tank cap was loose.

If the fuel tank cap was loose, that is why the DTC was stored.

If the fuel cap was not loose or if the customer cannot remember, troubleshoot according to the procedures on the following page.
- Read freeze frame data using the hand-held tester or the OBD II scan tool. Freeze frame data records the engine condition when malfunction is detected. When troubleshooting, freeze frame data can help determine if the vehicle was running or stopped, if the engine was warmed up or not, if the air-fuel ratio was lean or rich, and other data from the time the malfunction occurred.
- If 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 FUEL TANK CAP ASSY(CHECK THAT FUEL TANK CAP MEETS SPECIFICATIONS)
---	---

OK: Tank cap meets specifications in the owner's manual.

NG

FUEL TANK CAP ASSY

OK

## 2 CHECK THAT FUEL TANK CAP IS CORRECTLY INSTALLED

OK: Tank cap is correctly installed.

NG

CORRECTLY REINSTALL FUEL TANK CAP

OK

## 3 INSPECT FUEL TANK CAP ASSY (See page 12-9)

OK: Tank cap has no deformation.

NG

REPLACE FUEL TANK CAP ASSY

OK

## 4 CHECK FILLER NECK FOR DAMAGE

- Remove the fuel tank cap.
- Visually check the fuel inlet pipe for damage.
- Reinstall the fuel tank cap.

OK: Filler neck has no damage.

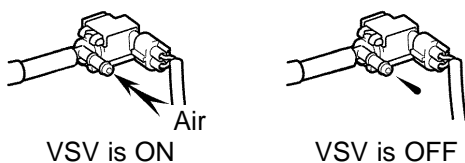
NG

REPLACE FUEL TANK INLET PIPE SUB-ASSY

OK

## 5 PERFORM ACTIVE TEST BY HAND-HELD TESTER(CHECK FOR EVAP PURGE FLOW)

### EVAP VSV:



A77159

- Select the item: DIAGNOSIS / ENHANCED OBD II / ACTIVE TEST on the hand-held tester.
- Disconnect the vacuum hose of the EVAP VSV from the charcoal canister.
- Put the engine in inspection mode (see page 01-27).
- Start the engine.
- Select the item: EVAP VSV (ALONE) and operate EVAP VSV (press the right or left button).
- When the EVAP VSV is operated using the hand-held tester, check if the disconnected hose applies suction to your finger.

### Result:

**VSV is ON: Disconnected hose sucks.**

**VSV is OFF: Disconnected hose does not suck.**

- Reconnect the vacuum hose.

OK

Go to step 9

NG

## 6 CHECK VACUUM HOSES(INTAKE MANIFOLD - EVAP VSV, EVAP VSV - CHARCOAL CANISTER)

- Check that the vacuum hoses are connected correctly.
- Check the vacuum hoses for looseness or disconnection.
- Check the vacuum hoses for cracks, hole, damage or blockages.

NG

REPAIR OR REPLACE VACUUM HOSE

OK

## 7 INSPECT EVAP VSV(OPERATION) (See page 12-9)

OK: Air from port E flows out through port F when applying the battery voltage.

NG

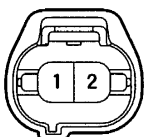
REPLACE EVAP VSV

OK

## 8 CHECK HARNESS AND CONNECTOR(EFI M RELAY - EVAP VSV, EVAP VSV - ECM)

### Wire Harness Side:

V1 EVAP VSV Connector



Front View

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A52933

- Check the harness and the connectors between the EVAP VSV and ECM connectors.
  - Disconnect the V1 EVAP VSV connector.
  - Disconnect the E5 ECM connector.
  - Check the resistance between the wire harness side connectors.

### Standard (Check for open):

Tester Connection	Specified Condition
EVAP VSV (V1-1) - EVP1 (E5-14)	Below 1 $\Omega$

### Standard (Check for short):

Tester Connection	Specified Condition
EVAP VSV (V1-1) or EVP1 (E5-14) - Body ground	10 k $\Omega$ or higher

- Reconnect the EVAP VSV connector.
- Reconnect the ECM connector.
- Check the harness and the connectors between the EVAP VSV connector and EFI M relay.
  - Disconnect the V1 EVAP VSV connector.
  - Remove the integration relay from the engine room R/B.
  - Check the resistance between the wire harness side connectors.

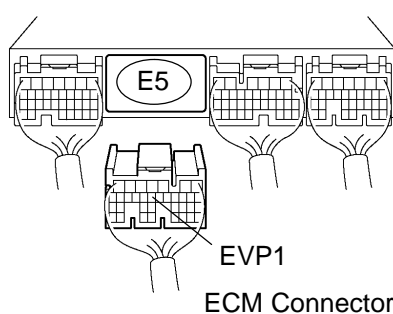
### Standard (Check for open):

Tester Connection	Specified Condition
EVAP VSV (V1-2) - EFI M relay (3I-8)	Below 1 $\Omega$

### Standard (Check for short):

Tester Connection	Specified Condition
EVAP VSV (V1-2) or EFI M relay (3I-8) - Body ground	10 k $\Omega$ or higher

- Reconnect the EVAP VSV connector.
- Reinstall the integration relay.

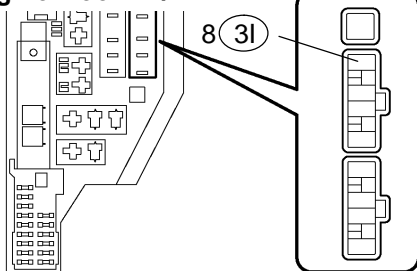


ECM Connector

Y

A65745

### Engine Room R/B:



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NG

REPAIR OR REPLACE HARNESS OR CONNECTOR

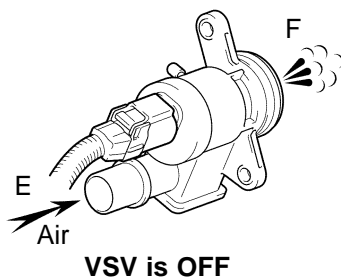
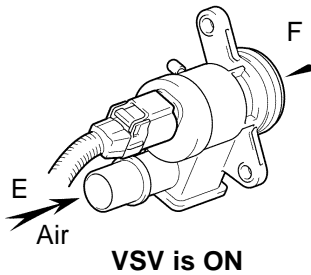
OK

REPLACE ECM (See page 10-24 )

9

## PERFORM ACTIVE TEST BY HAND-HELD TESTER(CCV)

CCV:



A72896

- Disconnect the vacuum hose of the CCV from the charcoal canister.
- Put the engine in inspection mode (see page 01-27 ).
- Start the engine.
- Select the item: DIAGNOSIS / ENHANCED OBD II / ACTIVE TEST on the hand-held tester.
- Select the item: CAN CTRL VSV and operate CAN CTRL VSV (press the right or left button).
- Check the VSV operation when it is operated using the hand-held tester.

**Standard:**

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

OK

Go to step 13

NG

10

## CHECK VACUUM HOSES(CCV - CHARCOAL CANISTER)

- Check that the vacuum hoses are connected correctly.
- Check the vacuum hoses for looseness or disconnection.
- Check the vacuum hoses for cracks, hole, damage or blockages.

NG

REPAIR OR REPLACE VACUUM HOSES

OK

11

## INSPECT CCV(OPERATION) (See page 12-9 )

OK: Air does not flow from port E to F when applying the battery voltage.

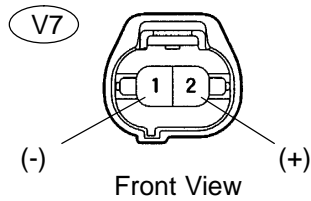
NG

REPLACE CCV

OK

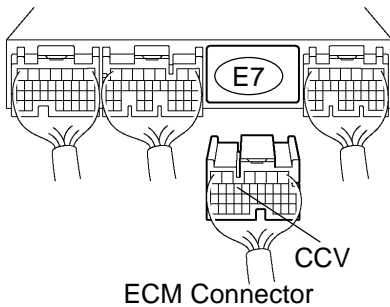
**12 CHECK HARNESS AND CONNECTOR(EFI M RELAY - CCV, CCV - ECM)****Wire Harness Side:**

CCV Connector



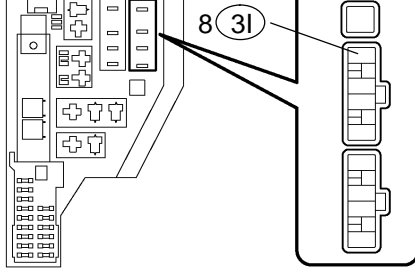
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Y

A65744

**Engine Room R/B:**

A82810

- (a) Check the harness and connectors between the CCV and ECM.

- (1) Disconnect the V7 CCV connector.
- (2) Disconnect the E7 ECM connector.
- (3) Check the resistance between the wire harness side connectors.

**Standard (Check for open):**

Tester Connection	Specified Condition
CCV (V7-1) - CCV (E7-13)	Below 1 $\Omega$

Tester Connection	Specified Condition
CCV (V7-1) or CCV (E7-13) - Body ground	10 k $\Omega$ or higher

- (4) Reconnect the CCV connector.
- (5) Reconnect the ECM connector.

- (b) Check the harness and the connectors between the CCV connector and EFI M relay.

- (1) Disconnect the V7 CCV connector.
- (2) Remove the integration relay from the engine room R/B.
- (3) Check the resistance between the wire harness side connectors.

**Standard (Check for open):**

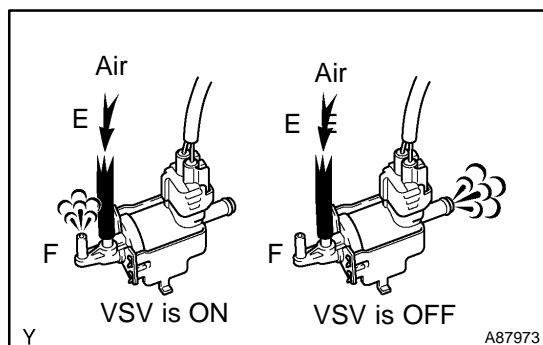
Tester Connection	Specified Condition
CCV (V7-2) - EFI M relay (3I-8)	Below 1 $\Omega$

**Standard (Check for short):**

Tester Connection	Specified Condition
CCV (V7-2) or EFI M relay (3I-8) - Body ground	10 k $\Omega$ or higher

- (4) Reconnect the CCV connector.
- (5) Reinstall the integration relay.

**NG****REPAIR OR REPLACE HARNESS OR CONNECTOR****OK****REPLACE ECM (See page 10-24 )**

**13 PERFORM ACTIVE TEST BY HAND-HELD TESTER(VSV FOR PURGE FLOW SWITCHING VALVE)**

- Select the item: DIAGNOSIS / ENHANCED OBD II / ACTIVE TEST on the hand-held tester.
- Select the item: TANK BYPASS VSV / ALL and operate TANK BYPASS VSV (press the right or left button).
- Check the VSV operation when it is operated using the hand-held tester.

**Standard:**

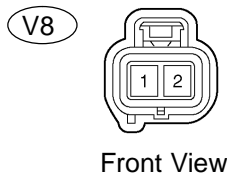
Tester Operation	Specified Condition
VSV is ON	Air from port E flows out through port F
VSV is OFF	Air does not flow from port E to F

**OK****Go to step 16****NG****14 INSPECT VSV FOR PURGE FLOW SWITCHING VALVE(OPERATION)**  
(See page 12-9)**OK:** Air from port E flows out through port F when applying the battery voltage.**NG****REPLACE VSV FOR PURGE FLOW SWITCHING VALVE****OK**

# 15 CHECK HARNESS AND CONNECTOR(EFI M RELAY - VSV FOR PURGE FLOW SWITCHING VALVE, VSV FOR PURGE FLOW SWITCHING VALVE - ECM)

## Wire Harness Side:

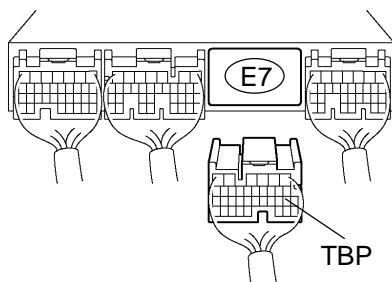
VSV for Purge Flow Switching Valve



Front View

Y

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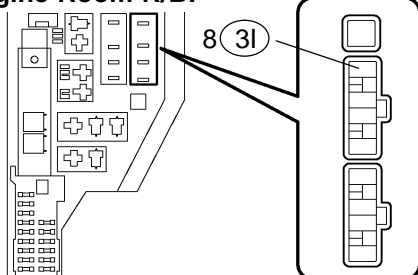


ECM Connector

Y

A65744

## Engine Room R/B:



A82810

- (a) Check the harness and the connectors between the VSV for purge flow switching valve and the ECM connectors.
  - (1) Disconnect the V8 VSV for purge flow switching valve connector.
  - (2) Disconnect the E7 ECM connector.
  - (3) Check the resistance between the wire harness side connectors.

### Standard (Check for open):

Tester Connection	Specified Condition
VSV for purge flow switching valve (V8-1) - TBP (E7-18)	Below 1 $\Omega$

### Standard (Check for short):

Tester Connection	Specified Condition
VSV for purge flow switching valve (V8-1) or TBP (E7-18) - Body ground	10 k $\Omega$ or higher

- (4) Reconnect the VSV for purge flow switching valve connector.
- (5) Reconnect the ECM connector.
- (b) Check the harness and the connectors between the VSV for purge flow switching valve connector and EFI M relay.
  - (1) Disconnect the V8 VSV for purge flow switching valve connector.
  - (2) Remove the integration relay from the engine room R/B.
  - (3) Check the resistance between the wire harness side connectors.

### Standard (Check for open):

Tester Connection	Specified Condition
VSV for purge flow switching valve (V8-2) - EFI M relay (31-8)	Below 1 $\Omega$

### Standard (Check for short):

Tester Connection	Specified Condition
VSV for purge flow switching valve (V8-2) or EFI M relay (31-8) - Body ground	10 k $\Omega$ or higher

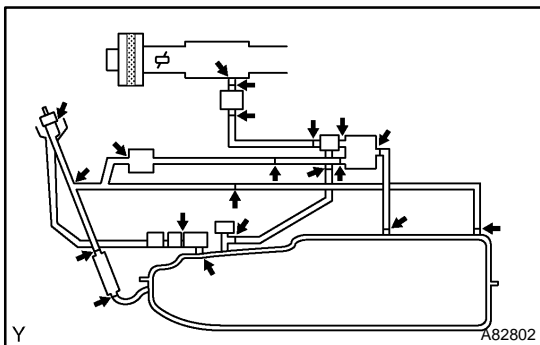
- (4) Reconnect the VSV for purge flow switching valve connector.
- (5) Reinstall the integration relay.

NG

REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

REPLACE ECM (See page 10-24 )

**16 CHECK FOR EVAPORATIVE EMISSIONS LEAK(NEAR FUEL TANK)**

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

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

- Fuel tank
- Fuel tank filler pipe
- Hoses and tubes around fuel tank

**OK: No leakage in the system**

**NG**

**REPAIR OR REPLACE EVAPORATIVE EMISSIONS LEAK PART**

**OK**

**17 CHECK VACUUM HOSES((1), (2) AND (3))**

- (a) Check that the vacuum hoses are connected correctly.  
 (b) Check the vacuum hoses for looseness or disconnection.  
 (c) Check the vacuum hoses for cracks, hole or damage.

**NG**

**REPAIR OR REPLACE VACUUM HOSE**

**OK**

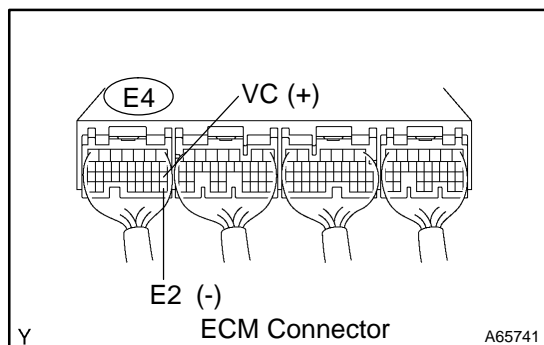
**18 CHECK HOSE AND TUBE(FUEL TANK - CHARCOAL CANISTER)**

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

**NG**

**REPAIR OR REPLACE HOSE AND TUBE**

**OK**

**19 INSPECT ECM(VC VOLTAGE)**

(a) Turn the power switch ON (IG).

(b) Measure the voltage between the terminals of the E4 ECM connector.

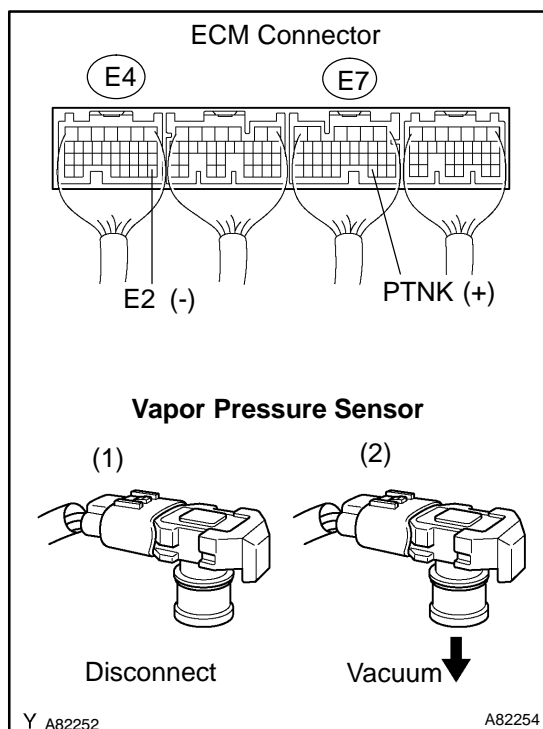
**Standard:**

Tester Connection	Specified Condition
VC (E4-18) - E2 (E4-28)	4.5 to 5.5 V

**NG**

**REPLACE ECM (See page 10-24 )**

**OK**

**20 INSPECT ECM(PTNK VOLTAGE)**

- (a) Turn the power switch ON (IG).
- (b) Measure the voltage between terminals of the E4 and E7 ECM connectors.
  - (1) Disconnect the vacuum hose from the vapor pressure sensor.

**Standard (1):**

Tester Connection	Specified Condition
PTNK (E7-30) - E2 (E4-28)	2.9 to 3.7 V

**NOTICE:**

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

- (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.

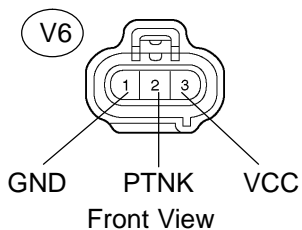
**Standard (2):**

Tester Connection	Specified Condition
PTNK (E7-30) - E2 (E4-28)	0.5 V or less

- (3) Reconnect the vacuum hose.

**OK****Go to step 22****NG****21 CHECK HARNESS AND CONNECTOR(VAPOR PRESSURE SENSOR - ECM)****Wire Harness Side:**

Vapor Pressure Sensor Connector



- (a) Disconnect the V6 vapor pressure sensor connector.
- (b) Disconnect the E4 and E7 ECM connectors.
- (c) Check the resistance between the wire harness side connectors.

**Standard (Check for open):**

Tester Connection	Specified Condition
PTNK (V6-2) - PTNK (E7-30)	Below 1 $\Omega$
GND (V6-1) - E2 (E4-28)	Below 1 $\Omega$
VCC (V6-3) - VC (E4-18)	Below 1 $\Omega$

**Standard (Check for short):**

Tester Connection	Specified Condition
PTNK (V6-2) or PTNK (E7-30) - Body ground	10 k $\Omega$ or higher
VCC (V6-3) or VC (E4-18) - Body ground	10 k $\Omega$ or higher

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

**NG****REPAIR OR REPLACE HARNESS OR CONNECTOR****OK****REPLACE VAPOR PRESSURE SENSOR ASSY**

**22 INSPECT FUEL TANK ASSY**

OK: Fuel tank has no crack or hole.

**NG****REPLACE FUEL TANK ASSY****OK****23 INSPECT CHARCOAL CANISTER ASSY(CRACKS, HOLES AND DAMAGE)**

OK: Canister has no crack or holes.

**NG****REPAIR OR REPLACE CHARCOAL CANISTER ASSY****OK****REPLACE ECM (See page [10-24](#) )**

**OBDII scan tool (excluding Hand-held Tester):**

<b>1</b>	<b>CHECK FUEL TANK CAP ASSY(CHECK THAT FUEL TANK CAP MEETS SPECIFICATIONS)</b>
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<b>NG</b>	<b>REPLACE FUEL TANK CAP ASSY</b>
-----------	-----------------------------------

<b>OK</b>
-----------

<b>2</b>	<b>CHECK THAT FUEL TANK CAP IS CORRECTLY INSTALLED</b>
----------	--

<b>NG</b>	<b>CORRECTLY REINSTALL FUEL TANK CAP</b>
-----------	--

<b>OK</b>
-----------

<b>3</b>	<b>INSPECT FUEL TANK CAP ASSY (See page 12-9 )</b>
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<b>NG</b>	<b>REPLACE FUEL TANK CAP ASSY</b>
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<b>OK</b>
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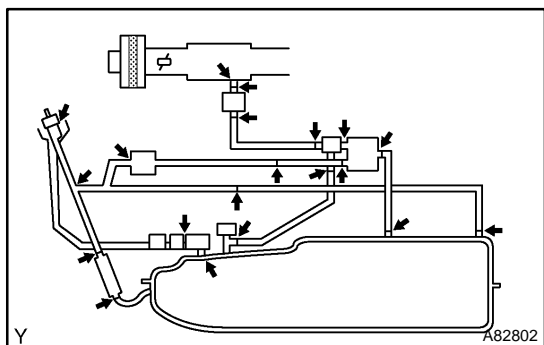
<b>4</b>	<b>CHECK FILLER NECK FOR DAMAGE</b>
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- (a) Remove the fuel tank cap.  
 (b) Visually check the fuel inlet pipe for damage.

<b>NG</b>	<b>REPLACE FUEL TANK INLET PIPE SUB-ASSY</b>
-----------	--

<b>OK</b>
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<b>5</b>	<b>CHECK FOR EVAPORATIVE EMISSIONS LEAK(NEAR FUEL TANK OR CHACOAL CANISTER)</b>
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- (a) Check whether hoses close to the fuel tank have been modified, and check if there are signs of any accident near the fuel tank or the charcoal canister.
- (1) Check the following parts for cracks, deformation or loose connection:
- Fuel tank
  - Charcoal canister
  - Fuel tank filler pipe
  - Hoses and tubes around fuel tank and charcoal canister

<b>NG</b>	<b>REPAIR OR REPLACE EVAPORATIVE EMISSIONS LEAK PART</b>
-----------	--

<b>OK</b>
-----------

**6 CHECK VACUUM HOSES((1), (2) AND (3))**

- (a) Check that the vacuum hoses are connected correctly.
- (b) Check the vacuum hoses for looseness or disconnection.
- (c) Check the vacuum hoses for cracks, holes or damage.

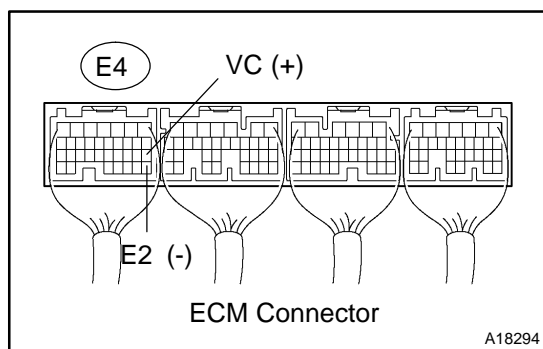
**NG****REPAIR OR REPLACE VACUUM HOSE****OK****7 CHECK HOSE AND TUBE(FUEL TANK - CHARCOAL CANISTER)**

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

**NG****REPAIR OR REPLACE HOSE AND TUBE****OK****8 CHECK VACUUM HOSES((5), (6), (7), (8) AND (9) IN FIG. 1 IN CIRCUIT DESCRIPTION)**

- (a) Check that the vacuum hoses are connected correctly.
- (b) Check the vacuum hoses for looseness or disconnection.
- (c) Check the vacuum hoses for cracks, hole or damage.

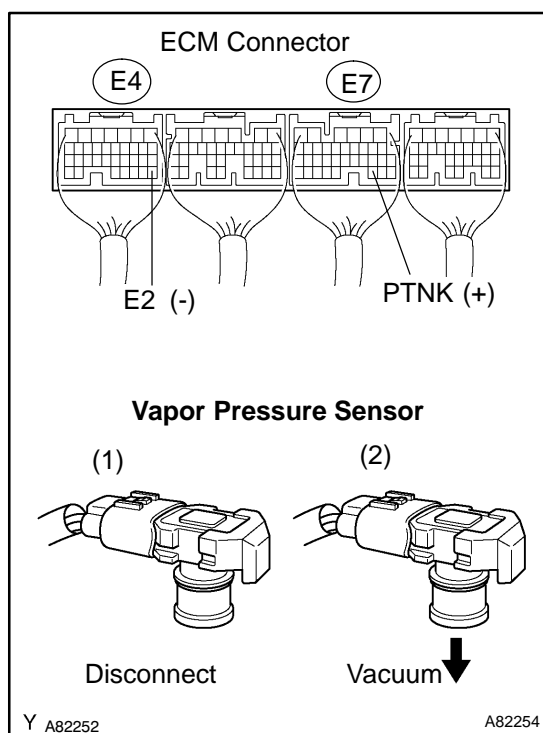
**NG****REPAIR OR REPLACE VACUUM HOSES****OK****9 CHECK EACH VSV CONNECTOR FOR LOOSENESS AND DISCONNECTION(EVAP VSV, CCV, VSV FOR PURGE FLOW SWITCHING VALVE)****NG****REPAIR OR CONNECT VSV AND SENSOR CONNECTOR****OK****10 INSPECT CHARCOAL CANISTER ASSY(CRACKS, HOLES AND DAMAGE)  
(See page 12-9)****NG****CHECK AND REPLACE CHARCOAL CANISTER ASSY****OK**

**11 INSPECT ECM(VC VOLTAGE)**

- (a) Turn the power switch ON (IG).
- (b) Measure voltage between the terminals of the E4 ECM connector.

**Standard:**

Tester Connection	Specified Condition
VC (E4-18) - E2 (E4-28)	4.5 to 5.5 V

**NG****REPLACE ECM (See page 10-24 )****OK****12 INSPECT ECM(PTNK VOLTAGE)**

- (a) Turn the power switch ON (IG).
- (b) Measure the voltage between the terminals of the E4 and E7 ECM connector.
  - (1) Disconnect the vacuum hose from the vapor pressure sensor.

**Standard (1):**

Tester Connection	Specified Condition
PTNK (E7-30) - E2 (E4-28)	2.9 to 3.7 V

**NOTICE:**

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

- (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.

**Standard (2):**

Tester Connection	Specified Condition
PTNK (E6-21) - E2 (E3-28)	0.5 V or less

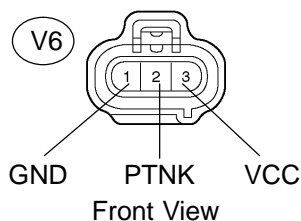
- (3) Reconnect the vacuum hose from the vapor pressure sensor.

**OK****Go to step 14****NG**

# 13 CHECK HARNESS AND CONNECTOR(VAPOR PRESSURE SENSOR - ECM)

## Wire Harness Side:

Vapor Pressure Sensor Connector



Y

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- Disconnect the V6 vapor pressure sensor connector.
- Disconnect the E4 and E7 ECM connectors.
- Check the resistance between the wire harness side connectors.

## Standard (Check for open):

Tester Connection	Specified Condition
PTNK (V6-2) - PTNK (E7-30)	Below 1 $\Omega$
GND (V6-1) - E2 (E4-28)	Below 1 $\Omega$
VCC (V6-3) - VC (E4-18)	Below 1 $\Omega$

## Standard (Check for short):

Tester Connection	Specified Condition
PTNK (V6-2) or PTNK (E7-30) - Body ground	10 k $\Omega$ or higher
VCC (V6-3) or VC (E4-18) - Body ground	10 k $\Omega$ or higher

- Reconnect the vapor pressure sensor connector
- Reconnect the ECM connectors.

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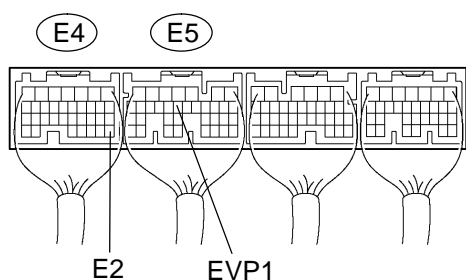
**REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

## REPLACE VAPOR PRESSURE SENSOR ASSY

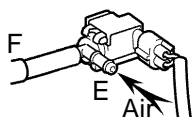
# 14 INSPECT EVAP VSV(FUNCTION)

ECM Connector

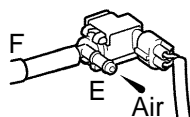


(1)

(2)



VSV is ON



VSV is OFF

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- Turn the power switch ON (IG).
- Check the VSV function.
  - Connect terminals EVP1 and E2 of the ECM connector (VSV ON).

## VSV is ON:

**Air from port E flows out through port F**

- Disconnect terminals EVP1 and E2 of the ECM connector (VSV OFF).

## VSV is OFF:

**Air does not flow from port E to port F**

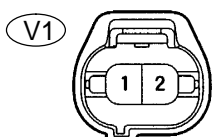
OK

Go to step 17

NG

**15 INSPECT EVAP VSV(OPERATION) (See page 12-9 )****NG****REPLACE EVAP VSV****OK****16 CHECK HARNESS AND CONNECTOR(EFI M RELAY - EVAP VSV, EVAP VSV - ECM)****Wire Harness Side:**

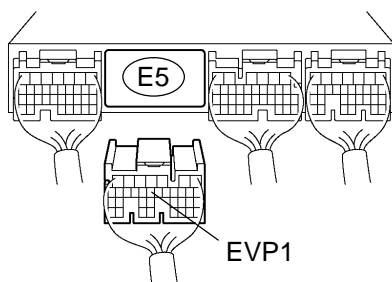
EVAP VSV Connector



Front View

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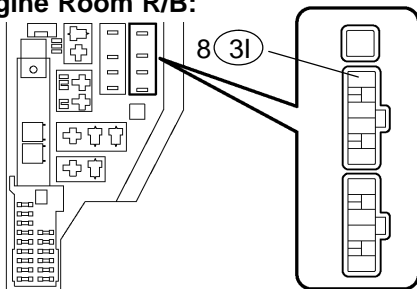
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ECM Connector

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**Engine Room R/B:**

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- (a) Check the harness and connectors between the EVAP VSV and ECM connectors.

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

**Standard (Check for open):**

Tester Connection	Specified Condition
EVAP VSV (V1-1) - EVP1 (E5-14)	Below 1 $\Omega$

**Standard (Check for short):**

Tester Connection	Specified Condition
EVAP VSV (V1-1) or EVP1 (E5-14) - Body ground	10 k $\Omega$ or higher

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

**Standard (Check for open):**

Tester Connection	Specified Condition
EVAP VSV (V1-2) - EFI M relay (31-8)	Below 1 $\Omega$

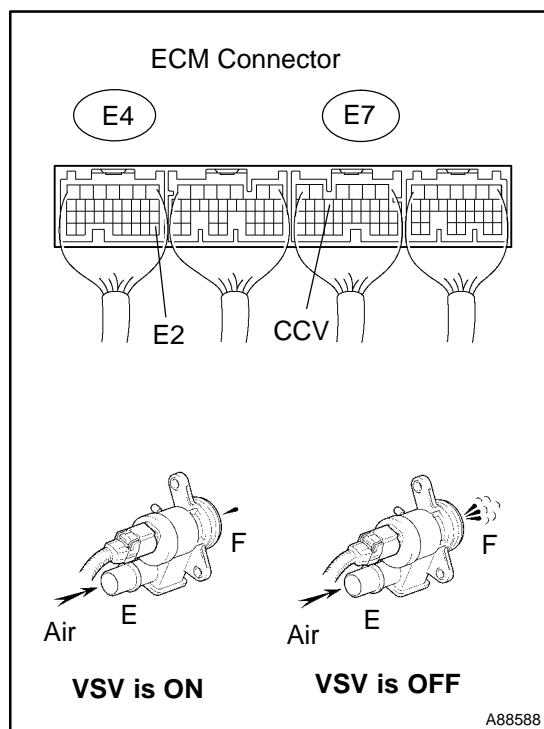
**Standard (Check for short):**

Tester Connection	Specified Condition
EVAP VSV (V1-2) or EFI M relay (31-8) - Body ground	10 k $\Omega$ or higher

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

**NG****REPAIR OR REPLACE HARNESS OR CONNECTOR****OK****REPLACE ECM (See page 10-24 )**

# 17 INSPECT CCV(FUNCTION)



- (a) Turn the power switch ON (IG).
- (b) Check the VSV function.
  - (1) Connect terminals CCV and E2 of the ECM connector (VSV ON).

**VSV is ON:**

**Air from port E flows out through port F**

- (2) Disconnect terminals CCV 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 20

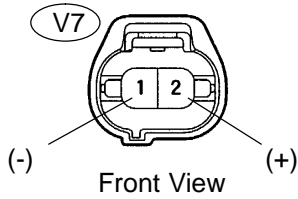
NG

# 18 INSPECT CCV(OPERATION) (See page 12-9 )

NG

REPLACE CCV

OK

**19 CHECK HARNESS AND CONNECTOR(EFI M RELAY - CCV, CCV - ECM)****Wire Harness Side:****CCV Connector**

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- (a) Check the harness and the connectors between the CCV and ECM connectors.
- (1) Disconnect the V7 CCV connector.
  - (2) Disconnect the E7 ECM connector.
  - (3) Check the resistance between the wire harness side connectors.

**Standard (Check for open):**

Tester Connection	Specified Condition
CCV (V7-1) - CCV (E7-13)	Below 1 $\Omega$

**Standard (Check for short):**

Tester Connection	Specified Condition
CCV (V7-1) or CCV (E7-13) - Body ground	10 k $\Omega$ or higher

- (4) Reconnect the CCV connector.
  - (5) Reconnect the ECM connector.
- (b) Check the harness and the connectors between the CCV connector and EFI M relay.
- (1) Disconnect the V7 CCV connector.
  - (2) Remove the integration relay from the engine room R/B.
  - (3) Check the resistance between the wire harness side connectors.

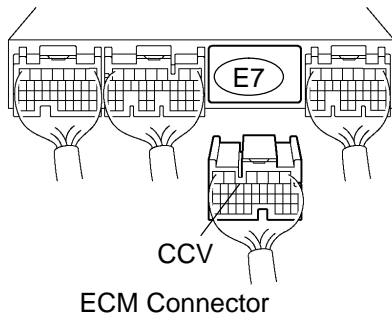
**Standard (Check for open):**

Tester Connection	Specified Condition
CCV (V7-2) - EFI M relay (3l-8)	Below 1 $\Omega$

**Standard (Check for short):**

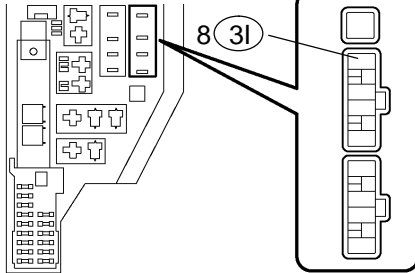
Tester Connection	Specified Condition
CCV (V7-2) or EFI M relay (3l-8) - Body ground	10 k $\Omega$ or higher

- (4) Reconnect the CCV connector.
- (5) Reinstall the integration relay.

**NG****REPAIR OR REPLACE HARNESS OR CONNECTOR****OK****REPLACE ECM (See page 10-24 )**

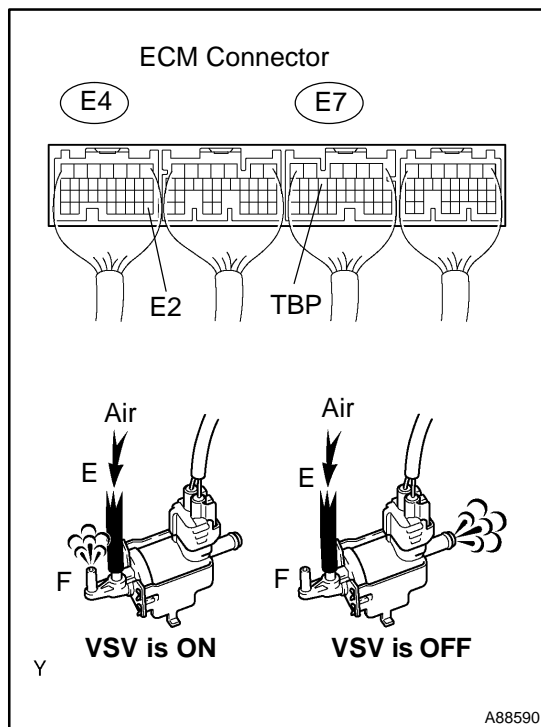
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**Engine Room R/B:**

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<b>20</b>	<b>INSPECT VSV FOR PURGE FLOW SWITCHING VALVE(FUNCTION)</b>
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- (a) Turn the power switch ON (IG).
- (b) Check the VSV function.
  - (1) Connect terminals TBP and E2 of the ECM connector (VSV ON).  
**VSV is ON: Air from port E flows out through port F**
  - (2) Disconnect terminals TBP and E2 of the ECM connector (VSV OFF).  
**VSV is OFF: Air does not flow from port E to port F**

<b>OK</b>	<b>Go to step 23</b>
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<b>NG</b>
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<b>21</b>	<b>INSPECT VSV FOR PURGE FLOW SWITCHING VALVE(OPERATION)</b> (See page 12-9)
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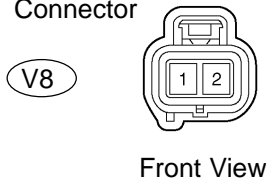
<b>NG</b>	<b>REPLACE VSV FOR PURGE FLOW SWITCHING VALVE</b>
-----------	---

<b>OK</b>
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22

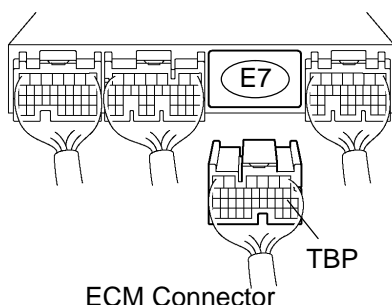
**CHECK HARNESS AND CONNECTOR(EFI M RELAY - VSV FOR PURGE FLOW SWITCHING VALVE, VSV FOR PURGE FLOW SWITCHING VALVE - ECM)****Wire Harness Side:**

VSV for Purge Flow Switching Valve Connector



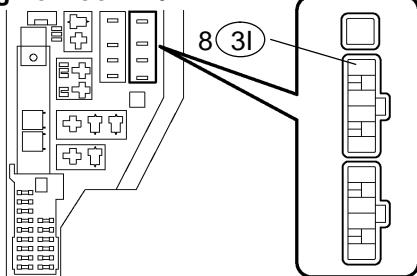
Y

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**Engine Room R/B:**

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- (a) Check the harness and the connectors between the VSV for purge flow switching valve and ECM connectors.
- (1) Disconnect the V8 VSV for purge flow switching valve connector.
  - (2) Disconnect the E7 ECM connector.
  - (3) Check the resistance between the wire harness side connectors.

**Standard (Check for open):**

Tester Connection	Specified Condition
VSV for purge flow switching valve (V8-1) - TBP (E7-18)	Below 1 $\Omega$

**Standard (Check for short):**

Tester Connection	Specified Condition
VSV for purge flow switching valve (V8-1) or TBP (E7-18) - Body ground	10 k $\Omega$ or higher

- (4) Reconnect the VSV for purge flow switching valve connector.
  - (5) Reconnect the ECM connector.
- (b) Check the harness and the connectors between the VSV for purge flow switching valve connector and EFI M relay.
- (1) Disconnect the V8 VSV for purge flow switching valve connector.
  - (2) Remove the integration relay from the engine room R/B.
  - (3) Check the resistance between the wire harness side connectors.

**Standard (Check for open):**

Tester Connection	Specified Condition
VSV for purge flow switching valve (V8-2) - EFI M relay (31-8)	Below 1 $\Omega$

**Standard (Check for short):**

Tester Connection	Specified Condition
VSV for purge flow switching valve (V8-2) or EFI M relay (31-8) - Body ground	10 k $\Omega$ or higher

- (4) Reconnect the VSV for purge flow switching valve connector.
- (5) Reinstall the integration relay.

NG

**REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

**REPLACE ECM (See page 10-24 )**

23	INSPECT FUEL TANK ASSY
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NG	REPLACE FUEL TANK ASSY
----	------------------------

OK
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IT IS LIKELY THAT VEHICLE USER DID NOT PROPERLY CLOSE FUEL TANK CAP
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