

<b>DTC</b>	<b>P0450</b>	<b>Evaporative Emission Control System Pressure Sensor Malfunction</b>
<b>DTC</b>	<b>P0451</b>	<b>Evaporative Emission Control System Pressure Sensor Range / Performance</b>
<b>DTC</b>	<b>P0452</b>	<b>Evaporative Emission Control System Pressure Sensor / Switch Low Input</b>
<b>DTC</b>	<b>P0453</b>	<b>Evaporative Emission Control System Pressure Sensor / Switch High Input</b>

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**DTC SUMMARY**

<b>DTC No.</b>	<b>Monitoring Items</b>	<b>Malfunction Detection Conditions</b>	<b>Trouble Area</b>	<b>Detection Timing</b>	<b>Detection logic</b>
P0450	Canister pressure sensor voltage abnormal fluctuation	Sensor output voltage rapidly fluctuates beyond upper and lower malfunction thresholds for 0.5 seconds.	<ul style="list-style-type: none"> <li>• Canister pump module</li> <li>• EVAP system hose (pipe from air inlet port to canister pump module, canister filter, fuel tank vent hose)</li> <li>• ECM</li> </ul>	<ul style="list-style-type: none"> <li>• EVAP monitoring (ignition switch OFF)</li> <li>• Ignition switch ON</li> </ul>	1 trip
P0451	Canister pressure sensor noisy	Sensor output voltage fluctuates frequently in certain time period.	<ul style="list-style-type: none"> <li>• Canister pump module</li> <li>• Connector/wire harness (canister pump module - ECM)</li> <li>• EVAP system hose (pipe from air inlet port to canister pump module, canister filter, fuel tank vent hose)</li> <li>• ECM</li> </ul>	<ul style="list-style-type: none"> <li>• EVAP monitoring (ignition switch OFF)</li> <li>• Engine running</li> </ul>	2 trip
P0451	Canister pressure sensor stuck	Sensor output voltage does not vary in certain time period.	<ul style="list-style-type: none"> <li>• Canister pump module</li> <li>• Connector/wire harness (canister pump module - ECM)</li> <li>• EVAP system hose (pipe from air inlet port to canister pump module, canister filter, fuel tank vent hose)</li> <li>• ECM</li> </ul>	<ul style="list-style-type: none"> <li>• EVAP monitoring (ignition switch OFF)</li> </ul>	2 trip

DTC No.	Monitoring Items	Malfunction Detection Conditions	Trouble Area	Detection Timing	Detection logic
P0452	Canister pressure sensor voltage low	Sensor output voltage less than 0.45 V for 0.5 seconds.	<ul style="list-style-type: none"> <li>• Canister pump module</li> <li>• Connector/wire harness (canister pump module - ECM)</li> <li>• EVAP system hose (pipe from air inlet port to canister pump module, canister filter, fuel tank vent hose)</li> <li>• ECM</li> </ul>	<ul style="list-style-type: none"> <li>• EVAP monitoring (ignition switch OFF)</li> <li>• Ignition switch ON</li> </ul>	1 trip
P0453	Canister pressure sensor voltage high	Sensor output voltage more than 4.9 V for 0.5 seconds.	<ul style="list-style-type: none"> <li>• Canister pump module</li> <li>• Connector/wire harness (canister pump module - ECM)</li> <li>• EVAP system hose (pipe from air inlet port to canister pump module, canister filter, fuel tank vent hose)</li> <li>• ECM</li> </ul>	<ul style="list-style-type: none"> <li>• EVAP monitoring (ignition switch OFF)</li> <li>• Ignition switch ON</li> </ul>	1 trip

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**HINT:**

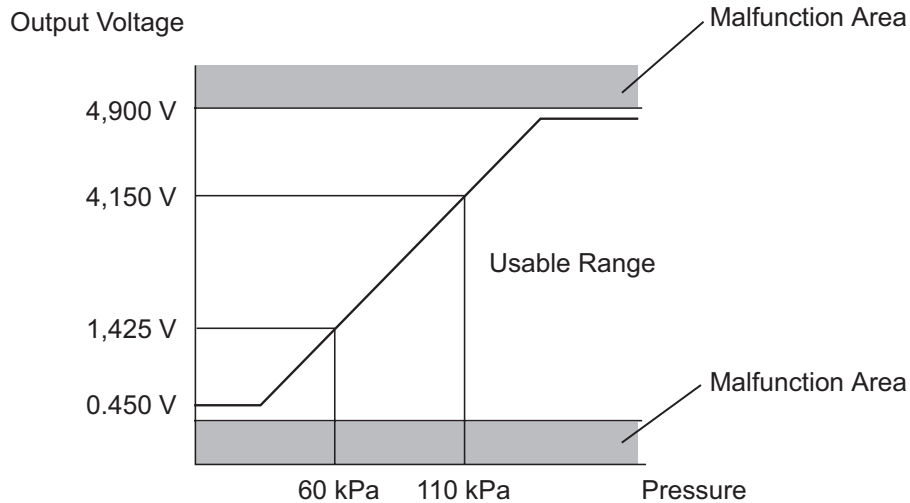
The canister pressure sensor is built into the canister pump module.

**DESCRIPTION**

The circuit description can be found in the Evaporative Emission (EVAP) system (see page [ES-272](#)).

**MONITOR DESCRIPTION**

Canister Pressure Sensor Specification



HINT:

Standard atmospheric pressure is 101.3 kPa

A115543E03

(a) DTC P0450: Canister pressure sensor voltage abnormal fluctuation

If the canister pressure sensor voltage output rapidly fluctuates between less than 0.45 V and more than 4.9 V, the ECM interprets this as an open or short circuit malfunction in the canister pressure sensor or its circuit, and stops the EVAP system monitor. The ECM then illuminates the MIL and sets the DTC (1 trip detection logic).

(b) DTC P0451: Canister pressure sensor noisy or stuck

If the canister pressure sensor voltage output fluctuates rapidly for 10 seconds, the ECM stops the EVAP system monitor. The ECM interprets this as noise from the canister pressure sensor, and stops the EVAP system monitor. The ECM then illuminates the MIL and sets the DTC.

Alternatively, if the sensor voltage output does not change for 10 seconds, the ECM interprets this as the sensor being stuck, and stops the monitor. The ECM then illuminates the MIL and sets the DTC. (Both of the malfunctions are detected by 2 trip detection logic).

(c) DTC P0452: Canister pressure sensor voltage low

If the canister pressure sensor voltage output is below 0.45 V, the ECM interprets this as an open or short circuit malfunction in the canister pressure sensor or its circuit, and stops the EVAP system monitor. The ECM then illuminates the MIL and sets the DTC (1 trip detection logic).

(d) DTC P0453: Canister pressure sensor voltage high

If the canister pressure sensor voltage output is 4.9 V or more, the ECM interprets this as an open or short circuit malfunction in the canister pressure sensor or its circuit, and stops the EVAP system monitor. The ECM then illuminates the MIL and sets the DTC (1 trip detection logic).

**MONITOR STRATEGY**

Required Sensors/Components	Canister pump module
Frequency of Operation	Continuous
Duration	Within 15 minutes

MIL Operation	Immediate: P0450, P0452, P0453 2 driving cycles: P0451
Sequence of Operation	None

## TYPICAL ENABLING CONDITIONS

### P0451 (Noise Monitor):

Monitor runs whenever following DTCs are not present	None
Atmospheric pressure	70 to 110 kPa (525 to 825 mmHg) [absolute pressure]
Battery voltage	10.5 V or more
Intake air temperature	4.4 to 35 °C (40 to 95°F)
EVAP canister pressure sensor malfunction (P0450, P0452, P0453)	Not detected
Either of following conditions is met	A or B
A. Engine	Running
B. Soak time (ignition switch OFF time)	5 hours

### Example of restart time

First time	7 hours
Second time	9 hours and 30 minutes

### P0451 (Stuck Monitor):

Monitor runs whenever following DTCs are not present	None
Atmospheric pressure	70 to 110 kPa (525 to 825 mmHg)
Battery voltage	10.5 V or more
Intake air temperature	4.4 to 35°C (40 to 95°F)
EVAP pressure sensor malfunction	Not detected
Soak time (ignition switch OFF time)	5 hours

### Example of restart time

First time	7 hours
Second time	9 hours and 30 minutes

### P0450, P0452 and P0453:

Monitor runs whenever following DTCs are not present	None
Either of following conditions is met	A or B
A. Ignition switch	ON
B. Soak timer	ON

## TYPICAL MALFUNCTION THRESHOLDS

### 1. P0450: Canister pressure sensor chattering

EVAP pressure	Less than 42.1 kPa (317 mmHg) or more than 123.8 kPa (928.5 mmHg)
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### 2. P0451: Canister pressure sensor noise

Pressure variation indicated by canister pressure sensor in 10 seconds	More than +0.3 kPa (+2.25 mmHg) 10 times
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### 3. P0451: Canister pressure sensor stuck

EVAP pressure change during reference pressure in 10 seconds	0.65 kPa (4.87 mmHg) or less
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### 4. P0452: Canister pressure sensor low voltage

EVAP pressure	Less than 42.1 kPa (317 mmHg)
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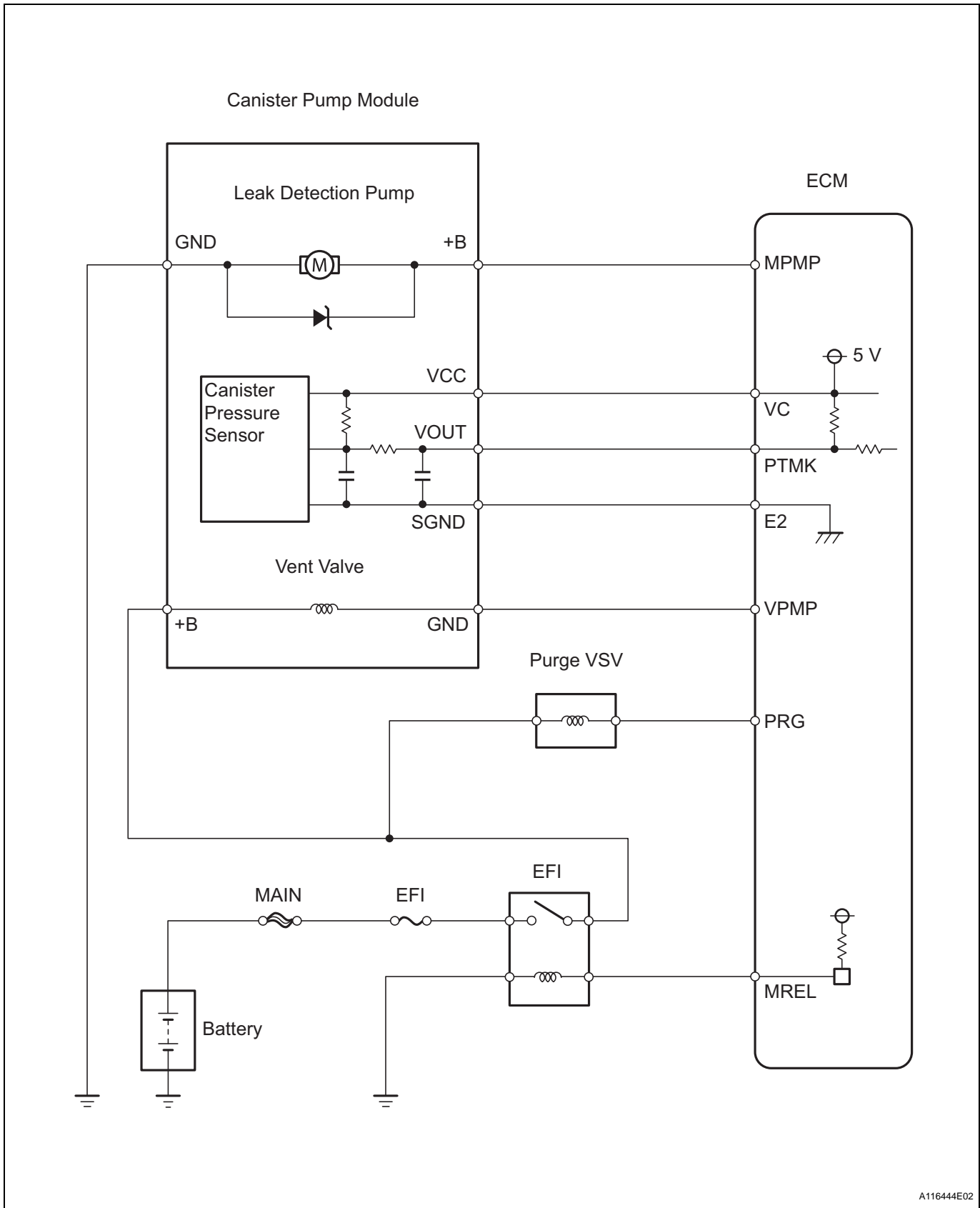
5. P0453: Canister pressure sensor high voltage

EVAP pressure

More than 123.8 kPa (928.5 mmHg)

WIRING DIAGRAM

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**NOTICE:**

- When a vehicle is brought into the workshop, leave it as it is. Do not change the vehicle condition. For example, do not tighten the fuel cap.
- Do not disassemble the canister pump module.
- The intelligent tester is required to conduct the following diagnostic troubleshooting procedure.

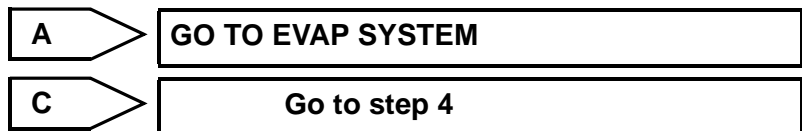
**1 CONFIRM DTC AND EVAP PRESSURE**

- (a) Connect the intelligent tester to the DLC3.
- (b) Turn the ignition switch ON and turn the intelligent tester ON.
- (c) Enter the following menus: DIAGNOSIS / ENHANCED OBD II / DTC INFO / CURRENT CODES.
- (d) Read the values.
- (e) Enter the following menus: DIAGNOSIS / ENHANCED OBD II / DATA LIST / EVAP / VAPOR PRESS.
- (f) Read the EVAP pressure displayed on the intelligent tester.

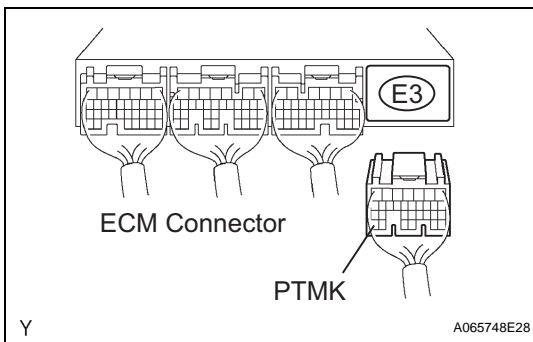
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**Result**

Display (DTC Output)	Test Result	Suspected Trouble Areas	Proceed to
P0451	-	<ul style="list-style-type: none"> <li>• Canister pressure sensor</li> </ul>	A
P0452	Less than 45 kPa (430 mmHg)	<ul style="list-style-type: none"> <li>• Wire harness/connector (ECM - canister pressure sensor)</li> <li>• Canister pressure sensor</li> <li>• Short in ECM circuit</li> </ul>	B
P0453	More than 120 kPa (900 mmHg)	<ul style="list-style-type: none"> <li>• Wire harness/connector (ECM - canister pressure sensor)</li> <li>• Canister pressure sensor</li> <li>• Open in ECM circuit</li> </ul>	C



**2 CHECK HARNESS AND CONNECTOR (CANISTER PUMP MODULE - ECM)**



- (a) Turn the ignition switch OFF.
- (b) Disconnect the E3 ECM connector.
- (c) Measure the resistance between the PTMK (E3-31) terminal of the ECM connector and the body ground.

**Result**

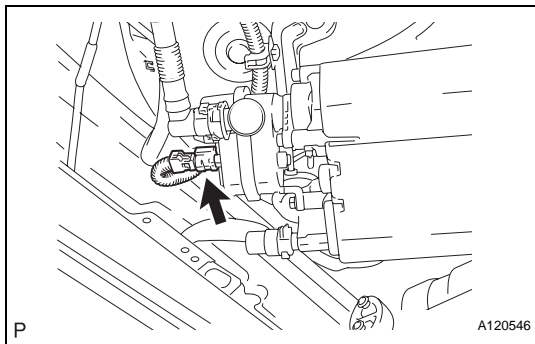
Test Results	Suspected Trouble Areas	Proceed to
10 Ω or less	<ul style="list-style-type: none"> <li>• Wire harness/connector (ECM - canister pressure sensor)</li> <li>• Short in canister pressure sensor circuit</li> </ul>	A
10 kΩ or more	<ul style="list-style-type: none"> <li>• Wire harness/connector (ECM - canister pressure sensor)</li> <li>• Short in ECM circuit</li> </ul>	B

B
Go to step 7

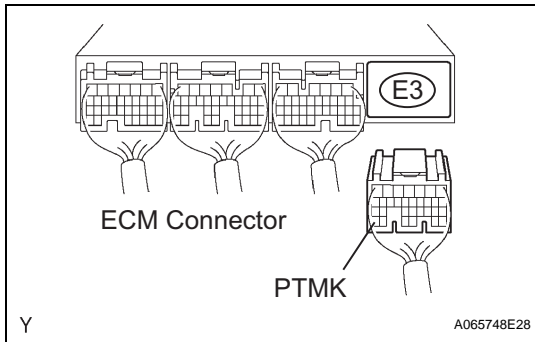
A

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**3 CHECK HARNESS AND CONNECTOR (CANISTER PUMP MODULE - ECM)**



(a) Disconnect the C10 canister connector.



(b) Disconnect the E3 ECM connector.

(c) Measure the resistance between the PTMK (E3-31) terminal of the ECM connector and the body ground.

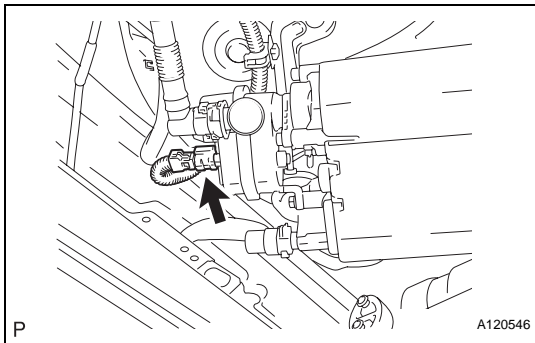
**Result**

Test Results	Suspected Trouble Areas	Proceed to
10 kΩ or more	<ul style="list-style-type: none"> <li>• Short in canister pressure sensor circuit</li> </ul>	A
10 kΩ or less	<ul style="list-style-type: none"> <li>• Short in wire harness/connector (ECM - canister pressure sensor)</li> </ul>	B

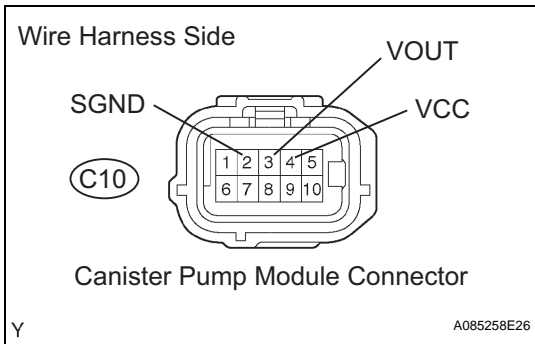
B
Go to step 6

A

**4 CHECK HARNESS AND CONNECTOR (CANISTER PUMP MODULE - ECM)**



(a) Disconnect the C10 canister connector.



(b) Turn the ignition switch ON.  
 (c) Measure the voltage and resistance of the canister pump module connector.

**Standard voltage**

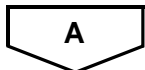
Tester Connection	Specified Condition
VCC (C10-4) - Body ground	4.5 to 5.0 V
VOUT (C10-3) - Body ground	4.5 to 5.0 V

**Standard resistance**

Tester Connection	Specified Condition
SGND (C10-2) - Body ground	100 Ω or less

**Result**

Test Results	Suspected Trouble Areas	Proceed to
Voltage and resistance within standard ranges	<ul style="list-style-type: none"> <li>Open in canister pressure sensor circuit</li> </ul>	A
Voltage and resistance outside standard ranges	<ul style="list-style-type: none"> <li>Open in wire harness/connector (ECM - canister pressure sensor)</li> </ul>	B



**5 REPLACE CANISTER ASSEMBLY**

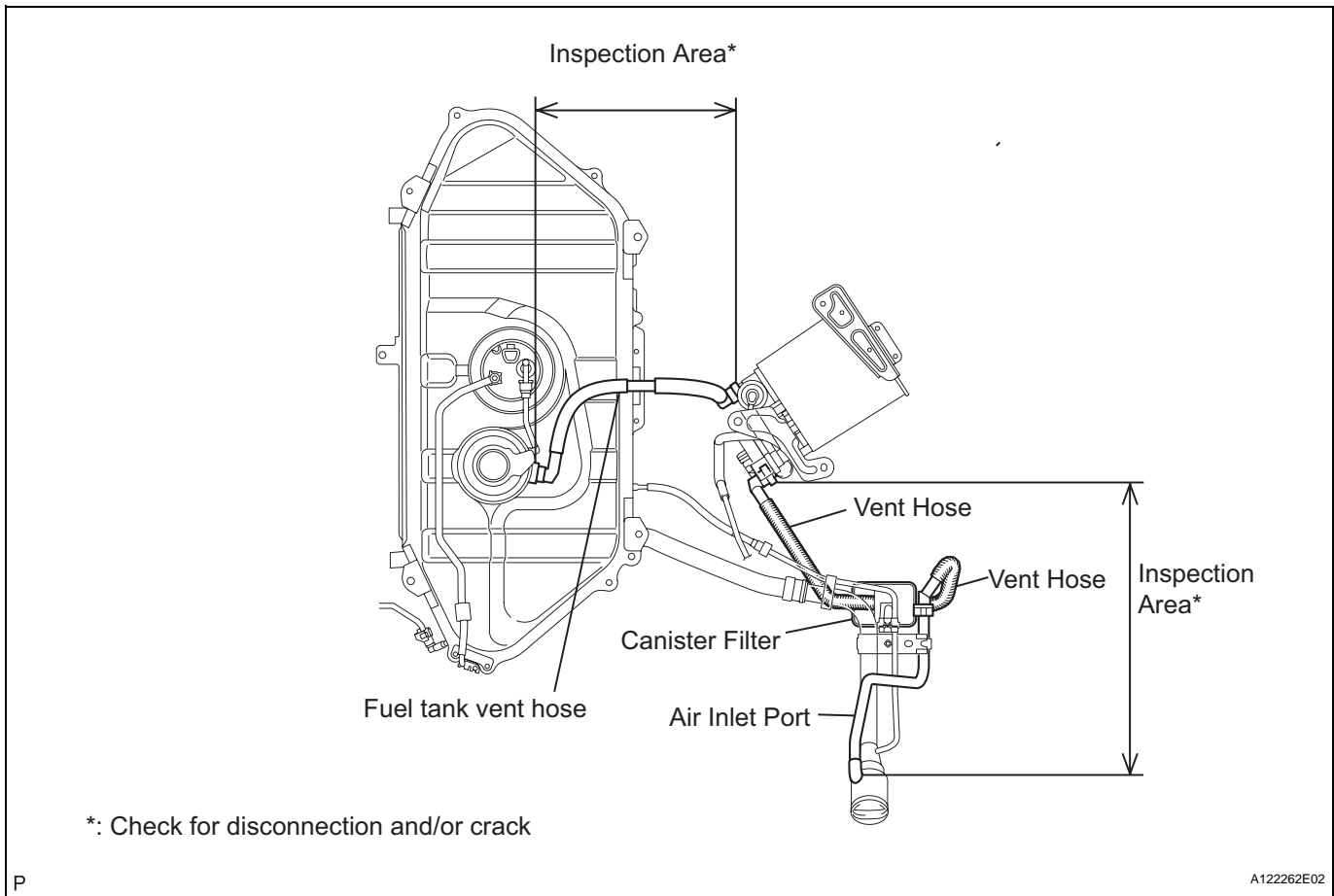
(a) Replace the canister assembly (see page EC-9).

**NOTICE:**

When replacing the canister, check the canister pump module interior and related pipes for water, fuel or other liquids. If liquids are present, check for disconnections and/or cracks in the following: 1) the pipe from the air inlet port to the canister pump module; 2) the canister filter; and 3) the fuel tank vent hose.



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**NEXT** **Go to step 8**

**6 REPAIR OR REPLACE HARNESS OR CONNECTOR**

**HINT:**  
If the exhaust tailpipe has been removed, go to the next step before reinstalling it.

**NEXT** **Go to step 8**

**7 REPLACE ECM**

(a) Replace the ECM (see page [ES-362](#)).

**NEXT** **Go to step 8**

**8 CHECK WHETHER DTC OUTPUT RECURS (AFTER REPAIR)**

- (a) Connect the intelligent tester to the DLC3.
- (b) Turn the ignition switch ON and turn the intelligent tester ON.
- (c) Wait for at least 60 seconds.
- (d) Enter the following menus: DIAGNOSIS / ENHANCED OBD II / DTC INFO / PENDING CODES.

HINT:

If no pending DTC is displayed on the intelligent tester, the repair has been successfully completed.

NEXT

COMPLETED