DTC	P0450	Evaporative Emission Control System Pressure Sensor / Switch

DTC	P0451	Evaporative Emission Control System Pressure Sensor Range / Performance

DTC	P0452	Evaporative Emission Control System Pressure Sensor / Switch Low Input

DTC	P0453	Evaporative Emission Control System Pressure Sensor / Switch High Input

DTC SUMMARY

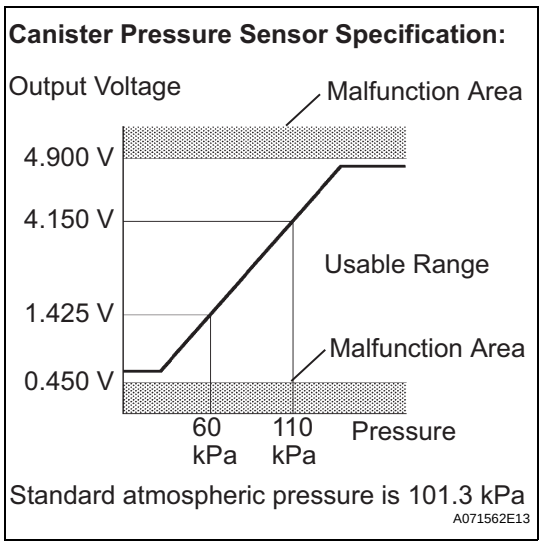
DTC	Monitoring Items	Malfunction Detection Conditions	Trouble Areas	Detection Timings	Detection logic
P0450	Canister pressure sensor voltage abnormal fluctuation	Sensor output voltage rapidly fluctuates beyond upper and lower malfunction thresholds for 0.5 seconds.	• Canister pump module • ECM	• EVAP monitoring (ignition OFF) • Ignition ON	1 trip
P0451	Canister pressure sensor noise	Sensor output voltage fluctuates frequently in certain time period.	• Canister pump module • Connector/wire harness (Canister pump module - ECM) • ECM	• EVAP monitoring (ignition OFF) • Engine running	2 trip
	Canister pressure sensor voltage fixed	Sensor output voltage does not vary in certain time period.	• Canister pump module • Connector/wire harness (Canister pump module - ECM) • ECM	• EVAP monitoring (ignition OFF)	2 trip
P0452	Canister pressure sensor voltage low	Sensor output voltage less than 0.45 V for 0.5 seconds.	• Canister pump module • Connector/wire harness (Canister pump module - ECM) • ECM	• Ignition ON • EVAP monitoring (ignition OFF)	1 trip
P0453	Canister pressure sensor voltage high	Sensor output voltage more than 4.9 V for 0.5 seconds.	• Canister pump module • Connector/wire harness (Canister pump module - ECM) • ECM	• Ignition ON • EVAP monitoring (ignition OFF)	1 trip

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

DESCRIPTION

The circuit description can be found in the EVAP System (See page ES-351).

MONITOR DESCRIPTION



(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 (Evaporative Emission) system monitor. The ECM then illuminates the MIL and sets the DTC (1 trip detection logic).
(b) DTC P0451: Canister pressure sensor noise 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 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	Once per driving cycle: P0451 sensor stuck Continuous: P0451 sensor noise, P0450, P0452 and P0453
Duration	-
MIL Operation	Immediate: P0450, P0452 and P0453 2 driving cycles: P0451
Sequence of Operation	None

TYPICAL ENABLING CONDITIONS

P0451 (Noise monitor):

Monitor runs whenever these DTCs not present	None
Atmospheric pressure (absolute pressure)	70 kPa (525 mmHg) or more, less than 110 kPa (825 mmHg)
Battery voltage	10.5 V or more

Intake air temperature	4.4° to 35°C (40° to 95°F)
Either of following conditions 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 (Fixed monitor):

Monitor runs whenever these DTCs not present	None
Atmospheric pressure	Less than 70 kPa (525 mmHg), or 110 kPa (825 mmHg) or more
Battery voltage	10.5 V or more
Intake air temperature	4.4° to 35°C (40° to 95°F)
Soak time (ignition switch OFF time)	5 hours

ES

Example of restart time

First time	7 hours
Second time	9 hours and 30 minutes

P0450, P0452 and P0453:

Monitor runs whenever these DTCs not present	None
Either of following conditions met	(a) or (b)
(a) Ignition switch	ON
(b) Soak timer	ON

TYPICAL MALFUNCTION THRESHOLDS

P0450: Canister pressure sensor chattering

EVAP pressure	Less than 42.1 kPa (317 mmHg), or more than 123.8 kPa (928.5 mmHg)

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

P0451: Canister pressure sensor voltage fixed

0.02 inch leak criterion variation indicated by canister pressure sensor in 10 seconds	Less than 0.65 kPa (4.87 mmHg)

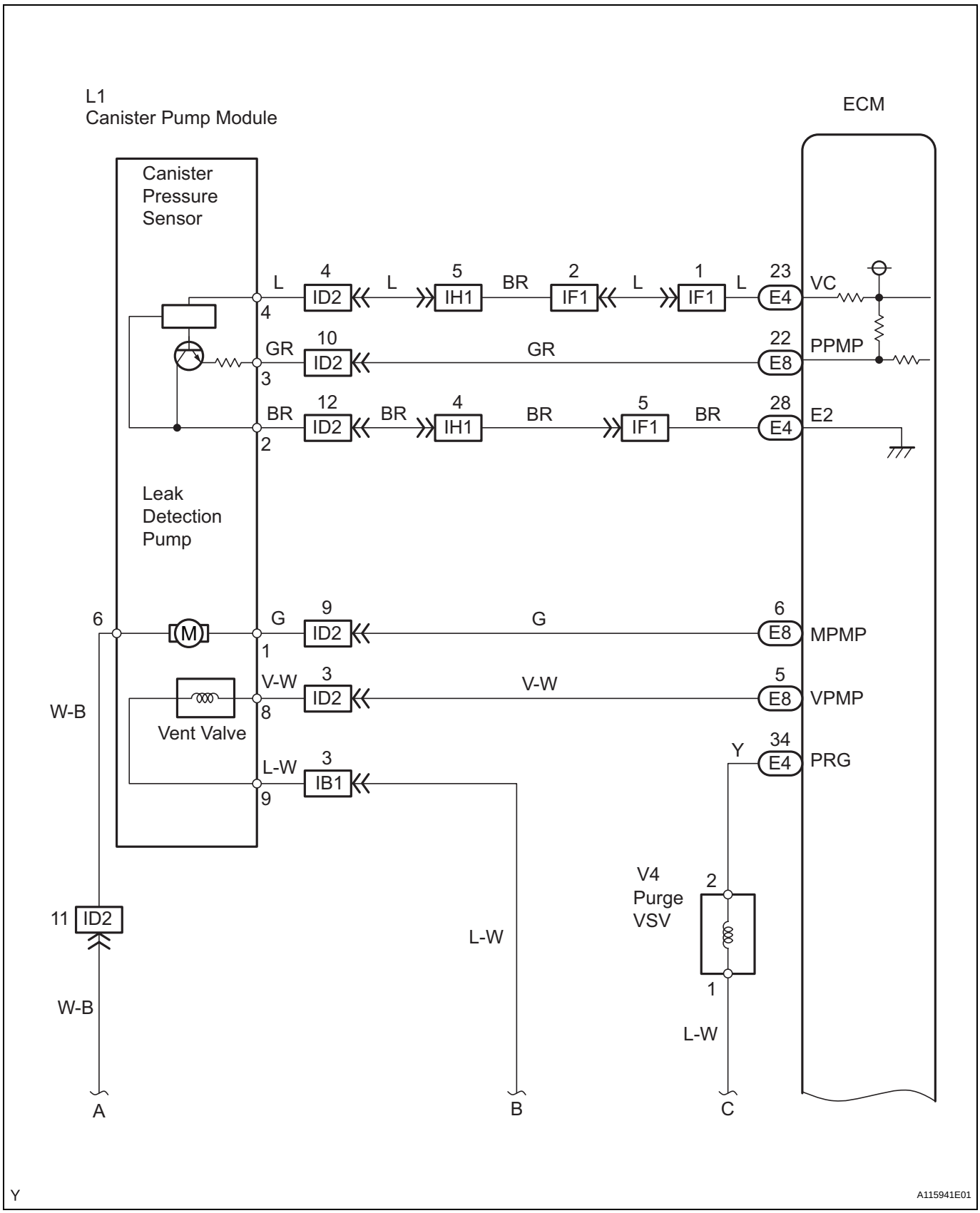
P0452: Canister pressure sensor low voltage

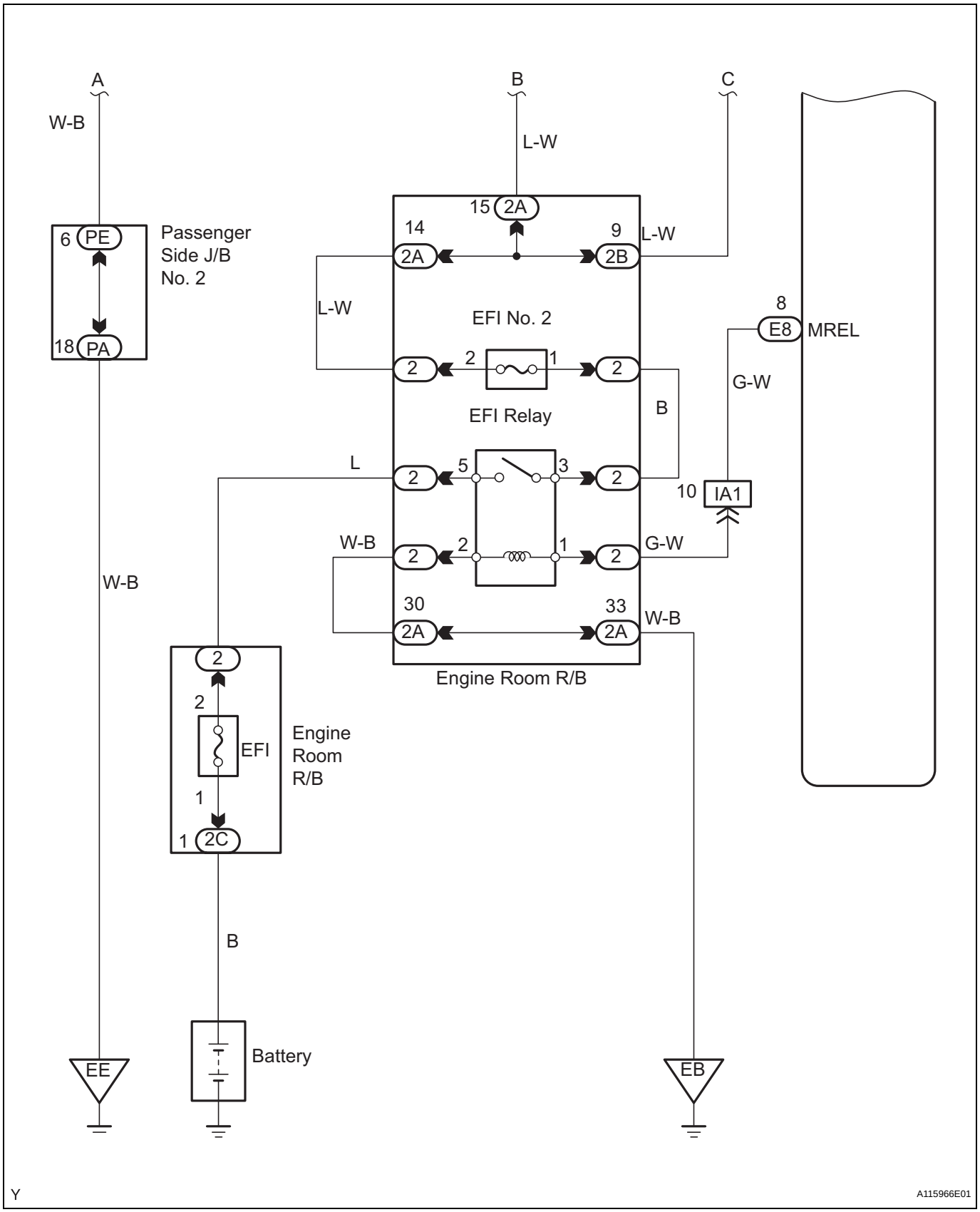
EVAP pressure	Less than 42.1 kPa (317 mmHg)

P0453: Canister pressure sensor high voltage

EVAP pressure	More than 123.8 kPa (928.5 mmHg)

WIRING DIAGRAM





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.**

- **An intelligent tester is required to conduct the following diagnostic troubleshooting procedure.**

1	CONFIRM DTC AND EVAP PRESSURE

(a) Connect an intelligent tester to the DLC3.
(b) Turn the ignition switch ON (do not start the engine).
(c) Turn the tester ON.
(d) Select the following menu items: DIAGNOSIS / ENHANCED OBD II / DTC INFO / CURRENT CODES.
(e) Read DTCs.
(f) Select the following menu items: DIAGNOSIS / ENHANCED OBD II / DATA LIST / PRIMARY / VAPOR PRESS.
(g) Read the EVAP (Evaporative Emission) pressure displayed on the tester.

ES

Result

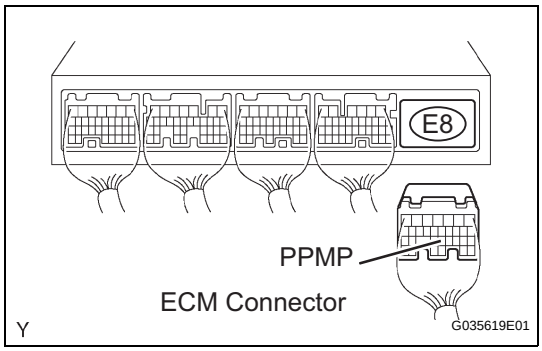
Display (DTC Output)	Test Results	Suspected Trouble Areas	Proceed to
P0451	-	• Canister pressure sensor	C
P0452	Less than 45 kPa (430 mmHg)	• Wire harness/connector (ECM - canister pressure sensor) • Canister pressure sensor • Short in ECM circuit	A
P0453	More than 120 kPa (900 mmHg)	• Wire harness/connector (ECM - canister pressure sensor) • Canister pressure sensor • Open in ECM circuit	B

B → Go to step 4

C → GO TO EVAP INSPECTION PROCEDURE

A

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



(a) Turn the ignition switch OFF.
(b) Disconnect the E8 ECM connector.
(c) Measure the resistance between the PPMP terminal of the ECM connector and the body ground.

Result

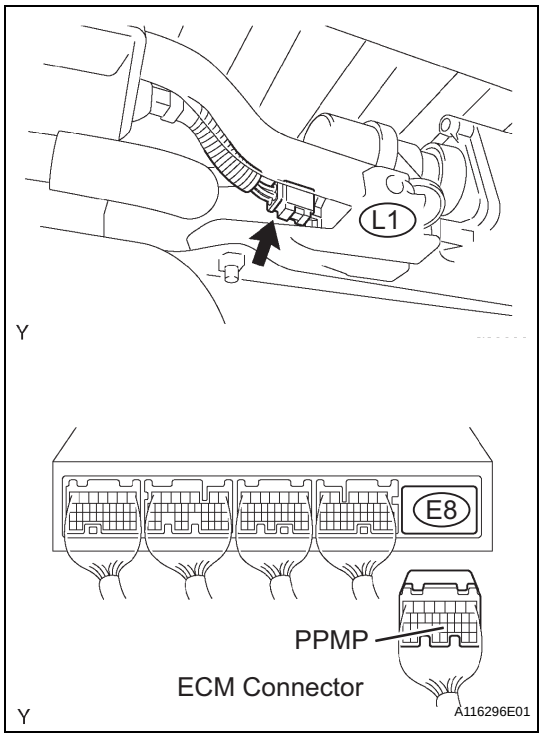
Test Results	Suspected Trouble Areas	Proceed To
10 Ω or less	• Wire harness/connector (ECM - canister pressure sensor) • Short in canister pressure sensor circuit	A
10 kΩ or more	• Wire harness/connector (ECM - canister pressure sensor) • Short in ECM circuit	B

(d) Reconnect the ECM connector.

B → Go to step 7

A

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



(a) Disconnect the L1 canister connector.
(b) Disconnect the E8 ECM connector.
(c) Check the resistance between the PPMP terminal of the ECM connector and the body ground.

ES

Result

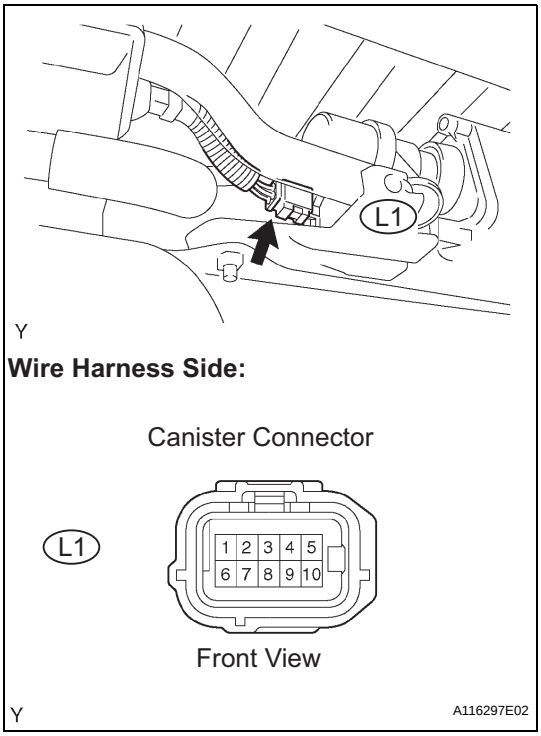
Test Results	Suspected Trouble Areas	Proceed To
10 kΩ or more	• Short in canister pressure sensor circuit	A
10 Ω or less	• Short in wire harness/connector (ECM - canister pressure sensor)	B

(d) Reconnect the canister connector.
(e) Reconnect the ECM connector.

A → Go to step 5

B → Go to step 6

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



(a) Disconnect the L1 canister connector.
(b) Turn the ignition switch ON.
(c) Measure the voltage and resistance of the L1 canister connector.

Standard

Tester Connections	Specified Conditions
L1-4 - Body ground	Between 4.5 V and 5.5 V
L1-3 - Body ground	
L1-2 - Body ground	100 Ω or less

Result

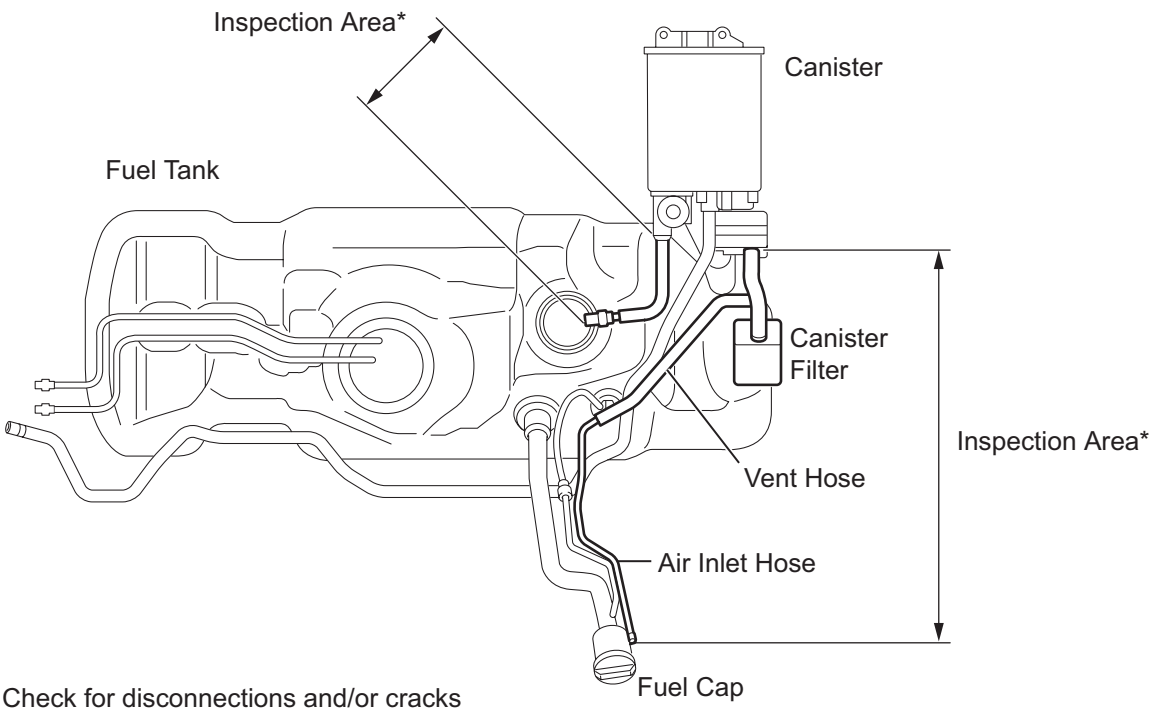
Test Results	Suspected Trouble Areas	Proceed To
Voltage and resistance within standard ranges	• Open in canister pressure sensor circuit	A
Voltage and resistance outside standard ranges	• Open in wire harness/connector (ECM - canister pressure sensor)	B

(d) Reconnect the canister connector.

A	Go to step 5
B	Go to step 6

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.

NEXT	Go to step 8

6	REPAIR OR REPLACE HARNESS AND CONNECTOR

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

NEXT	Go to step 8

7	REPLACE ECM

NEXT	Go to step 8

8	CHECK WHETHER DTC OUTPUT RECURS (AFTER REPAIR)

(a) Connect an intelligent tester to the DLC3.
(b) Turn the ignition switch ON and turn the tester ON.
(c) Wait for at least 60 seconds.
(d) Select the following menu items: DIAGNOSIS / ENHANCED OBD II / DTC INFO / PENDING CODES.
HINT:
If no pending DTC is displayed on the tester, the repair has been successfully completed.

NEXT

COMPLETED