

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

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DTC SUMMARY

DTC	Monitoring Items	Malfunction Detection Conditions	Trouble Areas	Detection Timings	Detection Logic
P0450	Canister pressure sensor voltage fluctuation abnormal	Sensor output voltage rapidly fluctuates beyond upper and lower malfunction thresholds for 0.5 seconds.	- Canister pump module - EVAP system hose (pipe from air inlet port to canister pump module, canister filter, fuel tank vent hose) - ECM	- EVAP monitoring (ignition OFF) - Ignition ON	1 trip
P0451	Canister pressure sensor noise	Sensor output voltage fluctuates frequently within certain time period.	- Canister pump module - Connector/wire harness (Canister pump module - ECM) - EVAP system hose (pipe from air inlet port to canister pump module, canister filter, fuel tank vent hose) - ECM	- EVAP monitoring (ignition OFF) - Engine running	2 trip
	Canister pressure sensor signal becomes fixed/flat	Sensor output voltage does not vary within certain time period.	- Canister pump module - Connector/wire harness (Canister pump module - ECM) - EVAP system hose (pipe from air inlet port to canister pump module, canister filter, fuel tank vent hose) - 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) - EVAP system hose (pipe from air inlet port to canister pump module, canister filter, fuel tank vent hose) - ECM	- Ignition ON - EVAP monitoring (ignition OFF)	1 trip

DTC	Monitoring Items	Malfunction Detection Conditions	Trouble Areas	Detection Timings	Detection Logic
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) - EVAP system hose (pipe from air inlet port to canister pump module, canister filter, fuel tank vent hose) - ECM	- Ignition ON - EVAP monitoring (ignition OFF)	1 trip

HINT:

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

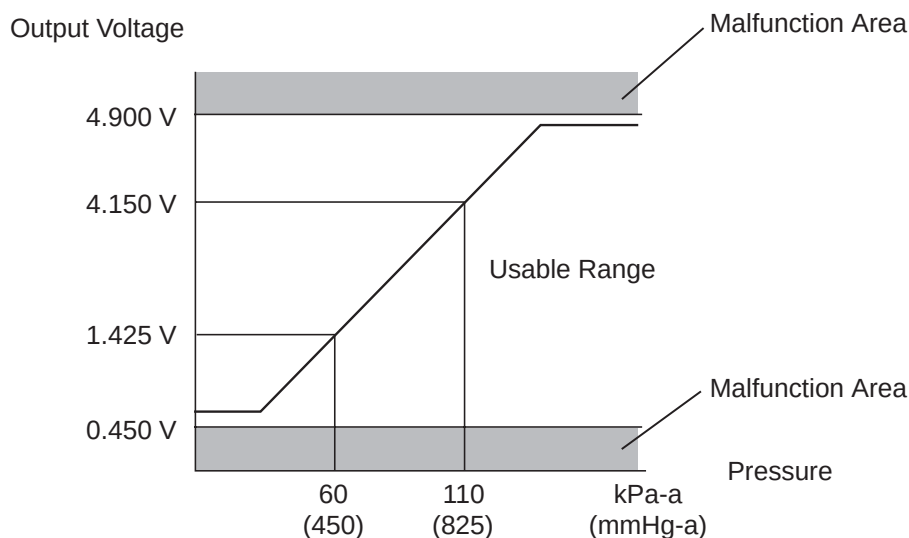
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DESCRIPTION

The circuit description can be found in the EVAP (Evaporative Emission) System (See page [ES-341](#)).

MONITOR DESCRIPTION

Canister Pressure Sensor Specification:



HINT:

Standard atmospheric pressure is 101.3 kPa-a (760 mmHg-a)

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1. DTC P0450: Canister pressure sensor voltage abnormal fluctuation

If the canister pressure sensor voltage output [pressure] rapidly fluctuates between less than 0.45 V [42.1 kPa-a (315.9 mmHg-a)] and more than 4.9 V [123.8 kPa-a (928.4 mmHg-a)], 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).

2. DTC P0451: Canister pressure sensor noise or fixed/flat
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 fixed/flat, and stops the monitor. The ECM then illuminates the MIL and sets the DTC. (Both the malfunctions are detected by 2 trip detection logic).
3. DTC P0452: Canister pressure sensor voltage low
If the canister pressure sensor voltage output [pressure] is below 0.45 V [42.1 kPa-a (315.9 mmHg-a)], 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).
4. DTC P0453: Canister pressure sensor voltage high
If the canister pressure sensor voltage output [pressure] is 4.9 V [123.8 kPa-a (928.4 mmHg-a)] 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).

OBD II MONITOR SPECIFICATIONS

MONITOR STRATEGY

Related DTCs	P0450: Evaporative emission control system pressure sensor/switch chattering P0451: Evaporative emission control system pressure sensor noise P0452: Evaporative emission control system pressure sensor stuck P0453: Evaporative emission control system pressure sensor/switch low input P0453: Evaporative emission control system pressure sensor/switch high input
Required Sensors/Components	Pump module
Frequency of Operation	Once per driving cycle: P0451 sensor stuck Continuous: P0451 sensor noising, P0450, P0452 and P0453
Duration	0.5 seconds
MIL Operation	Immediate: P0450, P0452 and P0453 2 driving cycles: P0451
Sequence of Operation	None

TYPICAL ENABLING CONDITIONS

P0451 (Noise monitor):

The monitor will run whenever the following DTCs are 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
EVAP pressure sensor malfunction (P0450, P0452, P0453)	Not detected
Either of following conditions met	A or B
A. Engine	Running
B. Soak time (ignition switch OFF time)	5 hours
Intake Air Temperature	4.4 to 35°C (40 to 95°F)

P0451 (Stuck monitor):

The monitor will run whenever the following DTCs are not present	None
Atmospheric pressure (absolute pressure)	Less than 70 kPa (525 mmHg), or 110 kPa (825 mmHg) or more
Battery voltage	10.5 V or more
EVAP pressure sensor malfunction (P0450, P0452, P0453)	Not detected

Soak time (ignition switch OFF time)	5 hours
Intake Air Temperature	4.4 to 35°C (40 to 95°F)

P0450, P0452 and P0453:

The monitor will run whenever the following DTCs are not present	None
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TYPICAL MALFUNCTION THRESHOLDS**1. P0450: Pressure sensor**

EVAP pressure	Less than 42.11 kPa, or more than 123.761 kPa
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2. P0451: Pressure sensor noise

Frequency that EVAP pressure change is 0.3 kPa (2.25 mmHg) or more	10 times or more in 10 seconds
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3. P0451: Pressure sensor stuck

EVAP pressure change during reference pressure measurement	Less than 0.8 kPa (6 mmHg)
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4. P0452: Pressure sensor low

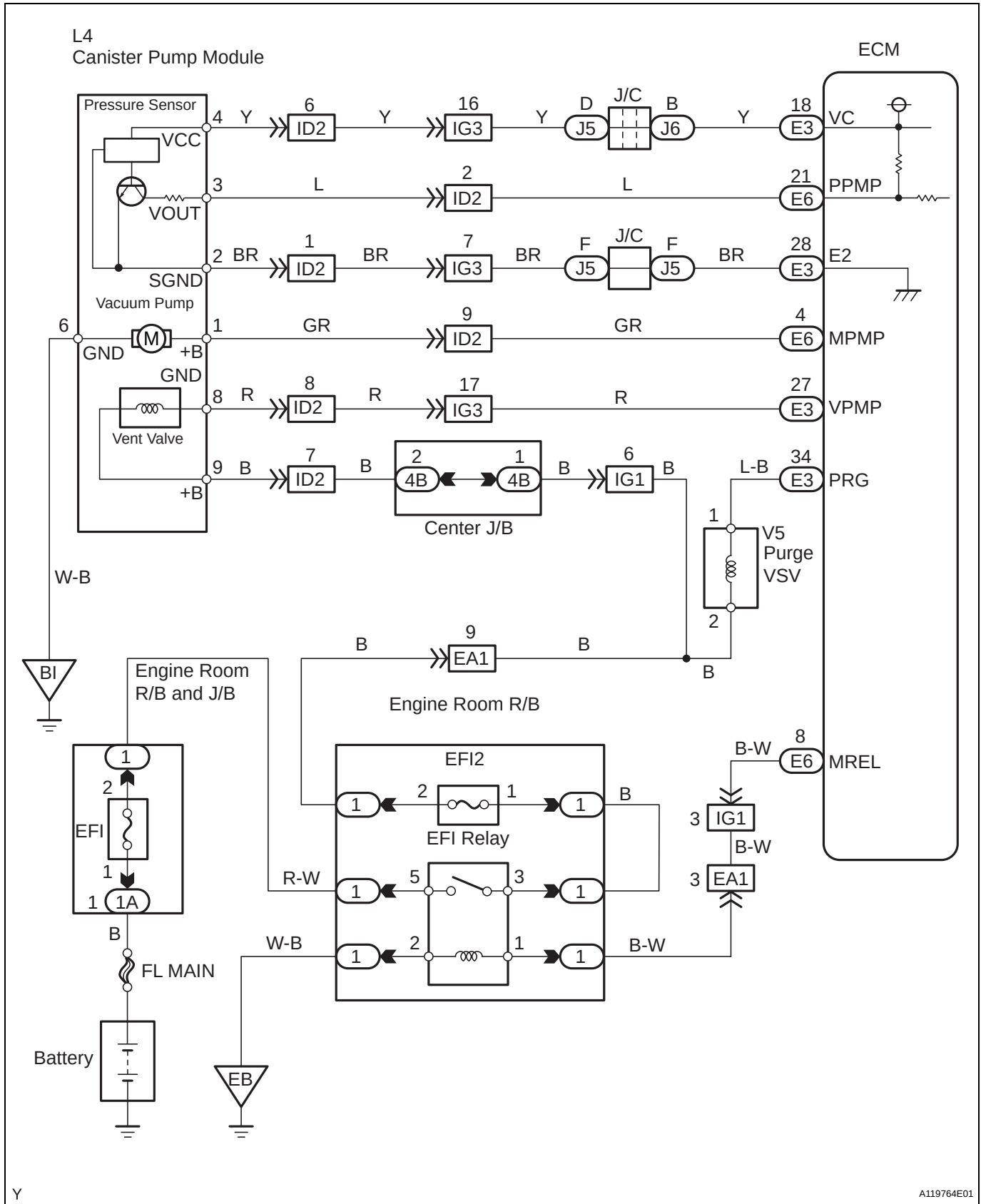
EVAP pressure	Less than 42.11 kPa
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5. P0453: Pressure sensor high

EVAP pressure	More than 123.761 kPa
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6. P0453: Pressure sensor high voltage

EVAP pressure	More than 4.9 V
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INSPECTION PROCEDURE

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 tank cap.
- Do not disassemble the pump module.
- An intelligent tester is required to conduct the following diagnostic troubleshooting procedure.

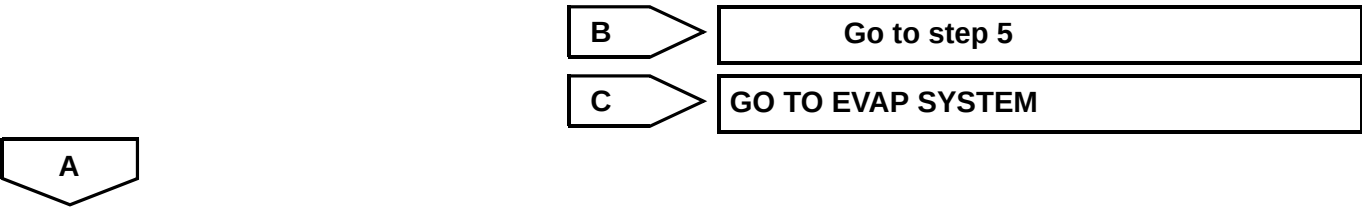
1

CONFIRM DTC AND EVAP PRESSURE

- (a) Connect an intelligent tester to the DLC3.
- (b) Turn the ignition switch to 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 / ALL / VAPOR PRESS.
- (g) Read the EVAP (Evaporative Emission) pressure displayed on the tester.

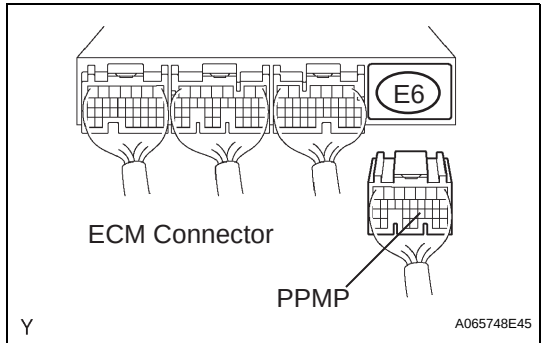
Result

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



2

CHECK HARNESS AND CONNECTOR (PUMP MODULE - ECM)

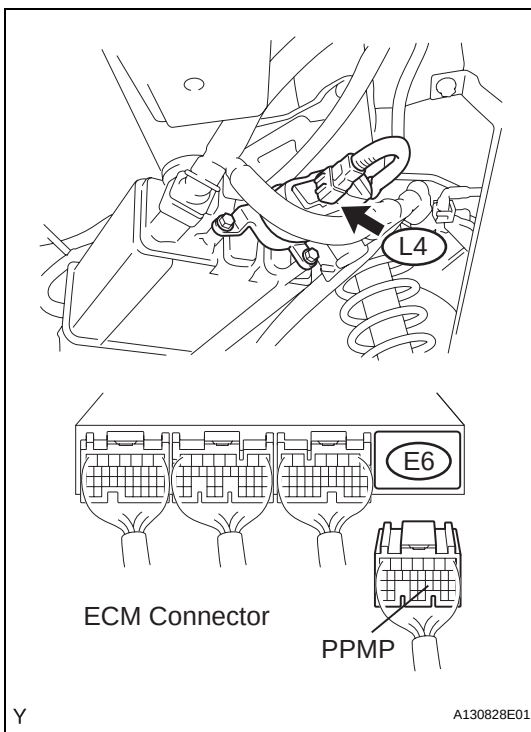


- (a) Turn the ignition switch to OFF.
- (b) Disconnect the E6 ECM connector.
- (c) Measure the resistance between PPMP terminal of the ECM connector and the body ground.

Result

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

(d) Reconnect the ECM connector.

B**Go to step 8****A****3****CHECK HARNESS AND CONNECTOR (PUMP MODULE - ECM)**

- (a) Disconnect the L4 canister connector.
 (b) Disconnect the E6 ECM connector.
 (c) Check the resistance between PPMP terminal of the ECM connector and the body ground,

Result

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

(d) Reconnect the canister connector.

(e) Reconnect the ECM connector.

B**Go to step 7****A****4****REPLACE CHARCOAL CANISTER ASSEMBLY**

- (a) Replace the charcoal canister assembly.
 (b) Connect the intelligent tester to the DLC3.

- (c) Turn the ignition switch to ON and turn the tester ON.
- (d) Wait for at least 60 seconds.
- (e) On the tester, select the following menu items:
DIAGNOSIS / ENHANCED OBD II / DTC INFO / PENDING CODES.

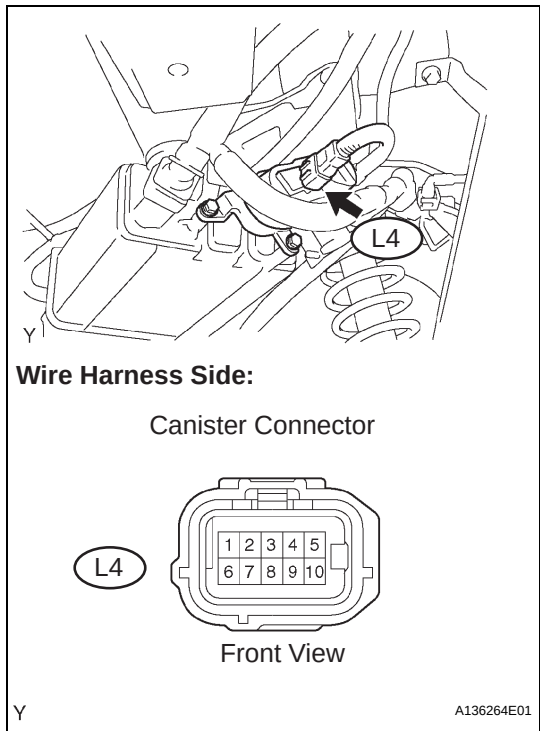
HINT:
If no pending DTC is displayed on the tester, the repair has been successfully completed.

NEXT

COMPLETED

ES

5 CHECK HARNESS AND CONNECTOR (PUMP MODULE - ECM)



- (a) Turn the ignition switch to OFF.
 - (b) Disconnect the L4 canister connector.
 - (c) Turn the ignition switch to ON.
 - (d) Measure the voltage and resistance of the L4 connector.
- Standard**

Terminal No.	Specified Condition
L4-4 - Body ground	Between 4.5 V and 5.5 V
L4-3 - Body ground	Between 4.5 V and 5.5 V
L4-2 - Body ground	Below 1 Ω

Result

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

- (e) Reconnect the canister connector.

B Go to step 7

A

6 REPLACE CHARCOAL CANISTER ASSEMBLY

- (a) Replace the charcoal canister assembly.
- (b) Connect the intelligent tester to the DLC3.

- (c) Turn the ignition switch to ON and turn the tester ON.
- (d) Wait for at least 60 seconds.
- (e) On the tester, 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

7

REPAIR OR REPLACE WIRE HARNESS AND CONNECTORS

- (a) Repair or replace the wire harness and connectors.
- (b) Connect the intelligent tester to the DLC3.
- (c) Turn the ignition switch to ON and turn the tester ON.
- (d) Wait for at least 60 seconds.
- (e) On the tester, 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

8

REPLACE ECM

- (a) Replace the ECM (See page [ES-407](#)).
- (b) Connect the intelligent tester to the DLC3.
- (c) Turn the ignition switch to ON and turn the tester ON.
- (d) Wait for at least 60 seconds.
- (e) On the tester, 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

ES