

| | | |
|------------|--------------|--|
| 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 |

ES**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. | <ul style="list-style-type: none"> Canister pump module EVAP system hose (pipe from air inlet port to canister pump module, canister filter, fuel tank vent hose) ECM | <ul style="list-style-type: none"> EVAP monitoring (ignition OFF) Ignition ON | 1 trip |
| P0451 | Canister pressure sensor noise | Sensor output voltage fluctuates frequently within certain time period. | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> 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. | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> EVAP monitoring (ignition OFF) | 2 trip |
| P0452 | Canister pressure sensor low input | EVAP pressure less than 42.1 kPa for 0.5 seconds. | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> Ignition ON EVAP monitoring (ignition OFF) | 1 trip |

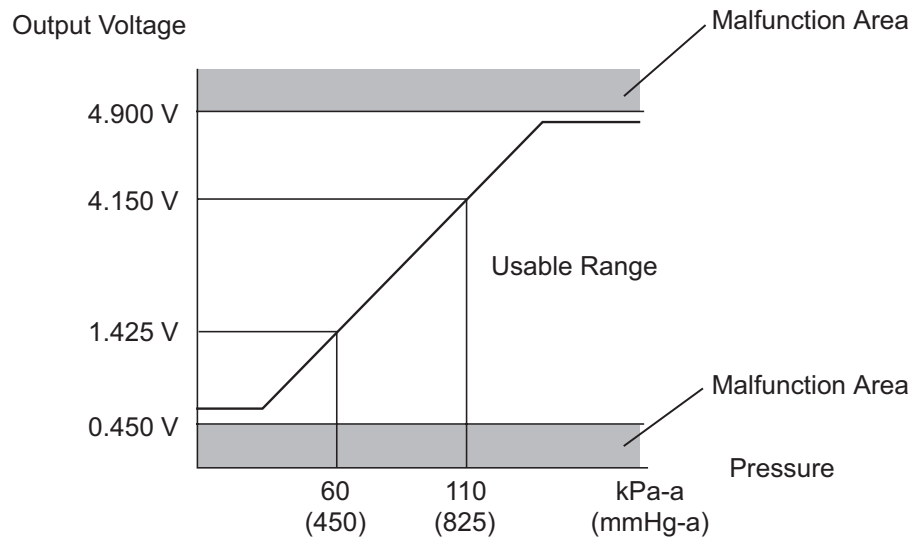
| DTC | Monitoring Items | Malfunction Detection Conditions | Trouble Areas | Detection Timings | Detection Logic |
|-------|-------------------------------------|--|---|---|-----------------|
| P0453 | Canister pressure sensor high input | EVAP pressure more than 123.8 kPa for 0.5 seconds. | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> Ignition ON EVAP monitoring (ignition OFF) | 1 trip |

HINT:

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

ES**DESCRIPTION**

The description can be found in the EVAP (Evaporative Emission) System (see page [ES-335](#)).

MONITOR DESCRIPTION**Canister Pressure Sensor Specification:****HINT:**

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

A115543E05

1. DTC P0450: Canister pressure sensor abnormal fluctuation

If the canister pressure sensor output [pressure] rapidly fluctuates between less than 42.1 kPa-a (315.9 mmHg-a) and more than 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 output [pressure] is below 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 output [pressure] is 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).

ES

MONITOR STRATEGY

| | |
|-----------------------------|---|
| Required Sensors/Components | Canister pump module |
| Frequency of Operation | Once per driving cycle: P0451 sensor fixed/flat Continuous: P0451 sensor noise, P0450, P0452 and P0453 |
| Duration | 0.5 seconds: P0450, P0452 and P0453 2 minutes: P0451 |
| MIL Operation | Immediate: P0450, P0452 and P0453 2 driving cycles: P0451 |
| Sequence of Operation | None |

TYPICAL ENABLING CONDITIONS

P0451 (Noise monitor):

| | |
|---|-------------------------------------|
| Monitor runs whenever following DTCs not present | None |
| Atmospheric pressure (absolute pressure) | 70 to 110 kPa-a (525 to 825 mmHg-a) |
| Battery voltage | 10.5 V or more |
| Intake air temperature | 4.4° to 35°C (40° to 95°F) |
| Canister pressure sensor malfunction (P0450, P0452, 0453) | Not detected |
| Either of following conditions met | A or B |
| A. Engine condition | Running |
| B. Time after key off | 5 or 7 or 9.5 hours |

P0451 (Fixed/flat monitor):

| | |
|---|-------------------------------------|
| Monitor runs whenever following DTCs not present | None |
| Battery voltage | 10.5 V or more |
| Intake air temperature | 4.4° to 35°C (40° to 95°F) |
| Canister pressure sensor malfunction (P0450, P0452, 0453) | Not detected |
| Atmospheric pressure (absolute pressure) | 70 to 110 kPa-a (525 to 825 mmHg-a) |
| Time after key off | 5 or 7 or 9.5 hours |

P0450, P0452 and P0453:

| | |
|--|------------|
| Monitor runs whenever following 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-a (315.9 mmHg-a), or more than 123.8 kPa-a (928.4 mmHg-a) |
|---------------|--|

P0451: Canister pressure sensor noise

| | |
|---|--------------------------------|
| Frequency that EVAP pressure change 0.3 kPa-g (2.25 mmHg-g) or more | 10 times or more in 10 seconds |
|---|--------------------------------|

P0451: Canister pressure sensor fixed/flat

| | |
|--|------------------------------------|
| EVAP pressure change during reference pressure | Less than 0.65 kPa-g (4.87 mmHg-g) |
|--|------------------------------------|

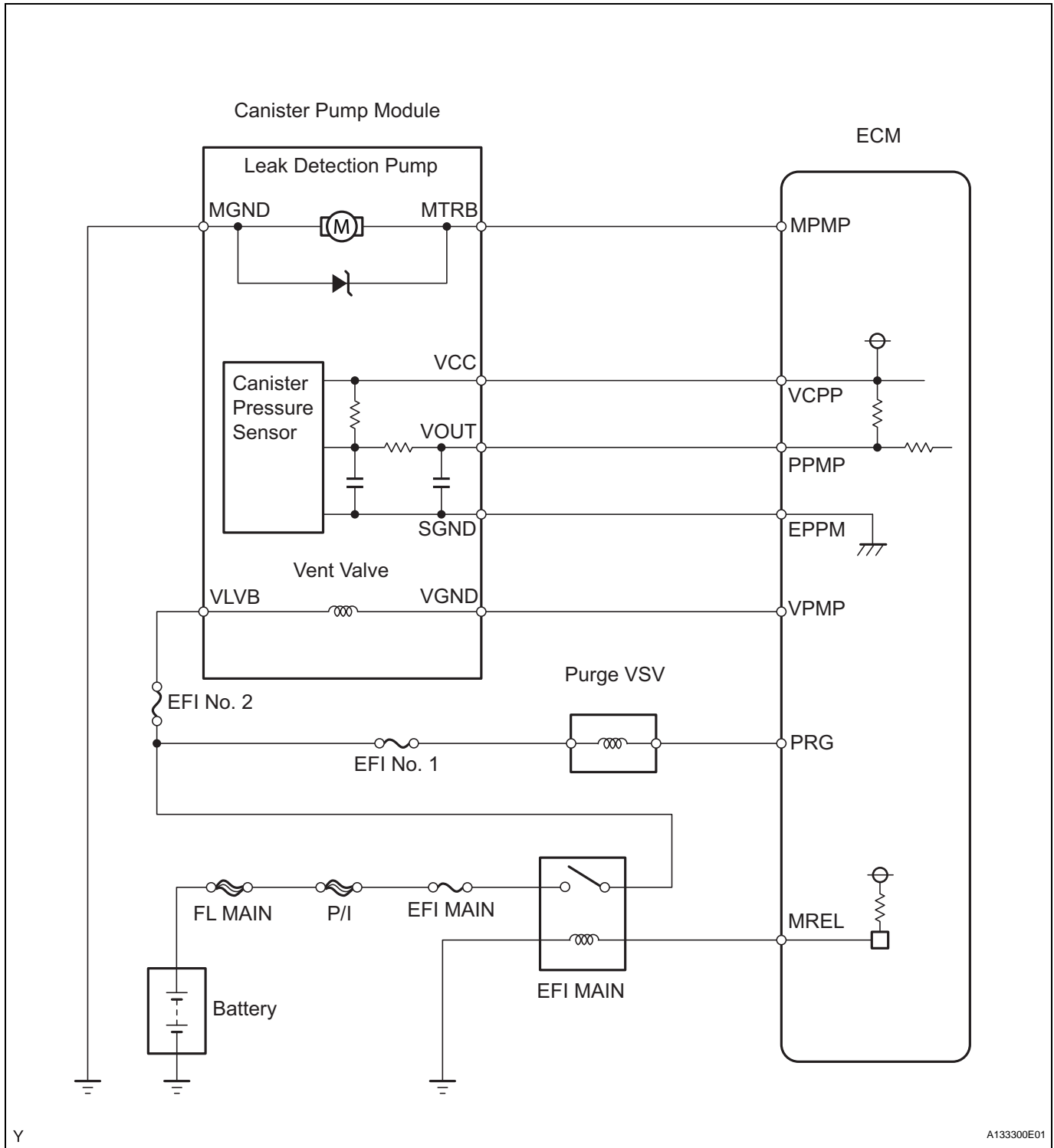
P0452: Canister pressure sensor low voltage

| | |
|---------------|-------------------------------------|
| EVAP pressure | Less than 42.1 kPa-a (315.9 mmHg-a) |
|---------------|-------------------------------------|

P0453: Canister pressure sensor high voltage

| | |
|---------------|--------------------------------------|
| EVAP pressure | More than 123.8 kPa-a (928.4 mmHg-a) |
|---------------|--------------------------------------|

WIRING DIAGRAM



ES

INSPECTION PROCEDURE

NOTICE:

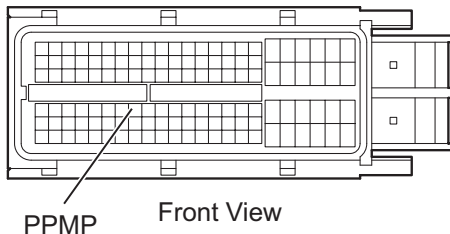
- When a vehicle is brought into the workshop, leave it as it is. Do not change the vehicle condition. For example, do not tighten the fuel cap.
- Do not disassemble the canister pump module.
- The intelligent tester is required to conduct the following diagnostic troubleshooting procedure.

1 CONFIRM DTC AND EVAP PRESSURE

- (a) Connect the intelligent tester to the DLC3.
- (b) Turn the ignition switch ON (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 / EVAP / EVAP 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 | - | Canister pressure sensor | C |
| P0452 | Less than 45 kPa-a (430 mmHg-a) | <ul style="list-style-type: none"> Wire harness/connector (ECM - Canister pressure sensor) Canister pressure sensor Short in ECM circuit | A |
| P0453 | More than 120 kPa-a (900 mmHg-a) | <ul style="list-style-type: none"> Wire harness/connector (ECM - Canister pressure sensor) Canister pressure sensor Open in ECM circuit | B |

B**Go to step 4****C****GO TO EVAP SYSTEM****A****2 CHECK HARNESS AND CONNECTOR (CANISTER PUMP MODULE - ECM)****Wire Harness Side:****(B30) ECM Connector**

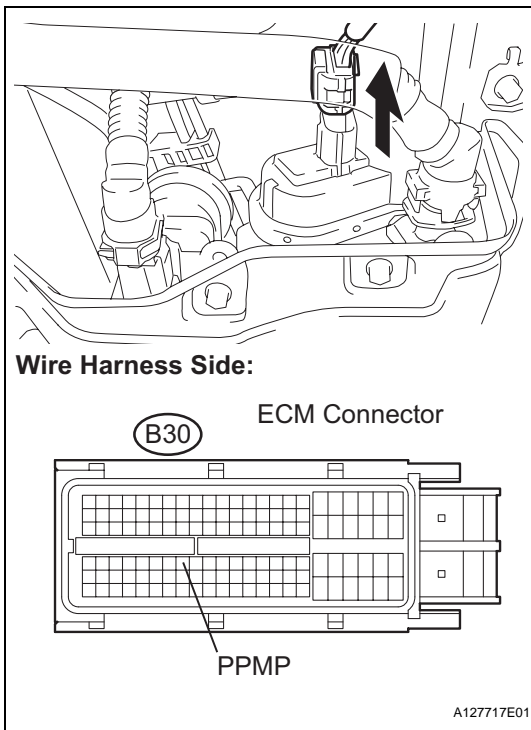
A107892E44

- (a) Turn the ignition switch OFF.
- (b) Disconnect the B30 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 | <ul style="list-style-type: none">Wire harness/connector (ECM - Canister pressure sensor)Short in canister pressure sensor circuit | A |
| 10 k Ω or more | <ul style="list-style-type: none">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 S3 canister pump module connector.
- (b) Disconnect the B30 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 k Ω or more | Short in canister pressure sensor circuit | A |
| 10 Ω or less | Short in wire harness/connector (ECM - Canister pressure sensor) | B |

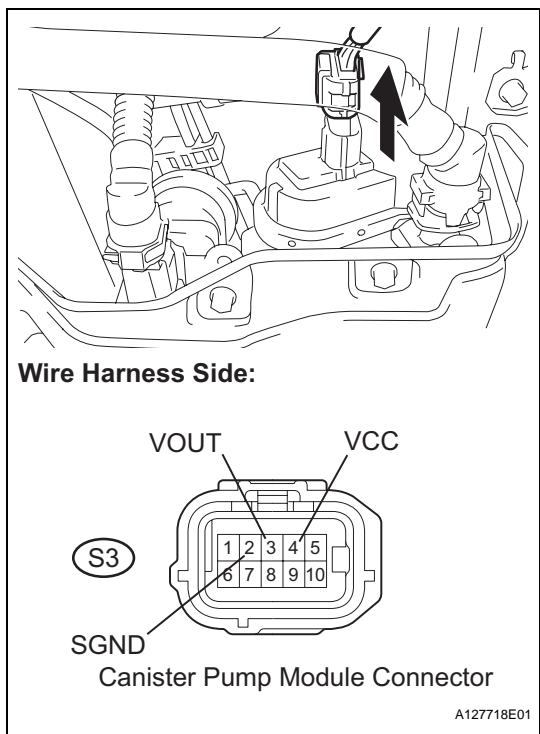
(d) Reconnect the canister pump module connector.

(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 S3 canister pump module connector.
- (b) Turn the ignition switch ON.
- (c) Measure the voltage and resistance of the canister connector.

Standard

| Tester Connections | Specified Conditions |
|---------------------------|----------------------|
| S3-4 (VCC) - Body ground | 4.5 to 5.5 V |
| S3-3 (VOUT) - Body ground | 4.5 to 5.5 V |
| S3-2 (SGND) - 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 pump module connector.

A

Go to step 5

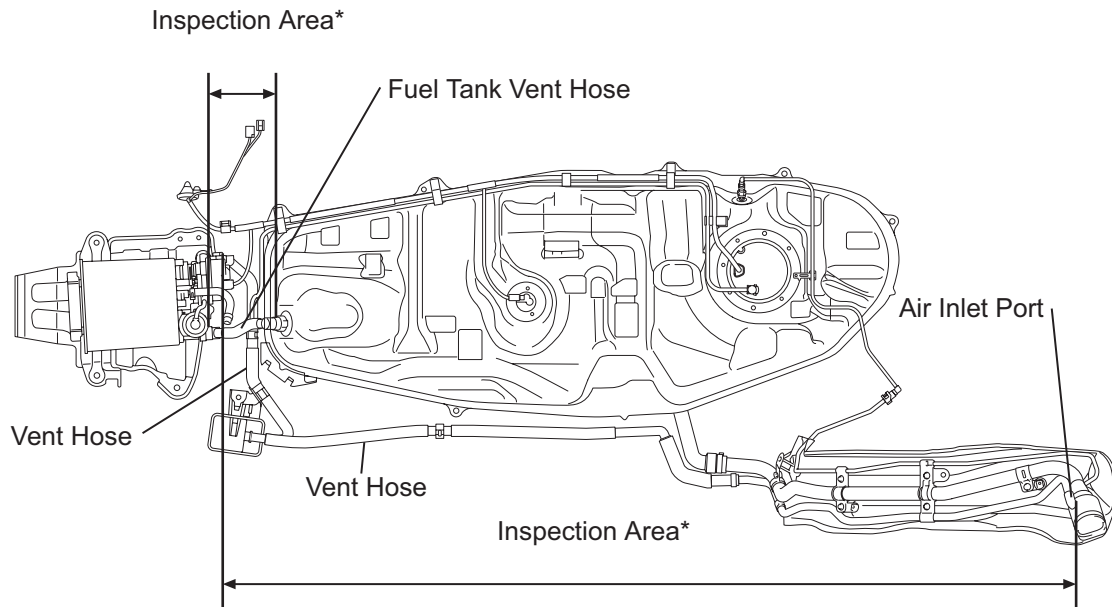
B

Go to step 6

5

REPLACE CHARCOAL CANISTER ASSEMBLY

- (a) Replace the canister assembly (see page EC-10).
NOTICE:
When replacing the canister, check the canister pump module interior and related pipes for water, fuel and 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.



*: Check for disconnection and/or cracks

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-429](#)).

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

HINT:

If no pending DTCs are displayed on the tester, the repair has been successfully completed.

NEXT**COMPLETED**