

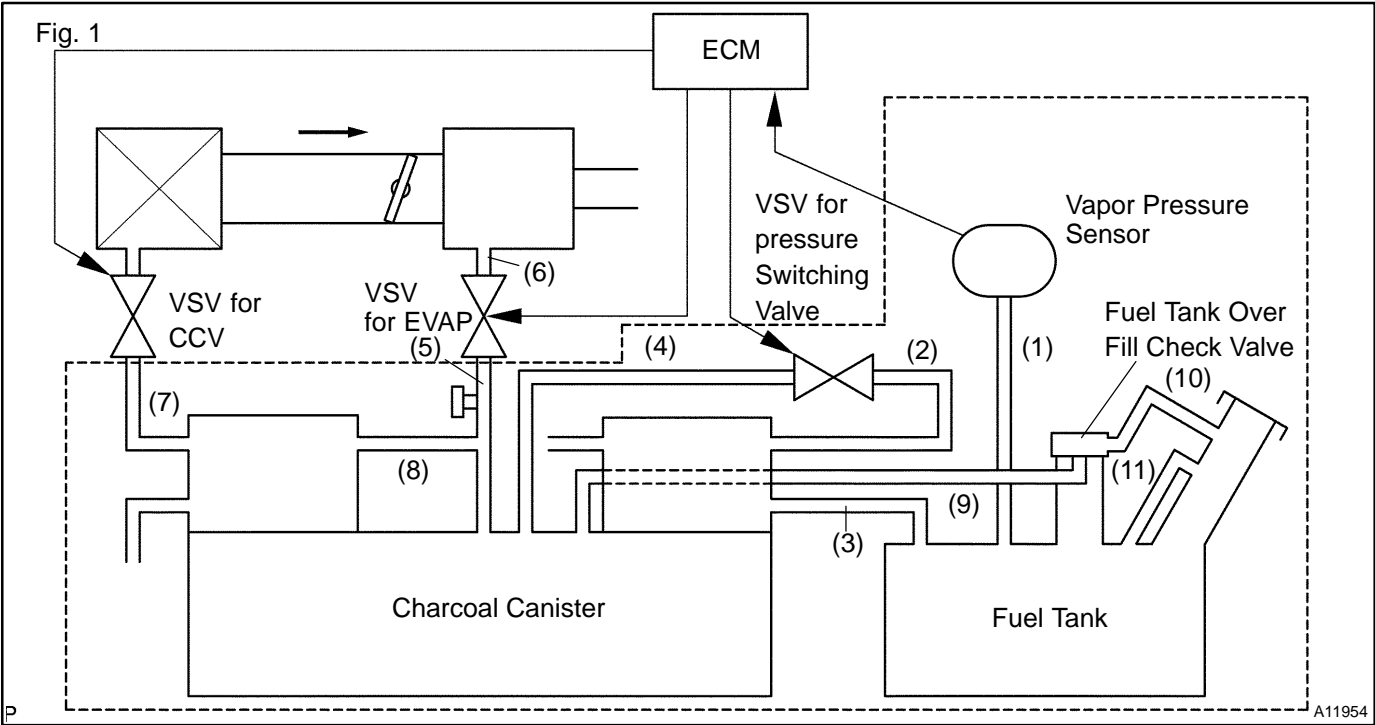
DTC	P0440	Evaporative Emission Control System Malfunction
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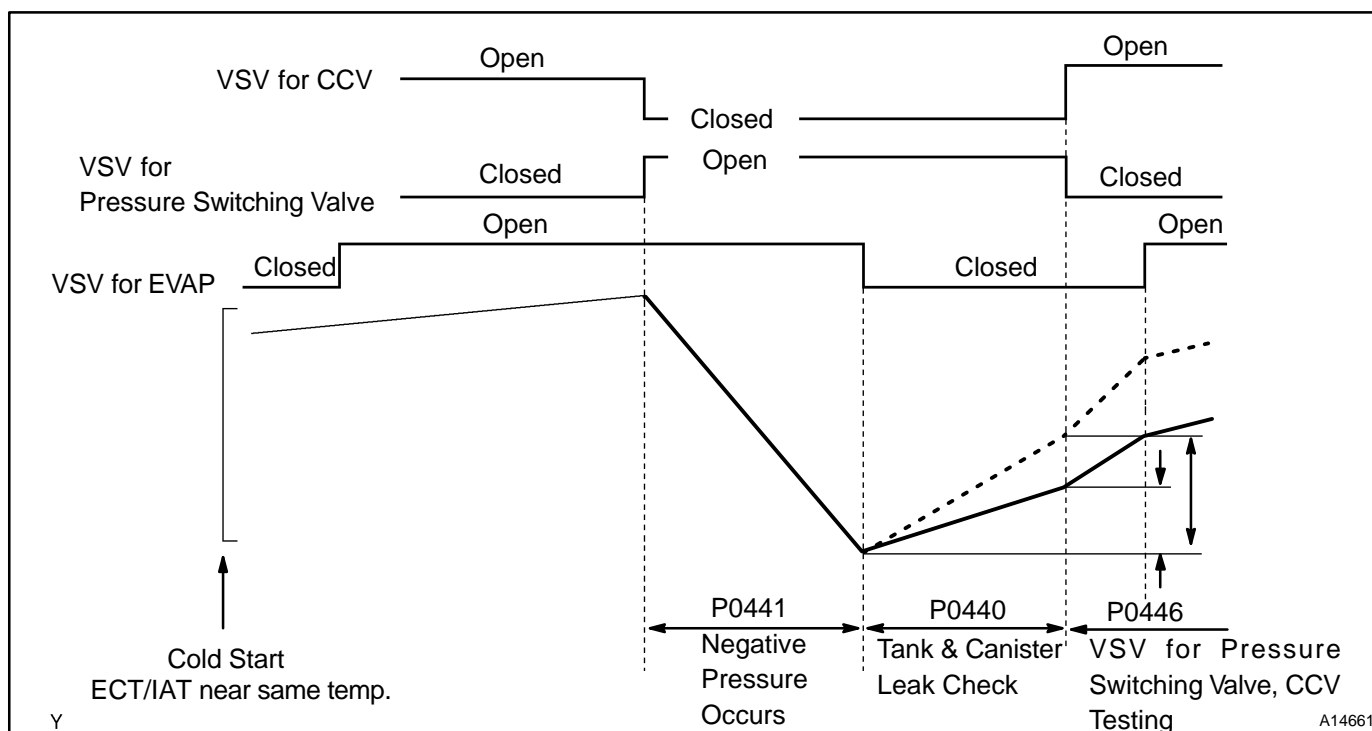
CIRCUIT DESCRIPTION

The vapor pressure sensor and VSV for vapor pressure sensor 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.

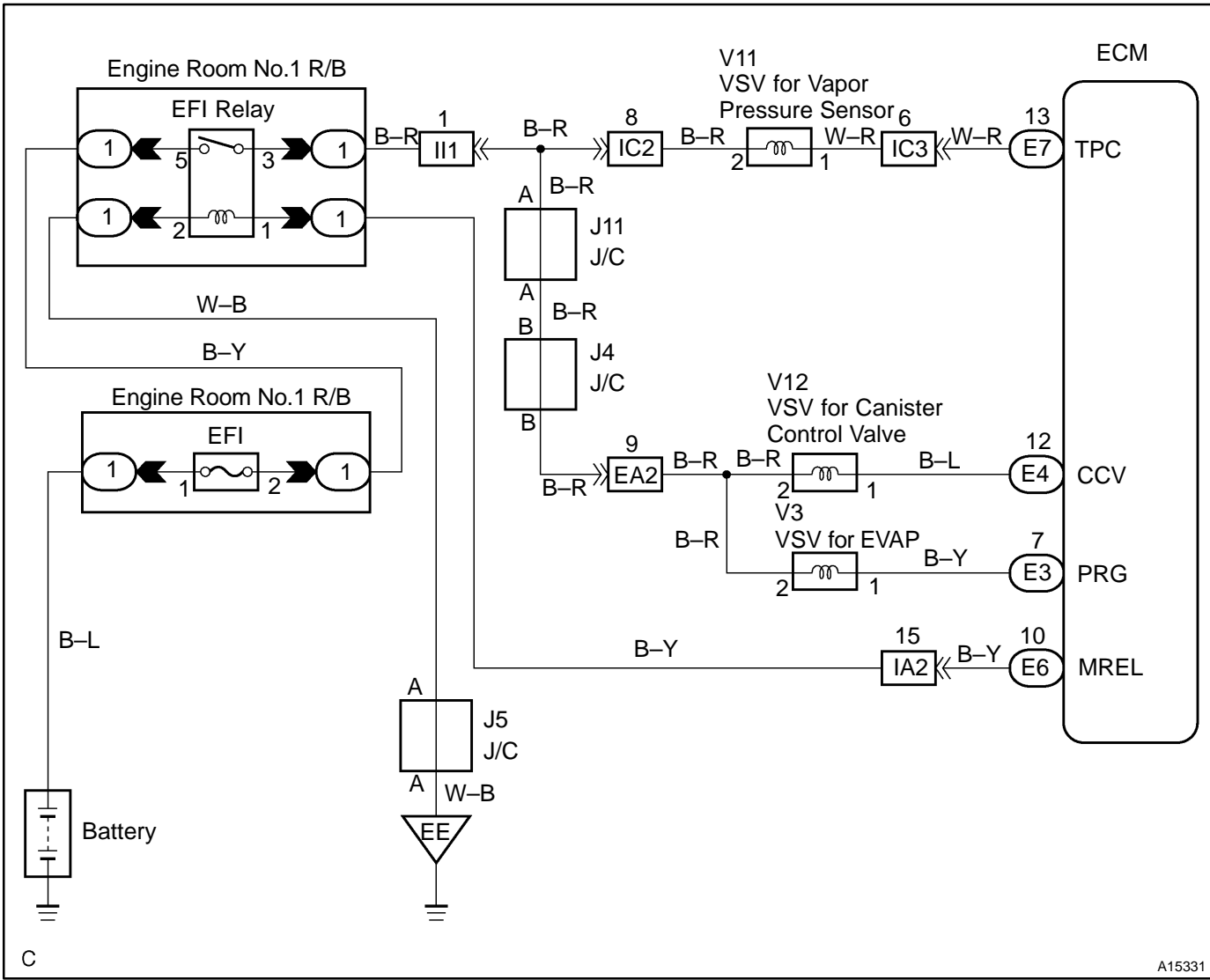
DTC P0440 is recorded by the ECM when evaporative emissions leak from the components within the dotted line in Fig. 1 below, or when the vapor pressure sensor malfunctions.





DTC No.	DTC Detecting Condition	Trouble Area
P0440	<p>After cold engine start.</p> <p>After VSV for EVAP operation, the VSV for EVAP is turned off sealing the vacuum in the system and the ECM begins to monitor the pressure increase.</p> <p>Some increase is normal. A very rapid, sharp increase in pressure indicates a leak in the EVAP system and sets this code.</p>	<ul style="list-style-type: none"> • Hose or tube cracked, hole, damaged or loose seal ((3) or (9) in Fig. 1) • Fuel tank cap incorrectly installed • Fuel tank cap cracked or damaged • Vacuum hose cracked, holed, blocked, damaged or disconnected ((1), (2), (4), (5), (6), (7), (8), (10) and (11) in Fig. 1) • Fuel tank cracked, holed or damaged • Charcoal canister cracked, holed or damaged • Open or short in vapor pressure sensor circuit • Vapor pressure sensor • Fuel tank over fill check valve cracked or damaged • ECM

WIRING DIAGRAM



CONFIRMATION READINESS TEST

First Trip Procedure

- Vehicle must be cold, ambient temperature approximately between 50°F – 95°F.
- Intake Air Temp. (IAT) and Engine Coolant Temp. (ECT) sensor almost same value.

READINESS TESTS	
MISFIRE MON.....	AVAIL
FUEL SYS MON.....	AVAIL
COMP MON.....	AVAIL
CAT EVAL.....	INCMPL
HTD CAT EVAL.....	N/A
EVAP EVAL.....	INCMPL
2nd AIR EVAL.....	N/A
A/C EVAL.....	N/A
O2S EVAL.....	INCMPL
O2S HTR EVAL.....	INCMPL
EGR EVAL.....	INCMPL

- Clear DTC's.
 - Disconnecting the battery terminals or EFI fuse.
 - Readiness tests will show INCMPL (incomplete).
- Drive the vehicle according to LA#4 drive cycle. Note the state of Readiness Tests. They will change to COMPL as the evaluation monitors operate and if the system passes. This procedure may take approximately 20 minutes or more.

NOTICE:

Do not shut off the engine – the results will be invalid.

READINESS TESTS

```

MISFIRE MON..... AVAIL
FUEL SYS MON..... AVAIL
COMP MON..... AVAIL
CAT EVAL..... COMPL
HTD CAT EVAL..... N/A
EVAP EVAL..... COMPL
2nd AIR EVAL..... N/A
A/C EVAL..... N/A
O2S EVAL..... COMPL
O2S HTR EVAL..... COMPL
EGR EVAL..... COMPL

```

A15403

Pass Condition – No Problem Found by the ECM

If the EVAP evaluation monitor shows COMPL, go to the Non-Continuous Test screen.

NOTICE:

Do not shut off the engine – the results will be invalid.

NON-CONTINUOUS TESTS

```

Time$01 CID$01..... Pass
Time$02 CID$01..... Pass
Time$02 CID$02..... Pass
Time$02 CID$03..... Pass
Time$02 CID$04..... Pass
Time$04 CID$00..... Pass
Time$04 CID$02..... Pass
Time$05 CID$01..... Pass
Time$06 CID$01..... Pass
Time$07 CID$01..... Pass

```

A15404

- To get there, go to Advanced OBD II, Onboard Tests, Non-continuous Tests.
- If all of the tests in the time \$02 category Tests show Pass, the evaluation monitor has operated and no problem was detected.

READINESS TESTS

```

MISFIRE MON..... AVAIL
FUEL SYS MON..... AVAIL
COMP MON..... AVAIL
CAT EVAL..... COMPL
HTD CAT EVAL..... N/A
EVAP EVAL..... INCMPL
2nd AIR EVAL..... N/A
A/C EVAL..... N/A
O2S EVAL..... COMPL
O2S HTR EVAL..... COMPL
EGR EVAL..... N/A

```

A15405

Fail Condition – Problem Detected by the ECM

If the EVAP evaluation monitor shows INCMPL, go to the Non-Continuous Test screen.

NON-CONTINUOUS TESTS

```

Time$01 CID$01..... Pass
Time$02 CID$01..... Fail
Time$02 CID$02..... Fail
Time$02 CID$03..... Fail
Time$02 CID$04..... Fail
Time$04 CID$00..... Pass
Time$04 CID$02..... Pass
Time$05 CID$01..... Pass
Time$06 CID$01..... Pass
Time$07 CID$01..... Pass

```

A15406

- (1) If all Tests show Pass, the following may have occurred.
 - The EVAP evaluation monitor did not operate.
 - The EVAP evaluation monitor did not finish.
 - The ECM withheld judgement.
- (2) If one or more of the tests in the time \$02 category show Fail, the EVAP evaluation monitor did operate and the ECM detected a problem.

CONTINUOUS TESTS

ECU: \$10 (Engine)
Number of Tests: 3

P0440
EVAP Control System Malfunction

P0441
EVAP Control System Incorrect
Purge Flow

P0446
EVAP Control System Vent Control
Circuit Malfunction

A15407

- (3) Go to Continuous Tests screen. This is the only place DTC's are listed for the first trip.

NOTICE:

The DTC listed may not be valid. A second trip is needed to confirm the DTC.

READINESS TESTS

```

MISFIRE MON..... AVAIL
FUEL SYS MON..... AVAIL
COMP MON..... AVAIL
CAT EVAL..... COMPL
HTD CAT EVAL..... N/A
EVAP EVAL..... COMPL
2nd AIR EVAL..... N/A
A/C EVAL..... N/A
O2S EVAL..... COMPL
O2S HTR EVAL..... COMPL
EGR EVAL..... COMPL

```

A15403

Second Trip Procedure

- Vehicle must be cold, ambient temperature approximately between 50°F – 95°F.
- Go to Readiness Tests screen.
- Drive the vehicle according to LA#4 drive cycle. Note the state of EVAP evaluation monitor. This procedure may take approximately 20 minutes or more.

NOTICE:

Do not shut off the engine – the results will be invalid.

CONTINUOUS TESTS

ECU: \$10 (Engine)
Number of Tests: 3

P0440
EVAP Control System Malfunction

P0441
EVAP Control System Incorrect
Purge Flow

P0446
EVAP Control System Vent Control
Circuit Malfunction

A15407

- If Readiness Tests changes to COMPL, the EVAP evaluation monitor has operated. Check for any stored DTC's.
 - If a DTC has stored, the problem has been detected and confirmed by the ECM.
 - If no DTC was found, the EVAP monitor operated but no problem was detected.

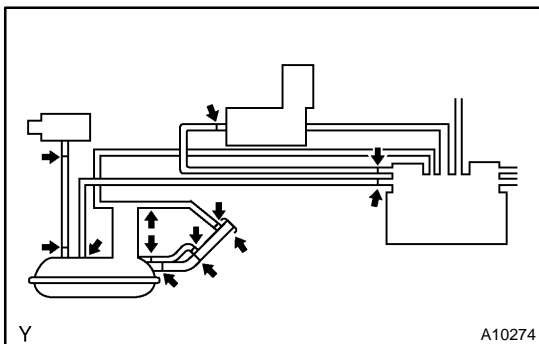
INSPECTION PROCEDURE

HINT:

- If DTC P0441, P0446, P0450 or P0451 is output after DTC P0440, first troubleshoot DTC P0441, P0446, P0450 or P0451. If no malfunction is detected, troubleshoot DTC P0440 next.
- Ask the customer whether, after the MIL came on, the customer found the fuel tank cap loose and tightened it. Also ask the customer whether the fuel tank cap was loose when refuelling. If the fuel tank cap was not loose, it was the cause of the DTC. If the fuel tank cap was not loose or if the customer was not sure if it was loose, troubleshoot according to the following procedure.
- Read freeze frame data using LEXUS hand-held tester or OBD II scan tool. Because freeze frame records the engine conditions when the malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air-fuel ratio was lean or rich, etc. at the time of the malfunction.
- When the ENGINE RUN TIME in the freeze frame data is less than 200 seconds, carefully check the VSV for EVAP, charcoal canister and vapor pressure sensor.

1

Check whether hose close to fuel tank have been modified, and check whether there are signs of any accident near fuel tank or charcoal canister.



CHECK:

Check for cracks, deformation and loose connection of the following parts:

- Fuel tank
- Charcoal canister
- Fuel tank filler pipe
- Hoses and tubes around fuel tank and charcoal canister

NG

Repair or replace.

OK**2****Check that fuel tank cap is LEXUS genuine parts.****NG****Replace to LEXUS genuine parts.****OK****3****Check that fuel tank cap is correctly installed.****NG****Correctly install fuel tank cap.****OK****4****Check fuel tank cap (See page EC-7).****NG****Replace fuel tank cap.****OK****5****Check filler neck for damage.****PREPARATION:**

Remove the fuel tank cap.

CHECK:

Visually inspect the filler neck for damage.

NG**Replace filler pipe.****OK**

- | | |
|----------|---|
| 6 | Check vacuum hoses between vapor pressure sensor and VSV for vapor pressure sensor, and VSV for vapor pressure sensor and charcoal canister. |
|----------|---|

CHECK:

- (a) Check that the vacuum hose is connected correctly.
- (b) Check the vacuum hose for looseness and disconnection.
- (c) Check the vacuum hose for cracks, hole and damage.

NG**Repair or replace.****OK**

- | | |
|----------|---|
| 7 | Check hose and tube between fuel tank and charcoal canister. |
|----------|---|

CHECK:

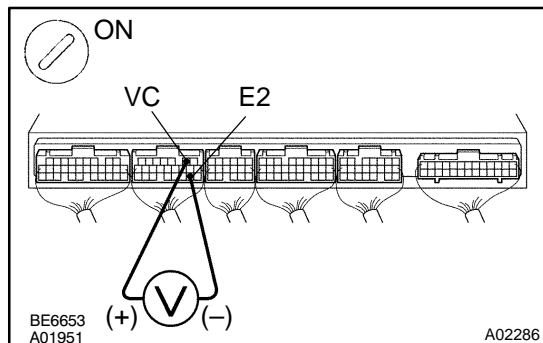
- (a) Check for proper connection of the fuel tank and fuel evap pipe (See page EC-7), fuel evap pipe and fuel tube under the floor, fuel tube under the floor and charcoal canister.
- (b) Check the hose and tube for cracks, hole and damage.

NG**Repair or replace.****OK**

- | | |
|----------|---|
| 8 | Check charcoal canister for cracks, hole and damage (See page EC-7). |
|----------|---|

NG**Replace charcoal canister.****OK**

9 Check voltage between terminals VC and E2 of ECM connector.

**CHECK:**

- (a) Remove the ECM hood (See page SF-73).
- (b) Turn the ignition switch ON.

CHECK:

Measure the voltage between terminals VC and E2 of the ECM connector.

OK:

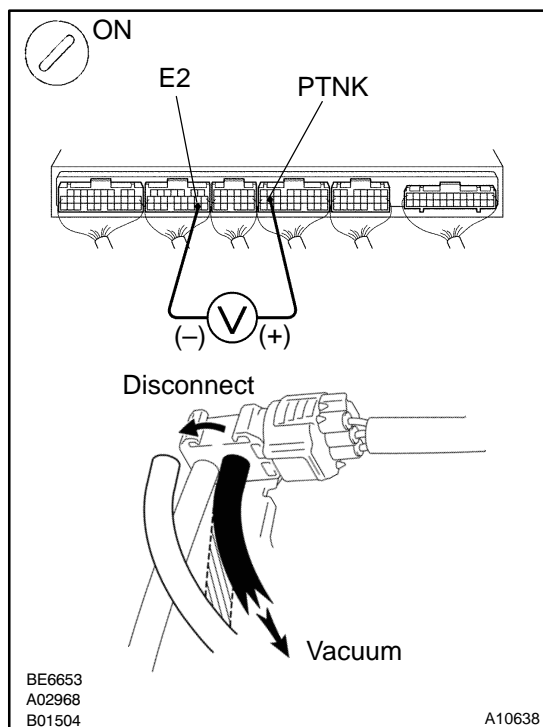
Voltage: 4.5 – 5.5 V

NG

Check and replace ECM (See page IN-32).

OK

10 Check voltage between terminals PTNK and E2 of ECM connectors.

**PREPARATION:**

- (a) Remove the ECM hood (See page SF-73).
- (b) Turn the ignition switch ON.

CHECK:

Measure the voltage between terminals PTNK and E2 of the ECM connectors.

- (1) Disconnect the vacuum hose from the vapor pressure sensor.
- (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.

NOTICE:

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

OK:

- (1) **Voltage: 2.9 – 3.7 V**
- (2) **Voltage: 0.5 V or less**

OK

Go to step 12.

NG

- | | |
|----|--|
| 11 | Check for open and short in harness and connector between vapor pressure sensor and ECM (See page IN-32). |
|----|--|

NG

Repair or replace harness or connector.

OK

Replace vapor pressure sensor.

- | | |
|----|--|
| 12 | Check fuel tank and fuel tank over fill check valve for cracks and damage (See page EC-7). |
|----|--|

NG

Replace fuel tank or fuel tank over fill check valve.

OK

It is likely that vehicle user did not properly close fuel tank cap. Please explain to customer how to properly install fuel tank cap.