

DTC P0440

Description

The evaporative emission (EVAP) large leak test applies vacuum to the EVAP system and monitors vacuum decay. The control module monitors the fuel tank pressure (FTP) sensor signal in order to determine the vacuum decay rate. At an appropriate time, the control module turns the EVAP canister purge valve ON, open, and the EVAP vent valve ON, closed. This allows the engine to draw a vacuum on the EVAP system. At a calibrated time, or vacuum level, the control module turns the purge valve OFF, closed, sealing the system, and monitors the FTP sensor input in order to determine EVAP system vacuum. If the system is unable to achieve the calibrated vacuum level, or the vacuum level decreases too rapidly, DTC P0440 will set.

Conditions for Running the DTC

- DTCs P0107, P0108, P0112, P0113, P0116, P0117, P0118, P0121, P0122, P0123, P0125, P0443, P0449, P0452, P0453, P1111, P1112, P1114, P1115, P1121, or P1122 are not set.
- The ignition voltage is between 10-18 volts.
- The barometric pressure (BARO) is more than 75 kPa.
- The fuel level is between 15-85 percent.
- The engine coolant temperature (ECT) is between 4-30°C (39-86°F).
- The intake air temperature (IAT) is between 4-30°C (39-86°F).
- The start-up ECT and IAT are within 9°C (16°F) of each other.
- The vehicle speed sensor (VSS) is less than 121 km/h (75 mph).

Conditions For Setting the DTC

The EVAP system is not able to achieve or maintain vacuum during the diagnostic test.

Action Taken When the DTC Sets

- The control module illuminates the malfunction indicator lamp (MIL) on the second consecutive ignition cycle that the diagnostic runs and fails.
- The control module records the operating conditions at the time the diagnostic fails. The first time the diagnostic fails, the control module stores this information in the Failure Records. If the diagnostic reports a failure on the second consecutive ignition cycle, the control module records the operating conditions at the time of the failure. The control module writes the operating conditions to the Freeze Frame and updates the Failure Records.

Conditions for Clearing the MIL/DTC

- The control module will turn the malfunction indicator lamp (MIL) OFF during the first consecutive trip in which the diagnostic has been run and passed.
- A current DTC, Last Test Failed, clears when the control module turns OFF the MIL.
- The history DTC will clear after the control module runs and passes 40 consecutive warm up cycles with no failure.
- Use the scan tool in order to clear the DTC.

Diagnostic Aids

- Use the [J 41413](#) EVAP Pressure/Purge Diagnostic Station in order to pressurize the EVAP system to aid in locating intermittent leaks. Move all EVAP components while testing with the [J 41416](#) Ultrasonic Leak Detector.
- A temporary blockage in the EVAP canister purge valve, purge pipe, or EVAP canister could cause an intermittent condition. To repair a blockage in the EVAP system, refer to [Evaporative Emission System Cleaning](#).
- Reviewing the Failure Records vehicle mileage since the diagnostic test last failed may help determine how often the condition that caused the DTC to be set occurs. This may assist in diagnosing the condition.

Test Description

The numbers below refer to the step numbers on the diagnostic table.

4. This step verifies that a failure condition is active.
5. This step is used to verify if a leak is present.
6. This step verifies proper operation of the FTP sensor.
9. This step tests the EVAP canister purge valve for a restriction or blockage.

Step	Action	Values	Yes	No
<i>Schematic Reference: Evaporative Emissions Hose Routing Diagram</i>				
1	Did you perform the Diagnostic System Check-Engine Controls?	--	Go to Step 2	Go to Diagnostic System Check - Engine Controls
2	Does the scan tool indicate DTC P0443 or DTC P0449 are also set?	--	Go to Diagnostic Trouble Code (DTC) List	Go to Step 3
	<ol style="list-style-type: none"> 1. Inspect the EVAP system for the following conditions: <ul style="list-style-type: none"> • Loose, missing, or damaged service port schrader valve • Loose, incorrect, missing, or damaged fuel fill cap • A damaged EVAP canister purge valve 2. Raise the vehicle on a hoist. Refer to Lifting and Jacking the Vehicle in General Information. 			

3	<p>3. Inspect the EVAP system for the following conditions:</p> <ul style="list-style-type: none"> • Disconnected, improperly routed, kinked, or damaged EVAP pipes and hoses • A damaged EVAP canister vent valve or EVAP canister <p>Did you find and correct the condition?</p>	--	Go to Step 17	Go to Step 4
4	<p>1. With a scan tool, capture and record the Failure Records data and clear the DTCs.</p> <p>2. Perform the Service Bay Test. Refer to Service Bay Test .</p> <p>Does the scan tool indicate that the Service Bay Test passed?</p>	--	Go to Diagnostic Aids	Go to Step 5
5	<p>Important: Always zero the EVAP pressure and vacuum (in H2O) gauges on the J 41413 EVAP Pressure/Purge Diagnostic Station before proceeding with diagnosis.</p> <ol style="list-style-type: none"> 1. Install the J 41415-40 Fuel Fill Cap Adaptor. 2. Connect the J 41413 and the vehicle fuel fill cap to the J 41415-40 . 3. Turn ON the ignition, with the engine OFF. 4. With the scan tool, seal the EVAP system. 5. With the J 41413 , pressurize the system to the specified value. 6. Rotate the J 41413 rotary switch to the OFF/HOLD position. Monitor the pressure gage for 1 minute. <p>Did you obtain and hold the specified value?</p>	5 in H2O	Go to Step 6	Go to Step 8
6	<p>Compare the J 41413 value to the scan tool FTP sensor value.</p> <p>Does EVAP pressure/purge diagnostic station value measure near the scan tool value?</p>	--	Go to Step 7	Go to Step 13
7	<ol style="list-style-type: none"> 1. With the J 41413 , pressurize the EVAP system to the specified value. 2. Rotate the J 41413 rotary valve to the OFF/HOLD position. 3. Monitor the pressure gage on J 41413 . 4. With a scan tool, command the EVAP canister purge valve to 50 percent. <p>Does the EVAP system pressure decrease?</p>	5 in H2O	Go to Step 9	Go to Step 10
	<ol style="list-style-type: none"> 1. With the J 41413 , continuously pressurize the EVAP system. <p>Important: The fuel tank may need to be partially lowered in order to inspect components located in the upper portion of the tank.</p> <ol style="list-style-type: none"> 2. With the J 41416 Ultrasonic Leak Detector, inspect for leaks in the following locations: <ul style="list-style-type: none"> • The EVAP system purge pipe--Refer to Evaporative Emission 			

8	<p>Hoses/Pipes Replacement - Engine .</p> <ul style="list-style-type: none"> • The EVAP vapor pipe--Refer to Evaporative Emission Hoses/Pipes Replacement - Canister/Fuel Tank . • The EVAP vent hose/pipe • The fuel fill pipe/hose and fuel fill cap--Refer to Filler Tube Replacement . • The EVAP canister--Refer to Evaporative Emission Canister Replacement . • The EVAP canister vent valve-- Refer to Evaporative Emission Canister Vent Solenoid Valve Replacement . • The EVAP canister purge valve--Refer to Evaporative Emission Canister Purge Solenoid Valve Replacement . • The fuel sender assembly and/or seal--Refer to Fuel Sender Assembly Replacement . • The FTP sensor seal--Refer to Fuel Tank Pressure Sensor Replacement . • The fill limiter vent valve, pressure relief valve, rollover valve, or fuel tank--Refer to Fuel Tank Replacement . <p>Did you locate and repair the system?</p>	--	Go to Step 17	Go to Diagnostic Aids
9	<ol style="list-style-type: none"> 1. Disconnect the EVAP purge pipe from the EVAP canister purge valve. 2. Install the J 41413 vacuum hose on the EVAP canister purge valve port. 3. Start the engine. 4. Run the engine between 1,200-1,500 RPM. 5. With a scan tool, command the EVAP canister purge valve to 50 percent. <p>Does the EVAP pressure/purge diagnostic station vacuum gage measure above the specified value?</p>	12 in Hg	Go to Diagnostic Aids	Go to Step 15
10	<ol style="list-style-type: none"> 1. Monitor the pressure gage on J 41413 . 2. Disconnect the EVAP purge pipe from the EVAP purge valve. <p>Does the EVAP system pressure decrease?</p>	--	Go to Step 15	Go to Step 11
11	<ol style="list-style-type: none"> 1. Monitor the pressure gage on J 41413 . 2. Disconnect the purge pipe at the EVAP canister. <p>Does the EVAP system pressure decrease?</p>	--	Go to Evaporative Emission System Cleaning	Go to Step 12
12	<ol style="list-style-type: none"> 1. Monitor the pressure gage on the J 41413 . 2. Disconnect the EVAP vapor line from the EVAP canister. <p>Does the EVAP system pressure decrease?</p>	--	Go to Step 16	Go to Step 14

13	Replace the FTP sensor. Refer to Fuel Tank Pressure Sensor Replacement . Did you complete the replacement?	--	Go to Step 17	--
14	Repair for a pinched or obstructed EVAP vapor pipe. Did you complete the repair?	--	Go to Step 17	--
15	Replace the EVAP purge valve. Refer to Evaporative Emission Canister Purge Solenoid Valve Replacement . Did you complete the replacement?	--	Go to Step 17	--
16	Replace the EVAP canister. Refer to Evaporative Emission Canister Replacement . Did you complete the replacement?	--	Go to Step 17	--
17	Perform the Service Bay Test. Refer to Service Bay Test . Does the scan tool indicate that the Service Bay Test passed?	--	Go to Step 18	Go to Step 5
18	With a scan tool, observe the stored information, Capture Info. Does the scan tool display any DTCs that you have not diagnosed?	--	Go to Diagnostic Trouble Code (DTC) List	System OK