

DTC P2127

Circuit Description

The accelerator pedal assembly contains 2 accelerator pedal position (APP) sensors. The APP sensors are mounted in the pedal assembly and are not serviceable. The APP sensors provide a signal voltage that changes relative to the position of the accelerator pedal. The engine control module (ECM) supplies a separate 5-volt reference and low reference circuit for each of the APP sensors.

The APP sensor 1 signal voltage increases as the pedal is depressed, from approximately 1 volt at rest to above 2.5 volts when fully depressed. The APP sensor 2 signal voltage decreases as the pedal is depressed, from approximately 4 volts at rest to less than 1 volt with the accelerator pedal fully depressed.

If the ECM detects that the APP sensor 2 signal voltage is too low, this DTC sets.

DTC Descriptor

This diagnostic procedure supports the following DTC:

DTC P2127 Accelerator Pedal Position (APP) Sensor 2 Circuit Low Voltage

Conditions for Running the DTC

- DTCs P0601, P0602, P0603, P0604, P0606, P0607, P0641, P0651 are not set.
- The ignition is ON or the engine is operating.
- The ignition 1 voltage is more than 5.23 volts.
- DTC P2127 runs continuously once the above conditions are met.

Conditions for Setting the DTC

The APP sensor 2 voltage is less than 0.3625 volts for more than 1 second.

Action Taken When the DTC Sets

- The control module illuminates the malfunction indicator lamp (MIL) when the diagnostic runs and fails.
- The control module records the operating conditions at the time the diagnostic fails. The control module stores this information in the Freeze Frame/Failure Records.

Conditions for Clearing the MIL/DTC

- The control module turns OFF the malfunction indicator lamp (MIL) after 4 consecutive ignition cycles that the diagnostic runs and does not fail.

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- A current DTC, Last Test Failed, clears when the diagnostic runs and passes.
- A history DTC clears after 40 consecutive warm-up cycles, if no failures are reported by this or any other emission related diagnostic.
- Clear the MIL and the DTC with a scan tool.

Diagnostic Aids

- Use the [J 35616](#) Connector Test Adapter Kit for any test that requires probing the ECM harness connector or a component harness connector.
- For an intermittent condition, refer to [Testing for Intermittent Conditions and Poor Connections](#).

Test Description

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

- This step tests the internal circuits of the APP sensor 2 throughout its range of motion. If this DTC sets when slowly moving the pedal from the rest position to wide open throttle (WOT), replace the APP assembly for an internal fault.
- The ECM produces a measurable steady-state amperage that provides the 5-volt reference to the APP sensor 2. If the amperage on the 5-volt reference circuit is less than 50 mA, there is a condition with the 5-volt reference circuit or the ECM.
- This step tests for high resistance in the low reference circuit of the APP sensor 2. The ECM must be completely powered down to obtain an accurate resistance reading. It may take up to 30 minutes for the ECM to power down after the ignition key is removed. Removal of the ECM/TCM fuse allows the ECM to power down completely.

Step	Action	Values	Yes	No
<i>Schematic Reference:</i> Engine Controls Schematics <i>Connector End View Reference:</i> Engine Control Module Connector End Views or Engine Controls Connector End Views				
1	Did you perform the Diagnostic System Check - Vehicle?	--	Go to Step 2	Go to Diagnostic System Check - Vehicle in Vehicle DTC Information
2	1. Turn ON the ignition, with the engine OFF. 2. Observe the accelerator pedal position (APP) sensor 2 voltage with a scan tool. Is the voltage less than the specified value?	0.36 V	Go to Step 5	Go to Step 3
	1. Observe the DTC information with a scan tool.			

3	<ol style="list-style-type: none"> Slowly depress the accelerator pedal to wide open throttle (WOT), then slowly return the accelerator pedal to the closed position. Repeat this action several times. <p>Did the DTC fail this ignition?</p>	--	Go to Step 13	Go to Step 4
4	<ol style="list-style-type: none"> Observe the Freeze Frame/Failure Records for this DTC. Turn OFF the ignition for 30 seconds. Start the engine. Operate the vehicle within the Conditions for Running the DTC. You may also operate the vehicle within the conditions that you observed from the Freeze Frame/Failure Records. <p>Did the DTC fail this ignition?</p>	--	Go to Step 5	Go to Diagnostic Aids
5	<ol style="list-style-type: none"> Turn OFF the ignition. Disconnect the APP sensor harness connector. Refer to Accelerator Pedal Position Sensor Replacement. Turn ON the ignition, with the engine OFF. Set up a DMM to test amperage on the 400 mA scale. Measure the amperage from the 5-volt reference circuit of APP sensor 2 to the low reference circuit of APP sensor 2, with a DMM. <p>Is the amperage more than the specified value?</p>	50 mA	Go to Step 6	Go to Step 9
6	<ol style="list-style-type: none"> Turn OFF the ignition. Connect a 3-amp fused jumper wire between the 5-volt reference circuit of the APP sensor 2 and the signal circuit of the APP sensor 2. Turn ON the ignition, with the engine OFF. Observe the APP sensor 2 voltage, with a scan tool. <p>Is the voltage within the specified value?</p>	4.8-5.2 V	Go to Step 7	Go to Step 10
7	<ol style="list-style-type: none"> Turn OFF the ignition. Remove the engine control module (ECM)/transmission control module (TCM) fuse from the underhood fuse block. <p>Notice: Do NOT use a test lamp to test the continuity of the circuit. Damage to the control module may</p>	10 ohms		

	<p>occur due to excessive current draw.</p> <p>3. Measure the resistance from the low reference circuit of the APP sensor 2 to a good ground, with a DMM.</p> <p>Is the resistance less than the specified value?</p>		Go to Step 11	Go to Step 8
8	<p>1. Disconnect the ECM.</p> <p>2. Test the low reference circuit of the APP sensor 2 for an open or high resistance. Refer to Circuit Testing and Wiring Repairs in Wiring Systems.</p> <p>Did you find and correct the condition?</p>	--	Go to Step 15	Go to Step 12
9	<p>Important: The 5-volt reference circuits are internally and externally connected at the controller. Other sensors that share the 5-volt reference circuit may also have DTCs set. Disconnecting a sensor on the shared 5-volt reference circuit may isolate a shorted sensor. Review the electrical schematic and diagnose the shared circuits and sensors.</p> <p>1. Test the 5-volt reference circuit of the APP sensor 2 for the following conditions:</p> <ul style="list-style-type: none"> • A short to ground • High resistance • An open circuit <p>2. Repair as necessary. Refer to Circuit Testing and Wiring Repairs in Wiring Systems.</p> <p>Did you find and correct the condition?</p>	--	Go to Step 15	Go to Step 12
10	<p>1. Test the signal circuit of the APP sensor 2 for the following conditions:</p> <ul style="list-style-type: none"> • A short to ground • High resistance • An open circuit <p>2. Repair as necessary. Refer to Circuit Testing and Wiring Repairs in Wiring Systems.</p> <p>Did you find and correct the condition?</p>	--	Go to Step 15	Go to Step 12
11	<p>Test for an intermittent and for a poor connection at the APP assembly. Refer to Testing for Intermittent Conditions and Poor Connections and Connector Repairs in Wiring Systems.</p>	--		

	Did you find and correct the condition?		Go to Step 15	Go to Step 13
12	Test for an intermittent and for a poor connection at the ECM. Refer to Testing for Intermittent Conditions and Poor Connections and Connector Repairs in Wiring Systems. Did you find and correct the condition?	--	Go to Step 15	Go to Step 14
13	Replace the APP assembly. Refer to Accelerator Pedal Position Sensor Replacement . Did you complete the replacement?	--	Go to Step 15	--
14	Replace the ECM. Refer to Control Module References in Computer/Integrating Systems for replacement, setup, and programming. Did you complete the replacement?	--	Go to Step 15	--
15	1. Clear the DTCs with a scan tool. 2. Turn OFF the ignition for 30 seconds. 3. Start the engine. 4. Operate the vehicle within the Conditions for Running the DTC. You may also operate the vehicle within the conditions that you observed from the Freeze Frame/Failure Records. Did the DTC fail this ignition?	--	Go to Step 2	Go to Step 16
16	Observe the Capture Info with a scan tool. Are there any DTCs that have not been diagnosed?	--	Go to Diagnostic Trouble Code (DTC) List - Vehicle in Vehicle DTC Information	System OK