

CIRCUIT DESCRIPTION

This diagnostic applies only to vehicles built with case grounded heated oxygen sensors (HO2S). To identify the HO2S, refer to Computers and Controls Systems Component Views.

The powertrain control module (PCM) supplies a voltage of about **450 mV** between the HO2S high and low signal circuits. The [oxygen sensor](#) varies the voltage over a range from about **1,000 mV** when the exhaust is rich, down through about **10 mV** when the exhaust is lean.

The PCM monitors and stores the HO2S voltage information. The PCM evaluates the HO2S voltage samples in order to determine the amount of time the HO2S voltage was out of range. The PCM compares the stored HO2S voltage samples taken within each sample period and determines if the majority of the samples are out of the operating range.

The PCM monitors the HO2S voltage and detects if the voltage goes out of the bias range. If the PCM does not detect the voltage went out of the bias range, a diagnostic trouble code (DTC) sets.

CONDITIONS FOR RUNNING THE DTC

- DTCs P0101, P0102, P0103, P0106, P0107, P0108, P0112, P0113, P0116, P0117, P0118, P0121, P0122, P0123, P0200, P0300, P0401, P0404, P0405, P0440, P0442, P0446, P0452, P0453, P1120, P1125, P1220, P1221, P1258, P1404, P1441, P1514, P1515, P1516, P1517, or P1518 are not set.
- The engine run time is more than **409 seconds** .
- The ignition 1 signal is between **9-18 volts** .
- Intrusive tests are not in progress.
- The scan tool output controls are not active.

CONDITIONS FOR SETTING THE DTC

The HO2S voltage is steady between **350-550 mV** for **60 seconds** .

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.
- The control module commands Open Loop.

CONDITIONS FOR CLEARING THE [MIL](#)/DTC

- The control module turns OFF the malfunction indicator lamp (MIL) after 3 consecutive ignition cycles that the diagnostic runs and does not fail.
- 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

IMPORTANT: Remove any debris from the PCM connector surfaces before servicing the PCM. Inspect the PCM connector gaskets when diagnosing or replacing the PCM. Ensure that the gaskets are installed correctly. The gaskets prevent water intrusion into the PCM.

- An oxygen supply inside the HO2S is necessary for proper operation. The HO2S wires provide the supply of oxygen. Inspect the HO2S wires and connections for breaks or contamination. Refer to Heated Oxygen Sensor (HO2S) Wiring Repairs in Diagnostic Aids.
- An HO2S that is loose causes this DTC to set.

For an intermittent condition, refer to Intermittent Conditions. [See: Initial Inspection and Diagnostic Overview\Diagnostic Strategies](#)

TEST DESCRIPTION

Steps 1-7

DTC P0134 or P0154 (4.8L or 5.3L w/Case Grounded HO2S)

Step	Action	Values	Yes	No
<p>Important: This diagnostic applies only to vehicles built with case grounded HO2S. To identify the HO2S, refer to <i>Engine Controls Component Views</i>.</p> <p>Schematic Reference: <i>Engine Controls Schematics</i></p>				
1	Did you perform the Diagnostic System Check—Computers and Control Systems?	—	Go to Step 2	Go to Diagnostic System Check - Computers and Control Systems
2	<p>Important: Allow the engine to cool for one-half hour before proceeding with this diagnostic. This allows the HO2S signal voltage to return to bias voltage, approximately 447 mV.</p> <ol style="list-style-type: none"> 1. Install a scan tool. 2. Turn ON the ignition, with the engine OFF. 3. Immediately observe the affected HO2S voltage for 2 minutes. <p>Does the HO2S voltage go from bias voltage to more than or less than the specified range?</p>	300–600 mV	Go to Step 3	Go to Step 5
3	<ol style="list-style-type: none"> 1. Start the engine. 2. Allow the engine to reach operating temperature. 3. Raise and hold the engine speed at 1,200 RPM for 2 minutes. 4. Observe the HO2S voltage with a scan tool. <p>Is the HO2S voltage varying outside the specified range?</p>	350–550 mV	Go to Step 4	Go to Step 5
4	<ol style="list-style-type: none"> 1. Observe the Freeze Frame/Failure Records data for this DTC. 2. Turn OFF the ignition for 30 seconds. 3. Start the engine. 4. Operate the vehicle within the Conditions for Running the DTC as specified in the supporting text, or as close to the Freeze Frame/Failure Records data that you observed. <p>Does the DTC fail this ignition?</p>	—	Go to Step 5	Go to Misfire/Lean Conditions
5	<ol style="list-style-type: none"> 1. Disconnect the affected HO2S connector. 2. Turn ON the ignition, with the engine OFF. 3. Jumper the HO2S high signal circuit to a good ground. 4. Jumper the HO2S low signal circuit to a good ground. 5. Observe the HO2S voltage with a scan tool. <p>Is the HO2S voltage less than the specified value?</p>	200 mV	Go to Step 9	Go to Step 6
6	<ol style="list-style-type: none"> 1. Remove both jumper wires from the HO2S high signal and low signal circuits. 2. Measure the voltage from the HO2S low signal circuit to a good ground. <p>Is the voltage above the specified value?</p>	4 V	Go to Step 7	Go to Step 8
7	<ol style="list-style-type: none"> 1. Turn OFF the ignition. 2. Disconnect the PCM connector containing the HO2S high signal circuit. 3. Test the HO2S high signal circuit for an open. Refer to Diagnostic Aids for Circuit Testing and Wiring Repair procedures. <p>Did you find and correct the condition?</p>	—	Go to Step 21	Go to Step 16

Steps 8-17

DTC P0134 or P0154 (4.8L or 5.3L w/Case Grounded HO2S)

Step	Action	Values	Yes	No
8	<p>1. Turn OFF the ignition.</p> <p>2. Disconnect the PCM connector containing the HO2S low signal circuit.</p> <p>3. Test the HO2S low signal circuit for an open. Refer to Diagnostic Aids for Circuit Testing and Wiring Repair procedures.</p> <p>Did you find and correct the condition?</p>	—	Go to Step 21	Go to Step 16
9	<p>Remove the jumpers from the previous step.</p> <p>Is the O2A fuse open?</p>	—	Go to Step 12	Go to Step 10
10	<p>1. Turn ON the ignition, with the engine OFF.</p> <p>2. Probe the affected HO2S ignition 1 voltage circuit with a test lamp that is connected to a good ground.</p> <p>Does the test lamp illuminate?</p>	—	Go to Step 11	Go to Step 17
11	<p>1. Connect a test lamp between the affected HO2S ignition 1 voltage circuit and the HO2S heater ground circuit.</p> <p>2. Turn ON the ignition, with the engine OFF.</p> <p>Does the test lamp illuminate?</p>	—	Go to Step 15	Go to Step 18
12	<p>1. Disconnect the opposite bank HO2S pigtail connector.</p> <p>2. Test the HO2S ignition 1 voltage circuit for a short to ground.</p> <p>3. Replace the O2A fuse.</p> <p>Did you find and correct a short to ground in the ignition 1 voltage circuit?</p>	—	Go to Step 21	Go to Step 13
13	<p>Important: Perform the following test on HO2S bank 1 sensor 1 and HO2S bank 2 sensor 1. A condition in either sensor will cause this DTC to set.</p> <p>Test the HO2S ignition 1 voltage circuit, sensor side, for a short to the HO2S body.</p> <p>Did you find the condition?</p>	—	Go to Step 19	Go to Step 14
14	<p>Important: Perform the following test on HO2S bank 1 sensor 1 and HO2S bank 2 sensor 1. A condition in either sensor will cause this DTC to set.</p> <p>Measure the resistance between the HO2S ignition 1 voltage circuit, sensor side, and the HO2S heater ground circuit, sensor side.</p> <p>Does the resistance of either sensor measure above or below the specified range?</p>	2–50 Ω	Go to Step 19	Go to Intermittent Conditions
15	<p>Inspect for poor connections at the harness connector of the affected HO2S.</p> <p>Did you find and correct the condition?</p>	—	Go to Step 21	Go to Step 19
16	<p>Inspect for poor connections at the harness connector of the PCM.</p> <p>Did you find and correct the condition?</p>	—	Go to Step 21	Go to Step 20
17	<p>Repair the open in the ignition 1 voltage circuit.</p> <p>Did you complete the repair?</p>	—	Go to Step 21	—

Steps 18-22

DTC P0134 or P0154 (4.8L or 5.3L w/Case Grounded HO2S)				
Step	Action	Values	Yes	No
18	Repair the open in the HO2S heater ground circuit. Did you complete the repair?	—	Go to <i>Step 21</i>	—
19	Replace the affected HO2S. Did you complete the replacement?	—	Go to <i>Step 21</i>	—
20	Replace the PCM. Did you complete the replacement?	—	Go to <i>Step 21</i>	—
21	1. Use the scan tool in order to clear the DTCs. 2. Turn OFF the ignition for 30 seconds. 3. Start the engine. 4. Operate the vehicle within the Conditions for Running the DTC as specified in the supporting text. Does the DTC run and pass?	—	Go to <i>Step 22</i>	Go to <i>Step 2</i>
22	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

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

2. After the ignition is turned ON, the HO2S heater heats up causing the HO2S signal voltage to either increase or decrease. This indicates that the HO2S heater is OK.
3. If the HO2S voltage is varying outside the specified range, the condition is not present.
5. If the voltage is below the specified value, the high signal circuit, the low signal circuit, and the PCM are OK.
6. If the voltage is above the specified value, the low signal circuit is OK.
12. The opposite bank HO2S must be disconnected to isolate a short to ground in the HO2S heater ignition 1 voltage circuit.
14. Resistance within the specified range indicates the HO2S heater is OK.