

P0112 Intake Air Temperature (IAT) Sensor Circuit Low Voltage

Circuit Description

The intake air temperature (IAT) sensor is an integral part of the mass air flow (MAF) sensor. The IAT sensor is a variable resistor that measures the temperature of the intake air. The engine control module (ECM) supplies 5 volts to the IAT signal circuit and supplies a ground to the low reference circuit. If the ECM detects a low IAT signal voltage, which is a high temperature indication, this DTC sets. The following table illustrates the difference between temperature, resistance, and voltage:

IAT	IAT Resistance	IAT Signal Voltage
Cold	High	High
Warm	Low	Low

DTC Descriptor

This diagnostic procedure supports the following DTC. DTC P0112 Intake Air Temperature (IAT) Sensor Circuit Low Voltage

Conditions for Running the DTC

- The engine run time is more than 3 minutes.
- The engine is idling for more than 10 seconds.
- DTC P0112 runs continuously once the above conditions are met.

Conditions for Setting the DTC

The ECM detects that the intake air temperature is more than 132°C (270°F) for more than 3 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.

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.
- 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-C Connector Test Adapter Kit for any test that requires probing the ECM harness connector or a component harness connector.
- The lower connector of the ECM is connector C1 and the upper connector of the ECM is connector C2. Refer to Engine Controls Component Views.
- Use the Temperature vs Resistance table in order to test the IAT sensor at various temperature levels in order to evaluate the possibility of a skewed sensor. A skewed sensor could result in a driveability condition. If the engine has sat overnight, the intake air temperature and the engine coolant temperature values should display within a few degrees. If the temperatures are not within 3°C (5°F), refer to Temperature vs Resistance - Intake Air Temperature (IAT) Sensor.
- For an intermittent condition, refer to Intermittent Conditions.

Test Description

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

2. This step determines that a condition exists. If the temperature is more than the specified value, test for a condition in the circuits of the IAT sensor.
4. This step isolates the condition. If the temperature is less than the specified value, the ECM and the signal circuit of the IAT sensor are OK.

DTC P0112

Step	Action	Values	Yes	No
Schematic Reference: Engine Controls Schematics Connector End View Reference: Engine Control Module (ECM) Connector End Views or Engine Controls Connector End Views				
1	Did you perform the Diagnostic System Check–Engine Controls?	—	Go to Step 2	Go to Diagnostic System Check–Engine Controls
2	1. Turn ON the ignition, with the engine OFF. 2. Observe the IAT sensor parameter with a scan tool. Is the temperature more than the specified value?	132°C (270°F)	Go to Step 4	Go to Step 3
3	1. Observe the Freeze Frame/Failure Records 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. 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 4	Go to Diagnostic Aids

Step	Action	Values	Yes	No
4	<p>1. Disconnect the mass air flow (MAF)/intake air temperature (IAT) sensor. Refer to Mass Air Flow (MAF)/Intake Air Temperature (IAT) Sensor Replacement.</p> <p>2. Turn ON the ignition, with the engine OFF.</p> <p>3. Observe the IAT sensor parameter with a scan tool.</p> <p>Is the temperature less than the specified value?</p>	-38°C (-36°F)	Go to Step 6	Go to Step 5
5	<p>1. Turn OFF the ignition.</p> <p>2. Disconnect the engine control module (ECM).</p> <p>3. Test the signal circuit of the IAT sensor for a short to ground. Refer to Circuit Testing and Wiring Repairs in Wiring Systems.</p> <p>Did you find and correct the condition?</p>	—	Go to Step 8	Go to Step 7
6	<p>Replace the IAT sensor. Refer to Mass Air Flow (MAF)/Intake Air Temperature (IAT) Sensor Replacement.</p> <p>Did you complete the replacement?</p>	—	Go to Step 8	—
7	<p>Replace the ECM. Refer to Engine Control Module (ECM) Replacement.</p> <p>Did you complete the replacement?</p>	—	Go to Step 8	—
8	<p>1. Clear the DTCs with a scan tool.</p> <p>2. Turn OFF the ignition for 30 seconds.</p> <p>3. Start the engine.</p> <p>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.</p> <p>Did the DTC fail this ignition?</p>	—	Go to Step 2	Go to Step 9

Step	Action	Values	Yes	No
9	Observe the Capture Info with a scan tool. Are there any DTCs that have not been diagnosed?	—	Go to Diagnostic Trouble Code (DTC) List	System OK

LAUNCH