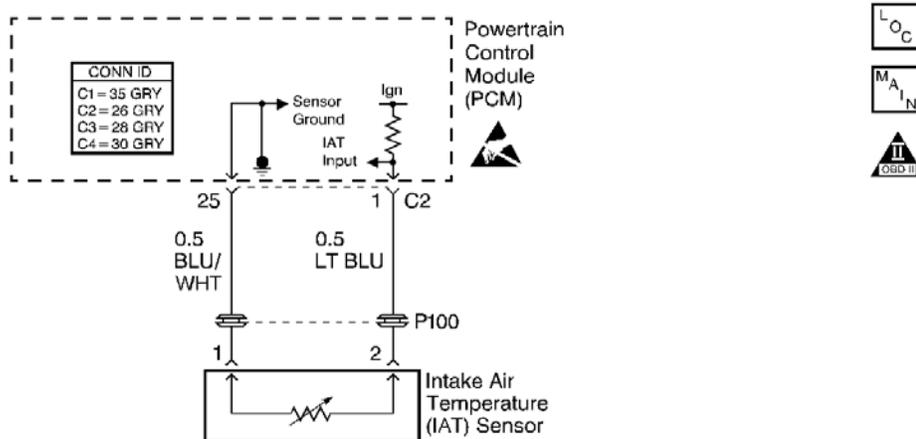


DTC P0113 Intake Air Temperature (IAT) Sensor Circuit High Voltage



Circuit Description

The intake air temperature (IAT) sensor is a thermistor (a variable resistor whose conductive value changes with temperature) in series with a fixed resistor in the powertrain control module (PCM). The PCM applies 5 volts to the IAT sensor. The PCM monitors the voltage across the IAT sensor and converts it into a temperature reading. When the outside air temperature is cold, the IAT sensor resistance is high, and when the outside air temperature is warm, the IAT sensor resistance is low. Therefore, when the air temperature is cold, the PCM will receive a high voltage input, and when the air temperature is warm, the PCM will receive a low voltage input.

Conditions for Setting the DTC

- The ignition is ON.
- IAT signal voltage indicates an intake air temperature -40°C (-40°F).
- The above condition is met for at least 0.5 seconds.
- The PCM will enter the fail-safe function and assume the intake air temperature is 23°C (73°F).

Action Taken When the DTC Sets

- The malfunction indicator lamp (MIL) will illuminate.
- The PCM will record operating conditions at the time the diagnostic fails. This information will be stored in the Freeze Frame buffer.

Conditions for Clearing the MIL/DTC

- The MIL will turn OFF after three consecutively passing cycles without a fault present.
- A History DTC will clear after 40 consecutive warm-up cycles without a fault.
- DTCs can be cleared by using a scan tool or by disconnecting the PCM battery feed.

Diagnostic Aids

Check for any of the following conditions:

- A damaged wiring harness -- Inspect the wiring harness for damage. If the harness appears to be OK, observe the IAT display on the scan tool while moving connectors and wiring harnesses related to the IAT sensor. A change in the IAT display will indicate the location of the fault.
- When replacing the IAT sensor the Temperature to Resistance Value scale may be used to test the sensor at various temperature levels to evaluate the possibility of a shifted (incorrectly calibrated) sensor. A shifted sensor could result in poor driveability complaints. Refer to [Temperature vs Resistance](#) .
- A shorted to voltage sensor signal circuit may cause DTC P0113 to set.

If the DTC P0113 is intermittent, driving the vehicle under the following conditions can verify whether the fault is present. Perform the scan tool Clear DTC Information function. Road test the vehicle while monitoring the DTC P0113 diagnostic on the scan tool under the Not Ran Since Code Cleared selection in the DTC Information menu. If a DTC P0113 appears in the Not Ran Since Code Cleared list, the P0113 diagnostic has not yet run. When the DTC P0113 does not appear in the Not Ran Since Code Cleared list, the P0113 diagnostic has run. If the MIL is NOT ILLUMINATED and there is no PENDING DTC Status in DTC Information, the P0113 diagnostic has passed. DTCs MUST BE CLEARED in order to view the CURRENT STATUS of the Not Ran Since Code Cleared list. DO NOT FORGET that the Not Ran Since Code Cleared list only indicates that the test has run, not whether the test passed or failed. The DTC Information screen must be checked for CURRENT or PENDING status, in order to determine the outcome of the diagnostic test involved.

An intermittent malfunction may be caused by a fault in the IAT sensor circuit. Inspect the wiring harness and components for any of the following conditions:

- Backed out terminals
- Improper mating of terminals
- Broken electrical connector locks
- Improperly formed or damaged terminals
- Faulty terminal to wire connections
- Physical damage to the wiring harness
- A broken wire inside the insulation
- Corrosion of electrical connections, splices, or terminals

If you cannot duplicate the DTC P0113, the information included in the Freeze Frame data can be useful in determining vehicle operating conditions when the DTC was first set.

Test Description

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

1. The Powertrain OBD System Check prompts the technician to complete some basic checks and to store the Freeze Frame data on the scan tool if applicable. This creates an electronic copy of the data taken when the fault occurred. The information is then stored in the scan tool for later reference.
2. This step will determine if fault is present.
3. Review the Freeze Frame data in order to determine when the DTC set. Always record this information.
4. This step determines if there is a fault in the IAT circuit wiring.

Step	Action	Value (s)	Yes	No
	Did you perform the Powertrain On-Board Diagnostic			Go to Powertrain On

1	(OBD) System Check?	--	Go to Step 2	Board Diagnostic (OBD) System Check
2	<ol style="list-style-type: none"> 1. Turn ON the ignition, leaving the engine OFF. 2. Install a scan tool. 3. Observe the IAT parameter on the scan tool data list. <p>Is the IAT display at or less than the specified value?</p>	-40°C (-40°F)	Go to Step 4	Go to Step 3
3	<ol style="list-style-type: none"> 1. Turn ON the ignition, leaving the engine OFF. 2. Use the scan tool Clear Information function. 3. Operate the vehicle within the Freeze Frame conditions as observed. <p>Is a DTC P0113 set?</p>	--	Go to Step 4	Go to Diagnostic Aids
4	<ol style="list-style-type: none"> 1. Disconnect the IAT sensor electrical connector. 2. Jump the IAT signal (input) circuit and the sensor ground circuit together at the IAT sensor harness connector. 3. Observe the IAT parameter on the scan tool. <p>Is the IAT display at the specified value?</p>	165°C (329°F)	Go to Step 6	Go to Step 5
5	<ol style="list-style-type: none"> 1. Jump the IAT signal (input) circuit at the sensor harness connector to chassis ground. 2. Observe the IAT parameter on the scan tool. <p>Is the IAT display at the specified value?</p>	165°C (329°F)	Go to Step 7	Go to Step 8
6	<p>Check for a faulty connection at the IAT sensor and repair as necessary.</p> <p>Did you find a problem?</p>	--	Go to Step 12	Go to Step 10
7	<ol style="list-style-type: none"> 1. Turn OFF the ignition. 2. Disconnect the PCM. 3. Check the IAT sensor ground circuit for an open circuit. Refer to Wiring Repairs in Wiring Systems. <p>Was a repair necessary?</p>	--	Go to Step 12	Go to Step 9
8	<ol style="list-style-type: none"> 1. Turn OFF the ignition. 2. Disconnect the PCM. 3. Check the IAT sensor signal (input) circuit for an open. 4. Repair as necessary. Refer to Wiring Repairs in Wiring Systems. <p>Was a repair necessary?</p>	--	Go to Step 12	Go to Step 9
9	<ol style="list-style-type: none"> 1. Check for a faulty connection at the PCM. 2. Repair as necessary. Refer to Wiring Repairs in Wiring Systems. <p>Was a repair necessary?</p>	--	Go to Step 12	Go to Step 11
10	Replace the IAT sensor. Refer to Intake Air Temperature (IAT) Sensor Replacement .	--		

	Is the action complete?		Go to Step 12	--
11	<p>Important</p> <p>The replacement PCM must be programmed.</p> <p>Replace the PCM. Refer to PCM Replacement/Programming .</p> <p>Is the action complete?</p>	--	Go to Step 12	--
12	<ol style="list-style-type: none"> 1. Perform the scan tool Clear DTC Information function and road test the vehicle within the Freeze Frame conditions that set the DTC. 2. Check for DTCs. 3. Review the scan tool data and if no DTCs are stored the repair is complete. <p>Are any DTCs displayed on the scan tool?</p>	--	Go to Diagnostic Trouble Code (DTC) List	System OK