P0127: INTAKE AIR TEMPERATURE TOO HIGH

OVERVIEW

Severity	:	High
DIY Difficulty Level	:	Intermediate
Repair Cost	:	**$90-$1000**
Can I Still Drive?	:	**Yes** (Short-term only)

What Does The P0127 Code Mean?

A stored code P0127 means that the powertrain control module (PCM) has detected an input signal from the intake air temperature (IAT) sensor circuit which is indicative of the temperature or circuit voltage being too high.

The IAT sensor input and the mass airflow (MAF) sensor input signals are used by the PCM to calculate fuel delivery and ignition timing. Sustaining an air/fuel ratio of 14.7:1 is vital to engine performance and fuel efficiency; therefore the input of the IAT sensor is critical.

The IAT sensor is typically inserted into the air inlet pipe or air cleaner box but it may also be threaded directly into the intake manifold.

The IAT sensor may also be integrated into the MAF sensor housing. Regardless of design, it must be positioned so that (with the engine running) ambient air, drawn into the intake manifold through the throttle body, can continuously and consistently flow across it.

The IAT sensor is normally a two-wire thermistor sensor. As varying degrees of air flow across the cold wire element, sensor resistance varies according to temperature. In other words, the more air that flows across the cold-wire element, the lower the degree of temperature and resistance it provides. OBD II equipped vehicles generally use a reference voltage (five-volts is normal) and a ground signal with the IAT sensor completing the circuit.

The varying degrees of resistance in the IAT sensor element create voltage fluctuations in the input

circuit. These fluctuations are recognized by the PCM as variations in intake air temperature.

If the PCM detects a level of voltage from the IAT sensor that is higher than the maximum allowable limit, a code P0127 will be stored and a malfunction indicator lamp (MIL) may be illuminated.

What Are The Symptoms Of The P0127 Code?

Symptoms of a P0127 code may include:

- Hesitation or surge at idle or upon light acceleration
- Diminished fuel efficiency
- Decreased engine performance (especially on cold start)
- Other drivability codes may also be stored

What Are The Potential Causes Of The P0127 Code?

Possible causes for this code include:

- IAT sensor harness has been left unplugged
- Open or shorted IAT sensor wiring and/or connectors
- Defective IAT sensor
- Faulty MAF sensor
- Clogged air filter
- Broken intake air inlet pipe

How Can You Fix The P0127 Code?

A good starting point is always to check for technical service bulletins (TSB) for your particular vehicle. Your issue may be a known issue with a known fix put out by the manufacturer and can save you time and money during diagnosis.

When diagnosing a code P0127, you will need a diagnostic scanner, a digital volt/ohmmeter (DVOM), an infrared thermometer, and a reliable vehicle information source (such as All Data DIY).

Step 1

I would begin by connecting the scanner to the vehicle diagnostic connector and retrieving the stored trouble codes and applicable freeze frame data. I like to write this information down in case I need it later. Next, I'd clear the codes and test-drive the vehicle. Should the code be reset, go to the next step.

Step 2

I would proceed with a visual inspection of IAT sensor related wiring and connectors (don't forget

the air filter and the air inlet pipe). Pay careful attention to the sensor connector as it is susceptible to corrosion because of its close proximity to the battery and coolant reservoir. Check technical service bulletins (TSB) that apply to the vehicle and the malfunction in question.

Step 3

I would continue by connecting the scanner to the diagnostic connector and opening the data stream if the system wiring, connectors, and components appear to be in good working order. You can get faster response by narrowing the data stream to include only pertinent data. Using the infrared thermometer, make sure that the IAT reading (on the scanner) correctly reflects actual intake air temperature.

If the temperatures coincide, consult your vehicle information source for IAT sensor testing recommendations. Use the DVOM to test the sensor. Compare your findings with manufacturer's specifications. You must replace the sensor if it fails to comply.

Step 4

Check for sensor reference voltage and a ground at the sensor connector, if the sensor passes the resistance test. If reference voltage and grounds are not present, repair the open or shorted circuit and retest the system. If system reference and ground signals are present, find the IAT sensor voltage to temperature chart in your vehicle information source and use the DVOM to test sensor output voltage.

Compare actual voltage with the temperature to voltage chart. Replace the sensor if the actual reading varies from the temp to voltage chart.

If IAT reference voltage is within specifications, disconnect the electrical connector/s from all related controllers and use the DVOM to test resistance and continuity in all system circuits. Circuits that prove to be open or shorted should be repaired or replaced.

Additional diagnostic notes: When the air filter is checked or replaced, the IAT sensor is often left disconnected. If your vehicle has recently been service, and a code P0127 is suddenly stored, suspect that the IAT sensor has simply been left unplugged. Reconnect it, clear the code, and drive the vehicle as normal (until the PCM enters readiness mode) to rectify the situation.

Related IAT sensor and circuit trouble codes: P0095, P0096, P0097, P0098, P0099, P0110, P0111, P0112, P0113, P0114.

Severity Description

The IAT sensor signal is used by the PCM to calculate fuel delivery strategy, therefore a code P0127 should be considered severe.

Reference Sources

Diagnostic Trouble Code (DTC) Charts and Descriptions for P0127 - Page 28.