

P0378: TIMING REFERENCE HIGH RESOLUTION SIGNAL B INTERMITTENT/ERRATIC PULSES

OVERVIEW

Severity	:	High
DIY Difficulty Level	:	Intermediate
Repair Cost	:	\$200-\$400
Can I Still Drive?	:	Yes

What Does The P0378 Code Mean?

This diagnostic trouble code (DTC) is a generic powertrain code, which means it applies to OBD-II equipped vehicles which have an engine position sensor (Chevrolet, GMC, Ford, Dodge, BMW, etc.). Although generic, the exact repair steps may vary depending on make/model.

The powertrain control module (PCM) requires a timing reference signal to determine engine speed and position. This is accomplished by means of an engine position sensor, such as a crankshaft, camshaft or fuel pump position sensor.

The PCM uses this information to determine one or more of the following: fuel injector control, ignition timing and misfire diagnostics. There are two basic types of engine positions sensors: Hall-Effect and permanent magnet.

Both types of sensors are triggered by a wheel or disc mounted close to the sensor. Typical wheel/disc mounting locations include the engine position, injection pump, harmonic balancer and distributor shaft. When triggered, the sensor produces a return signal which is sent back to the PCM.

- Hall-Effect crank position sensors have three wires: reference (power), signal, and ground. The sensor receives a reference voltage (usually 5-volts) from the PCM, and is triggered by a reluctor wheel. The sensor then sends a corresponding digital return signal back to the PCM.

- Permanent magnet (PM) sensors produce their own AC voltage based on their proximity to a rotating reluctor wheel. This voltage signal is sent back to the PCM where it is converted to a digital signal by an internal analog to digital converter.

In the codes outlined in this article, the “B” indicates the problem is with a portion of the system circuit, instead of a particular symptom or component.

A code P0378 is set when the PCM detects the engine position sensor “B” is producing a signal with intermittent/erratic pulses.

Related timing reference signal B trouble codes include:

- [P0375](#) – Timing Reference High Resolution Signal B Malfunction
- [P0376](#) – Timing Reference High Resolution Signal B Too Many Pulses
- [P0377](#) – Timing Reference High Resolution Signal B Too Few Pulses
- [P0379](#) – Timing Reference High Resolution Signal B No Pulses

What Are The Symptoms Of The P0378 Code?

Symptoms of a P0378 engine code may include:

- Illuminate check engine light
- Hard starting/no starting
- Poor engine performance

What Are The Potential Causes Of The P0378 Code?

Possible causes for this P0378 code include:

- Faulty sensor
- Wiring problems
- Reluctor wheel damage
- Contaminated oil
- Faulty PCM

How Can You Fix The P0378 Code?

Begin by visually inspecting the engine position sensor and the corresponding wiring. Look for loose connections, damaged wiring, etc. If damage is found, repair as necessary, clear the code and see if it returns. Also, check the engine for any metal particulates that may affect sensor operation.

Next, check for technical service bulletins (TSBs) regarding the issue. If nothing is found, move forward to step by step diagnosis of the system.

The following is a generalized procedure, as testing for this code varies between vehicles. To accurately test the system, you'll want to refer to the manufacture's diagnostic flow chart. Test procedures also depend on the type of sensor found in your vehicle.

Check the sensor

Hall-Effect sensor

Use a digital multimeter set to DC volts and a back-probe test lead to ensure the sensor is producing a signal voltage. Connect one meter lead to the sensor signal wire and the other to ground. Have an assistant rotate the engine by tapping the ignition key (don't start the engine); the voltage reading should fluctuate between 0 volts and reference voltage. If available, you can also use an oscilloscope to view the signal pulses while cranking the engine.

Permanent magnet sensor

Begin by checking the internal resistance of the sensor. Disconnect the sensor electrical connector and connect a digital multimeter set to ohms to each of the sensor terminals. The resistance should be approximately 500 to 1,200 ohms. Consult the factory repair information for the exact specification. If the resistance test is OK, you'll want to test the sensor performance.

To do this, reconnect the sensor electrical connector. Then, connect a digital multimeter set to AC volts to the sensor electrical connector using back probe test leads. Since the sensor produces AC voltage, it doesn't matter which way the meter leads are connected. Have an assistant crank the engine; you should see a fluctuating voltage reading.

One thing to remember during sensor testing damaged or improperly aligned tone ring will prevent proper sensor operation. When in doubt, access the tone ring and inspect as needed.

Check the circuit

It's a good idea to have the factory wiring diagram on hand to determine which wire is which, while performing these tests.

Hall-effect sensor

- Check the ground side of the circuit: connect the meter set to ohms (with the ignition off) between the ground terminal on the sensor connector and ground. If the meter reads out of limits (OL) there is an open circuit on the ground side of the circuit, which needs to be located and repaired. If the meter reads a numeric value, there is continuity.
- Check the reference voltage side of the circuit: with the ignition on, use a digital multimeter set to volts to check for reference from the PCM (typically 5 volts) at one of the three sensor terminals. If no reference signal is present, connect the meter set to ohms (with the ignition

off) between the reference voltage terminal on the sensor and the reference voltage terminal on the PCM. If the meter reads out of limits (OL) there is an open circuit between the PCM and sensor that will need to be located and repaired. If the meter reads a numeric value, there is continuity. Next, you'll want to check that there is 5-volts coming out of the PCM at the reference voltage terminal. If there is not a 5-volt reference from the PCM, the PCM is probably faulty.

- Check the return signal side of the circuit: with the ignition off, use a digital multimeter set to ohms to check for continuity between the engine position sensor output terminal and the signal voltage terminal on the PCM. If the meter reads a numeric value, there is continuity. If the meter reads out of limits (OL) there is an open circuit between the PCM and sensor that will need to be located and repaired.

Permanent magnet sensor

- Check the ground side of the circuit: connect the meter set to ohms (with the ignition off) between the ground terminal on the SENSOR connector and ground. If the meter reads out of limits (OL) there is an open circuit on the ground side of the circuit that will need to be located and repaired. If the meter reads a numeric value, there is continuity.
- Check the return signal side of the circuit: with the ignition off, use a digital multimeter set to ohms to check for continuity between the engine position sensor output terminal and the signal voltage terminal on the PCM. If the meter reads a numeric value, there is continuity. If the meter reads out of limits (OL) there is an open circuit between the PCM and sensor that will need to be located and repaired.

Severity Description

The severity of these codes is moderate to severe.

Reference Sources

[P0378 Timing Reference High Resolution Signal B Intermittent/Erratic Pulses](#), OBD-Codes.