

## P000A: A CAMSHAFT POSITION SLOW RESPONSE BANK 1

### OVERVIEW

Severity	:	<div><div>Medium</div></div>
DIY Difficulty Level	:	<div><div>Advanced</div></div>
Repair Cost	:	<b>\$50-\$400</b>
Can I Still Drive?	:	<b>Yes</b> (Short-term only)

### What Does The P000A Code Mean?

Many modern vehicles use variable valve timing (VVT) to improve engine performance and fuel economy. In a VVT system, the powertrain control module (PCM) controls solenoid-operated oil control valves. These valves apply oil pressure to an actuator mounted between the camshaft and timing chain sprocket. In turn, the actuator then alters the angular position, or phase change, of the camshaft. A camshaft position sensor is used to monitor camshaft position.

A camshaft position slow response code is set when actual camshaft position does not match the position desired by the PCM during camshaft phase changes.

As it pertains to trouble code descriptions, the "A" indicates the intake, left or front camshaft. On the other hand, "B" indicates the exhaust, right or rear camshaft. Bank 1 is the side of the engine that contains the #1 cylinder, whereas bank 2 is the opposite bank. If the engine is an inline or straight design, there is only one bank.

Code P000A is set when the PCM detects a slow response in camshaft position phase change from bank 1 circuit "A". This code is related to [P000B](#), [P000C](#), and [P000D](#).

### What Are The Symptoms Of The P000A Code?

Symptoms of a P000A trouble code may include:

- Illuminated check engine light
- Increased emissions
- Poor engine performance
- Engine noise

## What Are The Potential Causes Of The P000A Code?

Causes for this code may include:

- Improper oil supply
- Faulty camshaft position sensor
- Failed oil control valve
- Failed VVT actuator
- Timing chain problems
- Wiring problems
- Faulty PCM

## How Can You Fix The P000A Code?

Begin by checking the engine oil level and condition. If the oil is OK, perform a visual inspection of the camshaft position sensor, oil control solenoid, and corresponding wiring. Look for loose connections, damaged wiring, etc. If damage is found, repair as necessary, clear the code and see if it returns. Next, check for technical service bulletins (TSBs) regarding the issue. If nothing is found, you will need to 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.

Before proceeding, you'll want to consult the factory wiring diagrams to determine which wires are which. Autozone offers free online repair manuals for many vehicles and ALLDATA offers single vehicle subscriptions.

## Test The Camshaft Position Sensor

Most camshaft position sensors are either Hall Effect sensors or permanent magnet sensors. A Hall Effect sensor has three wires going to it: reference, signal, and ground. On the other hand, a permanent magnet sensor will only have two wires: signal and ground.

- Hall Effect sensor: Determine which wire is the signal return wire. Then, attach a digital multimeter (DMM) to it using a back-probe test lead. Turn the DMM to the DC volts setting and connect the black meter lead to chassis ground. Crank the engine – if the sensor is operating properly, you should see a fluctuating reading on the meter. If not, the sensor is faulty and should be replaced.

- Permanent magnet sensor: Remove the sensor connector and attach a DMM to the sensor terminals. Turn the DMM to the AC voltage setting and crank the engine. You should see a fluctuating voltage reading. If not, the sensor is faulty and should be replaced.

## Test The Sensor Circuit

- Hall Effect sensor: Start by checking the ground side of the circuit. To do this, connect a DMM set to DC volts between the battery positive terminal and sensor ground terminal on the harness side of the connector. If there is a good ground, you should get a reading of about 12 volts. Next, check the 5-volt reference side of the circuit by connecting a DMM set to volts between the battery negative terminal and the sensor reference terminal on the harness side of the connector. Turn the vehicle ignition on. You should see a reading of about 5 volts. If either of these two tests don't produce satisfactory readings, the circuit will need to be diagnosed and repaired.
- Permanent magnet sensor: Check the ground side of the circuit. To do this, connect DMM set to DC volts between the battery positive terminal and sensor ground terminal on the harness side of the connector. If there is a good ground, you should get a reading of about 12 volts. If not, the circuit will need to be diagnosed and repaired.

## Test The Oil Control Solenoid

Remove the solenoid connector. Use a digital multimeter set to ohms to check the internal resistance of the solenoid. To do this, connect the meter between the solenoid B+ terminal and the solenoid ground terminal. Compare the resistance measurement to the factory repair specifications. If the meter displays a reading out of specification, or out of limits (OL) indicating an open circuit, the solenoid should be replaced. It's also a good idea to remove the solenoid to visually inspect the screen for metal debris.

## Check The Oil Control Solenoid Circuit

- Check the power side of circuit: Remove the solenoid connector. With the vehicle ignition on, use a digital multimeter set to DC volts to check for power at the solenoid (usually 12 volts). To do this, connect the negative meter lead to battery negative terminal and the positive meter lead to the solenoid B+ terminal on harness side of the connector. The meter should read 12 volts. If not, the circuit will need to be diagnosed and repaired.
- Check the ground side of the circuit: Remove the solenoid connector. With the vehicle ignition on, use a digital multimeter set to DC volts to check for ground. To do this, connect the positive meter lead to battery positive terminal and the negative meter lead to the solenoid ground terminal on harness side of the connector. Command the solenoid on with an OEM equivalent scan tool. The meter should read 12 volts. If not present, the circuit will need to be diagnosed and repaired.

## Check The Timing Chain And VVT Actuators

If everything checks out up to this point, the problem may be with timing chain, corresponding, or VVT actuators. Remove the necessary components to access the timing chain and actuators. Check the chain for excess play, broken guides and/or tensioners. Check the actuators for visible damage, such as worn teeth.

## Severity Description

The severity of this code is moderate to severe. It's a good idea to address this code as soon as possible.

## Reference Sources

[Diagnostic Trouble Code \(DTC\) Charts and Descriptions for P000A](#) - Pages 2-3.