P2040: REDUCTANT INJECTION AIR PRESSURE SENSOR A CIRCUIT HIGH

OVERVIEW

Severity	:	High
DIY Difficulty Level	:	Advanced
Repair Cost	:	**$100-$1150**
Can I Still Drive?	:	**Yes**

What Does The P2040 Code Mean?

A stored code P2040 means that the powertrain control module (PCM) has detected an excess degree of voltage in the reductant injection air pressure sensor A circuit. Refer to a model specific service manual to determine which is the “A” circuit.

The catalyst system is responsible for reduction of (basically) all exhaust emissions although certain applications are also equipped with a NOx trap.

Exhaust gas recirculation (EGR) systems go another step further in the reduction of NOx. Nevertheless, today’s larger and more powerful diesel engines cannot meet strict federal (U.S.) emission standards with the EGR, diesel particulate filter/catalytic converter, and NOx trap alone. It was for this reason that selective catalytic reduction (SCR) systems were invented.

SCR systems inject a reductant compound or a diesel exhaust fluid (DEF) into the exhaust in front of the diesel particulate filter, NOx trap, and/or the catalytic converter via the reductant injection valve (solenoid). The precisely timed DEF injection elevates the temperature of the filtration element and allows it to perform more efficiently. It enhances filtration element longevity and allows fewer harmful exhaust emissions to be released into the atmosphere.

The entire SCR system is monitored and controlled by either the PCM or a stand-alone controller (which interacts with the PCM). Either way, the controller monitors the O2, NOx, and exhaust

temperature sensors (as well as other inputs) to determine the appropriate time for DEF (reductant) injection. Precise DEF injection is necessary to maintain exhaust temperature within acceptable parameters and optimize pollutant filtration.

The reductant/regeneration supply pump is used to pressurize the DEF in the liquid reductant system for use, when required. Supply pump voltage is monitored by the PCM for consistent fluctuation and load percentage. The PCM also monitors one or more pressure sensors in the reductant supply system to determine if there is a leak in the system.

If the PCM detects a degree of voltage in the reductant injection air pressure sensor A circuit that is excess, a code P2040 will be stored and a malfunction indicator lamp (MIL) may be illuminated. Multiple ignition cycles – with a failure – may be required for MIL illumination.

What Are The Symptoms Of The P2040 Code?

Symptoms of a P2040 trouble code may include:

- Reduction in fuel efficiency
- Excessive black smoke from vehicle exhaust
- Diminished engine performance
- Other SCR related codes

What Are The Potential Causes Of The P2040 Code?

Causes for this code may include:

- Defective reductant air pressure sensor (A)
- Open or shorted circuits in the reductant injection air pressure sensor system
- Bad SCR controller/PCM or programming error

How Can You Fix The P2040 Code?

Make sure that the reductant/regeneration supply system is not losing pressure (internally or externally). Activate the pump to create pressure and inspect the system for external leaks. Use a fuel pressure tester to monitor reductant system pressure manually. Check the supply pump and the injector for leakage. If leaks are discovered (internal or external), they must be repaired before continuing with the diagnosis.

A diagnostic scanner, a digital volt/ohmmeter (DVOM), and a source of vehicle specific diagnostic information will be required to diagnose a code P2040.

You may use your source of vehicle information to locate a technical service bulletin (TSB) that matches the vehicle year, make, and model; as well as the engine size, code/s stored, and symptoms exhibited. If you find one, it could yield helpful diagnostic information.

Use the scanner (connected to the vehicle diagnostic connector) to retrieve all stored codes and pertinent freeze frame data. It is a good idea to write this information down before clearing the codes then test-drive the vehicle until the PCM either enters readiness mode or the code is reset.

If the PCM enters readiness mode at this time, the code is intermittent and may be much more difficult to diagnose. If this is the case, the conditions which contributed to the code being stored may need to worsen before an accurate diagnosis can be made.

If the code is immediately reset, the next step of your diagnosis will require that you search your vehicle information source for diagnostic flow-charts, connector pin-out charts, connector face views, and component testing procedures/specifications.

Step 1

Use the DVOM to test reductant injection system pressure sensors according to manufacturer specifications. Components which do not test within maximum allowable parameters should be considered defective.

Step 2

If the reductant injection pressure is within specifications, the code P2040 persists, and the sensor in question is in working order, use the DVOM to test input and output signal circuits between sensors and the PCM/SCR controller. Disconnect all controllers prior to using the DVOM for testing.

- Reductant injector sensor codes are frequently attributed to supply pumps which leak internally

Severity Description

A stored code P2040 should be considered severe and addressed as quickly as possible. The SCR system could be disabled because of it. Catalyst damage could result if the conditions which contributed to the code being stored are not rectified in a timely fashion.

Reference Sources

P2040 Reductant Injection Air Pressure Sensor A Circuit High, OBD-Codes.