

P2146: FUEL INJECTOR GROUP A CIRCUIT/OPEN

OVERVIEW

Severity	:	High
DIY Difficulty Level	:	Intermediate
Repair Cost	:	\$350-\$850
Can I Still Drive?	:	Yes (Short-term only)

What Does The P2146 Code Mean?

Fuel delivery systems use varying amounts of components to control and monitor the volume, timing, pressures, etc. of the system in conjunction with the ECM (Engine Control Module). Fuel injectors were introduced as a replacement to the carburetor because injectors are more efficient and effective in controlling fuel delivery. As a result, they have improved our fuel economy, and engineers have been actively designing more ideal ways to increase efficiency to this design.

Given the fact that the injector's spray is controlled electronically, supply voltage is crucial in supplying fuel to the cylinders. That said, a problem in this circuit can and/or will cause significant drivability issues among other potential hazards/symptoms.

The group letter "A" in this code is used to distinguish what exact circuit the fault is referring to. To determine how this applies to your particular vehicle, you will need to refer to manufacturer specific technical information. Some examples of distinctions with injectors: Bank 1, 2, etc., paired injectors, individual injectors, etc.

The ECM illuminates the MIL (Malfunction Indicator Lamp) with P2146 and/or related codes ([P2147](#), [P2148](#)) when it monitors a fault within the supply voltage to the fuel injectors and/or their circuits.

The fact that the fuel injectors' harnesses are routed in close proximity to extreme temperatures should be noted. Because of the location of the harnesses, they are volatile to physical damage. With this in mind, I will say, most of the time, this will be a mechanical issue.

The P2146 Fuel Injector Group A Circuit/Open code is active when the ECM detects a open or malfunction within the fuel injector's supply voltage circuit.

What Are The Symptoms Of The P2146 Code?

Symptoms of a P2146 trouble code may include:

- Erratic engine performance
- Misfire
- Fuel economy reduced
- Erratic idle
- Excessive smoke
- Engine noise(s)
- Lack of power
- Cannot climb steep hills
- Reduced throttle response

What Are The Potential Causes Of The P2146 Code?

Causes for this P2146 fuel injector group supply voltage code may include:

- Defective or damaged fuel injector(s)
- Damaged wiring harness
- Internal wiring malfunction
- Internal ECM issue
- Connector problem

How Can You Fix The P2146 Code?

Basic Step #1

First recommended step is to locate which "group" of sensors the manufacturer is referring to. With this information, you can then find the physical location of the injector(s) and their circuits. This may involve removing numerous engine covers and/or components to gain visual access (if possible). Make sure to inspect the harness for broken wires. Any worn-away insulation should be properly repaired with shrink-tube to prevent further and/or future issues.

Basic Step #2

At times, water and/or fluids may get "trapped" in the valleys where the injectors are installed. This increases the odds of the sensor's connectors, among other electrical connections, to corrode at a faster than normal rate. Make sure everything is how it should be and the connectors tabs are properly sealing the connection. Don't hesitate using some electrical contact cleaner to make

everything connect and disconnect smoothly, not to mention the increased electrical connectivity within the connections with the use of this product.

Basic Step #3

Verify the integrity of the circuit by following troubleshooting steps provided by your specific vehicle's service manual. One example is to disconnect the supply voltage circuit from the ECM and at the fuel injector, then using your multimeter, determine whether or not the wires are in good working order.

One test I like to do to determine quickly if there is an open within a particular wire which would help with code P2146 is to do a "continuity test". Setting your multimeter to RESISTANCE (a.k.a.: ohm, impedance, etc.), touch one end to one tip of the circuit and the other end at the other tip. Any higher than desired value may indicate a problem within the circuit. Any issue here will need to be determined by tracing the particular wire you are diagnosing.

Severity Description

Pretty severe I would say. In the field, we call a lack of fuel in the mixture being burnt, a "lean" condition. When your engine is running lean, you run the risk of causing extreme engine damage in both the immediate and distant futures. With that in mind, always keep up on your engine's maintenance. There needs to be a certain amount of diligence here, so let's keep our engines running smooth and efficient. After all, they ARE pulling our weight around to transport us on a daily basis.

Reference Sources

[P2146 Fuel Injector Group A Circuit/Open](#), OBD-Codes.