

## P2140: THROTTLE/PEDAL POS SENSOR/SWITCH E / F VOLTAGE CORRELATION

### OVERVIEW

Severity	:	<div><div>High</div></div>
DIY Difficulty Level	:	<div><div>Intermediate</div></div>
Repair Cost	:	<b>\$100-\$200</b>
Can I Still Drive?	:	<b>Yes</b> (Short-term only)

### What Does The P2140 Code Mean?

The automotive trouble code P2140 throttle/pedal position sensor/switch E/F voltage correlation refers to a problem related to the throttle's ability to open and close properly.

In the 1990's automotive manufacturers began industry-wide installation of "Drive by wire" throttle control technology. It's mission is to afford greater control over the emissions, fuel economy, traction and stability control, cruise control and transmission responses.

Prior to this, the vehicle's throttle was controlled by a simple cable with a direct connection between the gas pedal and the throttle. A throttle position sensor (TPS) is situated opposite the throttle linkage connection on the throttle plate. The TPS converts throttle movement and position to a voltage signal and sends it to the engine management computer, which uses the varying voltage signal to form engine management strategy.

The new "electronic throttle control" technology consists of a accelerator pedal position sensor, an electronically controlled throttle body complete with an internal motor, two embedded throttle position sensors for correlation factors and the engine management computer.

Although the code has the same frame of reference, it is worded slightly different on some brands, such as "Throttle position sensor circuit range/performance" on an Infiniti or "Electronic throttle control system malfunction power management" on a Hyundai.

When you depress the accelerator pedal you are pushing down on a sensor indicating the desired amount of throttle opening which is sent to the engine management computer. In response the computer sends a voltage to the electric motor to open the throttle plate. Two throttle position sensors imbedded in the throttle body convert the amount of throttle opening to a voltage signal to the computer.

The computer monitors the correlation of both voltages. When both voltages agree, the system is functioning properly. When they deviate for two seconds, the code P2140 is set indicating a malfunction somewhere in the system. Additional trouble codes may accompany this code which further identify the problem. The bottom line is, it can be a dangerous situation when control over the throttle is lost.

**NOTE:** This P2140 DTC is basically the same as [P2135](#), [P2136](#), [P2137](#), [P2138](#), and [P2139](#), diagnostic steps will be the same for all codes.

## What Are The Symptoms Of The P2140 Code?

Symptoms of a P2140 code can range from stalling when you come to a stop, total lack of power, no acceleration, sudden loss of power at cruise speeds or stuck throttle at current rpm. Additionally, the check engine light will illuminate and the code will be set.

## What Are The Potential Causes Of The P2140 Code?

- It's been my experience that the wiring connector or "pig tail" on the throttle body gives problems in the form of a poor connection. The female terminals on the pigtail corrode or pull out of the connector.
- Possible bare wire on pigtail shorting to ground.
- The top cover on the throttle body distorted preventing the gears from turning properly.
- The electronic throttle body is faulty.
- The accelerator pedal sensor or its wiring failed.
- The engine management computer has failed.
- The TPS sensors were not correlating for a few seconds and the computer needs to be cycled through its relearn phase to restore active response to the throttle body, or the computer needs reprogramming at the dealer.

## How Can You Fix The P2140 Code?

A few points about the electronically controlled throttle. This system is incredibly sensitive and vulnerable to damage, more than any other system. Handle it and its components with extreme care. One drop or rough handling and it's history.

Apart from the accelerator pedal sensor, the remainder of the components are in the throttle body. On inspection, you will notice a flat plastic cover on the top of the throttle body. This houses the

gears to actuate the throttle plate. The motor has a small metal gear protruding up through the housing under the cover. It drives a large “plastic” gear attached to the throttle plate.

The pin that centers and supports the gear fits into the throttle body housing and the top pin fits into the “thin” plastic cover. If the cover is distorted in any way, the gear will be compromised requiring total replacement of the throttle body.

## Step-by-step guide

- The first thing to do is go online and get the TSBs (technical service bulletins) for your vehicle relating to the code. These TSBs result from customer complaints or recognized problems and the factory recommended repair procedure.
- Check online or in a service manual for a possible relearn procedure to reset the computer. For example, on a Nissan, turn the ignition on and wait 3 seconds. Within the next 5 seconds depress and release the pedal 5 times. Wait 7 seconds, press, and hold the pedal for 10 seconds. When the check engine light begins to blink, release the pedal. Wait 10 seconds and depress the pedal again for 10 seconds and release. Turn the ignition off.
- Pull the electrical connector out of the throttle body. Inspect it closely for missing or bent female terminals. Look for corrosion. Clean any corrosion using a small pocket screwdriver. Place a small amount of electrical grease on the terminals and reconnect it.
- If the terminal connector has bent or missing pins you can pick up a new “pigtail” at most auto parts stores or from the dealer.
- Inspect the top cover on the throttle body for cracks or warping. If any are present, call the dealer and ask if they sell just the top cover. If not, replace the throttle body.
- With a voltmeter, probe the accelerator pedal sensor. It will have 5 volts for reference and next to it a varying signal. Turn the key on and slowly depress the pedal. The voltage should climb from .5 to 5.0 smoothly. Replace it if the voltage spikes or it has no voltage at the signal wire.
- Look online for wire terminal identification on the throttle body of your vehicle. Probe the throttle body connector for power to the throttle motor. Have a helper turn the key on and slightly depress the pedal. If no power is present, the computer is at fault. If there is power the throttle body is malfunctioning.

**Other throttle related DTCs:** [P0068](#), [P0120](#), [P0121](#), [P0122](#), [P0123](#), [P0124](#), [P0510](#) & others.

## Reference Sources

[P2140 Throttle/Pedal Pos Sensor Voltage Correlation DTC](#), OBD-Codes.