

P0223: THROTTLE POSITION SENSOR/SWITCH B CIRCUIT HIGH INPUT

OVERVIEW

Severity	:	Medium
DIY Difficulty Level	:	Intermediate
Repair Cost	:	\$160-\$200
Can I Still Drive?	:	Yes (Short-term only)

What Does The P0223 Code Mean?

When I have encountered a stored code P0223, I have found that it means the powertrain control module (PCM) has detected a high voltage input from the throttle position sensor (TPS) circuit or a particular pedal position sensor (PPS) circuit. B refers to a particular circuit, sensor, or area of a particular circuit.

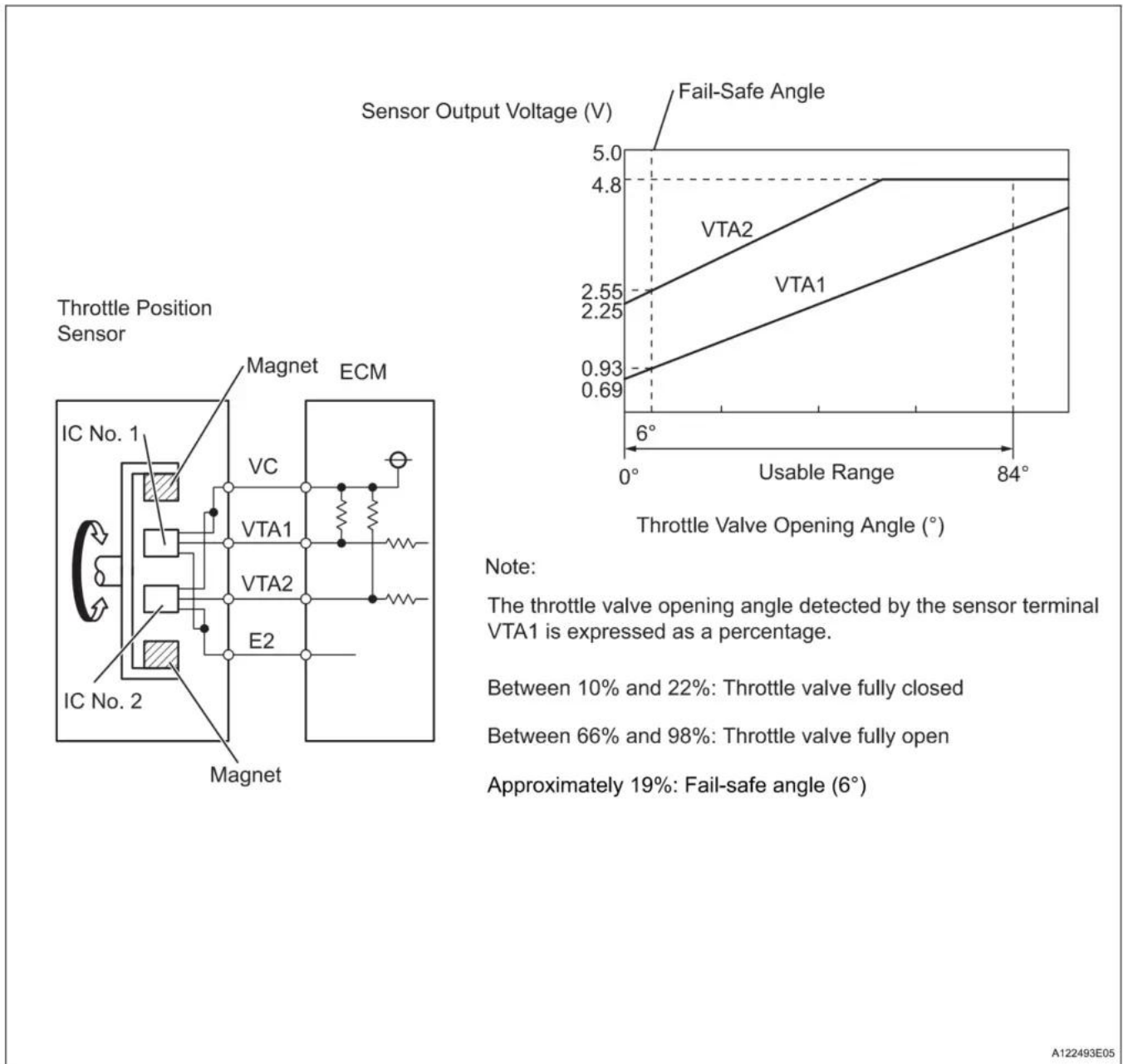
Consult a reliable vehicle information source (All Data DIY will work) for particulars for the vehicle in question. This code is only used in vehicles that are equipped with drive by wire (DBW) systems.

The PCM controls the DBW system using a throttle actuator motor, one or more pedal position sensors (sometimes referred to as accelerator pedal position sensors), and multiple throttle position sensors.

The sensors are provided with a reference voltage (typically 5-volts) and a ground. Most TPS/PPS sensors are of the potentiometer type and they complete the respective circuit. A pivoting fulcrum extension, on the accelerator pedal or the throttle plate shaft, actuates the contacts of the sensor. Sensor resistance changes, as the contacts are moved across the sensor circuit board, causing variations in circuit resistance and signal input voltage to the PCM.

If signal input voltage is greater than a programmed limit, for an extended period of time and under a certain set of circumstances, a code P0223 will be stored and a malfunction indicator lamp

(MIL) may be illuminated.



P0223 wiring diagram

What Are The Symptoms Of The P0223 Code?

Symptoms of a P0223 code may include:

- Stuck throttle (at any RPM)
- Limited or no acceleration
- Engine stall when allowed to idle
- Hesitation when accelerating

- Cruise control inoperative

What Are The Potential Causes Of The P0223 Code?

Possible causes for this engine code include:

- Open or shorted circuits between the TPS, PPS, and the PCM
- Defective TPS or PPS
- Corroded electrical connectors
- Faulty drive-by-wire actuator motor

How Can You Fix The P0223 Code?

A good starting point is always to check for technical service bulletins (TSB) for your particular vehicle. Your issue may be a known issue with a known fix put out by the manufacturer and can save you time and money during diagnosis.

I would gain access to a diagnostic scanner, a digital volt/ohmmeter (DVOM), and a vehicle information source like All Data (DIY) to diagnose a code P0223.

I would make the first step of my diagnosis a visual inspection of all system related wiring and connectors. I also like to check the throttle plate for signs of carbon buildup or damage. Excessive carbon buildup, that holds the throttle body open at startup, may cause a code P0223 to be stored. Clean carbon from the throttle body according to manufacturer's recommendations and repair or replace defective wiring or components as required, then retest the DBW system.

Next, I connect the scanner to the vehicle diagnostic port and retrieve all stored trouble codes. I write them down just in case I need the order in which the codes were stored. I also like to keep any related freeze frame data. These notes may prove helpful if the P0223 is proven intermittent. Now I clear the codes and test-drive the vehicle. If the code is reset, I continue with my diagnosis

Voltage spikes and inconsistencies, between the TPS, PPS, and the PCM, may be detected using the scanner data stream. Narrow the data stream to display only pertinent data for a faster response. If no spikes and/or inconsistencies are detected, use the DVOM to retrieve live data at each of the sensors, individually.

To retrieve live data with the DVOM, connect the test leads to the appropriate signal and ground circuits and observe the DVOM display while operating the DBW. Look for spikes in voltage as the throttle is actuated slowly from the closed position to wide open throttle.

Voltage usually ranges from .5-volts at closed throttle to 4.5-volts at wide open throttle. If spikes or other irregularities are detected, suspect that the sensor being tested is defective. An oscilloscope is also a great tool for testing sensor operation.

Additional diagnostic notes: Some manufacturers require that the throttle body, throttle actuator motor, and all throttle position sensors be replaced together.

Severity Description

When this code is stored, the PCM will usually enter limp in mode. Engine acceleration will be severely limited (if not disabled) in this mode.

Reference Sources

[2GR-FE ENGINE CONTROL SYSTEM SERVICE MANUAL for P0223](#)