P0105: MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE CIRCUIT MALFUNCTION

OVERVIEW

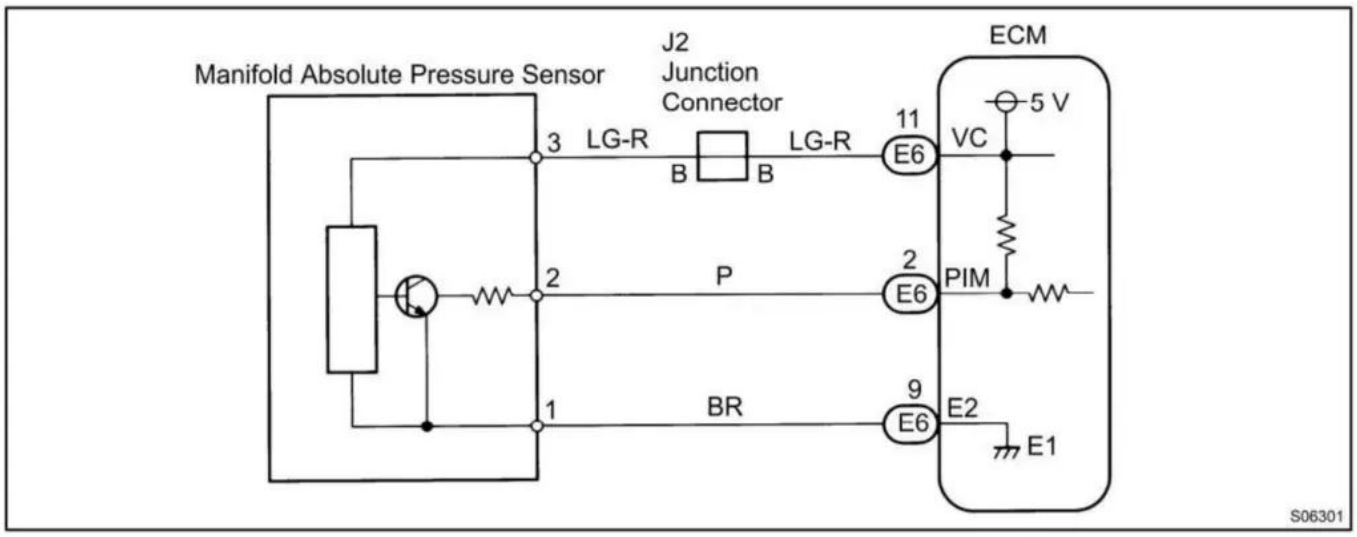
Severity	:	High
DIY Difficulty Level	:	Intermediate
Repair Cost	:	**$130-$170**
Can I Still Drive?	:	No

What Does The P0105 Code Mean?

The MAP (Manifold Absolute Pressure) sensor is part of the fuel management system. It reacts to changes in engine manifold pressure. The PCM (Powertrain Control Module) monitors the MAP sensor continually to properly run the engine. Changes in engine load require changes in the amount of fuel injected, and timing of the ignition system, etc.

An engine under load has more manifold pressure(or less vacuum) than an engine that is coasting. As the load changes, the MAP sensor voltage signal to the PCM changes accordingly. To check the MAP sensor operation, though, the PCM watches other sensors to verify that the MAP sensor is working properly.

For example, the PCM compares the TPS (Throttle Position Sensor) signal to the MAP signal to verify the MAP signal isn't "sticking". If the PCM doesn't see a MAP sensor change immediately follow a change in the throttle pedal sensor, it knows there is a problem with the MAP sensor and sets P0105. Or, if the PCM notices that the TPS indicates the engine is under load, but the MAP signal indicates that the engine is "coasting" it, again, knows there is a problem with the MAP sensor or TPS and sets P0105.



P0105 wiring diagram

What Are The Symptoms Of The P0105 Code?

Symptoms of a P0105 check engine light code may include:

- Poor running engine
- Engine runs rich
- Engine won't idle
- Engine backfires through tailpipe
- Engine misfire under load or at idle
- MIL (Malfunction Indicator Lamp) illumination
- In some extreme cases there may be no symptoms other than MIL illumination

What Are The Potential Causes Of The P0105 Code?

A P0105 DTC could be caused by:

- MAP sensor vacuum hose disconnected or plugged
- Bad MAP sensor
- Bad TPS
- Damaged or problematic MAP sensor connector
- Damaged or problematic TPS connector
- Damaged wiring
- Short to reference voltage on signal circuit of MAP sensor
- Loss of ground to MAP sensor or TPS
- Open on signal circuit of MAP sensor
- Bad PCM

How Can You Fix The P0105 Code?

Using a scanner or code reader, turn the ignition on and engine OFF; what does the MAP sensor voltage read? It should be about 4 Volts for sea level. If you are at a higher altitude, it should decrease about half a volt or so for each 1,000 ft. of altitude (this will vary from model to model). Or if you have a separate MAF (Mass air flow) sensor on your vehicle, they are usually equipped with a Barometric pressure reading. If so, the Baro reading should match the MAP reading (they both measure ambient air pressure). If they're roughly equal, then, check for Freeze Frame data of the MAP sensor (if available).

NOTE: Freeze Frame data is the PCM recording a fault when it happens. It captures the readings of the various PIDS (parameter identifiers) available to troubleshoot what happened. It's like a recording of the problem as it happened. At idle a typical MAP sensor Voltage reading should be about a volt, and at WOT (wide open throttle) it should approach 4.5 to 5 Volts. As for the TPS, at idle, the voltage reading is about 1 Volt or less. As the throttle is opened the reading will increase to 4.5 Volts at WOT.

Do the two readings make sense? For example, if the TPS reading on Freeze Frame data shows 2.5 Volts (indicating partial throttle) does the MAP sensor indicate a reading that isn't at either extreme? Using the Freeze Frame data (if available) compare the MAP reading to the TPS when the problem occurred. This can help you identify what happened

If you have no access to Freeze Frame data then check if the MAP sensor voltage changes when you apply vacuum to it. You can do this by mouth or a vacuum pump. The voltage should increase as you apply vacuum. If the reading doesn't change as you apply vacuum, make sure there are no obstructions in the hose to the sensor. If the hose is clear, the MAP sensor is usually bad, but it doesn't rule out the following from causing the problem: Does the MAP sensor appear to be stuck at less than .5 Volts? Then:

NOTE: This code shouldn't set if the MAP is stuck at extremely low voltage, however, I'm adding it in because there's no way to know for certain for which vehicles a low voltage condition may set a P0105.

- Inspect the wiring harness and MAP sensor connector. Repair any damage
- Unplug the MAP sensor connector. Also, at the PCM connector, remove the MAP sensor signal wire and check for continuity to the MAP sensor connector. If there is infinite resistance, then repair open in MAP signal circuit. If the signal wire has continuity to the MAP sensor connector, then check for 5 volt reference voltage to the connector and a good ground. If both are present, then re-install all removed wiring and replace the MAP sensor.

Does the MAP sensor appear to be stuck at full 4.5 voltage? Then:

- Inspect the wiring harness for damage. Repair as needed

- Remove the MAP sensor signal wire from the PCM connector. With a voltmeter measure the voltage with KEY ON ENGINE OFF. Is there 4.5 Volts? If so, unplug the MAP sensor and recheck. If it is still present, then repair short between the signal wire and 5 volt reference wire.
- If unplugging the MAP sensor causes the voltage to disappear, check that the ground is intact. If it is, then replace the MAP sensor due to internal short.

MAP sensor codes include P0106, P0107, P0108 and P0109.

Reference Sources

P0105: MAP Circuit Malfunction, OBD-Codes.