MAF Sensor Testing

The Tech-Assist Team

It's always a good idea to test a Mass Airflow (MAF) sensor before replacing it. Here is a fast and accurate way to track a MAF's performance and output to the PCM.

Connect a scan tool to see the MAF sensor Parameter Identification Data (PID) information. With the engine at idle, the MAF's PID value should read anywhere from 2 to 7 grams/second (g/s) at idle and rise to between 15 to 25 g/s at 2500 rpm, depending on engine size. Most manufacturers provide specifications for air flow at idle; some will provide specifications at several engine speeds. Those specifications can be found in manufacturer's PID value charts under "Scan Tool Testing and Procedures" in ALLDATA.

A MAF sensor works dynamically, so the question becomes: Is the MAF accurate throughout the engine's rpm range? If it is not linear, various drivability problems can occur.

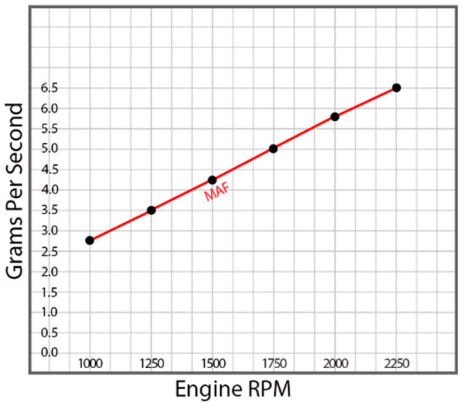
The most effective way to verify the MAF's signal to the PCM is to graph the sensor's output while running the engine between 1000 and 2250 rpm.

If you do not have a graphing feature on your scan tool, no problem. You can use graph paper, which can be purchased from any retailer that carries school or office supplies … or you can grab a few sheets from your kids.

1. Plot the horizontal points along the bottom of the graph paper for: 1000, 1250, 1500, 1750, 2000, 2250 rpm.
2. Mark increments of grams per second (voltage or frequency) up the left side. **Note:** To create your vertical scale, use the value you read at idle (g/s, voltage, or frequency) to determine the baseline value. Then mark each line above in equal increments. In Example 1 below, we used 0.5 grams per second increments.
3. Run the engine at each of the above-mentioned speeds and record the MAF sensor PID values on the graph.

Interpreting the Test Results

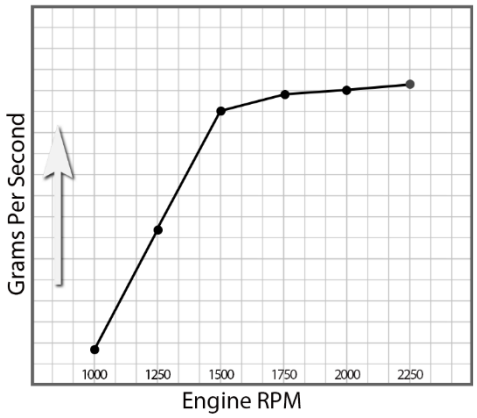
Note: Graphs below are examples. Actual grams per second, voltage or frequency readings should come from the MAF signal data on the scan tool at specified rpm settings.



Example 1

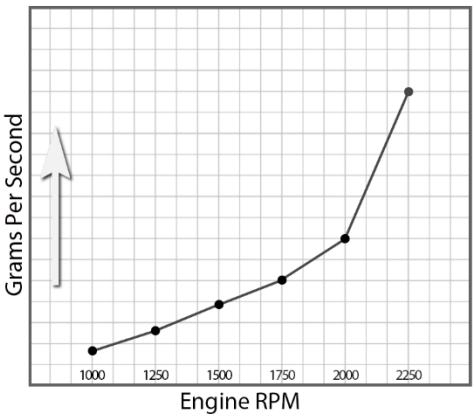
A good MAF senor should show a steady linear rise from 1000 to 2250.

(Sample from 2009 Ford Focus 2.0L)



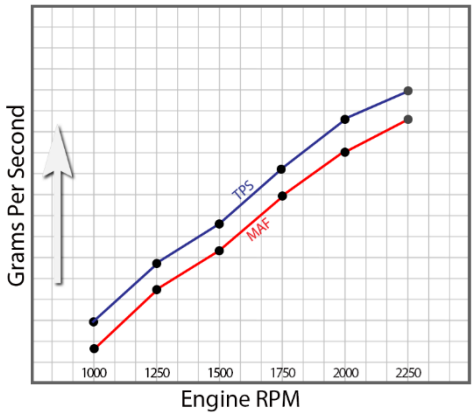
Example 2

A sensor out of calibration may rise too quickly in reaction to the rpm. This could cause an acceleration problem.



Example 3

A sensor with a dirty sensing wire or not measuring all the air (air leak downstream) may rise too slowly.



Example 4

Another approach would be to graph both the **TPS** and the **MAF** sensor because they should essentially produce a plotted graph rising parallel to each other.

The graph you've created is also a great sales tool at the front counter. It makes explaining and verifying the problem with your customers very easy and they'll appreciate the fact you took to time to diagnose the problem accurately.

Remember… If you've done your homework and are still not sure, then call Tech-Assist. We're always glad to help.