

Volkswagen Cabriolet

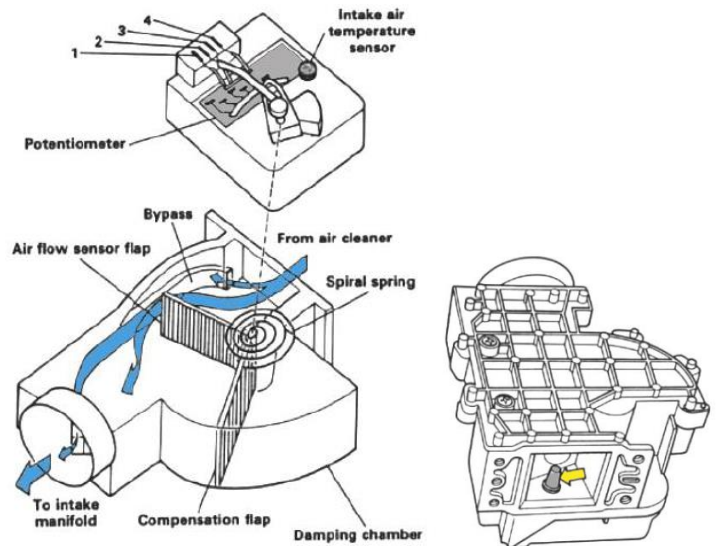
Digifant Guide: AFM vs. MAF

A common misconception today is that all electronic fuel injection vehicles utilize a MAF (mass airflow sensor), which is incorrect. The Digifant fuel injection system found in 1990-1993 Cabriolets (and other Volkswagen models of that era), utilize an AFM (airflow meter). Do not let anyone, including parts stores, convince you otherwise. What is the difference between the two?

Airflow Meter (AFM)

An AFM is not a "mass flow device." Air flowing through the AFM causes a mechanical spring-loaded flapper door to deflect an amount proportional to the dynamic pressure of the airflow as it passes over a temperature sensor (yellow arrow). The AFM sends both flapper door angle and temperature to the ECU in separate signals. The ECU interprets the flapper door angle as dynamic pressure and combines this with the temperature reading to determine the airflow.

VW part #037-906-301

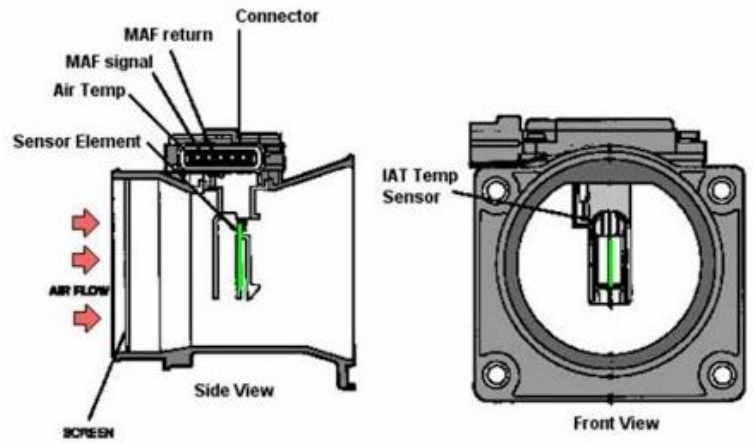


The door is mechanically attached to a variable-resistor assembly that sends a variable-voltage signal to the ECU that roughly correlates to the volume of air flowing past it.



Mass Airflow Sensor (MAF)

A mass airflow sensor replaces the mechanical measurements of the AFM with an electronic version. A MAF sensor uses active analogue electronics to measure current flow through a heated wire placed in the air-stream. As air flows past the heated wire, the wire is cooled; more air equals more cooling. The circuit then pumps more current through the wire to keep its temperature constant, with more current required for more airflow. This current then drives an output voltage to the ECU. Unlike an AFM, a MAF sensor also automatically includes air-temperature and pressure compensation in the output signal.



Explanations sourced from:

<https://www.zcar.com/threads/excellent-write-up-and-comparison-of-afm-vs-maf-vs-map-information.237882/>

<https://www.mye28.com/viewtopic.php?t=56283>