

2010 ENGINE PERFORMANCE

Engine Controls and Fuel - 2.8L, 3.0L, 3.2L, or 3.6L - Equinox & Terrain

DESCRIPTION AND OPERATION

AIR INTAKE SYSTEM DESCRIPTION (W/LF1)

The mass air flow (MAF) sensor measures the amount of air coming into the engine. This direct airflow measurement is more accurate than the calculated airflow information obtained from the other sensor inputs. The MAF sensor also houses an integrated intake air temperature (IAT) sensor. The MAF sensor uses the following circuits:

- An ignition voltage circuit
- A signal circuit
- A ground circuit
- An IAT signal circuit
- An IAT low reference circuit

The MAF sensor that is used on this vehicle is a hot film type and is used in order to measure the air flow rate. The air flow through the sensor passes over a temperature sensor, is then heated, and then passes over another temperature sensor. The difference in air temperature before and after the heater is measured. The air temperature difference is proportional to the amount of air flow. This air temperature difference also allow for determination of whether the air is flowing in the forward or reverse directions. As the air flow increases the delta temperature between the two sensors increases. The MAF sensor converts the temperature difference into a frequency signal that the engine control module (ECM) monitors. The ECM calculates the air flow based on this signal.

The ECM monitors the MAF sensor signal frequency and can determine if the sensor signal is too low or too high. The ECM can also detect airflow that is inappropriate for a given operating condition based on the signal frequency.

The scan tool displays the MAF sensor value in grams per second (g/s) and hertz (Hz). Values should change rather quickly on acceleration, but should remain fairly stable at any given engine speed. If the ECM detects a condition with the MAF sensor circuits, the following DTCs set:

- P0101 Mass Air Flow (MAF) Sensor Performance
- P0102 Mass Air Flow (MAF) Sensor Circuit Low Voltage
- P0103 Mass Air Flow (MAF) Sensor Circuit High Voltage

CAMSHAFT ACTUATOR SYSTEM DESCRIPTION