

Gotech-MFI

Engine Management Systems

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Wideband Digital Air / Fuel Ratio Meter

Gotech Digital Air / Fuel Ratio Meter



WARNING

The Oxygen Sensor used in this device gets very hot in operation. Do not touch the hot sensor. Do not let a hot sensor touch a combustible surface. Do not use the sensor with or near flammable liquids or gases. Failure to heed these warnings may result in severe burns, explosions or fires. When installed in the exhaust, the oxygen sensor **MUST** be connected and operating with the AFR-X whenever the car is running. An un-powered oxygen sensor will be quickly damaged when exposed to hot exhaust gases.

Do not reverse the polarity on the Gotech AFR X. Reversed polarity will cause severe damage to the Gotech AFR and other electrical components.

Gotech cannot be held responsible for any damage or loss due to improper use of the AFR X meter.

Introduction:

The AFR-X is a hand-held instrument used to measure the Air/Fuel Ratio (AFR) for an engine. For gasoline-driven engines, the theoretically optimal air fuel ratio is 14.7 pounds of air for every pound of fuel. At this ratio, theoretically, all available oxygen in the air combines with all available fuel. This ratio is called the stoichiometric ratio. Stoichiometric for different fuels are as follows:

Gasoline	14.7
LPG	15.5
Methanol	6.4
Ethanol	9.0
Diesel	14.6

This instrument provides a means to measure the actual air fuel ratio in the engine in operation directly from the exhaust. For this a special wide-band oxygen sensor is used to measure the lambda value derived from the oxygen content of the exhaust gases.

First Time Use:

1. Connect the power supply cable to the vehicle's battery. Note: The supply voltage to the AFR-X must not exceed 16V.
2. Connect the 16 Pin plug to the Gotech AFR-X. Do not connect the sensor yet. The AFR-X will now display.



3. Connect the supplied lambda sensor to the six pin plug on the wiring loom. The lambda sensor will now start to heat up. The AFR-X will start counting down as the lambda warms up to the optimum temperature.



installation:

Mounting the sensor using a Bung or Exhaust Clamp:

Using a bung is the preferred method for mounting the O2 sensor for both catalytic and non-catalytic cars.

On catalytic equipped vehicles

Bung: Install the oxygen sensor's bung upstream from the catalytic converter. Any decent muffler or exhaust shop can do this for you. The wide-band oxygen sensor is then installed into the bung to take a reading. The bung must be installed in the exhaust pipe at the side or on top, NOT on the bottom of the exhaust pipe. Best position is between 10:00 and 2:00 position.

Exhaust Clamp: You may use the optional Exhaust Clamp to mount the O2 sensor to the car's tail pipe when taking readings from cars with catalytic converters. However, it is recommended instead to use the bung (as described above) to give you the most accurate reading. Measuring after the cat will result in leaner-than-reality readings, depending on the efficiency of the cat. Some operators of chassis dynos use this method and roughly "correct" the reading.

On non-catalytic converter vehicles

Exhaust Clamp: With non-cat cars, you can simply take the reading from the car's tail pipe; however, you MUST use the optional Exhaust Clamp to do so. Do NOT simply insert the O2 sensor into the tail pipe. Doing so may damage the sensor and it will certainly not yield accurate measurements. (The oxygen sensor needs to have its cable exposed to outside air to yield the most accurate results.)

Bung: You have the option with non-catalytic cars to also use a Bung as described above. Use of a bung is the preferred method for mounting the O2 sensor for both catalytic and non-catalytic cars.

On TURBO CHARGED vehicles

Bung: Install the bung downstream from the turbo before the catalytic converter. The high exhaust pressure before the turbo interferes with the lambda measurement and the high exhaust temperatures encountered there can damage the sensor.

WARNING: Wide band oxygen sensors are designed to work with unleaded gasoline. Using them with leaded gasoline will significantly reduce the life span of the sensor. When installed into the exhaust the oxygen sensor must be powered up whenever the car is running. A unpowered oxygen sensor will be damaged when exposed to exhaust gas.