

Digital Electronic Fuel Injector Enhancer Installation manual

**Thank you for purchasing
4th generation Digital E.F.I.E.**

The installation and tuning is intended for skilled professional. Though installation is medium in complexity and can be done by anyone with average electric/wiring skills, we suggest you seek help of skilled mechanic or car shop specializing in installation of such devices.



INTRODUCTION

Digital E.F.I.E can be used with all zirconium type (narrow band) (1,2,3 or 4 wires) and all wideband oxygen sensors.

Dual DEFIE can control two oxygen sensors (dual output DEFIE version).

The D.E.F.I.E is not intended to be a fuel saver by itself. It works in conjunction with fuel saver devices like a hydrogen gas electrolyzer, a fuel vapor production unit, or other devices that get more power out of the same fuel by increasing combustion efficiency.

1. Locate the oxygen sensor signal wire (Standard 1v sensors)

The best way to find oxygen sensor signal wire is to look it up in your Haynes, Clymer or Chilton manual for your car. For a small fee (10-15\$) you can get diagram e-mailed to you from <http://www.ahdol.com>. Another source is AutoZone.com.

Go to the following URL:

www.autozone.com/shopping/vehicleSelect1.htm .

Then:

1. Locate your car, year, make and model.
2. Select "Repair Info" on the left side of the screen.
3. Select, "Vehicle Repair Guides" -> Chassis Electrical -> Wiring Diagrams.

Use wiring diagram to identify color of the o2sensor wires. If you still can not get wiring diagram locate o2sensor. In most cases the oxygen sensor has four wires:

- Heater 12 Volts +
- Heater ground
- Oxygen sensor signal +
- Oxygen sensor signal ground

Usually on a 4-wire sensor two white wires are for the heating element, a gray wire is ground and a black wire is signal or two black for sensor heater, blue is signal and white is ground.

If you have 2 or 3 wires, then your oxygen sensor has a common ground or no heater wires etc. The simplest setup is a single wire, which is the signal wire. The following procedure will help you to identify the wires:

Disconnect the o2sensor plug, use multi-meter and find two wires with low resistance about 2-30 Ohm. That is o2sensor heater circuit. The other two wires are sensor signal and sensor ground wires. You need to find the sensor signal. Strip insulation from the wires so the voltage can be measured. Now start the car and use multi-meter to probe the voltage between those two wires. You need to see Positive reading (between 0.1 and 0.8v) on the multi-meter, the Red probe will be your signal wire. If you see negative voltage reverse the probes. Cut oxygen sensor signal wire and strip the insulation from both ends. It would be better if you can locate the ECU pin leading to the sensor signal. It should be the same color and you can use multi-meter to find the wires with 0-2 Omhs between o2 sensor signal wire and ECU pin. Locating ECU pin

will make connecting D.E.F.I.E a much easier task. If the car has two primary oxygen sensors repeat the above procedure for second sensor.

2. Locate the oxygen sensor signal wire (Wideband sensors)

Use instructions above to get wiring diagram for your car.

Wideband sensors are controlled by current and not by voltage like Standard 1v sensors. On the 4 wire sensors identify the wire with constant 2.7 – 3.3 volts (with the car running). On the 5 wire sensors you will find current pump wires with voltage between 2.0 and 3.3 volts. Use the wire with the higher voltage.

You can refer to this resource which has in depth wideband installation information: http://www.fuelsaver-mpg.com/doc/afr_efie_install.html

3. Locate 12 Volt power and Ground.

You need to find ignition switching power wire. O2 sensor heater wire can not be used because in some cases ECU will cut the power to the o2 sensor during the trip. The D.E.F.I.E draws about 0.1A so you can connect it to any power source. You can also use power from the electrolizer.

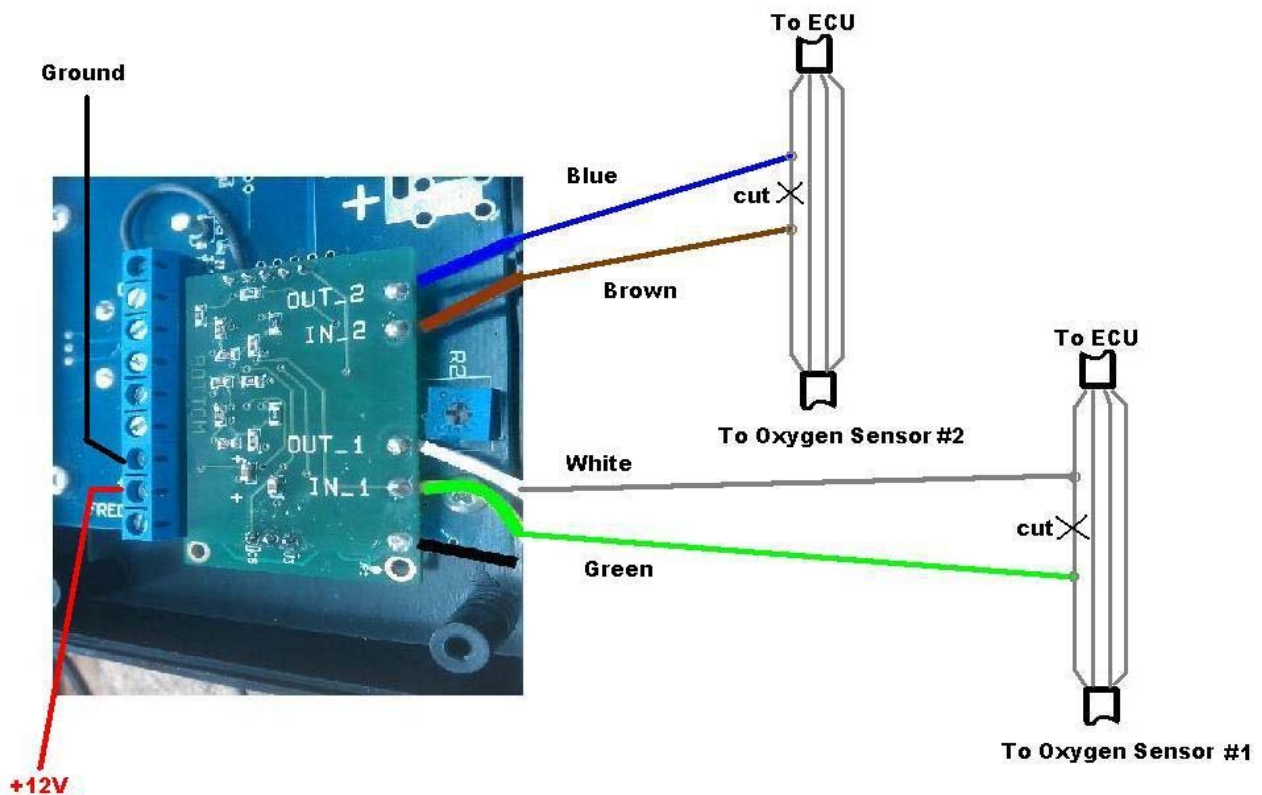
Ground can be the vehicle body (chassis ground), engine block or ground from another device. Do not use oxygen sensor ground. Test the resistance between ground wire and battery negative terminal, if it is < 2 ohm you can use it.

4. Placing D.E.F.I.E.

Place DEFIE so it is accessible for adjustment.

5. Connect D.E.F.I.E

- a. Connect Ground and +12v to the EFIE terminals.
- b. **Standard 1v o2 sensors:** Cut o2sensor signal wire and connect them to the EFIE with the supplied crimp connectors according to the diagram below. If connected only to one o2sensor isolated unused EFIE channel wires with electrical tape.
- c. **Wideband o2 sensor:** Do not cut the sensor signal wires. Just connect Out_1 and Out_2 to the signal wires. Leave In_1 and In_2 disconnected.
- d. Depending on the location of the DEFIE, wires might need to go through the back or the side of the DEFIE case. Drill 5/16" hole and use provided rubber grommets.



6. Configuration.

DEFIE control module menus:

1. Set Sensor Type
2. Set EFIE Output
3. Warm Up Delay
4. About
5. Exit

Set Sensor Type – Switch EFIE between Standard 1v and Wideband sensor types.

Set EFIE Output – Set EFIE output between 0 - 0.9V for Standard 1v and 0 – 10ma for Wideband sensor types.

Warm Up Delay – Set Fast, Medium , Slow or No warm-up delays. With Warm Up Delay configured EFIE will reach preset output levels over period of time. It allow o2 sensors to reach the operating temperature before adding full adjustment signal.

About – About information.

Exit Setup – Exits setup menu.

7. Make EFIE Adjustments.

Note: *When D.E.F.I.E is powered OFF oxygen sensor is directly connected to the ECU bypassing D.E.F.I.E.*

When it comes to making the actual adjustments to the D.E.F.I.E for your particular car and fuel saver combination we recommend consulting the manufacture of the fuel saver since the tuning and particular voltage depends on fuel saver characteristics and its implementation. Seek professional help of experienced technician.

In general we recommend starting with 200 milli-volts. The process of adjusting the D.E.F.I.E is trial and error. If you're setting the D.E.F.I.E above 350 milli-volts you are getting pretty high. Watch for symptoms of too lean fuel mixture such as rough engine, lack of power, "check engine light" etc. When these show up, adjust the voltage down until the symptoms go away.

For Wideband sensors start at about 1ma mark. Wideband sensor characteristics differ between the manufactures and amount of current needed to lean out will vary.