

## Oxygen Sensor Monitor

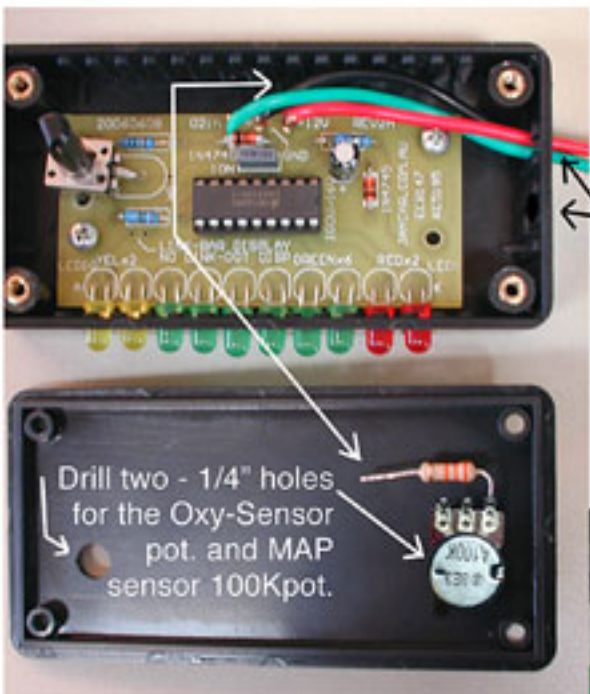
## MAP Sensor Monitor

## Assembly Instructions

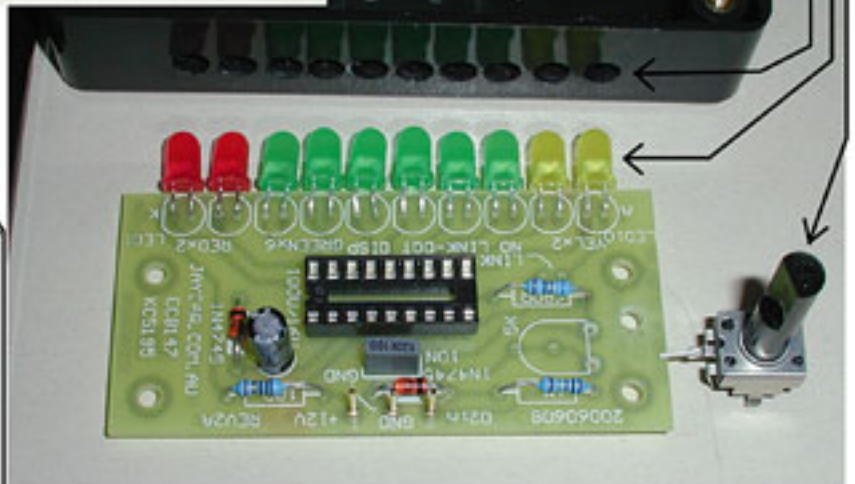
Start by soldering up the "Fuel Mixture Display Kit" follow it's included instructions, but **DO NOT** solder in the 5K small pot. we will be replacing it with a larger 5K pot. Solder in the LED lights on the side of the PCB board as shown below. I reversed the LED colors, so that lean(18:1) would be yellow & rich to be the red LED's. Opposite of the instructions. Next drill 10 holes into the side of the box. I start w/ a smaller drill bit & enlarge to 3/8" I drew a line measured carefully

## Air/Fuel Mixture LED monitor and MAP sensor monitor

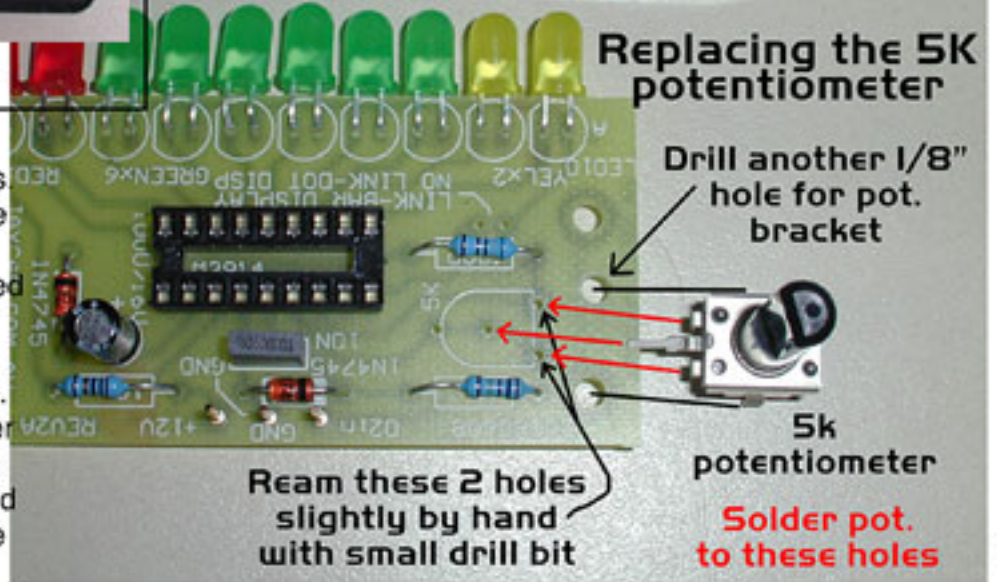
U-solder, U-build kit with 4"x 2" abs plastic box.



Drill two - 1/4" holes for the Oxy-Sensor pot. and MAP sensor 100Kpot.



Drill two more 1/4" holes for the the wires to come out. One for the 3 set of wires and another hole for the 2 MAP sensor wires Solder on the 33k resistor to one outside leg of the 50K pot. The paired speaker wires get soldered to the other 2 legs. The resistor gets grounded to the black wire on the FMD PCB board terminal. The black wire is ground, I solder on a 2" long wire to connect the pot to the (-) terminal post. I used 2' of black wire off the end of the wires that came with the kit.



## Replacing the 5K potentiometer

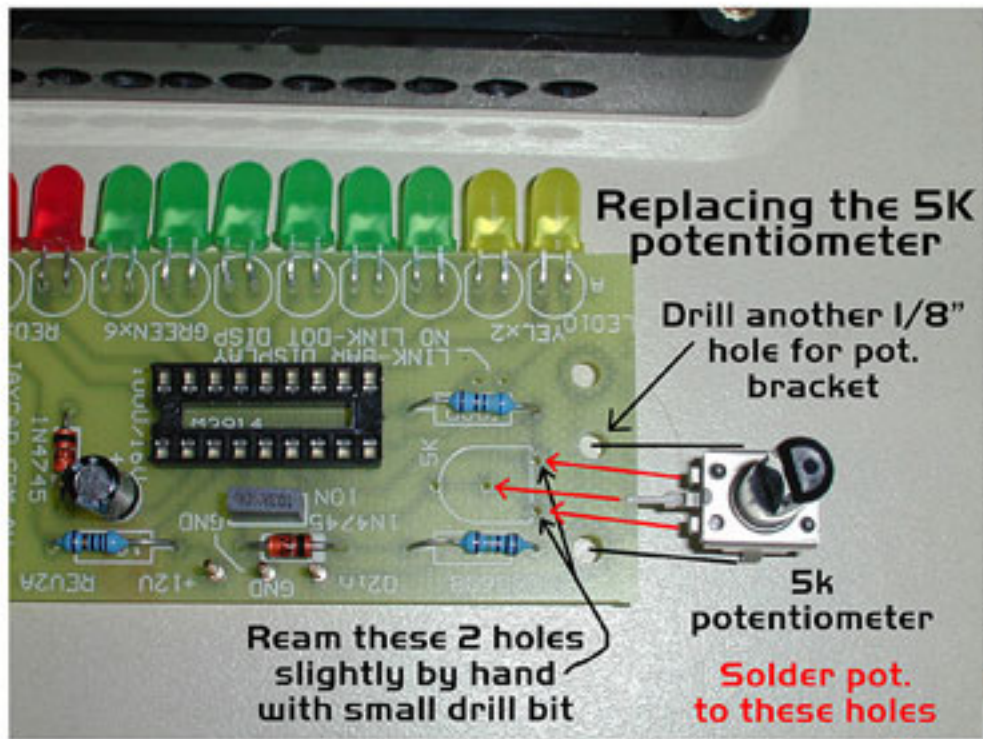
Drill another 1/8" hole for pot. bracket

Ream these 2 holes slightly by hand with small drill bit

5k potentiometer

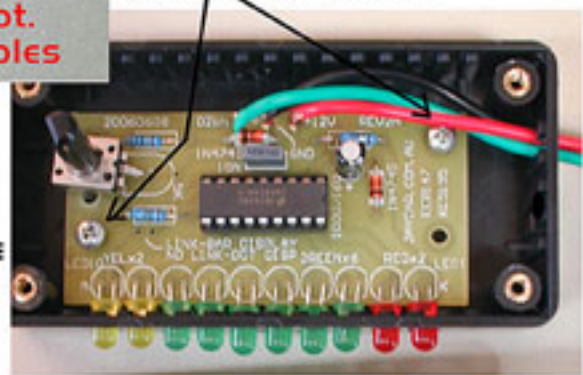
Solder pot. to these holes





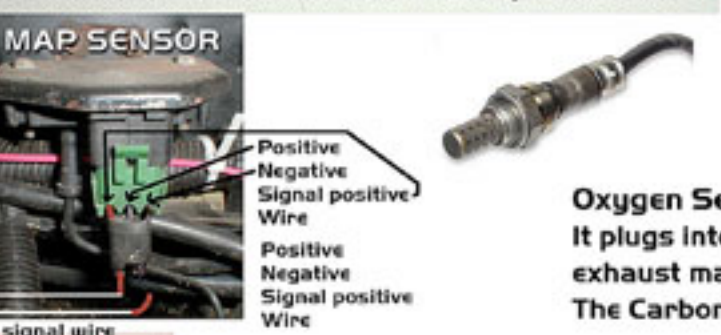
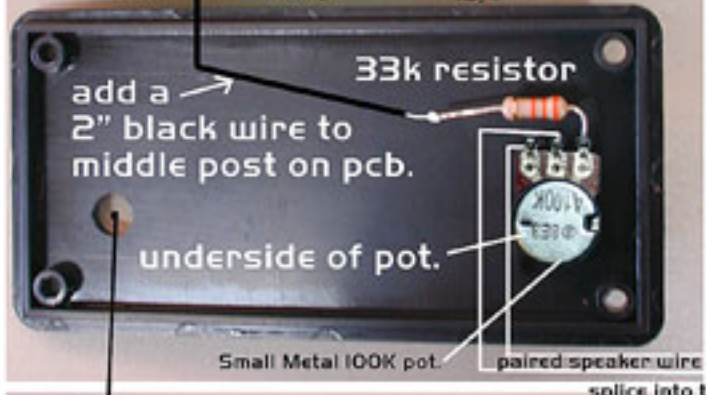
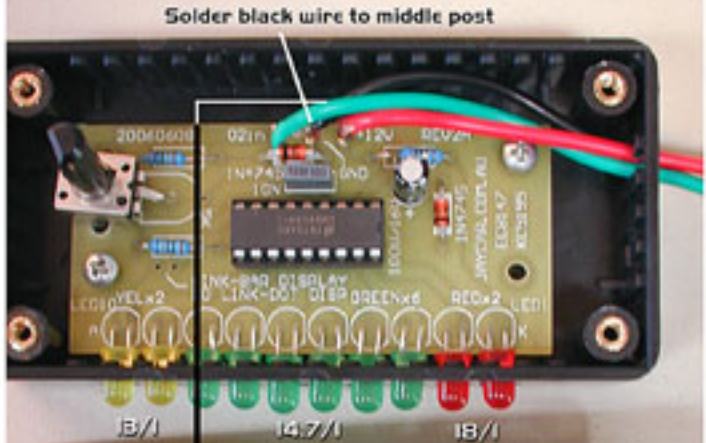
To mount the Linear shaft 5k - pot., you must drill a small 1/8" hole, to mount the pot. Also you will have to bend out the center tab to fit into the center solder hole. To make the new pot solder lugs to fit you have to ream the holes slightly with a small drill bit or exacto knife. This potentiometer shaft will stick out of the box lid, you have to mount the circuit board into the box lining up the LED holes that you drilled so perfect. We included 4 small screws to mount the board to the box. I used 2 in this photo.

On the PCB board please make sure the solder bridge on the back side of the PCB board that reads "BAR" is not touching you have to get out the 2x glasses to see it. I take a razor blade and scrape between the silver solder joint, making sure this BAR is NOT touching & a slight gap is between these 2 solder holes. One fla in the board.



The 50K potentiometer and resistor to ground, with soldered in paired speaker wires are to go to your MAP sensor under the hood. Get out your car manual, Haynes or Clymer can be bought at all auto part stores. Read up on the MAP sensor and it's function. Your MAP or MAF on some cars (same thing) has a 3 wire connector going to it. One wire is ground (black usually) 2nd wire is positive and a 3rd wire is positive (green ? ) and is the SIGNAL WIRE. That is the wire you want to splice this speaker wire into, so you can control the millivolts with the pot./knob on the little black box. The millivolts are from 0 volts to 1 volt, measuring in millivolts - 500 millivolts= 1/2 volt. To find out you for sure got the right signal wire. You need to start the car and get your Voltmeter out set for millivolts and ground one end and touch the signal wire with the positive probe of your Voltmeter, while you rev the engine the readings should go up and down with the readings, if it says at a constant 5 volts or 12 volts constant you got the wrong positive wire. If so try testing the other positive wire till you find the SIGNAL WIRE. I always use electrical connectors when I slice into a wire, so that you can always hook it back up stock, just incase this damn thing don't work. We like this little circuit. go slow and do it right the first time. For such a simple device, not costing too much, it will save you alot of money in gas savings in the future of driving this car. Follow the instructions that come with the "Fuel Mixture Display" on hooking up the "black, red, green" wires. You will have to find a hole that goes through your cab through the firewall to your engine compartment. The more modern your car the harder this will be. I own a BMW and I cannot get any holes through the dash. I had to go through a hole I drilled through the floor board. We included a Velcro strip for easy mounting of the LED display box. Mount in a place easy to view for driving, but take heed, these little LED lights flash alot and can be annoying while driving at night, so you might want to mount lower down on the dash. I personally like the flashing lights, curious passengers will ask you questions. "What's that?" "Oh, I'm just monitoring the carbon demon I got under the hood called an "Oxygen Sensor".





splice into the signal wire  
 One wire goes to the plug,  
 the other wire goes to the EMC (computer)

**Green wire** will go to your oxygen sensor signal wire. Some oxy sensors have one wire. Others have 3, you have to find the signal wire by reading your car manual, to find out which one is the signal wire, tap into this wire, don't cut and splice into, like the MAP in & out 2 wires. Just strip off some of them wire coating and solder in. The **BLACK** wire is ground. wire to any solid metal under your dash, for a good ground.

The **Red wire** goes to a positive ignition wire under your dash. They sell these piggy back blade fuses that fit right into your under dash fuse box. An easy way to get ignition positive, so it is only on when your key is turned on. Foreign cars the fuse box is under the hood.

This Fuel Mixture Display will work on OBO I (89-95) & OBO II (96 to 07) cars and trucks. You can lean your mixture up to 18:1. It helps re-gain MPG savings while adding a hydrogen booster to your fuel/air mix. Lean mixtures tend to make your engine temp. get too hot, but you add a good running hydrogen generator cell, it will actually cool the temp. down a few degrees and you can get away with running a 18:1 mixture and get better mpg savings. Also note smaller 4 cylinder engines will find better mpg savings than larger V8 engines. Every vehicle is different. First start out with the MAP sensor knob at 0, counter clockwise.



## MAP Sensor

Before soldering in or connecting the paired speaker wires to your MAP Sensor signal wire. Do a test with a volt meter to find out if it indeed is the signal wire. Get a Voltmeter set it a 1 volt DC or to millivolts, the signal will be between 0 volts and 1 volts, 500 millivolts being the middle. Bare the signal wire, so you can touch the positive tip of the probe, to the wire to get a signal reading. Now start your engine, run on idle. Take your volt meter probe, ground the black probe, and with the red positive side, stab the signal wire. Have someone rev the engine slightly, You should notice the volt meter reading to go up and down as you rev the engine. If you have just the positive wire and not the signal wire, it will read approx. 5 volts the whole time, not a varying millivolt reading ( 200- 800 millivolts)

Now that you found the correct wire, shoot and say "ya!" Next, you want to find where on your new MAP dial on your dash, where "0" is. All the way to the right or all the way to the left, or dead center on the pot. MAP knob. Two ways to do this, by tapping into the wire with your voltmeter and turning the dial to see what the reading is, or just turn the dial once the car is warm and while driving on an empty street, try turning the knob to see what happens, you will notice the car start to slow down and may even stall if turned to far, back it off the other direction and your back to normal. It is like having another throttle control on the dash. Best kept at 0 for starters. PLEASE NOTE, this does not work on all cars! One being a Dodge Van 1996. On the Dodge the changing voltage on the MAP, just made the mix richer only. Bummer.

Adjust your Air/Fuel ratio with the Oxy sensor knob first. You have to let the car warm up to normal operating temp. before the LED lights start blinking. The oxygen sensor works only when fully heated up. (5 minute) Turn the Oxy sensor knob as you drive and watch the lights change, more lean or more rich. Now you have control of your air/fuel ratio. PLEASE NOTE : The Oxy. Sensor knob, does not always work on some cars. We only "tee" into the Oxy. Sensor signal wire & does not change the millivolts on some cars. Though you can ignore the oxy knob and turn the MAP knob to lean the Air/Fuel mixture and notice the change by the LED lights moving around. PLEASE NOTE - The LED lights are erratic and move fast, jumping around fast.

## MAF sensors

Some cars have MAF sensors which deals with a vacuum, that is another setup. You will need a Vacuum gauge for your dashboard and airline. Not like the MAP, so if you have a MAF, e-mail us and we can send you info. on the MAF setup. You can always send this kit back for a refund, if you don't solder it.

## Oxygen Sensor Knob

Start driving the car, as it starts to blink, adjust the knob to lean "red" or in the middle "green". "Yellow" - rich. Now I solder my LED lights in backwards. So "red" = rich and "yellow" = lean, because I have a good running hydrogen from water cell bubbling away under the hood and want to take advantage of the I2O octane egas. I run at green to yellow (middle to lean) Drive and adjust as you like with the knob. Look at the MAP knob as a added feature, that you might not even use. Every car is different. Some gas saving geniuses say to disconnect the oxygen sensor all together, we can e-mail you info. on that if you request. Come back to the site for updates & new products.

## Check Engine Light

Adjusting with your MAP and oxygen sensor may trigger the "check engine light" on your instrument panel. You have turned the knob too far lean. For OBO II cars we sell the "Scanguage II" (\$160, works on OBO II ONLY) that replaces the "check engine light" To clear the "check engine light" on OBO I cars and trucks (89-95). just disconnect your positive battery terminal. On OBO I cars you can buy a OBO I reader for \$25, but all it does is jump the 2 terminals on your under the dash OBO I reader port. If you read your manual it will tell you which two terminal pins need to connect, very simple, instead of spending \$25 on a .50 cent product. You read your diagnosing by series of flashing lights, that you jot down and then look up in your trouble shooting section of your OBO I reader in your car's manual. Haynes and Clymer auto manuals tell you this information. On OBO II cars (96-2007) you will need an Actron OBO II Reader for about \$80. If you go to a paid mechanic, he will charge you \$75 just to check your check engine light diagnosing one time. The Scanguage II is cool, because it is like an OBO II diagnose display on your dash, it will till tell you present mpg , engine temp, RPM's and the present Air/Fuel ratio. Learning how to read your engine settings is all apart of saving gas mileage. Sorry it is a learning curve you will have to master. If your need more question answered just e-mail us. : info@hydrogengarage.com