

## Older Vehicles and HHO

( manufactured before 1996 )

**OBD I Compliant NON Carbureted.**

Revised 1/8/2014

I want to start by telling you that you will have an uphill battle due to the age of your vehicle. It is still using the Old OBD I diagnostic system. In order to achieve really large mileage gains, you will need an OBD I scan tool to tune in the Tuning 101 AFR Control Center. They are almost impossible to find anymore. Most of them that can be found are not capable of supplying all of the information needed. Quite simply it is considered an old antiquated system, and has not been used for over 19 model years. I still have a 1993 Mercury Villager which is really a Nissan Quest ( OBD I ) with a different trim package. I also have a SnapOn scan tool and engine analyzer that is capable of diagnosing problems on this vehicle, but it will not supply all of the needed ***live data stream information*** in order to ***fine tune*** everything perfectly. I spent the better part of 5 months tweaking on this vehicle to finally get it up to an 87% mileage gain. In contrast I also have a 2005 Chrysler Town and Country that took me less than 2 hours of tuning to achieve a 116% gain in fuel mileage.

Older vehicles also are host to many other problems. They generally appear to be in decent running condition and are not tripping any trouble codes, but still are not able to get any decent mileage gains. The O2 sensors are usually tired and worn. So is your MAP, IAT, CTS unless you have replaced them recently. With the old OBD I systems you would not normally receive a CEL until the actual component failed. Many of the older vehicles also have partially clogged catalytic converters unless you have replaced it recently. This can have a tremendous effect on fuel mileage. I am going to insert in the next paragraph, an informational piece of data that is printed in all of my generator's & Complete System's instructions.

### **Verify Vehicle Condition**

A common cause of vehicles fighting mileage gains is a hidden problem with the vehicle itself. Tired oxygen sensors, clogged EGR circuits, carboned throttle bodies, ignition components that are not up to par, partially clogged catalytic converters, defective sensors, and a whole host of other problems have been found. Usually the vehicle runs perfectly fine, no codes are set, and the stock mileage is typical for that type of vehicle. The owner assumes that the vehicle is in top operating condition because he/she has no reason not to. When the proper tuning procedure is followed and mileage gains just won't come, go back and start nit-picking the vehicle apart. Check everything. You might even consider planning on a complete tuneup at this time. In fact, this would be a good time to upgrade to Pulstar Plugs, MPG Plus ignition wires, Blue Streak or Neihoff cap and rotor. Clean out your throttle body and PCV system. Install new filters and oxygen sensor. Make sure the basics are in order.

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This is just a preview of what you might encounter. The older systems were for the most part analog based. The O2 sensors back in the 80s up to the mid 90's were a much slower 100 to 200 millisecond pulse rate as opposed to present day 25 millisecond or less, pulse rate O2 sensors. The downstream O2 sensors did not figure into the equation in determining air fuel ratio. Their only purpose was to report on the condition of the catalytic converter and report a total failure

to the vehicles computer. The older PCM's or ECU's were extremely loose in their tolerances and had what was referred to as an adaptive memory. It would adapt to worn sensors, weak ignition parts, etc and still keep your vehicle running in a relatively decent manner. This same adaptive memory is the reason many people who have installed an HHO Generator, an EFIE and possibly a MAF/MAP enhancer to alter the signals, would report great fuel gains for a while, and then suddenly they would disappear. This is due to the fact that the O2 sensor's and the MAF or MAP sensor were leaning out the fuel flow, but they were not in agreement with other sensors used to determine AFR, and the adaptive memory would adapt to the altered signal and change it back into compliance with the other sensors, and there went your mileage gains.

**It is possible to get some mileage gains in the 25% to 35% range and keep them, using one of our efficient HHO Generator's, Our Black Box Controller, and our 2 in 1 Combo Digital EFIE with built in MAF/MAP enhancer, But only if you do not push their adjustments too far and alter their signal's too much and your OBD I vehicle and all of its components are in great condition.**

<http://cgi.ebay.com/ws/eBayISAPI.dll?ViewItem&item=251171832789&ssPageName=STRK:MESE:IT>

Normally speaking if you can gain 25% to 30% and keep it, settle for that and stop tweaking. In order to go any further, you must alter the IAT and CTS signals using our Tuning 101 AFR Control Center. This requires a good Scan Tool and lots of time and patience. After you have altered these two sensors signals, you can go back and apply leaner settings to your EFIE and MAP circuits. Then the tweaking really begins. You need to display a minimum of 6 different gauges on your scan tool while you are adjusting, making certain that you are keeping all of the involved sensors in agreement and balance and most importantly keeping your LTFT ( long term fuel trim ) and STFT ( short term fuel trim ) numbers as close to "0" as possible. What you are effectively doing is altering your air fuel ratio to the range of 19/1 or possibly 20/1 and making your vehicle computer believe that it is still running at the 14.7 to 1 Air Fuel Ratio, that it is programmed for.

With our electronics in the hands of a knowledgeable and skilled technician this is a relatively easy task on OBD II ( 1996 and newer ) vehicles. OBD II Scan tools that are capable of supplying all of the needed information are available for as little as \$79.95 The least expensive OBD I scan tool that I have seen recently, and it still will not give you all of the needed information, is around \$900.00, and you then normally have to purchase a downloadable program for your specific vehicle.

In summation if you are willing to settle for a 30% ( possibly a tad bit more ) mileage gain, then purchase one of our Generator's, a Black box Controller, and Our 2 in 1 Quad Digital EFIE with a built in MAF/MAP enhancer, all in one unit.

<http://cgi.ebay.com/ws/eBayISAPI.dll?ViewItem&item=251171832789&ssPageName=STRK:MESE:IT>

*The other alternative is to install our complete Pure Power “Y”Tee Mite system on a 1996 or newer vehicle.*

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