

Tips For Tuning Your AFR & HHO System.

Through the years, and lots and lots of experimentation I have found some little secrets for maximizing your mileage gains with the use of Browns Gas (HHO).

In an ideal world, we could vary the output of HHO gas to work in correlation with the vehicles accelerator pedal. However this is not yet possible with electronics. The reaction time to an increase or decrease of applied current to your Generator (cell) is way too slow for this to be a practical reality at this point in time. But we are working on it.

With all of today's systems, the best we can currently do is apply a fixed amount of HHO, controlled by either our Black Box Controller, or a Good quality CCPWM. (not a PWM).

With a fixed amount of gas being applied, depending on the size of your engine, it will give you your maximum mileage gains within a certain RPM range.

Too many people make the mistake of doing all of their tuning and set up at idle speed. This will give you maximum fuel savings at idle. If you want to maximize your mileage gains at the the speeds and RPM range that you will be doing most of your driving, you MUST do your tuning at that RPM range. As you are doing your daily driving, take note of your engine's RPM. Find the engine RPM (within 700 rpm) range that your vehicle is running the majority of the time. This is the range that you will use when setting your Black Box Controller, and your Tuning 101 AFR Control center.

You will either need help in the form of someone sitting in your vehicle and maintaining pressure on the accelerator to maintain a given RPM, or you will need to find some manner of adjusting your throttle body to maintain this RPM. If you have found you are for example most often operating in the 1800 to 2500 RPM range you would want to hold your RPM's at 2150 (your Target setting) while doing your tuning. Maximum efficiency is attained from 350 RPM above to 350 RPM below your target RPM setting.

Using this method of tuning will maximize your gains for your particular driving habits and surroundings. Good luck with your project, and have a little fun along the way.

Addendum To Tuning Tips

The numbers and temperature settings that we provide in your instructions, are STARTING settings only. Rarely are any two vehicles exactly the same. As a result these starting settings will most likely need to be altered.

BASELINE:

It is imperative that you take baseline readings with your scan tool BEFORE your instal, and write them down. You will need these readings to fine tune your device after your initial settings have been made. You will need to write down the O2 sensor readings, MAF/MAP load readings, CTS reading, IAT, reading, LTFT & STFT readings, Spark Advance or Ignition Timing readings. I strongly suggest that you have a passenger with you to do the writing while you are driving and reading your scan tool. These readings can be taken when the vehicle is stationary and running at your target RPM setting, but I would recommend for a more accurate baseline that the readings be taken while driving under YOUR normal driving conditions.

O2 Sensor Adjustment:

The starting settings that we provided you in the instructions, are based on a vehicle with new or like new O2 Sensors performing at manufacturers specifications. O2 sensors that have more than 40,000 miles on them could be getting "Tired" or worn and will not respond properly to the starting numbers that we provided. Specially your upstream Digital signal. I have run into cases where the O2 sensors are so tired, that it was necessary to drop the switch point on the digital test points on the board to as low as .125 (2.65 Chrysler product) If you find that you need to adjust your Digital this low, it is time to replace your O2 sensors.

MAF/MAP Adjustment:

You will need your Baseline figures to make this adjustment. Your starting adjustment should be a 15% reduction in your load readings from your baseline figures. Further adjustment is possible on many vehicles in some cases as much as 20%. The more you can lower this reading without triggering a CEL, the less fuel will be sent to your injectors. The reduction in load readings will cause the ignition timing (spark advance) to significantly advance. This may cause the setting on your IAT to be modified even higher than the starting figure that we gave you.

IAT Adjustment:

This is one of the most critical adjustment's that you will be making. After you have modified your MAF/MAP adjustment, it is critical that you compare your Baseline figures of your ignition timing (Spark Advance) with those that you have now. You will find that your timing has been advanced, and now you need to bring it back to a lower figure than your original Baseline figure. If the 195 F. reading that we gave you in the instructions has not already taken care of this for you, You should increase the temperature that your computer is seeing from

your IAT until you achieve maximum retardation that your ECU will allow. We would like your timing to be around 1 to 2 degrees BTDC (before top dead center). This is not possible on ALL vehicles, but we want you to retard the timing as much as you can with your IAT adjustment.

CTS

Your CTS adjustment that we provided you in your instructions, is a constant and will NOT NEED further adjustment, if you have followed our instructions. If you need further fine tuning to bring your fuel trims closer to “0” you will need to see if any of the scenario's that we gave you in the “Modified Tuning” are applicable to your situation. As much as I personally would like to be there to assist you with your tune, this is not possible. I have given you all of the basics and as much help as I possibly can from a distance. Unfortunately there is no more that I can do without being there, with my own equipment and doing the actual tuning myself. **The rest is up to you and your tuning skills.** Don't forget, If you are having difficulty getting results after reading and following all of the help I have given you, check your vehicle thoroughly for some of the following. Any of these problems could be causing your problem.

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 tune-up at this time. In fact, this would be a good time to upgrade to Pulstar Plugs, and 8 mm. ignition wires, Blue Streak or Neihoff cap and rotor. Clean out your throttle body and PCV system. Install new filters and oxygen sensors. Make sure the basics are in order.

God Bless and
May the Blessings Be

Darol Mason
D&N Automotive Engineering
klondikedarol@yahoo.com