

HYDROGEN GENERATORS

(HHO Electrolytic Gas, Brown's Gas)

FOR

DIESEL FUEL POWERED ENGINES

Australian Owned, Designed & Manufactured

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About the Inventor and Developer

Gavan Knox 0403 177 183

Midland, WA

Gavan Knox is a professional Scientist / teacher / university researcher with 35 years experience. He is qualified with a Bachelor of Physics, Engineering, Education (chemistry) and is currently studying to complete his Masters in Chemical engineering (metallurgy).

Hydrogen Fuel Systems Pty Ltd specializes in building alternative energy systems for use in internal combustion engines and turbines to improve the fuel efficiency, power output and torque as well as reducing the toxic polluting gases produced by the internal combustion of fossil fuel.

Gavan has developed a complimentary fuel catalyst that helps reduce the environmental stress on our fragile planet by reducing pollution due to the incomplete combustion of fossil fuel. His is aware that this is a major risk to his children's planet and lifestyle. Pollution problems can be partially rectified by introducing Hydrogen fuel technology, providing the people of the world a better option, a safer option, a cleaner option and a cheaper option than indiscriminately burning fossil fuels.

Advantages of Brown's Gas (HHO) Bolt-on Units for Diesel Engines

Great return on investment!

Hydrogen Addition can increase power/torque at lower RPM

Increase fuel economy of the engine.

Engines run cleaner, cooler and smoother with less internal wear

Reduce polluting gases produced by internal combustion.

Hydrogen also allows increased compression ratios because of the ability of hydrogen rich intake air to prevent knock (high octane).

Brown's Gas Generators

Hydrogen gas significantly increases the rate of combustion of the fuel (due to the incredibly fast flame speed – 1000 times that of diesel and petrol) so that the entire fuel charge is burnt at or close to top dead centre on the power stroke. It is pointless having fuel burn at the bottom or near the bottom of the expansion/ power stroke of an engine. Consequently more power is delivered by the engine having the fuel charge burn at TDC and allowing the expanding gasses to deliver power more efficiently to the engine. Hydrogen also allows an increased compression ratio because of the ability of hydrogen rich gas to prevent knock (high octane).

How do they rate, what should I purchase??

To answer these questions, first discuss what HHO Brown Gas does in aiding a vehicle to achieve better fuel mileage.

Contrary to popular belief, **we are NOT using HHO as a fuel**. We are using it as a **catalyst** to greatly enhance combustion and burn 95% to 99% of the fuel that is being supplied to your engine.

One very important thing to remember is that your vehicle, in stock condition is **NOT** burning up to 50-60% of the fuel during the combustion process that is being supplied to the engine. Most of your fuel is being sent out the exhaust to be burnt by our catalytic converter.

The reason that HHO (Browns Gas) is so effective as a catalyst, is due to flame propagation properties. HHO has a flame speed roughly 1000 times faster than gasoline, and almost 1200 times faster than diesel fuel.

With the proper use of the Hydrogen Generator system you are able to reduce the amount of fuel being sent to the engine (by up to 50%) which is no longer needed because we are now only wasting 1 to 5% of the fuel.

We are burning up to 99% of it during combustion, not wasting expensive fuel in the catalytic converter.

There are literally hundreds of different designs of Generators on the market today. Most of which are a total waste of your money. Many sellers will advertise their LPM (liters per minute) of HHO output, but not tell you how much amperage draw it takes to produce this output.

One not commonly known fact is that it takes approximately 17 horsepower from your vehicles engine to power a 90 amp alternator when it is fully engaged. Of course larger alternator's need even more horsepower. It requires fuel to create this horsepower.

*There is **NO FREE ENERGY** in a vehicle.*

This is why it is so very important to choose a Generator that will supply your vehicles HHO needs with the least amount of amperage draw possible. You should **NEVER** allow an amperage draw greater than 15% of your alternator's rated output.

Choosing the **BEST HHO GENERATOR** is all about **EFFICIENCY**.

Efficiency of generators is measured by a rating term called MMW. This term stands for Millilitres of HHO per Minute, per Watt (of electricity consumed.)

The higher the MMW number is, the greater the efficiency. There is a scientific term called Unity.

Unity is the point where a device is producing as much energy in the form of HHO as the energy it is consuming in the form of electricity. 9.28 MMW is considered Unity.

Only one manufacturer of HHO Generators has been able to produce HHO Generators that operate efficiently. One of their Models operates at 19.135 MMW!

The closest any other manufacturer has been able to come is slightly under 8.00 MMW.

The average Dry Cell unit on the market operates in the 4.0 to 5.5 MMW range. The average Wet Cell is in the 2.0 to 3.0 MMW range.

Why is all this important to you??

Lets us start with your vehicles electrical system. Most all vehicle electrical systems are designed to accommodate all of the stock-standard on board electrical devices and have a built in maximum of 15% (of your alternator's rated output) for any additional electronic devices.

Anything beyond this will force the alternator to run almost constantly at full engagement.

Here come those 17 horses that power the alternator and they are hungry, really hungry. Hungry for the fuel that you are trying to save!

Take a look at 2 examples of Generators. One being the highest rated Dry Cell unit listed on eBay and the other being the Gen 10, Gen15 and Gen 20 multi cell unit.

For a comparison we will assume that you have a 5.7 litre V8 engine with a 90 amp alternator, something where a greater quantity of HHO will be needed. This engine should need approximately 1.5 LPM with the proper electronics for controlling signals from the various sensors that control your AFR (air fuel ratio)

Top Rated Dry Cell Specifications

Voltage	Amperage	LPM Output	MMW	% of Alternator
13.8	28	1.5	4.35	27.7%

Gen 20-Hydrocell system specifications (Hydrogen Power)

Voltage	Amperage	LPM Output	MMW	% of Alternator
10.5	15	2.2	13.95	14%

The test charts speak for themselves. The Dry Cell unit is using more than **1.8 times more electricity** to produce the same amount of HHO as the Gen 20 system

The Dry Cell is **using almost 28% of the alternator's rated output**, which will cause the alternator to run fully engaged over 90% of the time.

The "Gen 20 system is only using around 14% of the alternator's rated output which will cause the alternator to operate in trickle charge mode using only around 1 horsepower instead of the 17 horsepower being used by the Dry Cell.

Do you **WANT** to spend your fuel feeding 1 horse or would you rather feed 17??

Too many sellers of HHO Generators feel that by pumping you full of Big LPM numbers, you will assume that their units are better. They do not tell you how much electric current it takes from your vehicles electrical system that it takes to produce these big numbers.

In most cases the current draw and horsepower it takes to produce these big numbers will destroy any possibility of mileage gains.

What is not well known is that if your vehicle is tuned properly, **YOU ONLY NEED 0.15 - 0.25 LPM of HHO** for each litre of your engine's size.

Example: if you have a 3.0 litre engine you will only need 0.75 LPM for maximum performance. So when making your HHO Generator purchase, there are three things that you need to remember.

IMPROVEMENT AVERAGE

Diesel engine cars

- **Mechanical pump (before 1998) 30 - 40% HHO KIT**
- **Electronic Injection (1998-2012) 30 - 45% HHO KIT + 3 sensors + efie enhancer**

Diesel engine trucks, boats and generators

- **Mechanic pump (before 1998) 25 - 40% HHO KIT**
- **Electronic Injection (1998-2012) 30 - 40% HHO KIT + 3 sensors + efie enhancer**

The Truth, About Mileage Gains

Many people who purchase Browns Gas (BG)/ (HHO) generators expect to install them and instantly achieve large gains in fuel efficiency. **THIS IS NOT GOING TO HAPPEN** without adjusting the AFR.

Hydrogen Fuel Systems Pty Ltd, as builders of these devices are supplying you with BG (HHO) which is capable of tremendously increasing your mileage, but there is a lot more to it than just that.

First of all if you install one of these devices with no other electronics to lean-out your fuel mixture, **YOU WILL MOST LIKELY LOOSE MILEAGE, NOT GAIN!!**

There are things to be done on your part in order to achieve the gains in fuel mileage.

1. First and foremost you must control or regulate the amount of HHO that your generator is producing and sending to the engine. The best way to accomplish this is with our Black Box controller or a VERY good quality CCPWM (constant current pulse width modulator), --- Not a PWM.
2. Every vehicles volume of HHO that it can effectively use is different. A great deal of this has to do with the size of the engine, condition of the vehicle, electronics used, battery condition, alternator condition and many other factors.
3. You must address the problems created by your oxygen sensors. When you add a BG (HHO) device, it introduces more oxygen in. The oxygen sensor reads this extra oxygen, and interprets it as a "too lean" condition and immediately starts sending MORE fuel to the engine. The signal from the oxygen sensor must be adjusted to ignore the extra oxygen and also compensate for the much more efficient burn of the fuel.
4. A True Digital EFIE device should be installed and set to indicate a too "Rich" condition which will tell the ECU to send LESS fuel to the to the engine. 5.
5. MAF/MAP sensors are the second most important sensors to treat. These too can greatly affect the amount of fuel the ECU will attempt to send to the engine. Most (but not all) MAF/MAP sensors are voltage operated sensors. It is important to install a good quality device to alter the voltage (or resistance) signal sent to the ECU to further lean out the fuel flow and increase mileage gains. 6.
6. Altering or adjusting the signals from the O2 sensors and the MAF/MAP sensor will produce gains in the 25% to 45% range with an efficient generator. Efficient meaning, one with an efficiency rating of 8.000 MMW or higher. The next two steps can take you well beyond 60% gains in fuel mileage, several have exceeded 100%. 7.
7. Addressing the IAT. (Intake air temperature sensor) This is a little more difficult, although when done properly it will produce dramatic results. Proper application of an IAT tuning device and proper adjustment to this sensor will retard the timing, bringing it closer to TDC. Top dead centre is the ideal setting when running BG (HHO) 8.
8. Addressing the CTS is of equal importance to keep all sensors that affect AFR in agreement of their signals to the ECU. Proper procedures are all covered in 4. Tuning and Installation EFIE units.9.
9. Efficiency of the BG (HHO) generator used is critical. The more amperage drawn by your HHO device, the harder the alternator has to work. The harder it has to work the more fuel is needed to power the alternator, and there goes your fuel savings.

Browns Gas (HHO) devices are capable of tremendous mileage gains, but ONLY if the above mentioned procedures are followed otherwise **YOU ARE WASTEING YOUR MONEY!!**

Any BG (HHO) generator drawing in excess of 18/20 amps of current, will probably give little or NO gains in mileage!

Essential Information.....Batteries

The value for a new lead-acid car battery is in the order of 0.02 Ohm.

It is essential that the battery of a vehicle in which a HHO system is installed, is in good condition. As a car battery ages, the internal resistance increases. This increasing internal resistance reduces the percentage of the available battery energy that can be used for electrolysis. Over time the battery's internal chemical energy is used up.

In the case of a top quality new battery when a current of 18 Amp is being used to run the electrolysis unit, the voltage drop within the 12 volt battery is $18 \times 0.02 = 0.36$ volt.

This means that the available voltage for the HHO system has dropped from 12 volt to 11.74 volts. This voltage drop is not significant and a 5 cell unit can easily operate.

..... (Each cell using approx. 2.2 volts for the Hydrogen redox reaction) – 5×2.2 volts = 11 volts and the available voltage is 11.74 volts.

However in the case of a damaged battery, an old battery, or a battery close to the end of its lifespan, the internal resistance of the battery itself will increase significantly.

..... if the internal resistance rises from 0.01 ohm to 0.2 ohm, the voltage drop within the battery itself when 18 amp of current is flowing = $0.2 \times 18 = 3.6$ volts.

This means that although the battery is still providing 18 amps of current (which is achieved by using a stronger electrolyte solution in the HHO cells) The available voltage to power the cells has dropped from 12 volt to 8.4 volt. (you need at least 11 volts for 5 cells)

At this voltage the cell production is significantly reduced as there is insufficient voltage to support the Redox reaction to produce Hydrogen in the cells.

So where is the extra energy gone???

Into heat within the battery and HHO system!

Conclusion:

Make sure your battery and alternator are in good condition and avoid any avoidable line losses which can rob your HHO system of the energy needed to make Hydrogen from water using electrolysis.

General Installation Guidelines

Note! If you are installing the “Hydrogen generator system” on a diesel engine you must route the Hydrogen transmission hose to a location UPSTREAM of the turbo, that is, on the LOW PRESSURE side of the turbo, in the air-intake cowling, or into the mouth of the air intake cowling, if you can access it.

One of the advantages of using this system is that it can be provided to you preassembled with power supply PWM, electrolyte storage cell, wiring, switches, ammeter, electrolysis cells and hydraulic / pneumatic tubing all connected and mounted.

Your only task is to mount the wiring from the battery/ alternator to the cell enclosure and connect the delivery tubing from the cell enclosure to the air / fuel intake on the engine. After that you can move the cell assembly from one vehicle to the next etc with ease.

The cell enclosure is an extra large marine battery box and cover which can be placed and secured in any position in the vehicle (often there is no room under the bonnet but room in the rear of the vehicle)

Because of the thousands of ever-evolving vehicle configurations in the marketplace, we cannot offer specific, detailed, instructions to precisely fit every possible installation. The following guide is designed to present a typical installation, which the installer can use as guidance in installing the device in his/her own vehicle.

This is a relatively simple process and should be handled with ease by any professional mechanic or mechanically-inclined individual with the appropriate tools.

Properly installing and using this device will make a significant contribution to both your own well-being and the well-being of the world you live in.

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Warning

Having a low concentration of caustic is ideal as more energy is used into the oxidation / reduction of water into hydrogen and oxygen, rather on the “redox” of the caustic solution.

..... Greater efficiency = more gas with less electrical load

Do not use a concentration of caustic higher than the recommended value (11 grams/2 liters) as this may lead to excessive electrical energy being wasted as thermal energy and seeping of caustic powder from the joints of the sealed unit.

INSTALATION TOOLS and MATERIALS

DHI Coriolis Mass Flow meter

Haynes or Chilton's repair manual

Scan Tool or Data Stream Reader

- 1). 5m, 30 amp double insulated wring;
- 2). 5m, 10mm Ø HDPE air brake tubing;
- 3). One 30amp breaker/circuit breaker;
- 4). 2m harness strap & securing tabs;
- 5). Gas bubbler & three brass push-sock fittings;
- 6). Electronic fuel enhancer unit (EFIE);
- 7). Potassium hydroxide pellets; Sodium Hydroxide pellets
- 8) Five liters of distilled water;
- 9) 30amp double insulated wire
- 10) 10mm HDPE brake air line
- 11).30amp breaker

Installation

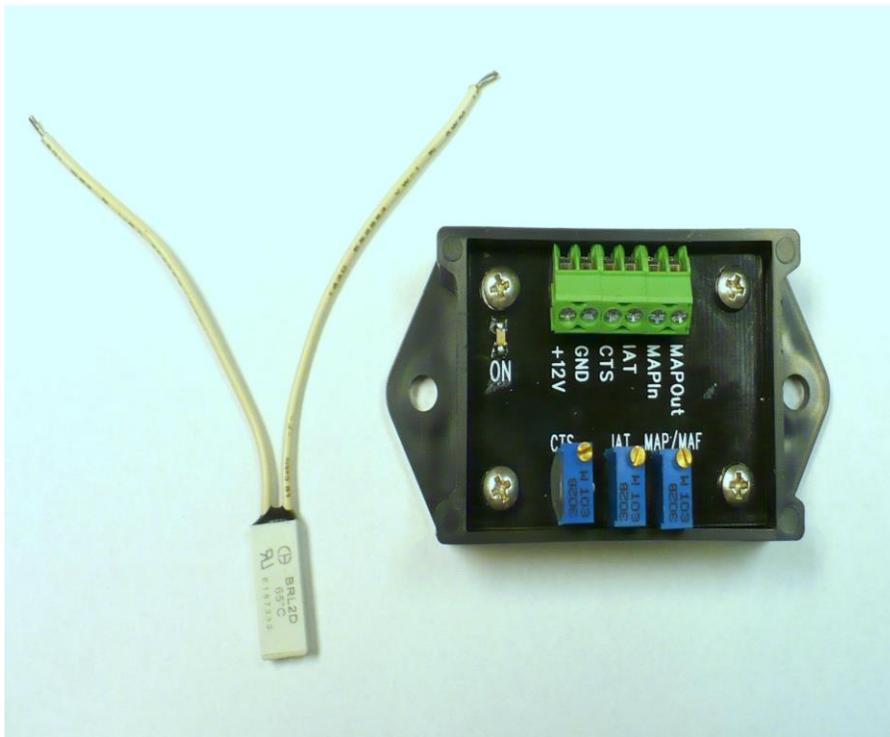
1. Begin by determining where you want to locate the “Hydrogen generator system” in/on your vehicle.
2. Then determine a path to route the Hydrogen hose and electrical wires from the system device to the engine compartment. You should remember that you will most likely want to run the hose and wires together along a frame member or other similar under-vehicle location where you can attach mechanic's wire or plastic ties to hold them in place.

You MUST keep both the Hydrogen transfer hose and electrical wire at least 12" from the exhaust pipes and exhaust manifold to prevent them from burning, shorting, or melting. The Hydrogen transfer hose and electrical cables will be about 25mm in diameter. Be careful not to create any tight curves as kinking may occur. Make sure you stay clear of the fuel tank, brake lines, and any other obstructions which would make it difficult for you to push or pull the Hydrogen transfer hose and electrical cable through any holes that you have drilled.

3. An experienced automotive electrician should be used to connect the cable to the vehicles electrical system so that it is activated from the oil pressure switch via a relay switch. Thus, when the engine Relay supplying electrical Power to the Generator system, switches off. This prevents the system working if the engine is not switched on and running.

4. Connect the 30amp double insulated cable to the battery positive cable via a 30amp circuit breaker and a 30amp relay unit. Connect a length of red 30amp wire to the positive terminal lug. Connect the other end of the wire to relay terminal _____. Connect relay terminals _____ & _____ to the power lead connected to the oil pressure switch. (This will only activate the relay unit when the engine is running.) Connect a wire from relay terminal _____ to the first terminal of the 30amp circuit breaker. Connect the 2nd terminal of the circuit breaker to the red wire of the double insulated 30amp cable. Secure the black cable from the 30amp cable to the body /earth of the vehicle.
5. Double insulated cable is used to protect them from possible wear and shorting. This cable is used to connect the Electrolysis system to the battery/ alternator in your vehicle engine bay. Pass the double insulated cable through the vehicle cabin along the line of the wiring loom. Attach the free end of the power cable to a 50amp Anderson Plug to connect to the HHO generator.
6. Mount and secure the 10mm Ø air pipe to the underside of the vehicle using metal ties. Pass one end of the pipe through the floor of the vehicle rear to connect to the HHO generator. Locate an area on your air-intake cowling as near the air- intake termination at the throttle throat as you can conveniently access (On diesel engines, you MUST input the Hydrogen transmission hoses UPSTREAM from the turbo, on the LOW PRESSURE side of the turbo).

Install instructions for the New Tuning 101 AFR Diesel Control Module Automated T-stat Control



Mounting a T-stat Switch

You must mount your T-stat switch onto the inlet Heater hose. We recommend using a universal hose clamp to hold it in place.

DO NOT over tighten. Locate it as close to the engine as possible.

DO NOT let any part of the metal sensor come in contact with the vehicles Ground or any metal part of the vehicle. The metal portion of the sensor is carrying 12v+ of positive current. Grounding it will immediately destroy the T-stat switch. **We do not want to have to SELL you another one!**

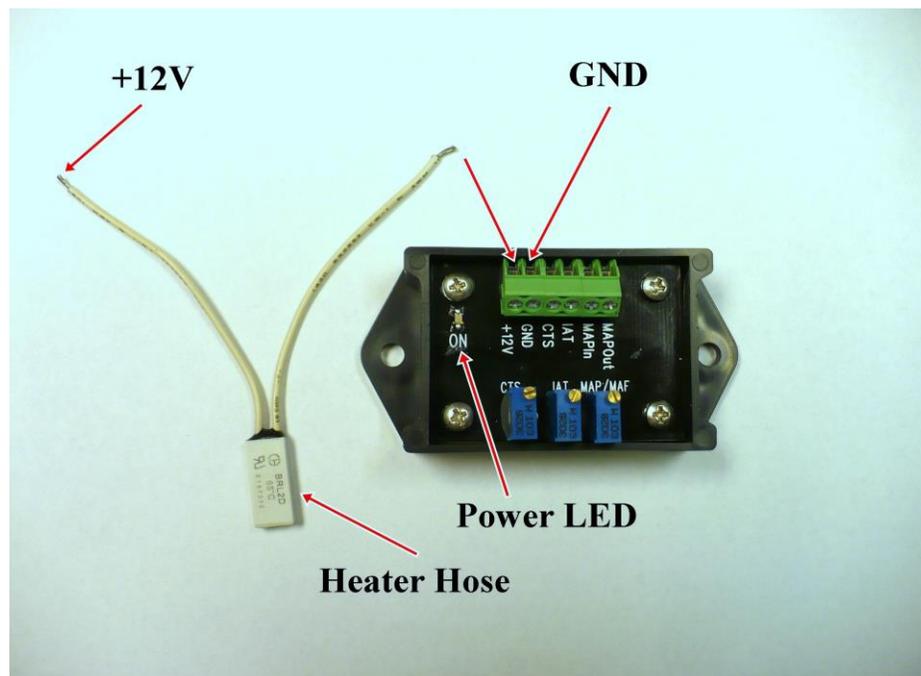
Important Update for T-stat Switch Mounting

If you live in a cold winter climate, it is advisable to wrap some fiberglass pipe insulation around your hose and T-stat Switch, and then wrap your insulation, and T-stat Switch with black electricians tape. This will insulate your T-stat Switch from cold air flow when you are driving in Cooler temperatures.

The T-stat switch will automatically apply power (turn on) your Diesel AFR Control Module when the sensor on the T-stat Switch reaches 145 F.

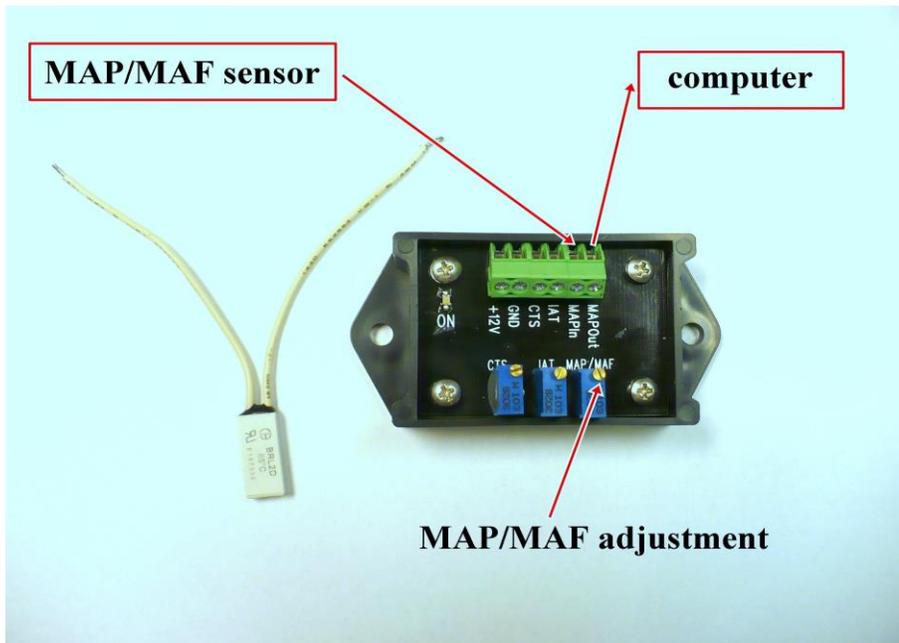
At this engine temperature, your vehicles computer will accept the altered signals from your sensors without any problems or CEL's (Check engine lights)

All of the following adjustments should be made after the "On" LED on the module lights up and connecting Power to your Module



With the new T-stat switching device, you will need to solder on lengths of wire to the T-stat stub wires in sufficient length to reach your 12 v ignition switched power source and to reach the 12v input of your Tuning 101 Automated AFR Control Centre. Refer to above photo. Connect your terminal marked GND to either the negative terminal of the battery or a GOOD clean chassis ground.

Connecting your MAF/MAP Enhancer



This AFR Diesel Control Centre contains a voltage based MAF/MAP enhancer, which is prevalent in most vehicles today.

There are some vehicles that use a frequency based MAF sensor and a voltage based MAP sensor. These are common, and are usually found in some Ford & GM products.

If your vehicle has this combination, use whichever of the two sensors is voltage based. You do not need to adjust the signals of both. Either the MAF or the MAP will suffice. If your vehicle has a voltage based MAF sensor we recommend using the MAF.

Locate your MAF or MAP sensor. They will normally have three wires. + 5volt, – Ground Signal Wire. Once again, cut the signal wire. Add additional wire if necessary to reach your EFIE mounting location. The wire that goes directly to the MAF or MAP sensor is inserted into **MAP In** connector. The wire that goes to the computer is inserted into the **MAP Out** connector.

Finding the Signal Wire

Of course the easiest way to find the signal wire is to use your manual's wiring diagram for your vehicle. This can tell you the exact wire, and the color code, saving time. If you didn't take our advice and don't have a wiring diagram, you can still find your signal wire by measuring it.

A MAP or a MAF will have 3 wires. One will be 5 volts, which powers the device and is supplied by the ECU. One will be ground, or 0 volts. So if you measure the 3 wires, just eliminate the 5 volt wire and the 0 volt wire, and the remaining wire is the signal wire.

This is slightly complicated by the fact that many MAF sensors today also include an Intake Air Temperature sensor in the same housing. In this case you'll have 5 wires going to the sensor. But it's OK, it's easy to find the correct wires you need.

The temp sensor will have a ground wire and a signal wire. The signal wire will be up near 5 volts when the sensor is cold, but as it heats up that voltage gets lower. But a temp sensor's voltage will not change when you goose the engine, and that's how you can tell the difference. Also, if you unplug the sensor, and measure the signal wire on the computer side, it will read 5 volts.

Now, how do you make sure your MAP is a voltage type, and not a frequency type?

You will need to watch the voltage as you make changes to the engine's RPMs. The best way is to goose the engine. The voltage will change dramatically on either a MAP or a MAF if it is voltage type. You will see a small change in DC voltage for a frequency type device too, but the changes will be slight, like tenths of a volt, whereas the changes on a voltage type will be much more dramatic. Changes of over a volt indicate a voltage type MAP or MAF.

Even if you find your signal wire using a diagram, you should still test it before proceeding. You must make sure that you see a voltage change when you rev the engine, and that the voltage drops back down when the engine slows back down again.

If you see these phenomena, proceed to install the circuit. If you don't see this, then you have the wrong wire, or an incompatible sensor type.

Do not try to use this circuit unless you find a signal wire matching these phenomena.

The biggest single cause of failure for any sensor modification project is to miss-identify the signal wire. So it's best to be absolutely sure.

*Note:

If your vehicle is one of the very rare models that uses frequency based circuitry for both the MAF & MAP sensor this MAF/MAP enhancer will not work with your vehicle. Contact us and we will advise you where you can purchase a frequency based MAF/MAP enhancer.

Setting up a Generator

1. Add 3 liters of distilled or rain water to recycle tank.
2. Weigh out 11 grams of Potassium Hydroxide Pellets.
3. Slowly add the Potassium Hydroxide to the recycling container which should be connected to the power supply and switched on.
4. Turn both potentiometer switches on the PWM fully clockwise. This places the PWM into the 100% duty cycle position so that the unit is 100% switched on.
5. Adjust Both Potentiometers anticlockwise one quarter of a turn and record the value of the current flowing. This current will be under 10 amps at 13.6 volt for the solution concentration in this setup.
6. Operating the system will slowly increase the solution to operating temperature of 70 degrees Celsius during which time the current flowing will rise to a stable current of 15 amps.
7. Run the system for one hour of operation time.

8. Re-check the current flow. Readjust the current flowing to a maximum of 15 amps. This is the operational value and you should not need to readjust the unit again. With each trip the current flowing will INCREASE as the temperature of the solution rises, to a maximum of 15 amps.
9. DO NOT EXCEED THIS CURRENT FLOW AS IT MAY LEAD TO INTERNAL DAMAGE WITHIN THE SYSTEM ELECTRONICS.
10. Add water to the recycling tank till it is 8cm from the top. The tank is now holding 2.5 Liters of a very dilute caustic solution.
11. The HHO gas piping is connected to the air intake pipe prior to the throttle body and prior to any turbo charger fitting.

Reduced Emissions

By injecting Hydrogen into the engine, the fuel is “flashed” at a much higher temperature allowing the fuel to burn more completely. A leaner fuel mix ensures a more complete combustion process resulting in less unburnt or partly burnt fuel and hydrocarbons being passed out the exhaust.

Cleaner Engines

By having a more thorough combustion process there is less wasted fuel producing buildups / coating on the valves, pistons and cylinder heads. The contaminants of incomplete combustion mean the lubrication fluids remain cleaner and in better condition for engine lubrication.

Gen 20 systems, stage 1 are ideal for 12 + liter engines.

The Power supply is mounted in a sealed die-cast aluminum box, with improved pumping and chemical etching.



Note from Gavan Knox: Dec 2016

Hi Neil

Coogee Chemicals Transport division have reported savings of 20% from their driver. They are willing as a company to document a 10% savings.

Coogee Chemicals have not installed any fuel enhancer units with the HHO systems which force the systems to produce much greater efficiencies.

The next set of results with Coogee will be done with the electronic fuel enhancer units fitted.

These trucks tow between 60 and 100 ton on 2 and 3 trailers respectively. Prime movers are Kenworth - C15 and C16 engines.

Kind regards

Gavan Knox | Managing Director "Hydrogen Fuel Systems Pty Ltd"
BSc(Physics, Chemistry), BEng (civil), BEdu(Physics,Chemistry)



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17 November 2016

To whom it may concern,

This is to certify that Coogee Chemicals Pty Ltd have conducted trials of the Hydrogen Gas generation system Gavin Knox has developed on two (x2) Kenworth prime movers within our domestic heavy vehicle fleet over the past three years or so.

During these trials, the equipment was used on line-haul road train application with little downtime resulting from the hydrogen-generation equipment – confirming its robustness and fitness for duty.

The hydrogen generation system was not documented as well as we would have hoped, however fuel savings were realized and informal records maintained suggested in the order of 10% from previous fuel records of the test combination.

Yours faithfully,

Robert I.G Hennessey
Business Development Manager



The Internationally PATENTED HFS system is designed to use all the available electrical energy by using a series of three PATENTED double electrolysis cells. These three cells use 4.4 Volt each running at 18amp so that 13.2 volt (battery voltage) is used in total.

No wasted voltage / energy / power.

High speed jetting and porting together with the SPECIALIZED Patented electrolysis cartridge, increases system efficiency therefore producing more Hydrogen gas.

The greater efficiency means less electrical load to produce the desired volume of gas for your engine which is 12.5 % to 20% of the engine capacity in liters / min – a 4 liter engine needs 500 to 800 ml of hydrogen gas per minute.

Other manufacturers are all based on the same inefficient design using “Neutral” plates rather than individual cells to break up the applied voltage into six 2.2 volt steps.

The NEUTRAL PLATE arrangement DOES NOT WORK and produces massive OVERVOLTAGE HEATING water to boiling point.

Our systems use PATENTED High pressure pumping systems to produce turbulent flow of water past the plates and allows a MUCH WEAKER SOLUTION to be used as well as making the system much more efficient making more gas with less HEAT.

Other systems use Buoyancy to circulate the water, which is slow, inefficient and generates MORE HEAT and LESS GAS. Simply put a more effective and efficient system is attained by using high pressure high volume pump.

Hydrogen ions are in very low concentration in water. It is these that are producing the gas, not water. Our systems Use PATENTED shape / geometry of the cells and improving the fluid flow it is now possible to use only water rather than having concentrated dangerous and damaging caustic solutions.

Our systems use a special PATENTED chemical etching process which prevents cells wearing away (also called electro-stripping) as increasing the gas volume produced.



