# Converted!



How to Convert Your Vehicle into a Hydrogen Hybrid in about 3 Hours and Save!

Richie Waddell Founder, HydroClubUSA

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# Special Thanks

I want to thank everyone who has helped Jessica and me start this business.

When starting a business from scratch, especially with two young kids, it takes a group effort to be successful. HydroClubUSA would not be where it is today if not for the selfless sacrifice made by many of our family members.

To my father-in-law who helped test/develop the Hydrocell, taught me business development and financed the money to get started. Thank you Danny.

To my father who helped by working in the office and always being here when we needed him. Thanks Dad.

To my two mothers who have watched our kids on countless occasions. Thanks Jeri. Thanks Mom.

To our dear friend who financed our building to help us get started. Thanks Mrs. Charlotte.

Last but not least, to our employees who work daily in a crazy environment with a 4 year old and 1 year old.

Thank you Zack and Joey. HydroClubUSA has been a great team effort of our family and shows what people can accomplish when they sacrifice and work together.

Thank You all!

Richie Waddell



# Contents

Special Thanks	3
The Reports Are in!	5
Getting Started	8
Our Story	9
Product and Process Explanation	12
Installation Process	19
Step #1: Read the Manual	20
Step #2: Plan HydroCell and Reservoir Installation Locations	20
Step #3: Install HydroCell(s)	23
Step #4: Install Reservoir	25
Step #5: Plan HHO Connections	25
Step #6: Install HHO Hose	26
Step #7: Plan Your Main Wiring	27
Step #8: Install the Main Wiring	29
Step #9: Install Relay(s)	31
Step #10: Attach the Positive Battery Lead	32
Step #11 Prepare the Electrolyte	33
Step #12: Test Run	35
Step #13: Install the Electronics Wiring	36
Engine Mount Electronics	36
Volo Chip Electronics	40
Step #14: Test Runs	42
Trouble Shooting	44
FAQs	47
Fuel Saving Tips	50
How to Build a Business	51
Data Logs	53
Diagrams	58



# The Reports Are in!

25% decrease in fuel consumption –1978 Cadillac Eldorado Biarritz 7 liter V8 - 4 barrel ... Everything works fine ... I certainly will soon order another kit for my son's Porsche. ... Bernard, France

Got the kit installed on my 2004 Nissan Xterra 3.3 liter. ... All is going great! ... 8.6 MPG increase at 12 amps with 4300 miles now driven, couldn't be happier! ... I've also recorded a 6 degree drop in operating temperature and a 9 hp increase at wide open throttle. ... Mark, Ohio

My Toyota 4 Runner converted to run on propane ... without HHO 20 km per gallon in the city and 27 km on the highway ... with HHO 35 km per gallon in the city (+75%) and 43 km per gallon on the highway (+59%) ... Luis, Dominican Republic

Here are the numbers for a Toyota Tacoma 2000, 2.4 liter, 4 cylinder with 159 thousand miles. ... 3 years ago, no HHO yet ... City traffic, no highways: 16.3 MPG ... 70 – 75 MPG highway: 24.6 MPG ... 55 MPG roads: 26.2 MPG. Today with HydroClubUSA's kit ... city traffic, no highways: 22.1 MPG (+36%) ... 70 – 75 MPG highway: 39.2 MPG (+59%) ... 55 mph roads: 48.9 MPG (+87%). ... It performs 28% better than my previous HHO wet cell system, runs cooler, evaporates less water, takes less space, you can feel more power throughout all ranges of acceleration and speeds, and it blends in with the existing engine equipment. I am really happy!

Just wanted to say I'm impressed with the units I bought and have been having good results. I'm currently experimenting trying to find the best balance for amps and mileage increase. I have a 1997 Chevy K3500 Duallie crew cab ... when I tested the empty truck I was getting 13.5 MPG. When I use the HydroCells I get 19.5 MPG (+44%) ... Jim

I have a 1998 Mitsubishi Eclipse RS 2.0 liter. ... I was originally getting 26-27 MPG. ...now 35-40 MPG (+30%).

Last month we ordered a HydroCell kit for a BMW e34 520i. ... After installation we made about 45% fuel savings and it works perfect. ... Josip

2002 Chrysler Town and country van (3.3 liter V6) ... Best this van did in the past was 19-21 MPG. ... 30 mile loop with some traffic stops, produced 28.5 MPG (+36%). ... And that is without any fine



tuning. ... I feel sure I can get it up to 30-31 MPG with some minor adjustments. ... Carey, Georgia

2000 Volkswagen Jetta ... Before install city 14 MPG highway 18 MPG. ... After install city 19 MPG (+29%) highway 23 MPG (+28%). ... Gerardo

Before install I got 28-29 MPG on my Mustang 4.0 liters V6 manual transmission. ... I drove 335 miles and got 37.5 MPG (+29%). ... Eddie, Arizona

The three systems are mounted on a BMW 330 i 2004 that operated on petrol and LPG (propane), a 2008 Ford Fusion and a 2002 Ford Fiesta – both diesel. ... We have already achieved a reduction in consumption from 20 to 25% ... Ermanno, Italy

I have a 2006 Toyota Corolla, 264,000 miles. ... MPG before the install was 30 MPG highway ... After the HHO gas install 55 MPG (+83%). ... I bought a Volo chip and that increased it to 65-70 MPG (+117%) highway. ... John Bails

1993 Plymouth Voyager 3.3 liter V6. ... 21% increase no electronics just HydroCell ... Paul Bilek

I installed this on a 1992 Mazda Protegee ... For my first initial trial run I have gained 9.5 MPG ... I have not even started tweaking the system yet, so far I am pretty happy getting 39.5 MPG. ... Most of my travel is highway miles. This is pretty amazing stuff, we had to fill our gas tank up every two and a half days and now it is looking like we may only have to fill it every four days and should get even better as I tweak the system. ... Dale

I own a 2004 Mountain Aire 39 Ft Class A motorhome with a huge 580 cubic inch gasoline engine. The mileage we were getting before the HHO was about 4-6 MPG. With a single HydroCell we jumped to a steady 8 MPG (+33-100%). ... Jeremy Scheehl

We converted a 1996 GMC Suburban 5.7 liter 350 to HHO ... before 12 MPG in the city ... 17 MPG on highway. ... We are getting about 30 MPG (+76%). ... Mick, Central America

2005 Jeep Wrangler Unlimited ... It works great. ... Average city with stop and go was about 12.5 MPG. ... One quick test before the



install on the highway was about 15 MPG. ... Now 23 MPG (+53%) with good gas. ... John, Nebraska

2005 Ford Freestar ... before 15.8 MPG ... after 43.3 MPG (+174%) ... Jack Gouverneur

I have already installed the unit on a 2.5 liter diesel (4 cyl) generator. It has already given a 20% decrease of fuel consumption. ... Ioakim Kampouridis

84 Honda Accord ... 26 years ... I use 94 octane fuel ... always have ... costs a few cents more, but the mileage is worth it. ... before installing your unit I was getting about 22 MPG in town and 32 MPG highway ... Now I get 36 MPG (+64%) in town and 68 MPG (+112%) on highway. ... I ordered another one of these for my lawn tractor ... Roy Phillips

2010 Toyota Tacoma 18 MPG EPA estimate to 24 MPG (+33%) at 73 MPH! More power, smoother. ... Rick McKean

I installed the 2008 Galant kit. Went from 24 MPG to 35 MPG (+46%) ... Very satisfied. ... Bill Taylor

2009 Hyundai Genesis ... 1,000 miles of testing ... before 22 MPG city and 35 MPG highway ... after 35 MPG (+59%) city and 52 MPG (+49%) highway.

2003 Dodge Ram V8 3/4 ton pickup ... from 12 MPG to 18 MPG (+50%)

2003 Dodge Ram Diesel 5.9 liter Turbo Cummings ... from 18 MPG to 35 MPG (+94%)

1993 Honda Civic ... from 24 MPG to 42 MPG (+75%)

1998 Toyota Avalon 3 liter V6 ... from 25 MPG to 36 MPG (+44%)

1997 Lexus 300 ... from 22 MPG to 38 MPG (+73%)

2000 Saturn Ion ... from 26 MPG to 51 MPG (+96%)

We can't tell you exactly how our system will do in your vehicle but we can tell you these results <u>are</u> typical.



# Getting Started

Thank you for your trust! HydroClubUSA is here to stay and we are leading the way in the "Hydrogen On Demand" industry.

The simplicity of the technology is as follows.

Using a safe process called electrolysis the hydrogen and oxygen in water are converted from a liquid to gas. This gas, called HHO, is pulled into the engine through the vacuum or air intake.

The result is a boost in engine efficiency, thus saving fuel, cooling down the engine while drastically reducing emissions. The fact is your engine only needs a small amount of HHO gas to give you the results you're looking for. We are very excited about helping this new industry move in the right direction. We are here to help you and others get the miles per gallon you deserve.

When you purchase our product you become a lifetime member of our HydroClubUSA family. That's an exciting aspect of our business. We want all our members to take advantage of it through the members' area. The online members area gives you access to our installation manuals, our videos and active links to products and other resources. You can visit our members area at www.hydroclubusa.com/membersarea.html.

Our family is here to serve you seven hours a day five days a week. You want to get the best results possible for your vehicle. We are here to help you do that and if you haven't purchased already we want you to do so right away because we can save you money. We maintain a data base with all the test results we have achieved here at our location and with all the feedback that people have sent us about their own vehicle installations. And they are happy!

We need your help as much as you need ours to take this new industry forward. Please send us any information you have on how you have used our product. If you are not getting good results, then you should take advantage of our tech support. Our tech support team works with you one on one to help you gain the very best results for your vehicle.

We are always looking for members who would like to start their own home-based business marketing all our HydroClubUSA products. The last chapter in this book will give you a brief explanation of how this could work for you.



Also be sure to check us out on Facebook to view member testimonials and installation videos, as well as pictures from members who have installed our complete HHO conversion systems on their vehicles.

www.facebook.com/hhojoe



# **Our Story**

We want to share with you who we are and why we created HydroClubUSA. But you can cut to the chase if you wish to go straight to Installation Process on page 19.

It all started in the spring and summer of 2008. Just like everyone else we were paying close to \$4.00 per gallon for low grade gasoline. Our vehicle used to take \$20-\$25 to fill up. We found ourselves paying almost \$60 to fill our small gas tank. This really put a dent in our finances along with everyone else trying to cope with high gas prices.

We decided to take action. I studied on the Internet and found water being used as a supplement to fuel. At first I did not understand the concept and found myself very skeptical. Then I remembered a science project we did in high school. We conducted this experiment with a bowl of salt water and two electrical current probes. Adding current to the probes – a positive current to one probe and a negative current to the other - we created what is known as electrolysis. Instantly a cloud of HHO gas arose from the bowl. Remembering all of this from high school triggered my belief. Now I knew electrolysis could and would work because we had already done it in science class.

Electrolysis is chemical decomposition produced by passing an electric current



through a liquid or solution containing ions. Electrolytes are substances that become ions in solution and acquire the capacity to conduct electricity. With electrolysis the two probes used are called the anode and cathode. The anode is the negative probe and the cathode is the positive probe. The hydrogen moves out of the solution to the anode and the oxygen moves to the cathode in the process.

As far as using this as a fuel though I was still unsure. So doing more research I found a lot of positive and a lot of negative discussion. We decided our only option to know the truth was to test the technology for ourselves. My father-in-law and I began building and testing HHO cells. We built one of the mason jar setups and placed it on his Toyota Camry. The next gas station we found ourselves dancing a jig in the parking lot after receiving 85 MPG. You may be wondering how such high MPG is possible. Our initial joy was short lived because that much economy was too good to be true.

On the trip home our oxygen sensors picked up the extra oxygen



going through the system and sent more fuel to the engine giving us a couple of MPG less than normal. Disappointment reigned for the moment.

This began our journey of learning. This Toyota is a 1989 and ran for years on gasoline alone. We figured out that over time the engine had developed engine gunk on the pistons and valves. We now know that HHO will actually use this built up gunk as fuel because that is all it is, unused fuel. We learned how to control the air/fuel ratio on fuel injected vehicles for HHO use. Along the way we tried several different electronic devices for controlling this ratio. Most of the devices we tried were junk which could never accurately and consistently control air/fuel ratio. This is one of the main reasons for all the negative reports out there claiming this technology does not work.

We began designing and testing different HHO cell designs. Like most people we started out with wet cells. No matter how good the design of a wet cell they still have problems. A wet cell is completely submerged in liquid. There is no circulation so it runs hot and takes up a lot of space even with the small thin designs. We saw several people using what is known as a dry cell design and believed this was the future of HHO production.

We had several goals in mind while developing our HHO dry cell.

- 1. We wanted it to be small enough to fit on all vehicles.
- 2. We knew it had to be powerful enough to supplement all vehicles on the road.
- 3. We definitely were going to make it out of only the best materials.
- 4. We wanted to bring our HHO dry cell to market as inexpensively as possible.

We met and exceeded all our expectations on the way to developing our HydroCell. As a matter of fact we did such a good job people began to copy our design immediately. They say imitation is the sincerest form of flattery.

But they do not know the secrets. They do not know the three step process our steel goes through to create as much HHO as our HydroCell produces. They cannot get their cells to circulate nearly as well as our design.

We want to keep this technology as green as possible that's why



we produce our nine plate design. We tested every HHO dry cell design that we knew possible and this design was clearly the most economical. We continually see great results and have not had any major problems with any of the HHO HydroCells we have produced.

There are a lot of myths floating around about HHO dry cells, but the biggest myth of all is that they don't work.

Our family started this whole project to help the average person save fuel on a daily basis. We know first hand how hard it is to keep up with rising gas prices. So go ahead and set yourself free. Don't be held hostage by high gas prices ever again.

I started out a skeptic. But I was a skeptic willing to dig out the facts. I am converted! And if you give yourself a chance you will be too. Be proactive and let us help you convert your vehicle to a hydrogen hybrid today. Let's get started!



# Product and Process Explanation

If you already are convinced and good to go, just jump to the next section on the Installation Process on page 19. But you might want to read this to encourage you along the way.

You are going to have some friends who think you are crazy for trying this. They may laugh at you now but the last laugh will be your own when you start saving outrageous amounts of money on fuel.

You can't get something for nothing. Most scientists end the discussion before it starts based on that fact. And so HHO proponents barely get a hearing. But there are other factors to consider. It is of course incomplete science if all factors are not taken into account. IF something works in spite of the known vairables, true science will look for the hidden elements.

The hidden element usually overlooked in using HHO as an on board fuel assist is the fact that there is an abundance of excess energy available on your car right now. Your alternator charges your battery from the power of the engine running. There is so much excess energy you can power your headlights, run your air conditioner and have your windshield wipers on all at once with no problem. You can use the excess energy in your vehicle to power a large radio system with subwoofers. So who cares if it takes some of your energy to produce HHO, you already have an excess on your vehicle not being used. This is why HHO fuel assists fits so perfectly with our current vehicles. We use a small amount of the extra energy already available to power the process to produce a clean, usable fuel.

Only those with an open mind listen carefully to these additional facts. The internal combustion engine is very inefficient. Most will concede that fact. If it were possible to increase that efficiency we could all save fuel and thus money. Clearly, it is possible. Vehicles today are much more efficient than they once were; that is common knowledge. In the year 2000 the calculation for the average mileage for passenger vehicles in the United States of America was 21.9 MPG. By 2008 that was up to 22.6 MPG (+4.7%). However, there is still a great deal of room for improvement. HHO is one place to look for improvement.

The need for alternatives is front and center in public consciousness but we are years away from some of those alternatives becoming commonplace. The new alternatives such as hybrid gas/electric or electric cars are still expensive. And there is no possibility to retrofit \* Source: http://www.eia.gov/emeu/aer/txt/ptb0208.html



all the existing vehicles. The need for alternative clean reusable fuels is today's major crisis and we can help solve it by getting the word out.

In 2008 the average passenger car in the United States traveled 11,788 miles and consumed 522 gallons of gasoline yielding 22.6 MPG.\* If each of those vehicles had our HydroClubUSA HydroCell system in operation and received a modest 25% improvement to 28.2 MPG average, each car would save 104 gallons of gasoline on average. Even if we averaged \$3.50 a gallon that would mean a saving of enough fuel in one year to pay for our basic kit. Our reports show that many users get much more than a 25% improvement. This is doable now! We don't have to wait for things like the new pure hydrogen vehicle to make a huge difference.

There can be no doubt that invention always proceeds through a series of trials and failures before success. Some get to the market too soon and create the illusion that all HHO kits belong in the trash with hundreds of other claimed inventions that don't work. Imagine how many failures Thomas Edison went through and the ridicule he endured before he created a serviceable light bulb. How about the wacky idea that you could send your voice through a wire? Or better yet talk on a phone with no wires to some one in China and be able to speak to them in real time.

The inventive process will always face ridicule but someone must see value in the vision despite of the ridicule. That is the phase we are in with HHO generators for vehicles. Some systems work better than others; some don't work at all. But in terms of mainstream acceptance, none are widely endorsed. There are lots of people who will tell you why this can't be done.

This doesn't mean there isn't a system that works. There is. I have it in my vehicle and soon you will have it in yours!

Here are four basic facts to keep in mind about the HHO advantages. These facts all combine to make HHO a sensible alternative for those with an open mind who want to save a pile of money and help clean up the environment.

1. There is no need for a storage system on board for volatile liquids, gases or electricity. HHO systems are not like natural gas, propane or electric systems that require you to have a way to move the fuel from somewhere, into the vehicle through a hose or wire. This is a critical point. All you need is water with the right substance added to make an electrolyte solution. With KOH (potassium hydroxide) and water in a small reservoir



similar to your windshield washer fluid container you are good to go. The fuel is made from this simple non-volatile water and chemical mixture. There are substances other than KOH that could be used to create the electrolyte mixture but we have found that they leave a flaky residue over time.

- 2. The alternator of the vehicle is already producing sufficient extra electricity to run through the system and break down the water molecules into two gases. Those two gases are hydrogen and oxygen.
- 3. If you throw a match into gasoline it goes boom! If you put a match to water and KOH it just fizzles.
- 4. Your vehicle doesn't actually run on gasoline. It runs on a mixture of gasoline and air. The carburetor or fuel injection system sprays the gasoline into the air to make a gas. That gas explodes inside your engine thousands of times per minute when small sparks from the spark plugs ignite it.

Now the question still remains about what is going on to make a good HHO system work. Here are some of the facts to consider.

- 1. The alternator in a vehicle makes an excess of power. The HHO generator only uses some of the extra capacity while the vehicle is running. This is analogous to your headlights. The vehicle doesn't slow down or fail when you turn your lights on. You are not aware that you are using extra energy which ultimately comes from your fuel tank because you are not taxing the system. It is another matter if you leave those lights on once the vehicle is stopped! Our HHO system draws power only when the vehicle is turned on.
- 2. Every internal combustion engine sucks in air from the atmosphere. That air contains nearly 80% nitrogen which is useless to the vehicle. It also contains around 20% oxygen. That is the gas the fuel mix uses. (There are trace amounts of other gases in the air such as argon, carbon dioxide, krypton and other gases but these amount to only about 1% in total.) All we are doing with a good HHO system is putting better "air" into the fuel – that is "air" that is much more useful for combustion.
- 3. Because HHO gas is simpler in construction than the gasoline molecule, it burns faster and acts as a stimulant to ignite the gasoline sooner and more completely.
- 4. The mixture's higher oxygen content allows more of the gaso-



HydroClubUSA's Single HydroCell Kit



HydroClubUSA's Dual HydroCell Kit



line to burn, which also increases efficiency. It is like adding wind to a fire. The combustion consumes other material in the cylinder such as excess lubricants and carbon residue resulting in cleaner engine combustion chambers.

- 5. HHO combusts at a higher rate than gasoline so HHO allows you to use more of your fuel. When HHO is not in use the extra unused fuel going through the engine is known as blow by. This is the engine gunk which forms on your pistons.
- 6. An HHO converted vehicle creates less pollution because the regular fuel burns more efficiently since it is combining with "air" that is more valuable for combustion so you can burn all your fuel. A more efficient combustion cycle allows you to use less fuel at the same throttle setting. Also, the efficiency increase allows a lower throttle setting for a given horsepower production and therefore reduces the fuel consumed for traveling a given distance.
- 7. This increased efficiency reduces pollutants such as hydrocarbons, carbon monoxide and nitrogen oxides that would otherwise come out your exhaust.

Every vehicle on the road is inefficient. Adding HHO to your air intake system increases this efficiency dramatically. This is how you can expect about a 30%–50% MPG increase with the right system.



HHO is three atoms. Specifically there are two hydrogen atoms which tend to pair up as one molecule and one oxygen atom. They are not chained together. Hydrogen burns at 560°C. Oxygen on it's own will not burn. In a vehicle you need fuel such as gasoline, diesel, propane,

natural gas or hydrogen. When a spark and compression are added the miniexplosions necessary to make the engine work are created. The liquid used to produce HHO won't burn if you throw a match at it. But please, don't try this part at home!

It takes energy to create the electricity to break the water down into hydrogen and oxygen. Some would argue that it takes more gasoline to create that energy we have to put in to get enough hydrogen out to add additional value. However, when you consider the efficiencies we just covered, that argument breaks down because all of the factors mentioned create additional efficiency in the entire system so the gasoline is not wasted but utilized to a higher degree.

One of the secrets many have missed is that a good HHO system has to trick the computerization of the vehicle. This part is called



the ECU meaning Engine Control Unit. In broader terms ECU may refer to Electronic Control Unit. Your vehicle can't understand this new efficiency and will readjust itself to push more fuel into the system than the vehicle needs. This can eliminate all the gains of the HHO generator if the electronics aren't carefully tweaked.

Most modern fuel injected vehicles use such a computer and oxygen sensing devices to monitor and maintain the correct oxygen/ fuel ratio. One of the key sensing devices is the oxygen sensor or exhaust sensor. Fuel injected vehicles have one or more oxygen sensors installed in them. The computer determines what the air/fuel ratio is, based on the amount of oxygen in the exhaust, as reported by the oxygen sensor.

When a HHO generator is installed, the petroleum based fuel is burned more completely. One of the results is that there is more oxygen (and less unburned hydrocarbons) in the exhaust stream. This is a good thing, and is in fact, what we are trying to achieve. However, the computer will perceive this condition as a too lean air/ fuel mix. In other words, what is now a desirable condition in the exhaust, will be interpreted as an undesirable condition with not enough fuel in the mix. The computer will direct the fuel injectors to increase the amount of fuel pumped into the engine. The end result is that the oxygen sensor and computer prevent efficient combustion from occurring because the computer is pre programmed by the manufacturer for a different set of conditions. It mistakenly will cancel out most of the improvement we have just made. With supplemental electronics we make the necessary compensation to keep the ECU happy.

What we are about to show you is amazingly simple science but it has escaped the vision of so many who want to make this more complicated than it is. We are going to use an electrical process to break water down into its constituent parts. You know that water is  $H_2O$ . That is one molecule made up of three atoms. We are simply going to use electricity to separate them. Then the individual atoms which are all gas are going to appear as big bubbles coming up through what looks to be pure water. The water has an extra component because the electricity we put through the water won't break down the water without it actually being an electrolyte solution. Those bubbles are like air; they are odorless and colorless.

Gasoline is made of a mixture of hydrocarbons, which are molecules composed of carbon and hydrogen atoms. Typically, in gasoline there are eight carbon atoms along with 18 hydrogen atoms forming each molecule. On average diesel





fuel is 12 carbon atoms and 23 hydrogen atoms per molecule. If you throw a match at gasoline it will burn; diesel fuel won't because it requires compression as well as heat. Don't try this at home!

If full combustion takes place, the products are carbon dioxide and water. This ideal is not achieved in a vehicle engine. Gasoline burns at about 260°C in air. Propane by contrast is a molecule of eight hydrogen atoms and three carbon atoms. It burns at around 540°C. Methane (natural gas) has one carbon atom and four hydrogen atoms per molecule. It burns at about 1650°C. These are only general concepts because many factors can change the way these fuels respond. Factors which may cause variation include partial pressure of oxygen, altitude, humidity and the amount of time required for ignition. The flames produced are much hotter than the ignition temperatures suggested here which are approximations of auto ignition temperatures or kindling points.

Just for comparison purposes the phosphorus on a wooden match starts to burn at 1600°C. Then the match settles back to the temperature of wood burning at about 270°C.

We are going to feed those bubbles into your combustion process in place of some of the air you would otherwise be using. Because this "enhanced air" has a gas (hydrogen) in it that will burn at a very high temperature. The new "air" can actually burn. In the end you are going to turn your vehicle into a kind of hybrid. For a vehicle it would take a major mechanical conversion to run completely on HHO. It is possible but impractical. So practically speaking we still need the gasoline, diesel fuel, propane or natural gas. However, with a smaller engine like a riding lawn mower it is possible to make it run completely on the hydrogen without any other carbon based fuel because the engine runs at a steady rate of RPM's (revolutions per minute).

We have videos of cars with the complete conversion to run on only HHO. There is also a video of a lawn mower running on only one of our HydroCells. These can be found on our website. www.hydroclubusa.com. Just click on the Videos tab.

You will not be using much water at all compared to gasoline. It only takes a quart of water to suplement your vehicles fuel for hundreds of miles. The hydrogen you will use comes out of the water moments before it is burned. There is no storage tank. There is no pressurized system as with propane. It is all simple and safe. The big boys are working on hydrogen cars but they currently seem to be stuck on the idea of filling a tank on board with hydrogen even if they do collect their hydrogen using electrolysis just like we do. And of course, they have to create filling stations. All we need is a



gallon of electrolyte in the trunk in case of a need to refill on the road.

Our product is better than any other alternative because of our careful testing and tweaking to optimize the system.

In summary, here are a few facts that make us stand out. Our technology uses a unique three step process with our steel to assure the best performance over the short and long terms.

We optimized our design to make the Hydro-Cell as small as possible and at the same time produce as much HHO as possible. All the HHO liters per minute tests we conduct are completed from a cold start with reasonable amperage to approximate real use. We do this to provide the most accurate HHO test possible. We don't exaggerate output by running the amperage up too high. That would stress the vehicle if you used high amperage in real world situations.

Before releasing our HydroCell we performed thousands of tests and found our nine plate design to be the most productive and most efficient. When you add more plates than that it restricts the flow of the liquid and requires twice the electrolyte. This extra corrosive electrolyte is not good for a HHO dry cell.

We strive to keep our HydroCell kit technology as green as possible and we will always do so. We are bringing the absolute best HHO dry cell technology to market. We want you to be proud and confident when you recommend our products to your friends and family.

When you get your system installed you will be able tune it to run optimally for your vehicle. Every vehicle is a little different. Once you get the recipe right you will love the fantastic fuel savings, the cooler quieter engine and the peace of mind knowing you are doing your part to cut down on the pollution of our environment.

# **Safety Precautions**

Incorrectly installing or incorrectly using our HydroCell may result in serious damage to your automobile or bodily injury. Read and follow the instructions and safety precautions given here and in relevant places throughout this manual to avoid these hazards. If you do not understand these instructions or do not like working on vehicles, have your mechanic do the installation. Be sure to work outside. No smoking. Make sure the engine is not hot.

Be sure to wear goggles and gloves and only use professional tools. Use common sense and general safety procedures used for automotive installations and maintenance. If you are not sure, ask!

Do not let people who have no understanding of the system intimidate you or tell you this can't work. HHO is combustible, but the HHO your HydroCell will produce is used by your engine immediately. Your HydroClubUSA system does not store hydrogen when installed properly, so there is no fire hazard due to hydrogen storage. The electrical components to the system are carefully engineered to assure safe conditions when installed properly as described. As with all electrical adaptations in vehicles, if you incorrectly install the system it is possible for you to create an electrical fire hazard.





Reservoir



# **Installation Process**

In this installation section we will walk you step by step through installing the HydroClubUSA kit. If you are reading this book to understand the potential of Hydrogen as a fuel assist you will enjoy reviewing this section as it shows exactly how simple this technology is.

We will show you in detail how to install each part. Actual installation will take about three hours exclusive of reading and planning time. You are not alone! You may always contact us with any questions you have along the way.

There are a few major components to a complete kit. These are:

- 1. Water Reservoir or Bubbler (We will use the word reservoir even though this tank also bubbles the gases toward their end use.)
- 2. Dry Fuel Cell (HydroCell is our term and when we refer to our specific product we will always use that term in this book.)
- 3. Electronics (We have two options to explain here but that comes later.)

There are several minor but essential components such as hoses, clamps and wires to hook everything up.

Then there is the water. But water without an added substance to create the electrolyte solution will not work by itself.

To give yourself a head start purchase some KOH flakes. We recmend only using KOH (Potassium hydroxide) in flake form and Distilled water.

I usually locate KOH within driving distance or within the state by searching the internet; this helps a lot in shipping cost.

Using Google or another search engine type "soap maker koh + your local area or state". Raw materials is another great key word. We normally are able to find a few options this way.

Otherwise, www.essentialdepot.com will supply it. 4 lbs. is a good amount to start with.

Installation on gas and diesel engines is very similar. Where there is a difference it will be noted with bold type for diesel. The same



will be true for the dual HydroCell install. The bold type will guide you to the additional steps.

Step #1: Read the Manual

Time Estimate = 30 minutes

For best results read through the entire installation manual before attempting to install the kit; it will save you time. For ease of understanding and installation we have broken the install down into several steps. The pattern we use is to encourage you to plan out exactly what you are to do next and then do it. You don't have to know the whole plan when you start but you will have much more confidence if you read the whole manual first. Some of the fuzzy things will become much clearer if you are patient with your reading. Always refer to any pictures or diagrams that will be placed near the text at the point you need to refer to them.

If you are a mechanic or familiar with working on vehicles you can scan the manual more easily than the novice. We have intentionally included detail here to make the installation as simple as possible for those who do best with precise instructions.

# Step #2: Plan HydroCell and Reservoir Installation Locations Time Estimate = 10 minutes

After you familiarize yourself with your HydroClubUsa kit and installation manual, make a plan for how you will mount your system. You will want to find a location that will work best for your vehicle.

The first part to review is the plumbing of your HydroCell, reservoir and hoses. The idea is to find a vacant vertical corridor with the footprint of your reservoir that runs from just under your hood down to the frame of the vehicle. The reservoir will be mounted at the top of this space. The HydroCell will be mounted directly below it about 12 inches under the reservoir. A dual cell installation needs a 16 inch drop.

Be sure that the reservoir is installed where you can access it to add liquid from time to time, similar to adding windshield washer fluid. This system works off of gravity and will not work properly if it is installed on angles or in different positions. Your HydroCell should have a 12 inch drop from the bottom of the reservoir to the top of



Single Cell Configuration



Dual Cell Configuration





Large Reservoir (optional)

HydroCell. Any more or less of a drop will effect the circulation. In a dual HydroCell installation the two HydroCells will be plumbed together as in the picture.

Gravity feeds the liquid into the HydroCell through one hose and the gas bubbles back up through the other hose and bubbles through the liquid exiting the reservoir from the top hose.

The HydroCell is the heart of the system. It generates the HHO gas. You will need to find a place in the engine compartment to mount your HydroCell. It should be mounted and secured in such a manner as to assure that it cannot bounce around when the vehicle hits bumps. Your HydroCell comes with mounting holes which make it easier to install. Be sure to install it so that you can access it and inspect, clean and service it about twice a year. Many people mount it on the frame under the vehicle. Consider a location in front of the radiator. There is often ample space between the radiator and the grill down near the bumper. This could mean you need to undo a few screws to remove part of the grill so you can access the space. The reservoir can be mounted on the other side of the radiator as long as you keep the hoses as vertical as possible.

Steel strapping used to hang plumbing may work or you could use large stainless steel gear clamps or other general purpose brackets. These are available at your local lumber store. Find an inexpensive, bendable and easy to use solution.

Plan to install your HydroCell as far away from the heat of your engine as you can. We cannot give you an exact number here for what is too hot because there is a combination of heating factors such as weather, engine, and the electrolysis process itself.

If you are unsure about where to mount your unit ask for tech support and we will work it out with you.



Why is the fuel cell called "dry" when there is liquid in it? Good question! With the other kind of HHO generator the whole cell is submerged into an open bath of electrolyte solution without a separate reservoir. The water in HHO dry cells is held in a reservoir above the

cell. This allows the liquid to circulate through the HHO dry cell and back to the reservoir. This acts like a radiator cooling the water before it returns to the HHO dry cell. Not only does this make your HHO dry cell run cooler but it allows your HHO dry cell to be more efficient. Although submerged wet cells had their day and were valuable for HHO experiments they are no longer cutting edge HHO technology. HHO dry cells run cooler and more efficient than HHO wet cells.

We have many members in frigid parts of the northern US, and



Canada. There is a lot of great information across the web to keep your solution from freezing.

If you allow your Hydro Cell to freeze it will push out the O-rings and damage the cell. The best thing you can do to keep your system from freezing is to go to your local Lowe's or Home Depot store and get some Yellow "Multi-Purpose Fiber Glass Roll". It comes in a 2" Thick x 16" wide x 48" roll. Then wrap your cell and the bubblier at least three times around. Just leave your cap exposed. Completely cover your cell; you don't need to see it. Don't be afraid to use too much fiber.

This is what plumbers use under houses to keep pipes from freezing. I cannot guarantee you won't have a freezing problem if it gets way below freezing, but this has worked very well in most cold weather states. If you live in a really cold climate we have some members who have used this approach. Purchase a small fish tank heater and install this on your tank or under your cell. Use a power converter to plug in your heater. You can still need wrap your cell for additional protection if needed.

I personally think this one is the best solution: "BATTERY WARM-ERS" are being sold online for as little as \$19.20. Battery Warmers from InfinitiPartsPeople.com or www.JCwhitney.com work on 110 volts, while Warming Pads from www.PadHeaters.com are good for 12 volts.

Both types of warmers take little energy (about 60 Watts) so you can keep it on all night. Wrap the battery warmer around any water-holding device in your system. You may also wrap the device WITH THE WARMER with Mylar<sup>®</sup> or aluminum foil to minimize heat loss. Disconnect the warmer before driving, because the Hydro Cell will keep itself warm when active.

The heated pipe wraps work as well.

HydroClubUSA is not responsible for damage cause by freezing. Freezing weather is the only thing that will cause the o-rings to fail on the HydroCell. Please take precaution to eliminate this problem



Hose Clamp



HydroCell (side view)



HydroCell (end view)





Reservoir (top outlet for HHO bottom outlets for liquid)



Flashback Arrestor



before it occurs. Some members choose to just drain their system in extremely cold temperatures.

Once you have your plan in place you are ready to move on to the actual install. We will get to the electrical part of the install at Step # 7. If you are planning on a tight location you may wish to attach the wires and hoses before you finally attach the HydroCell and the reservoir to make things easier.

Another method to prevent freezing is to use a PWM to control your amp draw but be able to add much more KOH. The KOH acts as an anti freeze. If your temps are getting below ten degrees you need to be able to prevent your system from freezing.

Step #3: Install HydroCell(s) Time Estimate = 30 minutes

Now that you know where you are going to place your HydroCell you can prepare for installation.

In many cases there are convenient existing bolts under the hood of your vehicle, possibly on the frame, that you can use to mount your cell. However you may need to design your own attachment mechanism. It is impossible for us to predict what you might need and thus include it in the kit. Wherever you attach the HydroCell you will need to assure that it cannot come loose over time and that it is in an upright position. The liquid cannot flow properly if it is not.

You may wish to pre-attach the appropriate length of hoses to the HydroCell before you actually mount it. Be sure to use the hose clamps supplied. You must use hose clamps on all the connections where there is liquid. There are the correct number of clamps supplied in your kit.

You will need to have access to the electrical connections on the HydroCell as well. We will discuss this later but you may wish to attach the wires in advance of permanently attaching the HydroCell to the vehicle.

# Step #4: Install Reservoir

Use the mounting holes on the reservoir to mount the reservoir directly above the HydroCell or as close as possible. Assure there

Time Estimate = 30 minutes

is about 12 inches of space between the bottom of the reservoir and the top of the HydroCell. This separation is easier on larger vehicles. If you are unsure about the best plan, ask for tech support. Don't be shy! We are here to help. Our success is in your success.

Step #5: Plan HHO Connections

Time Estimate = 10 minutes

The hose connection off the top of the reservoir is used to introduce the HHO produced by your HydroCell into the air system of the engine. There are several options.

But first, some logistics. We will not be using clamps on the hose that delivers the HHO gas because the vacuum in the system will hold the parts together and they are a snug force fit in the first place.

From the top of the reservoir the HHO must go into the engine in such a way as to replace some of the air normally used to mix with the fuel.

Generally speaking, air is about 20% oxygen and 80% nitrogen. All the other gases and pollutants squeeze in the crack between those percentages. All we are going to do is change the "air" by adding more oxygen and the hydrogen. The hydrogen will combust along with the carbon and hydrogen supplied by the regular fuel. The oxygen doesn't actually burn but it must be present for combustion to occur in the engine. Because we are adding more oxygen it messes with the vehicle's brain and we have to solve that with electronics but that comes later.

The HHO will come out of your reservoir and go along the hose across a drain tee. This removes any possible moisture that could get into the hose instead of allowing it to go into the engine. The drain tee has a shut off valve at the bottom.

The next stop along the route is the flashback arrestor or check valve. This flashback arrestor is added to the HHO hose in the unlikely event that a backfire flames back up the hose. This will keep the flame from reaching the reservoir.

Do you remember from high school science that hydrogen is the lightest element on the periodic table? So it naturally rises in air. Oxygen is slightly heavier than air but both gases float along the



hose by suction from the engine and leave any moisture to fall to the bottom.

Your HydroCell kit is designed to introduce the HHO gas into the engine through your air intake. Once in operation the hose will be full of HHO ready to enter the engine.

Insert the HHO into your air intake tube. The large tube running into the engine via the fuel injection system is the air intake tube. Insert the HHO hose into this tube as close to engine as possible and on the under side (bottom) of your air intake tube because the gas likes to rise. There is a 90 degree 3/8" hose barb supplied in the kit for this air intake insertion.

The process for installation on a diesel engine is the same as the third option above. When connecting the system to a diesel vehicle the only line available to insert HHO is the air intake line. Connect as close to the engine as possible and on the underside of the air intake. Generally a diesel will have a turbo. If so, connect pre-turbo but as close to the turbo as possible. You need suction on your HHO system – never pressure.

Hooking to the post turbo part of the tube would be on the pressurized side and could result in injury to you or damage to your system.

# Step #6: Install HHO Hose Time Estimate = 10 minutes

The HHO hose included with your kit is the same quality as used on fuel lines. You will have ample hose length to complete your install. Since you have mapped out the route from your reservoir to the entry points to your engine you will easily be able to measure the correct length.

Install the hose from the reservoir to the entry point first. Allow enough hose length so you can cut the hose and insert the drain tee in a place where it is accessible for you to see. This will allow you to





Air Intake



Hose barb 90 degree



Tee Barb

let out excess water from time to time using the shut off valve at the bottom end.

Be sure you keep your hose securely away from all moving parts and locations with extreme heat.

Install the flash arrestor in the HHO hose by cutting the hose in a similar way. Be sure that you install the flash arrestor (check valve) so that the flow is open so the HHO gas can flow to the engine. You will be able to blow through one side of the flash arrestor with ease; you will not be able to blow through the opposite end.

Make sure that the flow through your flash arrestor is going toward your engine.

Flashback Arrestor

This 3/8" flash arrestor will stop a possible backfire into the reservoir. This valve will most likely only stop one backfire. If you have a backfire you will have to replace it with a new one.

#### Connects to ground. 87 85 30 RELAY FUSE HOLDER Pin 85 connects to a wire or connection that turns ON/ OFF with the engine not just the ignition. (e.g. fuel pump / Cell BATTERY oil pressure sensor) Connects to a wire or connec-SHUNT tion that turns ON/OFF with the ignition. DIGITAL AMMETTER Single Cell Wiring Diagram

Step #7: Plan Your Main Wiring Time Estimate = 10 minutes

So far we haven't touched on the electrical part of the installation. Now we must prepare to deliver 12 volts and up to 30 amps of electricity to the HydroCell. In order to do this we use 10 gauge wire. This wire is thick so that it won't overheat when drawing power at the maximum.

Study the accompanying wiring diagram for your kit. There is a diagram for a single cell install and a dual cell install. We will take this one step at a time but first familiarize yourself with the wiring. Decide where to mount the additional components. Plan where you will run the wires.



Ohm's Law defines the relationship amongst four electrical factors. For our purposes the two we mention are volts and amperes. Volts are a measure of the push or pressure behind the current flow through a circuit. The voltage in a vehicle system stays near 12-14 volts at all times. The amperes (amps for short) are a measure of current or the

amount of electricity that flows on a wire or conductor like the amount of water flowing down a river. Each component in a vehicle that draws electricity draws a different amperage. We assure that the wiring in our systems is thick enough to take the current required. If the wires were too thin another element in Ohm's law would become relevant to us and that is resistance. If there is too much resistance in a wire it overheats. The lower the number on the gauge of a wire the thicker it is.

Your kit includes a length of red 10 gauge wire and a length of black 10 gauge wire. The black wire will go from the terminal on the HydroCell that has a black wing nut ultimately to the ground terminal on your vehicle battery after passing through your ammeter apparatus.

Your HydroCell will be drawing power directly from your battery through the 10 gauge red wire. Starting from the positive terminal on the battery, the red wire will run through the bladed circuit breaker that looks like a fuse, in and out of the relay and meet up with the other terminal on the HydroCell with the red wing nut.

Instead of a standard auto fuse we use a bladed auto reset circuit breaker. This will shut the system down in the event the current goes over 30 amps and resets itself in around 10 seconds.

The term relay may be new to you. The relay allows us to use a small current from one source with a thinner 18 gauge wire to turn on the full power in the 10 gauge wire. The relay has a built in switch to do this for us.

Examine the diagram to understand this flow. But of course, it won't actually look like this in your vehicle.

The ammeter must be located inside the passenger compartment where it can be seen while you drive. To achieve this we will drill one hole in the firewall on the driver's side of the vehicle. Find the easiest location to avoid hitting other active wires. Decide where to mount the ammeter on the inside of the vehicle where it can be seen by the driver but not so that it obscures other instrumentation or switches. Generally, somewhere near the driver's left knee works out well.

You need to be able to access the fuse holder on the red wire in the







unlikely event that you should blow the circuit breaker. You can also turn the system off completely by removing the circuit breaker.

Plan the path for all your wires so they are free from hot surfaces and moving parts.

With dual HydroCells the red (positive) wiring is duplicated for each HydroCell with separate wiring from the battery Through the relays to the two red terminals on the HydroCells. One black (negative) wire runs from one HydroCell back to the ammeter shunt and then on to the battery. The other black wire runs straight to the battery.

The electrical current to only one cell will be measured with the ammeter but since the electrolyte is the same in both cells, the cell without the ammeter will use the exact same current. The total current draw is double the reading on the ammeter. If your vehicle can take advantage of higher amps you can run up to 30

amps through each cell because the wiring is rated for that much current. The total draw in that case would be 60 amps and the ammeter would be reading 30 amps. That amount of draw should not overtax your alternator.

# Step #8: Install the Main Wiring Time Estimate = 20 minutes

To understand the flow of electricity we will start at the positive terminal (+) on your battery and describe the assembly of the wiring and components. However, do not actually connect to the positive terminal until everything is in place.

 Measure and string a length of red 10 gauge wire from the battery to the location you have designated for the fuse holder. Remember, you



Dual Cell Wiring Diagram

want to be able to get at the fuse holder in case you need to disable the system or change the bladed auto reset circuit breaker. It will work best if you select a location close to the firewall near where you will mount the relay. Try to string the wire along the





Cup Links

same path as other wiring. You can slip it through some of the existing wire ties and use some that are supplied with your kit.

2. On the battery end of the red wire, strip the insulation off about 1/4" of the wire. Attach a large ring connector to the red wire which will secure the red wire to the bolt on the positive terminal of the battery.

Caution! Do not attach this wire to the battery yet. If the other end of the wire were to touch a metal part of the vehicle you would have extreme sparking and even fire.

- 3. Strip 1/4" of insulation off of the fuse end of the red 10 gauge wire and off the fuse holder wire. Then using a cup link securely squeeze the wires into the cup link being sure there is no exposed stripped wire.
- 4. Drill a hole in the firewall and temporarily attach the relay using a metal screw.
- 5. On the unattached side of the fuse holder attach a blade terminal connector to fit on the relay. We will come back to the actual relay terminal to attach it to in Step #9 but for now we are only concerned with the length of the wire itself. Use another short length of red 10 gauge wire and a cup link to extend the wire if necessary.
- 6. Measure and string a black 10 gauge wire from the HydroCell to the negative post on your vehicle battery. Provide a little slack because in part 7 of this step you are going to cut this wire to insert the ammeter shunt. Again, be sure to avoid moving or extremely hot parts such as the exhaust system. Attach a large ring connector to the HydroCell end of the black wire and securely attach it under the black wing nut on the HydroCell. Secure another ring connector to the other end of the wire suitable for attaching to your battery post.
- Cut the black 10 gauge wire at the ammeter shunt and strip 1/4" off each end. Attach the small 10 gauge ring connections to these wires and attach the wires to the two larger screws on your shunt.
- 8. Attach the ammeter inside the passenger compartment in a suitable location. Think about making the wires from the am-



meter as unobtrusive as you can. Mount your ammeter shunt as close to the ammeter as possible.

- 9. On your ammeter display there are four wires. Two are thicker and two are thinner. The thicker wires are white and black and these connect to the ammeter shunt on the two smaller (inner) post.
- 10. The two thinner wires are used to power and ground the ammeter. Connect the thin black ground wire from the ammeter display to the large outer shunt post. There will be another wire grounded on this same shunt post. It is a ten gauge black wire which is grounded directly to your battery. Connect the thin red power wire into any wire on the vehicle which powers on and off with ignition. The wire thickness does not matter as the ammeter will only need a very small amount of power. You can usually find a suitable wire by thinking through what turns on with your ignition. For example, you don't want a connection that only turns on with your lights or your heater fan. Use a volt meter. Ground the black probe on the meter and use the red probe to find a wire with voltage running through it when the vehicle ignition is in the "on" position and no volts when the vehicle is "off." You can know you have this correct if you turn on your ignition and see the ammeter display light up and show a zero reading.



Ammeter Assembly



Ammeter Wiring



Splice Connectors



#### Step #9: Install Relay(s)

#### . . . . . . . . . . . . . . . . .

You have already mounted the relay on the firewall. You have two wires ready to attach but you need two more wires to actually provide switching power.

Time Estimate = 10 minutes

- 1. Attach the small 18 gauge black wire to any ground on your vehicle. You may connect this to your frame, the negative post on your battery, or any good ground source (bolt into dense metal). String this wire back to the relay and attach a blade terminal connector to it.
- 2. Connect the small 18 gauge red wire to your fuel pump power relay. When the fuel pump or the oil pressure is receiving power your HydroCell will also be powered up.

The reason we switch the relay on and off with this points is so the cell will only be powered when oil pressure is sensed or the fuel pump is on. If you just located any wire which powers on and off with the vehicle then chances are this wire would have active power when your vehicle's ignition is in the ACC ON position. This would mean that if you were sitting listening to the radio, without the vehicle running, your HydroCell would be turned on. You do not want to produce HHO without your vehicle running as this would cause the HHO to build up and that could create an unsafe environment. The safety of the system is based on the HHO being used immediately as it is produced. Using the fuel pump connection if you can. The oil pressure sensor is generally on the back side of the engine and difficult to reach.

To hook to the fuel pump power wire, locate the fuel pump relay and connect to the relay terminal transferring power. Connecting directly to the relay terminal does not require the use of the splice connector provided with the kit. The splice connector will be used if you connect directly to a wire like the oil pressure sensor. Attach a blade terminal connector to the other end of the red 18 gauge wire near the relay.

3. You should now have four wires with blade connectors attached ready to slide on to the relay. Two will be from the red 10 gauge wire. One will be from the black 18 gauge wire. The fourth will be from the red 18 gauge wire. Detach the relay from the firewall and look carefully for the numbers near each of the terminals. These numbers are small and difficult to see. Attach the wires as follows.

Terminal 86 = 18 gauge black wire Terminal 85 = 18 gauge red wire Terminal 87 = 10 gauge red wire to the HydroCell Terminal 30 = 10 gauge red wire to the fuse holder and on to the battery Terminal 87a = unused

With dual HydroCells you will have two relays to install. While there will be two red wires each attached to a separate relay, you may join the 18 gauge wires from part 2 above together.

- 4. Remount the relay to the firewall.
- 5. Assure that all the wires are nicely secured with ties.



Relay Terminal





Start by reviewing all your connections. If you are the least bit unsure have someone go over it all with you.

- 1. Once you are satisfied, attach the one remaining unattached red wire with the large ring connector to the positive terminal on the battery.
- 2. Install your fuse in the fuse holder. Actually, your fuse holder comes with a blade circuit breaker instead of a fuse. This will hook into your fuse holder just like a normal fuse but if more than 30 amps hits the fuse holder the circuit breaker will trip and automatically reset in a few seconds. This prevents more than 30 amps traveling through your system and also eliminates having to change blown fuses.



Blade Terminal Connectors



Here is what you need to know about electrolytes.

The best electrolyte we have found is KOH because it doesn't leave any flaky residue that could get into your HHO hose and into your engine.



KOH is potassium hydroxide. It is a white alkaline solid used in the manufacture of soap, liquid shampoos, and detergents. It is commonly used in various agriculture and industrial applications. It is sometimes called caustic potash. It is soluble in water.

If you haven't done so already and are unsure of a local source, purchase Potassium Hydroxide (KOH) flakes from www.essentialdepot.com or www.dudadiesel.com. They have a high quality product. You will only need a few teaspoons at a time per quart of water so you don't need a large quantity on hand.



**Ring Connector** 



Use gloves and goggles and a mask when handling raw KOH because it is very toxic. Avoid contact with your skin as irritation will occur. If it comes in contact with your skin neutralize immediately with vinegar. Also avoid your mixture coming into contact with painted surfaces.

In a seperate container mix between 1/2 teaspoon - 1 teaspoon (depending on engine size) of potassium hydroxide per quart of distilled water. You can always add more later, but start low.

Pour the premixed liquid from your container into the reservoir slowly, submerging the lower (straight) nozzle, while keeping the upper (90 degree) nozzle above the mix level. This way the mix flows into the straight nozzle and the air is able to release out of the 90 degree nozzle. Never fill the reservoir above the designated fill line.

We control the amps using the electrolyte formula. The electrical draw will increase with more KOH in the liquid.

Generally most vehicle applications need very little HHO in order to get the desired results.

Every vehicle responds differently so we cannot predict your results in advance. For optimal testing aim as close to 5 amps as possible to start. Over time you may experiment up or down in amperage to optimize performance. While it may not give you the optimum performance to start, we recommend you use a weaker mixture (1/2)teaspoon - 1 teaspoon). This will put lower demand on the electrical system. Test with small increments making the mixture stronger by adding more KOH and measuring the improved results, by taking accurate mileage calculations. When increasing amp draw ceases to give improved results you can back off the mixture to the optimum for your vehicle. At any point in time if you need more amps add more KOH and if you need less amps add more water. It is okay to add water or KOH directly to your reservoir if your cell is functioning by pulling amps and circulating. Just be sure to give the substance you add (water or KOH) ample time to circulate down to your cell before adding more. Never run your system over 30 amps. All wiring and components are rated for 30 amps. Attempting to run over 30 amps could result in damage to your HydroClubUSA kit components.

You can make extra pre-mixed catalyst mixtures to carry along with you in case you need to top up while you are on the road. It is a



good idea to keep this container properly marked and with a child proof cap. Never run the system dry.

The tanks generally last

250 miles for 1 QT tank

750 miles for 3 QT tanks

operating at 30 amps. With a much lower amp draw the tanks will last much longer as well. Your electrolyte usage can vary so keep an eye on your electrolyte level initially until you have an idea of your HHO systems water consumption. \*\*\* TIP: always make sure your lid is on tight, otherwise HHO could be escaping from your system, depriving you of your gains.

# Step #12: Test Run Time Estimate = 10 minutes

Your HydroCell reservoir and hose system are designed as a closed system. This means that you should have the lids on both the reservoir and the filter when you are operating the vehicle. Otherwise air will enter the system from the outside and may upset the balance causing the engine to run rougher.

- 1. Start by checking all your connections. Make sure your ammeter and auto reset circuit breaker (fuse) has been installed.
- 2. Now start your vehicle. While it's running, watch for bubbling action inside of your reservoir. You should be able to see the gas entering the reservoir.
- 3. Now it's time to check how many amps your dry cell is pulling. This cell was made to run at up to 30 amps without overheating at all. Aim for 18 amps to start and over time you may experiment up or down to optimize performance.

A dual HydroCell system is wired to draw twice the amps. Our digital ammeter takes a reading off of the negative side as opposed to the positive side. Since you will only be reading amps off of one cell's negative side, you will only see the reading for that cell, not both. Each cell is using the same electrolyte, so you can simply take the reading on your ammeter and multiply it by two. For example; if your ammeter is reading 12 amps, then you



know both cells are drawing 12 amps for a combined total of 24 amps.

If you have done everything right, within a short time, you will notice that the engine starts to sound dramatically different. It will run smoother and sound quieter. Your RPM's may be unstable for a couple of minutes. This is normal. The HHO is starting to change the combustion cycle and cancels the pinging and the engine is now adjusting to the changes.

If you are using the Volo Chip be sure to follow all instructions concerning resetting the chip to the letter. If you are using the engine mount electronics be sure to check your voltages and adjust your electronics accordingly.

# Step #13: Install the Electronics Wiring Time Estimate = 30 minutes

The oxygen sensor tells the computer what the oxygen content is by providing a voltage on its signal wire between 0 and 1 volt. 450 millivolts (.45 volts) means that the fuel/air mixture is correct. Higher values means the mix is rich (has too much gas), and lower voltage means the mix is lean (has too little gas). By adding voltage to the sensor's output, we can compensate for the additional oxygen in the exhaust and lean out the fuel/air mixture to get maximum economy.

The electronic part you add needs to have an adjustment that allows you to control, to within a few millivolts, the amount of this added voltage. Once you add this voltage the computer is unaware of the additional oxygen content of the exhaust.

Most vehicles have oxygen sensors both before and after the catalytic converter. The ones after the converter do not need to be treated. Their data is used to determine when the converter has gone bad, but they are not used in the air/fuel ratio calculations. The electronic component is only needed for all before upstream oxygen sensors.

Our kits come with two different products to achieve this. Depending on the unit you have follow the appropriate instructions for "Engine Mount Electronics" or "Volo Chip." These are both high quality third party products that integrate perfectly with our system. As always, if these instructions are not completely understood



contact techsupport@hydroclubusa.com and start a dialogue about the parts you need help with.

#### Engine Mount Electronics

To install this unit, you will need (up to) 8 pieces of 22 gage stranded wire (depending on your unit) 10 to 15 feet long, a volt meter, a portable hand drill and electrical tape, wire strippers/crimpers and a small screw driver. It may be difficult to find 22 gauge wire. Try a hobbyist/electronics store such as Radio Shack.

Make sure that your vehicle has oxygen sensors and not A/F sensors. Clean the outside of the sensor with isopropyl alcohol and a clean cloth and make sure it is working properly.

There are (up to) 8 wires to connect on this unit. The wire color coding is attached in the included diagram.

- With the vehicle running at normal operating temperature, locate the signal wire by probing the wires coming off the oxygen sensor in order to read their voltages. Be very cautious not to touch the exhaust or any other hot or moving components of the vehicle. This will be done on DC current on your voltmeter. The wire with the fluctuating current is your signal wire. The wire which reads 12-14 volts steady is your power wire not your signal wire.
- 2. Cut the O2 signal wire leaving at least one inch of wire attached to the sensor. This will leave you with one side of the wire coming from oxygen sensor (further referred to as input wire) and one side of the wire going to the ECU (further referred to as output wire).
- 3. Using the included cup links, slip the input wire (from the sensor) into a cup link and crimp the connection. Crimp the other side of the cup link used into one of the 10 15 foot long wires which will be used to connect to the enhancer.
- 4. Route this wire into your engine compartment to your engine mounted electronics. Be sure to avoid this wire from contacting hot surfaces when routing. This wire will connect to the white wire on your engine mounted unit (labeled O2B in). Strip a small piece of insulation from the end of the wire to be connected to the electronics and crimp it into the cup link already attached to the white wire of the electronics board.
- 5. Next, follow the same process explained in steps 3 and 4 except



this time connect to the remaining section of the cut O2 signal wire referred to as your output side (going to ECU). This wire will connect to the Yellow wire on the electronics board labeled O2B out.

6. If your vehicle has another O2 sensor in need of controlling, connect this O2 sensors signal wire to the electronics board in the same manner. The only difference is your input wire (from the sensor) will connect to the brown wire on your electron-



ics board (labeled O2A in) and your output wire (to the ECU) will connect to the blue wire on the electronics board (labeled O2A out). If your vehicle has only one O2 sensor in need of controlling it is okay to leave the extra O2 enhancer wires vacant on your electronics.

7. Next connect the MAP (manifold absolute pressure) enhancer. Locate the MAP sensor. It is usually on the intake manifold near the PCV inlet. If your vehicle does not have a MAP sensor connect to your MAF (mass air flow) sensor in the same manner. This is

located on your air intake line.

- 8. Locate the signal wire, usually the center wire, but not always. To confirm you have located the correct wire, measure the voltage on each wire (in the same manner as the O2 wire) with the vehicle idling. Idle should be 1 to 2 volts, revving engine should change the voltage to 2 to 5 volts. Once you locate the correct wire, turn the vehicle off.
- 9. Unplug the MAP sensor wire connector and cut the signal wire in a place where you can easily use wire strippers to remove a small 1/4" piece of shielding from each end of the wire.
- 10. Attach another 10-15 foot long wire, using the included cup link connector, to the cut wire coming from the MAP sensor plug. Crimp this wire to the electronics wire marked MAP (black).
- 11. Follow step 10 again except this time connect to the cut wire



going to ECU. Crimp this wire to the electronics board wire marked ECU (grey). Wrap the wire connections on the MAP with electrical tape to avoid problems.

- 12. Reconnect the MAP plug.
- 13. This unit must be grounded to the engine block, or battery ground for proper operation. Using one of your 10-15 foot long sections of wire attach to the grounding point on the engine block. Crimp this wire to the electronics wire marked GND (green).
- 14. Locate a wire which cuts on and off with your ignition and carries 12 volts. This means that the voltage must only be present when the vehicle is turned on. This is for safety reasons. Failure to do so is strictly prohibited. User accepts all responsibility for damage caused by failure to follow this instruction.
- 15. Secure one end of your 10-15' wires to the 12 volt source using the splice connector provided. Crimp this wire to the enhancer terminal marked 12V (red).
- 16. Start your vehicle and after the engine is warm, check the following voltages:

DC voltage at idle at the MAP connection on the enhancer (take average).

DC voltage at idle at the ECU connection on the enhancer (take average).

The ECU terminal must be a maximum of 0.10 volts lower than the MAP terminal, at idle. If the observed difference is not 0.1 volt, turning the MAP adjustment screw on the enhancer (see diagram) will adjust the signal. Turning the screw CW = LESS voltage at terminal ECU. CCW = more voltage at ECU.

The O2 sensor voltages can be viewed by measuring the input voltages from the O2 sensor at the brown or white wire terminals.

The output voltages can be measured at the blue or yellow wire terminals.

For one wire and 3 wire O2 sensors, the output voltage from the enhancer should measure higher by 0.13 to 0.18 volts DC at their corresponding output terminals.

For 2 and 4 wire sensors, the voltage may be set at 0.22 to 0.28



volts DC higher at the output terminals. Some 4 wire sensors require MORE than 0.22 volts.

If you receive little MPG gains and no check engine light after a few days, you may adjust the O2 adjustment screws to reflect a higher voltage.

When adjusting the O2 sensor signal on the EFIE, the output voltage should remain the same (e.g. 0.1 to 0.95 volts). However, the incoming voltage will drop when the unit is adjusted. This is due to the ECU leaning the mix and it is the correct way for the system to operate.

# Volo Chip Electronics

- 1. Start by locating your OBD II Port. This port is usually located underneath the dash by the steering column on the drivers side. If you don't know where it is go to http://www.obdclearing-house.com/index.php?body=oemdb and enter your year, make, and model.
- 2. Use the included zip ties or adhesive to mount the Volo Chip near the OBD II port. Make sure you can see the LEDs if necessary.
- 3. The Volo Chip will connect to the wires on the back of the port. It is designed not to interfere with OBD scanners, gauges, etc.
- 4. Make sure you can get to the wires on the back of the port. Most are held in by catches on both sides of the port. On some vehicles, you may need to remove a couple screws or wire wrap to gain access.
- 5. The OBD Port has 16 pins arranged in numerical order when viewed from the front, reverse order from the back. Note that every pin does not have a wire attached.

The white (S1) and green (S2) wire connections vary by protocol.

Vehicle specific diagrams are available at www.voloperformance.com/install.html.

6. Determine the protocol: Look at the front of the port. Write down which of the following pins are populated (have a metal contact or wire present) : 2, 6, 7, 10, 14, 15.

PWM – If pins 2 & 10 are populated, then connect white to pin



2, and green to pin 10.

VPW – If pin 2, but not pin 10 is populated, then connect white to pin 2 and green to pin 5

ISO – If pin 7 is populated, then connect white to pin 7. Connect green to pin 15 if populated, pin 5 if not.

CAN –If pin 6 & 14 are populated, then connect white to pin 6, and green to pin 14.

- 7. Connect the red 12V+ wire to pin 16.
- 8. Finally, connect the black GND wire to pin 4. The Chip should now be on.
- 9. You must reset the chip now.
- 10. After connecting all four wires, tuck them away and secure them with zip ties.
- 11. Replace any screws, panels, or wire wrap you removed to access the port.
- 12. After installing for the first time, start the car's engine. The Volo Chip will determine which protocol you have and calibrate its on-board map and communication baud rates. This calibration should take 1-3 minutes, depending on the vehicle. During calibration, the LED will flash red and green very rapidly.

Do not drive or rev the engine during calibration. Allow the engine to idle until complete.

13. In the event you make any changes to your vehicle you must reset the chip for optimum gains. If you feel the chip is no longer functioning properly, a reset will return it to normal. Changes include anything that affects engine performance or efficiency, such as new engine components or replacing defective parts.

To reset the Volo chip, while your vehicle is running and has reached a normal operating temperature, press the reset button with a paper clip. The Volo will take a few minutes to calibrate for the reset before eventually going into power on mode. Your Volo FS2-HHO chip has now been reset.

#### LED Status

Standby – (All LEDs off, DATA flashes every 5-10 seconds.) The Chip is connected properly and waiting for a signal from the ECU. Some newer vehicles with keyless entry or factory alarm may not



Volo Chip Electronics



enter standby.

Calibrating – (PWR LED on, DATA flashing rapidly for 1-3 minutes.) The Chip is self calibrating, adjusting its map for your specific engine and modifications. Vehicle must be running during calibration. If not, then apply reset. After calibration, the Chip will enter POWER ON mode. POWER ON – (PWR LED on, DATA flashes occasionally.) The ECU is active and communicating with the VP12 (Volo Chip).

Link LED – (Both LEDs flashing rapidly for 1-5 seconds.) The Link LED state indicates handshake with the ECU and used for diagnostic purposes.

# Step #14: Test Runs Time Estimate = 4 hours

From the beginning HydroClubUSA has collected data from the use of our products. Based on these results we have developed a step by step approach to get the most out of your system in the most accurate way. This is a simple three step process designed to accurately track your vehicles fuel economy.

1. MPG Baseline: To this day I still remember the testing methods that we used in my favorite class, science. I especially loved it when we would do scientific experiments. Always before testing a hypothesis, we would want to have a good baseline based on facts, for a good comparison.

With that said, you want to go about tuning your HHO system in the same way. In order to accurately test the effectiveness of your unit you must know what your fuel economy is previous to tuning.

Most newer vehicles come with a fuel economy gauge in the dash. If your vehicle does not, then we recommend starting a mileage log or purchasing a fuel economy calculator/scan gauge. In this log you can monitor your trips and jot down your gallons used per miles driven. This will insure the most accurate tuning. I like to keep a record if the driving was done city, highway or a combination of both. I also make a note of the description of the trip (heavy traffic, lots of stops, smooth very few stops). Get into a habit of doing this it will provide you with



a detailed fuel economy log for your vehicle showing how well it does in different scenarios.

2. Volo FS2-HHO Chip Pre-installtion test.

Before turning your HHO System ON and beginning your tuning we encourage you to do a pre-installion run with just the Volo by itself. During this time, you will install your Volo FS2-HHO chip according to the vehicle specific diagram on Volo's website. Then while driving through a complete tank of fuel log your MPG. Every vehicle responds differently to the FS2, but most vehicles should see a 1-3 MPG gain during this run.

3. Start Low and work your way up Slow.

In the past we started with a 2 Tablespoons per quart of distilled water electrolyte solution. Two Tablespoons of KOH per quart of distilled water usually will yield an amp draw around 16-19 amps .

We are seeing that most vehicles will reach their optimal fuel economy gains at much lower amp draw. This is because of several factors such as how the vehicles fuel combustion chamber is setup and as how much and what path air travels through the engine. This means that in order to find the optimum fuel economy your vehicle can achieve, you need to be as accurate as possible when tuning the HHO system for each vehicle.

Start with a mix of 1/2 of a teaspoon to one teaspoon KOH per quart of distilled water. The idea is to begin your testing with HHO at very low amperage. We suggest starting at 3 - 5 amps. You may need to add more water to get your amp draw this low. If you need more amps add more KOH and if you need less amps add more water. Be sure when adding water or KOH you give it plenty of time to circulate down to your cell before adding more.

You will keep it at this amp draw your entire fuel tank. Then you will increase your amp draw by 2 amps and reset your Volo chip according to the reset instructions. You will then be at 5 - 7 amps for this tank of fuel. This will ensure that you pin point the Optimal HHO input for your specific vehicle. We will be working on a database which will tell optimal amps for each vehicle based on member results. Until we have finished this database, we suggest starting your tuning at a low amp draw



and working your way up till you have reached a PEAK, or "sweet spot" for your vehicle.

We are getting great results with our kits. Some come right away, and some have required some fine tuning. Either way, if you need any help, have a question, or want to give us feedback to better the industry, our phone is always on 9am-5pm Monday through Friday EST. Give us a call, we are here to help all of our members get results.



# **Trouble Shooting**

# 1. My HydroCell is not producing bubbles.

First check all power connections and ensure you are getting power to and through all your connections (battery, pre and post fuse holder, pre and post relay, HydroCell).

If you verify your HydroCell is getting power ensure the ground (black wire) is connected to a good ground location. The best location is the negative terminal on your battery. Verify that all connections are snug. Sometimes it appears to be a good connection but still no grounding occurs. If this seems to be the issue because you are producing too little HHO, then remove this ground connection and ensure it is grounding properly by cleaning/roughing up the connections with a wire brush.

If the power and ground connections are correct, the only option left (if there are no bubbles coming from the HydroCell back into the reservoir) is failure in the electrolyte solution. Be sure you are using 2 teaspoons of KOH per one quart of distilled water. Also be sure you mix this solution in a seperate container and then pour into the reservoir.

If you pour water in your reservoir and then add KOH the cell will not work. This must be mixed before pouring into your reservoir to ensure the correct electrolyte ratio is getting to the HydroCell.

# 2. My reservoir is deforming or collapsing.

See "My system is experiencing too much vacuum."

#### 3. My system is experiencing too much vacuum.

Your kit has an additional on/off valve provided with kit. This is the valve used in the drain tubes. Cut your hose going from the reservoir to the engine vacuum between the filter and the flash arrestor. Now insert this on/off valve and rejoin the hoses to it. This will allow you to adjust exactly how much vacuum is getting to your reservoir. Also drill a small hole (as small as you can) in the reservoir cap to allow air to come in.

# 4. My ammeter is reading incorrectly.

This happens if the ammeter is experiencing electromagnetic interference. Do this. From the ammeter to shunt there are two wires (yellow and green). Make these as short as possible and braid these



together then reconnect. If the ammeter is still not reading accurately use a wire cover designed to deter electromagnetic interference for these wires.

#### 5. My electrolyte is changing color.

Be sure you are using distilled water and a good pure KOH (above 90%). If you use any other water besides distilled, any chemicals or minerals will burn up in the electrolysis process causing discoloration.

If your electrolyte solution is correct but discoloration is still occurring, this means your KOH is burning up. This is a sign your cell is not circulating well. This will not occur when the circulation is correct. You can improve your circulation by adjusting your hoses. Be sure you are getting a 12 inch drop between the reservoir and the HydroCell. More or less than this designated drop will prevent the HydroCell from circulating correctly. Also be sure your drop is straight down to the HydroCell and not on an angle. On some applications it is impossible to get all these factors perfect.

In this case you can use a small pump to circulate the electrolyte properly. You can find several of these by typing in "HHO pump" in the eBay search engine.

If your electrolyte has burned up you will need to flush your system.

To flush you system start by emptying your reservoir. To do this, use a turkey baster or a similar tool that can suction out the electrolyte mixture. Then unhook a hose from the bottom of the reservoir. Dismount the HydroCell and empty it out. Then hook the hose back up and put one part bleach to two parts water solution in the reservoir and HydroCell. Let this set for several hours then empty both the same as first time and then refill with electrolyte. You may also use white vinager to clean your cell.

# 6. All the water is out of my HydroCell and reservoir and there is an o-ring which has visibly moved.

This means your cell has frozen. The frozen water has expanded and developed a condition so your o-ring could move out of place.

7. Everything seems to be installed correctly but I am not getting an increase in fuel economy.

For HHO to work correctly all your factors must be just right. More



than likely something simple is not correct and this is normally an easy adjustment. This could be from a variety of factors. Be sure you keep good accurate MPG tests conducted under the same conditions. For instance, a different number of red lights or stop and go traffic can greatly vary your test. The most important thing you can do is to note if your MPG is staying exactly the same, increasing slightly or decreasing slightly. All three of these conditions require different solutions so keeping accurate MPG tests is the easiest and most accurate way to determine the adjustment needed for your vehicle. Contact us here techsupport@hydroclubusa.com and let us know which of these three test conditions you are experiencing and we will work with you to get this issue corrected.



# FAQs

1. QUESTION: How do I refill with water and how much?

ANSWER: The HydroCell has a removable cap for easy refill. Just add your mixed electrolyte to the bubblier/reservoir you are using.

# 2. QUESTION: Will I still get the same power I have come to expect from my vehicle?

ANSWER: Yes. Adding HHO to the fuel system on an internal combustion engine increases the combustion of the gasoline (or diesel). This can be compared to putting a super high grade of gasoline in your engine. You will get better overall performance, increased horsepower and gas mileage. You can expect 30-50% increase in gas mileage. It will all depend on the type of vehicle, engine size and driving habits.

(Important Note) You must fool the computer on all vehicles that have fuel injectors. If you don't do this, you might see a couple MPG drop after the computer picks up the extra oxygen.

# 3. QUESTION: Is is difficult to install?

ANSWER: No, it is very simple. All our cells and kits have complete detailed installation instructions located on our members' web site. Along with our installation video. The procedure is pretty straight forward and we have good pictures, so it should not take longer than a few of hours.

#### 4. QUESTION: Where should the HydroCell be installed?

ANSWER: Anywhere in the engine compartment that is lower then the bubblier/reservoir you will be using, but preferably in a place where it will have a constant airflow (like in front of the radiator).

5. QUESTION: What happens if my HydroCell runs dry?

ANSWER: Your HydroCell can be damaged if ran for a long period



of time dry. The easiest way to prevent this is to keep a gallon of mix in your vehicle and simply top off reservoir when refueling.

#### 6. QUESTION: Do I need a PWM for your system?

ANSWER: You can control your amperage by your mix and can be viewed any time through your amp gauge without using a PWM. However a PWM is a nice addition to easily adjust your cell's amp draw in the cab of your vehicle with the turn of a knob.

# 7. QUESTION: If I run my vehicle with the HydroCell, will I get rust or corrosion in my engine?

ANSWER: No. When HHO burns and converts back to water, the engine temps are high enough to keep it as a vapored steam until it exits the exhaust. A little moisture is actually good for your engine. There are several water injection system available for vehicle conversions today.

# 8. QUESTION: What happens if my water turns brown?

ANSWER: Simply flush unit with bleach water solution. This should not occur but every six months or so. When water is brown it is simply used KOH. If you have your cell circulating well this will not occur.

~ Members noted that running a mixture of white distilled vinegar through the system while the unit is running (cap off) resulted in a nice cleaning effect on the system. Run for 5-15 minutes at most. And be sure to cleanse the system afterwards.

# 9. QUESTION: Do I need to turn the unit off when not in use?

ANSWER: No. If you have followed our manual, then your unit should be connected to the ignition switch so, every time you turn the engine off, the unit will turn off with it.

#### 10. QUESTION: How do I service/clean my HydroCell?

ANSWER: It's very simple. Just flush the unit once every six months with bleach water solution.

# 11. QUESTION: Will It Void My Warranty?

ANSWER: Your car or truck is being damaged right now by unburned fuel! Our technology will help not only eliminate carbon



deposits caused by unburned gasoline but will actively clean out your engine every time you drive. Over the first few weeks you will notice that the engine becomes smoother and smoother. Then it will level off at a new level at which the engine continues to steam clean itself.

Your new HydroCell makes the engine quiet, and calm. The engine stops knocking or "pinging". The hydrogen changes the combustion cycle into a more even or "round" cycle. This happens immediately upon installation, and from that moment on, your engine works in a new way. The effect is not only less noise, it also has less vibration, resulting in reduced strain on the transmission (thus smoother gear shifts), cleaner pistons and valves, and generally better engine operation.

Water cools down the engine. For years, heavy trucks have been using water injection systems that cost up to \$15,000 to cool their engines. Truck owners are very sensitive to maintenance expenses and they know from years of experience that water reduces their breakdowns and overall operating costs.

Our Dry Fuel Cell system will widen the torque range and make vehicles accelerate faster. After acceleration, you don't have to press the gas pedal as much to keep going. Trucks pull better uphill with HHO Gas. Less strain on that Detroit diesel engine must result in less wear and tear over the life of the engine.

Our technology does not change your vehicle's engine or computer, so if you ever decide that you don't want this system, you can unhook it in less than a minute and your engine is just as it was – only cleaner!

You can always consults your warranty's outlines if you are unsure or worried.



# Fuel Saving Tips

You care about saving fuel; that's just why you are here!

Perhaps you already know some of these things but a helpful reminder might not hurt. There is no one complete answer but there are a series of things you can do.

**1** Be sure your vehicle is in good working order before installing your HydroClubUSA kit.

 $2^{\mathrm{Be}}$  sure all scheduled maintenance is done including replacing the oxygen sensors after the designated mileage for your vehicle.

3 Slow down! Studies show aggressive driving hurts fuel economy by as much as 30%. Set cruise control and enjoy the ride. Let the vehicle pace itself up to cruising speed. Jack rabbit starts are part of the problem not just the travelling speed.

Check your tire pressure. Maintaining correct tire pressure not only improves economy, but improves safety and reduces tire wear.

**5** Clean out your vehicle. The extra junk rolling around in your vehicle can easily add up to 50-100 pounds. This extra weight results in more load for the engine to carry and thus lower fuel economy.

 $6^{\rm Get\ a\ tune\ up.}$  An engine tune up will improve your fuel economy by 1 MPG average.

7 When you are driving above 60 MPH keep your windows up. Studies show you use less fuel by having your windows up and the air conditioner on at speeds above 60 MPH. The aerodynamics lost by having wind come in your vehicle decreases fuel economy.



# How to Build a Business

More than ever before people are looking for ways to make some extra money. Here are some simple ways!

- With your hybrid HHO / Gasoline vehicle you have bragging rights in your network! Simply tell people about it. Lift the hood; point out the components; start the vehicle and show them the bubble machine! Some will think you are nuts. Some won't show any reaction. Some will want to get a kit right away. One option, since you know how to get this kit installed is to help others with their installs. Hire yourself out on an hourly rate to help them with their planning steps. Or, if you like, you can get your hands dirty and charge a fair fee to do the installation yourself.
- Find a local mechanic willing to do the install. You charge the client and pay the mechanic a portion of what you charge.
- You can go around to the independent garages in your area and show your system. The mechanics will be fascinated and each one will want a system to try on their own vehicles.
- You can put a sign on your vehicle. "Hydrogen / Gasoline Conversion Car call for details 555-1212."
- Make a list of everyone who would come to your wedding or funeral and call them up and say this.
  "Hi Harry! I only have a moment but I wanted to ask you one quick question, would that be OK? Do you have any interest in finding a way to save a lot of money on gasoline because I have found a way? Would it be OK if I drop a small book off for you to read and then pick it up again in 72 hours after you glance at it?" If Harry says anything other than "Sure!" move on. Don't bother explaining it over the phone. He is very unlikely to take the next step if he won't look at your book. What book? This one of course!
- You may choose to purchase kits and distribute them yourself. We have a generous discount for all our products sold by distributors. You can start your distribution business for less than \$1,000.

You might expect to pay a lot of money for a franchise system like this. We supply all the information, create all the products, do all the delivery and courteously complete all the customer service.



Once you are totally familiar with our products and systems you can take it to whatever level you decide.

If you are serious and willing to put in the time you can be part of the next best thing!

HydroClubUSA 2007 W. Main St. Greeneville TN 37743 (423)-289-3713



Date	Amps	MPG	Miles	City	Hwy	Notes





# Fuel Efficiency Log

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Date	Amps	MPG	Miles	City	Hwy	Notes



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Date	Amps	MPG	Miles	City	Hwy	Notes
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# Fuel Efficiency Log



# Cell Service Log

Data	Notes
Date	INOLES

# Cell Service Log

Date	Notes



# Cell Service Log

Date	Notes

# Cell Service Log

Date	Notes











