How To Convert Your Car To Use Water As Fuel

Water Hybrid Engine Technology

Build Manual

This Manual covers:

Introduction to the Gas4Free System

Fabrication

Installation

Better Build Tips for the Long Haul

Acknowledgements

This book was made possible by the many that we would like to thank. In a world that almost truly seems to be driven by greed and fear, history has shown that the few can make a difference. All is not lost…

The price of gasoline WILL continue to RISE

Don't get caught like a deer in the headlights. These people dedicated their lives to this technology. Some even lost their lives. We offer our condolences and many thanks…

Stanley Meyer	Yull Brown	Randy Udall
John Richard	Dr. Even Callic	Joe Mihal
Denny Klein	Rivaz, Lenoir	Isaac De Rivas
Rev. William Cecil	Jean Joseph	Etienne Lenoir
William Nicholson	Delamare-Debouteville	Dr. Ruggero Santilli
Herman P. Anderson	Joe Cell (Joe X)	Henry "DAD" Garrett

William A. Rhodes	Michael A. Peavey	Francisco Pacheco
Robert Zweig	Rodger Billings	Archie Blue
Luther Wattles	Sam Leslie Leach	Steven Horvath
Carl Cella	Rudolf A. Erren	Andrija Puharich
Danial Dingle	Paulo Mateiro	Bob Boyce
Peter Lowrie	Edward Estevel	Dr. Cliff Ricketts
Steve Ryan	Captain Patrick	Paul Chi
	Vic Lawson	

And…

We would like to thank all of our staff for their continued hard work and drive toward improving life on Earth. Our team spent months perfecting this system so that you don't have too

But Most of All…

To all who has made an effort in pushing this technology forward &
To you for joining our side of the fence towards an economical and emissions free tomorrow!

Copyright Notice

LEGAL DISCLAIMER

All products from www.Gas4Free.com are strictly for informational purposes only!

This or any other form of hydrogen producing device maybe illegal in your town, city, state / province or country. It is your responsibility to inquire with your local DOT (Department of Transportation) about how to proceed. Vic was pulled over by state troopers in California and had no problems at all. But, the officer could have missed it.

Because this technology is experimental in the eyes of most of the United States, we are offering this information for closed track (Race Track) and off-road testing.

Gas4Free.com will NOT BE RESPONSIBLE for any mishaps that occur during the build, test and application phases of your construction. We are also not responsible for a partial or complete system that has problems or causes injury. You have all the information included in this manual to safely manage and handle your electrolyzer.

PLEASE READ THE ENTIRE MANUAL & ALL THE EBOOKS BEFORE DOING ANYTHING. THERE ARE TASKS AND TESTS TO BE DONE THROUGH OUT THIS BOOK

Contents

Hooray to Free Gas

We at Gas4Free.com congratulate you for taking the plunge towards a cleaner and more efficient tomorrow. With these plans, you will be able to build a custom electrolyzer to fit your specific vehicle. This system is by far the most "**RELIABLE**" method by all aspects. "*What do you mean by most reliable?*" you ask?

This is what we mean…

- Our electrolyzer body is industrial grade; to handle the rough environment that is endured under the hood of a car
- We recommend and illustrate the use of a **Proper** mounting Setup
- Our Gas4Free system will "**OUT-LAST**" any one of our competitors
- All materials that we recommend using are for ether automotive or industrial use
- Our Gas4Free's build and assembly was developed and build by our licensed Grade "A" technician, Mr. Vic Lawson, the maker of the Gas4Free system (Not some guy in his garage)
- Guaranteed Satisfaction!

Basically this means you got…

Nothing to Lose With ALL TO GAIN

So get ready to save BIG!!!

Warning!!!

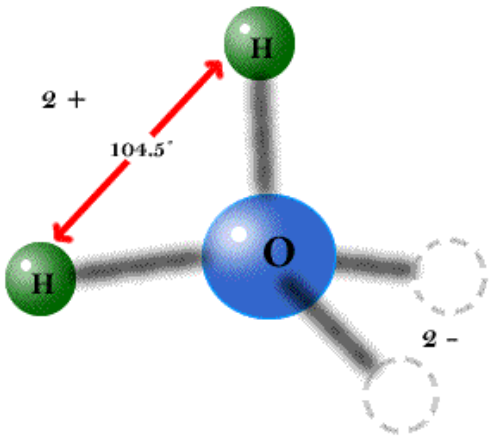
The Device, when completed into the finished product, will produce Hydrogen. Hydrogen is a volatile colorless gas that has a low temperature ignition point. This gas also has no smell. Serious injuries and bodily harm can occur if the device is not handled or used properly!

Please, Safety First!

So, "*water powered*" cars you say?

WATER: its molecular make-up is simple.

2 part HYDROGEN
1 part OXYGEN



Ball and stick model of water.

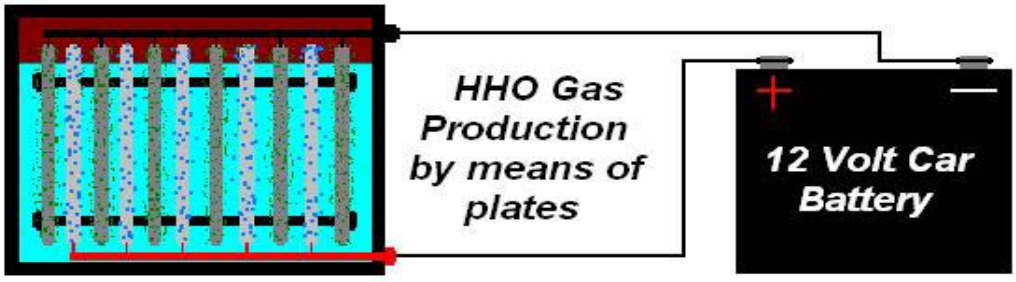
As we all know, Hydrogen is HIGHLY EXPLOSIVE, and **packs a mean punch** when in high concentration or pressure. Water, however, is not combustible. When in its h20 compound, this substance is used for everything from quenching your thirst to putting out forest fires. You can see in the diagram above how water is bonded (h20). But what if you were to break that bond between all 3 molecules? Could it

be done? Can that technology exist in today's world? Well, we are here to tell you YES and YES! Once that bond is broken, it arranges itself into a gas call HHO.

> **FACT:** HHO gas is so powerful that by weight it possesses 3 times the explosive power of gas.

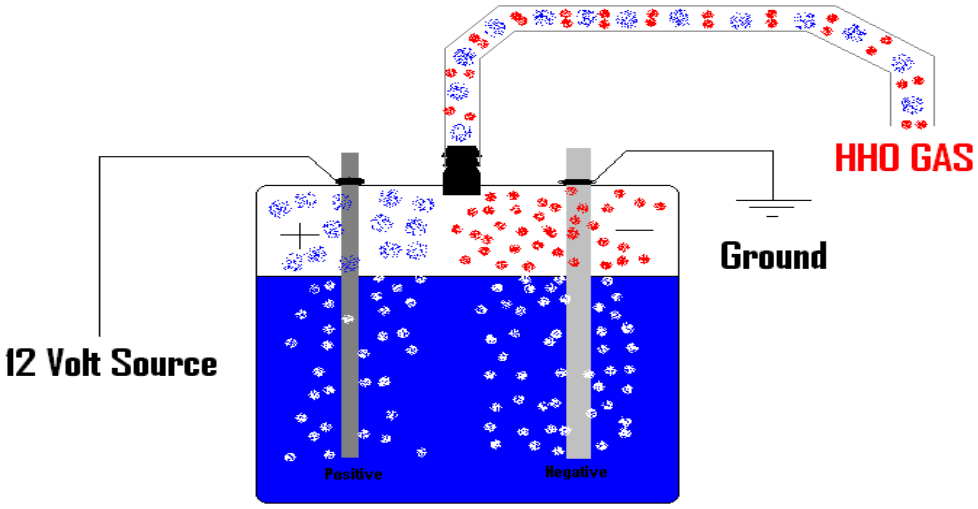
The way we have been able to harness this potent fuel is through a device called an electrolyzer. We call our device a **Hydrolyzer** so you don't get confused.

Really, it's not as confusing as you may think. Electricity is used to "ELECTRIFIY" water. By doing this, the bond is severed and begins its journey up and out of the water itself. Here is a simple diagram below. We will discuss this in detail later on in the manual…



Free Gas = Free Energy?

You got that right! Your custom made Hydrolyzer produces a powerful gas called HHO gas. You may have heard it by the name of "Brown's Gas" or "Rhodes' Gas". Either way, it's all the same.



FACT: Did you know… If you were to Hydrolyze 1 Litre of water that it would expand beyond 2000 GALLONS of HHO GAS! That is a HUGH supply of energy just waiting for you to tap. And the kicker is that in the form of water, it's completely safe and it's compressed energy!

Oxyhydrogen is also another name for this gas. In industry today, you can commonly find this technology used for cutting torch equipment; exactly like an Acetylene torch.

"But what does FREE ENERGY really mean?" Well, that's a good question. If you do a search online, it's defined as:

"A thermodynamic quantity that is the difference between the internal energy of a system and the product of its absolute temperature and entropy."

In short, **Free Energy** in its simplest terms is receiving more energy than giving. For example, if you were to throw a piece of rolled-up paper, it would only go so far. Now think of the energy it cost you to roll that paper into a "ball" and to throw it. Pretty straight forward.

Now, take a second sheet of paper and make a paper airplane. With a no-wind condition, that piece of paper will use air pressure to carry it 2 to 6 times further. That, my friends, is free energy. You would have spent approximately the same energy to make both paper flyers and thrown them the same way. Same amount of work but different results.

"How does this relate to gas for free?"

Let's take a common engine used today, a 1.8 liter Honda motor out of an Acura Integra. Its gas tank capacity is roughly 13.2 Gallons and gets approximately 26 miles to the gallon in city conditions. Now let's look at how the Hydrolyzer works. For this particular vehicle, it requires around 97 watts to operate and supplement an engine of this displacement. The MAX Cell draws the electrical power it needs to sustain itself. That electrical load is the water disassociating itself into Oxygen gas at the positive (+) plates and Hydrogen at the negative (-) plates. Electric load relates back to the electric power generator found on ALL vehicles; Otherwise known as the "Alternator".

This alternator converts mechanical energy into electrical energy. Usually mounted along the serpentine belt assembly and is belt driven. That work is done by your engine's crank pulley which would also power your power steering, air conditioning compressor, water pump or some type of emissions device if applicable. Now, at the expense of engine power and GAS (Because of more load) your alternator works to compensate. On Average, most alternators will only draw 5% total of engine power in high demand conditions, so we say our system might draw about 1% extra. A difference you won't feel. The Hydrolyzer will produce enough HHO to pay for itself and then some.

So, your Gas4Free system produces HHO at the expense of what… 1 % power reduction! But will give you a 20% to 80% increase in MPG realistically? Oh my, that is

FREE ENERGY

So let's convert that, 26 MPG times 1.20 (Just 20%)

= **31.2 MPG**

WOW…

26 subtract from 31.2 MPG equates to 5.2 MPG of

FREE ENERGY

What if you get an 80% increase?

IN YOUR POCKET &
OUT OF OUR LUNGS

Old Technology

This is truly nothing new. This technology is older than your oldest living relative, dating back to 1805 in recorded history. Here is a quote from an online resource…

"In 1805, Swiss inventor Isaac De Rivaz was the first to make a car powered by an internal combustion engine. But what did the engine use as fuel, since gasoline wasn't invented till the 1870? Amazingly, the first ICE automobile ran on the HYDROGEN extracted from WATER!

That's right, something that we can't seem to do now was done on a wooden-bodied car just five years after two British scientists discovered how to break up water using electric current! Is it because rainwater is free?

Surely 200 years of technological advancement has given us the ability to improve on something done so long ago."

Here's something you can relate to. We have been suppressed for decades by "Big Oil". Water, which is the most abundant substance on the planet, cannot possibly be sold for any large sums of money. Therefore, a get-rich-quick plan is impossible. It's clean, it's free and it's our future fuel. Just do a search on anyone of those who have been acknowledged at the beginning of this e-book. A wealth of information is available right at your finger tips.

Here is another quoted online resource…

"Jean Joseph Etienne Lenoir was a great Belgian inventor whose accomplishments include improving the design of internal combustion engines.

But in 1860 he built an ICE car that turned water into combustible hydrogen fuel by electroloysis, as it went down the road! Yes, a smog-free vehicle that used a renewable fuel was built way back in 1860!"

Stanley Meyer has made the biggest impact of all the inventors who pioneered this renewable power source. He alone has developed 9 patents that were used to power his 1.6 liter Volkswagen powered dune buggy.

He claimed his dune buggy would only consume 22 US gallons to drive from New York to Los Angeles.

There are several online videos about his achievements and struggles with "Organization X" who wished Stanley Meyer to "Vanish" if you will. You may have seen him on Action 6 News out of Grove City, Ohio where his ingenuous device and dune buggy were first aired on public television.

Unfortunately, Stan Meyer died by a cerebral aneurysm and is presumed by many that he was actually murdered. When he was interviewed during the later years of his life, he constantly mentioned that curtain bodies of power threatened him for exposing this life altering technology to the general public.

THIS IS THE SAME TECHNOLOGY IN YOUR HANDS, The Time for change is NOW!

Gas4Free.com is a group of individuals who are truly on a mission for all of mankind alike.

We believe in an absolute functional system that will not only help us little guys save a buck or two, but to save our environment.

The Gas4Free System is "*Proven Technology*" that will do both.

But this is just the beginning for us. Thousands of people just like you are installing their custom-made systems with phenomenal increases in gas savings.

Stay tuned with us as we are currently in the works of developing other energy saving methods for everyday life. But we will just say that for now.

We Need Your Help

Information is the key to this endeavor and your input is needed. We are developing different approaches weekly, but a couple of million heads are better than a few. Please, if you are keeping track of your fuel savings or have some input in regards to our system; please do not hesitate to contact us with your thoughts, opinions and gains.

We Thank You For It!

Wind of Change… 

If you have been reading everything we have been saying and have grown a passion for the cause, please, keep detailed records of all your efforts like MPG figures before and after and methods that worked and didn't. Honestly, we know some of our competitors are telling you to go and contact your local government official and spread the joy, but the truth is your efforts will go unanswered.

Oil companies are deeply entrenched with our economy

and our government will move or change when the OIL COMPANIES feel ready. However, we highly recommend you spread the joy to your fellow citizens. If more and more individuals come forward with evidence that better methods of increasing your vehicle's MPG are indeed available today, the government will eventually have no choice but to change……..

LET'S START A REVOLUTION! PEACEFULLY

We can do it together!
*Were In This **Together** Now*

Sure, we have developed a sound and reliable Gas4Free HHO gas powerplant and a means to control your cars computer system to allow supplement of this potent fuel, but we are just a resource. It's YOU who holds this endless potential of energy and it is YOU who can promote this to your fellow man or woman. *We kid you not*. Providing an internal combustion engine, sometimes referred as "ICE", with a free and renewable fuel does not just stop at the automotive sector, which is ENORMUS in itself,

We can power motorcycles, boats, houses and commercial buildings as well. Energy crisis no more! Cost of living goes down.

It saddens us when we think about all the effort the greedy, companies that keep us down. Not just about free energy, but everything. Your response is deeply needed so we can spread more information and technology.

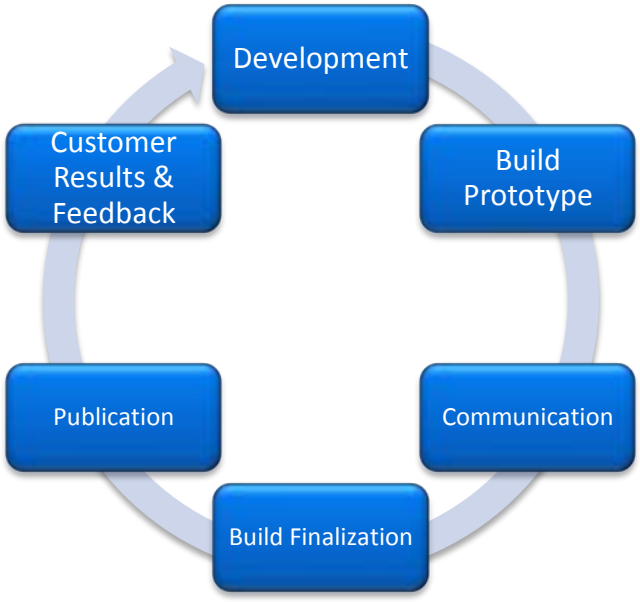
It's simple really. After you have completed building your custom Hydrolyzer, installed it securely, fed all the vacuum hoses to their appropriate locations, added our recommended electrolyte (Table Salt with Hydrogen Peroxide) and distilled water, wired all electric components including the o2 Sensor Enhancer and tested for correct operate you can begin to measure your results.

We will get into testing the operation and a proper means of measuring gains of your Gas4Free system later in this Manual…

Once you have some numbers laid down, you can email us your findings. Please, include anything you find relevant…

- Ease of installation
- Illustrations and use of our guide
- Our method of testing measurement of gain
- Up or down hill differences
- Different gains in curtain temperatures
- Performance gains
- Your thoughts and feeling towards us and our Gas4Free System

Gas4Free Information Cycle



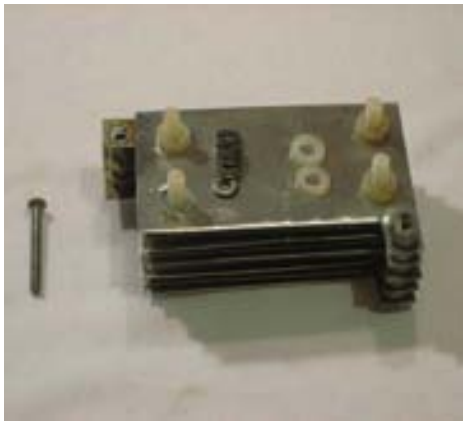
Introducing The Gas4Free System

Alright, it is time we now explain the entire system step by step. I will get into tuning components and operation later in this manual. First off, let's look at all the main components of the Hydrolyzer and Electrical System.

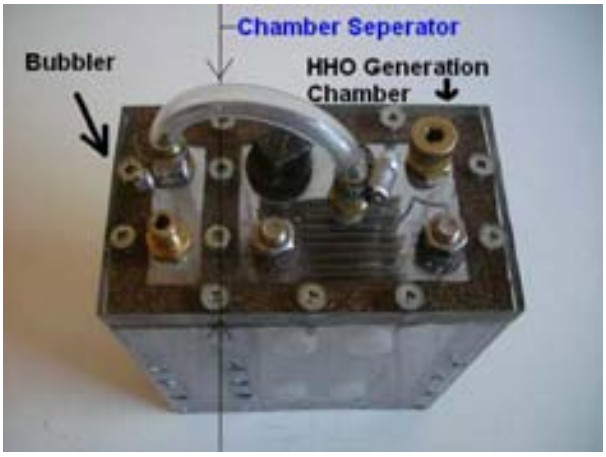
HYDROLYZER

Housing – This is what contains the HHO gas generation from the open atmosphere. Made of Polycarbonate, the housing must withstand heat from both the engine and the electrical heat from the MAX Cell. Climate change is another reason for choosing Polycarbonate as it can handle sub-zero temps. Impact was another consideration but you could smack this stuff with a hammer without a dent. This is certainly no glass jar!

MAX Cell – The MAX Cell has been in development for over 5 years now by Vic Lawson. He was determined to reduce the wattage output (Electrical power = Watts = Voltage X Amperage) to just under 100 watts. And it is just that! At 13.87 Volts and 7 Amps, our cell only draws 97.07 Watts. That's peanuts compared to other systems online. Electrical current runs from the positive cells to the negative cells. The water acts as an electrolyte and load is required to travel through the water. This causes a reaction in the water to un-bond the oxygen and hydrogen, thus giving you HHO gas.



Bubbler – Gas from the HHO generation chamber is transferred to the tube submerged in the bubbler. This gas begins to escape the tube and bubble to the top of the bubbler chamber. This is a backfire safety component. If the engine were ever to backfire the flame would stop at the water and not flow through the water & up the tube into the HHO gas generation chamber.



ELECTRICAL

Relay – This is the electrical switch that we use to turn our Hydrolyzer on or off. This is a common electrical component found in all automotive vehicles. This is how it works… Think of a light switch. You are the force that causes the electrical path to close. (From off to on) A relay uses electricity to power an internal magnet that pulls 2 contact tips together allowing current to flow. That signal is called the trigger.

Wiring – Automotive grade copper insulated wiring should be used. You should get a batch of red and black colored wires to easily indicate positive or negative power. This will ensure you connect it the right way all the time. Get about 5 feet of both at 14 Gauge (Thickness).

Note: If you plan on mounting the system outside the engine bay, make sure that you mount the Hydrolyzer first then use string to measure how much wire you need.

Electrical Connectors – These are the items you will use to ensure a good and clean connection. These connectors are crimped onto the ends of the wires. Connectors come in three colors; red, blue and yellow.

- Red – Used for wire gauge 24 to 18
- Blue – Used for wire gauge 16 to 14 ← This is what we will use
- Yellow – Used for wire gauge 12 to 10

* Wire Gauge means the THICKNESS of the wire. 24 ga. being thin to 10 being thicker and so on

Fuse – This is what we use to protect the wiring system from an electrical fire if the system were to ever "short circuit". We will be using a 20 Amp fuse because we will not exceed 7 Amps. We upped it a little incase of spiking that can occur from time to time.

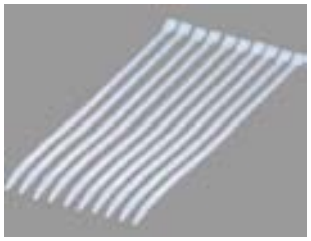
O2 Sensor Enhancer - This little device is referred to as an E.F.I.E or Electronic Fuel Injection Enhancer. You would not need this if you are running a carburetor. Let me explain so you can wrap your head around this.

A computer controlled fuel injection system uses sensors throughout the engine. The information that these sensors send back to the computer determines how much fuel to add or subtract and when to "fire" (ignite) the

cylinder. There are many other functions that modern cars have but that is not what we will be covering.

Do a search on www.google.ca under OBD 1 and OBD 2. You have the option of building yourself or simply buy it from www.fuelsaver-mpg.com The guys there are very helpful. This is what we use to "Lean out" the mixture (Removing some of the gas from the mix) so that HHO gas can take its place.

Odds and Ends **-** Here are some more items that are in the mix as well. 3/8 I.D. (Inner Diameter) vinyl vacuum tube in clear form work well. We opted for the clear so we can get an obvious indication if water is being sucked through the tubing. The 3/8 O.D.



(Outer Diameter) male tube connectors will attach all the tubes (Only 2 tubes used) and the tube clamps to hold them securely. Lets not forget the ½ iron pipe plug or a rubber stopper that is used for a water fill hole cap or plug. Zip–ties are used to hold you entire water hybrid system in place. Use an ample amount; we do not like to do the same job twice! Even worse, replace unnecessary parts do to a loose Hydrolyzer touching the engine.

The Gas4Free System's Development

This system was developed by Technician Vic Lawson. **In the last 8 years, we have seen a massive movement towards improving energy output and efficiency in all energy sectors; one or them being oil consumption.** So, because cost of gasoline plays a role in mark-up for all goods and services, he decided to tackle this dilemma with hopes of improving gas mileage. We had no idea what we were going to uncover. Vic Lawson was playing around with the idea of remote Hydrogen storage (Compressed Gas) and had great success. With the help of Paul Chi, they completely converted a Buick Grand National to run strictly on Hydrogen. THIS WAS GREAT NEWS… But two massive problems occurred:

1. **Common people fear the explosive power of compressed Hydrogen, regardless if the tank is bullet-proof.**

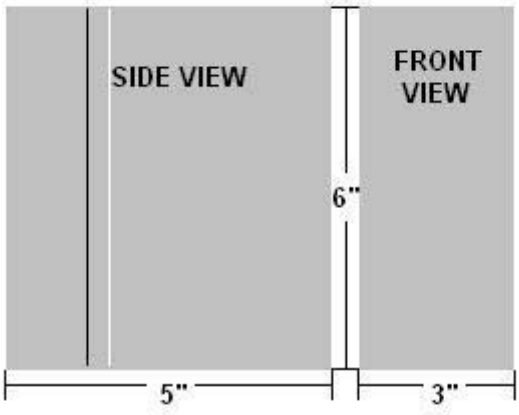
2. **Mass production of Hydrogen promotes more pollution and would severely draw from our already maxed out power grids.**

There goes that idea… So he researched bio-diesel, solar panels and a few other methods. A few things became apparent through all of this digging around. It has to make sense to Joe Average… You. Here is the list of objectives they set-out.

1. Total cost must not exceed cost of fuel for three years. (the shortest lease duration for the middle class)
2. It must not pollute more than current levels
3. The fuel source must be renewable
4. The fuel source must be available and affordable
5. The system must be simple and safe

Using this as a criteria, Vic continued in their search for a viable solution. In November of 2002, Vic stumbled across the use of a cell stack that could be electrified under water to produce low pressure Hydrogen. After 6 years of development, we introduced the MAX cell. Everything from plate size and thickness to spacing and number of plates has been explored. After all stones were turned, they decided that it was time to concentrate on building an electrolizer to house the MAX cell. This is where they came to the thought of incorporating a bubbler directly into the electrolizer itself. This move alone would

allow for much needed space savings that most cars today don't allow much of. The Final dimensions for the housing are 5 inches by 3 inches by 6 inches.



Final Dimensions of the Hydrolyzer

The Wiring was very straight forward with the simple use of a relay system to activate the Hydrolyzer. With the relay trigger wired to a positive source that only powers up when the engine is running, like the power windows or locks, the system will now turn on and off with the engine. The fuse is for the power side (I will explain later in the manual) of the relay. Both the relay and Hydrolyzer can be grounded to the frame of the car. Piece of cake!

Now we move on the vacuum route. Vic has chosen to mount the tube fitting before the throttle body aiming straight into the center of the air duct if possible. But here is something to consider if you are not familiar with an "ICE" (Internal Combustion Engine) intake manifold airflow dynamics. Manifold vacuum is strong when the engine is at idle.

That is because the throttle plate is at the closed position. (Foot off gas pedal) That plate is not air tight, it just gives the engine enough air to keep idling. Your engine can breathe more air than your allowing it at this point so vacuum is generated. It's like putting air in a tire but in reverse. You build up pressure because your tire really doesn't blow up like a balloon so air is forced to compress. In this case, if you were to suck out all the air the tire would go flat but it wouldn't cave in. It would require many inches of vacuum to pull that off but it

could be done. Now this vacuum is sucking at its best at idle which means all of the HHO gas you are producing would go through the motor at this level of RPM.

If you know anything about a car you know the harder you stay on the gas the more gas you use. So does it make sense to mount the tube fitting at manifold vacuum? NOT AT ALL! But so many others out there are selling it as such. It just saddens us further.

The best location for the vacuum hook-up in the intake tube is anywhere BEFORE the throttle valve. This is sometimes referred to as the butterfly valve or throttle body. Vacuum will be low at idle and will only draw minimal amounts of HHO gas. However, as you begin to accelerate, vacuum will rise until maximum RPM is reached. This means as demand rises for more gas, more vacuum draw will occur at the Hydrolyzer. So when your engine requires more air and gas, it will also receive more HHO gas. Now that makes sense.

Let's move on to the o2 Sensor Enhancer. This little gizmo is a must for all EFI (Electronic Fuel Injection) vehicles. Carbureted engines are easily tunable by means of ignition timing and carburetor flow jet changes. I will explain in detail in book 2. This device has been available since the late 1990's and is the ONLY WAY to truly adjust the fuel mixture. The o2 sensor, which is mounted in your exhaust manifold, senses the oxygen level in your exhaust fumes to measure how much fuel to add. Because we have to remove some fuel from the mix, the o2 sensor enhancer will electronically fool your computer to remove a minor amount. Please be advised, there are 2 types of emissions controlled computers. **Vic says this is a MUST in order to see HUGH GAINS!!!**

Mounting was the last thing on the list seeing that there is always a solution. This is very simple. As you look under the hood of your car you will notice that most components are well secured. So, all you need to do is zip-tie your Hydrolyzer to any secure location as long as it is more than 3 inches away from the engine, transmission and exhaust. As for the radiator, any distance will do providing that it doesn't touch directly.

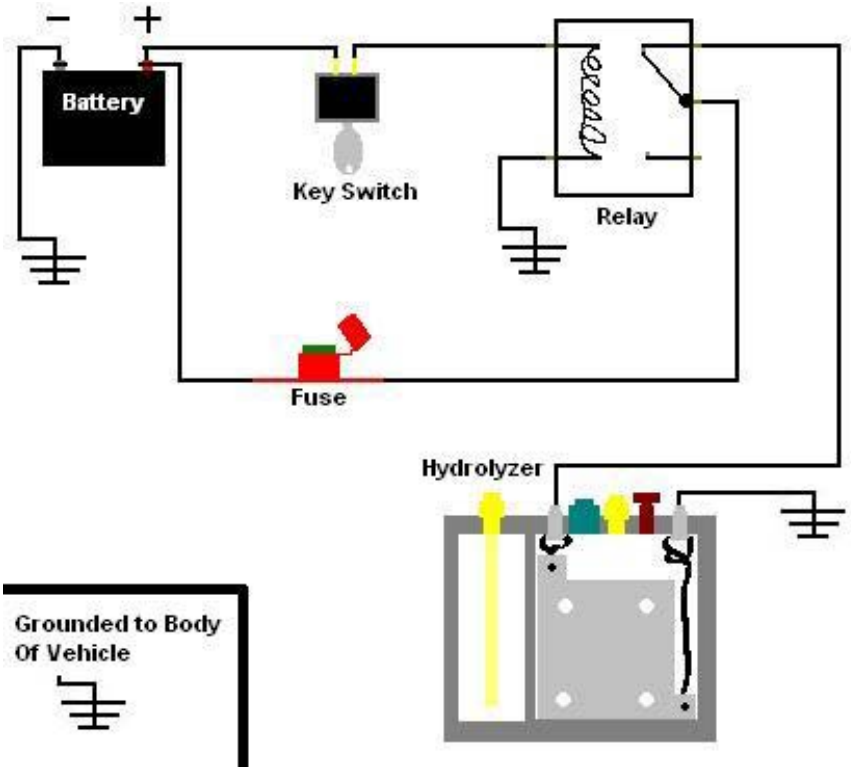
Please Note: Do not mount your Hydrolyzer on the engine, transmission or on the radiator itself! ESPECIALLY NOT THE EXHAUST!

How The System Works

Here, I am going to explain what happens once you have completed the construction and installation of you **Gas4Free** system. This is so you have a clear understanding of what is going on. There are 4 major areas that are required to make this system work. These include Electrical, HHO generation, Vacuum Action and O_2 Sensor Enhancement.

1. ELECTRICAL:

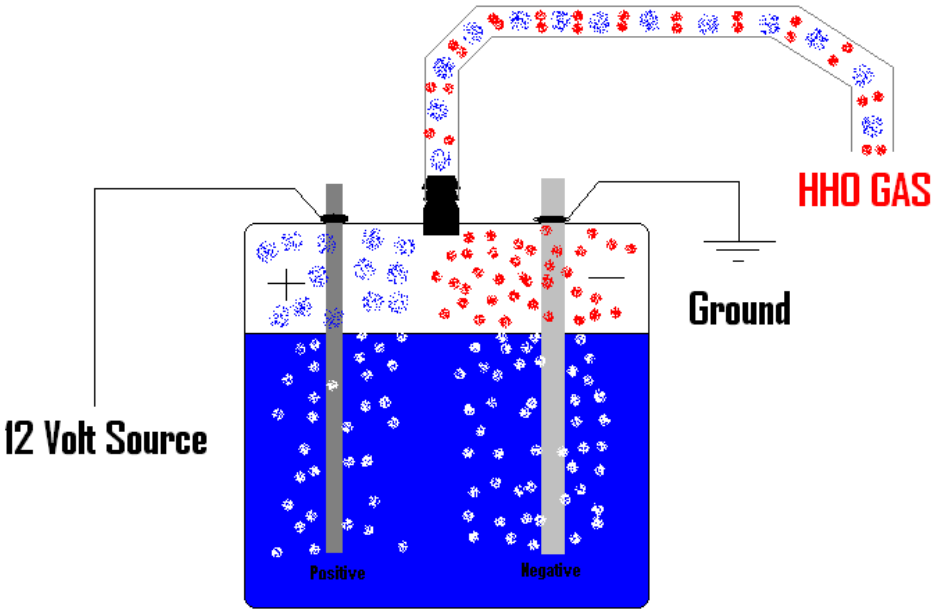
Power from you battery sits at your key switch, waiting for you to start the engine. Once you have turned the key and started the car, the relay you wired gets power and allows direct power from the battery. The fuse is in-line from Battery to the relay to protect it from a short. Just to answer your question, the trigger wire from your key switch is already fused so no worries there ☺… Once the positive plates are equalized (Charged), electrical current travels from the positive plates to the negative plates. Because water is not a great conductor of electricity, it becomes a load on the circuit (like installing a light bulb). "Power on" diagram below.



2. HHO GENERATION:

As electricity travels through the water, the compound bond between the Oxygen and Hydrogen become undone. The Hydrogen molecules are separated at the submerged surface area of the negative plate itself as the Oxygen does the same on the positive plate, **thus giving you HHO gas**. The electrolyte (Catalyst) that we use is hydrogen peroxide. We noted the best results using this as opposed to baking soda. We also use table salt. This will yield the best gains of all. The table salt will also help with the cold weather and resist freezing of the water during the winter.

Electrolyte Mixture: *Covered in The Final Tune…*
1 Tablespoon of Hydrogen Peroxide at 3%
6 Tablespoons of Table Salt (Crushed)



Warning!!!

This device is not a joke and should be taken VERY SERIOUSLY!

When you apply power to your built electrolyzer, IT WILL GENERATE HYDROGEN. If the vacuum tubes are not secure or the water fill cap is undone, that hydrogen is exposed to the environment that YOU are in. A minor spark from a cigarette lighter or match will ignite the gas.

We are not liable for any injuries, damages or violations of any applicable law.

3. Vacuum:

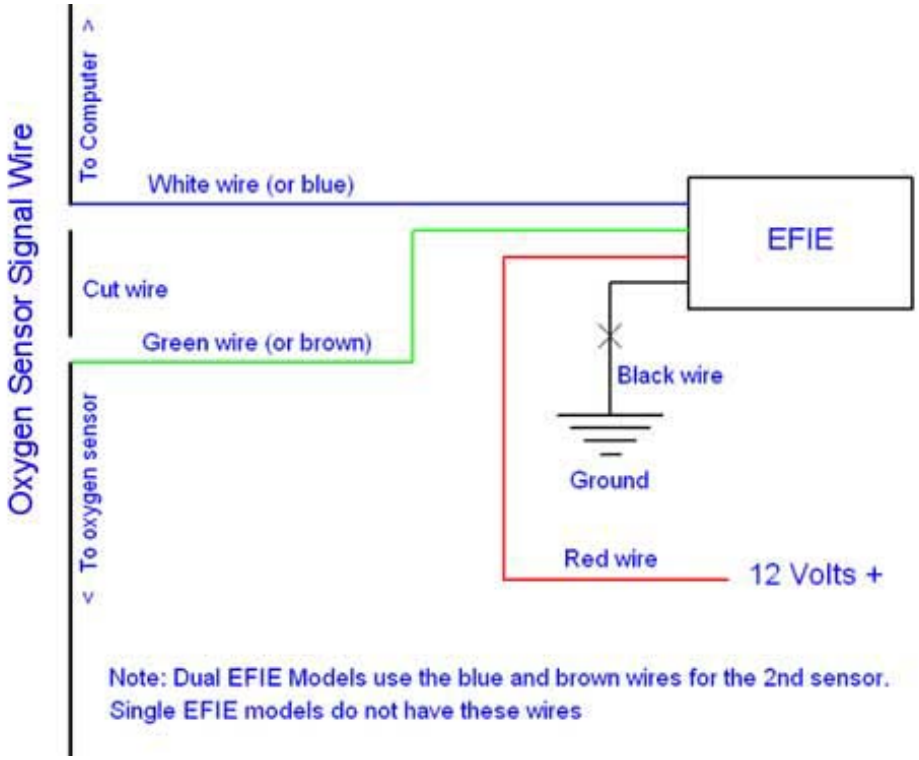
Remember that you have an air valve that is screwed into the top of the Hydrolyzer. But let's start at the engine. As we said before, the engine creates vacuum in the air intake ducting. This vacuum will apply a "sucking" affect right to the Hydrolyzer. It will then pull at the water in the bubbler. Because water is heavier than air, the air valve will extract air from the out-side environment and through the bubbler. Now, once this has occurred, you should turn the valve clockwise until you hear air restricting at the valve. **Make sure that valve is opened all the way before you start the engine.**

4. O2 Sensor Enhancement:

Once all the wiring and mounting of the EFIE have been completed, it is time to "turn on" this unit. When you turn this device on; there is a toggle on/off switch, the o2 sensor reading from the sensor itself is interrupted by the EFIE. The reading from the sensor is in Volts.

The EFIE takes the reading from the sensor and give the computer the same reading but a couple of points lower to **tell the computer to inject less fuel**. You will have the ability to adjust how much or little. All the details will be discussed later in Phase 4. The computer is the most gullible thing in existence. "Garbage in = Garbage out" is the saying with computers today as they will only do what you tell them to do. Your computer will not wake-up and say "No, that's not right!" This device is designed to work with the computer. Not against.

Some vehicles will have 2 o2 sensors, but we got that covered and so does www.fuelsaver-mpg.com They have two EFIE units, Single o2 and Dual. There are other o2 sensors that are used for OBD 2 computers (All 1995 made vehicles and newer) but are only in place to detect a bad catalytic converter. We are only concerned with any o2 sensors between the engine and catalytic converter. Here is a peak of the EFIE setup.



But I'm not a skilled builder…

Alright, so what if you were to have sections of this hydrolyzer built by someone else? Or even have experts build it for you completely. We have a couple of different ways to build this system. It will be more expensive to go about it in this manner but it will save you time. And to some, that's more important. Especially if you do not feel confident in building this yourself. Here are the other options we speak of…

Note: Get the materials yourself! Do not allow a mechanic or other tradesman use an alternate grade of materials or parts, particularly the Stainless Steel and the polycarbonate unless it's Teflon or Nylon. All under water or water exposed metal HAS TO BE WATERPROOF.

Option #1

Have someone build the Housing, Max Cell and buy the O_2 sensor enhancer but you will finish the install yourself.

1. **Housing:** **Have a local carpentry shop (woodworking) to build you the housing for you**. Print off **PHASE 1**, purchase the Polycarbonate plastic with all other materials required, and give them the plans with the materials. At this point, tell them that it will be used for holding water so that they use a good amount of silicon sealant. **Have them do the following**

    1. Cut all 7 pieces
    2. Drill and counter sink each hole
    3. Apply silicon to all edged mating surface
    4. Immediately screw all pieces together
    5. Pre-drill all fittings at the top (i.e. male tube connector holes)
    6. Allow 24 hours for adhesive to cure

2. **MAX Cell:** Once you have received all 11 pieces of your Stainless Steel plates and fasteners, you can visit a local machine shop. Print off **PHASE 2** of this instruction manual and **have them perform the following tasks**

   - Cut out 5 Positive Plates
   - Cut out 6 Negative Plates
   - Drill out 4 main holes
   - Drill out the Positive connector holes
   - Drill out the Negative connector holes
   - Assemble Cell

Note: All plates must be aligned when drilled.

3. **EFIE (O_2 Sensor Enhancer):** This is the easiest step of them all. Simply visit www.fuelsaver-mpg.com and order ether a single O_2 or dual O_2 EFIE box. It comes complete and ready to install. Check out their store section!

Here is an estimate of the total cost of option #1:	
1. HOUSING (Sub-Contractor Labor Cost)	$100.00 USD
2. MAX CELL (Sub-Contractor Labor Cost)	$50.00 USD
3. O_2 Sensor Enhancer (Built Retail Price)	$79.95 USD

Option #2

Have a professional build and install the system completely.

Now that you have the Hydrolyzer and the EFIE in hand, you can now take them along with the rest of the materials like the wiring, rubber stopper, relay and zip-tie straps to a local auto shop. I will warn you now; you should call the shop in advance because some shops will not install such a device because they most likely have not installed something like this before. They are more than capable of doing it but they have not seen a water hybrid first hand and will be doubtful.

Some of these guys would also love to see it work as well. But either way, call in advance and explain that you have 2 devices to install on your car. 1 item to wire into the o2 sensor and another to mount under the hood of the car, wire the device to activate while the engine is running and hook-up a vacuum tube to the intake. Just print them PHASE 3, 4, 5 and THE FINAL TUNE. Custom or performance shops are a good choice

Materials

So now you are ready to begin your build and you're guessing "Were do I begin…" Well, that's why you purchased this eBook in the first place. Start with rounding up all the materials you need first.

Materials:

You will first start sourcing out your parts from the build list of parts via internet or through local stores. Items like the vacuum tubes, clamp fittings and male tube connector are items that are readily available at your local Pep Boys, Napa or any other automotive supply stores. The Polycarbonate and stainless steel will have to be purchased through suppliers like Metal Supermarkets and the Plastic Store. Here are some of those links:

Stainless Steel	www.metalsupermarkets.com
Polycarbonate	www.redwoodplastics.com
EFIE O_2 Sensor Enhancer	www.fuelsaver-mpg.com
Air Valve	www.mastertoolrepair.com
Male Tube Connectors	www.thomasnet.com
Wiring, Relay and Connectors (Terminals)	www.wiringproducts.com
Marine Cable	www.defender.com
Nylon Fasteners (Bolts, Nuts and Washers)	www.thomasnet.com
Stainless Steel Fasteners (Bolts, Nuts, Washers and Housing Screws) S/S screws are better that deck screws	www.stainless-fasteners.com
Zip Ties (Cable Ties)	www.kss.com.tw

Cork Gasket	www.acehardware.com
Rubber Stopper	www.indigo.com
In-Line Fuse Holder Kit (30 Amp)	www.elecdirect.com
Silicone Sealant	www.automationsupply.ca
Vinyl tube clamps	www.idealtridon.com

Vinyl tubing and bubbler tube is not worth ordering. Just pick some up at your local auto parts or hardware supplier.

Gas4Free System Parts List

Here is your build list:

Materials	**Quantity**	**Cost** (Approx.)
Stainless Steel Plates Grade 316 2"5/8 by 4"1/4	11	$ 25.39
Stainless Steel Marine Cable	1 FT	$ 0.40
Stainless Steel Bolts 1" by 3/8" 18 Thread	2	$ 1.50
Stainless Steel Locking Washers 3/8	4	$ 0.40
Stainless Steel Nuts 3/8	4	$ 0.60
Galvanized Deck Screws 1" long	Box of 50	$ 1.50
Polycarbonate Plastic 8" by 36" at ½ Inch Thickness	1	$ 26.88
Air Compressor Water Drain Plug	1	$ 2.59
3/8 O.D. Male Tube Connectors	4	$ 7.25
5/16 Tube Clamp Fittings	Box of 20	$ 3.75
1/4 I.D. Vacuum Tubing (Or 3/8 O.D.)	5 FT	$ 4.00
Nylon Bolts 2" by 5/16 (Tapered Head)	4	$ 1.80
Nylon Finishing Washer 5/16 (Tapered)	4	$ 0.50
Nylon Washers 5/16	80	$ 7.50
Nylon Lock Nuts 5/16 (1.5 mm Thick)	4	$ 0.40
Stainless Steel Machine Bolts 2” by ¼ O.D.	4	$ 2.69
Stainless Steel Flat Washers For ¼ Bolt (0.375 mm Thick)	100	$ 5.00
Stainless Steel Locking Nut for ¼ Bolt	2	$ 0.40
O_2 Sensor Enhancer (by pieces for assembly)	33	$ 40.58
Red 14 Ga. Wire	5FT	$ 2.99
Black 14 Ga. Wire	5FT	$ 2.99
5 pin Universal 12 Volt Relay	1	$ 1.99

20 Amp Fuse Holder Kit	1	$ 1.89
Assorted Electrical Connectors (Blue)	Box of 25	$ 3.75
Cork Gasket Maker Sheet 12" by 12"	1	$ 3.49
Materials	**Quantity**	**Cost** (Approx.)
Clear Silicon Adhesive	1 Tube	$ 3.75
Rubber Stopper (18mm Hole)	1	$ 0.15
1/4 O.D. Vinyl Tube (Or 3/8 O.D.)	1 FT	$ 1.69

* Stainless Steel plates are 24 ga.
* Stainless Steel marine cable is 20 ga.
* The marine cable usually comes in 316(L) grade. Ask to be sure or look and the SKU # or product tag. The gauge of the wire is not that important as long as it is in a similar size.
* The list of parts to build the o2 sensor enhancer is included in the file titled “o2 sensor enhancer guide”

PHASE 1:
Construction of Hydrolyzer Housing

All of your materials are in, so it is TIME TO BUILD! Let's start with the housing itself. The housing will consist of 7 Polycarbonate pieces. The housing is the most "time Consuming" phase of them all. Mind you get a lot in return. We have been running this device for 2 years without one hiccup. This was on the prototype too!

ALL 7 PIECES

Here are all the measurements piece by piece:

Piece #	Length	Width
1	5	5 1/2
2	5	5 1/2
3	5 1/2	2
4	5 1/2	2
5	4	2
6	5	3
7	5	2

Another reason we used Polycarbonate is because it's clear.

Part 1 – Cutting the Housing Walls

Cut it Piece by Piece…

Let's begin by cutting all 7 pieces. There are TONS of pictures in case I am not clear. Pay attention to my **highlighted tips** as it may help save you a headache and time.

Note: We only use inches for measuring.

Required Tools and Markers:

1. An edged triangle
2. Measuring tape
3. A pencil or pen

4. A table saw

Piece #1:

Alright, so let's start at the first piece. **Remember, the thickness of the plastic sheet is half an inch (1/2")** this means we only need to think about each piece from a 2 dimensional standpoint. This is a side piece and it has to be cut.

The specs are: 5" by 5" 1/2

When placing the plastic sheet on the saw, make sure it that the backing is square. Being "square" means that there is no curve to a line; in other words, perfectly flat.

Now cut off 6 inches off that piece. If you're wondering why I said 6 and not 5 is because you should trust is to be square from the supplier you got it from. You

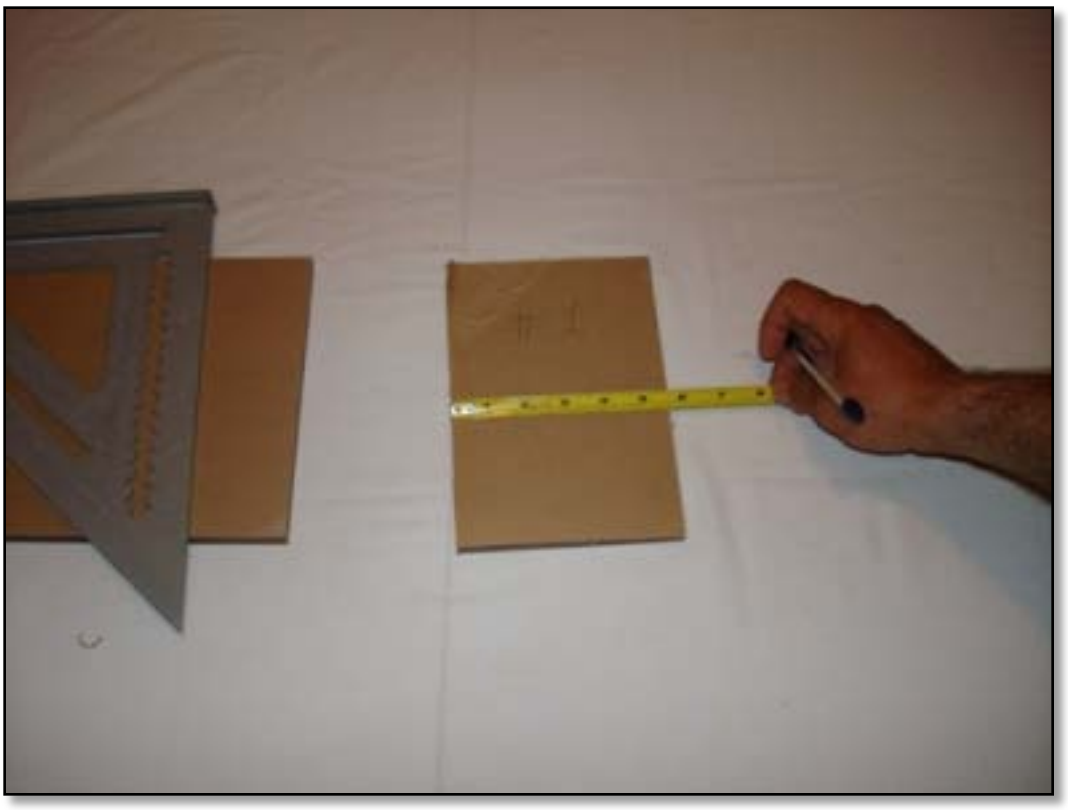
will cut extra for all your pieces. There is enough for all the pieces and some in case of an accident ☺.

Now place the cut end on the back guide and line up the saw blade to just trim off the least amount of material but just enough to give you a perfect square end.

You now have 2 cut and squared ends.

Note: Be sure you know which ends are cut! Use a pencil, pen or parker to indicate a cut and square end.

With only the square ends touching the guide, trim and square the other two ends off. You don't need to cut all 4 sides as you could cut the exact size from both the non-square end but this is full-proof way so you can measure from any end you wish. Now that all ends are square, begin your measurements…

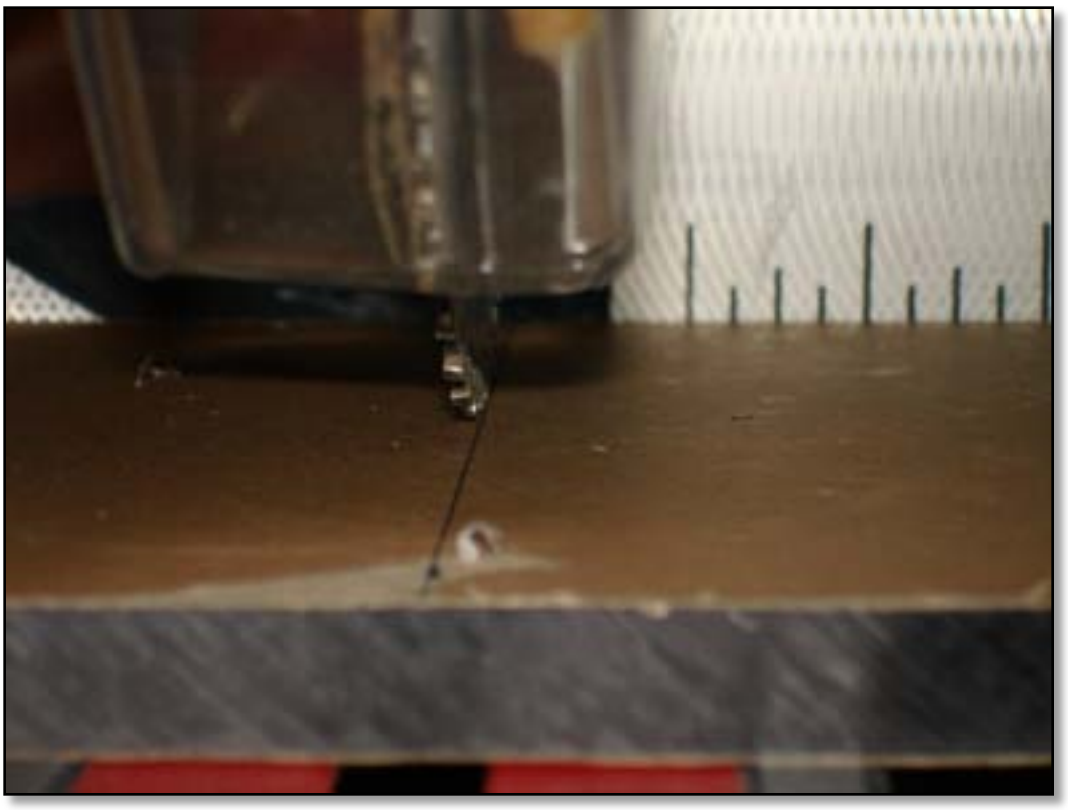


YOU SHOULD ONLY MEASURE FROM SQUARED ENDS

The piece is now 6 by 8. When you mark your measurements, make sure there is a good distance between them. Mark two “dots” per line.

AFTER YOU MAKE YOUR LINES, MARK AN “X” ON THE BAD PIECES

Now cut off those waste pieces. When you’re ready to cut along the good pieces, make sure the blade is butted up to the line; not cutting through it!



That’s an ideal line up of the blade

Here is what you SHOULD have after you trim off the bad ends of piece #1

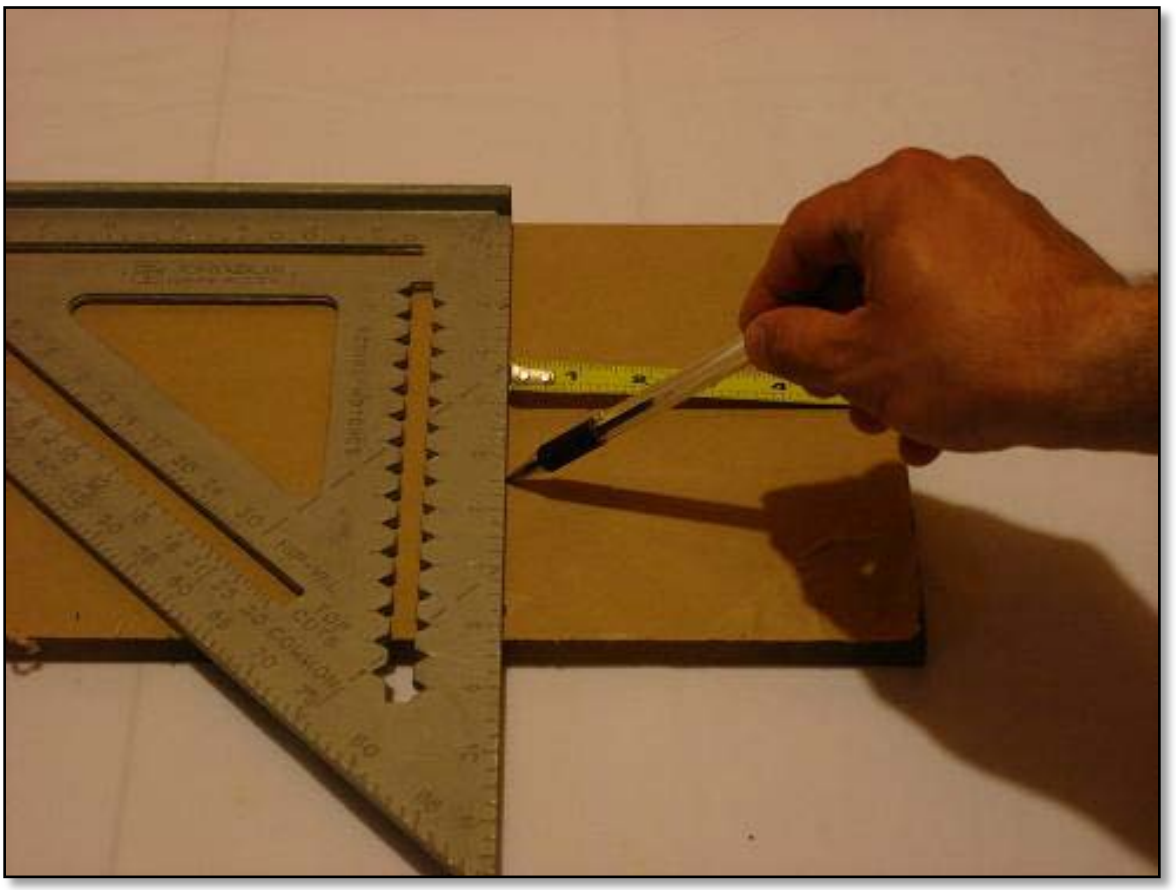
Now that you have finished piece #1, let's move on to piece #2.

Piece #2

Piece #2 is an exact duplicate of Piece #1. You should repeat all the steps and you will have the same result. So let's recap! This is a side piece and it has to be cut.

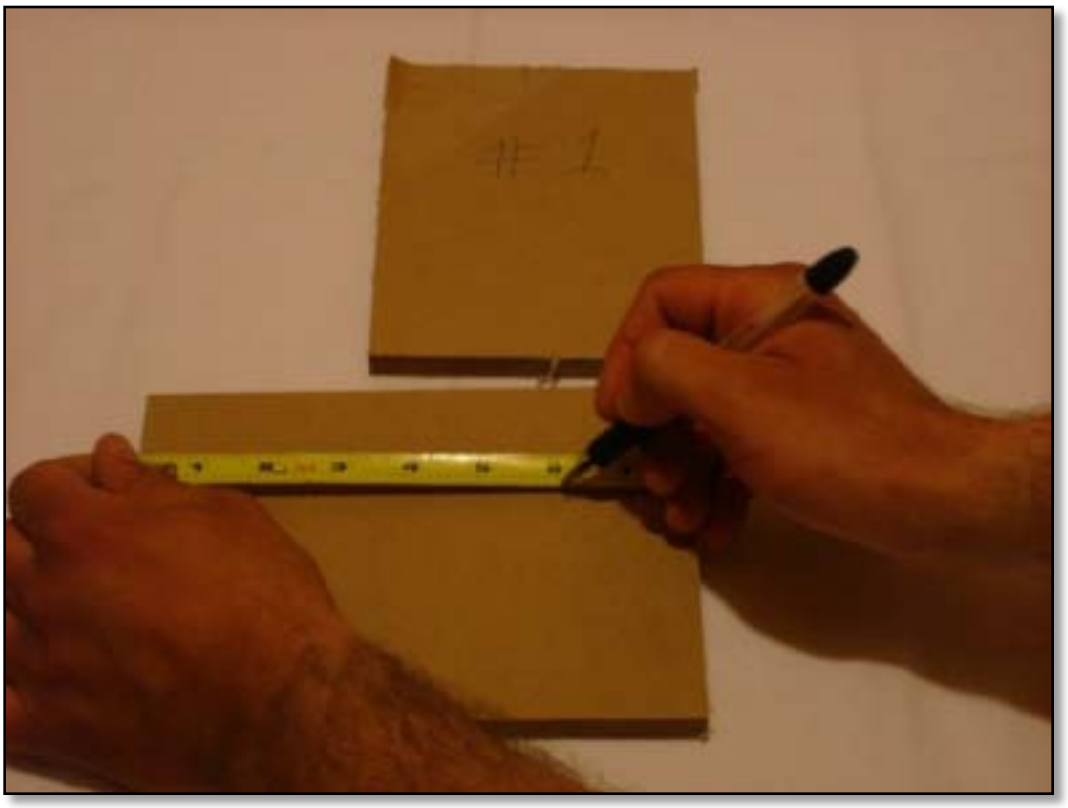
The specs are: 5" by 5" ½

Measure 6 inches from the cut-end side of the Polycarbonate sheet. Remember to mark two dots and draw a line straight through them.



Notice the lip at the one side of the protractor. This is ideal to ensure the flattest line possible.

Tip: Be sure to always MEASURE TWICE and CUT ONCE.



Making sure to mark all the squared ends of the piece, trim all non marked ends (not cut) of the piece. This piece is the opposite side of the Hydrolyzer.

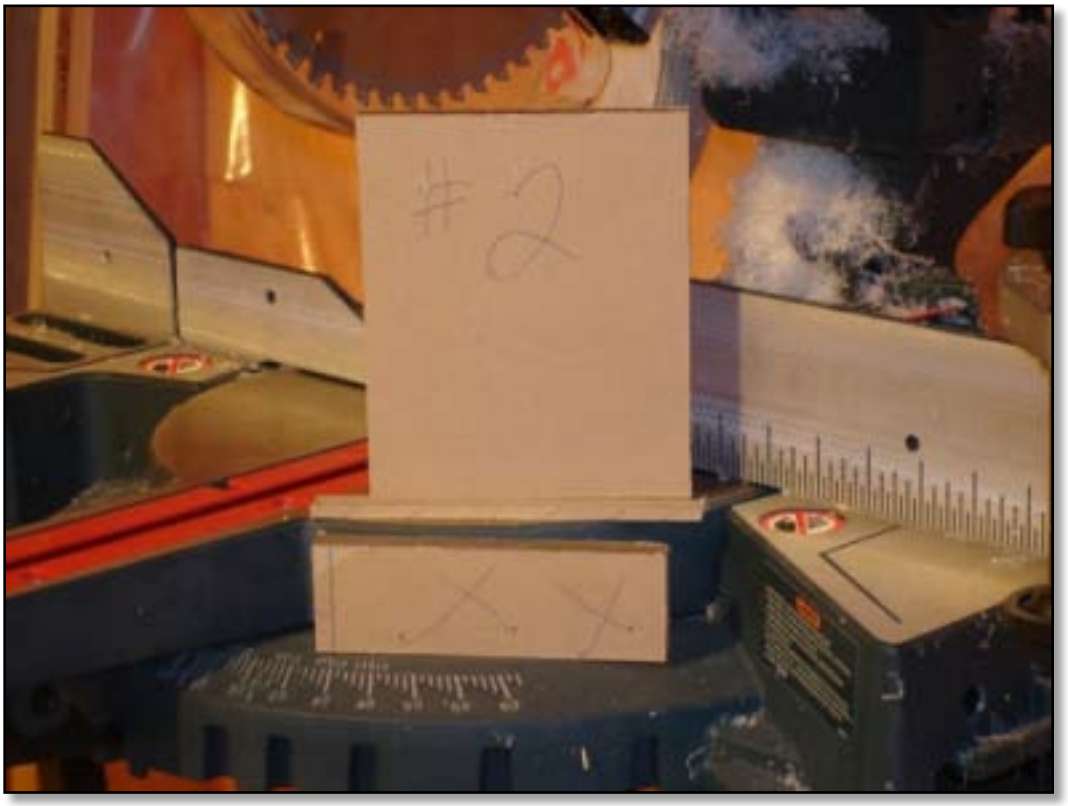
The specs are: 5” by 5” 1/2

Mark both of your measurements and draw the lines. Make sure again to mark the disposable ends with an “X”

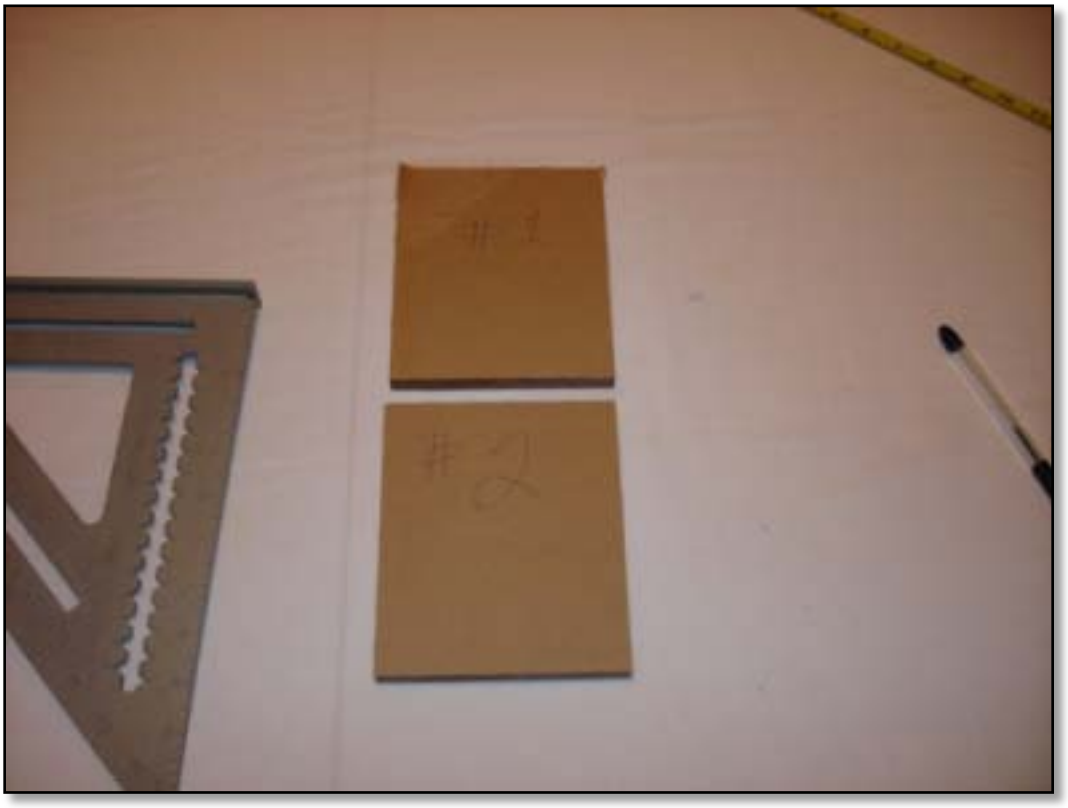
Vic is a nut when it comes to perfection. He suggests that you line up piece #1 with piece #2 after you cut off the bad ends. This will indicate the squareness of your cuts and will show you if you have a problem. DON'T forget you can e-mail Vic if you have a problem.

Go ahead and trim off the bad ends to piece #2.

This is what the end result of piece #2 should be



Let’s compare pieces 1 & 2



Thinking Ahead

Cutting and squaring every piece is necessary but it would become annoying. So here is a little something to cut down on the cutting time.

You will group a couple of pieces in one whole piece. After you square that piece, you can use it to make 2 or 3 pieces.

You are now going to cut 2 large pieces:

One cut of 6” 1/2 by 8” (Width of plastic)
Another cut of 5” 1/2 by 8” (Width of plastic)

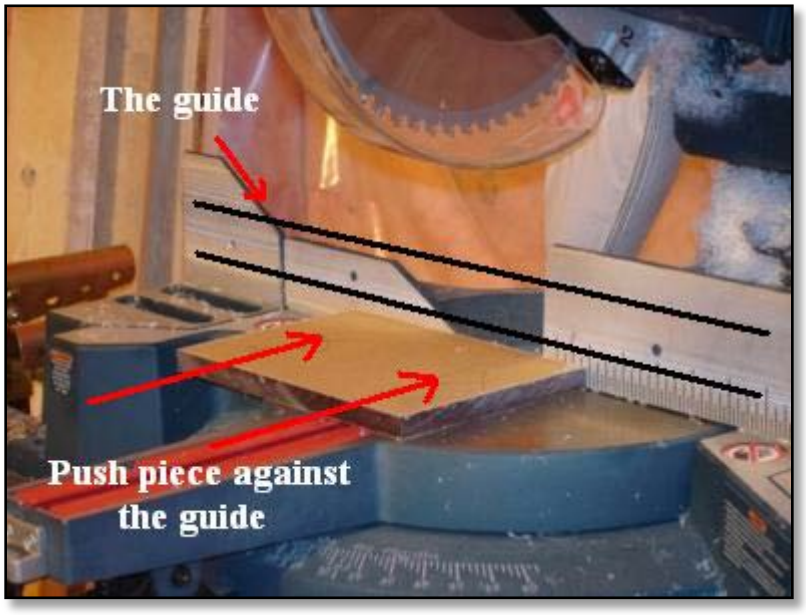
The 6” 1/2 by 8” will be used for:

- Piece #3
- Piece #4
- Piece #7

While the second cut of 5” 1/2 by 8” will be used for:

- Piece #5
- Piece #6

Again, ONLY USE an end that has been cut from the saw as it is square. Hold the piece along the guide-end of the saw.

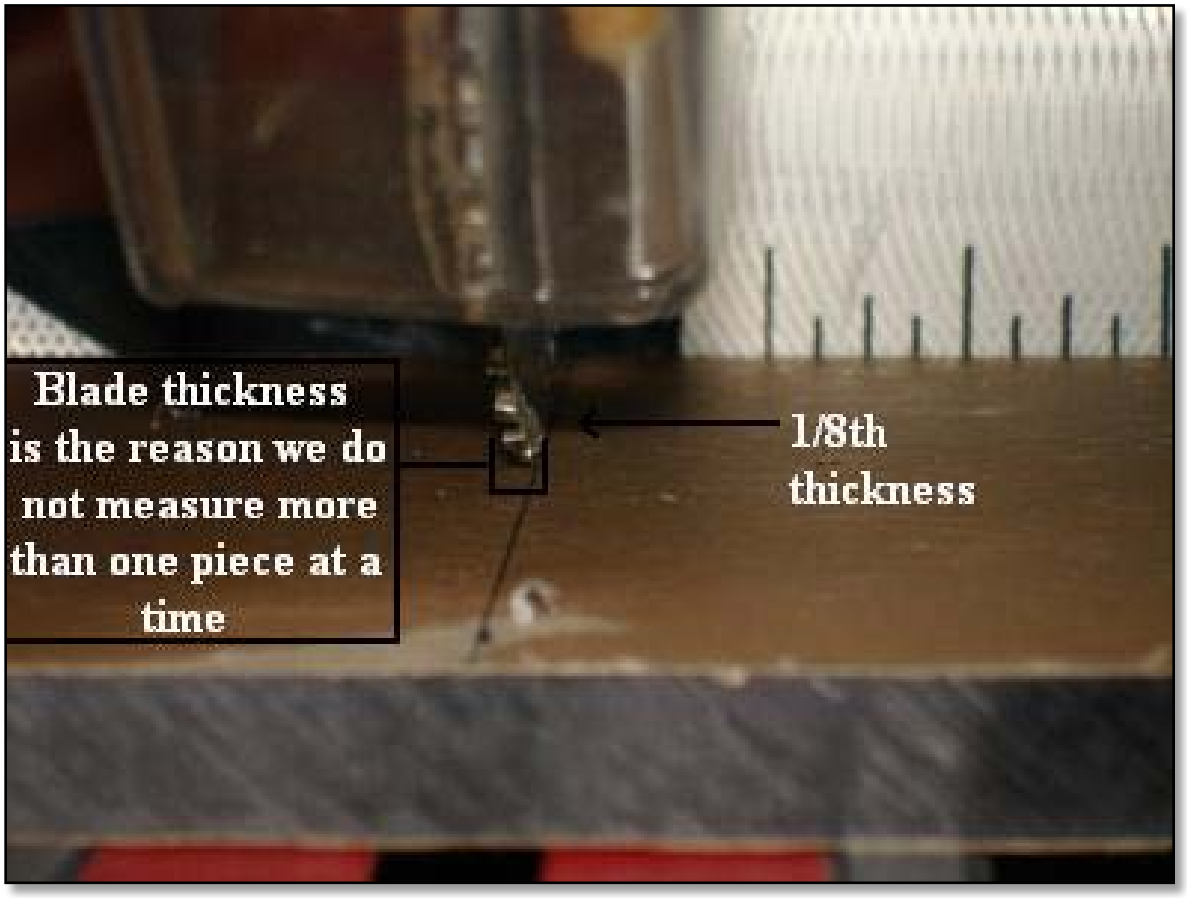


First: Cut the 6” 1/2 by 8” piece

Begin squaring of this piece and continue till you have cut all 4 sides.

This one piece is for pieces # 3, 4 and 7 and in that order. You will measure and cut ONE piece at a time. Do not measure and mark all of your pieces and then cut; you must take in account for the blade thickness itself. You lost about a 1/8th of an inch just for the cut alone.

Look and the picture on page 53
(The next page)



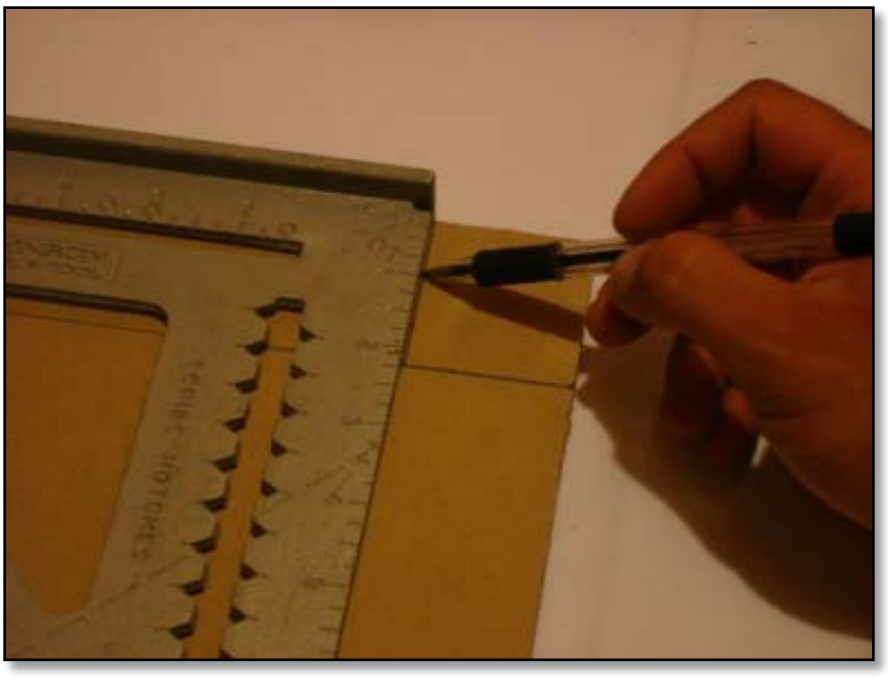
Tip: Make sure the blade is on the non finished side.

Piece #3:

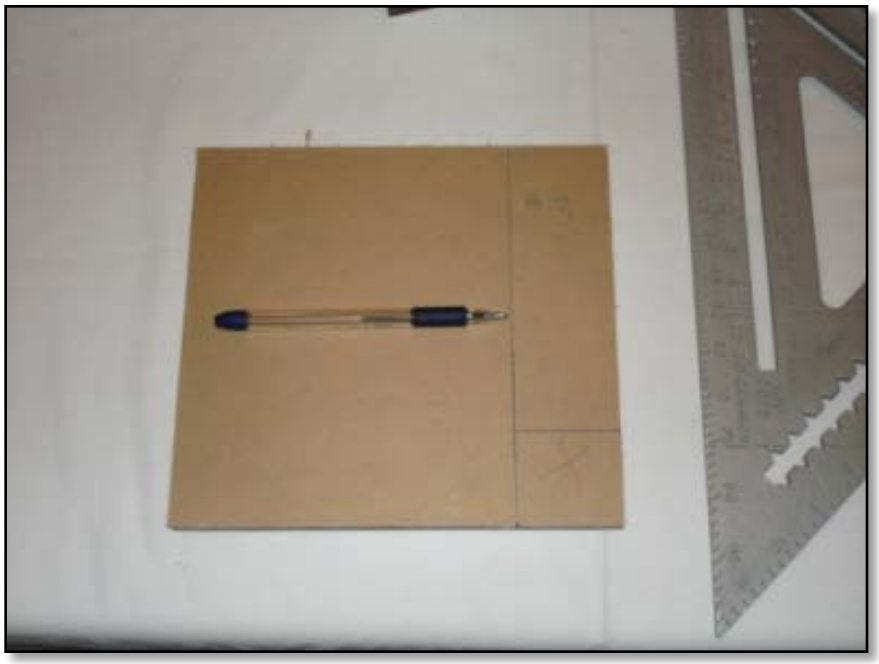
The specs are: 2” by 5” 1/2

So from the 6” 1/2 side, measure out 2 inches. Mark the usual two dot indicators and draw your line.

Within that 2 Inches, measure 5” 1/2 inches along the 8” side. Mark your line dots and draw the second line from the 2” line to the end of the board. (The 2” end!)

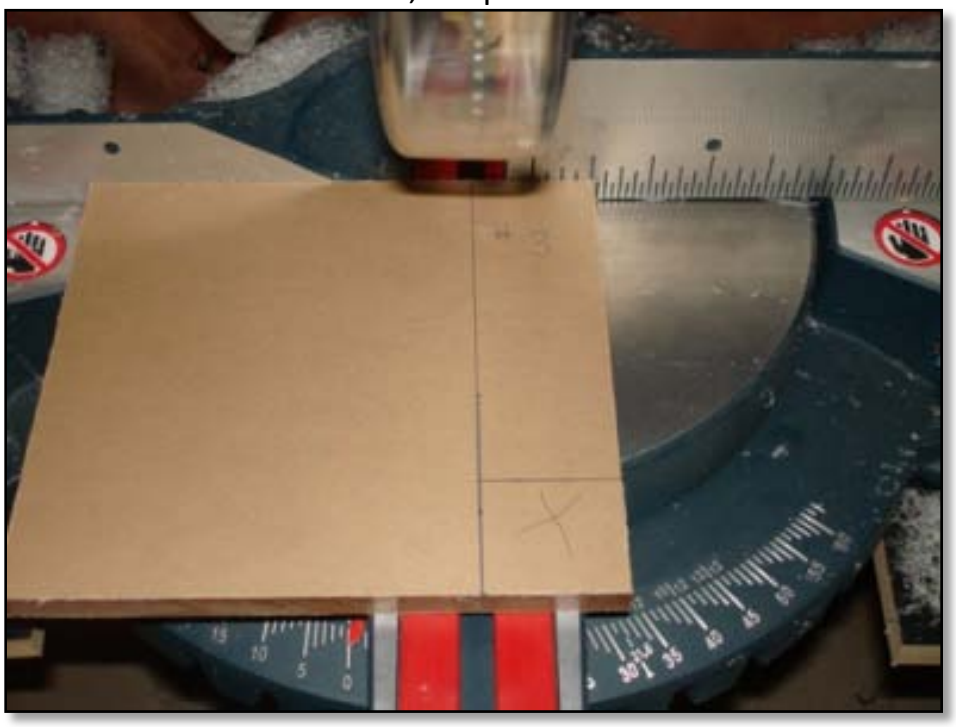


It should look like this

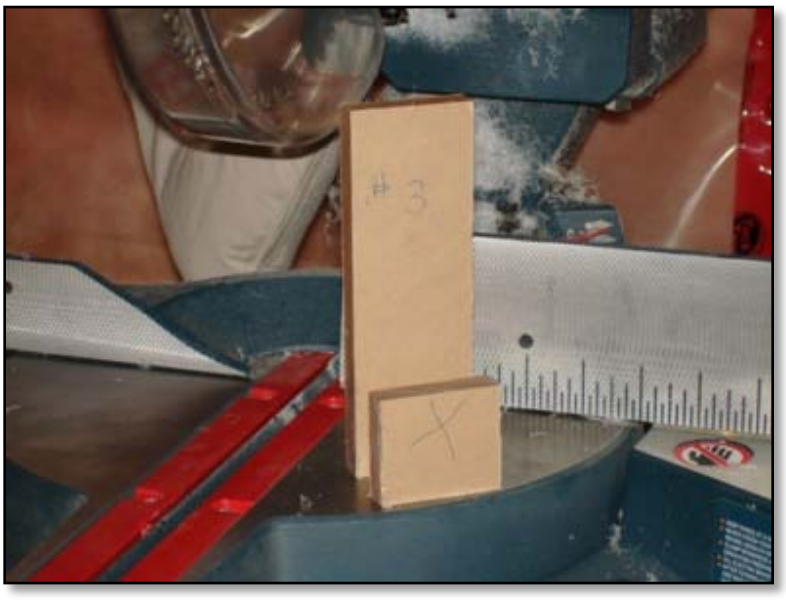


As you can see, the end to be discarded has been marked with an “X”. You must always use indicators to orient you. If you were to be distracted by someone or something, the last thing you want is to spend and hour just figuring out where you left off.

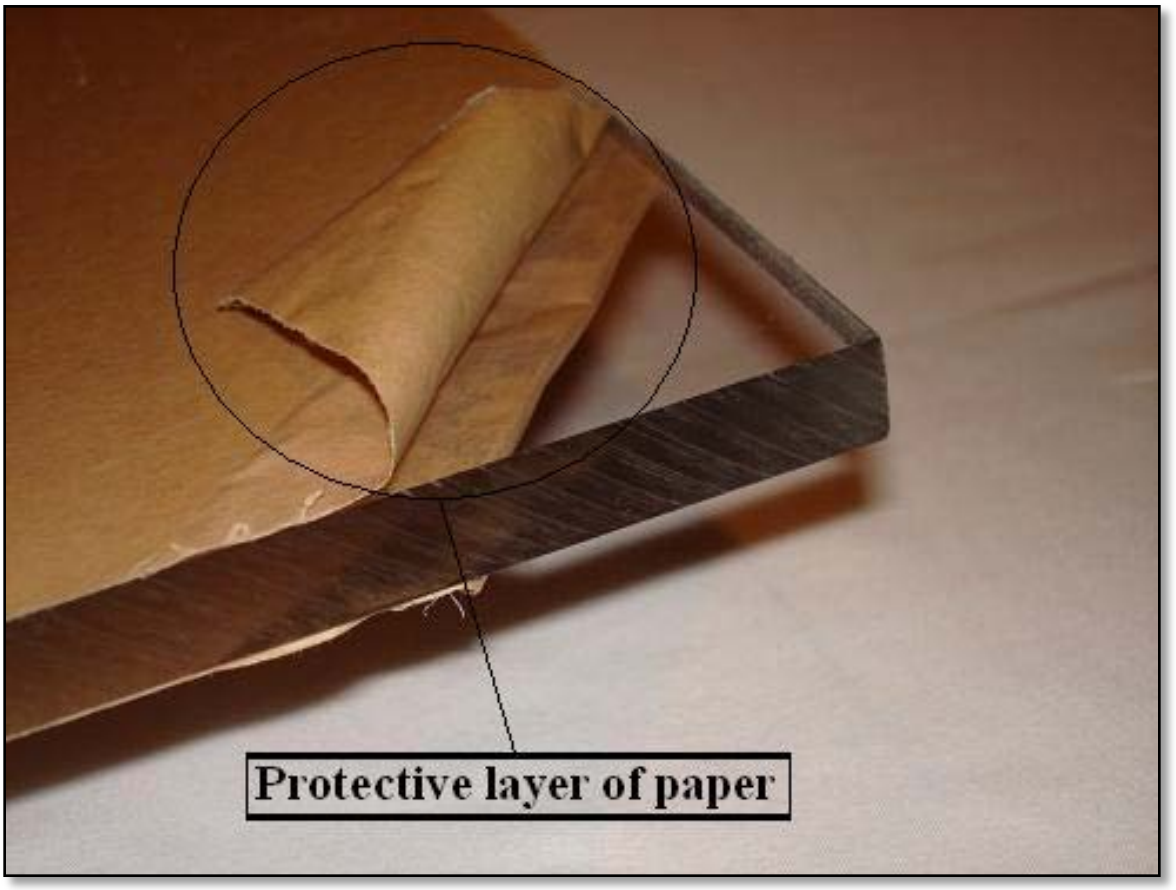
Now, cut piece #3.



Here is the what the piece looks like finished



Note: You may have notice that we kept the protective paper layer on the plastic. That is because we can write on it. You will be marking out the drill points out after you complete this section.



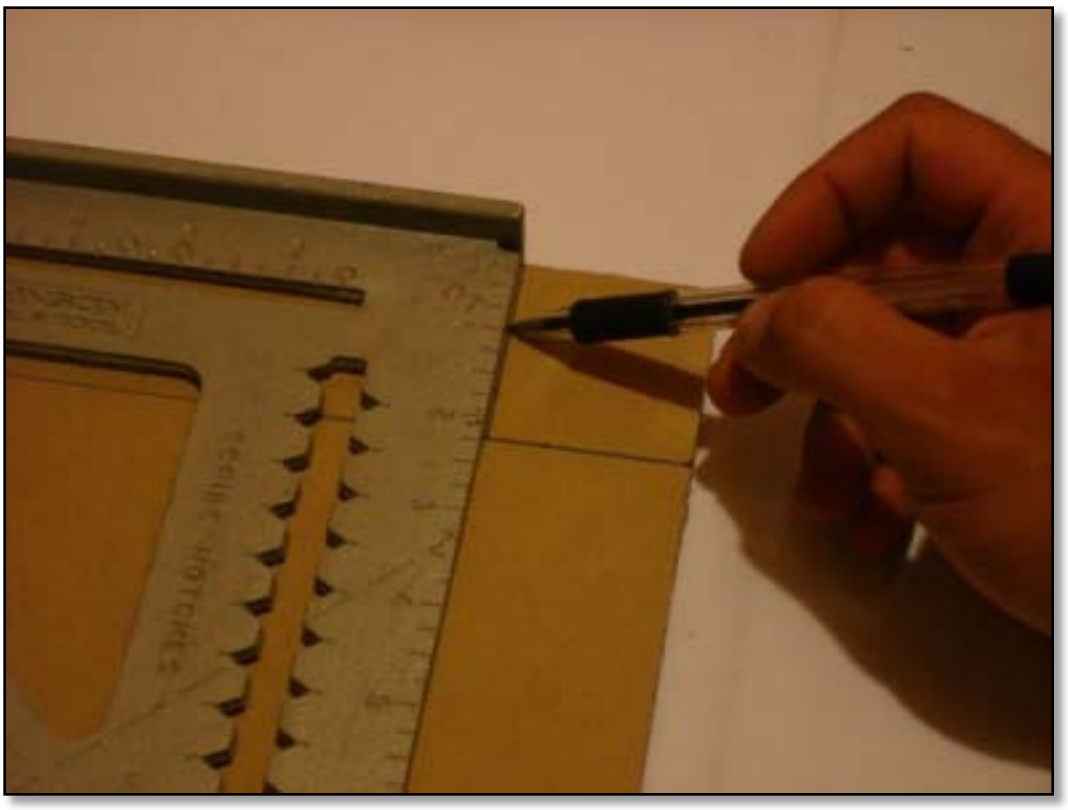
Now that piece #3 is done, let's start piece #4. Piece #3 and #4 also share the same dimensions like #1 and #2. Basically, you have to repeat the same steps.

Piece #4:

The specs are: 2” by 5” 1/2

Measure 2 inches from the end from the remainder piece you just cut.

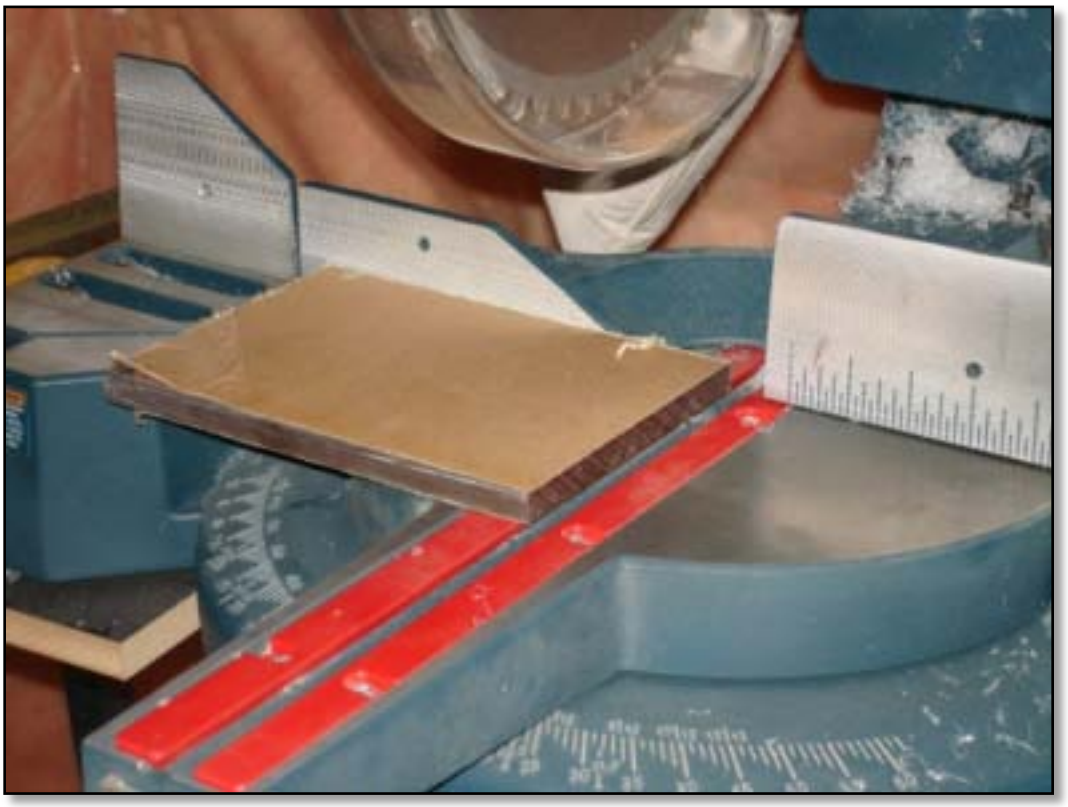
Mark your line indicators and draw your line. Now, on the end of the 8” long end, mark two 5” 1/2 dots and draw your line.



Again, you are just repeating the steps to piece #3, but there is a way to make this speed up the process.

Pieces #1 & 2 are identical just like pieces #3 & 4. You can just cut one of the finished pieces and use it to trace the outline of the next cut.

Simply lay the raw piece to be cut on a flat surface and push one of the edges against a squared end.



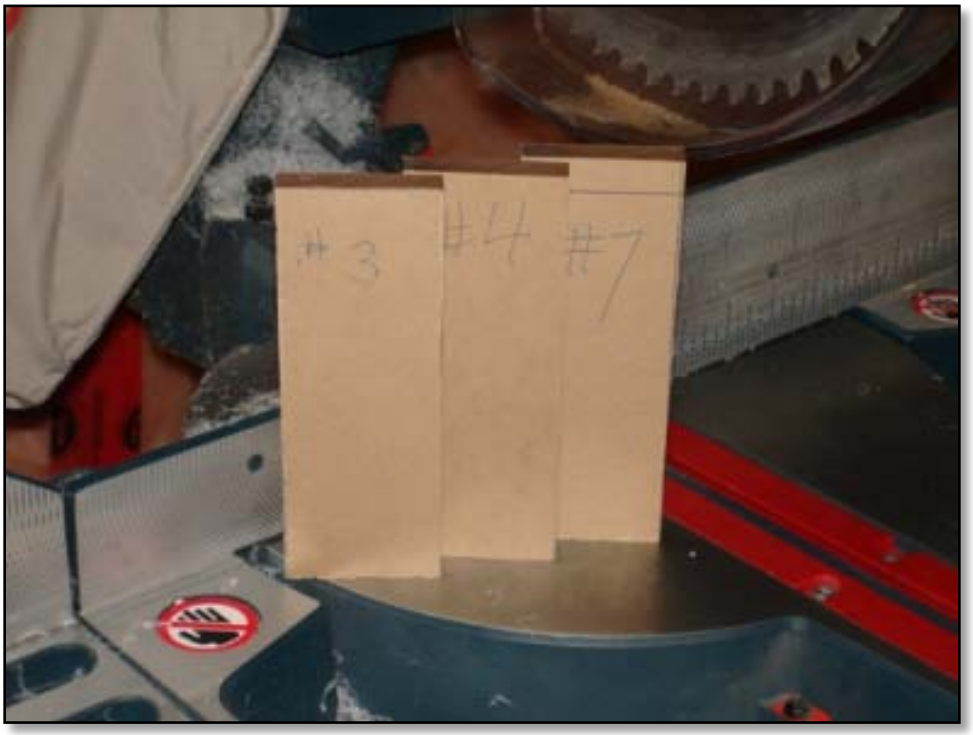
Vic just used the table saw because it is squared.

Now, place the piece you wish to duplicate on top of the raw piece and line it up the same corner of both pieces against the squared side of the guide.

Use a scrap piece of plastic to line-up the pieces evenly.
Just like on page 61.

Now, trace the outline of the finished piece. The photo below shows Vic duplicating piece #3 to make piece #4. **Make sure that when you cut a trace piece that the blade fills the marked line.**

We can also make piece #7 in the same way but you will have to measure and cut the length at 5 inches and oppose to 5” 1/2.



Notice the 1/2 inch line on piece #7? You still have to cut that off.
So let’s do it again.

Piece #7

The specs are: 2” by 5”

Take the remainder of the 6” 1/2 by 8” and lay it on the saw. Line up the pieces against the guide and use a scrap piece of plastic to square the open side of the corner.

Tip: Some table saws come with a hold-down mechanism to hold the material being cut from moving. It is recommended that you use this feature.

Trace the outline again making sure you don’t move the pieces. Now cut off the scrap ends.

REMINDER:

WHEN CUTTING TRACE PIECES, YOU MUST LINE THE BLADE TO FILL THE LINE YOU MADE!

This is because the pen traces the “outside” of the piece. The ink is actually surrounding the finished piece.

After you cut all three pieces they should line up perfectly.

Stack them and stand them on each end to verify flatness.

Just perfect!

Now you're starting to see it coming together! ☺

You will now move on to the second raw piece you squared.

5” 1/2 by 8

This piece will give you pieces #5 and 6

Piece #5:

The specs are: 2” by 4”

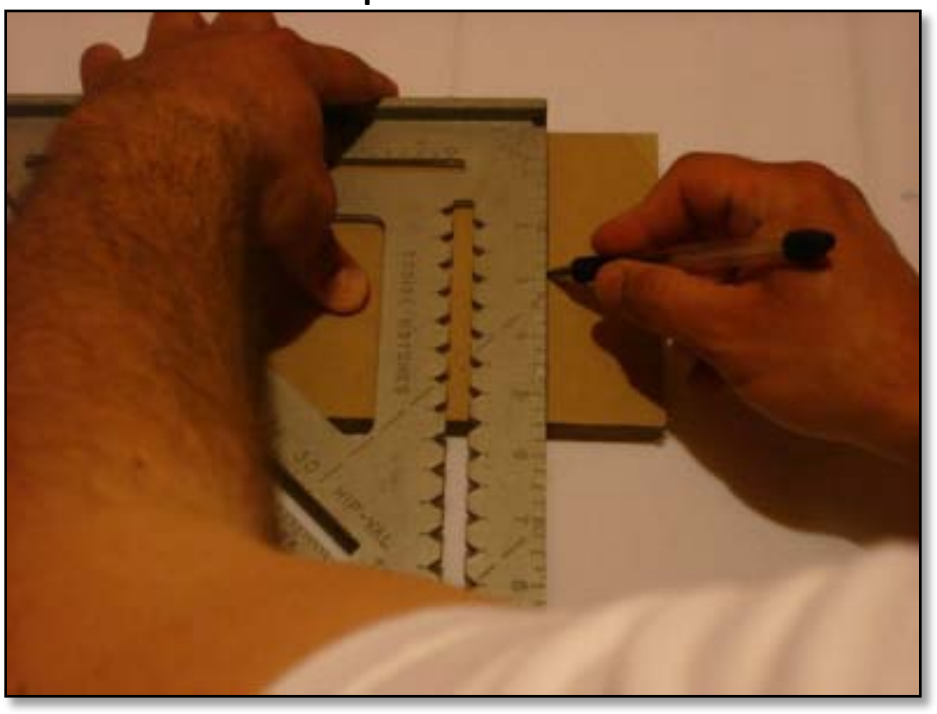
At this point, you have completed all 4 walls of the Hydrolyzer and the inner partition for the bubbler. Piece #5 is the bottom piece to this housing.

Run the measuring tape across the short ends of the raw piece, mark two indicator dots for your cut line.

You may have noticed that there are actually 4 pieces that have a 2” width. We separate piece #5 so that you don’t get lost in a “one track mind frame”

Measure 2 inches across the piece at opposite ends. Use your edged triangle to draw your line.

Look at the picture above and below.



Now measure 4” from the long end and mark your indicators. Again, draw your line. Now cut at the 4” line.

This is what you have left

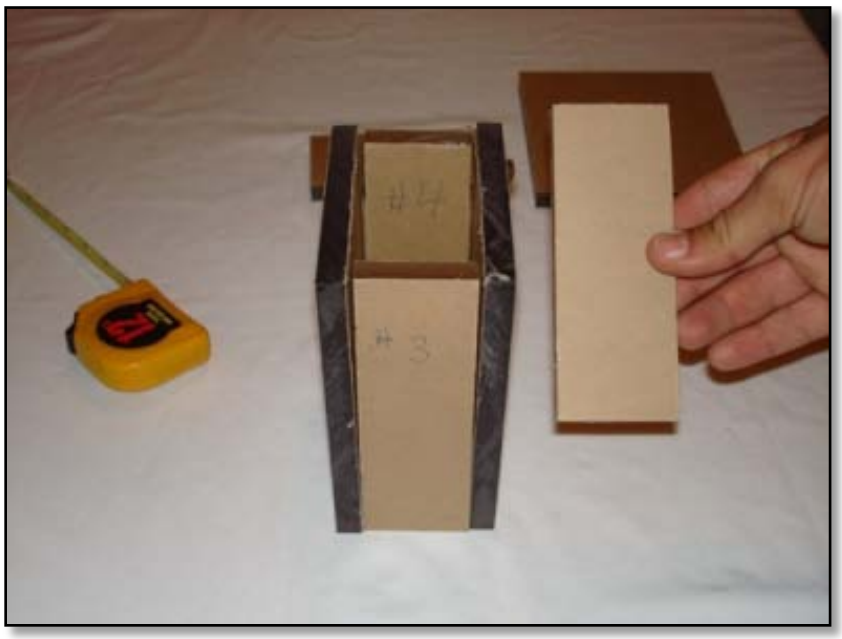
Mark the discarded end with an “X”

You will now cut-off the scrap end.

Note: Cutting Polycarbonate leaves long and thin “stringy” pieces around the cutting section of your table saw. We highly recommend you clean the area so that it doesn’t interfere with the straightness of your cuts.

This is the finished piece

You will now have 6 of the 7 pieces complete. Now is a good time to line-up all the pieces you just cut to see how they fit together.



If by chance you notice an edge of a piece out of spec, there is a way to correct it. A minuscule change in the housing's dimensions (like 1/8th of an inch) is not going to adversely affect the performance of the Hydrolyzer itself.

So if you do notice one of the ends is slightly out of place, here is what you can do to straighten things out.

You have to think about

- What piece is cut
- How it relates to the other pieces
- What other pieces will have to be cut
- If it is worth the attention (Build another)

If you have to shorten piece #1 at the 5” end, you will have to cut pieces #2, 5 and 6. That is because they all run along the same direction.

If you had to shorten the height side of piece #1 (5” 1/2), you would have to trim pieces # 3, 4, 2 and 7.

That’s because the all run the height of the Hydrolyzer.

You must record what you have done because it might affect your MAX cell dimensions. The 3” thickness is the third dimension and follows the same rule.

If piece # 3 had to be trimmed shorter than 2”, than you must cut pieces #4, 7, 5 and 6.

I’m sure you understand that for whatever piece you trim, you have to trim the other pieces in it sequenced direction.

For trimming the identical pieces, you simple should just stack them, line them up and trim them together.

Piece #6:

The specs are: 5” by 3”

This is the last piece you are going to cut for your housing. This piece is set on the top of the Hydrolyzer itself. You will be incorporating the adjustable air valve, rubber stopper fill cap, all 3 3/8 O.D. male hose connectors and the two power stainless steel electrical terminal bolts.

Here is a shot you will be seeing soon enough,

Take the remainder of the Polycarbonate and begin your measurements.

Measure 5” down from the 8” end and mark your two indicator dots. Like always, use your ruler or triangle and draw your line.

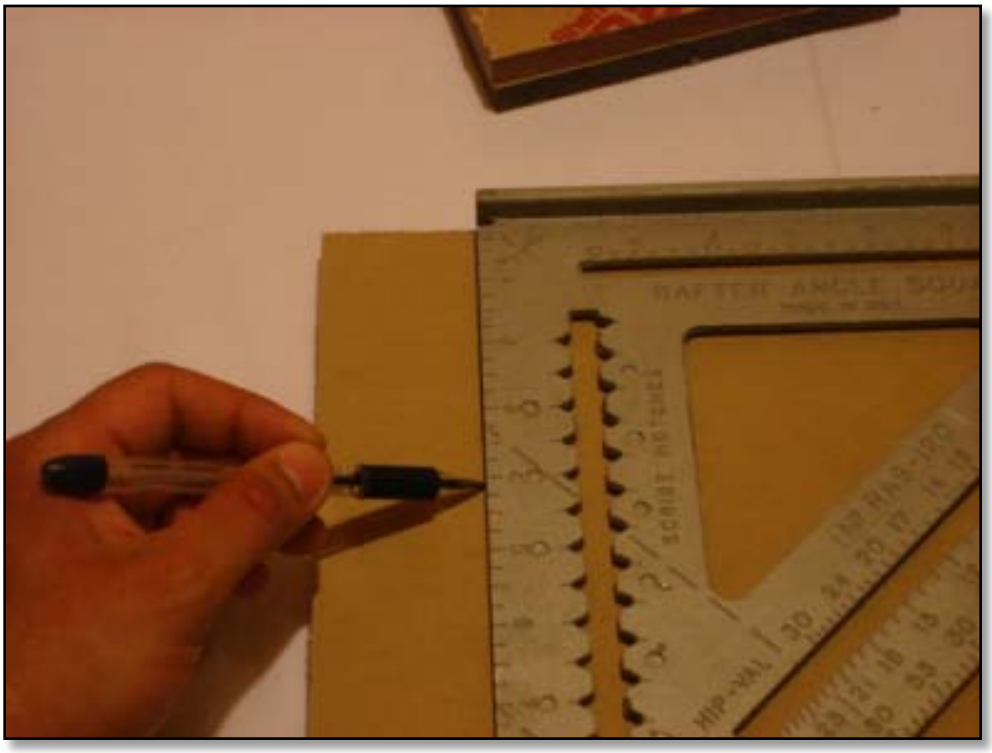
The photo above shows you the wrong way of measuring pieces like this.

When you are cutting short pieces in general on table saws, you want to be holding the “bulk” end of the piece. That is because you want your hands at the furthest part away from the blade. By measuring your 5” along the 8” keeps your hands away from the path of the cut.

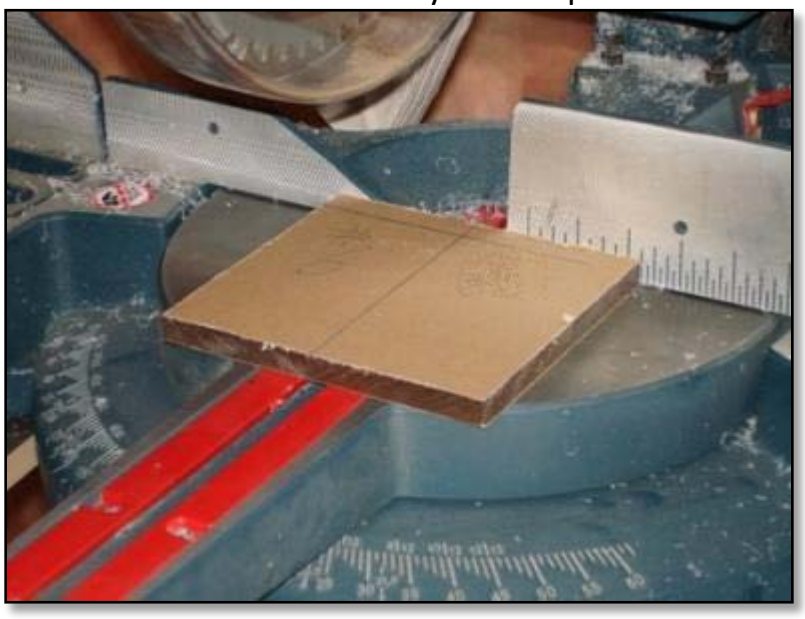
Makes sense right…

Now, run the tape measure along the width of the board, measure out your 3” line dots.

Now draw your lines.



Go ahead and cut your last piece.



Piece #6 is done.

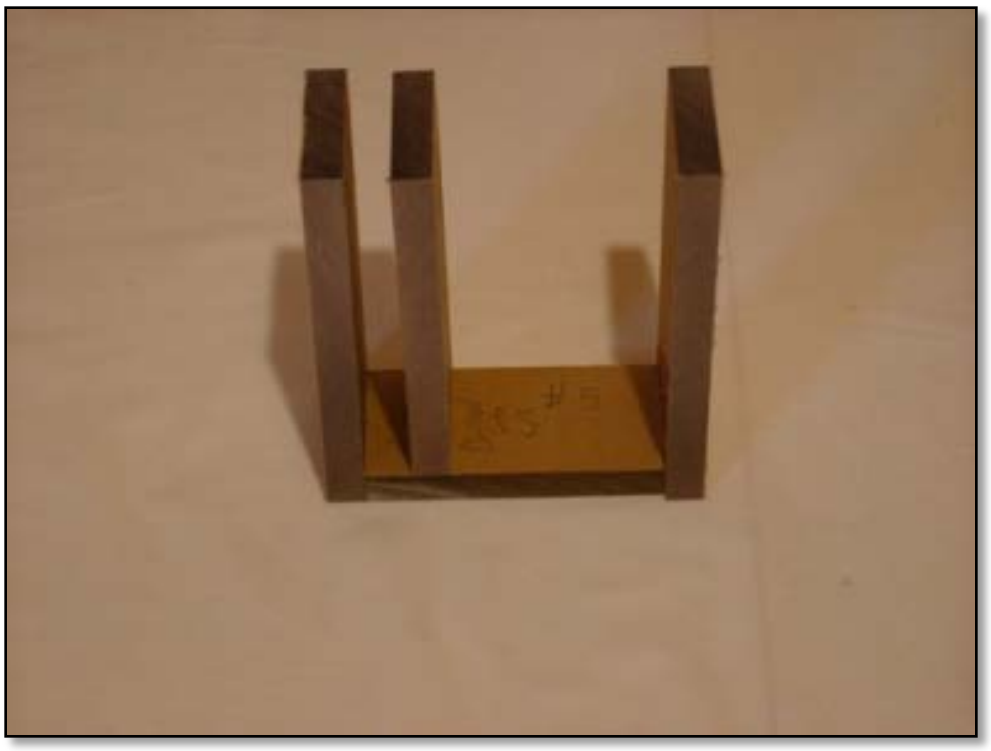
That took Vic about 20 minutes to complete. It will take you a bit longer since it's the first time you've made these cuts.

Congratulation!

You have just completed the first part in this build. This is what you should be looking at.

At this point you are lining up all the pieces together to see how it all fits. We encourage that you do just that.

Lay piece #5 in front of you with the length running side to side. Take pieces #3, 4 and 7, and stand piece #3 at one end and stand piece #4 and the other. Now take piece #7, measure a ½ inch in on piece #5 from piece #3's side. The next page will show you exactly that.



Here you will take piece #1 and 2 and place them standing up along the opposite sides of piece #5.

Now Place piece # 6; the last piece on top of the housing and look at the box you just made. You should push down very lightly on top of piece #6 and see how the pieces engage one another. We are just test fitting here before we move on to TEIR 2 of this build.

Note: Vic says he was in utter love with this project after he completed this Part. When you actually can see the silhouette of something you built from scratch fills you with a sense of accomplishment.

Fun is the key word here.

Part 2 – Housing Assembly

Putting it together…

All 7 pieces are now made and we can move on to the next step towards completion of your Gas4Free System. Now that you have a physical idea of how the housing comes together, it's time to perform the following steps:

1. Drill Out Mounting Holes
2. Countersink Mounting Holes
3. Silicone Seal Bonding Pieces
4. Final Assembly
5. Fabricate Maintenance Gasket

Again, there are going to be tips throughout each step to ensure you save your time and $$$$$ money. Patience is required in this Part because you don't want to mess up the pieces you just made. If you do make a mistake, you might have to cut that particular piece or pieces and perform the same task again. We don't like that either so pay attention. Take Your Time!

Tools Required

Electric Drill	Screw Driver	Knife or Exacto Blade	Adjustable Wrench	Socket Set
				

Step 1:

Here, you are going to see why we said to keep the protective layer on the plastic pieces in the first place. You are going to mark your indicator lines again to show you the thickness of the piece you are going to drill into so that you can mark the spot you will be drilling.

Indicator lines shown with holes drilled and countersunk

You don't necessarily have to draw lines for the dots that mark the drill holes. You still have to measure where the holes go but you can freehand the dot but try to get it in the middle between the line and the edge of the piece.

A table vice would be very helpful if you own one. They are priced reasonably for what they are worth. You can even pick them up from a garage sale for around $10.

A vice is not necessary but it's like a second pair of hands.

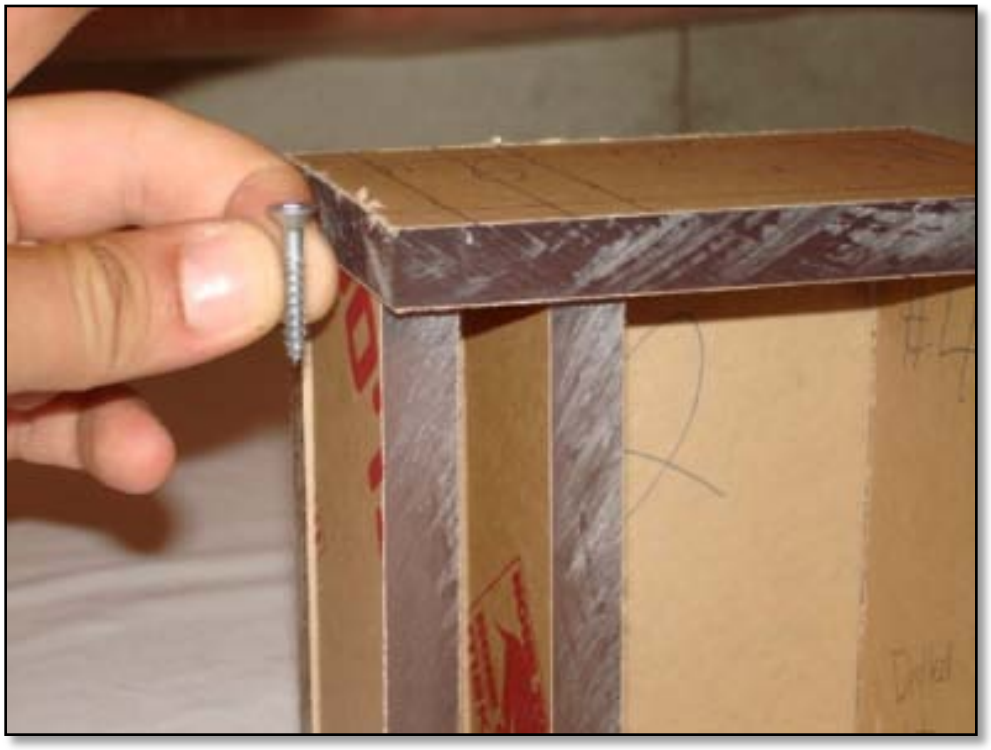
Moving on, we now need to orient you with what and where to drill. But before we do that lets make sure you understand how you will be mounting the pieces together.

Remember that the point here is to attach two pieces together using one screw. When drilling, you should make absolutely sure you are going in straight through both pieces.

Please look at the photo on page 86.

This is how the pieces are positioned and mounted.

So this is how the screw will penetrate.



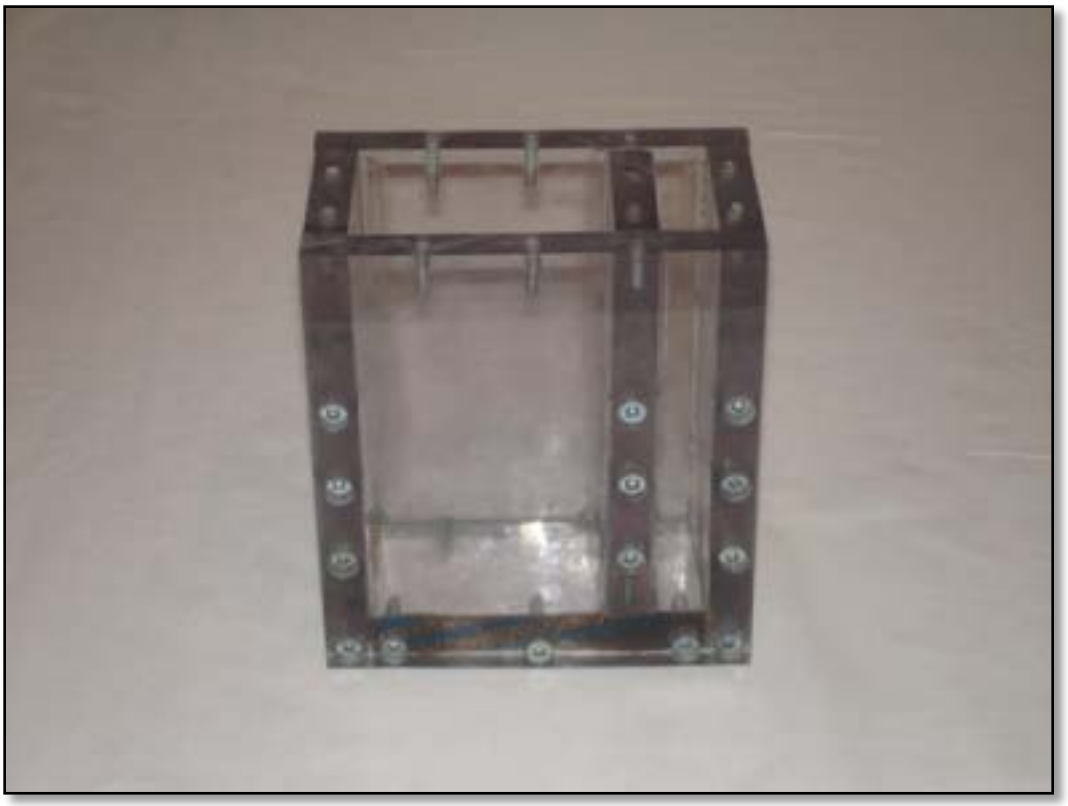
Here is another picture showing the bottom of the Hydrolyzer.

As use can see, all the screws will be inserted in the same fashion. The screw will enter through an outer piece at the finished surface first. Then, it will enter a second piece at its ½ an inch thickness. The finished surface will have to be countersunk using a countersink drill bit.

Without further ado, let's start marking your drill points. We are going to illustrate this again; piece by piece. We feel that most people will understand how to build this system a lot better with A LOT of good pictures.

The only pieces that need to be marked with the indicator lines and drill points are the pieces that will that need to be countersunk. The reason we do not mark and drill the second section where the screw enters is the lack of precise machinery. You will notice that unless you have a drill press, your freehanded drill is still going to be off by a minuet amount.

The only piece that is not being marked is piece #7 as it is not exposed on the outside.



With the top (piece #6) removed, you can see piece #7 is not exposed.

Good, now for the marking. Pieces #3 and 4 are identical. Pieces #1 and 2 share measurements but they are flipped over because of piece #7. Pieces #5 and 6 are different.

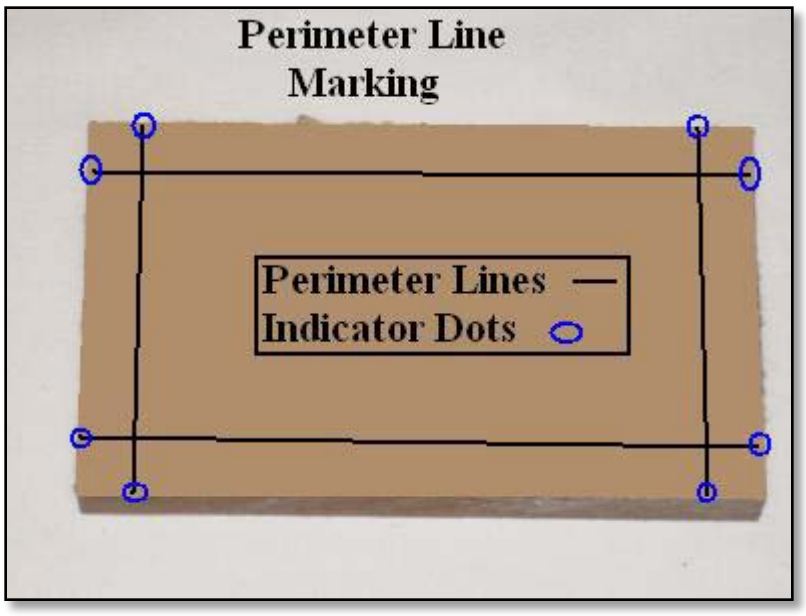
You will start with piece #6
THE TOP

With piece #1 removed

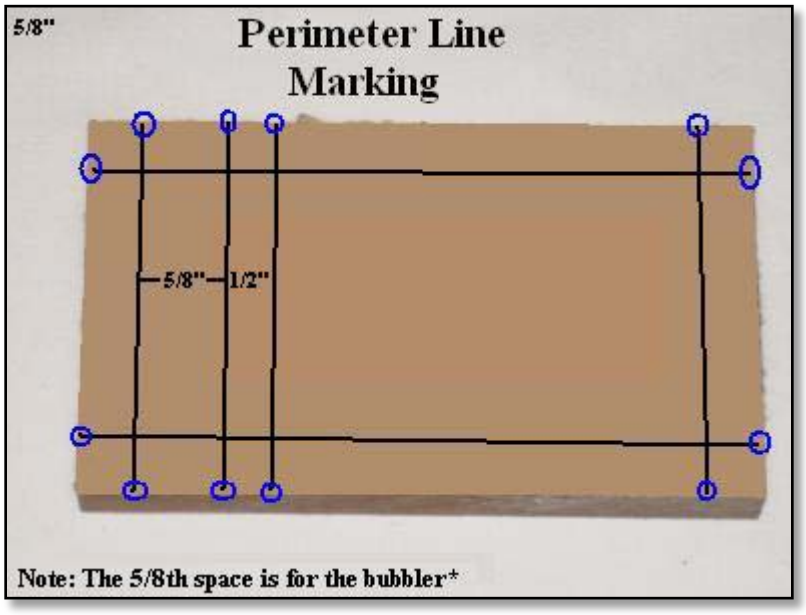
Alright, the perimeter is easy enough to do so lets start with that. Looking at the photo above should tell you that the purpose of those lines is to tell you the thickness of the piece behind it. Notice that each piece fits in perfect line with the markings? That's the idea.

Start at any corner. Measure along the length of the piece at ½ an inch. Mark your indicator dot. Go back to the same corner and measure ½ an inch along the width of the piece. Again, marking your indicator dot. Do this to all 4 corners of the piece.

Using a ruler, lineup these dots and draw your lines.



Piece #7 is 5/8th of an inch in from the end of the ½ inch line you just made. Mark you dots there and draw your line. Then, a ½ an inch more from that mark.



Here is a sequence of photos to show you the lines being made.

Now that you have that the lines you can begin marking your drill dots. Like we said before, you can freehand into the middle of the line but you still have to measure the spacing. Using the picture as a guide start at the bottom left-hand side.

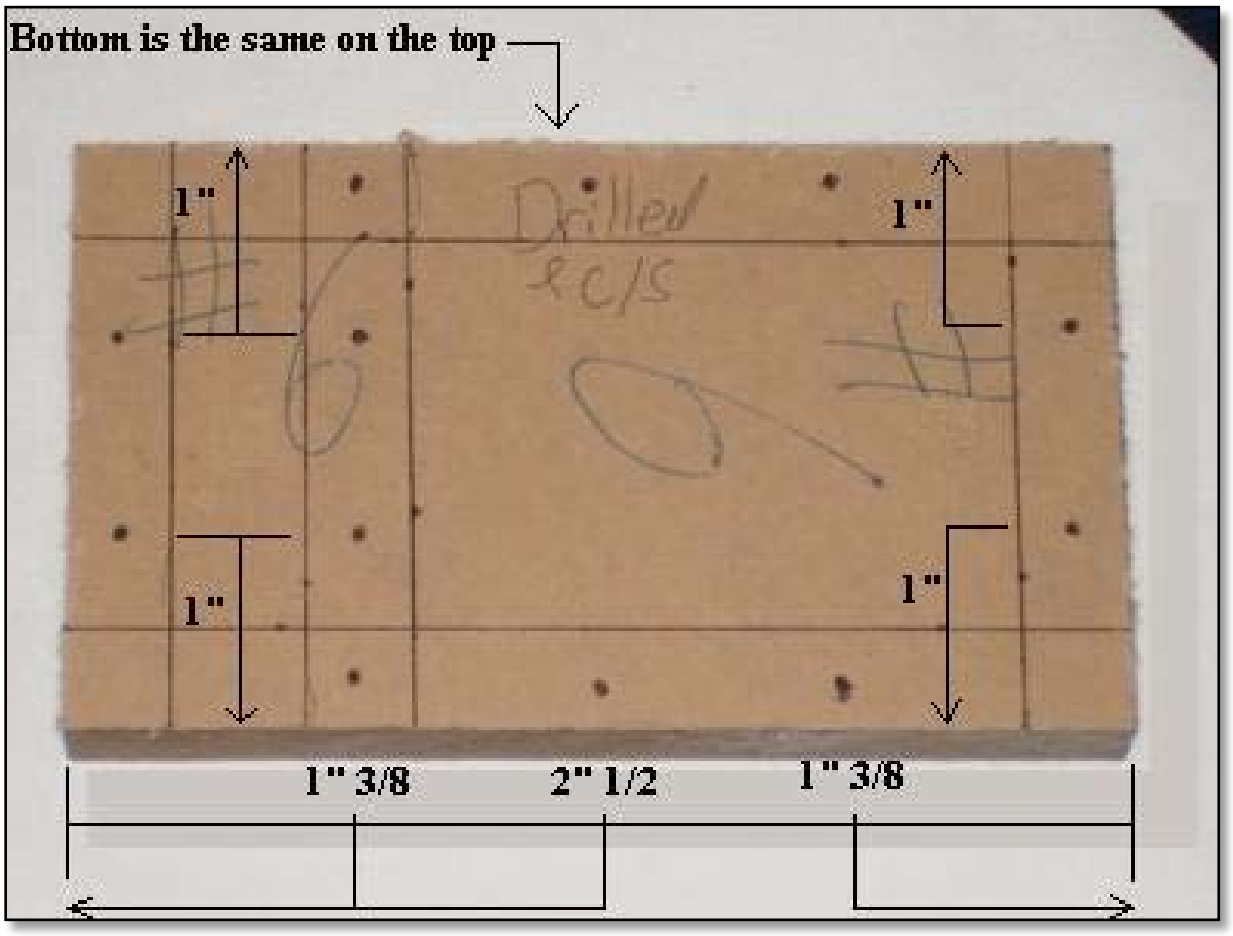
Here is another sequence. It should give you a good idea of what is going on in case we have confused you

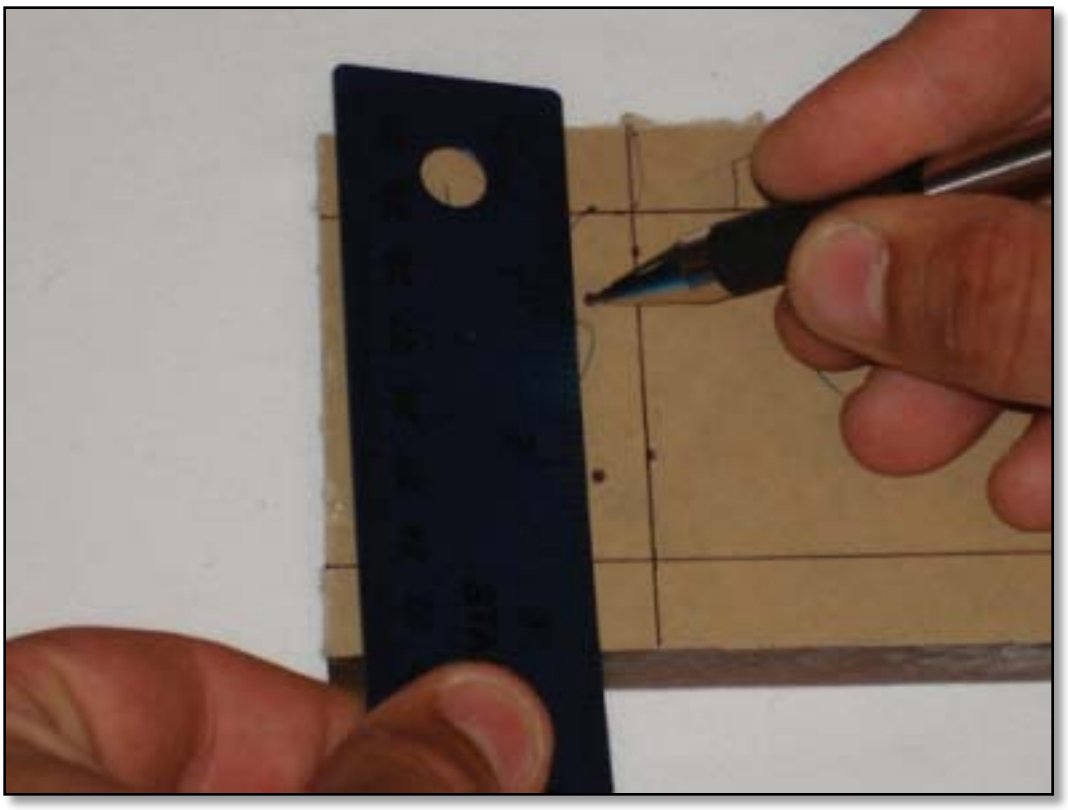
NOTE: Don't forget that you will receive free build support from the one and only, Vic Lawson himself. He will help you with all you questions.

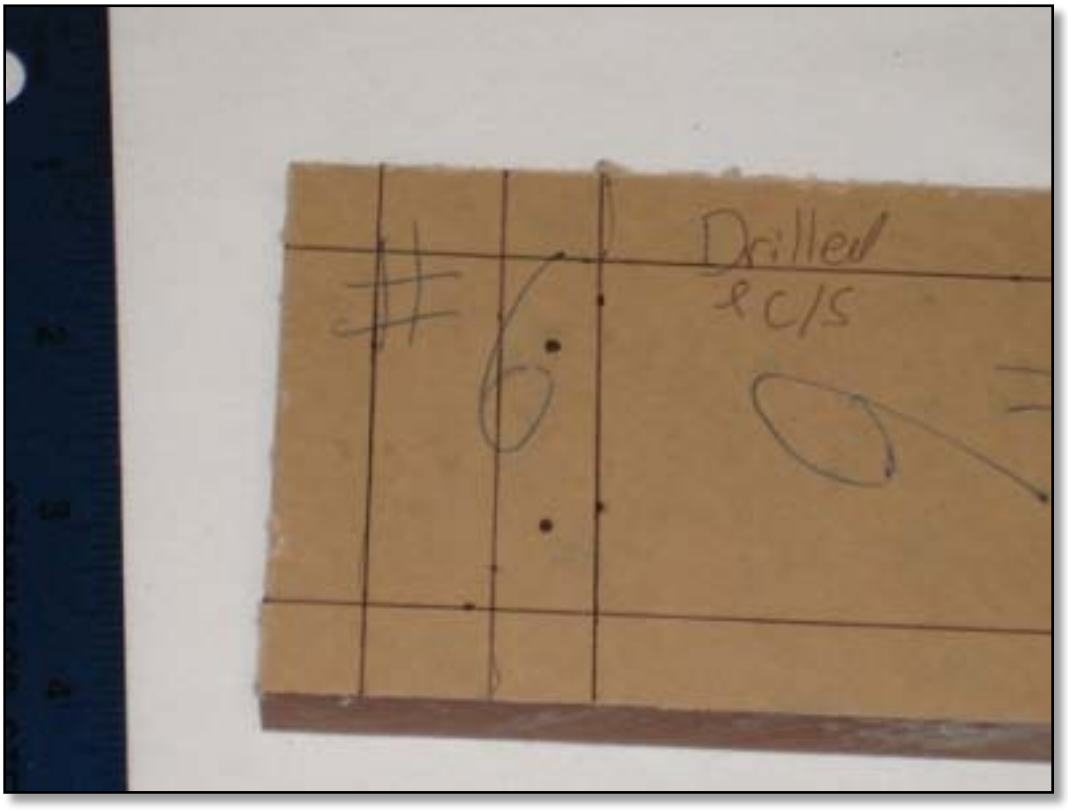
Here are the measurements to piece #6. You will be doing all the other pieces in this manner. I found that when doing any measurement and marking lines requires you to lean over quite a bit. This in turn will fatigue your back and make it sore. The best approach to avoid this is by simply sitting in a chair and performing all the markings on a table. Seeing how all the materials you are using are clean, you don't have to worry about making a mess.

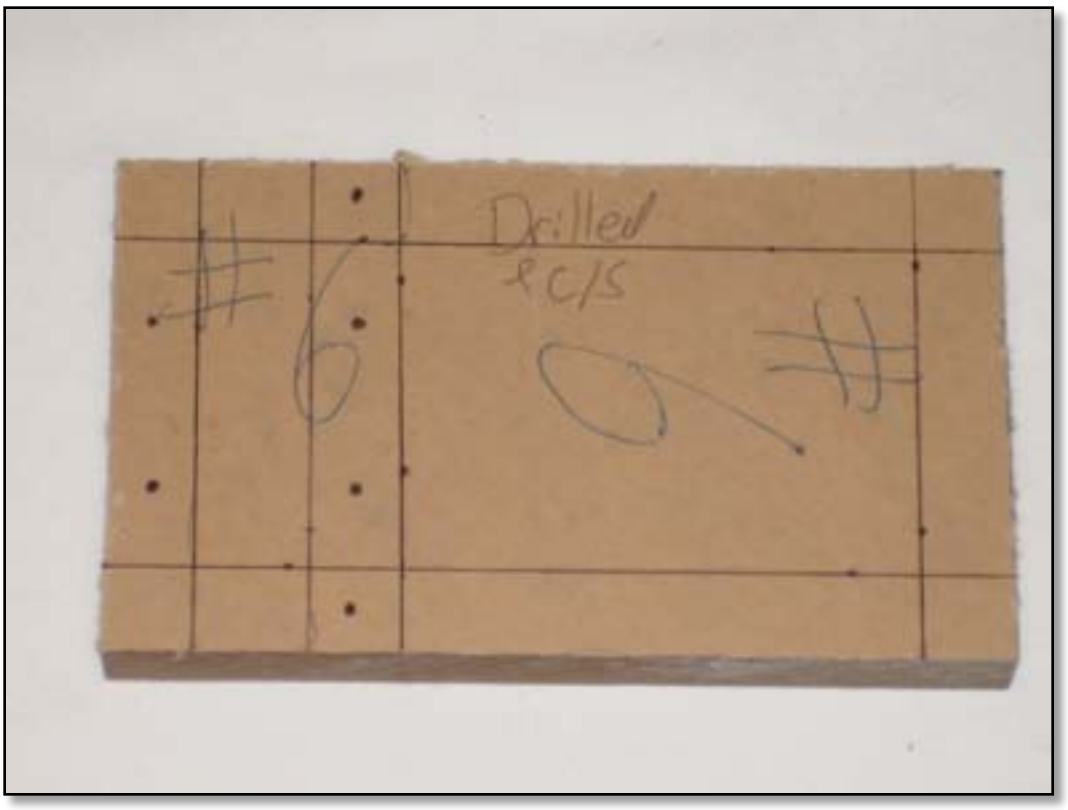
Here is another sequence of photos to give you a solid view of how the marks should be drawn in.

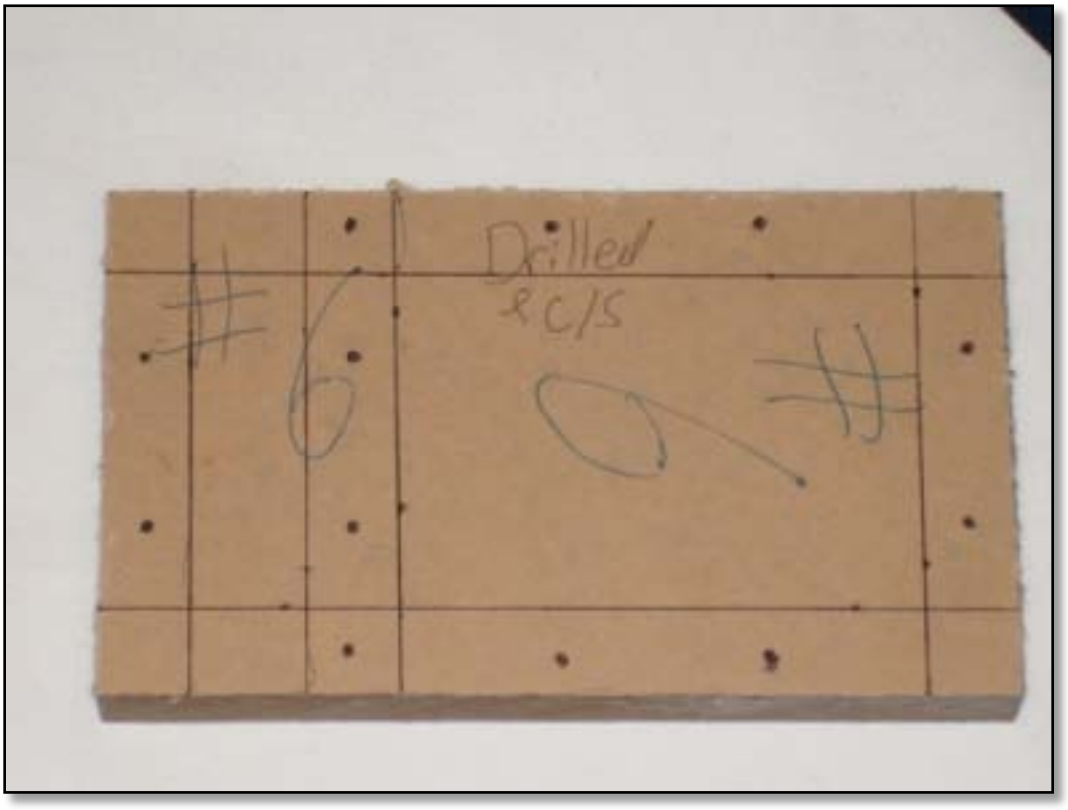
Piece #6 measurements



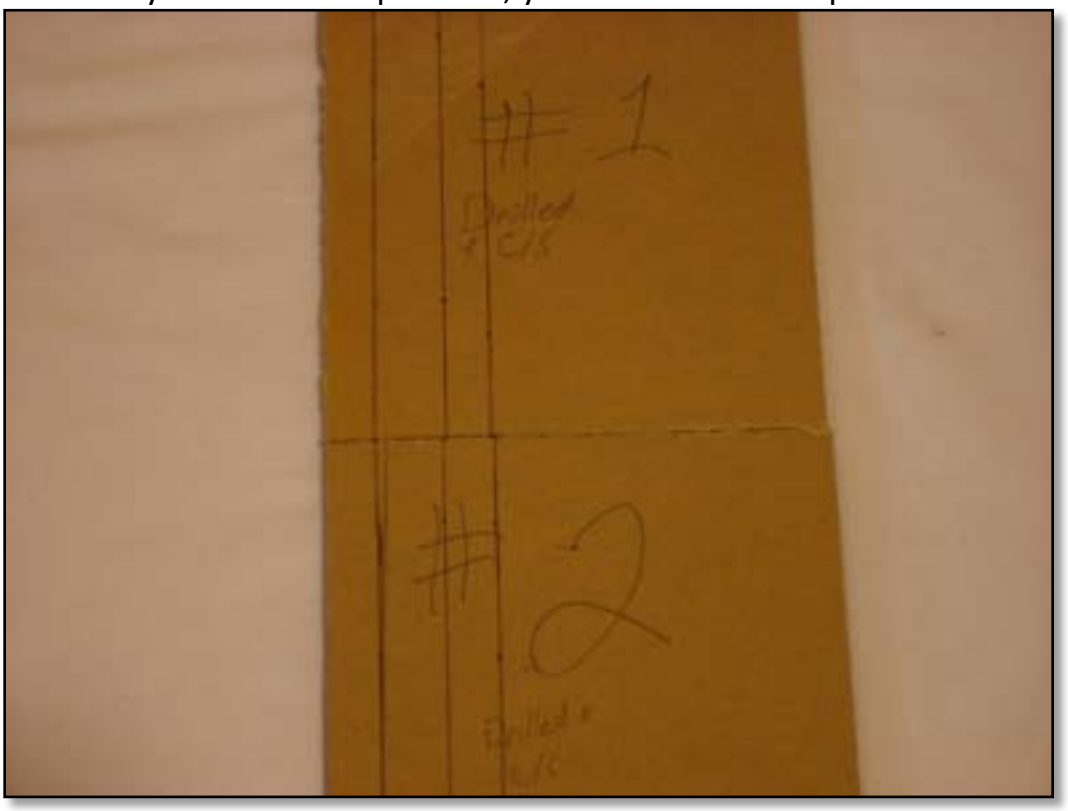








Now that you have done piece #6, you will move on to pieces #1 and 2.

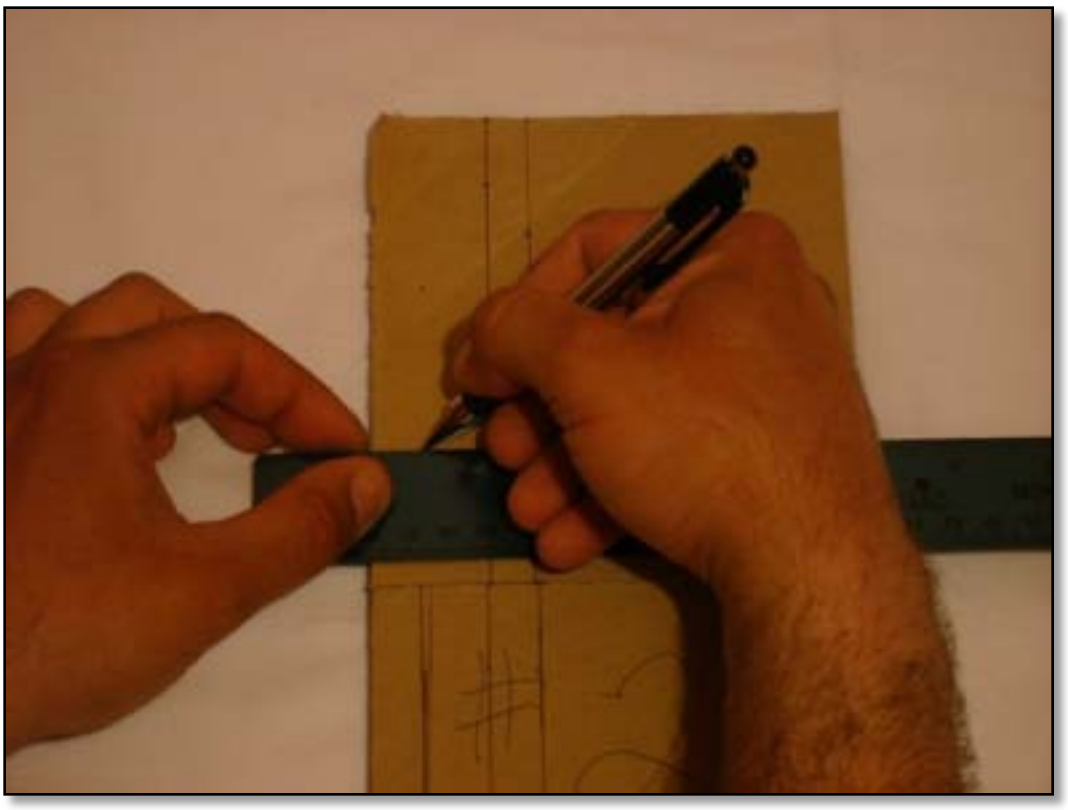


Now, pieces #1 and 2 have the same measurements but in the opposite directions. The pieces above are the result of rushing the process along. Piece #2 has the lines for mating piece #7 in the wrong position. You must pay attention when marking these particular pieces.

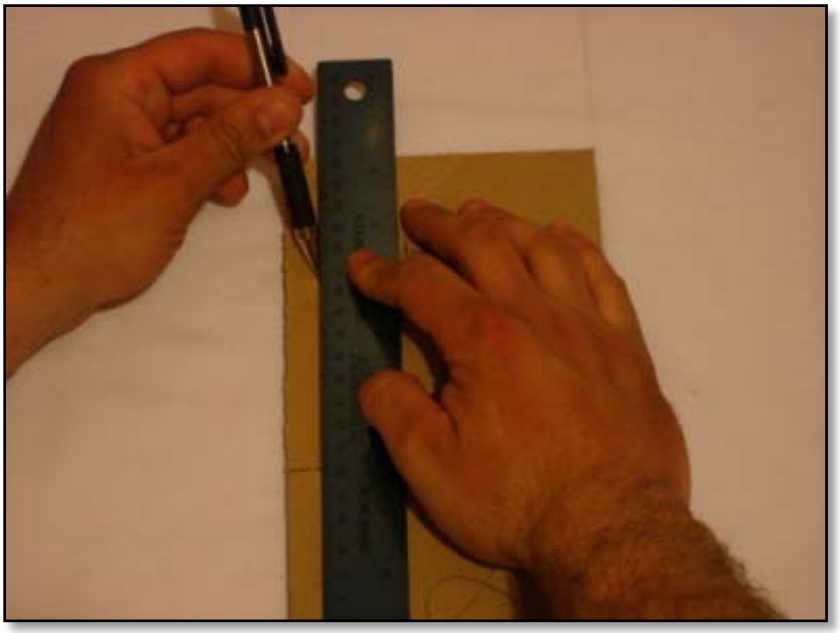
<u>Piece #1</u>

You will have 3 perimeter lines running along the length of the piece and only have one line along the bottom. Again, because all the pieces are ½ an inch thick you are only marking half inch spaces.

While looking at piece #1, start from the left side and work your way to the right. The widths of the piece should be at the top and bottom so from the left edge measure ½ an inch in. Mark your indicator dots and draw your perimeter line.

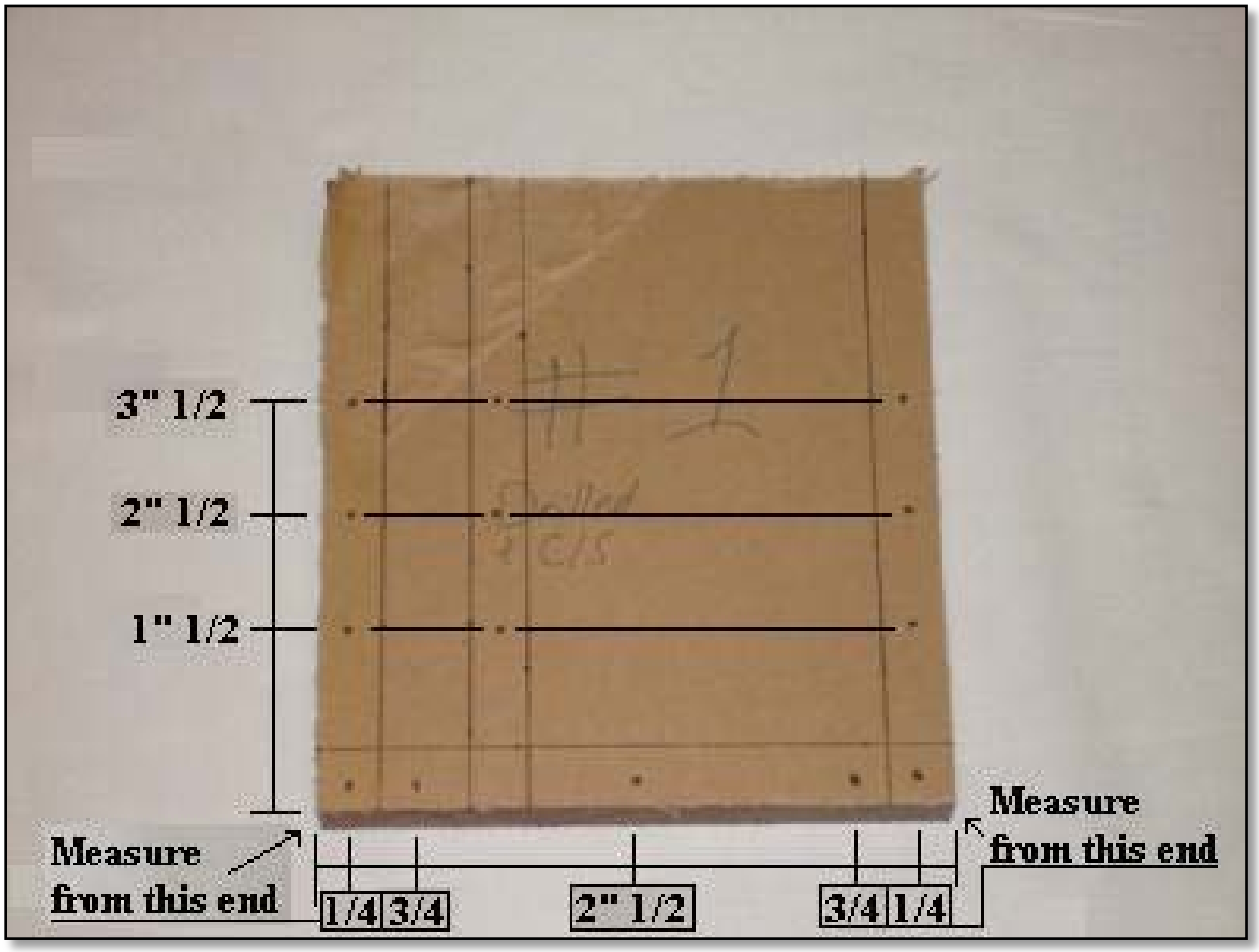


From the line you have just drawn, measure 5/8th of an inch and mark you indicator dots. Draw another line. Now measure ½ an inch from the last line and do the same thing. You should have three lines. Now start from the right side of the piece and measure in ½ an inch and mark your dots; then you lines.

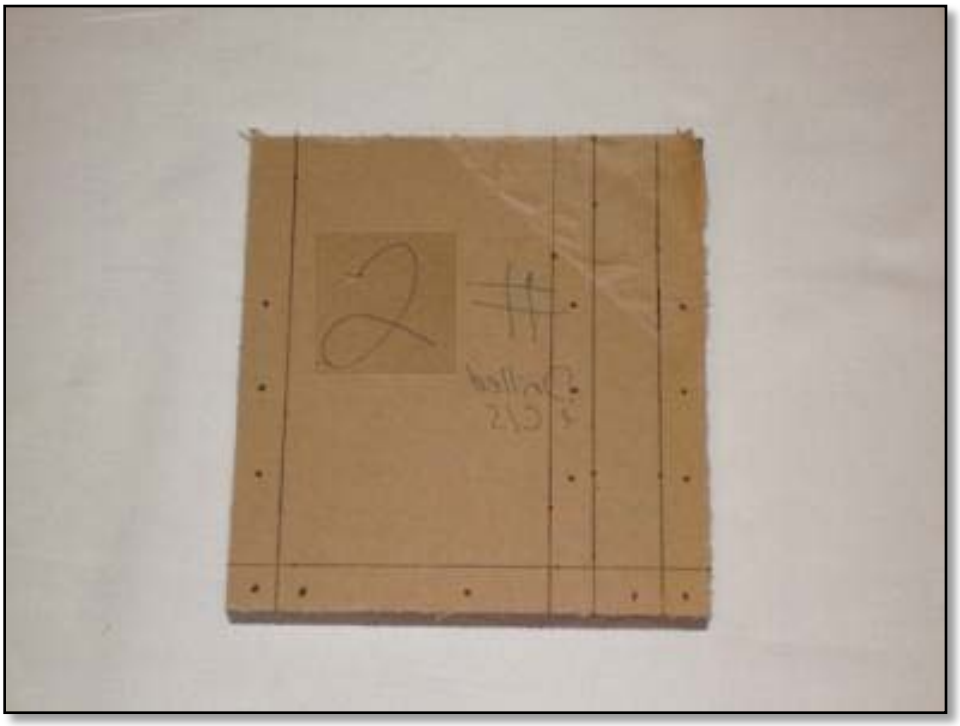


Now for the bottom. Simply measure ½ an inch up from the bottom edge and mark your dots; and draw your lines.

Now for the drill points. Like before, start from the bottom left hand side. When marking the bottom drill points, measure from their closest side as illustrated in the photo.

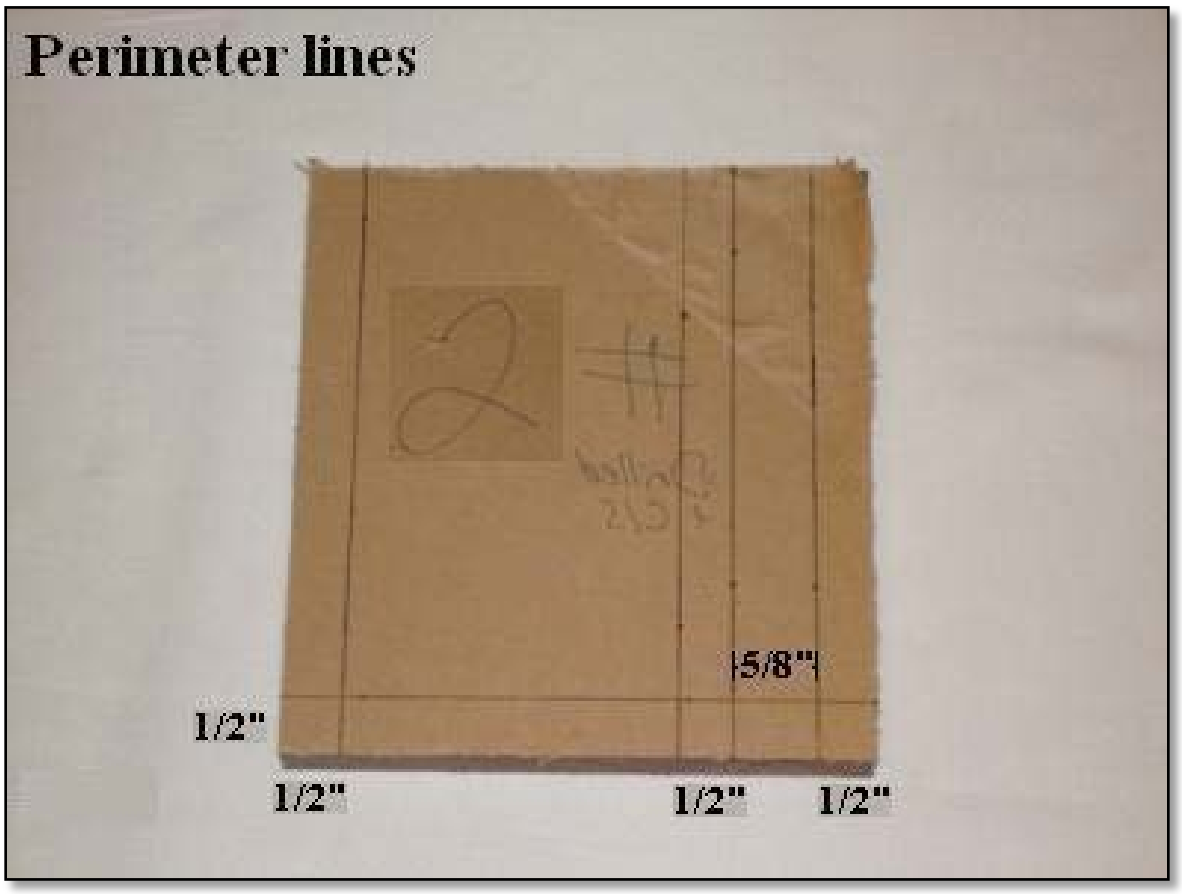


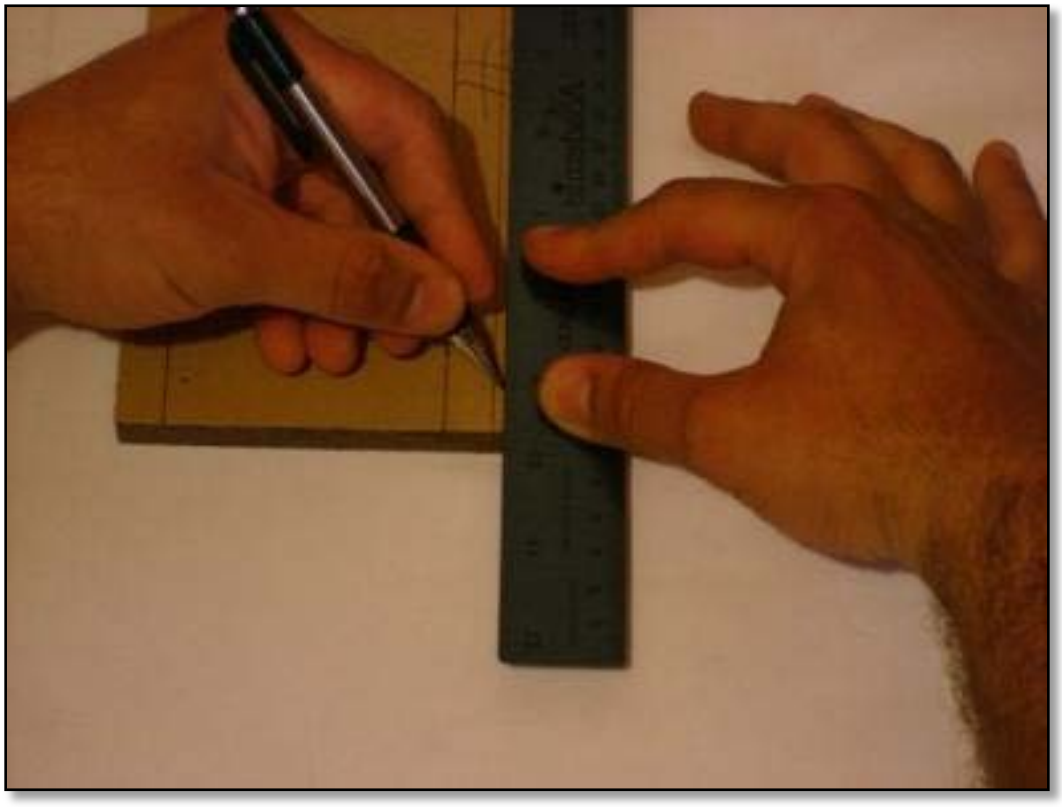
Piece #2 is an exact replica of piece #1 except that the two lines that are off center over to the left are now to the right. This is for the bubbler divider wall which is piece #7.



Let start the perimeter lines. This time you will start measuring from the right side and mark your indicator dots at ½ an inch. Now draw your line. Measure from the line you just drew and measure 5/8th of an inch, marking your indicator dots. You should be moving towards the left. Draw your lines. From that line now measure ½ an inch and mark your dots and again draw the line. Lastly, measure ½ an inch from the left side of the piece and mark the dots; fill in the line.

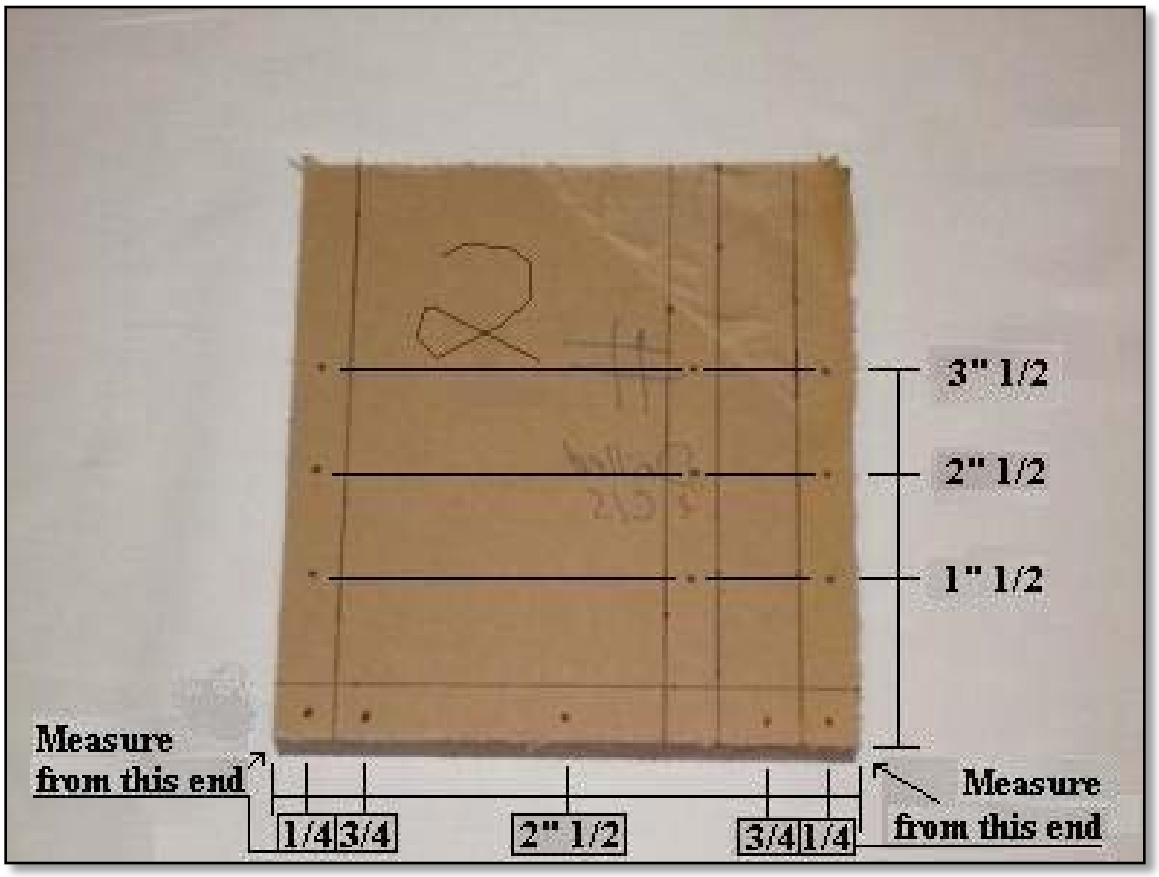
Here is a photo of the measurements





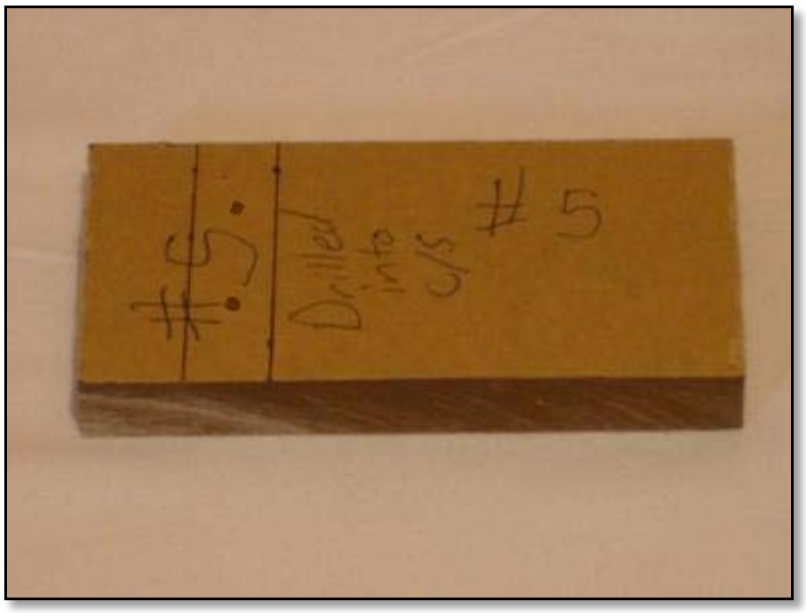
With the perimeter lines drawn in you can move on to the drill points. The drill points are just a flipped version of piece #1.

Here are the measurements for piece #2



From here you can clearly see all the drill points. Make sure that you measure the ¼ inch and ¾ dots from the side that is indicated in the photo.

You're ready to move on to piece #5 which requires only two drill points. Pieces #3 and 4 also only require two holes so you're almost finished this step.



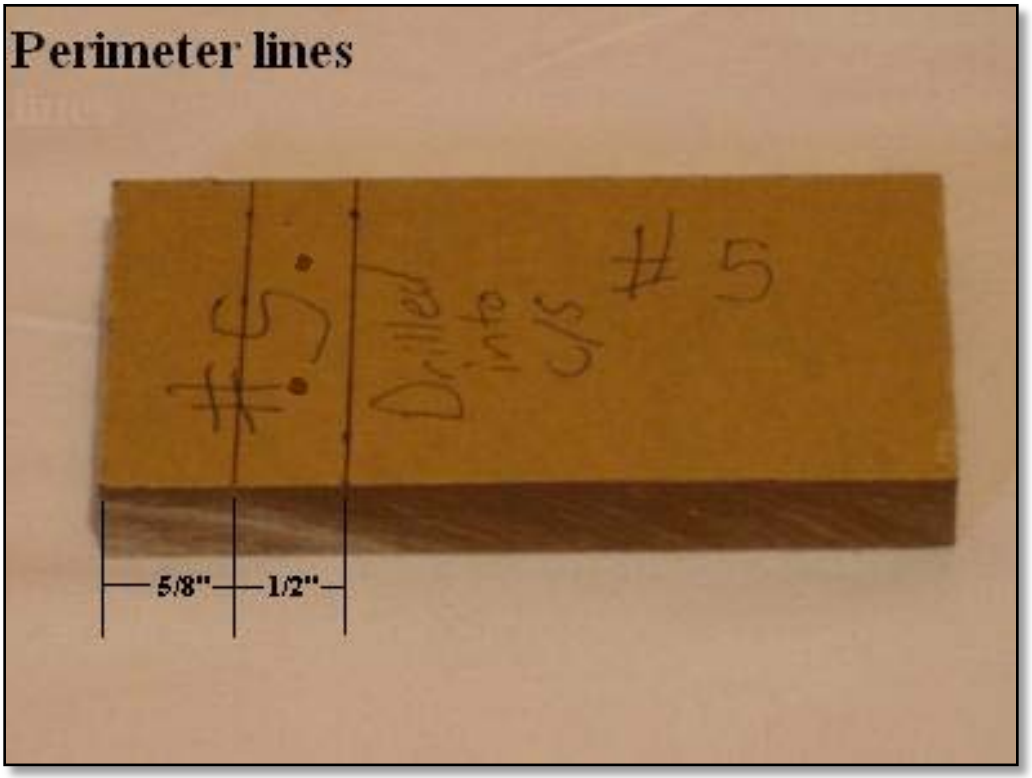
Start with the perimeter lines.

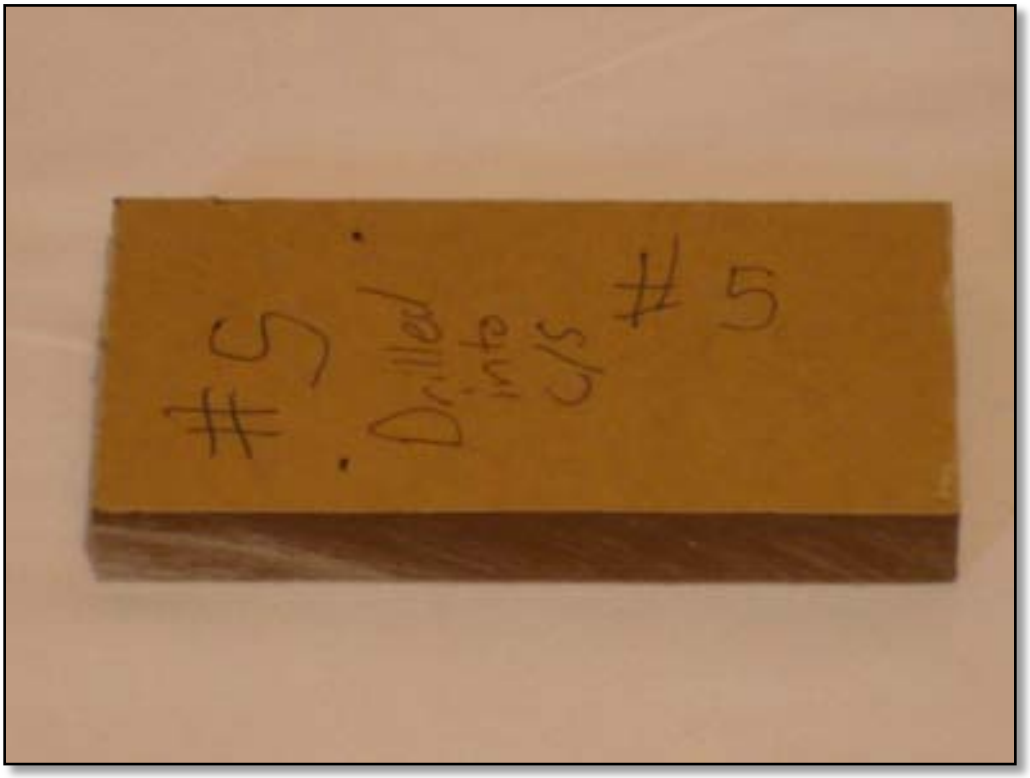
Measuring along the length of the piece, measure out 5/8th of an inch and mark you dots. Take your measurement from the left side end of the piece. Now take your ruler and draw the line. Measure ½ an inch from the line you just drew and do the same thing.

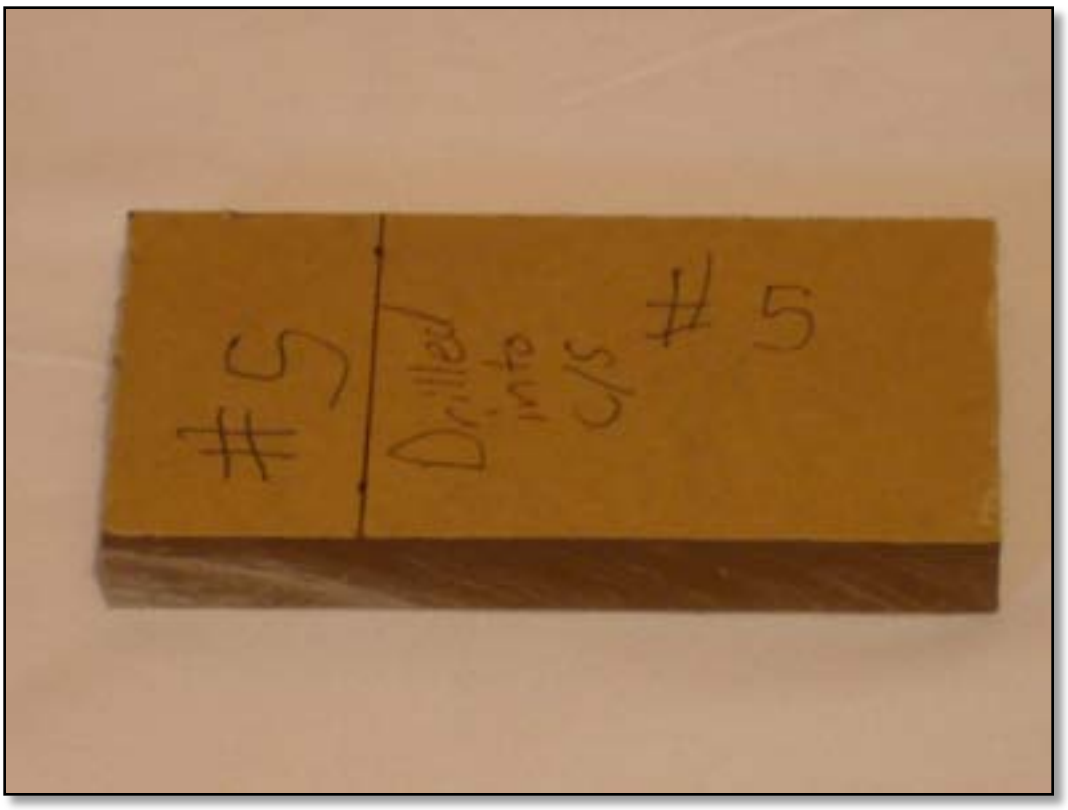
Remember:

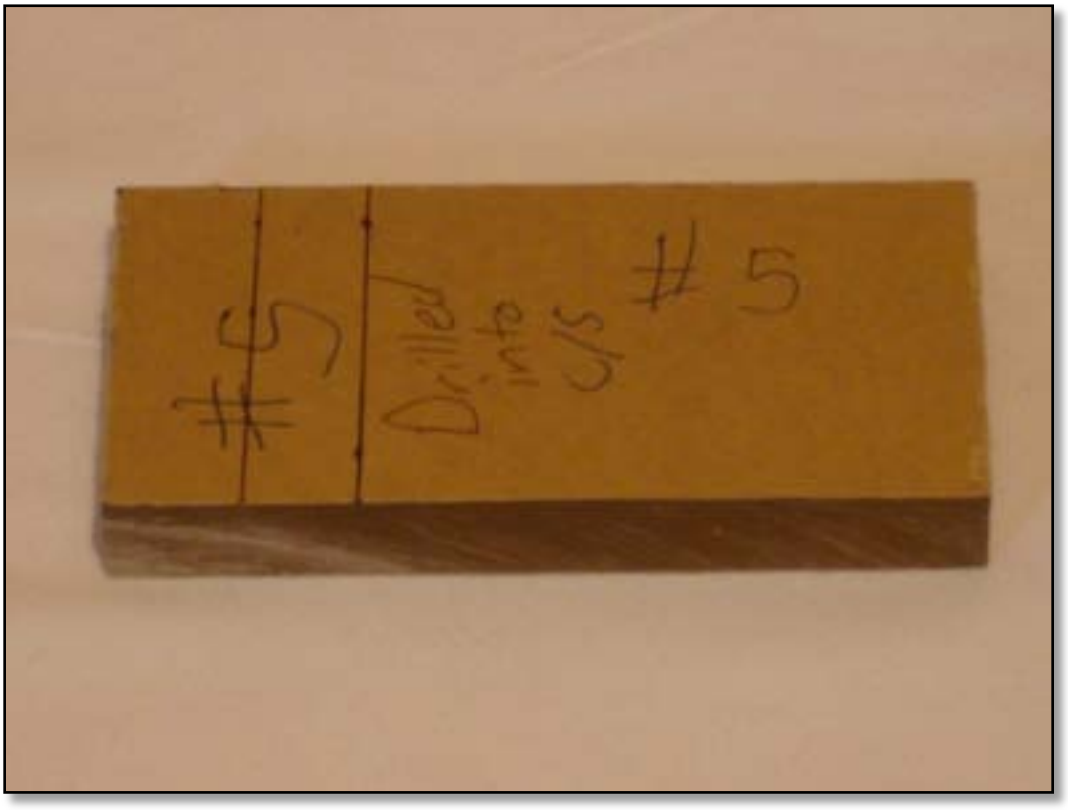
Piece #5 fits WITHIN pieces #1, 2, 3 and 4. You may be confused after you make the lines because of how other pieces are spaced apart. Only the finished side is exposed the outside environment.

Here are the measurements





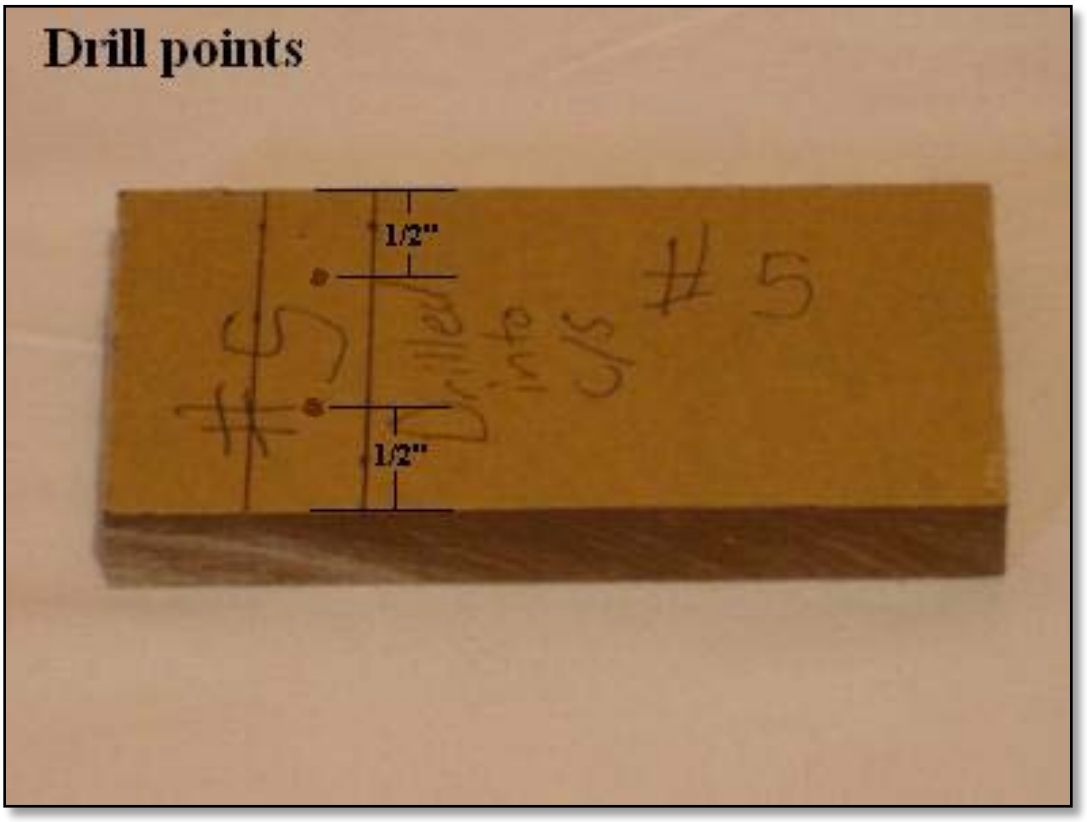




Now for the drill points

The measurement will be taken from the width of the piece; running along the lines. Measure ½ and inch in from both ends and mark your indicator mark in between the lines.

Here are the measurements for piece #5



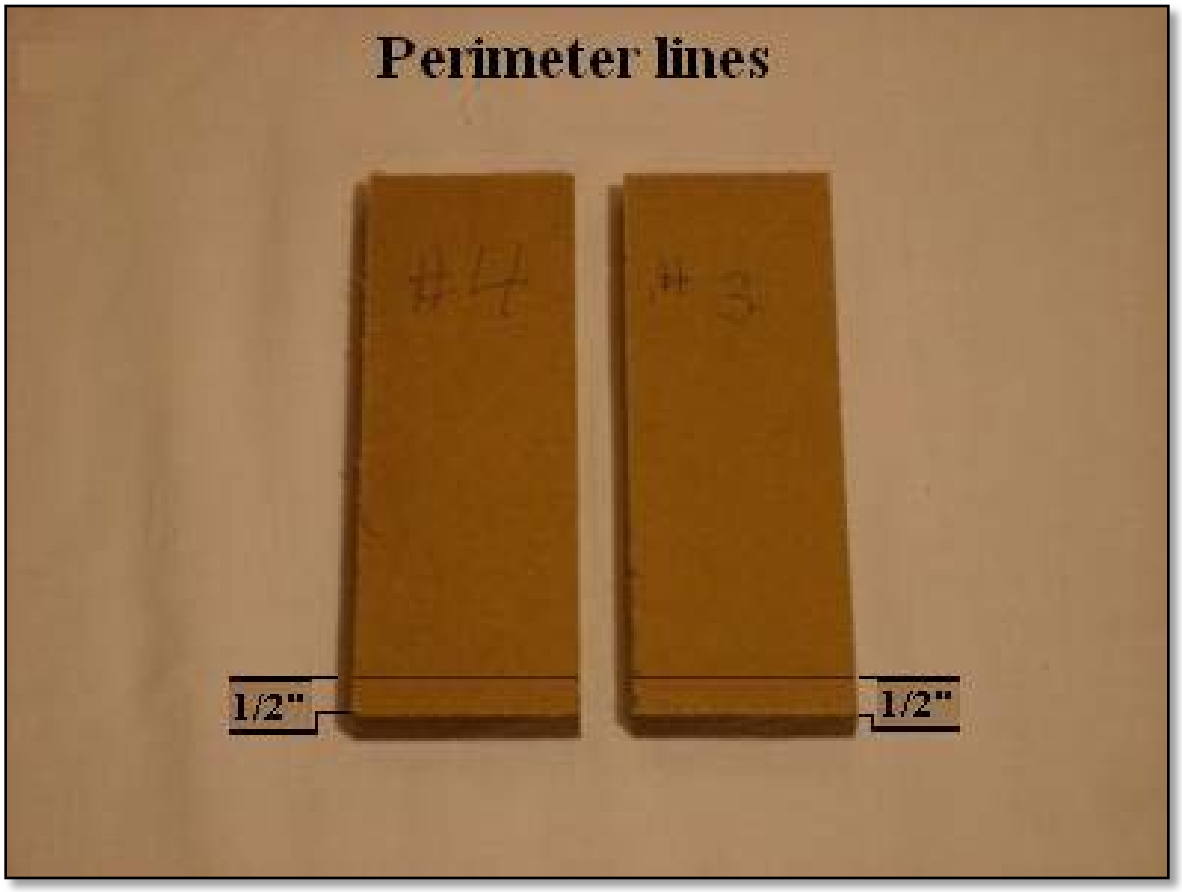
Piece #5 is now done.

Piece #3 and 4

Like we said before, pieces #3 and 4 are identical. So what you do to piece #3, you can apply to piece #4.

Let begin with the perimeter lines.

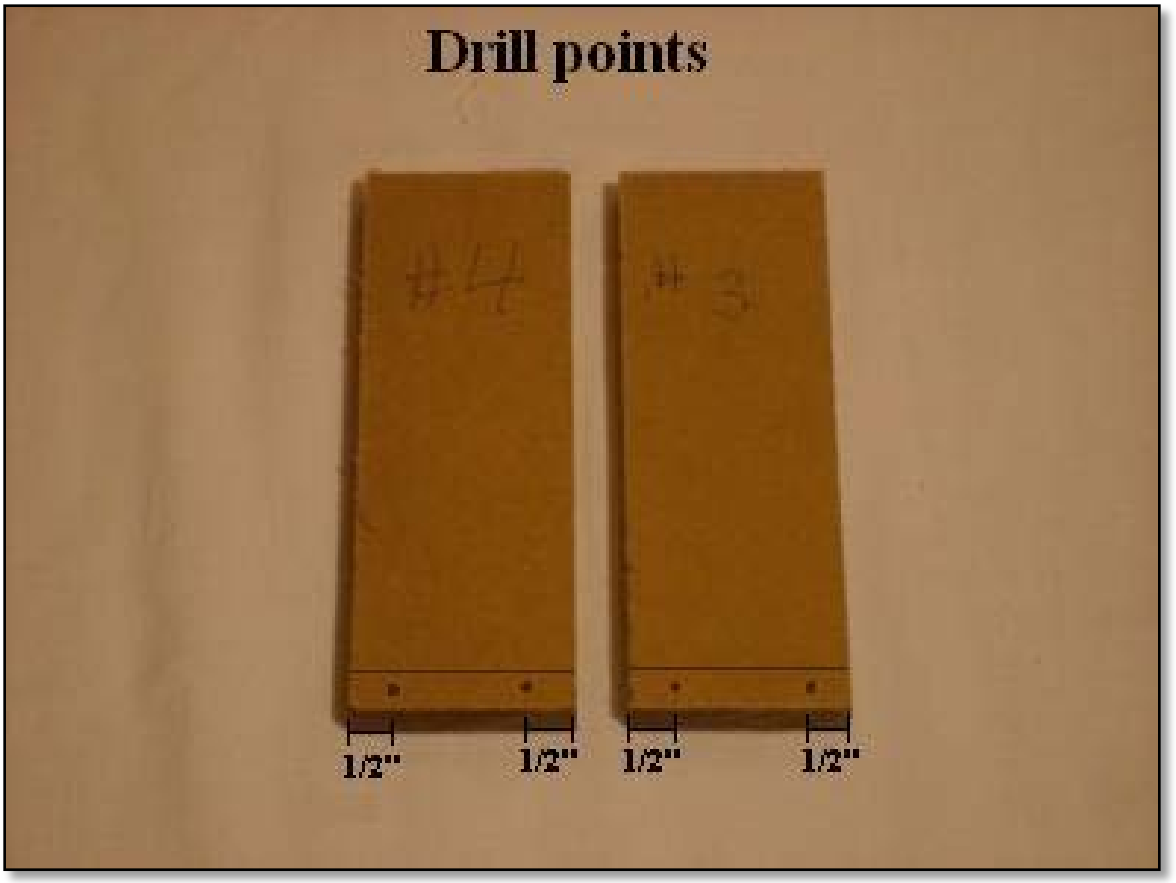
Measuring along the length of the pieces, measure ½ an inch from the end and mark your indicator dots. Now draw your line.



With that being done let mark the drill holes.

You are now going to measure along the width of the pieces. Between the end and the line you just drew on each piece, mark the drill point ½ an inch in from both ends.

Here are the drill point measurements
for pieces #3 and 4



GOOD JOB!

You have completed step 1 and are that much closer to getting gas 4 free.

Step 2:

Step 2 is where you will drill out the holes you have made. This is another step that you must take your time with. You will only drill-out the holes first. **The countersinking is in step 4 so don't jump ahead.** We are going to demonstrate how to drill these pieces with the help of a vise and clamps.

With these little guys you can be rest assured your drilling will be dead-on.

"Where do I begin?"

Good question!

But before we go on, Vic wanted to note that when you're setting up two pieces to be drilled, sometimes it can be difficult. When you are drilling, you clearly see the marked indicator on the first piece you are cutting. But, the second piece behind it is sometimes not visible because of the protective layer of paper lay. So, he suggests that you cut away the some of the protective paper so you can see.

Obviously not the perimeter lines and drill points.

Note: Some of the photos in this step are already countersunk. Vic was just trying alternate methods to speed up the process. Do not countersink at this point.

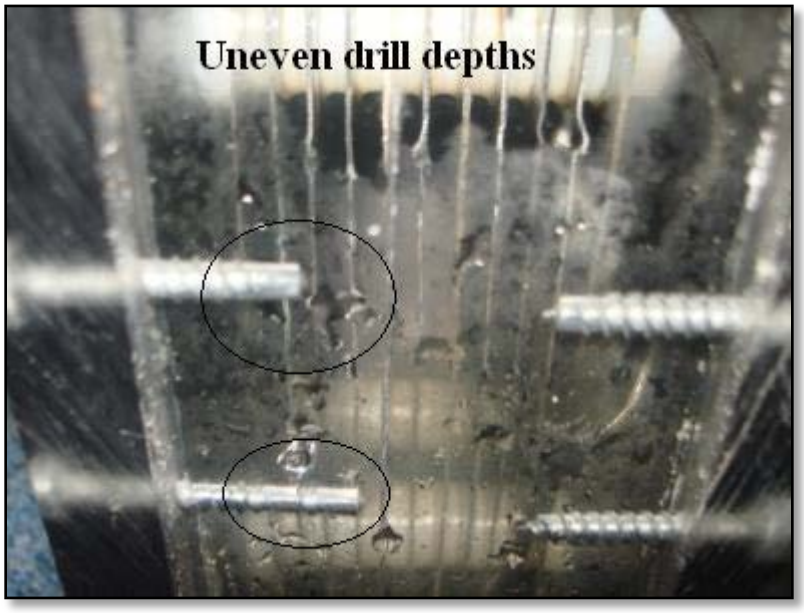
Let's Setup:
You will need to use a wood drill bit for this task. The size that Vic used was

Drill Bit Size: 1/8th

Countersink Size: #6

The screws you will be using are 1" long deck screws or anything that is waterproof like stainless steel.

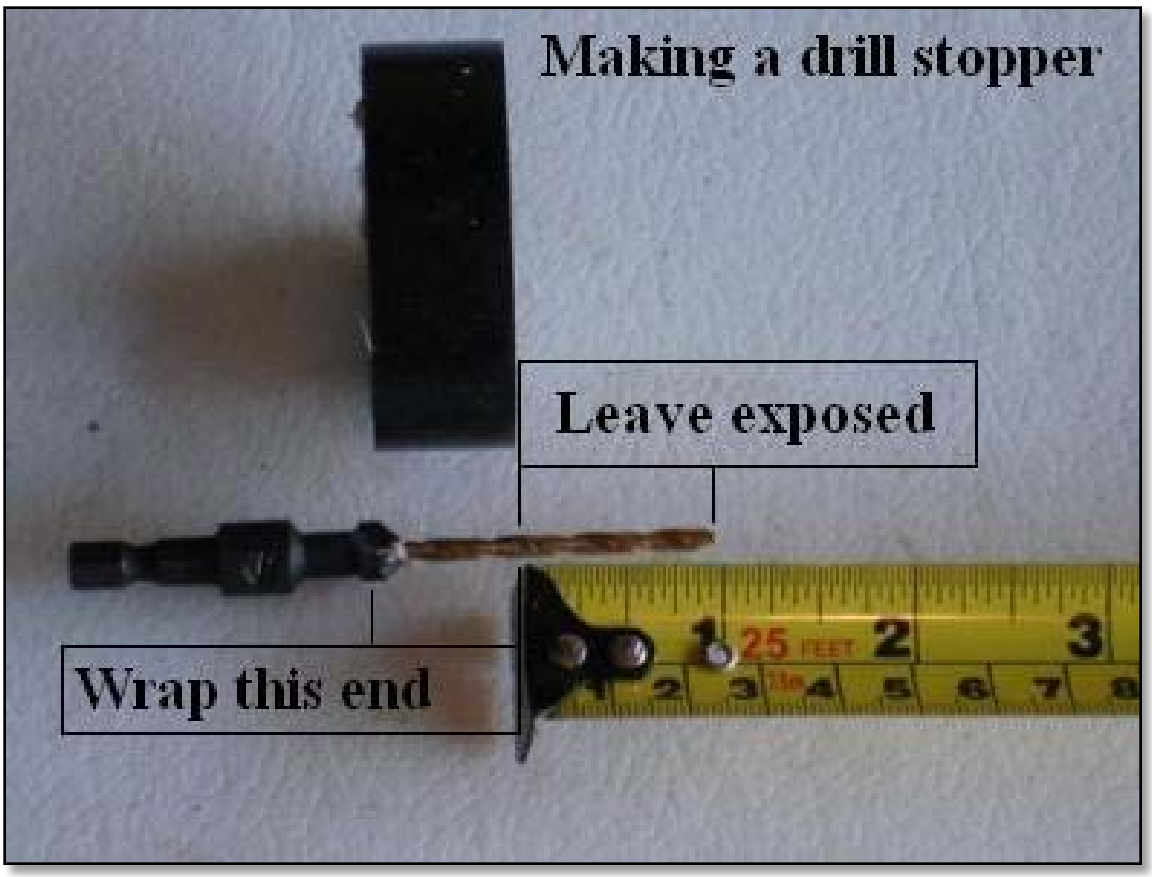
Before you begin, keep in mind that if you just randomly drill your holes out that you will see different lengths of drill lines in the plastic. To some, it looks like a poorly made and it's ugly to be honest.



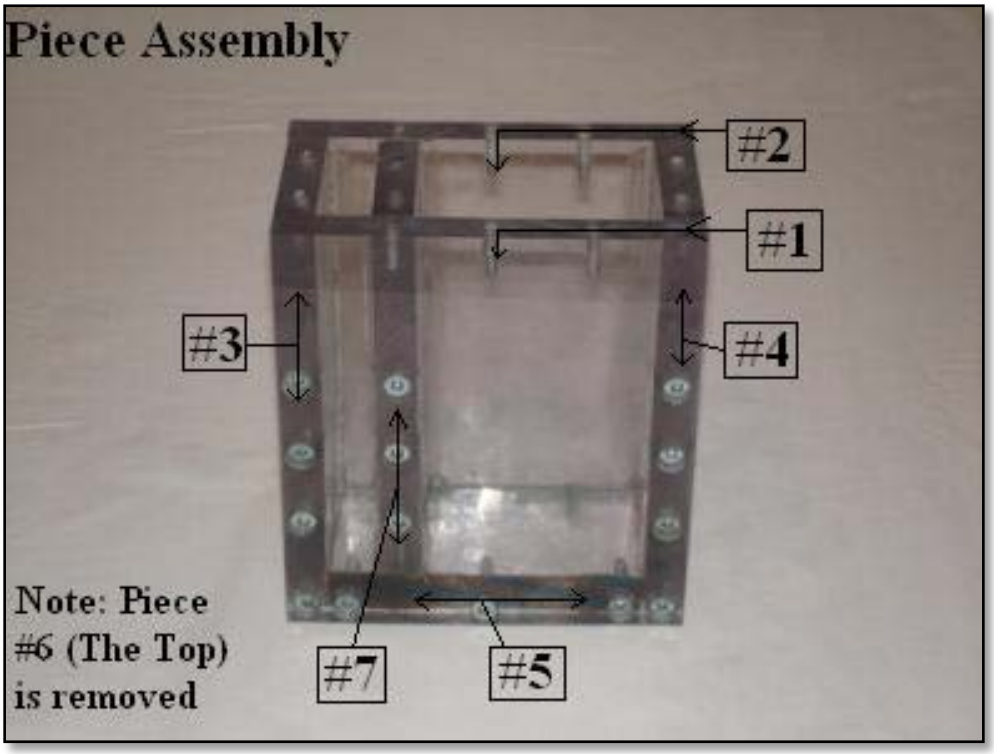
The way to avoid this is by using a stopper. Its so easy to make too. This is what Vic did; measure the length of the screw, add 1/8th of an inch to your length (1" and 1/8th), then pull out some electrical or duct tape and measure out that length on the drill bit itself. Measure from the tip of the bit and stop at the end of the measurement.

From that point, wrap your tape around the bit and keep wrapping it till you get a thick stopper. Now when you drill in 1" and 1/8th of an inch deep, your stopper will bump into the surface and your done.

You will remove this tape after if you are using the same style of countersink bit as Vic. After you finish all the holes, it will not be used again.



Here is a photo of the housing assembled and labeled.



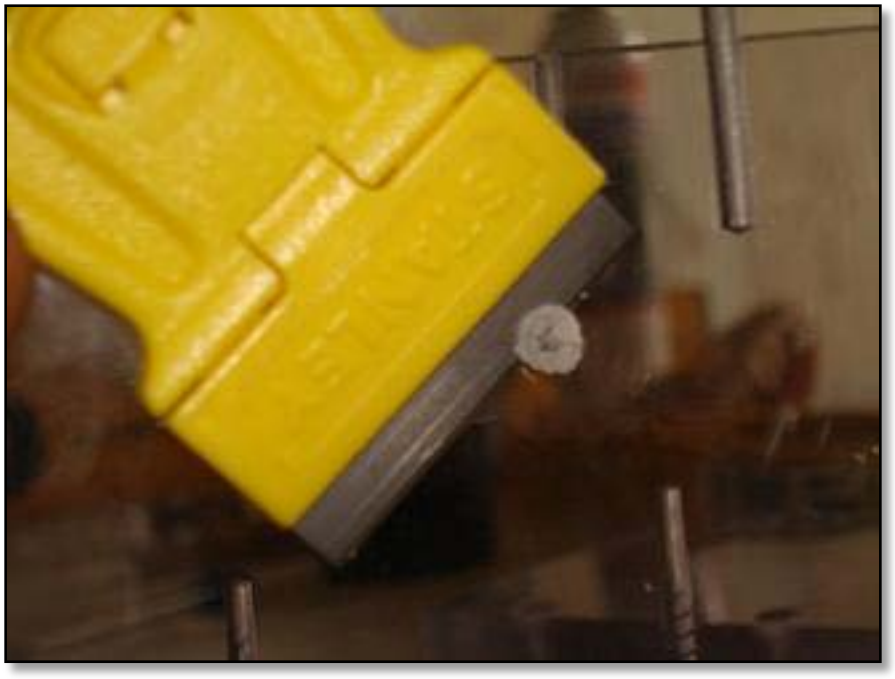
You're all set now. You will start by drilling pieces #1 and 3. You will be drilling through piece #1 and into piece #3. Lay piece #3 onto a flat surface. Use a clamp to position both pieces to exact locations.

Remember that the two marked drill holes should be on the same end with the 4 holes you are about to drill. Drill ONLY one hole.

You are going to notice two things here.

1. Drilling this material is like a hot knife through butter
2. The plastic shavings melt and harden quick

Every time you drill a line of holes, you will have to trim off the excess of melted plastic. Don't worry, it's easy!

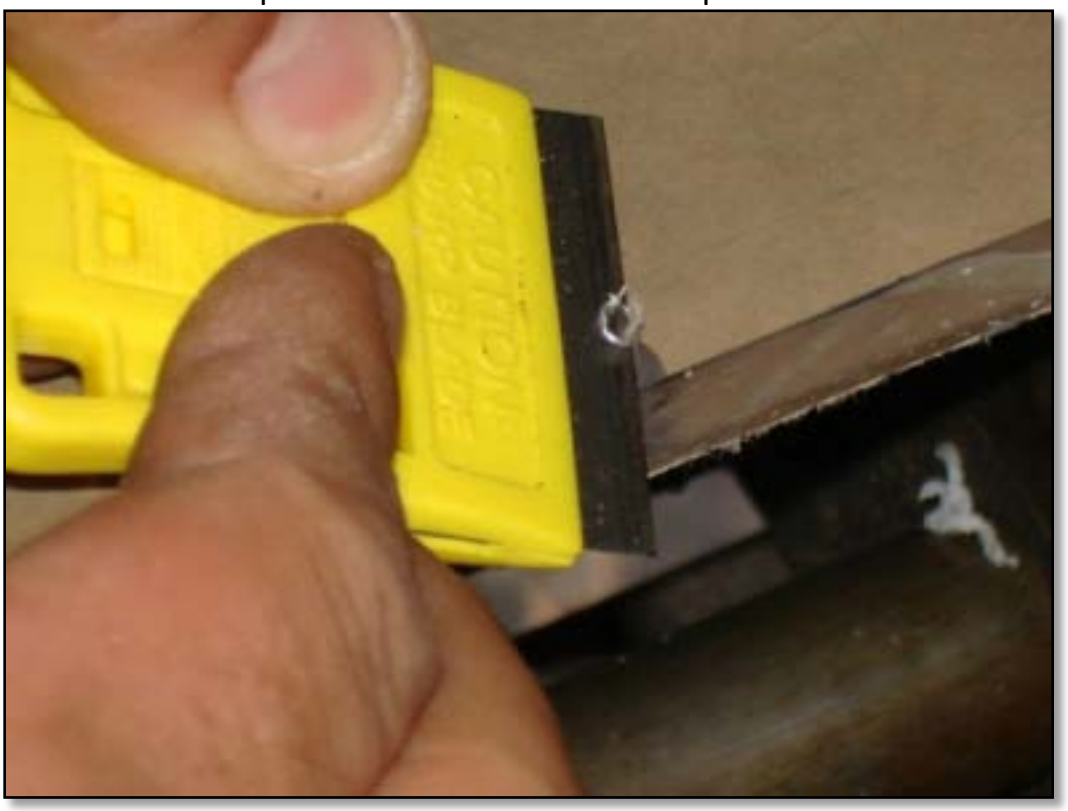


You will notice that you will have to use the table itself to hold both pieces from moving but it is not necessary because this plastic is so easy to drill you can almost freehand the drill. Once you have set both pieces in place, you can begin drilling. Some drills have a level indicator on the back of them so you can see if you are going down straight. Use this if you can, otherwise just continue with the drill.

In the photo above, you can see Vic with piece #2 and 6. He actually raised piece #2 and clamped piece #6 into position. He says that you should elevate the clamped pieces so that you don't accidentally clamp on an uneven surface.

Note: Be sure to double check the mating of both pieces. Also, make sure both surfaces are clean to ensure proper flatness.

Good, now like we said, only drill the first hole. Once that is done, unclamp the pieces and cut off the excess plastic.



After you have cut off the excess pieces, place both pieces into position again. Start screwing in a screw into piece #1 and stop just before it passes through. Now with both pieces in place, continue to turn-in the screw until it is ¾ the way in. Your pieces may out of position so reposition them. With the one screw in, you can now drill all the other holes. The purpose of the screw is to guaranty all the holes will align perfectly. Now again, separate both and cut off the excess plastic.

Please note that sometimes the burnt plastic can hold both pieces real good so don't be afraid to whack or pry the pieces apart.

Once the cleaning is done, screw pieces #1 and 3 together. Hand screw all 4 screws in only ¾ the way in. You might be tempted to use a drill for a screwdriver and Vic says ok but on one condition. If the drill you are using has no torque clutch, you CAN NOT screw pieces together while they are in the vise. You will snap the head of the screw.

That is the routine you will use until all the pieces are merged into one complete piece.

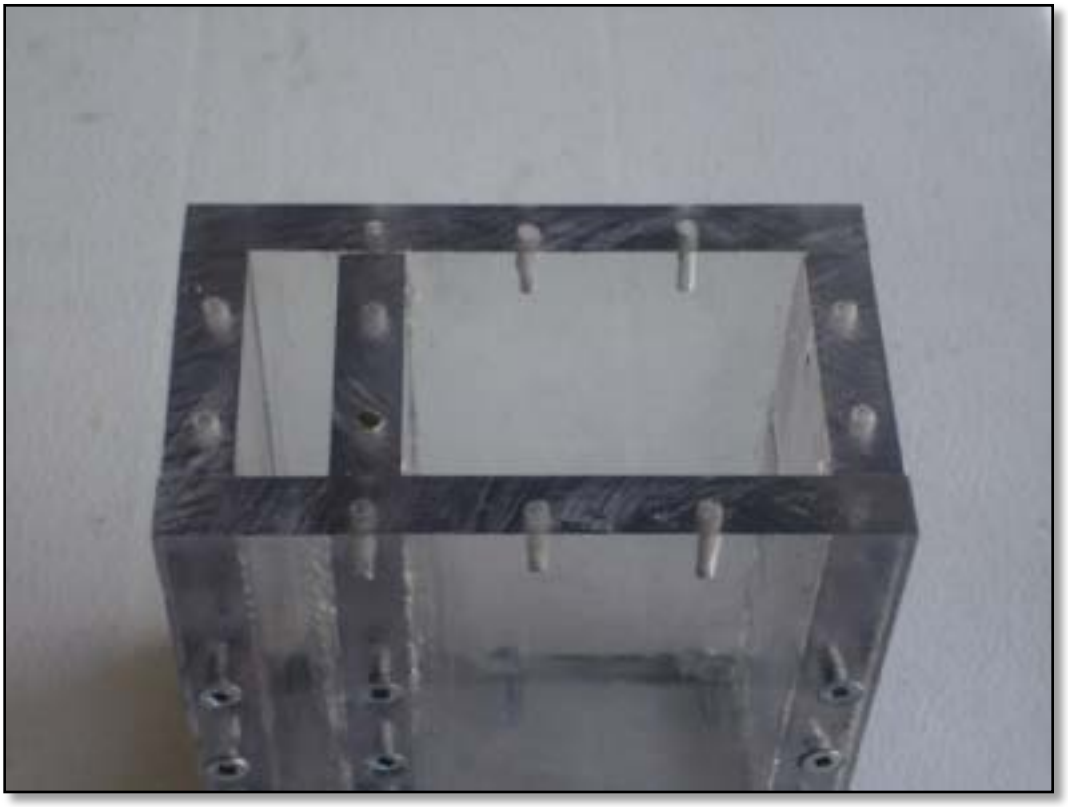
Now that piece #1 and 3 are together let's move on. You will now join the following pieces in this order:

- Piece #4
- Piece #5
- Piece #7
- Piece #2
- Piece #6

Step 3:

This is where you will make a top gasket that piece #6 sits on. The purpose for this gasket is to seal the top portion of the Hydrolyzer without the need for silicone. When you wish to do a major cleaning or any kind of maintenance, you can simply remove the screws and flush.

Remove piece #6 from the housing assembly.

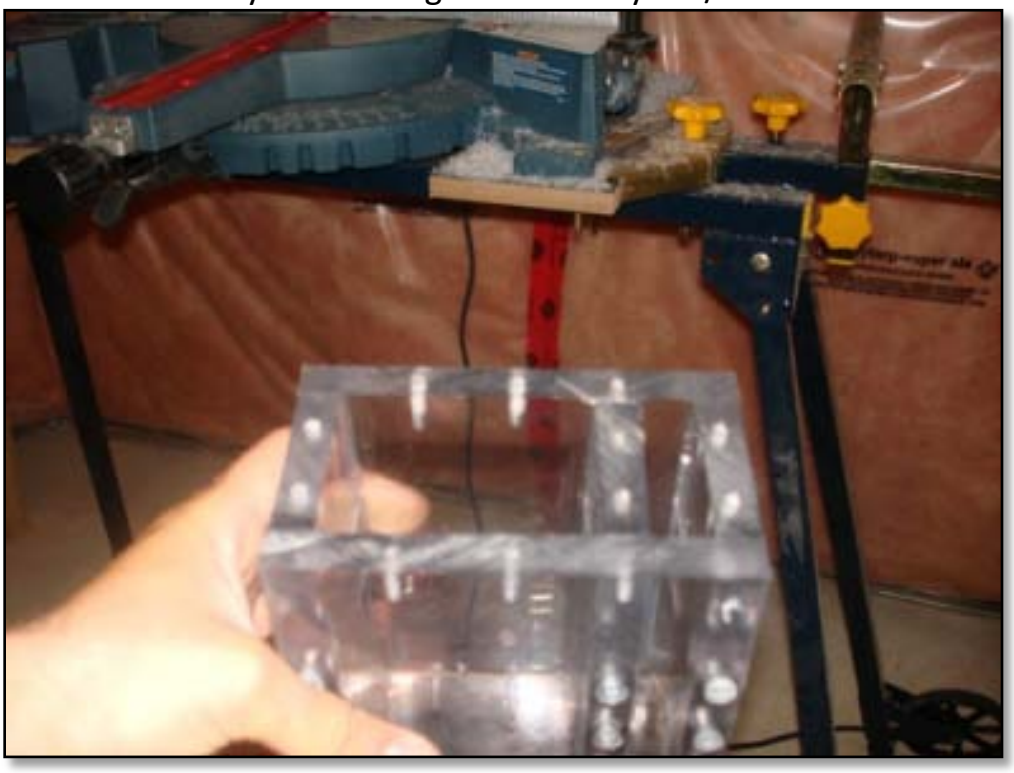


This is what you should have but with the paper still on it. You need to check it for straightness. If anything is unaligned by even a hair, you will have to use the table saw again.

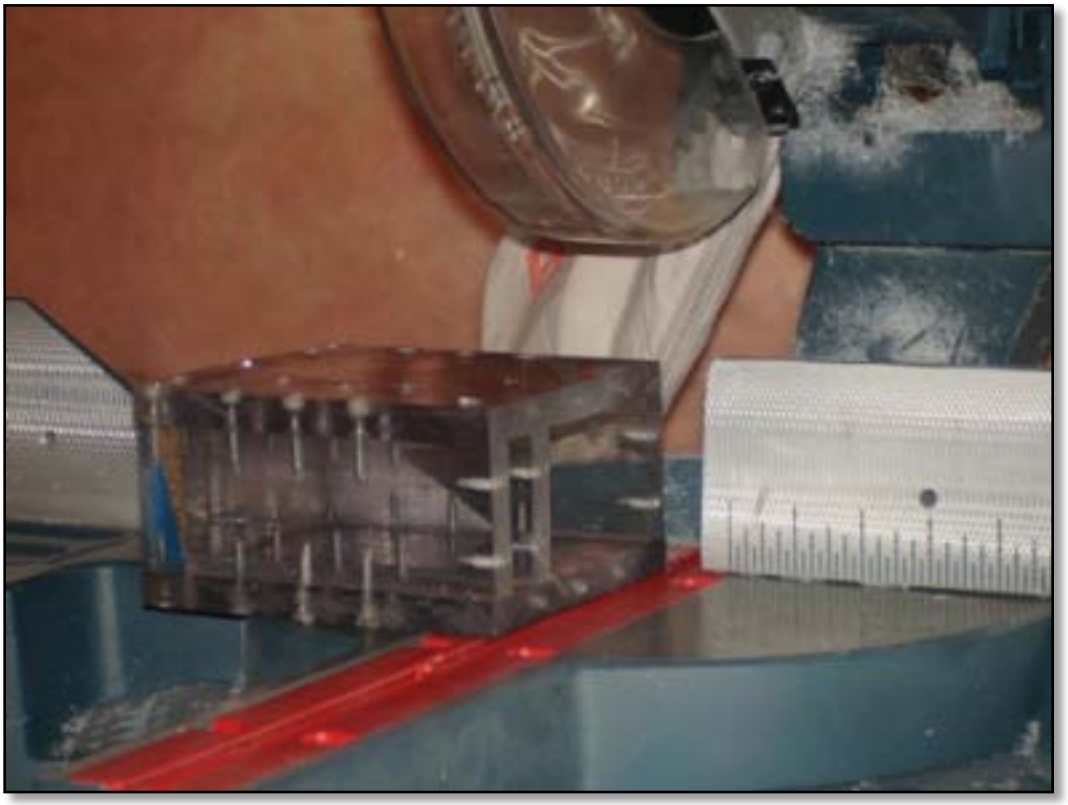
Vic says you shouldn't risk silicone sealing an imperfect surface because it will most likely leak.

We believe 20+ years of experience, you might want to as well!
Take the housing to the saw and lay it down.

The most your housing will be off by is 1/32 of an inch.



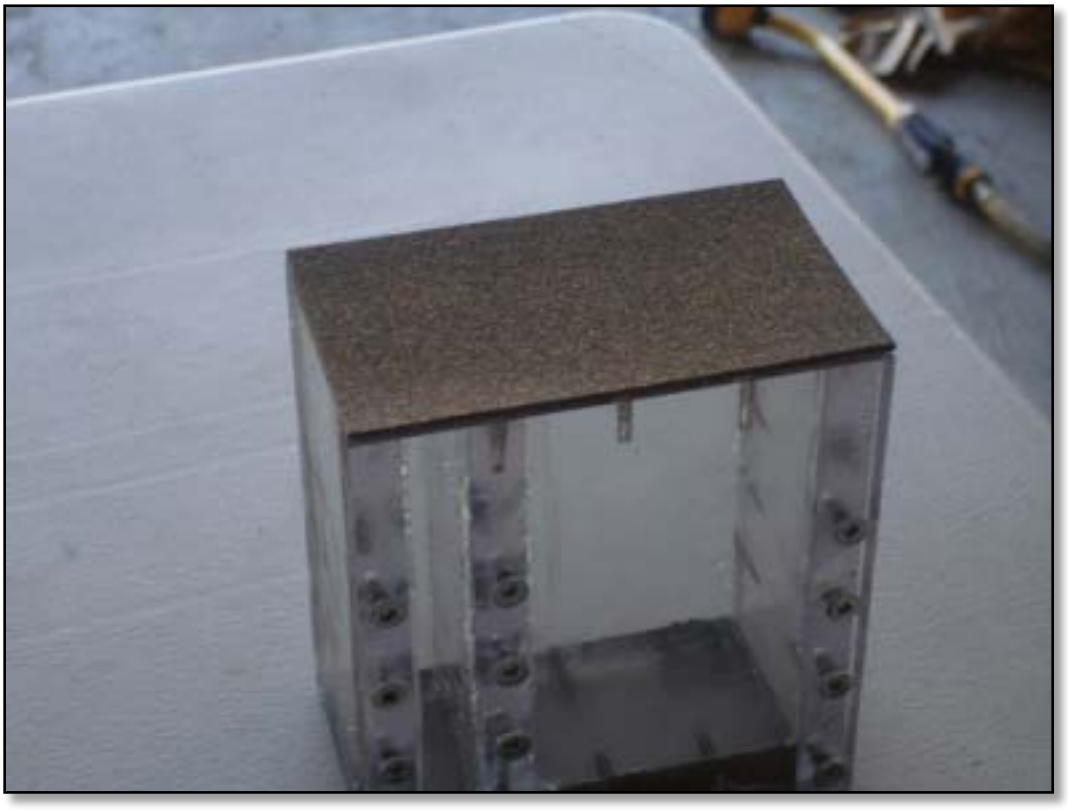
Just trim the end with half of the blade thickness to get a good flat surface.



Take out the gasket you purchased.

Stand the open side of the housing on top of the gasket by the corner

Using a knife, cut out a trace of the top housing.



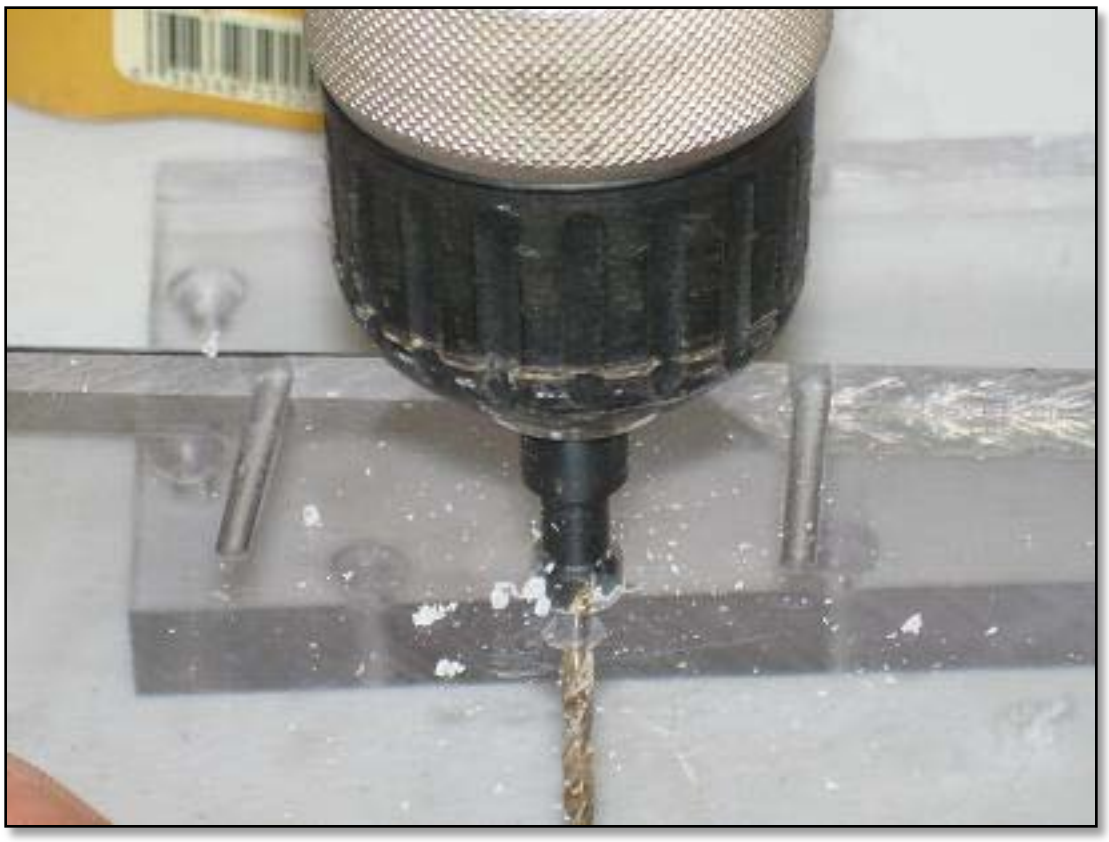
Great! Now let's move on to step 4. Save the gasket for step 5.

Step 4:

This will be a fast step like the one above. Take off the tape stopper from your countersink bit if so applied. Now just countersink ALL the holes you just drilled.

If you are wondering how much to countersink, you should try driving it ½ way down and then install a screw. If the screw is just right, that's your mark or adjust if you need to go in more or less.

Note: Countersinking also generates plastic threads that melt to the bit and surface too. Use a knife to trim the edges and bit. Sometimes you may need pliers.



Step 5:

You will finally assemble the housing for the last time in this step. This is where you will be Appling the silicone sealant to seal the device. This is what you will be using:

It is important that you assemble the housing exactly as said and shown.

You will assemble the pieces in this order:

1. Piece #7 to Piece #1, and then continue…
2. Add Piece #5
3. Add Piece #3
4. Add Piece #4
5. Add Piece #2

Chances are that the holes you drilled are not perfectly straight. At this point you are familiar with the pieces with the paper backings on them. Once you remove that paper layer on the plastic, it will disorient you from know which exact way the pieces go in together. For example, piece #7 can be flipped or turned around and still fit but the mounting holes will not line up.

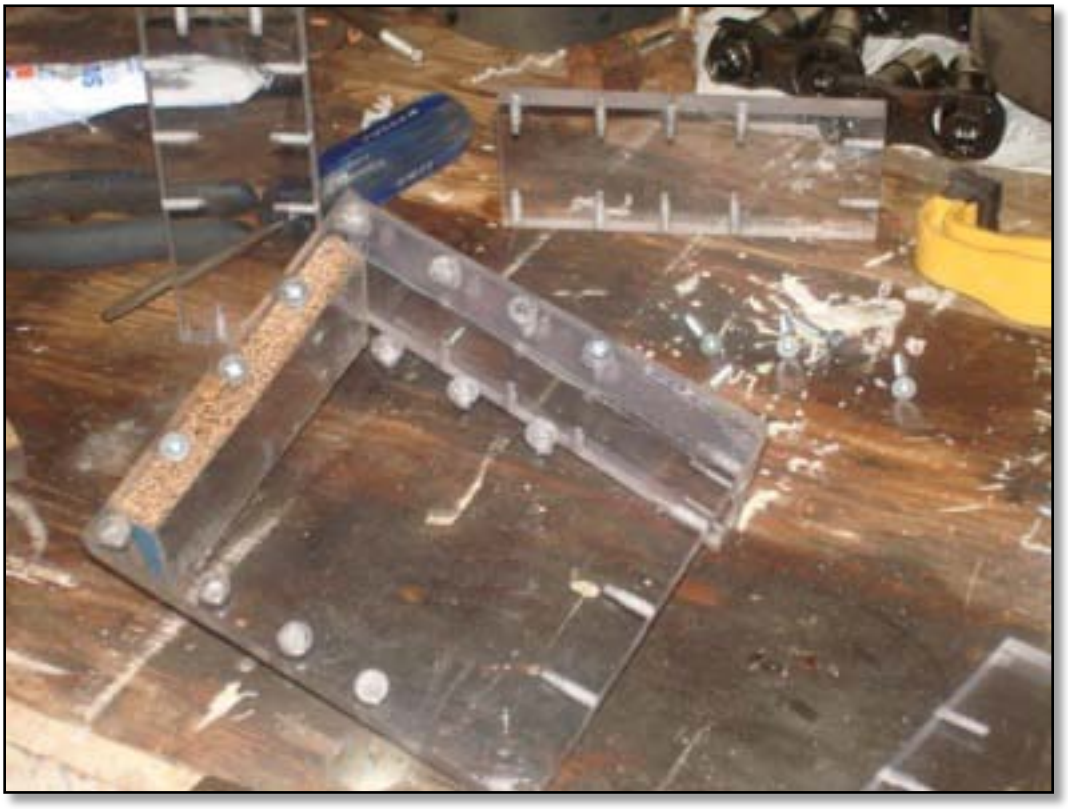
PAY CLOSE ATTENTION

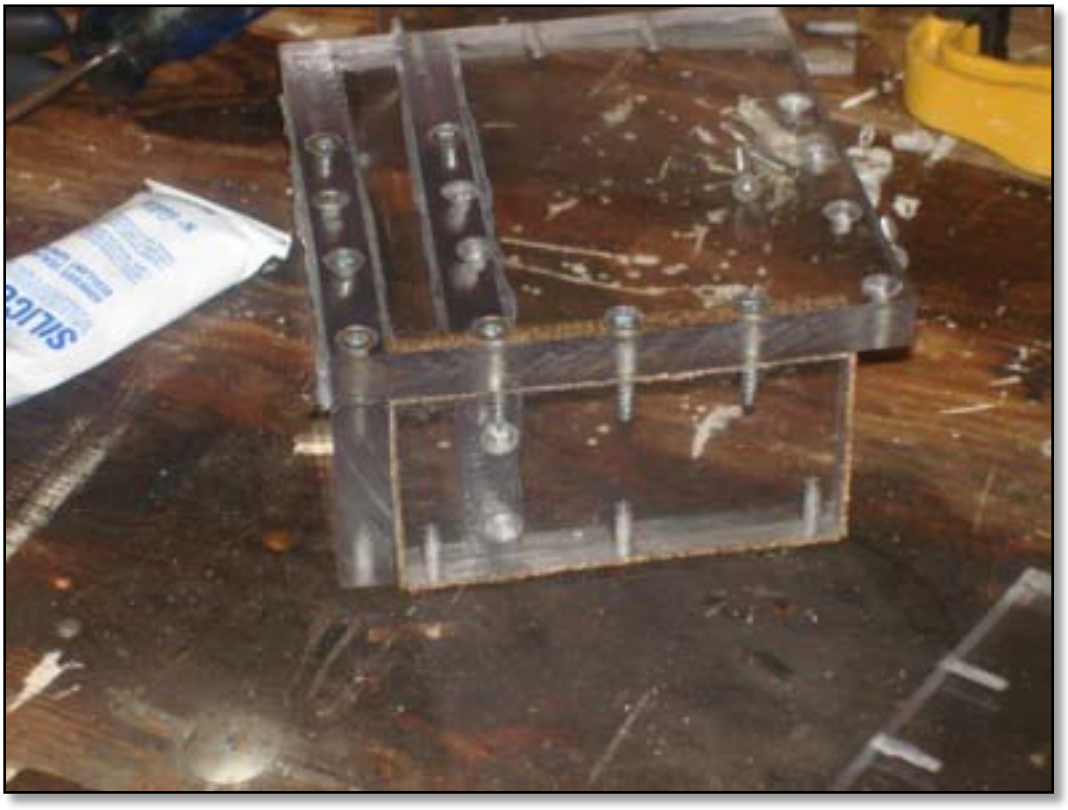
Piece Mating

Remove the internal (non-countersunk) side of piece #1. Start all the screws in all the countersunk holes for only 3 full turns. Now, take piece #7 and apply silicone along the end that mates with piece #1. Check first if you are unsure. Only apply a ¼ inch bead. Gentle mate the end of piece #7 to piece #1 to the closest proper position. Now, screw in piece #7 completely until it is firmly in place. Take a rag and wipe off as much excess silicone as you can.

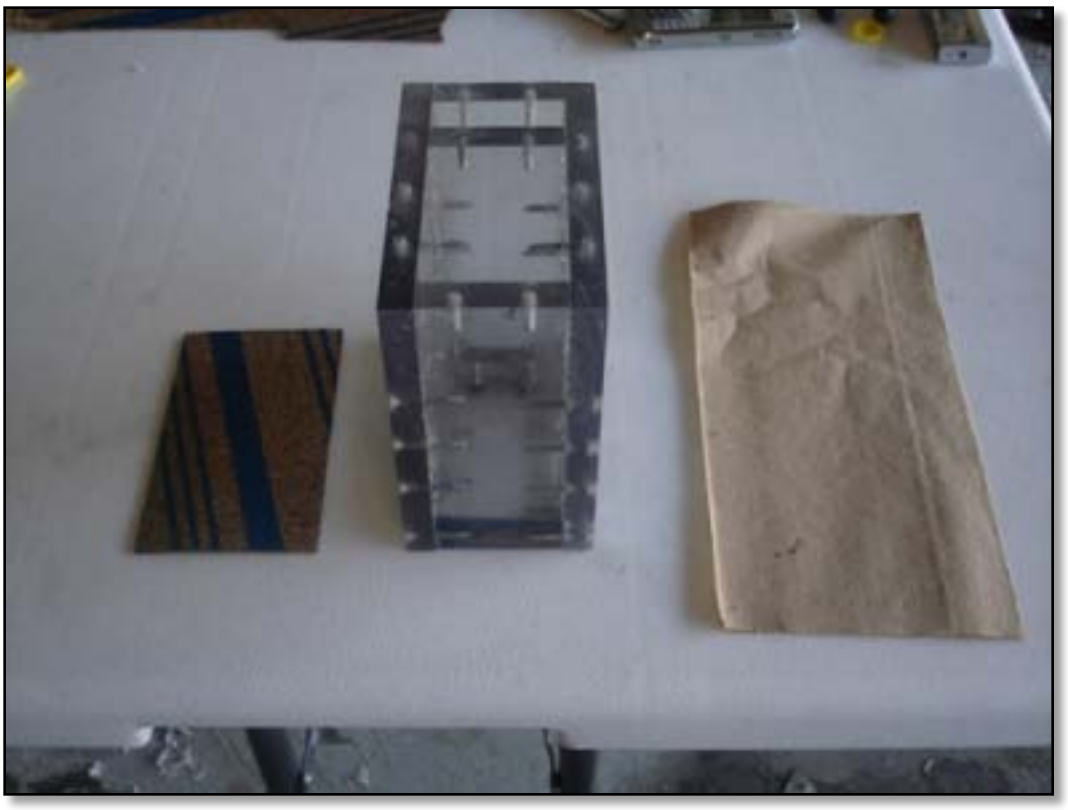
Important Note: Silicone is extremely difficult to remove off of clothing and skin once it cures. Keep a stack of towelettes or shop rags by your side when using this sealant. So, once you or your cloths become exposed; wipe it off immediately! Also, be sure to replace cap on the silicone tube after each use to avoid hardening of the sealant.

Now that you have completed the merger of piece #1 and 7, you have a good idea of how to assemble the other pieces. Remember to only apply silicone to the ends you will be mating and only do one piece at a time. You will have peeled off all the non countersunk sides from the plastic pieces once done. Then you can remove the external paper layer after all pieces are merged.





Alright, so with that done we can apply the top gasket. Get these things ready for the install.

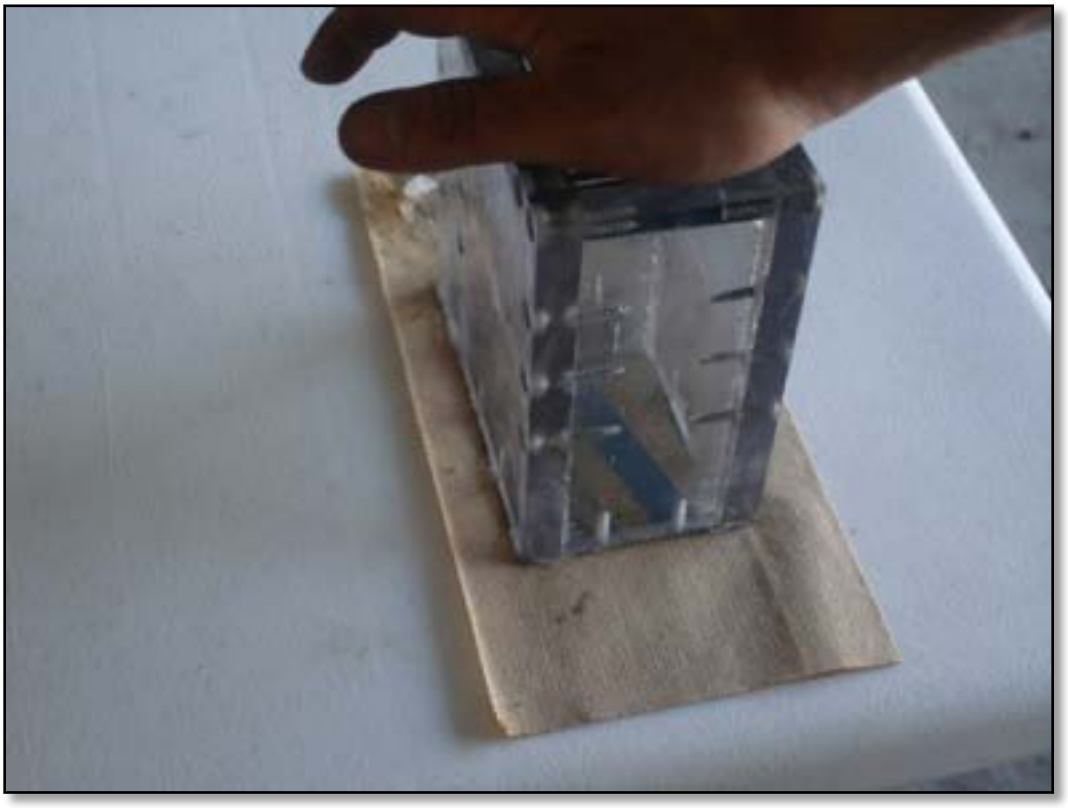


Clean the top of the housing and apply the silicone bead.

When going over the holes, try to push some of the silicone in. Now apply the gasket as straight as possible.

Flip the housing onto the rag (Upside down)

Press down gently on the bottom to ensure a good bond. When we say gently, we mean like as if you were to put a full bottle of water on in.



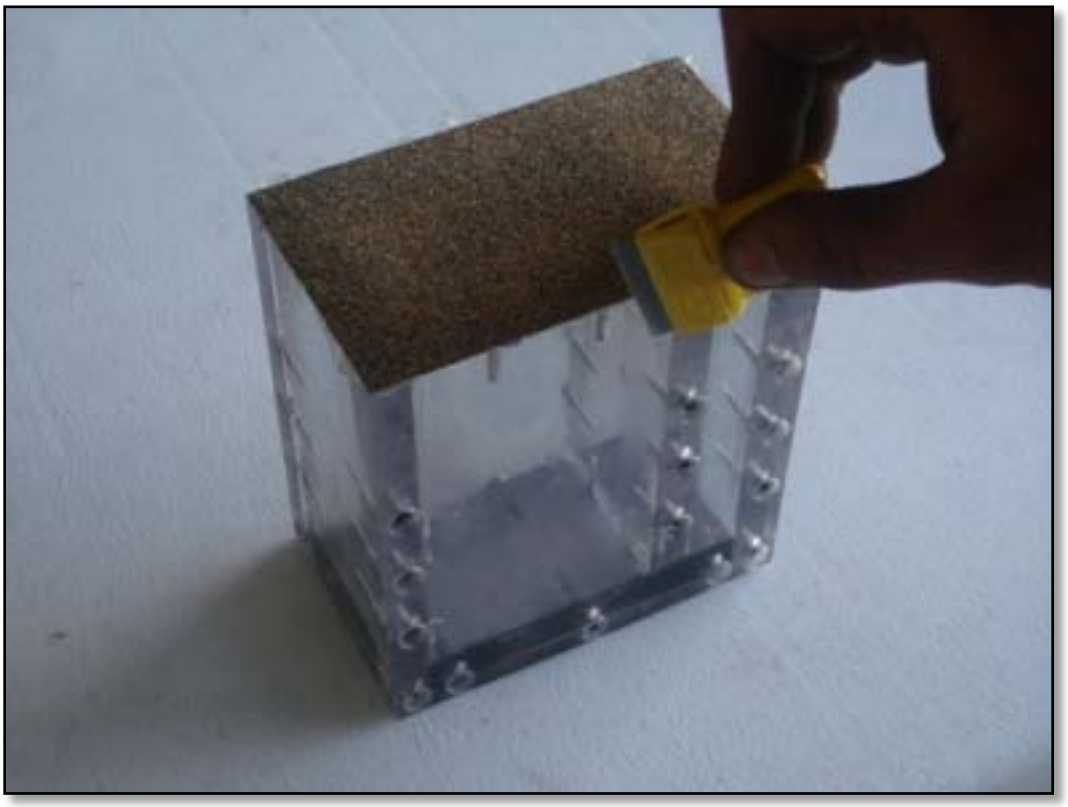
Be careful! The housing may slip out of alignment with the gasket. Be sure and ready to correct alignment if necessary.

Silicone takes about 2 hours to set and 24 hours (1 Day) to fully cure. Vic recommends that you skip to step 6 and carry on till 24 hours has passed.

Once the silicone has cured you will begin the trimming process of removing the excess gasket and silicone. This will be performed with a razor blade

Take the device and flip it right side up.

Now use the razor blade and trim off all the excess silicone.



Once you have gone around the top, you will cut out the openings for the HHO gas generation and bubbler chambers.

Start the cut from the center and work your way to one of the edges. Then, cut from end to end using the edge as a guide.

Continue until you remove the excess gasket.

One chamber down, one more to go.

And you're done…

You now have to remove the excess silicone around and in the housing, same idea here. Use the razor blade to tackle most of the silicone but in places like the bubbler, you might have a hard time getting to the bottom. No Problem! Use a long flat-headed screw driver and run it along the corners. The silicone does not stick well to smooth surfaces so it will come off easy enough.

Well, that's another task out of the way. Its time you move on to step 6 of the build if you have done it already.

Part 3 – Adding the Accessories

Here you will be drilling the holes for piece #6 so that we can install all the fittings, air valve, water fill plug and electrical bolt terminals.

This is an obvious task as it is clearly shown in the picture above.

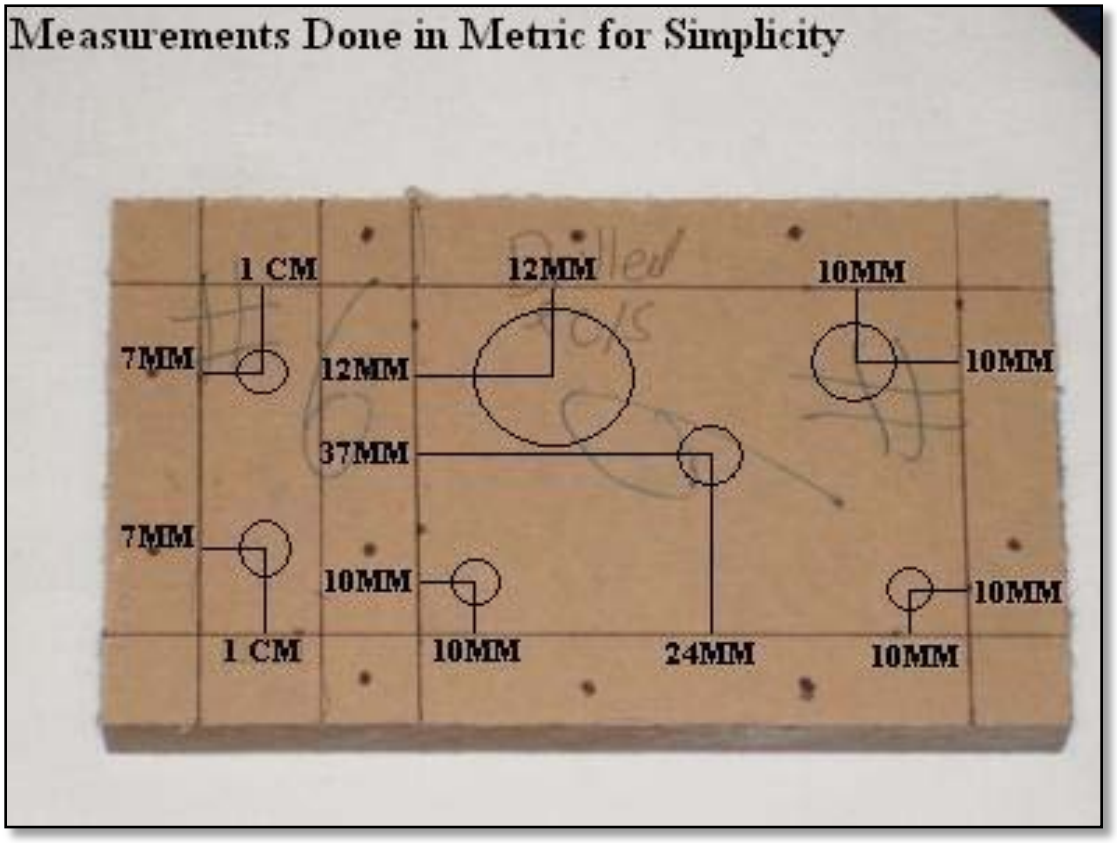
You will start by drilling all the necessary holes. As you already know, the polycarbonate plastic is easy to drill into. Be sure to drill through as straight as possible. Again, you are using wood cutting bits for this task.

Drill Bit Sizes:

- 3/8th Male Hose Connector – 3/8 bit
- Air Valve – 15/32 bit
- Water Fill Cap – 3/4 bit

- Electrical Terminals – 17/64 bit

Here are the measurements drawn out.



Place piece #6 in a vise

After you are finished with marking your measurements, you can begin drilling. A pilot hole will not be needed as you will just go straight through.

Now that you have drilled your holes, you can begin installing the hose connector fittings, air valve and electrical terminal bolts. You will be using silicone sealant for all six threaded components.

Note: You should verify that the bit end is not bigger or smaller than the component you are about to install. If you look at the components threads, you can see the base where the treads start. The drill bit should JUST be bigger than that. Use this just in case you find differences.

It doesn't really matter which item you start with. The only differences here are the two stainless steel bolts as they are fed in from the bottom up.

Let's start with the electrical terminal bolts.

First, we need to get the threads started. Take you socket set out and match a socket to the head of the bolt. You may need ether a deep or shallow socket. Attach the ratchet and make sure the direction set on the ratchet is turning clockwise with the socket side down.

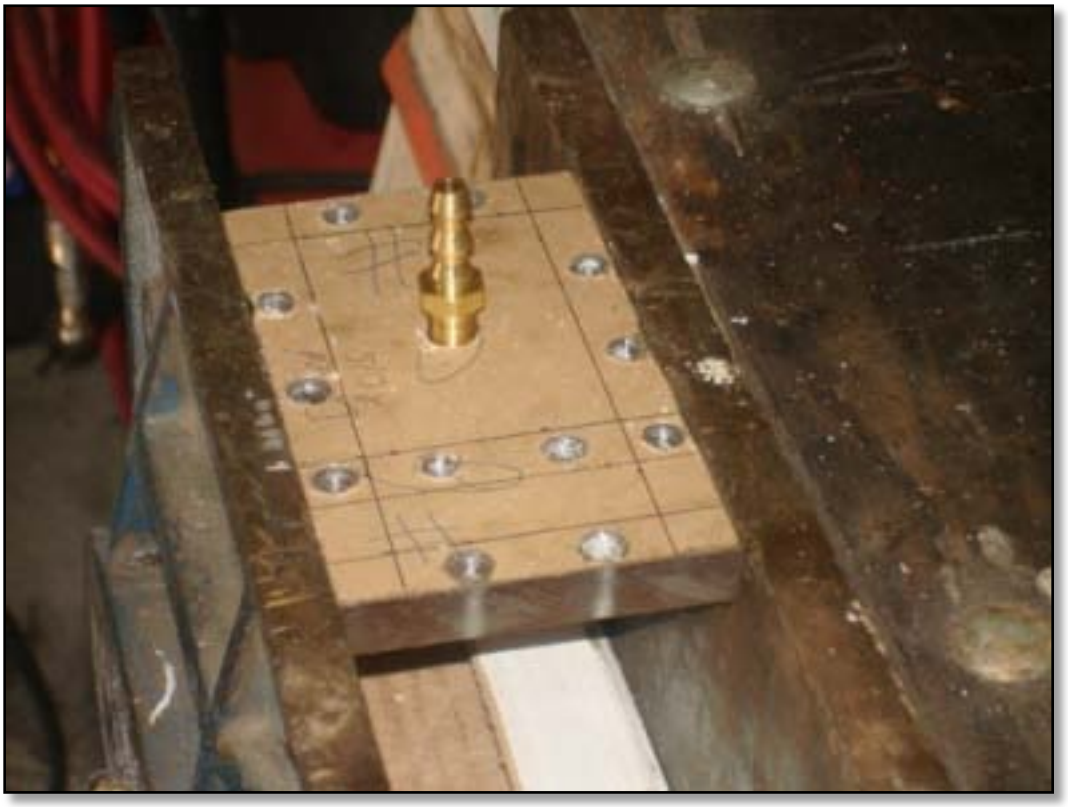
Deep Socket

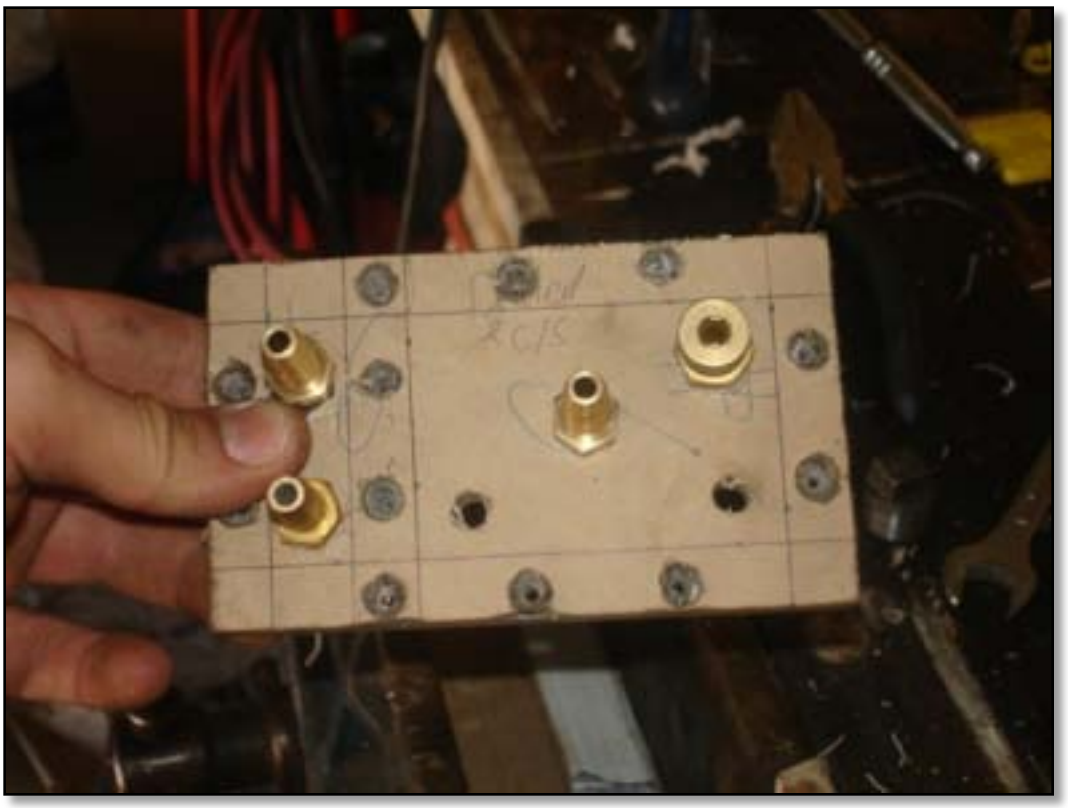
Shallow Socket

Put the component of your choice into the hole you drilled. Start turning it counter clockwise for half a turn. You should feel the component straighten up. If that doesn't happen, that's ok. With your hand, turn the item till it starts to thread into the plastic. Once you have done that, take your ratchet with the attached socket and press firmly down and straight. Make sure the socket engulfs the item and sits flush to the plastic. Now ratchet the component down to the end of its thread.

BE CAREFUL! You will notice the component gets real hot; hot enough to burn you.

Once that is completed, carry on and do all the others. When you are done all of them, back them all out 5 full turns and apply the silicone onto the thread except for the stainless bolts. You will finish them when you install the MAX cell. Tighten them back up.



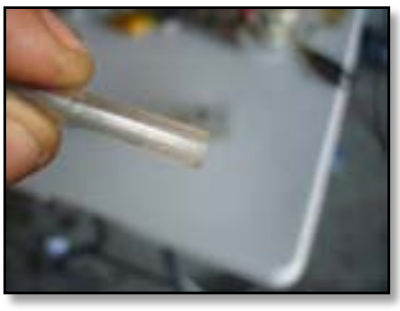


Don’t forget to add you Lock Washers

Now for installing the bubbler tube.

Pick ether hose connector, it doesn’t matter.

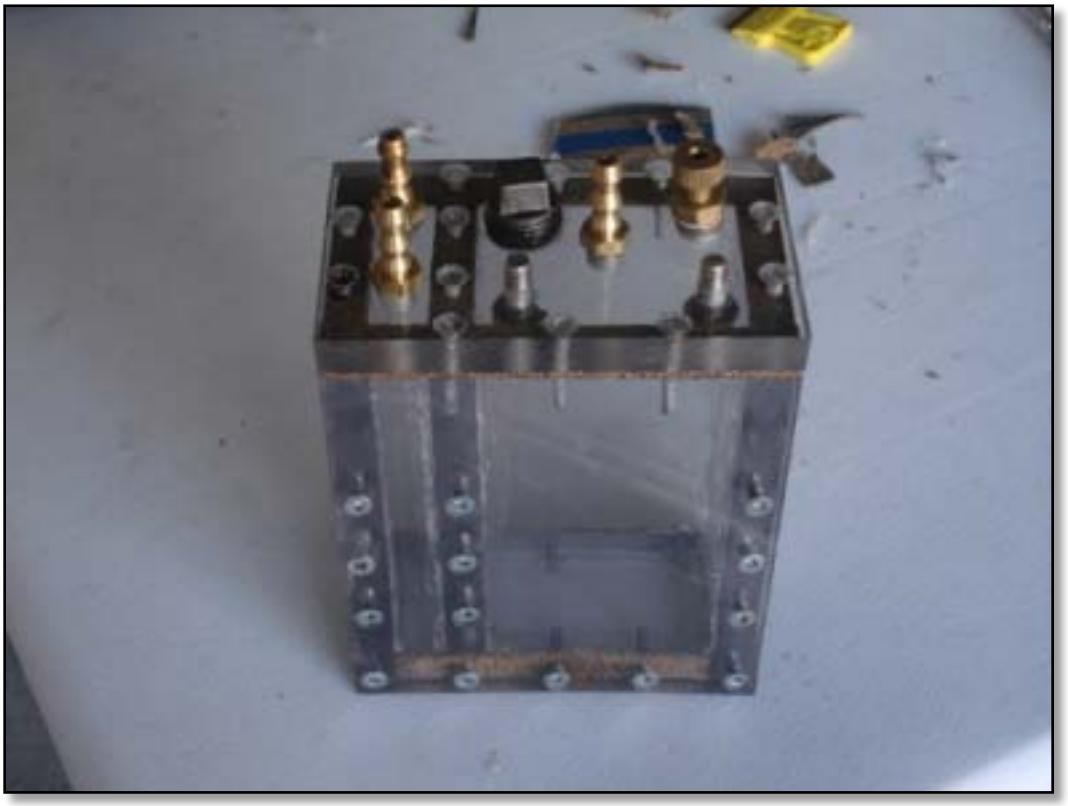
Take some 60 Grit or course sand paper and rough up about ¾ of an inch at the end of the bubbler tube you will be inserting into the hose connector. Cut only 4” of tube.

Using the sandpaper, rough up the inside of the hose connector. Apply silicone to the roughed up end of the tube, insert into the hole with a turning action and reapply silicon at the base with your finger. Wipe away excess and allow 24 hours to cure.

Congratulations

You have completed Phase 1



PHASE 2: Construction of the MAX Cell

Now that you can house the MAX cell, its time you build it. You will need 11 stainless steel plates of 316L grade.

Stainless steel is highly used in the food, drug and marine industry because of its remarkable resistance to corrosion from water. For underwater electrical devices, this severs the same purpose. Vic has tried aluminum and copper with very poor results. At first, it seemed alright but after a while the corrosion got real bad. So, long live Stainless!

Part 1 – Measure & Cut

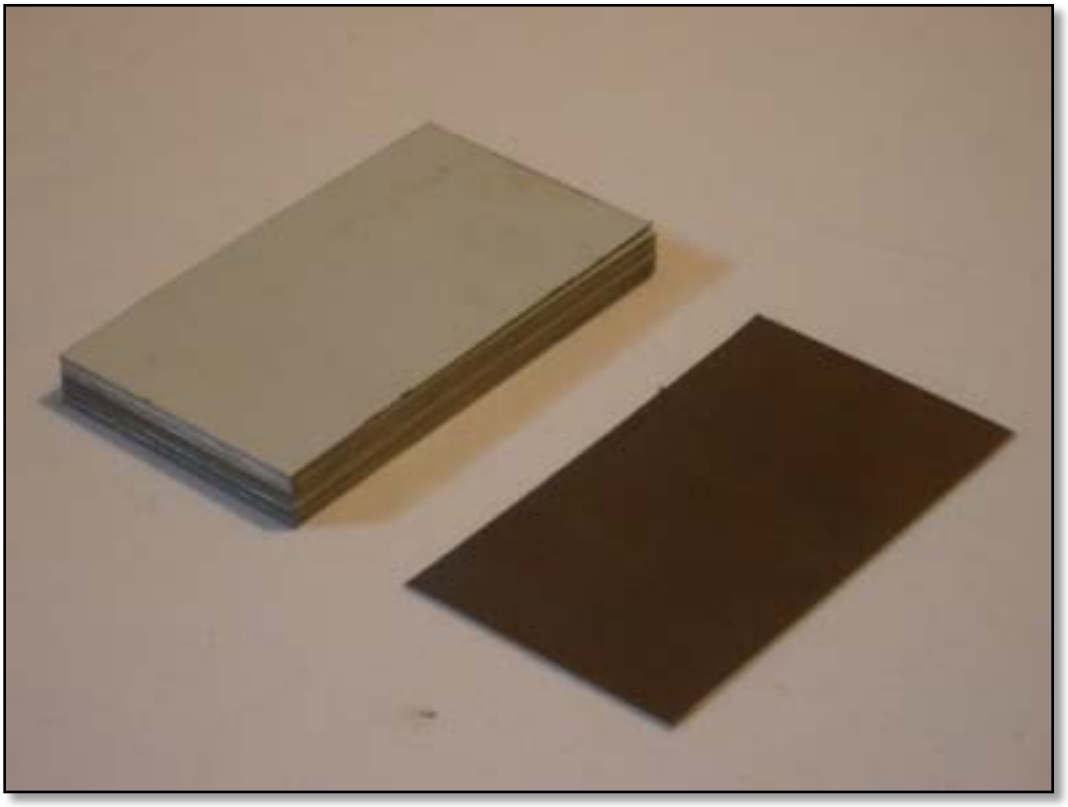
Measure and cut…

Alright, so you got the materials need to start this phase of the build. You will now measure your dimensions and cut off the unneeded sections of the pieces you are cutting.

Tools Needed:

- Sheet Metal Shears
- Ruler or Tape Measure
- Pen or Marker

The stainless steel pieces will have a protective layer just like the Polycarbonate. You will need this to mark your measurements.



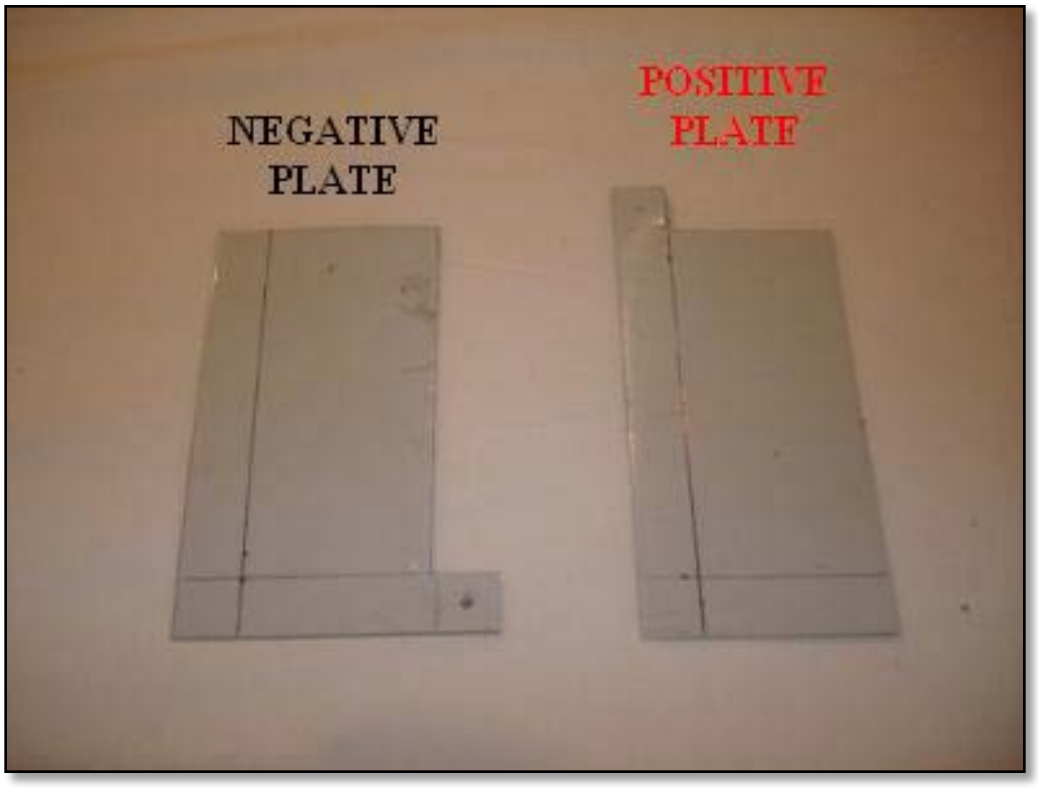
You will need to make:

6 NEGATIVE PLATES

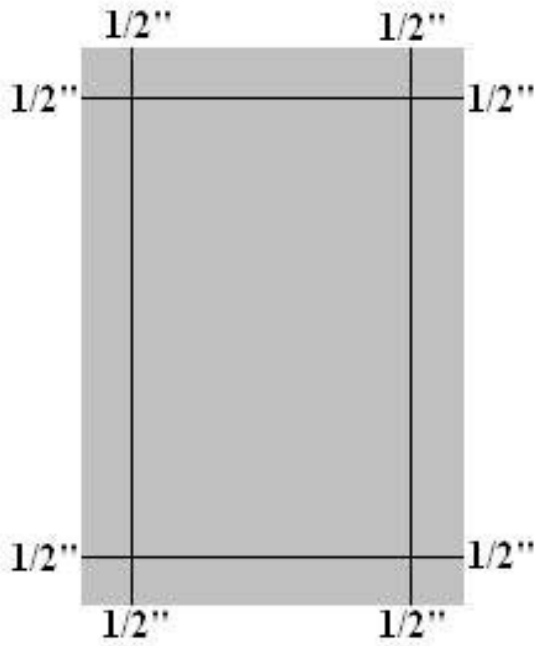
5 POSITIVE PLATES

Look at each plate and look for rough edges. Use your shears and trim these edges off.

These are the two different plates you are making.

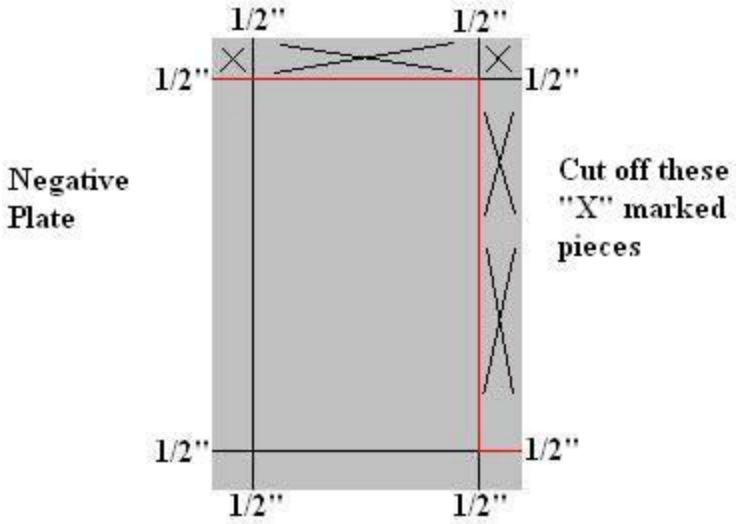


Measure and draw ½ inch perimeter lines around all 11 pieces just like you did with piece #6 of the housing.

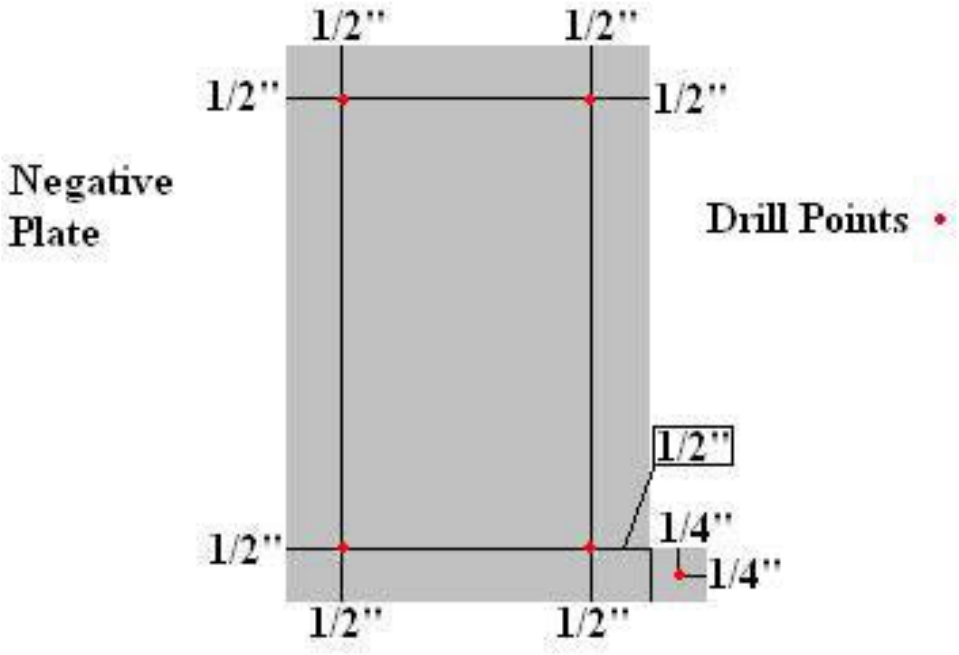


Perimeter Lines

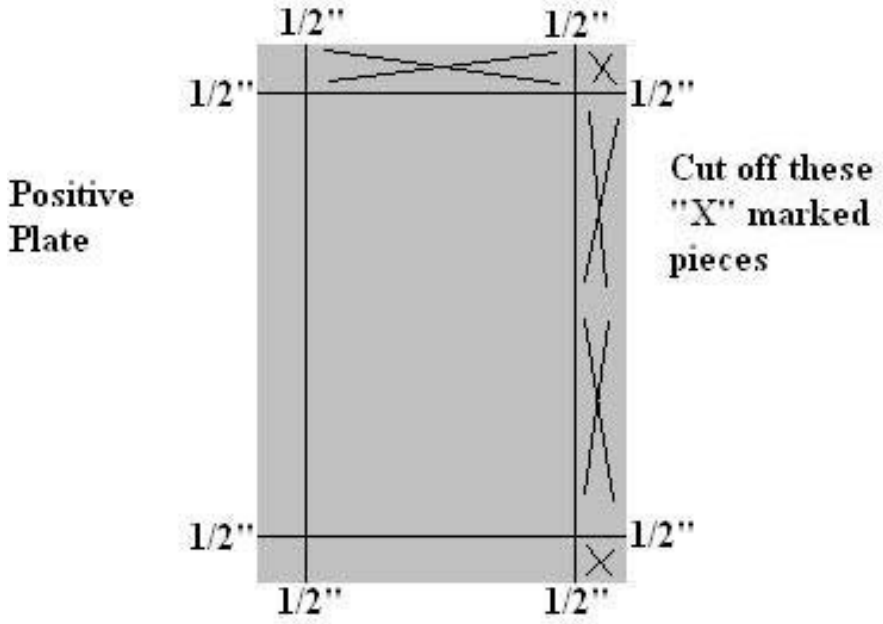
Take 6 plates. Make the negative plates first and mark these sections with an “X”. Then cut them off.



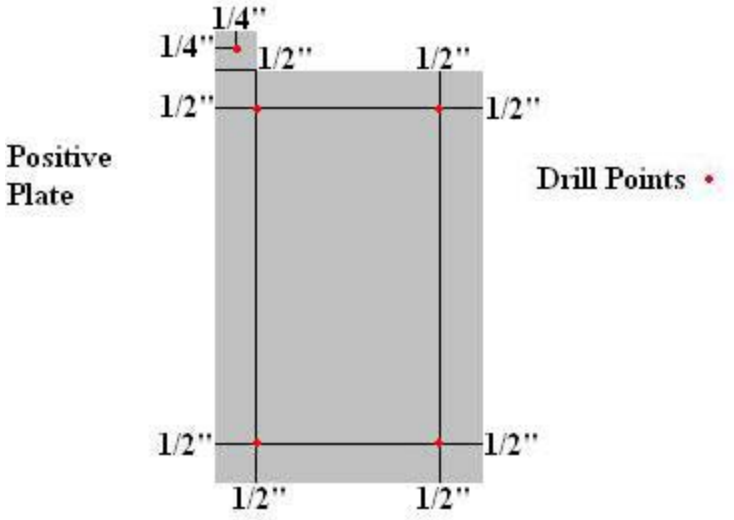
Drill points are now to be marked. Redo the perimeter lines at ½ an inch leaving the ½ by ½ inch tab out. At any corner of the tab, mark a ¼ inch by ¼ inch out from both directions and mark towards the center with the same measurement.



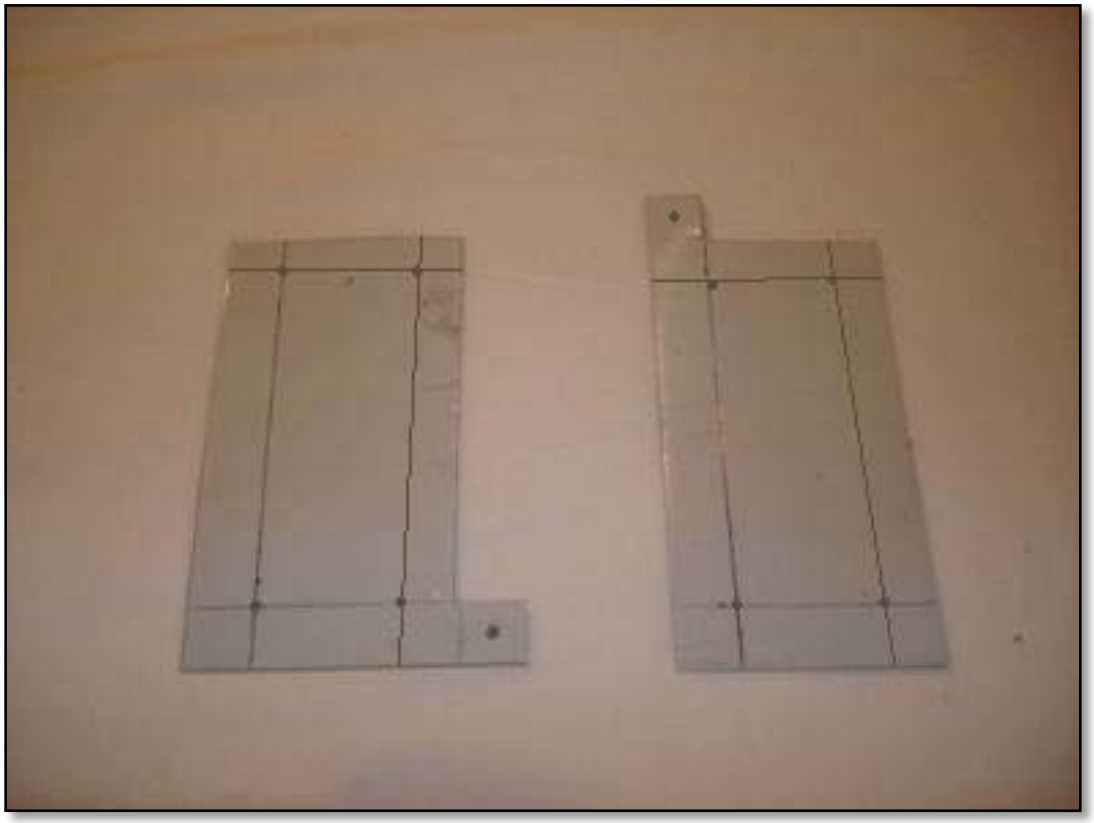
With the negative plates done, we move on to the positive plates. Mark the following sections with an “X”.



Drill points are now to be marked. Redo the perimeter lines at ½ an inch leaving the ½ by ½ inch tab out. At any corner of the tab, mark a ¼ inch by ¼ inch out from both directions and mark towards the center with the same measurement. Just like the negative plate.



Ta da! Part 1 is complete.



Part 2 - Drilling

Drill the holes…

Let's move on to drilling.

Machine shops use something called "cutting fluid" to keep a drill bit from "burning out". Vic recommends that you use this as well. Make sure the drill bits are "Cobalt" grade or better for drilling hard metals

Drill Bit Sizes:

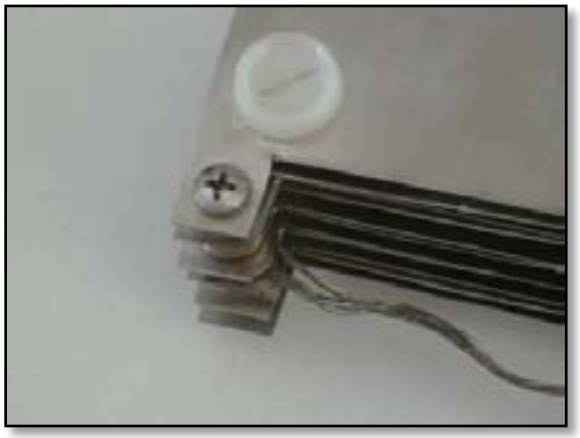
- 4 Main Isolator bolts – 9/32"
- Connector Tabs – 13/64"

4 Main Isolator bolts:

These are the long white nylon plastic bolts that you will be using to isolate the plates with. This is the main support for holding the stack together as a "Cell".

Connector Tabs:

The connector tabs are the tabs that stick out of the foot print of all the plate when formed into a cell; 5 tabs for the positive and 6 for the negative. You need to inner connect the same tabs so that you can electrify them using only one wire. So by drilling a hole, you can install a bolt with washers in between each plate to act like one big wire.



Drilling:

Before you drill take 2 pieces, negative and positive, and use a centre punch to mark all 4 main drill points with a divot. Only on one of them. Now, punch both pieces at the drill point of the connector tabs.

Place all the positive plates in the vise as straight as you can and make sure the whole stack is in. Squeeze the plates as hard as you can to straighten them. Do the same for the negative plates.

Take all 11 pieces and stack them together make the one piece you just punch all 4 main holes with is in the front. Wrap all the together with duct tape. TIGHTLY!

Square them the best that you can and insert the stack in the vise leaving only one main drill point exposed for drilling. Apply your cutting fluid to the bit and stack and commence drilling. Every so often, you should stop drilling and add more cutting fluid so it doesn't dry up.

Once that is done, allow to cool and move the stack so you can drill the others.

Continue till all are done.

Separate the negative plates from the positive plates. Using the punched tabs as the first plate, apply the same drilling method and stated on the last page. (Page 172)

Part 3 - Assembly

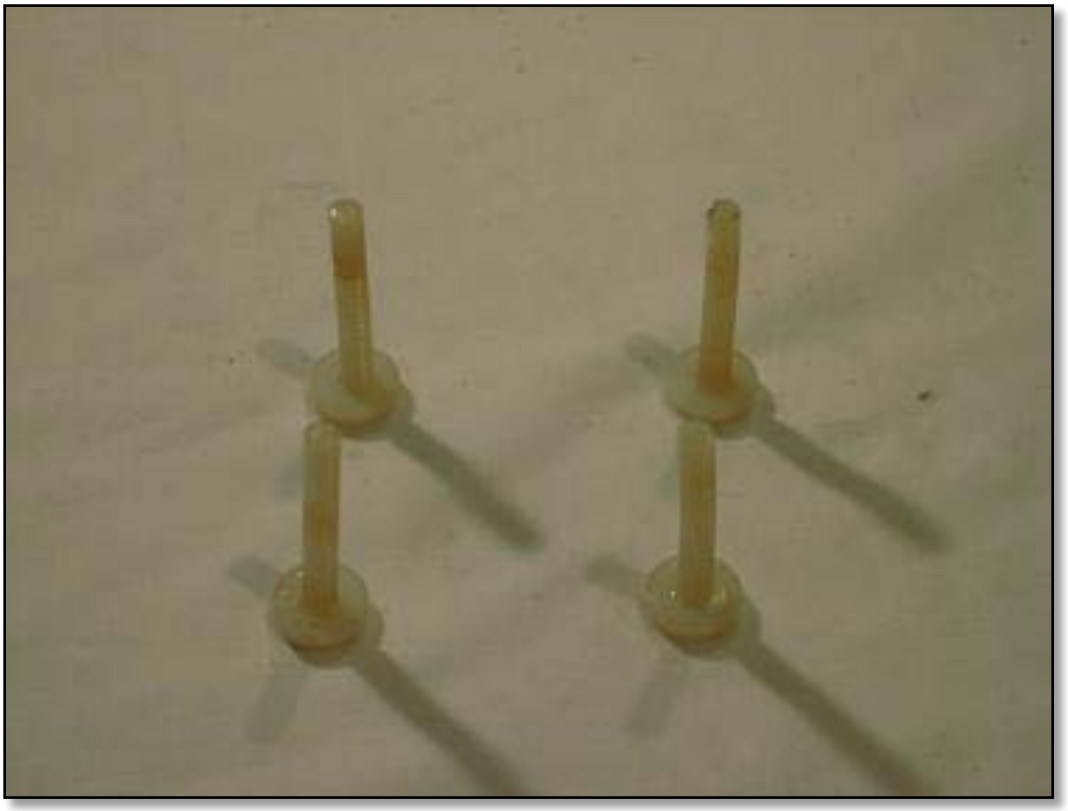
Assembly…

It is time to assemble the MAX Cell. You will be stacking the cell plate by plate feeding all necessary washers as well.

Tool Required

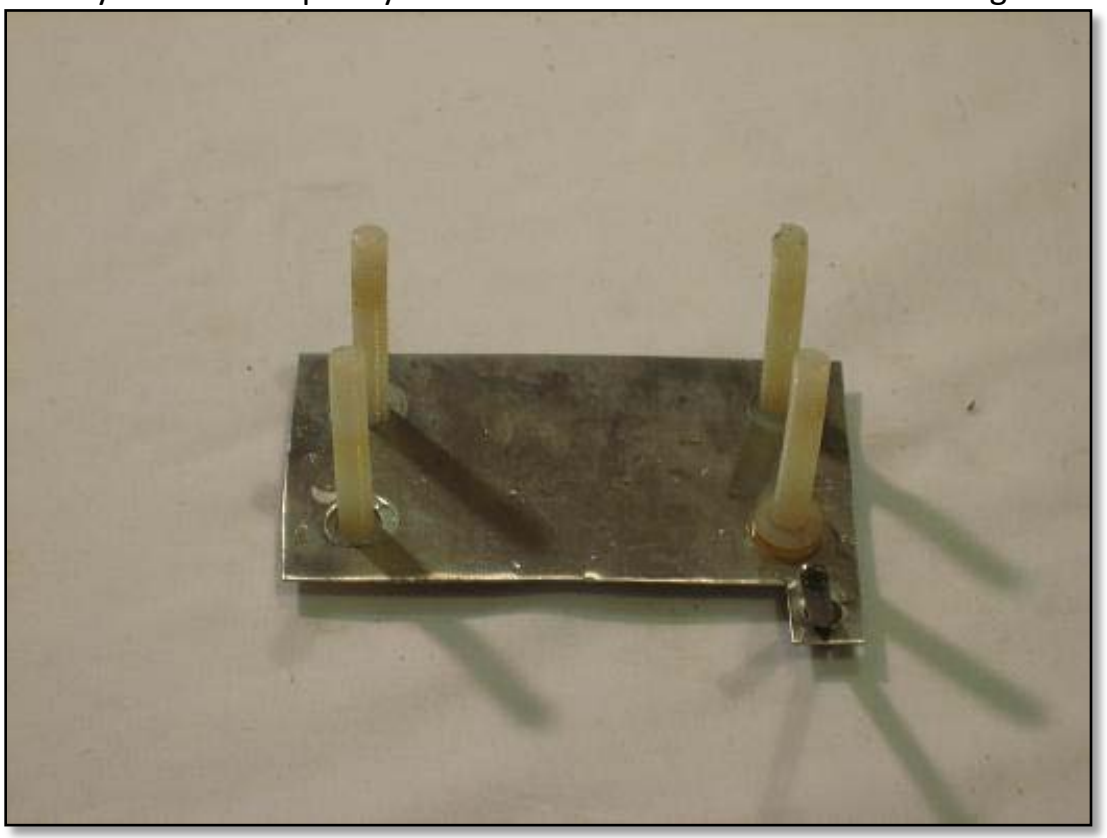
- Adjustable Wrench
- Flat-head Screw Driver
- Neednose Pliers

Lay out the 4 main nylon bolts and 1 Stainless Steel bolt as such.

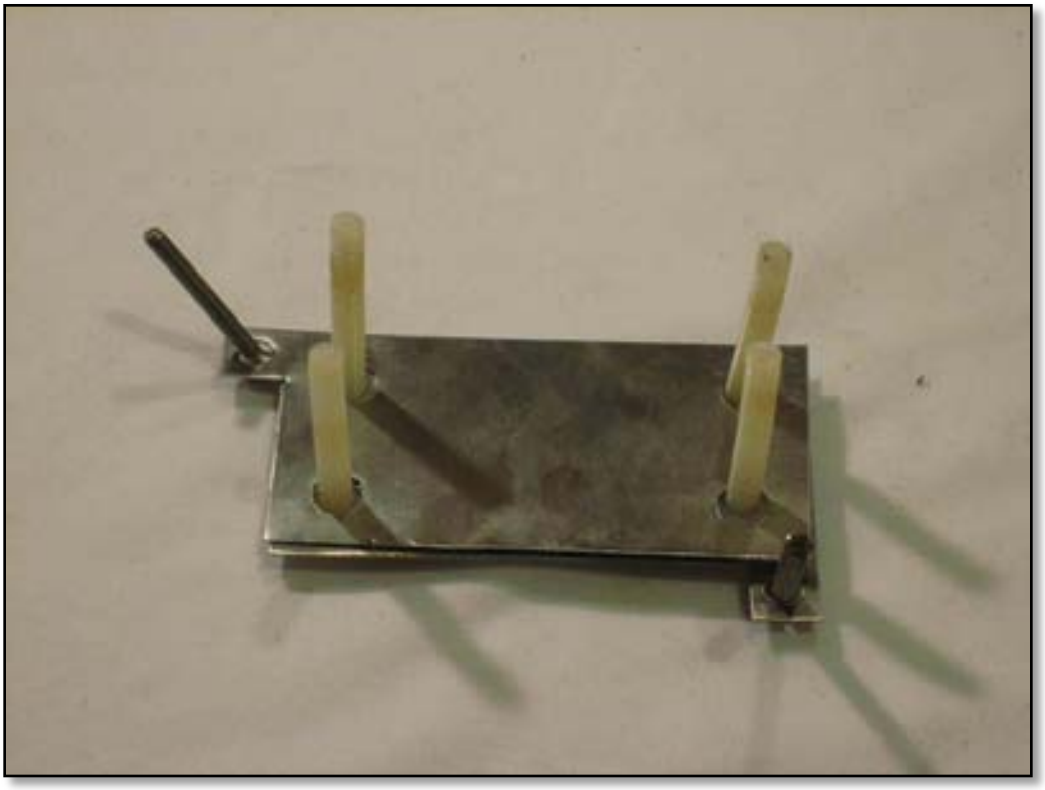


Lay a negative plate on the finished washers letting the nylon bolts penetrate the holes that were drilled.

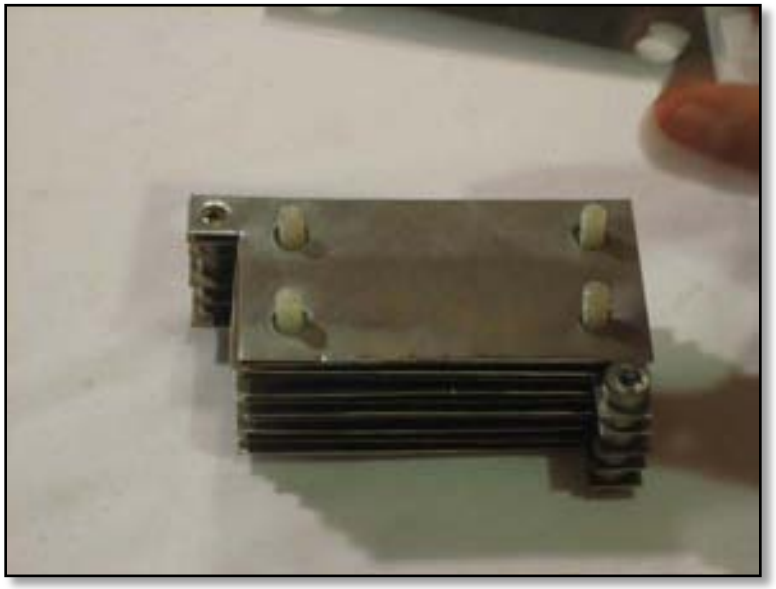
Stack 2 nylon washers per nylon bolt and 8 Stainless Steel connecting washers.



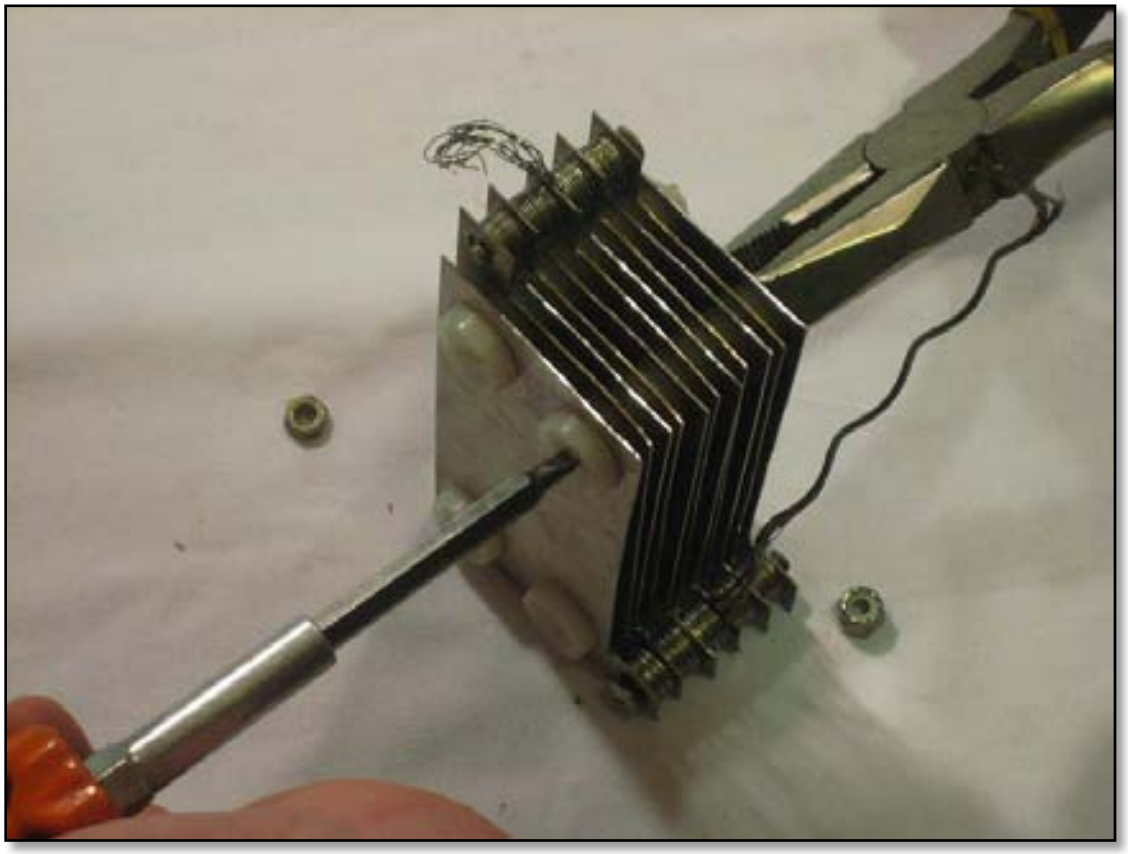
Now lay in a positive plate and do the same.



Keep stacking in this way till all 11 plates are in. REMEMBER: Vic used around 8 Stainless Steel washers between each alike plates. 2 Nylon washers between each plate.



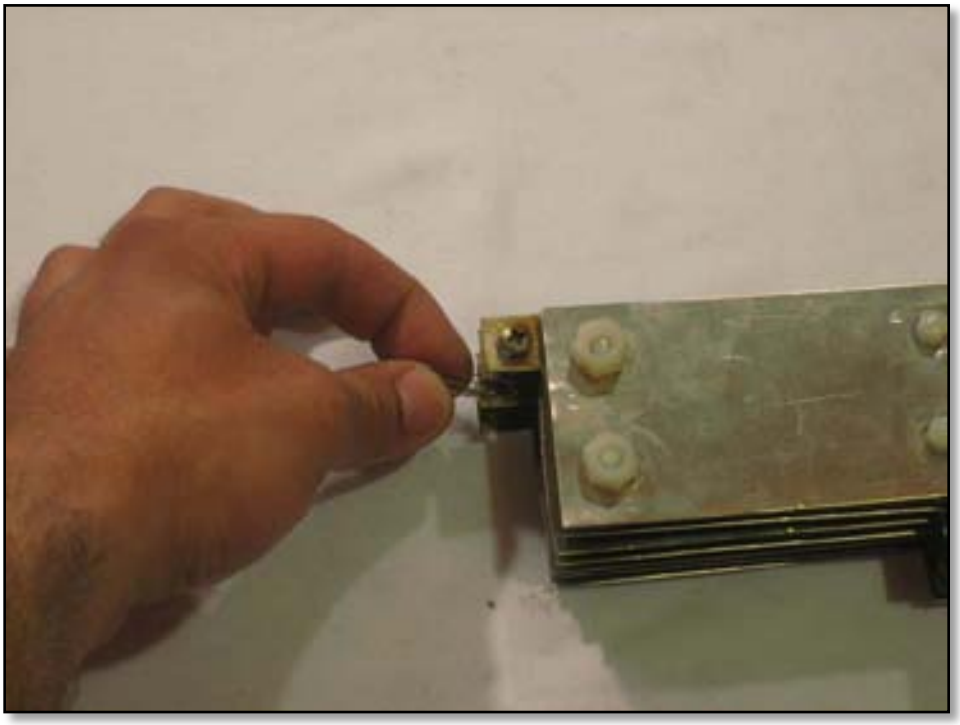
Secure all 4 nylon bolts. Be careful not to over-tighten the nut.



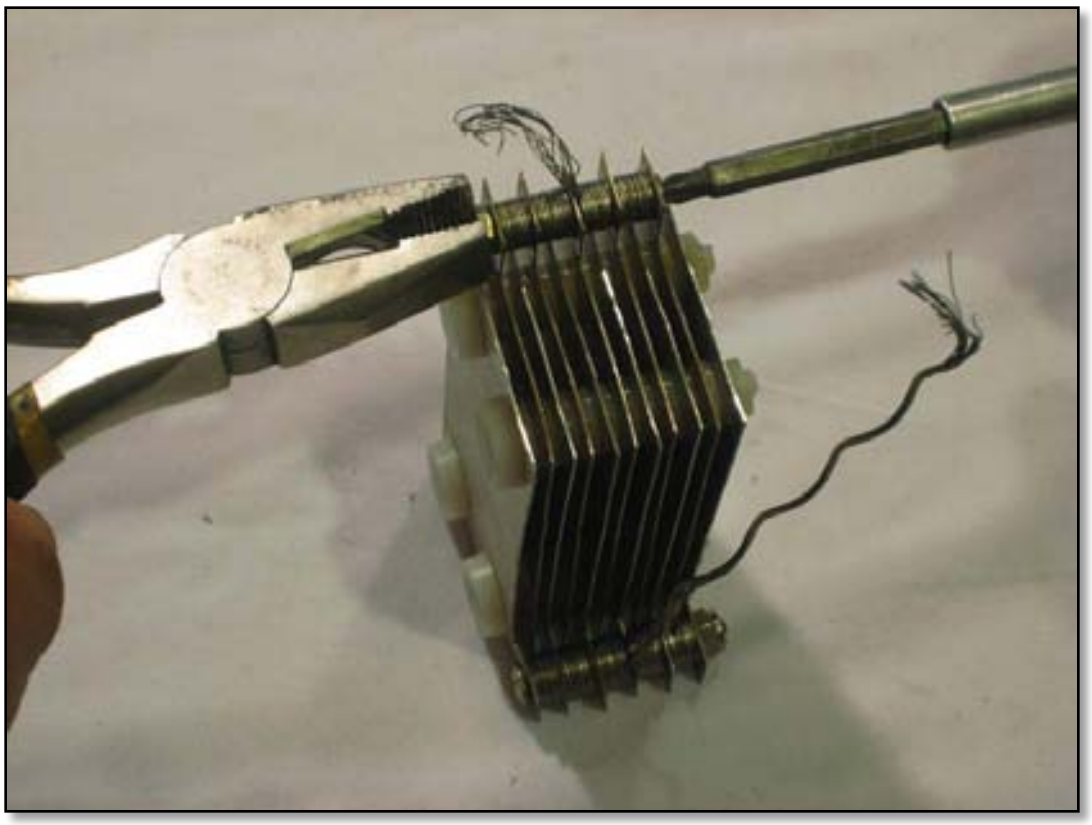
Cut 2 Stainless Steel strips of the marine cable

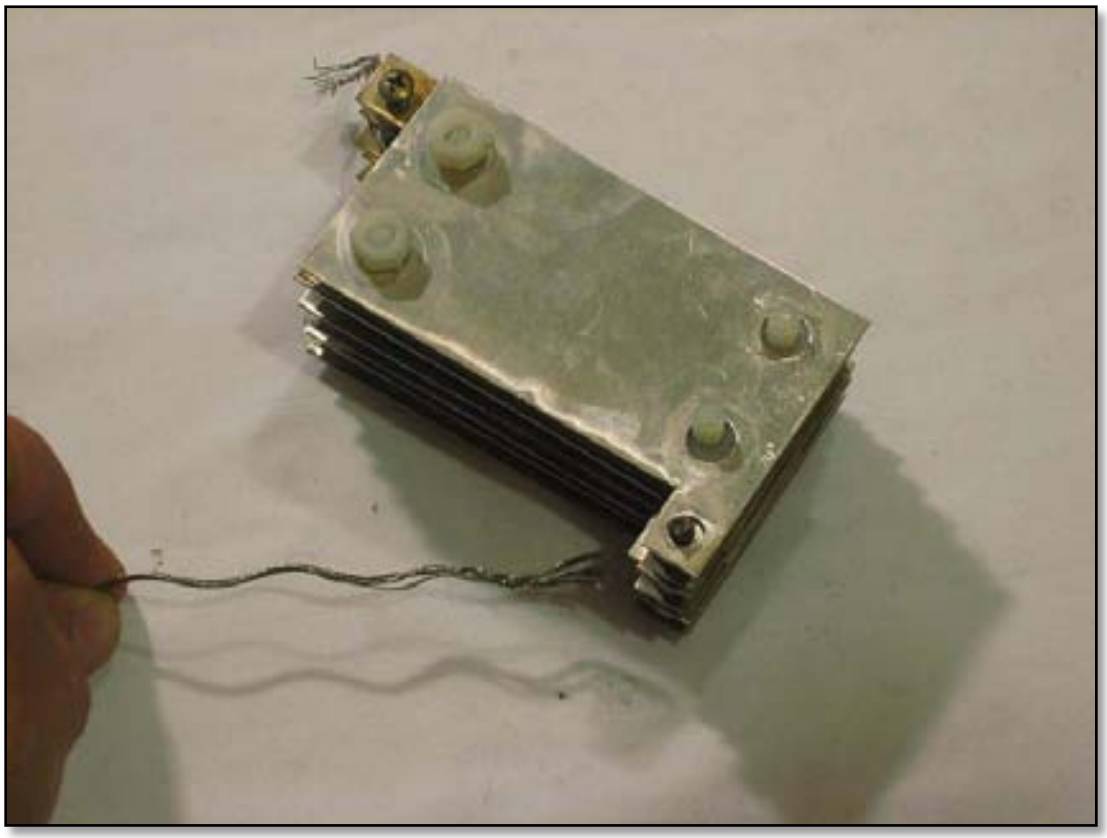
1. At 6 ½ inches (Negative Plates)
2. At 2 inches (Positive Plates)

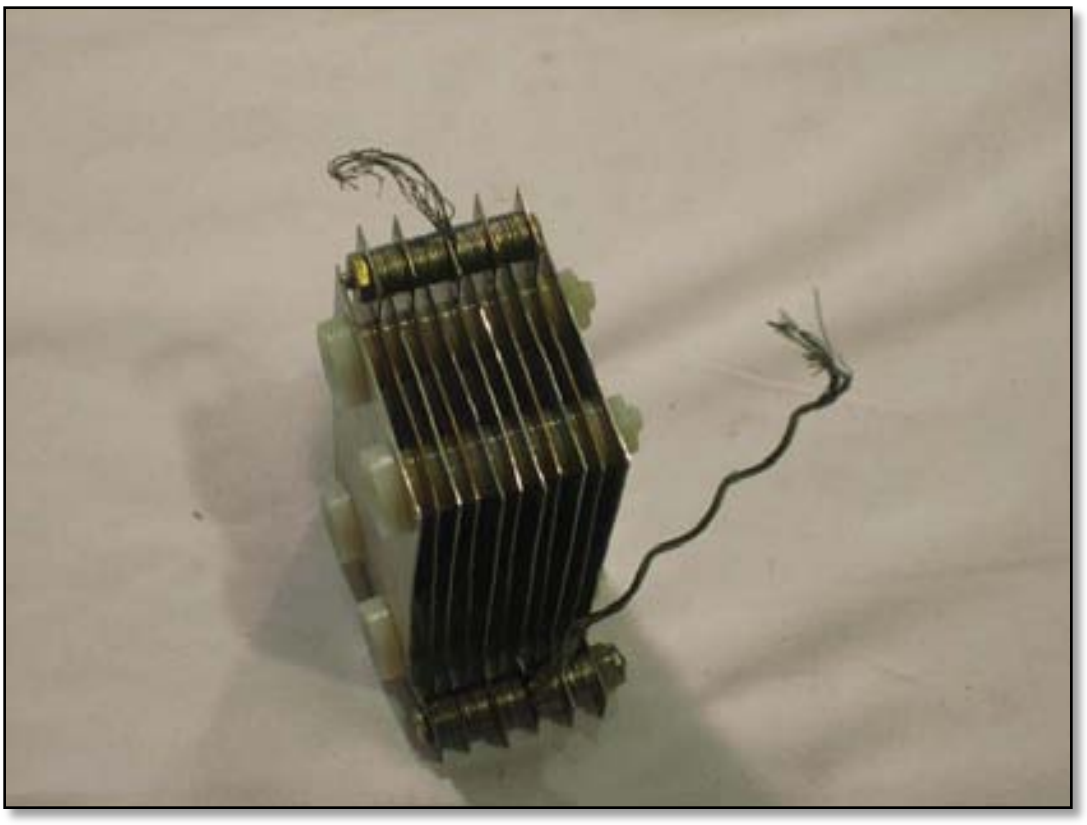
Split one end of the cable into two flat groups and insert between the connecting washers.



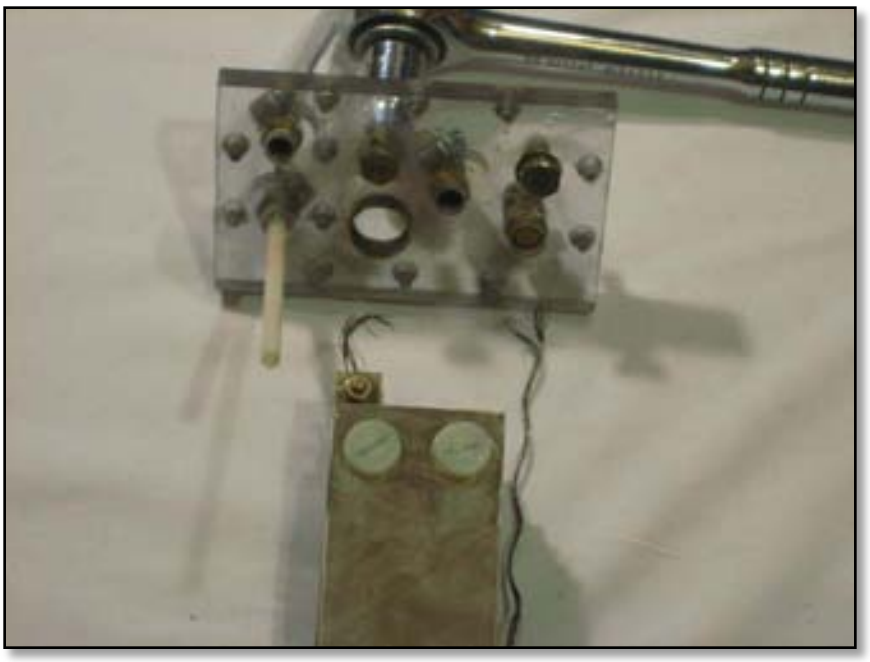
Now secure the bolt for both the negative and positive connecting tabs.



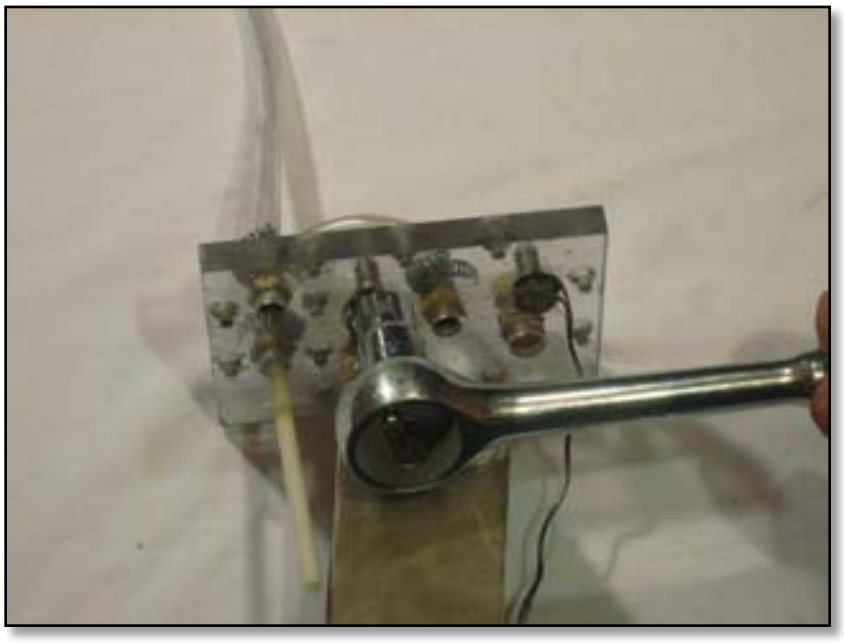




Now back-out the two bolt terminals in the top piece of the Hydrolyzer housing by 5 turns and apply silicone to the threads. Keep in mind that the cables CANNOT TOUCH the plates. The good thing here is that the cable is stiff enough for you to guide the cable away as you are tightening the bolt. The cable you will have will be straight. Vic was experimenting with these wires… god only knows why… ;)



Align the positive cable to the bolt head and ratchet the bolt down
Do the same to the negative.



Now all you have to do is pick up the cell, line the cell with the opening of the HHO gas chamber and mark how much of the protruding nylon bolts you have to cut off. Use a file if you must for fine work.

NOTE: You need the nylon bolt to slide on the sidewalls to ensure the cell does not shake around while driving.

Now simply install the MAX cell into the housing with the help of needle nose pliers and push it down until the cell sits flush to the bottom. You will notice that the top is attached by the power cables so be careful when installing. Screw the top down and you are done.

PHASE 1 & 2 ARE COMPLETE

In case you are wondering, this cell design electrically is considered a parallel powered system as appose to series. I will discuss this further in book #2.

Part 1 - Mounting Setup

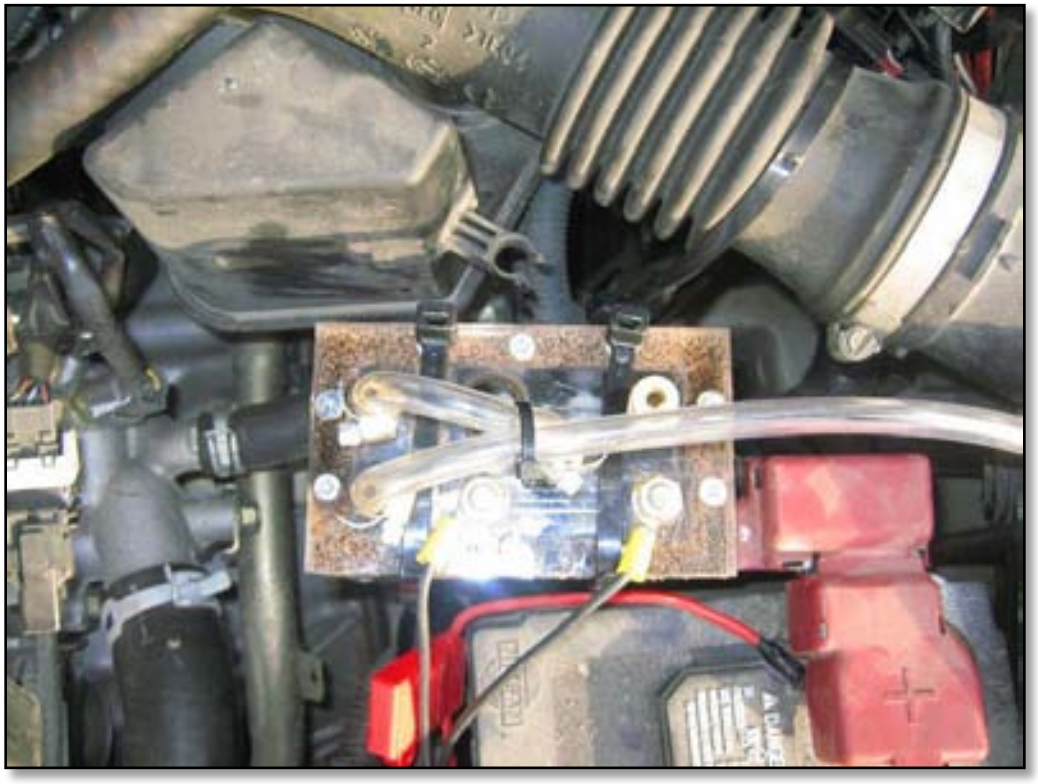
Here you learn how to install the Hydrolyzer into your vehicle.

Open the hood of your car and establish a good spot for mounting. Keep two things in mind:

1. Having a spot where the Hydrolyzer can rest on something secure make mounting easy.
2. Keep it away from a heat source like the exhaust or engine.

*We are going to show this install into a 2006 Nissan Altima with a 2.5 liter engine.

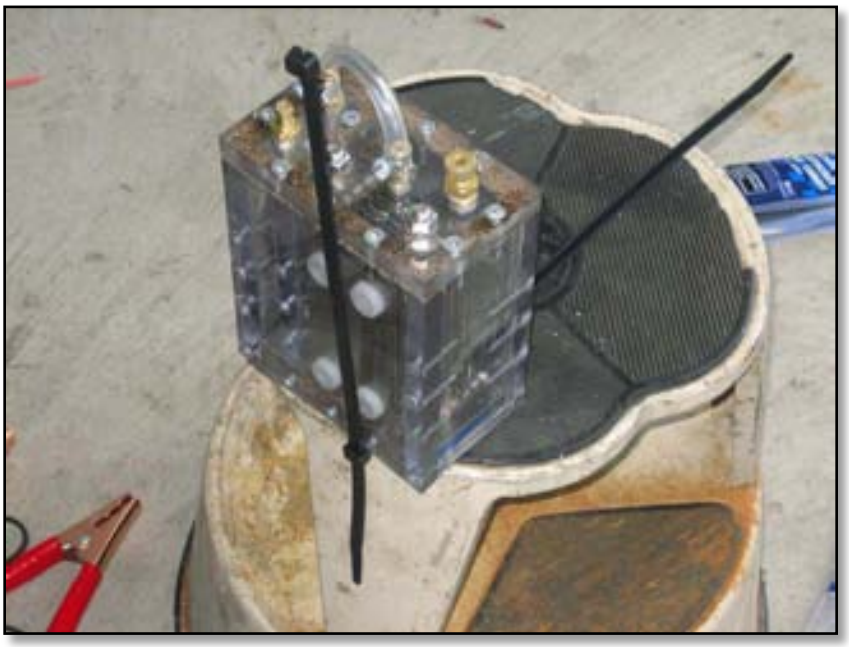
We chose to install the HHO power plant right behind the battery as there was thick conduit to hold the Hydrolyzer up in good position. It is also right by the intake ducting that we are going to tap.



Tools Required:

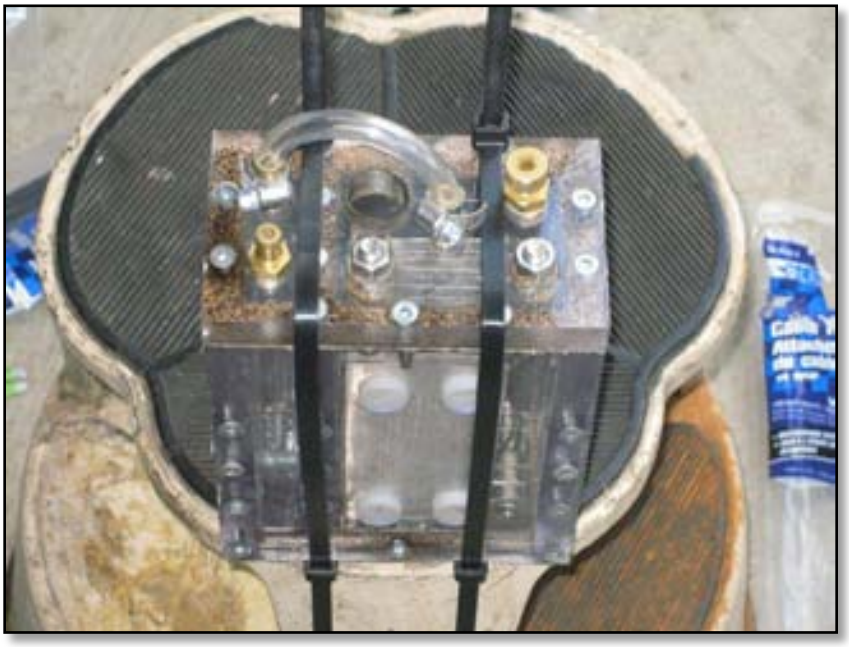
- Side cutters

Once you have decided on the location for mounting your Hydrolyzer, you can install the carry straps (Zip-Ties) to the housing of the Hydrolyzer.



Connect 2 zip ties together like in the picture. Connect the other side as well. The idea here is to have the locking head at the edges.

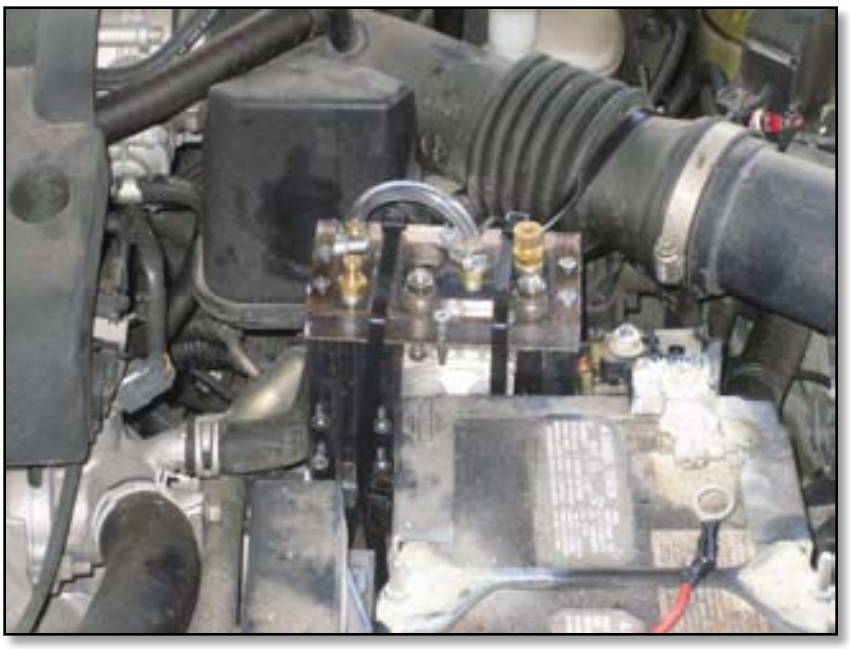
Use these two locations for strapping.



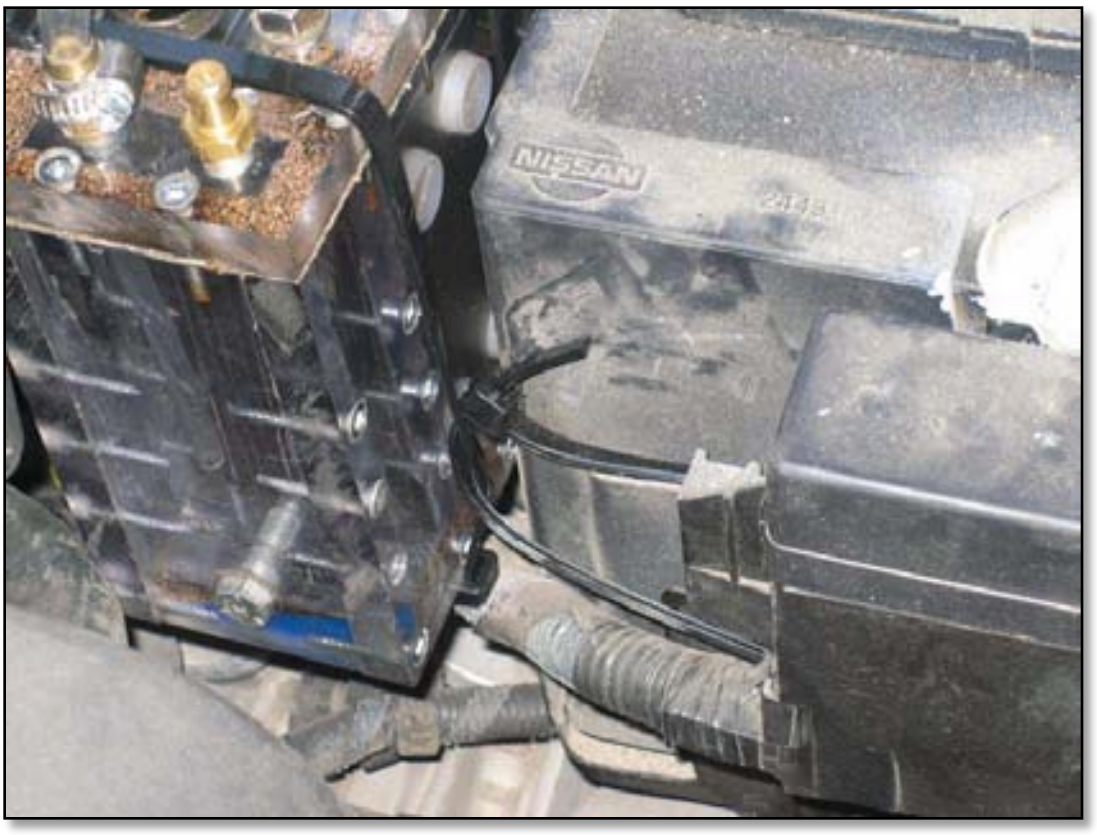
Pull in the zip ties as hard as you can trim off the excess.

Now you can begin mounting the Hydrolyzer in the car.

We tied the Hydrolyzer to the air intake duct and a mounting flange for one of the fuse blocks. Because the Hydrolyzer does not require up and down suspension, mounting is simple. We only needed 2 zip ties. You will require more if you have to suspend the unit.



The Hydrolyzer is less than 10 pounds with water.



Let's Move on to Vacuum Tubes

You are going to start by installing a tube between the HHO gas generator and the bubbler.

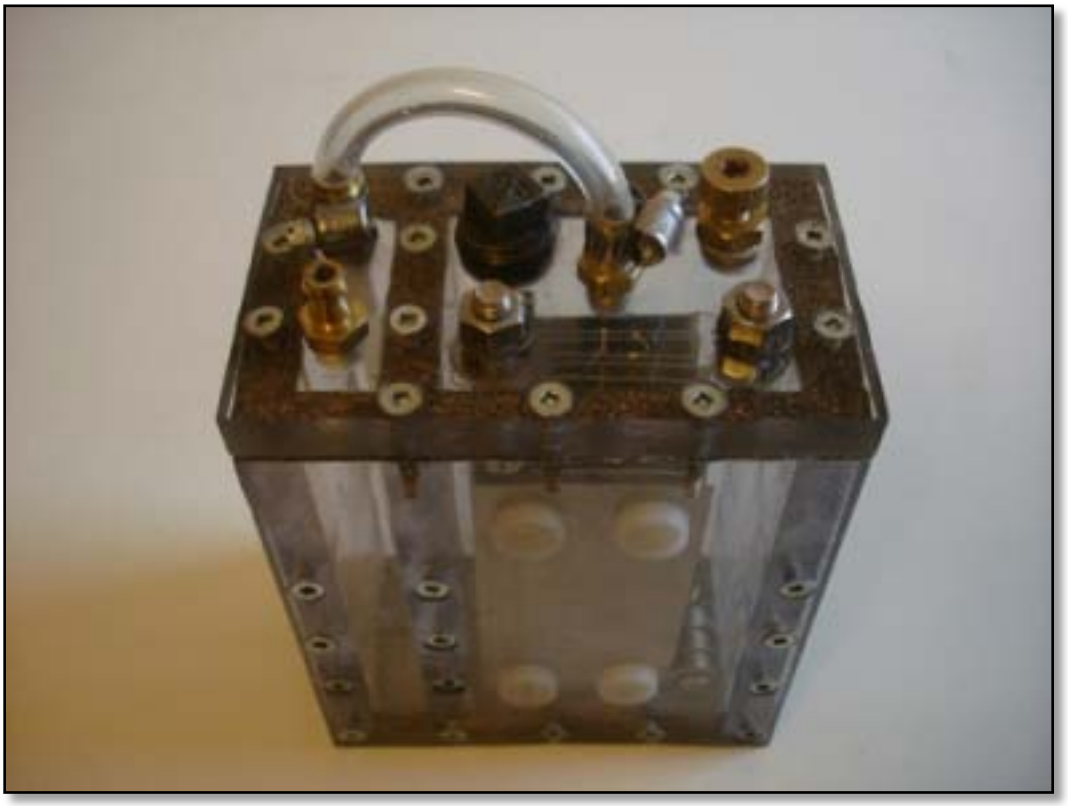
Cut 4 inches of tube and feed two hose clamps around the tube.

Install both ends, one at the bubbler and one at the HHO Generator.

Not a requirement but Vic cut-off half of the male tube connector as you can notice in these shots.

Use a screw driver to clamp them down.

That’s done!

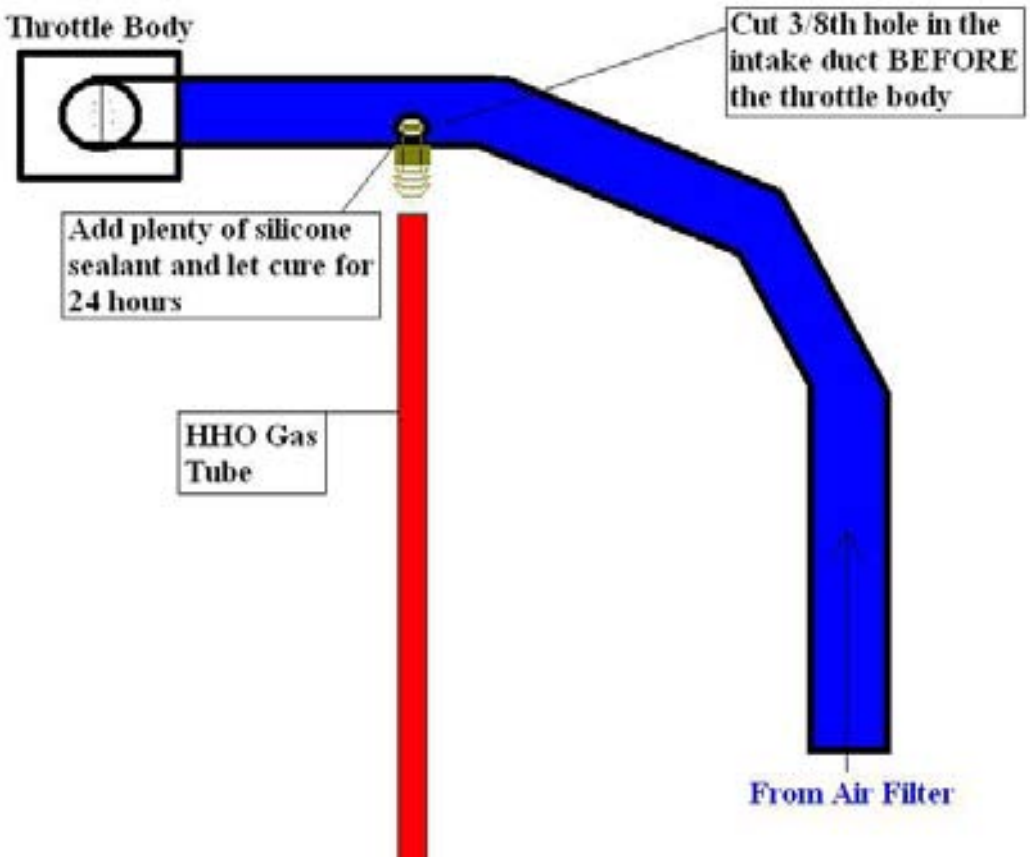


Part 2 – Vacuum Tube Installation

Now, Lets Cover the Intake Vacuum tube

There are two different routing methods covered

1. **Vacuum routing for N/A (Naturally aspirated) engines**
2. **Vacuum routing for Turbocharged and Supercharged engines**



The diagram above is for naturally aspirated engines (non turbo or supercharged). Simple remove the air intake ducting closest to the Throttle Body or Throttle Valve. The Throttle Valve is a coined shaped plate that controls the amount of air entering the engine. The gas pedal controls this valve with a cable or electronically via electric motor. The male tube connector only needs to be close to the throttle valve & weather you install it on a bend or not is irrelevant as Vic has tried this with no change in gain.

Try to think about heat sources when mounting as the tubing is less resistant to heat then the Polycarbonate.

For turbocharged or supercharged (Forced Induction) engines, the tube must be mounted in the air ducting between the air filter and the compressor inlet. Please visit www.howstuffworks.com and see how a turbocharger or supercharger works.

The only thing to be aware of is the straightness of the HHO supply tube going into the air intake. Vic noticed that sometimes the tube will want to bend if you have to turn or bend the tube onto the male tube connector. Make sure the tube goes on the male tube connector with no strain.

Once you have found a spot to mount the male tube connector, drill a 3/8 hole into the air intake duct. The ducking is usually made of plastic or rubber so it may stink or smoke a little. Not to worry, that is normal. Once the drilling is done, trim off any burnt ends and clean out any debris from the drilling with water and a rag. You will not want all those rubber bits being sucked into the engine.

Install the male tube connector buy pushing and turning the connector in a clockwise rotation. Ever hear the saying “Lefty loosey, Righty Tighty”? All generic items that are threaded like a bolt, nut or the lid to your pickle jar will tighten if you turn it clockwise. If you turn it counter-clockwise, it will loosen. Hence the saying. Turn left to loosen; turn right to tighten. It’s a rhyme. Once that is complete, dab the connector with silicone where the connector and the air intake duct meet. (all around the connector on the intake duct)

Reinstall the air intake duct and allow the silicone to cure for 24 hours.

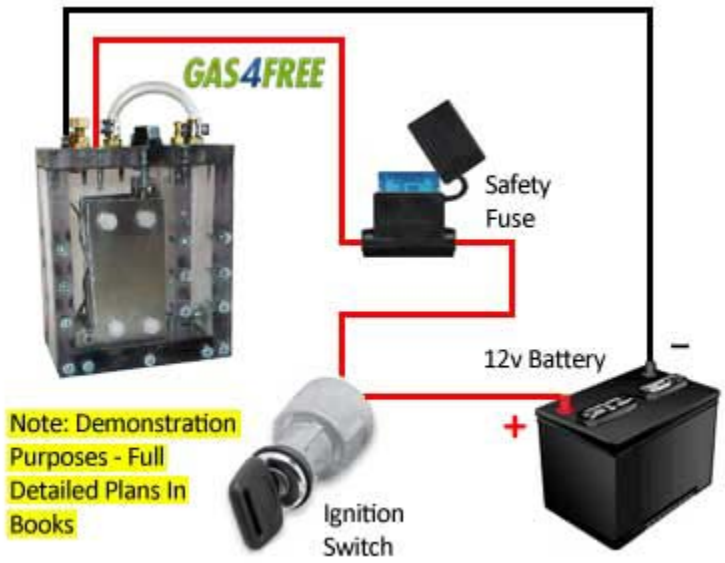
Then, attach the vacuum tube with the clamp already around the tube and secure it at the intake side.

Run the tube to the Hydrolyzer and cut to length. Secure the tube to the Hydrolyzer.

That concludes this phase of the build.

PHASE 4: Electrical Install

Part 1 – Wiring Diagram



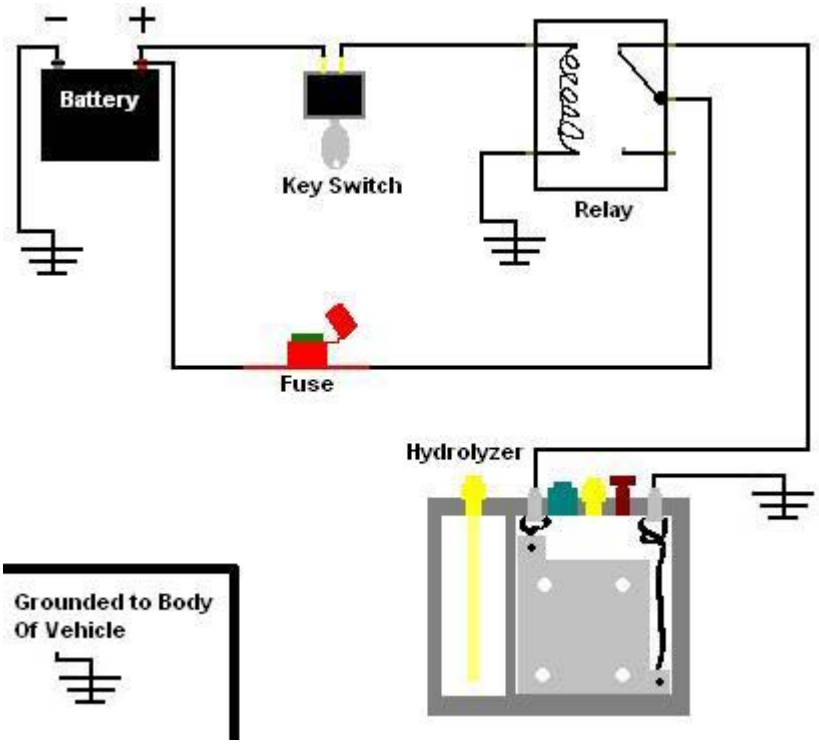
The wiring diagram above is not correct!

Here Vic shows you how to wire the Gas4Free system.

There are only 5 wires to make in total.

You can see that Vic uses a yellow gauge loop connector in the picture above but you should use a blue one

Now lets see the relay and wiring diagram.
This is how it should be wired and you do have grounding options.



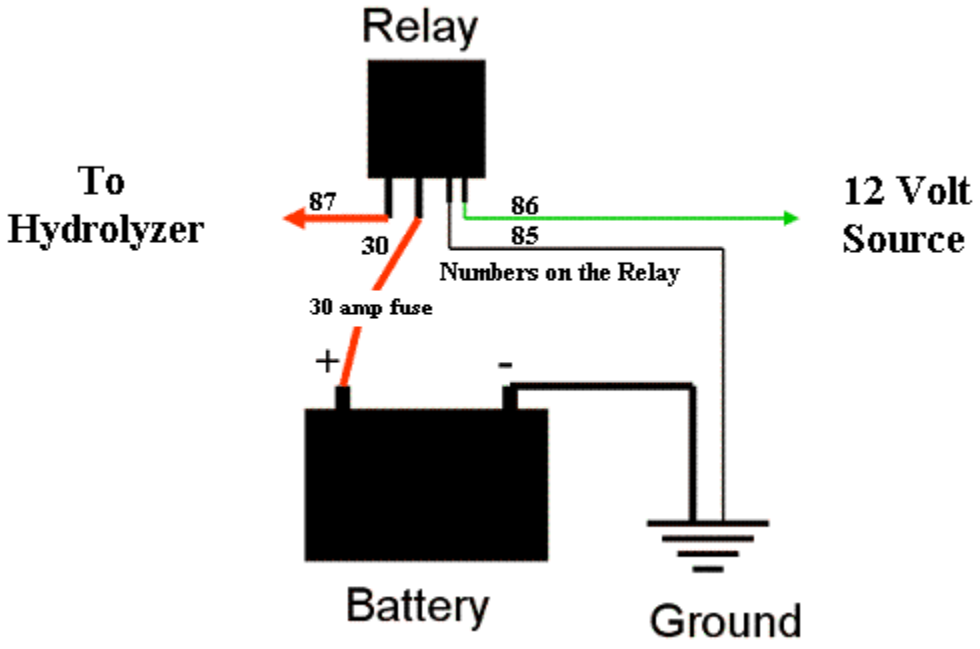
Some folk would want to wire all the grounds to the battery directly; that is just fine.

Vic says he has tried both methods with no problems at all. Try to keep the install clean, use as little wiring as you can to make it look clean but its not a requirement.

If you are wondering how much wire to give yourself, that will depend on you vehicle. Just install one wire at a time. Start at one end of the wire. Crimp on the right connector you need and secure it to its location. Then, feed the rest of the wire neatly to where the wire's 2nd location will be and cut it. Make sure there is some slack so you won't have to tug at the wire if it is too short.

Part 2 - Installation

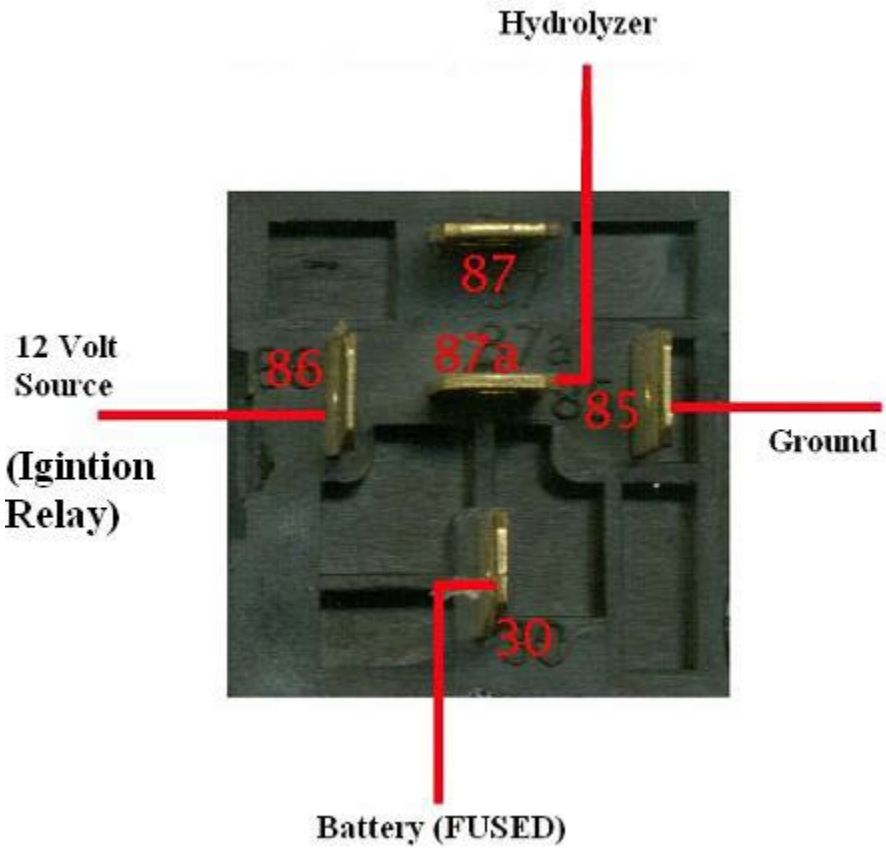
These are the 5 wires you need to make:



1. Ground (neg) wire for the Hydrolyzer (use black wire)
2. Power wire from the battery to the relay (#30) with the 30 amp fuse (use red wire)
3. Relay activation wire (#85) Ground (neg)(use black wire)
4. Power wire from the relay to the Hydrolyzer (#87) (use red wire)
5. Power wire from the relay (#86) to a 12 Volt source

This is not a difficult task as it is the simplest of all the phases. After you have installed all the wires, double check all the wiring to be sure each wire is in its proper location. It took Vic about 10 minutes to install all the wires so it should take you a similar amount of time.

Again, make sure none of the wiring is resting on a heat source like the exhaust as is will burn through the insulation of the wire and short if it is a positive wire (+). All metal parts attached to the body or engine are grounded!



Now that you know whats what, run a wire at a time and crimp you connectors.

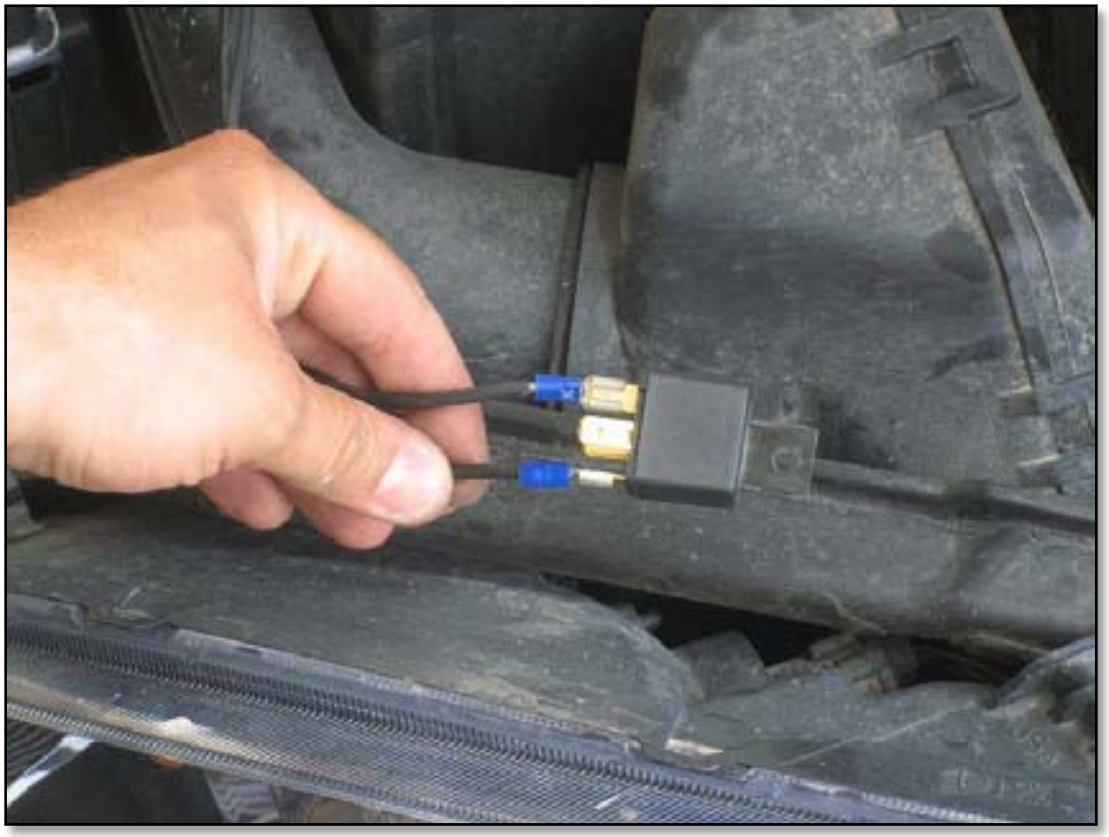
Your 12 Volt source will come from your Ignition relay. But some of you will not be able to find it easily or your vehicle may not have one. So, find the main fuse panel and just tap off of the wire on #86 of the ABS relay. Yes, it is safe. If you don't have ABS or you feel unsure about touching the ABS wiring, this is your next approach. You will use a Voltmeter (Multimeter) to source a 12 Volt signal. With the ignition in the "on" position without the engine running, place the black negative lead on the battery's negative post.

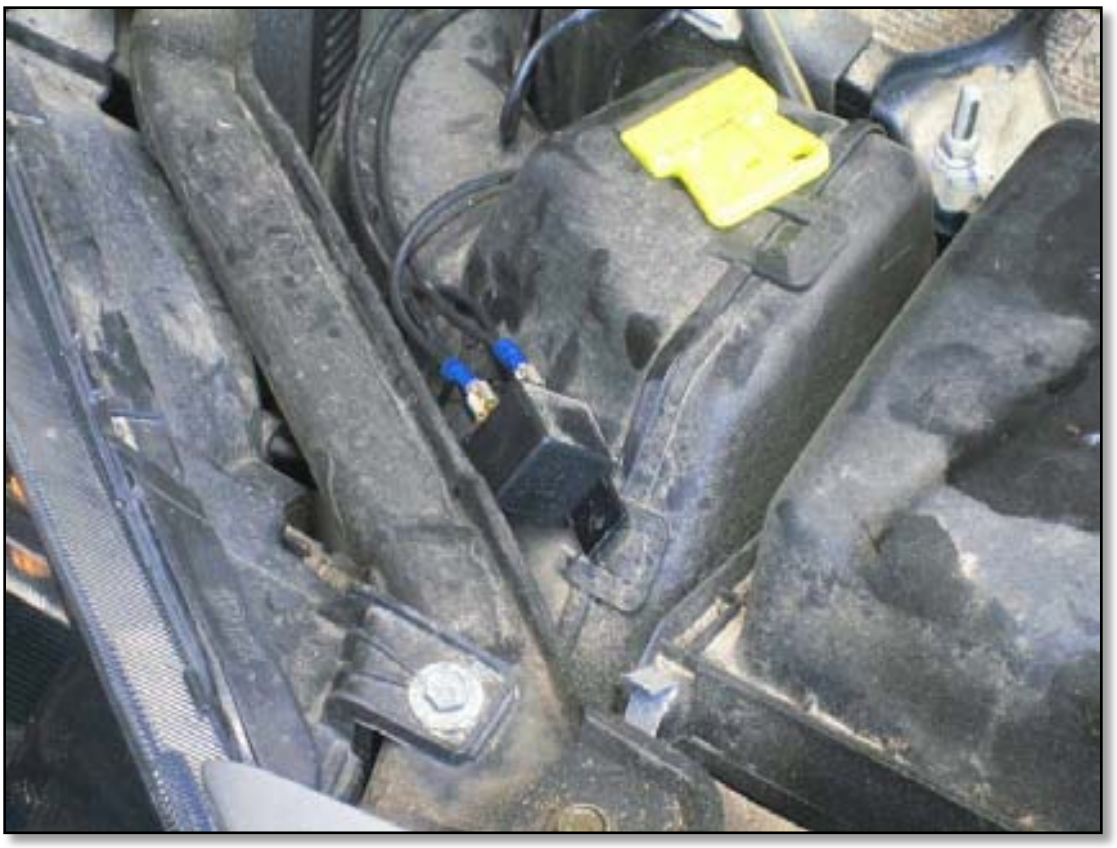
Stick it in somehow so you don't have to hold it there. Now, with the red positive lead, you will probe for wires that have 12 volts when the key is "on" position. Keep in mind that the Voltmeter will not read exactly 12 Volts; it can read for 11.8 to 14.5 Volts. This is normal. Start with a group of wires that lead into a single plastic union clip. This is called a Harness.

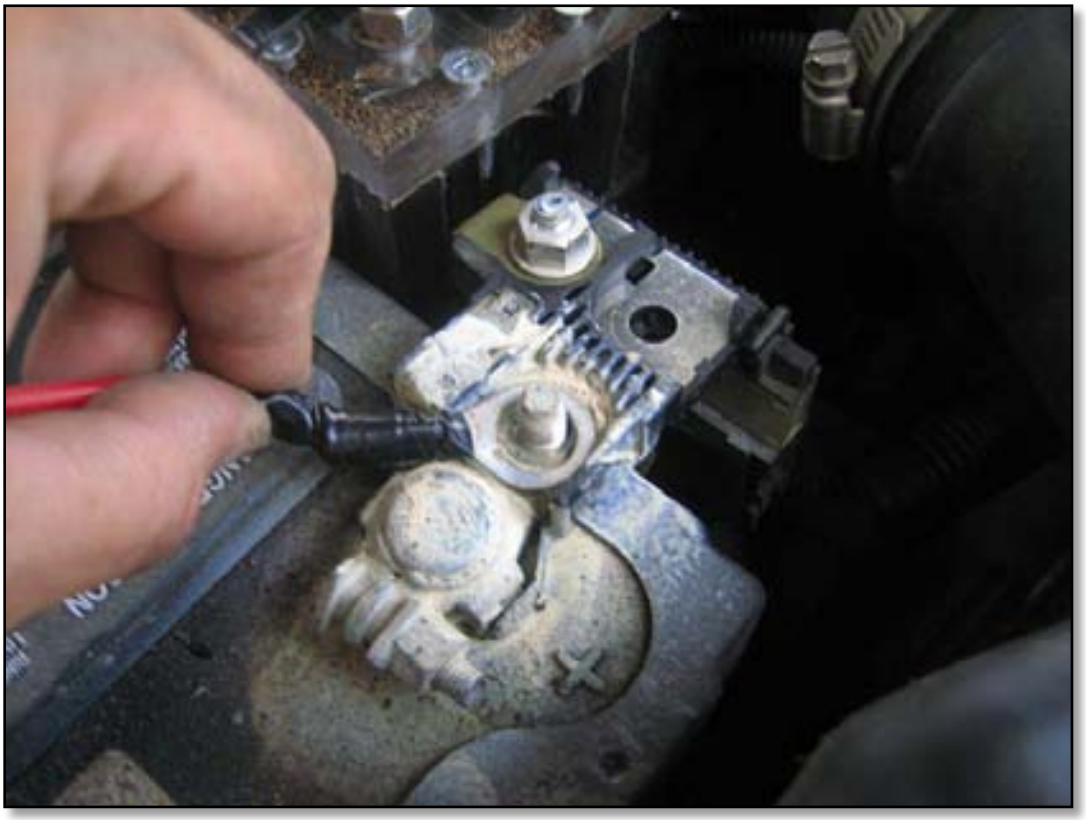
You don't have to disconnect the harness as you can slide the needle end of the positive lead in the holes that the wires feed into individually. A little elbow

grease may be required but not too much; the lead can bend easily. Once you have found a 12 Volt source, turn the ignition “off” and key out. Go back the engine and check the wire again with the Voltmeter. If it shows OL or a value under 0.5 Volts, use it as a signal (Trigger) wire for #86 of the activation relay (Turn-on for the Hydrolyzer). Use a splice connector (Shown below) so you don’t have to cut the wire.

Splice Connector only for the Trigger Wire. #86 on Relay







Mounting the Relay

Before you begin wiring you should first decide on a mounting location for the relay. It doesn't have to be mounted as you can secure it to other wires around using electrical tape or zip-ties.

With all the wires finished and installed, use electrical tape and wrap up all the exposed connectors on the relay to prevent a body short and corrosion.

Multimeter

A Multimeter is a tool that measures electrical output. This is an ideal tool to use during the testing stage and if troubleshooting is an issue. You can get one almost anywhere. Just contact your local auto parts store or look online at this link:

http://www.dealextreme.com

To learn how to use a Multimeter, follow the link below:

http://www.youtube.com/

Down to the LAST PHASE!!!

PHASE 5: EFIE (O2 Sensor Enhancer)

Part 1 – Installation & Adjustment

Let the install begin

We are going to use the instructions from our friend at Fuelsaver-mpg:

www.fuelsaver-mpg.com

Please Visit their site as it has plenty of trouble shooting info. They truly are pros in this subject.

1. Install your fuel efficiency device

The EFIE is not intended to be a fuel saver by itself. You should install a device that is designed to get more energy out of the same fuel, such as a HHO gas Hydrolyzer, a fuel vapor production unit, or other device that gets more power out of the same fuel by increasing the efficiency of the burn.

2. Locate the oxygen sensor signal wire

The easy way to do this is to look it up in your Haynes, Clymer or Chilton manual for your car. If you don't have one of these, there is a service at www.ahdol.com where you can pay a nominal fee, and get your wiring diagrams emailed to you. I have also recently found a resource at www.autozone.com whereby you can get your wiring diagram and specific service manual information on your sensors. However, the information is not available for all cars and trucks. To help you find your wiring diagram at autozone.com, follow the instructions found here. Using the wiring diagram data, you can get the wire color of the signal wire, and hopefully gain access to it up in the engine compartment, where it routes to the computer.

If none of these options are available, you'll need to locate the oxygen senor and then locate the signal wire by testing. The sensor can have 2, 3 or 4 wires, and you have to know which one is the signal wire. If you have 4 wires they will be:

1. **Heater 12 Volts +**
2. **Heater ground**
3. **Oxygen sensor signal +**
4. **Oxygen sensor signal ground**

If you have 2 or 3 wires, then you can have a common ground, or no heater wires etc. The simplest setup is a single wire, which is the signal wire and the sensor get's it's ground from the exhaust pipe. You can use the following procedure to narrow down which wire is which:

1. Disconnect the wire harness, turn on the ignition and probe for a wire produces 12 volts. This will be the heater circuit.
2. Next find the 2 wires that produce exactly 0 volts. These will be the heater ground and the signal ground. The remaining wire should be your signal wire.

3. Reconnect the wiring harness, then strip a little insulation from the signal wire and measure it to ground with the engine running. You'll get voltage readings constantly fluctuating between 0 and 1 volt, if you have the signal wire. Note, that you have to let the engine warm up a bit before you will get these voltages from the sensor.

Cut this wire at a convenient location for connecting the EFIE. We'll call the sensor side of this cut the sensor wire, and the other side of the cut, the computer wire.

Note: rarely an oxygen sensor wiring harness will have more than 4 wires. In this case, the sensor is possibly a "wide band" oxygen sensor. The EFIE has been reported to work with 5-wire wide band sensors.

Once you have determined which is the sensor's signal wire, you want to get it located up close to the computer. If you used a manual, or wiring diagram, you probably have already located the wire at the computer's wiring harness. If you had to figure out the wires at the sensor itself, then try to find the same wire at the computer's wiring harness. It should be the same colors, but test it with an ohm meter to be sure. Sometimes they use the same colors for different things. Even if it's a pain now, it's worth it to get the signal wire located up by the computer. This makes cutting into it and hooking up the EFIE much easier.

3. Locate 12 volt power and ground

You need to ensure that you have switched power, not power directly from the battery. You don't want the EFIE running 100% of the time. It's not that the unit couldn't run 100% of the time, it probably could. But it would slowly drain your battery.

Most of the fuel efficiency devices need switched power as well, and you can often piggy back onto them. Note that the EFIE draws negligible power. You can attach it to any circuit. The best choice for a voltage source is a fuel efficiency device, such as a Hydrogen generator. That way the EFIE only activates when the fuel efficiency device is turned on. Note that when power is shut off to the EFIE, or the EFIE's switch is turned off, the original connection between the oxygen sensor and the computer is re-established. If connecting to your fuel saver's power is inconvenient or inappropriate, just use any circuit that is accessory key switched. Your electrical diagram can come in handy here, and if you don't find another device to attach to, you can usually find a spare circuit in the fuse box

(you may have to add a fuse). One installer used the oxygen sensor's heater power for his EFIE's power, and this is perfectly acceptable.

Ground can be the vehicle body, engine block or ground from another device, including the ground for the oxygen sensor itself. Just make sure that whatever you choose to use for ground has a negligible resistance (less than 10 ohms) when tested against the negative battery terminal of your car.

4. Mount the EFIE

You can use the mounting ears to screw down the EFIE to a suitable location on the vehicle body or firewall. Some people like to mount the device inside the passenger compartment of the car. There are some considerations about where you mount your EFIE that should also be reviewed:

1. The EFIE is not waterproof. If you mount it under the hood, you will have to take care to cover it if you need to steam or spray clean your engine. If this is something you regularly do, you may want to mount the EFIE in the passenger compartment where it will be protected.

2. If you live in a cold climate, where temperatures are expected to be below freezing a significant number of days per year, you will want to ensure that the EFIE is mounted where it will be warmed, either by the engine, or inside the passenger compartment. Below freezing temperatures cause the EFIE to come up to it's voltage offset very slowly unless it is physically warmed. This is because it doesn't generate much heat of it's own. In most cases this can be accomplished by mounting your EFIE in the upper rear of the engine compartment, close to the firewall, which will allow it to benefit from trapped engine heat. Newer EFIEs now come with jumpers that if set will cause the EFIE to generate more heat. These were intended for use in very cold climates. Find J1 and J2 on your circuit board. Set the following jumpers for increasing amounts of heat: J1, J2, J1 and J2.

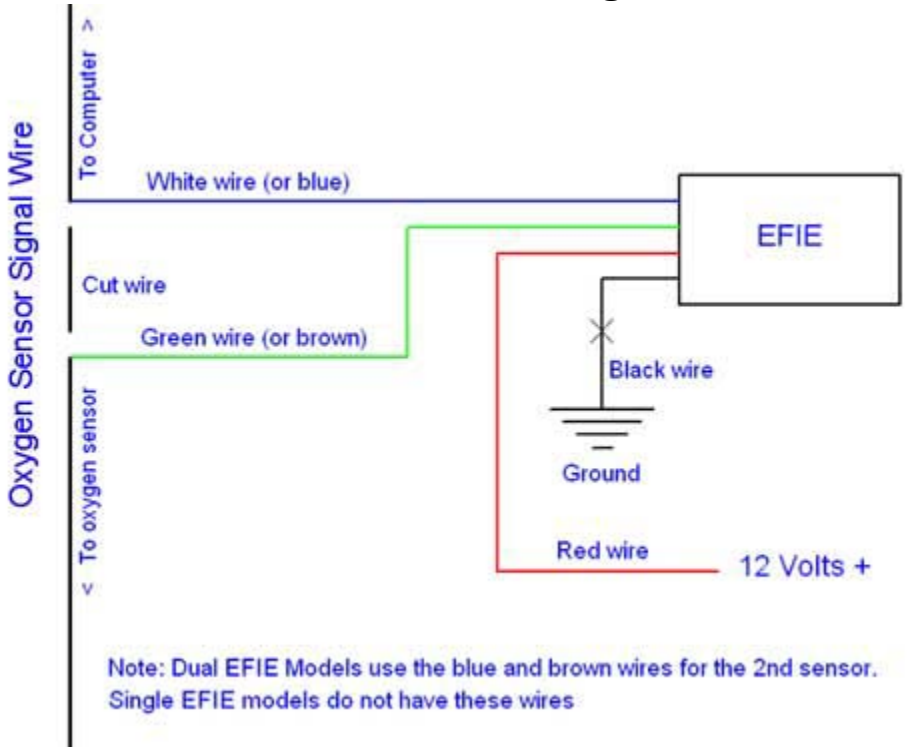
5. Attach the wires

The EFIE multi-conductor wire has 6 colors: red, black, white, green, blue and brown. Connect the red to your power source. Connect the black to ground. Connect the green wire to the oxygen sensor. Connect the white wire to the computer. For Dual EFIE units, the brown wire goes to the 2nd oxygen sensor, and

the blue wire goes to the 2nd sensor's computer line. Hopefully you've been able to locate all these wires up by the computer in an easily accessible location. But if so, be sure not to cut them too close to the computer so that you have plenty of slack to work with them.

You should solder them and use heat shrink tubing to insulate the connections from other wires. If you don't have heat shrink, you can use electrical tape. I personally always use heat shrink. It's more professional looking, and less likely to unravel later into a sticky mess.

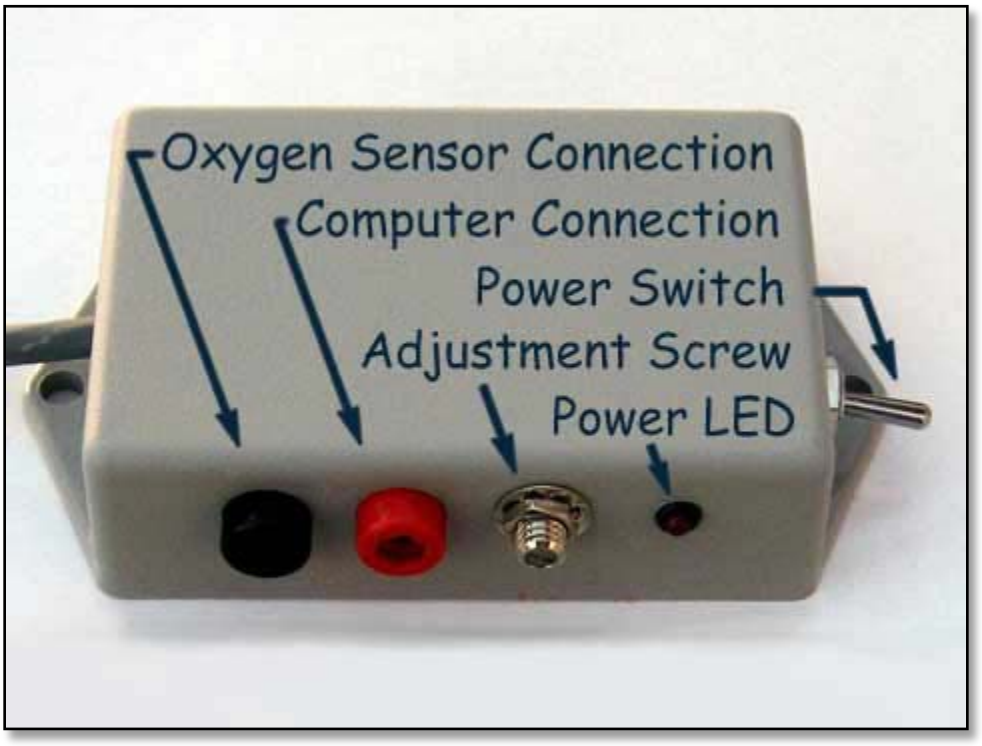
EFIE Connection Diagram



5. Adjust the EFIE

I have found that .200 volts is a good starting point. If you haven't done so already, you should get a benchmark for your mpg by going through a tank of gas with the EFIE and fuel efficiency device turned off, or disconnected. This way you'll know when you're getting closer to an optimum setting as your mpg improves.

EFIE Controls



The picture above shows a Single EFIE Deluxe, with the controls marked. The toggle switch turns the EFIE on/off, and the red LED glows only when the EFIE is on and has power. Note that when the EFIE is powered off, it makes the connection between the oxygen sensor and the computer, the same as it was before the EFIE was installed. If you ever have need to reconnect the oxygen sensor directly to the computer, just turn the EFIE (or Dual EFIE) off, and this will be accomplished. Also, if power is shut off to the EFIE, you'll get the same result regardless of which position the switch is in.

The red and black test points will accept and hold in place the electrodes (probes) from a multi-meter. The black point is attached to the oxygen sensor lead, and the red point is attached to the lead that outputs to the computer. Just push the leads in and they will be held in place by spring loaded clamps. With your probes in the two test points, you'll be reading the voltage offset being supplied by the EFIE, and this is the setup you need for EFIE adjustment.

The adjustment screw adjusts the voltage offset between the signal from the sensor, and what the computer "sees". Turn the screw in a clockwise direction to

increase the offset, and counter-clockwise to reduce the offset, and your multimeter will be reading the offset amount. The signal adjustment potentiometer (or "pot" for short) is designed to turn 18-20 full revolutions. This is so that the voltage offset can be tuned to a fine degree of control. Adjustments as small as a few millivolts can be made.

Most computers will see 425 millivolts from the EFIE, plus the sensor's voltage as high all the time. In other words even when the sensor is putting out it's lowest voltage, when the EFIE adds 425 millivolts, the computer will think the sensor is reading high. The computer will think the sensor is damaged, because it reads high all the time, and will ignore it's data. If this occurs you may or may not get a check engine light alerting you to the "defective oxygen sensor", but for sure your gas mileage will get very bad. So you should never operate your EFIE this high. The exact voltage is .45 volts to the ECU. Above that voltage is "high" and below that voltage is "low". The ECU must see transitions from low to high several times per second or it will "know" that the sensor is bad and then just start merrily adding gas.

It is possible to damage the adjustment pot by turning it past it's lowest or highest values. However, I've turned them at least 10 full revolutions past the end with no ill effects. But there is a limit to how many times you can turn them, and I have ruined one once by turning one too far. The thing to do, is only turn them with your multimeter hooked up. When you get down below 50 millivolts, and further turning doesn't change the amount, stop. And the same applies at the top end of the scale. In actual practice you should never need to be at the extremes.

When it comes to making the actual adjustments to the EFIE for your particular car and fuel saver combination, I recommend starting out with 200 millivolts. The process of adjusting the EFIE is trial and error. If you're setting the EFIE above 350 millivolts you're starting to get pretty high. Watch for symptoms of too lean a mix such as rough engine, lack of power, "check engine light" coming on, etc. When these show up, adjust it back down until the symptoms go away. Note, some computers will accept an EFIE setting of over 400 millivolts. This is not the norm however, unless you take some of the actions in Tuning For Mileage.

A couple of adjustment tips: 1) If your "check engine" light comes on, you've likely set the offset too high, and the computer thinks your oxygen sensor is on the fritz. This can also be caused by mis-wiring the EFIE, so make sure you're hooked up

correctly. 2) If you lose horsepower, you've got an incorrect setting, as fuel efficiency devices should increase horsepower proportionately with the increase in MPG (as well as decrease emissions). 3) If you have a high temperature probe, run down the highway with the fuel efficiency devices turned off, long enough to get the engine up to full operating temperature, and note the temp of your exhaust pipe, near the exhaust manifold. As you increase your voltage offset, this temperature may increase. Don't let it raise more than 180 degrees from your initial test.

You will probably find adjusting the EFIE to be frustrating at first. When you turn the adjustment screw, the voltage starts rising (or lowering) and keeps on doing so long after you've stopped turning the screw. It can take up to 10 minutes or more for the voltage changes to completely settle down. I have learned to set EFIEs similarly to balancing a long stick on your finger. You have to turn the screw farther than you expect the final position to be to get the EFIE's voltage changing in the direction you want. Then when the voltage gets close to your target voltage, quickly start turning the adjustment screw the opposite way until the voltage stops increasing. Once the voltage is at your target value, then you just make small adjustments either way to get the voltage to settle down. But note you'll want to check the voltage some minutes later to make sure it hasn't continued to drift to a different value.

Another small detail that might throw you if I didn't point it out. When an EFIE is first connected to a vehicle and powered up, the voltage will go higher than normal, and then slowly settle back down. This is without changing the adjustment. This settling out period can take from 5 to 10 minutes or more. The primary manifestation of this is when you make your first voltage setting, then 5 minutes later find it has changed. This is normal. Just go ahead and re-set the voltage you want. After the EFIE is acclimatized to your vehicle you won't see these phenomena again.

That's the basics. If you run into trouble in your installation, post questions on the support forum, www.fuel-saver.org. They can use the feedback to improve the guides, as well as answer questions others may have as well.

The Final Tune

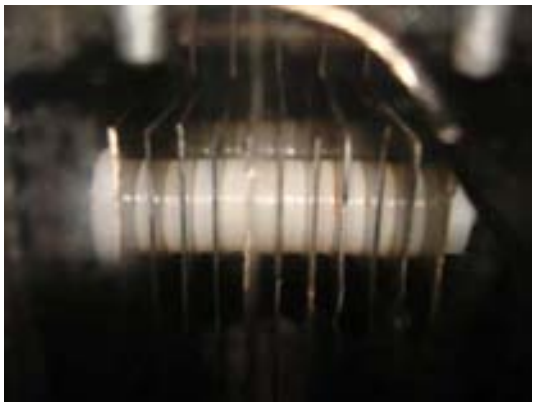
We are going to cover the last steps before you begin enjoying the free gas the YOU have provided yourself.

1. Bench Testing (Before you install the Hydrolyzer)
2. Electrolyte, Mixing and Water Filling
3. Vacuum and Air Valve Setting
4. The First Drive

1. Bench Testing the MAX Cell

DO NOT FILL THE SYSTEM WITH WATER YET

If any problems occur with the MAX cell, you would want to detect it before you install it on the car and fill it with water. Here, we want to see if there is any contact between the negative and positive plates.



The purpose of nylon fasteners is to isolate the negative plate from the positive plates. Do a search on "electric circuits" on www.howstuffworks.com and you will see that a "short" is when a negative wire connects to a positive wire, bi-passing the "load" of the circuit or vise versa. This will cause the wires to heat up and blow the 30 amp fuse. The "LOAD" here is the water.

Water does conduct electricity but not very well. When you're watching a movie and one of the characters through a hair dryer in a bathtub with someone in it, you see the them getting electrocuted. This happens because of one factor; Voltage. Household and commercial wall outlets use 120 Volts of A/C electricity where cars use 12 D/C. Voltage is electrical pressure.

Anything can be penetrated depending on the amount of Voltage applied; even wood, air and stone. A 12 Volt system cannot harm you but the electric socket in your home can kill you. The funny thing is that its not Voltage that kills you ether,

its Amperage (Current flowing). The water in the HHO generation chamber is the load because is has resistance. Here, once electricity is applied to the plates, the work being done is the hydrogen and oxygen splitting at the appropriate plate.

HYDROGEN = NEGATIVE PLATE
OXYGEN = POSITIVE PLATE

This should shed some more light on how plate (stack) designs work as appose to the wire design. Because splitting of the molecules occur at the surface of the plates, it proves that surface area optimizes HHO production. These companies that state wire designs are great are full of BULL, PEIRIOD! It would take 6 to 8 of those useless mason jars to match one G4Free Hydrolyzer.

The Stainless Steel fasteners that connect all the positive plates and negative plates together ensure all alike plates get power (Pos plates) or ground (Neg plates). This how we electrically charge all the plates with (-) or (+).

You will need booster cables and the 30 Amp fuse kit with fuse installed to bench test the Hydrolyzer. Do not have the top half (Piece #6 with the MAX Cell connected) installed at this point. The Long cable on the Hydrolyzer is the Negative and the Short cable is the positive. IT HAS TO BE THIS WAY!

If you have a multimeter, set it to read ohms (resistance) and take a reading between the 2 terminals. It doesn't have to be (-) to (-) or (+) to (+). Make sure the cables are not touching the plates.

WITH MULTIMETER
Take a reading between the terminals. Neg on one post and pos on the other. You should see OL (Out of Limits) or ERROR. Basically, nothing should be happening on the display.

WITH BOOSTER CABLES AND FUSE
You will be using a 12 Volt battery or your car. Strip off some of the insulation at both ends of the fuse kit. Wire one end to the positive terminal of the MAX Cell and clamp the other end the positive clamp of the booster cable. Now clamp the negative clamp on the negative terminal. At the opposite end of those booster cables should be 2 more clamps that are red and black; RED being positive and

BLACK being negative. You are going to connect the positive clamp the positive post of a 12 Volt battery or your car battery; whichever is easier. Now, clamp on the negative clamp. Listen for a "popping" sound. It will only happen once as that is the sound of the fuse blowing out. If you hear nothing and the fuse is good, disconnect the booster cables & fuse and continue with the build.

THE FUSE BLEW OR THE MULTIMETER HAS RESISTANCE OR 0.00 OHMS…
Now you know you have a problem. Something is connecting the negative and positive plates. Check the following:

- The stainless steel washers touching the plates
- The ends of the marine cables touching the plates
- A bent end of a plate touching an opposite plate
- A foreign object in between the plates
- The material you rested the Max Cell on conducts electricity

Correct the problem and repeat the bench test until the problem is resolved.

2. Electrolyte, Mixing and Water Filling

ELECTROLYTE: There are 2 substances we use for electrolyte

a) **Hydrogen Peroxide**
b) **Windsheild Washer Fluid**

There are 3 reasons for using both substances as we will explain…

1. Hydrogen Peroxide conducts electricity very well. When mixed in well with water, it help boost HHO production because of this.
2. You actually get some of the hydrogen from the hydrogen peroxide.
3. The Windsheild Washer Fluid slows down the freezing process 20 times.

Unfortunately, Vic is still researching on how to completely resolve the freezing process but with using our method you can resist freezing for 5 days at -30 (C) with the current mix ratio. Most of you don't leave your cars sitting that long or

have -30 temps without wind-chill (under hood of car) constantly. Please read MIXING for other options.

MIXING:

Some good thinking was put into the construction of the G4Free System. The Hydrolyzer complete with the MAX cell installed holds just under 500 mL of water. When filling, Vic recommends just using a normal plain Jane bottle of water that you can purchase anywhere. Do not use mineral water as it will contaminate the cell and make it dirty quick.

Here is your mixing formula per 500 ml:

- 1 Tablespoon of Hydrogen Peroxide at 3%
- 6 Tablespoons of Windsheild Washer Fluid (-40)

As we mentioned before, we can only slow down the freezing process, not stop it all together. Vic say that for those who will not be driving much or live in extreme sub-zero temperatures, up the washer fluid amount to 10 tablespoons.

DO NOT EXCEED THIS AMOUNT

You will lose HHO production efficiency if more washer fluid is added, not to mention the electrical stain through the plates, cables and terminals. It will run hotter and might overheat.

Perform the mix in this order

1. Empty the bottle of water
2. Add the washer fluid
3. Add the Hydrogen Peroxide
4. Only fill the bottle of water 70% with water
5. Close the lid and shake hard for a couple of minutes
6. Fill the rest of the bottle with water and shake again for a minute

You will need to add the washer fluid as a antifreeze DO NOT USE IT IF YOU LIVE IN WARM WEATHER. Maintenance is covered in the next chapter.

WATER FILLING:

The bubbler only needs tap water. So do not add the mixed electrolyte in the bubbler.

NOTE: We recommend filling the bubbler with the top off the housing for easy pouring but you can still fill it through the tube connectors.

1. Fill the Bubbler about 80% of the way up. You will notice that it will be close to level with the height of the MAX Cell. Not too high because you must accommodate for going up and down hills and driveways.

2. When filling the HHO generation chamber, only fill it just above the MAX cell plates. Again, not too high because you must accommodate for going up and down hills and driveways.

3. Secure the rubber stopper firmly.

Try to use distilled water as it will lengthen your maintenance intervals. Maintenance is covered in the next chapter.

And don't forget to check for leaks!

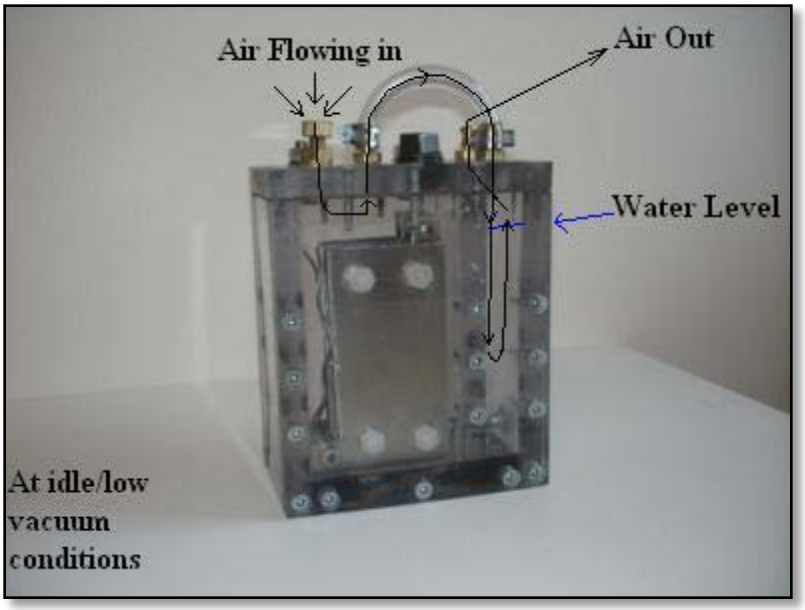
We can get about 1000 miles between fill-ups. After your initial fill-up with salt, you will only need to mix hydrogen peroxide with the mix until you clean out your Hydrolyzer and remove the water completely.

The MAX Cell was designed to only use half of the surface area to compensate for water consumption. So, until the water level reaches half the height of the cell; The refill level, you still get maximum production.

3. Vacuum and Air Valve Setting

VACUUM:

Hi folks, I myself, Vic Lawson, will be taking over the writing for the rest of this chapter and the rest of the eBook. Many of you have a hard time understanding engine vacuum and believe me, it's not as simple as some may say so I will do my best in explaining it to you. The first thought you have in your mind is "Won't the water be sucked up the tube?" That is a valid question to ask.



The answer, NO! Take a close look at the picture. This is at low vacuum conditions. Here is what is happening when your idling or at the halfway point of deceleration. The air is flowing straight through with no problems. Now, this is also what would happen under high vacuum conditions as well IF the opening of the air valve was opened all the way.

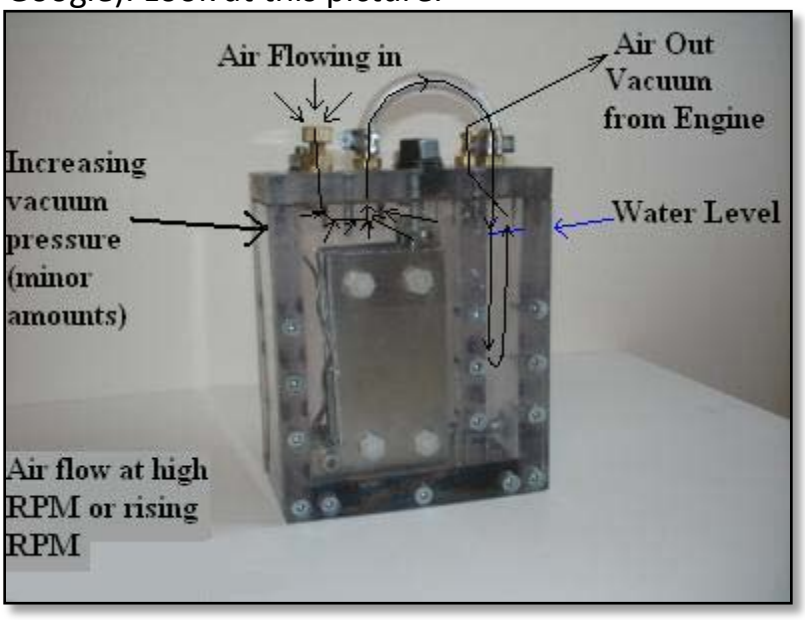
But because we set the air valve opening and restrict the flow slightly; and I mean slightly, as the vacuum pressure rises it will suck harder at the open walls and water. Here is where it gets tricky. Please keep in mind that as the vacuum pressure rises at the Hydrolyzer & it also rises at the air filter because both at attached at the air duct leading to the throttle valve.

The air filter is designed to allow air in so that is why the air pressure can't shoot through the roof like you think. Remember when I said HHO intake increases with the RPM? This is what I was talking about. At idle, fuel economy is not a concern. Its when you accelerate. As you step down further on the gas pedal, you are

demanding the engine to rev higher. For fuel injection, the computer reads what you are doing and dumps in more fuel.

For carb fed engines, the accelerator pump shoots a stream of fuel then the metering rods or power valve adds fuel accordingly. I will cover this subject in detail in Book #2. At idle, the HHO gas being generated is sucked into the intake but at a slow rate. It begins to stack against itself and slowly through the bubbler and into the air intake duck. Now, as you step on the gas, the vacuum pressure increases and begins to suck at the stacked HHO gas. This will also promote better HHO gas generation as pressurizing the chamber would slow the electrolyzing process.

No, you will not get positive pressure to answer your question. Positive pressure is PSI (Pounds Per Square Inch). When you blow up a balloon, you are using positive pressure. When you are taking a sip of water through a straw, you are using negative pressure measured in Hg-inch in our case (Please do search on Google). Look at this picture.



As the RPM's increase, the engine begins to suck in more HHO gas. If you were to use a vacuum line off of manifold pressure (after the throttle valve) all the HHO gas would be lost at idle. You cannot see gains that way. Some of these so-called "experts" even tell you to tap both manifold vacuum and the vacuum before the throttle valve. Shame on them of course as you now know better.

Time to check and set your vacuum lines & air valve
Vacuum Check

Close the air valve all the way and start the car. Listen for a hissing sound from all the vacuum tubes. Also, try splashing some drops of water on all the connections. You are checking to see if you have a vacuum leak. If you hear hissing or see the water droplets being sucked in, check the connections and secure it properly.

AIR VALVE SETTING:

You will only need to set the valve once. All you have to do is completely close the valve. Now turn the valve open one full turn and your done. Start the car and check the air valve for a loud hissing or whistle. If you hear it, open it in half turn intervals till it stops.

4. The First Drive

You have done your checks and have filled-up your Hydrolyzer. Now your ready to go. Any problems you may have will be covered in the Troubleshooting section of the next chapter. You should go on a long drive to set the plate surfaces. The plates get a hazy shine after a half hour of operation but it's a good thing because I record increases of production with this haze. I am having this analyzed soon. Start taking records asap and compare. It is a good idea to record the mpg before installing this system and after. Book #2 explains how.

REMEMBER: The water refill level is when the water reaches half of the MAX Cell's height.

Maintenance

SCHEDUALED MAINTENANCE:
You will be required to open up your Hydrolyzer and clean it out as you will notice that it will "dirty up" over time. Using the right type of water:

- Distilled

It is the best you can use and will allow for longer cleaning intervals. Tap water can be used without much ill effect on HHO gas production.

Cleaning Maintenance:
Tap Water – Required every 3 months or 3000 miles
Distilled Water – Required every 6 months or 6000 miles

Duties:

- Remove the zip ties (Cable Straps) by cutting them off.
- Remove the Hydrolyzer from the vehicle and remove the top.
- Drain out both the bubbler and HHO gas generation chambers.
- With a very soft brush, clean the housing with water and a touch of dish soap
- Rinse out the MAX Cell
- Use a soft brush to scrub the exterior and a pipe cleaner to clean between each plate. Use dish soap
- Check and resecure all the nylon fasteners and stainless steel fasteners
- Add water to the Bubbler (80% full)
- Rinse and refill with mix
    1. 1 Tablespoon of Hydrogen Peroxide
    2. 6 Tablespoons of Windsheild Washer Fluid
- Assemble Hydrolyzer and reinstall (You will need new zip ties)

Troubleshooting

There can only be so many things that can go wrong here. I will be covering every except problems with the EFIE unit weather you made it or purchased it. www.fuelsaver-mpg.com is the right place for that as it is their sole business and no one can cover the amount of info they have. Their site will answer ANY QUESTION you will have. Let narrow down your problems…

I will not be covering problems you may have with your build.
Please email me at support@gas4free.com

Hydrolyzer Housing

The inside walls fog up:
This is normal and should not be considered a problem.

The housing is leaking:
Take a close look at where it is leaking from. You will have to remove the Hydrolyzer from the car and remove the top with the MAX cell. Drain out all the water and dry the outside of the housing. Fill the house (both sides) with water and observe with the Hydrolyzer in the air.

Holding it up yourself works fine. Once you have located the location of the leak, use a razor blade to carve out the silicone in the leaking area. Apply silicone along the seam of the area you just scraped out. Overlap by half an inch. Check to see if any of the housing screws have become loose and screw in tight.

Allow 24 hours to cure and redo the leak test. If you are getting multiple leaks, you should disassemble the entire housing and reassemble with fresh silicone and gasket; just follow Phase 1 again. If all checks out, assemble the Hydrolyzer and fill with initial mixture.

Vacuum Tubes & Connections

I hear a "hissing" sound coming from the air valve:
First, close the air valve all the way and listen for the "hissing" to stop. If it stopped, open the air valve one full turn and continue to open it in half turn intervals till it stops.

I hear a "hissing" sound coming from the tubes/connections:
First, close the air valve all the way and listen for the "hissing" to stop. If you still hear a "hissing" sound, you need to check the tubes and connections. Get a spray bottle and fill it with a little bit of soap and water. Shake it up for a minute. Spray all the connections and tubes starting at the air duct to the Hydrolyzer.

Saturate about 5 inches at a time and look to see if some of the solution is being sucked in. It may even quite the sound too. If so, there is your problem. Resecure/Reapply silicone at the connection or replace tube. If you cannot find a problem, than it may be coming from your engine.

I see tracks of water ringlets transferring through the HHO generation chamber to the bubbler tube:
This is a normal condition and only occurs after you have filled up on electrolyte. The bubbler catches this little amount.

I have cut a slit into one of the vacuum lines by mistake:
If you have cut a slit into one of the vacuum tubes and it is less than ¼ inch long; you can you duct tape to repair it. Clean off the damaged area of tube and wrap it 3 times. Do not use electrical tape; it will not seal.

The MAX cell

Please see "Bench Testing" in "The Final Tune" chapter.

Electrical: (Multimeter or test light should be used)

I started my car and the Hydrolyzer is not doing anything:
You should first check the 30 fuse and see if it is blown. If not, you will not have to trace the problem and with ignition in the "on" position. With your multimeter set at volts, check to see if you have voltage at the Hydrolyzer. Place the black lead at (neg) and the red lead at (pos). You should have around 12 volts.

If not, ground the black lead to the battery or the body and ensure metal to metal contact. With the test light, testing is the same but you don't know how many volts just light turning on. As long as the light is fairly bright, your good. Ether end of a test light can be positive or negative. You will now have to check the relay connectors. Check to see if connector #30 on the relay is getting power.

If so, check connector #86 (12 volt source). If power is there, check connector #87. If no power is there, then you now know that the relay is not energizing. Place the red lead to the positive post of the battery and check all of your grounds. Start at the Hydrolyzer and work your way to the relay; your test light or multimeter should register at all grounds. It is possible that you did not crimp one of the connectors well so give them all a nice tug but not too much. If the wire comes out, re-crimp a new connector.

I get power or ground at one end of a wire but not the other:
Again, this is because of a interrupted connection in that particular wire. Check the connections of the crimp and to the surface it connects to. This is simple as you will see.

The relay is getting ground and power to the trigger but still not energizing:
This is a rare case of a defective part. Return the relay to the place of purchase and get a new one.

Email me if you have a unique problem that is not covered here.

Final Notes

This system was not made for complexity but rather simplicity. I want everyone to enjoy this technology and to have fun with it. I'm sorry but I do not sell the G4Free system built as a complete product. Contact one of our installers for a built system. The financial resource required to have 1000 of these units made is too much for my bank account. Not to mention I do not want myself or my family in the oil companies cross-hairs if you know what I mean. Thank you for your interest and for your time in reading my eBooks as the best satisfaction is knowing that I have helped many families across our great nation live just a little cleaner and better financially. Please read the eBooks before you begin building as you have many options to choose from.

Book #2 will get in depth with some of the following:

- What secrets they don't want you to know
- How you are saving gas
- What's happening in my engine
- In depth fuel injection fuel saving methods
- In depth carburetion fuel saving methods
- In depth diesel fuel saving methods
- Natural gas and LPG applications
- The EFIE advanced tuning and AFR sensor tuning
- Multi-cell builds and application
- And more

All of us at gas4free thank you greatly. This is just the beginning as we are developing new technology and at a lower cost. If you have purchased this product a year before we introduce a new device, you will get the plans FREE!

The Bolt you saw at the bubbler is for testing multi-cell configurations