

## ASSEMBLY INSTRUCTIONS MODEL 4.5 KIT

### READ ALL OF THE DIRECTIONS BEFORE BEGINNING

#### Tools and Supplies Needed

PVC Cement

PVC Primer

Lacquer Thinner

1- Small flat bristled Artist Brush

1- Hot Melt Glue Gun ( 100 watt or higher )

High Temp Hot Melt Glue Sticks ( 220 degree melt temp or higher )

2- ½ inch Open & Boxed end Wrenches

1- ½ inch Long Handled Nut Driver

1- Ratchet

1- ½ inch Socket

1- Pair of Needle Nose Pliers

1- ¾ inch Wrench or Adjustable Wrench

1- 20mm. Wrench or Adjustable Wrench

1- Pair Wire Cutters

1- Roll of Electrical Tape

Unpack the contents of your Package as pictured below, and place them on your work bench



You will notice that there are 2 six inch PVC tubes. You will be using 1 for cutting and building your cell tubes. You will use the other for cutting and shaping your plate spacers.

Before you begin make certain that you have a ( preferably flat type ) artist brush as pictured.



Fill a small container with lacquer thinner to store your brush in when not in use to prevent the PVC cement from hardening in the bristles.

Have all of your tools and supplies as listed on page 1, and arrange them so that they are readily available. Some of the steps require limited time. It is important to have all of your tools and supplies arranged for quick action.

### **Step One: Cutting of your Cell Tubes.**

Take 1 of the 6" inch PVC tubes and cut 2 pieces, each 2-5/8 inches long as pictured.



It is recommended that you use either a **Fine Tooth** Band Saw or Miter Saw.

If you do not have access to either, then you can cut them by hand using a Miter Box and a Hack Saw with a fine tooth blade. It is critical that the tubes be squared and even.

### **Step Two: Cutting of your Spacers**

Take the other 6"inch piece of PVC and cut 12 spacer rings exactly  $\frac{5}{16}$  of an inch wide as pictured



Once again it is critical that the spacers be  $\frac{5}{16}$  th of an inch wide all the way around. If you are cutting by hand, DO NOT LET YOUR SAW BLADE DRIFT.

### **Step Three: Cutting Spacers for Compression.**

Next you are going to cut 1- $\frac{1}{4}$  inches out of each spacer to allow for compression into the cell tubes. Measure and mark your cuts on the outside edge of spacer ring. You will have a gap, which will be located at the bottom when assembling. This gap is your fluid fill opening. Your spacers should look like the one pictured on the following page when you have finished your cuts. You can use a hand saw or a good pair of Dikes or Cutters to make the cut outs. When finished they should look like the photo on the following page.



#### **Step Four: Inserting Spacer Rings in Cell Tube.**

The next step will be to insert one of your spacer rings in one of the cell tubes that you cut. It would be a good idea to compress one of the rings and insert it as a test, before you continue. You will want to use your artist brush to spread a bead of PVC Cement around the inside edge of the cell tube going down into the tube approximately  $\frac{1}{4}$  inch. You will next compress a spacer ring and insert it into the cell tube so that the spacer ring and the top of the cell tube is flush with each other as pictured below.



Next, using your artist brush dipped in PVC cement fill any gaps between the spacer

ring and the cell tube. Allow cement to dry, and then turn the cell tube over so that the spacer ring that you have inserted is on the bottom. Once again using your artist brush and cement, put a bead of cement around entire spacer ring, filling any gaps on the inside of the cell tube as pictured below.



#### **Step Five: Neutral Plate Insertion**

After you have spread the cement and before it has a chance to dry, insert 1 of the 20ga. Neutral Plates. The gas hole in the Neutral Plate should be opposite, ( 180 degrees ) from the spacer gap as pictured below. The gas hole is the top, and the fill gap is the bottom of your cell tube.



Your next step is to compress and insert another spacer ring, **Make certain that the**

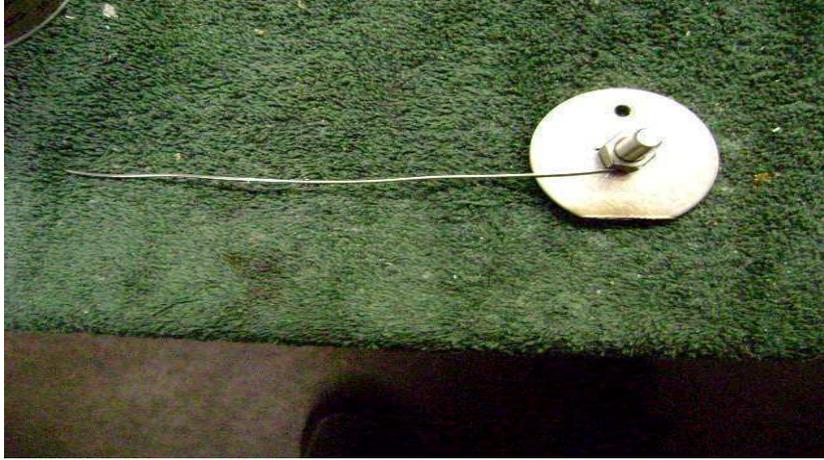
**spacer rings are tight against the plates** and repeat the gluing process. Install another Neutral Plate. **Make certain that the gas holes and the spacer gaps are aligned.** You can use your nut driver to tap them tight. Repeat this until you have all 4 Neutral plates installed and a spacer ring on the top of the last plate. Set this cell tube aside, and build your second cell tube. Repeating the process you did for the first cell tube.

**Step Six: Installing the Positive Electrodes.**

You will now find 1 of the positive electrodes. These can be identified by the gas hole near the top, a center bolt hole, and are ground flat on the bottom. Insert a 1 inch bolt through the center hole, and place a nut on the bolt and run it down to 1/8 inch of the Electrode Plate, leaving room to install the electrode wire as pictured below. Locate your other positive electrode and repeat the process.



Now find the piece of SS. wire, and cut it in half. Leaving 2 equal lengths. Using your needle nose pliers, form a horse shoe shape loop on one end and slide it between the nut and the electrode as pictured below. \* See note



**\*It is important to note at this time that you will be installing 1 wire running to your left, as pictured on the previous page, and one wire just the opposite, ( running to your right.)**

Tighten the nut securely on each electrode, making certain that the wire does not turn while you are tightening. Using your needle nose pliers, bend the wires at a 90 degree angle  $\frac{1}{4}$  inch in from the edge of the electrode as pictured below.



Your next step is to take one of the cell tubes that you have built and lay a bead of PVC cement around the top spacer ring. Then take one of your positive electrodes and align the gas hole with those of the plates and insert the electrode see below



Repeat this process with your second cell tube and set both cell tubes aside for about 5 minutes to allow the cement to form a bond with the electrode. Good time for a coffee break.

Now that your cell tubes and positive electrodes have had a chance to bond, you will be installing your final spacer rings. Lay a bead of PVC cement around the entire seam between the electrode plate and the outside tube wall. Make certain that you bring your bead of cement UP  $\frac{1}{4}$  inch on the cell tube wall.

Next insert your final spacer rings, in each cell tube. Making sure they are tight against the electrode as pictured below.



Your final step in building your cell tubes is to once again, take your artist brush dipped in PVC cement and lay a bead of cement around the entire spacer making sure you fill the gaps between the ring and the wall with cement. After having done this, set both cell

tubes aside. We are going to let the cement cure for a while.

### **Step Seven: Inserting the Positive Terminal**

You will now find your PVC “ Tee “. You will note we have already drilled and threaded a 5/16” hole in one side of the tee for you. You will now take your remaining 1” inch bolt with 2 flat washers and your rubber washer and place them on the bolt as pictured on the next page. Make certain that the rubber washer is located exactly as shown.



Next, stand you tee on end, and use your thumb and fore finger through the side opening on the tee to insert and screw in the bolt as pictured below.

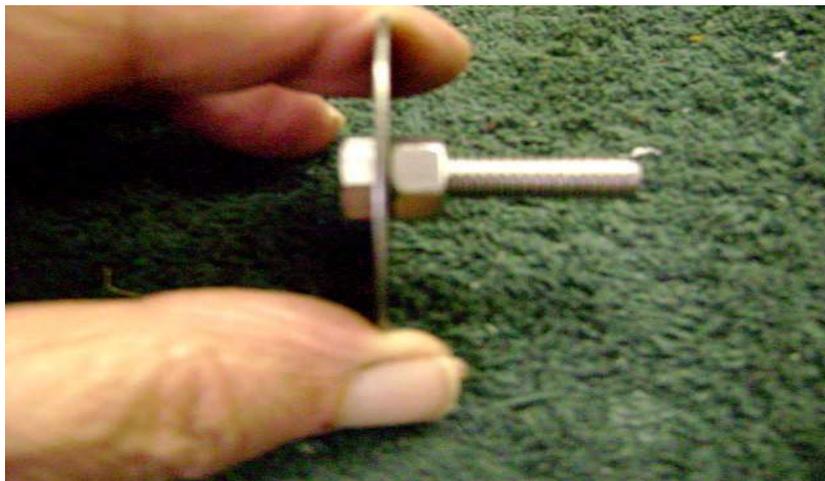


Turn the bolt so that it is approximately  $\frac{1}{2}$  of the way through the wall of the PVC tee.

You will now set the Tee aside, along with your cell tubes while we begin the next step. Now is a good time to plug in your Hot Melt Glue gun so that it can be heating to temperature.

**Step Eight: Building and Inserting your Negative Electrodes**

Your next steps will be assembling and inserting your Negative Electrodes. You will find the two 1-¼ “ inch bolts and the two 2” inch diameter round plates with a center hole. Insert the bolt through the hole, then screw a nut down the full length and tighten it as tight as is possible without straining. As pictured below.



You will next insert a flat washer on to the bolt as pictured below.



In your next step you will be using your Hot Melt Glue gun and High Temp Glue Sticks. Make sure your gun is heated to proper operating temperature. Now find both of your pre-drilled and threaded end caps and have them ready to use in quick manner.

You will now lay a bead of hot melt adhesive around the washer AND up the bolt at least 5 threads, **ON ONE ELECTRODE ONLY**. all the way around the bolt as pictured below. Do only one electrode. You are going to quickly thread it into an end cap before the adhesive hardens.



The small gap was left purposely for display only. **DO NOT** Leave any gaps when you are spreading the adhesive sealer.

You will be using your long handled  $\frac{1}{2}$ " nut driver to screw it into your end cap. Tighten it as snugly as possible without stripping threads in the cap. As pictured Below.  
**\* Note I suggest holding the end cap with one hand while turning your nut driver with the other.**



If you have done this properly you should have  $\frac{5}{8}$  inch of threads protruding through the cap. Now repeat this process with the remaining electrode and cap.

If you have successfully performed this function, your end caps will look like the picture's below.



Inside View of Cap

Outside View of Caps

Your next step will be to seal your Negative bolt terminals. Once again, using your hot melt glue gun, lay a **small** bead of high temp adhesive around the entire bolt and cap. Make sure you carry the adhesive up 3 threads on to the bolt as pictured.



You will now quickly insert a flat washer on to the bolt and then screw down a nut. It is important that this connection be very tight. You will use your ratchet with  $\frac{1}{2}$ " inch socket, and  $\frac{1}{2}$ " inch boxed end wrench to tighten. This is best accomplished by using a bench vise as pictured on the next page. It can be done without the vice, but is much more difficult. See photo on following page.



When you have completed both end caps they should look like the photo below.



**NOTE\*** The next steps you will be doing, must be done in a timely manner. You will need to follow directions explicitly. You will be gluing the cell tubes into the Tee and attaching the wires. You will be gluing the end caps with the Negative Electrodes in place. You will also be gluing your Bubbler tube and top cap in place. All of these procedures require precise alignment and must be done rather quickly before the PVC cement starts to set up. **THERE IS NO ROOM FOR ERROR. YOU WILL NOT HAVE A SECOND CHANCE.** Once the cement starts to set up ( around 10 seconds ) there are no adjustments you can make.

A good idea at this time, is to take a piece of sand paper and bevel the outside edges of the ends of your cell tubes. This will remove any small burr's that might have remained from the cutting process. It also provides a small taper on the edges of the cell tube which allows much easier insertion and reduces the possibility of not fully inserting them as a result of the cement setting too quickly.

**Step Nine: Getting your assembly materials ready for quick usage .**

Have your PVC cement and Primer ( or cleaner ) ready as pictured below.



Your cement and primer should have an applicator attached to the top of the can as picture above. Completely loosen the caps on your adhesive and primer. Have them ready for instant usage.

Now is a good time to familiarize your self with the STOP ridges in the Tee and End Caps. If you will note in the pictures below, you can see ( and feel ) a stop ridge, approximately 1-½ inches inside both the end cap and Tee.



End Cap



Tee

When applying primer and PVC cement to the cell tubes you will want to apply it 1-½” inches up the tube as pictured below. **DO NOT BEGIN YET.** **This is an explanation of how to.** **I will let you know when.**



If it is easier for you, you can mark your cell tube as pictured below.



**You are now ready to begin the assembly process.**

### **Step Nine: Cell Tube Insertion and Connection**

You will now take your Tee, and stand it on end with the Positive terminal facing your body. If you remember when you built your Positive electrodes you had one wire running to the left and one running to the right, This was done so that when inserting

the cell tubes that the bends would locate both wires on the side of the Tee with the Positive Terminal. You will be using the cell tube with the wire running to your left first.

( remember the gas holes are always on the top of the cell tube. ) Without Gluing place the cell tube in place as pictured below. **DO NOT PUSH IT INTO THE TEE YET.**



Take note of where the wire is at this time. **When you actually do the gluing and installing of the tube you will be using the fingers of your right hand to guide the wire out of the side opening on the Tee, while you are pushing the cell tube in place.**

Alright, !!! you are ready to begin gluing. Using your PVC Primer or Cleaner spread a thin layer inside the Tee all the way down to the Stop Ridge. Then spread a thin layer up your cell tube 1-½ inches. Set your Cell tube down for a moment. It is now time to apply your PVC cement. Apply a liberal amount of adhesive in the Tee all the way down to the Stop Ridge, and set the Tee down on your work surface with positive terminal facing you as pictured above. Now apply a liberal amount of cement to your cell tube ( wire side up)

1-½ inches down on the cell tube. Using your left hand, quickly align your cell tube so that it is exactly as pictured above, then push the cell tube down all the way to the Stop Ridge while at the same time guiding your wire out the side opening with your right hand. This must be completed in less than 10 seconds, or your cement will set and not allow the tube to slide all the way to the stop. Press down on the cell tube and hold it in place for at least 20 seconds before releasing.

Great, you have now completed your first glue joint. The rest should be easier now that you know the process. Allow the Tee to stand as pictured above after you have completed the gluing process for a couple of minutes.

You are now going to set the Tee down on its horizontal surface and trim the excess wire. As pictured below. Use your wire cutter or dikes.



Cut your wire approximately  $\frac{1}{4}$  inch down from the top of the Tee as pictured above. You will now wrap the wire around the positive terminal, between the 2 stainless steel washers. I prefer to use my forefinger for this, you may find it easier to use your needle nose pliers. When finished it should look like the picture below.



You will now stand the Tee on end once again but this time with the cell tube down standing on your work surface, and repeat the gluing process with the second cell tube.

Repeat the trimming and attachment of the second wire. If you have done everything correctly so far it should look like the picture below.



Your next step will be to tighten the terminal bolt to secure the connecting wires. This is best accomplished with a  $\frac{1}{2}$  inch ratchet wrench or a 12 point boxed end wrench as pictured below. You want to tighten the bolt snugly, **BUT NOT SO TIGHT AS TO STRIP THE THREADS IN THE PVC TEE.**



You will now seal the outside edges of your terminal bolt exactly the same way that you did when you built your end caps with the Negative electrodes. Apply a bead of Hot Melt adhesive around and up 3 threads on the bolt. You will be needing 2  $\frac{1}{2}$  inch wrenches standing by. Place a flat washer and nut on the bolt and tighten as securely as possible as pictured below. It is much more easily accomplished by using a bench vise.

This entire procedure must be done quickly before the adhesive sealer has a chance to set.



While holding inside bolt, Securely tighten outside Nut.

### Step Ten: Installing your End Caps with Negative Electrodes

You will next stand your unit on one of the cell tubes as pictured below.



You will now take one of your end caps with the Negative electrode installed and apply a coat of Primer approximately  $\frac{3}{4}$  of the distance to the Stop Ridge completely around the cap. **BEING CAREFUL TO NOT ALLOW ANY PRIMER TO TOUCH THE METAL ELECTRODE.** Now apply primer to the 1- $\frac{1}{2}$  inches of the cell tube that is facing upward in the picture. Repeat this process with the PVC cement. Then quickly press the cap down over the cell tube all the way to the Stop Ridge. Hold the cap down firmly for at least 20 seconds.

When finished your unit should look like the picture below.



You will now need a roll of electrical tape, or something similar to stand your unit on to install your second end cap. You need clearance for the Negative terminal Bolt.



Electrical Tape

Mighty Mite Standing on Tape

You will now install your second end cap, following the same procedure that you used to install the first. Now is a good time for another break, you are almost finished.

### **Step Eleven: Building your bubbler tube and Top Cap Assembly.**

You will now locate your Clear PVC tube, and your top cap ( the cap with 2 larger

threaded holes in it ) for assembly. You will partially screw in your 90 degree barbed fitting and fill plug in the cap at this time ( finger tight only ). This is for proper alignment of these fittings later on. Next you will use your primer, spreading a thin layer around the inside of the cap, down to the Stop Ridge and also 1-½ inches down on the clear bubbler tube. You will now apply PVC cement in the same manner that you have previously done. When completed your bubbler tube assembly should look like the picture below.

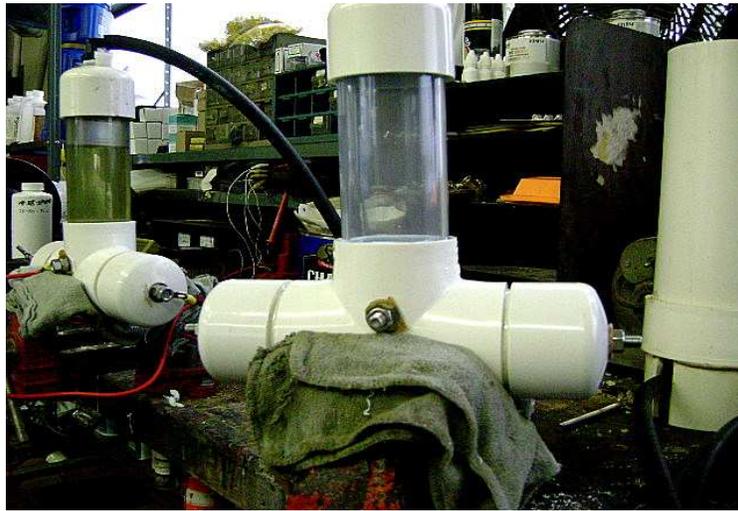


**\*Note: Before proceeding, I have found that it is of a certain degree of importance as to how the barbed fitting and the end cap be located on the finished product. I am inserting a photo of the finished product at this time, to illustrate the desired preference. Please take note the barbed fitting and the fill plug are interchangeable.**



Well you are almost finished. Your final step will be gluing your bubbler tube in to the base unit of your Mighty Mite 4.5. You will be following the same gluing procedure as

you have done on the previous glue joints. Spread a layer around the inside of the Tee all the way down to the Stop Ridge, and 1-½ inches up on to the bubbler tube. Repeat this process with the PVC cement. Now press the bubbler tube down into the Tee all the way to the Stop Ridge making sure that your fittings are aligned as in the picture on the previous page. Make sure you hold it in place for at least 20 seconds before releasing pressure. I like to use the bench vise for holding the bottom unit while performing this task as pictured below.



***CONGRATULATIONS*** if you have done everything correctly the only remaining parts you have, will be 3 nuts to attach your wires to your Positive Terminal and 2 Negative Terminals. Your finished product should look like the picture below. **You must let the Mighty Mite cure for 24 Hours before filling. Please read next page.**



**We at D&N Automotive Engineering**

**Thank You for Your Purchase. We hope that you have successfully completed the building and assembly process, and had a little bit of fun and enjoyment along the**

way.

The unit that you have just built is our basic unit. It will provide you with enough Brown's Gas to significantly improve your fuel mileage when used in conjunction with the procedures in "Tuning 101 Guide to HHO Success" You can obtain a copy of this guide by email which you will be able to print out with your printer, by sending your request to the following email address. Simply request Free Guide.

We carry a complete line of Wiring, Electrical Fittings, Gas Hose, PVC Fittings, Clear PVC, In Line Fuse Holders, Fuses, Ammeter's, Black Box Controllers. CCPWM's, PWM's E-22 Electrolyte, Cell Cleaner, and just about anything you need for a successful installation. A Price list is packed with your unit.

If you would like to purchase any of the above mentioned items and have them shipped FREE with your 4.5 Kit, Contact us prior to shipment at the following link.

[Klondikedarol@yahoo.com](mailto:Klondikedarol@yahoo.com)

Our Other Models contain some very sophisticated enhancements which greatly increases not only the gas output, but also drastically increases the efficiency. These models are not available in kit form. The building process is extremely technical and very non forgiving.

I am now 75 years old, and starting to get tired. When I finally reach the point that I am no longer able or have the desire to build the other models, I will release the plans to the public.

God Bless and  
May the Blessings be.

Darol Mason  
D&N Automotive Engineering