

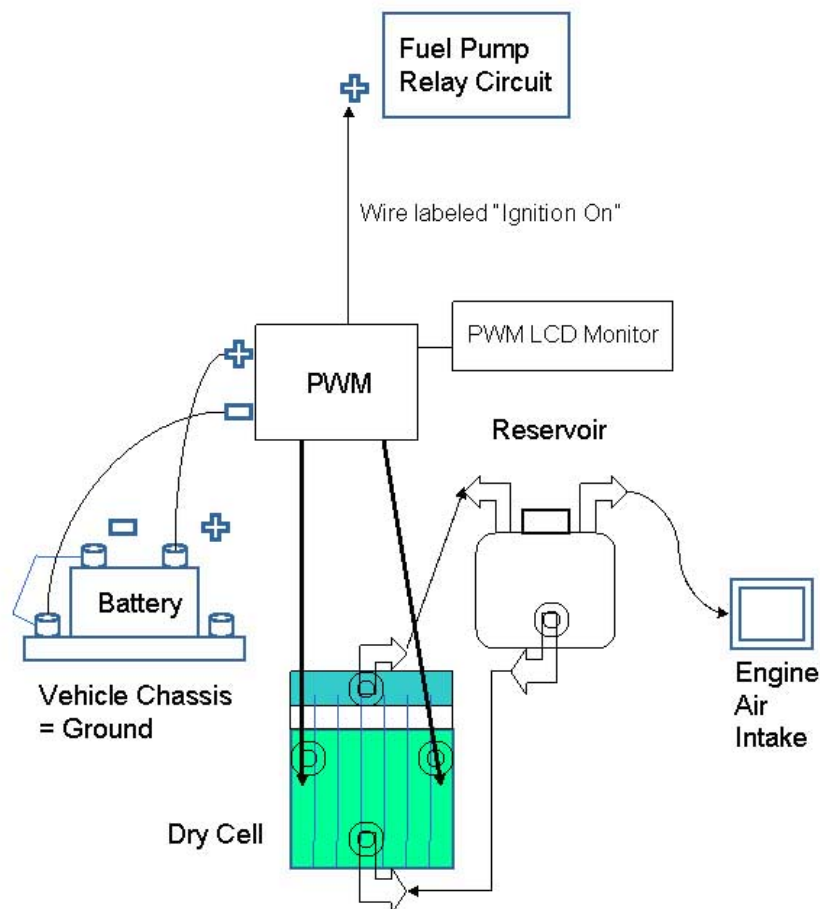
Installation Instructions

Please note: We have tried to make these instructions as easy as possible to understand and follow. But if you have trouble with a step, please email us at support@dry-cells.com. We will answer your question, but this will also help us know where we have to make the directions clearer so that they can be easily followed by all.

Complete Dry Cell Kit includes:

- Dry Cell System
 - Dry-Cell Hydrolyzer (two Dry-Cells if vehicle is 8-cylinders or larger).
 - Electrolyte Reservoir.
 - Two (2) one-way valves.
 - Heavy-duty plastic tubing (1/2" outside diameter, 1/4" inside diameter).
 - One bottle of pre-measured electrolyte.
 - The bottle is pre-measured for use with 40 oz. of distilled water.
 - Additional bottles can be ordered from <http://www.dry-cells.com>.
- Pulse-Width Modulator (PWM).
- Electronic Fuel-Injection Enhancer (EFIE).
- Frequency & Pulse Width Monitor with Liquid Crystal Display.

System Overview:



IMPORTANT – DO NOT SKIP THIS SECTION

HHO (hydroxy gas) is highly combustible, volatile, and explosive. It is no more dangerous than any other fuel, but only when it is used properly. The most important single element in your installation is to make sure that HHO is only being produced when the engine is actually running. For instance, you don't want HHO being produced when you are sitting in your car with the accessory switch on, listening to your CD player. So the key is to find a circuit that is only on when the engine is actually running.

We have made it easy to achieve this with our PWM design. In the diagram above, you'll see at the top, the wire labeled, "Ignition On". The PWM will only operate when 12 volts are applied to that wire. In this way, we have created a safety shutdown circuit for the system. We recommend connecting this wire to the output of your fuel pump relay. The fuel pump relay will only be powered when the engine is actually running, and is designed to shut off when the engine dies or is turned off. You should test the behavior of this circuit in your own vehicle and make sure it is only activated when the engine is running. This point is very important. You don't want to be producing hydroxyl gas when the engine is not running.

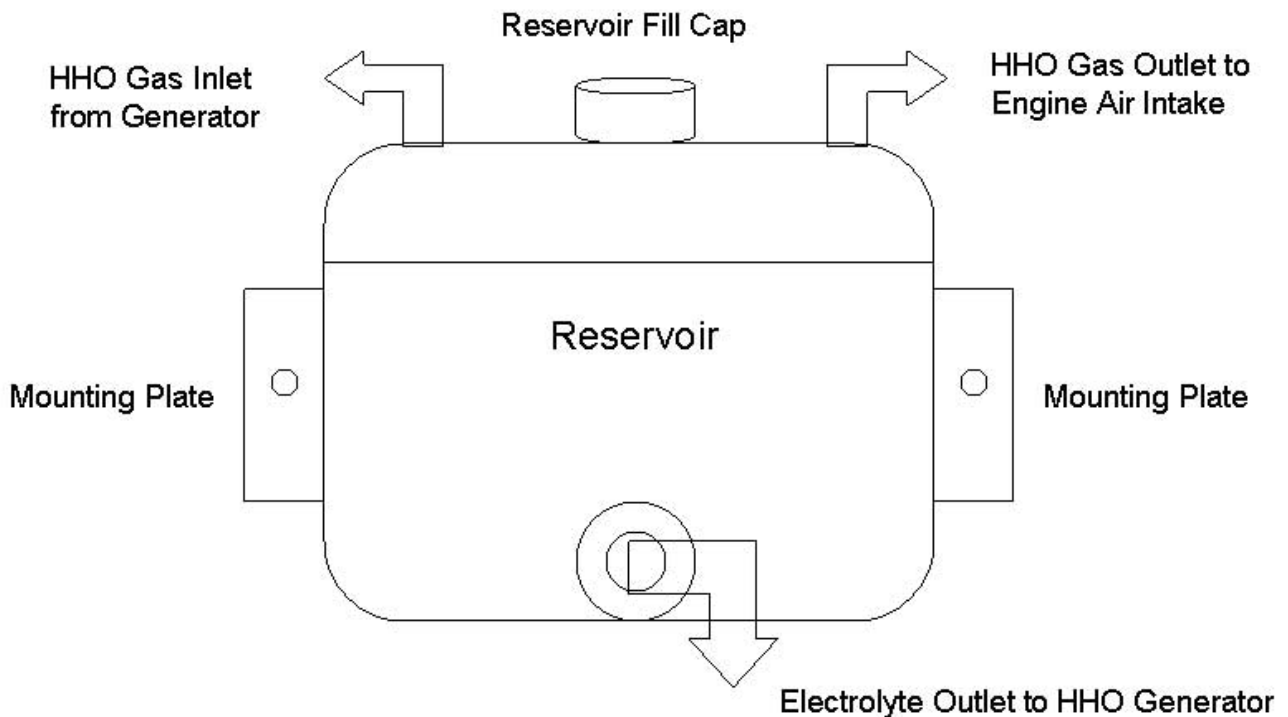
Other safety points to consider:

- NO spark or flame should be allowed near HHO gas.
- All one-way valves MUST be installed.
- Do NOT operate the Dry Cell indoors.
- Use eye and skin protection when mixing or handling electrolyte.
 - In the event of eye or skin contact with the electrolyte, flush with plain water.
- The electrolyte generates a substantial amount of heat when it is initially mixed.
 - Mix and store in heavy-duty plastic containers; do not use glass.

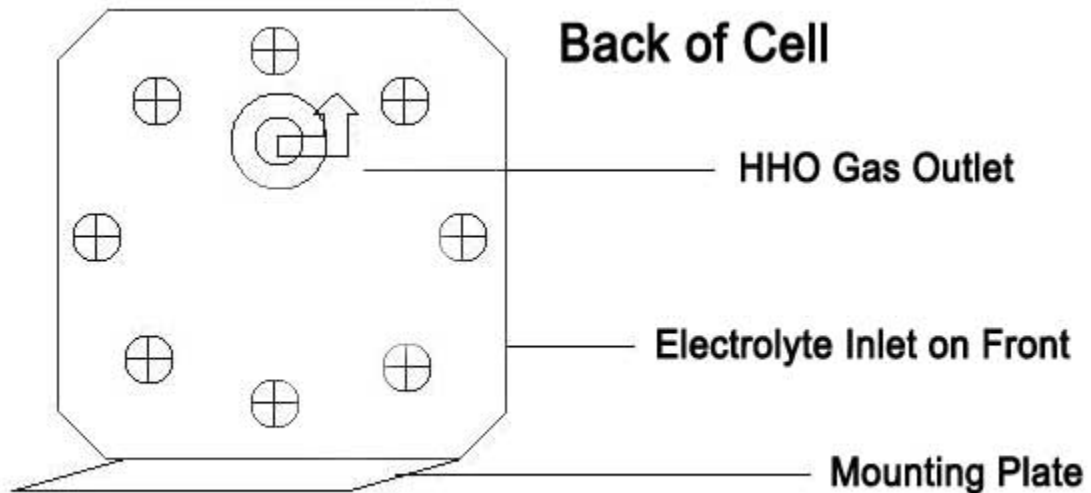
Installation Instructions

- Assemble the following items in addition to those provided in the Dry Cell Kit:
 - Voltmeter or multi-meter.
 - Basic tools: wire stripper, screwdriver, pliers, etc
 - 12 AWG insulated, stranded electrical wire.
 - ½" hose clamps (8 for single cell; 20 for dual cell).
 - Cloth electrical tape or heat-shrink tubing.
 - Distilled water, 40 oz. needed for electrolyte.
- Assess the space available in the engine compartment. You must find or create space for the following components, which MUST NOT be installed in the passenger compartment:
 - Dry Cell
 - You will need two Dry Cells if you have an 8-cylinder vehicle or larger.
 - Reservoir
 - The Reservoir should be installed above (i.e., higher than) the Dry Cell(s) to facilitate flow within the system.

- Assess the space available EITHER in the engine compartment OR in the passenger compartment for the following components:
 - Electronic Fuel Injection Enhancer (EFIE)
 - Pulse-Width Modulator (PWM)
 - Electronic PWM Monitor (Optional)
 - NOTE: If you install any of these items in the engine compartment, they should go into a location that will not receive direct water spray, such as from an engine-cleaning pressure wash.
- If you have a gasoline (not diesel) engine with electronic fuel injection (all modern cars use this), you must install the included Electronic Fuel Injection Enhancer (EFIE) in order to achieve fuel efficiency gains from your Dry Cell(s).
 - To get the correct EFIE for your vehicle, you must provide us with your make/model/year and engine size when you order. We will then ship you the correct EFIE. If you decide to install your cell on a different vehicle, please make sure you have the correct EFIE before proceeding. You may need to exchange it for the correct type for the new vehicle.
 - Installation instructions for the EFIE are available at <http://www.fuelsaver-mpg.com/install.html>.
- Install the Electrolyte Reservoir
 - Select a location that will permit the Dry Cell to be installed lower than the Reservoir.
 - Mount it securely.
 - Only one Reservoir is required, even if there are two Dry Cells.



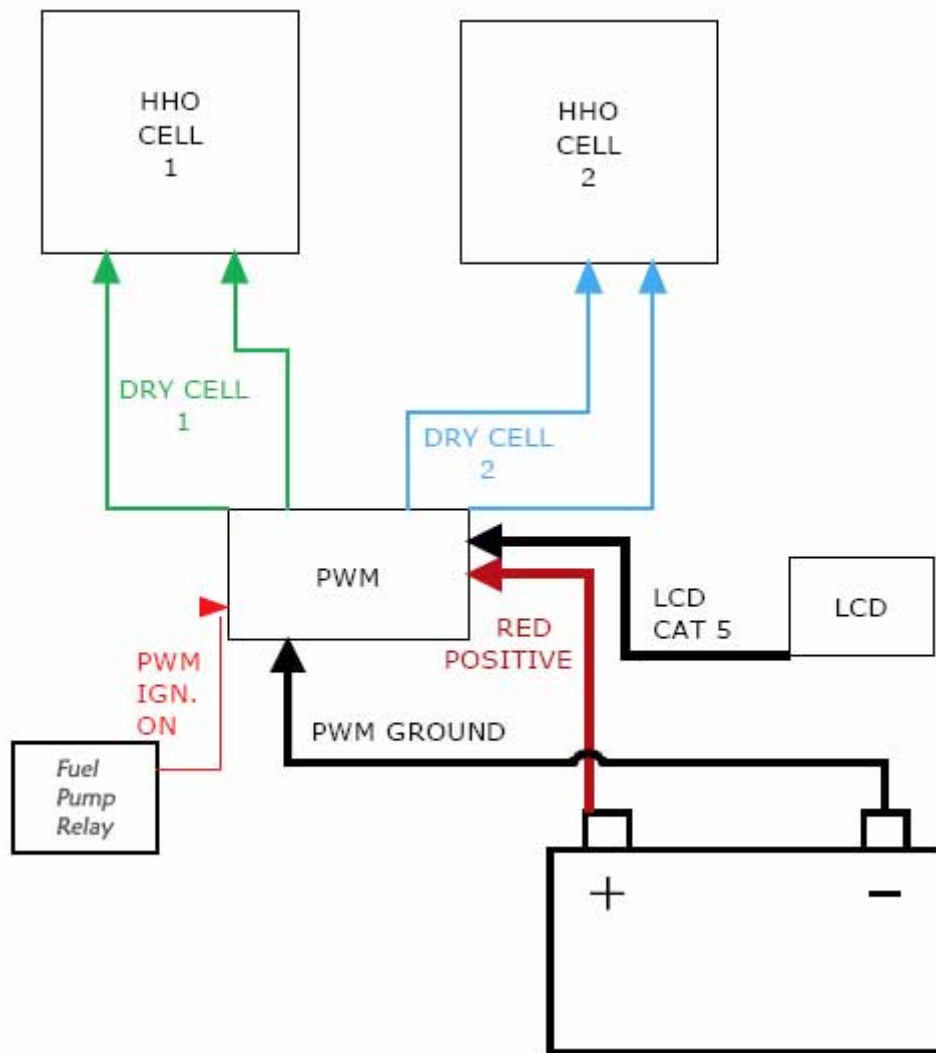
- Install the Dry Cell(s).
 - Select a location that will permit the Dry Cell(s) to be installed lower than the Reservoir.
 - Mount it securely.



- Install ¼" hose barb in plastic housing of the engine air intake.
 - It is crucial that this installation is leak-free.
 - Try to install it as close to the engine as possible.

- Measure and cut all required hose runs using hose supplied.
- One-way flow valves **MUST** be installed in the tubing that runs:
 - From the Reservoir to the Dry Cell.
 - NOTE: This one-way valve is pre-installed on the Dry Cell.
 - From the Reservoir to the Engine Air Intake.
 - Cut the hose at a convenient place between the reservoir and the engine. Install the one way valve.
 - Install the one-way valve so that the air-flows toward the Engine Air Intake. You can test the valve by blowing through it. In one direction there will be a flow of air, and the other, there will not. Air must flow towards the engine.
- Push tubing on to all exposed hose connectors. You may use a heat gun or hair dryer to warm the tubing. As the tubing warms, it will expand more easily to accept the hose barb. Apply heat carefully. Do not overheat the tubing. It will de-form or melt if overheated.
- There are two (2) hose connections at the **top** of the Reservoir.
 - Use one of these connections to connect to the **upper hose connection** on the Dry Cell. That will be the hydroxy gas output line into the Reservoir.
 - If the installation requires two Dry Cells, then a T-junction (“tee”) must be used to connect together the two hydroxy gas output lines (the upper hose connections on the Dry Cells).
 - Use the other connection as the output line from the Reservoir to the Engine Air Intake.
- There is one (1) hose connection at the **bottom** of the Reservoir. This is the line that supplies electrolyte to the Dry Cell.
 - The electrolyte-intake connection is the **lower hose connection** on the Dry Cell.
 - If the installation requires two Dry Cells, then a T-junction (“tee”) must be used to connect to both Dry Cells.
- Install zip ties on all hose connections. Please note, that we used to supply hose clamps for these connections, but they have proven to actually cause leaks. So don’t use them. You don’t want to put pressure on the hose directly over the fitting’s barbs. Install the zip ties between the end of the hose and the barb. You can use a pair of needle nose pliers to cinch the zip tie tight. See the one-way valve fitting that is factory installed on each cell for an example.
- Install the PWM
 - The electrical power to the Dry Cell is routed through the PWM. The Dry Cell(s) will not function properly unless the PWM is wired correctly.
 - Wire connections are per the following diagram.
 - Install the LCD display unit.
 - You can unscrew the back of the LCD display to disconnect the cable. Then the cable can be run through a hole in your dash to mount the LCD display. When done, you can plug the cable back in and re-secure the back onto the display.
 - Connect the “ignition on” wire to any circuit that is hot when the key is in the “on” position.

- We no longer need to find the fuel pump relay circuit to control the system. The PWM now senses when the alternator is no longer charging the system and shuts itself down automatically. In this way, your system will only run when the engine is actually running – not when the key is in the “on” position. This is a key safety feature of the PWM.
- This is the control wire for your system. When it is powered on, the system will run. It draws no appreciable amount of power, so can be connected to any circuit that is only powered when the engine is running. The diagram below shows that it connects to the Fuel Pump Relay. This is now changed. You can connect to any voltage source that is on when the key is switched on.
- 2 black wires go to your Cell or Cells. If you have 2 cells, you will connect both cells to the black wires in parallel. You can use a yellow butt splice connector to join one wire from each cell to each black wire on the PWM. The connection points on the cells are the 2 tabs on the top. Ignore the tabs on the side. The side tabs are used to make plate to plate connections, and these are done by the factory. Don't connect anything to the tabs on the sides of the cells.



- Install the Electronic Fuel Injection Enhancer (“EFIE”)
 - Follow the installation instructions at <http://www.fuelsaver-mpg.com/install.html>
 - If you have problems with the EFIE device(s), contact support@fuelsaver-mpg.com.
- Mixing the Electrolyte and Filling the Reservoir
 - Wear eye and skin protection; the electrolyte may be highly caustic.
 - Do not use glass containers for mixing or storage; the electrolyte may generate heat.
 - Use Distilled Water only.
 - Do not use tap water, mineral water, spring water, or purified water.
 - In freezing climates you may substitute up to 25% of the distilled water with denatured alcohol, such as you will find at Home Depot. Only use about 12% alcohol for temps of 0 degrees Fahrenheit and above, and 25% for areas where it gets colder.
 - If using the catalyst supplied with your kit, use one (1) bottle per gallon of distilled water. The formula is 1 gram per ounce of distilled water. We ship our systems with 128 grams of potassium carbonate, which when mixed with 128 fluid ounces of water (1 gallon), will make the proper concentration of electrolyte.
 - If using another catalyst, you’ll need to adjust the amount so that the cell is drawing about the same amperage, about 12 amps per cell.
 - Acceptable alternative catalysts are potassium hydroxide or sodium hydroxide. But be careful with these chemicals. They are good catalysts, but are much more dangerous to handle and can cause chemical burns. Flush with water if they come in contact.
 - Do NOT use baking soda or salt.
 - We do not recommend any other catalyst than the above 3.
 - Mix catalyst and distilled water thoroughly in a clean, separate container before transferring to the Reservoir.
 - When filling the Reservoir, keep the electrolyte at least 2” from the top.
 - Refill the electrolyte when the level gets to within 1” from the bottom.
 - To replenish the electrolyte, add water mixed with the electrolyte as covered in these instructions. This will maintain the correct electrolyte concentration, replenishing electrolyte lost during normal use.
 - We offer refills of pre-measured electrolyte in our [online store](#). However, you can get better prices when buying it in bulk. www.advance-scientific.com, www.labdepotinc.com, and www.wardsci.com, all supply potassium carbonate at reasonable prices. You want “Anhydrous potassium carbonate”, and you don’t care about lab grade or “reagent” designations (which cost more). If you don’t have an accurate scale, you can mark the level of catalyst in one of our bottles, and then use it to measure batches purchased in bulk.

Initializing the System

NOTE: To get the electrolyte flowing into the Dry-Cell(s), it may be necessary to evacuate air in the lines. Do this by loosening, or removing, one of the hose connections. Re-seal as soon as the electrolyte begins flowing.

With the engine running, check all hose connections for leaks by applying soapy water using a spray bottle. If there is a leak, bubbles will be immediately evident. Repair all leaks.

Check for electrolyte leaks by visual inspection during system operation.

Test the system. Be sure all tools are out of the engine compartment and start your vehicle. Watch the display and you will see the amperage climb to 12 amps. This is the correct setting for a single cell system. If you have a 2 cell system we need to adjust the control panel. To do this you will push in on the knob and turn the knob clockwise to the menu setting that says constant current amps. Push the button once and it will say locked by pressing the button again it will unlock so you can turn the amperage up to 24 amps. After you have done this, push the button again and it will display duty. This should be set at 85% press the button again. Now you want to turn the knob clockwise to exit setup. **YOU MUST EXIT SETUP FOR ALL CHANGES TO BE SAVED.** The panel will be in regular running mode after exiting setup and the programming is saved. Your amperage should then climb to 24 amps. We do not recommend putting any more than 12 amps per cell as overheating can occur damaging the cell.

If operation of the system results in a “check engine light” (“CEL”), refer to the EFIE installation instructions provided by FuelSaver-MPG; go to <http://www.fuelsaver-mpg.com/install.html> .

If all systems are “go,” then the final test of proper operation will be in improved fuel economy. Measure your mileage per gallon both before and after installation of the Dry Cell(s) in order to get an accurate comparison. Try to use the same filling station, the same grade of gasoline, and the same route for all your fuel economy tests.