

## Lead-Acid Battery Ventilation Fan Construction

The controller circuit that monitors the battery voltage and turns on the fan when the battery is being charged is detailed in a separate report. Find file named “Extremely\_Low\_Current\_Usage\_Battery\_Voltage\_Monitoring\_Switching\_2010+.pdf”.

The Ventilation fan construction is used to remove hydrogen gas from a closed Lead-Acid battery box when the battery is charging. It can be used with 12 to 48 volt battery banks. If a 24 or 48 volt battery bank is used, then one can use a fan of that voltage or lower. I found that a ball bearing 24 volt fan worked the best for a 12 volt battery setup. The fan runs slower, lasts longer, and uses less current. In this case it uses about 52 ma at 12 volts.

Small 12 Volt ventilation fans are common place in the computer electronics industry. Some are small enough to fit inside a large PVC pipe. The pipe can then be vented to the outside to harmlessly pump the hydrogen gas fumes to the outside. In this way the batteries can be enclosed in a closed housing that protects those living in the area from the hydrogen gas as the batteries charge.

The fans we found to use are 3”x3”x1” and run at 12 VDC .15 Amp or is 24 volt and run at about .052 amp at 12 volts. They are interfaced to a 4” to 3” reducer from Home Depot. The flanges on the 4 corners of the fan were ground down to fit the PVC reducer.

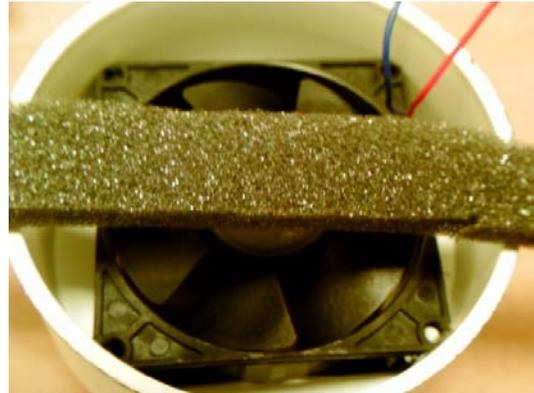
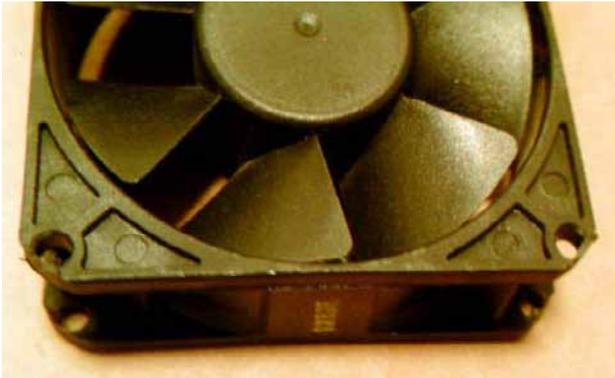
### List of parts:

1. 3x4 PVC pipe coupling from Home Depot (052063404073) \$1.70.
2. 3x3 Shielded Coupling with hose clamps (018578002821) \$8.87. This coupling is used to hook it to the pipe that goes through the wall.
3. DC 24 V .4 Amp Ball bearing Brushless 3” by 3” fan Mechatronics inc. (FB025E24B) or equivalent. It can be purchased for one dollar and up depending.
4. Foam rubber about .75 by .75” by 14” long. Cut from a bigger sheet.
5. Hardware cloth screen with .25” square mesh form Home Depot.
6. Silicon II rubber sealant.
7. # 18 gauge speaker wire and one or two alligator clips.



This is the finished result: The steps to making it follow.

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Round the corners of the fan and cut a piece of foam about .75 by .75" by 14" long.



Hold it in place with a bit of silicon rubber II gasket sealer.



Cut a screen to keep large particles out of the fan. Tape it on with some electrical tape.

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The following is an alternate more professional way to accomplish the same thing.



This method has an advantage if one uses a one way flow flapper valve. This would be a thin sheet of plastic hinged to open when the fan is running and gravity would close it when the fan is not running.