

The Volt Vette Project

Chapter 45 Winter Testing

The gasoline crowd wants the public to believe that electric cars can not be used in the winter, but with heated battery boxes we know it can be done. What we want is data that will give us an idea on how cold weather effects range and performance.

It's been a long hard winter here in Minnesota, just what I need for some serious winter testing!

Every time I drive out of my garage my battery pack is warm and happy, thanks to the battery box heaters, and at highway speed the batteries internal resistance keeps the battery temperature up.

I



The Corvette's 12 inch wide tires and low ground clearance make driving on snow and ice a little too exciting for me. I wait until the snowplows have cleared the streets before I drive.

For my first test I drive 23 miles at 50mph with the outside temp at 11 F. The headlights are on half the time and the car is still running strong at the end of the run. This is important because the Volt Vette battery pack does not up and die, leaving you by the side of the road. No! As the pack nears empty the car's top speed starts dropping, from 80 miles per hour to 60 mph to 40 mph to 20 miles per hour. So no speed drop is a good sign.

But I really need to get some more exact numbers.

One way is to measure the voltage drop in one of the 12 volt batteries within the pack. I pick battery #3 because it is easy to get to.

At the start of the test that battery reads 12.90 volts and a temperature of 75 degrees. I drive 8 highway miles then stop to shop for 2 hours. The cabin temp is 45, the heater is off. The outside temp is 5 degrees under a cloudy bright sky.

After 2 hours parked in the open the cabin temperature is now 65 and the batteries 77 degrees. I drive 8 miles home, wait 30 minutes, then measure battery #3 again. The battery now reads 12.35 volts for a drop of .55 over 16 miles.

I'm told a 12 volt battery is considered dead when it drops to 10.5v.

I plan to avoid going below 11.5 volts on each battery, or 150v for the whole battery pack.

In another test drive, I drove 9.6 miles thru light rain. The heater was at 1500 watts. Also on was the headlights, the DC-DC, power steering, and wipers. The outside temp was 35 and the car used 25 amp hours out of a total of 105.

Some want to know how much electricity is being used while driving on a flat road. I find out that 60 amps are needed to keep the car moving at 30 mph and 95 amps to keep moving at 55.

On our electric bills we are charged based on the number of Kilowatt hours we use. Run a 100 watt TV for 10 hours and you have used one kilowatt hour of electricity. (in my case, a wind turbine owner sells a kilowatt hour to the power company for 3 and a half cents and then the power company sells it to me for 10 cents)

Getting back to electric cars, many people think this is the best way to compare electric cars to gasoline, kwh vs mpg.



I buy a Kill-A-Watt gauge for \$30. but it quickly burns out.
Next, I buy a EML 2020 watt meter for \$235. This gauge is overkill but I can't find a heavy duty watt meter for less.

I was hoping I could get 3 miles per kwh, but I only got two on the highway and 2 and a half in town.

This would be the comparison:

- A car that gets 20 miles per gallon at \$4. per gallon costs 20 cents a mile.
- The vette, at 10 cents a kilowatt hour, costs 5 cents a mile.

Need to do more testing.

(By the end of March 2011, the Volt Vette has been driven over 6,600 miles)