Electrathon Design & Racing Tips from Cloud EV

The following Electrathon Design and Racing tips are listed from most important to least important but may overlap and change positions due to the race course being used.

1) Vehicle Weight - Design your vehicle to use the lightest construction materials possible. A uni-shell design using Light Weight Kevlar Fiber Board provides the best weight to strength ratio that we know of and also reduces the aerodynamic resistance.

2) Vehicle Rolling and power Resistance

....a) Use the best wheel bearings and drive train system possible. Using a chain drive system has proven to use less energy to transfer power from the motor to the drive wheel than either a belt, gear or friction drive system.

....b) Use a 3 wheeled vehicle design with a powered single front steering wheel versus a double front steering and rear wheel drive system. (See the information in the previous article). Never try to use a rear steering system or a 4 wheeled vehicle design.

....c) Use the thinnest (1.5 to 2 inch) highest pressure tires possible.

....d) Design and construct your vehicle to be as low as possible.

....E) Properly place the weight of vehicle components to reduce resistance and weight over each wheel.

3) Energy Management

....a) Use the available energy form the batteries to the maximum. Heat your batteries to about 120 degrees WHILE CHARGING, to increase their capacity to 50% or more, versus a 60 Degree battery temperature. If your batteries should cool down after charging, the available stored energy will dissipate by turning into expelled heat.

....b) Use meters to track battery pack voltage and amp draw information.

....c) Set up the gear ratio to match the race course - You want to gear your vehicle so it can average about a 40 amp draw for each lap. (See the following article)

....d) Charge your batteries properly. NEVER let your batteries stay dead for more that just a couple hours! You can charge them individually with 12 volt chargers or use a 24 volt charging system with the batteries in series, but always check the batteries for an equal charge. Charge them until you reach about 15 Volts at a 2 amp charge and then leave them at the 2 amp charge until they reach about 16 volts. Maintain this 16 volts (each battery) at less than 2 amps, until the last minute before the race. Make sure you heat the batteries WHILE CHARGING to about 120 degrees.

4) Aerodynamic Resistance - Design your vehicle to reduce the airflow over and around the vehicle, including the wheels and other protrusions. Use a canopy to cover the driver. This reduces the energy required to maintain a higher speed, and this becomes even more important on the longer or more banked race tracks.

5) Driver Ability
....a) Drive the best line possible.
....b) Use the brakes the least amount as possible.
....c) Watch your energy usage. Adjust your speed to maintain your energy usage plan.
....d) Be patient! Remember, you are not RACING other cars. You are RACING for distance against time!
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