

January 2014



UNIVERSITY OF MICHIGAN
SUPERMILEAGE

Editor: Agney Deshpande

Happy New Year!

Election Forms
for 2014-2015
season due
Feb. 6

Subteam Updates: DII Team

While Body team focuses on the outside of our vehicle, Driver Interface and Integration is concerned with the inner infrastructure. DII is responsible for designing the steering, safety, and controls systems for the vehicle. This year, subteam lead John Young has several new designs planned for the upcoming vehicle. We will implement a rear brake which functions similar to a parking brake; this way the driver can step out of

the vehicle without relying on another member to hold the car steady. Of particular interest to John, who is also our main driver during competition, is the new seat. Previously, we used a foam platform that required our drivers to brace themselves with their elbows. Now, with a new steering system that does not allow for this, we will develop a seat that supports the driver in all directions.

This new steering

system comes from a change in competition rules: all steering must be with a natural steering system. This makes our vehicle a little bit more like a road car- when the driver steers right, the car turns right. Finally, in order to place these components in their correct locations, DII has developed a mounting system to ensure precise mounting points. This new structure should provide more accuracy and better performance of our vehicle.

Sponsor Highlight: Michigan Fiberglass Sales



Michigan Fiberglass is a wholesale provider of high quality fiberglass supplies and composite materials. Though UM Supermileage has the male mold machined by the College of Art and Architecture and we prep the mold ourselves, Michigan Fiberglass helps with much of the mold making process. When it

comes time for the fiberglass female mold, they have provided mentorship and supplied us with the chemicals and materials for the process. Michigan Fiberglass Sales also allow us their time and the use of their facilities for the carbon fiber vacuum infusion. The staff has also provided body team with advice on how to go about the layup process. Based on

their advice, this year's mold will be created using smaller, discrete pieces. Also advised for this year's mold is the use of locators along the edge of the layup flange. These locators are shaped like pyramids and allow for easy access removing the mold as well as lining it up with the other pieces. Thank you for your support and guidance!

Wind Tunnel Testing

As soon as break ended, Supermileage members were back at work, testing our $\frac{1}{4}$ scale model in the UMich wind tunnel. We spent almost two days preparing our model in the tunnel, making sure that it was aligned perfectly and the tunnel was calibrated to our fit.



This 5'x7' tunnel is one of the largest in the area, a subsonic low turbulence tunnel capable of operating at over 150 mph. We are interested in measuring the aerodynamic resistance on our vehicle at different speeds that will occur during the race. We ran measurements up to 120 mph, though we don't plan on getting anywhere near that during competition! This high speed comes from the Reynolds number; our scale model is one quarter of the real size, so we have to run tests at four

times our projected race speed to compensate. With this empirical data, we can solve backwards to find a more accurate coefficient of drag to use in our simulation models. This coefficient, which describes how our vehicle interacts with a fluid, is uniquely characterized by the shape of our shell. A low drag translates to a lengthy coasting distance. As we cut out assumptions from our optimization model we will get a better understanding of the other areas and systems in which our car needs to improve.

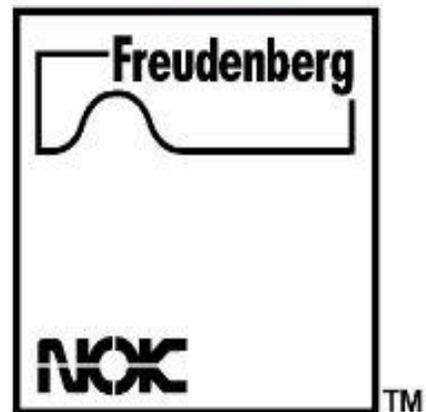




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