E-Racer

Week 5 (2/21/08 – 2/27/08)
February 27, 2008
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**Work Completed**

During the past week I worked extensively in AutoDesk to complete more of the tutorials and begin working on a full model of the go-kart. Additionally, I worked with Allison Meisner to develop methods for braking modifications. My work with Allison also involved the planning of the restraint and seating system installations. Finally, I have spent a brief amount of time in the machine shop assisting Allison with the final installation of the side supports on the aftermarket seat.

Having spent a considerable amount of last week installing the AutoDesk program on the lab computer and on my personal home computer, and going through the provided tutorials, I had a good basis for further work. I started the week by completing a few more tutorials where I learned basic skills for creating presentations (this included the preparation of exploded views which is shown below in Fig. 1), final assembly drawings, and working with frames and beams.

![AutoDesk tutorial progress.](image)

Figure 1: AutoDesk tutorial progress.

After making good progress in my effort to improve my AutoDesk skills I began working on the overall vehicle model which I hope to complete over the next week. This model will be very helpful when the steering linear actuator arrives. It is my hope that I will have the entire mounting process perfected by the time that the actuator arrives and I will have a bracket machined and ready to install. I have decided to do an entire vehicle model since this will also be helpful in the mounting of other components such as the seat and the restraint system, as well as for the mounting of the control system hardware. My progress on the model is shown below in Fig. 2.
Although this model is currently in a very basic state, I have spent a large amount of time making sure that everything is as dimensionally correct as is possible. While AutoDesk is a very good program it still requires much patience and time but I feel that the payoff will make such effort worthwhile.

Allison and I have been discussing the modifications to the braking system and have tentatively agreed that mounting the braking linear actuator on a steel plate between the seat and the rear sub-frame will be the most effective solution. In our effort to ensure that equal braking force is applied to each of the cables (which allow the left and right calipers to apply force to the disk brakes) we have decided to explore the possibility of using a small pulley to even out the application of force. A rough sketch of this concept is shown below in Fig. 3.
Allison and I also worked on a rough design of how we plan to mount the seat to the existing vehicle frame. We plan to use a steel or aluminum plate that will accommodate the holes that are already on the seat and will enable us to mount to the frame at our desired location. This plate will also serve as a mounting place for three out of the four points of attachment required by our racing harness. A sketch of this plate was generated in AutoDesk and is provided below in Fig. 4.

Figure 4: Bottom seat plate.

Finally, I have worked briefly with Allison in the machine shop and we have completed some of the steps required by the mounting of the side supports.

**Future Work**

For the next seven days I want to focus most of my energy on becoming more proficient in AutoDesk and completing the full model of the stock vehicle frame and the front steering setup. If this task requires less time than expected then I will begin working on creating a mockup of the steering linear actuator that will be arriving shortly. With this task done I will work in AutoDesk to create a bracket that will be “welded” to the computer model of the vehicle frame.

I plan to spend more time in the machine shop assisting Allison with the mounting of the restraint, seating, and support systems. Continued work in AutoDesk should yield a more detailed rendering of the bottom seat plate and if everything goes to plan we could start machining this part in the next week or so.

**Project Review**

The team continues to work harmoniously and is making good progress although much of the assembly is still in the planning stages. AutoDesk appears to be a very good program for modeling the mechanics of the overall project and I am excited about completing the model of the entire vehicle. I expect that once this task is completed we will have a good vision of how we want the project to progress and we will have an easy way to come up with plans for custom parts. Finally, our project continues to stay on budget--we currently have a remaining balance of $540 out of a total budget of $2000.

**Hours Worked**

Time spent on the project 2/21/2008 – 2/27/2008: 12 hours