Work Completed

After having out group meeting last week, it was recommended that we find a back up company that would be able to quickly produce and send us a linear actuator to our specifications if the custom one we ordered never came in on time. The reason we had ordered a custom one in the first place was that no company actually produced linear actuators that had all the specifications we wanted and we needed, especially one that has at least 100lbs of thrust and a very fast speed, even under full force. I had a hard enough time finding one company that would custom make a linear actuator to meet our needs, now I had to find a company that could make and send out this item to us in a very short time if we needed. I spent the next couple days on the same search engine, globalspec.com. I sent requests to multiple companies and received back emails from then stating that they could help us, but I have continuously been let down. Most companies will end up not producing electronic actuators, or will just be a middle man for our companies that actually produce this item. I am continuing to search for a company to produce the linear actuator for us, but I’m not sure I will ever find it. A custom built unit will always take at least a couple weeks to build, unless we spend thousands of dollars.

We got the bi-directional motor speed controller unit in and Kevin soldered the entire thing together. He also checked it to make sure it was working properly and outputting voltages that would move the linear actuator appropriately. My job is to build an enclosure to hold the electronics in and also connect the potentiometer to the steering shaft. I went to Home Depot and also Ace Hardware in Manchester and spent a while walking throughout the stores looking for metal and plastic containers that would be small enough to house the miniature speed controller circuit board, and also be sturdy enough to be placed on the go-kart and withstand weather and beatings from the client bumping into it. The box also needed to be small so I could attach it to the frame around the steering area and it would be out of the way for the client. I couldn’t find any boxes that seemed they would fully work in our application. A lot of boxes were good sizes, but I also needed one that had a top that I could remove for easy installation and quickly and easily put back on. Another advantage to the removable top would be the easy access to fixing internal components if something happened. I came to the final conclusion that I will simply build a box using the black hard plastic sheets of material that are already in the senior design lab.

When building an enclosure, I also had to figure out a way of keeping the internal components, dust, dirt, and moisture free. This was based on the fact that we are building a go-kart and go-karts are driven outdoors in dirty areas. They also are stored either outside or in a garage where dew could easily form on the box and potentially get in. To safely keep all the edges of the box dry, I will be adding strips of rubber along each edge.
The rubber will form a tight seal between the pieces of plastic as they are screwed together similar to a gasket in a car engine. Where the steering shaft meets the box, I will be installing a grommet to keep this area airtight and not allow things to enter. Rubber grommets are shown below in Fig. 1 and will be installed similarly onto the box. These items are relatively cheap and I will be ordering a custom made one to fit our application very snuggly but also give the steering shaft enough room to easily rotate.

![Figure 1: Picture of Rubber Grommets](image)

**Future Work**

In the next week I plan on building the box and installing the motor controller inside it. I will also need to order the rubber grommet that is our correct size, and install it onto the box that I make. I will also work on installing the box onto the go-kart and fit the steering column rod through the hole and rubber grommet and attach it to the potentiometer on the motor controller circuit board.

**Project Review**

The project seems to be going really well as usual. The group is finally at the point where some major installations and changes to the go-kart will be taking place. I have spent the last week out of commission, since I have been sick and still haven’t gotten over the sickness. This has caused me to put in less time towards the project this week. I plan on doing extra work next week to make up for my lack of work last week. Everyone else in the group has been very supportive and understanding about me being sick and doing less work. Each group member is currently working on important tasks that will all come together in the coming weeks. The group is very open and friendly and often willing to give help to each other to solve problems as a group.
Hours Worked

Hours spent working on the project, Week 2 (2/6/08- 2/13/08): 10