Work Completed

Last week, Lyndon and I performed integrity testing on the first ratchet design. This was done on a Tinius Olsen tension-testing machine. It was determined that the ratchet failed at 59.2 lb-ft which is more than sufficient for the application at hand. I was also responsible for determining the failure mode. To do this I disassembled the ratchet mechanism by filing off the pins and prying apart the housing. After this was complete it was obvious that the mechanism failed at the pawl head. This can be seen in Figure 1 below.

Figure 1. Failure at Pawl Tip
I also worked on updating the ratchet design drawings and obtaining the manufactured parts. The most recent drawing can be seen in Figure 2 below.

![Figure 2. Updated ratchet design with improved spring.](image)

This device works much better than the previous design due to the new spring configuration.

In addition, I also manufactured the housing for Phil's portion of the design. I did this by milling the part out of aluminum per Phil's specifications. A picture of this can be seen below in Figure 3.

![Figure 3. Production of Housing](image)
Project Review

This week we were able to accomplish many things. The prototype housing was completed, the ratchet was tested and found stable, and the new ratchet design was obtained and found to be a great improvement over the last revision.

Future Work

This week, more material will be ordered so that the complete ratchet mechanism can be manufactured. When this is complete, all the pieces will be assembled together and tested. From here, we will determine any further revisions necessary and a complete prototype will be assembled.

Hours Worked: 9