Project Identity

Adjustable Back Angle Controller
Week 8
March 28, 2007
Alaena DeStefano

Work Completed

This week we started by purchasing some supplies at Mansfield Supply. We bought slotted steel angle supports for the bed frame and 2” x 36” steel sheets for the motor cage on Wednesday afternoon. Friday morning was spent in the machine shop cutting the slotted steel angle to the measured lengths. Below in Figure 1 shows the pieces cut to length and roughly lay out in place. Another development that we came up with is the idea for supporting the scissor jack on the ground. We found a veneered particle board in the lab from a previous project that we could use. The idea is to attach four legs from the board and onto the bed frame and bolt the jack down to the board. This way the jack can be separated from the bed with the board if it needs to be removed.

![Figure 1: Placement of Scissor Jack and Metal Frame Layout](image_url)
On Friday morning a lot of time was spent in the machine shop working on the steel cage design for the motor. The holes had to be milled out. Figure 2 below shows the steel plate fitted onto the scissor jack. The extension of the plates will need to be bent out around the motor and welded to the circular brace that we’ll purchase at Mansfield Supply.

![Scissor Jack with fitted steel plate](image)

Figure 2. Scissor Jack with fitted steel plate

The jack will lift the load vertically, eliminating all angle changes. Since the jack would no longer tilt with the back of the bed, a wheel will be attached to the top of the jack and ride in the track placed on the back of the bed. As the jack rises, the bed back will rise smoothly along the wheel-in-track system. A simple polyurethane fixed castor wheel would be sufficient. This castor has been ordered and is expected to arrive this Wednesday. It is rated for 275lbs of force. Its overall height is 2-3/8”; which still gives plenty of clearance under the bed when it is attached to the top of the screw jack. The parallel metal bars, like the slotted steel angle plates we purchased, can be built around it on the back of the bed to roll straight on track.
Future Work

In the coming week we should receive the polyurethane wheel and then it can be properly placed on top of the jack. The construction can then be completed once we ensure the wheel is a good fit. A lot of dimensions depend on this wheel placement which is why the bed frame has not been completed. We plan on doubling our efforts in the lab to ensure this device is built in time. Future expenses include labor and cost of welding (~$80) and plywood to finish framing the bed (~$25).

Project Review

At this point I have submitted a purchase order for the wheel castor and expect to receive it by Friday. Early in the week we made a trip to the Mansfield Supply and bought steel sheets, slotted angle steel, and an aluminum rod which allowed us to start building. This past week our efforts were spent constructing the bed frame and milling out the steel frame for the motor cage. We are still within budget with about $600 remaining. We have currently spent about $1400 of our $2,000 budget.

Hours Worked
12 hours