Work Completed
Paint Cap Remover

We made a huge amount of progress on the paint cap remover this week. We started by trying to make a hole in the plate that holds the motor in place. The hole needed to be 1.5” in diameter to fit around the metal rim of the gear motor that we are using for this project.

In order to make larger holes in metals (greater than ½ inch in diameter) you cannot simply drill the holes directly through the metal with a large drill bit. This would require way too much torque for such a large bit and could damage the drill or drill bits. To put the hole in the motor plate we used a small end mill in combination with a Computer Number Control system, or CNC. The CNC has endless functions and can be programmed to perform specific tasks, but since our task was one of the most basic, it was already part of the programming software. The program can be created to make a circle, and when told the actual size of the drill bit, will build the prescribed circle size for you. This process takes time and should be done carefully to avoid putting too much stress on the end mill bit. You start by manually drilling the hole at the depth you want and locking the Z-direction in place. Then the computer automatically spirals outward, taking a small amount out of the
metal at a time. Finally, when the program is finished, it will yield a circular hole at the size you programmed.

These are the parts associated with the motor plate. The motor is inserted into the plate and the paint cap encasement can be placed on the motor shaft.

We then drilled 2 holes in the back wall for a ¼ inch screw using the end mill. To make the holes we used a ¼-20 drill bit. We used a hand drill to thread these holes so that we could insert the end of the screw into it. See figure below:

We also drilled holes in the motor plate so we could attach it to the back wall. After all is completed, the screws go through the base plate and screw into the back wall, securing the motor to the frame.
Monitor Lift

We’ve begun making the pieces for the back wall of the monitor lift. We bolted the T-connector together as shown in the figure. This plate attaches to both the linear actuator as well as the guide rails and in the center of the intersection of the two plates, it will attach to the mounting bracket.

The guide rails will be attached to this plate with bolts through a set of L-shaped brackets. This will be one of the things we work on in upcoming weeks.

Project Overview

The project went great this week. We made huge strides in the Paint Cap Remover and it is really taking shape. We will continue working on the paint cap remover frame and I think we are on task to finish early.

Future Work

- Drill a set screw for the clamp
- Cut an L shape out of the back wall to make space for the rotation of the clamp lever
- Cut the new long screws down slightly so they don't extend out the back
- Finish the circuitry for the paint cap remover switch
- Continue with the frame for the monitor lift

Total Work Hours: 16