

## Lineman's Base

The Notre Dame Robotic Football Club's robots all use high-density polyethylene (HDPE) for the main structure.  $\frac{1}{2}$  inch thick HDPE sheets are used for the base plate, battery plate, and the lineman's lid, and  $\frac{1}{4}$  inch thick HDPE sheets are used for the walls, motor plates, and the power switch lid and walls. The caster bearing is boosted by one  $\frac{1}{4}$  inch block and two  $\frac{1}{2}$  inch blocks, so the base plate is horizontal. These pieces are shown in Figure 1 below.

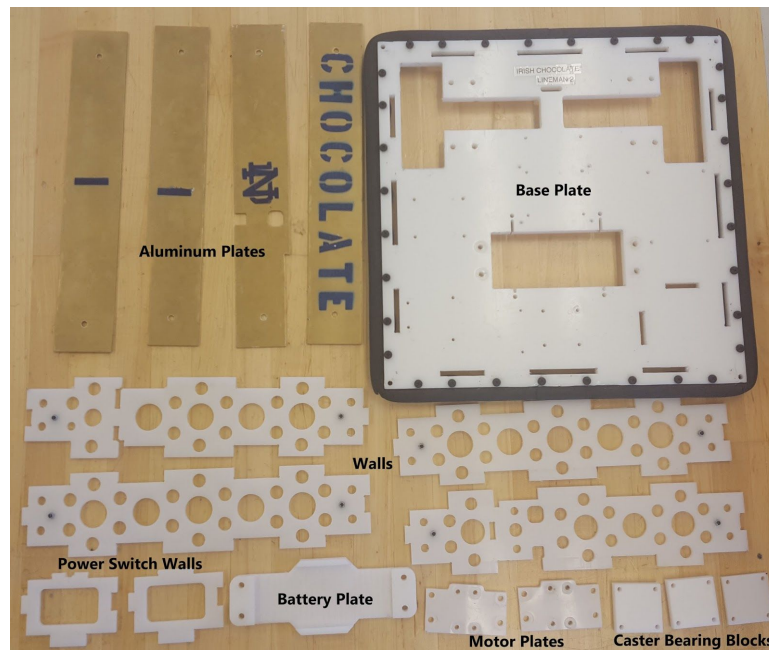


Figure 1: Picture of disassembled lineman parts.

The battery plate is suspended at a lower level than the base, as shown in Figure 2 and Figure 3, to allow for the height of the battery. The dimensions of the battery are milled into the top of this plate, to create a groove that the battery can be set securely into.

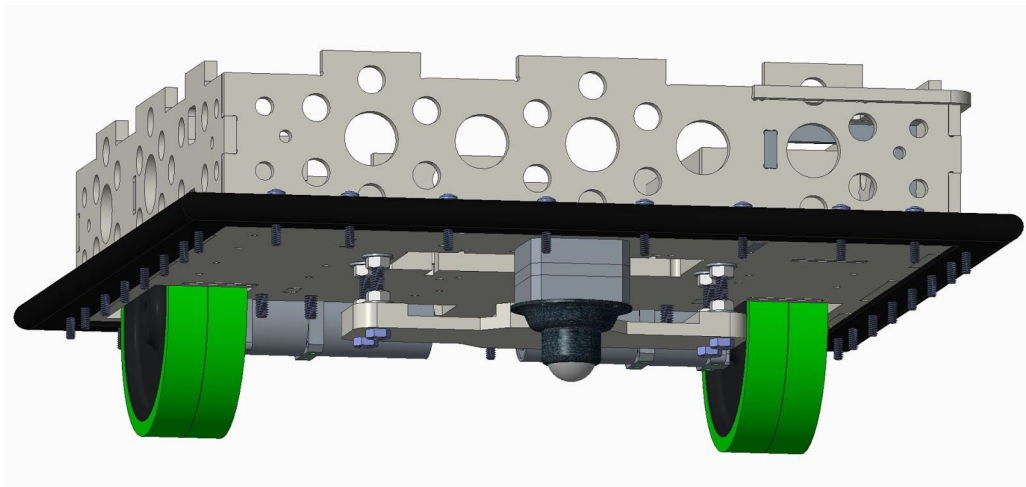


Figure 2: Bottom-front view of lineman.

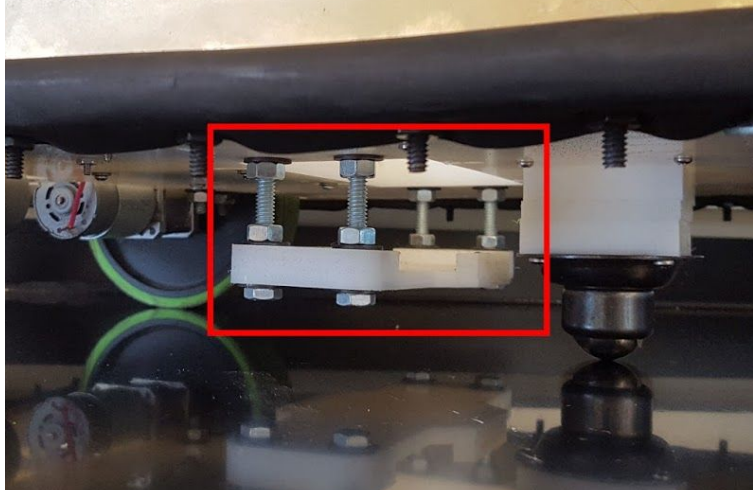


Figure 3: View of empty battery plate.

The power switch is elevated up to the lid by using HDPE walls and a lid, as shown in Figure 4. This was done so the switch can be easily accessed through the hole cut into the lid of the lineman, as shown in Figure 5. The purpose for this design was to avoid the difficulty of attaching the power switch directly onto the lid. The lid is completely detachable from the base, and the base houses the power source, so having a secure connection to a switch on the lid would cause unnecessary hassle. It is wise to avoid placing the power switch on the side of the robots, because the sides often take heavy impacts that damage anything that is not extremely durable.

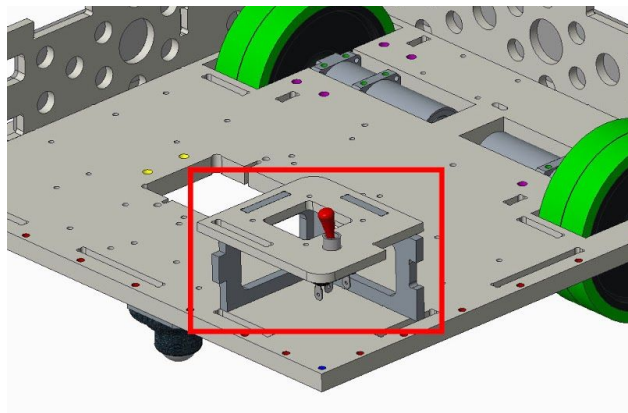


Figure 4: View of power switch booster.

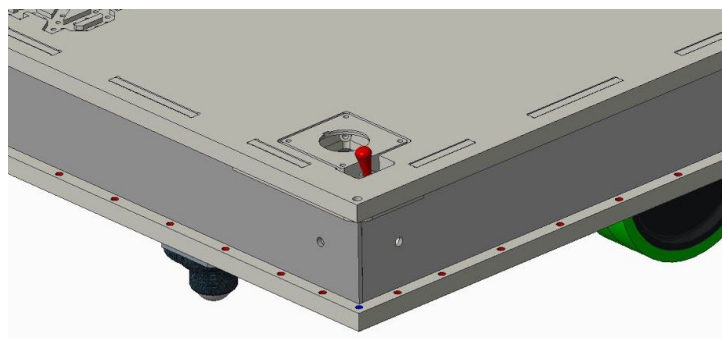


Figure 5: View of power switch with lid attached.

All HDPE parts were designed using Creo 3.0, and were cut out using a CNC machine. The sides have holes drilled into them to reduce the weight of the robot, without losing too much of the structural integrity. The HDPE sections that were used as the walls of the robot or used as the power switch booster all interlock to themselves without the use of additional fasteners. A good visualization of this is seen in Figure 6 below. The base plate is bordered by a P-strip of EPDM rubber to act as a bumper, to cushion any impact the robot receives.

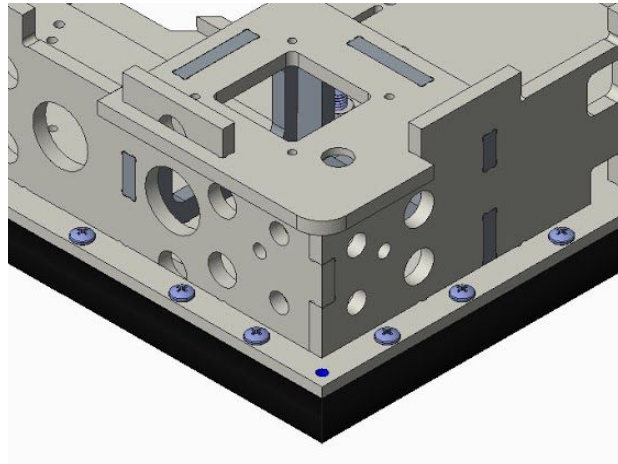


Figure 6: View of how some HDPE sections interlock.