

1069E Make It Real CAD Engineering Challenge Submission

For the 2018-2019 “Make It Real CAD Engineering Challenge”, our team designed a spacer at the length of twelve inches to allow for versatility when spacing shafts on our robot. Throughout the season, we struggled to put small spacers into tight areas and we then decided to create this part which would make spacing shafts quicker and easier. Whenever we had a motor burn out or a new prototype, the spacing process became very tedious and difficult which in turn wasted a lot of time. Our part has the potential to get cut which would allow for it to fit in any space within our robot. Instead of using many small spacers and washers to bridge a gap on the shaft, the long spacer could be used in its place and become tailored to the exact size of the current situation.

The use of shafts on a robot is almost always necessary to perform the given tasks and succeed at the objectives. Along with shafts, spacers are used as well. Stability, functionality, and uniformity are all needed characteristics of a complete robot. The long spacer aids the robot in achieving these standards. With stability, a spacer of the exact length will help to prevent play between gears and shafts. This reduction of certain inconsistencies will help the robot function as wanted and perform at its greatest potential. Finally, the addition of the long spacer onto a robot will help one space redundant shafts timelier and with greater ease. The spacer can be cut to constant lengths and then used in places which are symmetrical such as wheel spacing on the base.

In this challenge, we used Inventor for creating our part. To do this, we took the model of the vex spacer, added a sketch onto one of the sides, and extruded it to a length of twelve inches. This way the part would be the same as a normal spacer but with a greater ability to cut it as needed. From this project, we learned basic actions within Inventor which can be used to design

and build functioning systems. In the future, we may use Inventor to prototype a design for our robot while running a simple stress test on the certain parts. This software can assist our team in helping everyone visualize a certain idea and to test new designs without physically building them. Inventor can help in careers such as mechanical engineering, prosthetics, or robotics. A 3-D printed part can be light and inexpensive which could aid someone who does not have a limb or link multiple objects together in a machine.