VRC "Make It Real" CAD Challenge 2022

Project Title:
VEX License Plate Mounter

## Author/CADer:
Shaurya Agarwal

Team:
750 Royals (750R)

Location:
South Brunswick High School
Monmouth Junction, NJ

The License Plate Mounter was created to hasten and simplify the process of displaying one's team name and color on their bot. Typically, a red or blue license plate is screwed into or rubber-banded onto a portion of a bot. Oftentimes for teams, it is an inconvenience to repetitively detach and reattach their license plates prior to competition rounds. With the License Plate Mounter, teams are able to simply slide in and slide out their license plates in a fixed storage area.
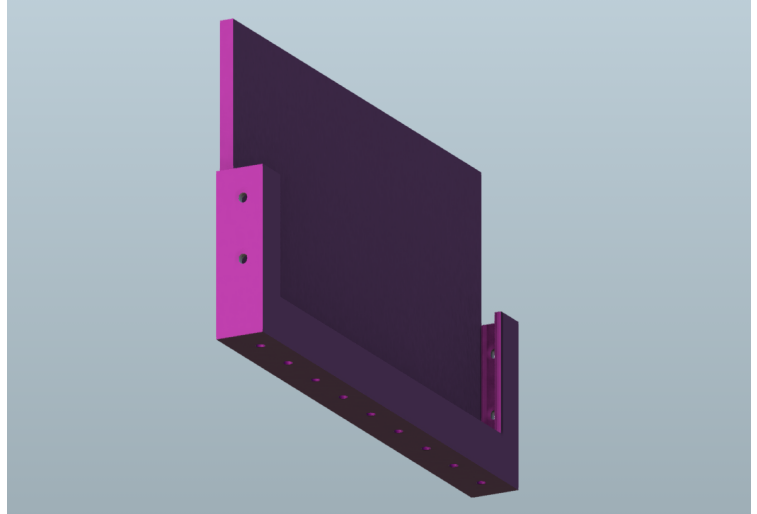

The License Plate Mounter has two screw holes on both of its sides along with 9 holes on the bottom, for increased adaptability depending on a bot's constraints. Two screws are effective in securing this lightweight part, making it easy to remove and relocate on a bot if necessary.
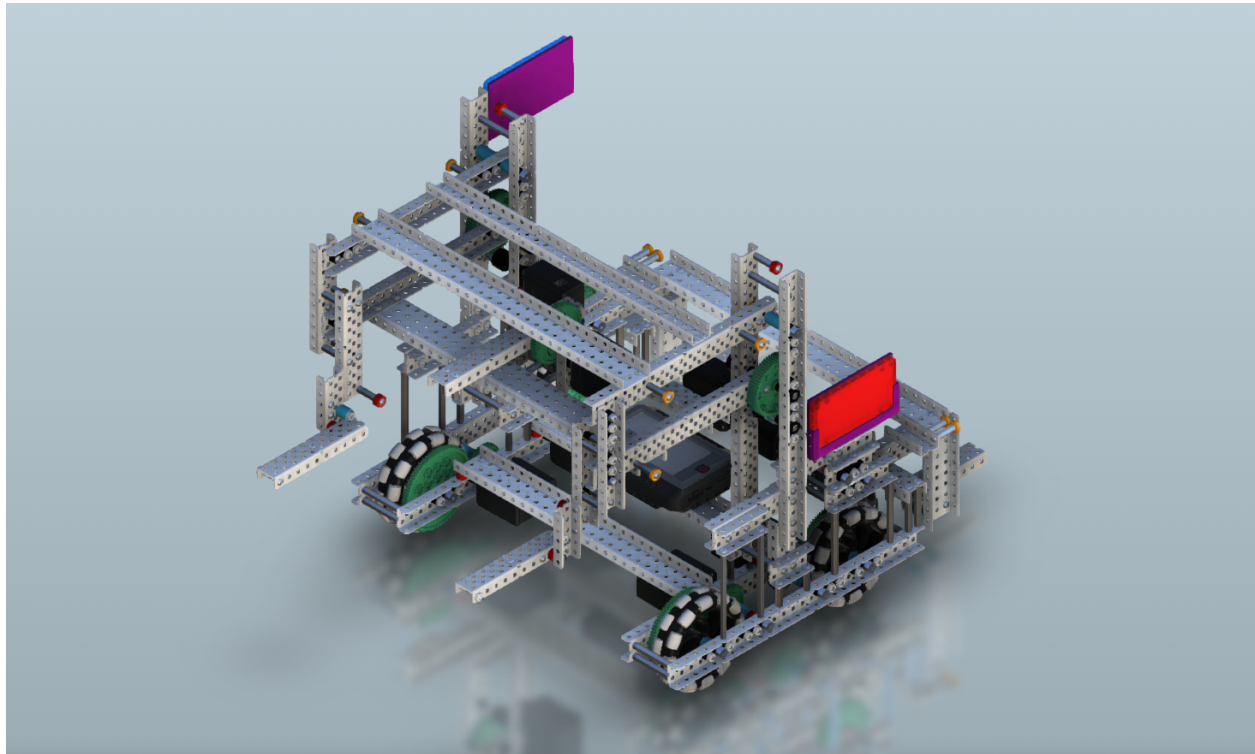
On our current robot for this year's game, Tipping Point, attaching the license plates directly onto the outside of the supporting bars for the 4-bar lift would cause the bot to exceed sizing constraints. Furthermore, replacing our two license plates without the License Plate Mounters takes over a minute. However, with the License Plate Mounters attached within the current dimensions of the bot and in convenient locations, we do not run into this issue.

In order to create this new part, we utilized Autodesk Inventor 2022's functionalities and referenced the dimensions of relevant VEX parts such as the license plates themselves. The main structure of the part was created through the extrusion of several stacked 2d sketches. The thickness of the supporting walls was made to be either 1/16 or 1/8 of an inch. The screw holes were created through the extrusion of circular geometries aligned in the center of relevant supporting walls and were repeated through the use of a rectangular pattern. Once the part was imported into the CAD file for our current bot, the license plates could be easily constrained to fit into them, and the part was able to be screwed into the bot's c-channels.
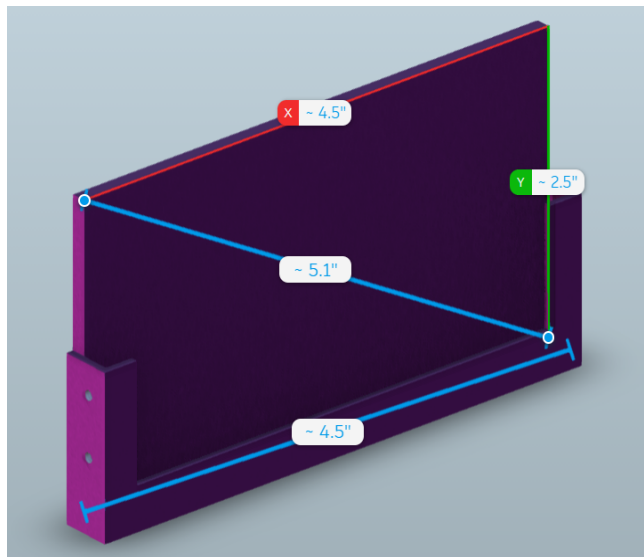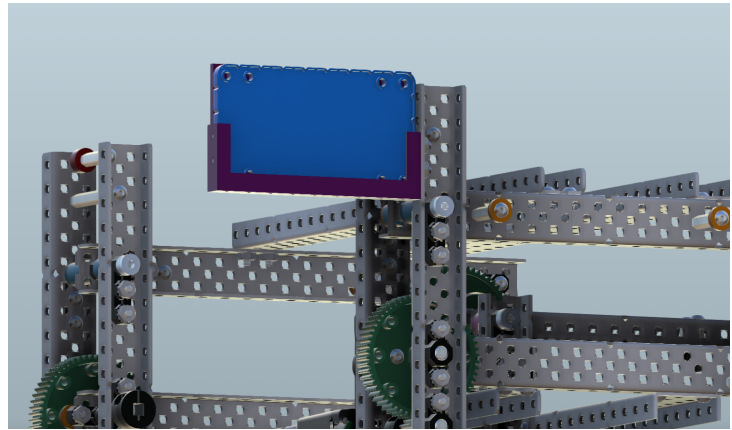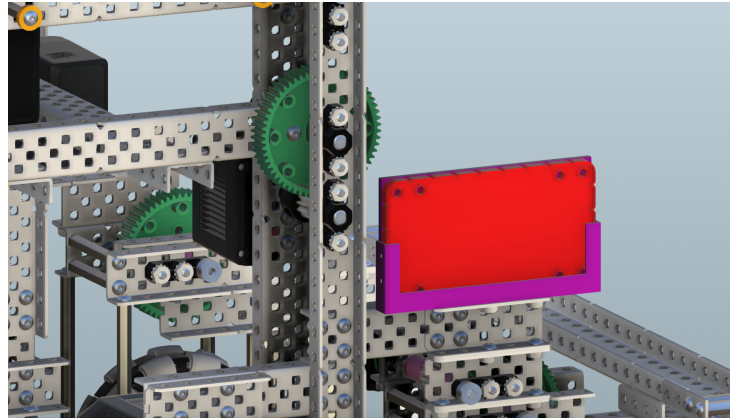
Through our work on this project, 750R gained the insight that improvements not only need to be made for robot functionality, but also for efficiency and convenience. Time is a precious resource, and in competitions, it is better to spend a final minute tweaking any issues with the bot rather than taking extra time to replace license plates. In the future, we intend to further explore the concept of 3D-printing parts such as the License Plate Mounter or for tasks such as wire management to improve the functionality of our robot.