

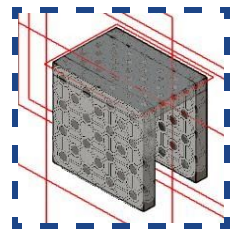
# The Swerve Drive Bracket

Written By Team 57429B

We are a 6th grade, VIQC team

## Background

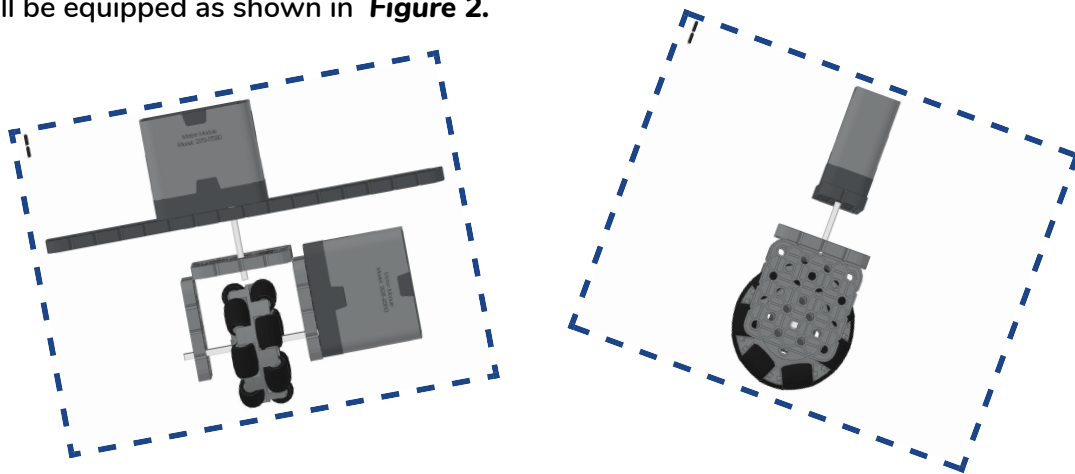
We are Team 57429B and we love robotics. Our team members are Murad, Derrick, Aadhya, Srinath and Rohan. We have worked hard as a team and during our time together we noticed that there is no bracket for the swerve drive. The swerve drive is a popular choice for chassis due to its extreme maneuverability, but such a great chassis setup doesn't have its own wheel bracket... yet. Our team decided to take matters into our own hands and created the Swerve Drive Bracket as our solution. The bracket is depicted in **Figure 1** in this paragraph.



**Figure 1**

## Introducing the Swerve Drive Bracket

The Swerve Drive Bracket is meant to be in the wheel section in the chassis of a robot. It will be equipped as shown in **Figure 2**.



**Figure 2**

## How Did We Come Up With Our Idea?

We were experimenting with different chassis for this years game, when we realised how hard it was to make a swerve drive, specifically how to make the wheels stay in place. We then started brainstorming for a better way, and put our best idea into Fusion 360.

## How the Swerve Bracket Works

First, put a wheel, and secure it with an axle in one of the bottom holes. Then, connect an axle in the axle cutout. Power the wheel axle and the pivot axle with motors. The swerve bracket is now ready for use. The wheel will pivot and move independently from the other wheels.

## Why This is Important

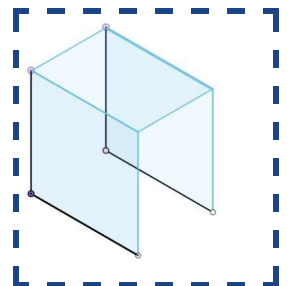
A swerve drive is one of the most maneuverable chassis designs ever. But, unfortunately, they are one of the hardest to build. But, with the Swerve Drive Bracket, one just needs to add a wheel, two axles and two motors, and a wheel section is done in under thirty seconds. The bracket simplifies a lot of the swerve drive process.

## Future Aspirations

We hope that vex may incorporate this idea into their kit of parts and that this concept will help the building of swerve drives in the future.

## CAD Development Process

We used version 2.0.7036 of the Fusion 360 software to fabricate the design of the Swerve Drive Bracket. We first started off with some quick framing, mapping out the basic frame of the bracket using the sketch tool. The framing can be seen in **Figure 3**. We then took pictures of different parts in the current Vex IQ kit of parts, and imported them onto the faces using the import tool. Then, we used the extrude tool to give the part 6.1 millimeters of thickness, the same amount on all Vex IQ parts. We got this number by using the measurement tool on a CAD model of a Vex IQ part.



**Figure 3**

## Project Learnings

This project marks the first time we have used Fusion 360. Fusion 360 is a relatively easy program to learn because of its simplicity, but our inexperience made the beginning of the modeling process rather hard. Throughout the entire challenge, we learned many different aspects of Fusion 360, the framing and animation capabilities, just to name a few.

Learning CAD Software is a valuable asset to anyone because of its capabilities throughout every profession. An example can be found in the engineering field. CAD software is already being used in engineering firms around the world. One can simulate environments and stress, without physically building the object, which is environmentally and time efficient. CAD can also be used in the field of competitive robotics. One can use CAD to build ones robot and stress test it, without building it physically. For all of these reasons, we hope we will be more experienced with CAD in the future and can use it in our desired careers.

## Conclusion

CAD has served as a valuable tool to develop, build and perform a design analysis for any given part. It has been a great tool in the process of developing this part. These skill sets can be used in a variety of applications. Because of the development style autodesk used, the software was user friendly and provided many detailed tutorials and forum posts for one to use. Autodesk was very generous in their donation of the necessary software for our project. We appreciate their interest in the Vex Robotics competition and the key role they play in providing for the future of robotics. Thank you for this opportunity you have given us