The Shovel

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<u>Report</u>

        The Shovel is a new part that VEX users could use to improve their robots while facing obstacles. There are many times when we find our robots stuck on an obstacle, hindering us from moving forward. However, the Shovel would fix all of that. Using the holes on either side of the part, one could mount the shovel on the drive, placed right in front of each wheel. Therefore, before any obstacle hits a wheel, the shovel would stop it from coming underneath the robot.

        In this year's Tipping Point challenge, there are rings around the field, and our team has found it challenging to avoid these rings. Even in the tournaments we have attended, we have noticed that a lot of robots have had trouble by getting caught on top of the rings. Extending beyond this year's tournament, VEX users can still use it to ensure that they do not get stuck on any obstacles in challenges. In past years, we have seen people get stuck on things such as broken pieces of chain that fell in front of their robot. This would fix not only the problem we've seen in Tipping Point, but would also work in a bigger picture, for various scenarios.

        To design this part, I used Autodesk Fusion 360. First, I used a solid cylinder to create the basic structure of the part. I used measurements by comparing the lengths to the drive, to ensure that the part would fit within the drive. Then I hollowed the cylinder out and cut the cylinder in half to create the scoop-like structure shown below. Finally, I used the "hole" function to create the holes for the screws. As a new cadder, this was the first time I used many of these functions, such as the hollowing and hole functions on Autodesk. I think that this experience taught me the different extent that I could use autodesk to.

        This project taught me how to clearly identify the problem before trying to come up with the solution. I was stuck brainstorming for some time because I couldn't find an answer to the challenge. When I took a step back and tried to identify the potential problems that robots could have, rather than simply think what parts could add onto the robots, I had a more clear picture of what I needed to do. In the future, I think this will help me to not rush into projects but to think about the whole problem to find the best, most efficient solution with any problem that I am faced with. Of course, this could apply to more robotics challenges, as I try to navigate building new systems, but I think it also applies to life in general, and I would be a lot more productive if I applied this to everything I do.