

## V5 Motor Mount Team Number: 15979K Chase and Landon Kent Celina, Texas

When building any engineering project, there is a question that appears frequently that is hard to answer: where do I put my motors? Many times, the gears that link the motor to the component block the only spot where the motors can feasibly be attached. To put the motor over the gears, you have to add an entirely new structure just to attach a motor. And just as frequently, the new structure doesn't fit, as the space is too small! You have to entirely redesign the project you're working on just because you can't attach the motor.

That is where the V5 Motor Mount comes in.

I have had gears block my motors many times, and I was never able to find a solution. Each time, I wished I had a piece that could fix this problem. I couldn't put motors on the other side of the structure

supporting the gears; the drivetrain prevented me from doing that. This lead me to create the V5 Motor Mount, which goes around the gears to hold the motor properly.



The V5 Motor Mount helps to lighten and simplify robots. It eliminates unnecessary motor mounting structures and therefore unnecessary weight. It looks great while still performing its job at an incredible level.

I designed the V5 Motor Mount using Autodesk Fusion 360 version 2.0.11415. At the beginning of making this part, I made the plate the motor is attached to. Originally, there were only two simple pillars connecting the motor mount to the robot, but that made it extremely difficult to put the V5 Motor Mount on a c-channel. After I saw this problem, I erased the circular pillars and added the rectangular pillars that are parts of the V5 Motor Mount now. Throughout the process of creating the V5 Motor Mount, I made 4 main revisions to this piece:

- I had to add holes to the top of the V5 Motor Mount to make it easier to screw the motor in, as shown in red in Picture 2.
- I added walls to the part of the mount touching the c-channel instead of making it a solid block. This reduces weight and cost while still retaining strength.



 I had to expand the space where the gears go to allow room for screws.



- Lastly, when I 3D printed the V5 Motor Mount, there were too many printing supports in inaccessible areas, and they were difficult to remove. As a solution, I split the V5 Motor Mount into three pieces:
  - A. the bottom part where the motor is attached



B. The right side to connect the mount to a c-channel



C. The left side to connect the mount to the same c-channel



When I did this, I also added holes through the V5 Motor Mount to allow it to be screwed together. After that, it was simply a matter of rounding edges and adding ribs to make it stronger.

This project helped me learn a lot about how to create brand new parts in Fusion 360. It helped me gain skill and knowledge about sketches and using them to create parts. I am a lot better at making complex creations after making the V5 Motor Mount. It also helped me learn to cut pieces in Fusion. It aided me in learning to focus on general strength and rigidity when creating anything, even when building our robot. Overall, this challenge was very fun and exciting, it helped me get better at creating robots and mechanisms in Fusion 360, and I can take what I learned into creating a CAD drawing of our team's robot.