Make is Real CAD Engineering Challenge
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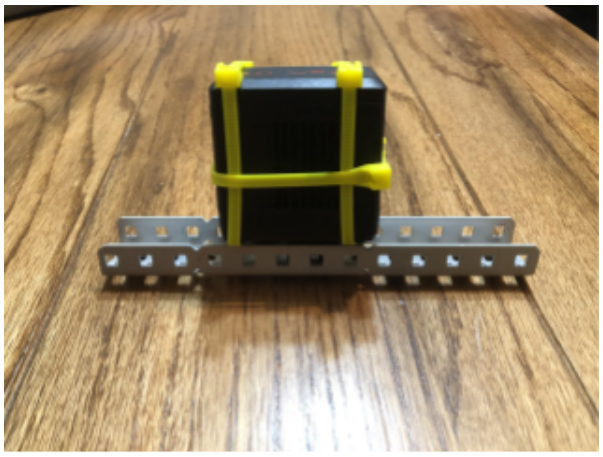
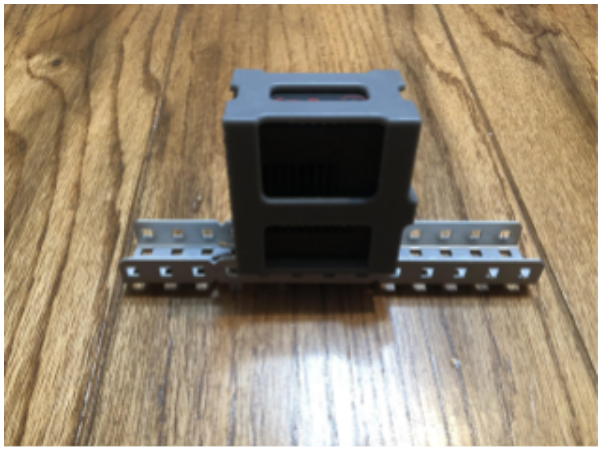
Quick Swap Motor Housing

Function

Using Autodesk Fusion 360, I found an innovative design solution for quick swapping motors in the event you need to quickly replace a motor. During a tournament, if a motor fails and needs to be replaced between matches sometimes the motor mounting screws are not easily accessible and may require removing other components to be removed to access the motor mounting screws. There may not be enough time between matches to disassemble components of your robot, replace the motor and reassemble your robot in enough time to make it to your next match. Many teams remove the four screws holding the motor assembly together, teams mount the motor base to the appropriate location and then they will use zip ties to hold the motor casing to the base to give them quick access for replacing motors.



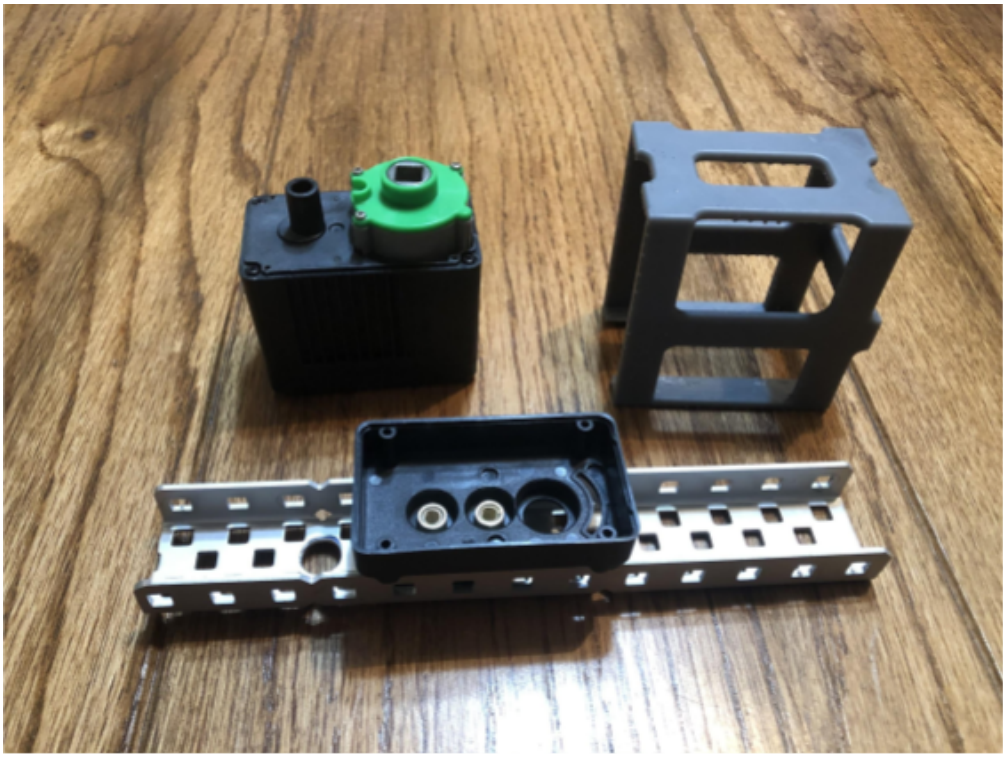
This is an image of the current motor swap method of using zip ties.



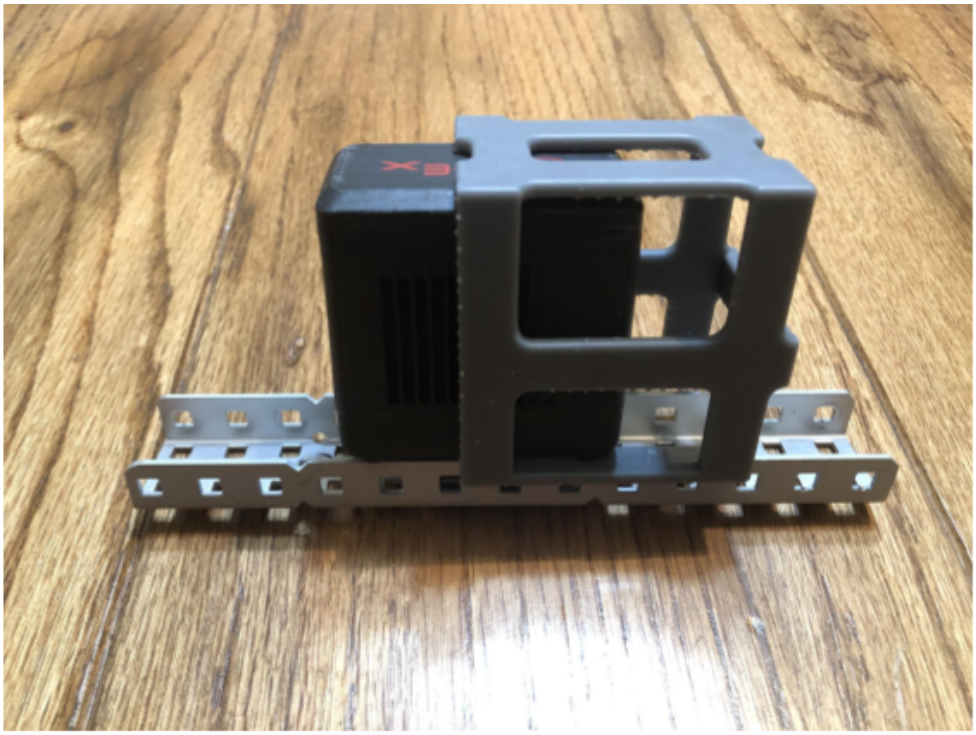
This is an image of the new method for motor swap using the Quick Swap Motor Housing.

The Quick Swap Motor Housing will solve the problem of having to remove the four screws holding the drive motor drive assembly to the motor base in order to replace the motor drive assembly. The Quick Swap Motor Housing will also be more reliable than using zip ties to hold the motor together and will minimize plastic waste as fewer zip ties will be headed to the landfill. The Quick Swap Motor Housing works by removing the four screws holding the motor base to the motor drive assembly, then replace the motor drive assembly back onto the motor base, and then slide the Quick Swap Motor Housing into place to hold the motor together. The Quick

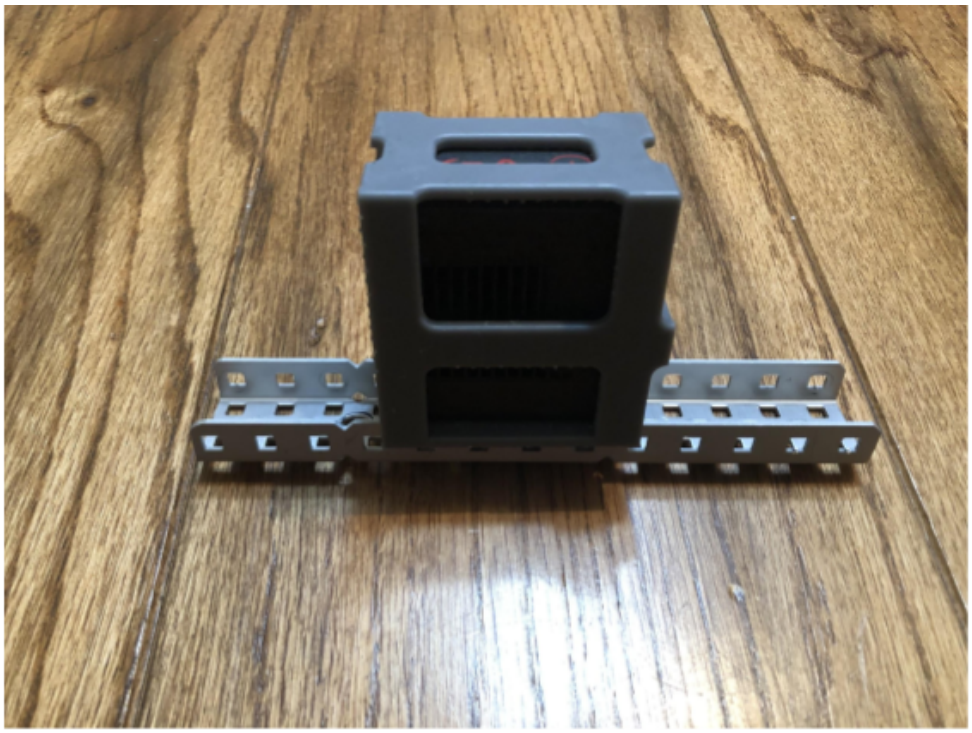
Swap Motor Housing can also be used to quickly replace the motor gear cartridges. The Quick Swap Motor Housing can be used in high torque applications without any performance issues. I used the power of Autodesk Fusion 360 to make this part functionally and visually appealing.



Step 1: remove the four screws holding the motor together and mount the motor base.



Step 2: place the motor drive housing on the motor base then slide the motor housing into place.



Step 3: process complete.

Design Process

I reached out to a local business to print the prototype designs. This design allows the Quick Swap Motor Housing to work in many different applications. I had to try many different designs to make it work well and be efficient.

Conclusion

In conclusion, this was an amazing learning opportunity on how to use Autodesk Fusion 360. I will most likely use Autodesk Fusion 360 in the future to design parts of our robot. This skill will help me in future engineering jobs as most engineering jobs require you to know how to use modeling software.