

TEAM 457B

Team Members

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(JENISON, MICHIGAN)

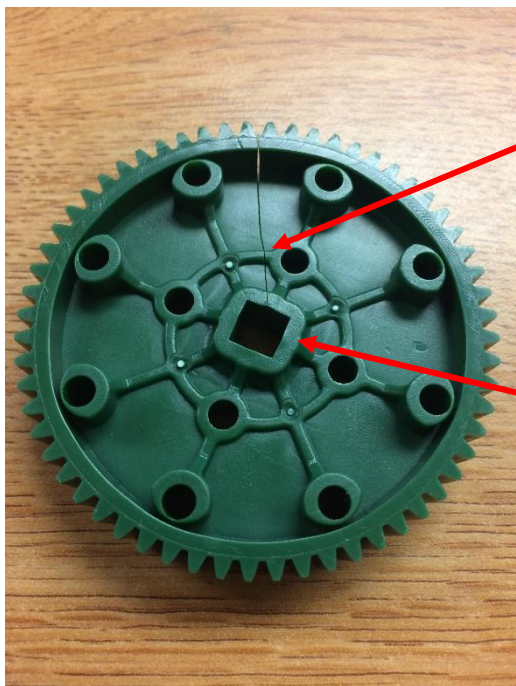
Written By: Mason Fish

Make It Real CAD Engineering Challenge

During our season, we had frequent problems with our gears. Our gears either kept on breaking, or cracking, and our robot couldn't shoot without the gears. Once a gear broke we would have to replace it because it would make our robot almost useless and therefore our alliance partner would be at a loss. Immediately after a match we would quickly have to take apart our robot to replace a gear for the next match. We were very tired of replacing the gears every four to five matches, then we came up with a solution. We combined our slip gear to the main gear that propels the slip gear, and we reinforced the gears with metal cut by our sponsors, and this was the temporary gear reinforcement. On pencil and paper we sketched a design concept for our reinforced gear, Next we went to the VEX forum and downloaded a CAD file for a VEX metal plate and we modified it to our liking, then used it on our gear reinforcement.

Using Inventor we created sketches on the CAD file we downloaded so we could modify the part to our liking. We created extrude cuts using the sketches, one of the extrude cuts was used to cut the part to the correct length. We used a second extrude cut to create a square hole that could be used to locate on to the quarter inch shafts. We created a drawing to show the specific measurements of the piece.

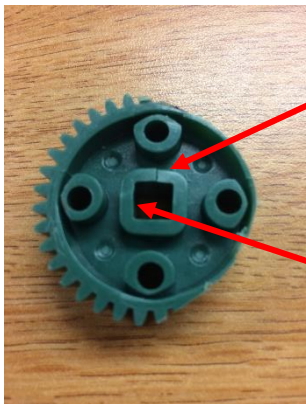
During this project I have learned to make custom parts using Inventor 2017 to sketch and extrude parts into a 3D model. Having a 3D model allows us to be able to have parts made that could be used on our robots. This software will be used by me in the future incase other things break or become problems to our robot so we could fix it by creating a new part. This software will definitely help me with my career path because if I get a job at a major gaming company like PlayStation, Nintendo of America, or Bethesda I would be able to know how to use 3D software to create 3D models of characters, items, or terrain for a 3D based game.



Crack in Gear caused by 1/4" shaft

Weakened square hole

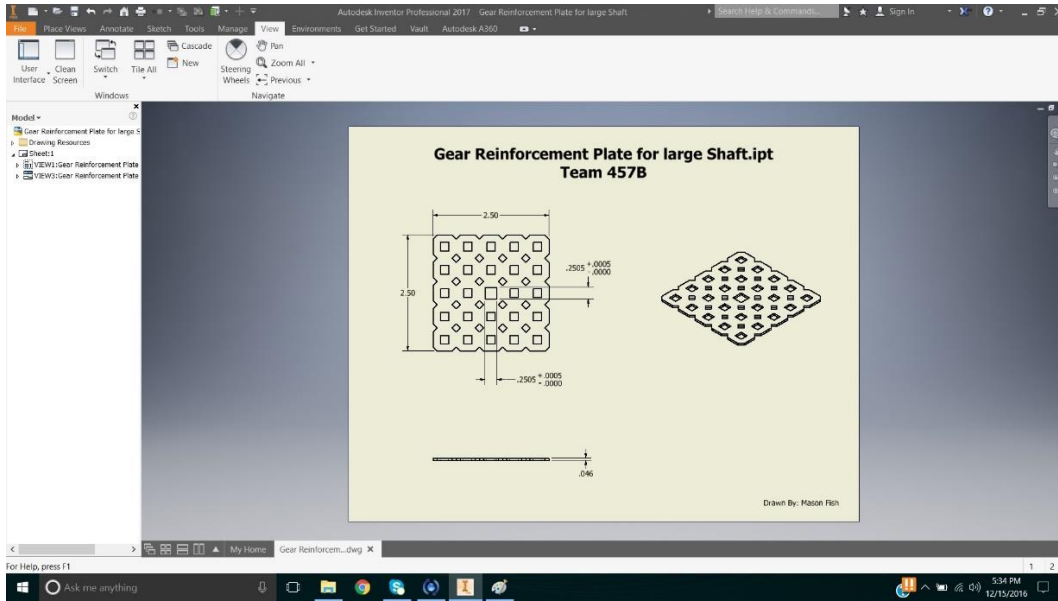
Broken 60 Tooth Gear
(Cracked from the stress)



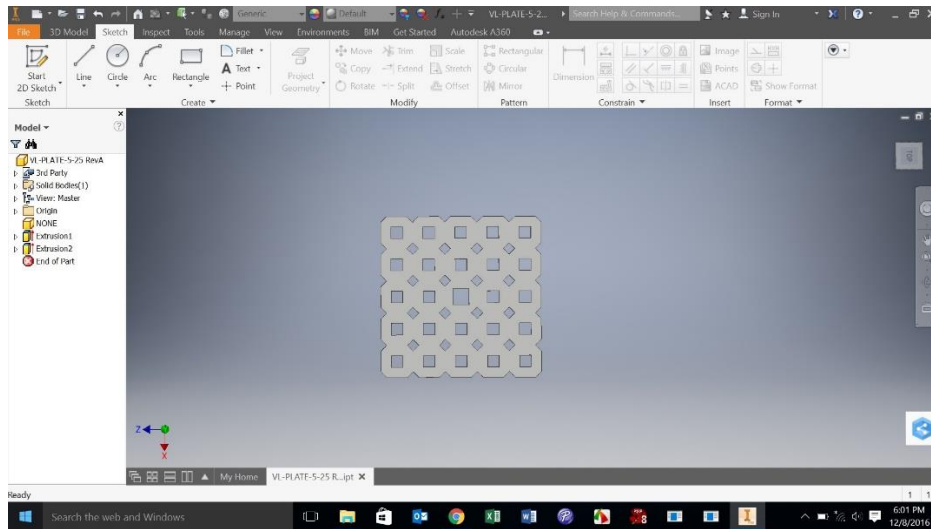
Crack in Gear caused by 1/4" shaft

Weakened square hole

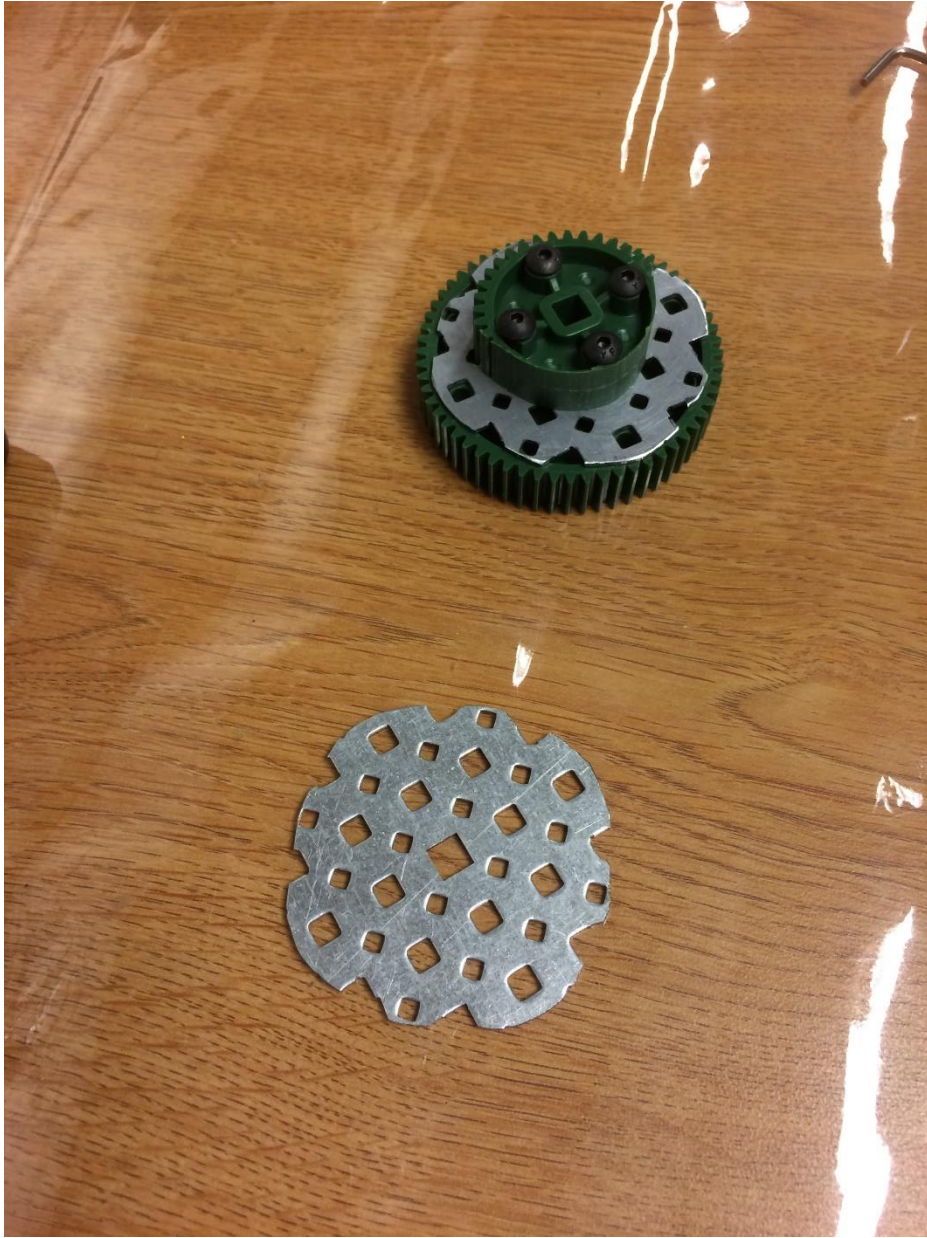
Broken Slip Gear
(Cracked from the stress)



Gear Reinforcement plate Drawing
(Created using Inventor 2017)



Gear Reinforcement plate part
(Created using Inventor 2017)



How we used the parts to reinforce the gears in our actual robot.