High Strength Square Gear Insert Edit

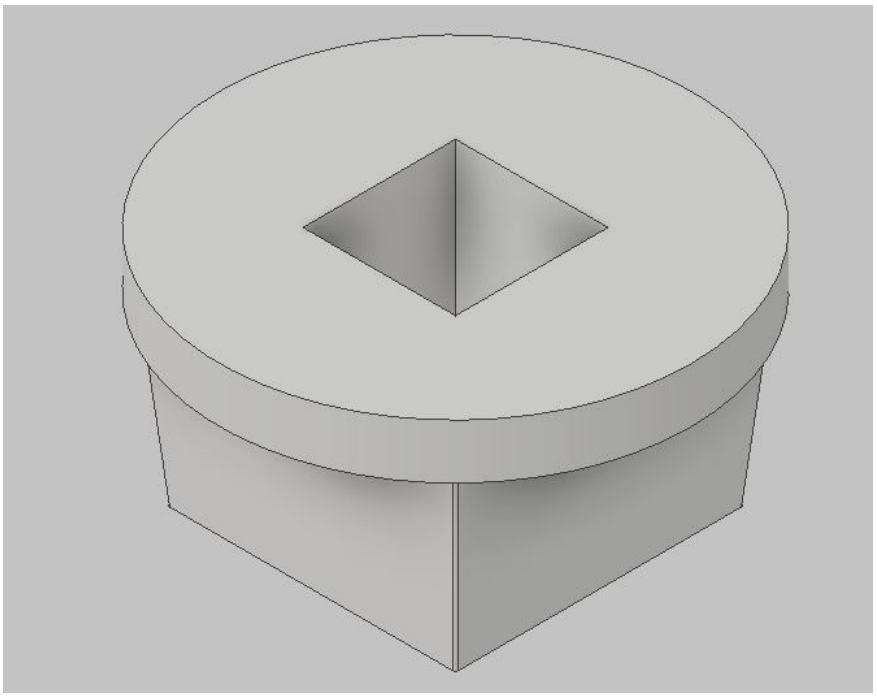
Our problem: When inserting these High Strength Square Gear Inserts into the high strength gears of our gearbox, we had a few difficulties. It always took us a couple times to put the gear insert into the gear since it could only layed on top of the gear, it didn't sit slightly into the gear so then it would be easier to insert it. We also had problems of putting the insert into the gear with just our hands, we had to hit it in with the end of a screwdriver (since a hammer would have damaged the gear). We decided that we should try to fix this problem.

How it will be fixed: Since this gear insert was the same thickness for the part that is in the gear, I decided that we should try a simple fix so then it is easier to put it in the gear. After brainstorming a few ideas, I decided that a slight taper would be the best option for this improvement. It would be a taper that is big enough so then the gear insert can easily fit slightly inside a high strength gear, but it still had to be tight enough at the top so then it would have a tight fit in the gear. If the gear insert does not have a snug fit in the high strength gear, then it would not function as efficiently.

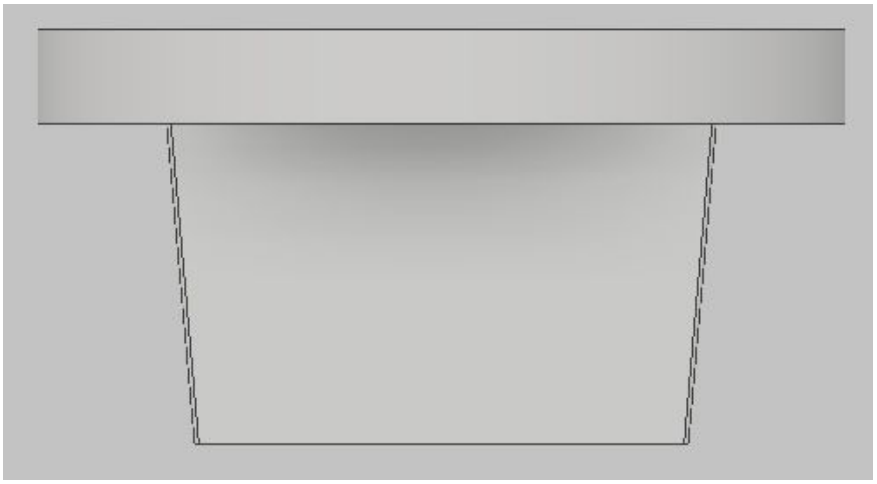
How it was created: To create this improved part, I used Autodesk Inventor and I opened a standard part file. I created a sketch on the Z-axis since our 3D printer prints off of this axis. At first, I made the sketch for the shaft of the gear insert and this is where I made the fix. I put a taper on it so it was originally smaller at the base, and the same size to slightly bigger towards the top so then it still had a tight fit. I then created an other sketch on top of the extruded sketch of shaft to make the the circle overlap that goes over the the gear. Through both of these extruded sketches, I cut a square hole all the way through the part that was the right size to be able to fit an axle.

Conclusion: I have used Inventor since a last year during DDP which was an engineering class that I took. I am also using Inventor currently in another engineering class that I am taking. I am planning on using this software in the future for my classes along with creating objects with the 3D printer. 3D printing fascinates me on how you can create something and watch it be built layer by layer. In my future I will be using 3D printing technology but not Inventor (well if I have my own 3D printer then I would use Inventor.) I am planning on becoming a Biomedical engineer who uses 3D technology to help create organs and tissues to help transplant patients. By learning the basics of modeling software, this should help me later on in my schooling and my future career.

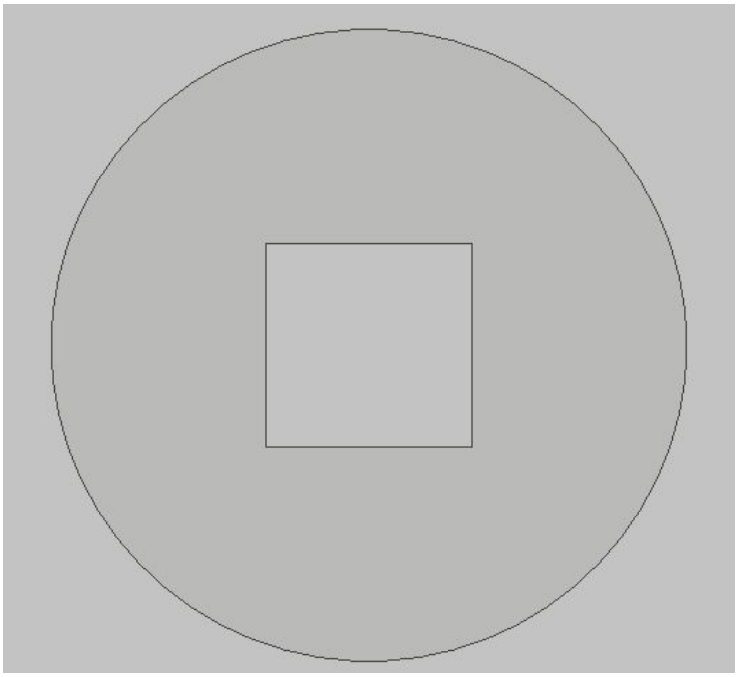
Views of the Gear Insert in Inventor



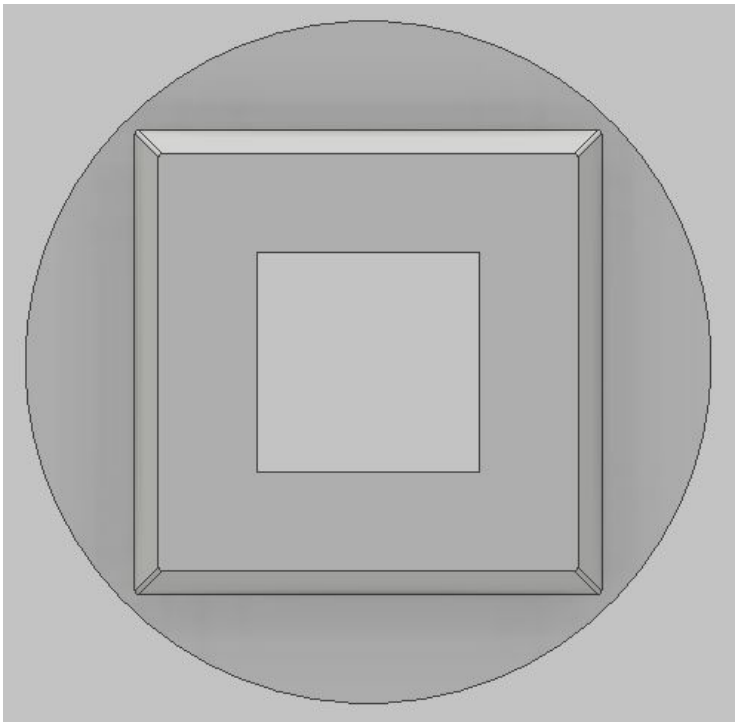
Isometric View



Side View

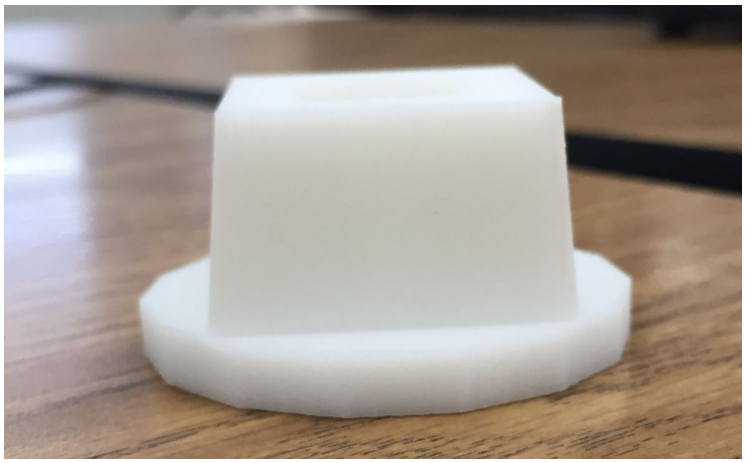


Top View

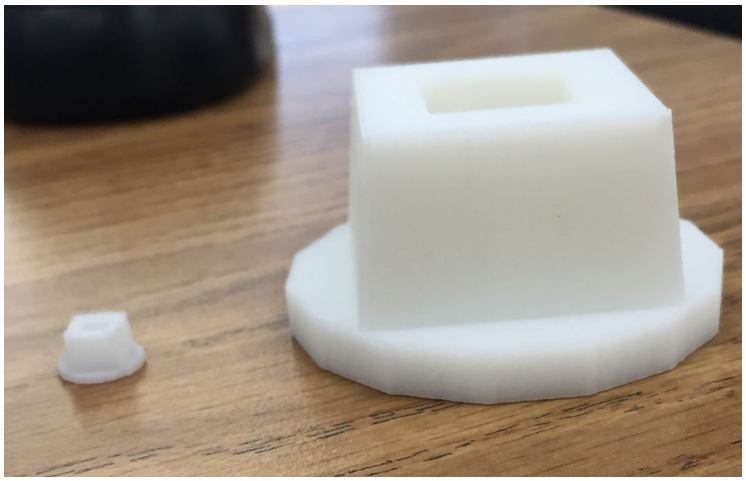


Bottom View

3D Printed High Strength Gear Insert



5 times the actual size of the Gear Insert. It is enlarged to have a better view of the taper on the Gear Insert.



Comparison of the enlarged and actual size of the part.

Actual size of the Gear Insert.