

Mechanical Shredder

Midpoint Presentation

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Overview

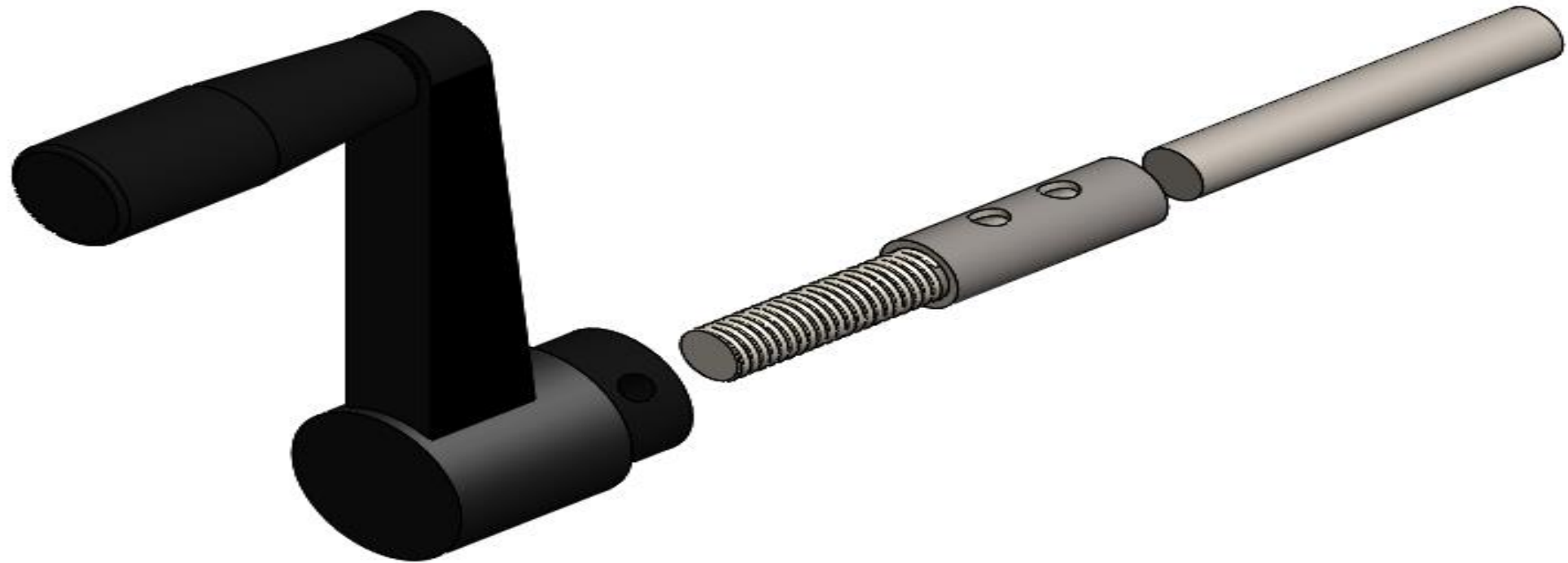
- Introduction
- Project Design
- Hand Crank Issues
- Solution Ideas
- Bill of Materials
- Conclusion

Introduction

- Group was tasked with retrofitting an electronic paper shredder to be operated manually with a hand crank and operate as efficiently as common paper shredders.
- Multiple hand crank designs were considered, but decided on a final design of attaching hand crank directly to main shaft in shredder mechanism.

Assembly Drawing

Hand Crank Assembly with Arbor Shaft

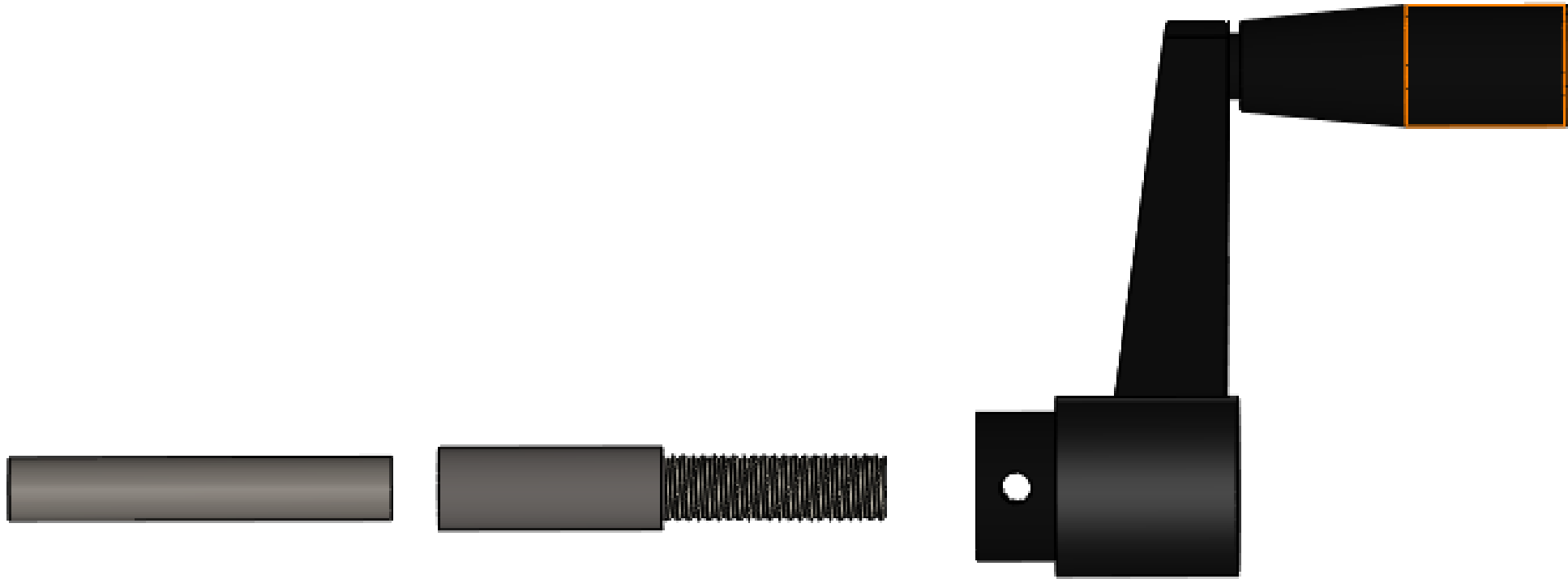


Crank Handle Issue

- Due to threading direction of bolt and handle, proper rotation of handle turns the main shaft in the reverse direction.
- Reverse rotation of handle unscrews the handle from the bolt.
- Need to find a solution to have the handle rotate either direction with the bolt without loosening.
- Solution must be able to be taken apart easily and non-permanent (no welding).

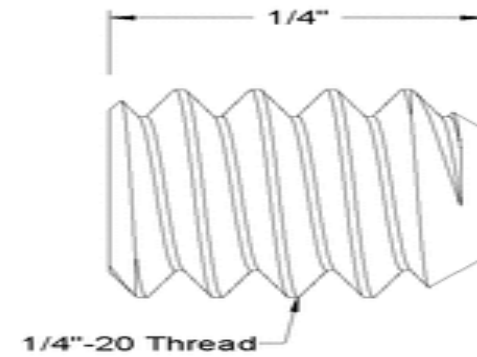
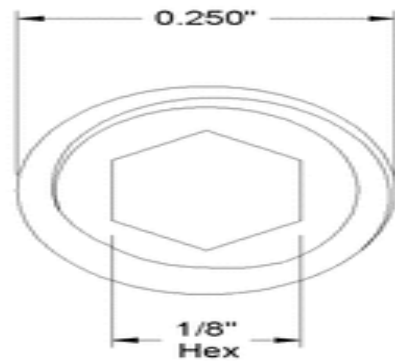
Set Screw Solution

Assembly with Set Screws Implemented



Set Screw Dimensions

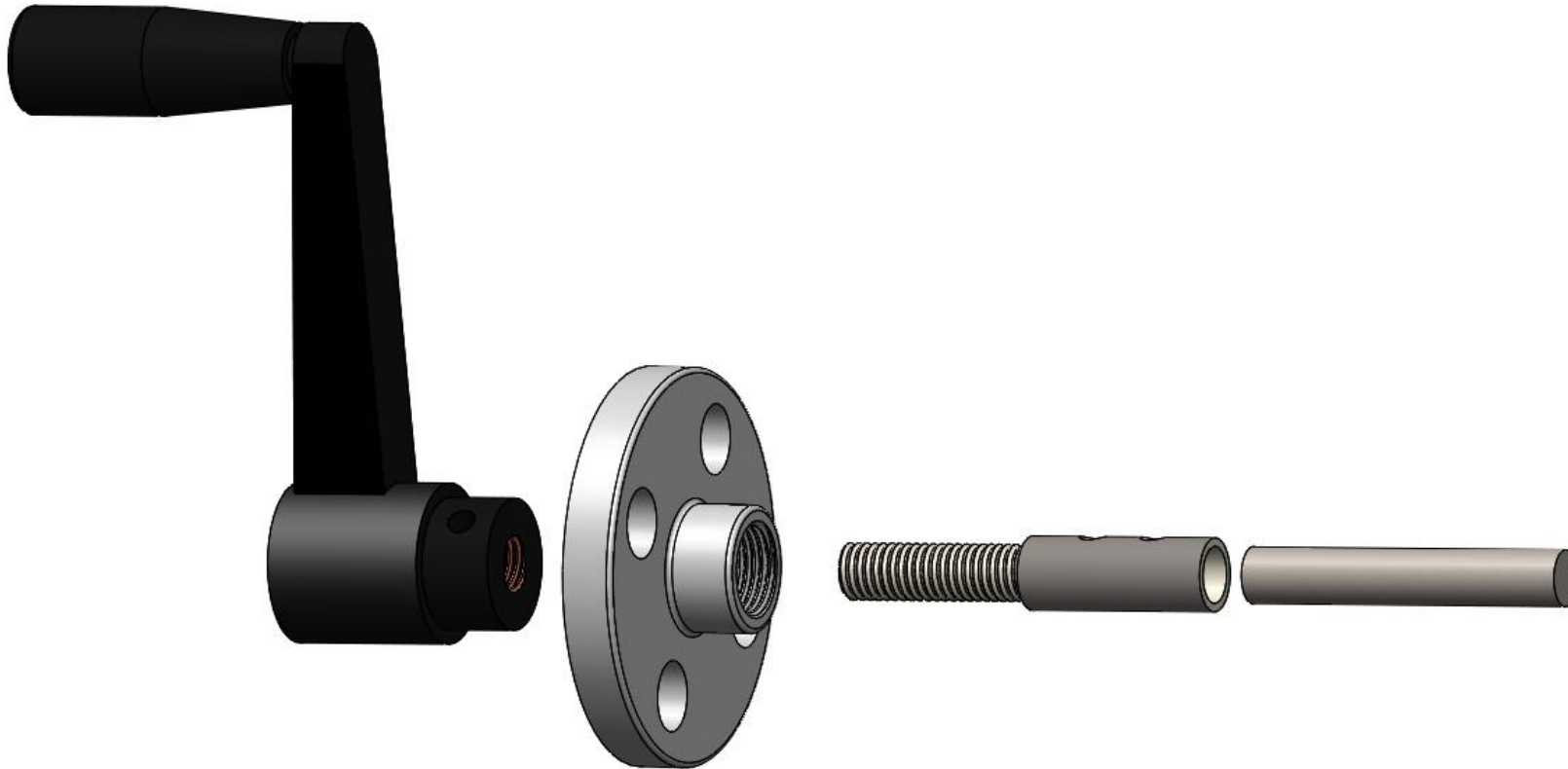
Set Screw Dimensions: McMaster [2]



McMASTER-CARR CAD http://www.mcmaster.com © 2013 McMaster-Carr Supply Company <small>Information in this drawing is provided for reference only.</small>	PART NUMBER 92158A417 Nonmarring Flat Point Set Screw
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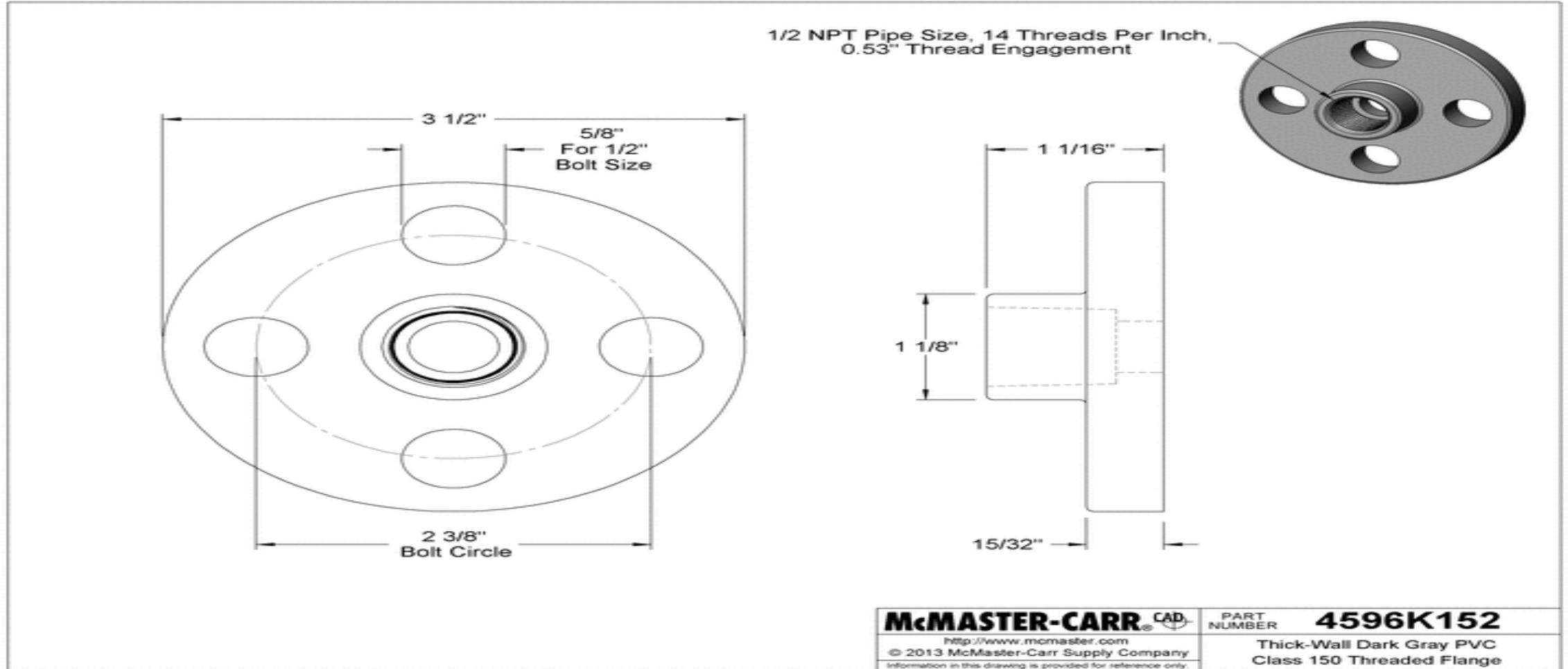
Flange Solution

Assembly with Flange Implemented



Flange Dimensions

Flange Dimensions: McMaster [2]



List of Parts and Prices (Set Screw Method)

Parts	Price
AmazonBasics 12-Sheet Cross-Cut Paper, CD, and Credit Card Shredder [3]	\$54.99
1/2" Arbor Attachments for Electric Motors [1]	\$6.06
Crank Handle with Revolving Handle [2]	\$29.21
10" Bolt	\$1.50
Set Screws [2]	\$5.50
	Total: \$97.26

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10" Bolt	\$1.50
Flange [2]	\$7.56
	Total: \$99.32

Conclusion

- The only remaining issue with the project is the threading issue with the handle.
- The set screw solution seems more ideal because of the multiple problems with finding a compatible flange.
- Both methods still keep the team under the budget and no further expenses should be needed.

References

- [1] Amazon. *Amazon Basics 12 Sheet Cross Cut Credit Shredder* [Online]. Available: <http://www.amazon.com/AmazonBasics-12-Sheet-Cross-Cut-Credit-Shredder/dp/B005QAQFFS>
- [2] McMaster. *McMaster-Carr* [Online]. Available: <http://www.mcmaster.com>
- [3] MSC Industrial Supply Co. [Online]. Available: <http://www.mscdirect.com>