



HYSTER-UI MINI LEVER MODULE (MLM) ARMREST ADJUSTMENT SYSTEM



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PROJECT OBJECTIVE

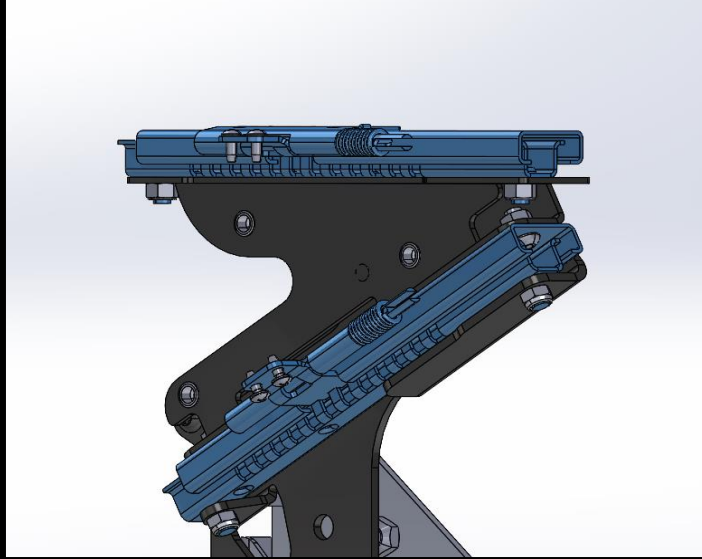
ITo convert the existing system into a single stage unlocking system

BACKGROUND

IManufacturer and service provider for lift trucks

IUse Mini-Lever Module (MLM) controller armrest and adjustment system

ITwo Stage adjustment system

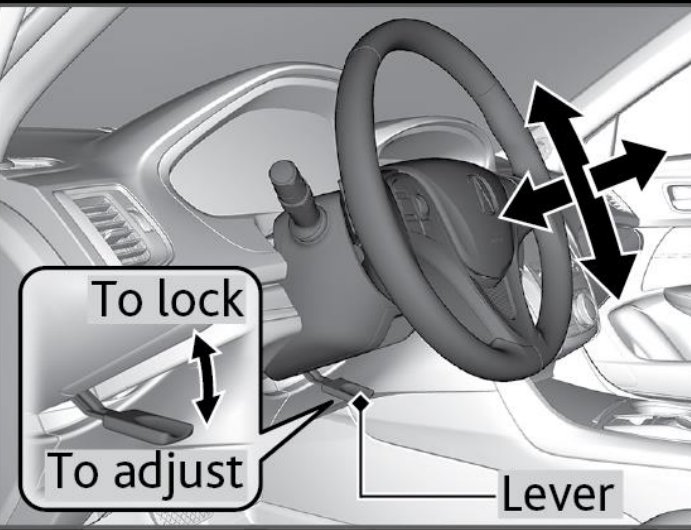


VALUE PROPOSITION: WHY CREATE A NEW SYSTEM?

IThe controls on a forklift armrest are a necessity for proper operation

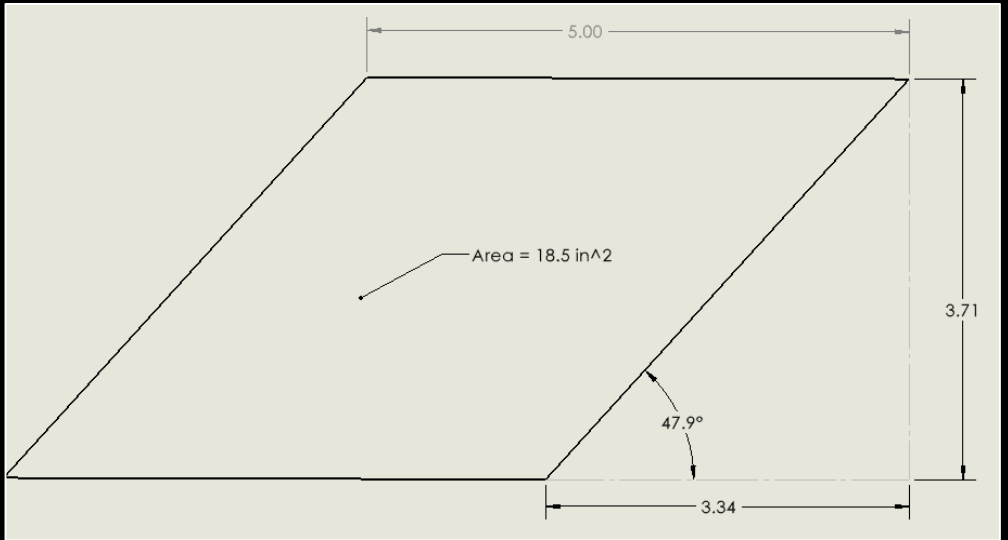
IOperators currently must unlock the vertical and horizontal slides individually

IA single stage system increases operator comfortability and ease of adjustment thus increasing competitiveness with other brands



PRODUCT REQUIREMENTS

- I**Able to withstand 300lbf vertically
- I**Able to withstand 150lbf laterally
- I**Able to withstand 75lbf fore and aft
- I**Single Stage locking mechanism
- I**Minimum adjustment area of 18 square inches



Vertical

Lateral

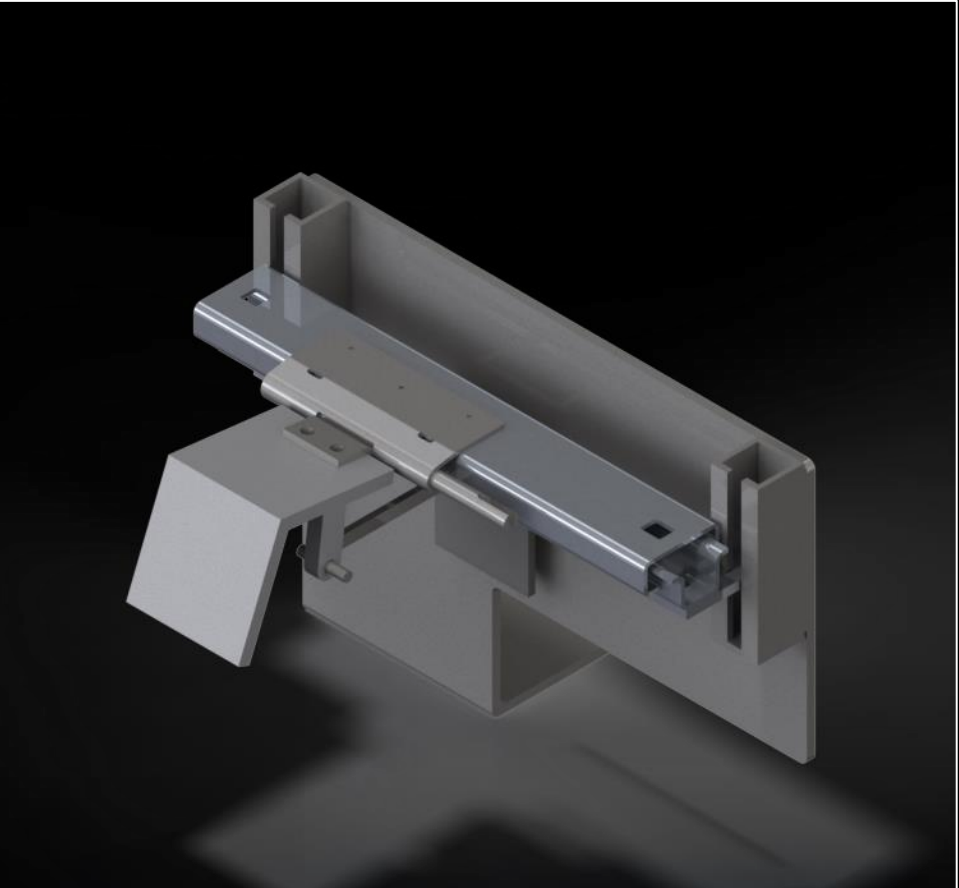
Fore/Aft

DESIGN ITERATIONS

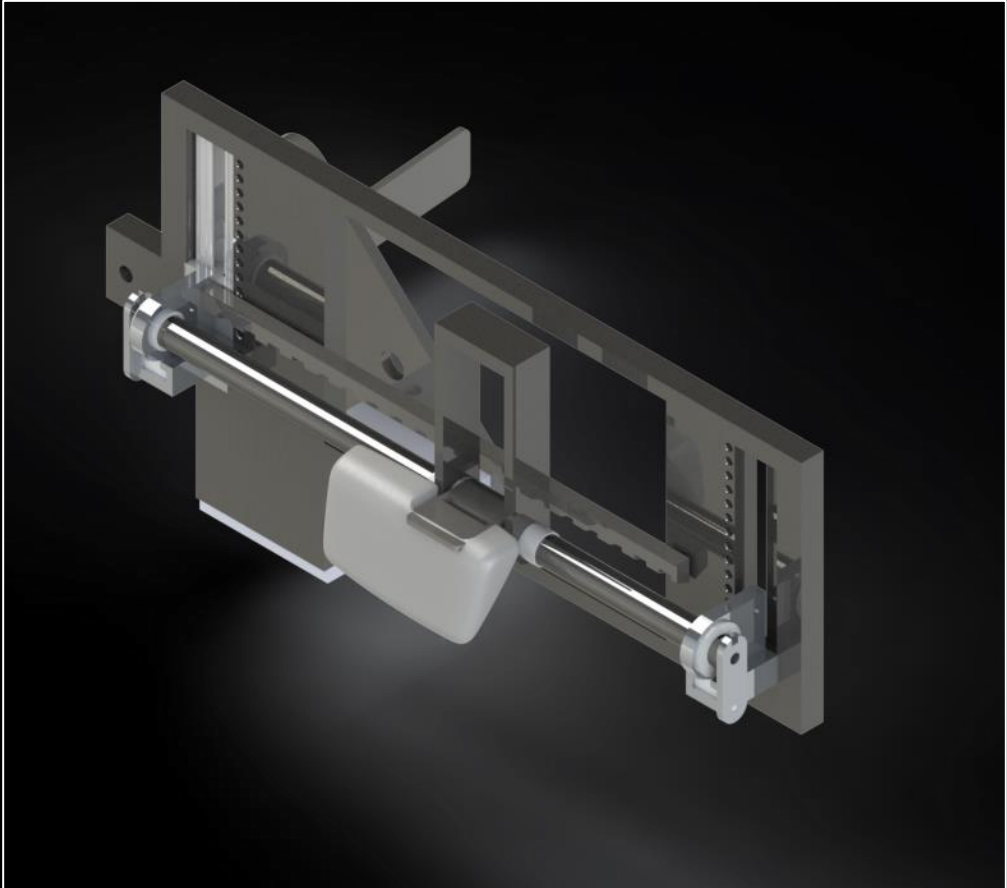
Hyster-Yale Version



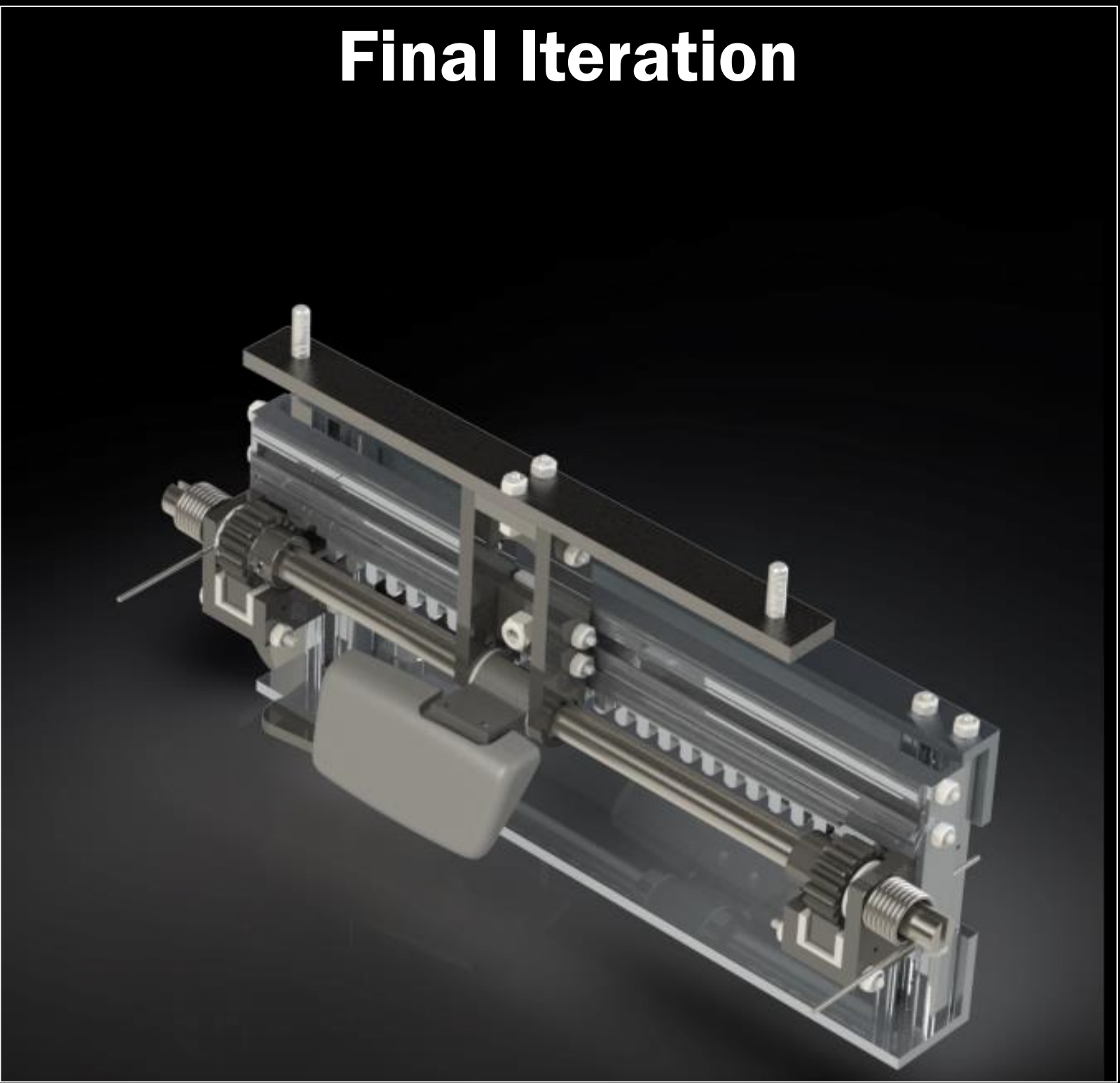
First Iteration



Second Iteration



Final Iteration



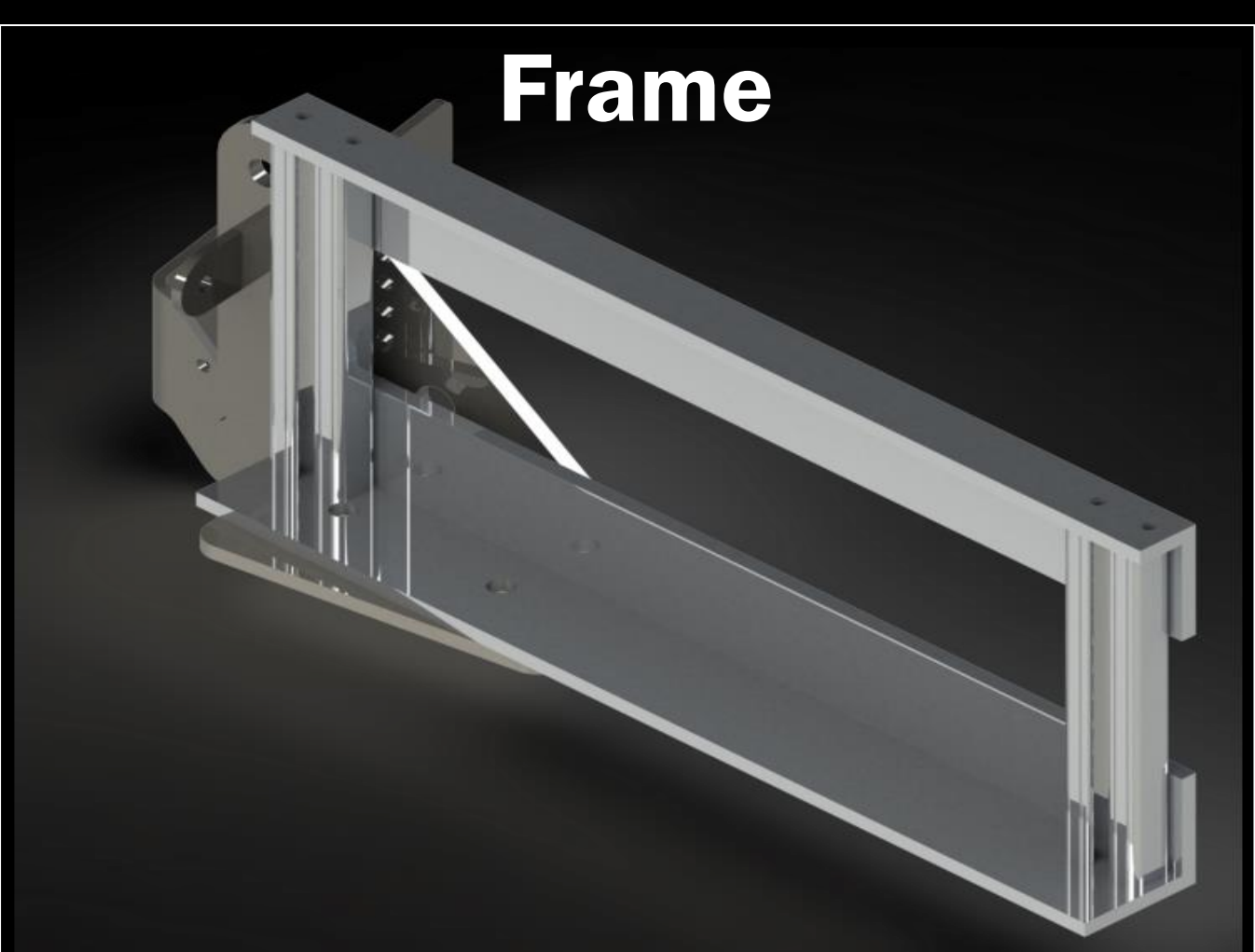
Final Iteration Integrated With
Seat & Armrest



Adjuster



Frame



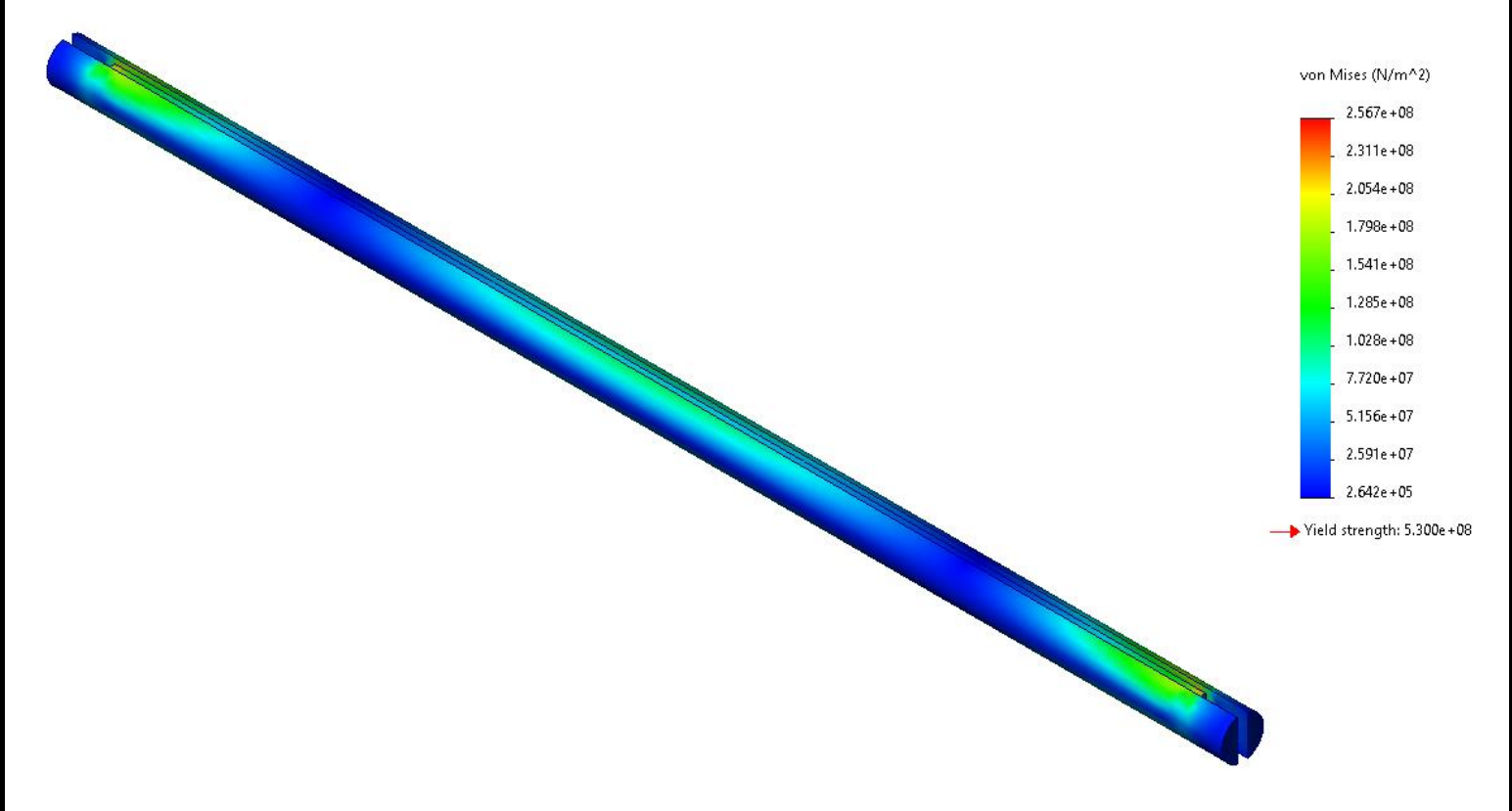
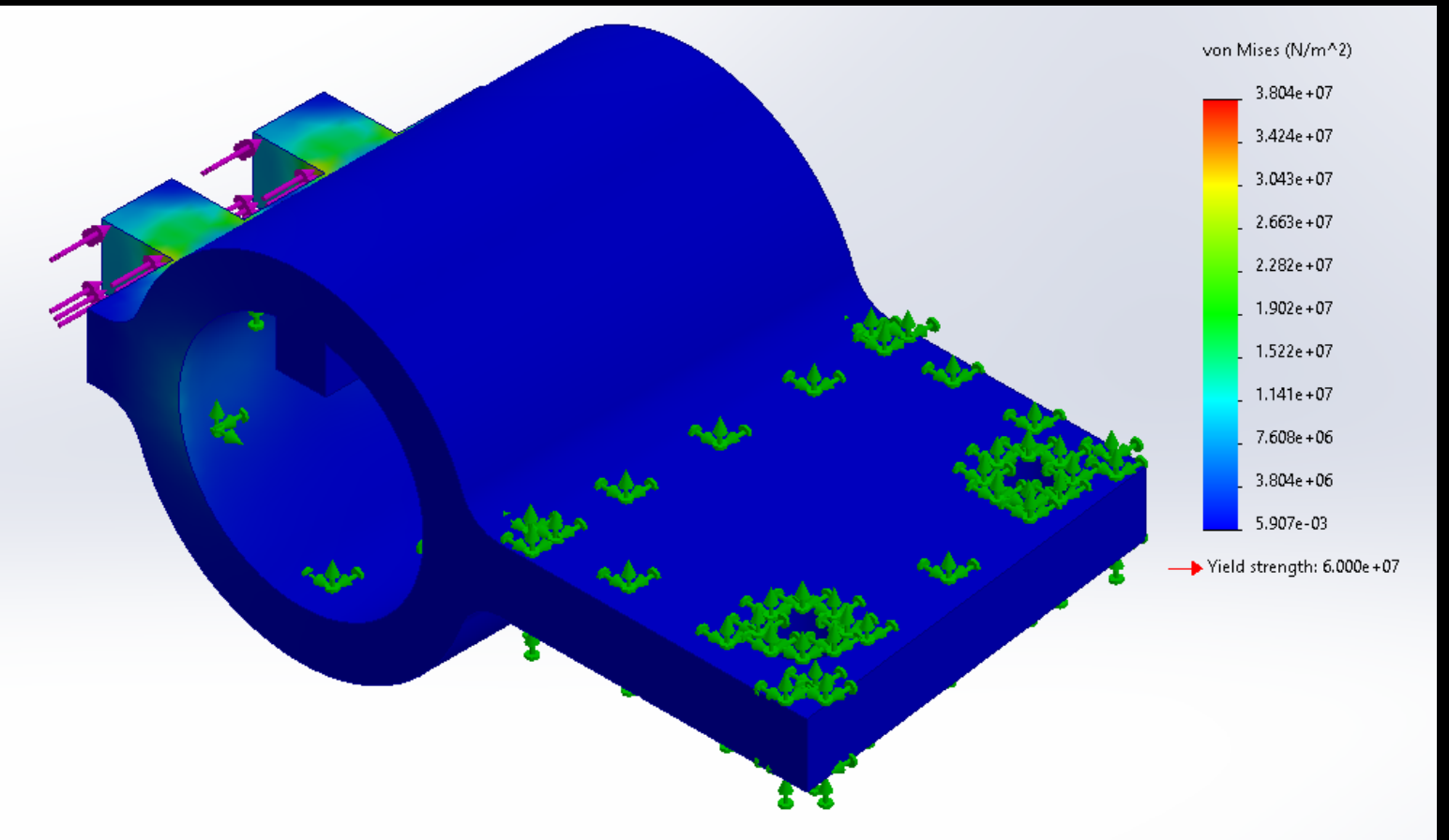
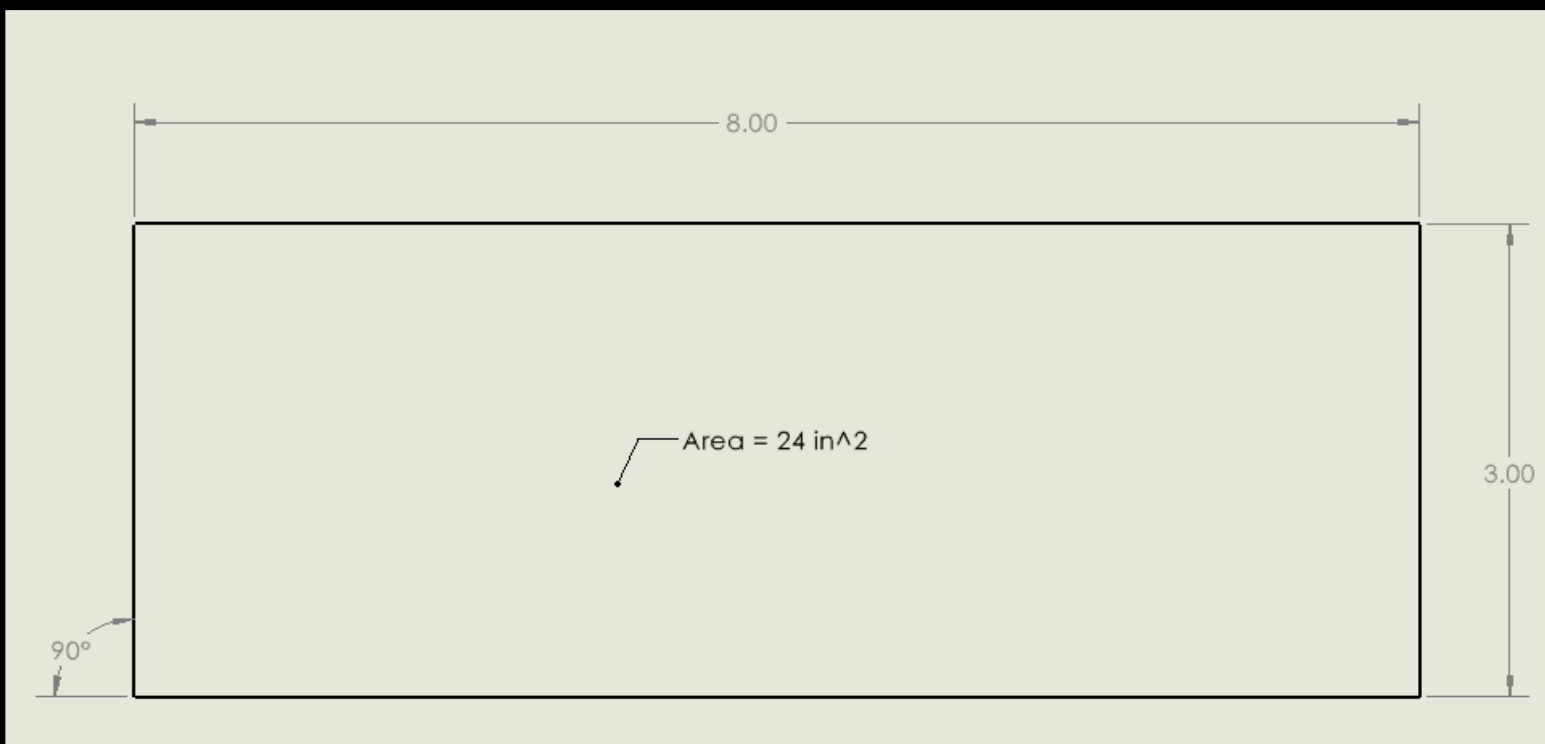
Handle



HOW IT WORKS

- I**The Horizontal lock de-meshes with the bar when the handle is lifted, and the shaft rotates
- I**When the shaft rotates, a rack pinion assembly pulls pins out of pin holes, which unlocks the vertical lock
- I**Both Horizontal and Vertical can slide in their respective directions

DESIGN VALIDATION



ACKNOWLEDGEMENTS

- I**Hyster-Yale Rep: Trevor Nielson
- I**Lead Instructor: Dr. Mathew Swenson
- I**Grad Student Mentor: Daniel Revard



2023 Capstone Project

