Separation Connector Improvement

Progress Update Presentation

Team 19:

Koll Christianson
Luis Herrera
Shaun Shultz
Amelia Fuller
Zheng Lian

Presentation Overview

- Project Overview
- Problem Statement
- Final Design
- Manufacturing a Prototype
- Gantt Chart
- References

Project Overview

- Original Separation Connection

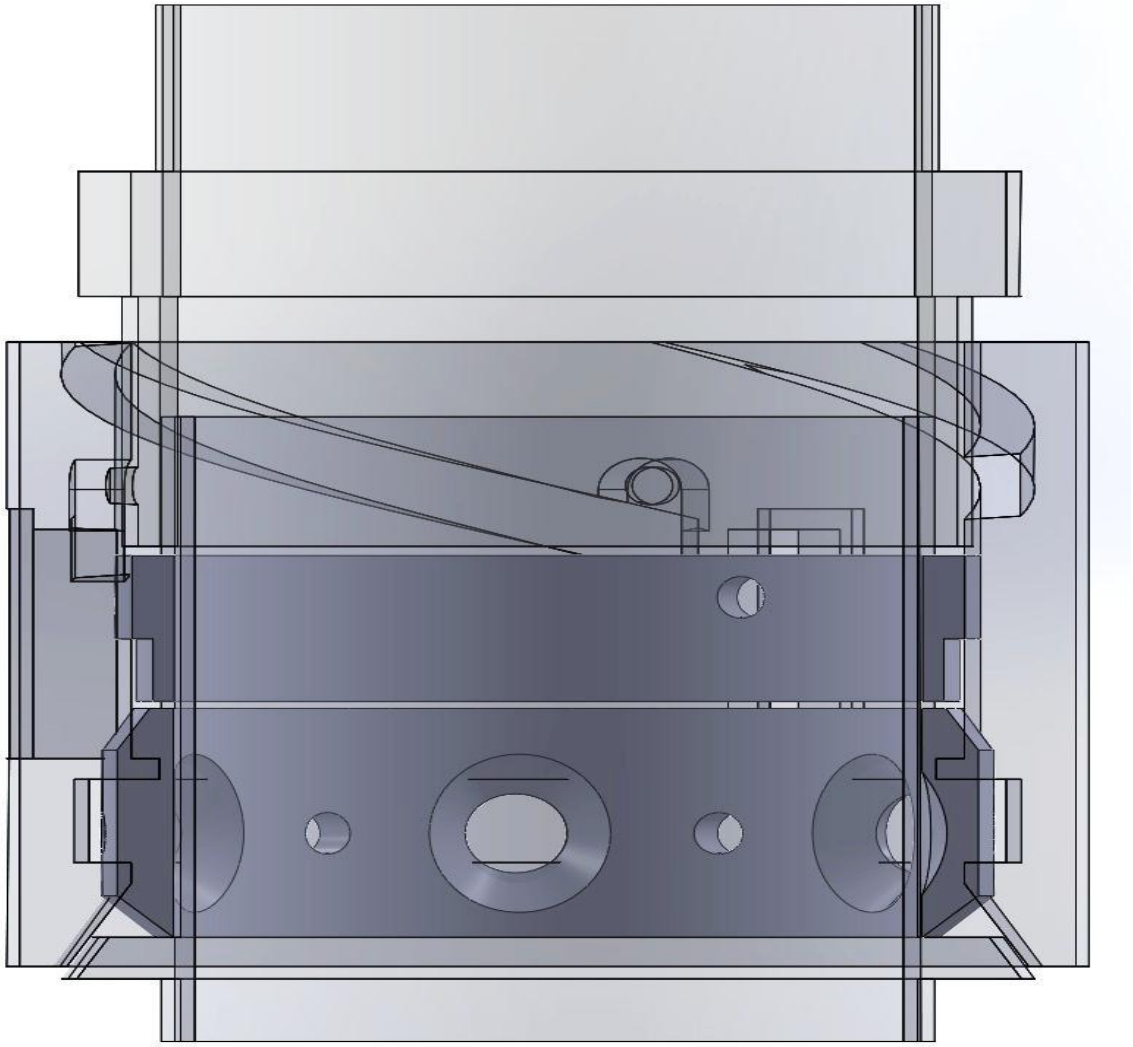
Problem Statement

- The goal for this project is to design and prototype a perfectly reliable, inexpensive, and easily manufacturable separation connector

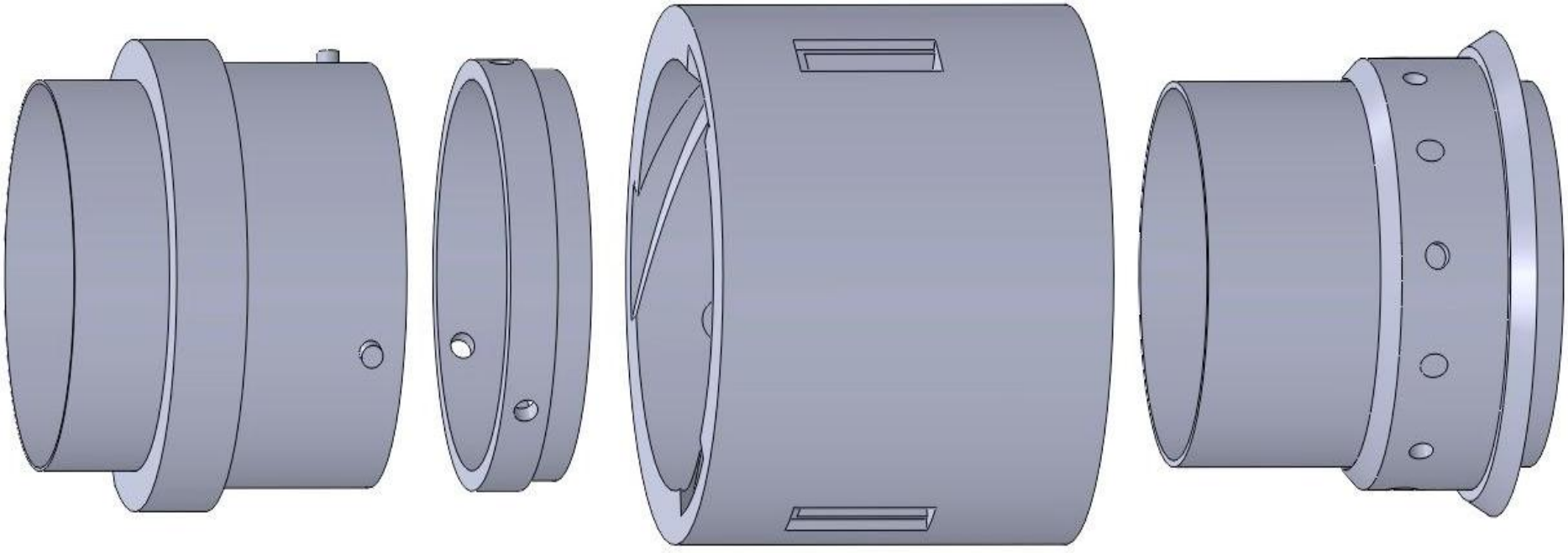
Constraints

- No greater than 25% larger than current design
- Weigh less than or equal to the current design
- Material cannot out-gas in a vacuum
- Must not de-mate prematurely
- Male end of the connector must remain unchanged

Final Design
-Cross-Sectional View-



Final Design
-Exploded View-



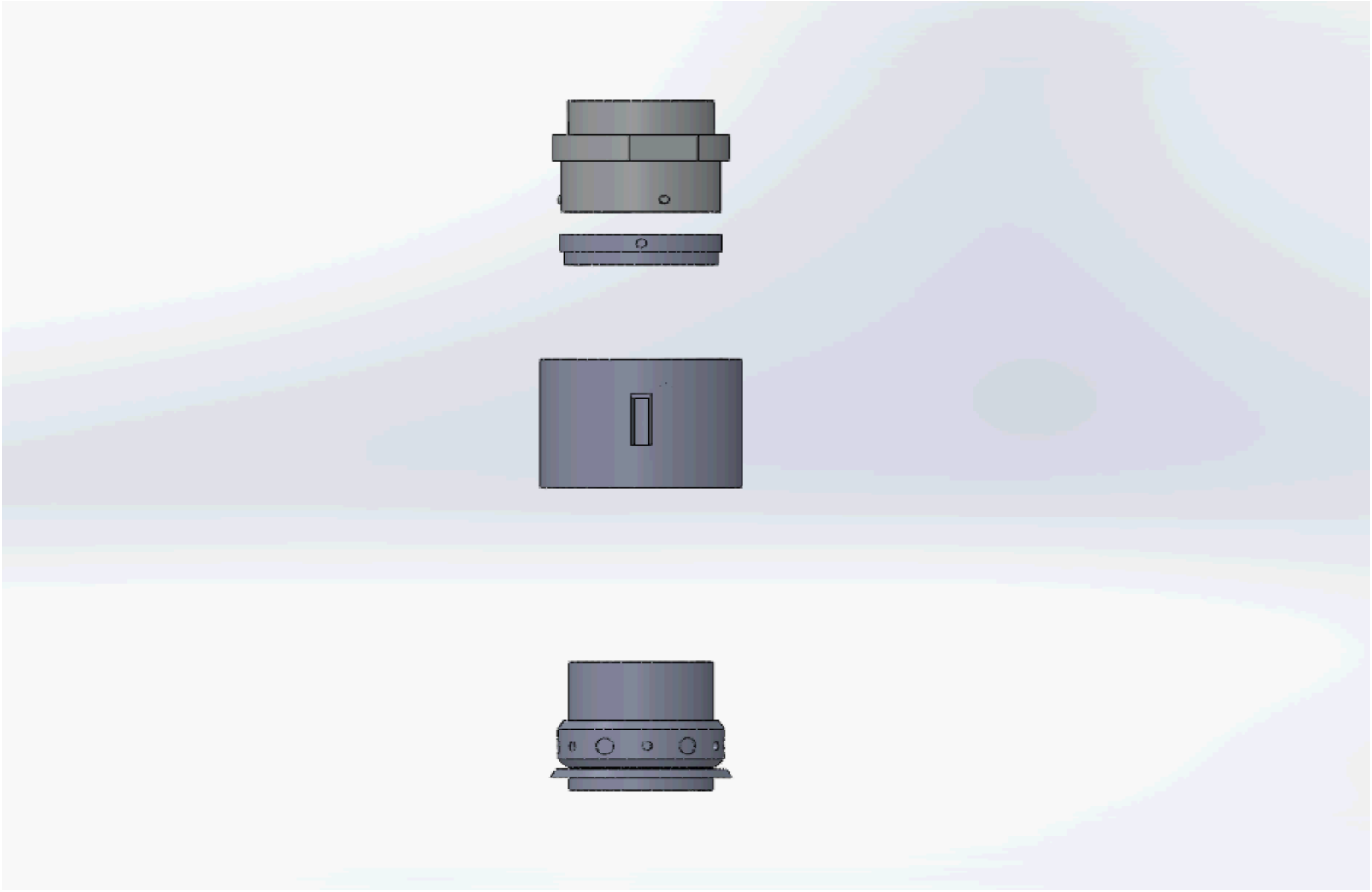
Final Design Components

- Coupling
- Male end
- Female end
- Leash ring
- Leash cord
- Ball bearing collar
- Springs
- Ball bearings
- Pressure plate

Final Design Materials

- Aluminum 6061 T6 for Coupling and Female End-Manufactured by Create Tech Enterprise
- Stainless Steel Ball Bearings
- Stainless Steel Compression Springs

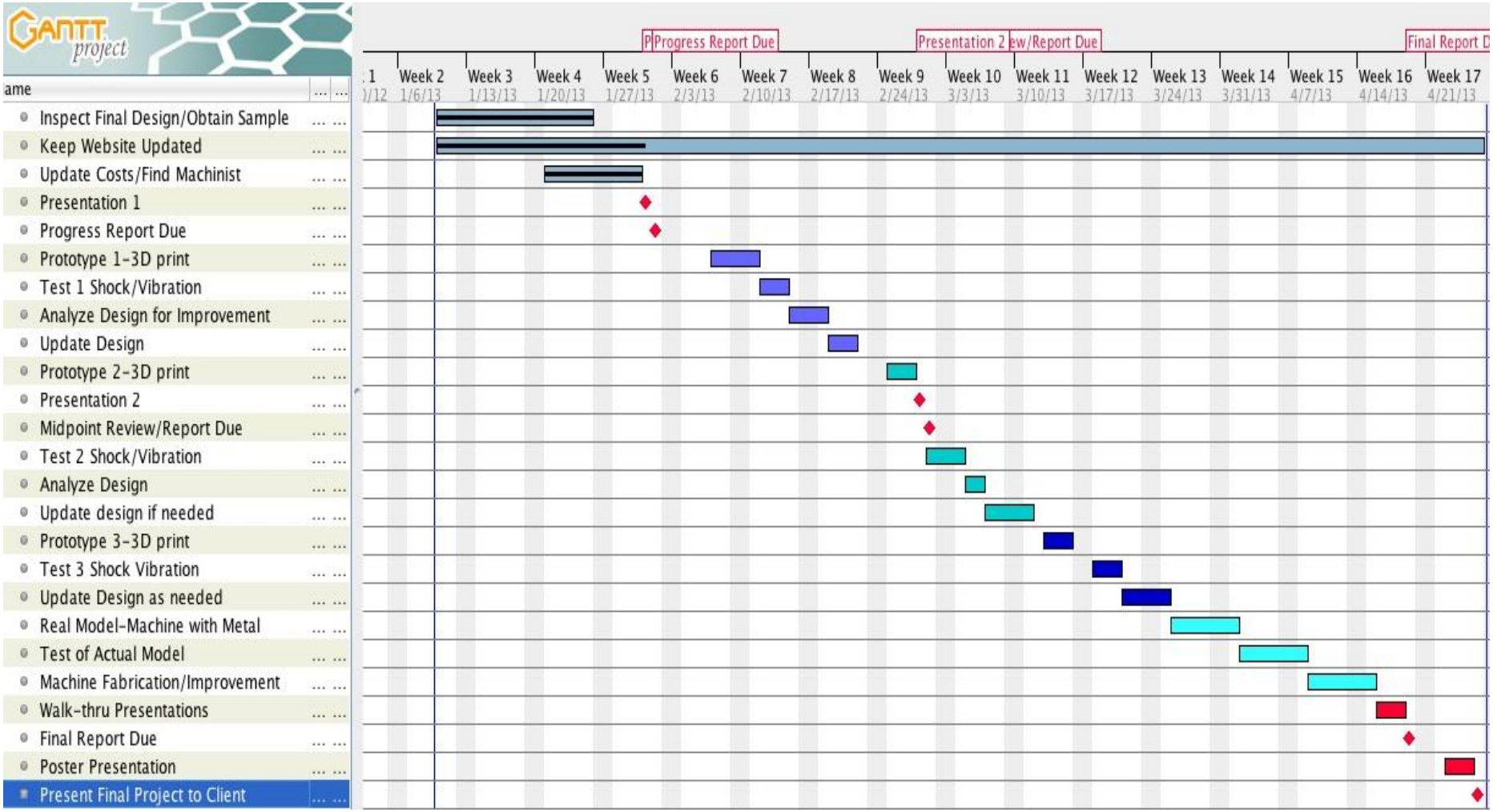
Final Design Animation



Manufacturing

- Ball Bearings Supplied from Bal-Tec of Micro Surface Engineering Inc.
- Springs Supplied from Century Spring Corp.
- Rapid Prototyping
  - 3-D Printing
- Machining-Final Prototype
  - Create Tech Enterprises-CNC Lathe

Gantt Chart


GANTT project
ame
Inspect Final Design/Obtain Sample
Keep Website Updated
Update Costs/Find Machinist
Presentation 1
Progress Report Due
Prototype 1-3D print
Test 1 Shock/Vibration
Analyze Design for Improvement
Update Design
Prototype 2-3D print
Presentation 2
Midpoint Review/Report Due
Test 2 Shock/Vibration
Analyze Design
Update design if needed
Prototype 3-3D print
Test 3 Shock Vibration
Update Design as needed
Real Model-Machine with Metal
Test of Actual Model
Machine Fabrication/Improvement
Walk-thru Presentations
Final Report Due
Poster Presentation
Present Final Project to Client
Week 2 1/6/13
Week 3 1/13/13
Week 4 1/20/13
Week 5 1/27/13
Week 6 2/3/13
Week 7 2/10/13
Week 8 2/17/13
Week 9 2/24/13
Week 10 3/3/13
Week 11 3/10/13
Week 12 3/17/13
Week 13 3/24/13
Week 14 3/31/13
Week 15 4/7/13
Week 16 4/14/13
Week 17 4/21/13

References

- R. C. Hibbeler (2010). *Engineering Mechanics: Statics*. Upper Saddle River, NJ: Pearson Prentice Hall.
- Richard G Budynas and J. Keinth Nisbett (2011). *Shigley's Mechanical Engineering Design*. 9th ed. New York: McGraw-Hill.
- Timothy A. Philpot (2011). *Mechanics of Materials*. 2nd ed. Missouri: John Wiley & Sons, Inc..

References

- Bedford and Fowler (2008). *Engineering Mechanics: Dynamics*. 5th ed. Upper Saddle River, NJ: Pearson Prentice Hall.
- James F. Shackelford (2009). *Introduction to Materials Science for Engineers*. 7th ed. Upper Saddle River, NJ: Pearson Prentice Hall.

References

- "Amphenol Tri-Start Subminiature Cylindrical Connectors." *Powell Electronics*. Powell Electronics, n.d. Web. 4 Oct 2012. <http://www.powell.com/Amphenol/D38999/D38999catalog.pdf>.
- "A World of Interconnect Solutions." *Glenair*. Glenair, 2012. Web. 4 Oct 2012. <http://www.glenair.com/interconnects/mildtl38999/>.

Questions?