

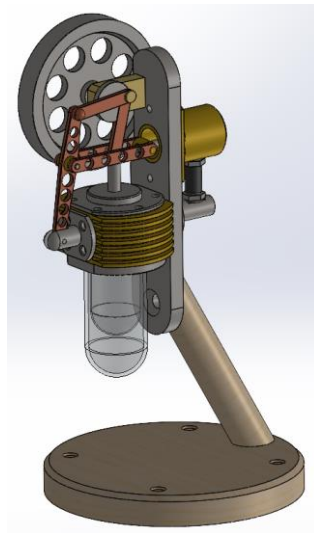
WEEKLY REPORT 1 (due to missing reports, the duration is longer 6/27/2024 – 7/25/2024)

Week 1: Topic of the project was decided – Vertical Stirling Engine. The project will encompass 3D modeling, assembly, structural simulations, and even manufacturing layout for the product. I will also be applying GD&T principles & right material selection strategies in order to ensure precision in the design, optimize the manufacturing process, and achieve the desired performance and reliability of the engine. This comprehensive approach aims to cover every aspect from design to production, ensuring a robust and efficient final product. After the initial meeting with the mentor, I started began with the installation process of SolidWorks and also modeling of some of the parts.

Week 2 & 3: I modeled 32 parts on SolidWorks for the Stirling Engine Assembly. I gave meticulous attention to detail, verified dimensions, and iterated on model to address potential issues. I adhered to best practices in modeling, such as maintaining clean and organized feature trees. Each part was carefully crafted to meet the specifications and requirements of the overall assembly by referring the drawings provided by the mentor, resulting in a precise final model of all individual parts.

I then assembled all 32 parts to create the Stirling Engine Assembly, ensuring the correct mating constraints among the parts. This process required careful alignment and positioning to achieve proper fit and function. By thoroughly checking and validating each mating connection, I ensured that the assembly was robust and free of interference, leading to a fully integrated and operational Stirling Engine model.

Week 4 & 5 (on-going): After completing the initial assembly, I met with my mentor to gather feedback on the design and assembly. Based on the feedback, I refined the models and assembly to address any identified issues and improve overall performance. Following this, I started working on the manufacturing report, which involved choosing the appropriate manufacturing processes for all individual parts. I added a cost analysis for single part, shared the initial draft with my mentor for further feedback, and based on the feedback, made necessary changes to complete the report. Additionally, I am including a Bill of Materials (BOM) to provide a comprehensive overview of the parts and materials.



Challenges & Lessons learned:

- While using SolidWorks, I was encountering software crash, so eventually I had to redo a few parts. No lesson learnt as such, but understood that my current laptop may not be able to support engineering software that easily.
- Adhering to best practices in SolidWorks, such as maintaining clean and organized feature trees, using parametric design techniques, and applying consistent naming conventions, significantly enhanced the efficiency of the modeling process. These practices facilitated easier modifications and reviews.
- The process of choosing appropriate manufacturing methods for each part required careful consideration of material properties and production constraints. I had never done this for so many different processes before, so this was new learning for me.

What will I be doing the following week:

- I'll be continuing on completing the report.
- I'll continue creating drawings and BOM to get some initial feedback for the same.