

Radial Engine - Display stand

Ryan Killowry - K00272782



Aim of the Project

- Merge Radial Engine Inner workings and Outer workings to complete final full assembly.
- Complete Manufacturing of all Engine Components.
- Design & Manufacture Display stand for Radial Engine

Background

This project aims to finish off the previously incomplete manufacturing and assembly of a radial engine, and to design and manufacture a stand to hold and display the finished Radial Engine project. The project will require compiling the work completed for the outer workings and the inner workings together to complete a final Full Assembly, Cataloguing of all components, and the completion of all unfinished manufacturing.

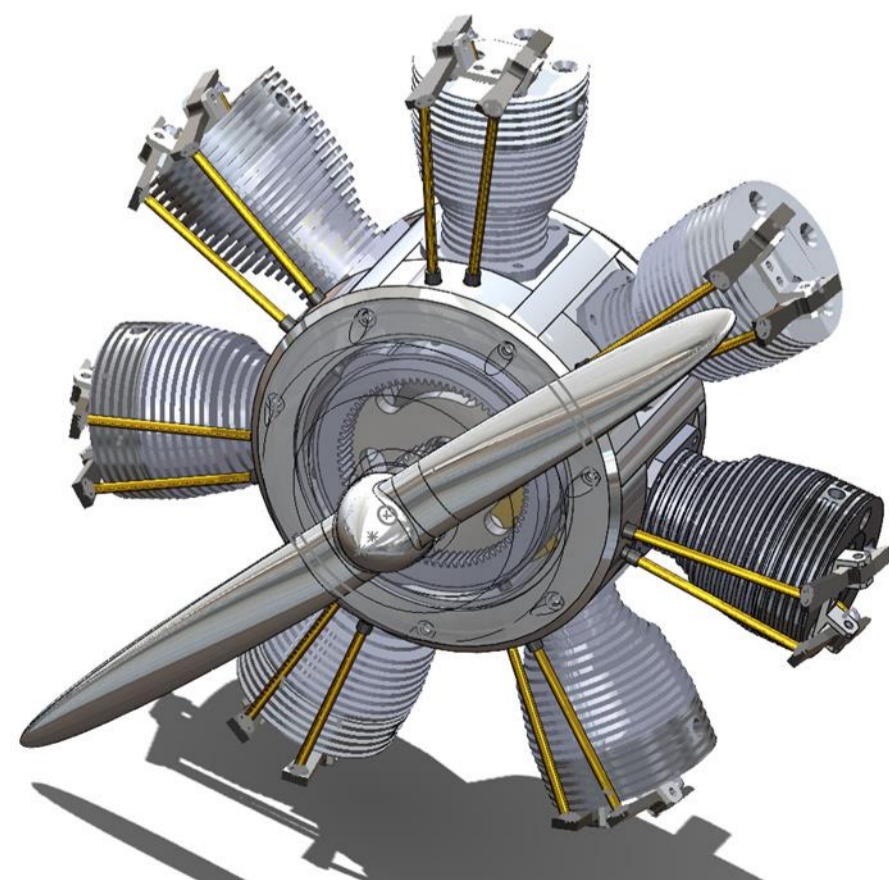


Figure: Completed SolidWorks Assembly

Design Review

A fully functional SolidWorks assembly was not just necessary for this Individual Project but also for the individual projects of two other 3rd year precision engineering students, this meant it was in everyone's best interest to work together as a team to complete the assembly as each of the three projects needed to build off of identical assemblies. Working alongside students that had more knowledge of the outer-working components allowed the mating process to go smoothly and quickly. Accurate mates in the SolidWorks assembly were crucial to simulate the mechanical motion necessary for full functional ability of the engine.

Bill Of Materials

A bill of materials table was created and shared amongst all parties participating in the completion of the radial engine, including supervisors, to gain a visual understanding of the progress made and yet to be made in the manufacturing of all components.



Figure: All initially completed components

Modifications

The majority of modifications necessary to complete a functional design of the radial engine had been applied previously by the members of the Radial Engine group projects in first semester. However, additional modifications were made to components throughout the duration of this individual project for both ease of manufacturing and to amend errors found in semi-manufactured components.

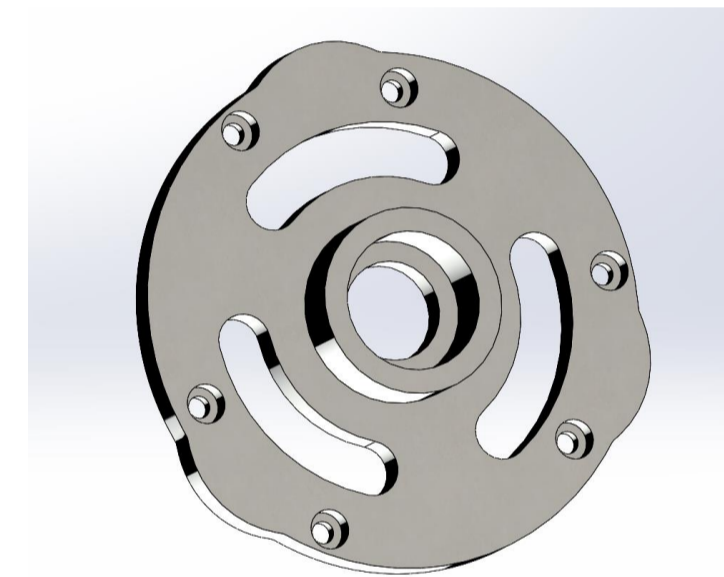


Figure: Modified Cam Ring Component

Manufacturing

One of the main aims of this individual project was to complete the manufacturing of all components necessary for the assembly of two fully functional Radial Engines. All the manufacturing was completed using the on-campus facilities in both the manual machining workshops and the CNC machining workshop.

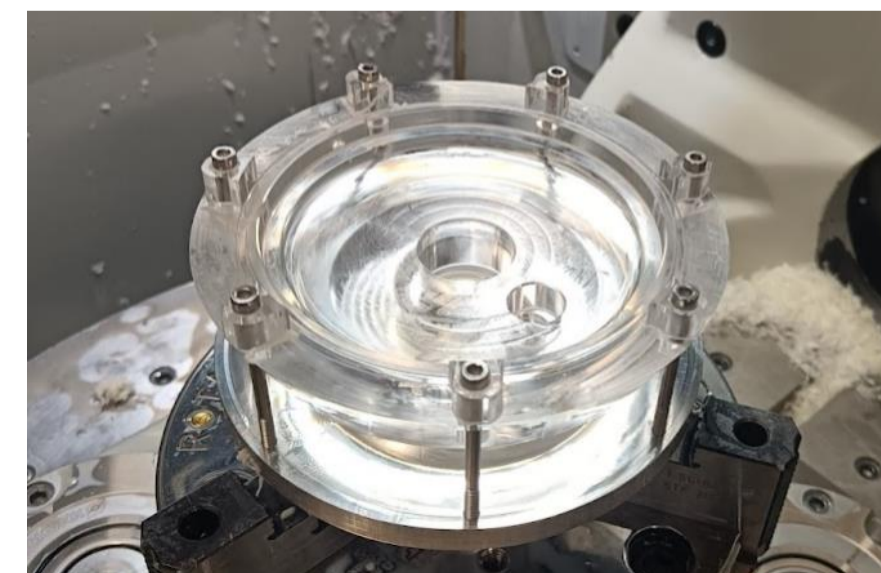


Figure: Acrylic Cover after Completion of second operation

Stand Design



Figure: Initial stand design (left) Model Aircraft stand (right)
The initial stand design included three components, the coupler mount, upright part and the base. The inspiration behind the sleek, aerodynamic look of the stand came from the commonly used design of model aircraft stands.

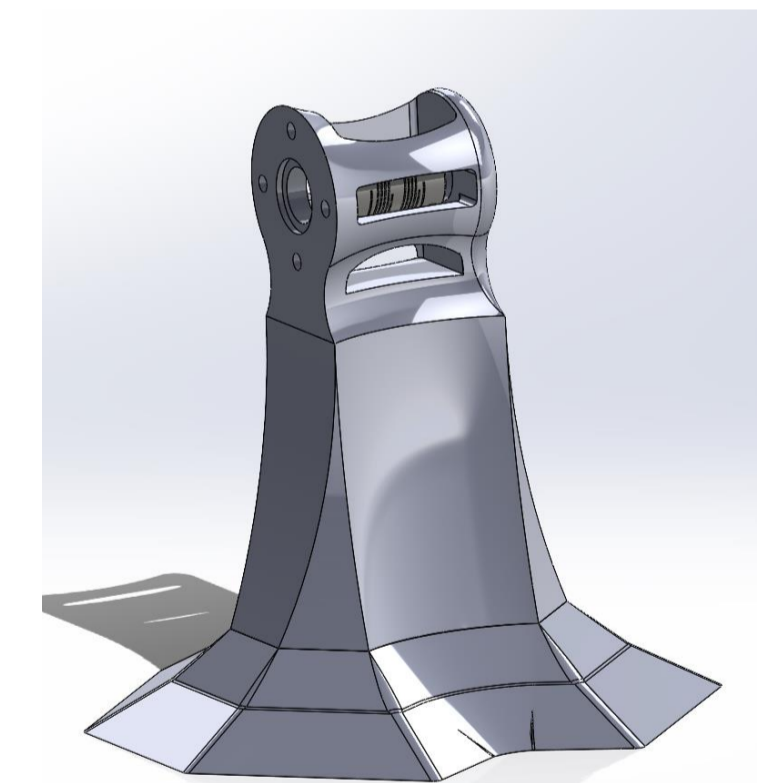


Figure: Up to date Radial Engine stand Design

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