

# Simplified Jet Engine Design in SolidWorks

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## Introduction

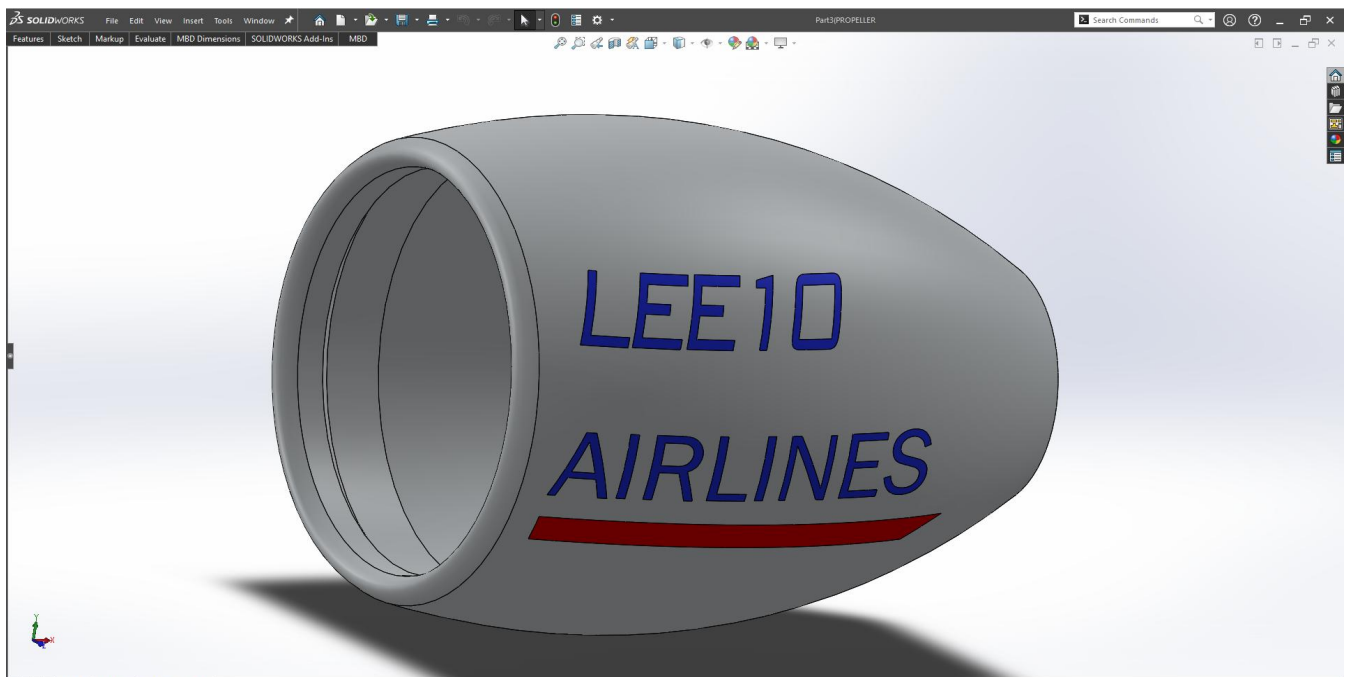
This project presents a simplified model of a jet engine designed using SolidWorks. The model captures the basic architecture and mechanical layout of a turbofan-style jet engine, including key rotating components and aerodynamic housing. The goal of the project was to understand the structure and working principles of a jet engine, practice assembly modeling, and explore basic motion analysis.

## Components Overview

### 1. Nacelle

Function:

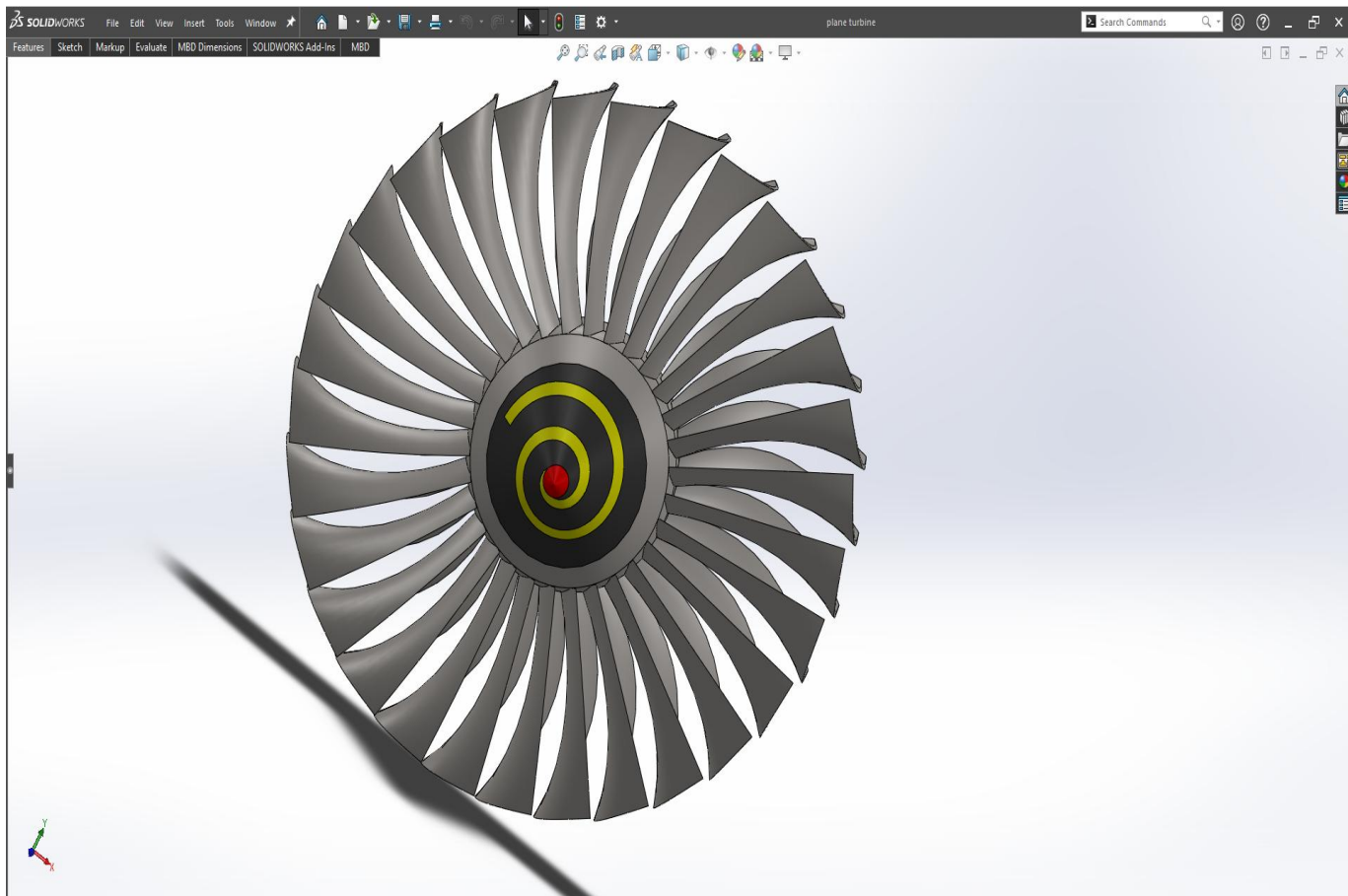
- Acts as the outer aerodynamic shell of the engine.
- Protects internal components from environmental exposure.
- Streamlines the airflow around the engine to reduce drag.



## 2. Front Compressor (Fan Blades)

Function:

- Draws in ambient air and compresses it before combustion.
- First stage of air compression in real jet engines.
- In this simplified model, represents airflow intake and pressure increase.



## 3. Shaft

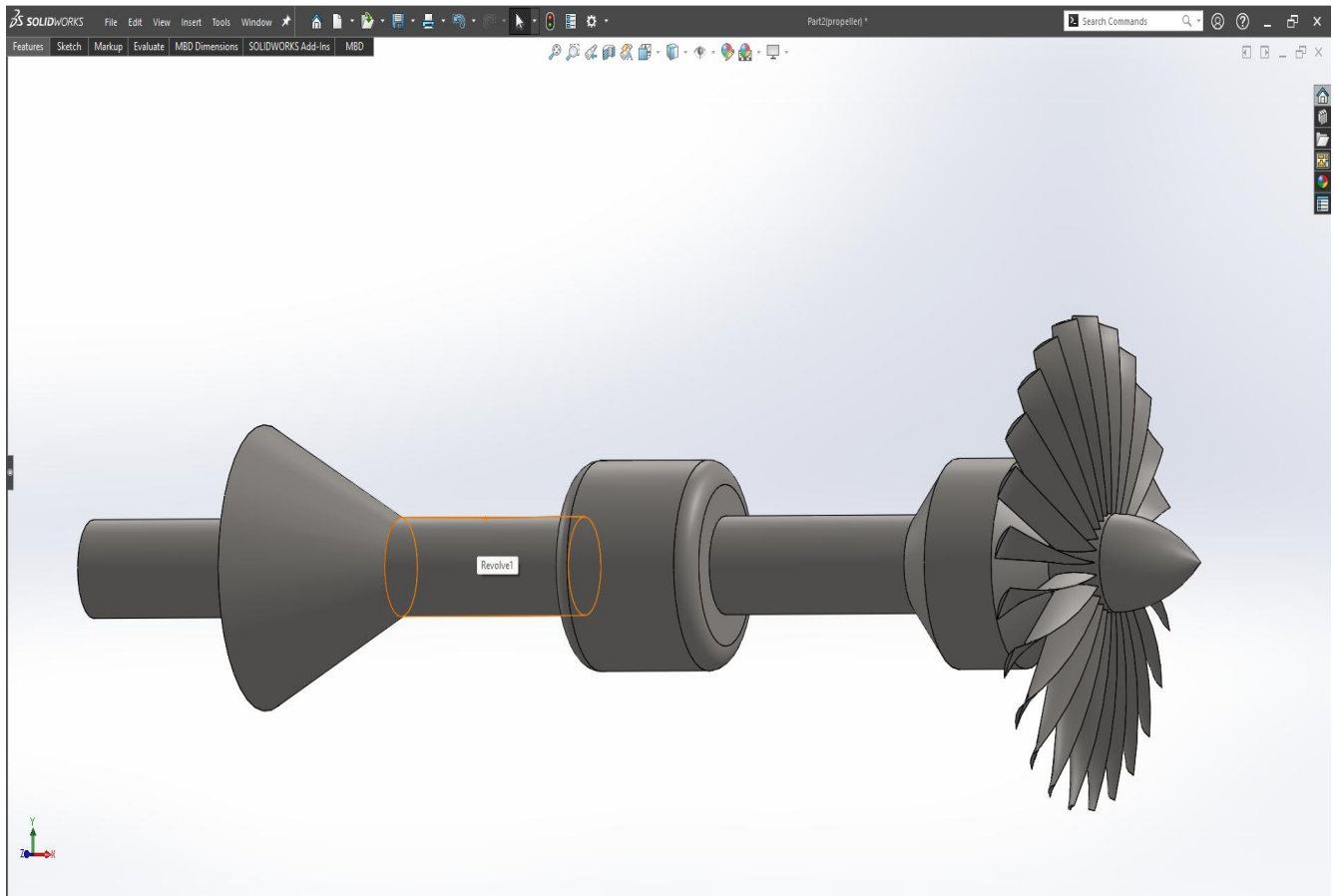
Function:

- Transfers mechanical energy from the rear turbine to the front compressor.
- Ensures synchronization of rotating components.
- Central rotating element around which the turbine and compressor are aligned.

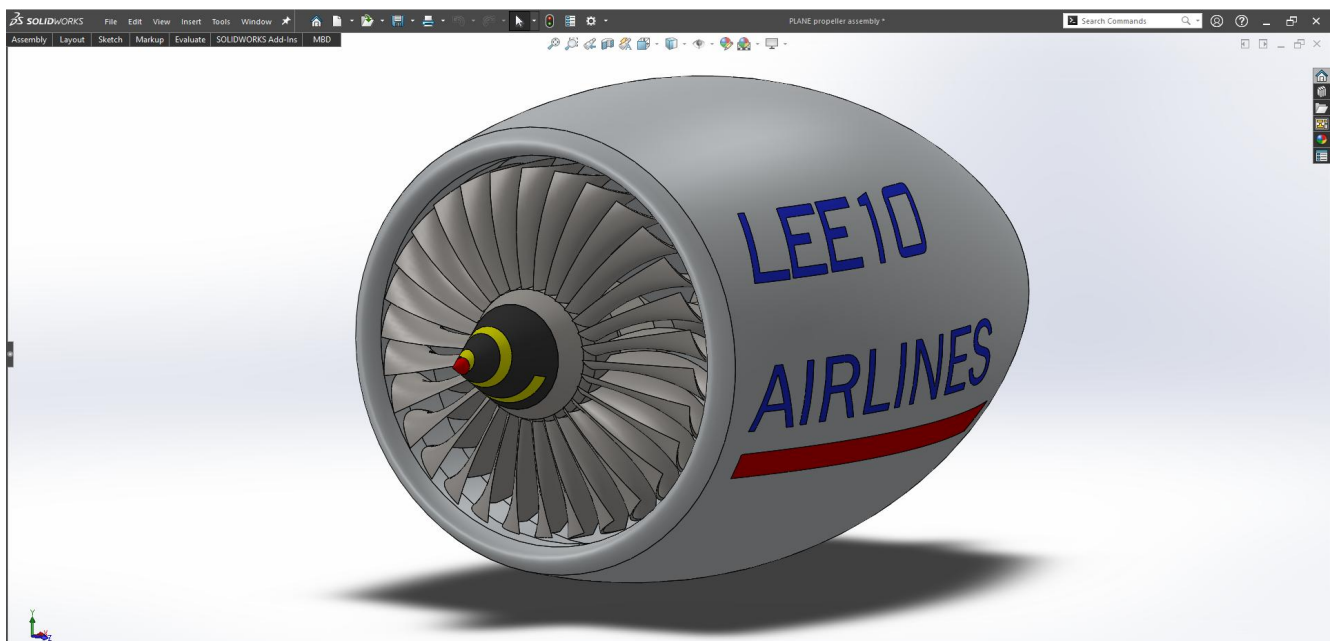
## 4. Rear Turbine

Function:

- Converts thermal energy from hot exhaust gases into mechanical rotation.
- Drives the shaft, which in turn rotates the front compressor.
- Simulates the energy recovery mechanism in real engines.



## Final assembly



## Assembly Summary

- All parts were modeled individually in SolidWorks.
- Rotating components were aligned along a common axis.
- Basic mates were used to fix the nacelle and allow the internal shaft and blades to rotate.
- A motion study was conducted to verify mechanical rotation and part interaction.

## Skills Applied

- SolidWorks Part and Assembly Design
- Axis-based design and rotational symmetry
- Understanding of turbomachinery layout
- Basic motion analysis and animation setup

## Conclusion

This simplified jet engine project served as a practical introduction to turbomachinery modeling and SolidWorks assembly techniques. The model captures the essential structure and function of a jet engine while allowing room for future enhancement, such as adding combustion chambers, multiple compressor/turbine stages, or nozzle design.