Project Juno

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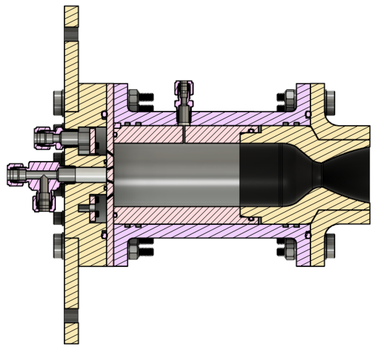
Introduction

Juno is the flagship project of ERPL's Liquids Division. It is a liquid bipropellant rocket engine made to collect data on different propellants and engine configurations. Its modular design allows for new iterations of parts such as injectors, combustion chambers, and nozzles to be made quickly.

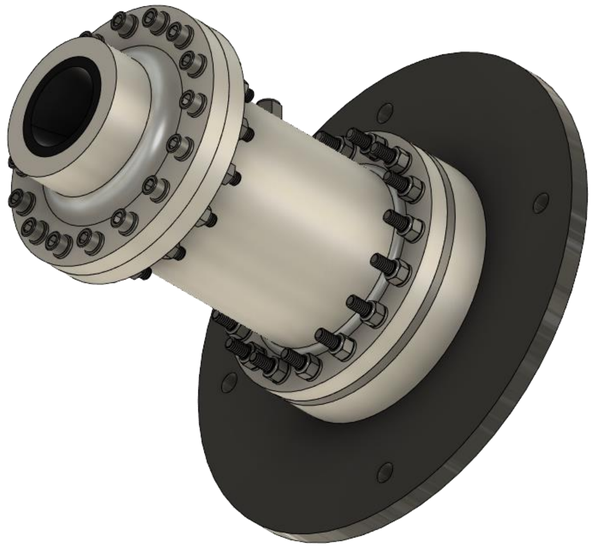
How is Juno Modular?



Because of its modular design, Juno can easily be fitted with different components. This is made possible by several features:

- The flanges holding the engine together allow for simple and time efficient assembly and disassembly.
- The engine housing will work with a variety of combustion chamber and nozzle sizes.
- The injector plate can easily be changed out for a plate with a different injector path.

Juno Assembled



How is Juno Experimental?

Much of what is known about rocket engines comes from experimental data taken from large engines. Comparatively there is not as much data from smaller rocket engines.

Juno will allow data to be collected for relatively low pressure and thrust. Depending on the iteration, it can be equipped to measure temperature and pressure at different locations of the engine.

First Iteration

- Combustion chamber pressure: 350 psi
- Thrust: 300 lbs
- Cooling method: Ablation
- Specific Impulse: 256 s
- O/F Ratio: 1.3
- Fuel: Liquid Ethanol
- Oxidizer: Liquid Oxygen

Moving Forward

The first iteration of Juno has been manufactured, however ERPL does not have the ability to test it. ERPL is currently designing a test stand to test Juno and other engines like it. This test stand has received funding and is on track to be assembled by the end of the Spring 2023 semester. Following its assembly, Juno will be tested and further iterations will be made.