Characterization of Cycloid Mechanisms
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Project Background

Problem Statement:
- Characterize the functionality of two proof of concept prototypes which utilize cycloidal gearing.

Prototypes:

![Figure 1: Single Stage Reducer](image1.png)
![Figure 2: Continuously Variable Transmission](image2.png)

Objectives

- Determine primary failure mode for Single Stage Reducer (SSR) prototype.
- Create a full set of engineering drawings for SSR prototype with the modifications suggested by primary failure mode analysis.
- Design and fabricate a demonstration model of the SSR prototype.
- Bench Test the Continuously Variable Transmission (CVT) prototype to determine application and advantages/limitations.

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CVT Bench Test Setup

1. Input motor
2. Secondary motor
3. Output load

CVT Testing

- Input motor will run at low RPM, high torque
- Secondary motor will be controlled to vary the output to a desired RPM
- Output will act as a generator to serve as load
- Ability to measure torque and RPM at both inputs and output simultaneously to understand power flow.

SSR Demonstration Model

- 3D printed Vero-Clear housing to demonstrate cycloid rotation of internal gearing
- 3D printed input coupling and base
- Portable, collapsible carrying case

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