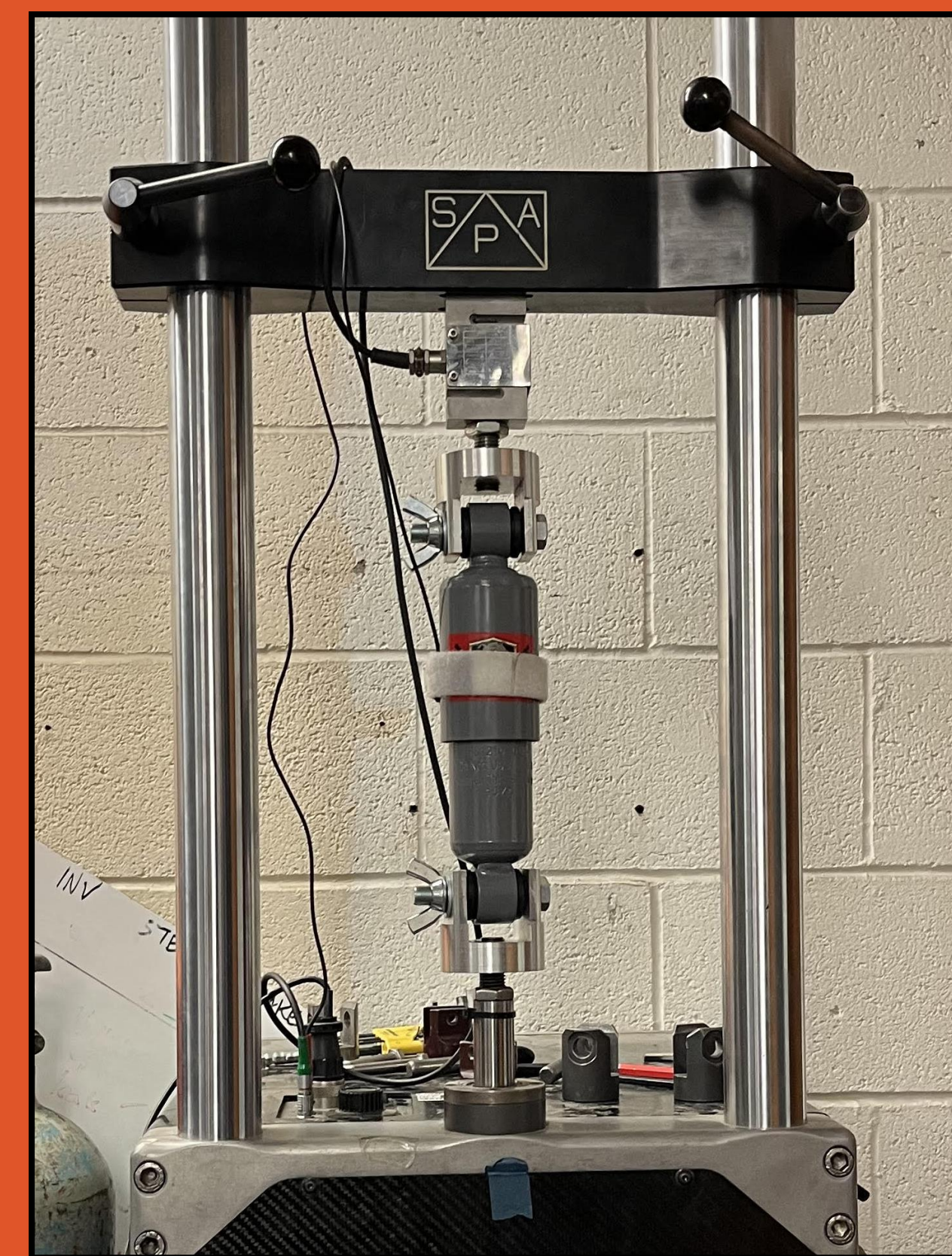


DATA COLLECTION

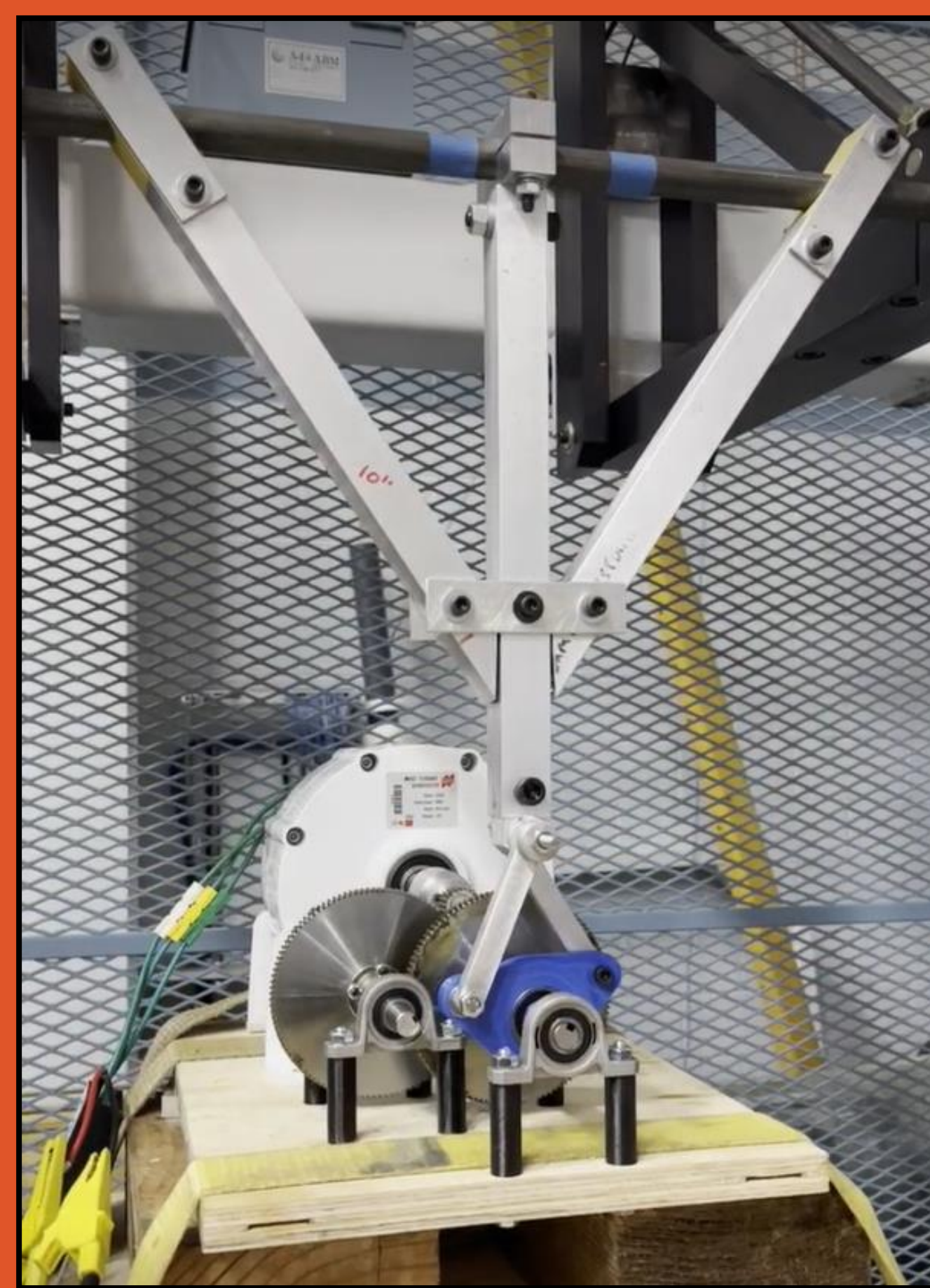
Displacement data collected from ConMet Truck using string potentiometers



Cab weight determined as 2000lbs



Damper Dynamometer w/ custom mounting clevises



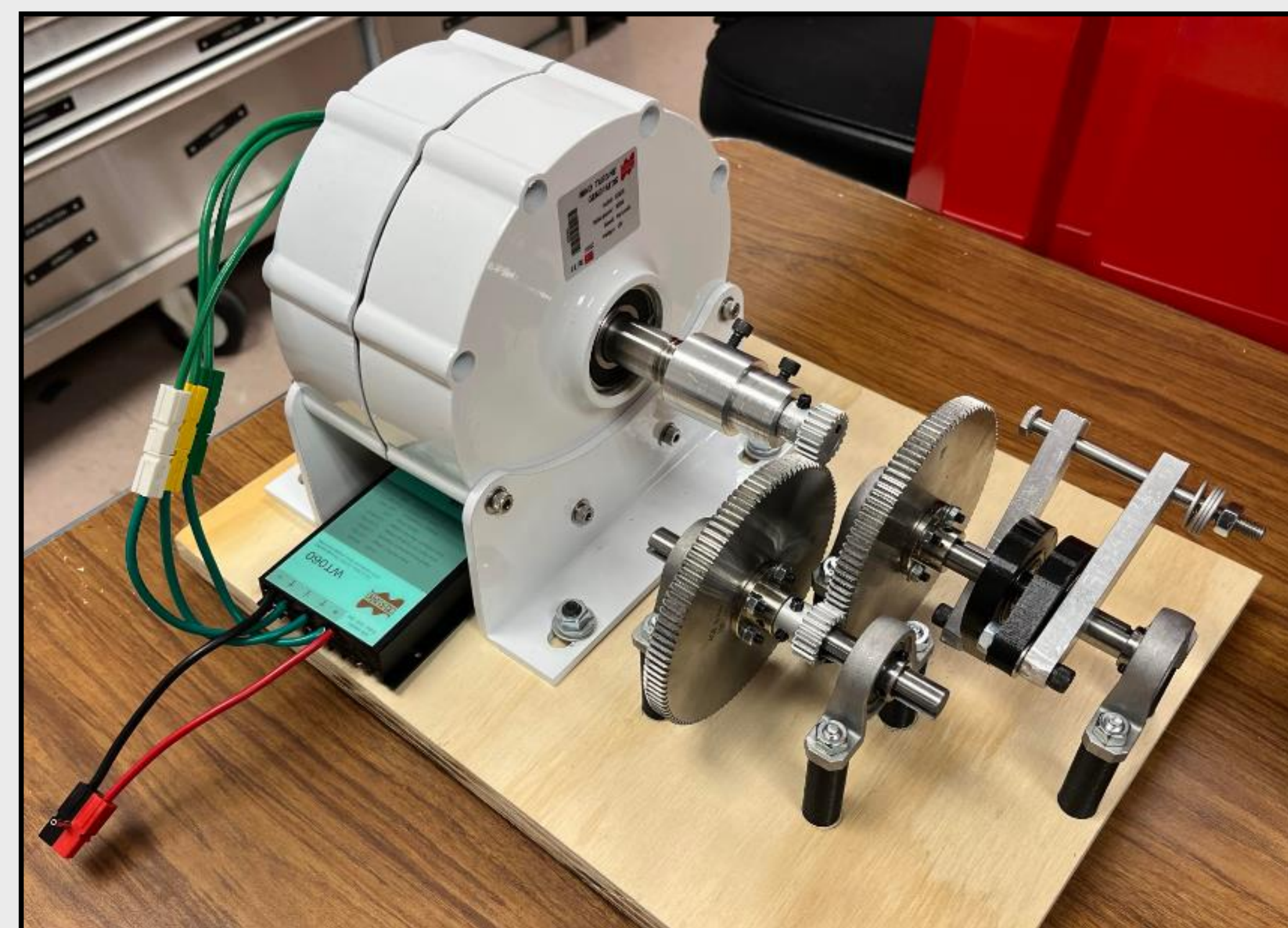
Mounting & Testing Harvester on Linear Test Bed



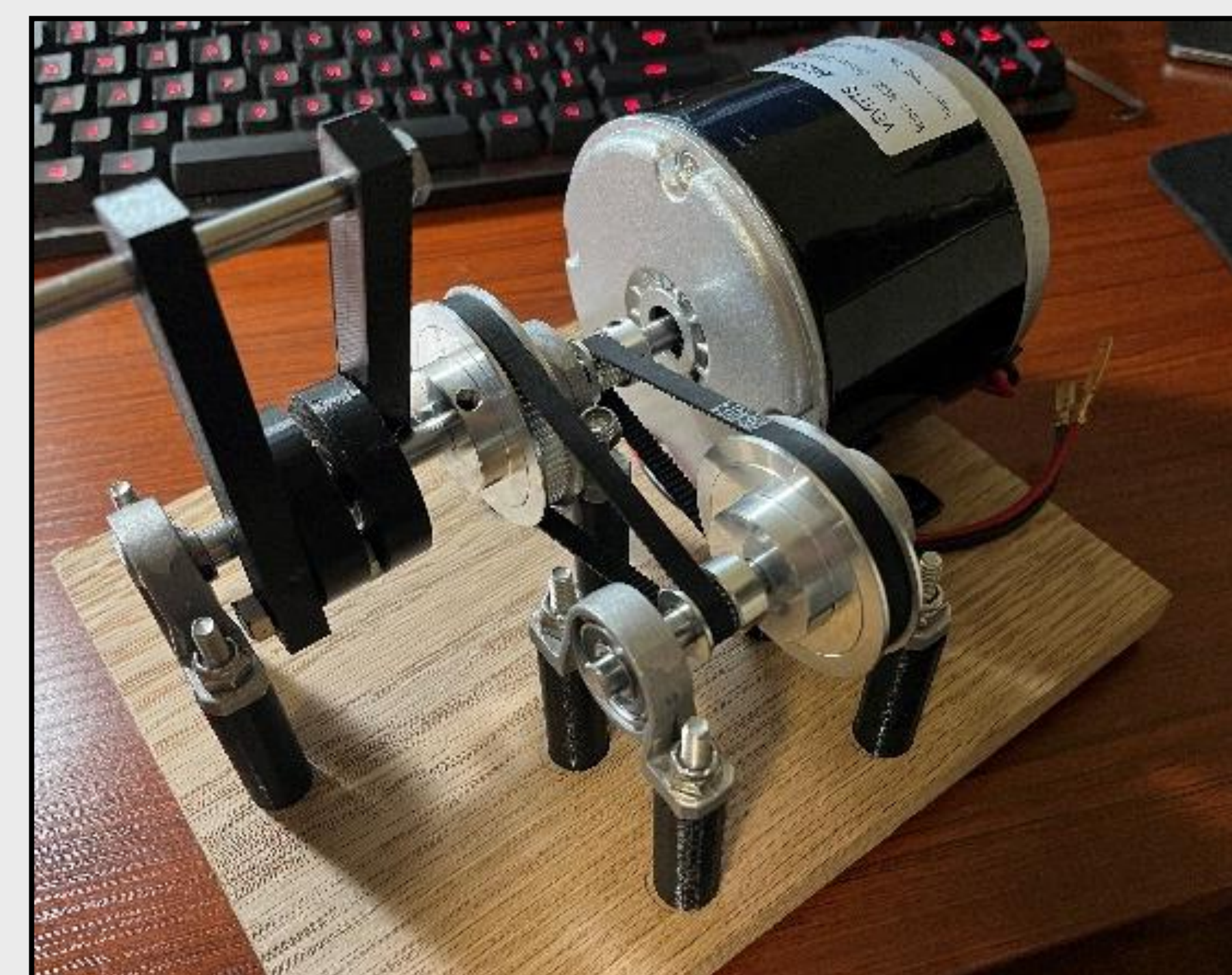
CONMET VEHICLE ENERGY HARVESTING

Summary: Investigate the feasibility of harvesting semi-truck cab suspension energy (like regenerative braking) and develop a minimally invasive proof-of-concept energy harvester to reduce parasitic losses and improve fuel economy while driving.

HARVESTER DESIGN



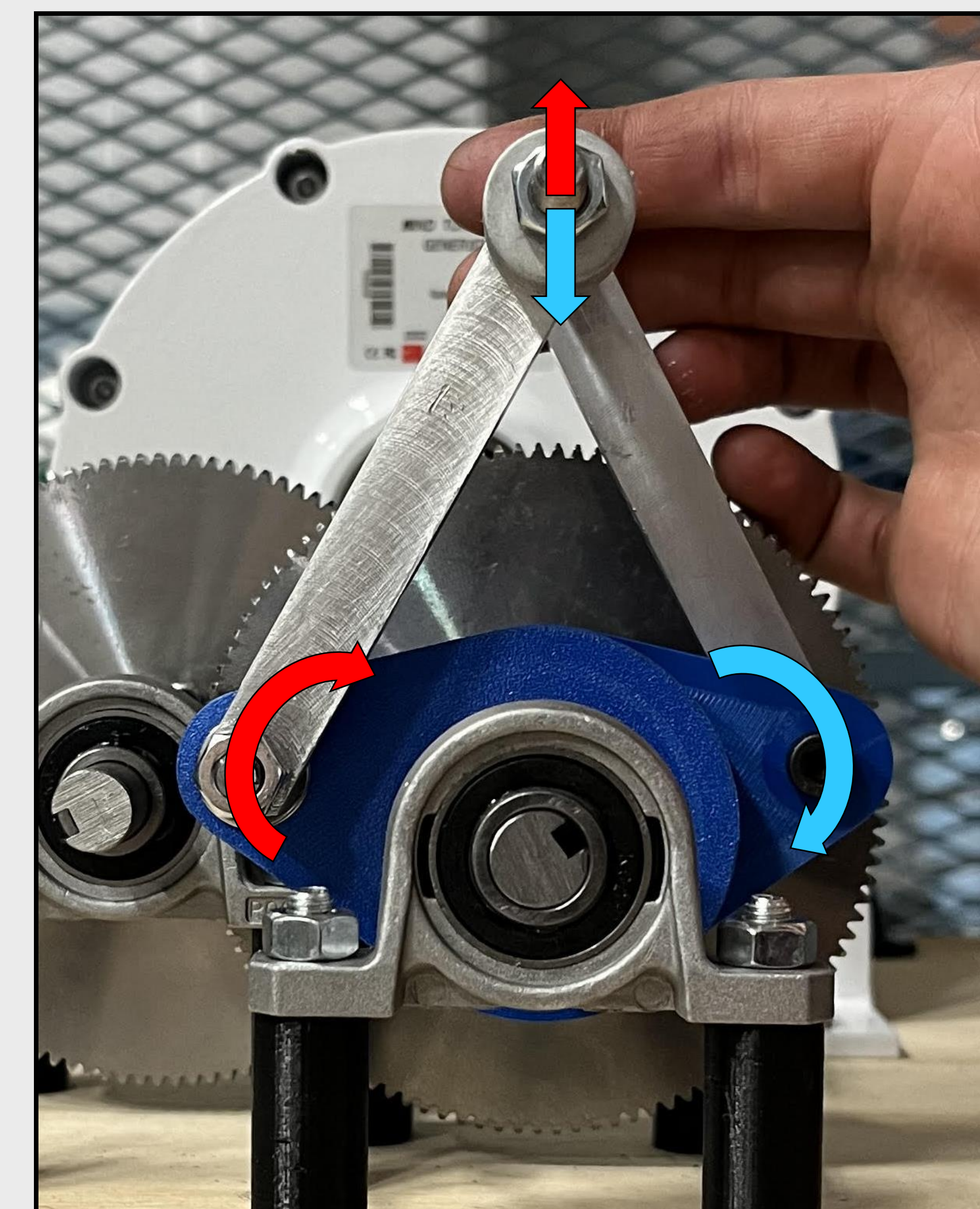
Final Prototype with 500W AC Alternator and DC rectifier



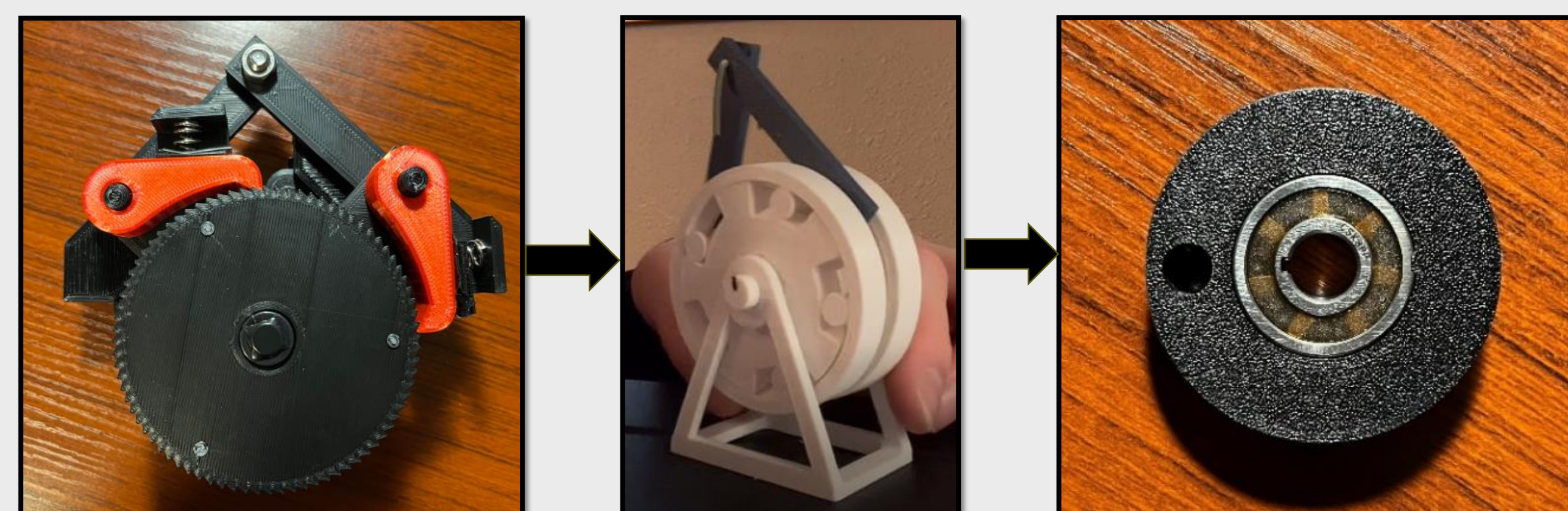
DC Motor Tabletop Prototype

HOW IT WORKS

As the truck cab oscillates, two-way linear motion is rectified into unidirectional rotation by using two one-way bearings and linkage arms.



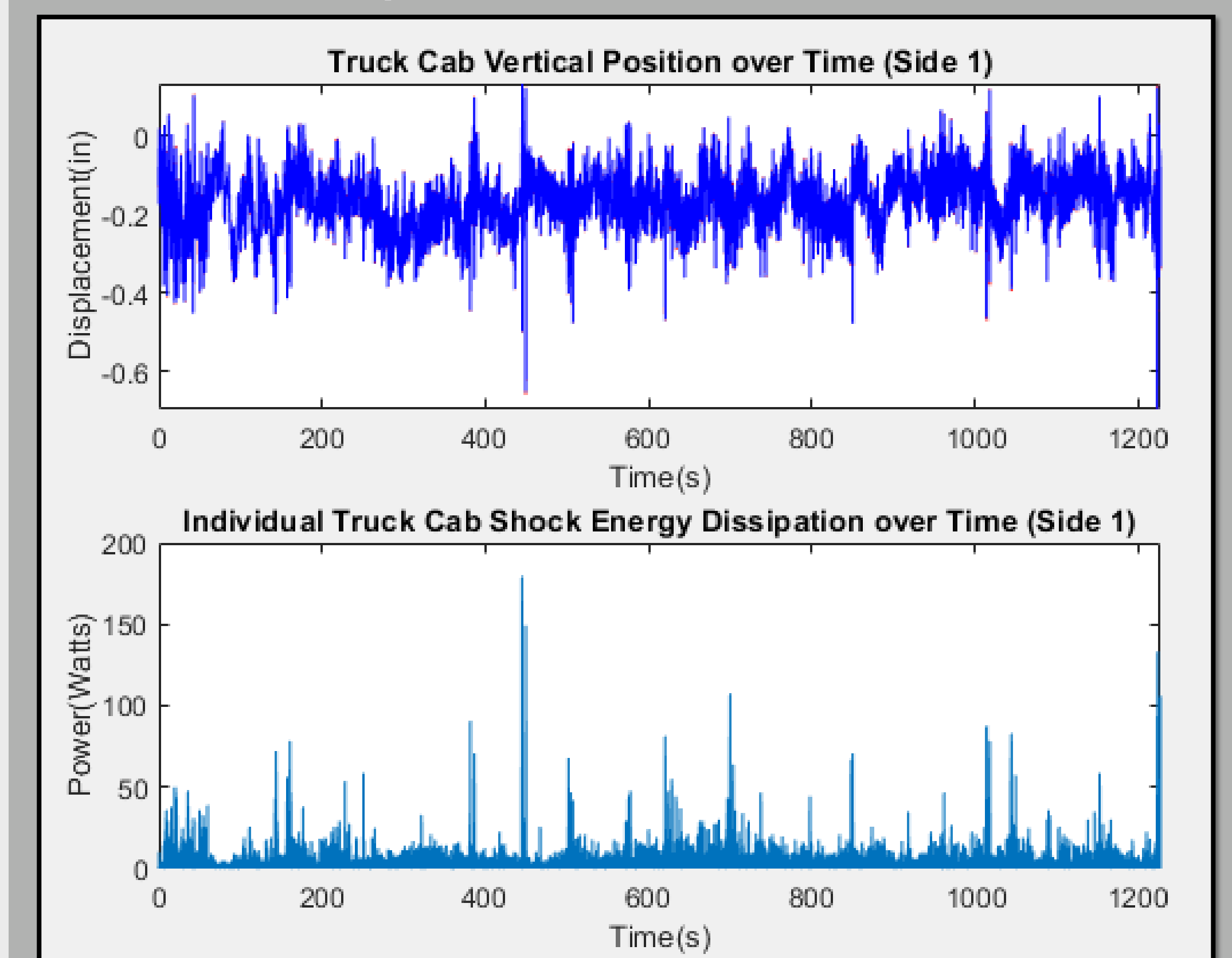
MECHANISM DESIGN ITERATIONS



MEMBERS

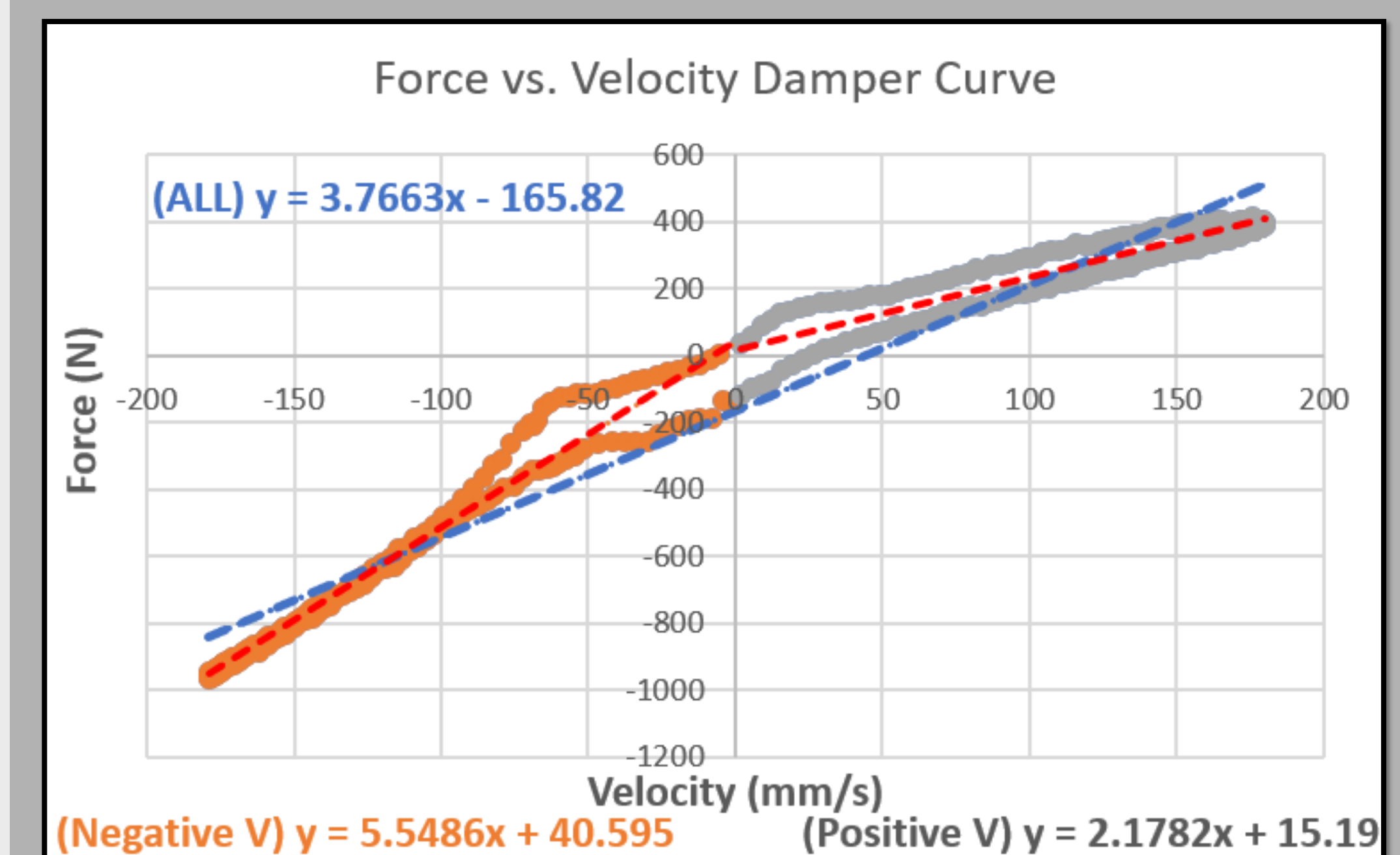
- Anthony Wilkins – ME & MFGE
- Micah Miyashiro – ME & MFGE
- Irvin Moreno – ME
- Michael Reimer – ME

DATA/POWER ANALYSIS



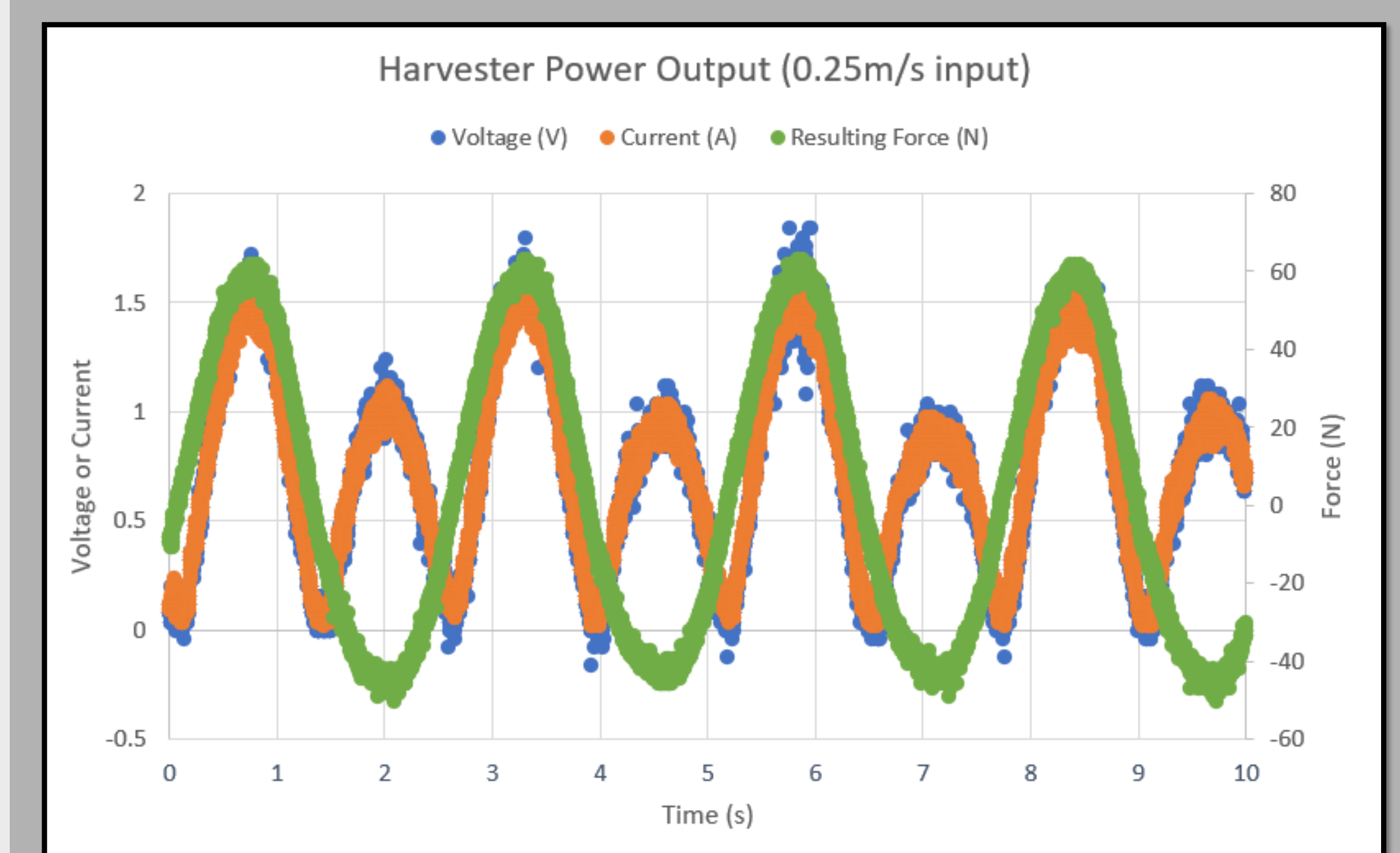
Method 1: Linear Potentiometer Suspension Analysis

- Average displacement: 0.4in
- Average Velocity: 0.5in/s
- Average Shock Power Dissipated: 2.56 W



Method 2: Shock Coefficient Calculation

- $C = 3700 \text{ Ns/m}$
- Avg Shock Power dissipated = 1.5W



Linear Test Bed Results:

- 0.25 m/s input, 1 OHM load on all 3 phases
- $V_{max} = 1.8V$, $I_{max} = 1.56A$
- $P_{in} = 14.8W$, $P_{out} = 2.87W$