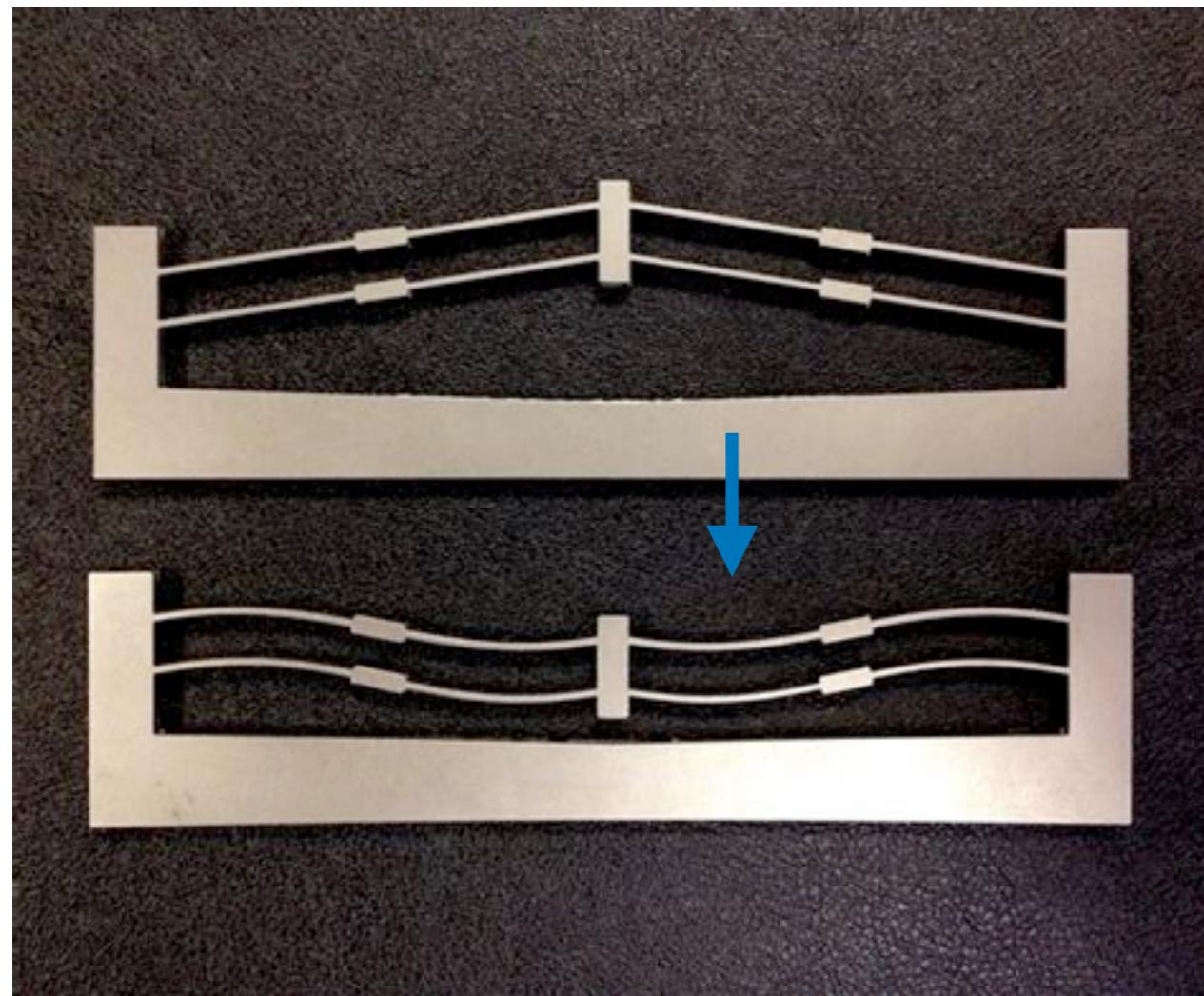


Compliant Mechanisms

Grant Fellows

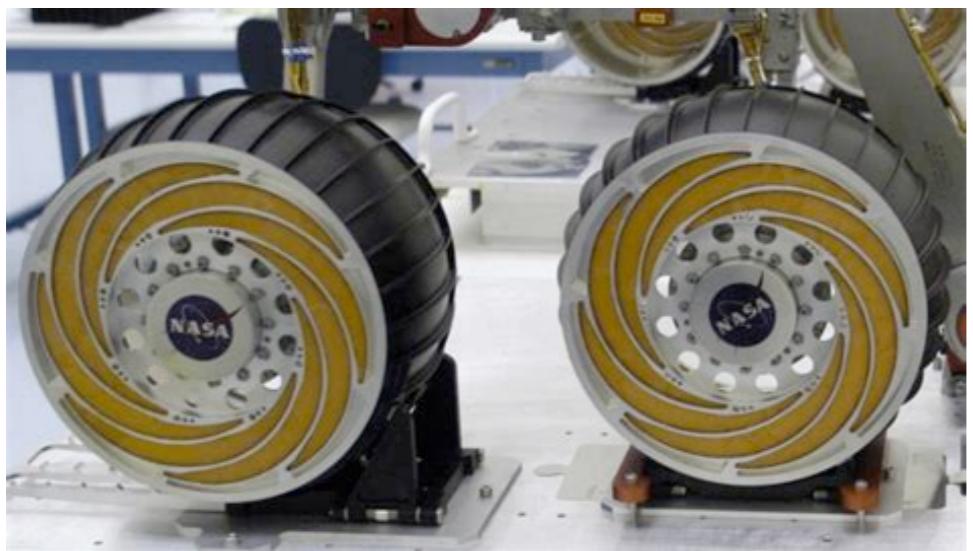
**What are compliant
mechanisms?**

Compliant Mechanisms are Mechanisms That Bend to Achieve Their Desired Motion



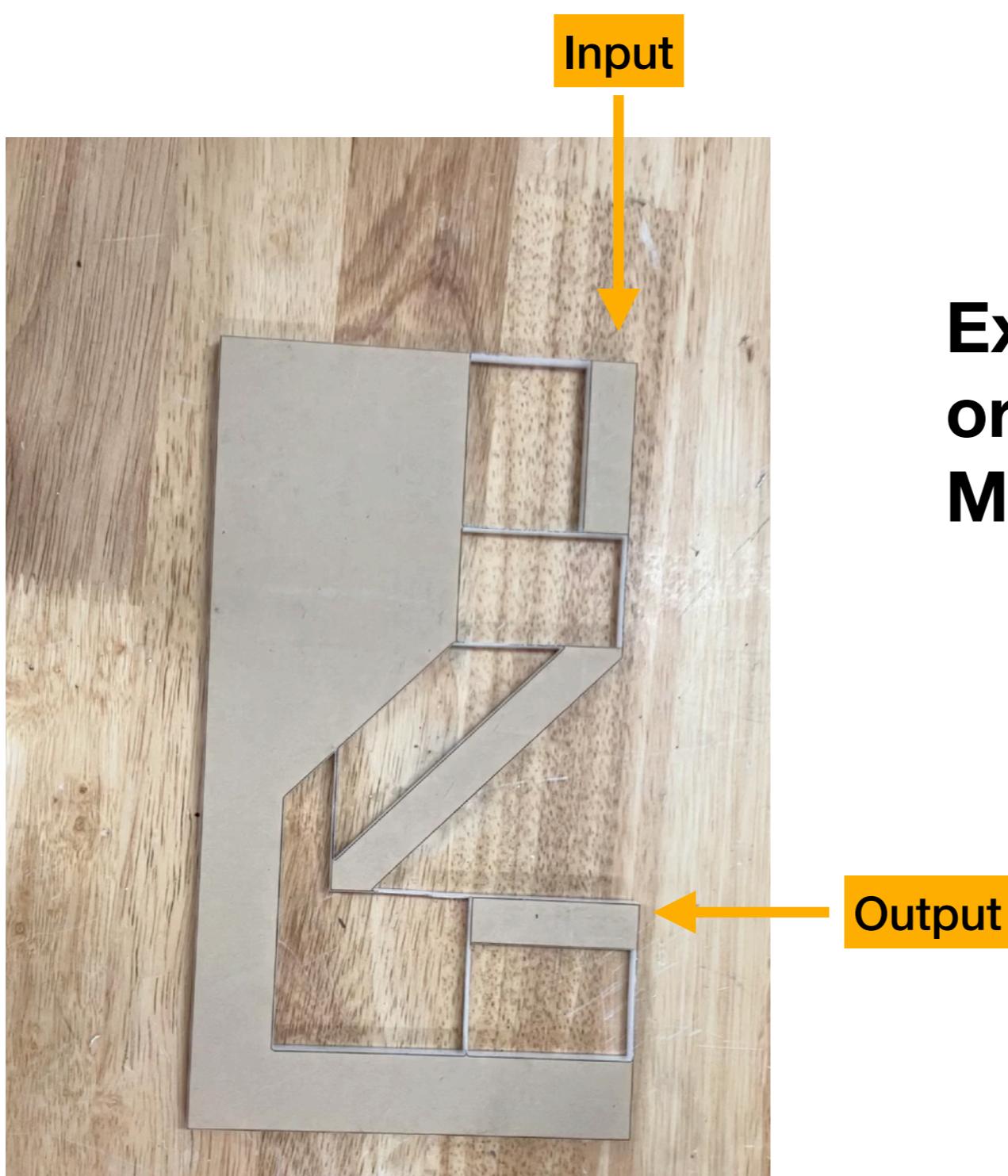
Uses:

- Frictionless rotational motion
- Frictionless linear motion
- Redirecting or transforming motion
- Absorbing shock



Why use compliant mechanisms over traditional rigid-body mechanisms?

- Low-cost, one-piece
- Potentially high-precision
- Zero friction/backlash
- No lubrication needed

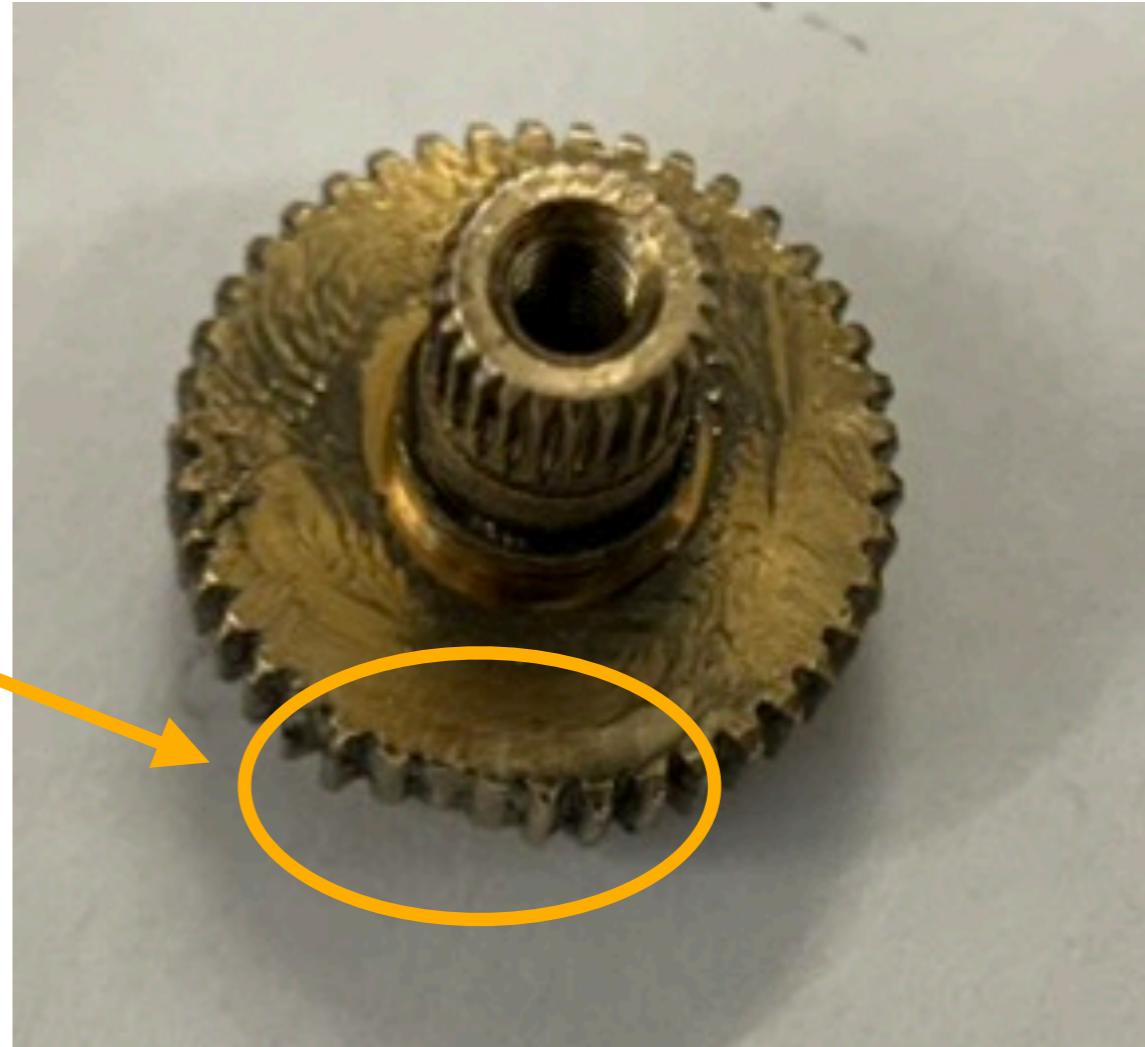
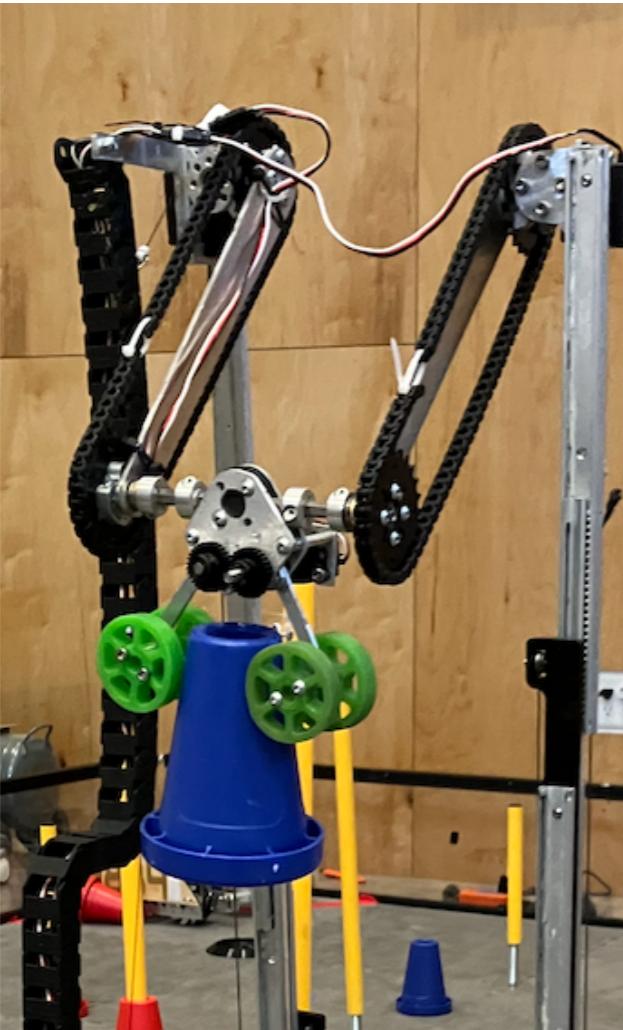


**Example: Redirecting
or Transforming
Motion**

Test Application: Compliant Servo Coupler

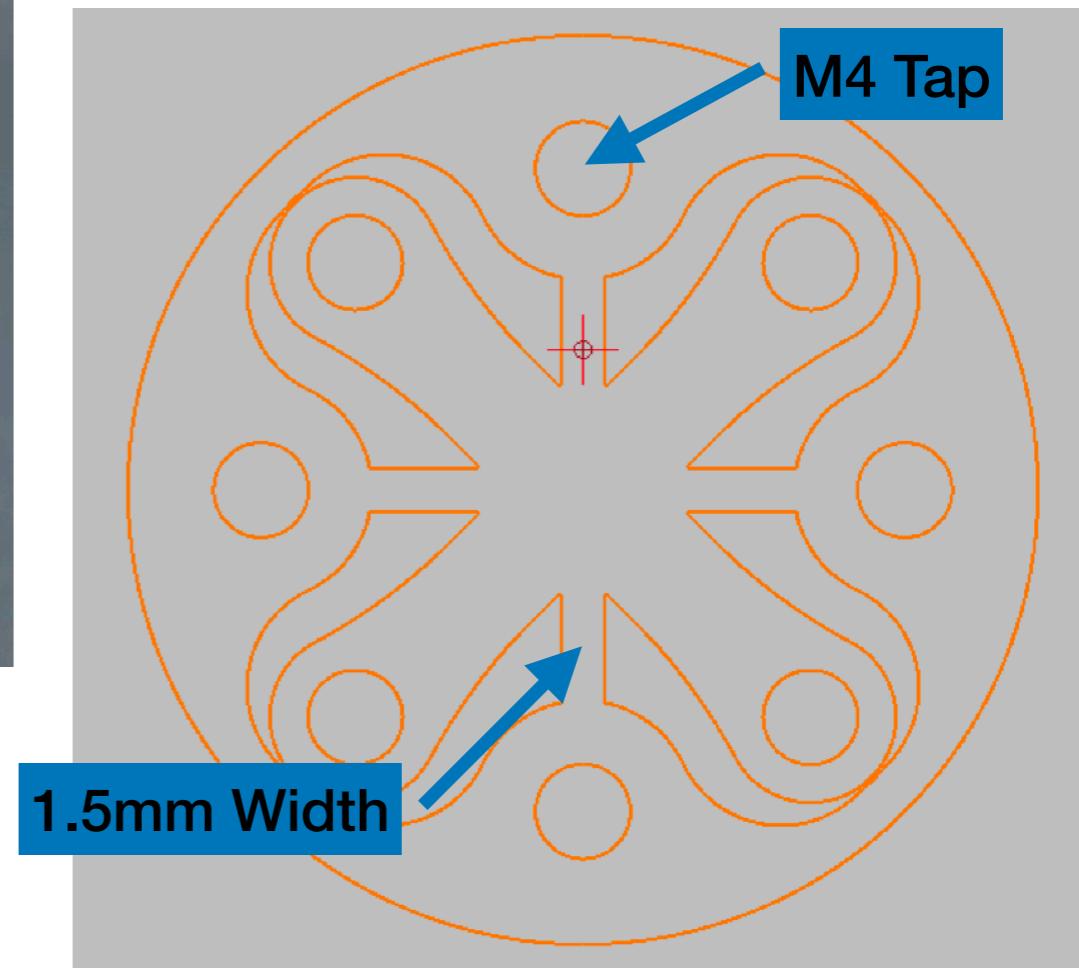
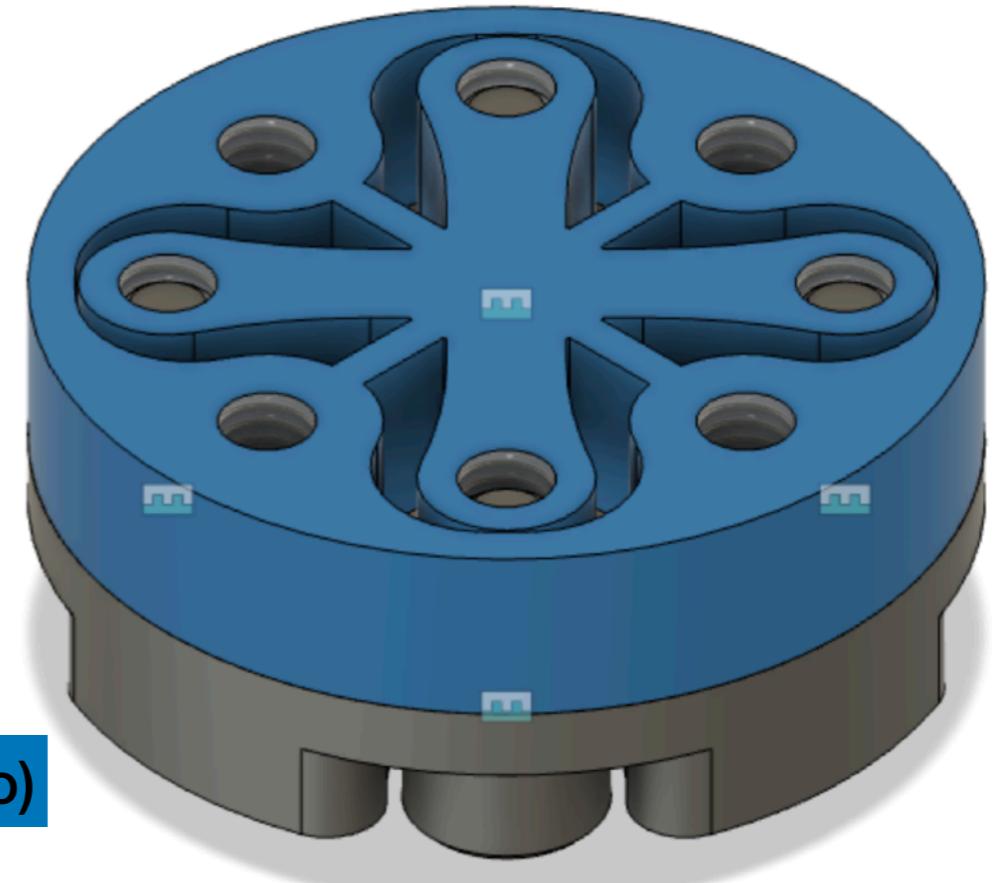
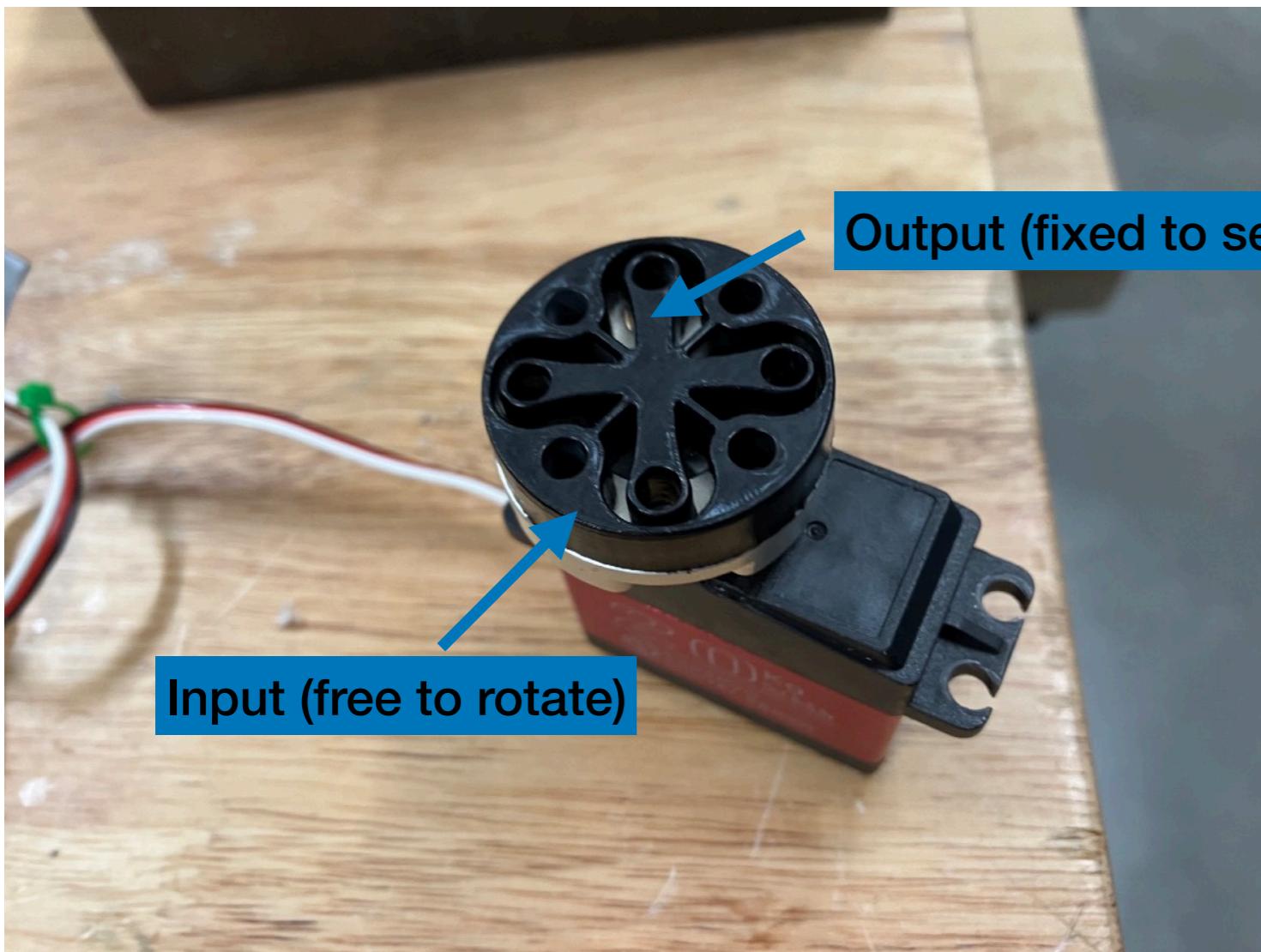
Problem:

- Servo Impact will break servo gears on our FTC robot

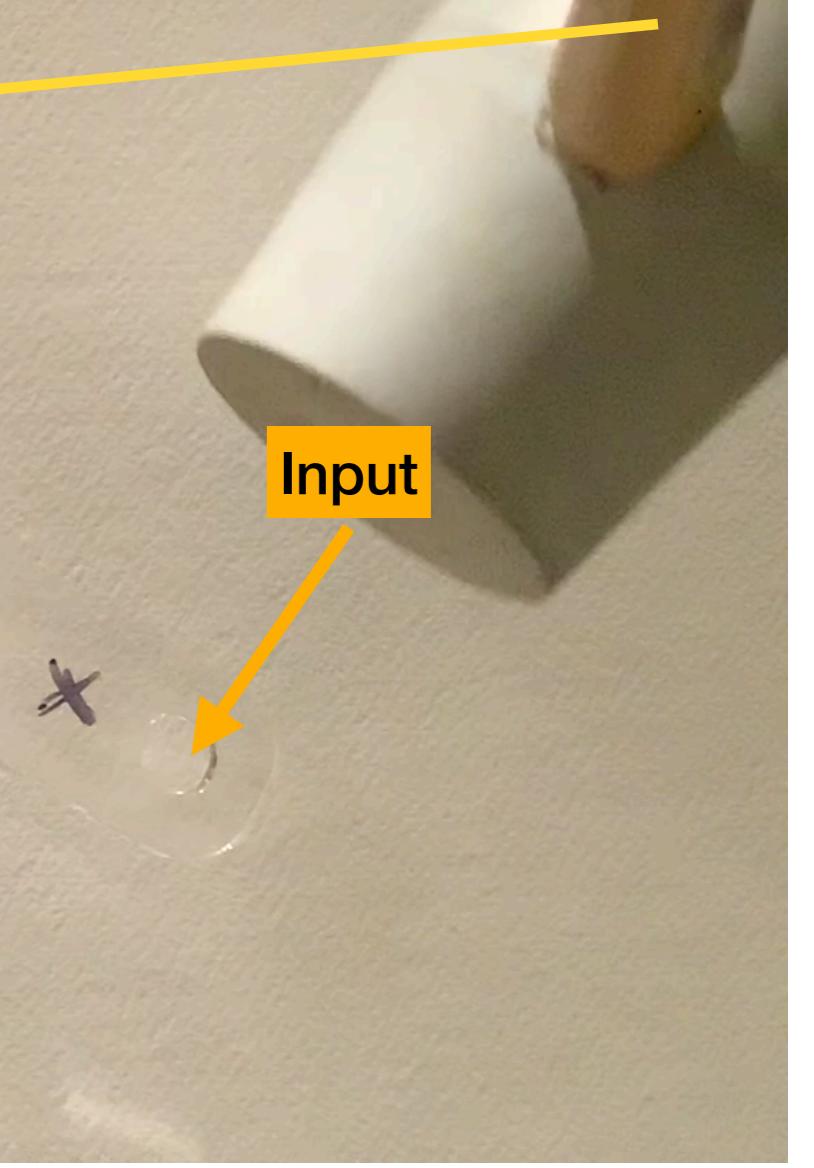
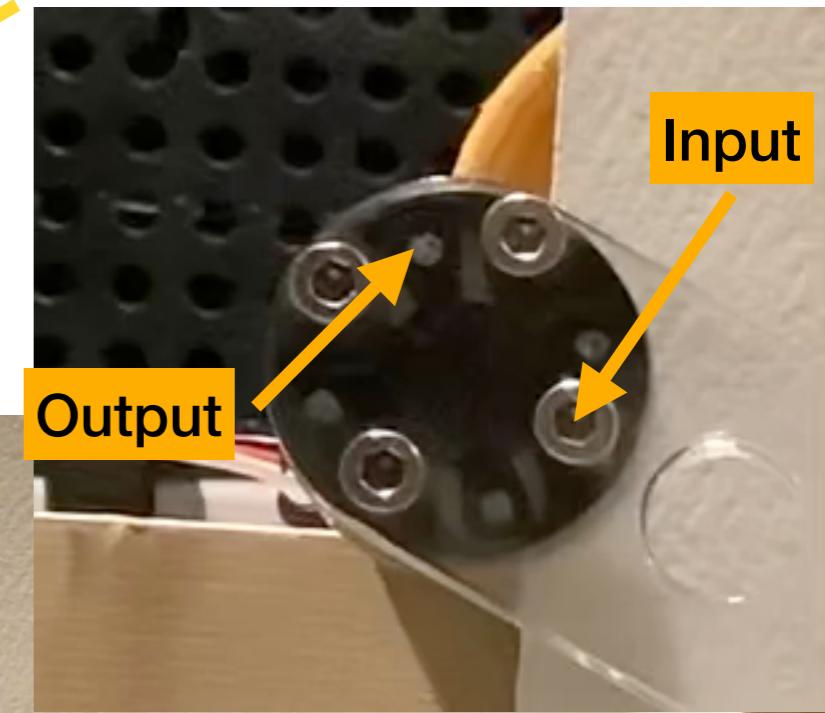
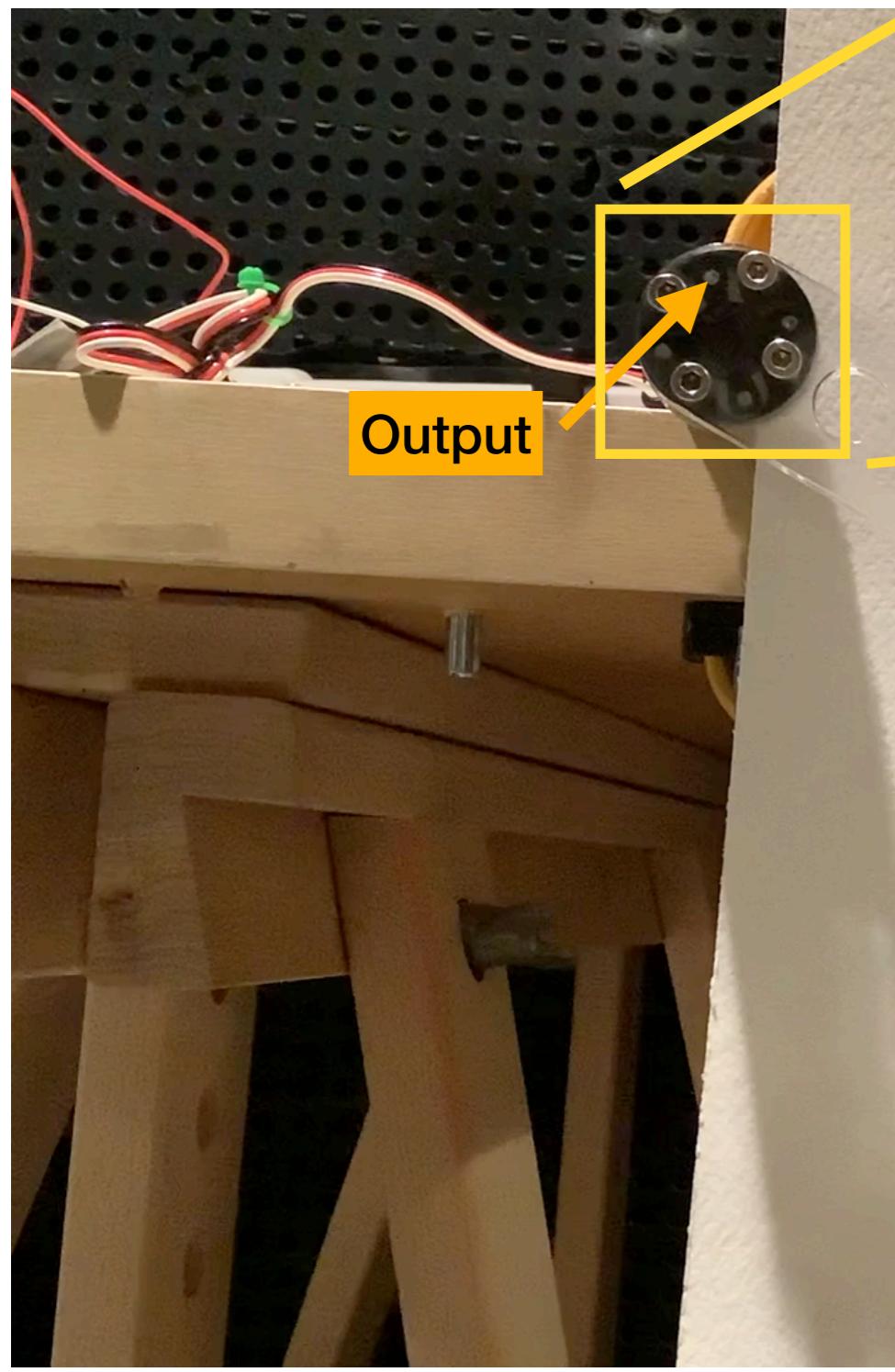


- Servos need to be isolated from sharp loads/impacts

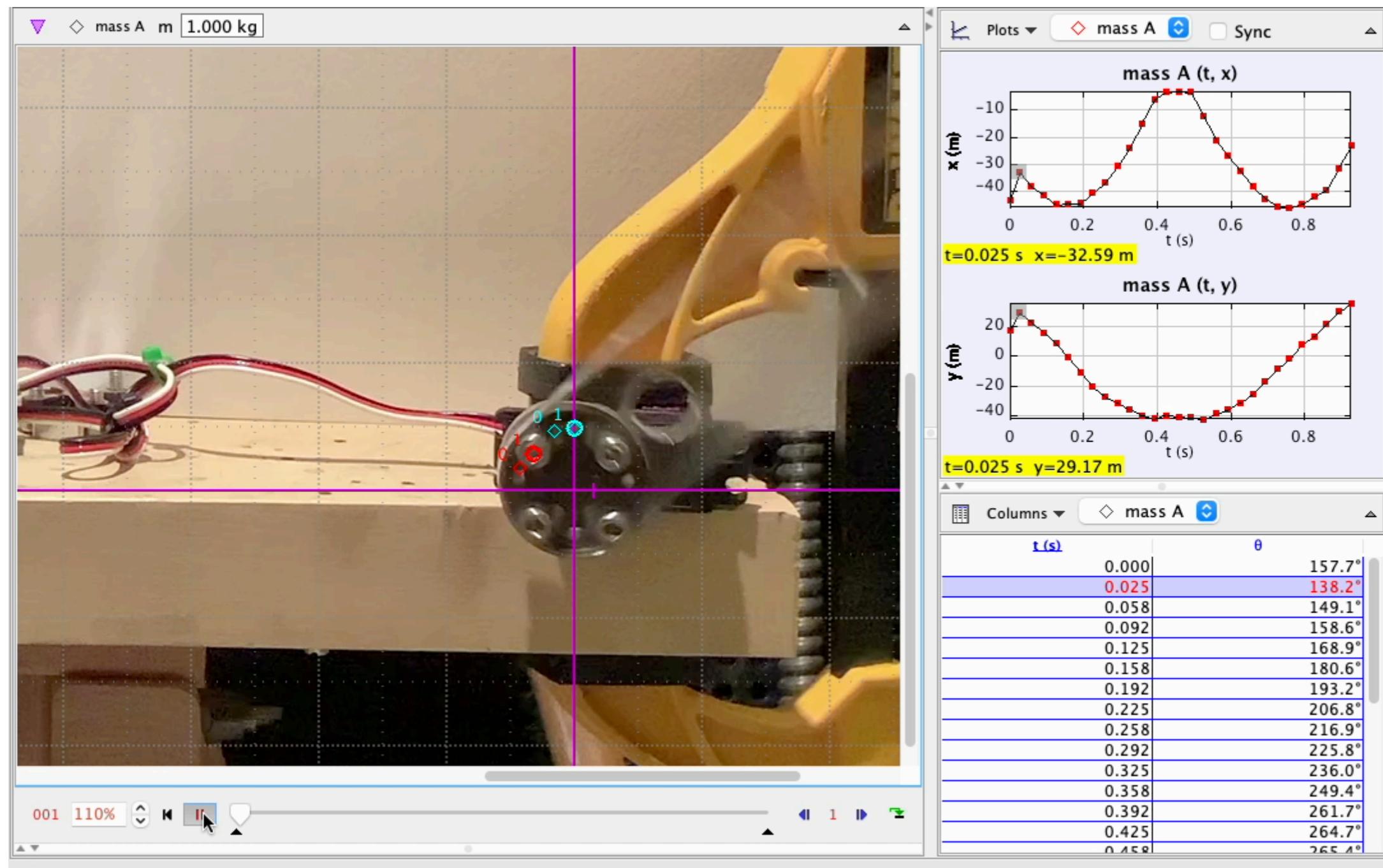
DESIGN



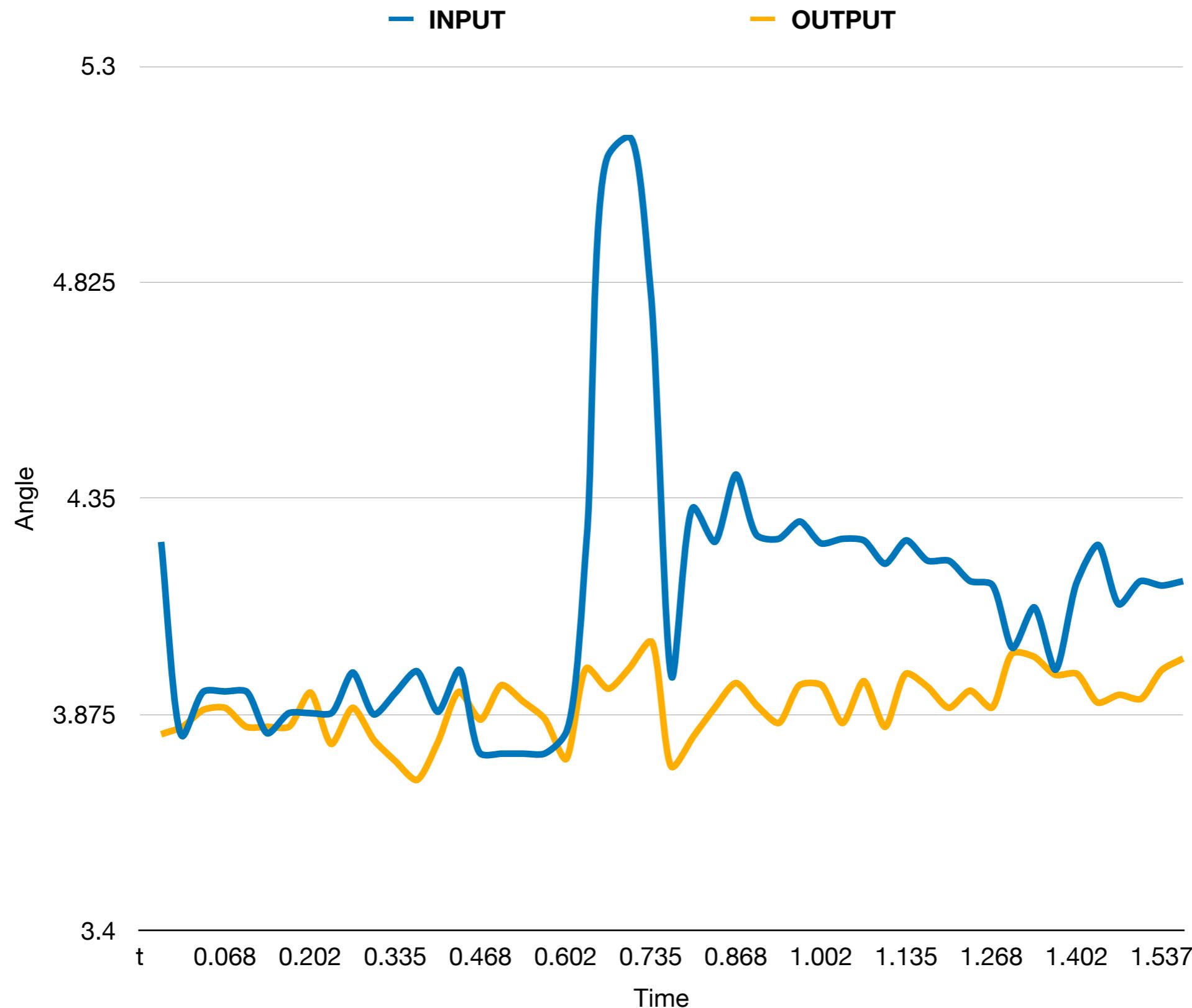
Testing

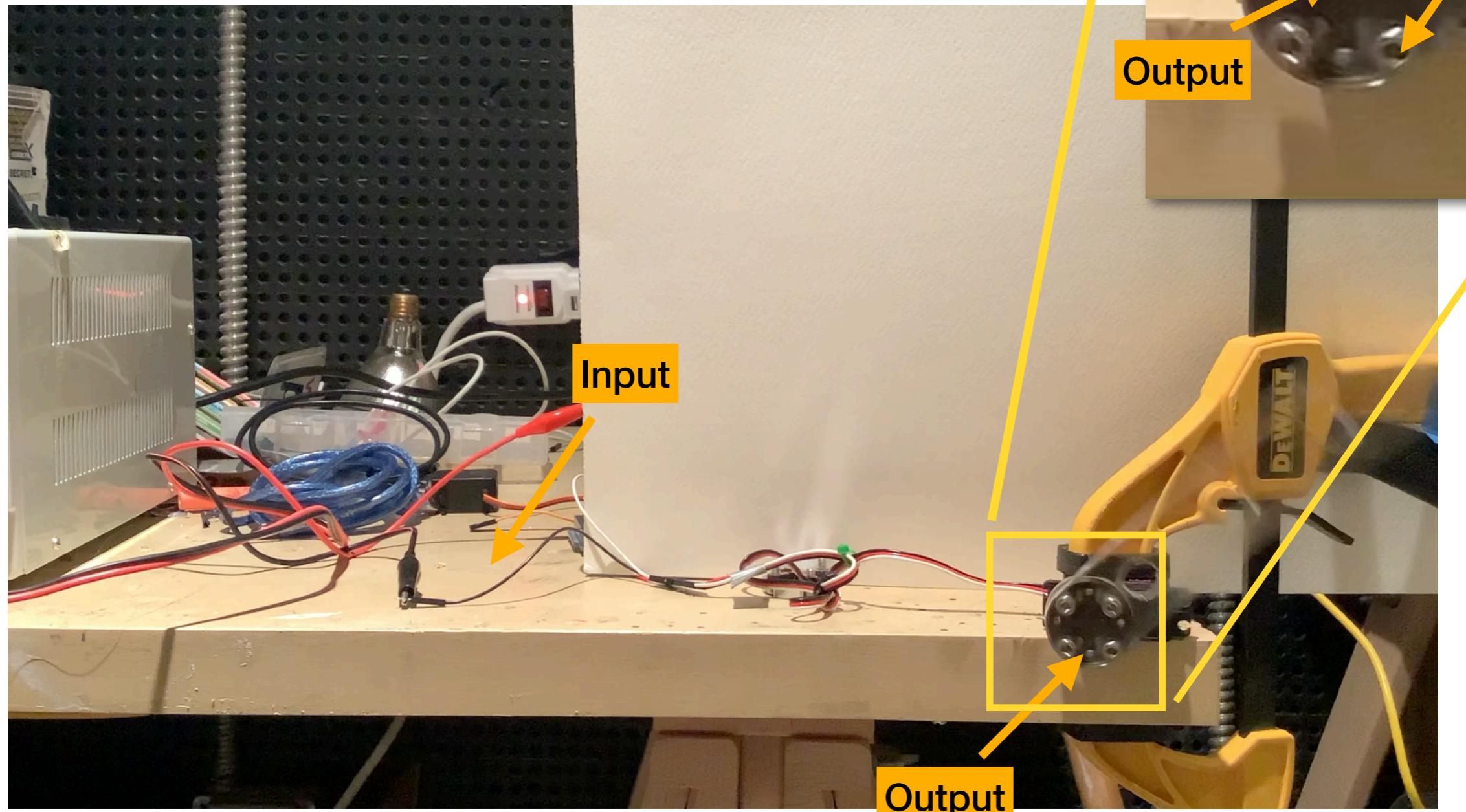


Angle Tracking



ISOLATION

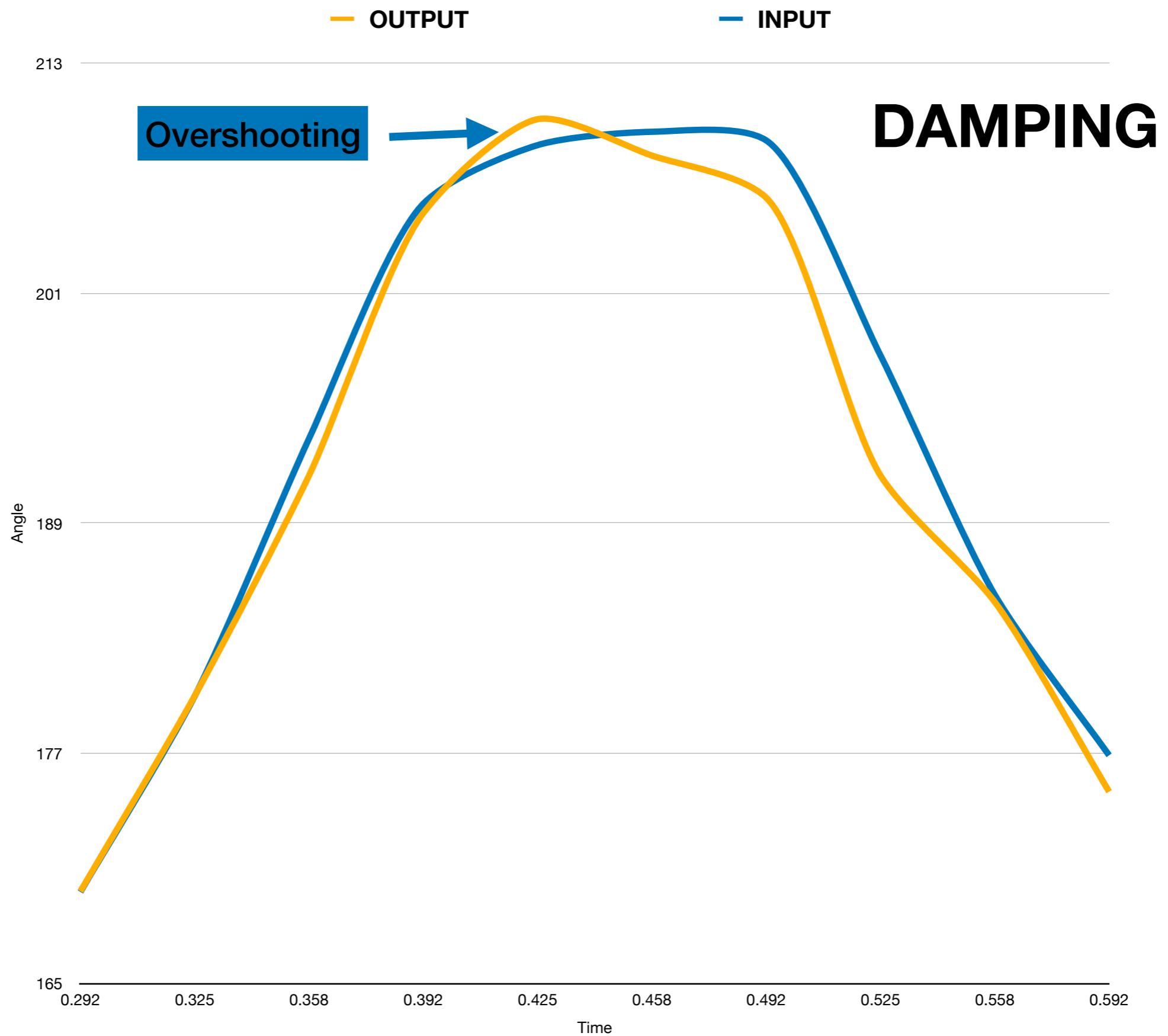




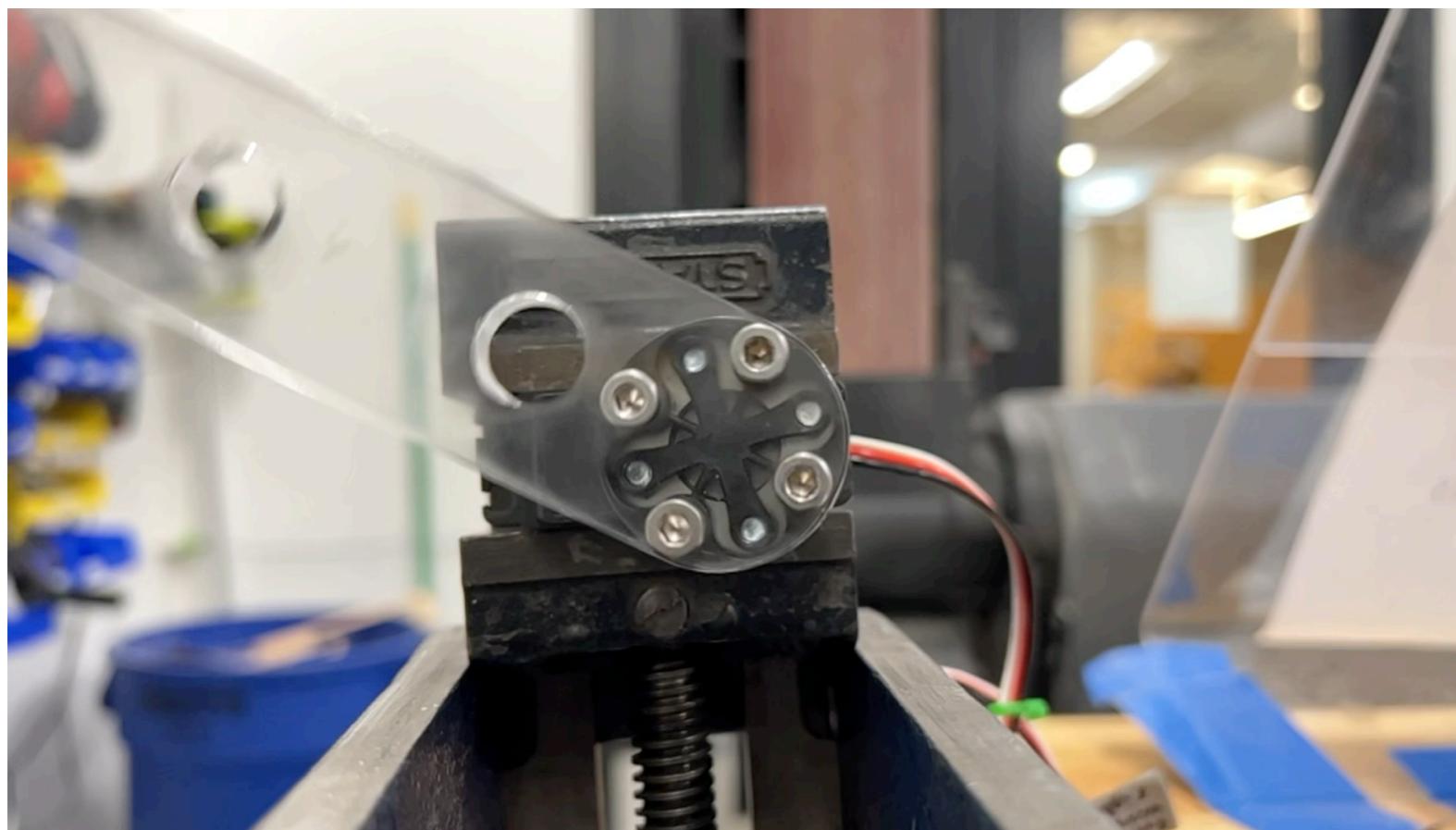
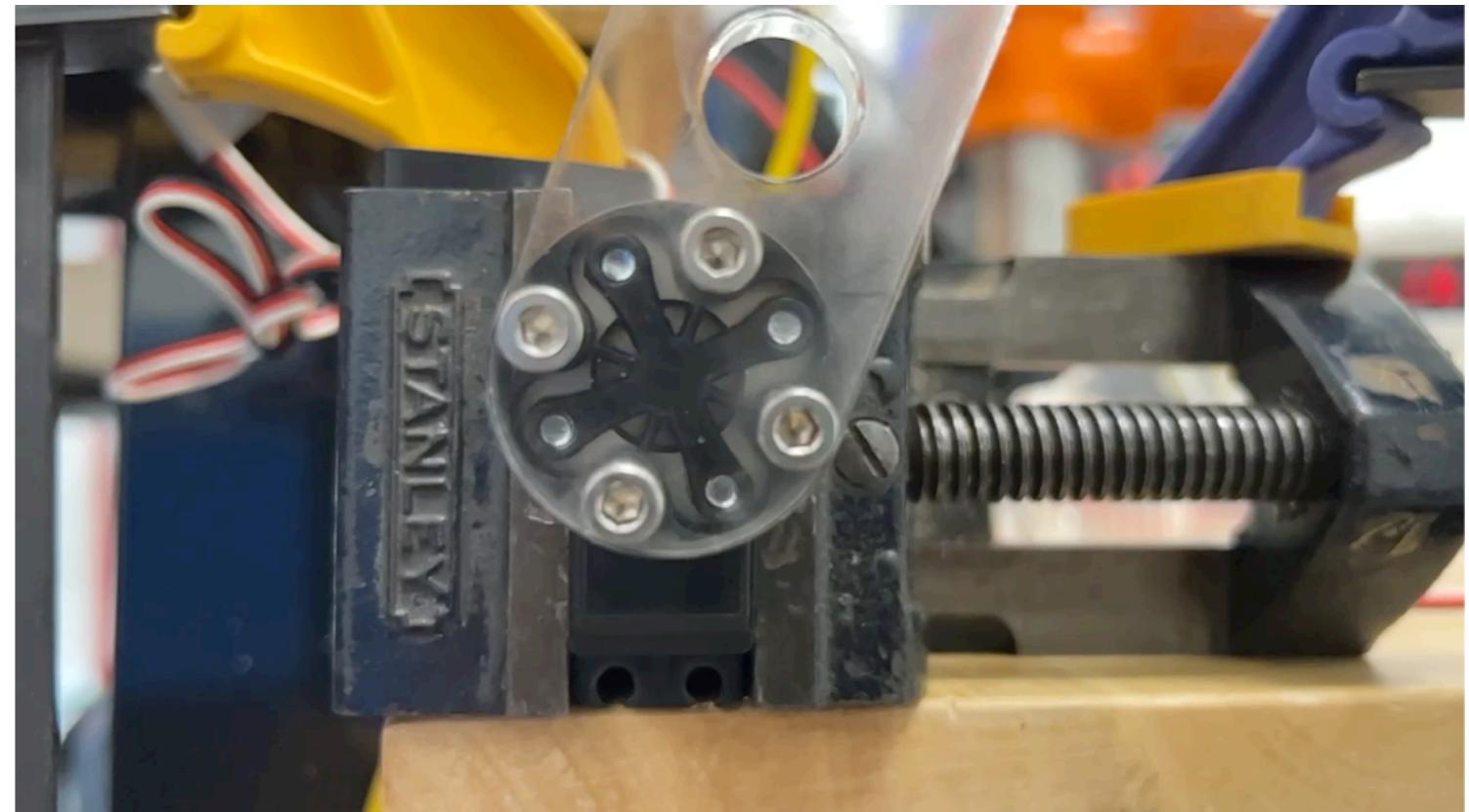
Input

Output

Output



More Testing



Further Work

- Manufacture in steel
- Fully test with force gauge
- Produce multiple of differing stiffnesses

Any Questions?