



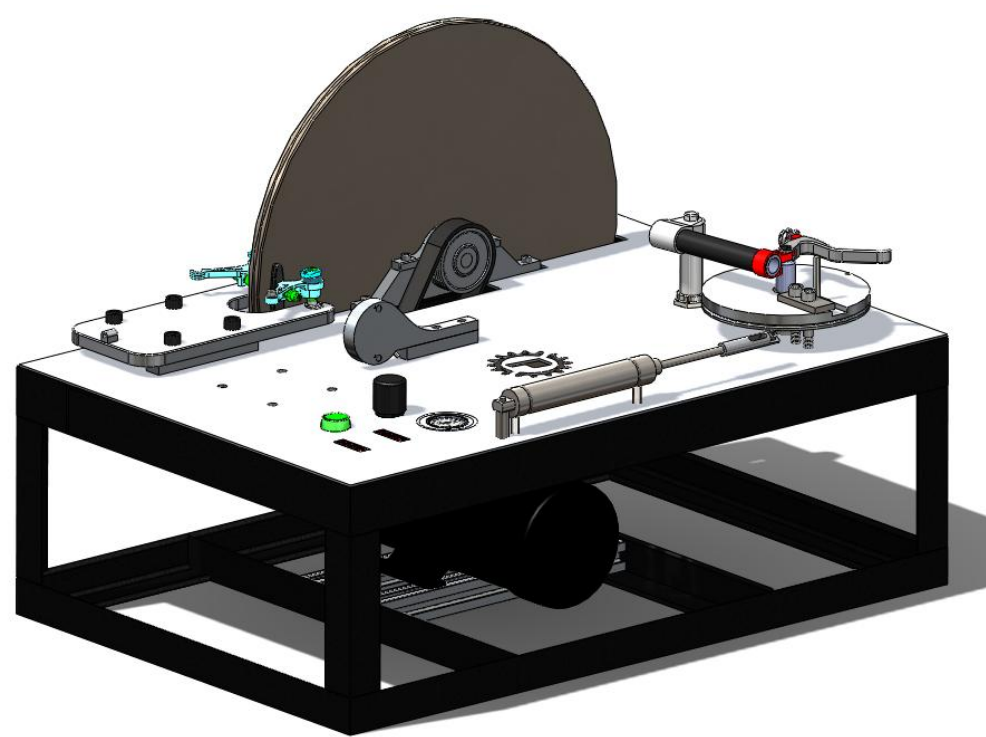
Bicycle Brake Performance Testing Machine

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PROJECT OVERVIEW

The purpose of this project was to test various brake components for the purposes of performance evaluation as well as comparison between different configurations.



The constraints of the project included:

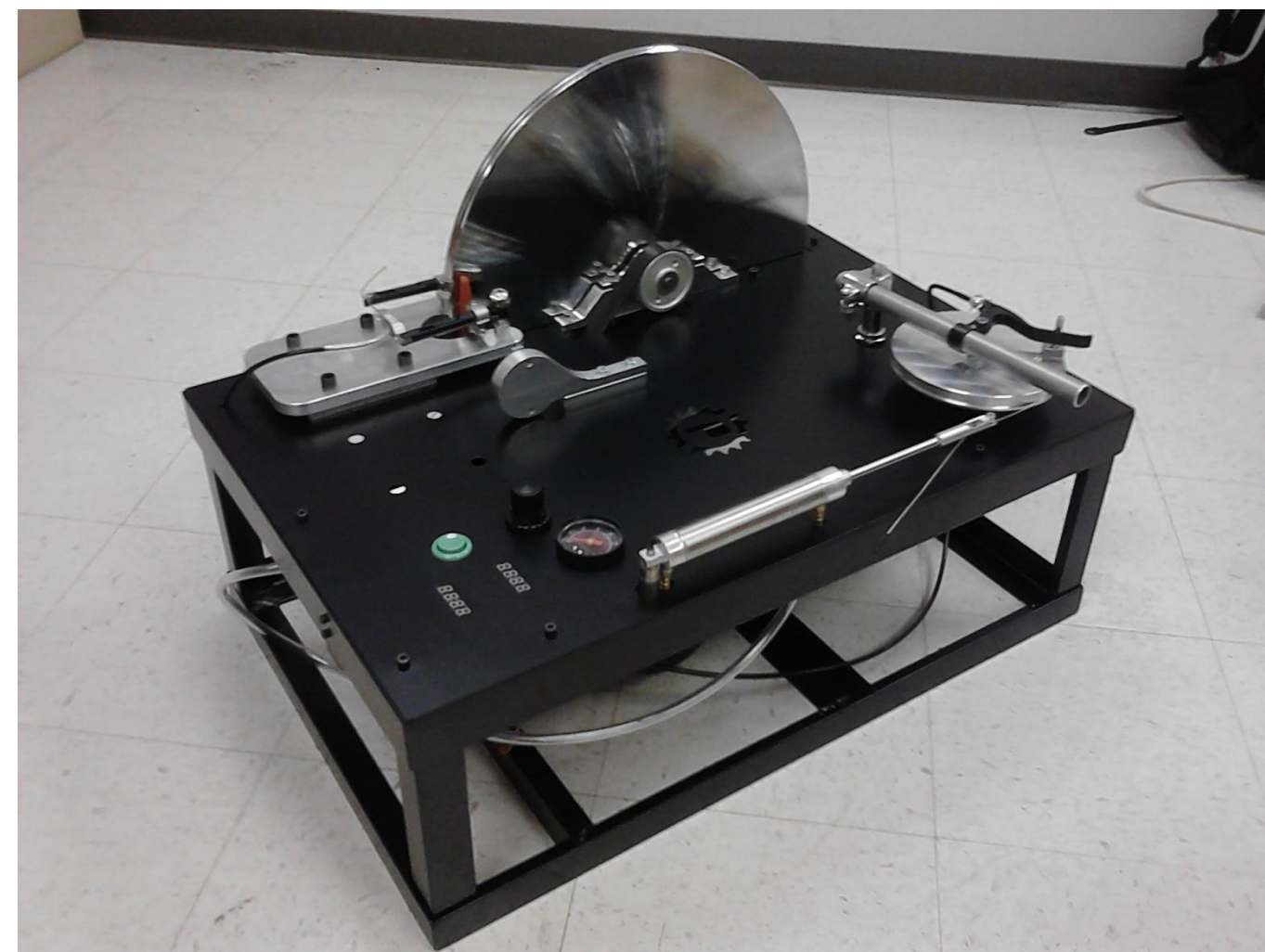
- Measurands must be repeatable to within +/- 5%
- Constant force Application to brake lever

The goal of the project included:

- Design, build, and test a machine that will measure brake system performance while accommodating different brake mounting configurations

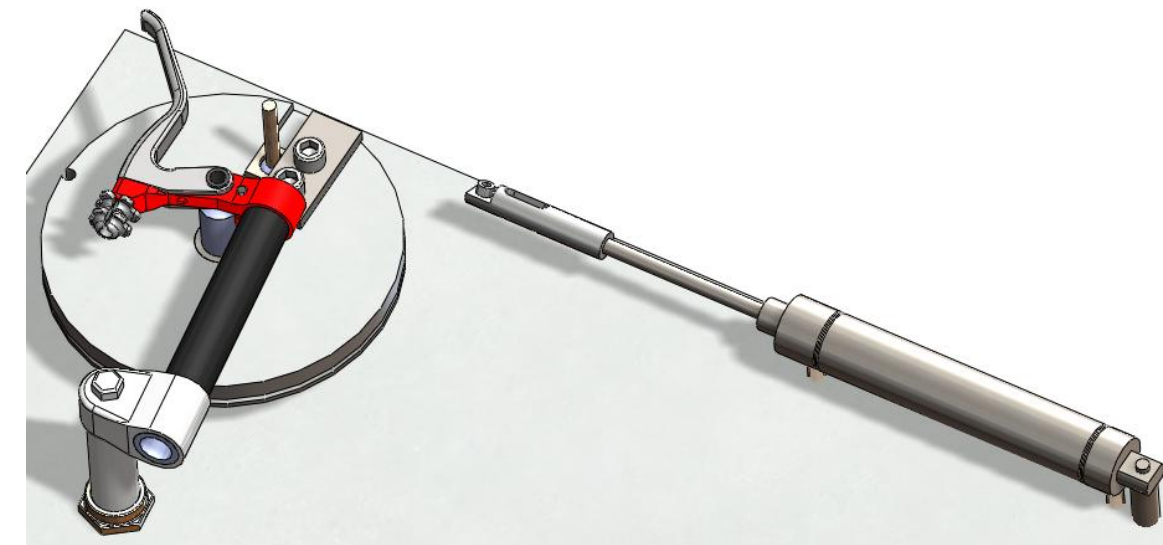
HOW IT WORKS

This machine was designed to implement two types of tests, static and dynamic. For both tests, a known force will be applied to the brake lever by means of compressed air. In the static test the force will be measured by a button load cell and displayed on a LCD screen. The dynamic test will consist of a flywheel that will be spun up to a known RPM and disengage from the motor. The air cylinder will be activated and bring the flywheel to a stop. The LCD will display distance required to stop. The dynamic test will be automated by the Arduino microprocessor.



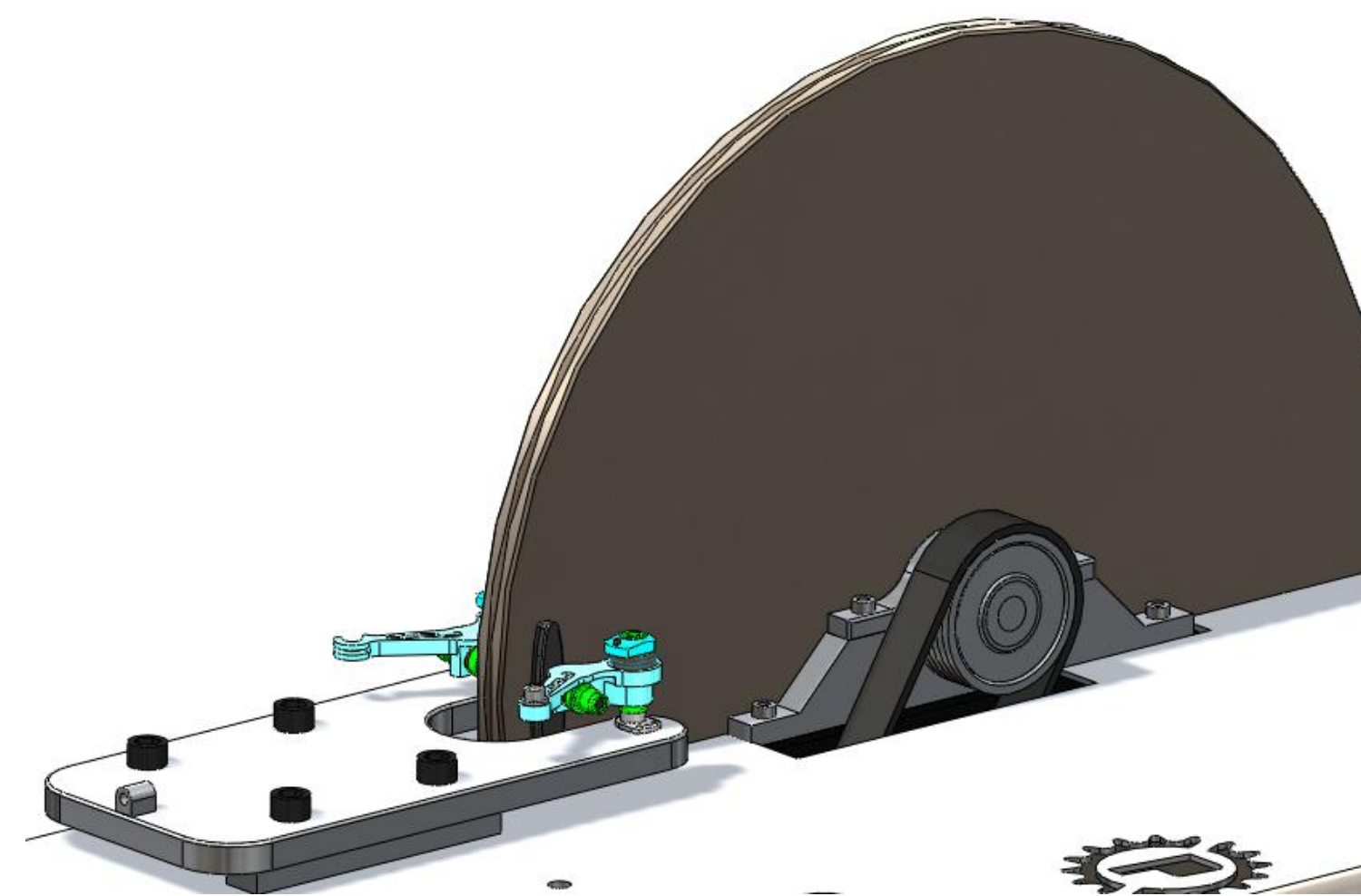
Force actuation

- Force application on lever maintains consistency by means of moment application about the lever hinge.



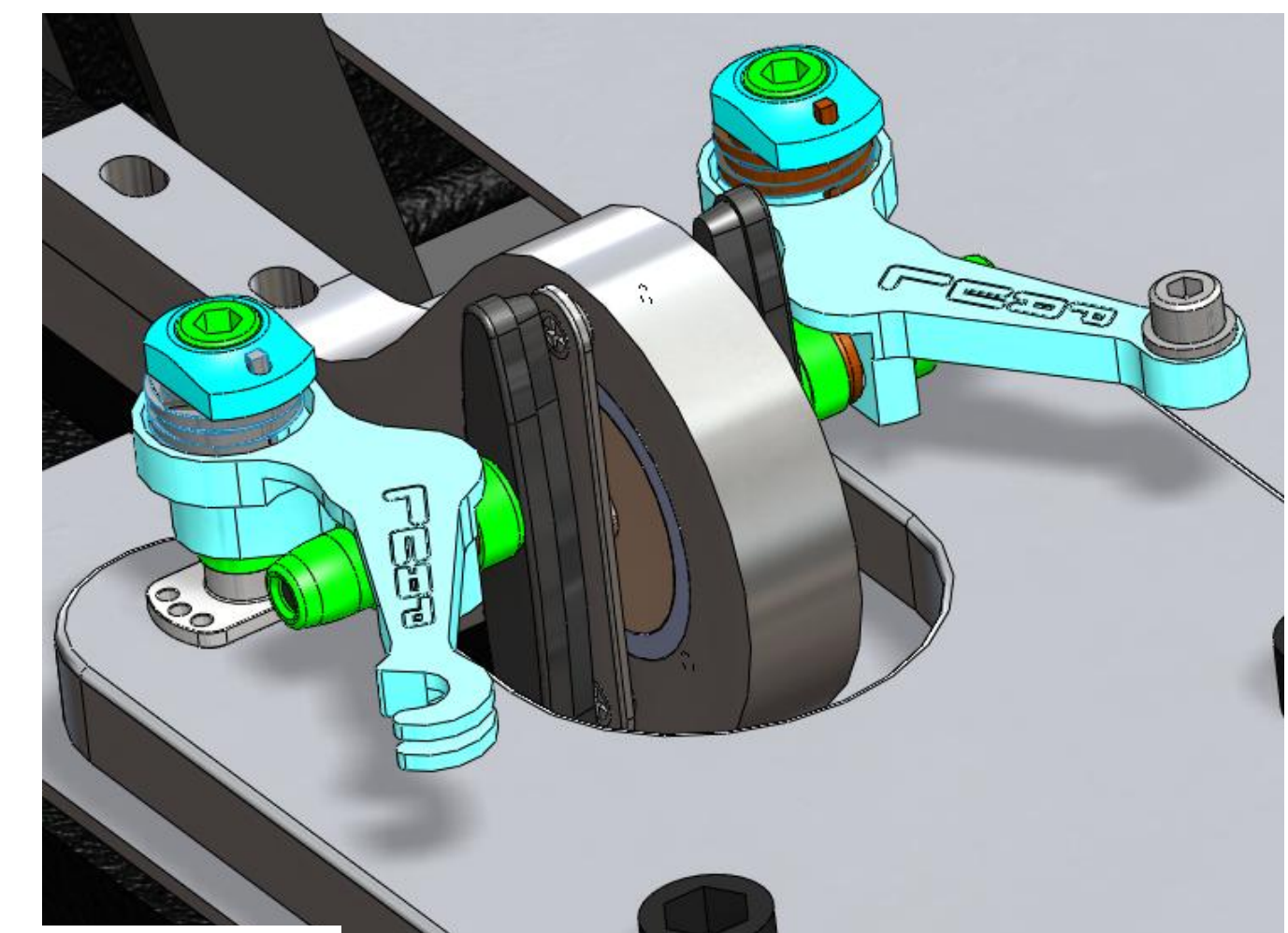
DYNAMIC TEST

- A 45lb flywheel is spun to known rpm by means of a DC motor. Flywheel rpm monitored via optical tachometer and controlled via arduino.
- Concurrence between motor kill and brake lever actuation.
- Displacement of flywheel required to come to rest measured and displayed on LCD screen.



STATIC TEST

- Constant force Applied to brake lever.
- Force transferred via cable to brake calipers
- Force output at calipers measured by means of button load cell positioned between brake pads.
- Resulting force measurement displayed on LCD screen.



PROJECT OUTLOOK

The Bicycle Brake Performance Testing Machine is able to produce repeatable testing results for both the static and the dynamic test. In the future this machine will be an integral part of the testing of new brake systems.