Inlet Guide Vane Testing System

Team 510 | Thiago Todesco | Hunter Dabbs | Tye Fountain | Joseph Bechara | Sponsor: Yiwei Liu | Adviser: Dr. Shayne McConomy

FAMU-FSU Engineering

Objective

Develop an apparatus that tests the functionality of four different Danfoss Inlet Guide Vane (IGVs), prompting the operator with a pass or fail message.

Background

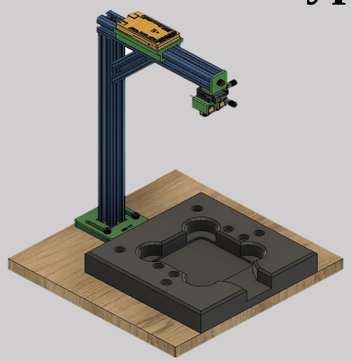
Goal:
Develop a reliable testing system to check the functionality of the IGV.

Assumptions

- Workspace won't change
- Production ready IGV
- Operator able to lift 50 lbs

Current State of Design

Current Prototype

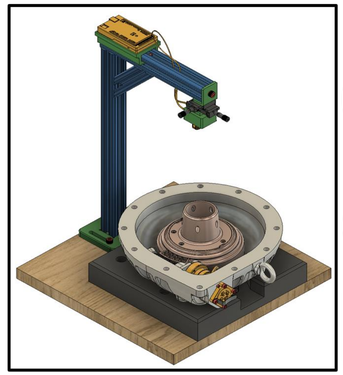


Main Components

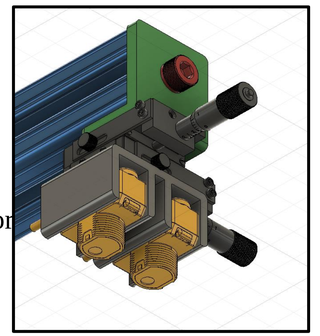
- Danfoss's Base Plate
- 80/20 Al Beams
- Laser Sensors
- Hall Sensor
- 2-Axis Displacement Plate
- Monitor
- Electrical Housing
- Arduino

How it Works

1. Place IGV in Danfoss's baseplate and connect the IGV motor to the testing device.



2. The operator presses the start button.



3. Senses movement of IGV blades through the laser transmitter and receiver and movement of the ball indicator location through magnetic flux sensor

4. Once the test concludes, the operator will receive a message through the monitor's screen indicating either a pass or fail, along with the specific type of IGV that was tested.

5. IGV is removed from the testing fixture and testing concludes.

Key Targets

- Indicator ball moves
- Open/Close IGV
- Supply power to IGV

Challenges

- Contain lasers
- Laser alignment
- Color sensor range/accuracy

Future Work

- Integrate barcode scanner
- Reference IGV's code instead of color