

N F P A

Fluid Power

VEHICLE

Challenge



NFPA
Education and
Technology
Foundation

Final Presentation
Milwaukee School of Engineering
Advisor: Dr. Luis A. Rodriguez
April 26th, 2023



Agenda

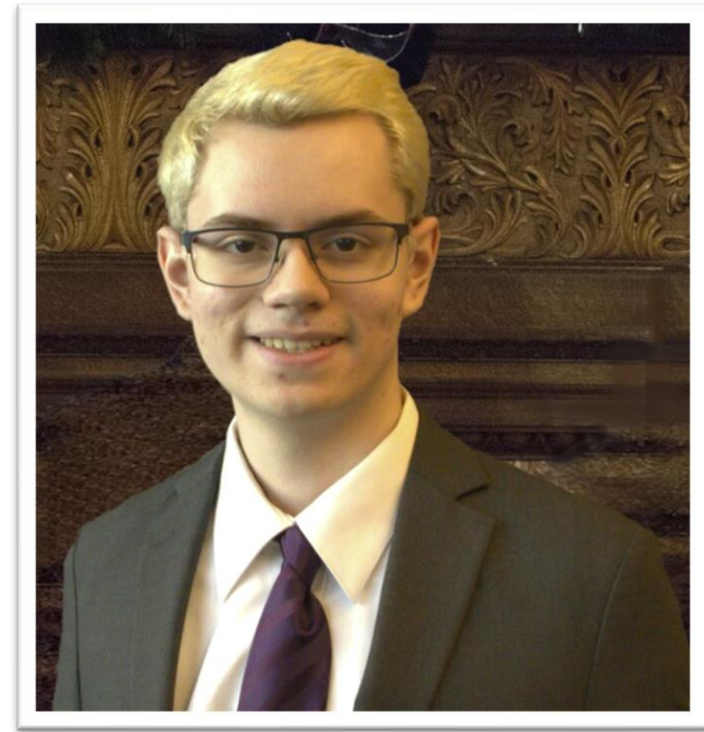
Informational Only



- Team Re-Introductions
- Midway Recap/Changes Since
- Vehicle construction
- Vehicle testing
- Final vehicle
- Lessons learned

Brandon Janes

- Junior at MSOE
- Mechanical Engineering
- Fluid Power Club
Secretary for '23-'24



Daniel Cantu

- Sophomore at MSOE
- Mechanical Engineering Major
- Fluid Power Club Vice President for '23-'24



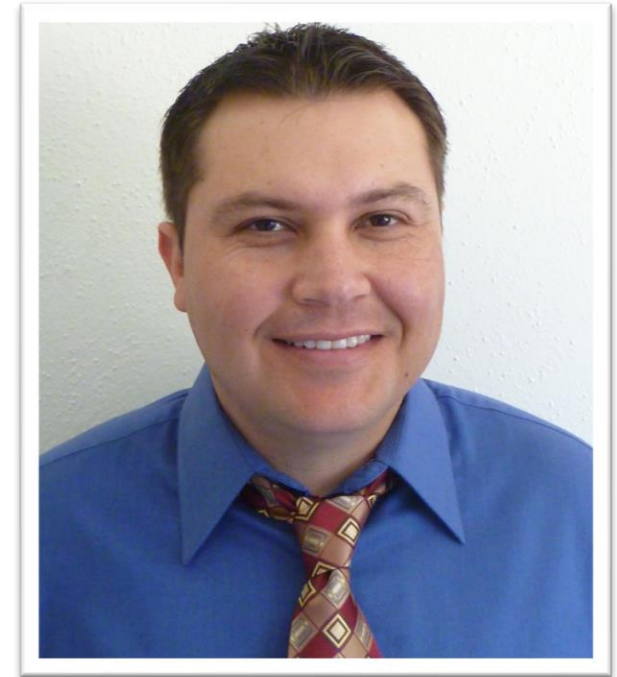
Jeff Kaas

- Freshman at MSOE
- Management Major
 - Technical Sales Minor
- Fluid Power Club President for '23-'24
- Incoming Sales Intern at IFP Motion Solutions
- Taking CFPHS test on May 4th
- Creator of FPVC Community Discord server (Email me to join!)



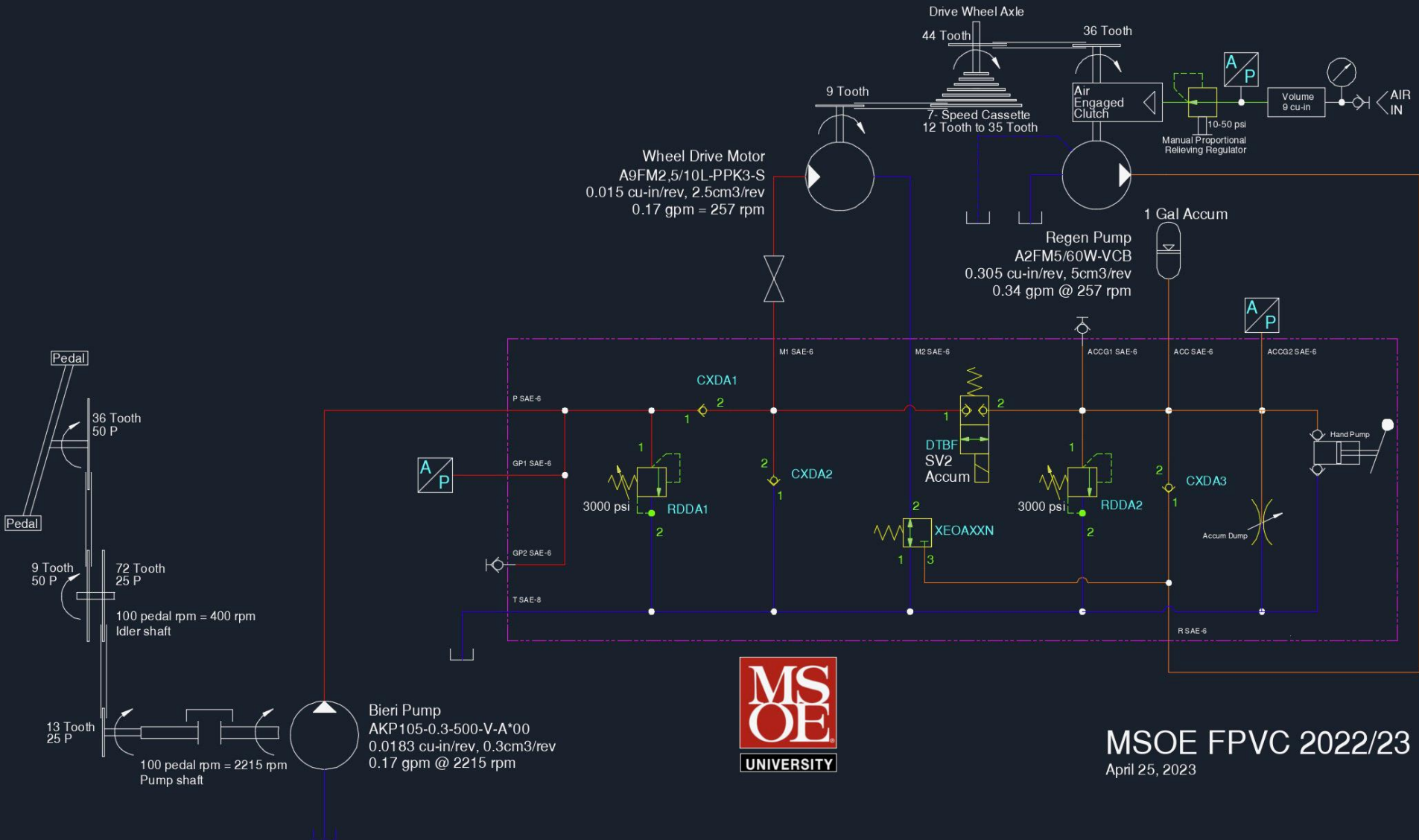
Dr. Luis A. Rodriguez

- Associate Professor
@ MSOE
 - Mechanical
Engineering
- FPVC and Fluid
Power Club Advisor



Midway Recap/Changes

Revised Schematic



Vehicle Construction

Final Major Components



- Bieri Micro-Piston Pump
- SteelHead Composite Accumulator
- Rexroth A9FM2,5 (2.5cc/rev) [Drive Motor]
- Rexroth A2FM5 (5cc/rev) [Regen Motor]
- Pneumatic Clutch
- Exor Controls Box

Vehicle Construction

Rear Bosch Assembly



- Benefits
 - Ease of mounting
 - Versatility
 - Strength
 - Availability of Bosch parts



Vehicle Testing

- Biggest issue – Chains
 - Drive chain replaced numerous times
- Regenerative braking
- Use of test points / gauges
- Accumulator pre-charge

Final Vehicle





Final Vehicle (cont.)

- Accomplish everything we wanted?
 - Yes, but improvements to be made
- Accomplish project objectives outlined in Midway?
 - A design that takes a safe approach to solve the required needs of the project while keeping costs and ease of manufacturing in mind.
 - Our main goal is to create a simple/reliable bike that will perform the basic functions.
- Confident/changes in race goals
 - Efficiency race discovery (accumulator solenoid)
 - Sprint race (torque issue)



Lessons Learned

- Frame choice
- Experience of non-senior design
 - Non-academic project
- Personal Testimonies

Thank You!

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