

N F P A

Fluid Power

VEHICLE

Challenge



NFPA
Education and
Technology
Foundation

FINAL PRESENTATION
The SHAARE Group - Texas A&M
Team Advisor - Brian Tritle
Thursday, April 28, 2021



Meet the SHAARE Group!



Arden Sinclair
TAMU '22



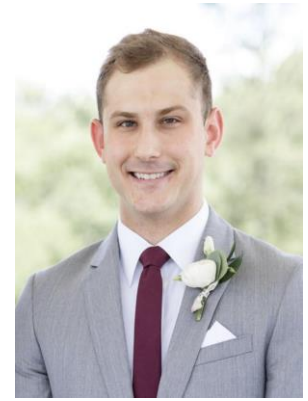
Henry Harshfield
TAMU '22



Aren Davis
TAMU '22



Sebastian Salazar
TAMU '22



Rhett Lee
TAMU '22

Midterm Review Overview

Design Objectives

- Satisfy customer requirements
- Create a fully functional vehicle with no leaks
- Compete in Colorado competition

Vehicle Design Features

- Stable and spacious tricycle frame
- Custom three gallon reservoir
- Maximize use of space for compact design

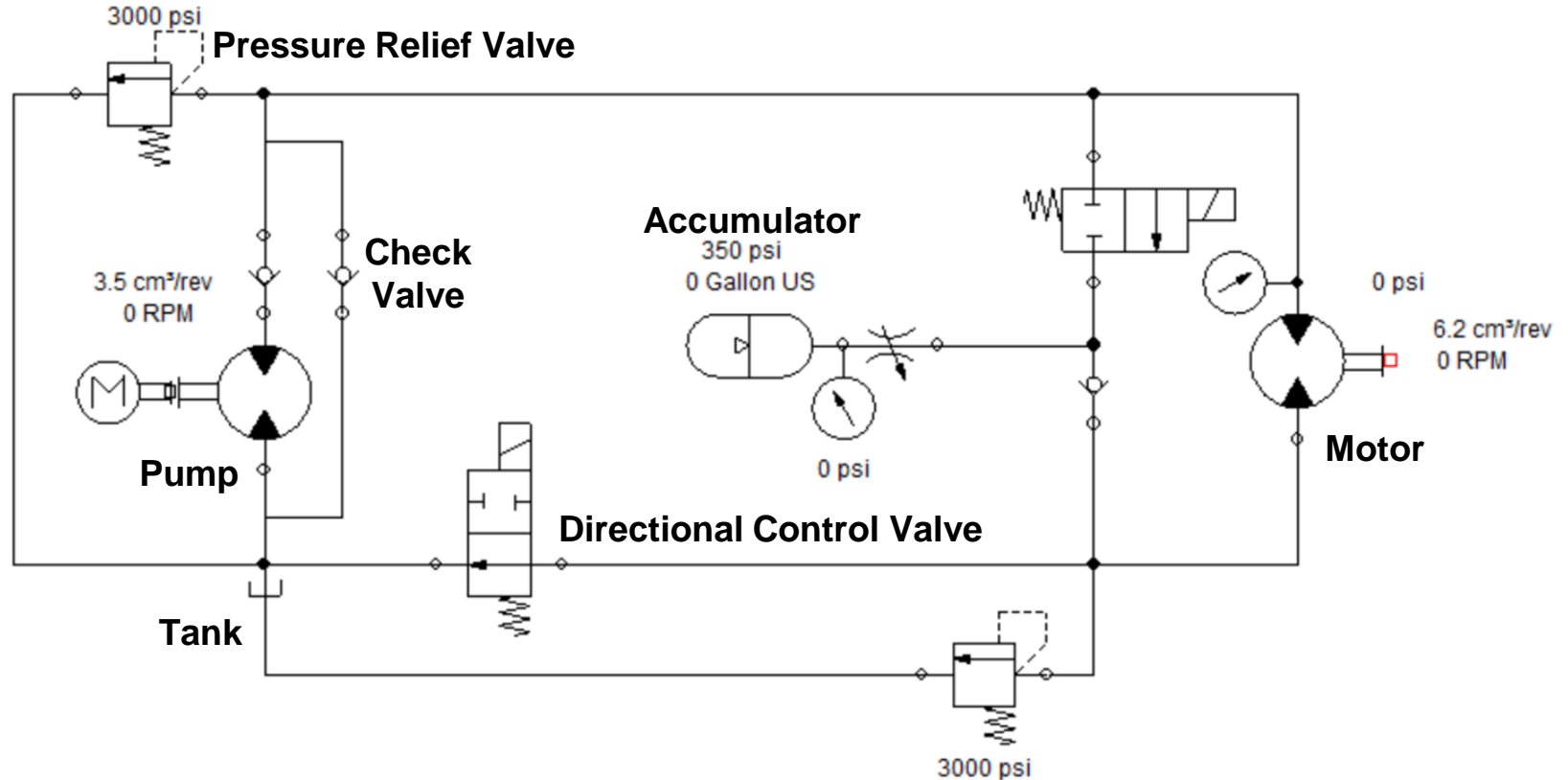
Fluid Power Circuit Objectives

- Implement five operating modes
- Construct the circuit around the pump and motor
- Minimize the number of valves and hoses

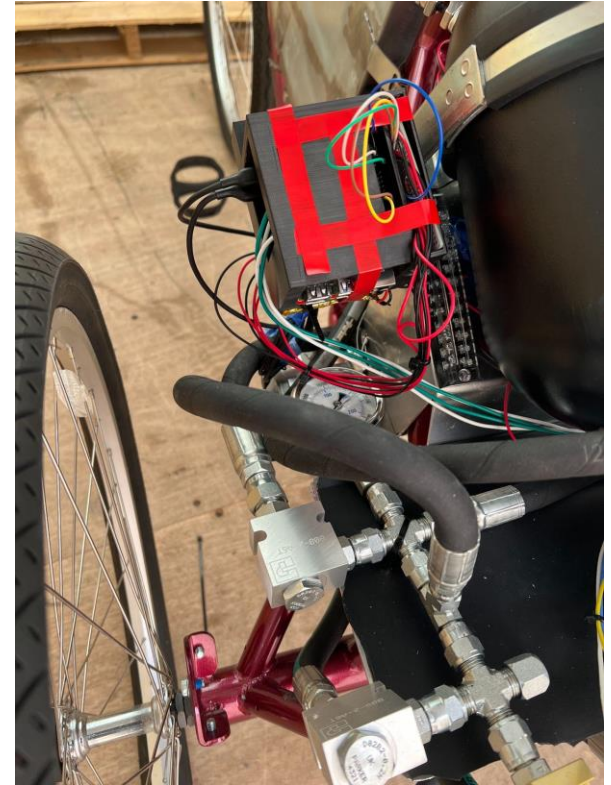
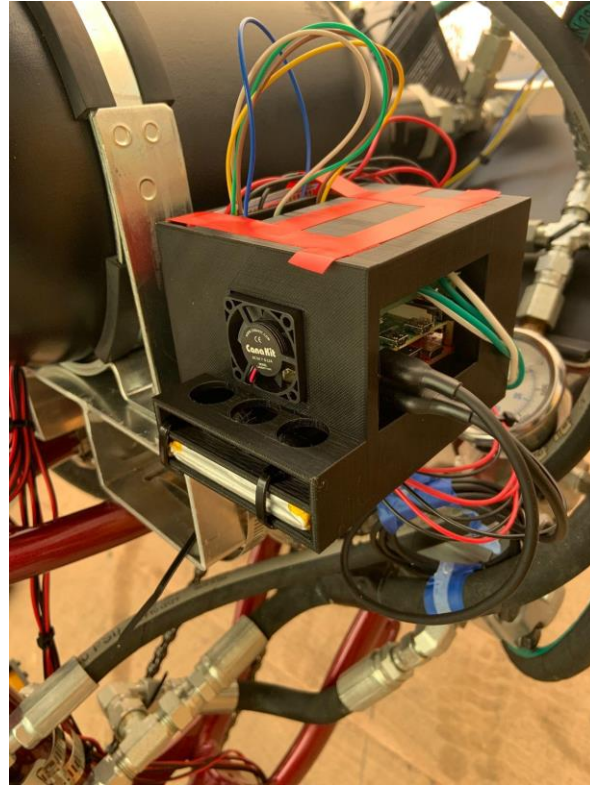
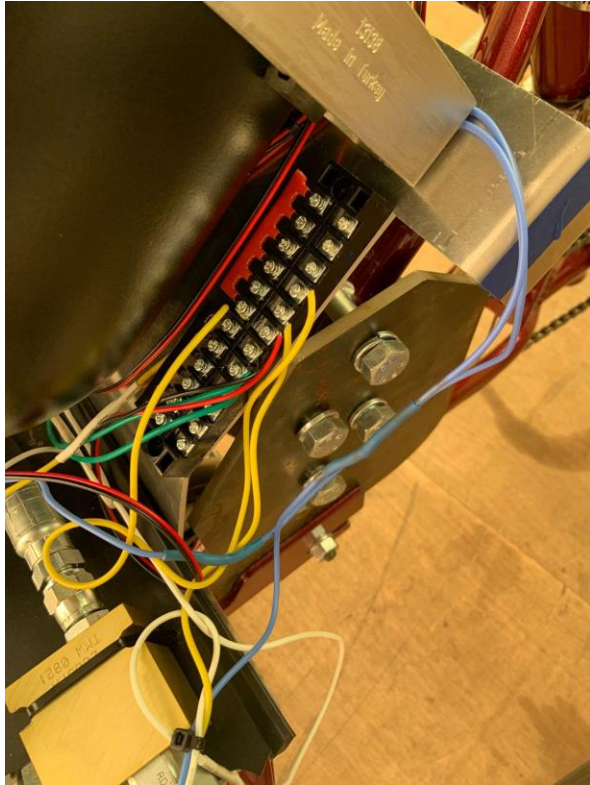
Hardware Selection

- Gear Motor
- Check Valve
- Relief Valve
- Needle Valve
- Raspberry Pi

Midterm Review Overview



Electronic Circuit



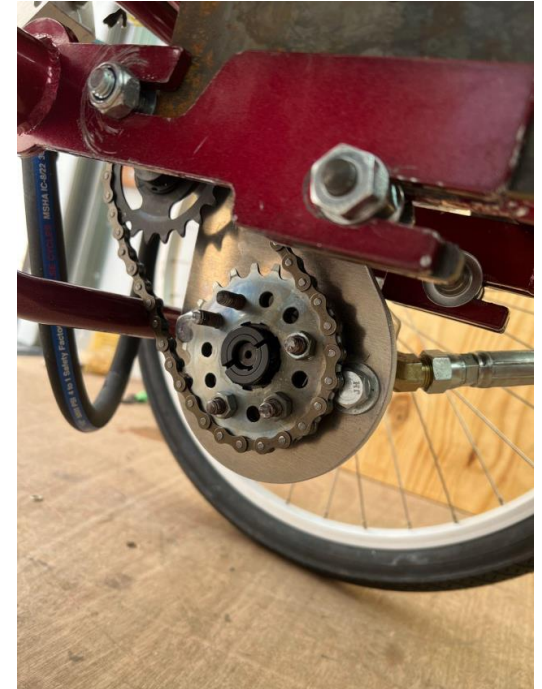
Electronic Circuit



Vehicle Construction - Reservoir



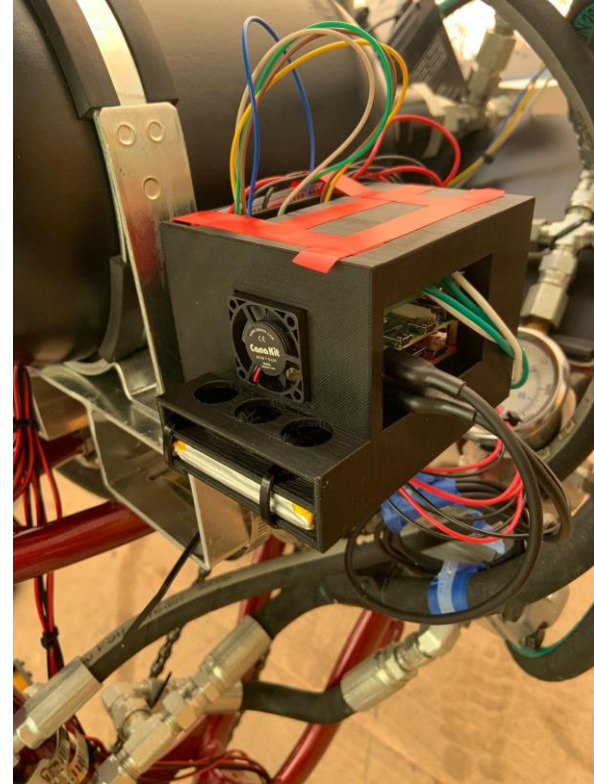
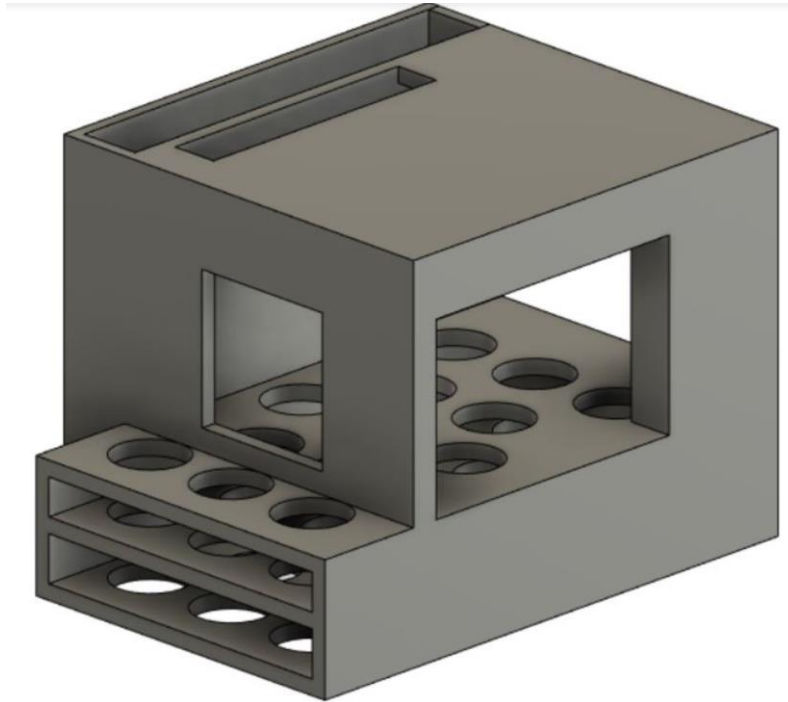
Vehicle Construction- Mounting Bracket



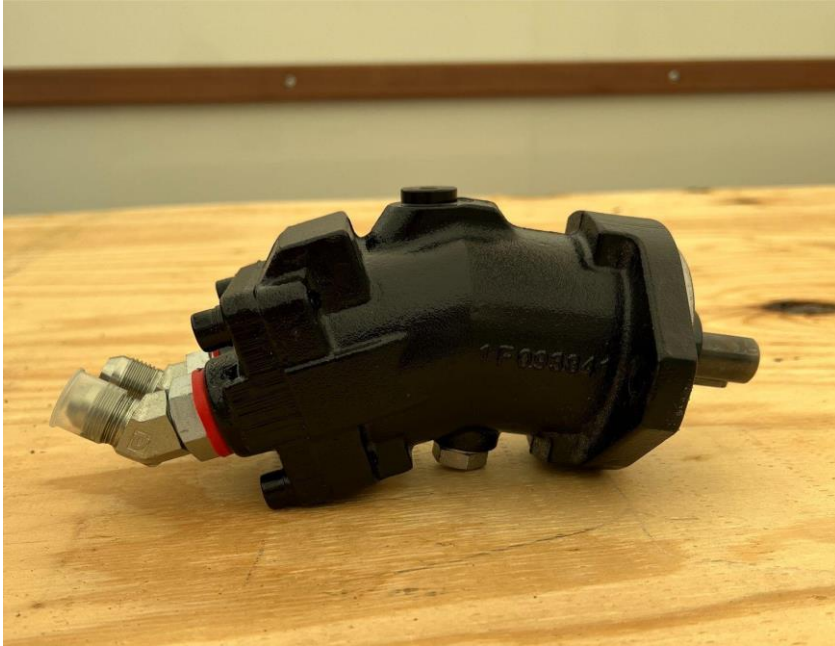
Vehicle Construction- Sprockets and Adapters



Vehicle Construction- Electronics Housing



Vehicle Testing- Bent-axis Motor



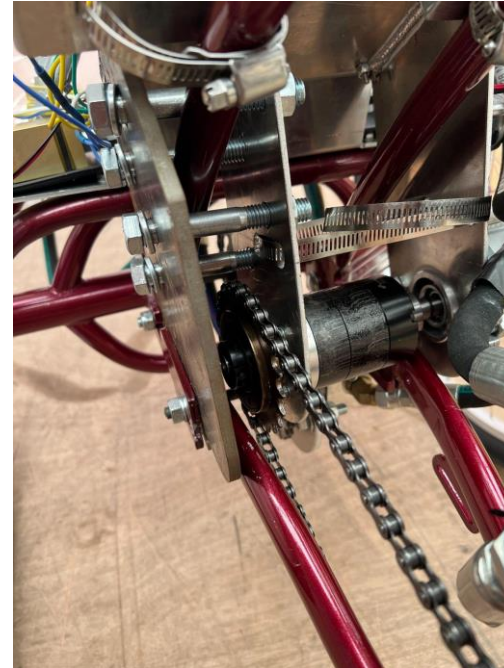
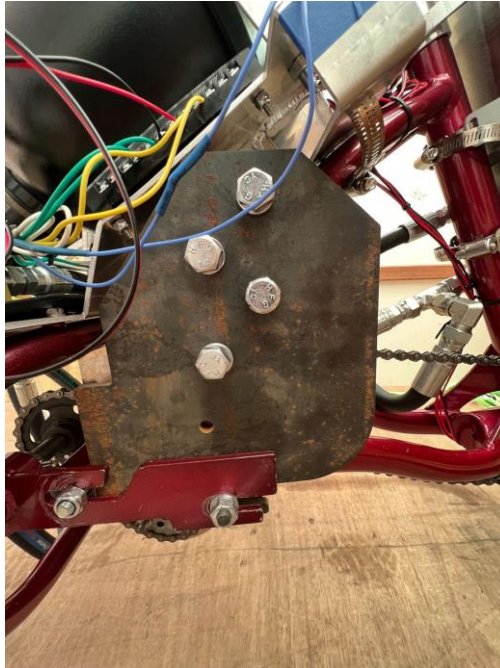
Vehicle Testing- Solenoids



Vehicle Testing- Gearbox to Pump Connection



Vehicle Testing- Gearbox to Pump Connection



Final Vehicle



Lessons Learned

- Incrementally test portions of the design rather than test everything at once.
- The ripple effect of making one change in the design.
- The use of a manifold would allow for a more organized hydraulic system.
- A custom made bike frame would make assembly much easier.
- The process of design and construction proved to be more difficult than planned.

Acknowledgments



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Kensey Sydness
Calvin Rivas



Ahmed Abdelaal
Bhaskar Vajipeyajula





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