



Race Mower

Team Members: Matthias Allen, Aidan Hau, Jack Conrad

Advisor: Benjamin Mitchell

Department of Mechanical Engineering, University of New Hampshire, Durham, NH 03824

Contact Info:
Matthias.allen@unh.edu
Aidan.hau@unh.edu
Jack.conrad@unh.edu

Introduction

Our goal for this project was to take a lawn tractor that had been sitting outside for a few years, make it run, and make it go fast. We also wanted to become more familiar with the different components of the lawn mower and to test our diagnostic and problem-solving skills.

Methodology

In order to complete the project on time, we had to keep our priorities in check. There were plenty of things we wanted to do, but some were more important than others. Making the engine start and the lawn tractor safe came before anything else. Many steering components were worn out, some of which could not be fixed by replacing worn out bushings. To solve this, we created our own Teflon bushing that supported a shaft. The metal by the original bushing location was too worn away to retain the original bushing.

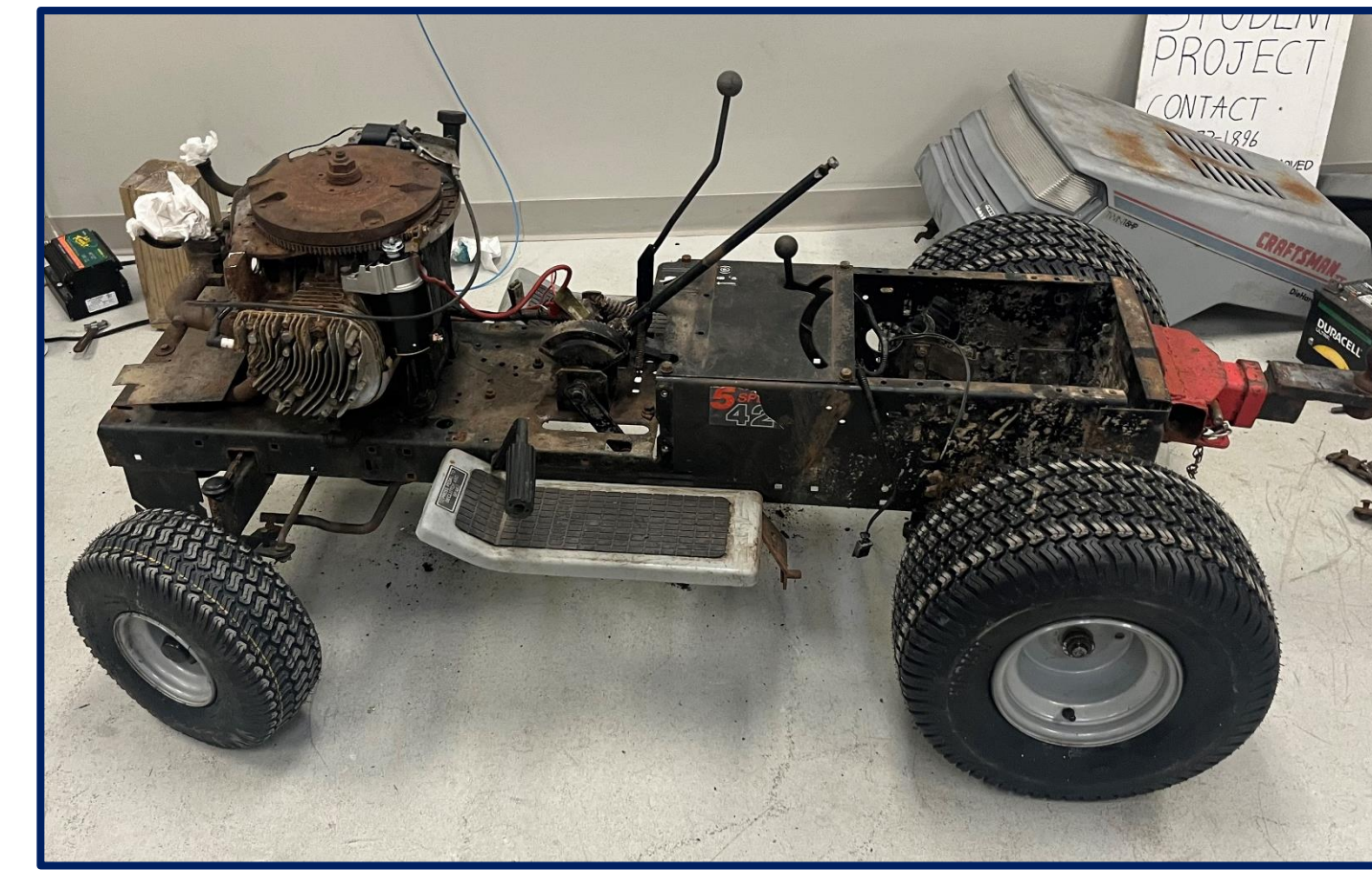
Issues

There were many things wrong with the lawn tractor, some issues more obvious than others.

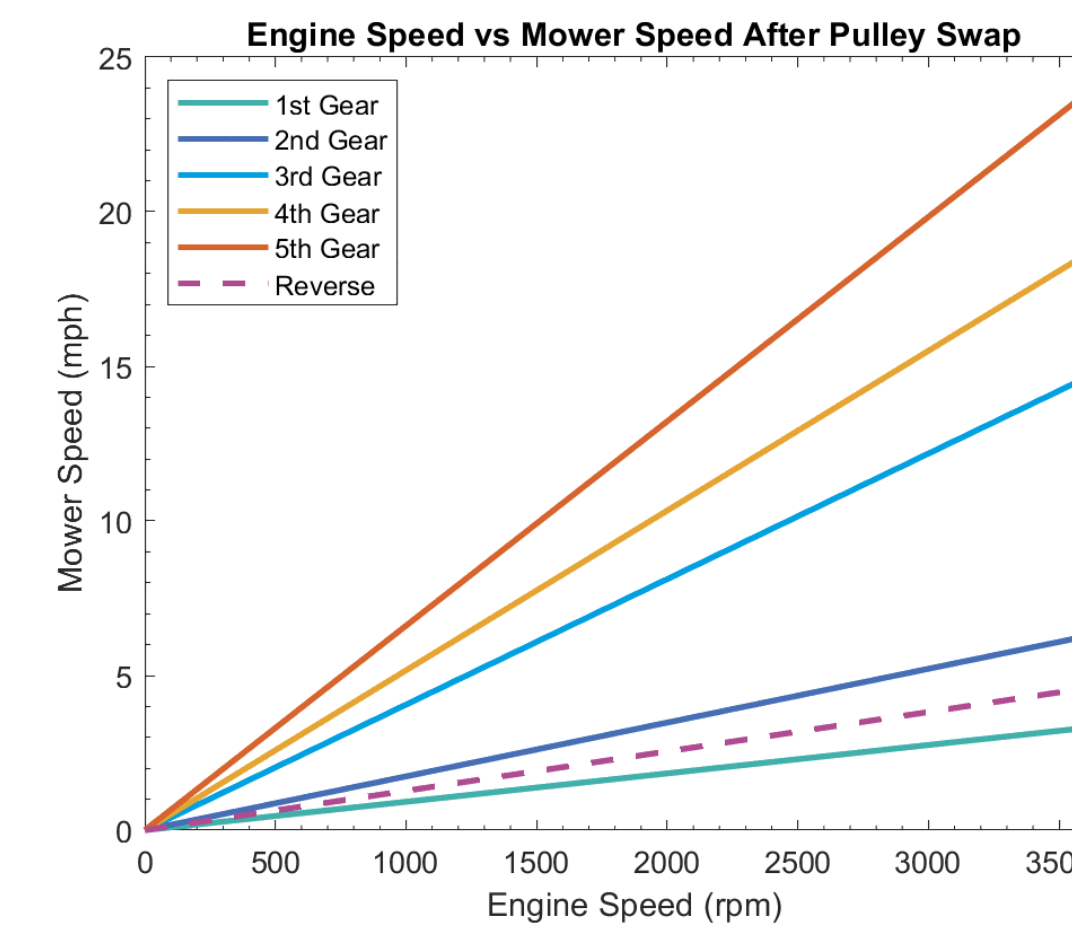
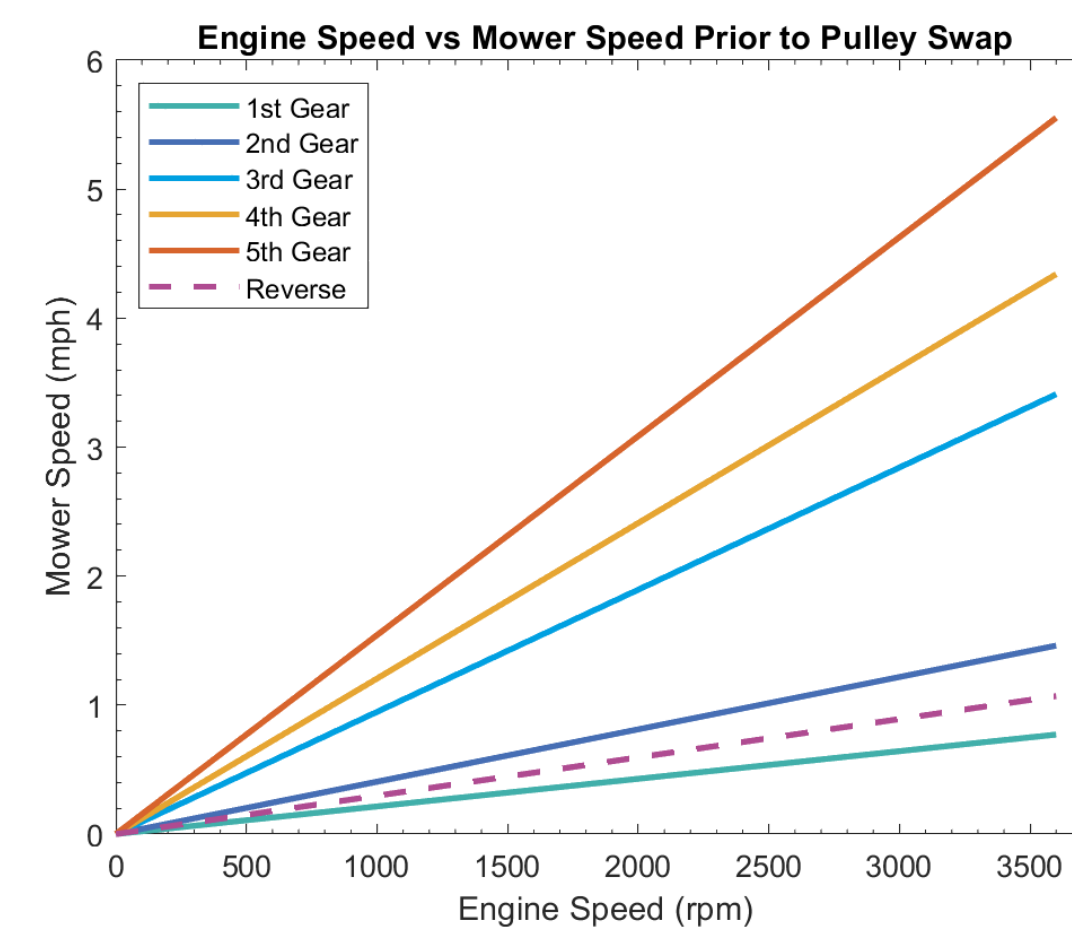
- Mower was covered in dirt
- Quarter turn of play in the steering wheel
- Some wires chewed through
- Starter motor brushes worn through
- Tires cracked and difficult to remove
- Crank pulley was difficult to remove
- Starter solenoid nonfunctional

In addition to these issues, we also had some issues with getting parts delivered. For example: our engine oil was delivered to the wrong building and our carburetor rebuild kit never arrived.

Before and After Cleaning



Speeds Before and After Swap



Repair Process



Lawn tractor tipped over to better access pulleys



Improvised replacement steering bushing

Results

As a result of our work, the mower now runs, drives, and stops. We were able to achieve our goals and complete the project within our given timeframe. While the mower is now much faster, it also has less torque. However, since we are not towing anything, this is of little concern. In theory, once up to speed, the mower should be able to tow the same amount. The only difficulty would be accelerating while towing something heavy from a dead stop.

Lessons Learned

In the end, we learned how to do a lot of things, some of which were unexpected.

- Calculate gear/pulley ratios
- Calculate speed
- Work with fuel systems
- Clean carburetors
- Mount tires
- Fix brakes
- Troubleshoot issues
- Learned that 90% of fixing is cleaning

Additional Notes

- Does wheelies
- Goes much faster than we are comfortable driving it

