

# Drift Trike Final Capstone Portfolio

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5<sup>th</sup>/ 6<sup>th</sup> hour

Research and Development

May 2019

Instructor: Mr. Mitchell

Motorized Drift Trike



## The Idea



The idea started back at the end of Junior year when I seen the drift trike build going on in the lab. This build was being made by Jeff Sakofske. Ever since seeing it, it peeked my interest in this project. Coming back senior year and hearing I could make a drift trike was all I needed to hear. And the rest is history.

## The Purpose “Defining the Problem”



The motorized drift trike is a rather unique item. To make everything work together that normally wouldn't requires a lot of fabrication work. The problem that this arises is that I before didn't understand how to perform the necessary actions to fabricate the frame for this project. I did not know how to weld (still haven't learned due to the lack of time), didn't know how to use Bendtech Pro, and I didn't know how to operate many of the machines required to do the job properly.

## The Research



Within my research, I had cleared up a solid majority of the needed to be answered questions. Using ideas from other trike builds like the Trike Daddy Customs' trikes and from Jeff Sakofske (who made his trike last year here at Dakota) helped to influence my frame design and the items of choice to make the trike into what it is today. Most of the research involved finding the parts I wanted to use for my trike, what frame design looked amazing and functioned well, and what concepts are good or bad.

## The Material



Within the building process of this amazing project, the following materials were used:

- Roughly 30 feet of 1 ¼ steel tubing
- 14 laser cut Pieces of 3/16 thick steel
- 1 12" x 1.5" x 1.5" steel
- 2 pieces of 1/8 thick aluminum
- About 1 sheet worth of matboard

## The Building Process



The build process took place over a rather small period of time. Starting April 9<sup>th</sup> and coming fully together this week (powder coating included too), the build process was the part that went swimmingly, unlike the design process. Yes, there were hiccups, mistakes, and some minor setbacks, but the process took less time than anticipated. If we were to build a trike frame again, I would make sure we have all the materials required before we started the build process.

## The Successes



I mean overall, I'd say the fact that this trike was built within the short time it was and turned out this good is a fat success just on its own. It works beautifully with no hesitation, what more do you need really?

## The Mistakes/ Failures



### Mistakes:

Although the build process took a rather short time, there were a few hiccups that came along those two months.

- Design flaws: Many of the frame's metal work needed off-drawing tweaks; better supports, improved caliper and brake booster mounts are a few good examples.



- Welding: There was nothing wrong with the welds whatsoever, ill just clarify that much. What I mean is that I never learned how to do welding like I wanted to. That is my own fault due to the extra time spent on the design of the frame.
- PVC Sleeves: The ones I purchased work, however I will not be able to use them very long due to them not covering the whole tire. I confirmed this with Jeff (who made his trike last year).
- A mis order: When I ordered the rear end kit for the trike, the was the option of the go kart hangar bearings or the pillow block bearings. I accidently ended up ordering the wrong kit and had to separately order the pillow block bearings.
- Throttle Linkage kit: Found out I could've saved \$33 by not purchasing the throttle linkage as it was an unneeded item.

The other issue that took place that happened before this time.

- Lengthy Design Process: The time it took me finish my drawings was 2 months over the planned date of completion. The frame in Inventor caused a lot of hardship. Having to be redesigned 4-5 different times and creating multiple errors with the redesign only slowed the process, and after a while it only lowered my morale to complete that process.

#### Failure:

Within the making of this trike, I cannot say there really was any true failures other than not making the deadline I set for myself. I finished a month later and wasn't able to test it as long as I would've like to.

## Testing / Analysis



This is the area where the hard work and dedication truly pay off and let me tell you it definitely did. Just hearing the engine fire up was amazing. Going to sit down in the seat and strapping on the helmet and getting ready to go for a spin made me extremely anxious. Even just slowly rolling on the side walk and occasionally giving it some gas makes your adrenaline start to pump. Now the fun part: Drifting. The thing is a complete madhouse at a flick of the throttle. A small flick is enough to get you going and you can just gas it from there. It drifts well once you get used to it. Its easy to maintain a nice long drift with the right amount of gas and angle. Overall, the thing is a blast to drift around on.

## Cost

- Rear end and brake kits: \$686.18
- Powder Coating: \$350
- 1 ¼" steel tube: \$82.50
- Engine: \$106
- 3/16" thick steel: \$50
- Performance Kit: \$60.31
- Tire Mounting: \$41.75
- Seat: \$39.69
- Throttle Linkage: \$32.43
- 12" x 1.5" x 1.5" steel: \$30.78
- Bike front end: \$30
- Throttle cable and twist grip: \$30
- Exhaust: \$29.48
- 1/8" thick aluminum: \$5
- Engine Hardware: \$2.76

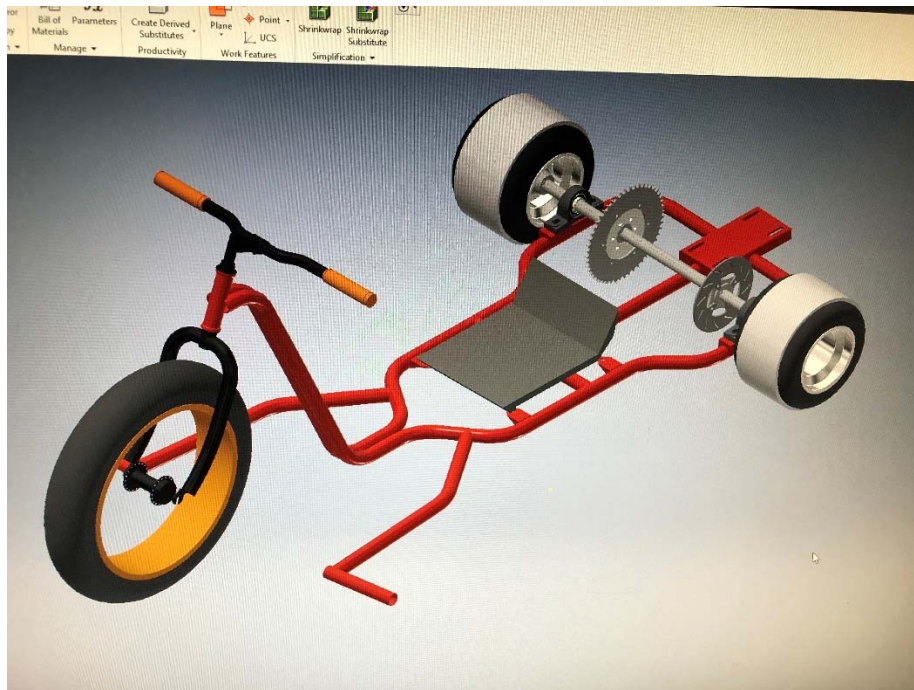
Running Total: \$1576.88

\*\*\*Entire cost payed for by me\*\*\*

## Photo Documentation



Bought a Predator engine and wasted no time upgrading it.



Back in February when it started taking shape in Inventor.



Front end donor for the drift trike



After the tubes were all bent, they needed to be cut down to the proper length.



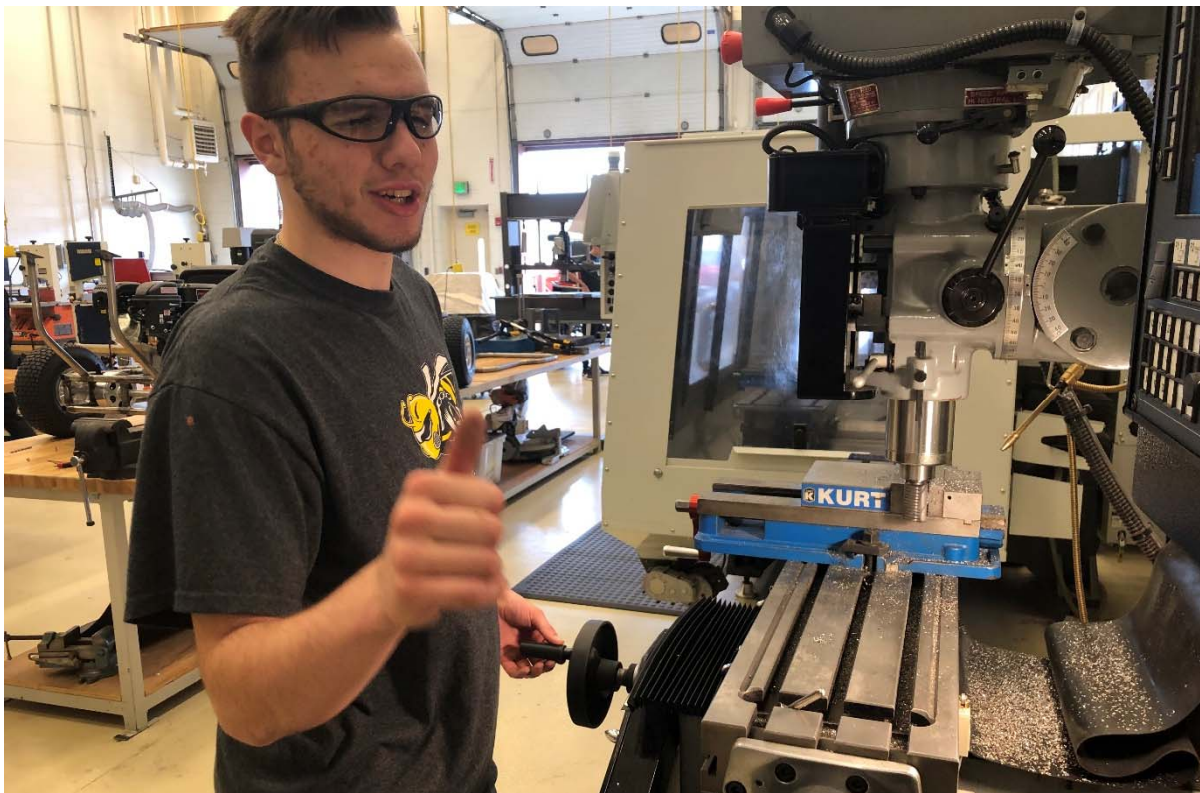
Main frame bent and cut, just needs to be welded up.



The welding of the main frame (shout out to Mr.D)



The picture where it starts to take shape.



Notching tubes is a great time.



Pillow block bearing mounts and support tubes in place ready for welding.

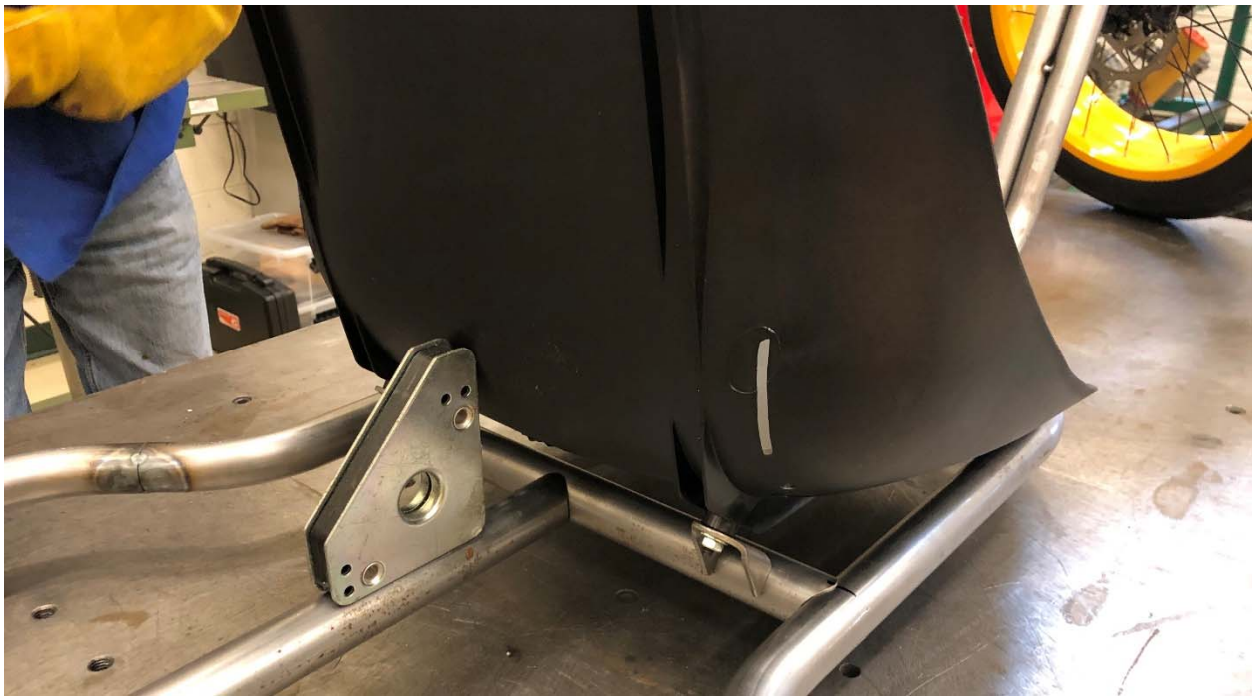


Some tasks require interesting thoughts.





Almost a roller, just dialing in the position.



Last minute seat mount placement that actually worked out well.



Trike has mostly taken shape by this point.



Rear brake caliper and engine mount to be welded in.



Completely welded up frame, just needs sanding.



Added kill switch because we do safe fun around here.



Frame, chain guard, and brake lever dropped off at powder coating.



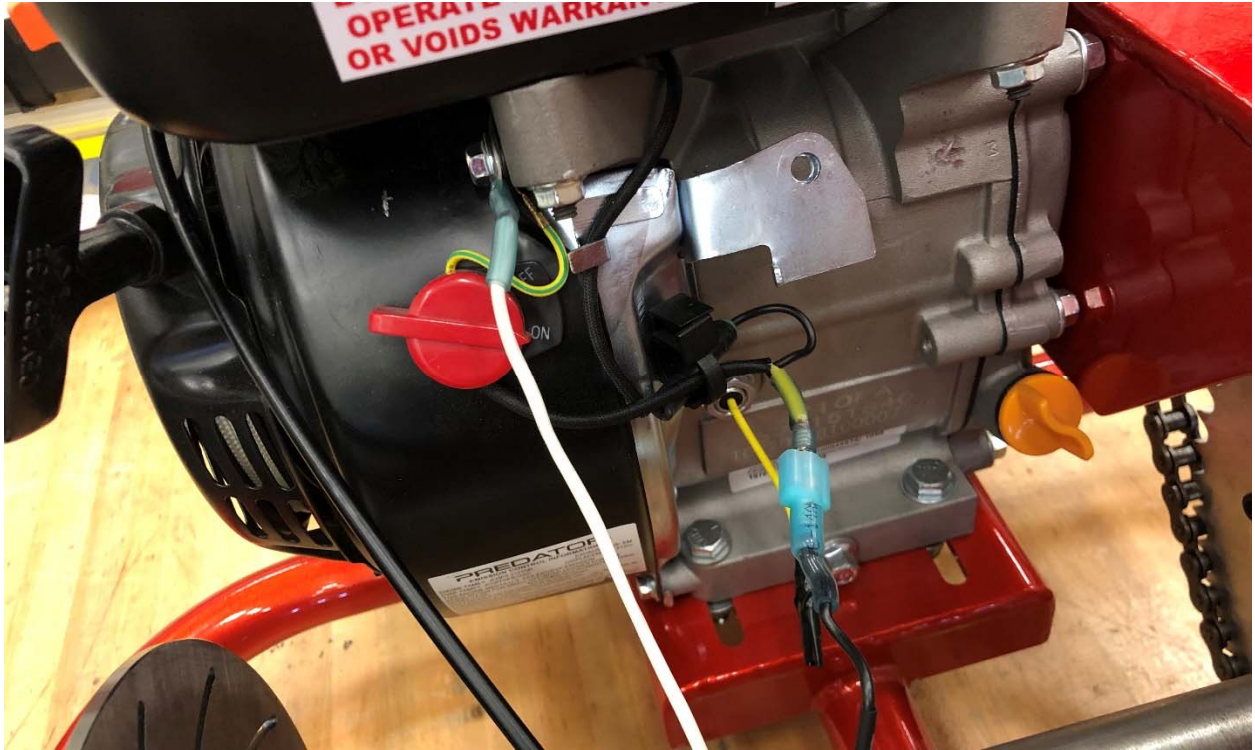
First look at the frame at the powder coaters



Beginning to reassemble the frame again.



Figuring out all the wiring lines.



Kill switch wired in with the motor.



Now all the hard work pays off