TEXAS STATE UNIVERSITY

The rising STAR *of Texas*

Group M1.05 – Bobcat Racing Pedal Assembly

Sean Wilhite | Victor Hernandez | Chris Lamas | Allan Alvarez

Sponsor: Abhimanyu Sharotry – Bobcat Racing

BOBCAT RACING

BACKGROUND

Formula SAE is an international collegiate engineering design competition that challenges universities to design, manufacture, and race formula cars.

GOAL

The goal for this project is to design, manufacture and assemble a pedal assembly that complies with the FSAE 2023 rules and regulations. It should pass technical inspection and operate effectively in the dynamic events during the 2023 Formula SAE competition.

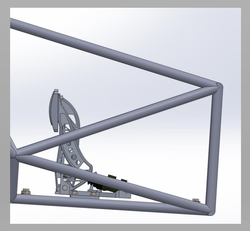
OBJECTIVES

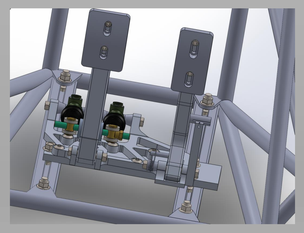
- High Strength to Weight Ratio
- High Factor of safety
- High Reliability

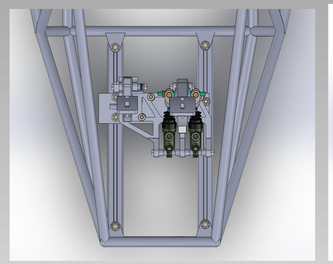
SPECIFICATIONS

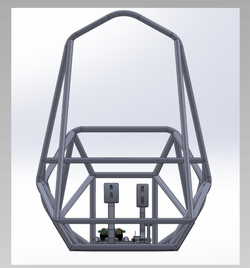
- Withstand 2000 N applied to brake pedal and associated components.
- SAE Grade 5/ Metric grade 8.8 or better hardware
- Two independent master cylinders
- Constructed from steel or aluminum
- Brake light switch accommodation
- Brake Over travel switch accommodation
- Smooth operation of throttle

IN CHASSIS

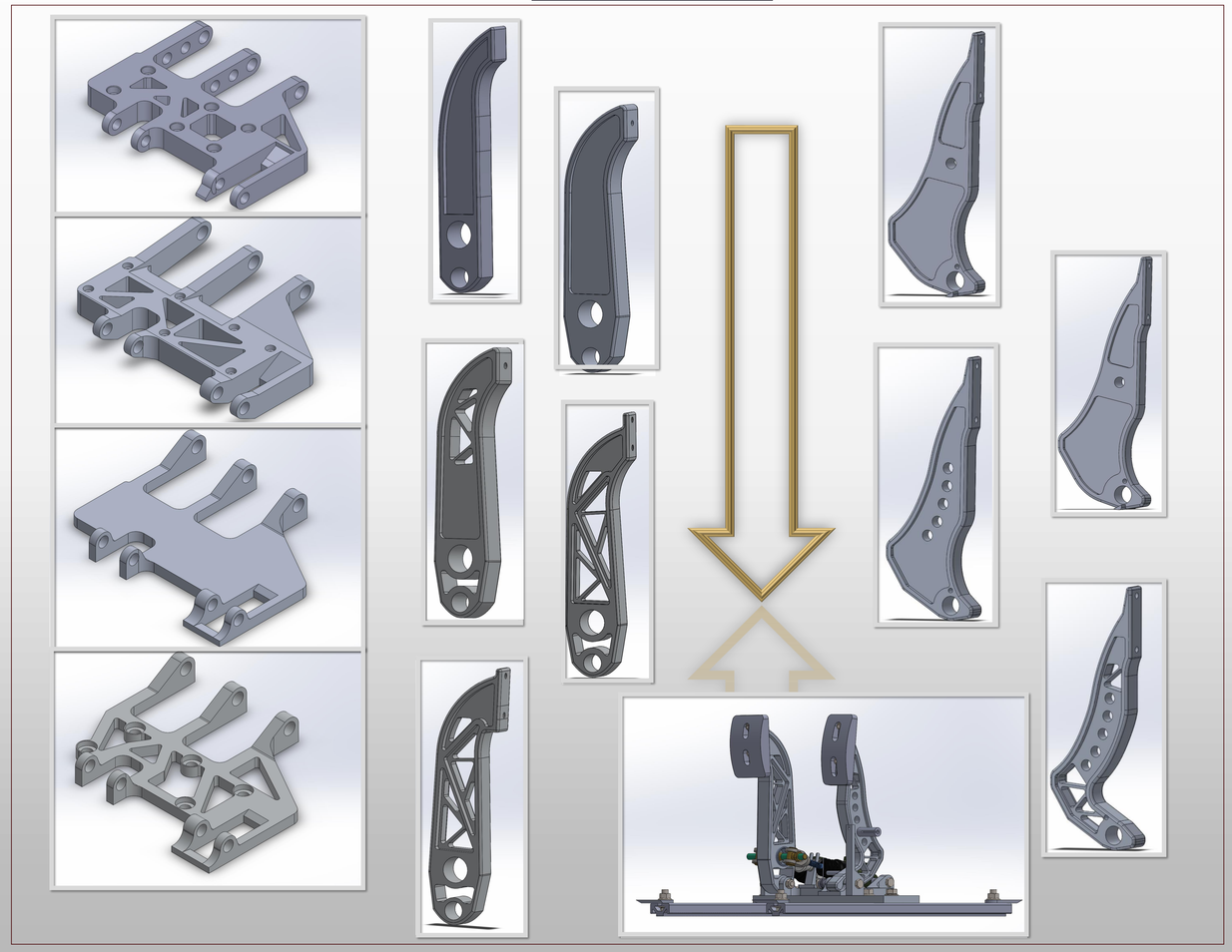






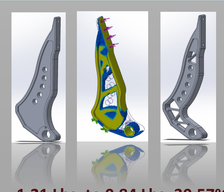


INNOVATION

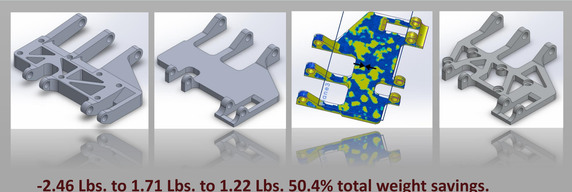


Throughout the evolution of the design, the components were refined to be lighter while maintaining its structural rigidity.

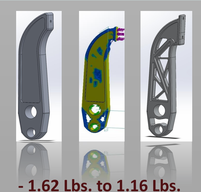
TOPOLOGY OPTIMIZATION



-1.21 Lbs. to 0.84 Lbs. 30.57% weight savings

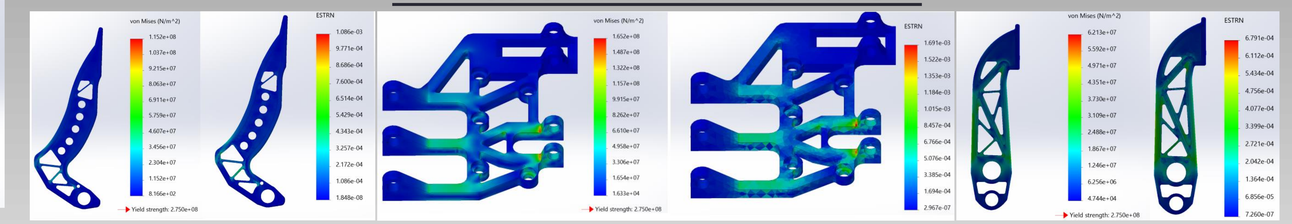


-2.46 Lbs. to 1.71 Lbs. to 1.22 Lbs. 50.4% total weight savings.



- 1.62 Lbs. to 1.16 Lbs. 28.39% weight savings.

STRESS-STRAIN SIMULATION



CURRENT STATUS

We are currently done with our prototyping phase and placed a purchase order for all the materials needed to create the final product

NEXT STEPS

A manufacturing plan will be created to aid our fixture design to be able to machine the components. We'll then design a test bed to perform real force testing on the assembly to confirm its function before installing in the chassis.

AKNOWLEDGEMENTS

Mark Summers – Technical Advisor
Abhimanyu Sharotry – Bobcat Racing Team Principal /Point of Contact/Project Advisor
Harrison Thramann – Bobcat Racing Lead/ Manufacturing support
Austin Talley – Course Instructor
Bobcat Racing Team - Sponsor

TEAM

Sean Wilhite
(Project Manager)

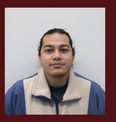
LinkedIn: https://www.linkedin.com/in/sw11234/
Email: Smw204@txstate.edu

Victor Hernandez

LinkedIn: https://www.linkedin.com/in/victor-h-031009109/
Email: Vah45@txstate.edu

Allan Alvarez

LinkedIn: https://www.linkedin.com/in/allan-alvarez-99281a229/
Email: Aaa335@txstate.edu



Christopher Lamas

LinkedIn: https://www.linkedin.com/in/christopher-lamas-965893223/
Email: C_l368@txstate.edu