Bulldog Racing - 2019 SAE Baja

Mechanical Engineering

Students: Elvis Pizano, Alan Pizano, Touchy Yang, Gerardo Bory, Ben Bohan, Eric Mah, Edward Mendoza

Advisors: Gemuna Happawana, Ph.D., Micheal Jenkins, Ph.D., The Ngyuen, Ph.D.

FRESNO STATE

Lyles College of Engineering

Abstract

Bulldog Racing is a nonprofit organization and the Fresno Collegiate Chapter of the Society of Automotive Engineers (SAE). The team designs, fabricates, tests, and competes with a prototype off-road vehicle against hundreds of other schools from across the world. Vehicles are then judged based on overall design, cost and dynamic performance. Students that are involved deal with real world challenges of funding and fabricating a big scale dynamic project while putting their theoretical knowledge to the test. While the club mainly consists of engineers seeking practical applications for their studies, we welcome anyone who shares our interests in promoting and racing a successful competition vehicle.

Drivetrain

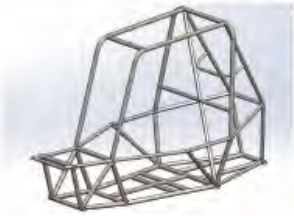
SAE requires all competing teams to utilize the same engine, the Briggs & Stratton Model 19, which was specifically designed for Baja SAE events. With an even playing field, it is up to teams to design and optimize the off-road performance characteristics of the vehicle.

Final Design

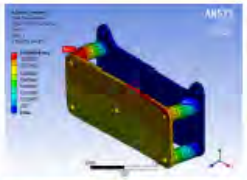
The car is nearing completion and the team will be taking it to Gorman, California for competition on May 16th – May 20th where it will compete with over 100 other teams from around the world.

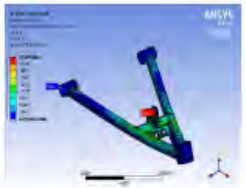
Chassis

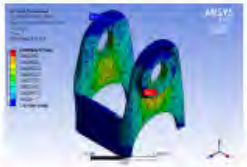
The chassis is a tubular space frame made of 4130 Chromoly Steel. This structure and material is selected due to its high strength to weight ratio. Changes from last year's design include a "nose" design, lighter frame, and wider cockpit.

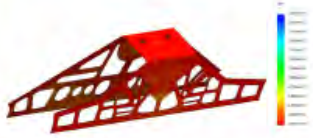


Analysis









Steering & Brakes

In order to decrease the weight of the brake system from last year's car, lighter weight calipers were selected and the brake pedal was completely redesigned.

This year's steering rack was made in house to enable us to minimize weight. The housing was made smaller while still being strong enough for our application. The steering column was made largely from aluminium to reduce weight over last years design.

Fabrication

Students learn a wide variety of fabrication techniques which give them hands on experience in an industry-like setting. Students learn to consider realistic properties to be incorporated in their designs.

Suspension

The front suspension design utilizes symmetrical, dual adjustable control arms. The rear design is a 3-link which is made up of the main trailing arm and two camber links. The two camber links feature 1/32 in. walled tubing and 1/16 in. thick mounting tabs.

Sponsors/Conclusion

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