Connor Archard

Cornell Racing

Fall 2014 Update

ARG15 Update

The 2014-2015 year is off to a strong start as the current Cornell Racing FSAE team works towards competing in Michigan and Formula North. Final designs are already nearing completion and weekend driving days have been very successful this semester. Team members will return to campus on January 2nd to manufacture the car by February 1st. ARG15 design highlights are detailed below:

AERO: With the changes in the 2015 FSAE rules, there will be major changes to Cornell's aerodynamic package. The package will feature a more narrow rear wing, as well as an undertray and sidepods. The incorporation of these new elements has been taken into consideration in the designs of many other chassis components.

COOLING: The cooling system aims to be the most reliable and efficient that we've ever had. More accurate heat rejection calculations have been made, using theoretical calculations coupled with data gathered from driving. More intricate and complex design steps have been taken this year to optimize the core thickness, no flow length, and the effectiveness of the radiator. The pump, fan, and duct have been selected for the newly designed radiator.

DATA: Our goal this year is to help tune the engine and chassis more efficiently and aid in creating a faster troubleshooting process. We are using hard data to push design decisions, especially in the suspension and aero teams.

DRIVETRAIN: This year we will be featuring a 26 tooth rear sprocket, compared to the 34 tooth used last year, while maintaining a gear ratio of about 2.4. We will also continue to tune our Drexler Limited Slip Differential for maximum drivability and performance through corners.

DRIVING TEAM: We are rebuilding the driver training program from the ground up by placing a focus on building depth and getting new team members in the car, enabling us to increase our capability to both test systems and perform well in competition. Additionally, a driver-adjustable traction control system is being developed to make our car easier to drive, maximizing driver performance.

DYNO: The engine dyno is a vital component for developing our engine tune. By mirroring the car's engine package on the dyno, we will perform experimental tests with greater efficiency, which will decrease the overall time spent on finding the proper tune.

ELECTRICAL:Student-developed communication boards will collect data to be packaged and sent over CAN from each corner of the car to the MoTeC ADL3 data logger. This CAN network will expand data collection to include load cells, gyroscopes, accelerometers, and tire and brake temperature sensors. The addition of current monitoring in the fuse box will allow further analysis of power distribution on the car.

ERGO: The ergonomics sub-system creates a system that allows the driver to interact with the car as comfortably as possible without sacrificing weight, performance, and reliability. Our goal is to design a reliable steering system with better electrical packaging, a more efficient brake pedal system, and incorporate aerodynamic elements in the headrest and roll hoop.

FLOW: The flow system is excited about successfully implementing a blow through turbocharged system. We will continue to build on last year's themes of reliability and serviceability by utilizing lighter materials, such as carbon fiber. Customizing various components of the exhaust tract will enable us to downsize, decreasing the weight of the entire engine package.

FUEL: The ARG15 fuel system was designed with the driver in mind. With a 1.75 gallon capacity it is capable of traveling over 20 miles, and with an ergonomic tank design, the firewall will no longer be in the way. This years fuel system emphasizes simplicity and reliability by utilizing all of our data and observations from last year in order to create a flawless design.

LUBE: ARG15 will feature the first all internal dry-sump lubrication system. The scavenging pump will be mated with the stock pump inside of the crankcase, increasing packaging and decreasing weight.

MONOCOQUE: The monocoque of ARG15 will be a composite frame consisting of carbon fiber panels and aluminum honeycomb core. The monocoque will support this year's goal of improving driver comfort and engine serviceability.

REBUILDS: This year we will be modifying the transmission and clutch on our CBR600RR engine. We are optimizing the gearing by selecting the gear ratios needed, removing all excess weight, and utilizing cam phasing. A slipper clutch is also being impemented to improve the drivability of the car.

SUSPENSION: The ARG15 suspension is an adaptation of previous years' designs, with changes such as a reduction in wheel base, additional aero elements, and more flexibility in the rear packaging. Starting in the first week of November we will begin building our suspension links and rockers, followed by the construction of our Anti-Roll.

UNSPRUNG: ARG15's unsprung is focusing on validation of design through computer simulation and real life testing on a compliance jig, as well as perfecting last year's system. This year we are also looking into the utilization of carbon fiber rims.

CONNOR ARCHARD

HOMECOMING

This year, Cornell celebrated its 150th anniversary! Homecoming weekend was October17-19th, with the football game against Lehigh University held on Saturday, October 18th. Many of the project teams had displays set up in Bartels Hall, showing off their most recent projects and explaining what their teams are all about to many interested alumni and visitors. Many racing alumni who were on campus for the weekend stopped by. It was great to meet so many former teammates, hear stories about their time as FSAE members, and update them on the current progress of ARG15. We strongly encourage any former members to come stop by if they ever find themselves back on campus!

UNIV. OF TORONTO SHOOTOUT

Cornell Racing participated in the 2014 University of Toronto Shootout on Saturday, September 26th. Over 30 team members made the trip to Canada to race last year's competition car, ARG14. Unfortunately, the team experienced technical problems, only allowing us to get a few laps in. The event served as a good learning experience for old and new members, allowing us to get troubleshooting experience under pressure and enabling new drivers to get competition experience. We will use the lessons learned in Toronto to improve our plans for ARG15. Our next race will be the 2015 Formula SAE Michigan competition at the Michigan International Speedway from May 13-16th.

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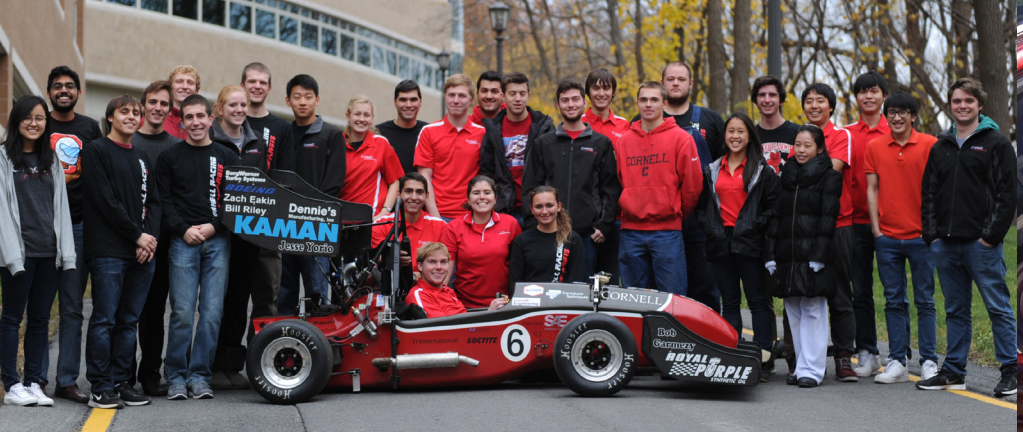

Attention Alumni!

Cornell Racing is excited to present a new opportunity to alumni! Pressed for space, Cornell University recently granted the team permission to begin selling our old cars. Sales will directly support the current team's work and future Cornell Racing efforts.

We have gone through and inventoried the Mitchell Street storage barn, and discovered many frames to sell. See below for available years. The frames are in varying conditions, having been gradually stripped for parts and scrap. We can provide digitized design and technical reports on file for each car, as well as manufacturing and competition photos to help individuals or groups of alumni rebuild the cars.

If you are interested in buying an old car to support Cornell Racing, we have prepared a detailed photo catalog of the remaining frames and body panels for alumni to view. Please email cufsae@cornell.edu for details.

Sales so far: ARG01 to Rory Jorgensen, ARG05 to Bill Riley, and ARG06 to Zack Eakin.

Cornell Racing now boasts 29 years of alumni beginning with the Cornell Engineering Class of 1987. Before members from this year's freshmen Class of 2018 were even born, the team had already won three championships in 1988, 1992, and 1993.

GET IN TOUCH

Contact Cornell Racing and update us with your contact info if it has changed. We want to hear from you!

cufsae@cornell.edu

2014-2015 TEAM LEADERS

Nina Buchakjian, Team Leader

TeAnn Nguyen, Engine Team

Luke Moll, Chassis Team

Sarah Behringer, Electrical Team

Connor Archard, Driving Team

Kern Sharma, Business Team

Claire Krejci, Teaching Assistant

Prof. Albert R. George, Faculty Advisor

Prof. John Callister, Faculty Advisor

DONATE TODAY!

To donate to the Cornell Racing FSAE team, please make checks payable to "Cornell Formula SAE" and mail to the address below:

Cornell Formula SAE
Attn: Albert R. George
258 Upson Hall
Ithaca, NY 14853

If you have any questions please see our sponsorship page:

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or contact us through our email, cufsae@cornell.edu

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