

# CRIMSON RACING NEWSLETTER

February 2016

## Greetings from Crimson Racing!

Groundhog Phil didn't see his shadow yesterday morning; if his prediction is correct, students at the University of Alabama may feel like they have skipped over winter entirely this year! Although we are just heading into the first full month of the semester, many students are already looking forward to the summer. Freshmen, sophomores, and juniors may find themselves considering summer classes or internships, while seniors are preparing for life after graduation. While each Crimson Racing Team member has an uniquely exciting plan for the summer, we're all looking forward to starting it off with the Formula SAE Michigan Competition in May. With only three months left, the team is working hard to make sure this year's car is the best one yet.

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## Suspension and Chassis

After the frame returned from being powder coated, we completed the floor and all the firewalls. Once we had them anodized by Industrial Specialties, we were able to install them all into the frame. After the floors were installed, we also assembled the suspension in order to perform a torsion test. To do our torsion test, we strapped three of the uprights' to cement blocks and put a jack under the fourth upright. Although we needed to use a lot of weight to hold down the cement blocks, we were able to hold the car down to complete the test. We measured the car from 0 – 100 pounds in five pound increments, testing five different points. The data we collected showed that our frame was within 8% of designed torsional rigidity in Solidworks; considering all of our variables, we see this as extremely accurate.

We have also completed the steering. In previous years, the team has used a heavy universal joint, but this year we have decided to use lightweight Apex joints, which are commonly used on aircraft. We have also chosen to use two one inch long bearings to support the steering shaft, rather than the plastic bushing we typically use, in order to steer more smoothly.

The suspension has been assembled onto the car in order to begin test fitting and the frame torsion test. This year, we have designed our own brake rotors, and plan to have them water jetted and precision ground to a very high tolerance flatness. These pieces will allow us to achieve a lower weight. Thanks to our generous sponsors, we have been able to raise enough money to purchase new shocks. This is something that has prevented us from building a second car in the past; now, the team will always have a driving car for testing and motivation.

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## Electrical, Powertrain, and Drivetrain

This year, we were also able to budget for some long-awaited upgrades for our electrical team. We purchased an expansion hub for our data acquisition system, which will allow us to log more than twenty-five sensors while we are driving. In particular, we are very excited about the linear potentiometers from Texense Sensors, which will collect data on the movement of the suspension. One of our biggest criticisms at the competition is a lack of data; these new sensors will certainly help to remedy that issue.

We have experienced some ups and downs with our engine in the last few weeks. While we've experienced issues in a few different areas, we have been able to get the engine to run on our new ECU, the PE3. We're currently in the process of tuning the engine unloaded in order to begin loading the engine on the water dyno.

We have also recently received the differential carriers and our oil pan from Fitz-Thors Engineering; the next step involves getting them anodized. By the time that is completed, we should be finished with the differential, and ready to install everything on to the car.

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## Looking Forward

As you can see from all the new features we have been able to implement in this year's car, our ability to progress as a team and continually make improvements depends heavily on the support we receive. We deeply appreciate your involvement with the Crimson Racing team, and we hope you realize how grateful we all are to have this opportunity. If you have any questions, comments, or suggestions for us, contact us at the email provided below; we'd love to hear from you!

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The University of Alabama  
Attn: Crimson Racing - Formula SAE  
245 7th Ave.  
359 H.M. Comer  
Tuscaloosa, AL 35487  
Email: [alabamafsae@gmail.com](mailto:alabamafsae@gmail.com)

Website: <http://fsae.eng.ua.edu/>  
Twitter: <https://twitter.com/alabamafsae>  
Instagram: [@crimsonracingua](https://www.instagram.com/crimsonracingua)

