



Greetings Sponsors,

The end of May is quickly approaching, signaling the end of yet another exciting year of progress for Alabama Formula SAE. Finals at the University ended May 1st, sending most students home or vacation bound for a few weeks before summer classes, jobs, and internships commenced. For the Crimson Racing team, however, the end of the semester began a two-week long effort to put the finishing touches on our vehicle to ensure it was race ready. Without the obligations incurred during the school year (classes, homework, other activities – though none we feel nearly as passionate about as FSAE), we were able to accomplish a great deal in those days leading up to the event. Early May 13th, the team embarked on a fourteen hour journey from Tuscaloosa to the Michigan International Speedway to participate in the annual Formula SAE Michigan competition.

Over one hundred teams arrived in Michigan that weekend, eager to see how their cars stacked up against their competitors. Universities from across the United States, as well international institutions from countries such as Poland, Singapore, and Venezuela, were represented at the event this year. The format of the competition separates events into two categories: static and dynamic. Static events, which included a cost report, business presentation, and design report, were held on the 14th. The dynamic events of acceleration, autocross, skid-pad, fuel efficiency, and endurance, took place on the 15th and 16th.



The first part of the competition that Crimson Racing participated in was the cost report. In the beginning of April, we submitted a report detailing the cost of each part of the car, as well as the cost of the labor used to create the parts. The material and labor costs are outlined by SAE, guaranteeing an even playing field for all teams to decide what features to include to make their cars as cheap or as expensive as they believe necessary. Historically, Crimson Racing has consistently presented one of the cheapest cars at the competition. However, this

year, the team opted for performance-enhancing additions to help us move ahead in other events, which meant sacrificing our usual low-cost position. In the end, our car still managed to be average priced compared to our competitors. For next year's competition, we plan on spending more time weighing the tradeoffs of cost and performance to create a more optimal balance.

Next, we headed to the business presentation. In previous years, the team consisted of only engineering students. Thus, this element of the competition presented us with a huge struggle, as we lacked the required skill set and time to adeptly prepare an entire pitch. We realized we desperately needed help on this front, and enlisted the help of business students to formulate the presentation this year. We were fortunate enough to have a business student, as well as one of our engineering team members, work together to deliver it for us at the competition. With their help, Crimson Racing moved up about forty places in this area of the competition. Now that they have a year of experience under their belts, we look forward to seeing what they will be able to do next year.

We concluded the static part of the competition with its most important component, the design review. During the review, teams must appear before a panel of highly qualified professional engineers, who will judge their designs. The team first explains and justifies all of their design decisions; following the explanation, judges have the opportunity to ask questions. The questions are aimed to make sure students truly understand the designs and components of their vehicle, rather than simply copying old designs or relaying information given to them by professionals. Instead of focusing on the car's performance, which is measured in the dynamic events, the judges place their emphasis on the students' rationale in how they decided on their designs. The organizers of the competition openly state that the competition focuses on the design element, and that in the end, driving the cars simply serves as a bonus for all our hard work. Thus, the design review scores contribute greatly to one's overall placement in the competition. Last year, our team performed poorly in the design review, so one of our main goals this year was to improve our scores. We can proudly say we succeeded in our goal, improving dramatically from previous years. In some areas (the final design score is the sum of several sub areas), we were able to triple the amount of points we received last year. We will continue to build on the foundation we created this year, hopefully leading to even more success in the future.

Prior to participating in any of the dynamic events, each team must pass a rigorous technical inspection of the entire vehicle, ensuring all 140 pages of FSAE rules are followed. In the first stage of technical inspections, the judges visually check every part of the car. Often, this is where teams struggle with template issues and the two-thread rule. After a few slight adjustments, the Crimson Racing team was able to pass this stage. In the second part of the inspection, the car is filled with gas and placed on a 45 and 60 degree angle to check for leaks. Unfortunately, we had a slight gas leak, and needed to fix the problem with adhesive. After a three hour cure time, we passed the second stage of inspection, and moved onto the third, where the judges check that the car is under 110 dBC. This requirement is a huge rule change from previous years, in which they measured sound in dBA. The change posed an issue for many teams, including ours. Since we were unable to get much driving practice prior to the competition, time did not allow us to test our noise as well as we initially intended. After the first test of the car, our noise level was at 114 dBC. Through some quick thinking and slight modifications, the team was able to decrease the noise to 111.5 dBC. Although we tried many different techniques, we were never able to get the noise below the required 110 dBC. In the process of the noise testing, some of our electrical wire harness loom fell onto the exhaust, causing a slight fire. The fire was out in seconds, and did not cause any damage to the car, but the incident would have required us to restart the technical inspection from the beginning. By this point, tech was about to close, and we were unable to pass in time to run in the dynamic events.

The entire team is disappointed about not being able to drive at the competition. We put hundreds of hours into the car, and not being able to see it driving next to the others was a truly devastating end to our year. We recognize that this misfortune stems from our inability to maintain a more rigid schedule throughout the year. When members of our team requested extra



time to complete their designs, we were flexible to allow for these delays, hoping the extra time would result in the best possible car. Flexibility is a necessity, especially for a team of college students with many other commitments, but the constant delays pushed back each manufacturing stage. The team was unable to start building the car until the month before competition, at which point we should have been at the driving stage. We take full responsibility for the setbacks, which resulted in us not being able to participate in the final portion of the competition. We are already in the process of documenting the mistakes we made and preparing a realistic schedule for next year. We plan on moving on from the design stage much earlier next year, which will allow for us to have ample time to prepare and test the vehicle.

Many teams do not take advantage of a certain part of the competition that Crimson Racing loves: appointments with the design judges. The judges kindly provide times for the teams to schedule informal reviews of their cars. This opportunity allows us to learn exactly what the judges are looking for, where we lost points, and how we can improve in the future. Though all teams receive judges' notes following the competition, the personal feedback during these appointments is incredibly valuable. The Crimson Racing team met with our set of judges for over an hour. One of the design judges was an Alabama alumni, and though he was not one of our judges, he still took the time to come talk to us for a couple hours. He also introduced us to some of the more senior judges, who provided even more feedback. After being advised for

several hours by ten different judges, we are very clear on our areas of struggle and which areas we should focus on for the easiest increase in score. Because of the great information we attained, we believe our design scores will continue to rise.



Despite not being able to drive, the team has much to hold our heads up about. Our design and business presentations saw huge leaps of improvements. Although we were able to drive at last year's competition, and were not this year, we were actually able to improve eight spots overall. This shows the incredible progress our team has made in the actual engineering side of the competition. We are proud of the work we accomplished in the last year, and we expect even more success in the future. If we had participated in driving, we believe our team would have cracked the top 50% of the competition. This is the first goal we have set for ourselves for next year, though we certainly intend on working as hard as we can to do even better. Thank you once again; we look forward to keeping you up to date on all our progress as we implement our new plans next year.

Sincerely,
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