NEWSLETTER

REVIEW OF 2017 SEASON
INTRODUCTION

This is ETSEIB Motorsport Newsletter

Dear reader,

We are glad to introduce you to our newsletter. After the most successful season for the team, after achieving a top 10 position in all the competitions, the team has just been renewed for the next season. It is clear that the team is improving year after year. This new season we will continue working hard in order to keep being among the best Formula Student teams.

Since early September, the design of CAT11e is ongoing. With new and highly motivated team members, we are really looking forward the next season and we really aim to be, at least, as successful as 2017 team.

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CAT10e

On September 2016 a renewed group of engineering students started the 10th season of ETSEIB Motorsport with one common goal: designing and manufacturing a racecar in order to compete in the biggest international students’ competition: Formula Student.

The design of the racecar, named CAT10e, was completed in late November. At that time started the manufacturing stage, which finished on May 2017 when the car was completely assembled.

May 25th was the first big date on our agenda. On an intense and lovely evening, the auditorium of the university was completely filled with representatives of our sponsors, students, professors, friends and family to see for the first time CAT10e, the result of nine months of really hard work.

As the current last step of the racecars designed and built by ETSEIB Motorsport, CAT10e gathered every good aspect from its predecessors and introduced significant improvements to reduce lap times.

First of all, the aerodynamic package was completely redesigned to increase the downforce, as well as to optimally direct the air flow to the air intakes of the accumulator with the goal of enhancing its cooling. A new carbon fiber monocoque was designed and manufactured in order to achieve a stiffer chassis, a key factor to ensure a good behavior of the car on turns. Moreover, CAT10e also introduced a brand new steering system.

Regarding powertrain and electronics, an optimized motor-inverter configuration increased the power of the car up to the maximum 80kW allowed by the regulations of the competition.

Furthermore, CAT10e introduced a self-developed BMS (Battery Management System) that significantly increased the reliability of the vehicle. And last but not least, all those changes and other minor improvements came along with a 10% weight reduction.

After two months of really valuable testing on track, the team could validate all the components of the vehicle and check that they behaved as expected, as well as improving the performance of the car and its the reliability of the vehicle.
**GOALS OF THE SEASON**

After securing a position to participate in Formula Student Austria, Formula Student Germany and Formula Student Spain, the most recognized competitions of Formula Student, we set an ambitious goal: scoring a top ten position in the three competitions.

We were aware of the difficulty of achieving this goal, but we also knew that with hard work and dedication we were able to get it.

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**COMPETITIONS RESULTS**

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Best prepared car for scrutineering special award

Best overall Spanish team special award
After a two days’ trip, the team arrived at the Red Bull Ring in Spielberg. The competition began on Monday 31st of July with scrutineering, the technical inspection of the vehicle to check that it has been designed and manufactured in accordance with the rules. Despite a small issue that made us leave the inspection area until it was fixed, we were able to get all the electrical and mechanical checks on the first day.

The second day started early with the last steps of scrutineering: tilt test, rain test and, in the afternoon, the brake test. Completing the technical inspection soon allowed us to do some tests in the Practice Area where we could adjust some control parameters. It was also the day of static events, starting with the Engineering Design event, followed by the Cost Report and finishing with the Business Plan presentation. In all of them we received good feedback and we scored 105 points out of 150 in the Design event and 51.2 points out of 75 in the Business Plan.

Wednesday began with great news: we had to participate in a tie-break with Greenteam (University of Stuttgart) for the first place in the Cost Report. While the Cost team was getting ready, we participated in the Acceleration and Skid Pad events. At the end of all runs, the final time was 4.07s for Acceleration where we finished in 9th place and 5.188s in the Skid Pad where we scored a 5th place. In the afternoon, thanks to a good strategy we were able to participate in the Autocross before the storm caused a red flag on track that stopped the event for more than 45min. Our final time was 1:22:100 which led us to a 5th place in Autocross. At the end of the day, the award ceremony for static events arrived and the team received the trophy for the first place in the Cost report, plus the congratulations of the judges for the good work carried out.
Thursday was the last day of the competition. After verifying in the Practice Area that everything was under control, CAT10e arrived at the Endurance circuit of Formula Student Austria ready to take part in the main event. The Endurance started without any problems and lap times were decreasing as our pilots realized that the car could improve its performance on track. We finished the endurance at a fairly good pace, although with room for improvement. Unfortunately, a problem with the regulations in the post inspection resulted in the disqualification of CAT10e from the Endurance and Efficiency events.

Formula Student Austria, one of the most renowned events in the calendar, left the team in 9th place in the Overall electric. The goal of finishing among the top 10 teams was achieved and the team left Austria with good feelings after confirming the potential of CAT10e, but disappointed because of the disqualification that would have left ETSEIB Motorsport in the 4th Overall position.
FS GERMANY

After spending some days in Kaiserslautern hosted by KaRaT Racing Team, on August 7th the team arrived at the campsite next to the Hockenheimring. The next day Formula Student Germany officially started. The biggest and most important event in the calendar, with 115 teams registered and 3 different categories: FS Electric, FS Combustion and, for the first time ever, FS Driverless.

Thanks to the good job done on the registration quiz, where we achieved the quickest time, we were one of the first teams in the queue for scrutineering. We started the accumulator check on Tuesday afternoon and the next day it was successfully completed. During the season, the team focused and worked hard in order to prepare for scrutineering. Because of that, we completed electrical and mechanical scrutineering, as well as the tilt test, rain test and brake test on Thursday. CAT10e was the third electric vehicle to have all the scrutineering stickers and was able to complete some laps on the test track under the rain.

In addition, on Thursday dynamic events started for the driverless vehicles. It was awesome being able to see the cars moving around the circuit with any driver on the inside.

On Friday, the team headed an intense day. Early in the morning, our product “Race It” was presented to the Business Plan presentation judges. At the same time, we participated with both drivers in the WetPad. In the wet track of the Hockenheimring, we secured good points with a time of 5.9 seconds finishing this event in 9th position. Later in the morning took place the Cost Report and the Engineering Design event. Static events concluded after having received really good feedback in all of them.

On Saturday morning it was time for Acceleration. A small issue with the ready to drive sound made us go through Electrical scrutineering again, but we had time enough to take part in Acceleration with our two drivers after fixing it. On a damp track, the CAT10e was 8th the fastest to accelerate in the 75 meters straight. 4.04 seconds was our best time. The results of the Business Plan presentation were also published on the morning. 55 points out of 75 were given to our Business team. Autocross was held in the afternoon. After showing great performance in the first rounds, a suspension failure left us out of the event. The front right suspension and the front wing were severely damaged and, in a lesser degree, the monocoque, the front right rim and the brake system. Lots of teams came to us offering their help and the team worked against the clock to be able to participate in the Endurance the next day.
While trying to fix the damages, really exciting news arrived in the first award ceremony. The best prepared car for scrutineering special award was given to our team. Furthermore, the Cost Report was won for the second time in a row after winning in FS Austria. Climbing to FSG podium for two times was a great feeling hard to describe.

Sunday was Endurance day at FSG, the day we had been waiting for the whole season. Once the box was re-opened, the team kept working to fix the damaged suspension. At around 9 AM the car, back with 4 wheels, went out of the box, receiving a big applause from other teams, to go through mechanical scrutineering again. Minutes later, FSG judges considered that the car was safe to race.

We want to thank all teams that helped us to fix the car for your huge effort and support, specially to High Speed Karlsruhe, Racetech Racing Team, Formula Student Team Delft, ARUS Andalucia Racing Team, eMotorsports Cologne, KaRaT Racing Team, StarkStrom Augsburg and Akron Formula Team to make possible our participation in the Endurance and making Formula Student so special.

CAT10e was one of the first cars to run in the afternoon session. After 18 laps, the checkered flag was shown to our second driver. With a time of 25:14 we finished the endurance on the 7th place.

Despite a penalty in post scrutineering that has already been repealed, we achieved an 7th position in the Overall Electric. This is the best result we have ever reached in this competition.

Formula Student Germany was an incredible experience. It was a really intense week, full of challenges and achievements in which we could compete with the best teams and share experiences and knowledge with them. We are really looking forward to participate in the next edition.
FS SPAIN

As usual, we closed the season at the home competition. On August 24th, the last European Formula Student competition of the year was started at Circuit de Barcelona-Catalunya.

For the third time, CAT10e was considered safe to race after successfully completing scrutineering.

For one last time, the Business Plan presentation was presented to the judges on Friday. The feedback received from the judges was without doubt the best of the season.

On the same day, our Cost team answered the questions of the judges concerning the Bill of Materials of our vehicle and completed the discussion concerning cost understanding.

Also for the last time, the engineering decisions taken during the season were presented to the judges in the Engineering Design event.

On sunny conditions, all the dynamic events were completed during the weekend showing again a brilliant performance.

After successfully finishing all the dynamic events and after completing the 3rd endurance of the season, CAT10e finishes the season with a 9th Overall position in Formula Student Spain. We can also announce that we are the best team from Spain after winning the Best Overall Spanish Team award.

A remarkable 2nd place in Cost report and a 3rd place in the Business Plan presentation confirms the awesome job of the team preparing the static events.
THE SEASON CAME TO AN END

Once F5 Spain was over, we can confirm that we have accomplished the goal of being among the top 10 teams in all competitions. The bar was set really high after the Overall victory in Czech Republic last year. But CAT10e reflected the good job done by ETSEIB Motorsport team members, and is definitely the best car ever made by the team. CAT10e can now sleep tight after the events in Austria, Germany and Spain.

A NEW SEASON

Nowadays, the team has been renewed with new and highly motivated students. With a great basis from last season, the design of CAT11e started in early September with the goal of improving last year’s performance. Stay tuned for further news!