

# End of season - Newsletter

High-Voltage Motorsports e.V.



## Dear sponsors, dear friends of our club,

our 2023/24 season came to a close with our participation in Formula Student Alpe Adria in Croatia. A lot has happened for our team since the last newsletter: we were able to compete in all dynamic disciplines at all three events we took part in. Despite a mechanical problem with our monocoque, we managed to start in the endurance competition at the last event, the FS Alpe Adria. We are very satisfied with our performance and the resulting results. In addition, we were able to deepen our knowledge at the events and gain many valuable insights for the coming season. In the coming weeks, our plan is to set up the team for the 2024/25 season and strengthen our team spirit.

October 2024

### Driverless

The season was a great success for the Driverless Team, we were able to drive at an event for the first time and the car completed a complex circuit fully autonomously, so we achieved all the goals we had set ourselves for the year despite little testing time. At FSG we were in DV Scrutineering for the first time and passed it smoothly so that we could start on time in all disciplines. Unfortunately, various technical problems then made life difficult for us and we only got to see our car drive in Trackdrive, but we managed a respectable seventh place there off the cuff. Overall, we can be very satisfied with the results and have created a great basis for future developments.

## The events from the perspective of the technical subteams

**Powertrain** - In the mechanical part of the powertrain, we have focussed primarily on reliability this season. Instead of drone motors, DC fans are now being used again to reduce the load on the electronics. The gearbox has been carried over from the previous year with only minor changes, such as improved sealing. We were also able to significantly improve the maintainability of the high-voltage battery with new connectors between the modules.

During the test phase, however, we had to contend with a few challenges, such as a broken drive shaft and a leaking gearbox and cooling system. Despite these difficulties, we passed the scrutineering during the events quickly and without any problems and had no failures during the dynamic disciplines.

The HV electronics were able to more than fulfil the targets set, so that the FAUmax rho was able to complete the inspections and disciplines at all events without any problems. The battery was equipped with an extremely compact controller, which was also easy to maintain during the events and whose design was convincing. The main focus of the season - the reliability of the high-voltage system - was high early on in the test phase and we were able to collect a lot of test kilometres. Thanks to the tests on the test bench and the expertise we gained, we were able to constantly improve the performance of the racing car during testing and identify faults in good time. This team success has made the rho the club's most successful electric model.

**Chassis** - After having completed the last steps of manufacturing, the events have been an incredible pay off. We have managed to pass the mechanical scruti, which mainly focusses on safety critical features of the chassis and suspension, right away. Only in Alpe Adria we had some bad luck. Our Chassis cracked at one of the attachments for the front rocker. This did set us back half a day, but with the help of other teams, we were able to fix this within one day.

Nevertheless we got to know a few ideas that will come in handy next season.

In the end, it was a great step forward in the development of our carbon structure of the monocoque. Additionally we could identify a few points in chassis that leave room for improvement. Next years design is already work in progress!

**Aerodynamics** - At the rollout most of our aero package had been finished. Some small elements have been added leading up to the events to improve performance.

Until and during the events we needed to adjust some elements and made reinforcements. We also had to remove a little bit of material on some parts to meet the regulations.

After that we were able to get through the mechanical scrutineerings with ease.

This years aerodynamic package has undergone some qualitative testing before the events with quantitative validation coming up in our after season testing. From the current data, that we have gathered, we could identify some smaller issues as well as what was working the way we expected it to work based on our simulations.

Overall this years concept seems quite promising and we'll improve on it further for the next car to enhance our performance.

**Suspension** - The suspension team has successfully implemented its new concept for the EBS (Emergency Brake System), which has created the basis for driverless driving. This season, the focus was on increasing the rigidity of the suspension. We also realised a new wheel design. Despite a break in the steering during Formula Student Austria, we were quickly able to get back on the road and take part in the other events.



## Between circuit boards and software

**Elektronics** - Last season was a complete success for our electronics team! We developed, tested and installed all the circuit boards, the wiring harness and the software in the vehicle on time. The car ran reliably at the events and passed the technical inspections without any problems. We are particularly proud to have driven driverless for the first time at an event. Even though we have unfortunately not yet been able to complete an endurance discipline this season, we have learnt a lot and are looking forward to next season with great motivation. We will continue to optimise reliability and driving dynamics control in particular.

## Final words..

We started the new 2024/25 season at the beginning of September. The team leaders have come together and the first concept meetings have been held. At the start of the winter semester, we will be starting our recruiting activities again at the Faculty of Engineering, the Faculty of Business and Economics and at the Langemarck canteen. We have two special events coming up in the next few weeks: our participation in Consumenta in Nuremberg in collaboration with FAU and the award as Innovator of the Year in the 'Student' category at FAU's Dies academicus 2024 on 4 November 2024.

Our entire team would like to take this opportunity to thank our sponsors and supporters. Without this valuable support, the realisation of such a project would not be possible. We look forward to continuing our collaboration and are confident about the challenges ahead!

