



Newsletter

High-Voltage Motorsports e.V.



Dear sponsors, Dear friends of the club,

after coming second in the Cost & manufacturing discipline at our last event, Formula Student Germany, we started the new season with a positive attitude and a lot of motivation. In the first few weeks of the new season, we had a lot of organizational matters on our agenda. As already announced at our rollout, our club changed its name to "High-Voltage Motorsports e.V." at the end of September. Now as we have been building exclusively electric racing cars for three years, this was an important step for us. We also took our time to redefine our goals in order to achieve the best possible result for our team. We have set ourselves the goal of building on our previous successes and putting our car to the test again.

During our annual recruiting campaign, we were once again able to attract many new members and thus build up a large team. After many design weekends, we were able to meet our first deadline - the design deadline - on December 10th.

DECEMBER 2023

TEAMBUILDING

Once again, it was time for our annual team-building weekend, which is always a highlight. With games to get to know each other and group games, but also design tasks, honest reflection and lots of fun, we experienced great moments together as a team. The weekend not only strengthened our sense of togetherness, but also provided space for valuable discussions with experienced team members as well as our youngest members to help them settle into the team.

A look at our nontechnical sub-teams

Cost Report - We are facing exciting times as we extend a warm welcome to our new members who have recently joined our vibrant team. Their valuable contributions are already shaping our journey ahead. Currently, we're in the midst of a transformative phase, diligently revising our cost report documents to elevate precision and effectiveness. But that's not all - our collective vision extends to pioneering advancement in cost understanding and manufacturing processes. Kudos to everyone for their dedication and enthusiasm.

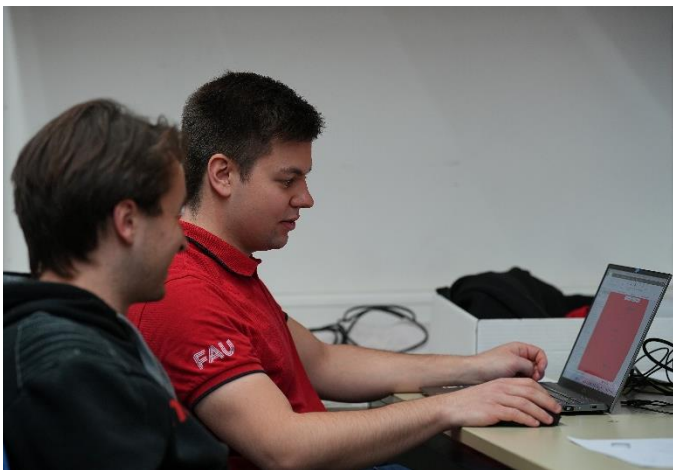


Mechanical development

Chassis - A seat for our Rho has already been laminated, although the finishing work is still pending. The first material tests have already been laminated and are currently in the autoclaves at Crosslink. The first material test will take place on Monday 11.12. According to the simulation in Matlab, the Rho-Mono will be very lightweight, despite the geometry remaining the same, we should be able to save a few kilos. Fingers crossed that the reality is just as good as the simulation.

Powertrain - In the cooling system, the focus this season is on fluid simulations. This will allow the aluminum 3D printed engine cooling jackets and the inverter cooling plate to be further optimized in terms of pressure loss and efficiency. Last year's gearbox will only be slightly revised. It relies on a hybrid output gear with an inner part made of aluminum, while proven elements such as an extremely lightweight 3D printed titanium housing are retained. The packaging of the battery is further reduced, and the focus is on reliability and simplified production.

Our test bench, which can be used to test dynamic motor runs, has been completed. This works with an eddy current brake as the load, the current drive inverter as the controller and either our power supply unit or one of our batteries as the power supply. In order to be able to test the electronic components of the car here as well, these are also tested in combination with the powertrain. This allows us to extensively test the functionality of the chassis even before it is completed.



Suspension - In recent months, the chassis team has been working intensively on the development of new wheel rim shapes and a new Emergency Brake System (EBS), which has to brake autonomously in emergencies. In addition, other assemblies such as the steering, pedals and kinematics have also been further developed. With the completion of the design phase in December, the first drawings are now being created in order to start production in the new year.



Aerodynamics - The aerodynamic package of the FAUmax RHO is designed to divert turbulent air away from the vehicle and in particular from the underbody, starting from the tires. The fact that less turbulent air interacts with the elements of the aerodynamic package and their influences are reduced means that a more constant downforce behavior can be achieved over time.

Another innovation is the implementation of a rear cover, starting from the headrest. This is intended to improve the airflow behind the driver and serve as a cover for some electronic components.



With our university president Prof. Hornegger

Between boards and software

Electronics - After giving a lot of thought to errors and optimizations for the new season, we used the last few months to rework our circuit boards. We decided to produce prototypes first in order to discover initial errors. We will assemble these prototypes before Christmas and then start testing them. We are particularly looking forward to the results of our active suspension, which has been severely revised. Some other circuit boards also require major changes; these are still under development and will only be put into operation after our second order phase. At the same time, we are being supported in CAD work by other sub-teams in order to make more effective use of the installation space within the monocoque this season.

Driverless - We are currently working with the other sub-teams to optimize the integration of our driverless components into the vehicle. The focus here is on making better use of the available space in the chassis and reducing the negative impact of our sensors on aerodynamics. On the software side, we have been able to cut the last dependencies on the outdated ROS1 framework, which will make further development easier for us. We are also concentrating on making the object recognition and mapping algorithms more robust so that we can steer our racing car through the courses faster in future.

Final words

Our team is looking forward to starting the production phase with its challenges again after a few relaxing Christmas days!

We wish you a relaxing Christmas season and a happy New Year!

