



Newsletter

High-Octane Motorsports e.V.



Dear sponsors, Dear friends of the club,

We have started the new season full of ideas and zest for action. Our design phase has already been running at full speed since September. Not only new team leaders, but also new sponsors enrich us this season. We are already looking forward to building an unforgettable car with them and, of course, with our long-time supporters. True to the motto "faster, lighter, more innovative", we have set ourselves high goals and want to finally be among the top teams again.

That's why a lot has already happened in the last few weeks. But not only long design weekends are behind us, but also trade fair visits, sponsor fluctuations and various workshops on the topics of software and personnel management, so that we can now finally take off.

DECEMBER 2022

TEAMBUILDING

A highlight of the last weeks was also our annual teambuilding weekend. Between getting to know each other games and construction tasks, there was even a snowball fight and of course lots of fun. This allowed us not only to strengthen our sense of togetherness, but above all to integrate our new members into the team.

A look at our non-technical sub-teams

Businessplan - A lot has changed in our subteam since last season. Our membership has increased by 100% and as Polina, our member since last year, said, "We are finally a real team!". Brainstorming ideas this time at the beginning of the season was a wonderful experience and we are getting a lot of support from the other sub-teams. The concept for the business plan is already done and soon the financial planning of the whole thing will come.

Cost Report - The Cost and Manufacturing Team was busy in the last weeks with the revision of previous concepts to analyze the cost structure of the race car manufacturing and the club. Furthermore, the implementation of a comprehensive cost of goods sold accounting started, which allows a professional back-calculation of all costs and expenses during the season and through existing inventory to the vehicle. Among the other ideas are the tracking of new Key Performance Indicators (KPIs) such as the costs per achieved point in the various event disciplines and a consideration of the environmental impact of the entire vehicle in the form of a Life Cycle Analysis (LCA). Here, the Bill Of Materials (BoM) serves as the basis and, among other things, raw material production and use, manufacturing and emissions must be taken into account.



Our positive wood mold during milling.

Mechanical development



The first two rims are laminated

Chassis - In the meantime, we were able to finalize the CAD design except for minor details, which resulted in sending the first prototype of the positive wood mold for the monocoque to our router. In addition, we are currently in the process of producing the first laminate test and will receive the first measurement results next week Monday.

Powertrain - Our stack frames of the high voltage battery are currently under construction. We are optimizing this with the background of achieving a better air flow in the battery and thus better cooling. We are disassembling the inverter and arranging the boards in a more efficient way, thus taking about a third less space in the monocoque.

Suspension - In the wheel assemblies, our topology-optimized wheel carriers are in the design stage. We have succeeded in further reducing their weight, which reduces our unsprung mass and thus contributes positively to the driving experience. In addition, we continue to work with electronics on the control of the active suspension to make it possible to change the damping constant continuously. In the case of the mechanical driverless systems, the design has been largely completed. A particular highlight is the autonomous steering system, which has been developed from scratch.

Between boards and software

Electronics - In electronics, our season started with final debugging and testing of the PCBs of last year's car, to get as much experience as possible from last season. After defining the concepts of this year's car, we started designing the schematics and layouts of the PCBs. Probably the biggest change here will be the active suspension, as this year we want to implement a stepless control using mosfets. At the same time, due to the poor availability of many components this year, system-critical components were ordered early to ensure that our schedule would not be jeopardized.

Driverless - For the first time, we have set up a realistic driving simulator to test, evaluate and compare our DV algorithms. We have also trained the latest state-of-the-art neural networks, with a new dataset which is of high quality. We have evaluated these qualitatively in the simulator as well as quantitatively with a test dataset and have found surprisingly good results. Furthermore, we have tightly integrated our computational unit into the car design, while paying great attention to maintainability and cooling.

Finally, a few words from our overall team leader

At the beginning of the year, we set ourselves some basic goals that we want to achieve in our season with our team and the car. One of the main goals we set is to finish the car early, for that we have to keep our schedule. So far everything is going very well, we have been able to meet all the deadlines we had set for the design phase. With the start of the production phase, new deadlines and challenges await us, but we are looking forward to them.



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