

FORMULA MANIPAL

MARCH 2025



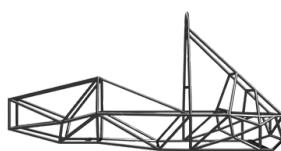
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Structures

The Structures subsystem iterated chassis designs using previous year's suspension points, preparing for the next chassis development. A specialized rig was designed for CF laminate testing, ensuring valuable data for future monocoque chassis, enhancing structural integrity, performance, and innovation in vehicle design.



Aerodynamics and composites

The Aerodynamics and Composites team refined the FM26 aero package for efficiency and manufacturability. Cooling setups for the radiator and accumulator improved. Material testing, ACP simulations, and layup feasibility assessments ensured compliance. Additionally, new materials were sourced, and manufacturing processes were researched.



Vehicle dynamics

The Vehicle Dynamics subsystem began its design process by determining front suspension outboard mounting points based on updated loads and dimensions. Centre-locking wheel hubs are in the design phase and is currently scheduled to be completed with a transient analysis in March. Along with this, anodization of Aluminium inserts for testing carbon fibre wishbones, determination of the master cylinders for next season, completing the suspension geometry and beginning design of uprights are also in the pipeline for March.

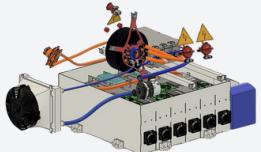


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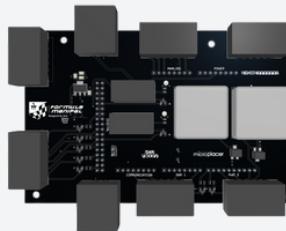
Transmission

Transmission's preliminary design is underway, evaluating performance, weight, manufacturability, and assembly ease. A 14ID halfshaft was sent for manufacturing to ensure system compatibility. Research on the LSD continues, with ongoing design iterations to optimize functionality and integration within the vehicle.



E-Powertrain

The Electric Powertrain subsystem used simulation tools and energy estimation models to optimize the electronic configuration of the battery pack. The design of the TSAC for the coming season is in progress with the goal of weight reduction in mind.



Electronics and controls

The Electronics and Controls subsystem focused on data acquisition and developing logic for TSAL to ensure rule compliance. Extensive debugging was done on the car to enable accurate data collection during static testing, refining system performance and integration.



Driverless

RMPC was successfully interfaced with the brake-by-wire servo motor. Mounts for the ZED 2i stereo camera were designed, while the Jetson module's encasing is in progress. Different simulators are being tested to ensure a robust software stack.



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