



Formula SAE Electric Overview



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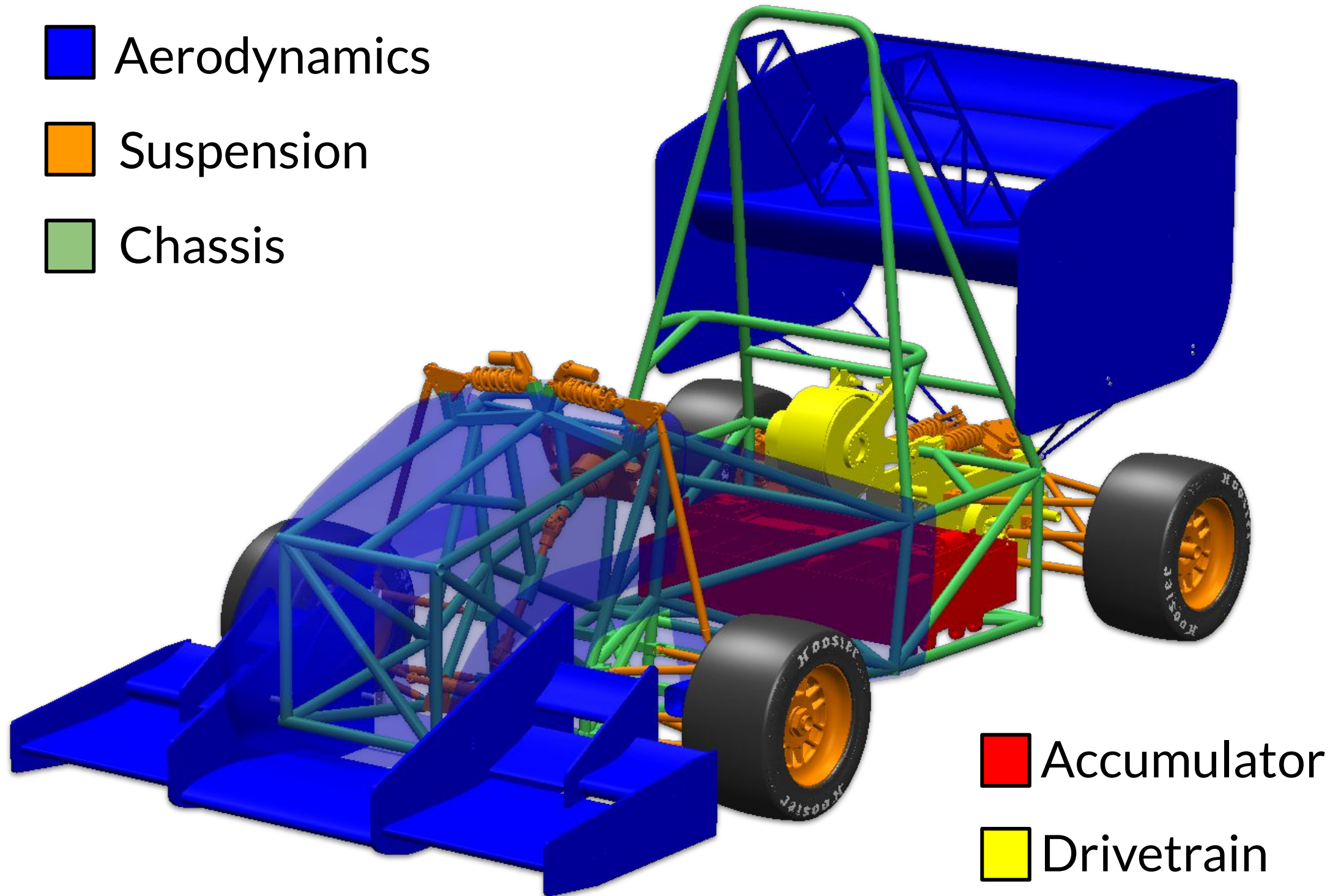
Background

Formula SAE Electric is a student engineering competition organized each year by the Society of Automotive Engineers which challenges students across the country to design, build, and race single-seater, electric, formula-style race cars. The cars are evaluated in both static (design, cost analysis) and dynamic (acceleration, skid pad, autocross, endurance) events that test the vehicle's performance and engineering

Engineering Specifications

Top Speed	55 MPH
Power	85.8 HP
Torque (Continuous)	88.5 lb ft
Weight	507 lbs
Wheelbase	61 in
Track Width (Front)	48 in
Downforce (@ 35 MPH)	67 lbs
Budget	\$60,000

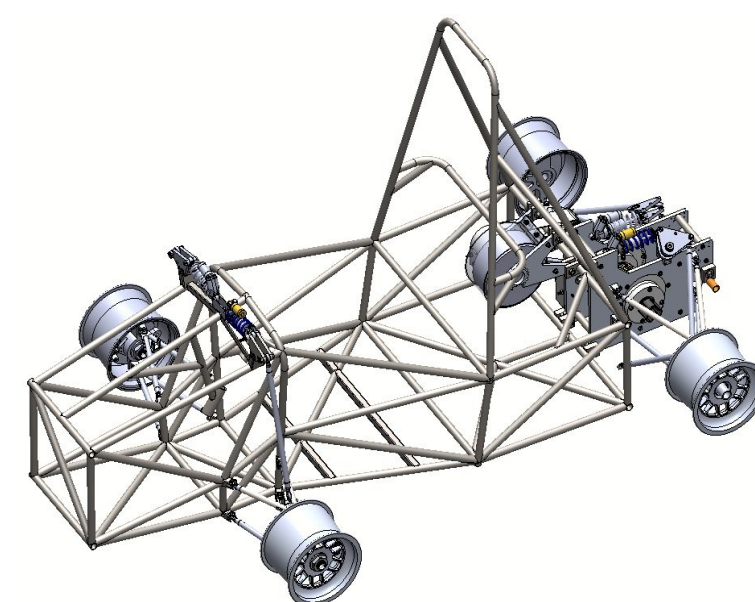
Subsystem Breakdown



GR24

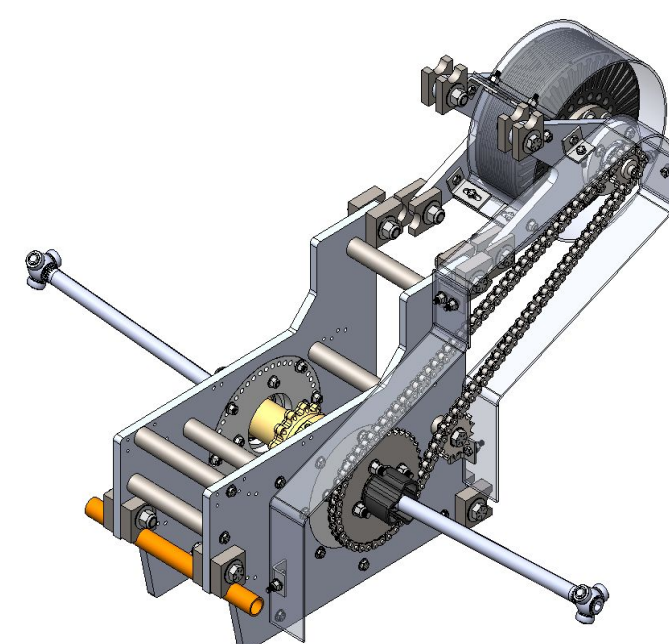


Vehicle Subsystems



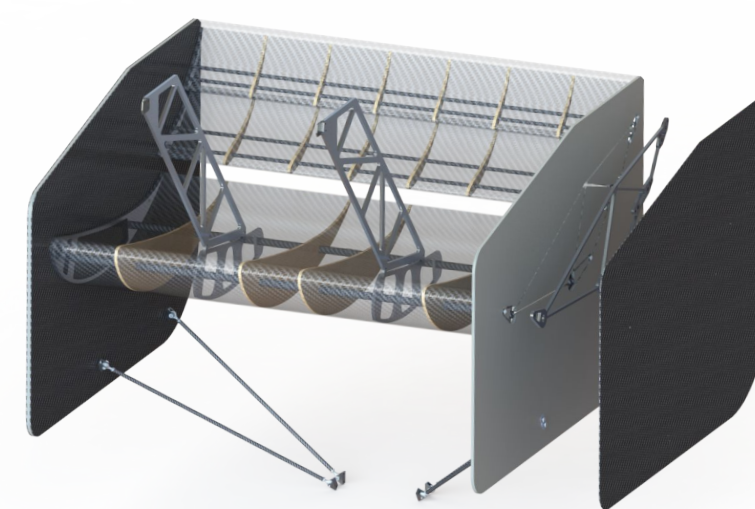
Chassis & Suspension

- 4130 Chromoly Steel frame chassis
- Double wishbone suspension
- Ackerman steering geometry



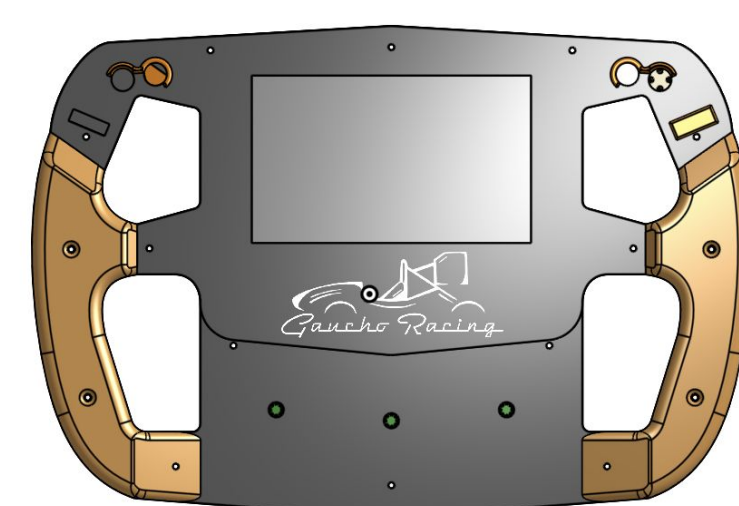
Powertrain

- Emrax 228 Electric Motor
- 537 V 8 segmented battery pack accumulator
- Chain-driven drivetrain
- Limited-slip differential housed in removable manifold structure



Aerodynamics

- Full carbon fiber and fiberglass bodywork
- Multi-element front and rear wings
- Lightweight rib and spar structure



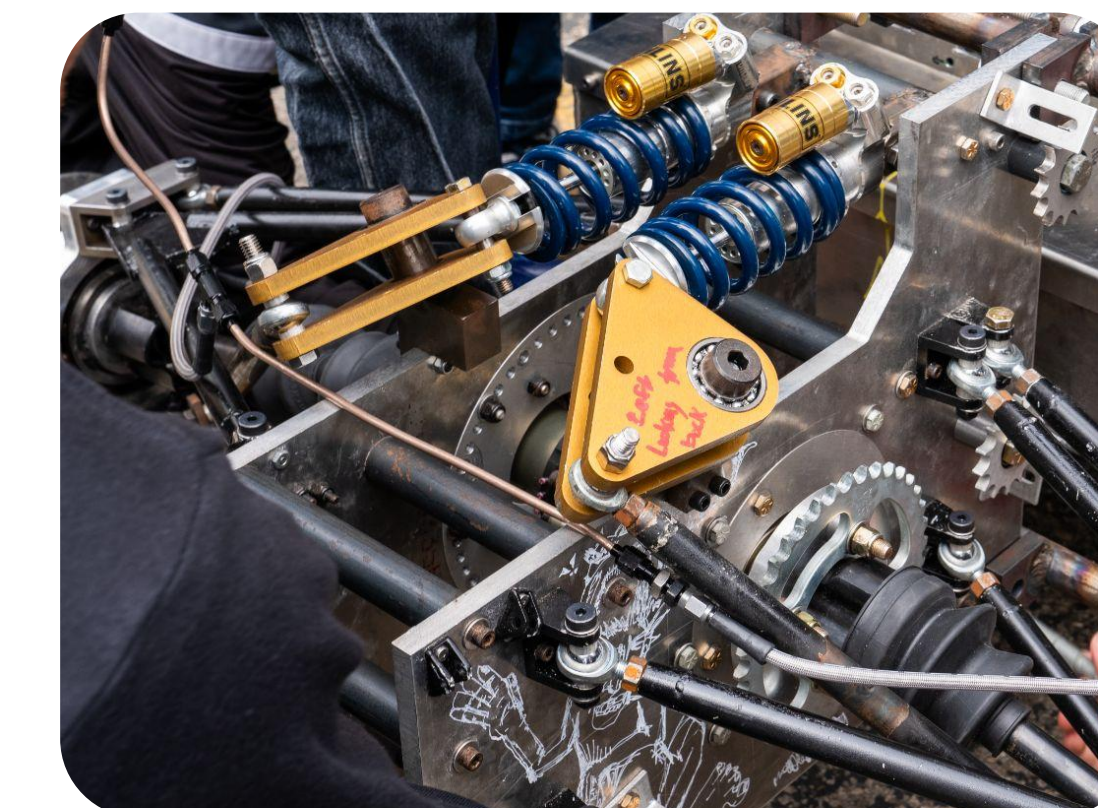
Control Electronics

- Data acquisition of sensors and cloud based software with 5 Teensy micro controllers.
- CAN bus to communicate with the sensors and components

Manufacturing

Chassis/Suspension Weld Jig

- 80/20 and plywood welding jig
- Components welded in-house
- Critical nodes placed at front suspension pickups and battery box mounts



Mechanical Systems Fabrication

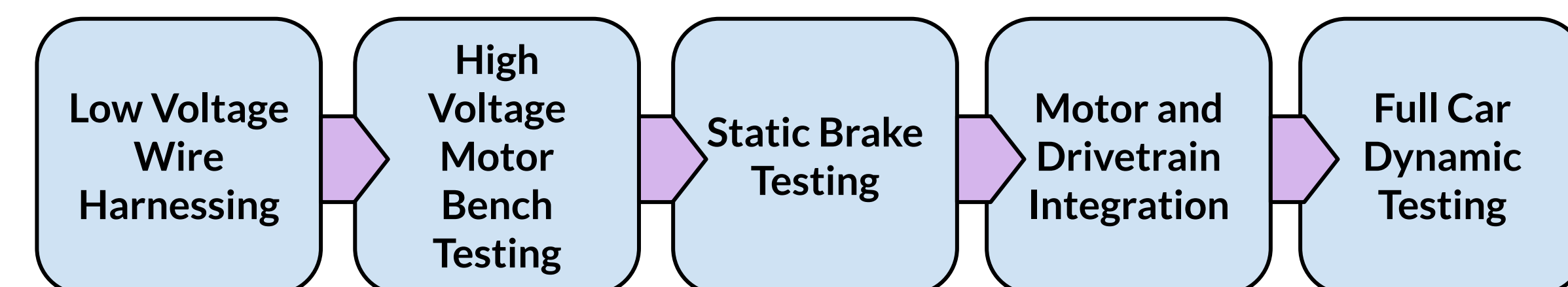
- CNC milled, lathed, and wire EDM'd aluminum wheel assemblies, mechanical drivetrain, and battery box
- Water jetted steel accumulator mounts and suspension rockers

Composites Manufacturing

- 3K Plain Weave Carbon Fiber and E-Glass Fiberglass Construction
- Epoxy wet layup on cut XPS foam and 3D printed molds
- PVC foam core sandwich endplates
- 2K Clear Coat and Vinyl Decals



Testing



Bench Testing

- Low and high voltage bench test of accumulator and sensors for connections, validation, and safety

Dynamic Testing

- Full vehicle static and dynamic testing for brakes, integration, and tech inspection



Sponsors:



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