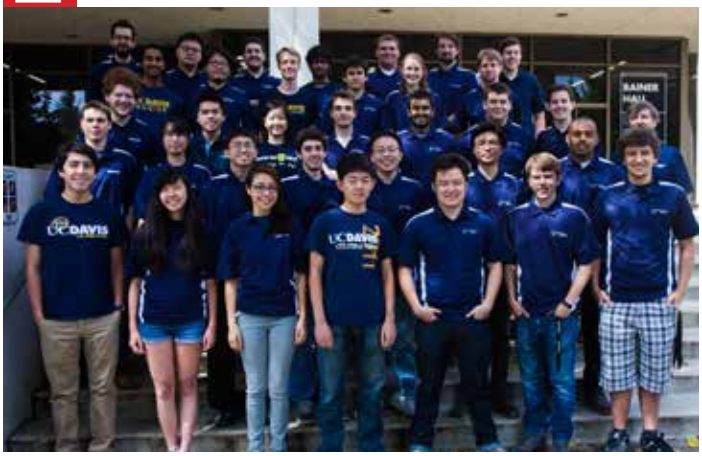
E203

University of California - Davis

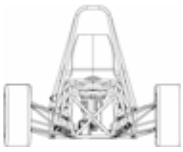
UC Davis Formula Racing

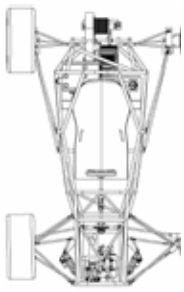


Our second entry into the Formula SAE Electric series is a complete revision of our first vehicle with major developments in powertrain, vehicle packaging, and suspension.

The most significant visual change is a 30 inch reduction in overall length. This primarily is achieved by shifting the accumulator forward in the chassis and reducing the sprocket-to sprocket distance. This distance reduction is allowed by a newly developed coaxial, planetary speed reduction device. Power is routed from that through a secondary chain-based reduction to the wheels with a Torsen differential.

The goals of the new suspension are to make the car easy to drive and provide a high level of maneuverability and stability during acceleration, braking, and hard cornering. The suspension is also designed to interface well with the powertrain and chassis. Another major goal was to reduce the vehicle's turn radius from last year's. This year, we implemented a lower multilink to reduce the turn radius to 13.5 feet while maintaining a small scrub radius.





BRAKE : 240 mm (front), 220 mm (rear) rotors, Brembo P2 Calipers
COOLING : Passive Air
DRIVE : RWD, Co-axial Planetary Reduction to Chain, Torsen LSD
ELECTRONICS : Custom BMS
EMCAC : NCM-cathode Li-Ion/7.5 kWh
FR/RR TRACK : 1295.4/1295.4 (mm)
FRAME : Tubular Spaceframe
MATERIAL : 1020 DOM
MAXMOTORRPM : 6000
MAXSYSVOLT : 116 V
MOTORCNTRLR : Curtis 1239e
MOTORTYP : Z-Force 75-7 Permanent Magnet Synchronous
NHLMM :
OLWH : 2203 mm, 1502 mm, 1079 mm
SUSPENSION : Upper A-Arm, Lower Multilink (F), Twin Trailing Link, Inverted A-Arm (R)
TIRE : 20.5x7-13 R25B Hoosier
TRANSRATION : 3:1/2:1 (6:1 Total)
WEIGHT : 675 lbs
WHEELBASE : 1676 mm/65.98 in

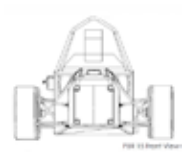
United States

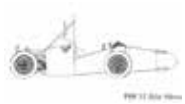
E204

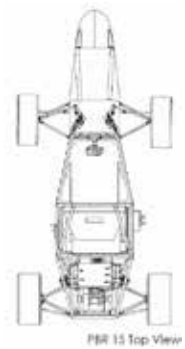
University of Manitoba

Polar Bear Racing

The major features of the UMSAE Polar Bear Racing's 2015 Formula Electric model are summed up as follows. The vehicle is built around on a strong, 41 kg steel chromoly tube frame clad with expanded aluminium foil impregnated composite panels. These panels were identified as the most elegant means of meeting the stringent electrical grounding requirements.The whole car is powered by a 263 V lithium ion accumulator, feeding into a BAMOCAR-D3 motor controller and finally to a three-phase, 240 Nm (peak, for 5 seconds) EMRAX 228 brushless motor. This power plant is expected to bring the vehicle up to a maximum speed of 130 km/h.Additional features include dedicated cores from Parallax Propeller micro-controllers for the throttle and brake position sensors as well as a dash mounted Android smartphone for vehicle telemetry. All indications suggest that the model has met its design goals, even performing above and beyond expectations in some areas.







BRAKE : Wilwood GP320 with custom stainless steel floating rotors
COOLING : Forced air with custom heatsinks for cells, Water cooling for MCU and motor
DRIVE : Direct chain drive system (
ELECTRONICS : Throttle/brake sensors; CAN across AMS, MCU, LV controls PCB; smartphone
EMCAC : Li[NiCoMn]O2 / 144 Ah
FR/RR TRACK : 1510 mm (front) / 1495 mm (rear)
FRAME : Welded tube frame
MATERIAL : Steel CrMo
MAXMOTORRPM : 5000 RPM
MAXSYSVOLT : 298.8 V
MOTORCNTRLR : Unitek BAMOCAR-D3
MOTORTYP : EMRAX 228 brushless synchronus 3-phase AC motor
NHLMM :
OLWH : 3058 mm (length) x 1510 mm (width) x 1148 mm (height)
SUSPENSION : Short-long A-arm. Sprung mass actuation with custom rockers and uprights
TIRE : R25B 20.5 x 7.0-13 (front) and 20.0 x 7.5-13 (rear) Hoosier
TRANSRATION : 3.73 : 1
WEIGHT : 322.9 kg (711.9 lb)
WHEELBASE : 1720 mm

Canada