



MAC

FORMULA ELECTRIC

SPONSORSHIP PACKAGE

TEAM OVERVIEW

MAC Formula Electric was started in 2015 when the McMaster Formula Hybrid team disbanded. It began as a small group of dedicated students who have grown the team into what it is now, a team of over 80 active members working on various aspects of the car. The team spans over multiple faculties outside of engineering, including a dedicated business team which creates a realistic and functional group dynamic.

As the group of original founding members graduated this past year, our team has embraced the opportunity to re-structure and accept new, ambitious young engineering students who will build upon what has been achieved so far.

TEAM LOCATION



After two years of initial design and team building, our team's first fully electric car was ready to be manufactured in 2017. This step came at an opportune time as it aligned with the opening of McMaster's Gerald Hatch Centre for Engineering Experiential Learning. This student building provides space for the university's extracurricular teams to get the hands-on experience that each team is built around.

TEAM LEADERSHIP



Jessie Boudreau
TEAM CAPTAIN



Blaire Pauli
MECHANICAL



Scott Sutherland
ELECTRICAL



Harjot Nijjar
CONTROLS



Dylan Boudreau
VEHICAL DYNAMICS

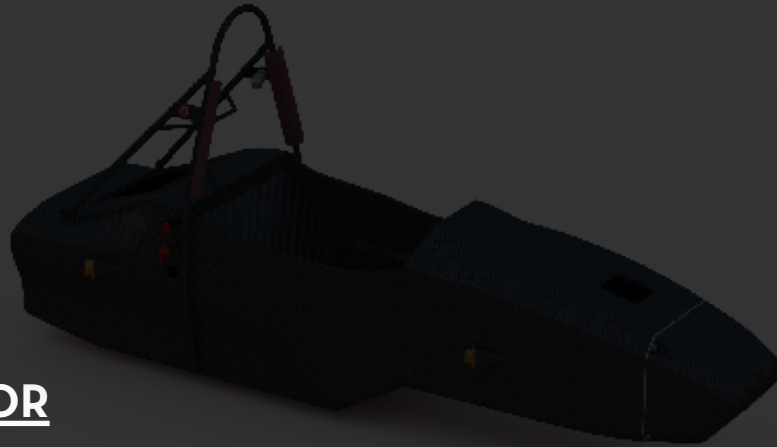


Jared Cox
MECHANICAL

MANUFACTURING HIGHLIGHTS

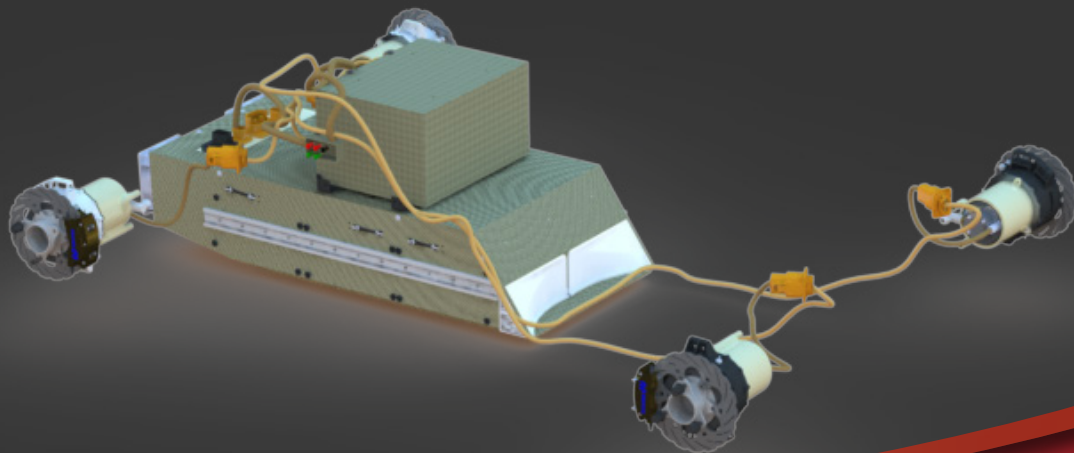
CHASSIS

The chassis for the formula car is a composite monocoque made from carbon fibre laminate panels. The design and layup of the carbon fibre is optimized in order to attain structural rigidity while also saving as much weight as possible in order to improve vehicle performance. FEA software is used to design the layup and thicknesses in each location, and the design is validated through physical testing. The chassis can then be manufactured entirely by team members who specialize in composites manufacturing.



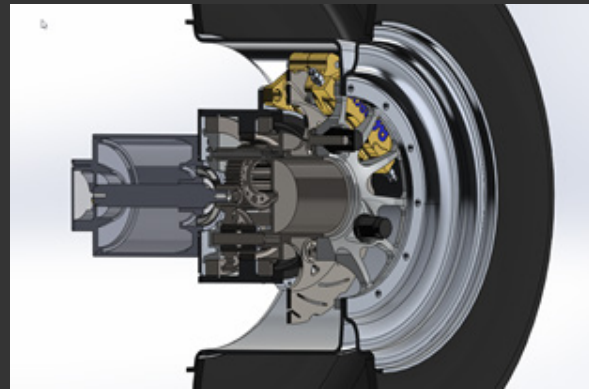
ACCUMULATOR

The accumulator is a specially designed lithium battery of high specific power and energy. The design is aimed to provide maximum power output to all four motors for a long period of time while consuming as little space and weight as possible. All team members involved in design, manufacturing, and testing of the accumulator received crucial high voltage and lithium battery safety training before any work is started.



GEARBOX ASSEMBLY

The car's gearbox consists of an in hub planetary gear train system, which a motor mounted to each assembly. This provides power to all four wheels of the car, which can be independently controlled using torque vectoring algorithms. The gear train was designed in partnership with a local engineering company who manufactured the final design.



TEST BENCH



To allow for testing of all electrical systems of the car, a test bench was built to independently verify all of the systems. The motors and pedals were mounted for testing along with the inverters and cooling jackets on the motors. A MicroAutobox II is used to verify the software and hardware.

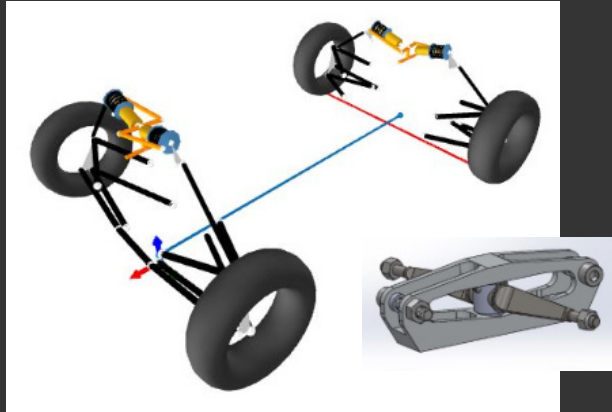


AMK Motor and Inverter Package

- 35kW peak **each**
- 3.55 kg
- Liquid-cooled
- Theoretical **0-100km/h in 1.7 seconds**

SUSPENSION

All components of the Pushrod suspension system were installed on the new chassis. It features a Z-bar design with a blade style anti-roll bar. This setup will be used as a mock for other parts of the car while the new chassis is manufactured.



LOOKING FORWARD

With our first ever electric car complete, we are now looking toward developing innovative designs to push the boundaries of electric vehicle technology.



FSAE COMPETITION

Formula Student and FSAE challenge teams in two types of events:

Static Events

- Design, Cost, and Sustainability
- Business Case
- Technical and Safety Scrutineering
- Tilt Test
- Brake and Noise Test

Dynamic Events

- Skid Pad
- Sprint (autocross)
- Acceleration
- Endurance
- Efficiency

COMPETITION ATTENDANCE

This year our team looks to compete in its first ever FSAE competition in north America and following that we will set our sights on competing in Europe's Formula Student competitions.

FSAE North America

- Formula SAE Michigan (Summer 2019)
- Formula North (Barrie Summer 2019)

Our teams goal is to first develop a strong foundation of experience with competitions in North America. Once established, we plan to bring a highly competitive car to the European Formula Student competitions which showcase some of the very best in the world.



SPONSORSHIP TIERS

	PLATINUM >\$5,000	GOLD \$2,000 - \$5,000	SILVER \$500 - \$2,000	BRONZE < \$500
Social Media Post Frequency	Twice/Year	Once/Year	Once	-
Sponsor Appreciation Events	✓	✓	✓	✓
Access to Resume Bank	✓	✓	✓	
Company Information Session	✓	✓		
Logo on Club Website	Featured	Large	Medium	Small
Logo on the Vehicle	1200 - 1900 mm ²	600 - 1200 mm ²	< 600 mm ²	-

The Sponsorship Tier's should only be used as a general guideline and are subject to change. All additional or alternative benefits should be agreed upon in writing between MAC Formula Electric and the sponsoring entity.

SPONSORSHIP BENEFITS

COMMON GOALS

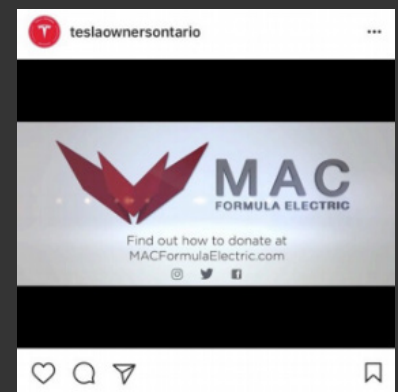
MAC Formula Electric looks forward to the possibility of a partnership with companies looking to contribute to student engineering competitions. We feel that the experience which our team members gain from the team make them very well rounded employees for future careers. Meaning that any company which looks to contribute to our team will be held in high regard when our team members are looking for both co-op and graduate positions.

BRAND PLACEMENT

For your support, prominent logos will be placed in our car, website, and on team apparel. Brand awareness includes international brand exposure to approximately 100,000 people each year through events on and off-campus, trade shows, motorsport events, competitions, and in the media.



MEDIA PRESENCE



WHY ELECTRIC



SUSTAINABLE

MAC Formula Electric recognizes the necessary shift to the use of cleaner technology. By using electric vehicles as a platform for innovation the team hopes to promote the development of a socially, economically, and environmentally sustainable future.



HIGH PERFORMANCE

With efficiencies of over 90%, electric motors are able to transmit a higher percentage of power to the wheels than an internal combustion engine. Moreover, with the ability to provide maximum torque at any speed, performance figures for MAC Formula Electric's first car rival the top combustion and hybrid automobiles.



FUTURE OF TRANSPORTATION

The entire automotive industry are part of a movement looking towards a more sustainable method of transportation. Showcasing impressive examples of electric vehicles helps this movement become more mainstream.



Thank you for taking the time to review our sponsorship invitation!

If you would like to find out more about MAC Formula Electric,
or inquire further regarding sponsorship opportunities,
please contact us at:

FORMULA@MCMASTER.CA

or visit:

WWW.MACFORMULARACING.COM