Regenerative Brakes for an Electric Formula SAE Racecar

SDSU San Diego State University
AER AZTEC | ELECTRIC | RACING
SAN DIEGO STATE UNIVERSITY | FORMULA ELECTRIC

ALL BRAKES NO GAS

Testing Method

Test	Regen Max Amps	Full Regen Braking at Speed	Hydraulic Braking Assisted Regen	Full Hydraulic and Regen	Coasting
Test 1	30	Deceleration starting from 10 to 5 mph, with each trial increasing in increments of 5 mph (i.e., 15 to 5, then 20 to 5, etc.) until 50 to 5 mph.	Same experiment as full regen, but with the addition of light hydraulic braking force from the tow vehicle.	Same experiment as full regen, but with full hydraulic braking force from the tow vehicle.	Same experiment as full regen; however, the brakes were not applied to check if there was any trickle charging.
Test 2	45				
Test 3	60				
Test 4	75				

Team Members

Jack Muller
Team Leader & Design Lead

Sonya Loredo
Manufacturing Engineer

Nolan Zaayer
Analysis Engineer

Henri Stephan
Manufacturing & Design Engineer

Ryder Bullock
Procurement Lead

Christian Lunt
Electronics Lead

Acknowledgements

San Diego State University:
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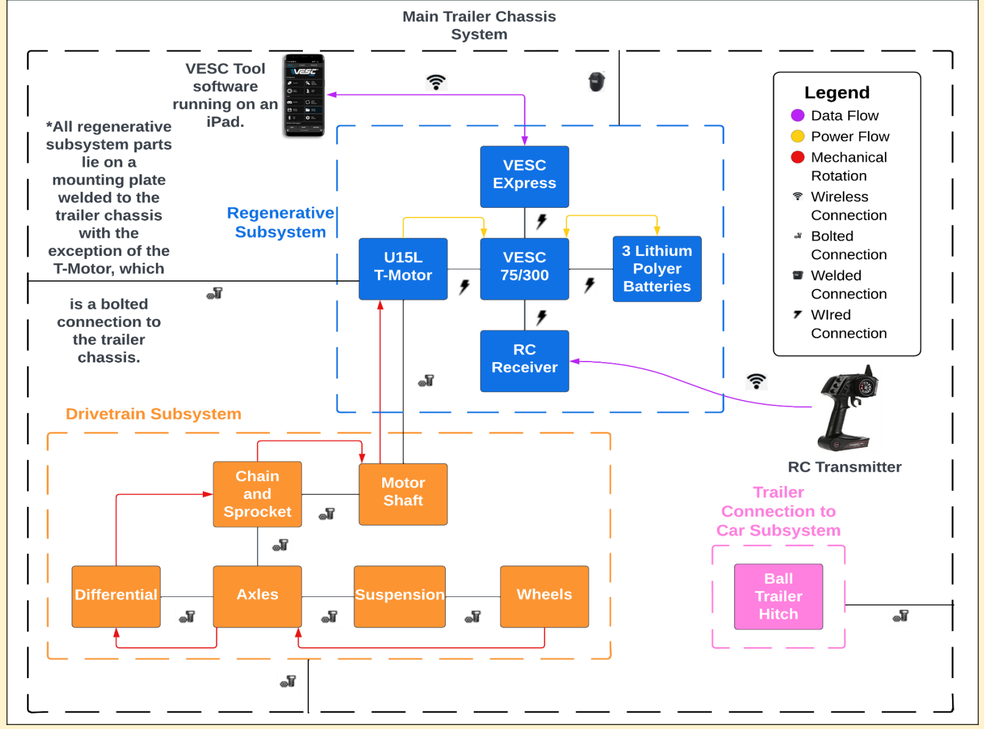
Mike Lester (Fabrication Support)
Aztec Electric Racing:
Andrew da Cunha (Club President & Project Sponsor)

System Level Diagram

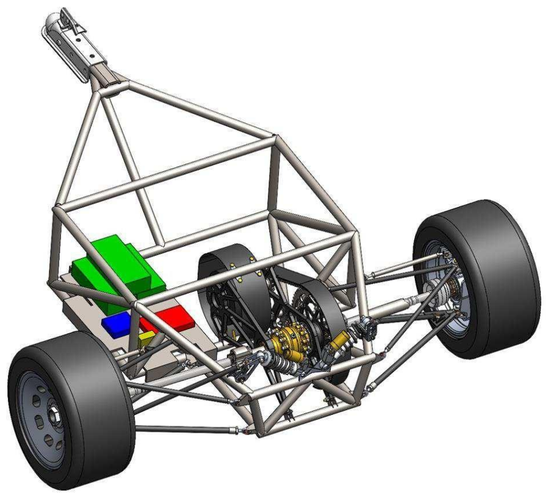


Project Overview

Every year, Aztec Electric Racing (AER) looks for ways to improve the performance of their Formula SAE Racecar. This year, the student-run club wanted to test a regenerative braking system to improve the car's efficiency and range. The purpose of this project was to quantify the power sent back through the system at a variety of speeds under regenerative braking. The system was developed as a testing trailer that attaches to the back of a vehicle and is a copy of the rear portion of the former 2022 AER racecar.

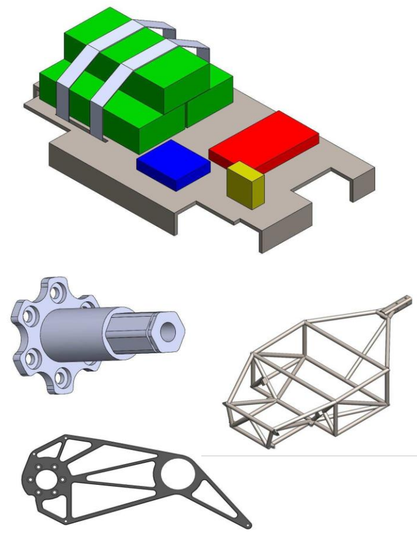
CAD Models & Important Componentry

Trailer Assembly



VESC and Motor

Team Designed Components



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