THE SPARTAN RACER

OCTOBER 2021

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U P D A T E S

FTTA Testing

On Saturday, September 25th, the team left East Lansing early to head over to FT Techno of America located in Fowlerville, MI. After going over basic safety and general rules, the team made their way to the proving ground's dynamic pad. The morning forecast was dreadful with lots of rain, but it cleared up nicely by noon for much-needed testing.

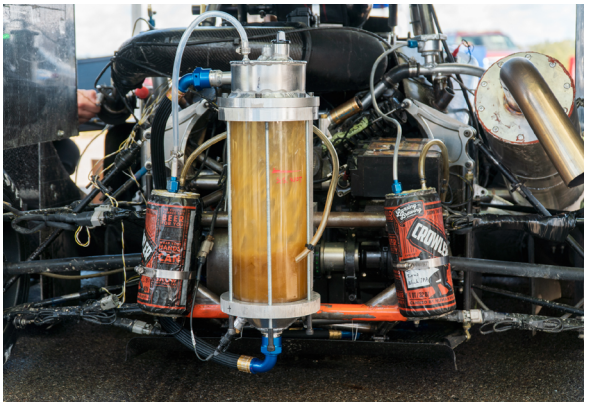
With a whole day dedicated to testing, it was imperative that the team outlined a concrete testing plan. This ensures each system can divide a certain amount of time for parts that they want to test. But, due to the weather, the schedule was re-assessed. The team had planned to test a clear oil reservoir on the rear of the car to analyze interchangeable oil baffling, but decided that the video footage of the reservoir would be unusable if wet.

Final check before going out on the track

The clear tank included the option to change out certain baffle configuriations. Testing these variations would separate the air and oil mixture (also known as aerated oil) located in the oil reservoir. This would then help scavenge the oil and lubricate the system. The team still has more testing and analysis to do before coming to any conclusion.

University of Michigan's Electric Racing Team was also present at FTTA that day. Past rivalry seemed to dissipate due to both universities competing with different platforms. The team enjoyed learning more about electric vehicles with the vision of starting their own project within the next couple years.

The team also planned to drive one more full endurance in SR-20. With the weather getting colder and the aerodynamic package still being new, it is important to get the drivers adjusted. They can then get more seat time and provide proper feedback needed for tuning. Though testing didn't go a well as they hoped,



Clear oil resevoir on Car 38

the team completed a full endurance run with no issues.

Many new subsystem leads continued to gain meaningful testing data that they can use to aid in the design of this year's car. The team appreciates the generosity of FTTA, and without their support, the car would be limited to moderate-speed testing on campus.

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MSU Homecoming Parade

The MSU Homecoming Parade is a cherishable memory for all ages. It represents school pride with different clubs, organizations, and communities showing off not only their Spartan pride but what they all love to do. The team hasn't attended the parade in over three years, so being able to show off the car to the community was a new and great experience for all who participated. The widened eyes of small children and thrilled minds of adults seeing what college students could produce boosted team morale and passion for the project.

The team was proud to represent the College of Engineering while sporting their new State Racing Hawaiian shirts. The team's falculty advisor, Dr. Gary Cloud, even joined in for the occasion.

Roy Bailiff's Retirement

Behind-the-scenes support from the faculty at Michigan State University does not go unnoticed. From training members on how to mill, lathe, and weld, Roy Bailiff has dedicated numerous hours to ensure students have the opportunity to manufacture a car. He has also recently advocated for a new student engineering building on campus to replace the cramped and outdated shop on Jolly Road. With the help of Roy, the 10,560-square-foot William A. Demmer Engineering Center will soon be constructed on the corner of Mt. Hope Road and Farm Lane. After construction, it will be fitted with machines and filled with eager Spartan Engineers.

Though we are sad to see Roy leave, the team thanks him for his 25 years of work at Michigan State University. He was a mentor for many and his impact will leave an ever-lasting footprint.

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MEMBERS

Name: Abhyuday Rastogi
Role: Dyno and Calibration Lead
Hometown: New Delhi, India
Major: Mechanical Engineering
Class Standing: Senior

Why did you choose to join Michigan State Formula Racing?

Being an international student, it has been a little difficult for me to find an internship in the automotive industry to get a hands-on experience due to sponsorship issues. MSU Formula Racing is the closest possible hands-on opportunity I could get. It has been a great learning experience for me. I have been able to learn so much about a car from its design to manufacturing in such a short time. Another reason I chose to join the team was that I get to work with some of the best engineering students at MSU.

What are you most excited about for this upcoming racing season?

Achieving an operational engine dynamometer would be huge for the powertrain system as a whole. We would be able to validate our new intake design and retrieve our engine's horsepower and torque curves. It will also help us validate and implement the custom camshafts an alumnus designed during his time on the team. A lot of powertrain validation depends on whether we can get the dyno operational, so I would say I am very excited to get it running and do some calibration and validation work for our system.

Do you have any professional work experience?

I have been working with my professor's company, Mid Michigan Research. My work involves the use of CASE which is a piston and ring pack dynamics simulation software. I communicate with clients of Mid Michigan Research to help in the development of more efficient engines by running simulations on CASE to get data for cylinder and ring pack wear, blowby, and energy losses. I have had the pleasure of working with them due to the never-ending set of projects. It has been an amazing experince working with various other companies and clients.

Name: Dave Yonkers
Role: Software Lead
Hometown: Lake Orion, MI
Major: Computer Science
Class Standing: Senior

Why did you choose to study Computer Science?

Back in high school, I enjoyed fast-paced and challenging classes like calculus and physics because they forced me to learn how to solve problems with limited resources. That, combined with an interest in automotive technology, lead me to computer science where many of my passions align. It was a bit of a shot in the dark, as I had no formal programming experience, but I couldn't imagine myself doing anything else. There's a lot of freedom in computer science to work on whatever I'd like.

What are some of the accomplishments you are most proud of since joinging the team?

Last year, I was the team's project manager, so I had the pleasure of making sure that the team didn't fall out due to the pandemic. There was no instruction manual for pandemic operations, so I had to think creatively to keep the team in good standing. Through a lot of hard work by a handful of team members, we were able to complete the car in time for competition, despite incredibly restrictive shop access. The team placed fourth overall after adding up the static and dynamic scores, so I would consider that a huge win.

Do you have any professional work experience?

I've had three internships: one at Brose North America, a tier one automotive supplier, and two at Pratt Miller, a multifaceted engineering company. At Brose, I created a test specification for their line of brushless motors. At Pratt Miller, my first summer was spent developing an application for wireless datalogging and telemetry, and my second summer consisted of streamlining pitstop analysis and creating machine learning models for Corvette Racing. I enjoyed all three of my internships, and I plan on returning to Pratt Miller this upcoming summer before I head to graduate school.

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ALUMNI

Name: Hillary Gregory
Hometown: Livonia, Michigan
Degree: B.S. Mechanical Engineering (2011)
Years on the team: 2007-2010
Roles: Cockpit Team (2007-2008)
Cockpit Lead (2008-2010)

How did you contribute to the advancement of Michigan State Formula Racing?

Through my time on the team, I supported in progressing the use of carbon fiber and Kevlar in cockpit design and manufacturing, from carbon fiber steering wheels to custom-formed seat backs and nose cones.

What is your favorite memory from the team?

My favorite memory with the team was traveling to California for the first time for FSAE West, and taking a tour of Jay Leno's garage. It was such a cool experience that I will never forget.

What is your current professional role?

I am currently the Vehicle Architecture Supervisor at Ford Motor Company. I lead a team of engineers in defining the accommodation and usage (interior roominess, visibility, cargo space, etc.), mechanical package (component positioning, tire clearances, ground clearance, etc.), and geometric compatibility (part-to-part interfacing) of small SUVs and trucks.

How did your experience as a member of Michigan State Formula Racing help shape your future?

Being a part of the team gave me a deeper passion for automotive engineering, along with teaching me valuable skills in CAD design, manufacturing and prototyping, and last but not least, teamwork and collaboration. All of these experiences have helped me get to where I am today in the automotive industry.

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Name: 3Dconnexion
Location: Munich, DE

With the history of the 3D mouse beginning in the late '70s, it was not until 1993 when the low-cost optical measurement system was granted a global patent. As this device is commonly used for CAD applications, 3D modeling, animation, and product visualization the appeal is continuously expanding

Since then, 3Dconnexion 3D mice deliver a level of ease and intuitive control of 3D models and environments that are not achieved through regular mouse and keyboard. They continue to drive design innovation by ensuring an intuitive and natural connection to today's 3D applications and design environments. As they continue to navigate an ever wider range of software applications and new market opportunities, the team supports the idea of the product becoming a fixed part of their lives.

3Dconnexion's donation has benefitted the team by providing numerous SpaceMouse's to illicit the highest level of performance when designing SR-22. The team appreciates the continued support and hopes to continue the partnership into the future.

Name: FT Techno of America
Location: Fowlerville, MI

On 950 secluded acres of land located in southeast Michigan lies the Fowlerville Proving Ground. It is a world-class, independent proving ground, equipped with professional engineering and operations staff that continue to exceed expectations.

With a 4,500-foot straightaway, a 20-acre dynamic pad, a 3-mile oval track, an ADAS Test Facility and many more the facility boasts multiple test tracks. With their unique mission of living in harmony with both their neighbors and the environment, fostering technological innovation, and promoting public safety through partnering with local emergency response and public service entities. Each year, they also help the community by hosting driver's training courses for the teens at Fowlerville High School.

FT Techno of America gave us the amazing opportunity to test our car on their dynamic pad this past month. Because of their generous donation, our team was able to run a full endurance and push the car to its limits.

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