Over spring break our team hit another season milestone by setting the assembled chassis on the ground! Road Warrior 9, aka Lily, was rolling around our shop floor that weekend. There’s still a few components that need to be installed and several adjustments to be made, but Lily handled her own weight and then some just fine. Everyone on the team was extremely pleased by this success, and we’re confident that its one of the earliest car drops in our program’s history. We’re one step closer to a running car, and one step closer to competing at the Michigan International Speedway this May!

**Frame**

Our frame was designed with weight reduction and torsional rigidity in mind. The CAD analysis and our torsion test confirmed that our chromoly steel frame was manufactured to spec. The majority of the subsystem brackets have been installed on Lily, and there’s just a few more final touches before we give her a nice coat of paint!
**Suspension**

The Suspension subsystem has definitely seen the most changes and improvements compared to everything else on the car. Mahesh Umasankar designed Lily’s suspension from the ground up, bringing in new concepts and ideas. This is also one of the few Road Warriors that features an anti-roll bar. The system as a whole has dropped a substantial amount of weight and after some quick tests everything seems to be working well. Once everything is installed and the car is running, Hesh will be able to tune RW9’s suspension to create the smoothest ride.

**Brakes**

Tirath Matharu returned to lead the Brakes subsystem, taking the best concepts of RW8’s design with him. Several major changes were incorporated into the new design. The orientation of the master cylinders has changed to optimize the pressure and assist with proper packaging. Aluminum is being used for the brake pedal instead of steel; designed to be lightweight by extremely durable. Soon enough the brakes lines will be run and bled, and then we’ll be able to validate the design of the system.

**Ergonomics**

Currently the main focus for Ergonomics has been the bodywork and seat. One of our newer members, Hunter Hollister, has taken on the role of Ergonomics captain. The molds for our carbon fiber panels, nosecone, and seat have been sent to our sponsor Michigan Fiber Glass to have the carbon laid out. In the meantime, there’s a few controls projects that need to be done such as the shifter. Our steering wheel has already been taken care of, and man does it look sharp!
While Road Warrior 9 (aka Lily) has been rolling around our shop floor the Powertrain Division has been busy at work getting everything ready for installation and debugging. Those members are lead by veteran Mohammed Kakli, who has a knack for tearing down and building up engines. This aligned perfectly with the division’s goal this year; getting the most out of the engine.

**Engine**

When talking about Powertrain what could be better to talk about than our engine? RW9 will be powered by a 2011 Honda CBR 600 cc motorcycle engine. Our team has run similar engines in the past, which is valuable when we are testing the new unit. Since the engine was bought used, there were a few restorations or repairs that needed to be done. This was a great opportunity for all members, as they got to see the inner workings of the engine.

**Induction**

Intake, exhaust, and fuel all comprise the Induction subsystem. It is lead by Justin Bekker, one of our returning members from last season. There has been plenty to do in the past few weeks, but our Induction team is up to the task. Lily’s fuel tank has been completed and installed on the frame. Its packaging and weight have improved from the previous model’s design. The exhaust is coming together piece by piece. Its always a challenging process manufacturing the twists and turns of the exhaust lines. Welding these stainless steel tubes takes a lot of skill and patience. Finally, Lily’s intake has been fabricated and mocked up on the engine. Special thanks to Synergeering for 3D printing our team’s design.

**Cooling**

One of the worst setbacks a team can face is an overheated or blown engine. Thankfully our Cooling Captain, Asaa Harajli, makes sure our engine is operating at optimal temperatures. RW9’s cooling system is almost finished. Many of the components, tubing, and brackets are already installed. All that’s really left is welding some finishing touches to the radiator and assembling it with the rest of the system.
**Drivetrain**

Our big goal for this year’s Drivetrain system was to make everything lighter. Michael Warmbold leads this system and decided to go with eccentric differential mounts this year. We would once again be using a MK2 Differential from Taylor Racing, thankfully a very light unit. The mounts were designed lighter without sacrificing any structural strength. All the Drivetrain system needs now is its axles and a few finishing touches and it’ll be driving the engine’s power to the wheels!

**Electrical**

The Electrical subsystem is the final part of the Powertrain Division. Abdul Fayed is a new member on our team who’s learning the responsibilities of leading this system. The bulk of RW-9’s electrical work is being done by our Powertrain Director and President, who have been building harnesses for years now. Everything is coming together nicely, and soon we’ll be collecting data from every subsystem of Road Warrior 9.
As an engineering organization, the members of Warrior Racing understand the importance of encouraging STEM education in high school and middle school students. Over the past few months, our members assisted two local FRC teams (FIRST Robotics Competition) in manufacturing various components for their robots. One of our current members is an alumnus of the Las Guerrillas team from Bloomfield Hills and credits his extensive knowledge of CAD to his experiences on this team. Team Cosmos is from my hometown of Hamtramck, where my sister is a high school teacher and one of the mentors of the FRC Team. I had the pleasure of attending two FRC events this season in Woodhaven and Center Line. At Woodhaven, Las Guerrillas took 4th place and Team Cosmos placed 12th overall out of 39 teams. Additionally, the Cosmos earned the Entrepreneurship Award, which recognizes a team’s ability to develop a comprehensive business plan that helps achieve team goals. At Center Line, Team 123 (Cosmos) made it to the semi-finals with their alliance teams from Pershing High School and Warren Consolidated Schools, and placed 6th out of 40 teams. In addition, they earned the Engineering Inspiration Award, which is considered to be the second-most prestigious award an FRC team can receive. The achievements of Team 123 this season have earned them a spot to compete at the MI FRC State Championship in Grand Rapids on April 8th-11th. We wish them luck during the rest of their season!
Road Warrior 9’s Unveiling!

Our latest car is complete and ready for testing! On April 12th we’ll be setting up a small track to test and showcase Road Warrior 9! We want everyone to witness the success our program has had thanks to everyone’s generous support! Please keep in mind that testing time is extremely valuable before competition, so there may need to be some adjustments or repairs throughout the day. We’ll also have some of our previous models to run the course while RW-9 is in the pit.

We’ll have some refreshments, snacks, and t-shirts available (limited quantities, 1-2 per sponsor). Please feel free to invite your family and friends!

Warrior Racing Café’ One Year Anniversary

Our team has hit a lot of milestones this year, and one of our projects is celebrating its one year anniversary! The Warrior Racing Café’ has been proudly serving our students quality food and drinks since last March. Raising funds through the café’ is a nice perk, but the real benefit comes from the convenience the team experiences by having such a wide variety of snacks at their disposal. If you haven’t witnessed the selection of the Warrior Racing Café’, be sure to stop by our office!
Royal Purple has been a part of Warrior Racing for several years now, and we’re always grateful to receive their generous donation of lubricants! Thank you Royal Purple!

Relay for Life team “Just Walk It” is a non-profit organization who raises money for cancer research and to provide support to patients. For the past two years they have helped plan our fundraisers and special events, making them successful and helping us
Warrior Racing is proud to welcome back Liberty’s Gears to our program! They have assisted our team with the precise manufacturing of many Drivetrain and Suspension components. Needless to say Road Warrior 8 wouldn’t be on the ground without their support! Thank you Liberty’s Gears!
We're thankful for Kart 2 Kart’s continued support of our program! They’ve helped us with event planning, prize donations, and much more. Keep your calendar open for our next fundraisers, where you can win some awesome Kart 2 Kart prizes!

Warrior Racing is excited to welcome back Synergeering! They helped our team by taking our intake design and bringing it to life through 3D printing! The quality of the parts are phenomenal, and we’re looking forward to that first roar of the engine!
Warrior Racing would like to welcome Naams to the program! They supported our Chassis Division by manufacturing our wheel centers and rotors!

The Pizza Connection of Hazel Park was kind enough to sponsor our team! They provided us with a funding boosts, and at our next events you'll have the chance to try some of their delicious pizzas! Be sure to check them out the next time you've got an empty stomach!
Josef’s European Pastry Shop sponsored Warrior Racing through the donation of exquisite baked goods. And if you didn’t get a chance to try them out at our bake sale there’ll be a few more opportunities to down the road! Thanks for the support Josef’s!

Thanks to our new sponsor NSK for providing our team with a wide variety of bearings! (and some awesome t-shirts!) These seal bearings will be great to use in the components that are directly exposed!
Wiremasters has joined the Warrior Racing family with the donation of stock wire! The wide variety of wire is extremely useful to have as we build Road Warrior 9’s harness!

Warrior Racing would like to thank RevPart once again for 3D printing our shifter and steering wheel grips. They look sharp!

Warrior Racing would like to thank our new sponsor Temprel for providing us with a wide variety of thermal couples for the Road Warrior series!
Our team’s success is made possible through the generous donations and support from the following companies. Without them our team would not have the resources needed to provide invaluable hands on experience and to manufacture our formula cars. From all members of our team, thank you Warrior Racing sponsors!
Wayne State

Woodward

Special Thanks

Brian Geraghty
Dr. Michele Grimm
Dr. Marcis Jansons
Dave Preston
Phil Hughes
Carl Occhialini

The Royce Family
Andrew Murrell
Sanket Sirpotdar
Jim Vito
Angela Childrey
The Niner Family

Contact Information & Media Sites

5050 Anthony Wayne Drive
Suite 1530
Detroit, MI 48202
Office Phone - 313.577.3829
Website - isae.eng.wayne.edu
Facebook - facebook.com/WSUWarriorRacing
YouTube - youtube.com/wsuwarriorracing
President Kristina Vujic
kvujic@wayne.edu
Business Director Adam Niner
adam.niner@wayne.edu