



Warrior Racing

Wayne State University

Formula SAE - Warrior Racing

2017 - 2018 Sponsorship Package



Warrior Racing

Warrior Racing is in need of your help to continue our tradition of intercollegiate engineering competition. Our budget, resources, and opportunities come directly from your private, personal, and corporate sponsorships. Your contributions allow students to apply knowledge accumulated in the classroom to real-world scenarios through hands-on experiences.

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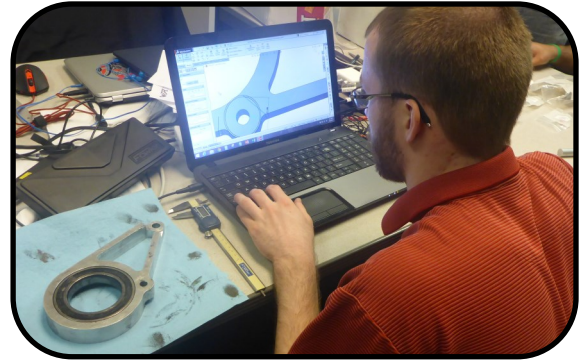
Wayne State Formula SAE, Warrior Racing, is a non-profit, student organization that designs, manufactures, and races with a small style formula car. We compete against other universities from across the globe at international events. Our team is primarily composed of engineering students, but we gladly welcome any individual with a passion for the program or automotive concepts. By taking what we learn in the classroom and applying it in a hands-on setting we obtain a greater understanding of engineering concepts. However, the team is a business and members learn the responsibilities of managing resources, personnel, and objectives. In short, our members graduate with well developed engineering and team management skillsets.



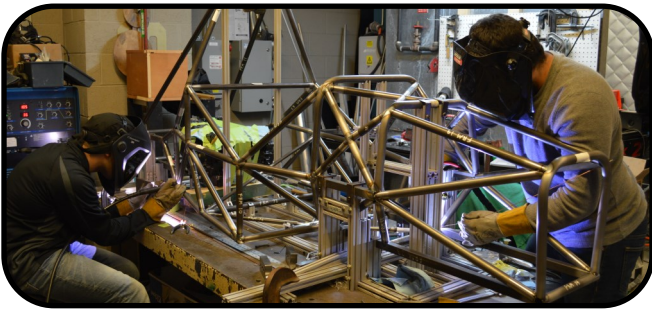
None of this could have been made possible without the Society of Automotive Engineers (SAE) supporting all of the programs. The Society of Automotive Engineers is an educational and scientific organization dedicated to the advancement of mobility technology in everyday life. From performance vehicles to aeronautical wonders, they cover it all. SAE organizes and hosts the major collegiate competitions that we attend each year in addition to a variety of smaller social, educational, and competitive events. The Society of Automotive Engineers also governs the rules of the competition which empathize safety and a fair playing field. More details about this organization, including links to the current rule book, can be found at students.sae.org/cds/formulaseries.

Formula SAE Season Breakdown

Each season roughly begins immediately after the last major competition of the previous year, which tends to fall around the 4th of July. During this time team leadership transitions take place and the goals for the new season are discussed by the returning members. Design and manufacturing deadlines are set up along with the delegations of responsibilities. By the start of the fall education semester, the designs of the next Road Warrior will be well underway. While all this work is going on, the team still tests, validates, rebuilds, and races with the previous competition car and any other active Road Warriors. Doing so helps our team members to build upon their creativity and sparks innovative designs. It also assists with attracting new members which is another major responsibility during the first few months of the season.



Once the design deadlines have been met, the team begins ordering raw materials and parts starting with the frame material. A rolling chassis, which includes a completely welded frame and fully assembled suspension, is the first major milestone the team will reach during the manufacturing stretch. Afterwards the other subsystems will begin assembling their sections of the car and soon enough the next Road Warrior will be ready to come to life! The first run is always satisfying to watch, but there's sure to be a lot more work to be competition ready. Warrior Racing always pushes to have as much testing time as possible before the first competition to work out all of the kinks of the Road Warrior and to give the drivers some time to gain experience behind this new set of wheels.



Soon enough it will be time for the first competition of the season. These events are hosted by the Society of Automotive Engineers with support from the Sports Car Club of America. Starting on Wednesday teams will arrive and set up their own paddocks. During this day, time permitted, the teams are able to get their car through the first of four technical inspections and scales for car weight and distribution. Thursday is a very busy day for the teams since the rest of the technical inspections are opened and all of the static events are scheduled throughout the day. Once a team has received all four technical inspection stickers they are cleared to race. On Friday there are three races to compete in; skid pad, acceleration, and autocross. The infamous endurance race is hosted on Saturday along with its related fuel efficiency event. Additional event details and point breakdown is discussed on the following page.



Static Events

Technical Inspection (0 points) - Tech inspection includes a thorough static examination of the car for safety and compliance, a tilt table test to check for fluid leaks, a noise test to check if the car runs in an acceptable range, and finally a brake test to determine if all four wheels lock during braking.

Presentation (75 points) - The team presents a business or advertisement case for the vehicle and 'company.'

Cost Analysis (100 points) - Prior to the event the team submits a detailed report containing all costs that went into the competition car. At the event, the team talks through the report and provides feedback on random cost saving case studies, for example a quick on-the-spot cost reduction for a given subsystem.

Engineering Design (150 points) - All of the research, innovation, and final designs are presented to a panel of senior engineers from multiple disciplines and industries. Each subsystem is critically analyzed and the team must defend and promote their designs, effort, and execution.



Dynamic Events

Acceleration (100 points) - This event tests the competition car's ability to accelerate on a flat, straight course over a distance of 75 meters. A well-tuned engine, lightweight designs, and efficient shifts are critical to this event.

Skid-Pad (75 points) - This event tests the effectiveness of the competition car's cornering abilities on a flat surface while executing a constant radius turn.

Autocross (125 points) - The autocross event is a longer course with multiple elements designed to test the vehicle's capabilities and the driver's skill. All of the subsystems need to work in harmony to perform well in this event.

Endurance (275 Points) - Two drivers must race the car for 22km, roughly 15 laps, against other teams without breaking down, losing any parts, or running out of fuel. Not only does the car need to be fuel efficient but the racers need to be able to drive at a competitive pace to score well against the rival teams.

Efficiency (100) - Teams can only score points in this event if their car successfully completed endurance. The amount of fuel consumed is measured and scored against other team's performance.

The Retired Fleet

Road Warriors 1 through 7



Since 2003, Warrior Racing has designed and manufactured 11 unique formula cars. The 7 pictured above have seen their glory and were ultimately retired. These Road Warriors left their mark in our program's history, from earning 'Rookie of the Year' at Warrior Racing's first ever competition to taking top finishes at a variety of international events. Our members are grateful for all of the lessons learned from the designs, execution, and performance of these models. They allowed our team to create the impressive fleet it races with today. Road Warriors 8 through 11 are still active and their more recent stories can be found below and over the next two pages.



RW8

Road Warrior 8, aka 'Trisha', is the oldest active vehicle in the Warrior Racing garage. This car was originally built to be a two-year car

but ended up retiring after a year's worth of competitions. During Trisha's season the team was undergoing some crucial internal development that would re-establish the structure for years to

come. This created some obstacles in getting her ready for competition and ultimately RW8 never made it to the dynamic courses. However she shined in the post season in testing, at university shootouts, and other informal racing events. That season is still considered to be a turning point for Warrior Racing, where negative concepts were replaced by positive structure and innovation. Every time Trisha races around our lot Warrior Racing is reminded of how far the team's come.





Road Warrior 9, aka 'Lily', was the car that almost shook our record board clean. From the beginning, Lily and the

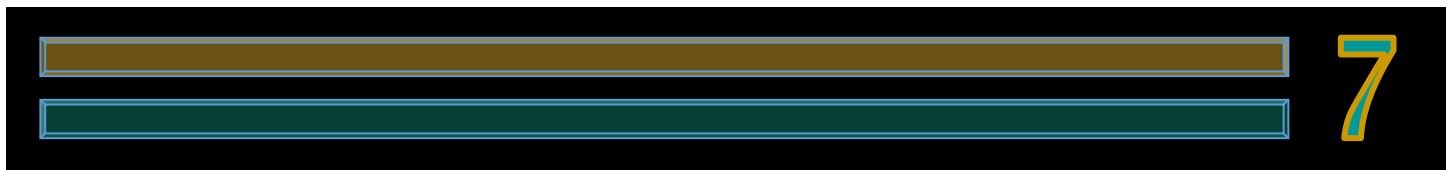
team achieved many victories, such as the earliest design freeze in the program's history to assembling the entire frame of the car in just two days. After getting

in a substantial amount of testing she headed to two competitions, one at the Michigan International Speedway and the other at the Lincoln Airpark in Nebraska. From the static to the dynamic events Lily and the team performed exceptionally well. The biggest victories were 12th place at Formula West and the perk of being the highest ranked team from Michigan present at the competition!



Warrior Racing Program Records

	Formula Michigan		Formula West		Formula North	
Overall points	2016	66th - 354.3 points	2017	10th - 686.0 points	2017	11th - 442.70 points
Cost	2015	2nd - 93.6 points \$9,342 Kristina Vujic	2017	2nd - 89.99 points \$10,116 Erin Kronell	2017	1st - 92 points \$10,151.73 Erin Kronell
Presentation	2016	13th - 61.8 points Tirath Matharu Erin Kronell Noah Lovins-Wiluz	2017	10th - 62.9 points Erin Kronell Noah Lovins-Wiluz	2014	10th - 52.50 points Monty Diaz Adam Niner Richard Le page
Design	2016	12th - 100 points Justin Bekker Mahesh Umasankar	2017	7th - 110 points	2017	8th - 115 points
Acceleration	2016	71st - 35.2 points 4.99 seconds Tirath Matharu	2017	14th - 83.64 points 4.44 seconds Elliot Carter	2017	17th - 54.62 points 4.609 seconds Noah Lovins-Wiluz
Skidpad	2016	67th - 10.1 points 5.64 seconds Brandon Horsch	2017	14th - 43.75 points 5.247 seconds Brandon Horsch	2017	16th - 32.60 points 5.652 seconds Brandon Horsch
Autocross	2016	68th - 48.3 points 58.41 seconds Michael Warmbold	2016	21st - 108.78 points 62.72 seconds Michael Warmbold	-	- - -
Endurance	2009	31st - 81.01 points 1903.7 seconds Sanket Sirpotdar Andrew V	2016	11th - 179.3 points 1624.25 seconds Tirath Matharu Mohammed Kakli	2017	11th - 29 points 2280.379 seconds Mohammed Kakli Michael Warmbold
Fuel Efficiency	2009	31st - 3.75 points 5.39 liters	2016	13th - 73.5 points 3.4 liters	2017	10th - 69.9 points 3.655 liters





RWX

Road Warrior X, aka 'Xena', is the 10th vehicle designed and manufactured by Warrior Racing. After building upon the success of previous sea-

sons Xena made a statement to other universities that Wayne State is here to compete. RWX marked a significant growth of engineering development for Warrior Racing, highlighted by the development of a lap simulator and extensive frame analysis. These developments had the team knocking on the door of design finals at both competitions. The team brought RWX to Michigan International Speedway and Lincoln Airpark and the improvement between the program's own results spoke for itself. At MIS she was on pace for a top finish but ran out of fuel half a lap short during the endurance event. There were no such shortcomings at Formula West and the team ended up taking 1st in Cost, 10th overall, and still held onto the title of being the highest ranked team from Michigan!



RW11

Road Warrior 11, aka 'Rose', is the 11th car to be manufactured and designed by Warrior Racing. Rose is extra special to our hearts as she has

been dedicated to fallen Sergeant Collin Rose, who lost his life in the line of duty at WSU. Striving to build a top-tier car we carried over RWX's successful designs and analysis results, subsystems that worked well and modified it to be more efficient and effective. Another milestone was our overall weight reduction. From dynamic to static events, Rose made it clear that she was here to break records. Rose placed top three in cost at both Formula West and North, as well as a placing top 10 for design! She completed all the dynamic events at Formula West. Overall, placing 10th place, Rose held our title of being the top-ranked team from Michigan as well as the top non-aero car!



There are many ways that your support can positively impact Warrior Racing. **Monetary and financial** contributions go a long way for our program since it gives us the versatility to cover expenses as needed. Funding can go towards competition fees, equipment repairs, stock material, expedited services, and a whole bunch of miscellaneous necessities between the shop and the office. In time sensitive situations, such as part failures at competition, the team can rapidly recover by purchasing a replacement component to get back to the events.

Material and resource donations help out our team in multiple ways. To start these, stock materials can be manufactured into competition parts. Not only is this more cost effective in general, but it also provides our team with an opportunity to teach manufacturing techniques. Members learn how to weld, mill, and



lathe different materials which helps them understand the complexity of their designs. Warrior Racing has also begun to work with carbon fiber and various composites for chassis projects, and those resources are invaluable to the team.



Although we want our members to have as much fabrication experience as possible sometimes our team needs **machining services and assistance** to get through the season. Our shop machining capabilities are limited so some more complex components cannot be made in house. Ideally our team would provide the materials and the designs for a company to manufacture the product. Examples include machining uprights out of an aluminum block or bending tubes for the frame members.

Educational resources are crucial to our team's development and competitive success. Even with our growing base of alumni, local professors, and a bookshelf of go-to engineering texts sometimes our members need the expertise of an experienced individual. Having experts visit our shop to see our designs helps sharpen the minds of our engineers and often points out areas where improvements can be made.

The last major form of contribution is **promotional**. Although our realm is primarily Wayne State's Campus we want to share our success with a wider audience. More exposure allows us to build new relationships and pursue unique opportunities.



These are the core resources our team needs each year to have a successful season. Sponsorships are by no means limited to these five concepts and we gladly welcome any support!



Sponsorship Level

		Bronze \$5-\$99	Silver \$100-\$499	Gold \$500-\$999	Platinum \$1,000-\$4,999	Motor City \$5,000-\$9,999	Detroit Legacy \$10,000+
Incentives & Benefits	Newsletter Recognition	○	○	○	○	○	○
	Newsletter Subscription	○	○	○	○	○	○
	Company Name on Website	○	○	○	○	○	○
	Company Link on Website	○	○	○	○	○	○
	Shop Tours (available upon request)	○	○	○	○	○	○
	Logo on website	○	○	○	○	○	○
	Logo on sponsor banner	○	○	○	○	○	○
	Logo in promotional videos	○	○	○	○	○	○
	Logo on team apparel	○	○	○	○	○	○
	Logo on competition vehicle	○	○	roughly (3x3) inch on side panels	roughly (5x5) inch on Front Nose Side	roughly (7x7) inch on Front Nose	roughly (7x7) inch on Front Nose
	Two Warrior Racing competition t-shirts	○	○	○	○	○	○
	Logo on driver suits	○	○	○	○	○	○
	Availability of competition vehicle at company events	○	○	○	○	○	○
	Invitation to testing sessions with team	○	○	○	○	○	○
Exclusive Warrior Racing apparel	○	○	○	○	○	○	





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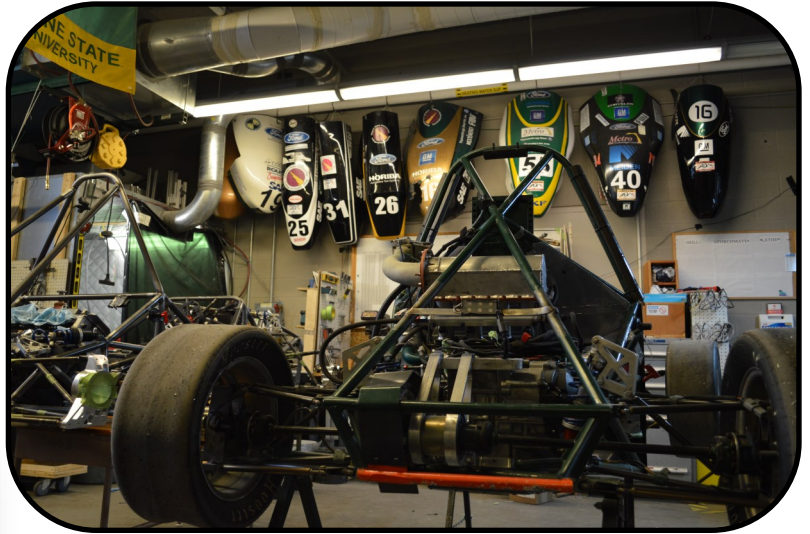
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Warrior Racing Legacy is a growing group of the team's alumni that was founded in the summer of 2015. These past members are so passionate for the program that they've come back as an official resource of the team. From providing funding, educational support and two seasonal advisers, the WRL aims to stay connected to Warrior Racing to help continue its success. If you need more reasoning to support Warrior Racing or if you'd like to here stories from its alumni, please contact Adam Niner and Kristina Vujic!

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