Warrior Racing's dynamometer is up and running! Mohammed Kakli, our engineering captain, led the project through all of its stages. Mo designed the layout, created the wiring harness, and assembled the structure. With help from the team, especially Krissy Vujic, Richard LePage, Ryan Scott, and Justin Bekker, Mo was able to get the dyno to a functioning state.

The dynamometer is a device used to measure a particular force. In addition the dyno can measure the amount of torque (moment of force) or power (energy consumed per unit time) that is required to operate a device. There are several different types of dynamometers available. They range from water brake, eddy current, and AC dynamometers. Our team uses a water brake dyno system due to its low cost and flexibility. Warrior Racing utilizes this dyno to measure the amount of torque and power that our engine produces at a given moment.

This is our first implementation of a water brake dynamometer on-site. The team has previously benefited by using the engine dynamometer facilities at Meiden in Northville which is approximately a 40 to 50 minute drive from campus. The convenience of walking into the back room of the shop and being able to fire up the engine at our convenience allows for the ultimate flexibility and very few hindrances when advancing the team’s progress.
Our dyno is actually intended to test a snowmobile engine by attaching it directly to the crankshaft. Due to the flexibility of our dyno, we are able to attach our engine through the output shaft. The biggest concern with engine dynamometers is that some of them are not capable of handling engines that spin up to 14,000+ RPM while still being able to handle the power that the engine produces. Warrior Racing’s dyno will be able to handle speeds of 14,000+ RPM and still contain the engine’s power, permitting us to still be able to modify the spark and fuel parameters.

The dynamometer allows us to accurately calibrate how much fuel is going in for the given amount of air, and when to ignite the spark plug with respect to piston position. These variables are very sensitive for a given combination of engine, intake, and exhaust parameters. We can observe what happens when we modify valve timing, increase compression, and increase/decrease runner lengths for both exhaust and intake. It also allows us to constantly monitor specific parameters of the engine such as air/fuel ratio, oil pressure, fuel pressure, exhaust gas temperature, coolant temperature, and oil temperature. Having all this data allows us to accurately design more reliable elements of the car and introduce new members to invaluable engine testing concepts.

The team recently had another water brake dynamometer donated from Go-Power Systems. Our current plan is to test the abilities of the dyno. If it is able to handle everything we throw at it we will develop a portable dyno system. With our multiple engines these dynos will advance the team’s testing possibilities and provide us with the information to design more efficient models.

Over the last month the team has made phenomenal progress on RW-8’s Chromoly steel frame. The frame is almost complete and there are only a few more steel members that need to be welded in place. Next the team will focus on mounting different components of the car. Our team’s knowledge and success has stacked upon itself over the years and resulted in the fastest frame completion in the history of Warrior Racing!
Best of Luck & Happy Holidays!

As this is our December newsletter, we’d like to wish everyone the best of luck on final projects and exams. Hopefully everyone has a relaxing break, a Merry Christmas, and of course a Happy New Year! Drive safe, stay warm, and see everyone next semester!

Keeping Up with Warrior Racing

facebook.com/WSUWarriorRacing
twitter.com/WarriorRacing
flickr.com/photos/warriorracing
youtube.com/user/WSUWarriorRacing

Meet a Warrior Racing Teammate

Monty Diaz
Currently pursuing a BS in Chemical Engineering,
Sophomore Status
A Little Bit About Myself
I volunteer a lot, mostly mentoring kids with science
and math. I’m very involved in the College of Engi-
neering and its organizations. Currently I am working
on a STEM program with Dean Ellis, SHPE, and the
CoE at Cristo Rey High School. In my spare time I
enjoy running marathons and playing intramural sports.

Why I Joined Warrior Racing
I joined the team to expand my involvement in the CoE
and to learn about the business concepts of FSAE.

Favorite Part of Warrior Racing
My favorite part of Warrior Racing is being able to
work in a team environment that encourages questions
and innovation. I enjoy being able to learn about all the
different aspects that go into the car.

Recent Team Activity
When it arose that the team needed some help with
business, I offered to better connect the team with its
sponsors. One thing lead to another and now we offi-
cially have a business team. Recently I was one of the
head planners for our sponsor appreciation event.
Warrior Racing hosted its first sponsor appreciation event on November 15th. Sponsors who attended our event enjoyed a light meal, were greeted by Dean Fotouhi, received updates on our progress, and toured our workspaces. We were able to thank our sponsors in person and directly show them how we put their contributions to use. This sponsor appreciation event was a great success and we intend on planning more events like these in the future. A big thanks to Dean Fotouhi, Carmen Gamlin, Jasmine Roberson, and Dr. Jansons for coming out and supporting our event.

Recent Sponsor Contribution

Yazaki has been supporting our team since the creation of our sixth formula car. Since then they have only contributed more to our team, raising their sponsorship to our Belle Isle level, our second highest rank. Recently Yazaki provided us with a generous supply of electrical wire and MX123 terminals. To learn more about Yazaki please visit their website at www.yazaki-na.com.

If you or someone you know would like to sponsor or donate to the Warrior Racing team please visit our GoFundMe site at www.gofundme.com/5235kc. We value and aim to get the most out of every dollar or donation we receive. Every dollar our program receives goes along way.