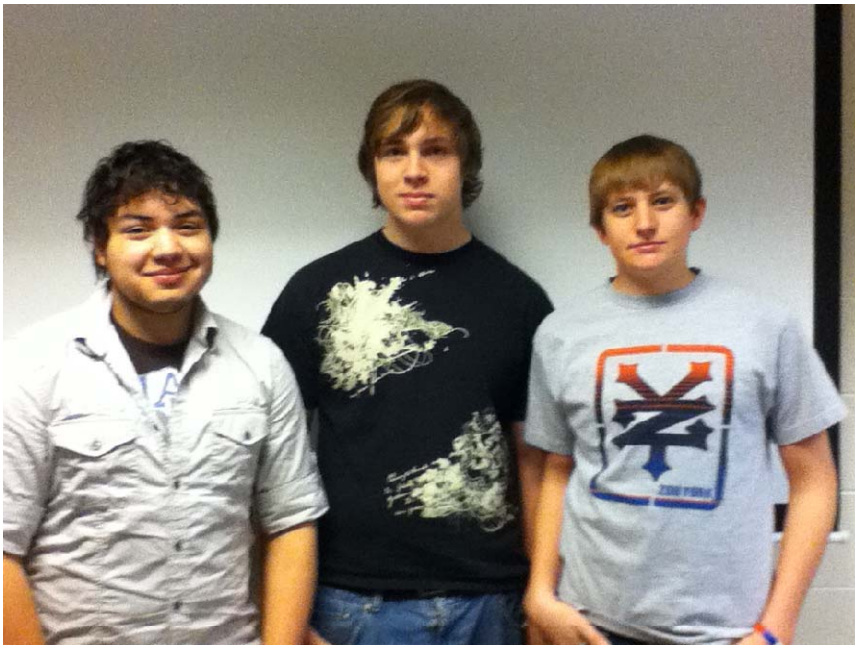
Hour One Semester Update



Pictured above Left to Right: Daniel Sierra, Logan Gareis, Kyle Jansen

What is Formula High School? Formula High School is a program designed to help engineering students learn about the basics of the manufacturing process. The program was started in 2008-2009 by Mr. Meyer and Mr. Besel. This program has a few goals. We must apply our knowledge from other disciplines to engineering problems, apply the concepts of marketing and increase public relations, and mainly increasing awareness of engineering and technical careers We learn how to operated machines, develop cad models of the car we are building. This is all done by creating our very own Formula High School car. The first stage of the process is to design and develop a chassis for the car using the computer program of CAD. Then we must acquire sponsors in order to construct the car. Then little by little we begin to build our car from the ground up. The first step of this process is to build the basic chassis. Due to the safety regulations, all team must use the same chassis. After the chassis has been completed we continue by adding a floor to the car. Once the floor has been stitch welded in place we can now turn our focus to the front end of the car. First thing to go on to the front of the car is the front axle. After the front axle is level and welded in, the tires can go on which are soon followed be the steering system. Once the wheels have a proper range of motion the pedals and seat can be add. After the seat is in place and all the drivers can access the car's mechanics without difficulty the rear end begins to take shape. Once the rear end is built the gear boxes can be mounted onto the car. This is a very important step because this will determine were the engine is to be mounted. Now that all the hardware is in place things such as wiring and brake lines can be set in place. This is a very time consuming process, but once it is completed, we can work on getting the car running. When we reach the point in which the car is running we must mount the body onto the chassis. Then the final step: the body and chassis must be painted. First we completely take apart the car in order to have it powder coated then the body must be repainted and the sponsor logos can be added. Once we reassemble the car is ready for race day.

About the Team:

Kyle Jansen: 2 years CAD experience
Logan Garies: 2 years CAD experience, 1 year welding
Daniel Sierra: 4 years welding experience, 1 year CAD experience

Sponsors: Gandrud Auto Group, Boca Bearings

The Design:

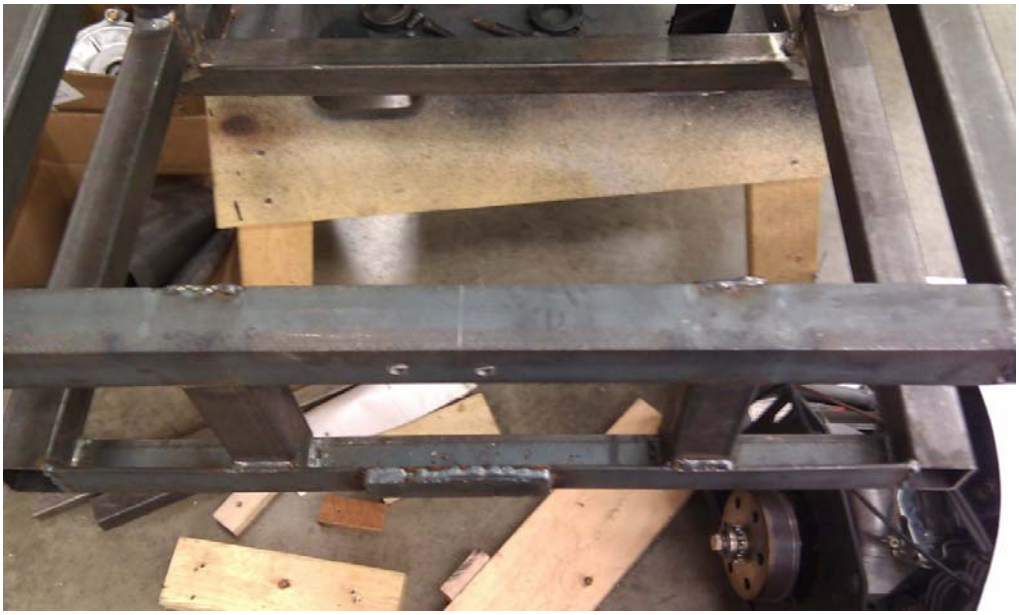
The Formula High School program is a very student driven program. This means that the students come up with the design for the car, with an exception to the chassis. However, our goal in the end is to have the fastest car come race day. Because of this, we created a design we thought would be lightest, have the best weight distribution, and have the best performance.

We believe our design is intuitive and efficient, and will give us a better overall performance. First, we decided to move are battery to the front of the formula car. This greatly helps the weight distribution of the car itself.

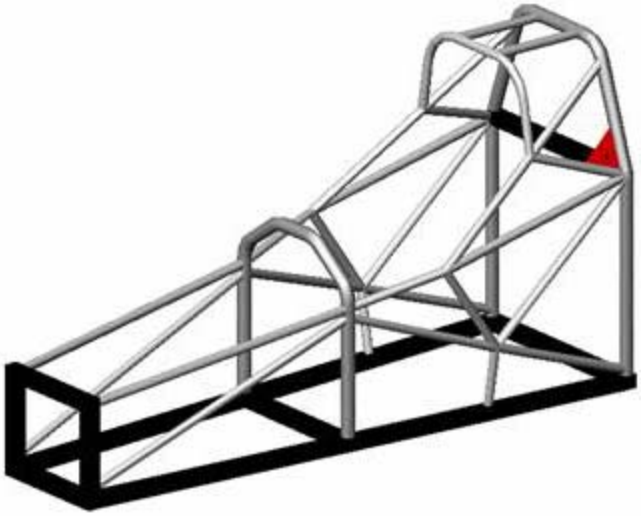
Also, for better performance on the track, our team decided to drop the steering column. In previous years there was a large gap between the steering rack and the axle. The steering rack itself sat slightly above the chassis. Our team decided to move the steering rack down under the front crossbars. This will give us much better handling when taking those tight corners when racing.

To make the car lighter and perform much better, our team decided to go with a different gearbox. The new gearbox our team received is about half the weight of the old gearbox, which in turn makes the car lighter. Also the gearbox has a differential that causes the outside tire to spin faster than the inside tire when in tight corners. This should increases performance of our car greatly at race day.

Next, our team had to agree on a design for the rear end. This was the most difficult aspect of the car for our team to agree on because there are so many different directions we could've taken for the design of the back end. The rear end's main purposes are to support the rear axle, the engine and the gear box. So with all of these things in mind, we created a very simple design that should give us maximum performance on race day. Our design is a simple rectangular structure coming off the back of the car. What makes our design stand out is its simplicity. It consists of is four 1 ½" pieces of rectangular tubing and two pieces of angle steel that run across the back of the car for the gearbox support. We choose to use angle steel because it's lighter than putting a plate on the car to mount the gear box and it gives the back end a lot of strength.

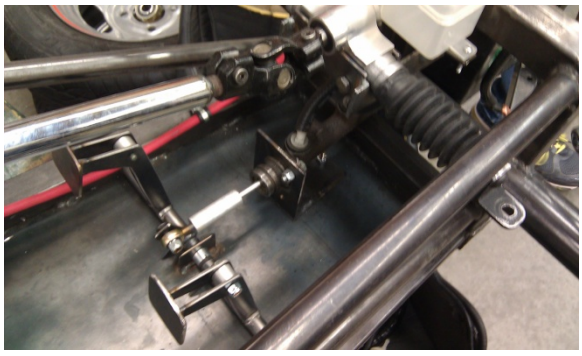


Construction



The main goal in the Formula High school is, after all, the actual construction of the vehicle. The first step towards completing the vehicle is the construction of the chassis. Every team is given a standard chassis design that they must follow within a +1/-1 inch tolerance. Pictured left is the 2010-2011 required chassis design.

Another important step is cutting, milling, fitting and welding the front axle and rotor mounts. Pictured right is our axle completely mounted on the front end of our car.

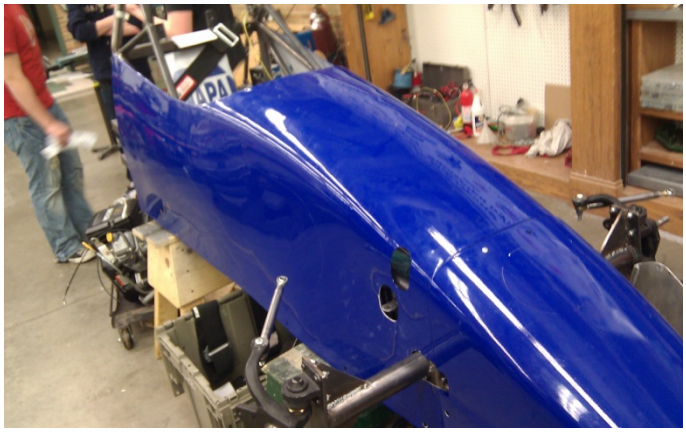


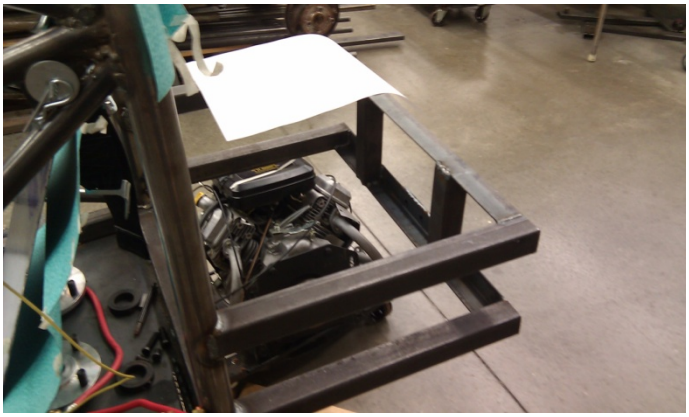
Next we designed and created most of the front end parts, including gas and brake pedals, steering rack and shaft mounts, the master brake cylinder mounts, and the battery mount.

← Our front end design.

Shown right is our seat design. This seat was donated by our teammate's uncle. We believe it is a better seating solution than that of the other teams'.

Next is the creating and mounting of the body. We were lucky enough to be able to use an old body from a previous year. Teams that do not have a body from years before have to lay up the body for the car themselves. Components for laying up the body are all thanks to Fiberglass Solutions Inc. They donate the time and materials to make the car bodies possible.





Our Rear End Design

The next order of business was to design and mount our rear end assembly, including our differential and engine. We are currently in the process of finishing the basics of our design. After this, we will have our engine mounted and ready for wiring!

We would like to thank all of our sponsors for all of the help they provide.

We will see you race day!