

# **Marinette High School**

## **High Mileage Car**

**Advisor- Mr. Paquette**

### **Participants**

**Haeden Brezsko  
Jed Buechler  
Mike Charlesworth  
Cory Thomson  
Tori Pynnonen  
Eric Wagner**

# Weekly Log

12/3/07

This week I tried TIG welding and did stringer beads.

Tom Kresl

12/7/07

- we took measurements for new body and voted on new body
- built a simulated model of steering
- decided where to place the driver in the cockpit
- looked for 2 new engines with less than 5hp and under \$1,000.00
- drew sketch and modeled new body
- started trying to figure out how to adjust the a arms to fit car and suspension

Steven Carroll

12/7/07

We did more cleaning, some things hang, and got a shelf put up.

Haeden Brezsko

12/7/07

Newsletter and clean.

Jed Buechler

12/7/07

worked on the model for 2 hours a day

Cory Thomson

12/7/07

I have mostly been welding and cleaning.

Tom Kresl

12/7/07

We worked on cleaning the upstairs. I brought a radio in. Tori and Corey worked on drawing. Tom welded.

Haeden Brezsko

12/7/07

We discussed plans on the frame and the body. We worked on the front end designs and Tom welded.

Jed Buechler

12/7/07

Monday- looked up info for program, symbols, did some measuring and sketching.

Measured and built on pro desk top.

Tuesday- worked on strength equations.

Wednesday- took pictures and worked on drawing

Thursday- took yearbook picture then voted.

Friday- drawings and helped Eric  
Tori Pynnonen

12/7/07

I worked on the computer about eight hours and took measurements for one.  
Cory Thomson

12/14/07

Monday- sketch of car model with Tori  
Tuesday- cut of car model and also made changes in dimension.  
Wednesday- made final of car.  
Thursday- angle measurements of sketch of car.  
Friday- design line sketch of car.  
Eric Wagner

12/14/07

Monday- sketch of car for model  
Tuesday- cut out car, made changes  
Wednesday- cut out final model  
Thursday- made angle measurements  
Tori Pynnonen

12/14/07

Cleaned up the upstairs  
Steve Carroll

12/20/07

We got everything clean and organized, so it should be easier to work on the car. Tools are organized and neat. Everything is good to go.  
Mike Charlesworth

12/20/07

Tom and I worked on the newsletter and Mr. Paquette read it 5 to 10 times to get it right. Then we cleaned upstairs more.  
Jed Buechler

12/20/07

This week I helped Tom and Cory with the car drawings and layouts of the car.  
Eric Wagner

12/20/07

This week I worked on drawings with Cory and Eric.  
Tori Pynnonen

12/20/07

This week we cleaned upstairs getting ready for the party.

Haeden Brezsko

12/20/07

Finished upstairs and completed a-arms on computer  
Steve Carroll

12/20/07

I worked on the car two hours a day except Tuesday.  
Cory Thomson

12/20/07

Jed and I did the newsletter which was very fun. Then I cleaned most of the week.  
Tom Kresl

12/20/07

1. we're getting the drawings done
2. we're getting enough pictures, so we know what were doing
3. the body work could use some help
4. welding is good
5. need more tools
6. tool board is looking good

Mike Charlesworth

1/11/08

The week Tom and I worked on the frame. We cut all the pieces out and outlined it on a piece of plywood. Tori helped along the way and helped me get dimensions and squaring everything up.  
Eric Wagner

1/11/08

I've been taking a lot of pictures, and so far there pretty good. I am a good photographer.  
Mike Charlesworth

1/11/08

- math calculations for gears
- made a 12 prong gear
- gear ratio calculations
- started calculating next gear
- also helped with the frame a little

Tori Pynnonen

1/11/08

I practiced welding on the a-arm jig. I helped layout the jig for the a-arms and worked on a prototype.  
Haeden Brezsko

1/11/08

We worked on the a-arms and built a jig to make them all the same then I milled the parts and Haeden was practicing welding.

Jed Buechler

2/1/08

Worked on sides of car on computer

Cory Thomson

2/1/08

Jed and I welded together sides and getting ready to weld onto frame.

Haeden Brezsko

2/1/08

Welded up the base of the frame and started and finished the walls and now starting on all the assembly.

Jed Buechler

2/1/08

Monday- worked out final math for gear

Tuesday- home sick

Wednesday and Thursday- no school

Friday- measured the inner part of the sprocket

Tori Pynnonen

2/1/08

Drew out plugs, g rinded and cleaned up welds, finished bottom of frame

Steve Carroll

2/1/08

The frame is coming together real nice and pictures are going good too. PS- I've got a lot of pictures.

Mike Charlesworth

2/15/08

This week I welded together the engine mounts once Tori and Cory got them all cut up.

Then me and Jed started to assemble the front end (a arms). Next I have to start welding up the rest of the engine mounts.

HAEDEN BREZSKO

2/15/08

This week I figured out the measurements of our plugs for the a-arms. I test ran my Measurements with wax sticks. I ran into a few problems but got them figured out.

Hopefully by this time next week I'll be finishing up the real aluminum plugs.

Steven Carroll

2/15/08

This week I wielded a little bit then I made wax for in the cnc for practice peaces. Then I g rinded the wields down on the car and tried to get the front end figured out. We did math to find out the weight the shocks could hold.

Jed Buechler

2/15/08

This week my main priority was to come up with a newsletter to be released to all our sponsors and parents that are supporting us in the big races. Steve helped me along the way and proof read everything. Then Mr. P helped with the printing and getting everything set up to make a perfect newsletter. It turned out great!!!!!!!!!!!!!!!!!!!!!!

Eric Wagner

2/15/08

This week I reconfigured the sprocket. I make one with a different size radius. Then I had to reconfigure the teeth to fit the pitch. I started to figure out the Design for the middle to cut out for less weight.

TORI PYNNONEN

2/22/08

This week we didn't have school on Monday for in-service.

On Tuesday and Wednesday I out together another sprocket, reconfiguring it with the pitch.

Thursday I stayed home sick.

Friday I set everything up so I can cut out the sprocket with the plasma cam.

TORI PYNNONEN

2/27/08

I worked on the back end and fab it up. Then I wielded it on the car and wielded the frame more. We also started to drill the plugs for the A arms and started on the front end of the car.

Jed buechler

2/29/08

This week I worked on the back end and front end. Got them all wielded up and in place. The I started on the drivers compartment and started welding that up.

JED BUECHLER

2/29/08

This week me and Jed fabricated the rear end and we worked on the front pieces so we can get started on the a arms next week

HAEDEN BREZSKO

3/4/08

This week I worked on making a bigger hole in the gear with the lathe. It turned out to be the perfect size in the end and it fits great.

Eric Wagner

3/4/08

This week after the sprocket was finished I moved on to drawing the back compartment. First putting the ideas down on paper then putting it on to the computer. I'm putting in The dimensions for everything in the back such as the rear tire and the engine.

TORI PYNNONEN

3/19/08

This Week I made the driver window. Made tubing for the car. Put surfacing on the Vehicle. I also made a few rendered drawings.

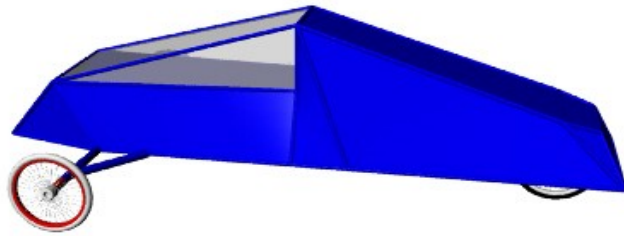
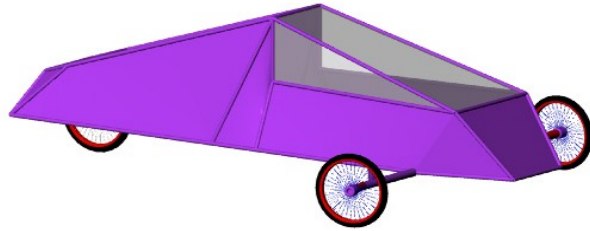
Cory Thomson

3/19/08

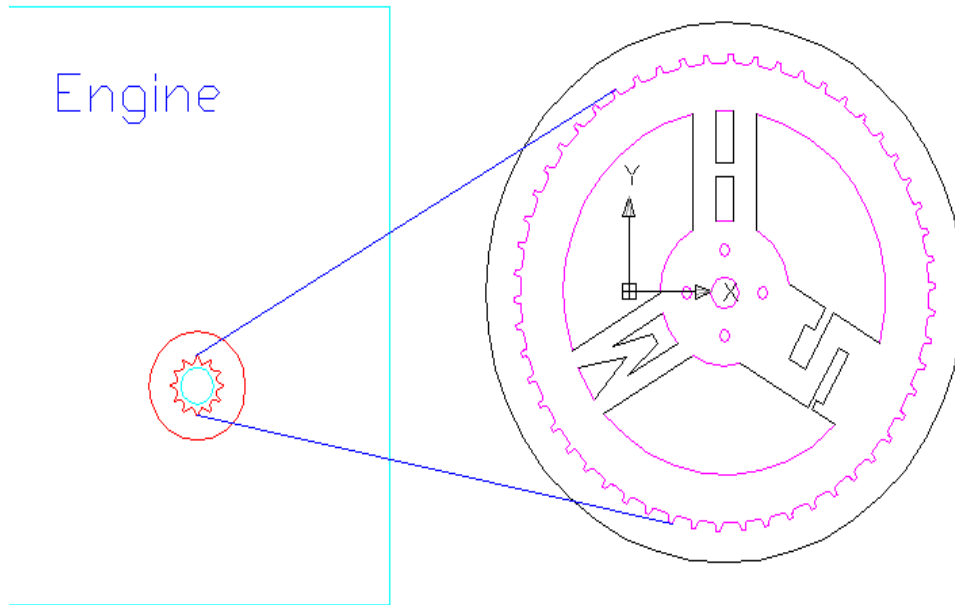
This week I sized the tires. I also attached some A-arms on the drawing. I Scaled the tires and attached them to the car.

Cory Thomson

# Basic Vehicle Configuration



# Power Train Configuration



# Performance

**We decided to run a diesel engine because they're 30% more efficient than a regular engine.**

**Along with our clutch we used ball bearings so that there is less friction so that things run smoothly.**

**Aluminum was chosen as our main material because it is light in weight.**

**Additional testing will be done the week April 14-17**

# **Brake System**

**We are using the brake system off of a Honda 50cc Mini Bike. We were going to use a break pedal, but to save room we decided to put the break on the steering wheel. This will also make it more convenient for coordination reasons.**

# Safety Items

A three point harness will be installed to hold the driver in place. There will be a roll-bar placed six inches above the highest point of the car. In the event of a fire, a fire extinguisher will be placed between the driver's legs, running underneath the steering wheel, in an easy to reach place.

A solenoid switch was placed in the fuel line to provide for two engine shut off switches, one for the driver and one for the pit crew. A solenoid was used because a diesel engine does not require an electrical current to run but rather requires fuel. Thus the only way to shut off the engine is to shut off the fuel.

A firewall was built from 18 gage aluminum sheet metal to provide a barrier between the engine and the driver. We also made the floor pan out of similar material, and it covers the whole extent of the driver compartment.

# Problem Solving Essay

This year high mileage car design consists of many features to make the design stylish and more aerodynamic. We started with 105 long inch square tubing that was TIG welded. The front of the car has an upward angle to allow the air to flow over the driver making it more aerodynamic and classier looking. We found that 2 feet of the square tubing can hold up to 30 lbs before deflecting. We made custom aluminum brackets to hold the frame together and tighter. The width of the driver's compartment is 25 inches; this gives the driver enough room to fully extend his/her body without feeling compacted. The roll bar is 6 inches away from the top of the helmet and is made from aluminum. We created custom steering rods that fit to our aluminum A arms that t the suspensions that connect to the frame. The engine compartment is slightly smaller in length then the driver's compartment; this allows us to fit the gearing and the wheel in that space without cramming it. There is also a firewall behind the driver that is flame resistant made from 18 gage aluminum. The firewall protects the driver from any malfunctions from the engine and gearing and also may cause fire from spill of fuel. The engine used in this car is a 4.5 H.P. air-cooled diesel engine. We choose this engine because it runs more efficient and should produce more miles to the gallon. Slick tires will be used because they provide a smoother and better ride on the courses we will be on. The under body of the car is covered with sheet metal and the exterior is covered with lightweight purple Mylar. This will give the car a smoother and cleaner appearance. On the Mylar there are names of our sponsors that have donated money and difference parts to us over the past few years, as recognition.