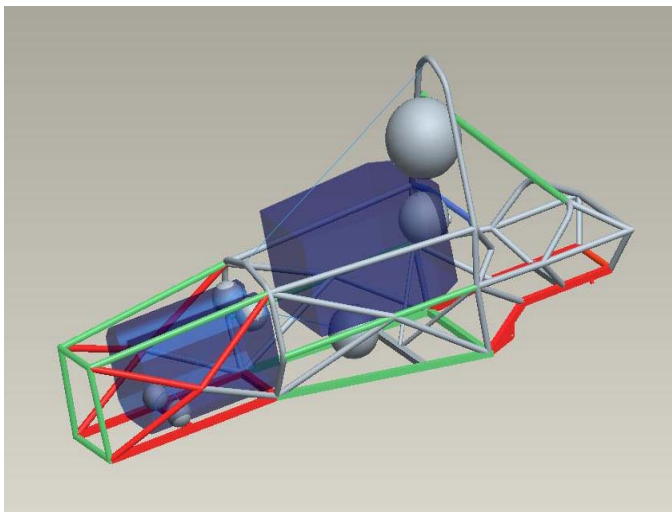


The UNH Precision Racing team has been hard at work designing and fabricating this year's entrant in the Formula SAE competition, Car 86. This year's car has many design advantages over previous cars, and the team expects the car to perform strongly at the FSAE competition at Michigan International Speedway in May. Car 86 has been designed from the ground-up for maximum performance, safety, and manufacturing efficiency. The team is using what they have learned in past seasons to develop their all-new competitor. With a target vehicle weight of less than 500 pounds, a high level of performance is expected.

### *Frame*

The team is working with a revised set of rules for the 2009 competition, which requires the cockpit area of the frame to adhere to a set of size templates to maximize driver safety.



This has presented a new set of challenges to the team, as they develop a frame that can deliver maximum performance while also adhering to the strict safety regulations. The frame of Car 86 is slightly larger than last year's car, but weighs the same and is equally as strong. It was also designed with ease of manufacture in mind, and the design has allowed for a much quicker fabrication process. The team is on target to finish the frame in January.

### *Engine/Drivetrain*

Car 86 will be powered by a 2007-model Suzuki GSX-R600 engine. The team is returning to a four-cylinder engine after fuel delivery problems with a single cylinder set-up last year. The emphasis of this year's engine is ease of maintenance and reliability. Because of this, stock engine internals will be retained. The only change to the internals is a modified ignition trigger wheel, which is necessary to operate the Performance Electronics Engine Control Unit. The team is fabricating an intake plenum and exhaust system to maximize engine efficiency, and has designed a restrictor that will maximize airflow into the engine. The engine, which makes over 100 horsepower in unrestricted form, is expected to provide plenty of power for Car 86.

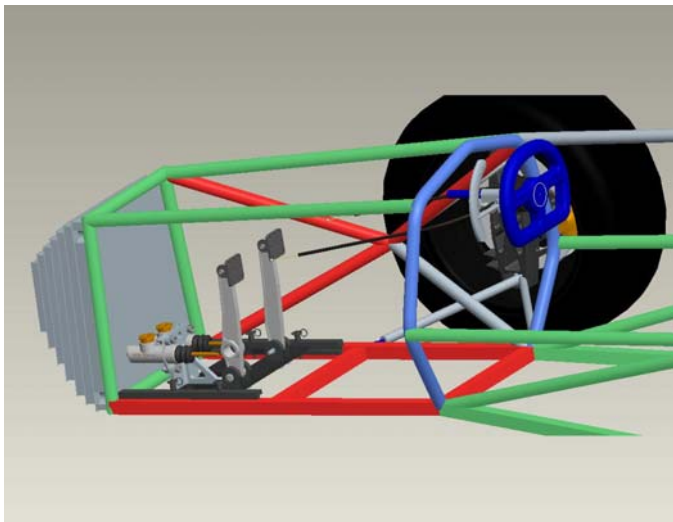
### *Suspension*

An emphasis of this year's design is keeping the center of gravity of the car low. The suspension and steering of the car has been designed with that in mind. The team will be using Penske 7800 shock absorbers, which will be mounted underneath the frame in a pull-rod

configuration. The steering rack is also an innovation, which will have components running inside the frame tubes of the car to maximize driver legroom in case of an emergency. The team will be again using Brembo brake components and Goodyear tires. Team members have also designed their own suspension uprights, which will be manufactured using the CNC equipment in Kingsbury Hall at UNH.

### *Controls and Electronics*

The team has worked hard on improving the control interface and user-friendliness of this year's car. Car 86 will utilize an all new control set-up, with an electronics suite to match. For the driver, gone is the shift-lever and clutch pedal. The car will instead be shifted with buttons on the steering wheel, using an electro-pneumatic system that utilizes compressed air to shift gears. This system is race-proven and found in many forms of motorsports.



The clutch will be a paddle located behind the steering wheel, alongside a paddle to engage neutral. This hand-operated system is modeled after those used in Formula 1. The team will be using a simplified gauge cluster, with only a tachometer and warning lights, so that the driver can concentrate on the track ahead. To keep the pits aware of engine and car performance,

the electronics team is developing a wireless data acquisition system to be used with the Performance Electronics ECU. Data will be streamed directly from the car to the pits throughout a run, so that the team will always be aware of the health and performance of the engine.

The UNH Precision Racing team has been working closely with our sponsors and technical partners on their 2009 Formula SAE entrant, Car 86. The team would not be able to undertake the challenge of developing a race-car from the ground up without their incredible support. This year, our students have been working closely with a few of our sponsors in developing key components on the car. A couple of the projects are highlighted below:

### *DEKA Research and Development Corp.*

The team has received support from DEKA Research and Development Corporation of Manchester, New Hampshire. DEKA has generously provided rapid prototyping support for the fabrication of component on Car 86. The rapid prototyping process allows components designed by our students using Computer Aided Design software to be quickly turned into high-strength thermoplastic components. The engine restrictor, which directs airflow into the engine, and the steering wheel have been manufactured using this process.



## *Oasis Alignment Services*

OASIS Alignment Services, located in Rochester, New Hampshire, has provided the team with laser tracker 3-D measurement services. This technology allows an object(s) to be scanned digitally, creating a 3D model that can be entered into CAD software. OASIS has provided this support to industries including power generation plant design, shipbuilding, and aerospace. UNH Precision Racing utilized this technology to create a 3D model of the GSX-R600 engine to enter into the CAD renderings of the car design.

## *Whelen Engineering*

Whelen Engineering, with sites located in Chester, Connecticut, and Charlestown, New Hampshire, has given UNH Precision Racing a professional photo-shoot and graphic design services in addition to opening their facilities for a tour by the team. Whelen Engineering is a leader in the emergency warning industry, manufacturing strobe and warning light systems for many industries including aviation, maritime, and civil and emergency services. The team toured engineering and manufacturing facilities and spoke with engineers about the work they do on a daily basis.



UNH Precision Racing would like to thank all of our sponsors and supporters for their help and dedication this year.

## *Team events*



The fall semester was a busy one for the students involved in the UNH Formula SAE team, UNH Precision Racing. After finishing a disappointing 97th at the 2008 competition, the team started early on designing an improved car.

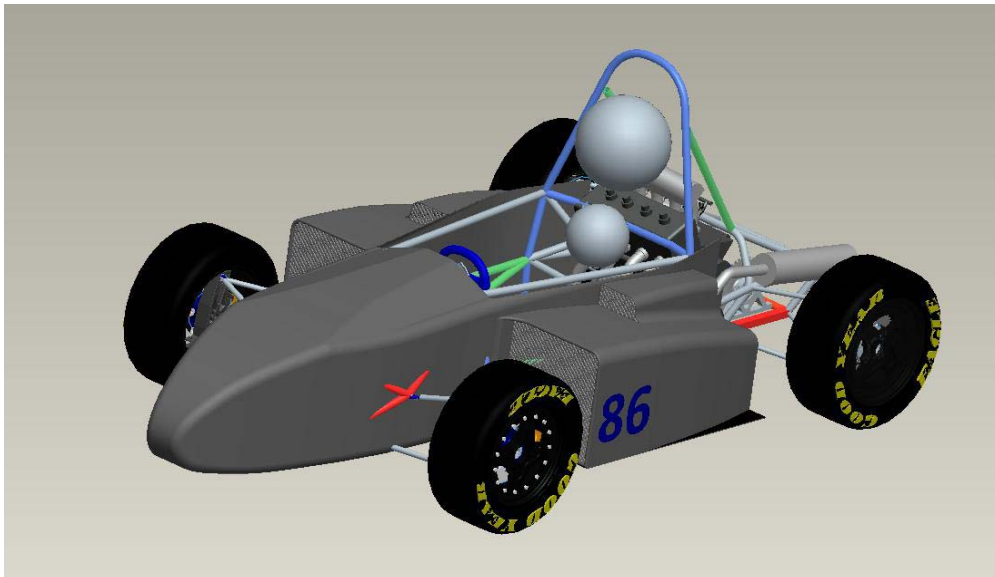
Alongside the design and development work, the team was also busy recruiting sponsors and showing the cars from previous years at UNH and community events. The cars were on display throughout the UNH Homecoming weekend and the team participated in the UNH homecoming parade. The team also brought a car to the UNH Career Fair and participated in the UNH Foundation's Great Works event, where the team was highlighted as a marquis UNH student project. UNH Precision Racing

has also been busy getting our name out in motorsport and automotive communities, participating in local car shows and setting up a display at the New England Drag Way during their IHRA race weekend.



## *Fundraising*

UNH Precision Racing has been very busy with fundraising efforts this year. The team has run a calendar raffle program and held a drawing for a season's pass donated by Cannon Mountain. Both of these programs were successful in bringing in additional funding. The team would like to again thank our sponsors for their support.



**Questions or Comments? Please Contact**

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