

# Formula SAE Update



Testing of the 2004 car at Springette parking lot.

## 2005 Entry on track

The 2005 Season is shaping up to be a great year. We are currently on track and plan to have the 2005 entry done by late March. The goal this year was to only make small changes for the 2005 season, but after some long summer hours of testing we found that we needed to change a lot more than we had expected. A lot of analysis went into the design of the suspension, chassis and drive train this year. After last years disappointment we knew that we needed to do a lot of work in

## Drive Train:

Drive Train Leader: Brent Bell

The Drive train has gone under a two year analysis initiative. This year the focus was on reduced mass, better packaging and moving to a smaller chain to reduce rotational inertia. In comparison to the 2004 drive train, the 2005 system decreases the mass of the rear sprocket by 0.75 lbs and the pillow blocks by 0.39lbs. Overall, the drive train has reduced in mass while still maintaining high strength and rigidity. The plans for next year are to do

order to have a competitive car for the 2005 season. We believe that this year we will be able to achieve all of our goals and be one of the top entries.

extensive analysis on the differential in order to develop it to the final stages of the optimized design that we had envisioned from the beginning.



## 2005 Season Features:

- Completely new Chassis Design
- Revolutionary Suspension
- Dash Data Acquisition System

*"We believe that this year we will be able to achieve all of our goals and be one of the top entries."*

**HONDA**  
The Power of Dreams

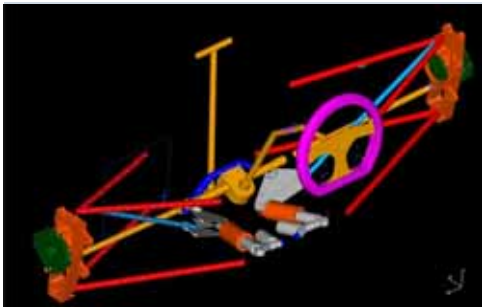
**LANXESS**  
Energizing Chemistry

**NSK**

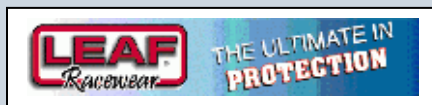


2005 Drive Train





2005 Front Suspension design



## Suspension

Suspension Leader: Chris Gregory

This year's suspension has taken a huge step forward in the area of design and analysis. Extensive Adams testing has been undertaken over the summer months to develop and prove the next generation of suspension design. The 2005 system allows for a lowered center of gravity and a reduction in weight. The new placement of the system reduces the number of components intruding the cockpit, thus improving driver ergonomics. The steering system has also been totally overhauled. Much research and computer simulations with regards to driver effort and feedback, as well as overall efficiency have developed a system that will far exceed its predecessor.

Also in the works is a prototype semi-active damping system that had been introduced early last season. A new group has formed with hopes to finish the project and have it ready for summer testing. The idea of the design is to take in real-time data during a race and feed that information to an on-board microcomputer. This information is then analyzed to develop a "fix" to send directly to each of the four shocks. By having the vehicle perform more efficiently, track times will consequently be reduced.

With so many changes and un-track-proven designs, we have allotted a large portion of our testing time to dialing in this new system. We plan to start the setup May 1<sup>st</sup>, 2005.

## Chassis:

Chassis Leader: James Kempston

The chassis has been developed to be lightweight and more rigid than previous designs. Overall, the chassis weighs about 56lbs which is 2 lbs lighter than last year. Load paths in each section of this chassis are clean and consistent, thus resulting in a very effective structure, allowing the suspension to operate as it should. The cockpit has been widened to allow for taller and larger drivers as well as added space for components. We have also moved from a three pedal design by implementing a two pedal setup with a hand clutch and shift mechanism. This will allow the driver to be able to use both feet for specific tasks (left for the brake and right for the accelerator) and give the driver better control especially during proper downshifting. Many high-tech materials have been implemented into the new design. The body will be made of lightweight carbon fiber, while the front and side crash protection will be made of an aluminum honeycomb composite. This honeycomb material has a very high compressive strength, while still remaining very light weight. The 2005 chassis will produce a stronger, better performing and safer car than any before it.



2005 Chassis



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Check out our new  
website:  
[www.eng.uwo.ca/sae](http://www.eng.uwo.ca/sae)

## Special Thanks

The 2005 Team would like to thank all of our sponsors for their continued support of our team and in future Engineers. We would also like to thank the Engineering Faculty for their support in helping the mega project teams start a co-operative initiative with outreach and relations within the engineering faculty. With their support, we will be able to expand our connections to allow us to become more successful and also provide the Engineering department a means to promote Western Engineering.

## Our New website

Check out our new website [www.eng.uwo.ca/sae](http://www.eng.uwo.ca/sae) Special thanks to Hiran Perera for taking the initiative to put together a beautiful site. We would like your feedback and if you have any suggestions or things that you want to see on the site please let us know.

## 2005 Team:

Managers: Alberto Da Rocha, Chris Gregory

Chassis: James Kempston, Ian Swentek

Brakes: Stan Whatmough

Engine: Jason Heal, Justin Kendall,  
Andrew Hall, Jeremy Cepek,  
Dan Striuka, Mark Blissitt

Suspension: Chris Gregory

Driver Interface: Murray Cutler

Drive Line: Brent Bell, Adam Zakrzewski

Electrical: Jon Berge, Ian Swentek,  
Chris Kerr



Hard at Work on the 2005 Chassis



**UWO Physical Plant**  
**UWO Parking Services**  
**University Machine Services**

