



University of Patras

Department of Mechanical Engineering & Aeronautics



*Laboratory for
Manufacturing
Systems & Automation*

Newsletter No.8

Oct. '08 - Feb. '09



With the major summer Formula Student events now only a few months away, all team members are working furiously in order to be ready to test their skills and gathered knowledge to the maximum once again.

During the past four months, UoP racing team concentrated its efforts to the building of the new racing car. This year, the team will participate in Formula Student (UK) competition in July 2009 and Formula Student Germany in August 2009, aiming again to a strong finish.

In addition to that a new team, UoP4, has been initiated by 1st and 2nd year students, aiming to participate this summer to Formula Student, Class 3. The new members are taking guidelines and knowledge from the older members, as well as from the big database existed from the previous cars. The new car, will incorporate new successful solutions and innovative ideas and therefore will be lighter, faster and all-in-all better car.



Chassis:



A lot of progress has been performed in the chassis group, over the last months. First of all, the Uop3 frame's four piece molds have been manufactured out of high quality material in order to achieve the best final work possible. There has also been an extensive chassis and ergonomics analysis in search for a lighter and more user-friendly car. Finally, almost every subsystem of the car, such as head restraints, firewall and safety harness, has been designed.



Also for the first deadlines of the event, an impact attenuator test has been performed by the team with a self made device. This has shown that the impact attenuator device meets the competition rules and that the team had done great job during the past years with the dynamic analysis of the process.



Finally, the safety structure equivalency form that was also required, in order to prove the safety of the composite tube, has been prepared and submitted using classical lamination theory.

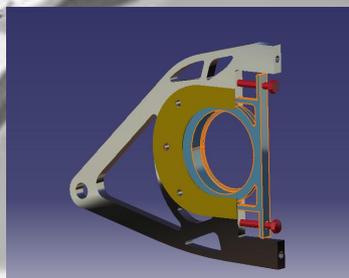
Drivetrain:

For the drivetrain compartment, the most important part is already available. The selected differential from Drexler, will have a key role on the performance of the car.

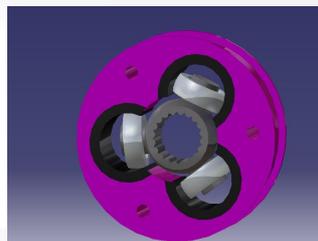
New differentials' mounts, supporting the differential itself and at the same time being used also as engine mounts, were designed. Taking into consideration the subscribed loads from the engine's weight and the sprocket's torque the team designed the mounts as light as possible without any compromise in reliability.

The mounts will be manufactured in-house with CNC milling, in order to achieve the maximum precision at the lowest cost.

The tripod CV joints to, be used in

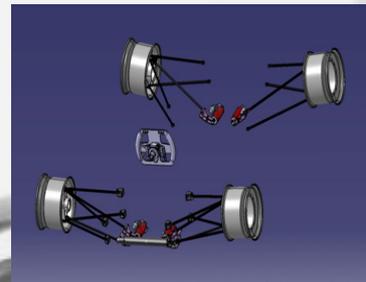


the car, were fully designed by the team members. They will be after-market tripods with custom made housing. Tripod housing is designed to allow the inserts of fixed diameter, to enter and let the tripod operate, providing in such way the best performance at low cost.



Suspension:

Thanks to the experience gained through our recent participation in FS2008 events, this year the team came up with a whole new promising suspension design. Special attention was given to the position of the steering rack and shocks, mostly because of the new set of regulations announced. Due to these facts, extensive analysis was carried out in trying to accomplish the best solution for the suspension set up.

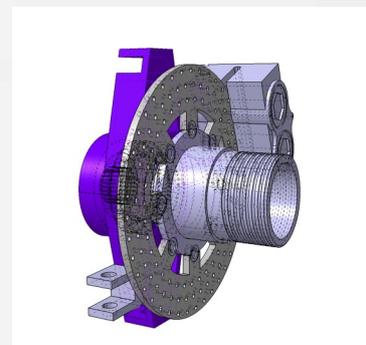


Many problems were solved on the way to the construction of the uprights and the suspension's team members are now looking forward to test the suspension on track.

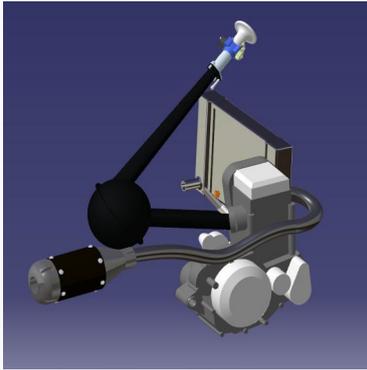
Brakes:

For the braking system of the new car four disk brakes will be used instead of three that were used in all the previous cars, for better drivability and stability during braking situation.

Moreover, an optimized design of the old pedal box was made in order to further improve its performance.

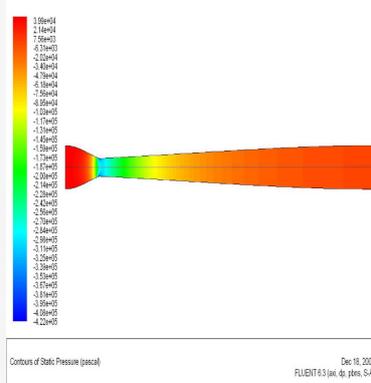


Engine:



The intake system, including retractor, diffuser, plenum and intake runner were designed for the best air flow and engine running, based on the simulation results. As for the fuel system, the appropriate fuel pump and injectors were selected. Moreover, the fuel tank was designed according to the engine's fuel needs.

Finally, a whole engine model was made using Ricardo WAVE software in order to simulate the engine's output and compare it with the initial performance of the engine.



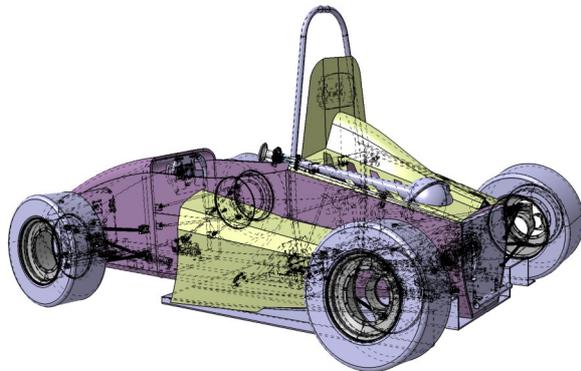
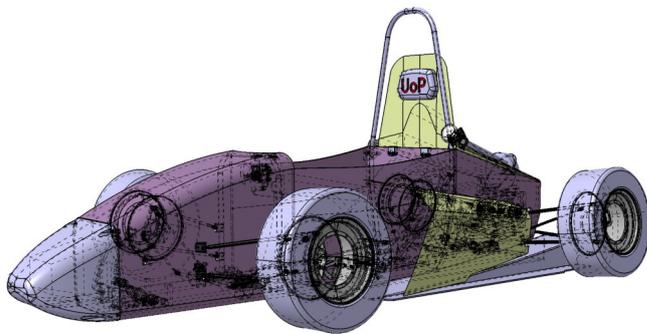
Sponsorship – Marketing:

This years marketing is mostly concentrating on expanding the already successful partnerships and finding some new sponsors aiming

on a wide advertisement of their companies' work through the team's publications and achievements. UoP racing team has already gained a generous offer from **Yamaha Motodynamics S.A.** which once again sponsored a **WR 450F** brand new engine.

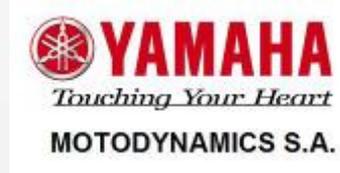
During the last four months, team's work has been promoted by some major publications, such as **Pathfinder — Technologicin** and **Skai TV**.

Finally, this year's sponsorship invitation has been already available on the team's official website.



UoP Racing is proudly sponsored by:

Grand Sponsors:



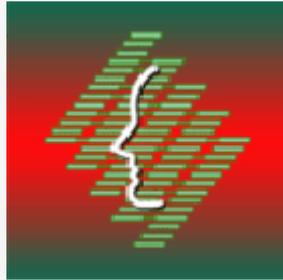
Sponsors:



Supporters:



Contact Information:



LABORATORY FOR MANUFACTURING SYSTEMS and AUTOMATION (LMS)

Director: Professor George Chryssolouris (xrisol@lms.mech.upatras.gr)

Department of Mechanical Engineering and Aeronautics

University of Patras

Patras 26110, GREECE

Tel.: +30-2610-997262, 997264

Fax: +30-2610-997744

Email : fsuop@lms.mech.upatras.gr

www.lms.mech.upatras.gr

www.lms.mech.upatras.gr/formula.html