MONASH MOTORSPORT

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Newsletter - July Edition

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Welcome to another month of Formula SAE at Monash, I can tell you it felt like less than a week. With the expected break for exams now completed, the new car is taking shape at a rapid rate. As will be shown later, several critical components have already been manufactured and the progress model is beginning to develop into a racing car. Significant work is expected to be performed in the next few weeks with the aim of having a rolling chassis by next month.

Testing of the 2002 car has also resumed in earnest, with a rigid program of development items planned to be added to the 2002 car to test their viability before the new car is finished. The mid-June session held at the Coles Myer Car Park in Glen Iris, also allowed the team to test several drivers with an eye to a possible to driver line-up come December. Several promising hopefuls have been located, with further, more rigorous testing planned for later in the year.

The team has also attracted some new support from industry in support of the 2003 campaign. While Coles Myer have assisted the team with a testing facility, the team have also received support from PBR, Vesco Plastics, and Davidson Measurement, who are assisting the team with our data logging requirements. The team have also received renewed support from Pirtek and APESMA during the month.

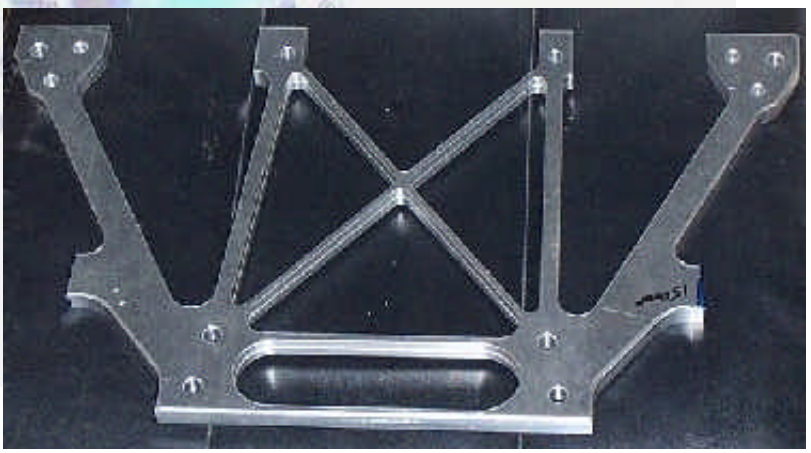
On the publicity front the team has recently been featured in industry publications from APESMA and the Composites Institute. The website features the full text of these pieces, so visit www-personal.monash.edu.au/~fsae for more details. Look out for further articles in the Monash Magazine and the Institute of Engineers Newsletter.

Construction Progress

While exams have slowed progress considerably over the past month, there have still been many parts manufactured, purchased or received. Manufacturing work has focused on the CNC machining of complex components such as the Inner brake rotors, and the rear chassis engine plate at Box Hill Institute. The Aluminium engine plate shown at the bottom, forms the link between the front and rear chassis, such that the two can be separated by simply undoing a couple of bolts. The brake rotors shown on the left have been cut from 2024 Aluminium (for best strength under cyclical heat stress) and form the major structure of the new fully-floating rotors. 'Floating' the rotors, (allowing them to move laterally under braking) improves the drivers pedal feel, while also reducing rolling resistance.

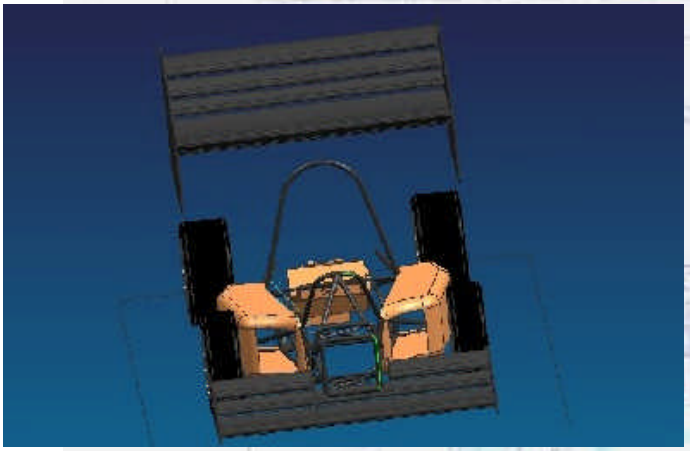
Another important factor in improving the braking performance of the vehicle is the master cylinders. Shown third on the left, the cylinders are designed to utilise a remote reservoir, hence allowing the team to place the units beneath the pedals rather than in front of them. This allows the front chassis to be reduced in length, saving considerable weight. The lightweight cylinders, generously donated by PBR, are ideal for meeting this goal.

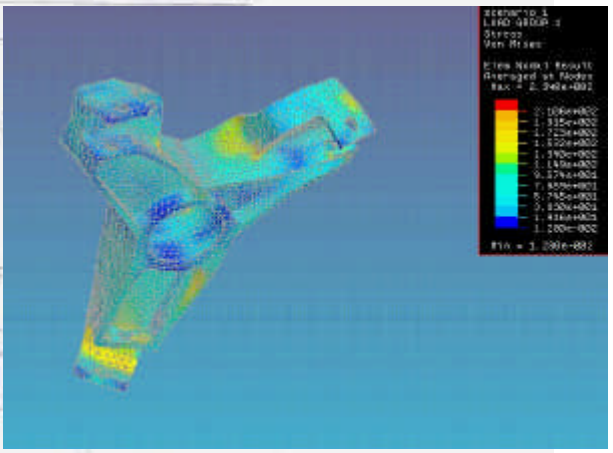
Also received during the month were the new custom spun wheel rims. Having sourced a suitable grade Aluminium the team has been able to significantly reduce the rim thickness and hence save a major amount of weight. With a weight saving of almost 1kg per wheel, a significant reduction in critical unsprung weight has been achieved.



Design Update

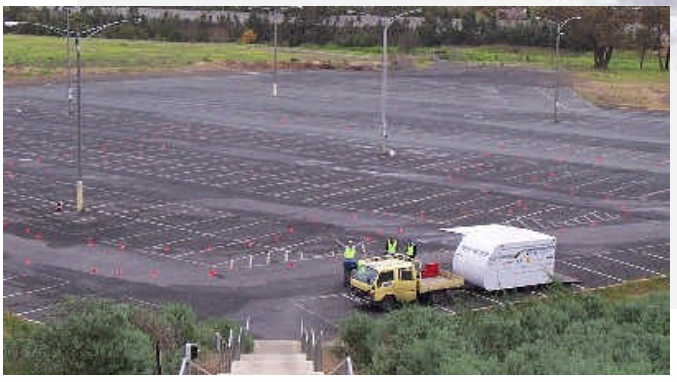
With the car now effectively entirely designed, there is very little to report in the design update. The pedal box design is finalised, front and rear bell-cranks and the wheel assemblies are all complete. The only unfinished component of the car is the bodywork, which since all the elements underneath it are now set in stone is capable of being designed. The first example of the sidepod design is shown below. Designed to maximise the cooling flow to the inclined radiator, the sidepods features a slight diverging section to increase the pressure differential across the core, hence increasing the cooling efficiency. Also shown here is the final FEA run on the rear upright. To be CNC machined from Aluminium the upright was subjected to extensive testing, (10 iterations) in order to reduce the weight to the bare minimum required for functionality and strength.





Testing the 2002 Car

With special thanks to Coles Myer the team were able to bring the 2002 car out of retirement. The Mid June run was hampered by an initially gravely track that reduced grip to a minimum and made driving difficult. Once a clean line was established some meaningful testing was performed with more concrete information on the wing performance being gathered. Until it broke! It is believed that a combination of high winds and high yaw angles resulting from the low grip level contrived to shear one of the laterally stabilising rod-ends. The team were surprised by the extent of these side forces and hence the 2003 wing mounts will be modified accordingly. The new smaller 2003 differential was also run and experienced no problems.



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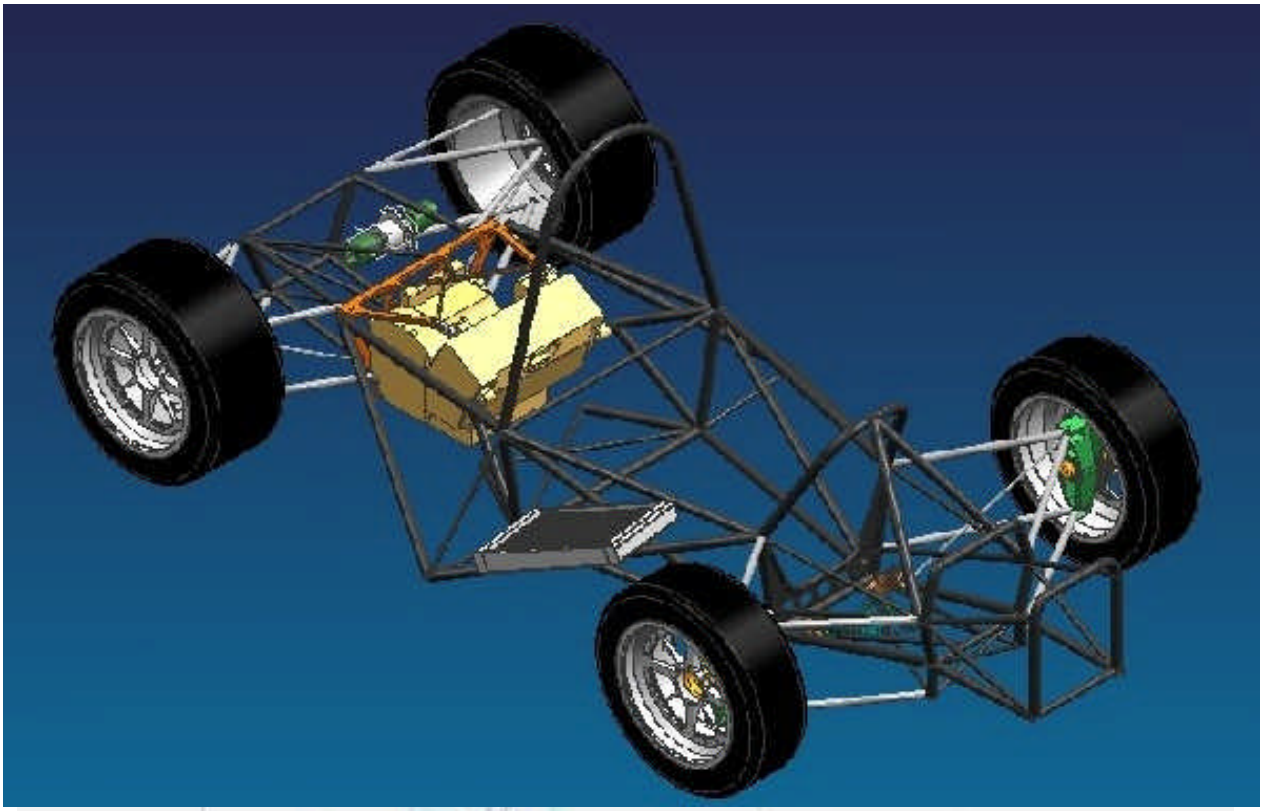
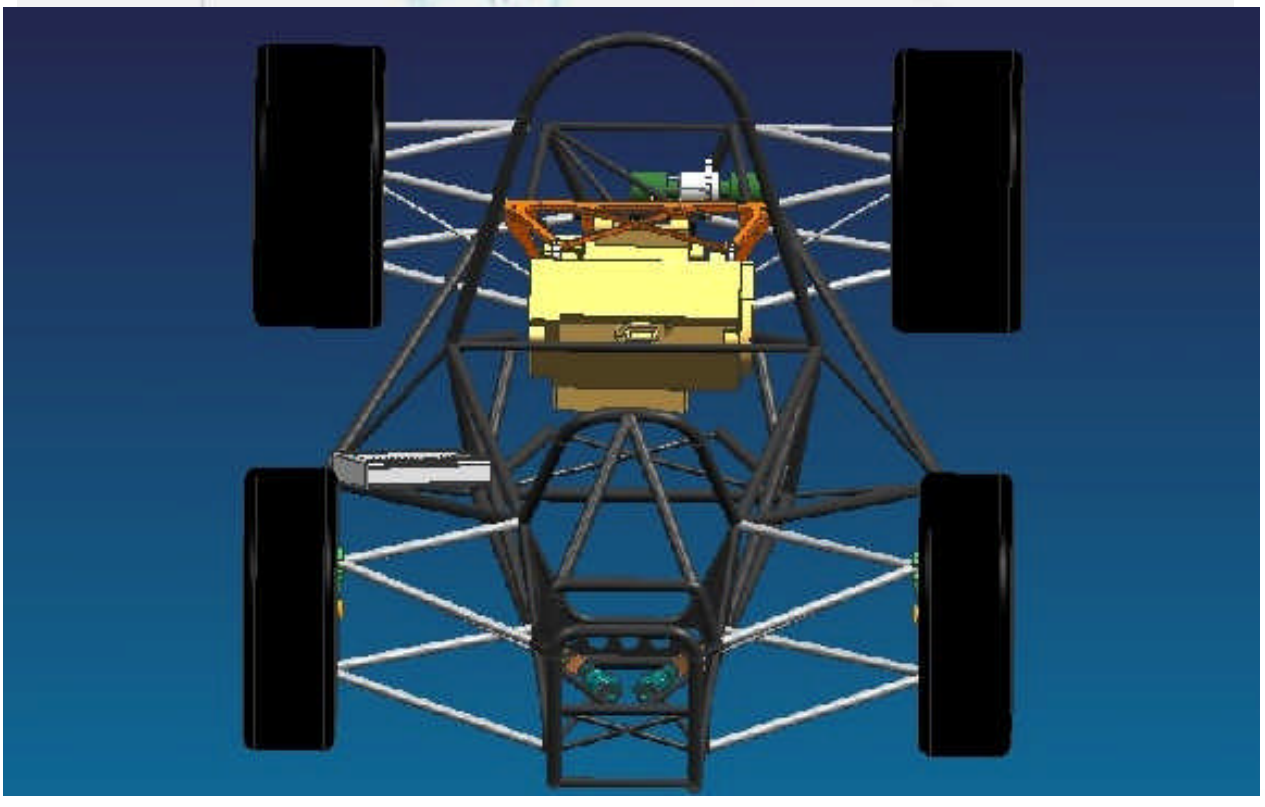
Unigraphics Progress Model





Sponsor Feature - Pirtek

Proudly and uniquely Australian, Pirtek are the market leader in providing a comprehensive portfolio of fluid transfer solution products and services. Pirtek aim to build long-term relationships with current and potential customers by consistently providing high quality products and services, wherever they are needed. Their highly visible field sales and mobile service personnel are experts in remedial and preventative maintenance needs in the service and supply of all fluid transfer solutions. With customers, large organisations and small businesses, from key industries including manufacturing, oil and gas, mining, construction, earthmoving, agriculture and defence, Pirtek consistently delivers the highest quality products and services where and when they are needed.

As the hose and fitting supplier of the Formula SAE team, Pirtek are helping the team to produce the lightest, neatest and most efficient cooling, fuel and braking systems possible. The team thank Colin Gray and the team at Pirtek Springvale for their tremendous product and technical support.

Sponsor Feature - NSK Bearings

NSK Australia are the leaders in the field of bearings and precision automotive components. With a full range of motion and control products from standard ball bearings, to integral wheel hubs and bearings, NSK pride themselves on quality. Backed by their Japanese parent company, NSK Australia stock one of the largest and most complete ranges of bearings, and hence are the place to contact for all your requirements. NSK are not only experts in precision bearing manufacture, they are also continually developing new and innovative products for the future. An example of the are the integral wheel and hub components that are standard OEM issue on a whole host of new vehicles today. It is with one of these enclosed double row tapered roller bearings that the 2003 car will run. The use of this product results in a short bearing length while it also eases manufacture and preloading of the bearings. NSK are supplying the team with these and other bearing needs. The team are extremely grateful for the support offered by Brad Neck and NSK in this important area of vehicle design.