

We hit the ground running with the Design Stage well underway!

With the Warwick Racing team all settled into their new roles and any sign of last month's grace period well behind us, November has demonstrated tremendous design progress towards WR4 and the final preparations towards our Australian adventure underway.

This month both chassis and powertrain teams alike have been working hard to finalise designs and implement them in CAD in preparation for the final deadline in December. November has also seen the launch of our new Outreach Programme in schools, with Campion School pupils the first to undergo our teaching seminar. With the Advanced Engineering UK 2013 show and a number of trips to numerous sponsors and manufacturers, this month has seen Warwick Racing popping up all over the West Midlands.



The Australian Adventure Begins

November has been a busy month in the run up to the Formula SAE-Australasia competition. We saw WR3 leave her home in WMG on Monday 11th November, and arriving quicker than expected at Monash University, Melbourne just 9 days later. Finally meeting the Monash Motorsport team face-to-face after 6 months of video conferencing will be exciting, and we can't wait to see how their facilities compare to what we have at Warwick.

There is much to be done before the team leave the UK on 29th November. The excitement of three weeks of warm weather, meeting new people, and competing alongside one of the world's best Formula Student teams is keeping us motivated through the long days and even longer nights! The departure of WR3 really hit home how quickly these events come around, and how soon we will be joining her down under. For everyone involved, this will be a trip to remember and we can't wait to show the Australasian formula SAE teams what Warwick has to offer.



Chassis

This month sees a good level of progress within the Chassis team. The rear bulkhead design has moved into its final design stages, undergoing topology optimisation with some help from one of our partners, GRM Consulting. This has helped us to identify how we can focus on one of our main objectives, weight saving. Our new composite crash structure has moved into the early stages of its iterative testing process, with the first scale nosecones being manufactured. This would not be possible without the aid of another of our partners, SHD Composites - who have kindly donated to us lots of material. The design for our combined seat and firewall has now been finalised, and talks will begin shortly about manufacturing possibilities and material usage. The spaceframe design is also nearing completion. It is currently undergoing analysis and the tubing has been ordered; the team looking forward to spending a good few hours leading up to Christmas welding and notching out tubes to form a new spaceframe!

Electric

November has shown the Electric team exciting times! We are happy to announce the acquisition of the chosen power-plant that comes from the heart of Oxfordshire equipped with one of the best power-to-weight ratios in the market - YASA 750. For our power source, we are currently in negotiations with a US based firm to acquire their state-of-art hard Carbon prismatic cells to build our accumulator unit. Control systems have been carefully selected from the rich range of National Instruments' CompactRIO modules. On the theoretical side, the team has been pursuing its systems engineering approach to identify intricate interdependencies in order to iteratively optimize design choices before they are frozen. Other major components such as the inverter and battery management system have also been picked. CAD work has begun and is gaining momentum with the motor now being scanned in 3D. We are eagerly looking forward to the coming month as we see specifications on paper turn into components in flesh.

A few words from the Chief

This month has presented the new challenge of a split team, with five members in Australia and the rest holding down the fort at Warwick. So far the Monash team have been a huge inspiration to the guys, exchanging information and key to help out solving problems. With WR3 running the best she ever has we are more confident in our ability to ensure WR4 will be properly set up for competition taking one more weight off our shoulders. With the guys still at Warwick hard at work manufacturing WR4's spaceframe and continuing the push for a 100% CAD deadline before Christmas. All in all the team have shown great enthusiasm and a professional attitude towards their work, producing some really promising and exciting new designs for WR4.

Powertrain

Powertrain has seen an exciting amount of progress since October. Manufacture has started for the output flanges, courtesy of RL Walsh & Sons based here in Coventry, and should be completed prior to Christmas. These high-specification flanges will allow us to utilise the new differential and engine package to its greatest potential come the competition in July. Our anti-shock drive system has entered the final stages of design with FEA currently underway. Bushes provided by Powerflex will be employed to 'cushion' the dynamic, jerk motion of the chain-drive prevalent during standing-starts and hence mitigate peak loading forces on the drivetrain. Developments have also been made with the intake system with an airbox and filter being provided by ITG. CFD analysis is also being used to optimise the interaction of the restrictor and throttle-body to deliver optimum air-fuel ratios for engine performance. Following the finalisation of the rear suspension system by the Chassis team, the half-shaft dimensions can now be determined and passed on to GKN Landsystems for fabrication.



Events

Outreach Programme – Champion School

On 13th November, five members of the Warwick Racing team delivered the first of a series of ‘Outreach’ events at local schools. We would like to thank all the participating year 8 pupils from Champion School for acting as guinea pigs! The aim of the multiple one-hour sessions was to help promote STEM subjects and particularly Engineering as a possible career choice, and to give the pupils an overview of University life. In small groups the pupils assembled small spring-powered cars, raced them and then discussed why some designs worked better than others. Everyone from Warwick really enjoyed the day and we’re looking forward to the next event – however in future, we’ll make the smaller cars’ chassis from a stronger, more robust material to avoid some of the catastrophic failures we witnessed!

The Advanced Engineering UK 2013 Show

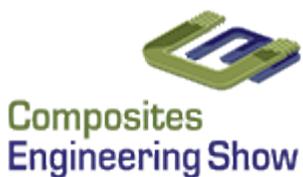
On Tuesday 12th and Wednesday 13th November, Hannah and Omar descended on the NEC in Birmingham to meet some of our existing partners and network with some of the industry’s leading suppliers and manufacturers in the hope of securing new sponsorship this year. The show proved a resounding success with lots of invaluable contacts made and leads to chase up, along with a rare opportunity to speak to some of our Formula Student competitors about their progress this term. Since the event Warwick Racing has managed to secure a number of new partners, including composite and consumables suppliers, with many more still in the pipeline.



Bruntingthorpe Proving Ground

On Monday 4th November the Australia contingent ventured to Bruntingthorpe Proving Ground for some much needed driver training and on track testing. This was primarily to familiarise the team with last year’s car, but also to give WR3 a chance to stretch her legs following considerable improvement works over the last few months.

Chief Engineer, Oliver Adams took the first leg and the car handled well. Despite a few excursions off track, the last few remaining issues were identified and a plan of action finalised for the build up to the Australasia competition.



Friends of Warwick Racing



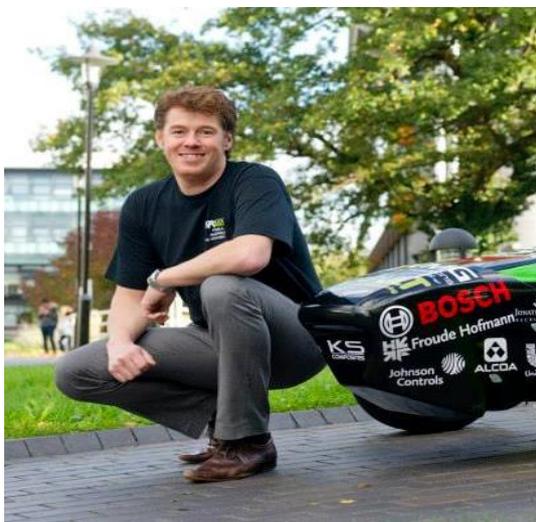
This year Warwick Racing faces its biggest challenge yet with a multitude of new and exciting challenges to overcome. On Thursday 12th December our Australia contingent will be participating in the Formula SAE-Australasia competition and will represent the only British entry there. Furthermore, next year Warwick Racing will be implementing an electric powertrain for the very first time, designed over a two year cycle. However, to ensure that successive teams are reading off the same page and to facilitate greater knowledge transfer between these teams, we hope to enter Formula Student Germany in July and take as many first – third year students as possible. This will give prospective members invaluable competition experience and enable them to learn as much as possible from the WR4 team before we depart, as well as giving our existing team the opportunity to see how we fare against the fierce German competition. Warwick Racing has also initiated an outreach programme in local schools this year, with the aim of promoting STEM subjects and encouraging pupils to pursue a career within engineering.

However, entering two additional competitions in the space of one year poses a huge financial burden on our team. We are thus desperately in need of additional funding to ensure that the WR4 race car is successful and to facilitate the progress of our electric entry next year by competing in Germany this summer.

Warwick Racing is thus extremely grateful for any financial contributions our friends, family and fans can offer us, to aid us in making this year the most successful year to date. We welcome financial donations of any size, no matter how seemingly small, in our efforts to raise approximately £26,000 worth of financial and in-kind contributions. Many of our donors receive our monthly newsletter detailing the team’s progress and attend many of our events, including our prestigious launch event in the summer, where they have the opportunity to meet our team and see our race car.

If you would like to donate to our team please follow the link to our donation page below and enter ‘Warwick Racing’ in the gift direction section: <http://www2.warwick.ac.uk/giving/donate/online/single>

Alternatively please make cheques payable to ‘**University of Warwick**’ and post them to Omar Sabri using the Warwick Racing address on the following page. Should you have any further queries please do not hesitate to get in touch using the details overleaf. Finally, we would like to take this opportunity to thank the friends, family and fans who have donated to us so far, your contributions are invaluable and greatly appreciated.



Coming Up in December...

- WR3 competes in Formula SAE-Australasia.
- Australian Adventure Special.
- Final CAD Deadline Progress.
- Chassis Spaceframe Build.

A Special Mention

Warwick Racing would like to extend particular gratification this month towards **David Cooper, Darren Stewardson** and **Darren Grant** for all the technical expertise and invaluable time they have so kindly given to us. The complete design, manufacture and assembly of a single seat racing car is no mean feat and could not be possible without the guidance and machining knowledge of all the staff in WMG and within the School of Engineering. A special mention should also be extended to **Paul Lorden** and the rest of his finance team for processing all of our order requests quickly and efficiently and lending a kind helping hand whenever requests need a little pushing along.



Sponsorship

First of all we'd like to take this opportunity to thank all of our partners for their sponsorship and continued support throughout this month, without which much of our progress may not have been possible. As you know, Formula Student is a fourth year engineering project at the University of Warwick and is funded almost entirely by external sponsors. As such, we are extremely grateful for any support you can offer us and in return we can offer you a number of benefits including promotion of your company brand on our WR4 car, throughout our assembly area and on our website, as well as promotional opportunities within our university and access to our highly sought-after graduate recruitment market.

Warwick Racing welcomes support of any kind, whether it be direct financial or in-kind contributions, expertise, advice, materials, use of manufacturing facilities or assistance with testing.

If you would like to sponsor Warwick Racing or if you have any further queries, please do not hesitate to get in touch using the details below. Furthermore, our new Sponsorship Opportunities 2013/14 brochure contains a brief summary of our history, our core design philosophies for the WR4 car and a look at our diverse range of sponsorship packages.

Link to brochures:

http://www2.warwick.ac.uk/fac/sci/eng/meng/warwickracing/fs/sponsorship/formula_student_wr4_brochure_2013-14.pdf

http://www2.warwick.ac.uk/fac/sci/eng/meng/warwickracing/fs/sponsorship/formula_student_wr5_brochure_2013-14.pdf

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