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FORMULA STUDENT

Institution of MECHANICAL ENGINEERS

Event Programme
15-18 July 2010

Improving the world through engineering

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RULES OF ENGAGEMENT

Despite the organisers taking all reasonable precautions, unavoidable accidents can happen. In respect of these, we must make clear the rules of engagement for all participants and visitors.

Motorsport may be dangerous and persons attending this event do so entirely at their own risk.

It is a condition of admission that all persons having any connection with the organisation and/or conduct of the event, including owners of the land and the drivers and owners of the vehicles are absolved from all liability arising out of accidents, howsoever caused, resulting in damage and/or personal injury to spectators, pass and ticket holders, or their goods and vehicles.

This event is held under the General Regulations of the MSA (incorporating the provisions of the International Sporting Code of the FIA), the FSAE & Formula Student Rules and Regulations, Final Instructions and any written instructions that the organisers issue for the event. MSA Permit COE 57247.

Front cover: photography by Mike Caldwell, www.mikecaldwell.co.uk art direction by B J Design,
with thanks to MERCEDES GP PETRONAS Formula One Team, Mercedes-Benz HighPerformanceEngines and the University of Bath.

WELCOME.

ROSS BRAWN OBE
TEAM PRINCIPAL, MERCEDES GP PETRONAS FORMULA ONE TEAM AND FORMULA STUDENT PATRON

During the five years that I have been its Patron, I have seen the number of Formula Student teams across the world expand rapidly, and it is fantastic to see the enthusiasm and commitment of these bright young engineers.

What I find most appealing about Formula Student is the innovation that it encourages, as the competition rules give the entrants a lot of design freedom. This results in many different solutions to the same issues; whether it is engine efficiency, lightweight materials or chassis design. My advice would be to make the most of this opportunity as regulations can be stricter in industry!

My career in Formula One began as a machinist with the Williams team back in the 1970s and since then I have worked as a mechanic, in R&D and aerodynamics, as a Technical Director and now as the Team Principal of the MERCEDES GP PETRONAS Formula One Team. Having worked my way up, I appreciate that to develop a good grounding in engineering, practical experience is essential. Formula Student combines hands-on practical applications with students' academic studies, but also gives experience in vital skills such as budgeting, project management and teamwork.

Whether the competitors go in to motorsport or a different sector of engineering after they graduate, they will find that industry is very competitive and I have no doubt that what they have learnt by participating in Formula Student will help towards their future success. Good luck!

JON HILTON
FORMULA STUDENT CHAIRMAN

Welcome to IMechE Formula Student's 13th competition! Having been the Chief Judge for the past 4 years, I am delighted to attend this year as FS Chairman for the first time. The competition has grown and developed hugely since it began in 1998 and I would like to take this opportunity to thank John Wood for steering FS as Chairman for the past 12 years.

Looking forward, we are continuing to liaise with industry and universities worldwide, as well as with the other official Formula SAE competitions. This is to ensure that the rules are continually reviewed and developed in the appropriate direction and to keep all competitions aligned with one another and with developments in industry.

The world needs innovative and entrepreneurial engineers that are going to help address future climate change, by reducing CO_2 emissions in line with governments' obligations. How this is going to be done is not yet clear and good engineers and scientists are needed to work alongside other specialist sectors to find clever solutions. I believe that by encouraging FS teams to develop alternative powertrains, measure CO_2 emissions and consider the sustainability of materials used, we are well on our way to producing the ground-breaking engineers so desperately needed in the modern world.

This year we were once again over-subscribed so I would like to congratulate all teams for getting this far! I also wish to thank our 2010 Partners; Airbus in the UK, Autodesk, Cenex, E.ON UK, Mercedes-Benz HighPerformanceEngines, National Instruments, Shell and The MathWorks – we could not put on this event at Silverstone Circuit without their support.

Good luck to participating teams and I look forward to meeting you.

FS INTRODUCTION

Formula Student is one of the largest educational motorsport events. It challenges student engineers to innovate, design, build and compete as a team with their own single-seat racing car.

The annual event is run by the Institution of Mechanical Engineers and was first held in the UK in 1998. The competition aims to inspire and develop enterprising and innovative young engineers by promoting the skills needed by engineers in the real world; creativity and technical ability; teamwork and communication; logistics and the ability to manage budgets and timings.

Formula Student has grown in size over the years and now regularly attracts more than 150 teams representing universities from all over the world. It is also strongly backed by industry and high profile engineers.

THE COMPETITION
The competition starts at the beginning of the university year when teams start to design their cars. They are to assume that a manufacturing firm has commissioned them to produce a prototype car for the non-professional autocross or sprint racer sales market.

To encourage innovation, there are very few restrictions on the overall vehicle design.

Successful teams are those who produce a car that is not only fast and reliable, but also low in cost and easy to maintain. The car's marketability is also enhanced by other factors such as aesthetics, driver comfort and the use of common parts.

The team's hard work culminates in July at the FS event, which has been held at the famous Silverstone Racing Circuit since 2007. It's here that the teams demonstrate to the judges in a series of events, that their car is fit for purpose, as well as presenting a business plan that sells their concept to potential investors.

LOW CARBON
Further to the main category (Class 1), a low carbon category (Class 1A) was launched in 2008 to raise awareness of the importance of alternative fuels and green technology. They compete in the same dynamic events as the petrol powered vehicles, except more emphasis is placed on the amount of carbon emissions produced and they are also required to calculate the CO_2 and energy that are used during the manufacture of the car in the Sustainability event.

To read more about the low carbon Class 1A, see page 9.

Class 1 Scoring

Acceleration	75	Fuel economy	100
Skid Pad	50	Design	150
Sprint	150	Cost & Manufacturing	100
Endurance	300	Business Presentation	75

SCHEDULE.

Wednesday 14 July	**Set-Up Day**	
14.00	Site Opens (for teams to set up their pits only)	IMechE Marquee
17.00 - 19.00	Class 1(A) & Class 2 Team Registration	
Thursday 15 July	**Scrutineering & Classes 1(A) & 2 Judging**	
09.00 – 18.00	Registration: All Teams	IMechE Marquee
09.00 – 16.30	Class 1(A) Design Judging	Garage 1
09.00 – 15.30	Class 1(A) Presentation Judging	Brooklands Suites
09.00 – 18.00	Class 1(A) Sustainability Judging	Parc Ferme
09.00 – 17.30	Class 2 Design, Cost & Presentation Judging	Student Marquee
09.00 – 18.00	Class 1 & 1(A) Technical & Safety Scrutineering	Scrutineering Bay
13.00 – 13.45	Opening Ceremony (All Team Members & Faculty Advisors must attend)	Student Marquee
14.00 – 18.00	Shell Fuel Open	Support Paddock
14.00 – 18.00	Tilt Table Open	Support Paddock
14.00 – 18.00	Noise Test	Copse Runway
14.30 – 18.00	Brake & Practice Area Open	Copse Runway
Friday 16 July	**Class 1 Judging Day**	
08.30 – 20.15	Class 1 Presentation Judging	Brooklands Suites
08.45 – 20.00	Class 1 Design Judging	Garage 1
08.45 – 20.00	Class 1 Cost Judging	Parc Ferme
08.30 – 18.00	Class 1 & 1(A) Technical & Safety Scrutineering	Scrutineering Bay
08.00 – 18.00	Shell Fuel Open	Support Paddock
08.30 – 18.00	Tilt Table Open	Support Paddock
08.30 – 18.00	Noise Test & Brake Tests Open	Copse Runway
09.00 – 17.30	Practice Area Open	Copse Runway
18.30 – 20.30	Faculty Advisor Reception	BRDC Clubhouse
Saturday 17 July	**First Dynamics Day**	
07.55 – 08.20	Driver Briefing, including walk of Sprint course (All Drivers & Team Leaders must attend)	BRDC Grandstand
08.00 – 17.30	Shell Fuel Open	Support Paddock
08.30 – 17.30	Practice Area Open	Copse Runway
08.30 – 17.30	Class 1 & 1(A) Technical & Safety Scrutineering	Scrutineering Bay
08.30 – 12.30	Tilt Table Open	Support Paddock
08.30 – 12.30	Noise Test & Brake Tests Open	Copse Runway
08.45 – 12.15	Acceleration Event	Start Line Straight
08.45 – 12.15	Skid Pad Event	Copse Runway
10.00 – 16.00	Corporate Hospitality “Paddock Club”	BRDC Clubhouse
13.00 – 17.30	Sprint Dynamic Event	Stadium Complex
18.00	All Team Photograph	Grand Prix Start Line
18.15 – 19.15	Design Final	Student Marquee
19.30 – 20.15	Presentation Demo (Winner of each class)	Student Marquee
20.15 – 20.45	Awards Ceremony (Part 1)	Student Marquee
Sunday 18 July	**Endurance Event Day**	
07.45 – 08.20	Driver Briefing, including walk of Endurance course (All Drivers & Team Leaders must attend)	BRDC Grandstand
08.00 – 17.00	Shell Fuel Open	National Straight
09.00 – 15.00	Practice Area Open	Copse Runway
09.00 – 17.00	Endurance Event	Stadium Complex
18.00 – 18.45	Judging De-briefs	Student Marquee
18.45 - 19.45	Student BBQ	Garage 1
19.45 – 20.30	Awards Ceremony (Part 2)	Student Marquee

Scrutineering will be available on Sunday by request only (at IMechE Marquee Information Point)

EVENTS EXPLAINED.

TESTING TIMES
As Formula Student aims to develop well rounded engineers, each team is assessed not only on their car's performance and their understanding of the engineering behind their design, but on their overall business proposal. This is done in a series of static and dynamic events.

STATIC EVENTS
Design 150 points
Students must be able to explain how their car's materials, components, and systems come together and how their design meets the needs of the intended market.

Cost 100 points
Here teams provide an accurate estimate of the cost of their car in a limited production. They should be able to show to the judges where they've spent the money and added value.

Presentation 75 points
In this event, the judges play the role of the potential investors. Each team has to present a business case that sells their concept to them.

DYNAMIC EVENTS
Before being allowed out on to the track to compete in any of the dynamic events, the teams must first pass technical and safety scrutineering, as well as the tilt test and brake and noise tests.

There are five dynamic events, all designed to test different aspects of the car's performance: an important part of any team's business case.

Acceleration 75 points
This event focuses on the car's engine performance and drivability and on the suspension's ability to provide maximum tyre grip. Each car's acceleration is measured as the total time it takes to travel down Silverstone's pit straight from a standing start.

Skid pad 50 points
In motorsport straight line speed isn't everything so the skid pad lets teams show how well their car goes round corners. Cars need to have good lateral grip to complete a figure of eight in the quickest possible time.

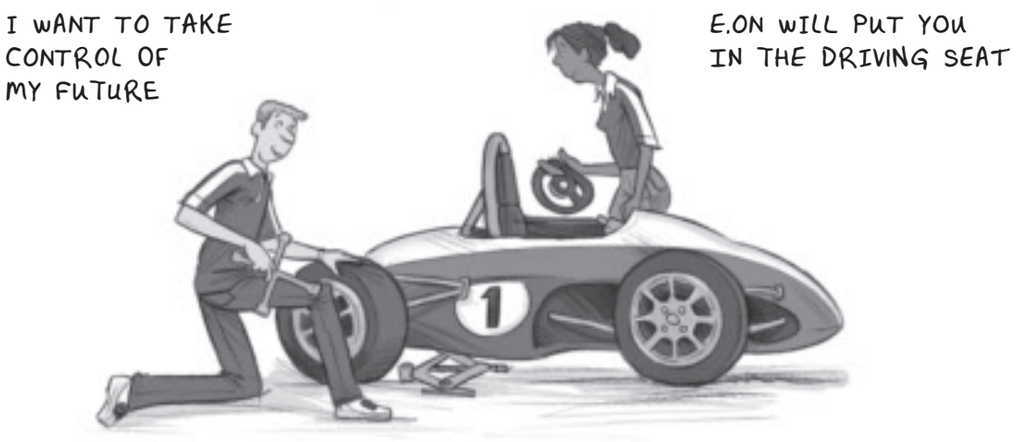
Sprint 150 points
This tests the car's manoeuvrability and handling qualities on a tight 800m course. To do well, cars have to be quick as well as nimble around the corners.

Endurance 300 points
The biggest test of the teams is the 22km endurance race where cars have to prove their durability. There is also a mandatory stop, driver change and hot restart that really tests reliability and the team's ability to efficiently make changes to pedal positions, seats etc.

Fuel economy 100 points
Efficient design is about more than the way the car looks. Customers will expect their car to be as green and fuel efficient as possible. To avoid penalties cars must achieve a corrected mileage of 26 litres per 100km during the endurance trial.

See page 62 for Class 1A scoring.

On getting ahead



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We're always looking for new ways to inspire the next generation of engineers, as like you, we're thinking about the future. Today we're putting millions of pounds into the new technologies to help us generate lower carbon energy. And we're using our size and resources to tackle some of the world's greatest energy challenges head on. Bring your big ideas to us and you could be part of it.

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FS GRADUATE CASE STUDY.

ANDREW DEAKIN
HEAD OF TRANSMISSION DYNO GROUP, RENAULT F1 TEAM
HEAD OF TECHNICAL RULES & SCRUTINEERING, FORMULA STUDENT

- Formula Student Competitor (1995-1998)
- Leeds University, Research Engineer (1995)
- Leeds University, PhD in Vehicle Dynamics and Active Suspension (1995-2000)
- Faculty Advisor, Leeds University FS Team (1999-2003)
- Renault F1 Team, Transmission Dyno & Virtual Car Engineer (2003)
- Renault F1 Team, Head of Transmission Dyno Group (2005)

Students are often attracted to Formula Student (FS) due to the excitement of being involved in a project linked to motorsport, however the benefits of participation go far beyond fulfilling a dream and relate to real experience of project management and design, development and testing of a real engineering product. These activities are equivalent to what any engineering company does on a day to day basis; hence as a potential employer, I actively seek FS graduates.

Many of my fellow Leeds team members are now successful engineers in lots of exciting areas, not only in F1, but in automotive and aerospace companies around the world. The technology embedded in the Class1A cars will continue to open up new opportunities to FS graduates.

I continue to give my support because I recognise the benefits that it gives to the participants and I appreciate the novel approaches that they demonstrate with new technologies. It is great to see the joy of teams that finish the Endurance event, but it is equally satisfying to know that all the participants will have gained immensely from their experience and challenges that competing in Formula Student provides.

"Formula Student is full-on, but I suspect that's why senior figures from industry are taking notice and attending the event in greater numbers than ever before"

FORMULA STUDENT WINNERS 1998-2009

1998		**University of Texas at Arlington, USA**
1999		**Rochester Institute of Technology, USA**
2000		**California State University – Pomona, USA**
2001		**Georgia Institute of Technology, USA**
2002		**Georgia Institute of Technology, USA**
2003		**University of Toronto, Canada**
2004		**RMIT University, Australia**
2005		**University of Toronto, Canada**
2006		**University of Toronto, Canada**
2007		**RMIT University, Australia**
2008		**University of Stuttgart, Germany**
2009	1st	**University of Stuttgart, Germany**
	2nd	**Delft University of Technology, The Netherlands**
	3rd	**ETH Zürich, Switzerland**
	4th	**University of Bath, United Kingdom**
	5th	**Helsinki Metropolia UAS, Finland**

CLASS 1A.

When Formula Student launched a low carbon category for the 2008 event the alternative fuel or 'low carbon' class was seen as something of a novelty. It worked well in its initial target of raising awareness of the importance of alternative fuels and technologies. Class 1A teams are judged on design and their business presentation, similar to the main FS category, however they are judged on Sustainability instead of Cost (which requires the teams to calculate the CO_2 and energy used during manufacture of the car). They also compete in the same dynamic events – Acceleration, Skid pad, Sprint and Endurance - as the petrol powered vehicles, except more emphasis is placed on the amount of carbon emissions produced.

Jon Hilton, FS Chairman, said: "The development of low carbon technologies and alternative fuels in a motorsport environment like [FS] is extremely fast and everything can be directly transferred to road vehicles. It will be up to this next generation of engineers to solve problems surrounding vehicle emissions and alternative energy, and this competition gives them the essential, practical skills they need to achieve this. We have deliberately put few restrictions in the rules and these students are pushing the boundaries with some very exciting, revolutionary technology coming through."

Last year quite how far those boundaries had been pushed became clear when the largely overlooked electric car from the University of Hertfordshire, dubbed the UH12A, showed its brilliance during the soaking wet endurance event. Not only did the UH12A beat its class rivals it also beat off all but five of the gasoline fuelled cars in class 1.

The cars simple design concept was to mate the same tubular steel chassis used on the teams conventional class 1 entry to a fully electric power train. But electric cars are not really green are they? After all batteries are difficult things to manufacture and they are near impossible to dispose of right? Well according to Team Leader James Major that is not the case, "the chemistry of these cells is that there is only a trace element of lithium in each cell, the majority of the cell make up is just copper and aluminium. They will do at least 3,000 cycles and they are highly recyclable."

With 240 of these LiFeBatt Lithium-Iron phosphate cells supplying energy to the 144 Volt power train consisting of twin permanent magnet direct current motors the UH12A proved a potent package.

The controls are incredibly Spartan, just an on off switch and a starter button, and what looks like a fire extinguisher pull, but I'm informed is just the off switch. There is no gearshift or clutch, the steering wheel is just an off the shelf unit. With no knobs or fairly lights to speak of, no dials either. The footwell is just as basic - just a 'throttle' and a brake. When journalists drove it after the event they were all stunned by just how easy it was to drive.

The University will be back at this years event with the successor to UH12A - UH13A, which has formed an integral part of the students final year projects. All of the team are hoping for a repeat performance but this year the Class 1A cars are expected to be better than ever.

There will be five other electric vehicles vying for the crown, in addition to other cars using low carbon technologies.

For the first time this year, all Class 1A cars will be fitted with an electric box to measure the current and voltage passing between the battery and the drive motor. This will determine the electrical consumption of the vehicles during the Endurance event and also act as a data-logger to capture information.

by Sam Collins, Racecar Engineering

Class 1A scoring can be found on page 62

Mercedes-Benz HighPerformanceEngines Ltd. are proud to partner Formula Student 2010.

Mercedes-Benz HighPerformanceEngines Ltd. is a Daimler AG company whose principal activities are the design, manufacture and testing of Formula 1 racing engines for the MERCEDES GP PETRONAS team. We are also proud to supply engines to Vodafone McLaren Mercedes and Force India F1 teams.

Mercedes-Benz HighPerformanceEngines is dedicated to developing young engineers through our graduate scheme and placement student programme. Applications for 2011/2012 opportunities open in September. For an application form, visit www.mercedes-benz-hpe.com or email students@mercedes-benz-hpe.com

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AWARDS.

SPONSOR	AWARD
Formula Student	**Class 1 Overall Winner**
Formula Student	**Class 1 Runner Up**
Formula Student	**Class 1 Third Place**
Cenex	**Class 1A Overall Winner**
Institution of Mechanical Engineers	**Class 1A Runner Up**
The MathWorks	**Class 2 Overall Winner**
Institution of Mechanical Engineers	**Class 2 Runner Up**
Autodesk	**Class 1 Design Winner**
Institution of Mechanical Engineers	**Class 1 Design Runner-Up**
Autodesk	**Class 1A Design Winner**
The MathWorks	**Class 2 Design Winner**
Institution of Mechanical Engineers	**Best Class 1 Cost Analysis**
Institution of Mechanical Engineers	**Class 1A Sustainability Winner**
Institution of Mechanical Engineers	**Best Class 1 Presentation**
Institution of Mechanical Engineers	**Best Class 1A Presentation**
Institution of Mechanical Engineers	**Acceleration Winner**
Institution of Mechanical Engineers	**Skid Pad Winner**
Institution of Mechanical Engineers	**Sprint Winner**
Institution of Mechanical Engineers	**Class 1A Endurance Winner**
Institution of Mechanical Engineers	**Class 1 Endurance Winner**
SAE International	**Overall Class 1 Dynamics Events**
Institution of Mechanical Engineers	**Top Individual Driver**
Shell	**Most Fuel Efficient Car in Class 1**
Cenex	**Lowest Carbon Production Car in Class 1A**
Allan Staniforth Award	**Best Newcomer in Class 1**
FISITA	**Engineering Excellence Award**
Airbus in the UK	**Lightweight Vehicle Award**
Airbus in the UK	**Teamwork Award**
E.ON UK	**Safety Award (for best crash avoidance or impact mitigation system)**
E.ON UK	**Innovation Award (for propulsion system or environmental impact)**
Mercedes-Benz HighPerformanceEngines	**Class 1 Best Powertrain Installation**
Mercedes-Benz HighPerformanceEngines	**Class 1A Powertrain Innovation Award**
National Instruments	**Best Use of Data Acquisition in Development of the Car**
National Instruments	**Most Innovative Use of an Embedded System in the Car**

PARTNER INFO.

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Formula Student competitors can become a part of this innovative team through the Airbus Direct Entry Graduate Scheme, which offers work experience, on-the-job development and high-calibre training programmes.

cenex

Cenex is extremely pleased to continue its partnership with Formula Student Class 1A in 2010.

As the UK Centre of excellence in low carbon and fuel cell technologies, Cenex is keen that young engineers appreciate the relevance of Class 1A and the importance of these technologies to the future of the UK low carbon automotive sector. We are also keen to demonstrate that, despite the recent economic recession, the UK continues to provide exciting prospects for automotive engineers of all ages particularly in the areas of low carbon automotive design, research and development.

We look forward to seeing you all at the Cenex stand at Silverstone in July.

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As a world leader in 2D and 3D design and engineering software, Autodesk delivers the broadest product portfolio, helping over 10 million customers, including every member of the Fortune 100, to continually innovate through the digital design, visualization, and simulation of real-world project performance.

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By enhancing collaboration and communication and digitally improving the real-world performance of projects before they are built, Autodesk customers are solving their business challenges, avoiding costly rework, accelerating project cycles and time to market, and ultimately gaining competitive advantage.

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A Formula Student Partner for more than a decade, National Instruments transforms the way engineers and scientists around the world design, prototype and deploy systems for test, control and embedded design applications. Using NI LabVIEW open graphical programming software and modular measurement and control hardware, customers at more than 30,000 companies annually simplify development, increase productivity and dramatically reduce time-to-market.

From testing next-generation gaming systems, to controlling industrial machines, to creating breakthrough medical devices, NI customers continuously develop innovative technologies that impact millions of people.

NI is also committed to enhancing STEM (science, technology, engineering and maths) education by helping integrate theoretical concepts with real-world applications.

Find out more about NI tools, career opportunities at NI and FS2010 prizes at ni.com/uk/formulastudent

Participating in Formula Student - you'll know all about problem solving, persistence and creative thinking. These are some of the values at Shell's core.

Operating at the heart of the energy challenge, Shell relies on positive, anti-complacent graduates who can think laterally to solve difficult problems. We currently have vacancies for around 250 graduates across Europe within the following areas: Research & Technology, Production & Manufacturing, Well Engineering and Earth Sciences - as well as many commercial roles.

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At E.ON we're committed to the future of energy. Whether it's generating electricity for millions of homes, distributing power through a network of 133,000km of overhead lines and underground cables, or working in partnership with universities to develop the low carbon technologies of the future, engineering at E.ON cannot fail to interest and challenge the most talented individuals.

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Mercedes-Benz HighPerformanceEngines is a wholly owned subsidiary of Daimler AG, whose principle activities are the design and manufacture of engines and hybrid drive systems for Formula 1 applications. We are passionate about winning and our successes are a product of world leading Engineering. Based in Brixworth, Northamptonshire, we are proud to be the powerplant supplier for the Mercedes Grand Prix, Vodafone McLaren Mercedes, and Force India Teams.

Mercedes-Benz HighPerformanceEngines is proud to support Formula Student as we consider it to be the foremost platform for students to stretch their engineering technical skills, as well as to develop business acumen in a competitive environment. The skills developed are thus an excellent match to those required by Mercedes-Benz HighPerformanceEngines.

MathWorks is proud to sponsor the Formula Student 2010 student competition and wishes all of the competitors the best of luck with their project work. MathWorks is the leading developer of mathematical computing software. MATLAB, the language of technical computing, is a programming environment for algorithm development, data analysis, visualization, and numeric computation. Simulink is a graphical environment for simulation and Model-Based Design of multidomain dynamic and embedded systems. Engineers and scientists worldwide rely on these product families to accelerate the pace of discovery, innovation, and development in automotive, aerospace, electronics, financial services, biotech-pharmaceutical, and other industries. MathWorks products are also fundamental teaching and research tools in the world's universities and learning institutions.

To learn more about The MathWorks and our products, visit us at www.mathworks.com/academia.

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Formula Student wouldn't be possible without the support and dedication of the following volunteers:

Jon Hilton – Formula Student Chairman
Richard Folkson – Chief Judge

Scrutineers, Event Captains and Dynamics

Ayotunde Adebanjo
Chris Baker
Vikki Benn
Jonathon Blackburn
Neil Carr-Jones
Alastair Clarke
Adam Covell
Steve Cox
Andrew Crome
Dyfyr Davies
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Geoffrey Willis
Gary Woods

Presentation Judges

Ayotunde Adebanjo
Murat Ali
William Ashford
James Barry
Peter Bell
Ian Bell
Mark Bridgeman
Elliot Brinkworth
John Butler
Colette Carroll
Naveed Choudry
Vincent Considine
Jen Corbett
Paul Crofts
Russell Crow
Chris Darwood
Paul Feetenby
Alan Fitzgerald
Klementina Gerova
Mark Hassall
Mike Hayward
Adrian Holland
Matt Jones
Puja Kapoor
James Miller
Dario Minutella
Javier Pérez de Arrilucea
Craig Powers
Michael Rahilly
Adam Reid
James Russell
Umer Saleem
Colin Smith
Jonothan Spencer
Clive Temple
Brian Walker
Ian Wallbridge
Tony Weston
Simon White

Cost Judges

Charlotte Ahern
Graham Bailey
Thomas Borlon
Mike Bottley
Tony Buttifant
Alan Caddy
Darren Cashman
Julie Cheung
John Connolly
Neil Cooper
Marvin Epton
Richard Hale
Jon Isherwood
Harinarayanan Jayaraman
Gareth Jones
Frank Marsh
Pavan Mukkamala
Michael Odenwald
David Paramo
Chris Peain
Mark Ramsden
Kamai Shamnani
Jonathon Speak
Robin Stephenson
Ritchie Walsh
Terry Wilson
John Xinos Dangerfield

Class 1A Judges

Andy Burston
Ralph Clague
Bill Ewin
Sergi Fernandez
Marc Fry
Terry Griggs
Morris Lockwood
James Marco
Ruaraudh McDonald-Walker
Nathan Morrison
Ian Murphy
Martin Ogilvie
Keith Ramsay
Stuart Rowell
Gerard Sauer
Chris Walsh
Alistair Wardrope
Charles Wright

Good luck to all **FS2010** teams

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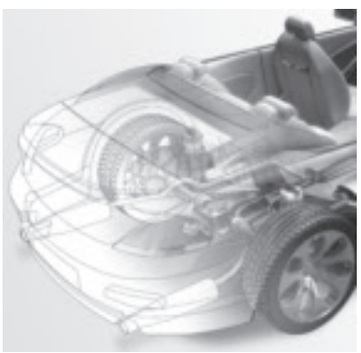





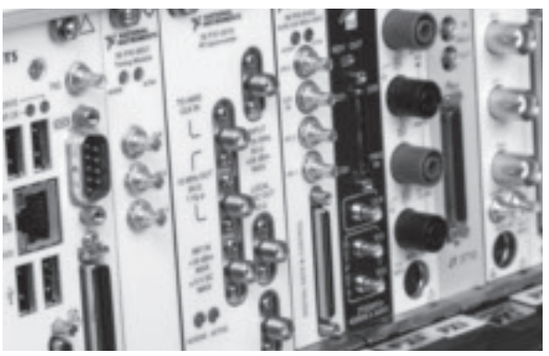




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NATIONAL INSTRUMENTS

TEAM LISTINGS.

UNIVERSITY	TOWN	COUNTRY	CLASS	CAR	PAGE
Aalborg University	**Aalborg**	Denmark	Class 1	18	19
University of Aberdeen	**Aberdeen**	UK	Class 1	71	19
UAS Amberg-Weiden	**Amberg**	Germany	Class 1	23	20
University of Bath	**Bath**	UK	Class 1	4	20
Queen's University Belfast	**Belfast**	UK	Class 1	47	21
University of Ulster	**Belfast**	UK	Class 1	135	21
University of the Basque Country	**Bilbao**	Spain	Class 1	36	22
Aston University	**Birmingham**	UK	Class 1	110	22
University of Birmingam	**Birmingham**	UK	Class 1	61	23
Birmingham City University	**Birmingham**	UK	Class 1	100	23
ISAT	**Bourgogne**	France	Class 1	158	24
Transilvania University of Brasov	**Brasov**	Romania	Class 1	111	24
Slovak University of Technology	**Bratislavia**	Slovakia	Class 1	89	25
University of Sussex	**Brighton**	UK	Class 1	16	25
Budapest University of Technology and Economics	**Budapest**	Hungary	Class 1	14	26
Università di Cagliari	**Cagliari**	Italy	Class 1	125	26
Helwan University	**Cairo**	Egypt	Class 1	73	27
University of Cambridge	**Cambridge**	UK	Class 1	82	27
Cardiff University	**Cardiff**	UK	Class 1	13	28
Universidad Politecnica de Cartagena	**Cartagena**	Spain	Class 1	190	28
UAS Cologne	**Cologne**	Germany	Class 1	60	29
University of Warwick	**Coventry**	UK	Class 1	50	29
Delft University of Technology	**Delft**	The Netherlands	Class 1	2	30
Delhi Technological University	**Delhi**	India	Class 1	51	30
UAS Dortmund	**Dortmund**	Germany	Class 1	27	31
University of Dundee	**Dundee**	UK	Class 1	177	31
Heriot Watt University	**Edinburgh**	UK	Class 1	67	32
University of Erlangen-Nuremberg	**Erlangen**	Germany	Class 1	74	32
Università di Firenze	**Firenze**	Italy	Class 1	28	33
University of Strathclyde	**Glasgow**	Scotland	Class 1	15	33
Chalmers University of Technology	**Gothenburg**	Sweden	Class 1	29	34
Graz University of Technology	**Graz**	Austria	Class 1	53	34
UAS Graz	**Graz**	Austria	Class 1	96	35
University of Surrey	**Guildford**	UK	Class 1	93	35
Tecnun University of Navarra	**Guipuzcoa**	Spain	Class 1	19	36
UAS Hamburg	**Hamburg**	Germany	Class 1	69	36
Leibniz Universität Hannover	**Hannover**	Germany	Class 1	26	37
University of Hertfordshire	**Hatfield**	UK	Class 1	64	37
Helsinki Metropolia UAS	**Helsinki**	Finland	Class 1	5	38
University of Huddersfield	**Huddersfield**	UK	Class 1	12	38
Istanbul Technical University	**Istanbul**	Turkey	Class 1	34	39
Karlsruhe Institute of Technology	**Karlsruhe**	Germany	Class 1	9	39
Karlstad University	**Karlstad**	Sweden	Class 1	54	40
Indian Institute of Technology Kharagpur	**Kharagpur**	India	Class 1	188	40
UAS Kiel	**Kiel**	Germany	Class 1	52	41
Queen's University	**Kingston**	Canada	Class 1	38	41
Lancaster University	**Lancaster**	UK	Class 1	11	42
Tuscia University	**Lazio**	Italy	Class 1	80	42
University of Liverpool	**Liverpool**	UK	Class 1	108	43
Liverpool John Moores University	**Liverpool**	UK	Class 1	22	43
University College London	**London**	UK	Class 1	33	44
Loughborough University	**Loughborough**	UK	Class 1	20	44
Universidad Europea de Madrid	**Madrid**	Spain	Class 1	83	45
Universidad Politécnica de Madrid	**Madrid**	Spain	Class 1	58	45
University of Manchester	**Manchester**	UK	Class 1	17	46
Manchester Metropolitan University	**Manchester**	UK	Class 1	161	46
Monash University	**Melbourne**	Australia	Class 1	66	47
Ecole Nationale d'Ingénieurs de Metz	**Metz**	France	Class 1	57	47
Politecnico di Milano	**Milan**	Italy	Class 1	90	48
UAS Mittweida	**Mittweida**	Germany	Class 1	32	48

UNIVERSITY	TOWN	COUNTRY	CLASS	CAR	PAGE
University of Modena & Reggio Emilia	**Modena**	Italy	Class 1	37	49
TU Munich	**Munich**	Germany	Class 1	31	49
University of Nottingham	**Nottingham**	UK	Class 1	75	50
University of Southern Denmark	**Odense**	Denmark	Class 1	124	50
Oxford Brookes University	**Oxford**	UK	Class 1	92	51
Università di Padova	**Padova**	Italy	Class 1	85	51
Thapar University	**Patiala**	India	Class 1	99	52
University of Patras	**Patras**	Greece	Class 1	86	52
University of Central Lancashire	**Preston**	UK	Class 1	123	53
DHBW Ravensburg	**Ravensburg**	Germany	Class 1	25	54
UAS Regensburg	**Regensburg**	Germany	Class 1	62	54
University of Rijeka	**Rijeka**	Croatia	Class 1	55	55
University of Sheffield	**Sheffield**	UK	Class 1	46	55
University of Stuttgart	**Stuttgart**	Germany	Class 1	1	56
University of Sunderland	**Sunderland**	UK	Class 1	107	56
Swansea Metropolitan University	**Swansea**	UK	Class 1	10	57
Tallinn University of Applied Sciences	**Tallinn**	Estonia	Class 1	44	57
Aristotle University of Thessaloniki	**Thessaloniki**	Greece	Class 1	77	58
Politecnico di Torino	**Torino**	Italy	Class 1	152	58
Ryerson University	**Toronto**	Canada	Class 1	21	59
Brunel University	**Uxbridge**	UK	Class 1	6	59
Université de Versailles-Saint-Quentin-en-Yvelines	**Versailles**	France	Class 1	78	60
Warsaw University of Technology	**Warsaw**	Poland	Class 1	84	60
Wroclaw University of Technology	**Wroclaw**	Poland	Class 1	24	61
UAS Zwickau	**Zwickau**	Germany	Class 1	7	61
ETSEIAT (Universitat Politècnica de Catalunya)	**Catalunya**	Spain	Class 1A	508	63
Eindhoven University of Technology	**Eindhoven**	The Netherlands	Class 1A	540	63
Graz University of Technology	**Graz**	Austria	Class 1A	553	64
University of Hertfordshire	**Hatfield**	UK	Class 1A	513	64
City University London	**London**	UK	Class 1A	525	66
Lund University	**Lund**	Sweden	Class 1A	500	66
University of Nottingham	**Nottingham**	UK	Class 1A	575	67
Oxford Brookes University	**Oxford**	UK	Class 1A	592	67
University of Central Lancashire	**Preston**	UK	Class 1A	567	68
ETH Zürich	**Zürich**	Switzerland	Class 1A	515	68
UAS Zwickau	**Zwickau**	Germany	Class 1A	507	69
UAS Lessius, Campus De Nayer	**Antwerp**	Belgium	Class 2	–	70
Universidade de Aveiro	**Aveiro**	Portugal	Class 2	–	70
University of Bath	**Bath**	UK	Class 2	–	70
University of the Basque Country UPV/EHU	**Bilbao**	Spain	Class 2	–	70
University of the West of England	**Bristol**	UK	Class 2	–	71
University of Warwick	**Coventry**	UK	Class 2	–	71
Cranfield University	**Cranfield**	UK	Class 2	–	71
Dublin Institute of Technology	**Dublin**	Ireland	Class 2	–	71
University of Hertfordshire	**Hatfield**	UK	Class 2	–	72
Kingston University	**Kingston**	UK	Class 2	–	72
Instituto Superior Técnico	**Lisbon**	Portugal	Class 2	–	72
Imperial College London	**London**	UK	Class 2	–	72
Imperial College London	**London**	UK	Class 2	–	73
Queen Mary, University of London	**London**	UK	Class 2	–	73
Newcastle University	**Newcastle**	UK	Class 2	–	73
University of Patras	**Patras**	Greece	Class 2	–	73
University of Portsmouth	**Portsmouth**	UK	Class 2	–	74
Polytechnic Institute of Setubal	**Setubal**	Portugal	Class 2	–	74
Swansea University	**Swansea**	UK	Class 2	–	74
Alexander Technological Educational Institute of Thessaloniki	**Thessaloniki**	Greece	Class 2	–	74
Brunel University	**Uxbridge**	UK	Class 2	–	75
Glyndwr University	**Wrexham**	UK	Class 2	–	75
Wroclaw University of Technology	**Wroclaw**	Poland	Class 2	–	75

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CLASS 1

UNIVERSITY OF AALBORG
AALBORG, DENMARK

18

Unicorn Race Engineering comes from Aalborg University.

The team consists of members from a variety of studies, and ranges from early bachelor to master students.

Members of the team are motivated by the chance to put their academic theory to the test on the track. The philosophy of the team is to always get the most of the members skills and time, keep an open mind towards new ideas and have a productive and fun environment to work in.

Building G4 was only made possible by the team members dedicating spare time to the project. The work was carried out with a flat structure giving a substantial natural diffusion of knowledge. New members to the team are this way gradually introduced to the aspects of race engineering, ensuring that Unicorn retains the knowledge and skills obtained from now building 4 race cars.

The main objective of G4 has been to reduce weight, mostly by implementing the use of composite materials, and to continue improving the parts that have shown to cause problems in the past. Altogether this has resulted in a well balanced car, founded on solid experience and with small and big improvements in every single corner.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase 2770mm/1365mm/1085mm/1600mm

Track (front/rear) 1205mm/1150mm

Weight including 68kg driver (front/rear) 123kg/170kg

Suspension (front/rear) Double unequal length A-Arm. Pull rod/Pull rod, horizontally oriented spring and damper, torsion ARB F&R

Tyres (front/rear) 6.2/7.2-20.0-13 A45 Avon

Wheels (front/rear) 6.5x13, 40mm offset, 3 pc Al-Mg / 7.0x13, 32mm offset, 3 pc Al-Mg

Brakes (front/rear) Low carbon steel, Ø224-Ø150/Ø230-176 x 4mm, vented, 2 piston 1280mm3/700mm^3.

Chassis construction Hybrid chassis with CFRP monocoque front and steel tubular spaceframe from roll hoop and back

Engine 2006/Honda CBR600RR Rotrex C15-60 supercharged

Bore/stroke/cylinders/cc 67.0mm/42.5mm/4 cylinder/ 599cc

Fuel 99 Ron

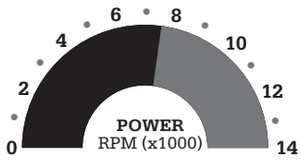
Fuel system Honda multi point fuel injection, intergrated pump with pressure regulator

Max power/max torque 8,500rpm/7,600rpm

Transmission Single 520 chain

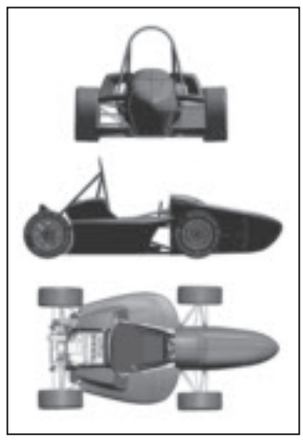
Differential Torsen traction limited slip

Final Drive 3:1



WEIGHT DISTRIBUTION

REAR FRONT



CLASS 1

UNIVERSITY OF ABERDEEN
ABERDEEN, UNITED KINGDOM

71

Last year's entry was the first car ever fabricated by TAU Racing and its first participation in the Formula Student competition. Our main design consideration was to produce a robust car that would complete all events reliably. Not only did we achieve this but competed in all dynamic events, coming 24th overall, 6th in the endurance event and 1st in fuel economy. All members of the team were extremely happy with these results in addition to 'Best Teamwork', 'Most Fuel Efficient Car' and 'Best Newcomers' awards as a first effort.

The 2010 car will refine the basic design that proved so successful last year while still being able to reliably compete in all dynamic events by removing weight and adding more power. We are aiming for a 15% total weight decrease while adding 50% more power which will enable us to be even more competitive. Working with Airbus, we have managed huge weight savings on components through optimisation and advanced manufacturing techniques.

As always, we are extremely grateful to have the support of our sponsors especially in this time of limited funds.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase 2600mm/1480mm/1240mm/1630mm

Track (front/rear) 1220mm/1100mm

Weight including 68kg driver (front/rear) 140kg/148kg

Suspension (front/rear) Double unequal length A-Arm. Push rod actuated vertically oriented spring and damper.

Tyres (front/rear) 6.2/20.0-13 / 7.2/20.0-13 A45 Avon

Wheels (front/rear) 6 x 13/7 x 13 3 piece aluminium

Brakes (front/rear) Floating, drilled hub mounted 200mm/ diff mounted 180mm

Chassis construction Mild steel space frame

Engine 2004 Husaberg FE-450e four stroke single

Bore/stroke/cylinders/cc 100mm/57.2mm/single/449cc

Fuel Keihin Multi Jet Carb

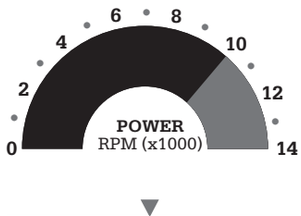
Fuel system Siemens VDO injectors, FRI Euro 4 ECU

Max power/max torque 30bhp@10,000rpm

Transmission 6 speed, 520 chain

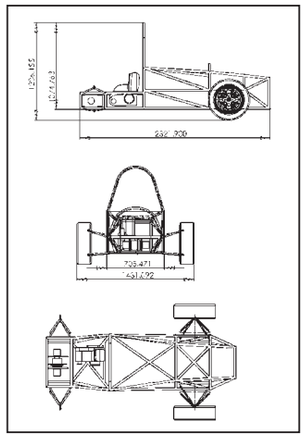
Differential Civic Type-R Hylical LSD

Final Drive 3.6:1



WEIGHT DISTRIBUTION

REAR FRONT

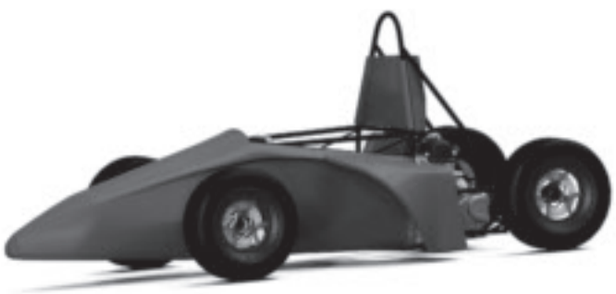


CLASS 1

UAS AMBERG-WEIDEN
AMBERG, GERMANY

23

The Running Snail Racing Team was established in August 2004. Since then we participated with sustained success at the Formula Student events in England, Germany and Italy. And we take the challenge in 2010 also. The RS10-LC4 is our 6th car, the result of the tests and competitions of our first five cars. Our goal was again to reduce the weight to 165 kg (wet), to keep our high quality standards, give the car a good drivability, and reach better ergonomics for the drivers. Beside the racetracks we are active as well. Our five race cars were shown in different exhibitions, company presentations, and the "Partner Cup". This is an event we originated in 2006 to thank our sponsors. They had the chance to drive one of our cars in a SAE level track and to feel what it means to be a race driver. More information about our team and our cars is available on www.running-snail.de



TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2585mm/1398mm/1135mm/1590mm

Track (front/rear) 1200mm/1200mm

Weight including 68kg driver
(front/rear) 109kg/122kg

Suspension (front/rear)
Double unequal length A-Arm. Pull rod actuated spring and damper adjustable in compression and rebound in high and low speed.

Tyres (front/rear) Hoosier 20.5x7x13

Wheels (front/rear) 7 inches wide, self made 2 pc Aluminium-Carbon fibre Rim

Brakes (front/rear) C/SiC, hub mounted, 220mm outer and 160mm inner diameter

Chassis construction
Steel tube space frame

Engine KTM LC4-690
(single cylinder)

Bore/stroke/cylinders/cc
102mm bore/74.6mm stroke/
1 cylinder/609,6 cc

Fuel 99 RON unleaded gasoline

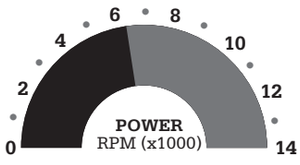
Fuel system Student designed and built, fuel injection, sequential

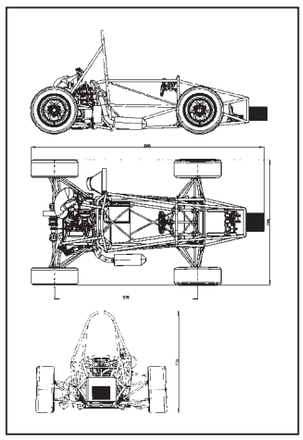
Max power/max torque
8,000rpm/6,200rpm

Transmission DID 520 chain

Differential Drexler limited slip differential

Final Drive 2.83 : 1





CLASS 1

UNIVERSITY OF BATH
BATH, UNITED KINGDOM

04

Team Bath Racing 2010, TBR10, is a team of 17 multinational, enthusiastic engineering students from the University of Bath, who have developed an all-new car for Class 1 for the Formula Student 2010 competition.

This year's car represents major developments in design compared with previous TBR cars, the main design drivers being minimising weight on a proven concept while improving the handling characteristics. One of the biggest changes has been the move from 10 to 13 inch tyres. In addition to this, lightness has been added by the extensive use of carbon composites in key areas of the car.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2700mm/1465mm/1177mm/1550mm

Track (front/rear) 1250mm/1200mm

Weight including 68kg driver
(front/rear) 131kg/142kg

Suspension (front/rear)
Double unequal length A-Arm. Push rod / Push rod actuated spring, damper and anti-roll bars

Tyres (front/rear) 521 x 178 - 330 R25B Hoosier/ 508 x 190.5-330 R25B Hoosier

Wheels (front/rear) 152.4mm wide, 3 pc CFRP Rim, Magnesium centre

Brakes (front/rear) Cast Iron, hub mounted, 202mm/180mm dia. Drilled

Chassis construction
One piece tubular steel spaceframe

Engine 2009 Honda CBR600RR four stroke in line four

Bore/stroke/cylinders/cc
67mm bore/42.5mm stroke/
4 cylinder/599 cc

Fuel 99 RON unleaded

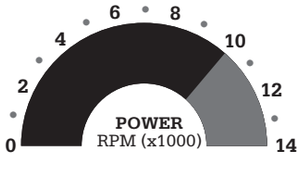
Fuel system Honda fuel injection

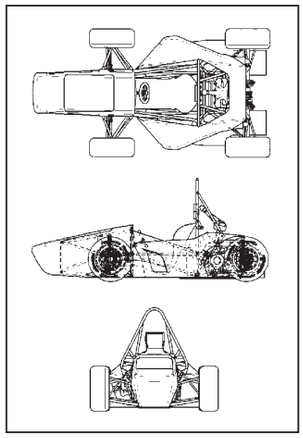
Max power/max torque
10,000rpm/9,000rpm

Transmission Single 520 chain

Differential Drexler limited slip differential

Final Drive 3.82:1





CLASS 1

QUEEN'S UNIVERSITY BELFAST
BELFAST, UNITED KINGDOM

47

Queen's Formula Racing consists of five Stage 4 MEng Mechanical and Manufacturing Engineering students who are responsible for car design and team management. Twelve Stage 3 students complete research projects for future car development and aid with car manufacture and testing. The design team is broken into four technical groups consisting of Chassis, Engine, Suspension & Unsprung Mass and Drivetrain/Ancillaries.

The team has a strong reputation for producing top quality racing cars, with past successes ranging from 'Rookie Design Award' to 2nd overall European team and Top UK team. The team was the winner of the National Instruments award for 'Best use of data acquisition' in 2009.

The QFX is the ninth car from Queen's University Belfast and builds on the first composite monocoque car in 2009 with an all new two-piece moulded composite front chassis. This provides improved chassis stiffness and reduced weight, as well as improved suspension design and packaging. Major engine work has been carried out in the form of the development of a dry sump system for the Yamaha R6 engine. Find out more at www.queens-racing.com

TECHNICAL SPECIFICATION

Length/width/height/wheelbase 2650mm/1400mm/ 1100mm/1667mm

Track (front/rear) 1220mm/1161mm

Weight including 68kg driver (front/rear) 134kg/166kg

Suspension (front/rear) Double unequal length A-arm. Push rod actuated horizontally oriented spring and damper.

Tyres (front/rear) 20 x 6-13 A45 Avon/20 x 7-13 A45 Avon

Wheels (front/rear) 6 inch wide/7 inch wide, 3pc Al Rim, 1.5 inch neg. offset

Brakes (front/rear) Stainless Steel, Hub Mounted, Drilled, 220mm dia./185mm dia.

Chassis construction Two-piece moulded Carbon Fibre front chassis, Rear Steel tubular spaceframe.

Engine 2005, Yamaha YZF-R6

Bore/stroke/cylinders/cc 65.5mm/44.5mm/4 cylinder/600cc

Fuel Shell V Power

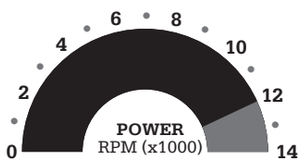
Fuel system Sequential fuel injection system using Motec ECU

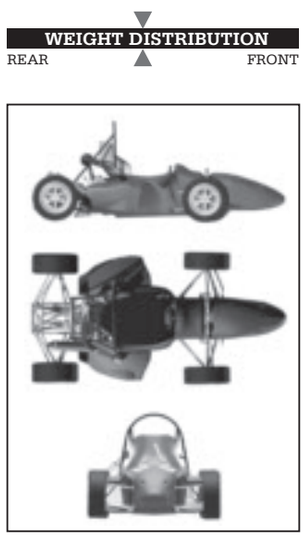
Max power/max torque 12,000rpm/9,000rpm

Transmission Single 520 Chain

Differential Quaife automatic torque baising differential

Final Drive 3.92:1



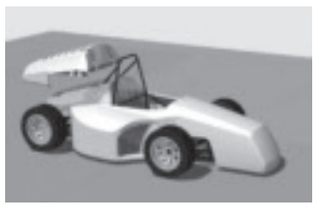


CLASS 1

UNIVERSITY OF ULSTER
BELFAST, UNITED KINGDOM

135

Ulster has competed at the UK Formula Student competition every year for the past 8 years and attended the Formula Student Germany and Italy events also. The team is made up of undergraduate students from a range of different courses within the Faculty of Engineering. Having this diversity of students brings together engineers with a number of useful skills that are of benefit to the team. The courses covered include Sports Engineering and Engineering Management as well as the more traditional Mechanical Engineering disciplines. The 2010 car has been built on knowledge gained from previous competitions and the new rules for the chassis design, resulting in a lighter, stiffer and safer chassis with an easy to adjust suspension system. Incorporated into the car's design is an electronic quick shift gear changing system which enables the driver to shift through the gears easier and faster. An optimised 2006 YZF Yamaha R6 was chosen as the power house for the car because it produces a high power output and usable torque throughout the rev range. An emphasis on teamwork during the design and manufacture of the car allowed decisions to be made and implemented quickly. A dedicated work ethic from all of the team members ensured that the high quality design was carried through to reality.



TECHNICAL SPECIFICATION

Length/width/height/wheelbase 2677mm/1422mm/1016mm/1600mm

Track (front/rear) 1200mm/1150mm

Weight including 68kg driver (front/rear) 127kg/170kg

Suspension (front/rear) Double unequal length A-Arm. Push Rod/ Pull Rod actuated horizontally oriented spring and damper

Tyres (front/rear) 508x182-330 A45 Avon

Wheels (front/rear) 202mm wide, 3pc Al Rim

Brakes (front/rear) Cast Iron, hub mounted, 220mm dia. Drilled

Chassis construction Tubular spaceframe

Engine 2006/Yamaha YZF-R6 four stroke in line four

Bore/stroke/cylinders/cc 65.5mm bore/44.5mm stroke/4 cylinder/599cc

Fuel 99 RON unleaded

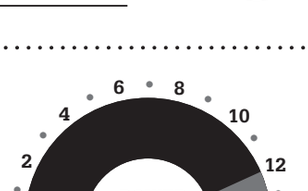
Fuel system Yamaha multipoint fuel injection

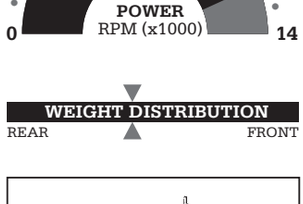
Max power/max torque 12,000rpm/8,000rpm

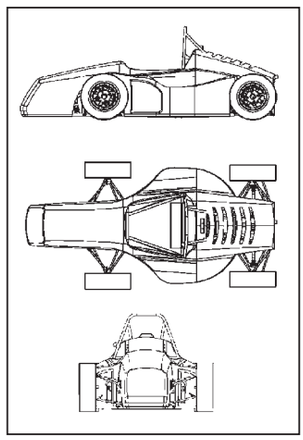
Transmission Single 520 chain.

Differential Quaife automatic torque biasing differential

Final Drive 4:1





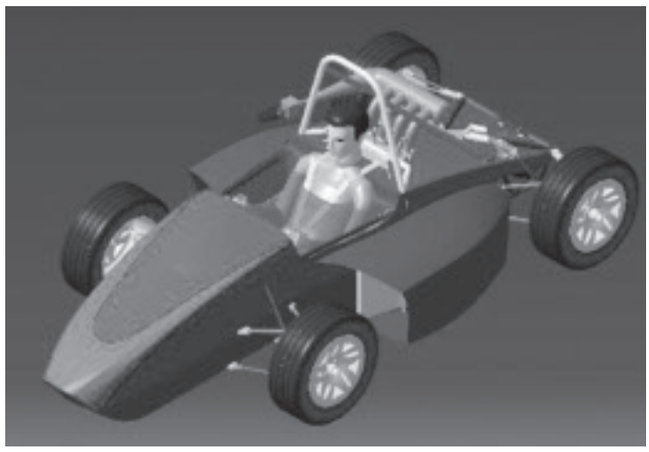


CLASS 1

UNIVERSITY OF THE BASQUE COUNTRY
BILBAO, SPAIN

36

Our team consists of twenty five engineering students. The Team Leader is a student of the last course, and 30% of the team is composed by rookie students, which helps to ensure a stable future. Our main objectives are design and manufacture of our race car, and their evaluation by professionals. Furthermore, we can mention the "healthy" competition, Formula Student in July at Silverstone. "Yes, we can: design it, manufacture it and do it". The vehicle is powered by a Suzuki GSXR 600 four-stroke inline four-cylinder. The suspension is characterised by the simplicity and ease of tuning of the vehicle.



TECHNICAL SPECIFICATION

Length/width/height/wheelbase 2,500mm/1,477mm/1,010mm/ 1,600mm

Track (front/rear) 1,250mm/1,200mm

Weight including 68kg driver (front/rear) 139.5kg/170.5kg

Suspension (front/rear) Double Unequal length A-Arms. Push rod actuated Öhlins TTX25 FSAE Dampers

Tyres (front/rear) 20.5"x 7"-13" R25B Hoosier

Wheels (front/rear) 13"x 7", 3 piece Aluminium Rim

Brakes (front/rear) Floating discs, laser cut steel, hub mounted, 230mm/220mm

Chassis construction One piece tubular spaceframe

Engine 2004-2005 / SUZUKI GSXR 600 four stroke in line four

Bore/stroke/cylinders/cc 67,0mm bore/42,5mm stroke/ 4 Cylinder/599 cc

Fuel Gasoline

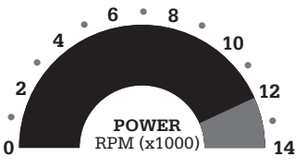
Fuel system Suzuki fuel injection

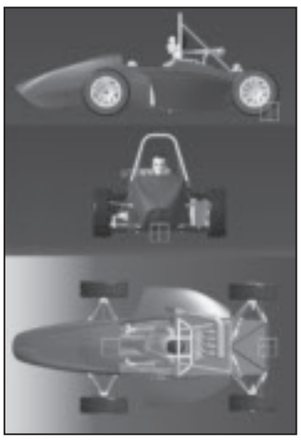
Max power/max torque 12,000rpm /10,000rpm

Transmission Single 520 chain

Differential Daewoo matiz differential

Final Drive 3.64:1





CLASS 1

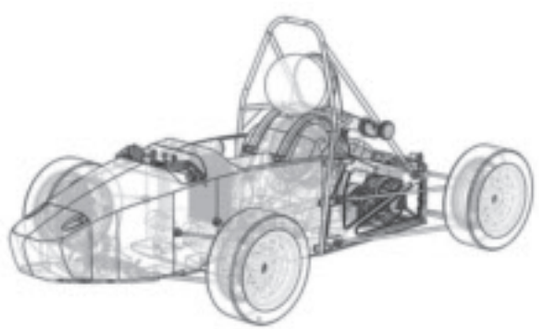
ASTON UNIVERSITY
BIRMINGHAM, UNITED KINGDOM

110

Aston University is currently undergoing its tenth year of competing in the UK Formula Student competition. The team is comprised of sixteen final-year undergraduate students and two postgraduate students from both engineering and design disciplines.

The 2010 car incorporates a two part chassis with a carbon fibre monocoque and an aluminium subframe at the rear. This has allowed accessibility to components and chassis stiffness to be optimised and has given a more diverse learning experience to team members.

The car utilises a CVT with a student designed and built epicyclic gearbox, which along with a pulley and belt drive produces the same reduction ratio as the 2009 car but with lower mass. Other highlights on the car include an SLA intake and throttle with an improved throttle design, carbon fibre suspension arms with revised construction, a self-contained Suretrac differential and hubs and uprights machined in-house.



TECHNICAL SPECIFICATION

Length/width/height/wheelbase 2370mm/1450mm/1125mm/1750mm

Track (front/rear) 1200mm/1200mm

Weight including 68kg driver (front/rear) 120.6kg/147.4kg

Suspension (front/rear) Double unequal A-Arm. Push rod driven horizontal oriented Fox Vanilla R damper and spring unit.

Tyres (front/rear) Avon A45 (Cut/Slick) - 6.2 x 20.0 - R13

Wheels (front/rear) BBS RD 3 Piece - 13" x 175mm - ET 12.5

Brakes (front/rear) AP Racing CP4227 Callipers, Stainless Steel 220mm dia. Slotted Rotors.

Chassis construction Carbon Fibre Tub with Aluminium Rear Sub-Frame

Engine 2008 Rotax Type 490 V-Twin

Bore/stroke/cylinders/cc 90.5mm/47.3mm/2Cylinder/609cc

Fuel Shell V-Power (99 RON)

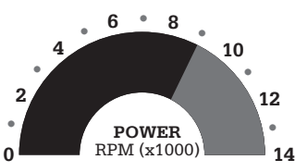
Fuel system EFI Euro 4 Ecu, Siemens VDO Injectors - Multi Point

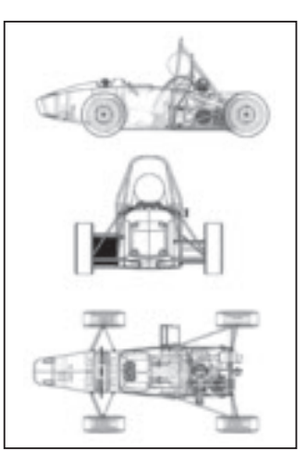
Max power/max torque 6000rpm/5500rpm (9000rpm Red Line)

Transmission CVT with an Epicyclic Reduction Box (3.14:1) and Belt Final Drive (2.45:1)

Differential Honda TRX450/ Foreman torque biasing differential.

Final Drive 7.7:1





CLASS 1

UNIVERSITY OF BIRMINGHAM
BIRMINGHAM, UNITED KINGDOM

61

In 2010, UBRacing enters its 13th car into the Formula Student competition. UBRacing hopes to improve on the results gained in last year's competition with a large continuation of team members and development in key areas of the vehicle, including Engine Electronics, Engine Gas Flow and the Drivetrain system.

A continuation of sponsorship from McLaren Electronic Systems has allowed for the development of the TAG400 ECU using Matlab/Simulink, which has also been kindly sponsored by The MathWorks. The ECU provides engine management as well as controlling the active differential and the pneumatic gear shift system.

The custom designed active differential, which has had several components manufactured with help from this year's new sponsor Mazak, has allowed UBR13 to optimise vehicle traction in all dynamic conditions.

With continued support from McLaren Racing, an improved intake design has increased volumetric efficiency and driveability, with increased mid-range torque. In conjunction with a side mounted exhaust silencer, the gas flow through the engine system has been improved through simulation using Ricardo Wave CFD software and physical testing.

With more experience and improvement in design, UBRacing is aiming to achieve its highest finish at FSUK and show it is one of the best UK teams.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase 2700mm/1380mm/1065mm/1600mm

Track (front/rear) 1200mm/1150mm

Weight including 68kg driver (front/rear) 127kg/158kg

Suspension (front/rear) Double unequal length A-Arm. Push rod actuated spring with 2 way adjustable KAZ Tech Dampers, Fr and Rr anti-roll bars.

Tyres (front/rear) 175/505 R13 Dunlop Motorsport

Wheels (front/rear) 178 mm wide, 3 pc Al/Mg Keizer Rim

Brakes (front/rear) Stainless steel, floating hub mounted, Fr 220 mm dia, Rr 186.5mm dia Drilled

Chassis construction One piece tubular spaceframe

Engine 2005 / Yamaha YZF-R6 5SL, four stroke in line four

Bore/stroke/cylinders/cc 65.5mm bore/44.5mm stroke/ 4 cylinder /599 cc

Fuel 101 RON unleaded

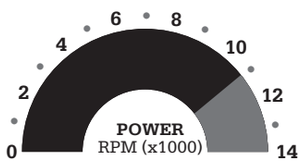
Fuel system Bespoke sequential fuel injection, McLaren TAG400 ECU

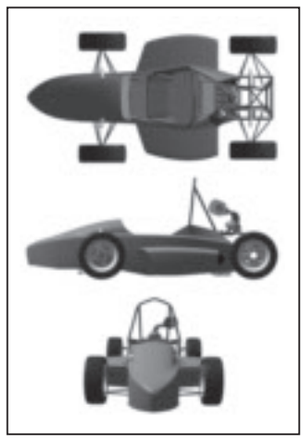
Max power/max torque 11,000rpm/9,000rpm

Transmission Single 520 chain

Differential Custom designed pneumatic acctuated acitve limited slip differential

Final Drive 4.6:1





CLASS 1

BIRMINGHAM CITY UNIVERSITY
BIRMINGHAM, UNITED KINGDOM

100

The is the first car to be entered by Birmingham City University. The BSc Motorsports Technology students are based in the Faculty of Engineering, Technology and the Environment. We are a small team of enthusiastic and committed students. The team has been working in four close-knit sub teams to design and build the vehicle. We have had to extend our CAD skills to build the car in time, to allow for some development and testing time and solve any unforseen problems. This is a steep learning curve and an ongoing process! We have approached the competition with the aim of completing the event successfully. So, our main objective this year is to have a reliable car, to ensure we compete well and learn lessons at the event. This will allow us to redesign and develop the car more radically for the 2011 event.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase 2900mm/1600mm/ 1050mm/2100mm

Track (front/rear) 1480mm/1480mm

Weight including 68kg driver (front/rear) 139kg/209kg(approx)

Suspension (front/rear) Double unequal length A-Arm. Outboard mounted spring and damper

Tyres (front/rear) 140-535 R13 Dunlop

Wheels (front/rear) Compomotive 5.5x13 Alloy wheel

Brakes (front/rear) Cast iron, hub mounted, 220mm dia. Drilled

Chassis construction One piece tubular spaceframe

Engine 2000 / Honda CBR 600 Y four stroke in line four

Bore/stroke/cylinders/cc 67mm bore/ 42.5mm stroke/ 4 cylinder/ 599 cc

Fuel 98 RON Unleaded

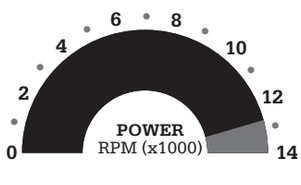
Fuel system Single carburettor

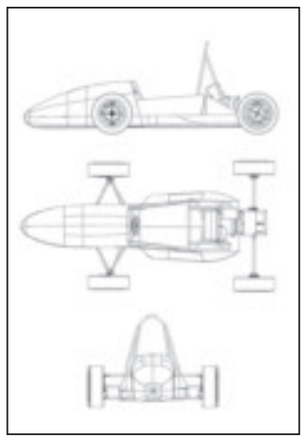
Max power/max torque 12,800rpm/10,000rpm (unrestricted)

Transmission Single 520 Chain

Differential Non limited slip differential

Final Drive 3.25:1





CLASS 1

INSTITUTE OF AUTOMOTIVE AND TRANSPORT ENGINEERING, BOURGOGNE, FRANCE

158

ISAT Formula Student team was created in 2003, and is composed of 15 students in their 3rd year. The whole team is renewed each year, and team members work on this project in parallel with attending a mechanical engineering course. The main purpose of this project is to enable students to discover how to design and build an entire car, and how to work in an autonomous way. This year, we decided to concentrate mostly on making a big step on weight reduction: chassis, uprights and many components were redesigned and the use of brand new wheels enabled a total saving of 20kg with lower unsprung masses. We also worked on comfort and ergonomics, in order to get the car easier to drive and to handle for the driver.

Our self developed data acquisition system was of great use, helping us to know a lot of parameters, by adding new sensors, and using telemetry to see data in real time.

The result of all these efforts is that TASIA10 is our highest achieved car since we have been competing.

Finally, we would like to express our gratitude to all the sponsors and supporters who helped us to reach our goals.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase 3032mm/1403mm/1028mm/1550mm

Track (front/rear) 1200mm/1150mm

Weight including 68kg driver (front/rear) 140kg/140kg

Suspension (front/rear) Double unequal length A-Arms. Push rod actuated horizontally oriented Cane Creek double barrel-2 spring / damper units. Adjustable in compression and rebound range

Tyres (front/rear) 521 x 178-330 Hoosier R25B

Wheels (front/rear) Braid Formrace 13 x 7 in, lightweight aluminium alloy, 2pc

Brakes (front/rear) Beringer 4 disk system self developed 201mm dia, hub mounted.

Chassis construction One piece steel E235 tubular spaceframe

Engine 2003/ Yamaha WR450 single

Bore/stroke/cylinders/cc 95mm bore/ 63,5mm stroke/1 cylinder/449 cc

Fuel Student modified fuel injection system using SODEMO ECU EV11, single injector

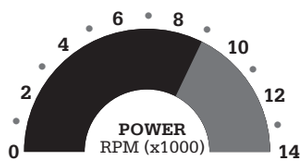
Fuel system Siemens VDO injectors, FRI Euro 4 ECU

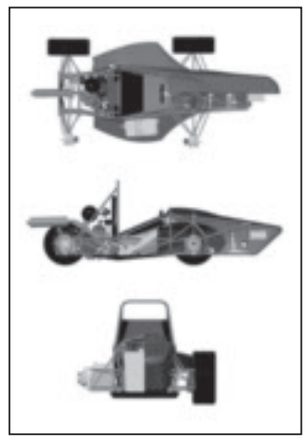
Max power/max torque 60hp at 9,000rpm/48Nm at 8100rpm

Transmission Single 520 chain

Differential Student design Torsen limited slip differential

Final Drive 2,67:1





CLASS 1

TRANSILVANIA UNIVERSITY FROM BRASOV BRASOV, ROMANIA

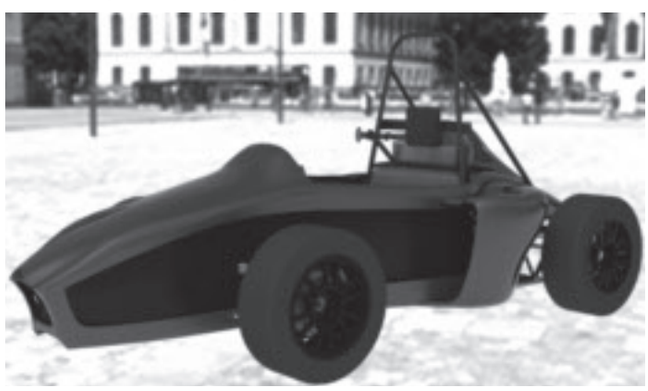
111

BlueStreamline is all about passion for cars, creativity in designing and using advanced technology, addiction for races, accepting new challenges ... and a bit of madness. Those, with no exception, simply wear our fingerprint...

The only Romanian Formula Student team, BlueStreamline, will represent for the second time the University of Transylvania at Silverstone.

After a good starting performance from which we have learned to avoid the imminent mistakes, we want to take the dream further so the team started designing a new single seat race car. This year, based on last year's experience, we managed to improve in all areas so we are confident that the BSL10 will rank in a higher position.

The team wishes to thank all those who have supported the project throughout.



TECHNICAL SPECIFICATION

Length/width/height/wheelbase 2658mm/1302mm/ 1246mm/1600mm

Track (front/rear) 1200mm/1200mm

Weight including 68kg driver (front/rear) 138/159Kg

Suspension (front/rear) Double unequal length A-arm. Pull-rod (front) - push-rod (rear) actuated spring and damper

Tyres (front/rear) Continental 20.5x7

Wheels (front/rear) OZ Racing 13x7 cast aluminium alloy rims

Brakes (front/rear) 4 piston ISR brakes, 4-disk system, semi-floating, 220 mm diameter

Chassis construction 25CrMo4 tubular space frame

Engine 2004 - Honda CBR 600RR four stroke,in line four

Bore/stroke/cylinders/cc 67.0mm bore / 42.5mm stroke / 4 cylinder / 599cc

Fuel 99 Unleaded

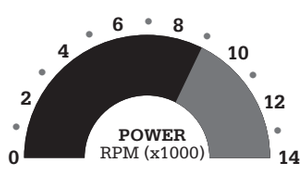
Fuel system Student built fuel injection controled by ECU GetData

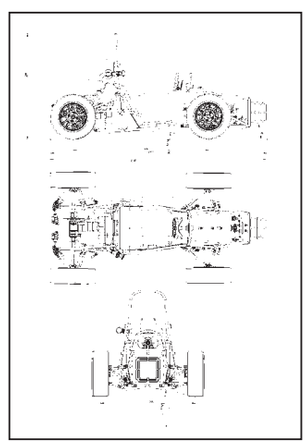
Max power/max torque 9000rpm/6400rpm

Transmission Single 520 chain

Differential Drexler Limited Slip differential

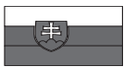
Final Drive 3.46:1





CLASS 1

SLOVAK UNIVERSITY OF TECHNOLOGY BRATISLAVIA, SLOVAKIA



89

It will be an honour for us to participate at the competition in Silverstone to compare our qualities and capabilities with the best designers of Formula Student racing cars. We are the team from the country which produces the highest amount of cars per person and it motivates us to show that we have the creative strength and development potential too. Therefore, we look forward to meeting teams from other universities in July at Silverstone. The team has been composed with a view to the future. This year we want to raise interest with the near cost construction of all parts and trendy design of the bodywork. Thanks to the support from the faculty, university and the team's pedagogical advisors, we succeeded in overcoming the most difficult problem – filling up the team budget at the time of financial crisis. Catia, ANSYS and Adams helped us to design the second team car, optimised in all parts. We hope for a successful start and suitable weather for all the teams during the competition!

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2600mm/1450mm/1200mm/1570mm

Track (front/rear) 1200mm/1150mm

Weight including 68kg driver
(front/rear) 150kg/200kg

Suspension (front/rear)
Double unequal length A-Arm. Push rod actuated horizontally oriented spring and damper

Tyres (front/rear)
20x7-13 D 2692, R075 /
20x7-13 D 2692, R075

Wheels (front/rear)
13x7 inch, 13x7 inch, BRAID

Brakes (front/rear)
BREMBO, 220 mm dia. Drilled

Chassis construction
One piece tubular spaceframe,

Engine 2002 / HONDA
500 CBR four stroke

Bore/stroke/cylinders/cc
73mm bore/ 59.6mm stroke/
2 cylinder/ 499 cc

Fuel Shell V Power

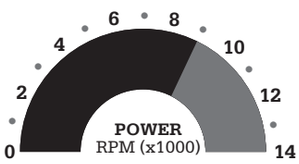
Fuel system
Honda engine with
Kehin Carburettor

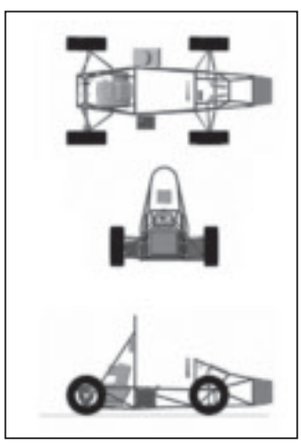
Max power/max torque
9000rpm/8000rpm

Transmission chain

Differential Drexler Slip differential

Final Drive 4:1





CLASS 1

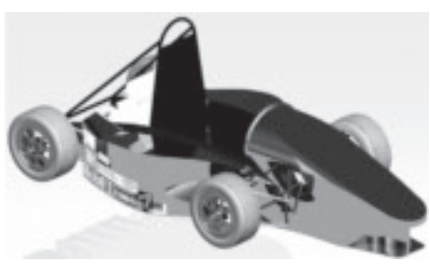
UNIVERSITY OF SUSSEX BRIGHTON, UNITED KINGDOM

16

Building upon our relative success in 08/09 Mobil 1 Team Sussex are returning to Formula Student with a brand new team of only 8 MEng and 3BEng students designing and manufacturing the car from scratch for Class 1.

Our new car for 09/10 is a product of all the lessons learnt in previous years where our main goal has been to reduce the weight of our car. The team has pulled together to shave off an approximated 50kg, a significant achievement without comprising strength, durability and power, with a large amount of this coming from the development of carbon fibre suspension arms. The vehicle dynamics have also been improved from feedback from the previous team.

Being a relatively new team to the competition, Mobil 1 Team Sussex aim to make it into the top 10 at Silverstone, giving some of the more developed teams a run for their money. With limited funding available we are always building upon our reputation and have increased our sponsorship interest this year, who we are keen to impress.



TECHNICAL SPECIFICATION

Length/width/height/wheelbase
3100mm/1250mm/1150mm/1750mm

Track (front/rear) 1435mm/1175mm

Weight including 68kg driver
(front/rear) 130kg/190kg

Suspension (front/rear)
Double unequal length A-Arm. Pull rod actuated spring and damper

Tyres (front/rear)
170/515R13 Kuhmo Ecsta

Wheels (front/rear)
Compomotive CXR 13in

Brakes (front/rear) AP Racing discs, calipers, hub mounted, 248mm drilled

Chassis construction
One piece tubular spaceframe

Engine 2004 / Yamaha YZF-R6
four stroke in line four

Bore/stroke/cylinders/cc
65.5mm bore/ 44.5mm stroke/
4 cylinder/ 600cc

Fuel Unleaded

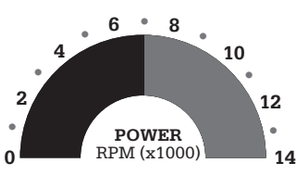
Fuel system BMRS Braided hoses, Malpassi regulator, DTA ECU, OEM injection

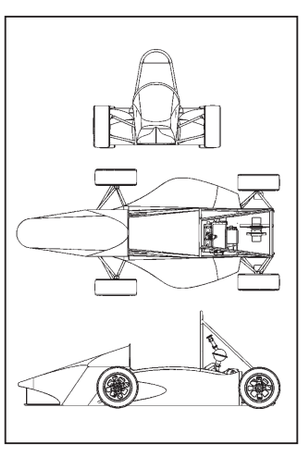
Max power/max torque
11000rpm/8000rpm

Transmission Single 520 chain

Differential Quaife automatic torque biasing differential

Final Drive 3:1





CLASS 1

BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS, BUDAPEST, HUNGARY

14

BME-FRT, the team of Budapest University of Technology and Economics, consists of 25 very enthusiastic students striving for creation. We are a very young team, and this is the first year we are entering the competition. We have systematically laid the foundations of a well-operating team over the past years. Our future goal is to integrate the Formula Student programme and the approach and attitude it carries into the Hungarian education. This year we are participating with the previous year's Class 3 plans. We are glad to present the result of our work. Feel free to visit us in our pit, where we will be pleased to answer your questions and discuss our car.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2640mm/1422mm/1071mm/1600mm

Track (front/rear) 1200/1080mm

Weight including 68kg driver
(front/rear) 145/153kg

Suspension (front/rear)
Double unequal length A-Arm. Pull rod actuated spring and damper

Tyres (front/rear)
205x55/235x50 R13, Continental

Wheels (front/rear)
7x13, 3 pc Al Rim

Brakes (front/rear)
Student made 200mm dia. Rotors, 16/13 mm Master cylinders

Chassis construction
Tubular spaceframe

Engine 2005 Yamaha YZF-R6 (5SL)

Bore/stroke/cylinders/cc
65.5mm bore/ 44.5mm stroke/
4 cylinder/ 599 cc

Fuel 99 RON

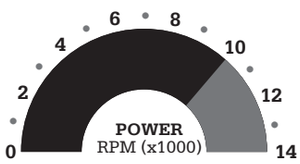
Fuel system
YAMAHA R6 fuel system

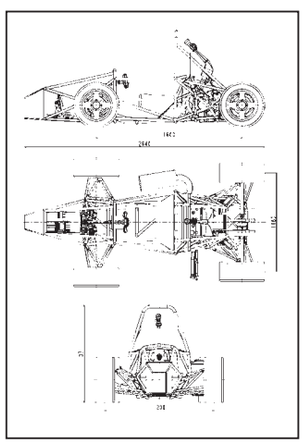
Max power/max torque
10,000rpm/7,000rpm

Transmission Single Chain

Differential
Quaife LSD differential (for FSAE)

Final Drive 3.15:1





CLASS 1

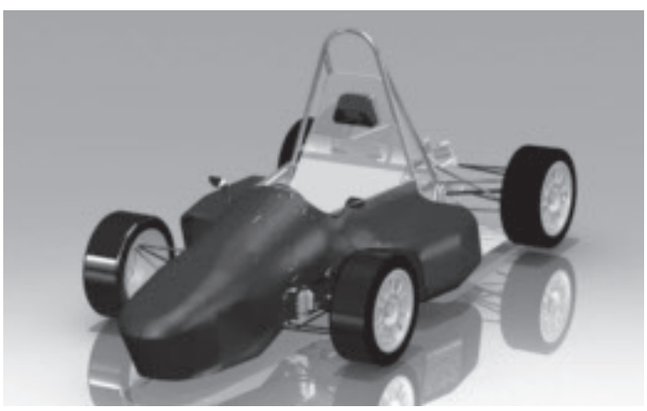
UNIVERSITÀ DI CAGLIARI CAGLIARI, ITALY

125

Team 2010 is composed of 11 students from the departments of Mechanical Engineering and Electronics, and has two Faculty Advisors. The team was created in 2007 and has competed in the Italian events (F-ATA) for 3 years. In 2008, we built the first car of the University of Cagliari, the Class 1 debut, which performed well on the track.

The design approach was influenced by scarce economic resources available, so the design choices were more focused than ever to achieve the best compromise between performance and innovation costs.

The team consists of eight operating segments that follows the breakdown of the project made in cost reports, and given the small number of members, there are some students that cover multiple roles.



TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2850mm/1550mm/1190mm/1700mm

Track (front/rear) 1300mm/1250mm

Weight including 68kg driver
(front/rear) 143Kg/175Kg

Suspension (front/rear)
Double unequal length A-Arm. Pull rod/Push rod actuated, vertical/ horizontal oriented shock a.

Tyres (front/rear) 19,5x6.5-R13

Wheels (front/rear) 7x13"

Brakes (front/rear) Steel, hub mounted, 220mm / Single, differential mounted, 230mm.

Chassis construction
4130 "Chrome Moly" welded trellis frame and rear Al 7075 Rear structure differential Housing.

Engine 2004 / Yamaha Fazer-FZ6, four stroke, four cylinder in line

Bore/stroke/cylinders/cc
65.5mm bore / 44.5mm stroke/
4 cylinder / 599cc

Fuel 95 RON unleaded

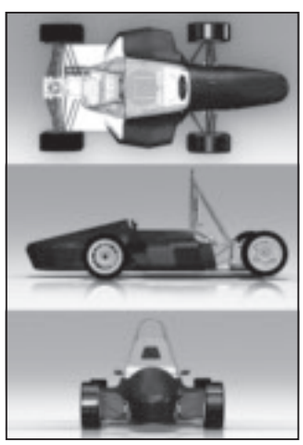
Fuel system Yamaha FZ6
Fuel injection system

Max power/max torque
68kW@12,000rpm/ 65Nm@7,900rpm

Transmission Single 520 chain

Differential Taylor Race Chain Differential Torque-Sensing. 80% Torque bias

Final Drive Z47 / Z13



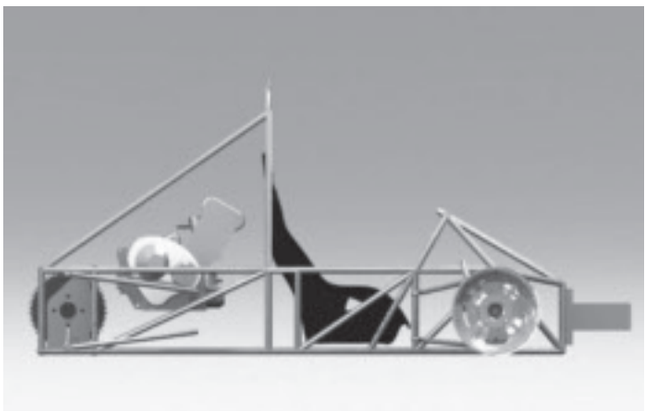
CLASS 1

HELWAN UNIVERSITY
CAIRO, EGYPT

73

We are the only team to compete from Africa and the Middle East.

By competing in this event we will be able to produce a whole new generation of world class automotive engineers to help raise our national industry. We hope to draw more attention to Egypt and to its universities. Our Faculty Advisor: Prof. Asst. Dr. Waleed Abed El Hady, our Chief Engineer: Eng. Mohamed Said Tyea, our team members: 27 dedicated and ambitious automotive engineering students who are divided into 5 main teams (power train, suspension and steering, brakes, chassis and body and organisation team).



TECHNICAL SPECIFICATION

Length/width/height/wheelbase 2677mm/1400mm/950mm/1600mm

Track (front/rear) 1250mm/1200mm

Weight including 68kg driver (front/rear) 130kg/170kg

Suspension (front/rear) Double unequal length A-Arm. Push rod / Pull rod actuated horizontally oriented spring and damper

Tyres (front/rear) (508 x 152-330)/(508 x 177-330) Hoosier

Wheels (front/rear) 330 x (152mm wide, 203mm wide) Al Rim

Brakes (front/rear) Stainless Steel, The hub is mounted by bolts, 220mm dia. Drilled

Chassis construction One piece tubular spaceframe

Engine Brand new 2009 honda Cbr600rr

Bore/stroke/cylinders/cc 67mm bore/42.5mm stroke/ 4 cylinder/599cc

Fuel 99 RON unleaded

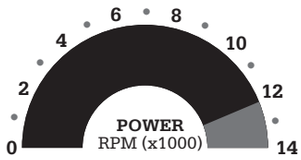
Fuel system PGM-FI

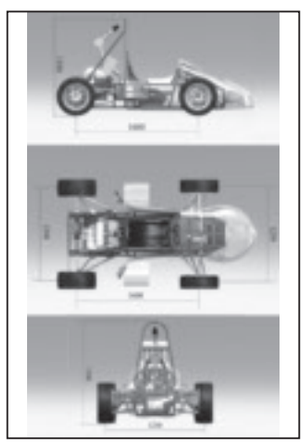
Max power/max torque 12,000rpm/8,000rpm

Transmission Single 525 chain

Differential Quaife LSD

Final Drive Adjustable From 1:2.5 to 1:3.4



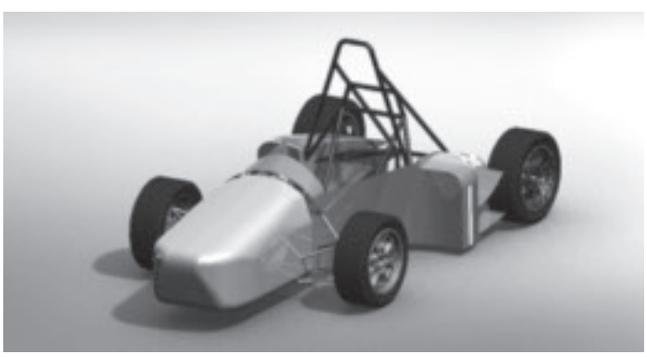


CLASS 1

UNIVERSITY OF CAMBIRDGE
CAMBRIDGE, UNITED KINGDOM

82

Full Blue Racing is delighted to be attending FSUK with its 4th car- the FBR10. This year the team has once again expanded with students from any department within the University. Hard work from the whole team has produced a vehicle that meets its aim for 2010, 'reliability without sacrificing performance'. This is achieved through the design of a simple, low maintenance vehicle with exceptional handling and acceleration performance. The team feels that this offers the ideal package for the weekend race whilst making the most of the facilities available to it. The FBR10 would not have been possible without the help and support of all the sponsors and supporters who have offered advice, facilities and vital encouragement - thank you to all those involved.



TECHNICAL SPECIFICATION

Length/width/height/wheelbase 2500mm/1422mm/1150mm/1600mm

Track (front/rear) 1250mm/1200mm

Weight including 68kg driver (front/rear) 161kg/182kg

Suspension (front/rear) Double unequal length. Front push, rear pull rod actuated spring and damper

Tyres (front/rear) 20" x7.0"Avon

Wheels (front/rear) 13" x 60", Al rims, -12mm offset

Brakes (front/rear) Solid front outboards/Solid rear inboard, hub mounted, 230mm dia.

Chassis construction Steel tubular space frame, MIG welded

Engine Yamaha Fazer FZ6 5VX R6 , four stroke in line four

Bore/stroke/cylinders/cc 65.5mm bore/ 44.5mm stroke/ 4 cylinder/ 599cc

Fuel 99 RON unleaded

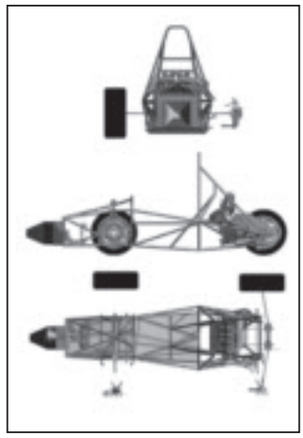
Fuel system Yamaha emi sequential fi, controlled by Megasquirt

Max power/max torque 10,000rpm/ 9,000rpm

Transmission single 520 chain

Differential fixed 7075T6 spool with EN24T tripod housing

Final Drive 4.25:1



CLASS 1

CARDIFF UNIVERSITY
CARDIFF, UNITED KINGDOM

13

At Cardiff Racing, students of all levels are encouraged to become part of the team. As a result, the team consists of students ranging from first year undergraduates to postgraduates. The majority of the design work is performed by third and fourth year project students, while the rest of the team is involved in manufacturing, construction and testing.

This year's entry, CR06, builds upon the experience gained by the team in previous years. The chassis is a complete monocoque, constructed from lightweight, high stiffness aluminium honeycomb composite panels. The sidepods house cooling and electrical systems allowing space at the rear for more efficient packaging and easier engine maintenance.

Power is provided by an Aprilia SXV 550 V-Twin engine with optimised intake and exhaust systems. The engine has a higher power-to-weight ratio than other four cylinder alternatives under Formula Student restrictions. Power is transmitted through a student designed aluminium spool that has resulted in faster lap times in testing than a differential.

To allow more testing and driver training, suspension layouts were developed, rather than revolutionised to shorten development time. Driver controls were simplified to improve gear changes, while adjustable launch/traction control makes the car suitable for drivers of varying experience.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase 2706mm/1316mm/1176mm/1550mm

Track (front/rear) 1150mm/1100mm

Weight including 68kg driver (front/rear) 115kg/145kg

Suspension (front/rear) Double unequal length A-Arm. Pull/Push rod actuated horizontally oriented dampers.

Tyres (front/rear) Hoosier C2000 R25B (18x6.0-10/18x7.5-10)

Wheels (front/rear) 3pc centre lock wheel, Al rims 6.0"/7.0" wide, 1.25"/2" negative offset, team manufactured lightweight aluminium centres

Brakes (front/rear) Student designed grey cast iron rotors - hub/spool mounted

Chassis construction Full aluminium honeycomb sandwich panel monocoque, steel tube roll hoops and bracing

Engine 2007 Aprilia SXV 550 V-twin

Bore/stroke/cylinders/cc 80 x 55 / 2 cylinder / 553cc

Fuel 98 octane petrol (Shell Optimax)

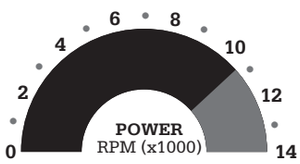
Fuel system Student designed/fuel tank and piping, stock injectors

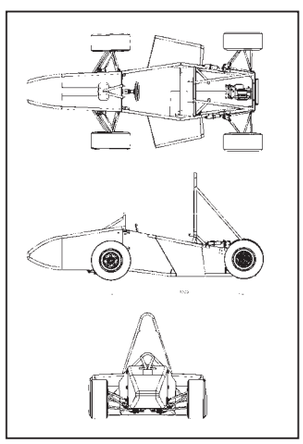
Max power/max torque 10750rpm, 7960rpm

Transmission Single 520 chain

Differential Student designed aluminium spool

Final Drive 2.875:1





CLASS 1

UNIVERSIDAD POLITECNICA DE CARTAGENA
CARTAGENA, SPAIN

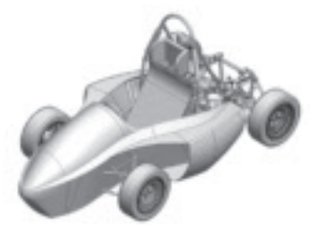
190

The Universidad Politecnica de Cartagena (Spain) is competing in Class 1 of the prestigious Formula Student international competition for the first time, with the design of a single-seat racing car including the complete design and selection of mechanical and electronic components, analysis of kinematic and dynamic response, and optimisation of required manufacturing technologies.

The UPCT Racing Team is integrated by students from different programmes and years, joined by their passion towards the automotive industry and technology development, which motivates them to work really hard in this first UPCT prototype for Formula Student.

One of the main objectives of the team members is to complete their technological learning in areas such as design, manufacturing, analysis and optimisation of components. The participation in Class 1 of Formula Student will serve for training inside the practical aspects of manufacturing, assembly, testing and fine-tuning of vehicle prototypes.

The UPCT Racing Team is divided into different working groups, such as engine/transmission, chassis, steering, suspension, and body groups. We would like to thank the collaboration of our sponsors, university and all the people and companies that have contributed to make the development of this ambitious technological project possible



TECHNICAL SPECIFICATION

Length/width/height/wheelbase 2775mm/1316mm/1250mm/1654mm

Track (front/rear) 1316mm/1316mm

Weight including 68kg driver (front/rear) 127 kg/170 kg

Suspension (front/rear) Double unequal A-Arm. Push rod/Pull rod actuated vertically oriented spring and damper units

Tyres (front/rear) 7 x 20-13 Avon

Wheels (front/rear) Braid Formrace 16, with 7" width, 13" diameter and 4 drills

Brakes (front/rear) AP Racing, with aluminium body pumps and piston diameter of 0.7 and 0.75"

Chassis construction Steel tubular spaceframe

Engine 2007/Suzuki GSX-R 600 four stroke in line four

Bore/stroke/cylinders/cc 67mm bore/ 42.5mm stroke/ 4 cylinder/ 599cc

Fuel 99 RON petrol

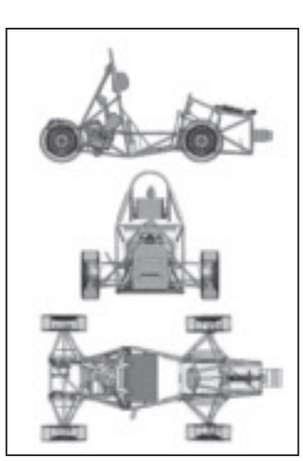
Fuel system Suzuki multi point fuel injection

Max power/max torque (123 HP) 14,000 rpm/ (6.7 kg m) 12,500 rpm

Transmission Single 520 chain

Differential Suzuki LT-A 700 XK differential, specially modified for UPCT prototype

Final Drive 3:1



CLASS 1

UAS COLOGNE
COLOGNE, GERMANY

60

After three successful years in Germany we will compete at Silverstone for the second time since 2009.

The CC-X is a revolutionary re-designed car with some fresh new ideas.

The lighter and stiffer frame in the back, the CFRP Monocoque in the front and the specially designed dampers are some of the highlights.

The gas exchange of the Yamaha R6 engine has been re-calculated for more power and efficiency. Re-designed and re-ground camshafts, together with a newly designed regulating gate valve will help to make the car even faster.

The new car is much lighter due to re-calculating most of the parts, so we are capable of bringing us among the top 10 teams.

The team has 50 percent of new members who had to learn a lot in a short time. The CC09 finished the endurance at Silverstone with fuel problems which are erased out for 2010. This year, extended testing time will help us to eliminate all possible faults of the car, thus turning it into a robust and stable competitor for the 2010 Silverstone event. In 2009 we won the "Best Individual Driver Award" which we want to defeat.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2696mm/1326mm/1027mm/1650mm

Track (front/rear) 1216mm/1200mm

Weight including 68kg driver
(front/rear) 132,88kg/151,12kg

Suspension (front/rear)
Double unequal length A-Arms. Push-rod actuated efficiently orientated spring and damper.

Tyres (front/rear)
20.5x7.0-13, Hoosier R25B

Wheels (front/rear) 7x13, -1.9mm offset, BBS 3 pieces Magnesium Rim

Brakes (front/rear) 4-disc system, floating, hub mounted, 220mm/200mm, 4 piston/2 piston

Chassis construction
CFRP Monocoque with Tubular steel space frame behind firewall

Engine 2005 / Yamaha YZF-R6 four stroke in line four

Bore/stroke/cylinders/cc
66mm/45mm/4/600

Fuel 100 octane unleaded gasoline

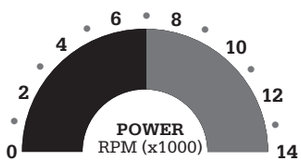
Fuel system Bosch ECU with sequential fuel Injection

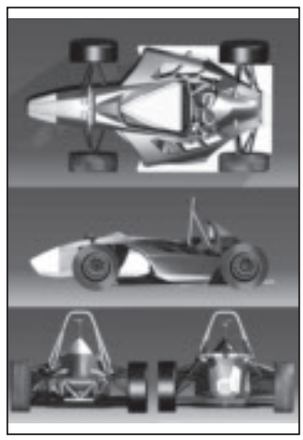
Max power/max torque
99 bhp / 66,3 Nm

Transmission Single 428 chain

Differential Drexler Cluth Pack Limited Slip Differential

Final Drive 3,25:1





CLASS 1

UNIVERSITY OF WARWICK
COVENTRY, UNITED KINGDOM

50

The team's aim this year has been to produce a simple, reliable and lightweight car to be competitive in all dynamic events. The team consists of 12 final year engineering students focusing on management, chassis, powertrain and electronics.

The team has manufactured all the components on the car; learning skills in CNC and welding to ensure a timely build. The car is estimated at 180kg, with 40-50bhp and special features such as CTG carbon fiber half shafts, EOS laser sintered exhaust and shocks and AP Racing brake calipers. The car features high specification electronics allowing such advantages as traction control. The car has an Eco-seat made from coconut fibres by Johnson Controls and bodywork vinyls provided by Showtrax.

This year the WFS team completed the car in April to allow maximum testing opportunities and a chance to solve any problems. All in all the W10 from Warwick Formula Student should be the university's most competitive yet.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2580mm/1420mm/1010mm/1653mm

Track (front/rear) 1229mm/1187mm

Weight including 68kg driver
(front/rear) 112kg/136kg

Suspension (front/rear)
Double unequal length A-Arm. Push rod/ Pull rod actuated horizontally oriented spring and damper

Tyres (front/rear)
Avon A45 6.2/20-13, 7.2/20-13

Wheels (front/rear)
Compomotive CXR 6x13, 7x13

Brakes (front/rear)
4 pot AP Racing calipers. Student designed CNC'd brake discs

Chassis construction
One piece tubular spaceframe

Engine KTM 525 EXC 2006

Bore/stroke/cylinders/cc
95mm, 72mm, Single Cylinder, 510cc

Fuel Shell Optimax 98 RON

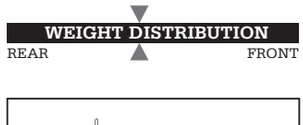
Fuel system
Custom single point fuel injection

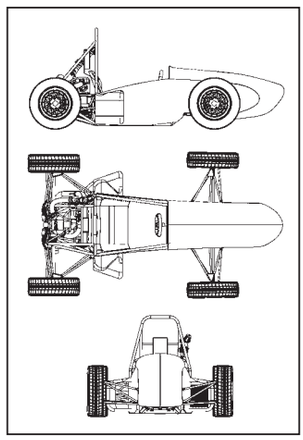
Max power/max torque
7500rpm / 5500rpm

Transmission
Duplex Chain Direct Coupling

Differential
Suzuki King Quad front differential

Final Drive 3.6:1





CLASS 1

DELFT UNIVERSITY OF TECHNOLOGY
DELFT, THE NETHERLANDS

02

After ten years of evolution and revolution, the Delft University of Technology has designed the DUT10. Its predecessor won both (!) the design events in FSUK and FSG and also won second place at FSUK, so the expectations are quite high for the tenth car of the DUT Racing Team. With its carbon-fiber monocoque, one-cylinder fuel-efficient engine and student built data-acquisition system; the DUT10 is up for the challenge! Centered around the end-user, the amateur weekend racer, the design focuses on the needs, wants and limitations of this particular driver. The design of this year is based on performance, safety and fuel-efficiency. The sixty students working on the DUT10 are eagerly waiting for the competition to show what they have built and learned this year!

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2507mm/1382mm/1070mm/1540mm

Track (front/rear) 1202mm/1176mm

Weight including 68kg driver
(front/rear) 100kg/117kg

Suspension (front/rear) Unequal length A-Arms. Pull rod actuated 4-way adjustable Cane Creek Double Barrel damper with custom springs

Tyres (front/rear) 18x6,0-10 LC0 Hoosier / 18x6,0-10 LC0 Hoosier

Wheels (front/rear) 6"x10", custom aluminium center, carbon shell

Brakes (front/rear) 4-Disk system, Full-floating steel rotors, adjustable brake balance, AP4226 Calipers

Chassis construction
Carbon-fibre monocoque

Engine 2007 Yamaha WR450F

Bore/stroke/cylinders/cc
95mm / 63mm / 1 cylinders / 449cc

Fuel E85 Bio-ethanol

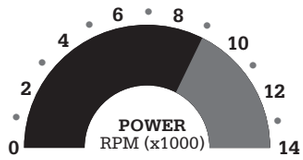
Fuel system Student designed/ built dual injector sequential fuel injection system

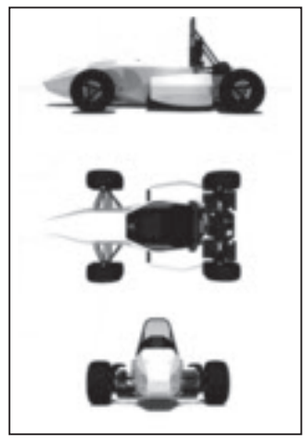
Max power/max torque
9000 rpm / 6500 rpm

Transmission Single 520 chain

Differential
Drexler Limited Slip Differential

Final Drive 3:1





CLASS 1

DELHI TECHNOLOGICAL UNIVERSITY
DELHI, INDIA

51

Team Defianz Racing is a Formula Student team from Delhi Technological University (formerly called Delhi College Of Engineering). This year we switched over to CBR 600 from Yamaha WR450 considering the reliability of the engine. The kinematic suspension design was analysed to reach the right ride-roll config. The cooling system was paid attention to as it was a major issue with this engine. There were several situations where we had to compromise on one aspect to get the other one going, so we went with the middle ground. The aim of the team for this year is to perform well in the dynamic events.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2780mm/1540mm/1030mm/1751mm

Track (front/rear) 1260mm/1170mm

Weight including 68kg driver
(front/rear) 128kg/192kg (total 320kg)

Suspension (front/rear)
Unequal double wishbone suspension, with push/pull rod actuated spring over damper

Tyres (front/rear)
20.5x6.0-13 R25B Hoosier

Wheels (front/rear)
BBS 3pc Aluminum alloy
13" x 6" -10.8mm offset

Brakes (front/rear) Cross drilled rotor, hub mounted, 26 mm dia aluminium piston - KBX

Chassis construction
Mild steel tubular spaceframe

Engine 2001 Honda CBR 600 F4i

Bore/stroke/cylinders/cc
95.0 x 63.4mm / 4 cylinder / 599cc

Fuel 98 octane petrol (Shell Optimax)

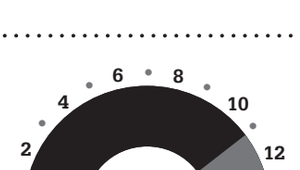
Fuel system Student designed/ built fuel injection system using DTA S80 ECU

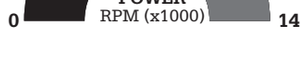
Max power/max torque
11,000rpm/8,000rpm

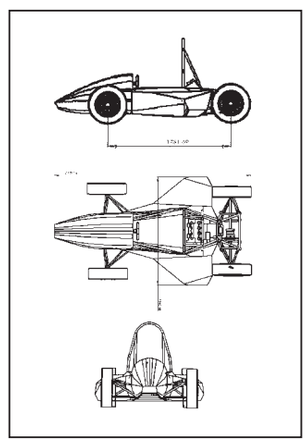
Transmission Single chain

Differential Zexel Torsen Universtiy Special Modified. Bias Ratio 2.6:1

Final Drive 3.5:1







CLASS 1

UAS DORTMUND
DORTMUND, GERMANY

27

The Race-Ing. team represents UAS Dortmund in the Formula Student competition. The team was founded in 2005 and consists of 17 members.

Based on last year´s car, the RI 10 was built new and better than its predecessor. While the basic features remain the same, the driver ergonomics, the fuel efficiency and the student designed dry sump have been improved as well as the new catch tank with its enhanced defoaming warrant and optimal oil supply in each driving situation. Also the pedal system, the steering wheel and the cooling system have been optimised. The updated gear shifting mechanism works faster than its predecessor. The chassis of the RI 10 is a one-piece carbon fiber monocoque to offer high chassis-stiffness for best suspension performances. All major structure components, casings and intake-system parts are hand lay-up laminated with advanced composites. A high range of adjustment options for the suspension permit the great performance of the RI 10 in every discipline. The goal for the 2010 season is to present a highly competitive vehicle to get closer to the European top teams.

We wish all teams all the best, success and of course a lot of fun for the hard work that has been done.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase 2835mm/1405mm/1059mm/1640mm

Track (front/rear) 1200mm/1150mm

Weight including 68kg driver (front/rear) 148,5kg/181,5kg

Suspension (front/rear) Double unequal length A-Arm.Pull rod/Push rod actuated vertically orientated spring and damper

Tyres (front/rear) 205x55 R13 Hoosier R25

Wheels (front/rear) 6,5x13, 0mm offset, 3pc Al Rim with Mg Center

Brakes (front/rear) Floating, hub mounted, 240mm outer dia, 170mm inner dia.

Chassis construction hand lay-up laminated Carbon composite monocoque with honeycomb core

Engine 2001 / Honda CBR 600 PC35 / 4 cylinders in-line / modified with student build dry sump

Bore/stroke/cylinders/cc 67mm bore / 42.5mm stroke/ 4 cylinder / 599cc

Fuel 100 RON unleaded

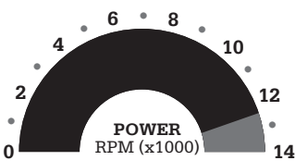
Fuel system Trijekt Engine management,sequential injection and ignition timing

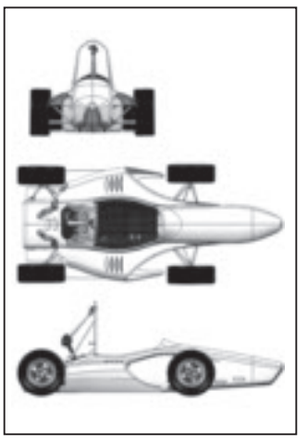
Max power/max torque approx. 12500rpm/approx. 9800rpm

Transmission chain drive,chain links: 112, chain partition: 15,88mm, Norm: 525

Differential Drexler limited slip differential

Final Drive 3,86:1





CLASS 1

UNIVERSITY OF DUNDEE
DUNDEE, UNITED KINGDOM

177

2010 is DRIVE's third year at Formula Student and will be our second Class 1 entry. We are a very small team with only a handful of core members so this year has been a huge challenge, yet an exciting one for all involved. DRIVE 2.10 is a radical improvement on our first car and we are aiming to save at least 80 kilos. This will be achieved by using high spec cold drawn tubing, re-engineered suspension components and optimised hub design amongst other savings. We have moved to 13" wheels allowing a more suitable tyre choice, coilover shock absorbers are used as a replacement for last year's air sprung units which were found to be unsuitable. An entirely new suspension system has been developed that allows for excellent adjustability and much improved dynamic performance. The logistics of getting our team to Silverstone involve a longer drive than many European teams! Nevertheless we are looking forward to the competition and are confident that we can better our '09 result.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase 2890mm/1390mm/1190mm/1720mm

Track (front/rear) 1200mm/1175mm

Weight including 68kg driver (front/rear) 168kg/176kg

Suspension (front/rear) Double A-Arm. Pull-rod Front / Push-rod Rear

Tyres (front/rear) A45 Avon slicks

Wheels (front/rear) 13" x 6J

Brakes (front/rear) Hub mounted 220mm, Wilwood PS-1 caliper

Chassis construction Tubular steel spaceframe,

Engine 1989 Yamaha FZR-600 I4 four stroke

Bore/stroke/cylinders/cc 59mm/ 54.8mm/ 4 cylinder/ 599cc

Fuel 99 RON unleaded

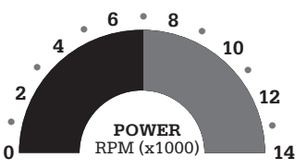
Fuel system Webber 40 DCOE carburettor

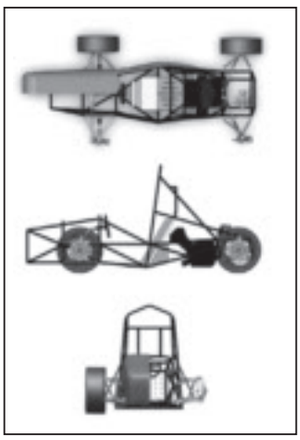
Max power/max torque 10,000rpm/7,000rpm

Transmission Chain Drive

Differential Quaife automatic torque biasing differential

Final Drive 3.692



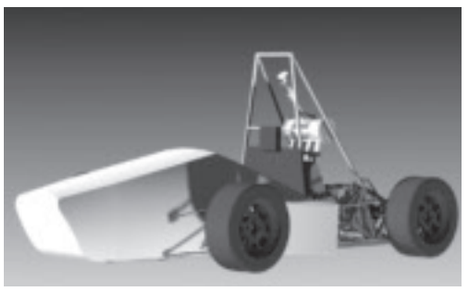


CLASS 1

HERIOT WATT UNIVERSITY
EDINBURGH, UNITED KINGDOM

67

2010 sees Heriot Watt University into the Formula Student competition. Heriot Watt Racing consists of a small team of highly motivated fifth to first year students studying mainly Automotive and Mechanical Engineering degree courses. The car has been designed with ease of manufacture and assembly at the forefront of decisions; through using common parts, modular assemblies and designing within the process capabilities in house. Our aim is to produce a simple, reliable car to achieve a respectable finish whilst being the basis for development for future entries. HWR01 incorporates an inboard dual rear brake set-up mounted to the rear differential, tuned intake system, and student-tuned engine map. Being based in Edinburgh, close to Knockhill racing circuit, has allowed the team to tap into a wealth of motorsport knowledge and experience to add to the full backing and support from Heriot Watt University staff and technicians. The Heriot Watt Racing Team is looking forward to the first of many exciting entries in Formula Student at Silverstone.



TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2700mm/1502.2mm/1270mm/1600mm

Track (front/rear) 1260mm/1300mm

Weight including 68kg driver
(front/rear) 127kg/191kg

Suspension (front/rear)
Double equal/unequal length A-Arm. Push rod actuated vertically oriented spring and damper.

Tyres (front/rear)
175/505R13 Dunlop

Wheels (front/rear) Compomotive CXR-1380 - 203.2mm wide 1pc Alloy

Brakes (front/rear) Stainless Steel hub-mounted/diff mounted, 218mm dia

Chassis construction
One Piece Tubular Spaceframe

Engine 2006 / Honda CBR600RR four stroke in-line four

Bore/stroke/cylinders/cc
67mm bore/ 42.5mm stroke/ 4 cylinder/ 599cc

Fuel 100 RON unleaded

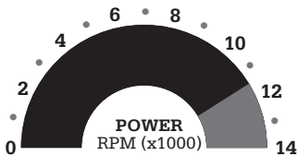
Fuel system Honda Multi point fuel injection

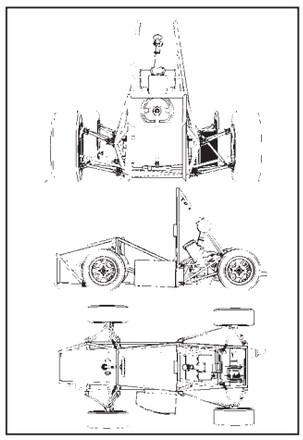
Max power/max torque
11,500rpm/8,000rpm

Transmission Single 525 chain

Differential Honda EK9 Torsen helical differential

Final Drive 4:1





CLASS 1

UNIVERSITY OF ERLANGEN-NUREMBERG
ERLANGEN, GERMANY

74

The FAUmax gamma is the third race car of High-Octane Motorsports. Based on the very competitive FAUmax beta 2009, we reduced the weight by more than 35kg with an overall weight less than 200kg. The whole package was redesigned to get a shorter and lighter race car with a better weight distribution. The Aprilia V2 engine has been retained but advanced in many ways, for example a new manifold was designed. New dampers, rims, tyres and carbon wishbones are the main features of our new suspension system, which will lead to a much better drivability. We adapted our steel frame to the new rules of 2010 and also increased stiffness and reduced weight. Thanks to a strict time schedule we were able to complete the assembly of our race car two months earlier than the season before. Therefore, all members of High-Octane Motorsports worked very hard during the last year.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2600mm/1367mm/1167mm/1580mm

Track (front/rear) 1220mm/1180mm

Weight including 68kg driver
(front/rear) 124kg/144kg

Suspension (front/rear)
Double unequal length A-Arm. Pull rod actuated vertically oriented spring and damper

Tyres (front/rear)
20.0 x 7.5-13 Hoosier

Wheels (front/rear)
8" x 13" , Braid Al Rims

Brakes (front/rear) C/SiC, beringer calipers, hub mounted, 220mm/210mm(f/r), drilled

Chassis construction Tubular space frame, carbon fibre body

Engine Aprilia SXV550(modified)

Bore/stroke/cylinders/cc
80mm bore/ 55mm stroke/ V2 cylinder/ 553 cm³

Fuel E85

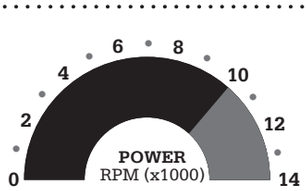
Fuel system
DTAfast full sequential, cylinder selective, traction control

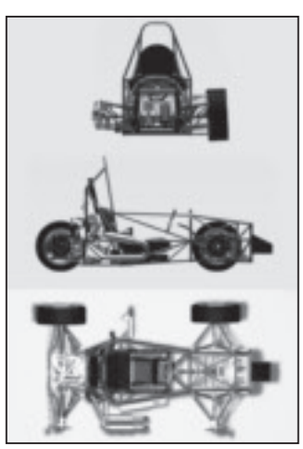
Max power/max torque
10,000rpm/8,000rpm

Transmission
cardan and angle drive, BMW

Differential
Drexler limited slip differential

Final Drive 3:1





CLASS 1

UNIVERSITÀ DI FIRENZE
FIRENZE, ITALY

28

Firenze Race Team is the oldest Italian team, with ten years of international experience in F-SAE competitions. During these years of activity we always dedicated our passion to the construction of easy and smart cars, always focusing on the "design for manufacturing". The basic idea of our cars is to build it around two main components: the driver and the unavoidable Ducati twin cylinder engine. The presence of the Ducati engine is a pride of ours, as we have the only official sponsorship in F-SAE series, and a challenge, as its shape is not easy to position in a race car. But what a lovely sound when it roars! The 2010 car, the 2810RR, is traditionally made with a really light steel tube chassis, with large use of CN laser cut, making the most of the strong Ducati engine structure to reduce the number of tubes in the rear part. The whole team, even if composed by a limited group of students, is organised as a small company, with the team leader that oversees the three main work groups: engine, electronics and structures. We're always trying to improve our competences, keeping an eye on students' formation and teamwork.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2630mm/1386mm/962mm/1700mm

Track (front/rear) 1200mm/1140mm

Weight including 68kg driver
(front/rear) 126kg/154kg

Suspension (front/rear) Double unequal length A-Arm. Push rod (front) / Pull rod (rear) actuated horizontally oriented spring and damper with anti roll bar

Tyres (front/rear) A45 Avon

Wheels (front/rear)
6x13 front, 6x13 rear

Brakes (front/rear) 4 hub mounted, monolithic calipers, radially attached, with floating discs

Chassis construction
Steel spaceframe

Engine Ducati Desmo3 engine

Bore/stroke/cylinders/cc
84mm bore/ 55mm stroke/
2 cylinder/ 610cc

Fuel 99 RON unleaded

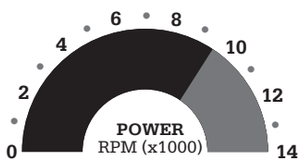
Fuel system Magneti Marelli electronic injection with Magneti Marelli fuel pump, electronically controlloed

Max power/max torque
9500rpm/7500rpm

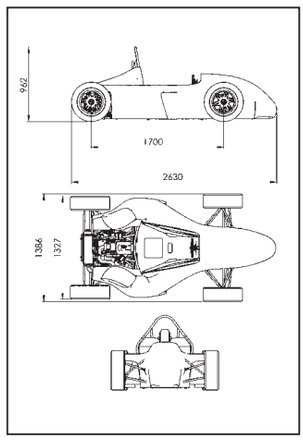
Transmission Single 520 chain

Differential Bacci limited slip differential with self made housing

Final Drive 2,75:1



WEIGHT DISTRIBUTION
REAR FRONT



CLASS 1

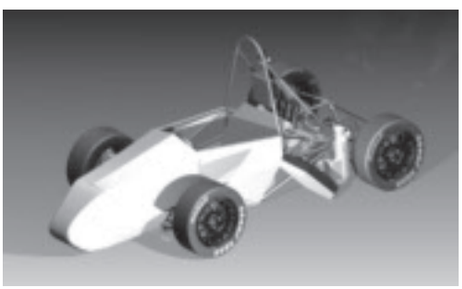
UNIVERSITY OF STRATHCLYDE
GLASGOW, UNITED KINGDOM

15

University of Strathclyde Motorsport is pleased to present USM X. With a team currently consisting of 40 members and running on a purely extra curricular basis, substantial work has been put in to make USM X a more competitive package than the solid base laid out by USM 09. The team is overseen by senior experienced members that encourage younger students to design smaller components in sub-systems. This ensures that USM has a continuous progression of knowledge within the team to maintain a high standard.

Validation of components on USM X has been achieved through dynamic testing. New developments for the team this year include aluminium hubs with steel inserts, resulting in a 50% reduction in mass and a Drexler differential with custom sprocket carrier. Other highlights of USM X include increased compression ratio of the engine and a custom rapid prototype intake.

USM would once again like to thank all our sponsors for backing the project.



TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2560mm/1390mm/1130mm/1535mm

Track (front/rear) 1200mm/1180mm

Weight including 68kg driver
(front/rear) 146kg/147kg

Suspension (front/rear) Double unequal length A-Arms. Pull rod front / Push rod rear actuated Ohlins/Cane Creek dampers

Tyres (front/rear)
Goodyear D2696 20.0x7.0-13

Wheels (front/rear)
OZ Superleggera 13" x 7"

Brakes (front/rear)
Laser cut steel floating rotors.
Wilwood GP320 & PS1 callipers.

Chassis construction
TIG welded steel tube space frame

Engine 2002 / Honda CBR 600 F4i

Bore/stroke/cylinders/cc
67mm bore/ 42.5mm stroke/
4 cylinder/ 599cc

Fuel 99 RON unleaded

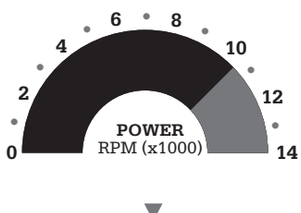
Fuel system
Student designed/built fuel injection system using DTAFast ECU.

Max power/max torque
10500rpm/9000rpm

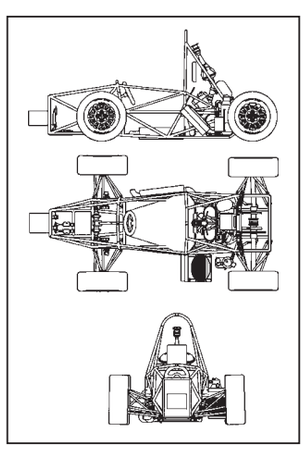
Transmission Single 525 chain

Differential
Drexler 2010 FSAE clutch pack differential

Final Drive 3.46:1



WEIGHT DISTRIBUTION
REAR FRONT



CLASS 1

CHALMERS UNIVERSITY OF TECHNOLOGY GOTHENBURG, SWEDEN

29

Chalmers Formula Student started in 2002 and has come a long way since. With help from sponsors, partners, industry contacts, mentors and teachers we build not only high performing race cars but also engineering talent.

Chalmers Formula Student 2010 is divided into six subgroups; body, frame, unsprung mass, engine and drivetrain, suspension and technical communication. By good teamwork and benchmarking, CFS10 will build a reliable, well documented car, making CFS10 well known in Scandinavia and finishing in the top ten at Silverstone in July 2010.

The 2010 car offers you inspiring creativity with titanium uprights, a directional sensitive locking differential and a new suspension solution. The harmony between the suspension package and the frame was designed through a propeller type anti-rollbar concept, which requires only three joints for the dampers and anti-roll bar. The engine is a Yamaha Fazer 600 cc with a tailor made intake, exhaust and fuel system. The body has been designed with a sense of continuum with colours stating less is more.

Furthermore, the overall goal is to reduce the weight by using light-weight materials such as carbon fiber and aluminium.

http://www.chalmers.se/formulastudent

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2700mm/1400mm/1085mm/1595mm

Track (front/rear) 1200mm/1170mm

Weight including 68kg driver (front/rear) 133kg/150kg

Suspension (front/rear)
Double unequal length A-Arm. Push rod actuated spring and damper. Adjustable propeller type anti-roll bars.

Tyres (front/rear)
Goodyear Eagle D2696 20.0x7.0-13

Wheels (front/rear)
Aluminum spokes and carbon fiber rims bolted together

Brakes (front/rear)
Radially mounted 4 piston calipers with 190 mm wavediscs/2 piston calipers with 190 mm wavediscs

Chassis construction
4130 Chromoly Steel, Single-piece Spaceframe, TIG welded

Engine 2007 Yamaha Fazer FZS6W

Bore/stroke/cylinders/cc
65.5mm bore/ 44.5mm stroke/ 4 cylinder /600cc

Fuel 99 RON unleaded

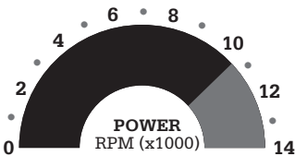
Fuel system Sequential fuel injection

Max power/max torque
88ps@10300rpm / 63Nm@9000rpm

Transmission Yamaha original 6 speed gearbox, Single 520 chain

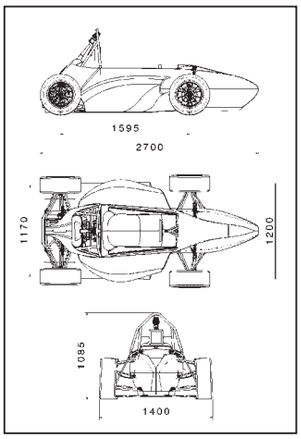
Differential Chalmers developed DSLD (Directional Sensitive Locking Differential)

Final Drive 3.85:1



WEIGHT DISTRIBUTION

REAR FRONT



CLASS 1

GRAZ UNIVERSITY OF TECHNOLOGY GRAZ, AUSTRIA

53

Our 52 team members mainly focus on designing and building a lightweight, powerful, innovative and aesthetic car, which is competitive in every single competition, easily adjustable for changes of driver, track, weather, etc., easily maintainable and safe. Therefore, advanced materials such as carbon fiber, titanium, aluminium alloys and high alloyed steels are used for designing and developing the single parts. For getting closer to the limit of the materials, many simulations and calculations as well as physical tests are done. Innovative systems invented by its predecessors were further improved and new solutions were found for better maintainability, easier setup adjustments and ergonomics. Reliability and different setups are the reason for a certain period of testing prior to the competitions. The team is divided in 7 modules, 4 technical ones that are working on bodywork, electronics, powertrain and suspension. Getting the perfect environment are the 3 organisational modules marketing and organisation, IT and x-active which is responsible for team spirit. The TU Graz Racing Team can look back to 6 years of experience, which mainly influenced the developement of our 7th car, the TANKIA 2010 alias “Lucky #7”, which will compete in all four European competitions.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2784mm/1453mm/980mm/1575mm

Track (front/rear) 1220mm/1180mm

Weight including 68kg driver (front/rear) 123kg/127kg

Suspension (front/rear)
double unequal length carbon A-Arms, pull(fr)/push(r) rod actuated horiz. spring/damper

Tyres (front/rear) 20.0 x 7.5 - 13 R25B Hoosier

Wheels (front/rear) 13 x 7.0 selfmade, single piece carbon rim

Brakes (front/rear) C/SiC disks and pads, hub mounted discs, 200mm front, 190mm rear

Chassis construction
carbon fibre monocoque

Engine 2006 / Yamaha YZF-R6 RJ11 four stroke in line four cylinder

Bore/stroke/cylinders/cc
67mm bore/ 42.5mm stroke/ 4 cylinder/ 599cc

Fuel 101 RON unleaded

Fuel system self designed multi point fuel injection

Max power/max torque
12000rpm/8000rpm

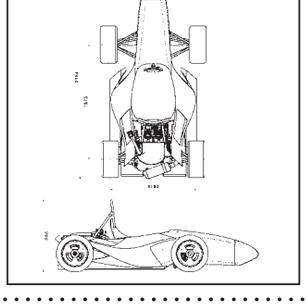
Transmission
Single 520 chain, self developed electric actuated gear box actuation

Differential Drexler multiplate limited slip differential

Final Drive 3.3

WEIGHT DISTRIBUTION

REAR FRONT



CLASS 1

UAS GRAZ
GRAZ, AUSTRIA

96

Joanneum Racing Graz team took part in the static competitions in 2003 for the first time and has built a new car every year since 2004. Each year, a new team with new innovative ideas takes over. The basic team consists of approximately 50 Vehicle Technology students from the University of Applied Sciences in Graz. The "Weasels" have been successful right from the beginning.
- 2003: won the Presentation event with their first participation
- 2006 in Italy: the Joanneum Racing team achieved the "Overall Winner"
- 2008 in Silverstone: the team was rewarded for the hard work with the 3rd place Overall
- 2009 at the first Austrian event: the team reached the 2nd place Overall

This year there is one aim: Get into the top 3 in the UK.

The jrX has an improved engine concept for high performance and efficiency. Furthermore, we improved the chassis concept from last year. We replaced the rear tubular frame with a Rear-Monocoque. Also, for the first time this year the gearbox is actuated hydraulically.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2660mm/1427mm/1019mm/1650mm

Track (front/rear) 1230mm/1150mm

Weight including 68kg driver
(front/rear) 116/142 kg

Suspension (front/rear)
Double unequal length A-Arm.
Pull rod actuated horizontal spring and Oelins TTX25 damper

Tyres (front/rear)
7.0/20.0 - 13 GOODYEAR

Wheels (front/rear)
6 x 13 CFRP wheels

Brakes (front/rear) laser cut, hub mounted, 230mm dia. / 210mm dia.

Chassis construction CFRP monocoque / CFRP ; roll-over hoops integrated in front monocoque; CFRP tubes integrated in rear spaceframe.

Engine BRP Rotax Type 449 single-cylinder engine

Bore/stroke/cylinders/cc
97mm/60.8mm/1 cylinder/449.3cc

Fuel E 85

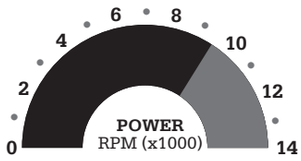
Fuel system Bosch Motorsport 2-Point injection system

Max power/max torque
9,500rpm/6,500rpm

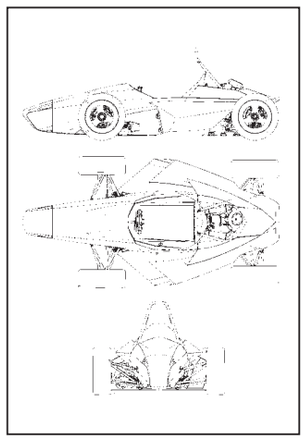
Transmission Single 5.8 x 1/4 Chain

Differential
Drexler limited-slip differential

Final Drive 31:14



WEIGHT DISTRIBUTION
REAR FRONT



CLASS 1

UNIVERSITY OF SURREY
GUILDFORD, UNITED KINGDOM

93

2010 will see the team enter its second ever car into the Class 1 event. We hope to greatly build upon our last year's performance by manufacturing a much more technologically advanced car, with the view of lowering the mass to below 200kg, increasing power and improving the handling of the car.

Exotic low weight, high strength materials have been further introduced into this year's car. The chassis is now a two piece monocoque, delivering weight and stiffness advantages. The wheel rims are now made from CFRP and the centre plates are made from Aluminium 7075-T6, resulting in a lighter weight rim.

Engine power has increased by utilising a more modern Honda engine, introducing a dry sump, custom air intake system and by fine tuning the custom map to get maximum power.

New transmission features include carbon fibre half-shafts and tripod joints with custom made integrated hubs, which are lighter weight solutions than previously used.

New to this year's team are five business management students, who will produce a comprehensive costing report and will also conduct the business presentation event. This will help the team to produce an overall better performance.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2653mm/1366mm/1045mm/1555mm

Track (front/rear) 1200mm/1150mm

Weight including 68kg driver
(front/rear) 113kg/155kg

Suspension (front/rear)
Double unequal length A-Arm.
Push rod actuated horizontally oriented spring and damper

Tyres (front/rear)
20.5" x 7.0" - 13" Hoosier slick tyre

Wheels (front/rear) 180mm wide, 3 pc Carbon fibre & Al Rim

Brakes (front/rear)
ISR Cast Iron disks, 230mm OD fronts, single 180mm OD rear

Chassis construction
Two-piece carbon fibre monocoque

Engine
2007/ Honda CBR600RR/ Inline four

Bore/stroke/cylinders/cc
67.0mm bore/ 42.5mm Stroke/ 4 Cylinder/ 599cc

Fuel 99 Octane

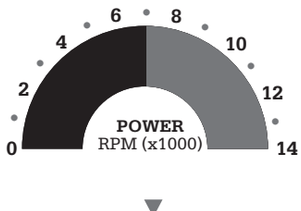
Fuel system
Custom multi point fuel injection

Max power/max torque
11000rpm / 7500rpm

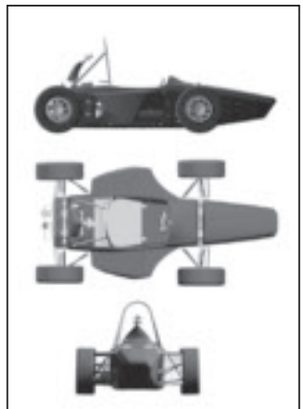
Transmission
Single 520 Tsubaki chain

Differential
Honda Suretrac based custom diff

Final Drive 3.2:1



WEIGHT DISTRIBUTION
REAR FRONT



CLASS 1

TECNUN UNIVERSITY OF NAVARRA GUIPUZCOA, SPAIN

19

FSTEC 10' is the second vehicle from the Tecnun MotorSport team. The main objectives of this year are: Improve the reliability, reduce the overall weight and construct a more effective car. To accomplish these points, the experience acquired during the last competition has been invaluable, as well as some components that we have incorporated this year, like the AP brakes and Drexler Limited Slip differential. Great efforts have been done to design a high performance suspension, a modular chassis, a dry sump lubrication system and an optimised drive shaft design. A secondary but very important objective has been to improve the team management. To sum up, this year we, Tecnun MotorSport Team, want to materialise our illusion of building a good car. The Formula Student competition brings us a great opportunity to achieve it.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2805mm/1420mm/1260mm/1750mm

Track (front/rear) 1250mm/1200mm

Weight including 68kg driver (front/rear) 130kg/185kg

Suspension (front/rear) Double unequal length A-Arm. Push rod actuated horizontally/vertically oriented spring and damper

Tyres (front/rear)
20.5 x 7.0 - 13 Hoosier

Wheels (front/rear)
152mm wide, Al Rim

Brakes (front/rear) Galfer Wave, Cast Iron, hub mounted, 270mm/ 250mm floating discs. Ap Racing CP-4226 double opposite piston Calipers, 25,4mm bore

Chassis construction
One piece tubular spaceframe

Engine 2004/ Suzuki GSX-R 600 k4/ four stroke/ four cylinders in line

Bore/stroke/cylinders/cc
67mm bore/ 42.5mm stroke/ 4 cylinder / 599cc

Fuel 99 RON unleaded

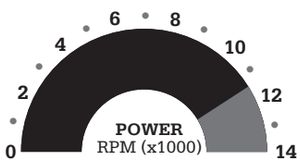
Fuel system Multi point fuel injection controlled by MegaSquirt ECU

Max power/max torque
80kW @ 11,500rpm/50Nm @ 8,000rpm

Transmission Single 520 R3 chain

Differential
Drexler Limited Slim Differential

Final Drive 3.72:1



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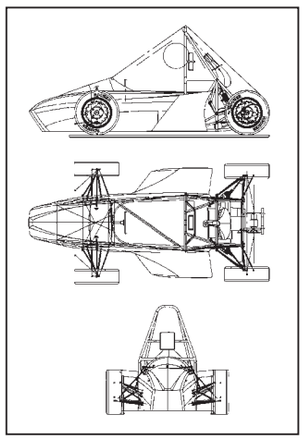
REAR FRONT



CLASS 1

UAS HAMBURG HAMBURG, GERMANY

69

The HAWKS Racing Team of HAW Hamburg was founded in 2003. The first car's appearance was based on the style of the Lotus 49b from 1969. Due to this fact, all our cars are decorated with the number 69.

The team then planned two years for designing the next car establishing a working team structure. The car of 2006 got a completely new design which was very attractive. From then on, every year a new car was built, every time with the aim to make it lighter, faster and even more powerful. Over the years it became a trademark of HAWKS, that every car combines uncompromising performance with an eye-catching design.

Our car for the 2010 Formula Student competition is the H05, which finished 3rd overall in last year's event in Italy. So we look forward to the competition ahead and are ready to show what the Hawks Racing Team is made of. Good Luck to all competitors!

Yours, HAWKS Racing Team #69

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2940mm/1396mm/960mm/1800mm

Track (front/rear) 1200mm/1200mm

Weight including 68kg driver (front/rear) 149Kg/151Kg

Suspension (front/rear)
Double unequal length A-Arm. Pull/Push rod actuated adjustable spring and damper

Tyres front and rear: Goodyear D2692 20.0x7.0-13

Wheels front and rear: aftermarket aluminum OZ rims, 13x7"

Brakes (front/rear) 4x254mm rotors, custom-made 4/2 piston calipers, adjustable balance

Chassis construction
One piece tubular spaceframe

Engine
Modified Kawasaki ZX-6R 2000

Bore/stroke/cylinders/cc
66.0mm/43.8mm/4 cylinders/599cc

Fuel 100 octane gasoline

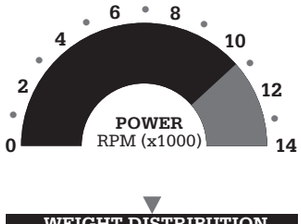
Fuel system
Student des/built, fuel injection, fully sequential, Walbro ECU

Max power/max torque
10.800rpm/8.900rpm

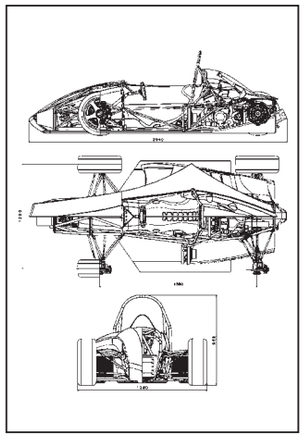
Transmission Single 520 chain

Differential Drexler clutch pack limited slip differential

Final Drive 4:1



WEIGHT DISTRIBUTION
REAR FRONT



CLASS 1

LEIBNIZ UNIVERSITÄT HANNOVER
HANNOVER, GERMANY

26

HorsePower Hannover, founded in 2007, is the Formula Student team of the University of Hannover in Lower Saxony, Germany.

After having some technical difficulties in last year's season we start this year with the second car of our team and hope to improve our result.

Because we have at least three times as many members than in 2009, we had enough manpower to design a whole new car. Improvements of the RP10 have been made in nearly every component. The most important ones are completely new suspension kinematics, a lighter tubular steel space frame, a pneumatic clutch system and a more powerful Yamaha YZF-R6 engine. Also, the body work was totally redesigned to get a more individual and recognisable appearance.

We are really looking forward to the event in Silverstone and are full of belief and hope to have more success this year.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2558mm/1380mm/1206mm/1540mm

Track (front/rear) 1220mm/1180mm

Weight including 68kg driver
(front/rear) 136kg/167kg

Suspension (front/rear)
Double unequal length A-Arm. Push rod actuated spring and damper

Tyres (front/rear)
205 R13 Continental

Wheels (front/rear) 7"

Brakes (front/rear)
Steel alloy, hub mounted, 220/210 mm dia. Lasered

Chassis construction
One piece tubular steel spaceframe

Engine
Yamaha YZF-R6 R05 four stroke in line four

Bore/stroke/cylinders/cc
65.5mm bore/44.5mm stroke/ 4 cylinder/599cc

Fuel 98 / 100 Oktan

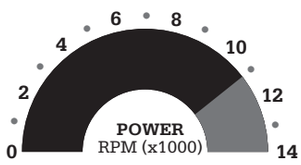
Fuel system
Yamaha multi point fuel injection

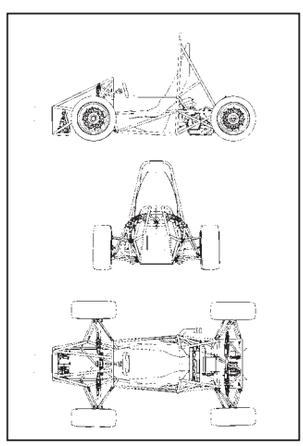
Max power/max torque
11,000rpm/7,340rpm

Transmission Single 520 chain

Differential
Drexler limited slip differential

Final Drive N/A





CLASS 1

UNIVERSITY OF HERTFORDSHIRE
HATFIELD, UNITED KINGDOM

64

UH Racing returns to the grid in 2010 for their thirteenth consecutive year in Formula Student. UH Racing is consistently ranked in the world top ten. The cohesive team structure encompassing both Class 1 and Class 1A teams has enabled improvements in productivity and brought a great deal of experience to the team. The Class 1 team consists of 13 final year undergraduates who have been developing this year's challenger as an extracurricular project.

This season's car, UH13, continues the developments of recent years. With the core principle of developing a low cost, high performance race car. A revised chassis and suspension system, coupled with further development to the power and drive train has led to a highly competitive car. UH Racing is aiming for the top step of the podium!

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2600mm/1357mm/1210mm/1535mm

Track (front/rear) 1200mm/1150mm

Weight including 68kg driver
(front/rear) 129kg/ 141kg

Suspension (front/rear)
Double unequal length A-Arm. Push rod actuated vertically oriented spring and damper

Tyres (front/rear)
20.5" x 7.0"- 13" R25B Hoosier

Wheels (front/rear) 3 pc Al rim 13" x 7", student machined centreset

Brakes (front/rear)
UH developed floating rotors - 220mm dia drilled, adjustable bias

Chassis construction
Tubular steel spaceframe with detachable rear bulkead, with bonded composite sandwich floor

Engine
Modified 2006/7 Yamaha R6 YZR-R6

Bore/stroke/cylinders/cc
67mm / 42.5mm / 4 cylinder / 599cc

Fuel 98 RON unleaded

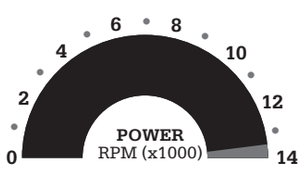
Fuel system Modified Yamaha fuel rail, fuel injection

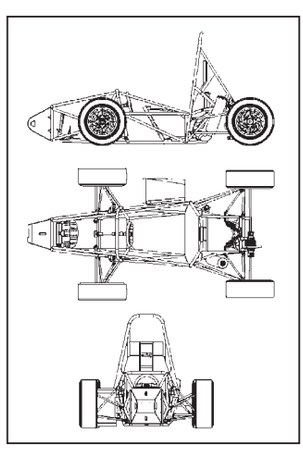
Max power/max torque
13500 rpm/ 9000rpm

Transmission Single 520 chain

Differential
Salisbury type, self designed case

Final Drive 3.42:1



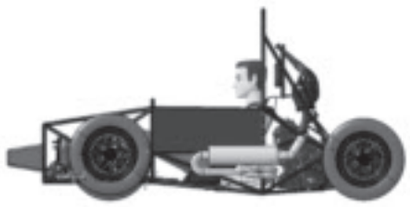


CLASS 1

HELSINKI METROPOLIA UAS
HELSINKI, FINLAND

05

HPF010 is the 8th Formula Student car designed and engineered by Metropolia Motorsport. The new car uses more composite materials in order to increase the torsional stiffness of the frame and to make parts even lighter. Power is produced by a modified Yamaha R6 engine. The engine has been tested and tuned on the engine dyno to verify the great results we got from the simulations. Variable length intake system provides wide powerband and great torque. The dry sump system guarantees lubrication even in hard corners. Increased power and torque are transferred to a Drexler LSD via a modified 4-speed hydraulically operated gearbox. The steeltube space frame is reinforced with a carbon fiber/nomex-honeycomb floor panel, sideplates and carbon fiber rear-end monocoque. Composite materials can also be found in components like the driver seat, steering wheel and driveshafts. Design of the bodywork was as challenging as always. The bodywork was designed using the philosophy we always have, style and smoothness. This year the 5th place isn't going to do it anymore. We're aiming for 1st place.



TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2650mm/1430mm/1220mm/1600mm

Track (front/rear) 1215mm/1150mm

Weight including 68kg driver
(front/rear) 124kg/141kg

Suspension (front/rear)
Double unequal length A-Arm.
Pull rod / Push rod actuated
horizontally mounted dampers.

Tyres (front/rear)
20.5 x 7.0-13 R25B

Wheels (front/rear) 3pc Al Rim

Brakes (front/rear)
Lasercut mild steel, hub mounted,
195mm dia. 4 piston brake caliper

Chassis construction
Steel tube spaceframe/
carbon fibre reinforcements

Engine 2009/ Yamaha R6
four stroke in line four

Bore/stroke/cylinders/cc
67mm / 42.5mm / 4 cylinder / 599cc

Fuel
99E unleaded

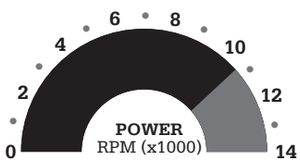
Fuel system
sequential fuel injection &
secondary fuelrail / 8 injectors

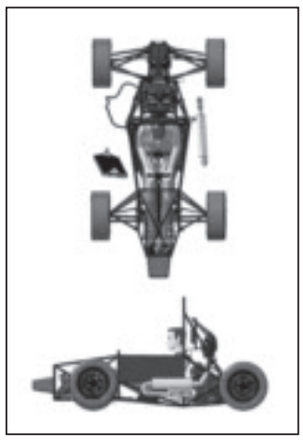
Max power/max torque
10700rpm / 8000rpm

Transmission single 428 chain

Differential
Drexler motorsport formula student

Final Drive 2.9





CLASS 1

UNIVERSITY OF HUDDERSFIELD
HUDDERSFIELD, UNITED KINGDOM

12

This will be the 11th year in the Formula Student event for team HARE, who are built up of students from a wide range of principles including mechanical, automotive & electrical engineering. This gives the team the best possible starting point to create its 2010 entry, the PFK-01.

As with all previous Team HARE entries to Formula Student, the PFK-01 uses a Honda CBR600 FSi engine at heart, with engine management coming from a MoTec ECU. Ensuring that the PFK-01 gets the most from its naturally aspirated engine, a custom carbon fiber intake has been developed alongside a tuned exhaust system. This is complemented by a Quaife LSD with custom housing.

A tubular spaceframe provides the backbone of the PFK-01, onto which attaches the fully adjustable suspension system made up of carbon fiber wishbones & 4 way adjustable shocks. Over this is laid the skin, again formed from carbon fiber, along with a full underfloor diffuser.

Every component on the car is designed with lightness in mind, allowing the PFK-01 to come in at 210kg, shedding 35kg from previous designs.

Needless to say, the PFK-01 is the most advanced car ever to have rolled out of the Team HARE workshop.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2812mm/1481mm/1035mm/1599mm

Track (front/rear) 1279mm/1200mm

Weight including 68kg driver
(front/rear) 125.1kg/152.9kg

Suspension (front/rear)
Unequal length carbon fibre
A-arms, Pull rod actuated,
Ohlins TTX 25 FSAE dampers

Tyres (front/rear)
Michelin 16/53-13 X TL

Wheels (front/rear) Keizer FSAE

Brakes (front/rear)
Floating Ø240mm/Ø220mm disks
with AP Racing 4pot/2pot calipers

Chassis construction
One piece tubular spaceframe

Engine Honda CBR 600 Fsi

Bore/stroke/cylinders/cc
67.0 x 42.5mm / 4 cylinder / 597cc

Fuel 98 octane petrol

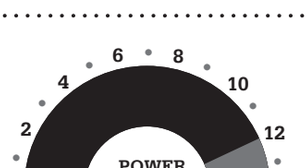
Fuel system
Student designed/built fuel
injection system (Honda OEM
rail) using MoTec ECU

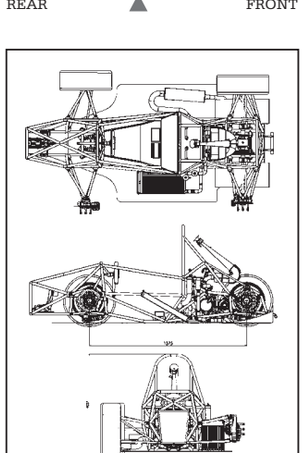
Max power/max torque
12,000rpm/9,000rpm

Transmission Chain drive

Differential
Student Designed Re-housed
Quaife ATB LSD differential

Final Drive 6.3:1





CLASS 1

ISTANBUL TECHNICAL UNIVERSITY
ISTANBUL, TURKEY

34

Istanbul Technical University FSAE Team is a first year competitor in Formula SAE. The newborn FSAE Team's first goal is to build a challenging car. To impress the judges, a fascinating view with a combination of ergonomics is our second goal. In chassis design, special importance was given to durability and reliability. Our impact attenuator is chosen by very detailed physical tests with high speed cameras. This allowed our team to test various materials in real conditions. The suspension system, one of the most important aspects of the car, has a convenient damping rate for better stability concerning performance. After calculations for shock absorbers, we decided to carry a choice on the bell-crank and pushrod mechanism. Besides the suspension system, the steering system was designed to have a good handling, stability and linearity. Since the brake system has an enormous effect on performance and safety, brakes are used on each front and rear sides, also supporting the independence between front and rear with the aim of better stability and balance on cornering.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
3024mm/1419mm/1249mm/1700mm

Track (front/rear) 1240mm/1200mm

Weight including 68kg driver
(front/rear) 170kg/210kg

Suspension (front/rear)
Double unequal length
A-Arm. Push rod / Pull rod
actuated spring and damper

Tyres (front/rear)
Hoosier R25B 20.5x7.0-R13

Wheels (front/rear) 13x6 Al

Brakes (front/rear) Cast Iron, hub mounted, 240mm dia. Drilled

Chassis construction
One piece tubular spaceframe

Engine
2001 / Honda CBR600F
four stroke in line four

Bore/stroke/cylinders/cc
67mm bore/ 42.5mm stroke/
4 cylinders / 599cc

Fuel 100 RON unleaded

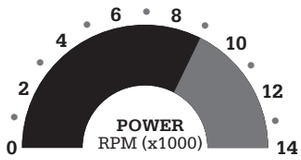
Fuel system
Honda multi point fuel injection

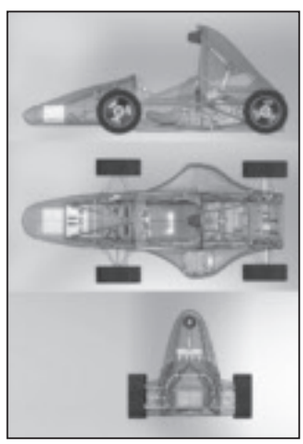
Max power/max torque
9000rpm/6500rpm

Transmission Single 525 chain

Differential
Quaife automatic torque biasing differential

Final Drive 3.3:1





CLASS 1

KARLSRUHE INSTITUTE OF TECHNOLOGY (KIT)
KARLSRUHE, GERMANY

09

KA-RaceIng is the Formula Student team of Karlsruhe Institute of Technology (KIT), formerly University of Karlsruhe (TH). The team consists of 53 students from different fields of study, mainly mechanical, electrical and industrial engineering. Organised into mechanical or organisational sub teams, every team member has a task for which he is fully responsible. The KIT 10 is the fourth car of KA-RaceIng and the third car participating at Silverstone. The highlight of the KIT10 is the direct injection fuel system which we developed in the last two years. It is the first direct injection system in a Formula Student race car. With this system, we can reduce the fuel consumption and increase the torque in the middle rpm range. KA-RaceIng would like to thank all its supporters which made it possible to build this race car. The team is looking forward to another exciting and successful competition at Silverstone.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2795/1440/997/1650mm

Track (front/rear) 1220mm/1150mm

Weight including 68kg driver
(front/rear) 131kg/142kg

Suspension (front/rear)
unequal lenght A-Arms, Pull rod/ Push rod with torsion springs an Sachs F3 TRD dampers

Tyres (front/rear)
20.5x7-13 Hoosier R25B

Wheels (front/rear)
in house developed, centerlock, 3 spoke CRFP Rim

Brakes (front/rear)
Floating steel, 2x ISR 6 Pistons/ 2x ISR 4 Pistons, Continental ABS

Chassis construction Modular CRFP monocoque produced with VARTM (Vakuum Assisted Resin Transfer Moulding) method

Engine Honda CBR 600 PC 35

Bore/stroke/cylinders/cc
67.0 x 42.5mm/ 4 cylinders/ 599cc

Fuel 99 octan

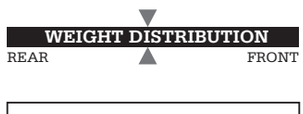
Fuel system in house developed direct injection system

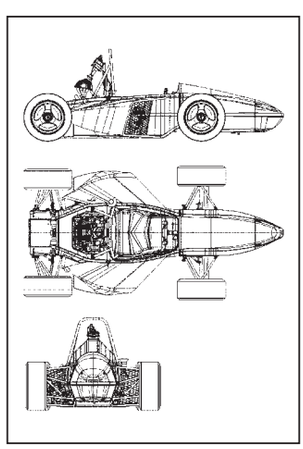
Max power/max torque
60kW at 10500rpm/60Nm at 8500rpm

Transmission Single 520 chain

Differential
Drexler clutch pack limited slip differential, adjustable bias ratios

Final Drive 3.67:1





CLASS 1

KARLSTAD UNIVERSITY
KARLSTAD, SWEDEN

54

Clear River Racing is representing Karlstad University at Silverstone for the third consecutive year. The team consists of 38 students from various engineering degrees all aiming to build the best car so far.

This year's theme is ice which is reflected in the body design, graphic profile and the colour selection. The car can be driven all year round, in wintertime using studded tires to drive on frozen lakes.

The body model has been milled in our workshop by the team members. The model is then used to produce the all-covering body made of carbon fibre. This year we use a solenoid to perform automatic or semi-automatic gear shifting by buttons on the steering wheel. To minimise the weight, the uprights, hubs, and A-arm mountings have been manufactured out of high strength aluminium. When constructing the wheel suspension we focused on making it stable, but also easily adjusted since we are running on many different surfaces. The inlet manifold channels are reduced to increase the air velocity. The camshafts are optimised to achieve a more prominent power peak.

Using our well equipped workshop, we've been able to manufacture almost everything on the car ourselves, which we are very proud of.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2700mm/1410mm/1170mm/1680mm

Track (front/rear) 1220mm/1160mm

Weight including 68kg driver (front/rear) 119kg/179kg

Suspension (front/rear)
Double unequal length A-arm. Push rod actuated spring and damper. Adjustable anti roll bars.

Tyres (front/rear)
521x178-330 / 521x178-330 Hoosier

Wheels (front/rear)
178mm wide, 1 pc OZ Al Rim

Brakes (front/rear) Cast Iron, hub mounted, 210 mm dia drilled, cnc-machined calipers, ISR

Chassis construction
One piece tubular spaceframe

Engine 2003 / Yamaha R6 four storke in line four

Bore/stroke/cylinders/cc
65.5mm bore/ 44.5mm stroke/ 4 cylinder/ 600cc

Fuel 99 RON unleaded

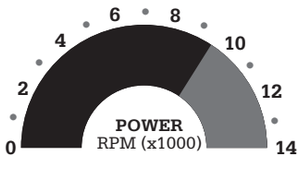
Fuel system Yamaha fuel injectors and Vipec control unit

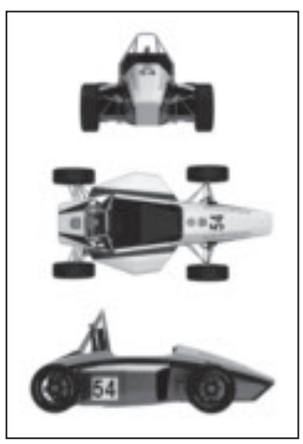
Max power/max torque
9,400 rpm / 7,900 rpm

Transmission Single 520 chain

Differential FSAE Drexler limited slip differential

Final Drive 50:13





CLASS 1

INDIAN INSTITUTE OF TECHNOLOGY KHARAGPUR, KHARAGPUR, INDIA

188

Formula Student at IIT Kharagpur began in October 2008 when a group of enthusiastic students took the initiative to undertake such a project and involuntarily spread the knowledge of automotive technology and innovation, something which was surprisingly still very new in the institution. This was the birth of Team Kart.

It was a very daunting task ahead of them since nothing like this had ever been done before at IIT Kharagpur. The challenges of administrative coordination and approvals, research and development of the car, all had to be done by the team alone. But these were met with vigour and determination which ultimately made it possible for this project to succeed.

The entire team is divided into sub-teams, namely Engine and Transmission, Suspension and Steering, Brakes, Chassis and Body on the technical side and Sponsorship, Public Relations, Design and Web on the Management side. This ensures parallel work and thus leading to quicker results and solutions.

The work of Team Kart doesn't end with this competition. Our entire team now consists of students from all academic years so that they can understand, appreciate and ultimately take this project forward in the coming years. We never stop our team members from constantly challenging themselves and bringing out new forms of innovation to continuously better our automobiles.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
3100mm/1428mm/1225mm/1831mm

Track (front/rear) 1250mm/1180mm

Weight including 68kg driver (front/rear) 138kg/162kg

Suspension (front/rear) Double unequal length A-Arm. Push rod actuated, horizontally oriented spring and damper, Roll center: 39mm from ground, Ride height: 40mm static

Tyres (front/rear)
520.7/177.8X330.2mm R25B Hoosier

Wheels (front/rear) 330.2mm dia, 139.7 mm wide, Single pc Al Rim

Brakes (front/rear) Cast Iron, hub mounted, 250mm dia. Rotor

Chassis construction
ASTM 106 Grade B seamless MS single piece tubular spaceframe with tube specifications of:
- 26.7mm OD x 2.87mm WT
- 25.4mm OD x2.5mm WT

Engine Honda CBR 600RR

Bore/stroke/cylinders/cc
67.0mm bore/ 42.5mm stroke/ 4 cylinder/ 599cc

Fuel 99 RON unleaded

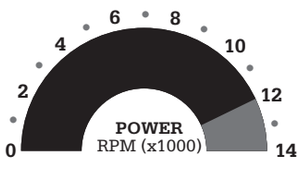
Fuel system
PGM-FI with throttle bore 40mm

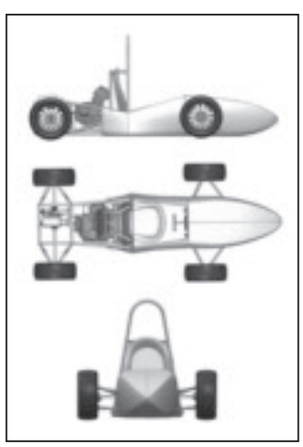
Max power/max torque
12000 rpm max/ 65Nm

Transmission Single 520 chain, front sprocket: 16t, rear sprocket: 56t

Differential Quaife automatic torque biasing differential

Final Drive 3.5:1





CLASS 1

UAS KIEL
KIEL, GERMANY

52

Raceyard Kiel, the northern-most of the German Formula Student teams, started to participate in Formula Student events in 2006, when the team made an impressive debut at the Hockenheim ring.

In 2009, the team completed its most successful season so far, finishing 11th at Silverstone and winning the acceleration event at both Silverstone and Hockenheim. Having proven that Raceyard can build vehicles which go fast in a straight line, our goal for the 2010 competitions is to improve cornering capabilities.

The team had gained a lot of knowledge in this magnificent competition, so we are confident to achieve our goals and get our footprint among the top 10 teams in the European FS events. In order to improve the performance in the dynamic events other than acceleration, the suspension of the vehicle had to be changed drastically. The main changes include the choice of new tyres and the reduction of the wheelbase.

We would like to thank all our sponsors for their magnificent support! And always remember: we are "NORDISH BY NATURE"

TECHNICAL SPECIFICATION

Length/width/height/wheelbase 2620mm/1384mm/948mm/1600mm

Track (front/rear) 1200mm/1150mm

Weight including 68kg driver (front/rear) 132kg/144kg

Suspension (front/rear) Double unequal length A-Arm. Pull rod/Push rod actuated spring and damper

Tyres (front/rear) 20.5x7-13 A50 Avon

Wheels (front/rear) 178 mm wide, 5 pc Al, hollow wheel shells

Brakes (front/rear) Stainless steel, hub mounted, 250/210mm diameter, drilled for ventilation, two-piston brakes front and rear

Chassis construction One piece tubular spaceframe, 4130 Chromoly steel

Engine 2005 Honda CBR 600RR four stroke in line four

Bore/stroke/cylinders/cc 67mm bore/ 42.5mm stroke/4 cylinder/599 cc

Fuel 99 RON unleaded

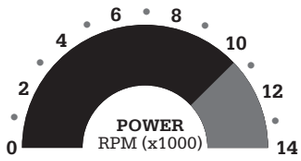
Fuel system Athena/Walbro system with sequential injection and wasted-spark ignition

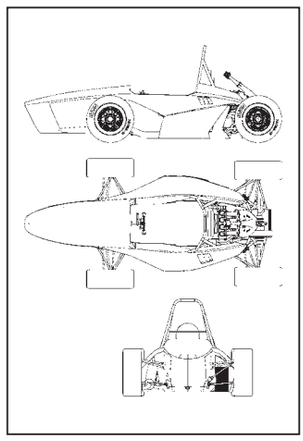
Max power/max torque 10,500rpm/8,300rpm

Transmission Single 520 chain

Differential GKN Salisbury type limited slip differential in lightweight aluminium housing with internal preload adjustment

Final Drive 4:1





CLASS 1

QUEEN'S UNIVERSITY
KINGSTON, CANADA

38

The Queen's University Formula SAE Team is looking forward to attending Formula Student UK for the first time ever this season. The team consists of 15 individuals that are dedicated to conceiving, engineering, fabricating, testing, and racing a world class Formula SAE car. The team is unique in that a large majority of the car is fabricated in house by team members (i.e. Driveshafts, CV joints, differential housing, hubs, printed circuit boards, brake rotors, uprights) over the course of approximately four months to reduce cost. The team has focused their engineering efforts in areas that will provide the best competition result within resource limitations. The Queen's car runs Goodyear D2696 tires to provide maximum acceleration capabilities and good kinematic flexibility.

The wheel packages, carbon fiber control arms, and chassis have been designed to minimise mass while meeting stiffness targets. CG height and inertia have further been reduced through the use of front pullrods, a 55˚ seatback angle, a dry sump oiling system, a 44" track, and a 60" wheelbase. The Honda F4i has been chosen for its reliability and driveability. The end result is a reliable, stiff, lightweight, highly adjustable, race car.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase 2645.4mm/ 1301.8mm/ 861.1mm/ 1527.2mm

Track (front/rear) 1124mm/1124mm

Weight including 68kg driver (front/rear) 285kg

Suspension (front/rear) Double unequal length A-arm. Pullrod (front) and Pushrod (rear) actuated.

Tyres (front/rear) Goodyear Eagle D2696, 508x178-330

Wheels (front/rear) 152mm wide, three piece aluminum

Brakes (front/rear) Cast iron floating rotors (235/195mm), Tilton 77 Series MCs

Chassis construction 4130 Steel spaceframe

Engine Honda F4i

Bore/stroke/cylinders/cc 67mm/42.5mm/4/599cc

Fuel 99 Octane unleaded

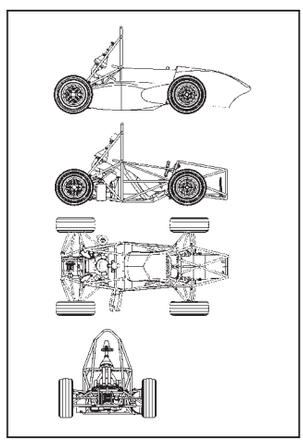
Fuel system Electromotive TEC GT Engine Management

Max power/max torque 80hp @ 10000rpm, 48lb-ft @ 7600 rpm

Transmission 520 chain driven

Differential Salisbury type LSD with aluminum housing

Final Drive 3.73



CLASS 1

LANCASTER UNIVERSITY
LANCASTER, UNITED KINGDOM

11

The 2010 Lancaster Race Car team consists of mixed discipline Engineering Masters students. Despite a dedicated and enthusiastic team and a low budget, we aim to compete successfully in all events.

This year our main aim is to speed up production. This allows more time to work with the final car, making small improvements and gaining driver experience. To do this we look at previous years designs and improve or re-invent previous systems.

The main change is to the chassis design; we have chosen a steel box section as opposed to tube. This reduces the time taken for manufacture and reduces the cost dramatically. As in previous years we are using a Honda CBR600F4i engine with custom dry sump, intake and exhaust manifolds.

Body work is provided using sheet aluminium. The advantages of fibre-glass or carbon fibre sheets are that they are cheaper to buy and work with, again keeping with our aim to improve speed of manufacture and reduce costs.

Last year we saw how essential driver experience is and so we have made steps to train the drivers in racing a car of this type. All these factors will help improve Lancaster University Race car team's performance at the events.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2825mm/1400mm/1084mm/1640mm

Track (front/rear) 1200/1150

Weight including 68kg driver (front/rear) 129Kg/193Kg

Suspension (front/rear)
Lancaster Links

Tyres (front/rear)
Front and Rear Hoosier
18 x 6 x 10 R25B Compound

Wheels (front/rear)
185mm Wide, 3pc Al Rim

Brakes (front/rear)
Mild Steel, Hub Mounted,
175mm Dia, Drilled

Chassis construction
One piece steel square box section frame

Engine Honda CBR 600F4i Four stroke inline four cylinder

Bore/stroke/cylinders/cc
67.0mm Bore /42.5mm Stroke/
4 Cylinder/ 599CC

Fuel 99 RON Unleaded

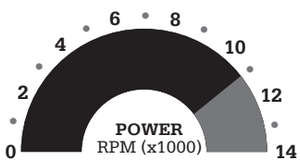
Fuel system
Multipoint fuel injection

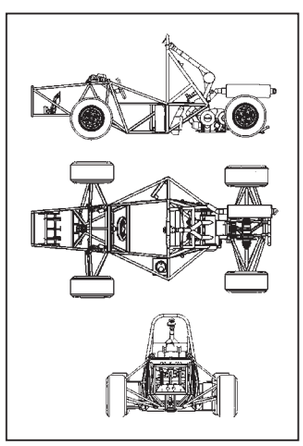
Max power/max torque
11,000rpm/8,000rpm

Transmission
Single Chain 520 Chain

Differential
Honda Quadbike Differential

Final Drive 3.2:1





CLASS 1

TUSCIA UNIVERSITY
LAZIO, ITALY

80

POMOS Reparto Corse is the racing team of the Sustainable Mobility Centre of Regione Lazio, POMOS, which organises motorsport events and competitions with an ecological and educational feeling.

In the Centre of Cisterna di Latina, the POMOS laboratories are equipped for the design, construction and testing of innovative and educational prototypes of POMOS Reparto Corse; the team is able to fulfil all the processes, from design to management, during racing competitions for experimental and promotional purposes.

POMOS Reparto Corse covers a very important educational role, with the participation of university students in all the activities of the team; the curriculum of a good, young automotive engineer needs strong and effective practical experience of real group work.

In order to achieve this important target, POMOS Reparto Corse is participating in Formula Student with the University of Tuscia, after a collaboration with Sapienza and Tor Vergata universities in 2007 and 2008.

POMOS Reparto Corse has participated in Formula SAE Italy 2009 as a first year team, achieving the 36th place. In 2010, participating in Formula Student UK, Formula Student Germany and Formula SAE Italy is planned. For 2011, a full electric Formula SAE car will become a realisation.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2545mm/1380mm/1120mm/1575mm

Track (front/rear) 1200mm/1185mm

Weight including 68kg driver (front/rear) 151kg/172kg

Suspension (front/rear)
Double unequal length A-Arm.
Push rod actuated horizontally oriented spring and damper

Tyres (front/rear) 20.0" x 7,0"-13 "SAE2" D2696 Goodyear

Wheels (front/rear)
13" x 6.5" Magnesium Rim

Brakes (front/rear) 4 AP Racing CP3696-6E0 aluminium calipers, 4 AP Racing CP2866-211 discs 7.0mm Thick - 146.0 P.C.D. - Bolted

Chassis construction
One piece tubular spaceframe,

Engine 2002 / HONDA CBR 600 F Sport four stroke in line four

Bore/stroke/cylinders/cc
67.0mm bore / 42.5mm stroke /
4 cylinder / 599cc

Fuel 99 RON unleaded

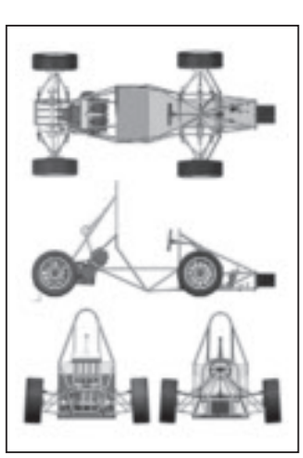
Fuel system Walbro multi point fuel injection

Max power/max torque
10,800rpm/8,500rpm

Transmission Single 520 chain

Differential
Drexler Limited slip differential

Final Drive 52:11



CLASS 1

UNIVERSITY OF LIVERPOOL
LIVERPOOL, UNITED KINGDOM

108

The University of Liverpool Motorsport team began life in 2005 and is now entering its fifth year in the UK Formula Student Competition. The team comprises of 19 final year and penultimate year mechanical and material MEng engineering students. The team's performance at the 2009 competition was greatly improved after a number of disappointing years, putting the team in good stead for the most successful year in its history.

The most significant change for ULM_005 sees the introduction of a tubular steel space frame, replacing the monocoque design of previous years. An aluminium honeycomb floor gives strength and improves stiffness while keeping weight to a minimum.

The Aprilia RXV 550 engine used for ULM_004 has been upgraded to an SXV 550 Van De Bosch edition, improving power and driveability. The car also utilises a pneumatic gear shifter and fast change slipper clutch, while a bespoke inlet and exhaust enhances power output.

Finally, the team would like to thank all of our sponsors this year, without them the construction of the car would not have been possible.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase 2753mm/1520mm/1120mm/1530mm

Track (front/rear) 1200mm/1160mm

Weight including 68kg driver (front/rear) 111.2kg/166.8kg

Suspension (front/rear) Unequal length A-Arms. Push rod actuated laterally mounted Fox DHX 5.0 shocks and dampers

Tyres (front/rear) 19.5 x 6.5-10 R25A Hoosier

Wheels (front/rear) Keizer alloy 254mmx150mm-25mm offset, 4mm thick 6061 aluminium

Brakes (front/rear) Willwood PS1 Callipers. Student designed, AISI 01 ground steel discs, hub mounted

Chassis construction One piece tubular spaceframe,

Engine 2010 / Aprilia SXV Van De Bosch 550 V-Twin Four Stroke

Bore/stroke/cylinders/cc 80mm bore/ 55mm stroke/ 2 cylinder/ 550 cc

Fuel 98 RON super unleaded

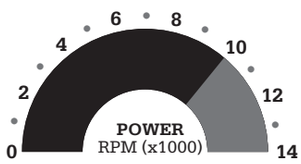
Fuel system Aprilia multi point fuel injection with DTA Fast S60 ECU

Max power/max torque 10,000rpm/7,000rpm

Transmission Tsubaki 520 XRG chain

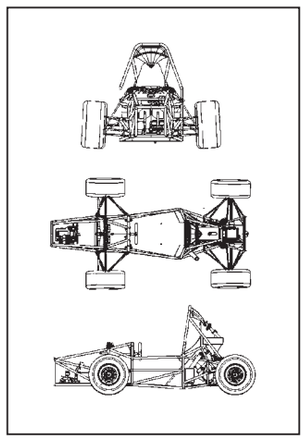
Differential Zexel Torsen T-1 University Special

Final Drive 10:3



WEIGHT DISTRIBUTION

REAR FRONT



CLASS 1

LIVERPOOL JOHN MOORES UNIVERSITY
LIVERPOOL, UNITED KINGDOM

22

2010 is LJMU Racing Team's first Class 1 entry. Having successfully completed Class 3 then Class 2, the team has now developed the existing concept designs into a fully functional racing car. The huge transition from Class 2 to Class 1 required a more appropriate team structure to ensure all aspects of the competition are considered. A team manager was employed to oversee 8 MEng students who supervised the design and manufacture, that was completed by 15 BEng and BSc 3rd year students.
The ethos of the LJMU10 entry is a well engineered and reliable car with the ultimate aim to finish all events. Not only has the team concentrated on completing the car, but a lot of time and effort has been spent on building the infrastructure to ensure the team can maximise their effort in 2011 on the weight and cost budget. LJMU Racing Team is using the 2010 competition as a basis on which to build a successful and prominent Formula Student team. LJMU Racing Team would like to thank all of its sponsors. Our biggest gratitude is to the LJMU School of Engineering Technology and Maritime operations without which none of this project would be possible.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase 2650mm/1500/1250/1600

Track (front/rear) 1500mm/1490mm

Weight including 68kg driver (front/rear) 116kg/174Kg

Suspension (front/rear) Double unequal length A-Arm. Directly acting / Push rod actuated horizontally oriented spring and damper

Tyres (front/rear) 6.0 x 20 x 13 A45 Avon

Wheels (front/rear) 150mm wide single piece aluminum alloy

Brakes (front/rear) Cast Iron hub mounted, 248mm dia. Grooved. centre mount at rear

Chassis construction one piece tubular steel spaceframe

Engine 2004 / Honda CBR 600 RR four stroke in line four

Bore/stroke/cylinders/cc 65.5mm bore/ 44.5mm stroke/ 4 cylinder/ 599cc

Fuel 98 RON unleaded

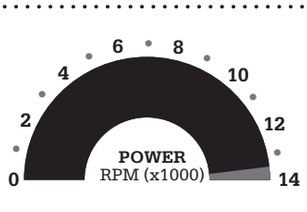
Fuel system Honda Multi point fuel injection, HRC control

Max power/max torque 13,500rpm/7,500rpm

Transmission Single 520 chain

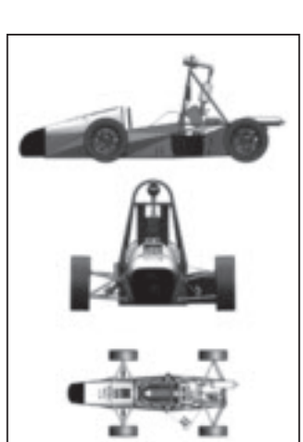
Differential Quaife automatic torque biasing differential

Final Drive 4:1



WEIGHT DISTRIBUTION

REAR FRONT



CLASS 1

UNIVERSITY COLLEGE LONDON (UCL) LONDON, UNITED KINGDOM

33

With a team of 7 fourth year MEng students from UCL, we have taken it upon ourselves to compete in this year's competition with very limited experience. This has set about the primary objective of component reliability, while maintaining a strict mass constraint. With such a small team, much exposure has been obtained to the design and analysis of the various components whilst great enthusiasm from all members has provided sufficient drive through all the obstacles faced. We wish to set a firm foundation for future years, whilst having as much fun as possible, and taking part in all dynamic events is a definite desire. With a workshop in the heart of London, most components were chosen to be custom built. Although time restraints have been cutting edge all year round, we have squeezed every hour to take part in the race, so wish us luck!

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2595mm/1432mm/1158mm/1575mm

Track (front/rear) 1215mm/1138mm

Weight including 68kg driver
(front/rear) 162kg/108kg

Suspension (front/rear)
Double unequal length A-Arm. Push Rod actuated. Fox Van-R Shocks.

Tyres (front/rear)
7.2in/20.0-13 Avon Tyres

Wheels (front/rear)
Compomotive 13" Rims

Brakes (front/rear) 220 mm dia. Drilled EBC Brakes / 296mm dia. Drilled EBC Brakes

Chassis construction
One piece tubular CDS Spaceframe

Engine 1997 / Honda CBR 600 F3

Bore/stroke/cylinders/cc
65 mm bore/ 45.2 mm stroke/ 4 cylinder/ 599cc

Fuel 98 RON unleaded

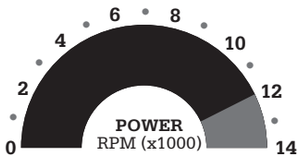
Fuel system Direct port injection EURO-4 ECU.

Max power/max torque
64.7 kW @ 12000 rpm/ 58.7 Nm @ 5000 rpm

Transmission single 520 chain

Differential Quaife DF7Z5 Torque control differential

Final Drive 3.85:1



WEIGHT DISTRIBUTION

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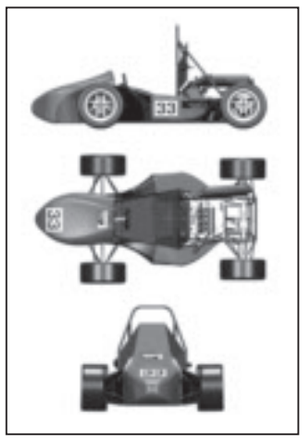
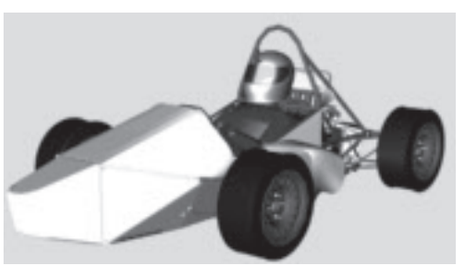


CLASS 1

LOUGHBOROUGH UNIVERSITY LOUGHBOROUGH, UNITED KINGDOM

20

LUMotorsport is now entering its 8th year of the competition and is now establishing itself as one of the top Formula Student teams in the country with hopes of becoming the top UK team in a competition this year. The team is made up of 10 highly motivated individuals who fit designing, manufacturing and testing the car around their individual degree courses. Needless to say, this involves lots of late nights, many pizzas and lots of fun along the way. This year's car LFS10 is based upon last year's excellent performing car LFS09 which was by far LUM's most reliable car to date. The main focus for this year's car has been to remove over 20Kg from the car whilst improving performance and increasing fuel economy. To achieve these targets, every component designed for LFS10 has been scrutinised to remove the most amount of weight. These components include new front uprights and stub axles, new inlet manifold, simpler pedal box, improved chassis and suspension. With all these improvements based upon a successful recipe, we hope that LFS10 will become one of the top cars in this year's competition. Good Luck to All!



TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2758mm/1487mm/1005mm/1547mm

Track (front/rear) 1300mm/1130mm

Weight including 68kg driver
(front/rear) 140kg/148kg

Suspension (front/rear)
Double unequal length A-Arm. Pull rod actuated horizontal Cane Creek dampers and springs

Tyres (front/rear)
20.5x7.0-13" Hoosier R25B

Wheels (front/rear) Braid 2-piece alloy 13"x8J 45mm negative offset

Brakes (front/rear)
Stainless Steel, Hub mounted Floating Disc; 220mm Front; 205mm Rear

Chassis construction
4130/Mild Steel Tubular Space Frame with bonded CFRP Panels

Engine 2005 Honda CBR600RR Four Stroke In Line Four

Bore/stroke/cylinders/cc
67mm/42.5mm/4 cylinders/599cc

Fuel 99 RON unleaded

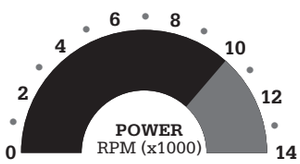
Fuel system Bespoke 4 Point Single Injection, Motec M800 ECU

Max power/max torque
10,000rpm/7,500rpm

Transmission Single Chain

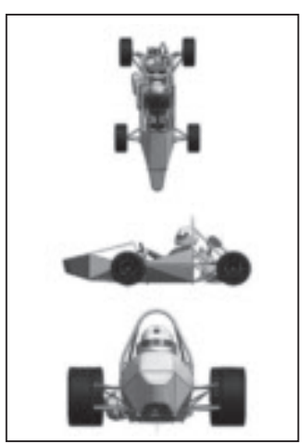
Differential
Drexler Formula Student LSD

Final Drive 4:1



WEIGHT DISTRIBUTION

REAR FRONT



CLASS 1

UNIVERSIDAD EUROPEA DE MADRID
MADRID, SPAIN

83

This is the second year that the Universidad Europea de Madrid (Formula UEM) will participate in Formula Student, a big challenge which brings students face to face with real-life problems of an engineer and therefore providing them with a vital experience.

This competition demands a high level of technical knowledge and for this reason we have gathered a team of 15 students in the latest years of their engineering studies.

This year´s goal was to design, build and test a car from scratch to be able to compete for the 2010 edition focusing in performance. Based on last year´s experience, the design has been focused on the suspension and chassis design.

The team has been structured in 6 groups: Powertrain, Chassis, Electronical design, Steering and suspension, Braking system and Management and logistics which work jointly to be able to achieve our objective to compete this year.

Although we know our attempt this year is primitive at best, Formula UEM understands that the most important aspect of FS is learning experience, which has been our main goal already achieved this year.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase 2699mm/1225mm/1104mm/1650mm

Track (front/rear) 1225mm/1208mm

Weight including 68kg driver (front/rear) 141/147kg

Suspension (front/rear) Double unequal length A-Arm. Push rod actuated horizontally oriented spring and damper

Tyres (front/rear) 20,5x7,0x13 R25B Hoosier

Wheels (front/rear) 13´´x 7´´ Aluminium Braid Rim

Brakes (front/rear) Floating Caliper. Lasercut disc, hub mounted, 250'mm dia. X46Cr13 steel

Chassis construction One piece tubular 4003 steel spaceframe,

Engine 2005 / Honda CBR 600rr/ four stroke/ in line four cylinder

Bore/stroke/cylinders/cc 67mm bore/42,5mm stroke/ 4 cylinder/599 cc

Fuel 99 Octane Petrol

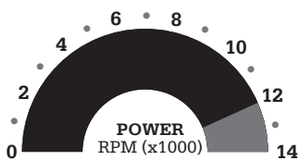
Fuel system OEM Honda CBR 600rr 2005 with Power Commander fuel and ignition module

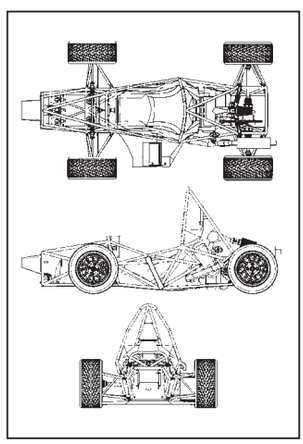
Max power/max torque 12,000rpm/8,000rpm

Transmission Single 520 chain

Differential Quaife automatic torque biasing differential

Final Drive 4:1





CLASS 1

UNIVERSIDAD POLITÉCNICA DE MADRID
MADRID, SPAIN

58

The Universidad Politecnica de Madrid Racing Team is once more fighting in the Formula Student competition. This year we have made an equilibrium between the things from the past year that we know that work and new items in order to develop the car. One of the radical changes in this car is the new pneumatic shifting system with the gears on the steering wheel including the clutch. The new car also incorporates a traction control adjustable in various positions from the cockpit. In the suspension area, we achieved an anti-squad geometry and adjustable front RC . In order to reduce weight, a lot of composite materials have been used like the new carbon fiber economical seat that gives more comfort to the driver. In the engine division we have designed a new plenum and with many tests we have tried to smooth the torque-rpm curve . In the brakes aspect we have made a new fully student design up-rights in aluminium cast. Also, we have included a Drexler (LSD) and lightened the whole transmission assembly. Another big change in the car is the lack of front-rear wings. This decision was made on a benefit/cost parameter, so this year the aerodynamics is left only to the body work and the ground effect plate.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase 2766mm/1370mm/1070mm/1600mm

Track (front/rear) 1230mm/1160mm

Weight including 68kg driver (front/rear) 135kg/165kg

Suspension (front/rear) Unequal length A - Arms. Push rod actuated. Öhlins damper units

Tyres (front/rear) 20.5x6 – 13 R25B Hoosier/ 20x7.5 – 13 R25B Hoosier

Wheels (front/rear) Keizer alloy 13"x6" – 33 offset / Keizer alloy 13"x7" – 2 offset

Brakes (front/rear) Student designed, laser cut and ground from steel, hub mounted, 220mm dia.

Chassis construction Stainless steel AISI A304 tubular spaceframe with carbon fibre baquet and floor panels

Engine 2003 Yamaha YZF-R6

Bore/stroke/cylinders/cc 65.5mm bore/44.5mm stroke/ 4 cylinder/599cc

Fuel 99 octane petrol

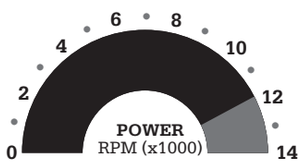
Fuel system Custom fuel injection system using PE – ECU

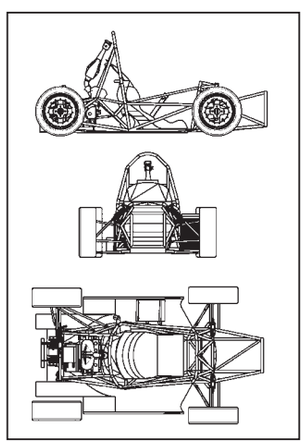
Max power/max torque 11780 / 7840 rpm

Transmission Single 520 chain

Differential Drexler (LSD)

Final Drive 42:11





CLASS 1

UNIVERSITY OF MANCHESTER
MANCHESTER, UNITED KINGDOM

17

University of Manchester enters Formula Student for the fifth time with the aim of improving on its highest place finish in 2008. Last year saw a misinterpretation of the new cockpit template rules and a disappointing performance in the dynamic tests. However, Manchester showed strongly in the static events and looks to improve once again up the standings.

The MAN X is the most professional and detailed car ever produced by Manchester. Featuring Ohlins/Cane Creek Dampers, Torsen Differential, Aluminium Body Panels with Carbon Nose and Pneumatic Gear Shift. Confidence is high that with valuable testing and driver training, the 2010 Formula Student event will see the University of Manchester Formula Student Team record its highest place finish ever.

The small team is made up of members from first to fourth years, from Mechanical, Aerospace and Electrical Engineering backgrounds. Formula Student is not part of any course at Manchester making every member of the team a volunteer who dedicates their time freely. A good finish at the competition will see the profile of Formula Student raised even further within the University, bringing with it increased support and more team members to drive the success of the project well into the future.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2845mm/1370mm/1094mm/1550mm

Track (front/rear) 1230mm/1100mm

Weight including 68kg driver
(front/rear) 112kg/170kg

Suspension (front/rear)
Unequal length, non-parallel wishbones. Push rod actuated spring and ohlins damper

Tyres (front/rear)
18x6-10 Hoosier R25B

Wheels (front/rear) 10" three piece aluminium, 150mm wide

Brakes (front/rear) Laser cut and ground mild steel, hub mounted, 200mm dia.

Chassis construction
One piece tubular spaceframe

Engine 2004 Yamaha R6 four stroke in line four

Bore/stroke/cylinders/cc
65.5mm bore/44.5mm stroke/
4 cylinder/599cc

Fuel 98 RON Unleaded

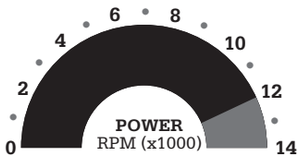
Fuel system Custom design using Pico injectors and DTA S60 ECU

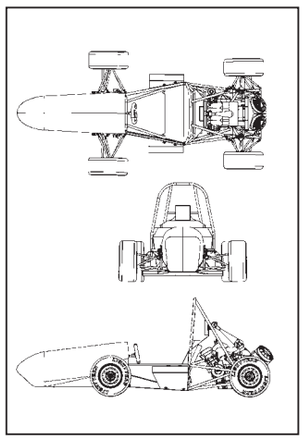
Max power/max torque
12,000rpm/8,000rpm

Transmission Single 520 chain

Differential Torsen T1 internals in bespoke 7075-T6 housing

Final Drive 4-3:1
(variable with sprocket changes)



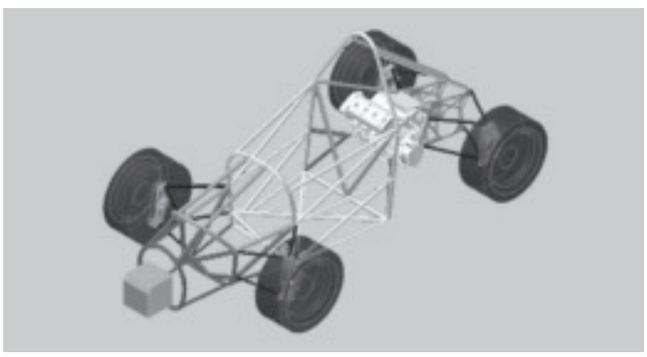


CLASS 1

MANCHESTER METROPOLITAN UNIVERSITY
MANCHESTER, UNITED KINGDOM

161

The team is entering its fourth year of participating in the Formula Student competition. Each year the team has seen significant improvements in the design of our cars, which has been reflected in the year on year rise through the overall standings. This year we are entering the competition with the aim of improving our preformance in all the tasks and events. We feel confident that the car we have produced this year is a step in the right direction - the chassis incorporates the engine as part of the rear structure which increases the strength and reduces the weight of the chassis. There has been a lot of work put into tuning the engine for optimum performance this year. MMU Racing is expanding and gaining confidence as we improve each year, which is down to the hard work and determination of the entire team.



TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2550mm/1400mm/1225mm/1420mm

Track (front/rear) 1200mm/1100mm

Weight including 68kg driver
(front/rear) 150kg/145kg

Suspension (front/rear)
Double unequel length A-Arm.
Pull rod front, Push rod rear.

Tyres (front/rear) Avon 6.2/20-13

Wheels (front/rear)
Compomotive CXR1365
6.5x13 aluminium alloy

Brakes (front/rear)
Stainless steel rotors, hub mounted.
248mm dia. / 220mm dia. Drilled

Chassis construction
One piece, tubular spaceframe.

Engine
2006 / Yamaha YZF-R6 four stroke.

Bore/stroke/cylinders/cc
67mm bore/42.5mm stoke/
4 Cylinder/599cc

Fuel 98 ron

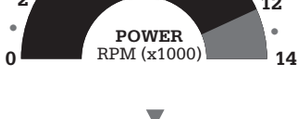
Fuel system
Custom designed, built
4 point injection system

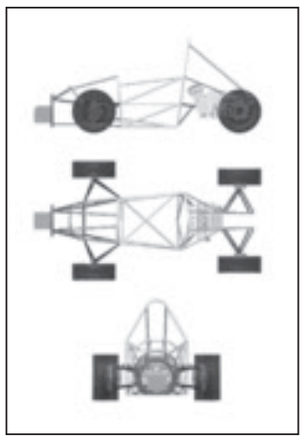
Max power/max torque
93bhp @12000rpm/64Nm @8000rpm

Transmission
Single 525 chain

Differential
Torsen university special

Final Drive 4:1





CLASS 1

MONASH UNIVERSITY
MELBOURNE, AUSTRALIA

66

Monash Motorsport's design philosophy focuses on simplicity and reliability. The M9 is the product of a three year evolution, the first of the series to incorporate stressed carbon panels to complement the chassis' outrigger design. The aerodynamic package on the M9 has been physically validated with many hours of wind tunnel and track testing, increasing cornering and braking capacity significantly.
A Honda CBR600 RR is utilised through a single reduction drive-line and locked differential providing the M9 with 80Hp. Ohlins ST44 direct-acting dampers were chosen for simplicity and adjustment allowing suspension setups to be altered quickly and accurately. After winning the 2009 Australasian competition, the Monash Motorsport team is excited to be competing amongst the top teams in the world at FS.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2840mm/1390mm/1300mm/1550mm

Track (front/rear) 1200mm/1150mm

Weight including 68kg driver
(front/rear) 144kg/144kg

Suspension (front/rear)
Double unequal length A-Arm directly actuated coil over Ohlins ST44 dampers

Tyres (front/rear)
Avon A45 7.2x20 - 13

Wheels (front/rear) 178mm wide, 3 piece aluminium rim, custom wheel centres

Brakes (front/rear) Red Devil 4 pot caliper, cross drilled / Brembo 2 pot, cross drilled

Chassis construction Hybrid steel space frame with bonded carbon fibre stressed panels

Engine 2006 Honda CBR600 RR four stroke in line four

Bore/stroke/cylinders/cc
67mm bore / 42.5mm stroke/ 4 cylinder / 599cc

Fuel 98 RON unleaded

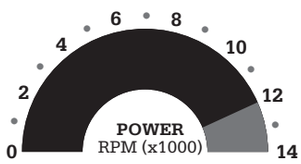
Fuel system MoTeC M400 ECU, Bosch injectors and fuel pressure regulator

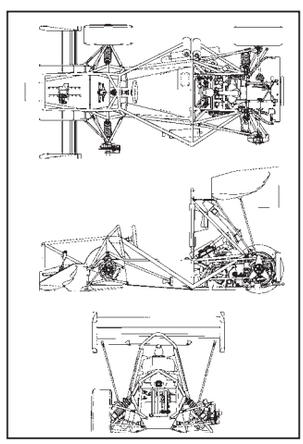
Max power/max torque
79 HP @12000rpm/60Nm @8000rpm

Transmission Single 428 Chain

Differential
Locked differential spool

Final Drive
Adjustable from 3.125:1 to 4.231:1





CLASS 1

ECOLE NATIONALE D'INGÉNIEURS DE METZ
METZ, FRANCE

57

ENIM initiated MCAC (Mechanical Conception Assist by Computer) one year ago to design and develop a racecar for automotive competitions. The team plans this year to participate for the first time in the Formula Student competition. Enim Racing Team was a spinoff of one of the final university year projects in 2008 and is part of the sport mechanics option that students can choose. Having undertaken a general brainstorming on the project "Genesis", we decided to place the emphasis in our conception on reliability, while keeping an important place for innovation. The front part of the chassis and the passenger compartment will consist of tubes. The back part will be one "cubicle" composed entirely of aluminium where the rear wheel-axle will be fixed. We have taken the decision to place the back air suspensions horizontally. In an innovative approach, the ERT decided to study the concept of a mono-shok on the front train. Using Altair Engineering's OptiStruct software in the development of the new race car, ERT reduced the weight of an engine mount while at the same time improving its eigenmode characteristics. We would like to thank our partners and the ENIM school, whose engagement has been necessary for the build of the ERT002.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2943mm/1340mm/1123mm/1720mm

Track (front/rear) 1250mm/1200mm

Weight including 68kg driver
(front/rear) 129kg/220kg

Suspension (front/rear)
Double A-Arm. Push rod monoshocks/Push rod actuated horizontally oriented spring and damper

Tyres (front/rear)
20,5 x 7, 0-13 Hoosier

Wheels (front/rear)
13' x 6', 3 pc Al Rim

Brakes (front/rear) Al, hub mounted, 220mm dia. Floatting disc/205mm dia. Floatting disc

Chassis construction
Two pieces, tubular spaceframe - Aluminium rear box

Engine 2001 / Honda 600 CBR four stroke in line four

Bore/stroke/cylinders/cc
67mm bore/ 42,5mm stroke/ 4 cylinder/ 599cc

Fuel 95 unleaded

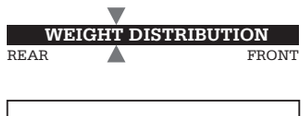
Fuel system Honda multi point fuel injection

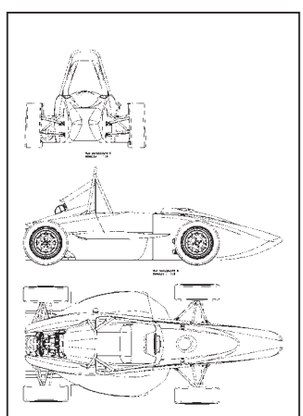
Max power/max torque
11 300rpm / 8 500 rpm

Transmission Single 520 chain

Differential Drexler Limited Slip Differential

Final Drive 2,85:1





CLASS 1

POLITECNICO DI MILANO
MILAN, ITALY

90

The aim of the team is to produce a lightweight, powerful and reliable car. The small, but technically strong team (only 19 people) has worked hard to optimise each subsection through all the car: an extremely detailed CAD model and many hours spent on FEA and CFD simulation helped us to reach our objectives. The team has worked also on the reliability of the engine, an Aprilia RXV 550 V-Twin, which allows it to have high torque from the lower rpm's till redline, but is a very sensitive engine. The suspension system is based on the old one, but is optimised for the new chassis, coupled with an innovative modular standalone data acquisition which guarantees a simple and rapid set up of the car. The strong reductions of weight, although the chassis is a steel tubular one, and inertias complete the most competitive and well designed car ever conceived by the team. After the confirmation on the track of the performances of our small engineering jewel, team Dynamis proudly presents its fourth car, the new DPRC XVO010.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2655mm/1440mm/1195mm/1675mm

Track (front/rear) 1280mm/1280mm

Weight including 68kg driver
(front/rear) 130kg/138kg

Suspension (front/rear)
Double unequal lenght A-Arm.
Push rod actuated. Ohlins
spring/damper linear units.

Tyres (front/rear)
20,5"x7"-13 R25B Hoosier

Wheels (front/rear) Student
designed 13"x6", + 5 mm offset

Brakes (front/rear)
Student designed, AISI 420, floating,
wave, hub mounted, 190mm dia.

Chassis construction
Tubular, AISI 304.

Engine Aprilia SXV 550 V-Twin 77°

Bore/stroke/cylinders/cc
80mm bore/55mm stroke/
2 cylinder/549 cc

Fuel 98 octane petrol (Shell Optimax)

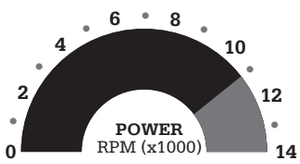
Fuel system
Student designed, built fuel
injection system using original ECU.

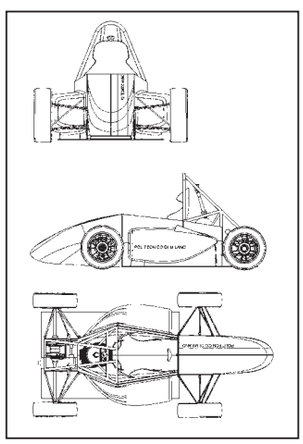
Max power/max torque
49,6kW@11000rpm/51Nm@7000rpm

Transmission Single 520 chain

Differential Quaife automatic
torque biasing differential

Final Drive 3,3:1





CLASS 1

UAS MITTWEIDA
MITTWEIDA, GERMANY

32

Since the foundation of Technikum Mittweida Motorsport (TMM), it's a meeting point for motivated students from all faculties of the university, from engineering to media, who are interested in motor-racing and follow the common aim in every season: a successful participation in the Formula Student competition.

Going forward together - learning from each other - supporting one another. That's just the strength of our team: Around 30 people from various study courses with so many different mentalities and approaches make up the team, providing many opportunities for new and unusual solutions and ways.

We will improve our concept of our previous year's motorcar, just as in the past. And even though it was just last season, it's our aim to reduce the weight of the racing car further. Therefore, our new frame-construction and the less spring-borned bulks of the wheels will help to reach the new weight bare 230 kg (from primary 296 kg in the last season). Beside this we will introduce new features like our multifunctional steering wheel which allows the driver to check the whole car before the start or a CAN- based telemetry system.

"Propulsion made in Mittweida."

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2802mm/1240mm/1185mm/1650mm

Track (front/rear) 1240mm/1200mm

Weight including 68kg driver
(front/rear) 131kg/167kg

Suspension (front/rear)
Double unequal length A-Arm.
Pushrod actuated horizontally
oriented spring and damper

Tyres (front/rear)
Continental 205/510 R 13

Wheels (front/rear)
7J x 13" Braid Formrace

Brakes (front/rear) 4-Disk
system, adjustable brake
balance, Wilwood callipers

Chassis construction
Tubular steel frame

Engine Honda CBR600 FS (PC35)

Bore/stroke/cylinders/cc
67mm bore/ 42,5mm stroke/
4 cylinder/ 599cc

Fuel 99 RON unleaded

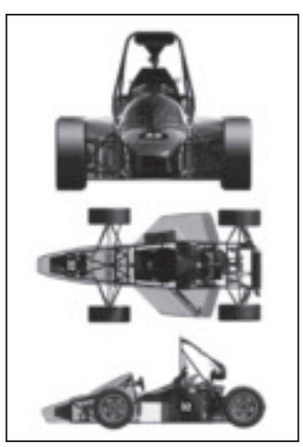
Fuel system
Student designed/build, Trijekt
ECU, fuel injektion, sequential

Max power/max torque
11000 rpm / 8700rpm

Transmission Single 525 chain

Differential
Drexler limited slip differential

Final Drive 3,5 : 1



CLASS 1

UNIVERSITY OF MODENA & REGGIO EMILIA
MODENA, ITALY

37

MMR is the Modena & Reggio Emilia University team for the Formula Student competition.
This is the 7th time our university takes part in the competition and 2010's team has 14 students from Vehicle and Mechanical Engineering, Marketing and the Language Faculty.

This year we have some new important features: aluminium spaceframe, 13" ultralight aluminium wheels, high performance fuel injection. All of them are designed to improve car performance and at the same time to minimise fuel consumption and costs.

Our 2010 car, MM_EVO_X, is fully designed to obtain a user-friendly, basic, lightweight and economical product. Our team worked hard for 8 months to obtain these goals and we tried to reach these targets in all project areas.

A basic car is not a "slowly and neglected car". All the components have been approached through an extensive use of CAD-CAE-CFD software simulations and of dynamic simulations to optimise the suspensions. We completely re-designed the motor crank mechanism and have a fully adjustable driver position.

Last but not least "Racing appeal" MM_EVO_X uses a light fiber glass body that is able to attract the interest of many people, not only the track-day fan.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2680mm/1390mm/1070mm/1600mm

Track (front/rear) 1200mm/1150mm

Weight including 68kg driver
(front/rear) 138kg/150kg

Suspension (front/rear)
Double unequal length A-Arm.
Front: Pull rod actuated/
Rear: Push rod actuated

Tyres (front/rear) 20,5 x 7 x 13"
R25B Hoosier Front & Rear

Wheels (front/rear) 178mm
wide, 1 pc Aluminium Rim

Brakes (front/rear) Cast Iron, hub mounted, 220mm dia. Drilled

Chassis construction
One piece tubular Aluminium spaceframe with Amulinium structural panels. AISI 4130 Steel Main Hoop

Engine 2008 Yamaha XT-X 660
Modified, single cylinder, 4 valve

Bore/stroke/cylinders/cc
100mm bore/ 76.5mm stroke/
1 cylinder/ 600,8cc

Fuel 100 RON unleaded

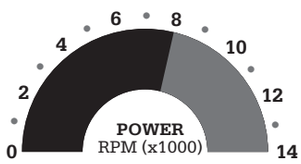
Fuel system Electronic fuel injection

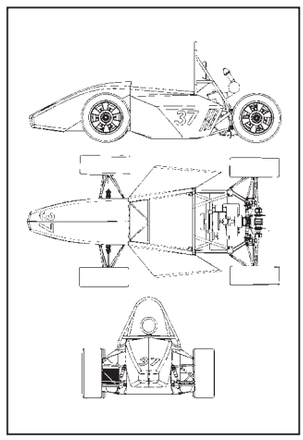
Max power/max torque
8,000rpm/6,000rpm

Transmission Single 520 chain

Differential
Drexler LSD Differential Unit

Final Drive 3,6:1





CLASS 1

TECHNICAL UNIVERSITY OF MUNICH
MUNICH, GERMANY

31

With an almost completely new team of 35 members, TUfast has now built the seventh racecar. We refined the concept of the nb09 and are proud to present the nb010:

The nb010 has a new lighter monocoque, a stiffer rear frame, redesigned kinematics and suspension, the powerful 4-cylinder Kawasaki engine and a lot of other awesome parts, all put together in a tiny package.

To find out, have a look at our car in the pits to discuss it or visit us on the camping ground to have a beer and a chat with us!

We had a great time designing and building this car and now we're looking forward to celebrating with you guys at the competition!

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2736mm/1423mm/1037mm/1610mm

Track (front/rear) 1220mm/1140mm

Weight including 68kg driver
(front/rear) 123kg/143kg

Suspension (front/rear)
Double unequal length A-Arm.
Pull rod actuated horizontally oriented spring and damper

Tyres (front/rear) 521 x 178-330/508 x 190-330 R25B Hoosier

Wheels (front/rear) 178mm/190mm wide, Self designed 1pc CFRP Rim

Brakes (front/rear)
Steel, hub mounted, 235mm/200mm dia. Drilled. 4/2 piston calipers

Chassis construction
Carbon Fiber Monocoque with tubular spaceframe rear frame

Engine 2007 / Kawasaki ZX-6R
four stroke in line four

Bore/stroke/cylinders/cc
67mm bore/ 42.5mm stroke/
4 cylinder/ 599cc

Fuel 100 octane unleaded

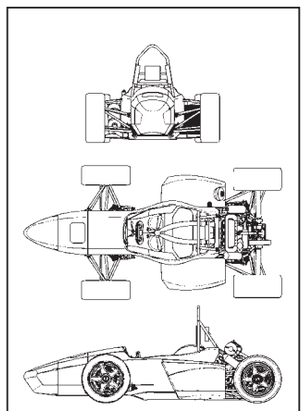
Fuel system Dual sequential multipoint fuel injection with Denso injectors

Max power/max torque
12,000rpm/10,000rpm

Transmission Single 520 chain

Differential Drexler LSD

Final Drive 3.1:1 to 3.8:1



CLASS 1

UNIVERSITY OF NOTTINGHAM
NOTTINGHAM, UNITED KINGDOM

75

The University of Nottingham Class 1 entry for 2010 comprises of a small team of four members.

Our objective has been to design and build a competitive, high performance, single seat racing car, whilst facing the challenges of a limited budget. The team has focused on key areas such as the chassis and suspension systems to improve the weight and performance of the final racing car.

We are a highly motivated and determined team, excited about competing in this year's Formula Student event.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2546mm/1465mm/1100.8mm/1600mm

Track (front/rear) 1250mm/1200mm

Weight including 68kg driver
(front/rear) 280.21kg

Suspension (front/rear)
Double SLA design. Directly actuated spring and damper located at key chassis node points

Tyres (front/rear)
13" x 7.2 - 20 / 13" x 8.2 - 20

Wheels (front/rear)
13" wide 3 pc billet Al Rim

Brakes (front/rear)
Cast Iron, hub mounted, 250mm dia. Drilled

Chassis construction
One piece tubular space frame

Engine
2004 / Yamaha YZF-R6 four stroke in line four

Bore/stroke/cylinders/cc
65.5mm bore/44.5mm stroke/ 4 cylinder/599cc

Fuel 101 RON unleaded

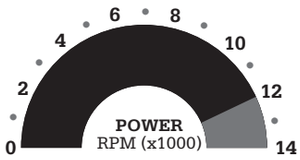
Fuel system
Yamaha multi point fuel injection

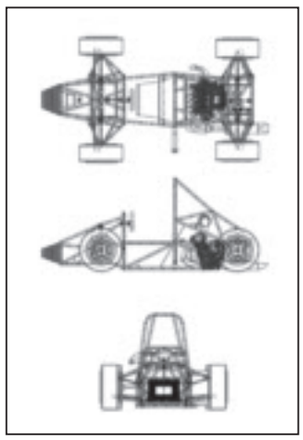
Max power/max torque
12,000rpm / 8,000rpm

Transmission Single 520 chain

Differential
Quaife ATB helical LSD differential

Final Drive 4:1





CLASS 1

UNIVERSITY OF SOUTHERN DENMARK
ODENSE, DENMARK

124

The SDU Vikings is proud to present the third race car that competes in the Formula Student event: The Viking 3.

Our team consists of 44 students from Denmark, The Netherlands, Iceland, Lithuania, Latvia, Germany, Czech Republic, Italy, France and Poland. The students are all studying at one of the following departments of the University of Southern Denmark: Mechanical Engineering, Global Management and Manufacturing and Electronic Engineering. Thanks to the variety of nationalities, ages and fields of study of the members, our team is very innovative.

This year we concentrated on reducing the weight of the car. The goal was to get below 250kg – and we have achieved it. Viking 3 is our first attempt to use alternative fuels. We have converted our engine to run on E85. Most parts have been designed and manufactured in-house by the students; this approach secures a high-level of in-house knowledge for the future.

The electronic system in the car consists of a distributed real time Ethernet communication system, which renders the possibility to separate the individual units, such as gearshift, Engine Control Unit, datalogger and dashboard – and letting them interact and communicate safely.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2700mm/1402mm/1235mm/1565mm

Track (front/rear) 1250mm/1250mm

Weight including 68kg driver
(front/rear) 156kg/156kg

Suspension (front/rear)
Double unequal length A-Arm. Push rod / Direct actuated

Tyres (front/rear)
508 x 152-330 Hoosier

Wheels (front/rear)
Keizer Kosmo series, 3 piece, megnesium and aluminium

Brakes (front/rear) Lasercut 250mm 1040 steel, hub mounted/ differential mounted

Chassis construction
One piece tubular spaceframe,

Engine 2005 Honda CBR600RR, four stroke in line four

Bore/stroke/cylinders/cc
67mm bore/ 44,5mm/ 4 cylinder/ 599cc

Fuel E85

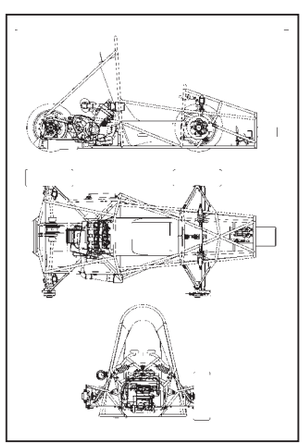
Fuel system Student designed/ built fuel injection system and ECU

Max power/max torque
12,000rpm/8,000rpm

Transmission Single 520 chain

Differential Quaife automatic torque biasing differential

Final Drive 4.62:1

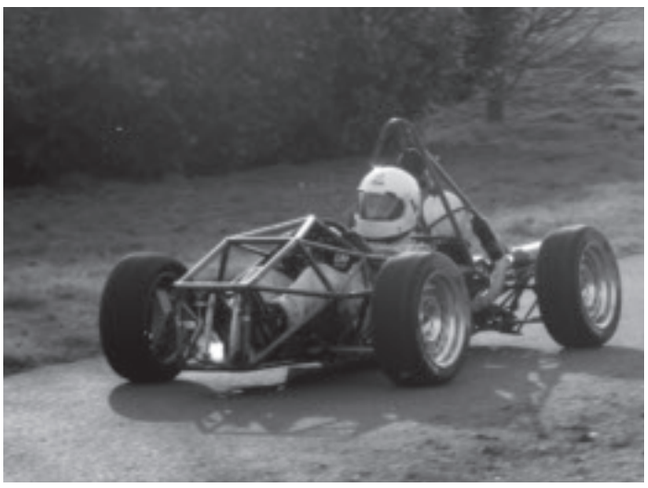


CLASS 1

OXFORD BROOKES UNIVERSITY
OXFORD, UNITED KINGDOM

92

The overall goal for OBR's ISIS-X was to reliably improve the drivability of the ISIS-09 car, through weight reduction, and improvements to suspension and engine. After a thorough analysis of the 2009 design, a mass reduction of 5kg was targeted and the suspension was redesigned to produce an easier to drive car. The engine package was modified with the goal of optimising performance around part-open throttle response and low range torque pick-up out of corners.



TECHNICAL SPECIFICATION

Length/width/height/wheelbase 2585mm/1278mm/964mm/1525mm

Track (front/rear) 1140mm/1100mm

Weight including 68kg driver (front/rear) 112kg/121kg

Suspension (front/rear) Double unequal length non-parallel A-Arms. Pull rod actuated Cane Creek DB

Tyres (front/rear) 20x7-13 Hoosier

Wheels (front/rear) 6 inch wide, 25mm neg. Offset, 3 pc carbon rim/aluminum centre

Brakes (front/rear) Floating, Cast Iron, hub mounted, 220 mm dia.

Chassis construction Tubular space frame

Engine 2008 KTM 530 EXC-R

Bore/stroke/cylinders/cc 95mm bore/72mm stroke/ 1 cylinder/510cc

Fuel 98 octane petrol

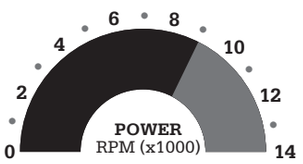
Fuel system Student designed and built, fuel injection, MOTEC M800 ECU

Max power/max torque 9,000rpm/5,600rpm

Transmission 520 Chain

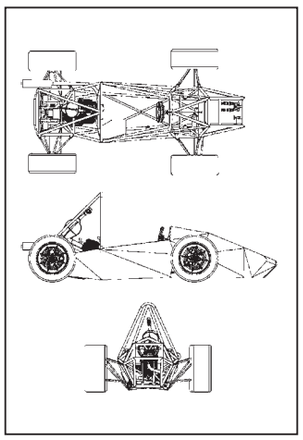
Differential Drexler clutch-pack salisbury LSD

Final Drive 3.67:1



WEIGHT DISTRIBUTION

REAR FRONT



CLASS 1

UNIVERSITY OF PADOVA
PADOVA, ITALY

85

RaceUP team is divided into 5 groups: 1. Frame & Body, dedicated to the design and realisation of the frame and body of the car, but also the realisation of the car cad assembly; 2. Engine & Drivetrain, dedicated to the engine and the assembly of the differential; 3. Suspension Wheel & Brake, dedicated to the design and project of all suspensions and steering wheel components; 4. Electronics, dedicated to the mapping of the engine and all the car's wirings; 5. Business & Marketing, dedicated to recruit sponsors and make our car known.

UNIVERSITY OF PADOVA RACING TEAM

TECHNICAL SPECIFICATION

Length/width/height/wheelbase 2700mm/1408mm/990mm/1630mm

Track (front/rear) 1260mm/1230mm

Weight including 68kg driver (front/rear) 156.5kg/156.5kg

Suspension (front/rear) Double unequal length A-Arm. Pull rod actuated horizontally oriented spring and damper

Tyres (front/rear) 20.5"x6.0" R13, Hoosier R25B/ 20.5"x7.0" R13, Hoosier R25B

Wheels (front/rear) Wheel, 13", 1 Piece O-Z Racing, Aluminum/ Wheel, 13", 1 Piece O-Z Racing, Magnesium

Brakes (front/rear) Floating, AISI 420, hub mounted, 220mm outer diam., 169mm inner diam.

Chassis construction Tubular space frame

Engine 2006 Kawasaki ZX-6RR 4 cylinder

Bore/stroke/cylinders/cc 67mm bore/43mm stroke/ 4 cylinder/599cc

Fuel gasoline 100 RON

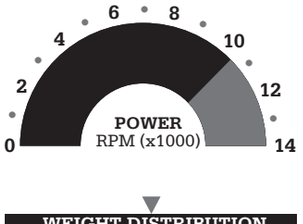
Fuel system Walbro electronic injection, multipoint fuel injection, semi sequential

Max power/max torque 10,500rpm/9,000rpm

Transmission DID 520 chain, z=70

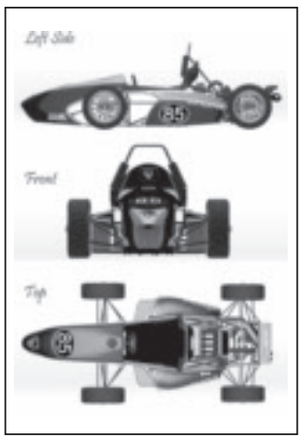
Differential Quaife QDF-7ZR Automatic Torque Biasing Helical LSD differential

Final Drive 3.69



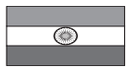
WEIGHT DISTRIBUTION

REAR FRONT



CLASS 1

THAPAR UNIVERSITY
PATIALA, INDIA



99

Perseverance, Diligence and Excellence in Quality give stepping stones to TEAM FATEH of THAPAR UNIVERSITY. This provides us with a benchmark in an arena of mechanical engineering, FORMULA STUDENT, where the most skilled compete for their design of a racing car.

After mundane performances in the first two years, TEAM FATEH is ready to enthrall and astound the circuit with its all new FALCON. The car comes with enhanced design and enticing features which give it a complete new dimension of performance, unlike ever seen before. Coming into this combat for the 3rd year, the FALCON comes with an MPFI Kawasaki ZX6R engine, a lighter frame enhancing speed & all body works aerodynamically designed. Furthermore, the newly designed attenuator (which is attested by the Automotive Research Association of India ARAI), exhaust torque expansion chamber for elevated torque at lower speeds, Kiezer's 3 pc magnesium centered alloy wheels and reduction in unsprung weight, hones the car's performance.

The exemplary design and the extraordinary performance of the car are attributed to the latest software which has made it possible to design the most intricate detail with precision. In addendum, the quality of the body parts of the car have been given exceptional importance. Every failure is another step towards an improved delivery. Keeping this in the cognitive perception, the team comes fully prepared to conquer yet another hurdle.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2740mm/1466mm/1300mm/1575mm

Track (front/rear) 1250mm/1200mm

Weight including 68kg driver
(front/rear) 140kg/168kg

Suspension (front/rear) Double unequal length A-Arm, Push rod actuated spring and damper

Tyres (front/rear) 20.5x6.0-13 Hoosier

Wheels (front/rear) 152.4mm wide, 1" position offset 3 pc Keizer Magnesium wheels

Brakes (front/rear)
KBX 0.625"/0.625" master cylinder, PS-2 KBX calipers, 230mm drilled steel rotors

Chassis construction
1020, Tubular spaceframe using round tubing of varied thickness

Engine 2001/Kawasaki ZX6 four stroke, in line four

Bore/stroke/cylinders/cc
64.00mm bore/46.6mm stroke/ 4 cylinder/599cc

Fuel 100 octane unleaded

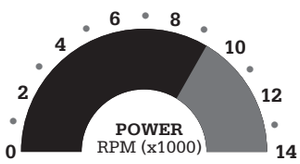
Fuel system
Semi sequential injection system designed by students

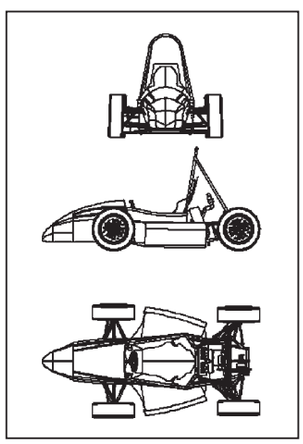
Max power/max torque
9,200rpm/6,500rpm

Transmission Single 520 chain

Differential Chain-drive, Quaife ATB Helical LSD differential

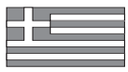
Final Drive 4.14:1





CLASS 1

UNIVERSITY OF PATRAS
PATRAS, GREECE



86

This is the 3rd car of the University of Patras Formula Student team. Its design is defined by the successful features of the previous car, UoP 2, and also new ideas aiming to reduce the overall weight while maintaining reliability and high performance. The biggest step forward for the team was the use of composite materials and aluminium in most parts of the car, in order to keep the weight low. Another major change made to the vehicle was the use of a single cylinder Yamaha WRF 450cc engine which was modified in order to be fuel injected and controlled by a Haltech ECU. A Drexler LSD differential transmits the power to the wheels through the chain and sprocket, while the easy to adjust suspension stabilises the construction. Regarding all these new features, we expect that UoP 3 will be a step in front of its ancestor, UoP 2. We would like to thank our many supporters and sponsors for sticking with us and without whom our new race car would not have been possible. We look forward to the great competition ahead.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2537mm/1431mm/1146mm/1650mm

Track (front/rear) 1240mm/1220mm

Weight including 68kg driver
(front/rear) 109/134kg

Suspension (front/rear)
Double unequal length A-Arm. Pull rod / Pull Rod actuated horizontally oriented spring and damper

Tyres (front/rear)
457.2 x 190.5-254 Hoosier R25B

Wheels (front/rear)
254mm wide, 2pc aluminum rims

Brakes (front/rear)
Cast Iron, hub mounted, 180mm dia. Drilled rotors with ISR 4 piston calipers

Chassis construction
Two piece carbon fiber monocoque

Engine
2008 Yamaha WR450 single cylinder

Bore/stroke/cylinders/cc
95mm bore/ 63.4mm stroke/ 1 cylinder/ 449cc

Fuel 99 RON unleaded

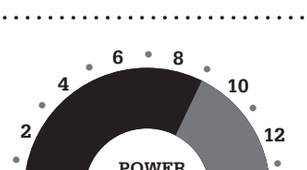
Fuel system
Custom designed fuel injection system

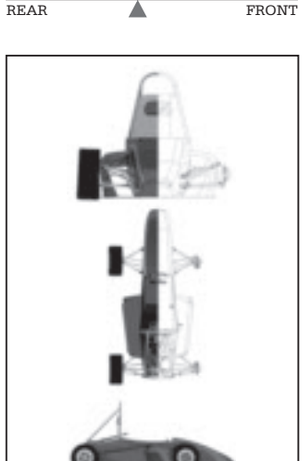
Max power/max torque
9,000rpm/7,500rpm

Transmission Single 520 chain

Differential Drexler FSAE LSD

Final Drive 2,57:1





CLASS 1

UNIVERSITY OF CENTRAL LANCASHIRE PRESTON, UNITED KINGDOM

123

Formula UCLAN is a small team studying in their 3rd year of Motorsports Engineering and Motorsports Operations degrees at the University of Central Lancashire in Preston. Formula Student forms a large part of a teaching module at the university and sees teams averaging between 6 and 12 members conceiving, designing, manufacturing and testing their vehicles in a 9 month period alongside the rest of their studies.

This year's entry in Class 1 is the FSX, a car designed from the ground up to be customer focused whilst marrying the team's distinctive side-engine layout with cost effective performance. The car is intended to build on the previous year's potential in the dynamic events with increased chassis stiffness, improved weight distribution and component reliability. There has been a focus on maximising performance with user friendly adjustability. Weight increases are limited through sensible design and component selection, including the use of an extremely high power to weight ratio engine.

Whilst looking forward to successes in the summer, Formula UCLAN would like to take this opportunity to thank Fusion Provida, Preston City Council and all of our additional Sponsors and Partners for their support throughout this and other projects.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2345mm/1365mm/1064mm/1615mm

Track (front/rear) 1165mm/1070mm

Weight including 68kg driver (front/rear) 103kg/167kg

Suspension (front/rear)
Unequal length wishbones outboard coil-over-dampers F&R

Tyres (front/rear)
Avon A45 20 x 6.2 - 13 F&R

Wheels (front/rear)
13" x 6.2 Keiser Magnesium centred Alloy F&R

Brakes (front/rear) 220mm drilled discs, aluminium bells, Brembo twin piston callipers F&R

Chassis construction
Seamless steel tubular spaceframe

Engine
2007 Aprilia RXV-550 77° V-Twin

Bore/stroke/cylinders/cc
80mm Bore/ 55mm Stroke/ 2 Cyllinders/ 549cc

Fuel E85 Bio Ethanol

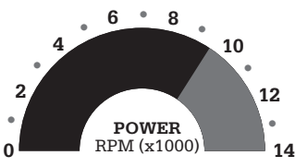
Fuel system Motec ECU with Denso Injectors and Aprilia pump

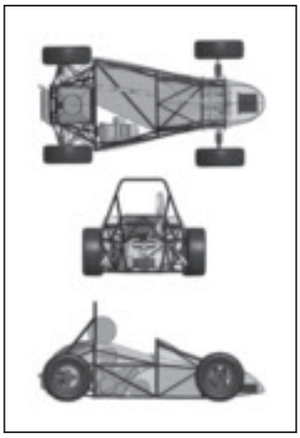
Max power/max torque
9,500rpm / 7,000rpm

Transmission Single Chain #520

Differential GKN Viscolock

Final Drive
Adjustable with sprocket 3.36 - 3.92





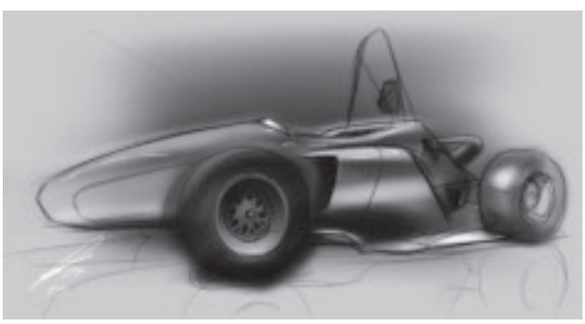
CLASS 1

DHBW RAVENSBURG
RAVENSBURG, GERMANY

25

Global Formula Racing is the first innovative global collaboration of its kind in the history of both the US-based Formula SAE and EU-based Formula Student programmes. The former BA Racing Team from the Duale Hochschule Baden-Württemberg-Ravensburg (DHBW-R), Germany, and the Beaver Racing Team from Oregon State University (OSU) have combined forces to compete as a single entity. The two universities have shared physical and intellectual resources to create a highly competitive vehicle worthy of international reputation.

Design, manufacturing and testing has occurred at both schools. The collaboratively developed GFR 2010 design has been used to manufacture two identical cars — one at the OSU campus in Corvallis, Oregon, USA, and the other at the DHBW-R campus in Friedrichshafen, Baden-Württemberg, Germany. GFR will travel across the United States and Europe to compete with these cars in six events.



TECHNICAL SPECIFICATION

Length/width/height/wheelbase 2474mm/1328mm/1191mm/1555mm

Track (front/rear) 1120mm/1120mm

Weight including 68kg driver (front/rear) 101kg/114kg

Suspension (front/rear) Double unequal length A-Arm. Pull rod/Push rod actuated horizontally oriented spring and damper

Tyres (front/rear) 10" diameter, 6" wide, 3pc Al Rim

Wheels (front/rear) BBS Alloys 13"x175mm – 12.5mm offset

Brakes (front/rear) Cast Iron, hub mounted, floating/Stainless Steel, differential mounted

Chassis construction Full Monocoque

Engine 2009 / Honda CRF450x four stroke

Bore/stroke/cylinders/cc 96mm bore/ 62.17mm stroke/ 1 cylinder/ 449cc

Fuel 99 Octane

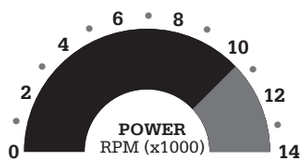
Fuel system Honda fuel pump, Bosch 945 injector, custom rail, full sequential

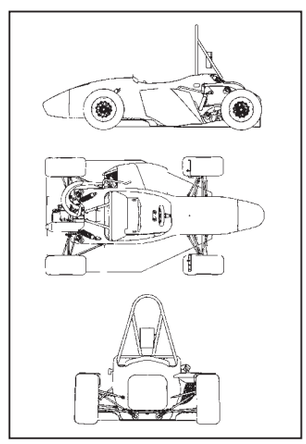
Max power/max torque 10,500rpm / 8250rpm

Transmission 520 non-O-ring chain

Differential clutch pack limited slip, adjustable preload,

Final Drive 3.3 :1





CLASS 1

UAS REGENSBURG
RAVENSBURG, GERMANY

62

As the popular proverb says: "All good things come in threes", the Dynamics Racing Team of the University of Applied Sciences in Regensburg has perfect preconditions, starting their 3rd season. The team was founded in 2006 by 20 dedicated students and now has up to 50 race car enthusiastic team members from every faculty. Last year was their first time in Silverstone with the team´s second car RP09. This year, more experienced, they aim to improve last year´s performance at the Formula Student Event 2010 at Silverstone and are proud to present their new race car: RP10. The perfect mixture of optimisation from last year's car version, enthusiastic and committed people and their Bavarian charm will contribute to the success of the RP10.

Our intention for this year is to get a perfect handling of our car which will be realised by a low weight CFK-body, which will not only be light but also awesome looking. Also, the centre of gravity will be lowered by lightweight construction and the use of a dry sump engine.

So let's rock!

For more information visit our homepage: http://dynamics.fh-regensburg.de

TECHNICAL SPECIFICATION

Length/width/height/wheelbase 2727mm/1456mm/1031mm/1575mm

Track (front/rear) 1250mm/1220mm

Weight including 68kg driver (front/rear) 142kg/138kg

Suspension (front/rear) push- and pullrod acting suspension type with a progressive motion rate. The roll behaviour is controlled by a hydro pneumatic anti roll bar

Tyres (front/rear) 205/510 R13 Continental Formula Student Tyre

Wheels (front/rear) 7.0 x 13 OZ Superlegera 1pc Al cast rim with centre lock

Brakes (front/rear) Steel, hub mounted, 220mm dia. Laser cut

Chassis construction steel tube spaceframe

Engine 2005 / Honda PC37 four stroke in line four

Bore/stroke/cylinders/cc 67mm/42,5mm/4 cylinders/599ccm

Fuel 99 RON unleaded

Fuel system Bosch MS4 Sport multi point fuel injection

Max power/max torque 11,000rpm/8000rpm

Transmission Belt drive 8mm pitch

Differential self made torque sensing limited slip differential

Final Drive 3,4:1

CLASS 1

UNIVERSITY OF RIJEKA
RIJEKA, CROATIA

55

The University of Rijeka has a very long tradition in naval architecture. We are seven second, third and fourth year students who want to start a new tradition: building Formula Student cars to enrich the theoretical knowledge our university provides to us and to implement FS as part of our educational programme. We don't have experience in projects like Formula Student so we decided to build a simple car. Steel tubular chassis, double A-arms with pushrod actuated dampers, O.Z. Racing wheels with Hoosier tires, naturally aspired Yamaha R6 engine with VEMS ECU, our own patent protected differential and fiber glass bodyshell. We have tried to replace lack of experience with good benchmarking but have also brought our own ideas. As rookies, we are aware of our imperfection. But we are fighters and eager to learn. We are looking forward to the competition and meeting racing fans like ourselves.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2560mm/1450mm/1250mm/1585mm

Track (front/rear) 1270/1180mm

Weight including 68kg driver
(front/rear) 130kg/150kg

Suspension (front/rear)
Double unequal length
A-Arm. Push rod

Tyres (front/rear)
21,5"x7 Hoosier R25B

Wheels (front/rear)
OZ Racing Superleggera
Competition 13"x7"

Brakes (front/rear) Steel, hub mounted 200mm dia. Drilled

Chassis construction
One piece tubular spaceframe

Engine 2004 / Yamaha YZF-R6 four stroke in line four

Bore/stroke/cylinders/cc
65.5mm bore/ 44.5mm stroke/
4 cylinder/ 599cc

Fuel 101 RON unleaded

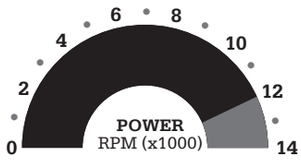
Fuel system Yamaha multi point fuel injection

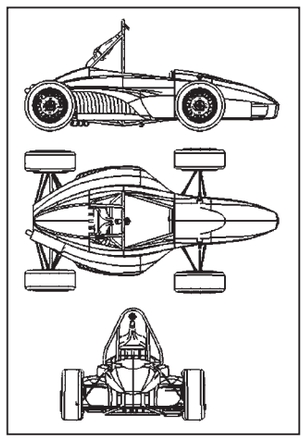
Max power/max torque
12,000rpm/8,000rpm

Transmission Single 5/8" 10B chain

Differential
Our own designed, self made LSD differential

Final Drive 4:1





CLASS 1

UNIVERSITY OF SHEFFIELD
SHEFFIELD, UNITED KINGDOM

46

In the thirteen years that Formula Student has been running in the UK there has never been an entry by the University of Sheffield until now. Under the leadership of team creator and manager Marissa Bole, the SFR (Sheffield Formula Racing) team received one hundred and thirty-five applications which were whittled down to an initial team of sixty, with twenty-five of the most devoted given the opportunity of attending the competition. The project's run as an extra-curricular activity and as such we had to secure our own funding, work around the limited workshop time we had and fit in all our academic work. With a team in which no-one had any previous knowledge of motorsport, our aim this year was simply "to get a working car to the competition". Design, build, testing and completion were achieved in only one year, an amazing accomplishment to have started with nothing, not even build space!
The design is simple and straightforward as the main focus of this year's project was to become familiar with what it was to build a single seat racing car. Thanks go to all those who spent their free time contributing to the project and those who offered sponsorship and help along the way.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
3162mm/1384mm/1280mm/1687mm

Track (front/rear) 1254mm/1222mm

Weight including 68kg driver
Unknown at Time of Submission

Suspension (front/rear) Double Unequal Length A-Arms with Front and Rear Pushrod System and Body Mounted Spring/Damper

Tyres (front/rear)
Unconfirmed at Time of Submission

Wheels (front/rear)
4 Compomotive CXR1362 (13" x 6")

Brakes (front/rear) Hub Mounted Rally Design Brake System

Chassis construction
One Piece Tubular Spaceframe

Engine 2007 Suzuki GSXR600 Four Stroke In Line Bike Engine

Bore/stroke/cylinders/cc
67.0mm Bore/42.5mm Stroke/
4 Cylinder/ 599cc

Fuel 99 RON Unleaded

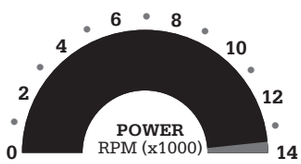
Fuel system Suzuki Multi-Point Fuel Injection

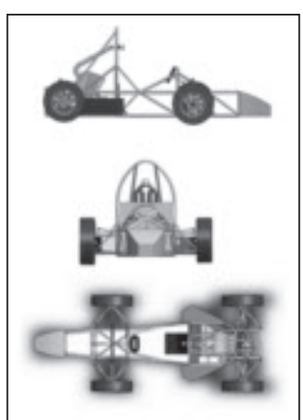
Max power/max torque
13,500rpm/8,000rpm
(Approximate Figures)

Transmission Single Race Chain

Differential Ford Escort 4/5 with Quaife ATB Gearing Internals

Final Drive 3:1





CLASS 1

UNIVERSITY OF STUTTGART
STUTTGART, GERMANY

01

From the beginning of the existence of our team, we worked according to some basic principles. One of them is that we set clear goals at the beginning of a season. Our goals for this year are: get the car done in time - finish - win. Especially the first point is important to be able to have a competitive car at the competitions. The first test run of our 2009 car, the F0711-5, was in the middle of April so we could test it for more than two months before we took it to the first competition. One big point was to optimise the weight of our CFRP-Monocoque. We also optimised our engine design to save fuel and to have higher torque at low rpms. Of course we also tried to optimise every detail of the car to be very competitive again and to have a good chance to repeat last year's success.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2681mm/1450mm/1054mm/1620mm

Track (front/rear) 1216mm/1155mm

Weight including 68kg driver
(front/rear) 130/136kg

Suspension (front/rear) Double unequal length A-Arm. Push rod actuated horizontally oriented ZF Sachs Formula 3 Damper

Tyres (front/rear)
Hoosier, R25B, 13"-20.5 x 7.0

Wheels (front/rear)
Aluminum Rim 13" x 7"

Brakes (front/rear) X46Cr13 steel floating disc, hub mounted, 240/190mm dia., laser cut

Chassis construction
Two piece carbon monocoque

Engine 2005 / Honda CBR 600RR four stroke in line four

Bore/stroke/cylinders/cc
67mm bore/ 42.5mm stroke/ 4 cylinder/ 599cc

Fuel 98 ROZ unleaded

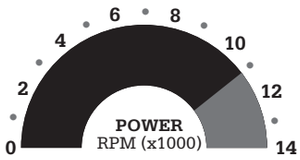
Fuel system Sequential fuel injection system

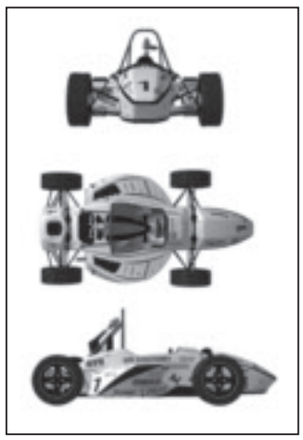
Max power/max torque
11,000rpm/8,000rpm

Transmission Single 520 chain

Differential Drexler clutch pack differential

Final Drive 3,5:1





CLASS 1

UNIVERSITY OF SUNDERLAND
SUNDERLAND, UNITED KINGDOM

107

Sunderland's SU Racing team consists of 11 members from various subject areas from around the university. Mostly made up of 3rd year Automotive and Mechanical engineers, we have a really good mix of design and manufacturing expertise. We have used 6082 aluminium to produce a detachable engine module which houses not only the engine but all the drive and rear suspension components. This then bolts onto the chassis and can be easily and quickly removed to undergo maintenance to the rear of the car. We are also increasing the braking performance by changing from a single rear diff brake to a more conventional 4 outboard braking system. We are using Fox VanR shocks with coil over springs to improve our handling this year instead of the Fox air shocks from previous years. Our main aims this year have been to reduce weight, get more power from the engine and overall increase reliability to ensure we can compete on all days at the event.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2200mm/1300mm/1100mm/1900mm

Track (front/rear) 1300mm/1100mm

Weight including 68kg driver
(front/rear) 145kg/155kg

Suspension (front/rear)
Double unequal length A-arms with push rods on front / Multilink pull rod system on the rear

Tyres (front/rear)
508 x 182-330 A45 Avon

Wheels (front/rear) 202mm wide, 3pc Formula Ford split rims

Brakes (front/rear) Cast iron Brembo Goldline, hub mounted, 220mm Galfer wave discs

Chassis construction
One piece Tubular T45 steel spaceframe with 10mm Aluminum honeycomb shear panels

Engine 2006 / Honda CBR600RR four stroke in line 4

Bore/stroke/cylinders/cc
65.5mm bore/ 44.5mm stroke/ 4 cylinder /599cc

Fuel 99 RON Unleaded

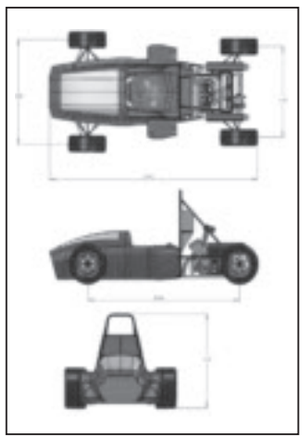
Fuel system Honda Multipoint Fuel Injection / HRC ECU

Max power/max torque
11000rpm/ 6000rpm

Transmission Single 520 chain / 37 tooth rear sprocket

Differential Quaife automatic torque biasing differential

Final Drive 3.07:1



CLASS 1

SWANSEA METROPOLITAN UNIVERSITY
SWANSEA, UNITED KINGDOM

10

Following an impressive 2009 performance, our ambitions for the 2010 competition focused on maintaining the reliability and improving the performance of the car. The journey towards achieving these aims began with the heart of the car, the driver. By conducting a thorough analysis of the 2009 vehicle during testing, a better understanding of its dynamic characteristics was achieved. This allowed the team to focus on maximising the performance of the already reliable Honda CBR600RR engine, while enhancing the balance of the vehicle to create an extremely refined and driver-focused machine. We have chosen to remain with a tried and tested T45 spaceframe chassis, which has been re-designed to provide a more compact platform from which to develop the car. A diverse new team, representing a range of areas within the university has allowed us to develop and implement innovative design solutions throughout the entire vehicle, while a structured approach to deadlines has allowed us to clearly focus on addressing our weaknesses and maximising our strengths. This balance within both the project as a whole, as well as the SMU-10R has motivated our team to aim to be better, faster and stronger in 2010.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase 2345mm/662mm/1180mm/1549mm

Track (front/rear) 1269mm/1230mm

Weight including 68kg driver (front/rear) 153/153kg

Suspension (front/rear) Double unequal length A-Arm. Front Pull Rod, Rear Push rod actuated vertically oriented Fox DHX 5.0 spring/damper units

Tyres (front/rear) 6.2-20.0-13 Avon A45

Wheels (front/rear) 180mm wide, 3 pc Aluminium Rim with In-house CNC 7075T6 Alloy Centres

Brakes (front/rear) Laser cut and ground from 1040 steel, hub mounted, 193mm dia. / 198mm dia.

Chassis construction T45 Tubular Spaceframe

Engine 2004 Honda CBR600RR Four Stroke In-Line Four

Bore/stroke/cylinders/cc 67.00mm bore/ 42.5mm stroke/ 4 cylinder/ 599 cc

Fuel E-85 BioEthanol

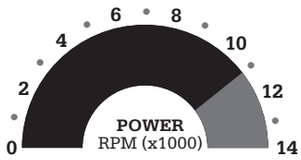
Fuel system EFI Euro-4 Fully Sequential

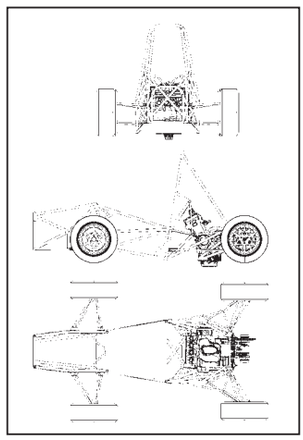
Max power/max torque 10,500rpm / 8,000rpm

Transmission Single 525 Chain

Differential Drexler Limited Slip Differential

Final Drive 3.5:1





CLASS 1

TALLINN UNIVERSITY OF APPLIED SCIENCES
TALLINN, ESTONIA

44

FS Team Tallinn comes from Estonia and is one of very few eastern European teams competing in the worldwide FSAE competitions. We first came together in December 2006 and since then have competed in Silverstone, Hockenheim and Helsinki. In 2008 we won the Best Newcomer trophy in Silverstone. In 2009 we won the Baltic Open competition in Finland.

This year we are presenting our most advanced car yet - the FEST10.

Design Approach: The objective of designing a race car is to have minimum weight with sufficient strength, reliability and superior handling characteristics. It is clear that a race car is always a little bit too heavy; it is an art to find the best balance between mass reduction and performance.

Our first car FEST 08 was built to last, it was built to finish at it did exceptionally well in this standard.

Our next prototype FEST 09 was built to win – redesigning all components to save as much weight as possible. After sufficient testing and some problems at our first competition FEST 09 proved its value by winning Baltic Open in 2009. FEST 10 – our latest prototype combines all of our earlier experience. We have focused on not only saving weight but also maximising the power output and dynamics of the car.

All components are analysed through different computer aided simulations, manufacturing is done to the highest standard - nothing is being left out of attention. This year we have taken our customisation to a completely new level.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase 2525mm long, 1378mm wide, 1000mm high

Track (front/rear) 1200mm/1150mm

Weight including 68kg driver (front/rear) 128kg/150kg

Suspension (front/rear) Double A-Arms. Push rod actuated. Cane Creek Double Barrel dampers with coil springs

Tyres (front/rear) FRONT: Hoosier 7.0"/20.5" - 13" R25B (dry), 6.5"/21.0" - 13" N6B5 (wet) REAR: Hoosier 7.0"/20.5" - 13" R25B (dry), 6.5"/21.0" - 13" N6B5 (wet)

Wheels (front/rear) 13"x 7.0" ; 17mm offset; Custom made aluminium

Brakes (front/rear) Floating, S355 steel, hub mounted, 220mm outer diam., thickness 3.8mm, vented

Chassis construction Steel tube space frame; 25CrMo4; TIG welded; 25kg

Engine 2007 Yamaha YZF-R6

Bore/stroke/cylinders/cc 67mm bore/ 42.5mm stroke/ 4 cylinder/ 599cc

Fuel 99 octane petrol

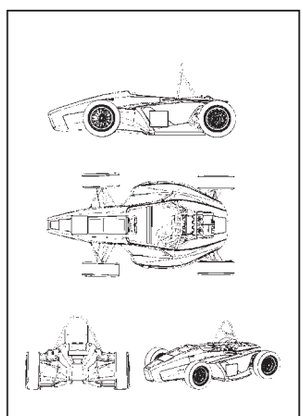
Fuel system custom injection system; EFI Euro4 ECU; pressure 3.0 bar

Max power/max torque

Transmission Yamaha, 5th & 6th gear removed

Differential Torsen. Student designed housing. Bias ratio 2.6:1

Final Drive 4:1



CLASS 1

ARISTOTLE UNIVERSITY OF THESSALONIKI
THESSALONIKI, GREECE

77

After winning the design award in Formula Student 2009 (Class 3), Aristotle Racing Team (art) from Thessaloniki, Greece, will take part in Class 1 at Silverstone, with its second car, manufactured according to the original design, for the 2010 competitions. All 20 team members are eagerly awaiting to race amongst the top teams in the most competitive class of Formula Student.

The new car is lighter and smaller than the previous one (2007) and complies with all new cockpit rules. It is also more ergonomically designed and has better drivability. The tubular frame chassis is built from 25CrMo4 combined with carbon fiber parts, in the driver's seat and body panels. The OEM Honda CBR600RR engine unit is significantly modified in terms of management and compression while main parts such as the variable length intake runners and a new exhaust system are designed from scratch to increase power and torque distribution. The fuel system is compatible to E85, thus the engine runs on environmentally friendly biofuels. The coupling of the engine and the new lightweight differential is extremely compact. The team has finetuned the car setup through a series of engine, chassis dyno and track tests.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase 2650mm/1384mm/1265mm/1550mm

Track (front/rear) 1210mm/1155mm

Weight including 68kg driver (front/rear) 158kg/165kg

Suspension (front/rear) Double Unequal Length Wishbones, Front Pushrod / Rear Pullrod actuated, Fox DHX RC4 Shocks

Tyres (front/rear) Avon 20x6.2-13/20x7.2-13 A45 slicks

Wheels (front/rear) 6 inch wide,3 pc AI-Mg Rim,10.8mm positive offset/8 inch wide, 3 pc AI Rim, 10.8mm positive offset

Brakes (front/rear) ISR 22-048 Calipers, 220mm Disks /ISR 22-036 Calipers, 200mm Disks

Chassis construction Tubular Space Frame 25CrMo4, Carbon panels

Engine 2005 Honda CBR 600 RR

Bore/stroke/cylinders/cc 67mm bore/ 42,5mm stroke/ 4 cylinder/599cc

Fuel E85

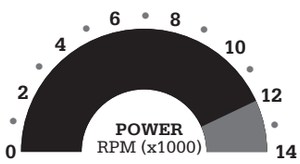
Fuel system Honda CBR1000RR fuel injectors, Bosch high pressure fuel pump

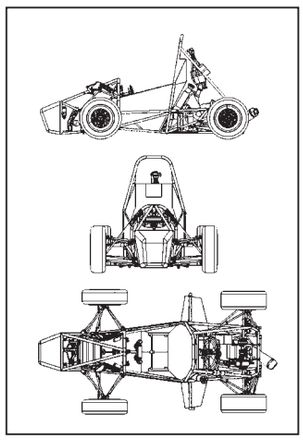
Max power/max torque 12.000RPM/8.000RPM

Transmission Chain Drive #525

Differential Drexler FS 2010 Limited slip differential

Final Drive 4,5:1





CLASS 1

POLITECNICO DI TORINO
TORINO, ITALY

152

When taking shape in 2005, the project SquadraCorse was gathering no more than ten people and could count on a very small amount of funding and resources made available almost exclusively from the Polytechnic of Turin. This year, for the development of the SCX, sixth prototype of the team, SquadraCorse may rely on more than fifty students and boast collaborations with sponsors that are internationally well-known. Moreover, a strong renewal in the organisational structure of the team has created all the conditions for a more effective and strong collaboration between the divisions and the members, which have been able to conduct in a proactive way all the operation necessary for the completion of the project. This seasons car, more than ever, is a natural child of the passion of the group and for this reason we are sure that it is not going to leave us disappointed under any circumstances. Following the development history of SC cars, we have chosen to keep the tubular steel frame architecture, the Honda CBR 600cc engine and the traditional rear aluminum "box" while implementing some new solutions such as the ELSD and the pneumatic actuation of the clutch.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase 2744mm/1416mm/1045mm/1620mm

Track (front/rear) 1210mm/1180mm

Weight including 68kg driver (front/rear) 135kg/152kg

Suspension (front/rear) Double unequal length A-Arm. Push rod/ Push rod actuated horizontally oriented spring and damper

Tyres (front/rear) Hoosier 20.5" x 7" - 13 R25B

Wheels (front/rear) 7" wide, 13" rim, Magnesium cast alloy

Brakes (front/rear) Cast Iron, hub mounted, 220 mm dia. Drilled

Chassis construction One piece tubular spaceframe

Engine 2005 / Honda CBR 600 RR

Bore/stroke/cylinders/cc 67mm bore/ 42.5mm stroke/ 4 cylinder/ 599cc

Fuel 100 RON unleaded

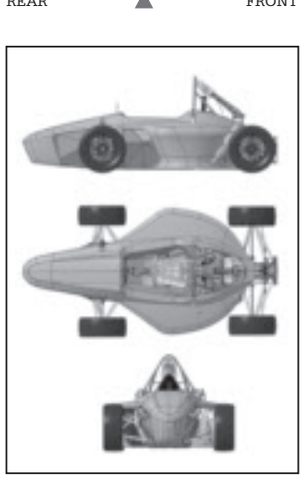
Fuel system Magneti Marelli multi point fuel injection

Max power/max torque 95 hp @ 11750rpm / 60 Nm @ 8000rpm

Transmission Single 520 chain

Differential Electronic limited slip differential

Final Drive adjustable from 4.4:1 to 4.75:1



CLASS 1

RYERSON UNIVERSITY
TORONTO, CANADA

21

The 2010 Ryerson Formula SAE car is the team's most innovative and powerful car to date. Brand new engine components (including an improved intake, exhaust and re-ground cams) work in conjunction with each other to produce more power than ever before, all while having a wider torque band. Gear ratios allow the driver to stay within the torque band as long as possible. Composites have played a major role this year with the inclusion of a fiber glass fuel tank and completely carbon fiber body. Carbon fiber suspension A-arms were created to ensure a very agile yet light car. This year's steering wheel will be completely carbon fiber, housing a versatile electronic dash. Wrought Magnesium uprights, which were designed and machined in-house, ensures that the upright assemblies can withstand any force applied to them, yet are lighter than comparable aluminium uprights. Data acquisition and integrated sensors provide improved feedback from the car during test and race conditions, while also enhancing the fine tuning of the engine's mapping capabilities. The mechanical shifter will be set aside for a pneumatic shifting system this year. For more information, visit www.RyersonFormulaSAE.com

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2783mm/1441mm/1159mm/1613mm

Track (front/rear) 1244mm/1168mm

Weight including 68kg driver (front/rear) 103kg/153kg

Suspension (front/rear)
Double unequal length
A-Arm. Push rod actuated

Tyres (front/rear)
Hoosier 20.5x6.5-13 Front,
20.5x7-13 Rear

Wheels (front/rear)
202mm wide, 3 pc Al Rim

Brakes (front/rear)
Fully floating front/ fixed rear rotors

Chassis construction
4130 Chromoly Space Frame

Engine
2009 / Yamaha YZF-R6
four stroke in line four

Bore/stroke/cylinders/cc
67.0mm bore/ 42.5mm
stroke/ 4 cylinder/ 599cc

Fuel E-85

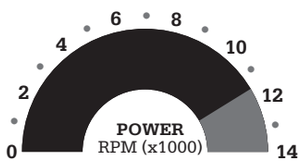
Fuel system
Link G4 Storm, sequential
fuel injection

Max power/max torque
11,500rpm/9,000rpm

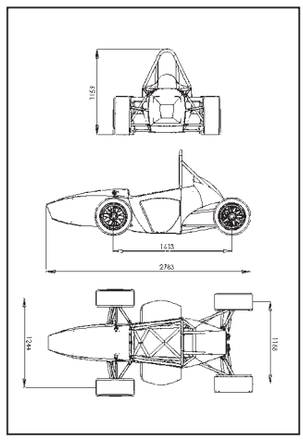
Transmission Chain-Drive (520)

Differential Drexler
Formula Student Special

Final Drive 3.61:1



WEIGHT DISTRIBUTION
REAR FRONT



CLASS 1

BRUNEL UNIVERSITY
UXBRIDGE, UNITED KINGDOM

6

Brunel Racing has been competing in Formula Student events since 1999 and the team has become an integral part of Brunel University's Motorsport Engineering degree course. The 2010 car, BR-XI is the team's 11th consecutive entry to Class 1 and builds upon the experiences and successes of previous years. BR-XI carries over a similar concept from 2009 with an aluminium honeycomb sandwich monocoque with rear steel spaceframe. The extremely high stiffness to weight ratio of the honeycomb sandwich monocoque has allowed the team to produce a fully equipped 4-cylinder car weighing only 200kg. BR-XI incorporates a 2007 R6 petrol engine with bespoke throttle, intake manifold and exhaust manifold producing 70kW peak power and a broad torque curve. Driveability and ergonomics have been high priorities for 2010 and BR-XI features a proven electronic gear shifter and a new servo actuated clutch system with steering wheel mounted paddles. BR-XI aims to improve upon the success of 2009 and the team are looking forward to this summer's competitions. For more information please visit us at www.brunelracing.co.uk and in our pit at Silverstone.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2406mm/1475mm/980mm/1600mm

Track (front/rear) 1300mm/1250mm

Weight including 68kg driver (front/rear) 129kg/139kg

Suspension (front/rear) Double Unequal Length A-Arm. Pull-rod Actuated Kaz Technology Dampers

Tyres (front/rear)
Hoosier 7.0/20.5 R13 Front & Rear

Wheels (front/rear)
Bradi 13-inch Aluminium Rims

Brakes (front/rear) AP Racing
4-Pot Front/ 2-Pot Rear Calipers
220mm Bespoke Slotted Discs

Chassis construction
Aluminium Honeycomb Monocoque/
Steel Spaceframe Hybrid

Engine 2007 Yamaha YZF-R6

Bore/stroke/cylinders/cc
67.0mm/42.5mm/599cc

Fuel 98 RON Petrol

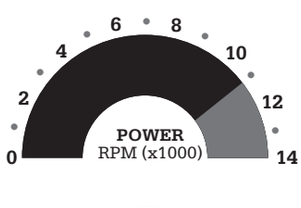
Fuel system
MoTeC M800 Controlled Non-
Return Fuel Injection System

Max power/max torque
11,000rpm/5,700rpm

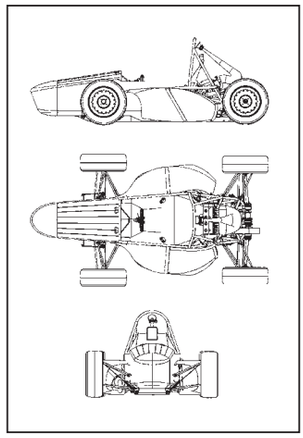
Transmission
Single 520-pitch Chain

Differential Drexler 2010 Clutch-
Type Limited Slip Differential

Final Drive
Multiple Final-Drive to Suit Events



WEIGHT DISTRIBUTION
REAR FRONT



CLASS 1

UNIVERSITÉ DE VERSAILLES-SAINT-QUENTIN-EN-YVELINES, VERSAILLES, FRANCE

78

DMS Racing Team is ready to meet a new challenge this year.

Winning the 2nd place in the Formula Student Italy Class 3 category, as newcomers, has been the best source of motivation for this year.

For its first participation in the Class 1 category, the DMSRT has one motto: Simple and Efficient.

The optimisation of last year's model was the main step. The digital scanning of our Honda Hornet engine, the development of real-life test models and digital machining permitted us to model the best compromise between security and performance.

The best position for the different drivers has been possible thanks to a personalised moulding.

Creative skills and intellectual rigour were in the place of honour.

To win or to learn, the DMS Racing Team is ready for Silverstone.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2950mm/1378mm/1235mm/1600mm

Track (front/rear) 1200mm/1200mm

Weight including 68kg driver
(front/rear) 152kg/185.9kg

Suspension (front/rear)
Double unequal lenght A-Arm.
Push rod actuated verticaly oriented spring and damper

Tyres (front/rear)
20.5 x 7.0-13 R25B Hoosier

Wheels (front/rear)
7"X13" Formrace by BRAID

Brakes (front/rear)
Laser cut in inox Z40, hub mounted, 220mm dia. Drilled

Chassis construction
One piece tubular spaceframe

Engine 2008 / Honda Hornet 600 four cylinder in line

Bore/stroke/cylinders/cc
67mm bore/ 42.5 stroke/
4 cylinder/ 599cc

Fuel 99 RON unleaded

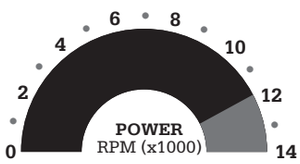
Fuel system
4 point semi-sequentiel injection/
2005 CBR 600 RR fuel rail

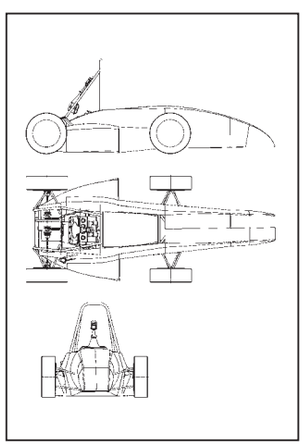
Max power/max torque
11,750rpm/9,000rpm

Transmission single 530 chain

Differential
QDF7ZR Quaife differential

Final Drive 3.7:1





CLASS 1

WARSAW UNIVERSITY OF TECHNOLOGY WARSAW, POLAND

84

We are a group of students interested in motorsport from Warsaw University of Technology. In SiMR Team we combine our passion and knowledge to build our first Formula Student car. We wanted to learn as much as possible so we have done as much as possible ourselves. Simple construction guarantees that even someone with just a little knowledge of car construction will be able to service it and have fun from driving.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2900mm/1650mm/1175mm/1800mm

Track (front/rear) 1382mm/1432mm

Weight including 68kg driver
(front/rear) 152kg/179kg

Suspension (front/rear) Double unequal length A-Arm. Two springs beetwen A-arm and frame/ Push rod with one horizontal spring

Tyres (front/rear) D2696
20.0x7.0-13 "SAE2" Goodyear

Wheels (front/rear)
7 in. wide, Al Rim

Brakes (front/rear) Standard brakes from Toyota Yaris 1st gen, front and rear disk brakes.

Chassis construction
One piece tubular spaceframe,

Engine 1994 / Suzuki GS-500 four stroke in line two

Bore/stroke/cylinders/cc
74.0mm bore/ 56.6mm stroke/
2 cylinder/ 487cc

Fuel 101 RON unleaded

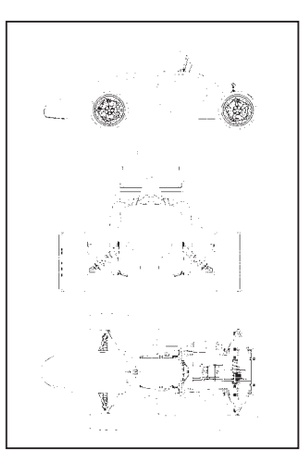
Fuel system One Mikuni BSR34SS carburettor

Max power/max torque
9200rpm/7.500rpm

Transmission Single 520 chain

Differential
Standard differential from Toyota Yaris with 1.0 litre engine

Final Drive 4.5:1



CLASS 1

WROCLAW UNIVERSITY OF TECHNOLOGY
WROCLAW, POLAND

24

PWR Racing Team is a group of 20 students from Wroclaw University of Technology. In 2009, as a new team, our virtual car RT09 achieved 7th place in the Class 3 competition at Silverstone. These results show that our team can be one of the main favourites this year. The new RT01 car is built on knowledge gained from the previous year. We are aware that as newcomers in Class 1, it is a great challenge to design and build a car that can compete with the best teams. That is why we put emphasis on mass reduction and innovation. In a four cylinder engine, the Honda CBR 600, we found the heart of our vehicle. Our custom-made shock absorbers allow us to obtain the desired suspension characteristics. Despite mechanical advantages we cooperate constantly with a designer from the Academy of Fine Arts to achieve a modern body shape.

We would like to thank our University, our Sponsors and everyone who helped us to build this car. We wish all Formula Student teams the best of luck.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2788mm/1428mm/1139mm/1650mm

Track (front/rear) 1220mm/1160mm

Weight including 68kg driver
(front/rear) 135kg/165kg

Suspension (front/rear)
Double unequal length A-Arm.
Push rod actuated horizontally oriented spring and custom damper

Tyres (front/rear)
Hoosier 20,5x6.0x13/20,5x7.0x13

Wheels (front/rear)
Braid 13x6.0/13x7.0

Brakes (front/rear)
ISR Callipers, hub mounted, brake disc ISR 230mm/220mm

Chassis construction
One piece tubular spaceframe,

Engine Honda CBR600 RR, PC40

Bore/stroke/cylinders/cc
67,0 mm / 42,5 mm /
4 cylinder / 599 cc

Fuel 98 octane unleaded gasoline

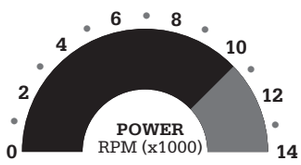
Fuel system
Honda multi point fuel injection

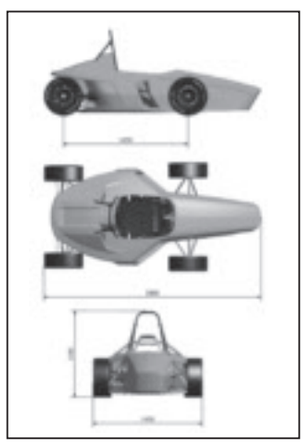
Max power/max torque
10,500rpm/7,500rpm

Transmission Single 525 chain

Differential
Drexler Differential 2010 v2

Final Drive 3:1





CLASS 1

UAS ZWICKAU
ZWICKAU, GERMANY

07

Innovation meets Tradition - if you look at Zwickau's automotive history you can easily find out why we picked out this slogan for our team. Zwickau is the birth place of Horch and Audi, and furthermore in the 1930s, it was the domicile of the Auto Union race cars which dominated the race tracks in Europe. Almost 70 years later, our WHZ Racing Team was founded. Now in 2010, we bring our fourth car, the FP410 to the tracks. The FP410 is a basic concept from the last car, concentrating on weight reduction, calibration and driver training. We created a fast and reliable car for Formula Student.

Nowadays, our team consists of about 40 members from different departments of UAS Zwickau. This team has worked hard and efficiently to upgrade its results for the 2010 season. If you would like to see more of our car, we are looking forward to meeting you at the competition. For more information visit our homepage www.whz-racingteam.de

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2695mm/1373mm/1118mm/1550mm

Track (front/rear) 1200mm/1140mm

Weight including 68kg driver
(front/rear) 120kg/146kg

Suspension (front/rear)
Double unequal length A-Arm.
Push rod actuated horizontally oriented spring and damper

Tyres (front/rear)
20,5 x 7,0 - 13 Hoosier

Wheels (front/rear)
8" wide, 1 pc carbon fibre rim

Brakes (front/rear)
self developed brake calliper, front 250mm, rear 230mm

Chassis construction tubular spaceframe with bolted rear assembly

Engine 2002 / Honda CBR 600 PC35 four stroke in line

Bore/stroke/cylinders/cc
67mm bore/ 42,5mm stroke/
4 cylinder /599cc

Fuel ROZ 100 unleaded

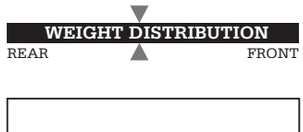
Fuel system stud.des.
Carbon tank / Bosch fuel injection fully sequential

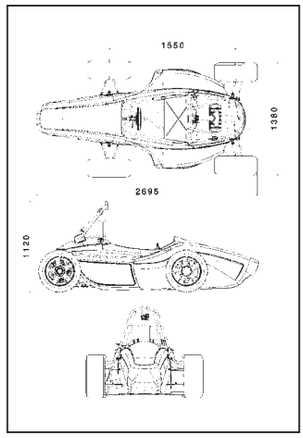
Max power/max torque
11000rpm / 9500rpm

Transmission single 428 chain, self developed sprocket

Differential Drexler limited slip differential

Final Drive 4,5:1





CLASS 1A SCORING.

Acceleration	75	Low Carbon Production	200
Skidpad	50	Design	150
Sprint	150	Sustainability	100
Endurance	200	Business	75

2009 Class 1A Winners, University of Hertfordhire

CLASS 1A

ETSEIAT (UNIVERSITAT POLITÈCNICA DE CATALUNYA), CATALUNYA, SPAIN

508

We are UPC ecoRacing, a nonprofit association of ten industrial engineering students of the ETSEIAT (UPC) with a special interest in everything related to cars.

Our association was created as the first Formula Student (FS) team of our school. Our purpose was to develop a hybrid car as an ecological alternative to classic combustion cars. Everything is an excuse to learn about alternative energies applied to automotive engineering.

In general terms, our car is the same as any other FS car but it combines a combustion engine with an electric motor. Both deliver power in parallel but the car can also work as a full electric car. This permits us to recover kinetic energy while braking to recharge the batteries and reduce both emissions and fuel consumption.

Bearing in mind that we are a first year entry team and that in our school there was no previous experience with FS, developing a hybrid car from scratch and having everything on time is a real challenge and the team considers that achieving all this is a success itself, even before the great event at Silverstone.

We would like to thank all our sponsors for their help because without them, our dream couldn't have come true.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2827mm/1338mm/1142mm/1680mm

Track (front/rear) 1160mm/1160mm

Weight including 68kg driver
(front/rear) 160kg/210Kg

Suspension (front/rear)
Double unequal length A-Arm. Push rod actuated spring and damper with Adj. antiroll bars.

Tyres (front/rear)
20,5 x 7 R13 Hoosier R25B

Wheels (front/rear) 7 x 31 mm offset, 1 pc Braid Al Rims

Brakes (front/rear)
Steel, hub mounted, 220mm dia. Drilled

Chassis construction
Tubular steel spaceframe

Engine
2005/ Derbi GP1 four stroke

Bore/stroke/cylinders/cc
72mm bore/ 60mm stroke/ 1 cylinder/ 244,29cc

Fuel 99 RON unleaded

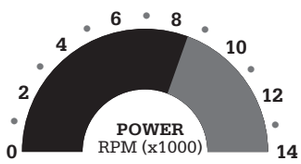
Fuel system Electronic injection

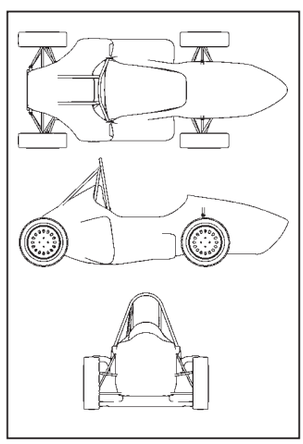
Max power/max torque
8,500rpm/6,500rpm

Transmission
Self designed torque coupling

Differential Quaife automatic torque biasing differential

Final Drive 4:1





CLASS 1A

EINDHOVEN UNIVERSITY OF TECHNOLOGY EINDHOVEN, THE NETHERLANDS

540

The URE05e is the team's first electric Formula Student car. University Racing Eindhoven has focussed on developing a reliable electric powertrain. The URE05e has the chassis and suspension design of the previous year's car, the URE05, and a completely new electric powertrain and electronics. Last year the carbon fiber monocoque and full multilink suspension proved to have a good performance on the track. The new powertrain has two independent 35kW electric motors; one for each rear wheel. The self developed active electronic differential performs torque vectoring resulting in faster cornering. The powertrain, including the self designed battery, has been extensively tested on a special test bench.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2745mm/1334mm/1062mm/1600mm

Track (front/rear) 1225mm/1175mm

Weight including 68kg driver
(front/rear) 157kg/160kg

Suspension (front/rear)
Full multilink. Push/pull rod actuated Koni 2612 dampers, Merwede springs

Tyres (front/rear)
20.5X7-13 R25B

Wheels (front/rear)
Carbon fibre rims

Brakes (front/rear) 230mm/185mm rotors, Brembo P32/Grimeca, adjustable brake balance

Chassis construction
Carbon fibre monocoque and steel tubular rear frame

Engine
Two LEM200 brushed PMDC, Lynch Motor Company

Bore/stroke/cylinders/cc

Fuel Electrons

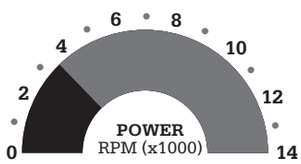
Fuel system
Lithium Ion Polymer batteries

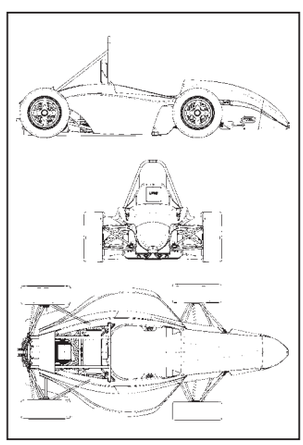
Max power/max torque
3,500rpm/0rpm

Transmission Double 428 chain

Differential Active electronic differential (torque vectoring)

Final Drive 4:1





CLASS 1A

GRAZ UNIVERSITY OF TECHNOLOGY
GRAZ, AUSTRIA

553

Since Graz University of Technology already has a highly successful Formula Student racing team, other ambitious students keen to develop a competitive electric racing car were easily found. The TU Graz e-Power Racing team was born. Our mission is to put our knowledge of electric automotive construction into practice and furthermore to highlight the benefits of zero-emission cars for the environment. We want to demonstrate that racing cars, constructed on the basis of the innovative electric technology, are without any doubt able to compete with traditional petrol-engined racing cars.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2832mm/1410mm/1189mm/1575mm

Track (front/rear) 1200mm/1180mm

Weight including 68kg driver
(front/rear) 157kg/170kg

Suspension (front/rear)
Double unequal length A-Arm. Push rod actuated horizontally oriented spring and damper

Tyres (front/rear)
Hoosier 20.5 x 7.0-13

Wheels (front/rear)
178mm wide, 3 pc Al Rim

Brakes (front/rear) Rotors: floating, steel Callipers and Master Cylinders: AP Racing

Chassis construction
carbon fibre monocoque

Engine 2 x interior permanent syncronous magnet motors

Bore/stroke/cylinders/cc
none

Fuel Electricity

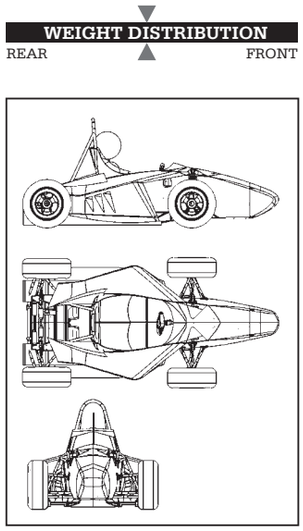
Fuel system student designed lithium chem. battery packs and dual inverters

Max power/max torque
55kW/180Nm

Transmission double 06B-1 chain

Differential none / electronic torque vectoring

Final Drive 6:1



CLASS 1A

UNIVERSITY OF HERTFORDSHIRE
HATFIELD, UNITED KINGDOM

513

In a never ending pursuit for the winner's podium, the University of Hertfordshire is returning from their wins in both previous Class 1A events at Silverstone in 2008 with a hydrogen powered car, and 2009 with the first purely electric Formula Student race car. The cohesive team structure encompassing both Class 1 and Class 1A teams has enabled improvements in productivity and brought a great deal of experience to the team. UH13A, the team's latest and greatest Class 1A car, has been designed based on the experience gained from last year's electric car with the core principal of building low cost high performance race cars. Powered by two Lynch Motor Company motors and LiFeBatt cells, whilst incorporating large advances in packaging and electronics, the university's third Class 1A car is looking to leave quite an impact this summer. www.racing.herts.ac.uk

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2620mm/1357mm/1280mm/1535mm

Track (front/rear) 1200mm/1150mm

Weight including 68kg driver
(front/rear) 156.5/176.5

Suspension (front/rear)
Double unequal length wishbones. Pushrod actuated spring and damper units.

Tyres (front/rear)
520.7 x 177.8-330.2 Hoosier/
520.7 x 177.8-330.2 Hoosier

Wheels (front/rear) 3-piece Al rim, machined centre 330.2 x 177.8mm, 40.5 offset Fr+Rr

Brakes (front/rear) 4 self developed rotors - 220mm dia drilled, adjustable brake bias

Chassis construction
2 piece tubular steel space frame with bonded fibrelam floor

Engine Lynch Motor Company LEM 200 D127 2x2 Motors

Bore/stroke/cylinders/cc n/a

Fuel Electric

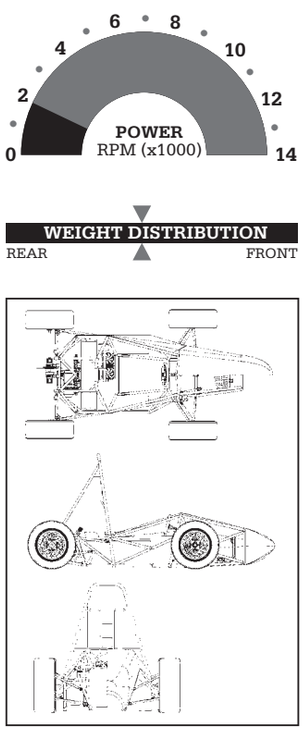
Fuel system LiFeBatt
LiFe PO4 10Ah cells 48S5P configuration, 144V 50Ah

Max power/max torque
2000rpm/0rpm

Transmission Chain#250

Differential Gripper Salisbury LSD

Final Drive 4:25



cenex

LCV 2010

UK National Low Carbon Vehicle Event

15th and 16th September 2010, Millbrook Proving Ground, Bedfordshire

GVC 2011

UK National Green Vehicle Congress

March 2011 (Dates and Venue tbc)

For more information email events@cenex.co.uk

SEMINAR

EXHIBITION

RIDE & DRIVE

CONFERENCES

WORKSHOP

NETWORKING

CLASS 1A

CITY UNIVERSITY LONDON
LONDON, UNITED KINGDOM

525

We are a team motivated to build an innovative racing car destined to represent the excellence of our teamwork, diligence and commitment. The team consists of third year and forth year mechanical, aeronautical and automotive engineering students from City University London. We are building on our 2009 Class 1 entry by developing a flywheel/ICE powered series/parallel hybrid. This year's entry will test the design of the chassis, suspension and engine components; the flywheel system has been developed alongside this year's entry and will be integrated for 2011.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2613mm/1580mm/1156mm/1600mm

Track (front/rear) 1400mm/1250mm

Weight including 68kg driver
(front/rear) 135/165kg

Suspension (front/rear)
Double A arm push rod actuated

Tyres (front/rear) 6.2/20.0-13 Avon

Wheels (front/rear)
165 mm wide, 13" Al Rim

Brakes (front/rear) Cast Iron, Hub Mounted, 220 mm dia. Slotted.

Chassis construction
One piece tubular spaceframe

Engine 1990 Honda CBR 250

Bore/stroke/cylinders/cc
48.5 mm bore/ 33.8mm stroke/
4 cylinder/ 250cc

Fuel 98 RON unleaded

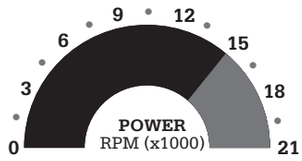
Fuel system
Multi point fuel injection

Max power/max torque
15,000rpm/10,000rpm

Transmission Single Chain

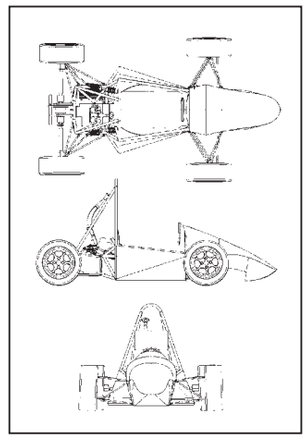
Differential Quaife Unit

Final Drive 3.2:1



WEIGHT DISTRIBUTION

REAR FRONT



CLASS 1A

LUND UNIVERSITY
LUND, SWEDEN

500

LURacing is the team from Lund, Sweden. We are making a hybrid car this year and will therefore compete in Class 1A. The propulsion will be handled by one electric motor and one combustion engine. The chassis is made out of a carbon fiber monocoque and a steel tube subframe to reduce the total weight of the car. The team consists this year of 38 students with a wide variety of backgrounds.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2745mm/1500mm/1150mm/1579mm

Track (front/rear) 1226mm/1076mm

Weight including 68kg driver
(front/rear) 180kg/ 220kg

Suspension (front/rear)
Double unequal, non parallel
A-arm. Pushrod actuated
horizontally oriented

Tyres (front/rear)
460 x 150 -250 R25B Hosier

Wheels (front/rear)
185mm wide, 2pc Al Rim

Brakes (front/rear)
ISR, 4 pistons, 195mm front,
170mm rear, drilled

Chassis construction
Carbon Fibre Monocoque
with a tube subframe

Engine
2004, Honda CRF 250X four stroke

Bore/stroke/cylinders/cc
78mm bore/ 52.2 mm stroke/
i cylinder/ 250cc

Fuel
Fuel injection

Fuel system Siemens VDO
injectors, FRI Euro 4 ECU

Max power/max torque
-

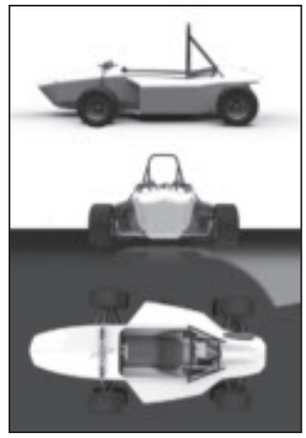
Transmission 5 speed,

Differential Honda ATB

Final Drive -

WEIGHT DISTRIBUTION

REAR FRONT



CLASS 1A

UNIVERSITY OF NOTTINGHAM
NOTTINGHAM, UNITED KINGDOM

575

Our team consists of just four team members, who are studying in their final year of a Masters in Mechanical Engineering. This project has been our final year group development project.

This year the University of Nottingham is using the Yamaha WR450F engine for the first time. Our main aim has been to simplify the design of the car and keeping with the lightweight engine to produce a very low mass car.

The mass of our car is 180kg which is 70kg lighter than any car previously entered by the University whilst still using a steel space frame.

A feature of our drivetrain is that the LSD is an interchangeable item with a locked differential that we have designed. This allows us to save a further 5kg on our design mass. The performance of this differential will be assessed during testing.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
1977mm/1363mm/1157mm/1525mm

Track (front/rear) 1200mm/1160mm

Weight including 68kg driver
(front/rear) 102.5kg/142.5kg

Suspension (front/rear)
Double unequal length A-Arm. Outboard mounted spring and damper

Tyres (front/rear) 508 x 158-330 Avon /508 x 182-330 Avon

Wheels (front/rear) Alloy 13" dia 6" wide/ Alloy 13" dia x 7" wide

Brakes (front/rear)
Steel Discs, hub mounted and Dynalite Single Callipers

Chassis construction
One piece tubular space frame

Engine
Yamaha 250cc four stroke

Bore/stroke/cylinders/cc
95mm bore / 63.4mm stroke/ 1 cylinder / 449 cc

Fuel 99 RON unleaded

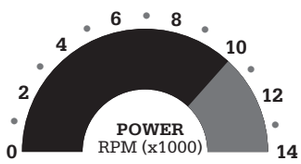
Fuel system 39mm Keihin FCR

Max power/max torque
10200rpm/ 7500rpm

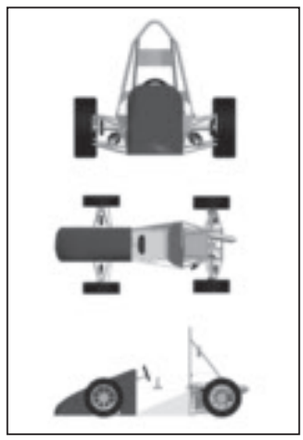
Transmission Single 520 chain

Differential Quaife automatic torque biasing differential

Final Drive 3.2:1



WEIGHT DISTRIBUTION
REAR FRONT

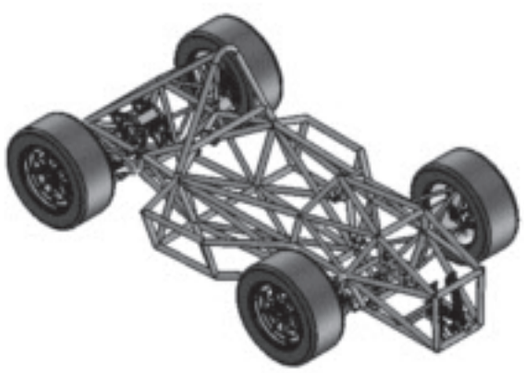


CLASS 1A

OXFORD BROOKES UNIVERSITY
OXFORD, UNITED KINGDOM

592

The 2010 Class 1A entry from OBR is coming from a new direction compared to previous years, in the form of an electric car. The car has a 360V HV system, with a maximum discharge of 150A. The motor is from a company called Oxford Yasa Motors, with a torque of 500nm. The system is controlled by a 600V Semikrom Invertor. Our main objective this year is to continue with our record of reliability and produce a highly competitive race car.



TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2585mm/1278mm/964mm/1525mm

Track (front/rear) 1140mm/1100mm

Weight including 68kg driver
(front/rear) -

Suspension (front/rear)
Double unequal length non-parallel A-Arms. Pull rod actuated Cane Creek DB

Tyres (front/rear)
20x7-13 GoodYear

Wheels (front/rear) 6 inch wide, 25mm neg. Offset, 3 pc aluminium rim/aluminum centre

Brakes (front/rear) Floating, Cast Iron, hub mounted, 220 mm dia.

Chassis construction
Tubular space frame

Motor OYM 500nm Motor

Batteries 360V 150A LifeBatt

Fuel Shell V Power

Fuel system Siemens VDO injectors, FRI Euro 4 ECU

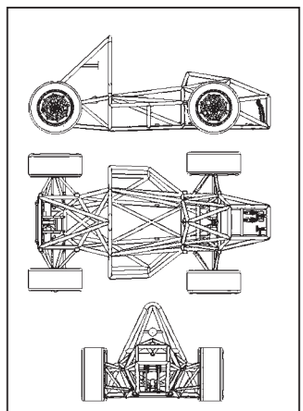
Max power/max torque
45kW/500nm

Transmission Single 520 chain

Differential
Drexler clutch-pack salisbury LSD

Final Drive 1.6:1

WEIGHT DISTRIBUTION
REAR FRONT



CLASS 1A

UNIVERSITY OF CENTRAL LANCASHIRE PRESTON, UNITED KINGDOM

567

Formula UCLAN is a small team studying in their 3rd year of Motorsports Engineering and Motorsports Operations degrees at the University of Central Lancashire in Preston. Formula Student forms a large part of a teaching module at the university and sees teams averaging between 6 and 12 members conceiving, designing, manufacturing and testing their vehicles in a 9 month period alongside the rest of their studies.

This year's entry in Class 1A is the FSX 1A, a car designed through the intelligent selection of materials to produce lightweight and sustainable components. The car is intended to build on the previous year's success in the sustainability event whilst retaining our side-engine layout common to Formula UCLAN's family of cars. There has been a focus on substituting environmentally advantageous materials for those usually associated with motorsport, including the use of basalt fiber and bio resin as an alternative to carbon fiber and epoxy resin.

Whilst looking forward to successes in the summer, Formula UCLAN would like to take this opportunity to thank Fusion Provida, Preston City Council and all of our additional Sponsors and Partners for their support throughout this and

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2387mm/1318mm/1075mm/1610mm

Track (front/rear) 1145mm/1124mm

Weight including 68kg driver
(front/rear) 105kg/158kg

Suspension (front/rear)
Double unequal length A-Arm wishbones with outboard directly actuated dampers/Double unequal length wishbones with outboard directly actuated dampers

Tyres (front/rear) Avon A45 20 x 6.2 - 13/ Avon A45 20 x 6.2 - 13

Wheels (front/rear)
13" x 6.2 Weller lightweight steel

Brakes (front/rear) 220mm drilled discs on aluminium bells with Brembo twin piston callipers

Chassis construction
Seamless steel tubular spaceframe

Engine
2007 KTM EXC-F four stroke single

Bore/stroke/cylinders/cc
76mm bore/ 55mm stroke/ single cylinder/ 249.5cc

Fuel E85 Bio-Ethanol

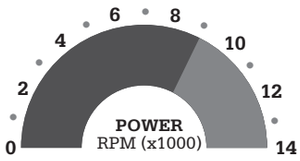
Fuel system Motec M400 ECU with single point fuel injection

Max power/max torque
9,000rpm/ 8,000rpm

Transmission Single 520 chain

Differential GKN Viscolock

Final Drive 3.5:1



CLASS 1A

ETH ZÜRICH ZÜRICH, SWITZERLAND

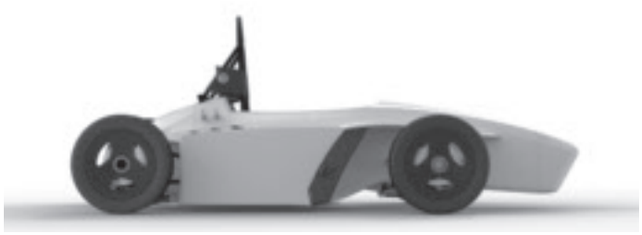
515

After three successful Formula Student cars with combustion engines, the AMZ Racing Team decided in the summer 2009 to concentrate on developing an electric car. By designing not only a new drivetrain, but also a new chassis and suspension, our goal is to outperform the ICE cars in every dynamic discipline.

Furka's monocoque is an evolution of our 2009 chassis simplon, with a completely redesigned rear section. Thanks to the small electric motors, a pullrod suspension was realised. The suspension geometry was further optimised with extensive simulation of tire data, while the components' weight was reduced.

The LiIon batteries are contained in composite boxes, mounted to the sides of the chassis. Safety is maintained by our self-made battery management system and the central vehicle control unit. To achieve a high power to weight ratio, two DC motors are used. Each of them is linked to one rear wheel, which allows active torque vectoring and recuperation.

We are looking forward to meeting you at the event!



TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2716mm/1403mm/1000mm/1625mm

Track (front/rear) 1200mm/1160mm

Weight including 68kg driver
(front/rear) 134 kg / 154 kg

Suspension (front/rear) CFRP double unequal lenght A-Arm, pullrod (f/r) actuated double barrel spring and damper unit

Tyres (front/rear)
20,5 x 7,0-13 R25B Hoosier / 20,0 x 7,5-13 R25B Hoosier

Wheels (front/rear)
7,5 x 13", one piece CFRP

Brakes (front/rear) 4 disk system, floating, 220mm (f) / 212mm (r)

Chassis construction
Two piece full length CFRP monocoque (detachable rear)

Engine 2 x DC motor AGNI 95

Bore/stroke/cylinders/cc
motor controller: 2 x Kelly KDHE

Fuel 111 V DC electric

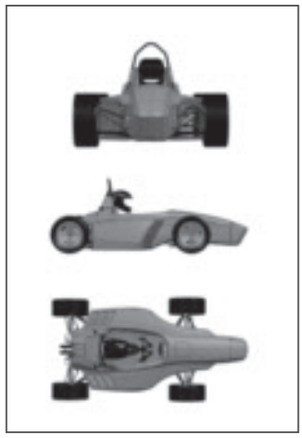
Fuel system 8 kWh LiIon battery with selfmade BMS, enclosed in composite housing

Max power/max torque
2 x 33 kW / 2x 65 Nm

Transmission 2 x 425 Chain with aluminium two piece sprockets

Differential no mech. connection, electronic torque vectoring

Final Drive 5.8 : 1



CLASS 1A

UAS ZWICKAU
ZWICKAU, GERMANY

507

UAS Zwickau is famous for their know-how in internal combustion engines and vehicles. With our new founded Formula Student Electric team, we want to show that there are possibilities in racing besides pistons and camshafts. With our FP410e ("E-Horst") we combine the knowledge of three Formula Student cars with the advantages of electric drives. The result is a fully electric race car with four individually powered wheels that compensates the surplus weight in comparison to a standard FS car with its higher driving dynamics. We are a team of only 12 team members, but all of them work with a fantastic spirit and result in a great team. This team will bring the first full electric German FS car to Silverstone - we really look forward to a great event with fantastic teams from all over the world.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2655mm/1378mm/1150mm/1550mm

Track (front/rear) 1200mm/1200mm

Weight including 68kg driver
(front/rear) 153kg/187kg

Suspension (front/rear)
Double unequal length A-Arm.
Push rod front / Pull rod rear, horizontally oriented spring and damper

Tyres (front/rear) 20.5x7-13 R25B

Wheels (front/rear)
6.5" wide, 2 pc Mg/CFRP rim

Brakes (front/rear)
Alloy steel, hub mounted, 250mm dia. front, 230mm dia. rear, Drilled

Chassis construction
One piece tubular spaceframe

Engine Front: hub engines/
Rear: self developed central engines

Bore/stroke/cylinders/cc -

Fuel -

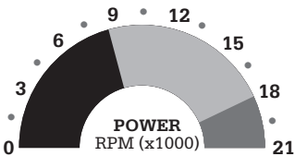
Fuel system -

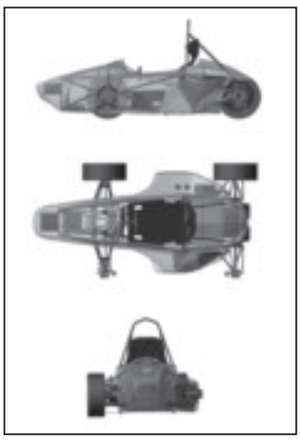
Max power/max torque
Front: 18,000rpm / Rear: 8,500rpm

Transmission direct transmission

Differential electronical differential

Final Drive
Front: 12,3:1 / Rear: 6,4:1





CLASS 2

UAS LESSIUS, CAMPUS DE NAYER

The De Nayer Racing team is participating this year for the first time and we are the first Belgian team to compete in FS. 15 students decided they wanted something more than a theoretical thesis. We are master and bachelor students in Automotive engineering, Electro-mechanical engineering and Electronics. Next year we'll be participating in Class 1. The main goal for our current car is to build a reliable car that meets all the FSAE rules, which will be a platform for further testing and development of a more advanced car. We decided to convert the injection system to E85 Bio-ethanol, and use a lightweight welded aluminium spaceframe for a chassis to minimise consumption of fossil fuels. This is our first car, DNRT01.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase 2750/1430/1154/1600mm

Track (front/rear) 1200mm/1150mm

Weight including 68kg driver (front/rear) 141kg/159kg

Suspension (front/rear) Double unequal length A-Arm. Push rod actuated vertically oriented spring and damper

Tyres (front/rear) 510 x 205-330 Continental

Wheels (front/rear) BBS, 3pc Al Rim, 8x13

Brakes (front/rear) 4 disc system with 248mm diameter, 2 piston AP Racing Calipers

Chassis construction One piece tubular aluminium spaceframe

Engine 2003/ CBR600RR four stroke, 4 cylinder in line

Bore/stroke/cylinders/cc 67,0mm bore/ 42,5mm stroke/ 4 cylinder / 599cc

Fuel E85 Bio-ethanol

Fuel system Honda Programmed dual stage multipoint fuel injection

Max power/max torque 117 HP @13.000RPM / 66Nm @11.000RPM

Transmission Single chain

Differential Drexler limited slip differential Formula Student

Final Drive Not designed yet

CLASS 2

UNIVERSIDADE DE AVEIRO

It is the second time Engenius enters Class 2, having won the Class 2 competition in 2008 with the xante car.

The team is brand new this year and this project showed us practical situations. It gave us much pleasure doing this car as we saw it rise from nothing.

We present a new car called LINX as we are a team from Portugal that is thought to honor a noble endangered species.

This car has some advantages over the previous car as we have optimised the frame and chosen an engine with a reduced weight (Aprilia SXV 550). We added a compressor in order to increase the weight/ power ratio. As a result we reduced the weight by about 20kg in total compared to last year, thereby making a car weighing about 195kg.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase 2900/1367/1210/1570mm

Track (front/rear) 1366mm/1273mm

Weight including 68kg driver (front/rear) 106kg /159kg

Suspension (front/rear) Upper and lower "virtual A-arms". Push rod / pull rod actuated horizontally to damper

Tyres (front/rear) 20x7.2-13 A45 Avon Racing Tyres

Wheels (front/rear) Compomotive alloy 13" x 6.5" mm offset, 4mm thick 6061 aluminium

Brakes (front/rear) 273mm dia. Driled, BILLET POWERLITE CALIPER 120-8726

Chassis construction one piece tubular spaceframe

Engine 2008 / Aprilia SXV 550 four stroke 2 cylinders in v

Bore/stroke/cylinders/cc 76mm bore/ 49.5mm stroke/ 2 cylinders / 549cc

Fuel 98 Ron

Fuel system Aprilia fuel injection

Max power/max torque 90hp / 8.000rpm

Transmission AFAM Drive Chain 520

Differential Quaife QDF7ZR, Quaife ATB Helical LSD Differential

Final Drive 1:1

CLASS 2

UNIVERSITY OF BATH UNITED KINGDOM

Team Bath Racing 2011 is a team of 26 mechanical, automotive and electrical engineers from over 10 countries.

After a decade of participating in FS with increasing success, TBR look forward to presenting an all new concept focused on weight reduction and improved drivability.

Powered by a new, lightweight Aprilia V-twin engine, the TBR11 car benefits from a weight saving of 30kg and reduced wheelbase.

Engine simulation software has been used extensively to optimise the powertrain, resulting in a significant increase in torque at lower engine speeds and a flatter overall torque curve, offering improved driveability and transient response to the driver.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase 2460/1405/1025/1535mm

Track (front/rear) 1250/1200mm

Weight including 68kg driver (front/rear) 123kg/123kg

Suspension (front/rear) Double unequal length A-Arm. Push rod actuated longitudinal/horizontal oriented spring and damper

Tyres (front/rear) 18x6.0 10" / 18x7.5 10" Hoosier

Wheels (front/rear) 153mm/202mm wide custom carbon

Brakes (front/rear) Stainless Steel, hub mounted, 180mm dia drilled

Chassis construction One piece tubular spaceframe

Engine 2010 / Aprilia RXV 550 four stroke V2

Bore/stroke/cylinders/cc 80mm bore / 55mm stroke/ 2 cylinder / 550cc

Fuel 101 RON unleaded

Fuel system Custom design with Pectel ECU

Max power/max torque 9500rpm / 4500rpm

Transmission Single 415 chain

Differential Drexler Formula Student 2010 V3

Final Drive 2.84:1

CLASS 2

UNIVERSITY OF THE BASQUE COUNTRY

"FSB Full Electric" is a newborn team of 5 final year students enriched by the experience of 2 international students. Our challenge is to develop a new team enthusiastic about the idea of an electric racing car. In collaboration with the university as a source of experience, our goals are to learn about project management, team working and people skills at the same time as improving our knowledge about car skills, in the fields of design and manufacture.

Our car will be powered by a battery-operated electric motor, simplifying the several combinations that the hybrid power-system offers.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase 2,500/1,477/1,010/1,600mm

Track (front/rear) 1,250/1,200mm

Weight including 68kg driver (front/rear) 170 kg / 210 kg

Suspension (front/rear) Double Unequal length A-Arms. Push rod actuated Öhlins TTX25 FSAE Dampers

Tyres (front/rear) 20.5" x 7"- 13" R25B Hoosier

Wheels (front/rear) 13"x 7" , 3 piece Aluminum Rim

Brakes (front/rear) Floating discs, laser cut steel, hub mounted, 230mm/220mm (front/rear)

Chassis construction One piece tubular spaceframe,

Engine UQM380 Brushless PM Motor/Generator (electric)

Bore/stroke/cylinders/cc -

Fuel Electicity

Fuel system -

Max power/max torque 4,000rpm/1,000rpm

Transmission Timming Belt 2"

Differential Quaife automatic torque biasing differential

Final Drive 3.64:1

CLASS 2

UNIVERSITY OF THE WEST OF ENGLAND

This year the UWE Racing team is split into five sections: drive train, chassis, suspension, electromech and costing/ sponsorship. Our Class 2 car is based around a simple steel spaceframe chassis, running a 600cc bike engine. We have not yet made a decision on whether to use a differential. Our intentions are to enter Class 1 and have a fully working car on the track within the next two years. Our main objectives for this year are to score highly in the Class 2 category and learn from more experienced teams about maintaining and developing the car.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase 2520/720/1175/1702mm

Track (front/rear) 1200mm/1200mm

Weight including 68kg driver (front/rear) 95.7/184.3kg

Suspension (front/rear) Double unequal length arms. Push-rod actuated, inboard mounted spring-damper unit.

Tyres (front/rear) Avon Motorsport 157/530 R13

Wheels (front/rear) 330.2 dia, 203.2mm ide, 1pc Al rim, 100mm pod

Brakes (front/rear) Al disks, bell mounted, 214.4mm front 168mm rear, grooved

Chassis construction CDS steel tubular spaceframe

Engine 1999 Yamaha R6 inline four

Bore/stroke/cylinders/cc 65.5 x 44.5mm/ 4 stroke/ 4 cylinder/ 599cc

Fuel 98 ron unleaded

Fuel system Adapted EFI with MegaSquirt-I programmable EFI PCM

Max power/max torque 120bhp @ 13000rpm/ 68Nm @ 115000rpm

Transmission 6-speed Single 520 chain

Differential Quaife chain drive ATB Differential

Final Drive 4.2:1

CLASS 2

UNIVERSITY OF WARWICK

Warwick University's Class 2 vehicle is being designed for entry into the 2011 Class 1 competition. The team is separate from the 2010 Class 1 entry and is made up of 3rd year engineering students studying at Warwick. The Class 2 concept is a step away from the previous Warwick Formula Student vehicles as the engine is mounted on the side of the chassis. Having the engine mounted on the side should allow for a reduced wheelbase and better performance.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase 2590/830/985/1525mm

Track (front/rear) 1330mm/1240mm

Weight including 68kg driver (front/rear) aimed below 200kg

Suspension (front/rear) Double Wishbone with unequal arms

Tyres (front/rear) Not Defined

Wheels (front/rear) Outside diameter: 360mm

Brakes (front/rear) Dual circuit caliper, 220mm dia.

Chassis construction One Piece tubular spaceframe

Engine KTM 525

Bore/stroke/cylinders/cc 95.0/ 72.0mm/ 1 cylinder/ 510cc

Fuel Not Defined

Fuel system Not Defined

Max power/max torque 7500/6000rpm

Transmission Standard KTM transmission - 6 speed sequential

Differential Clutch plate LSD - Gripper Diffs Coventry

Final Drive 4.5:1

CLASS 2

CRANFIELD UNIVERSITY

The Cranfield University team has been created with a sustainable view. The aim of this design was to mirror a 600cc IC Engine's performance, with vastly reduced $C0_2$ output. We have coupled electric motors with a smaller motorcycle engine, achieving environmentally friendly and better torque characteristics. This has been achieved with Aluminium Alloy brake disks, a high stiffness chassis and almost perfect front/ rear weight distribution.

Cranfield University is solely a Postgraduate Institution, so ensuring continuity between teams has been established by using a 2 year development cycle. This will see Cranfield as front runners in Class 1A over the next few years...watch this space!

TECHNICAL SPECIFICATION

Length/width/height/wheelbase 2677/1374/1138/1600mm

Track (front/rear) 1200mm/1150mm

Weight including 68kg driver (front/rear) 151.65kg/185.35kg

Suspension (front/rear) Double unequal length A-arm front and rear. Push rod actuated spring and damper system.

Tyres (front/rear) Goodyear D2696 20 x 7.0 x 13"

Wheels (front/rear) 177.8mm wide, Magnesium

Brakes (front/rear) Aluminium Alloy, hub mounted, 220mm dia. Drilled

Chassis construction One piece tubular spaceframe with cockpit shear panel

Engine Kawasaki 250r/Remy HVH250 Electric motor

Bore/stroke/cylinders/cc 62mm bore/ 41.2mm stroke/ 2 cylinder/ 249cc

Fuel E85

Fuel system Kawasaki common rail fuel injection

Max power/max torque 12,000rpm/8,000rpm

Transmission Dual 520 chain

Differential Drexler FSAE Limited Slip Differential

Final Drive 3:1

CLASS 2

DUBLIN INSTITUTE OF TECHNOLOGY

Dublin Institute of Technology enters FS for the first time in 2010. The DIT team is comprised of 12 undergraduate engineering students. The goal is to design and build a car so that the basics of racing car automotive design and manufacture can be understood, leading to a Class 1 entry next year. The team plans to have a fully built car which next year can be extensively tested, enhanced and further redesigned. Each member of the team has responsibility for a key aspect of the car; the frame, cockpit, front/rear suspension, drivetrain, braking/steering, bodywork, air intake, engine and costing.

It is anticipated that the DIT team will have a long and fruitful relationship with FS.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase 2770/1550/1300/1650mm

Track (front/rear) 1300mm/1350mm

Weight including 68kg driver (front/rear) 144kg/216kg

Suspension (front/rear) Double unequal length A-Arm. Push rod actuated spring & damper.

Tyres (front/rear) 490 x 180

Wheels (front/rear) (13") 175mm

Brakes (front/rear) Aluminium 2 pot callipers – dia 248mm solid disc.

Chassis construction Tubular mild steel – TIG welded

Engine Suzuki GSX-R-600cc four stroke in line four.

Bore/stroke/cylinders/cc 65.5mm bore/ 44.5mm stroke/ 4 cyl

Fuel 94 octane gasoline

Fuel system Fuel Injected

Max power/max torque 11,000rpm/8000rpm

Transmission 6 speed sequential

Differential Quaife ATB automatic

Final Drive 3.6:1

CLASS 2
UNIVERSITY OF HERTFORDSHIRE

The UH14 team is one of the most experienced that the University of Hertfordshire has ever had and we aim to attain early feedback on our design concepts to gain a head start on finishing the build of UH14 upon the team's return from industrial placements.

After careful evaluation of UH's performance in the 2009 season, the UH14 team are continuing with the development of a restricted Yamaha R6 engine, concentrating on tuning work to make this our most fuel efficient, yet powerful and drivable, car to date. Along with this continued engine development, improvements to the suspension and steering systems will improve the handling, resulting in a superior overall performance.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2605/1352/1100/1550mm

Track (front/rear) 1200mm/1150mm

Weight including 68kg driver
(front/rear) 130kg/140kg

Suspension (front/rear)
Double unequal length A-Arm. Push rod actuated spring and damper

Tyres (front/rear)
20.5x7.0-13 Hoosier

Wheels (front/rear)
178mm wide, 3 pc Al Rim

Brakes (front/rear) Cast Iron, hub mounted, 220mm dia. Drilled

Chassis construction
Two piece tubular spaceframe

Engine
2006 / Yamaha YZF-R6 four stroke in line four

Bore/stroke/cylinders/cc
67mm bore/ 42.5mm stroke/ 4 cylinder/ 599 cc

Fuel 98 RON unleaded

Fuel system Multi Point Fuel Injection

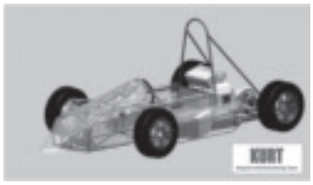
Max power/max torque
13,000/8,500rpm

Transmission Single 520 chain

Differential
Salisbury type limited slip differential

Final Drive 3.2:1

CLASS 2
KINGSTON UNIVERSITY



Kingston University is returning to Formula Student after several years of absence. We are hoping to reignite the flame and present our all new car design with the aim of building our first ever complete car next year.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2965/1085/1115/1725mm

Track (front/rear) 1300mm/1350mm

Weight including 68kg driver
(front/rear) 112kg/208kg

Suspension (front/rear) Double unequal length A-Arm. Push rod actuated horizontally (front) and vertical (rear) oriented spring and damper

Tyres (front/rear)
180/550 R13 250/570 R13

Wheels (front/rear)
Custom Magnesium Wheels

Brakes (front/rear)
Cast iron, outboard front (248mm)/ single inboard rear (220mm)

Chassis construction
One piece tubular space frame,

Engine 2004 / Kawasaki ZX6R four stroke in line

Bore/stroke/cylinders/cc
68.00mm bore/ 43.8mm stroke/ 4 cylinder/ 599cc

Fuel 101 RON unleaded

Fuel system
Kawasaki multi point fuel injection

Max power/max torque
175bhp / 100N/m @ 1150 rpm

Transmission Single 520 chain

Differential
Civic Type R Differential

Final Drive 3.5:1

CLASS 2
INSTITUTO SUPERIOR TÉCNICO

In 2010, Projecto FST comes to Formula Student presenting it's 4th prototype: the FST 04e. This prototype will be our first fully electric car. Our commitment to achieve high performance, while maintaining an eco and simple car, has led us to this concept. This car will feature two permanent magnet DC motors, powered by LiFePO4 cells. We are aiming to start the construction of our car in September, to guarantee enough track time for our new prototype, assuring it's reliability and performance. We will also present some natural material applications in our design, following our motto: "Engineering the Future".

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
2953/1436/1228/1630mm

Track (front/rear) 1220mm/1200mm

Weight including 68kg driver
(front/rear) 147kg/180kg

Suspension (front/rear) Double unequal length A-arm. Pull rod / push rod actuated, horizontally oriented, ohlins spring and damper

Tyres (front/rear)
Avon A45 13"-20x7.2"

Wheels (front/rear)
13" x 8.2"wide, 2 pc Al Rim, student developed wheel centre

Brakes (front/rear)
220mm diam. Drilled, floating disk, hub mounted on four wheels

Chassis construction AISI 4130 steel tube spaceframe, welded

Engine
2 x Agnimotors 95-R Motors

Bore/stroke/cylinders/cc
NA

Fuel
Lithium Iron Phosphate Cells

Fuel system 144V - 7,2kWh

Max power/max torque
52kW/104Nm

Transmission Single 520 chain

Differential Type 1 (T-1)
University Special (012000)

Final Drive 5:1

CLASS 2
IMPERIAL COLLEGE LONDON
(IMPERIAL RACING GREEN)

Imperial Racing Green is a cross faculty project to design zero emission cars.

Having won an award for 'innovative design' in 2009 with a fuel cell powered Class 1A car, we are entering it's successor in Class 2. IRG04 is pure electric, powered by an evolution of Racing Green's in-house lithium polymer battery pack, and featuring an all-new suspension and drivetrain with a new spaceframe chassis. With a design focus on simplicity, robustness and handling, testing will develop the powertrain, control and dynamics over the coming year.

Behind the scenes, the team continues R&D work with hydrogen fuel cells, with the intention of turning the technology into a car in the next few years.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase
1992/1428/1160/1590mm

Track (front/rear) 1250mm/1200mm

Weight including 68kg driver
(front/rear) 158kg/179kg

Suspension (front/rear)
Double unequal length A-Arm. Interchangeable push rod / pull rod actuated spring and damper

Tyres (front/rear)
20.5" x 7"-13" R25B Hoosier

Wheels (front/rear)
13" x 6" Keizer Aluminium

Brakes (front/rear)
Hub mounted. Magura/ Wilwood calipers

Chassis construction
TIG welded tubular steel spaceframe

Engine
DC permanent magnet Motors

Bore/stroke/cylinders/cc
N/A

Fuel Electric

Fuel system
Dow Kokam Lithium Polymer Batteries

Max power/max torque
TBA

Transmission Chain

Differential TBA

Final Drive TBA

CLASS 2

IMPERIAL COLLEGE LONDON (IMPERIAL RACING)

Imperial Racing started afresh with a new vision and direction this year with 50 Mechanical Engineering students. IC06 has been designed to be light, agile and adjustable. The lightweight spaceframe chassis shares a common platform with Imperial's 2011 1A entry, reducing costs and enabling inter-changeability of key components as they are developed over the project life-cycle. The Powertrain consists of a twin cylinder Aprilia RXV engine. Six final year students manage the project whilst completing their own technical project. They also mentor and guide 3rd year students with their group 'Design Make and Test' projects, which form the core basis for the development of the car.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase 2375/1420/1238/1525mm

Track (front/rear) 1300mm/1250mm

Weight including 68kg driver (front/rear) 116kg/142kg

Suspension (front/rear) Double Unequal Length A-Arms with Pull rod/rocker actuated shock absorbers front and rear

Tyres (front/rear) Avon 19.5 x 7 - 13

Wheels (front/rear) R13 Custom made aluminium alloy centre

Brakes (front/rear) 220mm outboard at front, 180mm inboard at rear

Chassis construction Tubular spaceframe 4130 Cromoly TIG welded

Engine 2006 Aprilia RXV 550

Bore/stroke/cylinders/cc 80mm Bore/ 55mm Stroke/ 2 Cylinder/ 549CC

Fuel 98 RON Unleaded

Fuel system Port fuel injection controlled by DTA ECU

Max power/max torque 10,500rpm/7,000rpm

Transmission Single 520 Chain

Differential Quaife FZ05

Final Drive 2.7:1

CLASS 2

QUEEN MARY, UNIVERSITY OF LONDON

Queen Mary Racer is competing for the first time this year. We are a diverse team comprised of Mechanical, Aerospace and even Medical engineers from all 3 years brought together to design a car.

The design of QMR10 was undertaken using the best available design tools to display our engineering proficiency. A rear mid-mounted engine ensures optimum weight distribution for track racing while a rear wheel chain drive together with a 4-1 custom exhaust system enables best acceleration. The sequential manual transmission connected to a clutch type LSD ensures optimum torque and speed shifting. The engine and the powertrain are fitted on a steel tubular frame that is lightweight and ensures torsional rigidity.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase 2600/1350/1150/1600mm

Track (front/rear) 1200mm/1120mm

Weight including 68kg driver (front/rear) 138/169kg

Suspension (front/rear) Double unequal length A-Arm, Spring and damper

Tyres (front/rear) 20x7.5-13in Hoosier R25B

Wheels (front/rear) 7.5in wide, Magnesium alloy, Custom made

Brakes (front/rear) AP Racing Disc Brakes

Chassis construction Welded Tubular Steel Spaceframe

Engine 2008 / Yamaha YZF-R6 /DOHC / four stroke in line four cylinders

Bore/stroke/cylinders/cc 67mm/ 42.5mm/ in-line 4/ 599cc

Fuel 99 RON Unleaded

Fuel system Fuel Injection with YCC-T and YCC-I

Max power/max torque 91.0 kW @ 14,500 rpm/ 65.7 Nm @ 10,500 rpm

Transmission 525 O-ring chain

Differential Clutch type LSD

Final Drive 3.8:1

CLASS 2

NEWCASTLE UNIVERSITY

NR8 is the latest car being designed by Newcastle Racing for the Class 1A competition next year and consists of 10 third year Mechanical Engineering students.

The focus is on understanding electric vehicle technology and optimising the advantages associated with it.

The main features of the car include 2 AC synchronous motors, Lithium ion battery packs, composite chassis design of styrofoam sandwiched by aluminium sheets, and structural side pods to store batteries and lower the centre of gravity.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase 2500/550/800/1600mm

Track (front/rear) 1300mm/1200mm

Weight including 68kg driver (front/rear) 150kg/200kg

Suspension Double unequal length A Arm. Direct acting spring and damper ZF sachs RD-36

Tyres (front/rear) 7.0/19.5-13 Avon Slicks

Wheels (front/rear) 170mm wide, 3 piece Al &Mg 80mm negative offset

Brakes (front/rear) Steel, hub mounted, 250mm dia. 10mm thick

Chassis construction Sheet aluminium monocoque

Engine 2 x Perm PMS150 Electric Motors

Bore/stroke/cylinders/cc None used

Fuel Electric

Fuel system 4 x 96V LiFe Batt Lithium Iron Phosphate Batterry Modules

Max power/max torque 6000rpm/6000rpm

Transmission toothed belt and pulley

Differential 2 x Pulley and belt drive system transferring power individually from the motors to each of the rear wheels. The motor controllers will then regulate motor speed to act as a differential.

Final Drive 6.5:1

CLASS 2

UNIVERSITY OF PATRAS

UoP 4 incorporates all of our knowledge, experience, hard work and imagination. The cars highlight is the chassis design. It has a more complex geometry than our last 3 cars, but it's ergonomically focused design gives us confidence for the construction of a high performance car. The suspension is designed so our drivers can have optimal control of the car. Regarding the transmission, intake and fuel system, our team has always had these 3 words in mind: FUNCTIONALITY-DURABILITY-LIGHTWEIGHT. Finally, we would like to thank our sponsors and the University of Patras, especially the LMS, for making a concept come true. UoP4 - 'A Complex Simplicity'

TECHNICAL SPECIFICATION

Length/width/height/wheelbase 2700/1495/1122/1671mm

Track (front/rear) 1370/1308mm

Weight including 68kg driver (front/rear) 94/126Kg

Suspension (front/rear) Double unequal length A-Arm. Push rod (Rear) and Pull rod(Front) actuated horizontally oriented spring and damper

Tyres (front/rear) 457.2 x 190.5-254 Hoosier R25B

Wheels (front/rear) 254mm wide, 2pc aluminum rims

Brakes (front/rear) Cast Iron, hub mounted, 180 mm dia. Drilled rotors with ISR 4 piston calipers

Chassis construction Two piece carbon fiber monocoque

Engine 2008 Yamaha WR450 single cylinder

Bore/stroke/cylinders/cc 97mm bore/ 63.4mm stroke/ 1 cylinder /469cc

Fuel E-85 fuel

Fuel system Custom designed fuel injection system

Max power/max torque 8000rpm/6500rpm

Transmission Single 520 chain

Differential Drexler FSAE LSD

Final Drive 2.368:1

CLASS 2

UNIVERSITY OF PORTSMOUTH

Formula Student Portsmouth's main aim is to improve on last year's performance by creating a more cost effective design without compromising on performance. The new chassis is based on the 2009 model with modifications to meet a new track width, wheel base and suspension design. It has also been designed to allow for the Yamaha R6 engine to be dropped through the bottom of the chassis causing minimal disturbance. The bodywork will comprise of 5 sections to increase access to important areas and save storage space.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase 2245/1230/1088/1600mm

Track (front/rear) 1230/1200mm

Weight including 68kg driver (front/rear) 126/154kg

Suspension (front/rear) Double unequal length A-Arm, Directly mounted spring damper

Tyres (front/rear) 20x7x13 Hoosier (508x177.8x330.2mm)

Wheels (front/rear) 13" x 8" Compomotive CRX - Aluminium Alloy

Brakes (front/rear) Custom Billet Aluminium 6061 Hub, Honda NC30 Discs, Willwood PS-1 Calipers.

Chassis construction One piece tubular spaceframe

Engine 2006 / Yamaha / YZF-R6 four stroke in line four

Bore/stroke/cylinders/cc 65.5mm bore/ 44.5mm stroke/ 4 cylinder/ 599cc

Fuel 99 RON Unleaded (Shell V Power)

Fuel system Yamaha single point fuel injection

Max power/max torque 10,500rpm/ 10,000rpm

Transmission Single 520 chain

Differential Modified open differential

Final Drive 3:1

CLASS 2

POLYTECHNIC INSTITUTE OF SETUBAL

The first IPS team has worked for several years to complete a prototype car.

Our team is organised in four areas and the chassis is a space-frame tubular 25CrMo4 and our design provides a strong torsional stiffness and lightweight simultaneously.

The engine is a Suzuki GSX-R600 unit. To offset the loss of power, the implementation of a turbocharger is being considered.

The suspension consists of four Öhlins coil over units, push/pull rod actuated, with 2 way adjustable damping as well as ride height, camber and toe adjustments.

The overall small size of the car, driver position, easy gear changing and the powerful engine, will make this car fun and easy to drive.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase 2600/1455/1300/1850mm

Track (front/rear) 1300mm/1250mm

Weight including 68kg driver (front/rear) 120Kg / 170Kg

Suspension (front/rear) Front: double unequal length A-Arm, push rod actuated Öhlins coilovers / Rear: double unequal length A-Arm, pull rod actuated Öhlins coilovers.

Tyres (front/rear) 20,0x6,5-13 Goodyear Eagle Sports Car

Wheels (front/rear) 13x6,0 Minilite

Brakes (front/rear) Willwood 4 pot callipers (front and rear), 260mm cast iron, cross drilled disks; 2 outboard disks(front), 1 inboard disk (rear).

Chassis construction One piece tubular spaceframe,

Engine 2002 / Suzuki GSX-R600 four stroke in line four Supercharged by GT12 Garret

Bore/stroke/cylinders/cc 67,0mm bore/ 42.5mm stroke/ 4 cylinders/ 599,4 cc

Fuel 101 RON unleaded

Fuel system Suzuki multi point fuel injection

Max power/max torque 10000rpm / 4000rpm

Transmission Single chain

Differential Quaife limited slip differential

Final Drive 4:1

CLASS 2

SWANSEA UNIVERSITY

The team includes a wide variety of engineering disciplines, physics and economics backgrounds. The most senior members of the team have passed on vital knowledge to the new members.

Development of the car builds on our 2009 Endurance event success, using a Class 2 entry to take 2 years to learn and optimise systems such as the fuel system, suspension, telemetry, and drivetrain. The chassis design has also had design developments and improvements.

Overall, with this 2 year plan we hope to exceed last year's results, doing ourselves, sponsors and the university proud, all of whom we would like to thank for their support.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase 2855/ 1435/1315/1610mm

Track (front/rear) 1255mm/1210mm

Weight including 68kg driver (front/rear) 135kg/165kg

Suspension (front/rear) Double unequal length A-A arms. Pull rods at front, push rod at rear.

Tyres (front/rear) Avon 20x6.5-13 A15 compound (front and rear)

Wheels (front/rear) 6.5"x13" cast magnesium alloy centres and machined rims

Brakes (front/rear) Steel, hub mounted, 254mm diameter, cross drilled

Chassis construction Aluminium Honeycomb monocoque with tubular rear spaceframe

Engine 2008 / Honda CBR600RR

Bore/stroke/cylinders/cc 67.0 mm/ 42.5mm/ 4 cylinders/ 599cc

Fuel Student designed/built fuel injection using DTA S60 ECU

Fuel system Siemens VDO injectors, FRI Euro 4 ECU

Max power/max torque 10,000rpm/9,250rpm

Transmission Single 520 pitch

Differential AP Racing Suretrac differential

Final Drive 3.8:1 -> 3.2:1 (adjustable)

CLASS 2

ALEXANDER TECHNOLOGICAL EDUCATIONAL INSTITUTE OF THESSALONIKI

The present team: Formula Student Racing Car (FSRC) was founded in October 2009 within the Technological Educational Institute (TEI) of Thessaloniki, Greece. This is our first participation, so our goal is just to join the event and to establish a competitive team (let alone win it!). We have focused our efforts on all aspects of car construction, opting for conventional and low-cost solutions in many parts, while taking a deeper consideration on a few components, like the frame construction. At present we keep our hopes high and we believe we will successfully handle this sporty endeavour.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase 2645/1415/1020/1550mm

Track (front/rear) 1250mm/1200mm

Weight including 68kg driver (front/rear) 120kg/160kg

Suspension (front/rear) Double unequal length A-Arm. Push rod actuated spring and damper

Tyres (front/rear) 532x175-33 56B michelin

Wheels (front/rear) 140mm 1ps Al Rim

Brakes (front/rear) Cast iron, hub mounted, 218mm diam. Drilled / Cast iron, diff. mounted, 320mm diam. Drilled

Chassis construction Steel tube space frame with aluminum rear subframe

Engine Yamaha YZF-R6 four stroke in line four

Bore/stroke/cylinders/cc 67 / 42.5mm / 4 / 599cc

Fuel 100 RON unleaded

Fuel system Yamaha multi point fuel injection

Max power/max torque **11500 / 8500 rpm.**

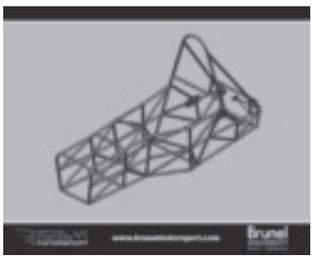
Transmission Continuously Variable Transmission

Differential Williams racing developments (WRD-CDD-1000)

Final Drive 2,8 : 1

CLASS 2

BRUNEL UNIVERSITY



The Brunel Masters Motorsport team is comprised of a broad mix of International and UK students, each studying an MSc in Automotive and Motorsport Engineering.

The primary goal of the current team is to complete a running car, focusing on reliability and allowing for development to be undertaken by subsequent Masters teams.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase 2700/1400/1235/1580mm

Track (front/rear) 1210/1130mm

Weight including 68kg driver (front/rear) 136/184kg

Suspension (front/rear) Double Wishbone, Pull Rod (Front and Rear)

Tyres (front/rear) Avon

Wheels (front/rear) 185mm wide, 2 pc Al Rim from Braid

Brakes (front/rear) AP Racing, Single Piston, Floating Drilled Disks

Chassis construction Once Piece Tubular Spaceframe

Engine 2005 / Yamaha YZF-R6 four stroke in line four

Bore/stroke/cylinders/cc 65.5mm bore/ 44.5mm stroke/ 4 cylinder/ 599 cc

Fuel 101 RON unleaded

Fuel system Yamaha multi point fuel injection

Max power/max torque 12,000rpm/8,000rpm

Transmission Single 525 chain

Differential Quaife limited slip differential

Final Drive 3.8:1

CLASS 2

GLYNDWR UNIVERSITY

The Glyndwr Racing team consists of a diverse European group of students. We are a multiskilled team of individuals and we have a broad range of expertise in many different fields. The Motorsport Design and Management students have taken control of the media/marketing and management of the team, and the Performance Car, Avionic and Aero Mechanical students focus on the design and manufacturing. The main aim of our design is to meet the requirements of the 'Amateur, non professional competition market'. We have designed our car to be cost effective, and use a minimum amount of bespoke items. 80% of the car, other than the chassis, can be purchased off the shelf, making parts readily available and being ideal for economical weekend racing.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase 2214/ 1420 /1009/ 1600mm

Track (front/rear) 1399mm/1337mm

Weight including 68kg driver (front/rear) 123kg/169kg

Suspension (front/rear) Double unequal length A-Arm. Push rod actuated horizontally oriented spring and damper

Tyres (front/rear) Yokohama A048 185/50/R13

Wheels (front/rear) Compomotive Minilite 13in/7in

Brakes (front/rear) Custom Billet Aluminium 6061 Hub, Honda NC30 Discs, Willwood PS-1 Calipers.

Chassis construction One piece tubular spaceframe,

Engine 2002 K2 Suzuki GSX-R 600cc four stroke in line four

Bore/stroke/cylinders/cc 67.0mm bore/ 42.5mm stroke/ 4 cylinder/ 599cc

Fuel 98 RON Unleaded Shell Optimax

Fuel system Custom Fuel Rail with multi point fuel injection, Suzuki GSX-R 600cc injectors.

Max power/max torque 89hp @ 10,251rpm - 76ft/ lbs torque @ 7,123rpm

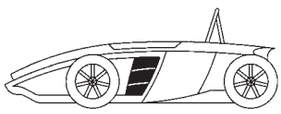
Transmission Single 520 chain

Differential Quaife automatic torque biasing differential

Final Drive 14/48

CLASS 2

WROCŁAW UNIVERSITY OF TECHNOLOGY



The Wrocław University of Technology's second Formula Student team is a group of third and second year mechanical engineering students, competing in Class 2.

After a successful attempt in 2009, we decided to create a completely independent team to design a vehicle for the Formula Student 2010 competition.

The main goal is to design a concept that will become a reality in 2011.

We are aiming to design an innovative space frame construction, with suspension providing excellent handling and braking properties as well as an efficient engine.

TECHNICAL SPECIFICATION

Length/width/height/wheelbase 2702/984//1570mm

Track (front/rear) 1270mm/1125mm

Weight including 68kg driver (front/rear) target<300kg

Suspension (front/rear) Double unequal length wishbones / Double unequal length wishbones (independent suspension)

Tyres (front/rear) 20.0 x 7.0 13" D2696 Goodyear Eagle

Wheels (front/rear) 13x7 2-piece Al. Rim Real Racing Wheels

Brakes (front/rear) Al alloy, 220mm dia. Drilled / Al alloy, 150mm dia. Drilled

Chassis construction Tubular steel spaceframe, sanwich panels

Engine Honda CBR600RR

Bore/stroke/cylinders/cc 67.0mm bore/ 42.5mm stroke/ 4 cylinder/ 599 cc

Fuel 98 Octane petrol (Shell Optimax)

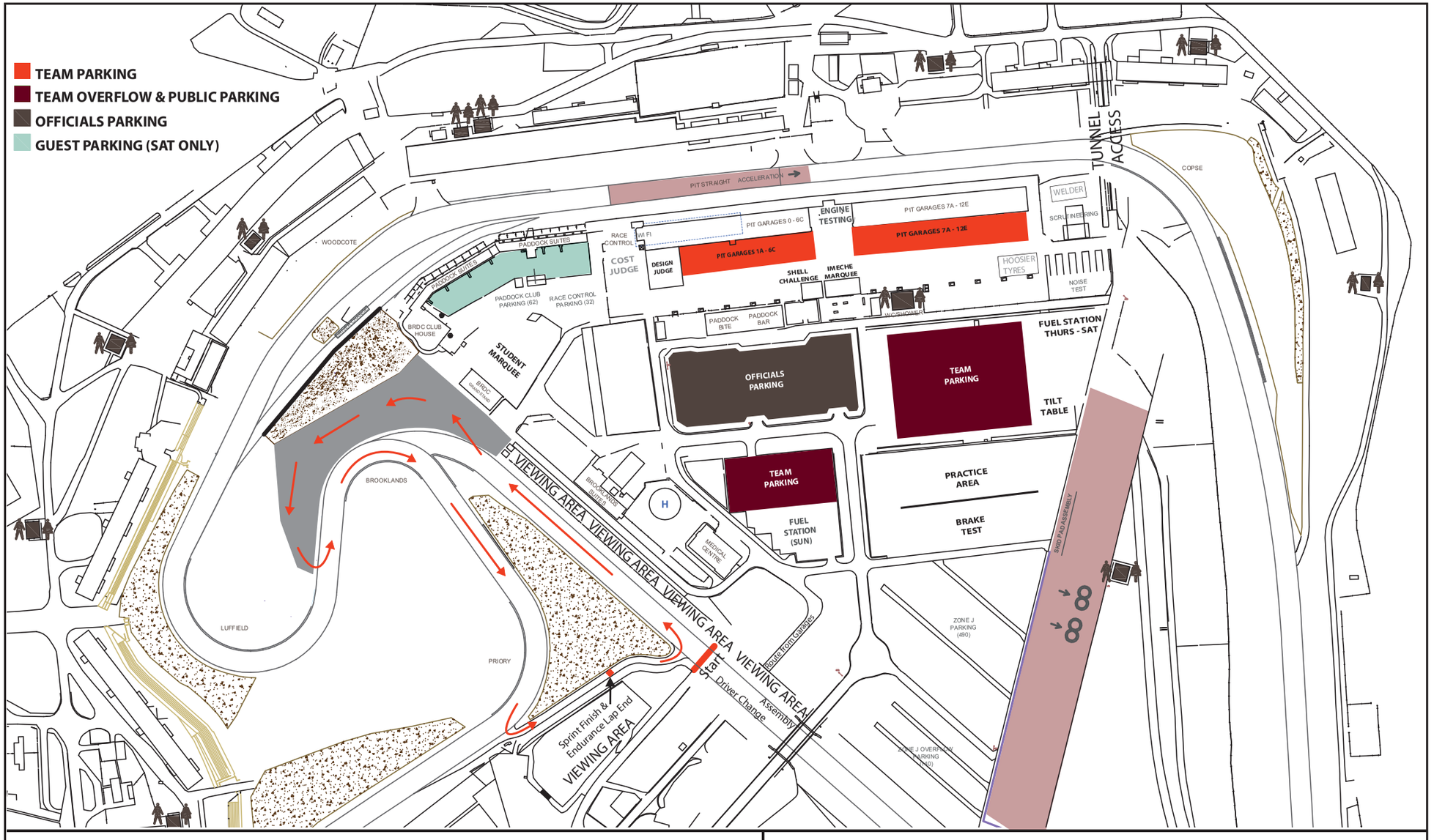
Fuel system Honda fuel injection, sequential

Max power/max torque N/A

Transmission Single 520 chain

Differential Limited slip differential

Final Drive N/A



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