dallara MAGAZINE
05/2010
PUBLISHED BY DALLARA
THE PURSUIT OF EXCELLENCE

GP2

DIDIER PERRIN EXPLAINS THE REASONS BEHIND THE SUCCESS OF THE SERIES THAT PREPARES TALENTED DRIVERS FOR F1

INDY 500

"THE GREATEST SPECTACLE IN RACING" HAS SEEN A DALLARA TRIUMPH FOR THE TENTH TIME. ALL THE PILOTS THANK THE SAFETY CELL THAT SAVES LIVES

TECHNOLOGY

LOOKING AT THE DALLARA TEST BENCH, THE INSTRUMENT THAT GIVES ENGINEERS THE BEST WAY OF TESTING COMPONENTS AND PREPARING THE CAR FOR THE RACE


IZOD
Firestone
Firestone

“THE GREATEST SPECTACLE IN RACING”

“The Greatest Spectacle in Racing” was the title of the article, published last May in “Race Tech International” and the 500 Miles of Indianapolis is effectively the biggest show in the sporting calendar. Its television audience has reached a level that is greater than any other sport. 292 million viewers from 213 countries simultaneously tuned in to watch the race! We also play a role in this race: this year we won for the tenth time, something nobody else had previously achieved. They are as follows: Penske (7 victories), Watson (6), March (5), G Force (4), Lola, Eagle e Deidt (3), Maserati, McLaren, Reynard and Colt (2). This may now seem obvious, but many of us remember the effort required to overcome initial wariness, the delusions of defeat, the ongoing challenges with G-Force, the stubborn will to catch up and become the best. I really think it is these characteristics that are our strengths, and this determination gives me the hope that we can compete in Indianapolis for a long time to come.

Gian Paolo Dallara,
President of Dallara

SAFETY IN THE RACE: MUCH MORE THAN JU

MIKE CONWAY'S ACCIDENT AT INDIANAPOLIS WAS A PERFECT DISPLAY OF DALLARA'S SURVIVAL CELL AT WORK, IT IS DESIGNED TO WITHSTAND ALL KINDS OF IMPACT, WITH SAFETY LEVELS THAT GO WELL BEYOND THOSE REQUESTED BY THE REGULATIONS

UST CRASH TESTS

What defines the safety of racing car? The images from this year's final of the 500 Miles of Indianapolis have the answer.
The car's body, otherwise known as the "survival cell", has to protect the driver and the petrol tank in the event of an impact. Mike Conway's Dallara performed this function well, withstanding an impact - that is difficult to imagine let alone reproduce - without significant injury to the driver and without the fuel tank catching fire.
The lesson we can learn by looking at the images of the car's impact with the Indianapolis barrier is that safety is much more than just passing the regulation crash tests, it means designing a car with safety in mind, in other words: to think about even the rarest situations, to give safety priority over performance and therefore work responsibly, thinking beyond the regulations.
The word "safety" can be said to have two meanings. The first meaning is linked to the word "save". A safe structure will save the life of the driver in the event of an accident. In Italian the word for safety is "sicurezza" which is more similar to the English "secure". This is the second meaning, to secure the driver, without worry. We feel secure in a car when we are not excessively concerned with what is happening around us. Both of these aspects exist and must be responsibly taken into account.
In short, safety is a "journey" and we never arrive at absolute safety: the details of the situation (new circuits, different tyres, improvements in aerodynamic efficiency, engine development,

driver expectations) are continually changing. For us at Dallara, for the businesses that we are in competition with (those who work responsibly) and for the car industry in general, safety is an attitude and a culture that develops an open minded approach to be able to rethink a product, anticipating the demands of the organisers and all the clients who put their trust in us.

Andrea Toso,
Head of R&D and US Racing Business Leader

THE DRIVERS THANK DALLARA: "YOU SAVED OUR LIVES"

VITOR MEIRA

"I have taken a few spectacular rides in an Indy car - Milwaukee and Indy come to mind - so I speak from personal experience. The Dallara chassis has saved my life and I believe the lives of many other drivers like Kenny Brack for one. As drivers, we are just an instant away from a crippling accident or worse. Our number one safety tool is the car. The safety of the chassis is of critical importance and should be the number one factor in choosing the new chassis design. Dallara has proven that it puts the driver's safety first and they have the track record to prove it. While I do not want to choose sides, I do want those in charge of choosing the next generation of Indy cars to make sure they choose a car that is an upgrade from the current chassis design that is as safe or safer than the car we have now. With the increased public profile of the series, the IZOD IndyCar Series cannot afford to do anything less".

KENNY BRACK

"I've had a long and good relationship with Dallara. I won the world's largest motor race, the Indianapolis 500 in one of their chassis. But performance is not the only thing Dallara think about. They are also extremely safety-conscious. I drove one of their chassis when I had the biggest accident in my career at Texas Motor Speedway, when my car was launched into the barriers at 220 miles per hour while battling for the podium in the latest stages of the race. The g-force of the impact was measured an incredible 214 g's, as the car virtually exploded from the impact. It was highest the highest g-force to be recorded in an impact, ever. But the safety cell was intact. The sheer energy from the impact left me severely injured and hospitalized for 3 months. It's not in the nature of motorsports to be "bulletproof", but I am convinced that it was thanks to Dallara's innovation and safety thinking that I lived to race another day".

DAVEY HAMILTON

"Dallara,
I just want to thank you for the most important thing in motor racing: SAFETY! Not only are your cars fast and very competitive, they have proven time and time again how safe they are".

ANDREA PONTREMOLI

FACE TO FACE WITH THE CEO AND MD AT DALLARA: THE CURRENT CHAMPIONSHIPS, PROJECTS AND FUTURE CHALLENGES

TO WIN, MAKING INNOVATIONS

June. Mid-year and time to look at the results of the Dallara cars. Results that we want to discuss with the engineer Andrea Pontremoli, CEO and managing director of Dallara. Together we will look at the situation for all the competitions in which the business is operating.

Let's begin with Formula 3, one of the classic Dallara cars. You won the first Italian F3 championship in 1980, what about more recently?

Our successes and achievements continue to grow in this competition. In Italy, for example, the great work done by the Commissione Sportiva Automobilistica Italiana (Italian Racing Authority) together with Ferrari, will allows for the top three drivers in F3 to enter into testing with Marinello's F1, providing opportunities for many young drivers. Nowadays there are around thirty cars, compared with thirteen only three years ago. Of these thirty, nine belong to the competitor (Mygale, ed) which has spiced up the competition: up until this year Dallara has always managed to win.

And abroad?

We compete in Spain and Japan (17 cars), in Britain (21 cars), in Brazil and the Euro Series (13 cars), and in Germany (20 cars). A complete monopoly abroad, except Germany where there are three other competitive cars. Every week, over a hundred Dallara F3 cars guarantee performance and reliability on the track, all over the world. A very satisfying feeling.

Another series where there is free competition is Grand Am. How is that going?

The number of cars gives you an idea of how competitive the series is. Luck has not been on our side this season. Up to now, we have only managed one victory, it could have been so many more. Let's hope that the second part of the a season gives us something to smile about. In the Mid-Ohio race, there will be a third Dallara starting, that of team Michael Shank Racing.

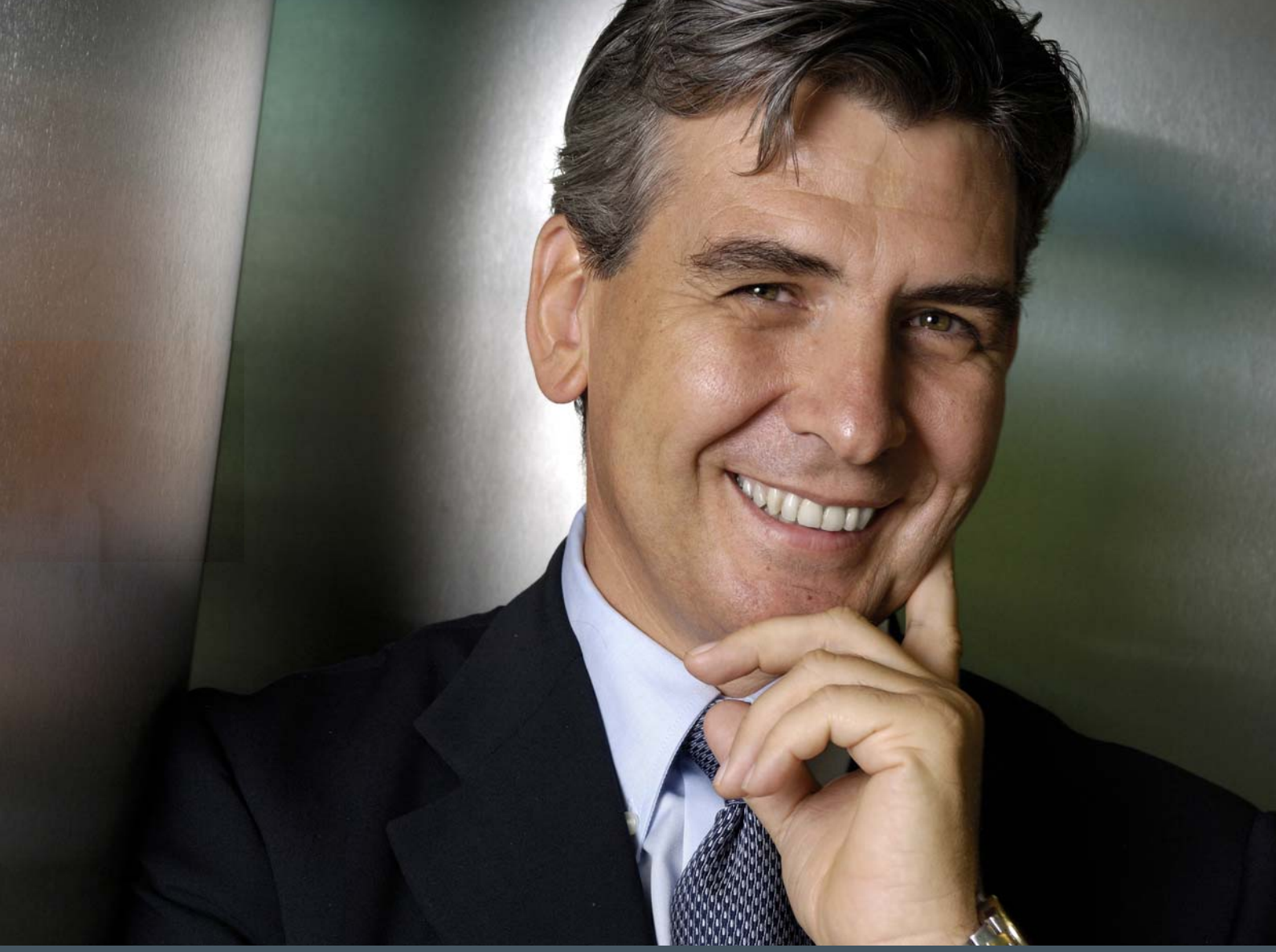
And GP2?

The car is definitely closer to F1 and is great test for drivers and teams, before the leap to F1. To give an example, the best time at the Montecarlo GP2, completed after the first free practice session by Maldonado for the Rapax team, would have given the driver the 22nd place on the F1 starting grid, putting the car ahead of three others.

You have always been major players in the IRL in the States. It is only a few weeks since the 500 miles, how was the race?

The race was, as ever, an incredible spectacle. For the first time there were four women on the starting grid and there was excitement and suspense right up until the end. There were some serious accidents but once again the safety of our car saved the drivers from having tragic consequences. The result being that we can never lower our guard and we continue to invest in safety

Firestone Indy Lights is another



American competition.
Indy Lights is to the IRL as GP2 is to F1. We are present there and the series is proving to be a great training ground for young drivers who are confronted with both oval and road circuits. The best, who will later transfer into the Indy series, are achieving very good results.

So you have a large presence in many competitions…
Yes, and we haven't yet mentioned the World Series, a powerful marketing tool for Renault. An enjoyable series, high-performance cars and large numbers of spectators at the races. Then there is Formulino, a dependable car, at a low price, that allows very young drivers to experience the track in a car whose characteristics are not so far removed from F3.

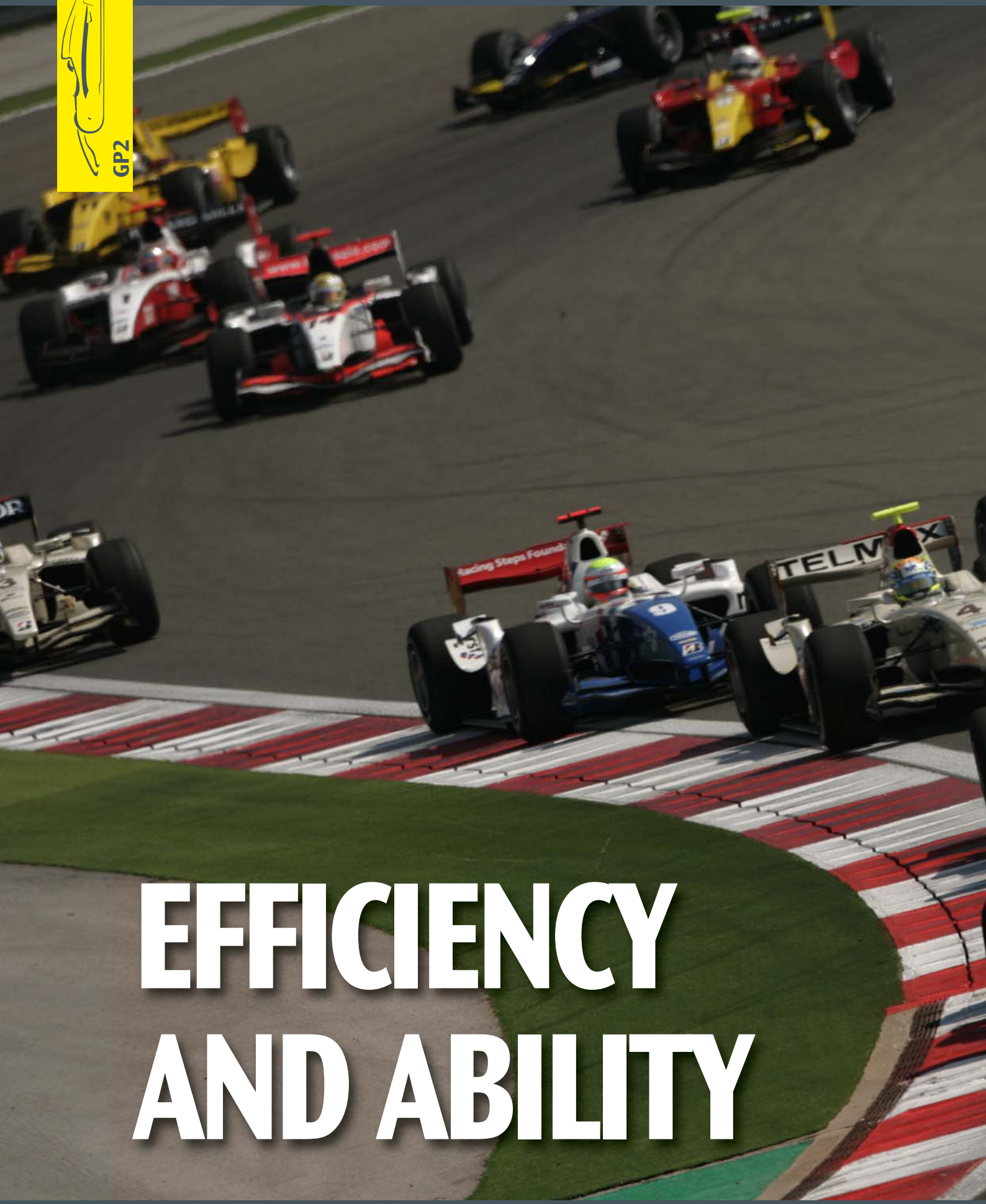
How is the development of the ME2 car going?
Very well. It will be designed by the Dallara engineer and will be an economic, open top car for people who want to rediscover the beauty of driving. The first virtual tests are showing exceptional performance.

Are you working on any other projects?
Development of the Dallara simulator is in progress, it has already been successfully tested. In the coming months we will decide about the development of cars and circuits so that we can make it available to the market. In the future it will become an indispensable instrument for car development, both in reducing costs and researching innovative solutions.

Which are the areas of your business that you believe will see the most growth in the future?
We are continuing to recruit people to strengthen our expertise in car aerodynamics and vehicle dynamics. The engineering and consultation businesses continue to grow, a testament to all the good work put in. For confidentiality reasons we cannot give names of clients, but we have been satisfied with their responses.

How has Dallara been affected in a year in which the economy has struggled to get back on its feet?
In a period when costs are being cut everywhere, Dallara is continuing to invest in research and innovation: two concepts which cannot be overlooked if we want stay competitive in the a high performance sector. And continue to win.

Alessandro Santini



EFFICIENCY AND ABILITY

Didier Perrin, the technical director of GP2, explains the reasons for the success of the long-standing relationship between Dallara and the series that prepares drivers for F1

When GP2 was created, why was Dallare chosen?
"The first GP2 was in 2005 replacing F3000 with a series that could provide a more similar car to that of F1. The initial objective was construct a single-seater at a reasonable cost that could lap around six seconds slower than an average F1 car. We chose Dallara for its experience and we haven't looked back, it is a great collaboration with a good working relationship and a fantastic car".

The first Dallara GP2, which was used between 2005 and 2007, ran for another three seasons in the GP2 Asia Series and finished its glorious career in 2010. An excellent car, can you tell us its secrets?
"Actually it has just been a good car, which has taken part in the greatest races in the history of GP2. Its retirement has given me mixed feelings: half of me is sad because there are many good memories connected with the car; the other half is happy because six years is a very long period for a racing car".

A third version of the Dallara will be on the track for 2011. Have you asked Dallara for improvements in terms of performance, cost or reliability?
"We want an efficient, less expensive car with a winning look! But seriously, the most important thing for GP2 is to ensure that the driver has the chance to shine and offer the public a good show. The car needs some restyling so that it looks more like, and also behaves more like, an F1 car. Reliability and affordability remain the basic concepts for GP2".

Can you talk a bit about the relationship between GP2 and Dallara during the season?
"We know we have made the best choice. We have faith in Dallara, between us there is a great amount of trust. Great work, great efficiency, the quality is always very high. All these factors put together make the collaboration very easy".

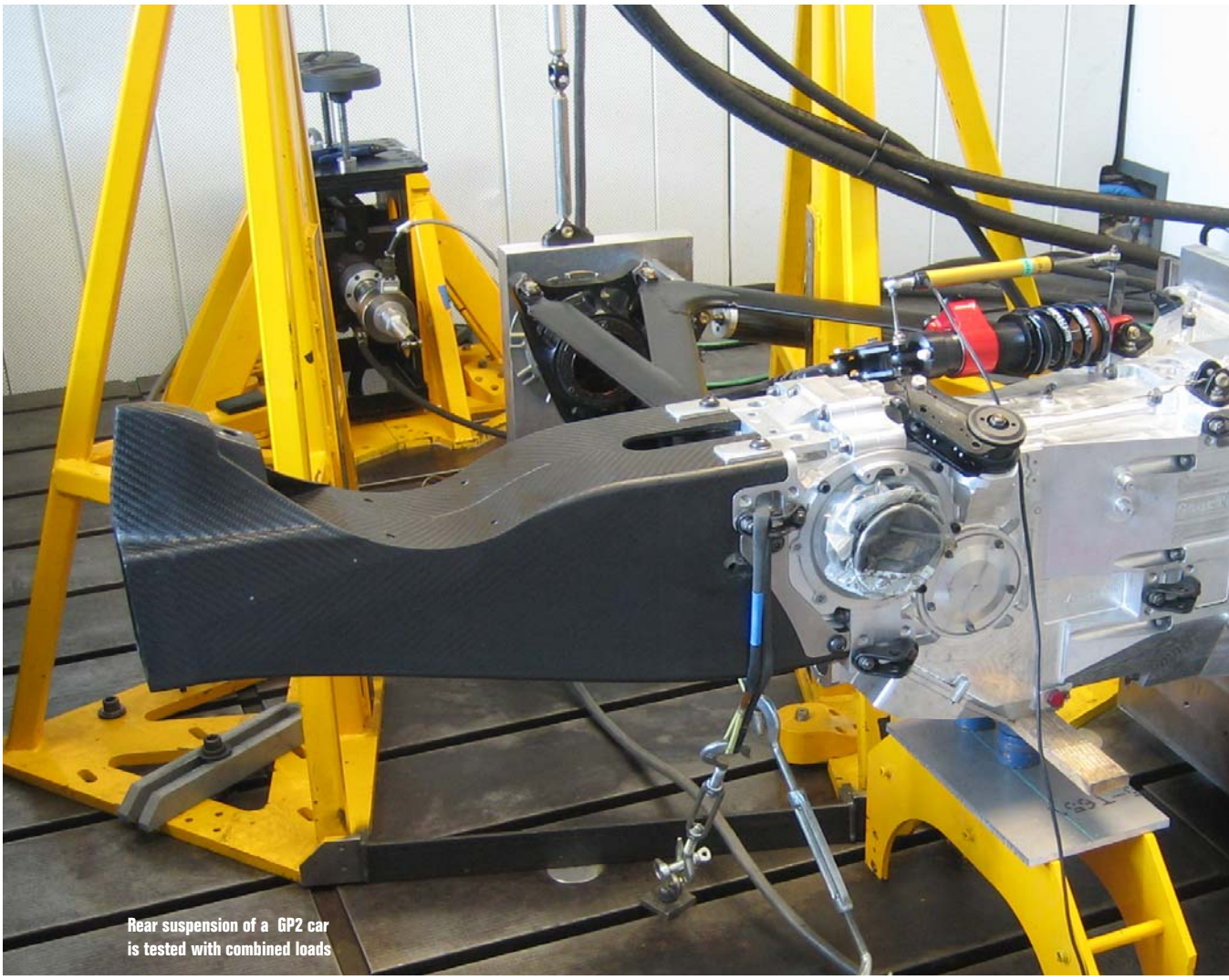
After six years working together, what strikes you most about the Dallara?
"The efficiency and their ability to quickly achieve the goals. Dallara's ability to understand the demands of this category".

Can you make a comparison between F1 and GP2 in terms of performance, safety and top speed?
"With regards to safety, the F1 regulations are also relevant to GP2. GP2 2011, for example, is subject to the same crash test regulations as F.1. As for performance, GP2 is fractionally below F1, with costs that are 100 times lower. So you could say, it is money well spent!".

Alessandro Santini

UNDER PRESSURE...

Performance, Reliability, Safety. Amongst the various attributes that characterize a winning race car, these three are the most important. In all the different types of competition – be it Formula One, Le Mans or any other competition – a winning car will not lack any of these qualities.
The second of the afore mentioned attributes (always bearing in mind the third) requires knowledge of how the components of a car will behave under pressure and how long they will last.
In addition to calculations and simulations, useful in the defining phase of the prototype, numerous tests help the engineer to create components with the strength to support the forces that occur from time to time during the race, without adding too much weight to the car with the resulting consequences. Here we also encounter the impact of the first attribute, performance.
There are various different kinds of tests carried out by the Dallara bench: isolated components such as rods, steering columns or mechanical struts; or alternatively assembled pieces such as hydraulic steering boxes, wings or even entire suspension sets made up of gearboxes, rods, wheel hubs and suspension.
The most simple test requires at least one actuator able to apply the load which must be resisted (at times equivalent to a few tons), for a set number of cycles, equal to the



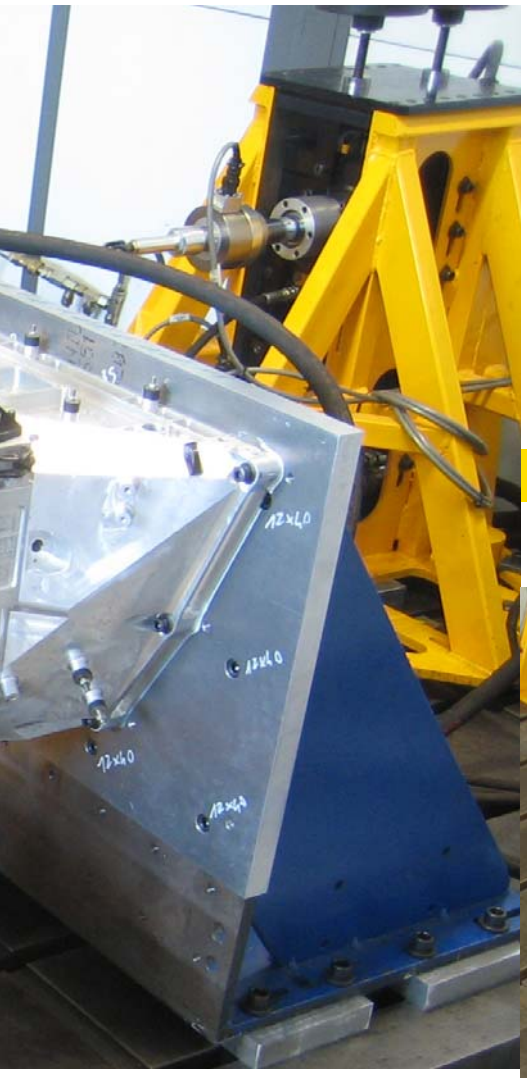
Rear suspension of a GP2 car is tested with combined loads

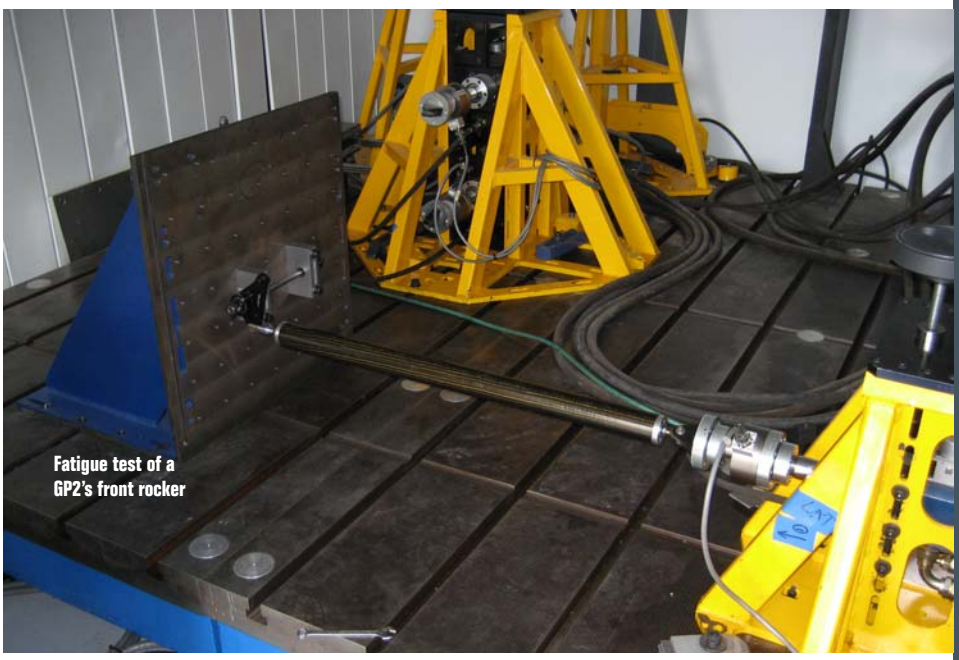
TO WIN

How the special test bench works, allowing Dallara Engineers to test single elements or assembled sections to predict possible problems and better prepare the car for a race

duration of the desired operation. The speed or frequency with which this load is applied has an impact on the duration of the trial. If it is necessary to test components that must be set in more than one direction or installed in different places, then more than one actuator is used at the same time. Some tests are carried out at high temperatures, this can be set to match the predicted temperature on the track, to test for possible specific problems with materials (for example a carbon rod that goes next to the engine). These test answer many of the engineer's questions: How long will this piece last? What are the weakest sections? How much will a component warp under pressure? How does it fare under repeated tests?
In this way it is possible to try and improve the car's components (in terms of rigidity, weight, and robustness), to optimize the production process (repeatability) and to reduce costs.
To arrive at the finish line, to arrive first.

Ull Thaler,
R&D Engineer





Fatigue test of a GP2's front rocker

"To finish first, you must first finish"

Rick Mears, four-times winner of the Indy 500

A fatigue test of a GP2's rear upright

dallara

www.dallara.it

THE PURSUIT OF EXCELLENCE

- Consultancies, design and production of racing cars and high performance road cars.
- Aerodynamics: wind tunnel and computational fluid dynamics (CFD).
- Research & development: vehicle dynamics and driving simulator.

www.dallara.it