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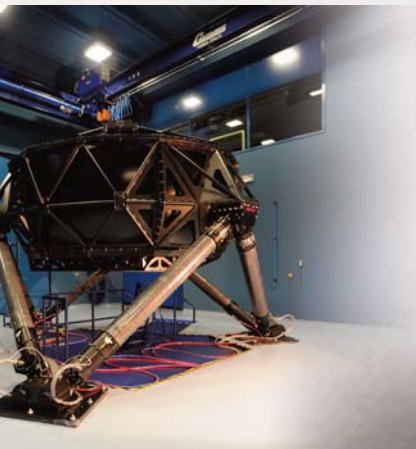
THE PURSUIT OF EXCELLENCE

WS RENAULT 3.5

THE CATEGORY, BASED ON A SUCCESSFUL COLLABORATION BETWEEN DALLARA AND THE FRENCH MOTOR MANUFACTURER, CONTINUES TO GROW AS PERFORMANCE LEVELS REACH THOSE OF THE MORE PRESTIGIOUS COMPETITIONS. VITTORIO GHIRELLI, THE YOUNG ITALIAN DRIVER, WHO HAS ALSO RACED IN GP3 IN THE PAST, EXPLAINS THE CHARACTERISTICS OF THE NEW CAR, AND THE COMMITMENT NECESSARY TO TAKE IT TO THE LIMIT

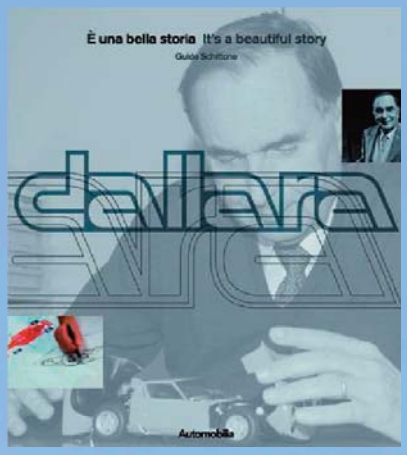
AERODYNAMICS

THE APPEAL AND THE DIFFICULTIES OF DESIGN, IN THE WORDS OF DIALMA ZINELLI, THE ENGINEER WHO WAS ACCLAIMED THE "BEST AERODYNAMIC DESIGNER IN THE WORLD" IN 2008. IN A WORLD OF MOTORSPORTS THAT IS INCREASINGLY COMMITTED TO TECHNOLOGICAL INNOVATION, COMPUTERS AND TALENT COME TOGETHER TO OFFER TEAMS AND CUSTOMERS TOP PERFORMANCE, AT COMPETITIVE PRICES



SIMULATOR

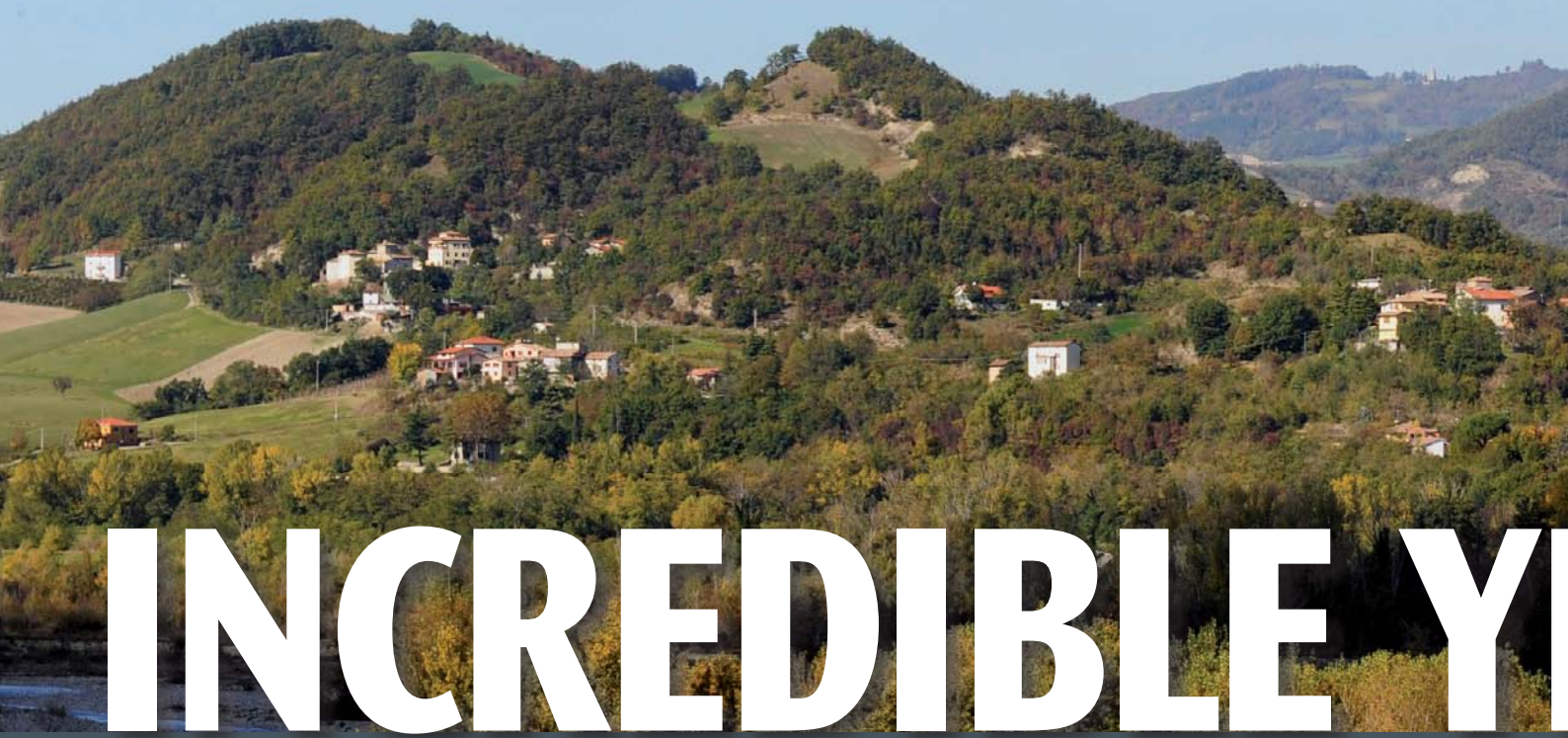
THE FUTURISTIC MACHINE CAPABLE OF REPRODUCING TRACK CONDITIONS TO A HIGH DEGREE OF ACCURACY AT VARANO, NOW PROVIDES DRIVERS WITH AN EXTRAORDINARILY REALISTIC RACING EXPERIENCE IN THE COMPLETE RANGE OF DALLARA CARS. AND WITH A DATABASE THAT COVERS ALL THE MOST IMPORTANT CIRCUITS IN THE WORLD



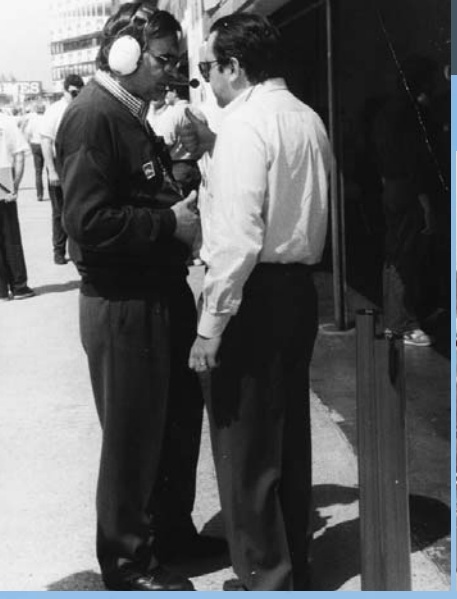
Dallara Automobili was founded in 1972 in Varano de' Melegari. But the young engineer, Gian Paolo Dallara, had already gained important experience at Ferrari, Maserati and Lamborghini, three key names in Italian motoring. To celebrate the 40th anniversary of a company that has become a significant player in national and international motorsports in its own right, we present a fascinating extract from the interview with Gian Paolo Dallara published in the book "E' una bella storia" ("It's a beautiful story")

Engineer, you graduated in aeronautical engineering, so what prompted the transition to motoring?
«I initially attended the University of Parma, which didn't offer the industrial design course that would have enabled me to qualify for the three year graduate mechanical engineering course, so, once I'd completed my first two years, I enrolled at the aeronautical engineering faculty at Milan Polytechnic. I developed a passion for it: the aeronautics course was more in line with what I wanted to do, and suited my aptitudes and skills. After graduating I expected to start working at Aermacchi, I studied the structural problems that affect aeroplanes and similar subjects. But I'd always been interested in motorcars, ever since I was a child, because my father, who owned a road construction firm, often took me to see the races. I remember watching the Mille Miglia pass through Parma, or the race up to the Poggio di Berceto».

First job: Ferrari, in 1959. Not everyone gets a start like that…
«While we were carrying out a series of trials for Ferrari in the wind tunnel at the Milan Polytechnic, Enzo Ferrari asked my professor if he could recommend a bright young man for his company. And professor Bianchi put my name forward. I would have gladly walked all the way to Maranello: the offer from Ferrari made me forget all my other options immediately. I statrted work as engineer Chiti's assistant. Calculations, drawings using the drafting machine, vehicle dynamic studies. I wasn't involved in the racing activities, but that year I went to Montecarlo, paying my own train fare and ticket just for the pleasure of attending the grand prix. To this day I'm still a little ashamed of the way I left Ferrari: I didn't have the courage to tell the Commendatore (as they called him back them) that I was going to work for Maserati, and I told him instead that I was going to work for the family business. When Enzo Ferrari found out that I had gone to work for Maserati he came to Varano, met my father, and convinced him that the best thing for me would be to move back to Ferrari one day; however, I refused to change my mind, not least because it would have meant making a fool of myself twice in one month. After that, I always felt awkward whenever I met the



INCREDIBLE Y



Commendatore; I felt guilty. Then, during a Ferrari F.1 test session at Varano, he saved my blushes by sitting down on a bench in front of my house and telling the people who had gathered there the story of his racing career. I'd love to be a director capable of recapturing those unbelievable moments».

Maserati, one of Ferrari's competitors…
«I loved competition and in 1961 Maserati offered me the chance to follow my dream. I was hired by Giulio Alfieri, who was a friend of my future father in law. Then, all of a sudden, I was on a DC6 to Florida for the 12 Hours of Sebring. At 25 years of age I was representing Maserati, incredible! The race featured Vaccarella and Bonnier's Birdcage and Bruce McLaren and Roger Penske who came fourth in their Cooper-Maserati. It was then that I fell in love with motor racing, and I never fell out again!».

But two years later it was time for another change and you moved on to Lamborghini.
«Yes, because at a certain point Maserati took the decision to pull out of motor racing. I got a call from Giotto Bizzarrini, who knew me from my days at Ferrari. Lamborghini wanted to move into racing and was looking at the 24 Hours of Le Mans. However the structure was too small for the factory that was beginning to develop. My first responsibility was the 350 GT, working on the chassis, gearbox and workshop settings. Bob Wallace, who had arrived in Europe together with Chris Amon, worked in the factory and was also responsible for testing. But in reality, the real test drivers were our customers. Then came the Miura, which was originally designed with the central engine used on the Mini. Ferruccio Lamborghini's avowed intent was to produce faster and more attractive cars than Ferrari. Initially the bodywork was to have been produced by Touring, but they were replaced by Bertone, who was also in competition with Pininfarina and Ferrari. I remember when Nuccio Bertone arrived in the factory on Christmas Eve with the original sketch: it was an immediate success, we were really impressed. And that was how one of the greatest phenomena in Italian motoring history was born».

EARS

THE WORLD AT YOUR FINGERTIPS

Engineer Alessandro Moroni, who is in charge of the Dallara's state-of-the-art facility for drivers, teams and manufacturers, reveals the latest "upgrades" implemented on the simulator in Varano. It is now possible to run virtual tests in all the current Dallara cars, and the database has been expanded to include even more circuits, and to an extremely high degree of accuracy. And there's even a procedure designed to counteract the consequences of the "reality effect"

Engineer Moroni, drivers and teams continue to praise the Dallara simulator. What are the latest innovations?
"As of the beginning of this season, in addition to GP2 and Indycar, which were already present, we have added all the other current Dallara models. The virtual cars now include: Grand-Am, F3 with all its different engine and tyre configurations, GP3 and World Series".

Have you also increased the number of circuits?
"The other important recent development was in the number available circuits. We have included practically all the GP2 and GP3 championship circuits, as well as an assortment of IndyCar, World Series and F3 tracks: from Brands Hatch to Sebring, from Indianapolis to Mid-Ohio, and Le Castellet to Lausitzring".

What factors determine the decision to add a new circuit? And how do you go about acquiring the data?
"We decide on the basis of requests received from drivers and teams, in order to satisfy specific requirements. We acquire the data by surveying the tracks with lasers, and using photographs and video recordings. This is followed by a graphic and physical modelling stage, which we do "in house", together with our technicians, before defining the final configuration".

How many parameters are used?
"We use thousands just for the car, then there are all the parameters that describe the track conditions and geometry. All these factors are monitored, which means that they are traceable, and can be analyzed, duplicated and memorized etc".

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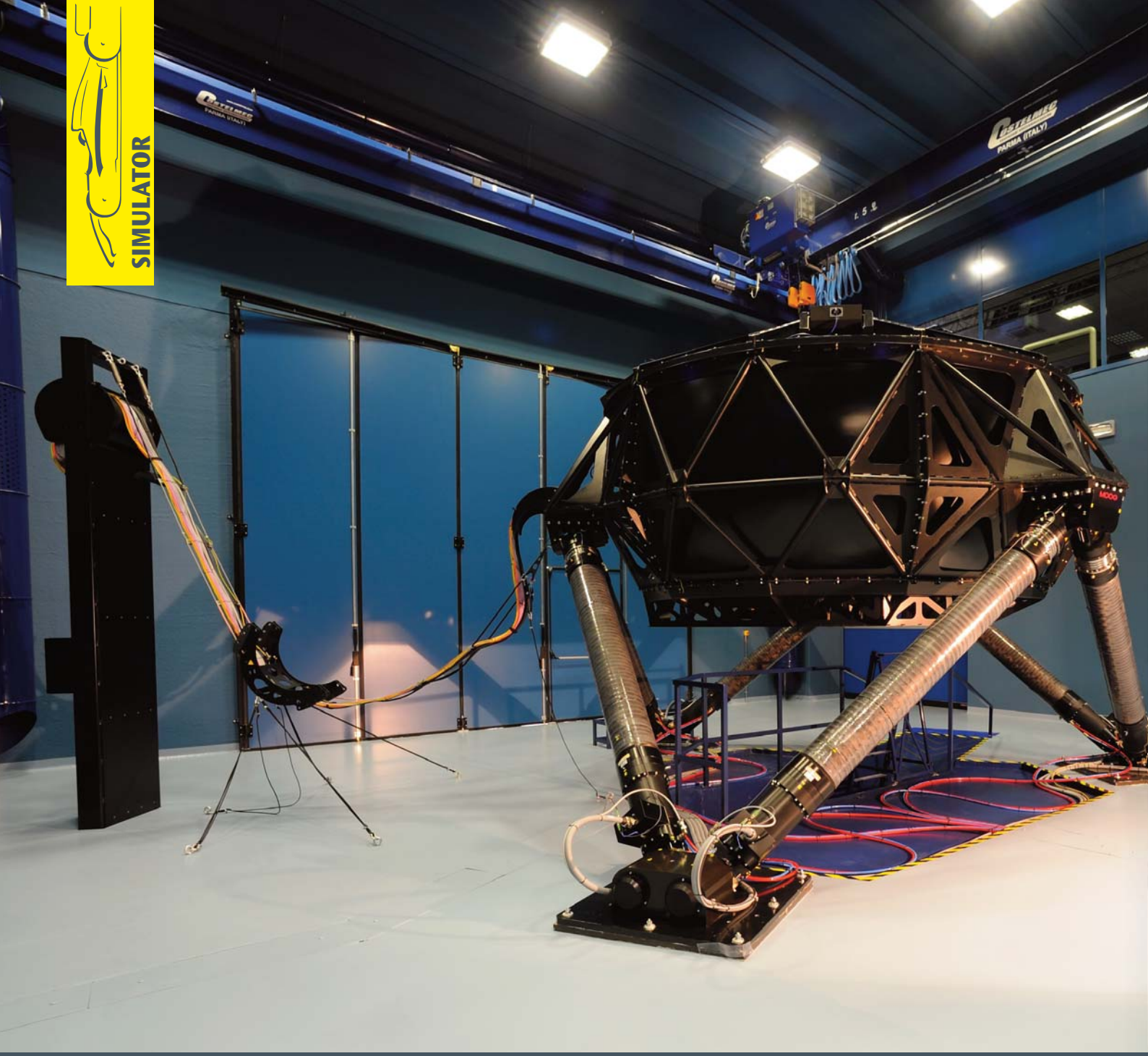

What level of detail is it possible to reproduce? The state of the asphalt, roughness, etc.?
"The current laser scans allow us to reproduce the track surface with a resolution of a few millimeters".

Can the simulator be used to "challenge" other drivers, or race against the champions?
"The simulator is not configured to be used simultaneously with other units, so it is not possible for two drivers to race against each other at the same time. Comparisons are normally made on the basis of data acquired during previous sessions, and by measuring a driver's performance against our reference drivers".

Have you ever had any drivers get carried away and react as if they were really out on the track?
"That happens fairly regularly when drivers attempt a manoeuvre at the limit of the car's capabilities. Also, on the Indy oval, you often see drivers preparing themselves for an impact as if they were in a real race situation".

What's the average duration of a session for a driver who wants to familiarise him/herself with a specific car or circuit?
"It takes approximately half a day for drivers to become fully confident in new car or on a new circuit and to start achieving the same performance levels as the others. They can easily cover 500 or 600 km in half a day".

Could you give us an idea of the costs involved?
"Even though our platform represents the state-of-the-art in professional simulators, at the same level as the systems the F.1 teams use to develop their cars, our costs are in line with the other simulators currently available in Italy".

Who "trusts" the simulator more: the drivers or the team engineers?

Eng. Alessandro Moroni working together with his collegue eng. Filippo Ramaciotti

"Both. There are pilots who want to use it before every race, and there are teams that like to send us their drivers to prepare before every event. The basic idea behind the simulator, ever since its inception, is that it should be used as a training tool for drivers, but more importantly for setting up the cars".

Do the big OEMS in the motoring sector also use it? And if so, what are their objectives, and what feedback have you had?

"We have collaborated with a number of OEMs, including some from outside Europe, and with a range of different objectives. In the road vehicles sector, the simulator is extremely useful for setting up the on-board electronics, which are becoming increasingly sophisticated (ABS, ESP, engine control units, etc.)".

Is it true that you have also created procedures to counter the effects of "simulator sickness"?

"Yes, it's true. We have procedures that can limit, or even eliminate, the risk of nausea during the first hour of a driver's first session. This enables the technicians to decide which is the best movement to apply to the simulator without having to worry about the individual driver's preferences and perceptions. All drivers are different, and the stress levels that the simulator must transmit in order to ensure that they can feel the limits of the car differ accordingly".

What developments have you got lined up for the future? Are you going to add any more cars or categories?

"We've already added all the current Dallara models, so we'll only be adding other cars if specifically requested by our customers or partners. One of the next developments will be to increase the degree of reality from the driver's point of view, by activating the seat belts during driving in order to heighten the perception of breaking and curving".

Alessandro Santini

DESIGNING IS LIKE CONDUCTING AN ORCHESTRA

An interesting excursion into the world of racing and road design, thanks to Engineer Djalma Zinelli, who was acclaimed the best aerodynamic designer in the world in 2008 in Oxford. He explains how CAD technology works together with the wind tunnel, what are the dialectics that govern a successful project, and the difficulties that designers encounter when dealing with the customer. With an acknowledgement of the F.1 produced by the great Colin Chapman and look at the exciting world of prototypes

Eng. Dialma Zinelli
Dallara's Head
of Aerodynamics

Engineer Zinelli, talk us through your professional career, from your degree at Milan Polytechnic, though your Oscar for Aerodynamics in Oxford(Race Tech Award) in 2008, up to you present commitments?

"After graduating in aeronautical engineering at Milan Polytechnic and completing my military service, I immediately began working in the wind tunnel at Dallara, where I was lucky enough to develop together with the aerodynamics department, which has grown from 3 people (me included) at the end of the 80s/beginning of the 90s, to around 50 people today. It's been hard work, but thoroughly enjoyable, the fruit of experience that has gradually expanded to cover every single motoring category (road vehicles included) and has permitted us to offer our services to the most prestigious car manufacturers. This has all be made possible by the company, and by Engineer Dallara, who has invested both resources and a belief in the fundamental importance of aerodynamics, as well as helping me to develop and grow according to the principles that the company is founded on: solidity, reactivity, low profile. Nowadays, my work is used in many more applications than in the past, I have an orchestra full of excellent musicians and it's up to me to make sure that each one is permitted to play to the best of their ability".

You have been involved in numerous top-level motorsports categories: in your field would you say that F.1 is the most challenging, or simply the most famous?

"It's the most 'vertical' and the most specialised: the principal driver represents pure performance, almost at any cost. If we were to imagine a hypothetical budget/performance diagram, F.1 would occupy the high performance/high budget area; however this doesn't mean that the other areas on this diagram are any the less demanding, or stimulating, from a design point of view".

Can you describe the most interesting aerodynamic developments on the new IndyCar?

"Our aim was to create a car based on our studies into lateral-directional aerodynamic stability: only the track will be able to confirm if we have been successful in converting our research into reality, but from a design point of view it was very interesting to focus primarily on the geometrical solutions that could improve the car's lateral stability, before attempting to combine these forms with the project performance targets".

WSR, F.3, GP2 and GP3. What challenges did you face when working on the latest cars in these categories?

"In all these categories the end product is more or less predefined, this means that the common denominator in all these projects is economic efficiency; however, each category has its own distinct aerodynamic character. I remember the DRS system for the World Series Renault, the sophistication of an F.3, the work that went into ensuring the high maneuverability of the GP2 and GP3 in traffic, which was necessary in order to ensure that races were competitive, as specifically requested by the customer".

→

What roles do the wind tunnel and the computer play when designing a car?
"The wind tunnel and the CFD have become perfectly complementary elements in aerodynamic vehicle design: the wind tunnel is still the most effective instrument from a quantitative point of view since it produces a greater quantity of data/unit of time; the CFD is fundamental from a qualitative standpoint since it is capable of providing important information and visualising the physical phenomena for a much smaller financial outlay. Naturally, the CFD will see the more significant developments over the next few years".

Safety has always been a priority at Dallara. Could you give us an example of how aerodynamic developments might influence a car's safety standards?
"As I mentioned earlier, the latest generation of Indycars is a typical example: I would stress again that we hope the aims and results of our research will translate into reality. In more general terms, it's obvious that your aerodynamic choices will have greater impact in the mono-product championships because you share the architectural decisions about the car with the customer right from the beginning; in competitive championships, the aerodynamics produced by the manufacturer have less impact on safety because the car layout is defined by the regulations, leaving you to obtain the best possible results within a fixed framework".

What are the other tools of your trade: do you still use notebooks, pencils and 'rapidographs', as Adrian Newey claims?
"I'll often sit down with talented 'surfacers' in our department, and say to them: "give me a sheet of paper" and draw them a sketch of what I want them to transform into CAD surfaces. Everyone has their own little rituals: I like to stand and watch the wind tunnel model during the test sessions and try to envisage the next development stage".

Talking of famous colleagues: who are they, and who – in your opinion – were the founders of aerodynamic development in motorsports?
"I don't really like to talk in terms of prima donnas because I think that, more often than not, the real aerodynamic developments are produced by very good engineers who work largely incognito; the team leader must be able to put together a group of people with these qualities, and possess a clear vision of the way that the car will develop. However, if I have to give you a name (and I must stress that he's Engineer Dallara's contemporary, and not mine), the one that springs immediately to mind is Colin Chapman, because he was the first to win, back in '78, with a car whose shape was clearly dictated by aerodynamics, thereby demonstrating that, in addition to engine and chassis design, there was a third way to achieve success. He effectively ushered in a new era: from that moment on, aerodynamic research became a fundamental element in the design of any new car".

How is the Dallara aerodynamics department structured and how does it work?
"We have two wind tunnels and a CFD department; there are around fifty employees in total. The department covers all the phases of the aerodynamic development process: design and development, production, testing".

Where do you start when designing a new single-seater?
"First of all, the whole project depends on good levels of interaction between the various people within the company who are capable of defining the three cardinal project prerequisites: time, costs, and performance, as

clearly and as solidly as possible. It may seem banal, but if the program manager is not certain about the fundamental aspects of the project, the need for reworking is practically inevitable. With specific reference to aerodynamics, we do a great deal of preliminary CFD so that when we move on to the wind tunnel, the model as already reasonably well advanced".

You also work with Dallara's partners in the road vehicles sector, what kind of requests do you receive from these customers?
"The automotive environment is generally a lot more complex than the racing world, and aerodynamics is no exception. In the racing environment you're normally the leader of the process, but in the road sector you're always the 'follower'; this is because style is by far the most important consideration: you have to follow the evolution of the style as closely as possible, while doing your best to ensure that the car continues to meet the project target values. In all these years, and despite the fact that, in principle, the advantages ought to be obvious for all to see, I have yet to witness a road car develop out of a true marriage of style and aerodynamics".

What ventures would you like to be involved in at Dallara in the future? Would you prefer F.1, the prototypes at Le Mans, or…
"From a personal point of a view,
"From a personal point of a view, and speaking as a fan, the car that always fascinated me the most is the Sport Prototype, therefore…".

Stefano Semeraro


PRO JET
V. GHIRELLI
RENAULT SPORT
MERIT
INTERNATIONAL HOTEL & CASINO
NORTH CYPRUS
elf
MICHELIN
OWS

«A CAR THAT IS DIFFICULT TO TAKE TO THE LIMIT, BUT VERY SAFE»

We interviewed Vittorio Ghirelli, the young Italian driver who debuted in the World Series 3.5 by Renault this year and asked him for his impressions of the new Dallara.
An important championship that enables drivers to improve their technique and gain experience, thanks also to the support of the factory in Varano

It's your first time in the World Series Renault 3.5 this year: how does it differ from your previous experiences?
"Well it's definitely a step up from the championships I have competed in up to now. I like the competitiveness: there are some very good drivers who are capable of winning any race. Also, it's very difficult to take the car to its limit, and that's another strong point of the category".

After F.3 and GP3, now's your chance to try out Dallara's new car: what characteristics set it apart from the cars in the other two categories?
"Without a doubt, the most obvious characteristic is its aerodynamic load, which is considerably greater than the single-seaters I'm used to. For this reason, as I mentioned before, it's difficult to get the most out of the car, and the tyres".

Is it the type of car that suits your driving style?
"I would say so. In the past I have raced in GP3 and Formula Renault 2000, where the cars have 250 horsepower, these have 560, it's a big step up. Another important detail is the set-up: even the slightest variation can make all the difference, so it's essential to have a good relationship with the engineer, in order to understand exactly what your needs are and define the ideal set-up for you".

Do you think that WSR is the best category for preparing drivers to take the step up to F.1?
"GP2 is still the closest category to F.1, due to the tyres. F.1 and GP2 both use Pirelli tyres that have similar characteristics and are subject to wear, and this is a significant factor in race management, whereas the World Series uses Michelin tyres, which last longer. In World Series you can take every lap as fast as possible; in GP2 and F.1 it's different, and you have to know how to manage your resources correctly. That said, the difference in lap times between World Series and GP2 has been significantly reduced in recent seasons".

In your opinion, what is Dallara's greatest asset in motorsports: the quality of its chassis, the attention to safety, or the trackside assistance it provides to the teams?
"Without a doubt, it's strongest point is the safety aspect, which is excellent. I have seen numerous incidents, but no one has ever been seriously injured. Fortunately I've only been involved in a small number myself, but the standards are very high. Then there's Dallara's trackside personnel, always ready to resolve any type of problem, and in record time. For example, I recently had a problem with the body. We sent it back to Dallara, where they carried out all the necessary tests. Once they had identified the problem, they sorted it out really quickly, and now the car is perfect. Dallara generally provides a very high level of trackside assistance".

The latest generation of Italian drivers is finding it very hard to make their mark in single-seater racing: what do you think is the reason for this?

"In Italy, no one is prepared to offer drivers the necessary financial help. Nowadays we see so many drivers from Venezuela, Russia, Colombia and other countries who receive government funding or financial support from large corporations in their respective countries: there's Maldonado in F.1, but also various Russian drivers who enjoy the support of companies like Lukoil or Gazprom. The companies help them to reach the top. There's no shortage of large companies in Italy – Eni, Ferrari, Fiat -, but they are not prepared to invest. This is partly due to the current crisis, but also because that is the Italian mentality".

What are your projects for this season and for the future?

"This year I'm finding it a bit hard going because the championship is very challenging and at my age I lack the necessary experience on such powerful cars. It's also a bit of a struggle from a financial point of view, I do have sponsor, but I'm also having to cover a part of the investment myself. My aim is to gain as much experience as I can as quickly as possible and achieve some good results before the end of the season so that I can find a sponsor who will enable me to break into a top-team. If you want to make it to the top you have to cement your place in important categories like World Series by Renault".

"LORENZO BANDINI" AWARDS: GIAN PAOLO DALLARA AWARDED THE FONDERIA MORINI MEDAL

THE ENGINEER RECEIVED THE AWARD IN BRISIGHELLA IN MEMORY OF THE DRIVER FROM ROMAGNA WHO DIED IN 1967. A CHANCE TO REMEMBER THE MEETING THAT TOOK PLACE WHEN THE FOUNDER OF DALLARA WAS WORKING AT MASERATI, WHO WERE SUPPLYING THE ENGINES FOR BANDINI'S COOPER AT THE TIME. THE DRIVERS AWARD WENT TO BRUNO SENNA, NEPHEW OF THE GREAT AYRTON

Bruno Senna

The nineteenth edition of the traditional "Bandini awards" was held on the 15th July 2012 in Brisighella, in the Province of Ravenna.
The award is presented in honour of the famous driver Lorenzo Bandini, who grew up in the charming little town of Brisighella and drove his single-seater Ferrari to important victories such as the 24 Hours of Le Mans in 1963 and the 12 Hours of Daytona in 1967. It was also in 1967 that he met his tragic death at the Monaco Grand Prix when, following a collision in the Chicane du Port, his Ferrari N.18 caught fire and he lost his life.
Years before, during the early 60s, while racing for Mimmo Dei's "Centro Sud" team in Modena, Bandini was given the opportunity to drive a Cooper fitted with a Maserati 1500cc engine, in which he finished in third place at Pau in France. Gian Paolo Dallara, who worked for Maserati from 1961 to 1963, remembers this extraordinary character very well: thanks to a twist of fate he also got to meet him one last time just before that tragic last race in Monte Carlo.
At the Bandini awards, Gian Paolo Dallara and Dallara Automobili were presented with the "Fonderia Morini" medal by Augusto Morini, the owner of the company of the same name, who helped to sponsor the event and also supplies Dallara with the clutch bells for the IndyCar. The medal was accepted on behalf of the company by Alessandro Santini, the marketing manager at Varano.
In front of a large audience at the municipal amphitheatre, including civil and military representatives (mayor, chief of police, carabinieri etc.), the president of the association, Francesco Asirelli, also awarded the "Città di Brisighella" medal to Maurizion Losa, the assistant director general of Rai Sport, the "Comune di Imola" medal to Matteo Bonciani, the FIA press officer, the "Provincia di Ravenna" ingot to the photographer Flavio Mazzi and the "Assemblea Legislativa Regione Emilia Romagna" medal to the journalist Livio Oricchio.
Every year an award is also presented to an emerging F.1 driver, and this year the prestigious jury, including motoring experts such as Pino Allievi, Cesare Fiorio, Giancarlo Minardi, Carlo Edoardo Valli, Carlo Mantellini, Daniele Manca, Pier Antonio Rivola, Ezio Zermiani and Jonathan Giacobazzi, selected the Williams team driver Bruno Senna, nephew of the great Ayrton.
Bruno Senna, who was warmly welcomed by a representative from his Italian fan club, knows Dallara cars well, having driven them in F.3 in Great Britain, in GP2 and F.1: an example for all young drivers who dream of breaking into the world of F1.

Augusto Morini, owner of the Morini firms and Alessandro Santini from Dallara Automobili

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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.

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Dallara is a performance partner of PTC