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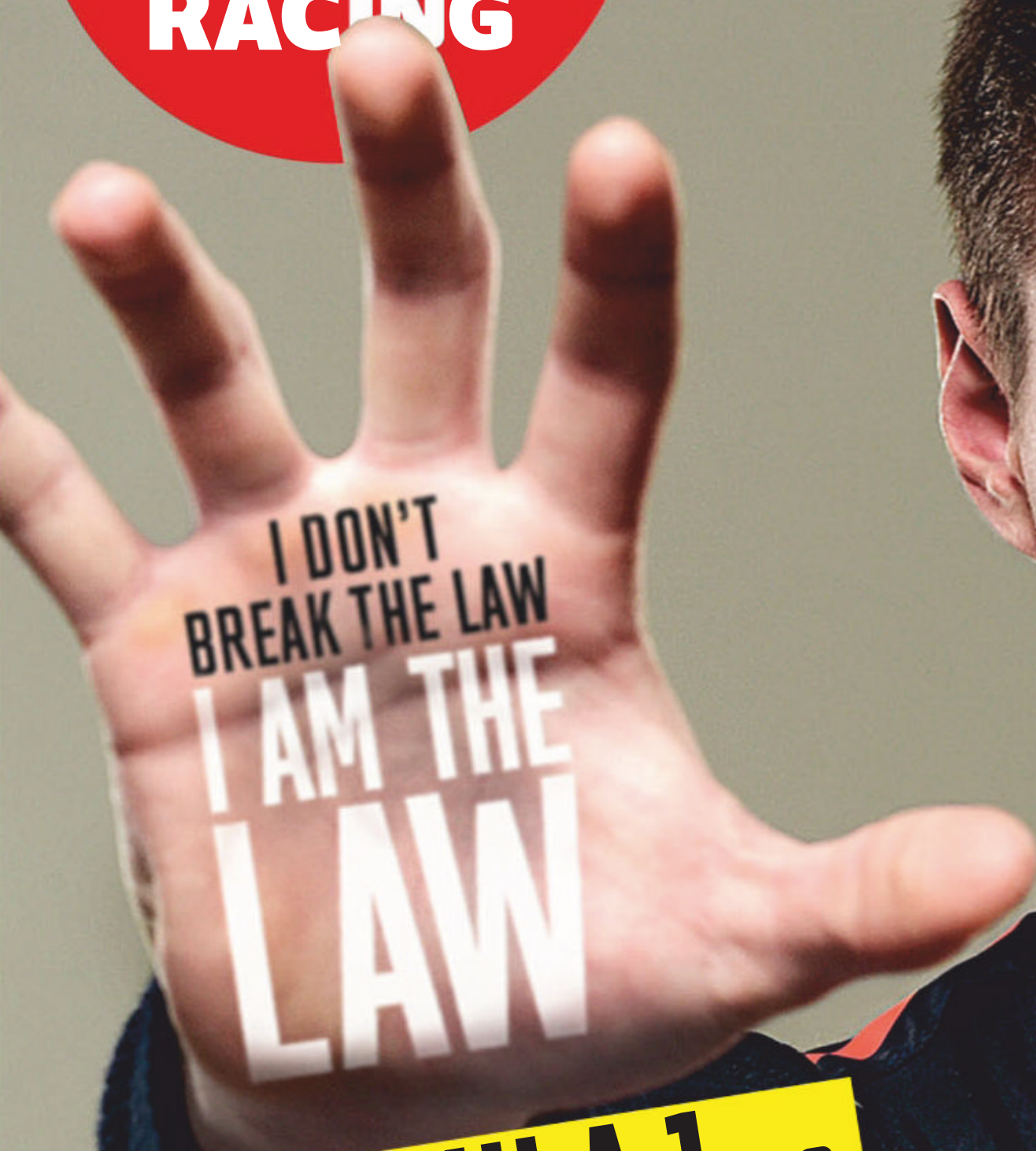
INSIDE

WILL BREXIT  
BREAK F1?

THE BATTLE STARTS HERE

ON THE SCENE AS F1 2019  
BEGINS EARLY IN ABU DHABI

NIGEL ROEBUCK FORMULA 1'S MOST HEROIC DEBUT



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Can Red Bull tame  
the beast within?



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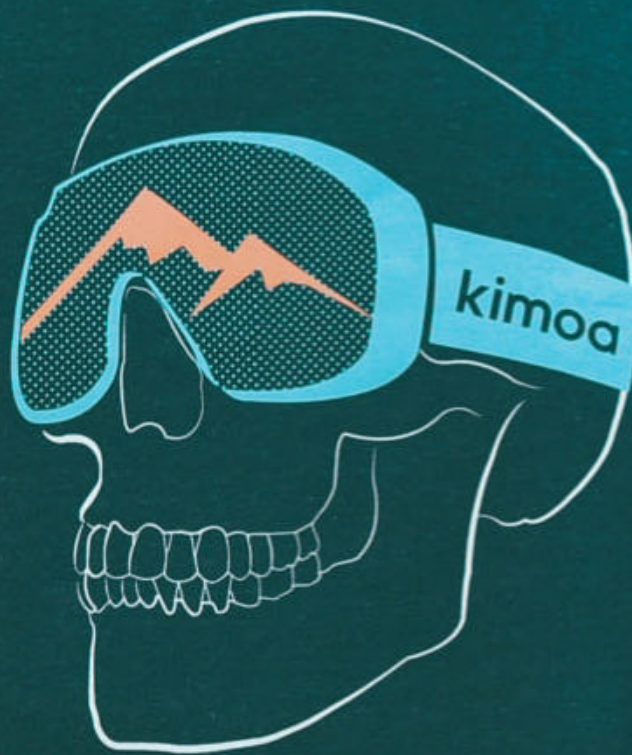


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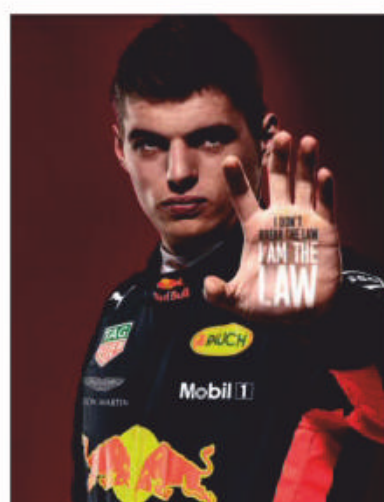
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## RAGING BULL

Max Verstappen has made a real name for himself in Formula 1 by driving fast, racing aggressively, speaking forcefully and never backing down. But after yet another season filled with controversy, missed opportunity and personal frustration, has this one-man Red Bull hurricane finally found the true path to greatness?

## IS

MAX VERSTAPPEN

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### MAX VERSTAPPEN: RAGING BULL



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Ben Anderson

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## Verstappen's law needs to mature

**Sebastian Vettel is closest** to Lewis Hamilton in terms of track record, but Max Verstappen is the driver Hamilton has yet to gain a true measure of, the one who looks most likely (depending on how soon Red Bull-Honda and/or Charles Leclerc get their acts together) to challenge Hamilton's status as Formula 1's undisputed king.

Great teams inevitably gravitate around great drivers, whether it be Lotus and Jim Clark, Tyrrell and Jackie Stewart, Ferrari and Michael Schumacher, Mercedes and Hamilton, or Red Bull and Verstappen. Toto Wolff says Mercedes have "two alpha pilots" in Hamilton and Valtteri Bottas, but the reality is two true alphas tend to breed destruction. McLaren found it with Ayrton Senna and Alain Prost; Mercedes had it with Hamilton and Nico Rosberg; and Red Bull went through the same struggle twice with Vettel and Mark Webber, then Daniel Ricciardo and Verstappen.

It seems near-impossible to keep both drivers truly happy in the long term unless you decide who your top dog is. However hard Red Bull tried to convince Dan of his equal status, eventually he jumped ship – surely (at least partly) because he could clearly see momentum was with Max.

But have Red Bull made the right choice? Helmut Marko is fond of saying Max reminds him of Senna, but that comparison entails the negatives too. Senna

was undoubtedly a great driver, but he was also uncompromisingly ruthless, to the extent he would occasionally stray beyond the boundaries of fairness – and refuse to recognise when he was in the wrong. Similar could be said of Schumacher – certainly in the white-hot heat of battle – and that same trait is apparent in Verstappen too: brilliant in the car, but also instinctively obstinate, and prone to bringing unnecessary trouble on himself.

Until Lewis began re-writing the record books, we might have concluded this trait part of what makes a great driver: 'never back down, no matter what'. But Hamilton is not like that and yet stands a realistic chance of becoming the most successful F1 driver ever. Maybe it's a matter of maturity. Lewis is one of F1's elder statesmen, 34 years old and soon to start his 230th race. Verstappen is 21 and hasn't reached 90 starts, so there is time to iron out the creases.

As Andrew Benson explains on page 24, Max has shown encouraging signs of growth recently – that he recognises the need to evolve to take on a driver of Hamilton's stature and Prost-like equanimity. But, this is still a work in progress. The incessantly demanding aspect of Verstappen's personality may yet get the better of him again, especially if Red Bull-Honda falters and further frustrates his burning ambitions. Max is rising, but the final steps to the top are usually the toughest to take...

### Contributors



**ANDREW BENSON**  
Before he was BBC Sport's chief F1 writer, Benson was the news hound for *Autosport*. See p24 for his story on cover star Verstappen



**ALEX KALINAUCKAS**  
It was while covering Formula 2 and GP3 for *Autosport* that Alex met Toro Rosso new-boy Alex Albon. Read his verdict on page 42



**ANDREW FERRARO**  
After criss-crossing the globe covering F1, Ferraro now photographs Formula E. This month he's up at Haas for us (page 44)



**STUART CODLING**  
For the first time in his career, 'Codders' got the chance to tell an F1 driver about the TV show 'Allo 'Allo. Leclerc's reaction is on page 64

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## WHY ARRIVABENE HAD TO GO



JONATHAN NOBLE

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01 **The failure of Ferrari to win** last year's world championship has triggered the long-expected departure of Maurizio Arrivabene as team principal. While 2018 was Ferrari's strongest season for a decade, strategy and management mistakes ultimately proved costly in the fight against Mercedes.

Former president Sergio Marchionne is believed to have resolved to replace Arrivabene during 2018, but Marchionne's death last September, from complications following surgery, delayed the process. Rumours had long been circulating of tensions behind the scenes at Maranello between Arrivabene and technical chief Mattia

Arrivabene has paid the price for Ferrari not winning any titles in 2018



Binotto, who has now been anointed as his successor.

Arrivabene's tenure at Ferrari, after he replaced Marco Mattiacci at the end of 2014, was notable for a significant change of tone. His abrupt and abrasive management style engendered a climate of fear within the team that often manifested itself in outright aggression towards photographers and other members of the press.

While it is understood that the directive to shut out the media came from Marchionne, perhaps interpreted too literally, it was deviations from managerial best practice in other areas that terminally weakened his position.

Failing to support Sebastian Vettel's title push triggered unnecessary flash points at the German and Italian Grands Prix. Then Arrivabene left onlookers astonished when, in the wake of a strategy blunder in qualifying in Japan, he let rip at his own staff. It was certainly not a case of we win together and lose together.

Binotto is credited with creating a more positive work environment on his side of the business. He revamped the team's engine department and then, as replacement for James Allison as technical chief from 2016, totally restructured the chassis side. Tasked by Marchionne with unleashing more creativity, Binotto stripped away what had been a vertical management structure to let more of the team's talented individuals

express their ideas. Removing the fear of blame for failures generated a wave of innovation at Ferrari, the likes of which had not been seen for years.

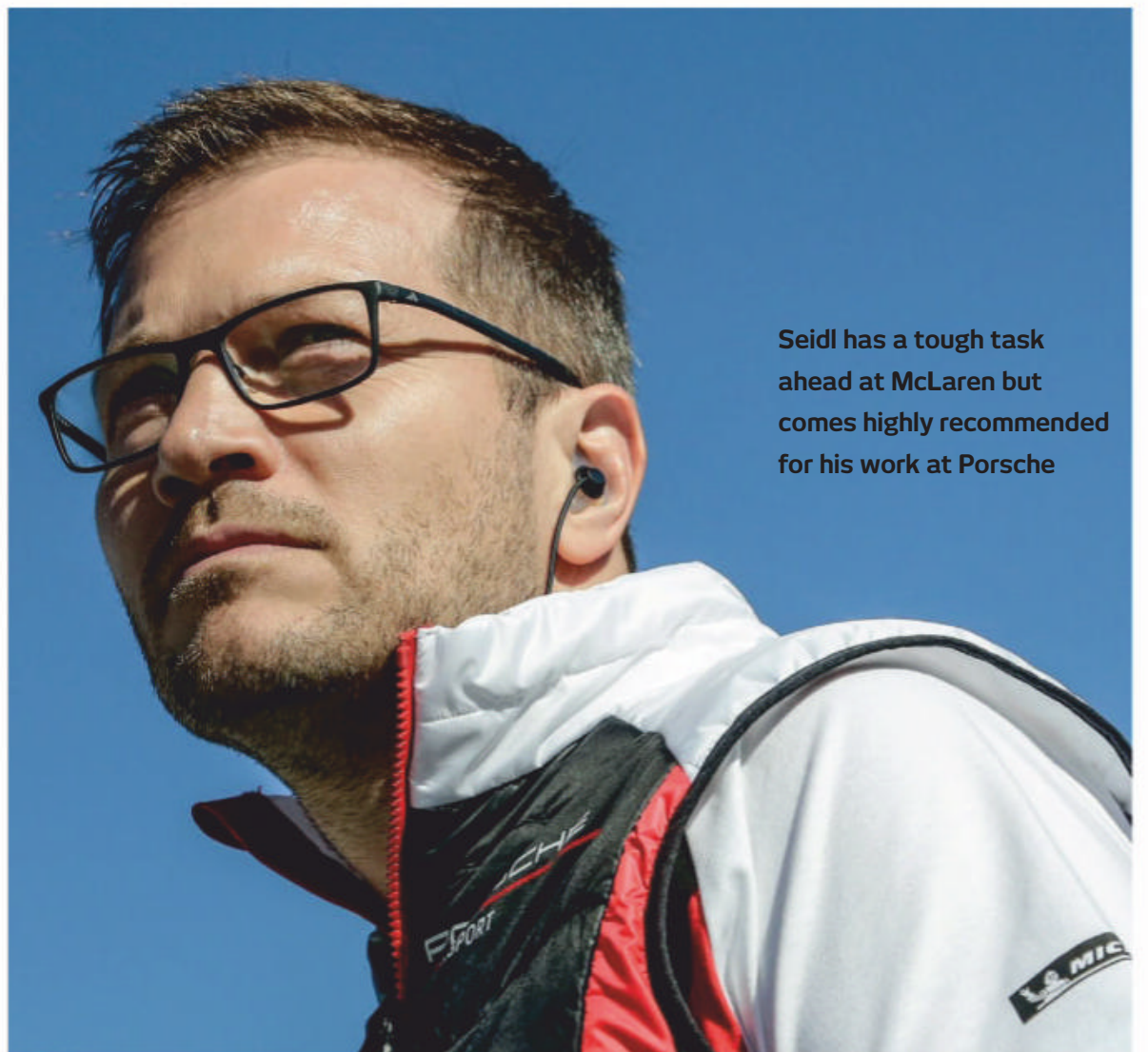
But having helped produce what was at times (if not consistently) both the fastest car and the best engine, Binotto needed no reminding that mistakes from Sebastian Vettel and errors by the team's operational side had to be eliminated. A post-season review into Ferrari's performance by senior management concurred with this. Faced with the very real prospect that Binotto could leave, Ferrari chairman John Elkann took the decision over the Christmas break that change was needed.

"After four years of untiring commitment and dedication, Maurizio Arrivabene is leaving the team," said a statement issued by Ferrari. "The decision was taken together with the company's top management after lengthy discussions related to Maurizio's long-term personal interests as well as those of the team."

Binotto will retain overall control of the technical department. While he perhaps lacks

the commercial experience that someone like Arrivabene brought, what he has in spades is an understanding of how a team should operate. And it's that area that will be key to Ferrari's 2019 title prospects.

## SEIDL STEPS IN AT McLAREN



Seidl has a tough task ahead at McLaren but comes highly recommended for his work at Porsche

**ARRIVABENE'S ABRUPT AND ABRASIVE MANAGEMENT STYLE ENGENDERED A CLIMATE OF FEAR WITHIN THE TEAM**

Mattia Binotto has already revamped Ferrari's engine and chassis departments



**The rebuilding at McLaren** continues after a tricky 2018 that led to the departure of several high-profile figures including racing director Eric Boullier, technical chief Tim Goss and engineering head Matt Morris. While the team is still awaiting the arrival of new technical director James Key, it has swooped for Porsche sportscar chief Andreas Seidl as their new F1 managing director.

Seidl arrives at McLaren having overseen Porsche's ultra-successful World Endurance Championship LMP1 team, which won three titles and Le Mans from 2015-2017. He had previously made a name for himself working at BMW Sauber in F1 until 2009, and then led BMW's return to the DTM. Highly respected in sportscars, Seidel carries the reputation of being a calm and methodical perfectionist, willing both to play the team orders card and bear the brunt of the flak eventuating from it. ▶

## “BROWN HAS ACCEPTED HE CAN'T DEVOTE THE TIME NEEDED TO FOCUS ON THE F1 SIDE OF THE BUSINESS. THAT'S WHY HE RECRUITED SEIDL”

Former F1 driver Brendon Hartley, who worked with Seidl at Porsche, is convinced he will fit in well in F1.

“He’s definitely capable,” said Hartley, speaking before confirmation of Seidl’s move to McLaren.

“I have a huge amount of respect for Andreas and he has a great feel of how to get the best out of people. Any

team that he’s going to will be very lucky to have him. I have no doubt he will have a positive influence. He’s a top professional. He was a big part of our success at Porsche.”

Such a combination of leadership skills, technical understanding and political savviness will be needed at McLaren, who are undergoing a major rebuilding process under the leadership of CEO Zak Brown. While Brown has previously suggested that a revolving door of management was partially responsible for the team’s slump, he’s also accepted that he can’t devote the time needed to focus on the F1 side of the business. That’s why he recruited Seidl.

Brown wanted someone able to focus on running the F1 team day-to-day, while he can take a higher-level view of operations. Seidl will report directly to Brown, and will manage the three key department heads: Key in charge of design, Simon Roberts in charge of production and Paul James, chief mechanic, whose job is to run operations at the track. The appointment will also allow sporting director Gil de Ferran more freedom to become involved in McLaren’s wider operations – including their assault on this year’s Indy 500 – rather than be devoted to F1.

## GHOSN WITH THE WIND

03

Renault’s bullish talk of their ‘biggest ever’ winter gains has lifted hopes that the fight at the front of F1 in 2019 may not be just a three-way affair again. But it will need to maintain a strong competitive focus to achieve this ambition – and that might be difficult as company president Carlos Ghosn, a key supporter of the F1 project, continues to be embroiled in legal proceedings in Japan.

Ghosn was arrested by Japanese authorities late last year over alleged breaches of financial law. He was accused of understating his pay over a period of several years, as well as running a scheme to transfer his personal investment losses to Nissan. If convicted, Ghosn could face up to 10 years in prison or a hefty fine.

Nissan have also alleged that Ghosn misused company funds, including the purchases of homes in Brazil and Lebanon as well as hiring his sister on an advisory contract.

Ghosn has consistently denied any wrongdoing and made his first appearance in court last month to defend himself. But he is likely to face a lengthy wait for a trial to begin.

While Nissan replaced Ghosn as chairman in the wake of his arrest, the Renault car company has been more supportive. Former COO Thierry Bollore is now acting as deputy CEO with the ‘same power’ as Ghosn while the legal matters are sorted in Japan. ▶



Renault claim that Carlos Ghosn’s arrest will not affect the F1 team

Bollore is now acting as deputy CEO with the ‘same power’ as Ghosn while the legal matters are sorted in Japan. ▶

## F1 DIGEST THE MONTH’S BIG STORIES AT A GLANCE

**10.12.18** Bernie Ecclestone claims that he tried to buy Silverstone



**11.12.18** Valtteri Bottas announces rallying debut in Arctic Rally

**13.12.18** Former F1 driver Karun Chandhok joins Sky Sports F1 team for 2019

**13.12.18** Monza proposes radical changes to circuit layout to boost top speeds

**14.12.18** Moneytron founder and Onyx F1 backer Jean-Pierre Van Rossem dies aged 73

**16.12.18** Charles Leclerc admits he found F1 intimidating at first

**19.12.18** London street race ‘should be possible’, says Mayor



**21.12.18** FIA relaxes CFD restrictions to improve research on 2021 solutions

**29.12.18** Gordon Murray awarded CBE in New Year Honours list



**08.01.19** Former Mercedes junior Pascal Wehrlein joins Ferrari in development driver role

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Ghosn's situation has removed a strong link between the Renault road car business and the F1 operation. He was one of the key architects of Renault's return to F1 as a works team, green-lighting the necessary investment to revitalise the Enstone operation. His absence has prompted some

doubts about the future of the team.

At a time when major road car manufacturers are channelling greater investment towards electric cars, losing such an F1 ally from a senior role is seldom positive. But, as Renault F1's managing director Cyril Abiteboul has made clear, the team is far from a one-man operation, and Ghosn was not the only individual supporting that investment for F1.

"It is fair to say that Carlos Ghosn was instrumental in the decision to return in late 2015, but obviously it is not one man's decision: the decision was debated at length and it was a decision of the company," said Abiteboul.

"We have been racing in F1 for more than 40 years. We have been on the journey of a long-term plan for six years – six years to build the team and six years to hopefully challenge the top guys, so that is where the focus is at the moment.

"There is a clear continuity of all the operations with Thierry Bollore, who is no stranger to F1 because he has been a director of the board of the team since 2016. So this is where we need to focus and support Renault."

The team continues to have friends in high places. F1 supporter Thierry Koskas, Renault's executive vice-president of sales and marketing since the start of 2016 and a member of the manufacturer's executive committee, is now president of Renault's sporting arm, taking over from stalwart Jérôme Stoll. The early indications are that he is not planning any major revolution.

"It has to be business as usual," says Abiteboul. "The team is under a clear trajectory, I think that I would like to recognise that Jérôme Stoll has done a tremendous job in securing a structure for Renault in F1 back in 2015.

"He and I were under the direct spot from the executive committee and CEO to convince the board of the merits of returning as a works team, putting in place the infrastructure and the management team, securing the first partners and securing the first progress of the team.

"I think after three years we are fully in line with the plan that was agreed and committed for the Renault board.

"Now it is up to a different management to take it from there and keep on going with the same trajectory. I am not anticipating any major change apart from continuity, stability and progression."



**“ WE HAVE BEEN RACING IN F1 FOR MORE THAN 40 YEARS. WE HAVE BEEN ON THE JOURNEY OF A LONG-TERM PLAN FOR SIX YEARS – SIX YEARS TO BUILD THE TEAM AND SIX YEARS TO HOPEFULLY CHALLENGE THE TOP GUYS ”**

**CYRIL ABITEBOUL  
RENAULT F1 TEAM BOSS**

# F1 MASTERMIND

Your chosen specialised subject: the world's greatest sport

- Q1** Which Finn led more laps in 2018: Kimi Räikkönen or Valtteri Bottas?
- Q2** How many times did Lotus finish second in the world championship: two, five or seven?
- Q3** At which circuit were the two Luxembourg GPs, in 1997 and 1998, held?
- Q4** Which driver started his F1 career with Tyrrell, then drove for Ferrari, Benetton, Prost and Sauber before ending his career at Jordan?
- Q5** How many races is Lewis Hamilton's longest winless drought in Formula 1?
- Q6** What was the highest position a Williams reached during a race in 2018: 7th, 8th or 9th?
- Q7** Mike Hawthorn, the 1958 world champion, won three world championship GPs. One was France in 1958, but when and where were the other two?
- Q8** Who was the only driver not from Mercedes, Ferrari or Red Bull to record a fastest lap in 2018?
- Q9** In the chaotic 1982 Monaco GP, how many official race leaders were there?
- Q10** When was the last time Silverstone was used for a full Formula 1 test day: 2015, 2016, or 2017?



1 Räikkönen, 92 to 84 2 3 Nürburgring 4 Jean Alesi 5 10 France 1953, Spain 1954 8 Kevin Magnussen 9 Four races 7th, by Lance Stroll, for four laps in Azerbaijan 6 Prost, Arnoux, Patrese and Pironi 10 2016

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# THE F1 ANALYST

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of Ferrari but it's unlikely he'll continue to ply his trade in red for much longer. The stakes are sky-high – everything Vettel has worked for in his professional career, and his legacy.

So, what does Vettel need to do? One problem is in containing his own emotions. The 2017 Azerbaijan Grand Prix, when he furiously sideswiped Hamilton under the Safety Car, is the classic example, but so are some of the wheel-to-wheel mistakes he made last year. Elite competitors are at their best when they keep a calm head, and if Vettel does that he can stabilise this downward spiral and rebuild.

During his time at Red Bull, race engineer Guillaume 'Rocky' Rocquelin was an essential presence on the pitwall, and this is perhaps something Vettel is lacking. Maybe Vettel and Ferrari must re-evaluate the environment he's operating in and whether the people around him are the right ones to extract the best from him and keep him in the ideal 'operating window'? And the problem might not even be on track. We forget these are human beings whose lives

extend beyond what they do for a few hours on a Sunday afternoon, and who knows what distractions the intensely private Vettel might have been battling?

The arrival of Leclerc will have one of two impacts. It could destabilise Vettel further, taking away a team-mate he was very comfortable with in Kimi Räikkönen and bringing in someone who represents 'the future'. But perhaps that team-mate relationship was *too* comfortable, and this change will drive Vettel to sort himself out. Those are the two possible paths; the only question then is how profound the effect either way is. The outcome will define Vettel's immediate future, and partly define his career.

Vettel is just one side of the Ferrari coin, the obverse being Leclerc. He's rightly been promoted to Ferrari after a stellar rookie season with Sauber during which he showed not only pace, but good racecraft and an ability

## IT'S PREMATURE TO WRITE OFF SEB'S FUTURE

**The twin forces** of time and progress are inexorable, even the greatest athlete cannot hold them back forever. As Sebastian Vettel reflects and regroups during the off-season, he will be conscious of their looming presence, made manifest in the form of new Ferrari team-mate Charles Leclerc. How could he fail to feel the pressure from the 21-year-old standard bearer for the next generation of grand prix drivers who will collectively force Vettel into obsolescence?

The question is, when? That's partly down to Vettel to answer. At 31, he should be in his prime and capable of another five years at least at the top level. He's leading Formula 1's most famous team and will likely have the machinery to fight for, and win, the 2019 world championship. And despite his struggles in the second half of 2018, he's a seriously fast racing driver who doesn't have four world championships to his name by chance. But he's teetering on the precipice of career oblivion and could end the coming season a busted flush.

But there's hope. Sporting greats can't hold off the inevitable fall in perpetuity, but they can

delay it. They do that by pushing themselves to the next level, emerging stronger, finding the mental strength to rise to the challenge posed by a thrusting young charger like Leclerc. All drivers have their highs and lows, but it's about how they respond to the lows, and how many times they can pick themselves up and go again. That's the challenge Vettel faces.

Those clamouring to write Vettel off do so at their peril. He was outstanding for much of the first half of last season, and a few months blighted by errors and a slump in one title fight doesn't mean he's been exposed as a driving fraud and should be put out to pasture. What we can be sure of is that if he does fail to recover and Leclerc seizes the initiative, not only will Vettel have lost leadership

**After four seasons with Räikkönen as his team-mate, Vettel will face a tougher challenge from Leclerc**





Although 2018 ended badly for Vettel, he remains the most likely challenger to Mercedes in 2019

to deliver when it really matters. But racing at the front in F1, in the pressure cooker that is Ferrari, is a sterner test. Leclerc has passed every exam with flying colours as he's climbed the ladder to F1, but the higher he rises the harder it gets. There is nowhere to hide at the front, where every mistake is magnified, and some have collapsed under these demands.

At a midfield team, it's possible to get away with the odd bad day because they aren't noticed. The highs are celebrated, the lows ignored and you can get on with improving yourself. Leclerc had many more highs than lows last year, but in only his second season in F1 needs to raise his game to deal with Vettel. Marcus Ericsson was an underrated team-mate for Leclerc to pulverise in 2018, but Vettel is something else entirely and will expose any chinks in the armour.

Take qualifying. Leclerc turned in some stunning Q2 laps to make the top 10 shootout, not least in Brazil where he improved despite damp conditions that had led everyone else to give up. But his Q3 laps haven't always delivered on that promise. No driver strung

together their theoretical best qualifying lap less often than Leclerc did in 2018, achieving it just three times and often losing a place on the grid as a result. Yes, he usually only had one fresh set of Pirellis for Q3, but so did his other midfield rivals who all have better records on that score. And who had the best hit rate? Vettel.

This is the kind of small detail that makes a big difference at the front. Vettel is a blindingly fast racing driver and had, on average, almost a quarter-of-a-second advantage over Räikkönen in dry qualifying conditions last year. Should Leclerc consistently give away the 0.136s to his own best that he did in 2018 – which he probably won't because he too is a great self-improver – that will

## “IS LECLERC EQUAL TO THE TASK? YES. IS VETTEL? YES. AND THAT'S WHAT MAKES THIS TEAM-MATE BATTLE SO IRRESISTIBLE”

add up to a chasm and consistently put him at a track position disadvantage.

This might seem like a minor criticism, and it is. But at the top, it's all about those infinitesimal differences. Leclerc's game will be tested, pulled apart, dissected, criticised, praised, investigated, stress-tested like never before. Not just by Vettel on the other side of the garage, but by Lewis Hamilton, Max Verstappen and all the other drivers jockeying for supremacy.

Is Leclerc equal to the task? Yes. Is Vettel? Yes. And that's what makes this team-mate battle so irresistible. Thanks to the artificially binary nature of sport, either the irresistible force or the immovable object must prevail.





# UNDER THE HOOD

PAT SYMONDS

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CO<sub>2</sub> reduction is an unavoidable element of our future.

The FIA and the engine manufacturers recently agreed the regulations that will govern the power units from 2021 to 2025. These are largely based on the engines of today, but with the ability to produce more power from the internal combustion engine and also to increase the electrical power from the hybrid system. With these regulations in place we must now turn our focus to the next generation of engines, which will reach mid-life around 2030.

One might ask why we're continuing to look at internal combustion engines when so many are talking of an electrified future. But the road to full electrification is long, and fundamentally

relies on breakthroughs in battery technology as well as finding the economies of scale that will start to bring electric vehicles to an acceptable price point.

In such an emotive field it's hard to find reliable predictions. One study of forecasts from business analysts with no particular axe to grind would suggest that by 2030, with sales of new vehicles driven more by total cost of ownership rather than regulatory requirements, only 14% of new vehicles will be EVs. 47% will still have conventional gasoline engines, and 34% will be gasoline/electric hybrids of various forms.

It's for this reason that F1 must continue to push forward gasoline engine technology. A look back at the last few engines shows just how effective the heat of competition ▶

## EFFICIENCY MUST REMAIN KEY PRIORITY

**Some people may feel** that energy efficiency and motorsport are words that don't belong in the same sentence. Many who don't follow our sport think of racing cars as being gas guzzlers – but this belies the fact that success in motorsport has always been driven by efficiency, whether it be in engine design, aerodynamics, or use of resources.

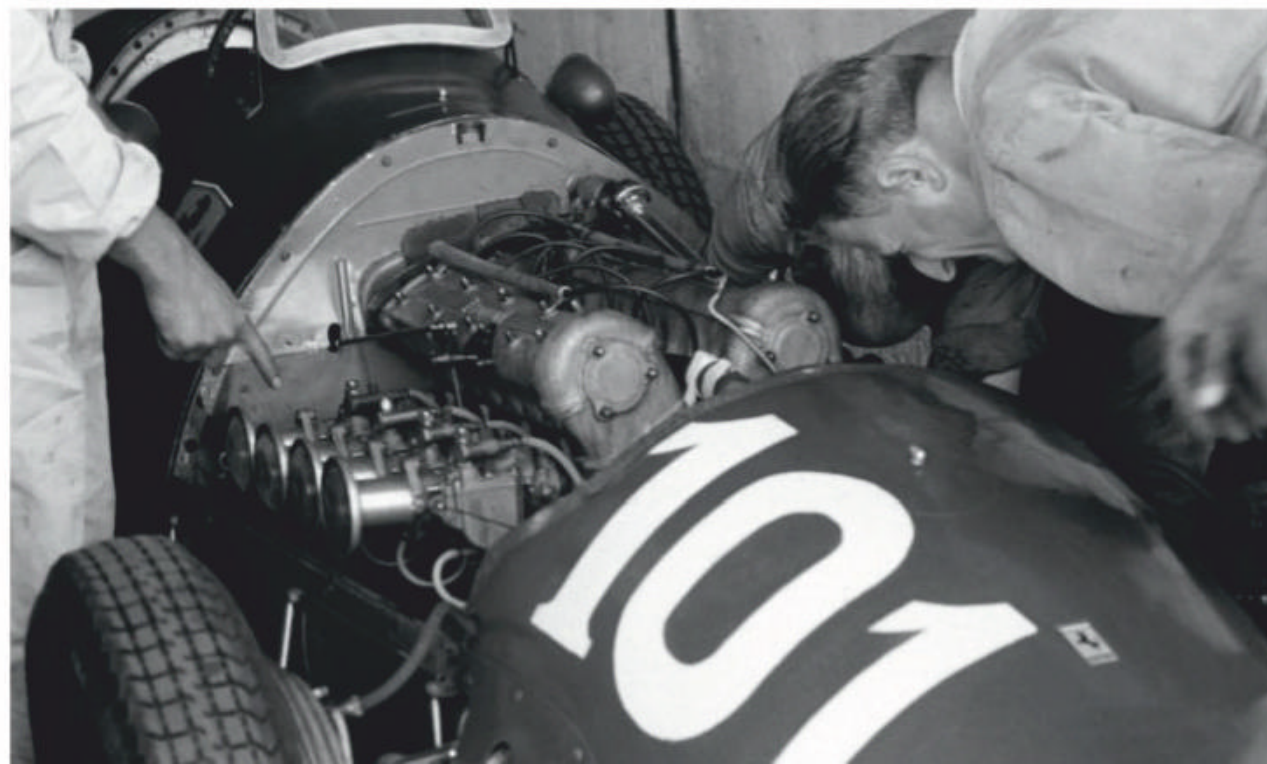
You might think the current generation of F1 engines is the embodiment of this, but in fact it's nothing new. The basic architecture of road car engines of today has much in common with that of racing engines of some decades ago. The production engines of tomorrow will show their heritage in design cues from today's race engines.

The 13th Energy Efficient Motorsport Conference was held recently in Birmingham. This conference grew from a paper put together in 2002 by the Motorsport Industry Association, aiming to demonstrate to a wider audience the role that motorsport can play in CO<sub>2</sub> reduction. The need hasn't diminished, and the MIA continue to champion the cause.

In those days CO<sub>2</sub> was the major energy-derived pollutant of note, but since then our awareness has expanded to include oxides of nitrogen and sub-2.5-micron particulates. This leaves the industry with a much finer balancing act, since diesel engines are demonised for their particulates and the technologies of lean-burn gasoline engines inevitably lead to higher NOx emissions.

The overarching driver, though, led by political demands and public opinion, is for CO<sub>2</sub> reduction. Whether one accepts the perils of climate change or even the role of road vehicles in the growth of greenhouse gases is no longer relevant, because

**Race engines have always given a lead to production engines and will continue to do so**



OTHER PICTURE: MERCEDES. ILLUSTRATION: BENJAMIN WACHENJE



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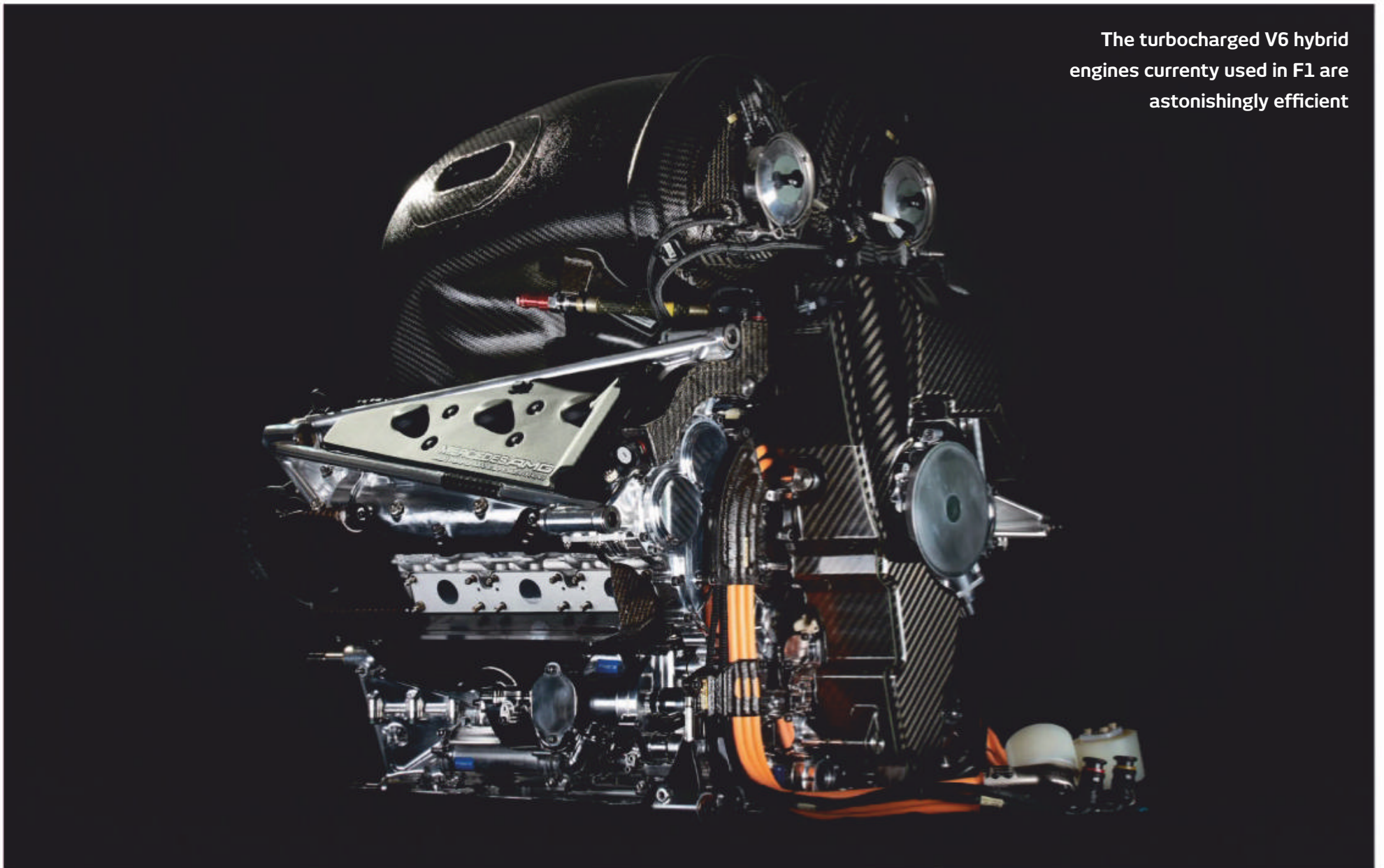
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The turbocharged V6 hybrid engines currently used in F1 are astonishingly efficient



has been in lowering fuel consumption and hence CO<sub>2</sub> emissions.

Until 2006, F1 was running normally aspirated 3-litre V10 engines. These were extremely powerful, eventually reaching around 980bhp, but their maximum fuel consumption, though, expressed in the units we've adopted since 2014, was 194kg/hr. This suggests a thermal efficiency of around 31%. This engine was superseded by the 2.4 litre V8, which produced around 775bhp at a flow rate of around 165kg/hr, suggesting a similar efficiency. The current turbocharged V6 produces around 800bhp at a flow rate of just 100kg/hr, giving an astonishing thermal efficiency of 50%.

A more common way of expressing efficiency is to quote fuel consumption. This number is the number of grams of fuel needed to produce one kilowatt for one hour, and hence the lower the number the more efficient the engine. The values for the three engines above are 325, 284 and 167g/kWh respectively. Remember this is for the internal combustion engine alone, before its overall efficiency is augmented by the hybrid electrical system.

To put this in context, these numbers relate to full-throttle, maximum-load operation. Most road vehicles achieve their lowest specific fuel consumption at well

below full load – and even then few achieve the sub 200g/kWh of our current engines. In F1 we do have some of the most efficient engines on the planet.

For our next-generation power unit we need to look again at new architectures and techniques, as we did for 2014. These may include gasoline compression ignition (a sort of mix between a petrol and a diesel engine), or some of the more innovative two-stroke opposed-piston designs that are showing remarkable thermal efficiency in prototype form and are able to run on a multitude of fuels. Almost certainly we will be looking at novel valve control since this is a key enabling technology for improved thermal efficiency.

Since all of this is some way in the future we must question if there's more we could do now, and the answer to that is yes. Biofuels have been around for a while now, and have moved from the food-depleting first-generation fuels through a second generation where ethanol was made

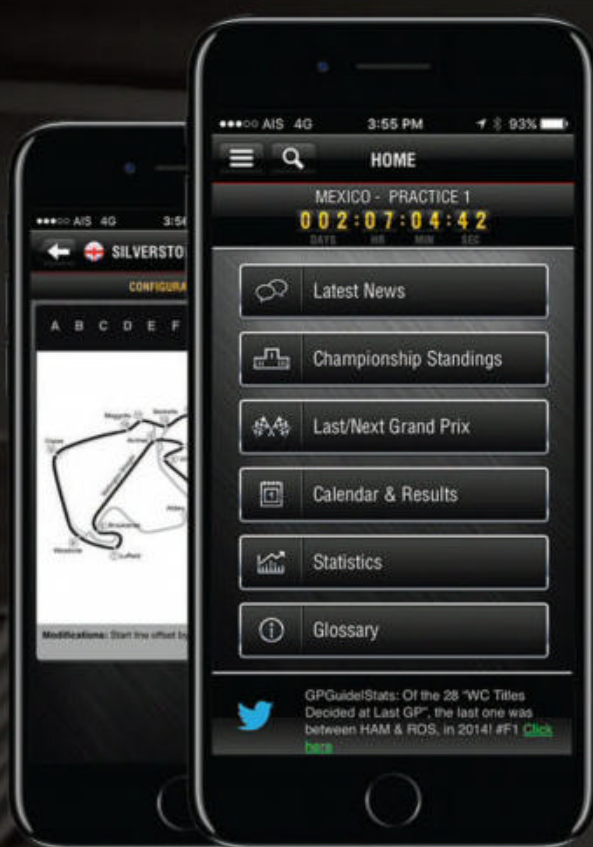
**“FOR OUR NEXT-GENERATION POWER UNIT WE NEED TO LOOK AGAIN AT NEW ARCHITECTURES AND TECHNIQUES, AS WE DID FOR 2014”**

from waste plant materials. The third generation of biofuels hold far more promise. They're made from the cultivation of algae, and not only have a much higher yield per hectare than conventional biomass, but also the fuel produced has a much higher energy content than the ethanol, which is the typical end product of biomass conversion.

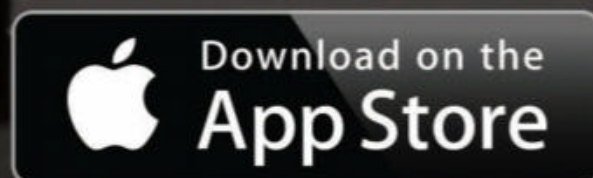
In any analysis we must consider a holistic view of CO<sub>2</sub> production, so the carbon release of manufacturing, driving and disposing of the vehicle, power unit and energy store as well as the CO<sub>2</sub> produced in burning the fuel. In other words, full life-cycle emissions. There is no such thing as a zero-emission vehicle or, in production quantities, a carbon-neutral fuel. Algal fuels, though, have the potential to make a large step in carbon reduction. Some engine redesign and re-calibration would be needed but they could be introduced in a compressed timescale – putting F1 again at the forefront of environmental excellence.

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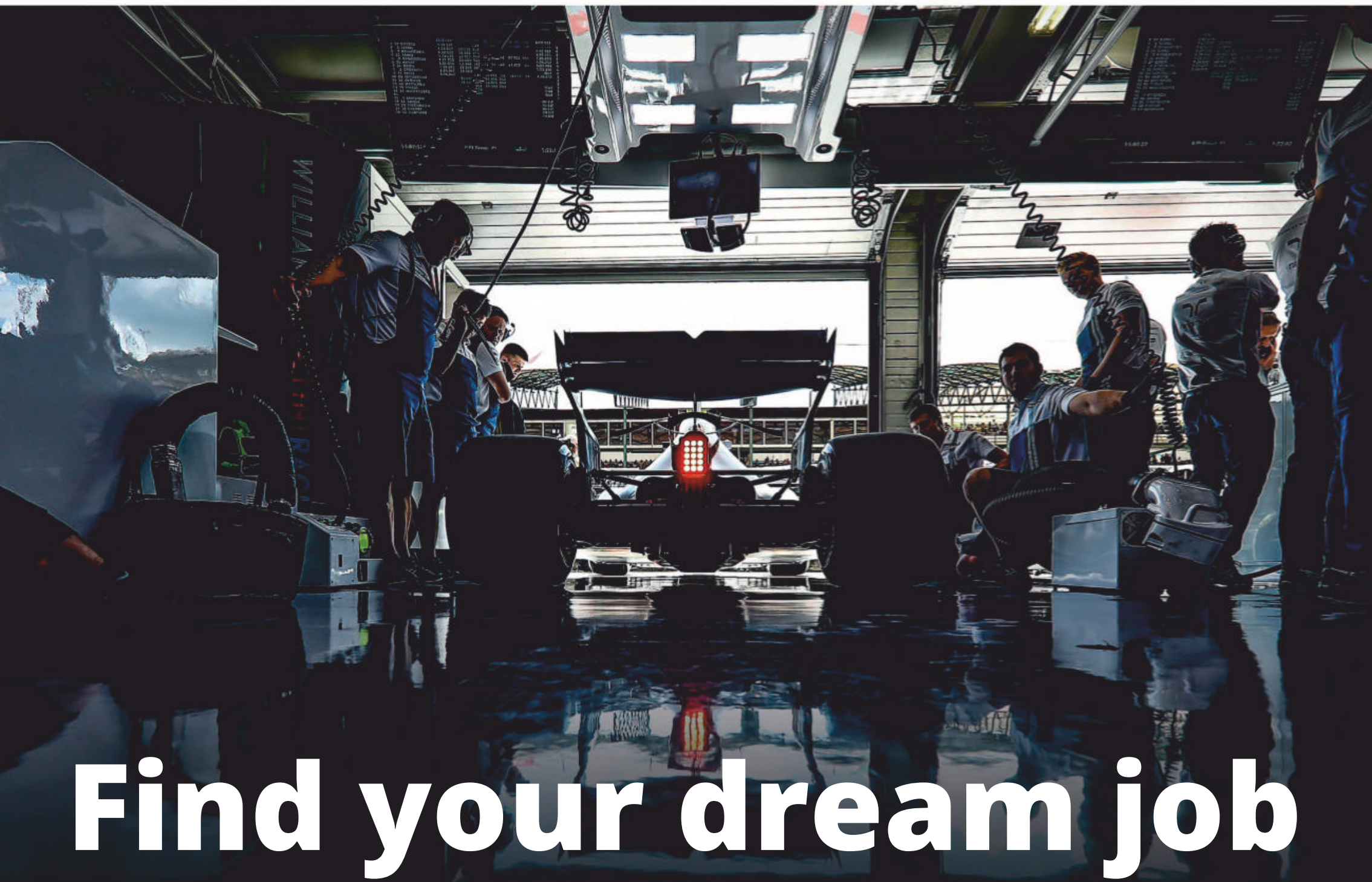
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# STRAIGHT TALK

MARK GALLAGHER

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## DOES IT HELP TO DIVERSIFY?

**You know the narrative.** They are two of F1's most successful teams – with 17 constructors' and 19 drivers' championships between them – yet neither have won the teams' title this century, and haven't won a race since 2012.

Twenty years ago, McLaren scored their eighth constructors' title, while Williams had just claimed back-to-back crowns in '96 and '97. But the world has changed since then, old certainties have been washed away and new business models required.

Both have diversified their businesses, McLaren with their Automotive and Applied Technologies divisions, Williams with Advanced Engineering. But when these teams filled the final four places in qualifying twice last year it only served to magnify a nagging suspicion that eyes were not firmly on the Formula 1 ball.

The dramatic drop in performance has been mirrored by a decline in sponsorship. McLaren have been without a title sponsor since 2013, while Williams are believed to have sold those rights to AT&T and Martini for relatively modest sums.

**Both McLaren and Williams have diversified to survive and in the long run this could help bring about a lift in on-track form**

Neither team is alone in this battle, however. Claire Ritchie, CEO of sports consultancy Sine Qua Non, says F1 sponsorships have declined by around 25% since '08, while James Parrish of Rush Sports estimates sponsorship only delivers 25-40% of team revenue.

The decision to diversify is a natural extension of previous projects. McLaren Cars produced the F1 road car in the '90s, then collaborated with Mercedes on the SLR. Williams delivered the Metro 6R4 rally car, Renault's British Touring Car Championship programme and BMW's Le Mans project. None of these had truly significant scale, but they did suggest potential. Potential that has now been realised.

McLaren Automotive's success, employing 1,700 staff with a turnover of £526.9m and 3,340 cars sold in '17, is well known. But MAT and WAE deserve more direct comparison, with sales of £56.4m and £39.5m in '17 respectively. The number of employees are similar, MAT with 377 staff and WAE 300.

Both play to core engineering strengths. MAT are recognised

for their exclusive provision of Electronic Control Units to F1, Indycar and NASCAR, less so for work with Singapore's Mass Rapid Transit System or a project aimed at preventing type 2 diabetes.

WAE enjoyed a strong 2018, typified by the success of Aerofoil – a device which keeps cold air inside supermarket fridges. Half a million units have been fitted, deals with Sainsbury's and Asda just the start. A joint venture with Unipart to supply electric vehicle batteries complements work with Aston Martin on the Rapide E, while diversity is underlined by the development of fast jet cockpit simulators and lightweight transportable baby incubators.

Both businesses have their own dedicated management teams, but share centralised group services. WAE's managing director Craig Wilson says both sides of the business collaborate, making best use of people and facilities. Williams team sponsors, such as Unilever, have even migrated to working with WAE. This can also be seen within McLaren, as commercial sponsorships and technology partnerships merge.

Revenue aside, there are benefits in being able to attract and retain talented staff, deliver sustainability and counter the negativity surrounding F1. The question now arises as to whether the management of the F1 teams can mirror the success of their advanced engineering colleagues, for whom innovation and creativity have been key. Far from being a distraction, could it be that some of the answers to on-track issues lie across the corridors in Woking and Grove?



## THIS MONTH



### Carsten Tilke

Managing director,  
Tilke GmbH

One company has dominated the business of Formula 1 circuit design and construction over the past 20 years, transforming the architectural tradition of the sport. Where once tracks occupied found spaces or brownfield sites, F1's expansion eastwards demanded greater scope and scale – as well as a distinctive vision. We catch up with Hermann Tilke's son to discuss the family business and the new project in Hanoi, Vietnam

## CV

**2017**

Managing director  
and partner of  
Tilke GmbH

**2014-17**

Civil engineering  
project manager,  
Tilke GmbH

**2010-14**

Chair of construction  
process management  
and real estate  
management,  
Munich University

**2014**

PhD in engineering,  
Munich University

**2009**

Diploma in civil  
engineering,  
Munich University

**F1 Racing:** Since your father is the renowned Formula 1 track designer Hermann Tilke, you must have been integrated with motor racing all your life...

**Carsten Tilke:** From as early as I can remember, I was going to race tracks with my father and watching racing. Then latterly I've been competing in the Porsche Cup and the German ADAC GT Masters series, and I've raced in several 24-hour races around the world, winning the Dubai 24 Hours in 2009. After graduating with a degree and a doctorate in civil engineering, I joined Tilke in 2014 as project manager for the new F1 street circuit in Baku, and then a year later I became the managing director and partner of the company.

**F1R:** So, with the street circuit in Baku, how difficult was it to decide exactly where the layout of the circuit went around the city?

**CT:** To understand the difficulties of designing a street circuit, you have to consider many points. The track should be next to some extraordinary buildings, which reflect the culture and beauty of the city, but you also have to deal with the existing streets, traffic lights and walkways.

The track has to be about four to six kilometres in length and meet the F1 safety requirements as well as being exciting for drivers and the spectators.

In addition, an open square area large enough to accommodate the paddock is needed, where all the teams base their hospitality units and pitlane garages. In Baku, we found the Freedom Square in front of the government building and from there we utilised other key buildings to showcase the city, such as the very narrow 'castle' section of the lap and past the Maiden Tower. I remember we visited that narrow stretch of road and the challenging Turn 15 many times, closing the streets at night to find the optimal design.

We also had to find a solution to cover up the existing cobbles on this stretch of road and then, once the race had finished, removing the layer of asphalt to restore them to their original look.

## INTERVIEW JAMES ROBERTS

**F1R:** What considerations do you have when you are tasked with creating a completely new circuit?

**CT:** We never start designing with a white piece of paper – we always have to take conditions into account like the existing topography, the borders and the shape of the land, where the road traffic will come from, the main wind direction, the soil and ground condition – and also the budget. For example, if the land we get is flat, it will be hard and costly to build a racetrack with lots of elevation, which makes the track more exciting. For a racetrack we need a certain size of land, which ideally is next to a big city. Unfortunately, these plots of land are usually expensive and reserved for other uses like retail developments. We often get land which nobody wanted, with the worst ground and soil conditions. For example, in Shanghai we had to create a racetrack in swampy conditions in record time.

**F1R:** How difficult is it to create a track that is conducive to overtaking, but is also a challenge for the drivers?

**CT:** It is a balancing act, as every client wants a really challenging circuit, yet sometimes 'easy' circuits are very good for racing. The old Hockenheim looked easy, with long straights and chicanes, but it was perfect for racing.

**F1R:** Tilke have designed many Formula 1 circuits over the years and nine of the current 21 – what project are you working on at the moment?

**CT:** The one project taking up a lot of my time is the new street circuit in Hanoi, which will host the Vietnam Grand Prix in 2020. In total, I've visited Hanoi six times in the past few months and one of the challenges of this track is that it will use a combination of existing roads in the city, but also will have a completely new section built. We have worked closely together with F1, who did lots of simulation work, to create the best possible track.

Tilke currently have over 25 projects on the go around the world. That means in total we have 150 engineers working on many circuits, proving grounds, stadiums and other architectural projects.







I DON'T  
BREAK THE LAW  
I AM THE  
LAW

Red Bull

TAG  
HEUER

RAUCH

Mobil 1

ASTON MARTIN



# RAGING BULL

**Max Verstappen** has made a real name for himself in Formula 1 by driving fast, racing aggressively, speaking forcefully and never backing down. But after yet another season filled with controversy, missed opportunity and personal frustration, has this one-man Red Bull hurricane finally found the true path to greatness?

## IS MAX VERSTAPPEN

WORDS ANDREW BENSON  
PORTRAITS ADRIAN MYERS

headed for greatness, or is he on a collision course with frustrated ambition? Right now, it's a question without an answer – or with two possible answers, from two possible futures.

First let's consider the Verstappen who had incidents in every one of the first six races of 2018 and who, at the end of the year, was *still* disputing the fairness of a penalty he had received for driving Valtteri Bottas off track at Monza. The same Verstappen who threw away certain victory at the Brazilian Grand Prix by colliding with a backmarker, and then shoving Esteban Ocon in the pits afterwards.

But on the other hand, there is the man who took two beautifully judged wins in Austria and Mexico, one of them after utterly dominating the entire race weekend, who scored podium finishes ▶

in the final five races, and just missed out on finishing third in the championship despite that error-strewn first portion of the year.

Often, Verstappen acts as if he is a law unto himself. Many see him as arrogant and entitled, behaving as if he believes success is his birthright. He can come across as a man who ignores advice, won't accept authority and shows an inability to learn from his mistakes. Even Red Bull team boss Christian Horner accepts "how people could come to that conclusion, because he is very much a driver who wears his heart on his sleeve. He's an all-out, ballsy racer and, in his very short career, what he has achieved so far has attracted a huge amount of attention and therefore scrutiny that comes with it."

Verstappen hardly helps himself. In Canada, questioned for the umpteenth time about the mistakes he was making, he said he was "getting tired of the questions." And added: "If I get a few more, I might headbutt someone." At the start of the Brazil weekend, he told journalists he was so frustrated after losing pole to team-mate Daniel Ricciardo at the previous race in Mexico that he "could literally [have done] some damage if somebody said something wrong to me after qualifying". Three days later, on his slow-down lap after finishing second to Lewis Hamilton, he remarked that Esteban Ocon, who was involved in the collision that had cost Verstappen the win, had better hope they did not meet in the paddock. When the two *did* cross paths at the weigh-in, Verstappen began an altercation that, given his earlier comments, looked premeditated.

None of which exactly screams maturity and growth. And this is unfortunate, because personal growth leading to new-found maturity is actually what has been happening with Verstappen behind the scenes over 2018. The problem – if indeed there is a 'problem' – is that, as Christian Horner puts it: "Max is unfiltered."

Horner elaborates: "That's the appeal of Max Verstappen. He's got his own personality. He's hugely determined. He's non-conformist in some respects, but that's what people warm to in him. They see this real fight, this real hunger within him: he'll scrap for any position and he just wants to race and go wheel to wheel."

There is no doubting that this 'rage to win' – a phrase that entered the F1 lexicon when legendary Ferrari designer Mauro Forghieri used it about Gilles Villeneuve – can lead down a dark path, whether that is the mistakes Verstappen made early in 2018, or a behaviour pattern that does him no favours in the eyes of many. ▶

**“MAX IS UNFILTERED.**

**HE'S GOT HIS OWN PERSONALITY.  
HE'S HUGELY DETERMINED.  
HE'S NON-CONFORMIST IN SOME  
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HE'LL SCRAP FOR ANY POSITION  
AND HE JUST WANTS TO RACE  
AND GO WHEEL TO WHEEL**

**THAT'S THE APPEAL  
OF MAX VERSTAPPEN”**

CHRISTIAN HORNER





Red Bull

TAG  
HEUER

RAUCI

Mobil

MOVE

OVER

Red Bull



MAX

“Obviously he had a tricky start to the season,” says Horner, “where things weren’t going his way and moves that would have previously worked for him, like on Hamilton in Bahrain, he tripped over. The margins are so fine because a similar move in Austria, where he had a slight touch with Kimi Räikkönen, was the decisive moment that won him the race.

“Of course, he’s also so young, so he’s growing in worldly experience all the time, and he has this huge hunger and determination within him. What we saw was that we talked very openly about the issues, tried to declutter things around him, just to allow him to focus on himself and his priorities. And he turned it around. Really, since Montréal, he has been fantastic.”

When asked how Max has managed it, Horner replies: “I don’t think it was any one thing. He just reflected on the mistakes he made. For example, a telling moment for me was the first lap in Singapore against Vettel, where Sebastian just outpowered him and he conceded the corner, whereas perhaps at the beginning of the year he may not have. So, he’s just a lot more measured in his approach, which is the value of experience.”

Talk to Verstappen about this, and it is clear that he is not the one-dimensional thug with talent some would have you believe. The conversation is worth playing out in full. “The first six races, I basically fucked up,” Verstappen says, matter-of-factly, “and then afterwards we did a much better job. It’s not really changing my approach to how I’m racing because I am still the same person and always going for the gap. But it is just that I wanted too much initially. I wanted to try to challenge and with the package we had it was not possible. My dad told me that sometimes when I think I am going slow, I am still going fast enough. I got that approach back after Monaco and it seemed to make me faster than I was before, but without mistakes.”

Was he guilty of overdriving?

“I was just trying to get too much out of it, which was not possible at the time.”

So he sort of went slower to go faster?

“Yeah and it worked for me in karting, and it’s working again now.”

And what flicked that switch?

“Talking. Mainly to my dad. He is the only one who really knows me. We have experienced everything together. I think it is always good

then to reflect. You can always improve. Everybody can. So, that’s what we did.”

And is that where he finds his self-analysis? In talking to his dad?

“Not always. Through the years, spending time with my dad, I learned how to do it myself, but initially it was always with my dad. And now of course in some critical situations like it was at

## A QUESTION OF HONDA



When Red Bull pair up with Honda for 2019, will they enjoy a rumoured power increase of 60bhp? Honda F1 boss Toyoharu Tanabe won't quite be drawn...

**How will switching** to Honda engines affect Red Bull in 2019? For now, it’s all positivity; Red Bull’s relief at ending five years of frustration with Renault in the turbo hybrid formula is palpable. And that is compounded by their belief that Honda’s latest engine is far more potent than Renault’s, with more power to come.

Red Bull can compare data from both engines, since junior team Toro Rosso switched to Honda units at the start of 2018, and there are whispers that the engine was as much as 60bhp more powerful than the Renault. Put that to Honda’s F1 technical director Toyoharu Tanabe, though, and he chuckles and says: “60bhp? A little bit too much.”

Tanabe raises his hand to head height and says he

believes Mercedes and Ferrari are “up here... very close. He then remarks that Honda and Renault are “still close to each other, in terms of reliability, experience and calibration”.

Suggest to him that paddock perception is that the final version of the Honda engine was significantly better than that of the Renault, and he chuckles again and says: “Not significant. Comparable.”

Nevertheless, Christian Horner insists that if Red Bull had, for the entirety of 2018, an engine as good as the final Honda spec, they would have “certainly been an awful lot closer” to fighting for the title.

But what is really giving Red Bull hope for 2019 is “what we see and hear in the pipeline”, as Horner puts it. Word on the street is that Honda have had

a eureka moment, particularly with the hybrid system, which should unlock a serious amount of development for next year. The belief that Honda are still on a significant upward curve, while Renault are stuck, is what led to the decision to switch in the first place. Max Verstappen is certainly positive about it.

“The dynamics of the Honda relationship are totally different,” says Horner, “and Max has bought into the route we’re going, the reasoning behind it and what the potential long-term gain is. We expect bumps along the way – it won’t be a Mercedes-beater in year one, but we’re taking a long view on it and believe the resource, the capability, and the desire of Honda is far better suited compared to our previous situation.”

the beginning of the year, you talk a lot about it, because it would be wrong not to. It would be wrong to be really stubborn and try to fix it yourself. And so you go back to the person who really knows you.”

Verstappen is not a man who necessarily comes across well within the artificial constraints of Formula 1 media opportunities. Although he visibly relaxed as 2018 progressed, and ended the year joking with Hamilton and Vettel at the

post-race conference in Abu Dhabi about the joys of the FIA prize giving ceremony and his community service punishment for his fraças with Ocon in Brazil, his default position tends to be short, to-the-point answers.

One-on-one, though, a very different personality emerges. And the more you talk to him, the more you come to understand that while bravado, intransigence and extreme self-confidence might be his default position, they ▶

STEVE ETHERINGTON/MOTORSPORT IMAGES



Hamilton: "If his team does the job and delivers, he'll be in the fight"

ANDY HONE/MOTORSPORT IMAGES



Vettel: "He certainly has all the ingredients for success"

JERRY ANDRE/MOTORSPORT IMAGES



Ricciardo: "He keeps improving and he was quick from day one"

## WHAT THE OTHER BIG-HITTERS MAKE OF MAX

On lap 54 of the 2018 US GP, there was a snapshot of a potential future title fight between Lewis Hamilton and Max Verstappen. Hamilton had been trailing Verstappen, and finally got close enough to have a go.

They went side by side through the switchbacks of Turns 12 to 15, and then Hamilton went for the outside of the long triple right-hander of 16-18. An unusually cautious Hamilton ran wide, and the battle was over.

The context for each driver was different – Hamilton was on the verge of winning the title, and did not want to take risks; Verstappen was defending second place and had nothing other than that to lose. But the exchange between them in the news conference afterwards was more revealing.

Lewis: "Was it close between us? I think I gave you too much space."

Max: "You could have squeezed a bit more, yeah."

Lewis: "I never know with you. I didn't want a coming-together."

Max: "I was also thinking: 'I don't know what Lewis is going to do here!'"

And there, in just a few words, it was possible to discern the level of

respect between them; the mutual awareness of how future Hamilton-Verstappen battles, when the stakes are spread more evenly, might unfold.

Hamilton is under no illusions that Verstappen is a rival to watch out for. After Abu Dhabi, he said: "Max has been driving very well throughout the year and has shown his consistency and has been up here many times with us. So, if his team does the job and delivers a platform with which he can compete even closer with us, then of course he'll be in the fight."

Sebastian Vettel adds that Verstappen "certainly has all the ingredients for success". But it is Verstappen's former team-mate, Daniel Ricciardo, who knows him best after three years together: "For sure there is some potential greatness for Max," says Ricciardo. "He keeps improving, and he was quick from day one. I am sure he'll keep improving."

"It is probably going to be more of a situation in terms of whether he is going to be with a car that's capable of winning. That's probably what's going to dictate what levels of greatness he's able to achieve. If that goes through a course where it's not happening, then you might get the frustrated version."

form something of a racing mask – a thin veneer resting on top of a character who has a far greater propensity for self-awareness and self-analysis than many may realise.

What is easy to forget is that, increasingly, F1 drivers do their growing up in public. Whereas the likes of Ayrton Senna and Alain Prost made their debuts in their mid-20s, these days talent of that level is fast-tracked. Verstappen, as Horner points out, was just three days past his 17th birthday when he first drove an F1 car at a grand

prix weekend. He has since become the youngest driver to lead a lap, set fastest lap, score points, secure a podium and win a race.

"All these guys with raw talent, they arrive in the sport when they're so young," Horner notes. "They've still got an awful lot of learning to do, but on a very public platform. And even more so with Max; he'd done just one year of car racing before Formula 1. That's sport in general. Athletes, drivers, sportsmen and women, they are arriving at the top end far quicker. Talent is

getting fast-tracked and so, of course, you are a very different person at 19, 20, 21 to 30."

It goes without saying that there are still rough edges for Verstappen to smooth out. There is not yet any evidence that he has rowed back on his reputation as "king of the double move", as Hamilton describes his propensity for changing direction twice in defence, which is strictly forbidden by the rule book. It was this tactic that led to the collision between the two Red Bulls in Baku, causing Horner to lose his temper with Verstappen behind the scenes.

His "unfiltered" character leads to outbursts on the radio and elsewhere that in future he might be better advised to avoid – such as the frustration he showed at times with Renault's unreliability in 2018. This sort of thing would not go down well with Honda, who are notoriously sensitive to public criticism. But Horner believes this will inevitably change in line with the ▶

**THERE ARE STILL PLENTY OF ROUGH EDGES FOR VERSTAPPEN TO SMOOTH OUT. THERE IS NOT YET ANY EVIDENCE THAT HE HAS ROWED BACK ON HIS REPUTATION AS "KING OF THE DOUBLE MOVE"**



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## THE MISHAPS OF THE FIRST SIX RACES LED TO A RETHINK OF MAX'S APPROACH, ESTABLISHING HIM AS NOT ONLY ONE OF F1'S FASTEST AND MOST EXCITING DRIVERS, BUT ONE OF ITS MOST **CONSISTENTLY EXCELLENT**

different dynamics in the relationship between Red Bull and Honda next season.

"It is not a customer-supplier relationship," Horner explains. "It is a true factory partnership. So, it's going to be a different scenario and he feels they will be listening to him, they will be trying to implement his requests and demands. And I think his role naturally holds next year because he will become the senior driver. The burden of responsibility as the experienced driver will be more focused on Max as opposed

to – even though he's older – the relatively inexperienced Pierre Gasly."

The final two-thirds of 2018 proved that when Verstappen is in the right mindset, he is a force to be reckoned with. After his costly qualifying crash in Monaco, he was outqualified by Ricciardo on merit only twice, and his average advantage was 0.222s. And Ricciardo is no slouch. In the same period, Verstappen scored more points than Räikkönen, and just ten fewer than Vettel, despite two retirements.

The mishaps of the first six races directly led to a rethink of his approach, establishing him as not only one of F1's fastest and most exciting drivers, but one of its most consistently excellent. Verstappen modestly claims that this is down to "just life experience, and just getting more experience by doing more races and experiencing different scenarios".

He elaborates: "It just comes over the years. It is the same as in karting. When you just jump into the world there, you also don't really know how it is going to work out and then throughout the years, my final years, I was definitely in the best shape I ever was in karting. It is the same in F1. It just keeps on developing and getting better. It is just continuous progress. I don't think it is one big change or anything."

The trick now is for him to carry that on. 🏎️

*Andrew Benson is BBC Sport's chief F1 writer*

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# F1 2019 HAS ALREADY BEGUN

Only two teams will field the same driver line-up this season – and we’ve already watched the new and returning faces from trackside to get a sense of what to expect. It’s a tantalising prospect...

PICTURES  **motorsport**  
IMAGES

WORDS SCOTT MITCHELL

**T**aking a first look at Formula 1’s new-faces-in-different-places as they emerged in turn from the Yas Marina pits felt like it had much in common with an insomniac counting sheep. There’s one. There’s another. And another...

But while there *was* a soothing air of rhythm and repetition in watching one driver after another accelerate onto the track for the post-season test in a different car to the one they’d driven (or not) in the grand prix two days earlier, it was far from soporific. It was a tantalising taste of the very different dynamic we can expect this coming season.

Only two teams, Mercedes and Haas, will field the same line-up this year as last. Charles Leclerc (now at Ferrari) and Kimi Räikkönen (now at Sauber) have swapped seats. Daniel Ricciardo’s shock Renault move forced Carlos Sainz to McLaren, alongside rookie Lando Norris. That in turn opened the Red Bull door to Pierre Gasly, who leaves behind a Toro Rosso team that will field an all-new line-up of Daniil Kvyat (remember him?)

and Formula 2 graduate Alexander Albon.

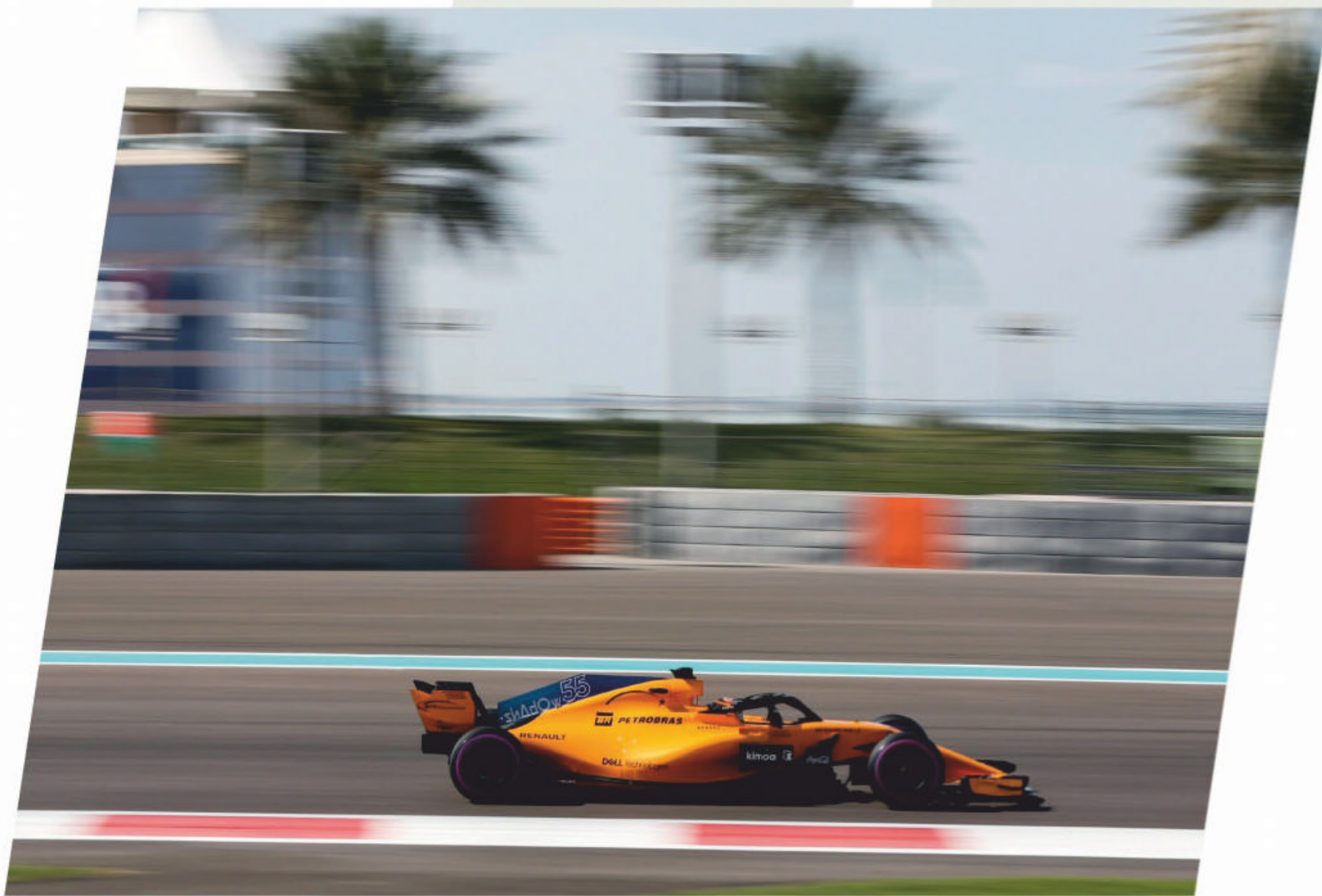
Williams have given Robert Kubica the chance to make his incredible comeback alongside F2 champion George Russell, while Lance Stroll has left to join Racing Point, where his father heads the consortium that saved the team from oblivion last year. Antonio Giovinazzi, another full-season debutant, will partner Räikkönen at Sauber.

However, this is not a question of sheer quantity of change. The quality of the many sub-plots is also incredibly high. ▶





PICTURE: JOE PORTLOCK



# DRIVERS WITH A POINT TO PROVE

A Formula 1 driver's reputation is a fragile entity. Playing second-best to Max Verstappen at Toro Rosso and being bested by Nico Hülkenberg at Renault means Carlos Sainz is relishing the prospect of stepping into a team leader role at McLaren.

This is an important season for Sainz. He will be expected to be well ahead of Norris, who only won once in F2 last year, and is tasked with heading up the revival of a McLaren team that's looking less a wounded giant and more a permanently injured one. Sainz says the prospect is not daunting, but "powerful".

"I think I've been at the two extremes of car balance," says Sainz.

## DANIEL RICCIARDO

RED BULL  
TO RENAULT



## CARLOS SAINZ

RENAULT TO  
McLAREN

"Because of that I'm going to McLaren with a lot of knowledge and wanting also to lead, and follow a direction with them that is hopefully a good one."

Sainz was delighted to get a "head start" for 2019 by testing in Abu Dhabi. Nobody was chasing lap times at the test, which was a two-day affair with the purpose of giving the 10 teams the chance to experience Pirelli's finalised range of 2019 tyre compounds for the first time. Sainz says that didn't stop it being very useful for anyone bedding in to a new team, "to say already what you like, what you don't like, what you want to be changed, your seat comfort, the steering wheel, the controls".

That was a luxury that his replacement at Renault, Ricciardo, wasn't afforded. Sainz describes moving teams as "another world", and that is something Ricciardo will need to wait until pre-season testing to truly experience, as Red Bull blocked him from driving for Renault in Abu Dhabi.

Ricciardo won two races in 2018, but his overall defeat at the hands of Verstappen means he has a bit of reputation rebuilding to do at Renault. That will not be easy given Hülkenberg is a formidable opponent who has spent the past two years building Renault around him.

# MOVING INTO THE LIMELIGHT

The most exciting move, and the one most likely to impact the front of the grid, is Leclerc stepping up to replace Räikkönen at Ferrari.

Sebastian Vettel's error-ridden 2018 campaign contributed to Ferrari's failure to mount a season-long title bid and Leclerc has already been talked up as slotting straight in as a championship contender.

Leclerc stuck to the task at hand in Abu Dhabi, ignoring performance to focus on tyre work, completing 135 laps after Vettel's first-day programme was limited to 69 laps because of damaged parts.

"To get to know the team, even if I already knew most of them before,

and working with them for the first time since it was announced I would be racing with Ferrari was important, because every team has its own specific way of operating," says Leclerc. "It allowed me to see and understand how this team does things."

Leclerc started life at Ferrari on top, beating Vettel's day-one benchmark to set the fastest time of the test. That was symbolic rather than tangible evidence of Leclerc's ability, though, since the times were unrepresentative: Leclerc's best was a long way off Saturday's pole time for the grand prix.

Another man moving into the big-time in 2019, but with a little less

## CHARLES LECLERC

SAUBER TO  
FERRARI



PICTURES: ZAK MAUGER; JOE PORTLOCK; MARK SUTTON

## PIERRE GASLY

TORO ROSSO  
TO RED BULL



fanfare, is Red Bull's latest graduate Gasly. The Frenchman is making the move, like Leclerc, after just one full season in F1 but into a slightly different environment. Red Bull's title prospects are difficult to assess given they are switching to Honda power, and in Max Verstappen, Gasly will have a team-mate looking to build on an ultra-successful campaign – not one who is trying to recover from a damaging title defeat.

Gasly is no stranger to Red Bull, having joined their junior programme in 2014 and he first tested for the senior team a year later. So, seeing him roll out in slightly different colours in Abu Dhabi wasn't quite as defining a moment. What could be is how quickly he adapts, and how close he can get to Verstappen, who outscored every driver other than world champion Lewis Hamilton after the summer break in 2018.

"I will probably need some time to get comfortable with the team, to get used to the car, the people, the way of working," says Gasly. "It is different targets, but a different culture also. I know when I do things right and when I do something wrong, and I always learn from these situations. I always question myself about what can I do better to improve myself as a driver." ▶



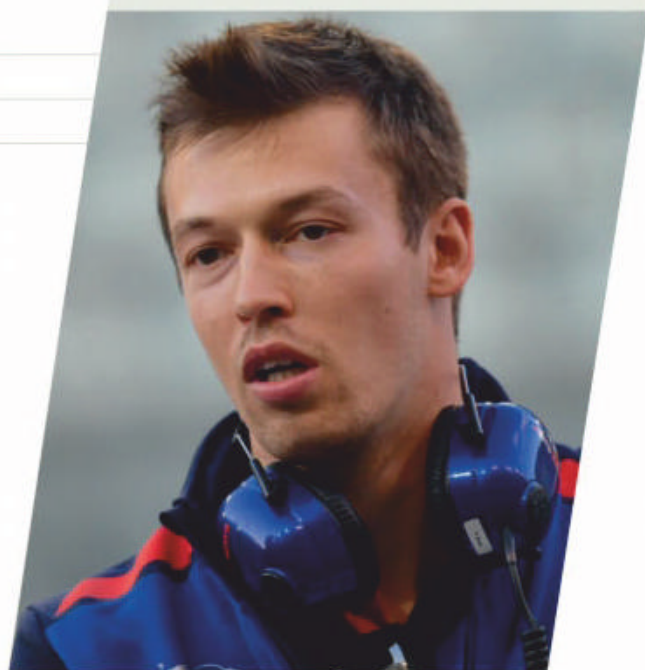
**KIMI RÄIKKÖNEN**  
RETURN TO SAUBER  
AFTER 17 YEARS



**ROBERT KUBICA**  
BACK ON THE  
F1 GRID WITH  
WILLIAMS

PICTURES: GLENN DUNBAR; JERRY ANDRE

**DANIIL KVYAT**  
BACK ON THE F1 GRID  
WITH TORO ROSSO



“They [Sauber] have all the tools, they have a great windtunnel and they have everything to build a great car. We have a Ferrari engine, so we know what we are going to get. I am excited” **Kimi Räikkönen**

“I am excited,” says Räikkönen. “They have all the tools, they have a great windtunnel and they have everything to build a great car. We have a Ferrari engine, so we know what we are going to get. The test was important to drive the car and see if there are some things we need to fix, but it was pretty straightforward.”

F1’s returnees have it a little less clear cut. Kvyat has only been out for little over a season after his demotion from Red Bull to Toro Rosso in early 2016 ended with him being axed before the end of 2017. Now he’s back, “comfortable and confident” after completing 155 laps in Abu Dhabi. His team boss, Franz Tost, reckons Kvyat is poised to have a “very important and successful story” after a year on Ferrari’s books as a development driver.

“I expect he learned a lot and got more experienced,” says Tost. “I hope he’s now in a position to stabilise his natural speed, and to transform it into good results. He has a clearer picture now about everything.”

Winning the vote of confidence from your team is very different to producing the results to justify it, though. It’s a similar situation facing Kubica, who was turned down by Renault and Williams for a 2018 race drive and has only now, with the help of his Polish backers, got a deal over the line.

Williams say his year as a development driver has completely won them over, but the one-time grand prix winner will be more like a rookie next year. He will not be the driver of old because he is simply not the same, having had to adjust to life as a left-handed person and racing driver following the 2011 Rally Andora accident that rendered his right hand almost useless. Anyone looking for clues in the test will be disappointed given the lack of comparable running. However, Kubica insists onlookers “just need to wait and you will see” how ready he is to be back on the grid. ▶

# OLD HANDS WITH FRESH CHANCES

Second chances are supposed to be hard to come by in the Piranha Club, but there are a few drivers defying that long-established wisdom this year. As well as Räikkönen extending his career by two more years at Sauber, Kvyat is back for a third stint at Toro Rosso, and Kubica has confounded his doubters by getting a race seat at Williams.

Räikkönen was back behind the wheel of a Sauber for the first time in 17 years in the post-season test. There’s a romance about this reunion, even if the first day did end with Kimi stopping on track with a technical problem, resulting in a red flag.

F1 should relish the prospect of Räikkönen in a new environment, free from the negatively charged political environment of Ferrari. There should be no lack of competitive motivation either, if Sauber can build on immense progress they made through 2018.

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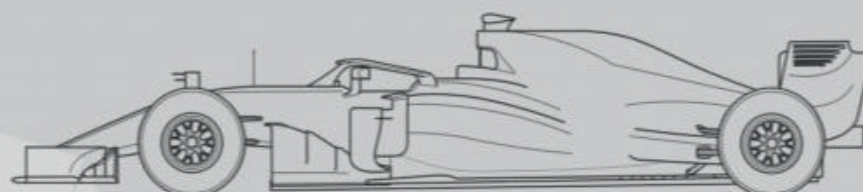
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**GEORGE RUSSELL**

ROOKIE WITH  
WILLIAMS

**BREAKING INTO  
THE BIG LEAGUE**

Kubica has the worst possible team-mate alongside him for his F1 return: a highly rated, incredibly motivated rookie. Big things are expected from Mercedes protégé George Russell, who is fresh from his F2 title. Since Lando Norris and Alexander Albon are stepping up too, this is the first time the top three in the feeder series have graduated to F1 together since Nico Hülkenberg, Vitaly Petrov and Lucas di Grassi did so in 2010.

**ANTONIO GIOVINAZZI**

'ROOKIE' WITH  
SAUBER



**LANDO NORRIS**

ROOKIE WITH  
MCLAREN

Russell has F1 testing experience with Mercedes and Force India, but Abu Dhabi was the first time he drove with Williams. “Just getting to know everyone in the team is the hardest part really,” he says. “There is a huge amount of people here, and I’m quite well up to speed with the buttons after a couple of days in the simulator. With more time in the car, the more I’ll get used to it.”

Russell reckons his experience of contemporary F1, having been embedded in Mercedes this year as their reserve driver, will dovetail nicely with Kubica’s wider racing history. He is rightly confident about his prospects against the ‘faux rookie’, and his chance of winning his intra-team battle is probably better than fellow rookies Norris and Albon.

Racing with Sainz pits Norris against an established, experienced midfield driver, while Albon has never even driven an F1 car before. For commercial reasons, Toro Rosso partnered F2 driver Sean Gelael with Kvyat in Abu Dhabi. Norris has plenty of experience in the McLaren from 2017 and 2018, but even he talked about how much more there is to learn – especially “more starts and feeling the degradation of the tyres” – which rams home the learning curve Albon faces.

Throw in another full-season rookie in the form of Antonio Giovinazzi, alongside Räikkönen at Sauber, and you get the full extent of F1 2019’s jam-packed promise. When it all comes together at the start of the season it should be utterly spellbinding. 🏁



**ALEXANDER ALBON**

ROOKIE WITH  
TORO ROSSO

PICTURES: GLENN DUNBAR; STEVEN TEE; ZAK MAUGER; JAKOB EBREY

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# RED BULL REDEMPTION

Like his predecessor Brendon Hartley, **Alexander Albon** has been dropped and re-hired by Helmut Marko to fill a gap on the Red Bull merry-go-round. Can this “underrated” rookie succeed where Hartley failed and make the grade in F1?

**“HE’S ONE OF, IF NOT THE, MOST UNDERRATED DRIVERS IN JUNIOR FORMULAS.”**

Those are the words of new Williams recruit George Russell on his 2018 F2 title rival – and fellow ’19 F1 rookie – Alexander Albon. High praise for a rival, which gives considerable insight into the character of Toro Rosso’s latest signing.

Albon was a highly rated karter who made a slow-burn transition to cars in 2012, which explains his under-the-radar career status. Things took off in ’16 when he pushed Charles Leclerc hard for the GP3 title. After that near miss, he struggled in F2 the following year before recapturing momentum to claim four wins and three poles (all in succession) on his way to third in 2018.

Plenty of highs, and lows, but Albon has had to do things the hard way. He has reached the highest level without backing from an F1 junior scheme. In fact, he’s been dropped by two of them.

Red Bull supported him in karting, but the step up to cars was a disaster. Albon failed to score a point in the 2012 Formula Renault Eurocup, as he struggled with the increase in speed and downforce. He left the scheme at the end of that year but the Lotus junior team picked him up the following season and he stayed there for three years. When Renault retook the reins at Enstone, they launched their own setup for ’16 and Albon again fell by the wayside.

But, largely by himself – although wisely retaining a link to Gwen Lagrue, who ran the Gravity Sport Management-supported Lotus junior programme and is now in charge of the Mercedes equivalent – Albon carried on making waves.

Quiet and friendly, Albon has proved he can survive numerous setbacks and keep improving. During his rookie F2 campaign, he drove with a broken collarbone – sustained on a mountain bike training ride – and scored a maiden category podium when he returned for the next round in Austria.



Age 22  
Nationality British-born Thai

## 2018

Third in Formula 2 with DAMS with four wins. Signs to Toro Rosso F1 team for 2019 after exiting Nissan e.dams Formula E deal

## 2017

Tenth in Formula 2 with ART GP

## 2016

Second in GP3 with ART GP with four wins

## 2015

Seventh in European F3 with Signature. Leaves Lotus junior programme at the end of the year

## 2014

Third in Formula Renault Eurocup with KTR

## 2013

Joins Lotus junior team and finishes 16th in Formula Renault Eurocup with KTR

## 2012

Formula Renault Eurocup with EPIC Racing. Leaves Red Bull junior fold at the end of the year

## 2006-11

Karting successes include the CIK-FIA European Championship (KF3) in 2010. Becomes a Red Bull junior

Perhaps the most serious threat to his career came when he lost a sponsor over the 2017-18 winter, which threatened his F2 deal with DAMS. But team bosses Jean-Paul Driot and Francois Sicard were convinced by his talent to take a “huge risk”, financially. “He was so impressive that we considered that it was worth it,” says Sicard. “Both DAMS and Alex showed that we were right.”

Albon’s move to DAMS had career-changing consequences. First, both team and driver assessed what had gone wrong in ’17 and how to improve his weaknesses. The results soon came and he was in the title hunt all year. Despite that success, an F1 graduation looked unlikely. Driot, however, was suitably impressed to sign Albon to a three-year contract with the Nissan Formula E team run by his e.dams division. Albon’s future finally looked settled.

Then Red Bull, needing a licence-qualified driver to promote to F1, came back into the frame. As Driot puts it “when you ask a blind man if he wants to see, you know the answer,” and so Albon had to extricate himself from his FE deal. But, with Driot’s blessing, Albon got his way, and he is finally an F1 driver.

Although he doesn’t possess the glittering CVs of Leclerc, Russell or Lando Norris, Albon has consistently demonstrated speed and high levels of intelligence. As Sicard says: “On the driving – he is like a cat: extremely fast and capable of adapting. He’s also good for providing technical feedback.”

Respected by junior teams and rivals alike, Albon is at heart a likeable and nice guy. But there lies a possible problem. In F1, and especially in the Red Bull fold, he is entering a highly charged and unpredictable atmosphere. Sicard reckons he will need to learn to “protect himself”, while Driot points out “in F1 you need to be political, which he is not”.

So, Albon immediately faces another challenge – hanging onto his seat. Red Bull is likely to have Dan Ticktum waiting in the wings for 2020 and, as with Brendon Hartley, Helmut Marko has shown he is ready to cut loose charges only recently welcomed back. Albon is clearly adept at not burning bridges – but he’s not the one carrying a lighter.



# BREAKING THE F1 MOULD

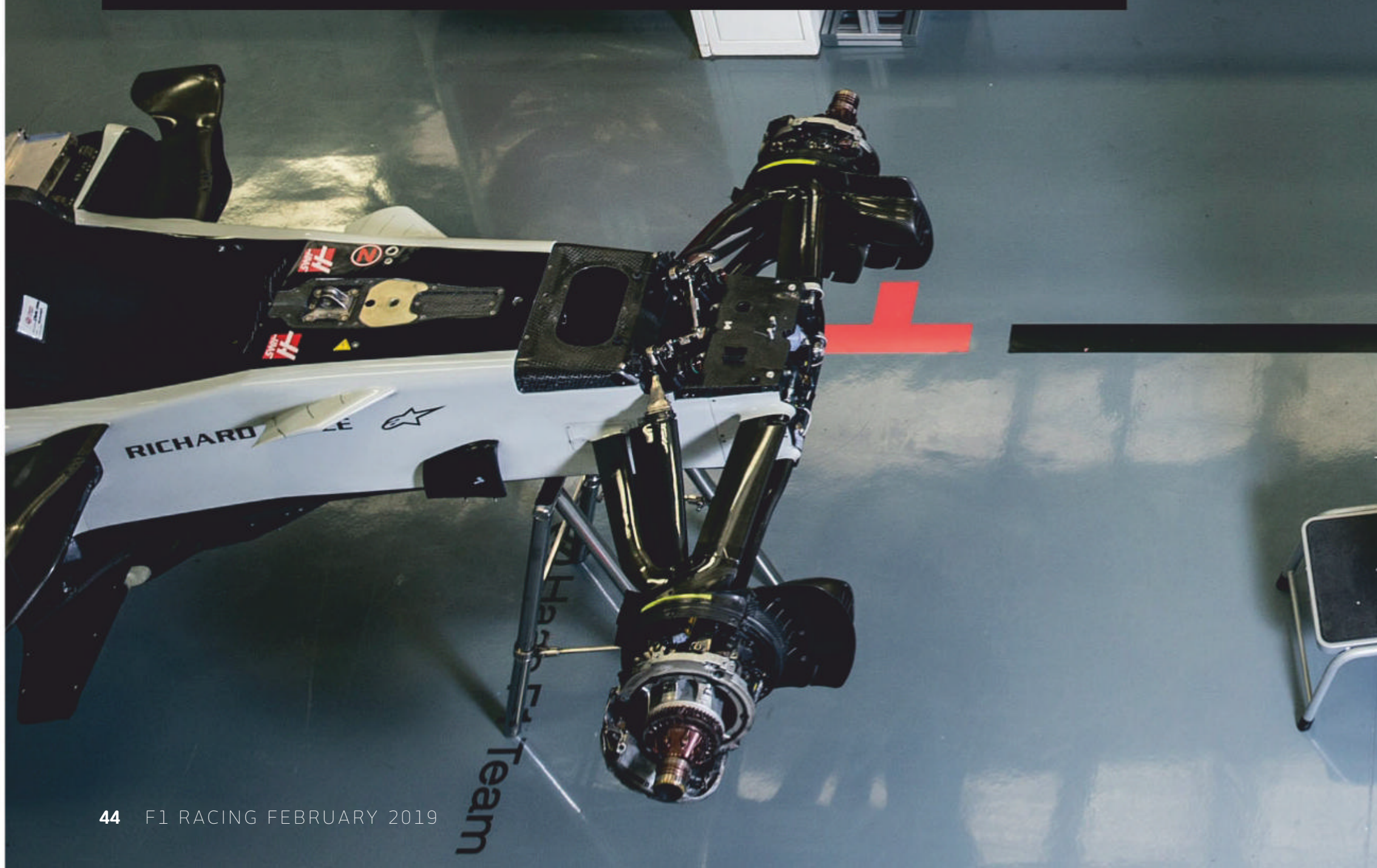
Haas finished fifth in the 2018 world championship, ahead of established giants McLaren and Williams. Their success is largely due to their efficient racing model, in which they outsource the design and build of their car. *F1 Racing* took a tour of their UK base to find out how it works in practice

**Parma, Italy:**  
Design/build

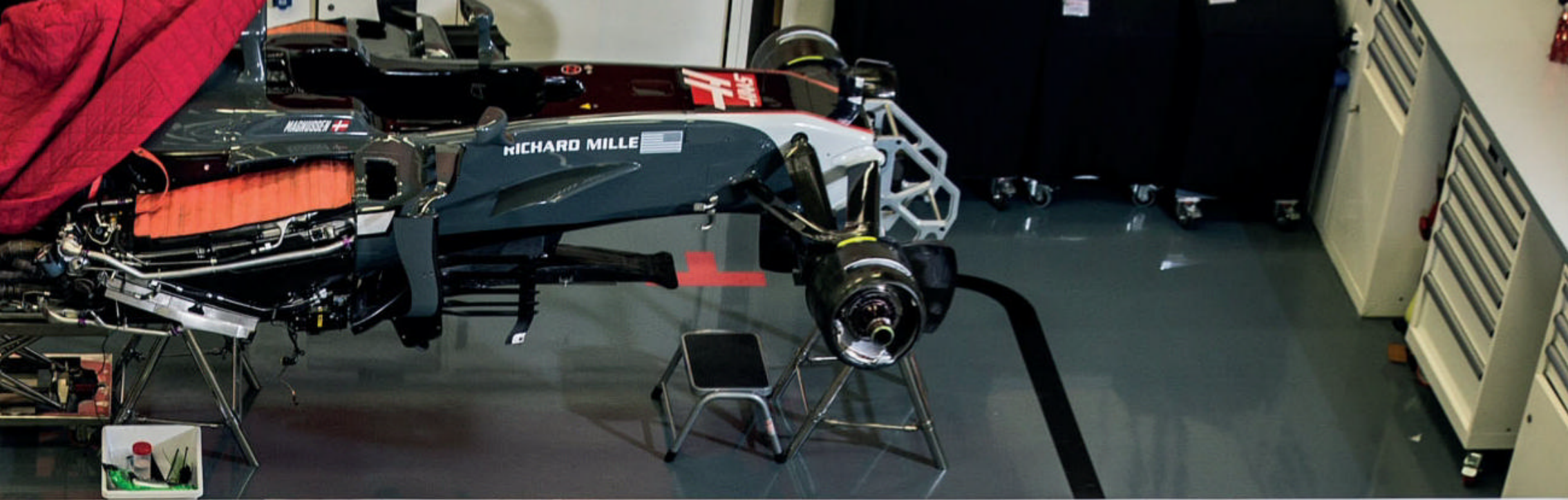
**Banbury, UK:**  
Race-team operations

**Kannapolis, USA:**  
Finance and R&D

**WORDS** JAMES ROBERTS  
**PICTURES** ANDREW FERRARO



RICHARD





# OFF JUNCTION 11

of the M40 motorway, there is a familiar landscape. Out-of-town retail stores and drive-through franchises for hungry motorists. Roundabouts, industrial estates and warehouses. But on one corner of Banbury's sprawl is a small unit where the stripped-back monocoques of two Formula 1 cars sit still.

After a season spent tearing up race tracks across the globe, each chassis, perched on its own stand, is silent. Their secrets can now be revealed, for both machines are redundant, never to be competitively raced again. The edges of the cockpits are slightly worn; oil and rubber still detectable around the suspension arms.

Inside the cockpit of one is a sticker – a diagram of the Abu Dhabi circuit, complete with corner numbers. Next to it is a child's drawing: stick men and colourful scribbles. A reference to where the car was most recently raced and a reminder of home for its pilot, Romain Grosjean.

Stripped of their engines, gearboxes, radiators, electronics and bodywork, the cars' naked forms reveal tiny intricate details. Water pipes, brackets and screws, all engineered to perfection. There is no manual for these machines: the Haas VF-18 was a custom-designed one-off. In contrast, in a factory over 700 miles away, work is feverish. Machine shops, composites and assembly lines are constructing the cars' successors. Design offices are abuzz with new ideas as the 2019 Haas F1 cars come to life before being unleashed onto the track to race.

The work on the 2019 cars is taking place at the Dallara factory near the Italian city of

Parma, just 30 miles from Ferrari's Maranello headquarters and windtunnel. Haas sub-contract Dallara, under the legal entity of Haas Italia, to design their car each year, in combination with Ferrari engines and gearboxes and other 'non-listed parts' – that is, designated parts of the car that can be sourced from a rival constructor.

As much as 95 per cent of Haas's operation is outsourced to other suppliers for parts to be built. There's just a skeleton crew to take care of essentials. This is Formula 1 stripped back, lean and efficient. A new model for grand prix racing, which is rocking the established giants.

Once the cars are assembled at Dallara in the days prior to testing, they will be flown from their birthplace never to return. Their new base after each race is here, in Banbury, where the race team take over their care. After genesis, the focus for Haas Italia switches to upgrades and the following year's machine.

The mechanics who have travelled the world with the two Haas VF-18s are all based in the UK, within the confines of the self-proclaimed motorsport valley. This is the reason the 44,000ft<sup>2</sup> logistics hub exists in Banbury. Dallara are contracted to design and develop the car, while a separate UK team will service and race

them. Over in the US, meanwhile, team owner Gene Haas oversees the finance, administration and HR. In the 21st century, no longer does a Formula 1 team need to exist all under one roof.

"We are a US-based company, but our collaboration with Dallara meant we needed something in Italy," explains Guenther Steiner, team principal and brains behind the Haas F1 project. "Because it takes time to set things up, it was easier to find people who were already going racing. We couldn't set up a design team here in the US because it would be too detached from the Ferrari windtunnel we had an agreement with, so the design team is in Italy, but the race team mechanics are in the UK – hence, we came up with this system."

Inside the Banbury base, there are race bays for stripping down and servicing the cars after each grand prix, a department that houses spares and processes upgrade parts that are incoming from Italy, plus a small composites department that can make tiny repairs.

"For the flyaway races the cars remain in transit, but after the European grands prix, they come back to the UK for servicing. They are very complex, so we might need to tweak areas of the car, service bearings and de-bond parts – or take everything apart and check the carbon with ultrasound for any cracks that might otherwise go undetected," Steiner explains.

There is no huge floor of industry here; this is not a manufacturing facility on the grand scale of the other established F1 teams on the grid. The Banbury building takes up a space 15 times smaller than McLaren's Technology Centre in ▶



Haas's race cars are serviced at their streamlined Banbury base, which includes a spares department housing kit such as front wings and wheels



**“WE ARE A US-BASED COMPANY,  
BUT OUR COLLABORATION WITH DALLARA MEANT  
WE NEEDED SOMETHING IN ITALY... BUT THE RACE TEAM MECHANICS ARE IN THE UK  
- HENCE, WE CAME UP WITH THIS SYSTEM”** GÜENTHER STEINER





Pictured next to Romain Grosjean's VF-18, team principal Guenther Steiner explains how Haas's outsourcing model has contributed to their success

Working, but in 2018 the minnows outscored the established giants by 31 points.

"When we started out in 2015 everyone was doubtful about what we were doing because we weren't doing it in the traditional way," notes Steiner. "But we couldn't do it that way with our budget. It just wouldn't have worked. We are not cleverer, we have just found a different way. Other teams could follow suit, but you need a good partner, like we found in Ferrari, which helps. We're a small team but another car manufacturer might want to do it differently and make everything for themselves."

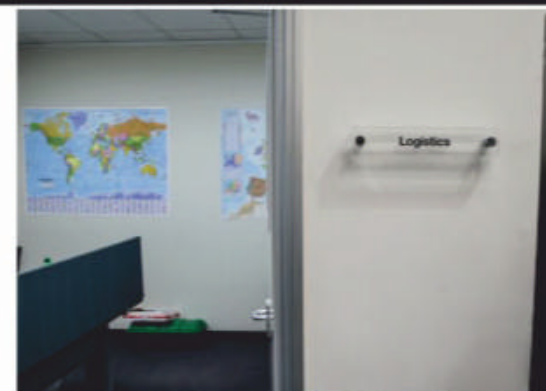
As Steiner begins our tour of the Banbury facility, there is everything you would expect to see in a modern F1 team. There's a small gym, with weights and static bikes to keep the mechanics in shape, helping them cope with long-haul travel and demanding hours. There's also a logistics office, adorned with world maps, to manage the sets of air and sea freight that accompany the team around the world. Like most F1 outfits, Haas own half a dozen sets of sea freight – stored in another part of the site – that travels in different directions around the globe. The race team then catches up with the freight when the grand prix is in town.

Inside the sea-freight containers are the tools and equipment for the garage, plus fridges, catering equipment and furniture for hospitality units. The first boxes set sail for Melbourne in

early January and they will criss-cross the globe to make it to every race track to coincide with the personnel and cars that will arrive separately via plane. The planning and co-ordination is akin to a military operation.

This Banbury Haas HQ also has a showroom – but there are no cars in it. Unlike McLaren, Ferrari and Mercedes, the business behind the Formula 1 team is not to sell cars for the road. Haas builds computer-controlled precision tooling machines for global companies. Employing nearly 1,500 workers in locations including Shanghai, Mumbai and Brussels, Haas Automation is one of the largest machine tool makers in the world. In 2014, annual revenues for the company exceeded one billion dollars for the first time as they sold over 14,000 units. The Formula 1 project is a promotional tool (no pun intended) for global exposure to sell even more. Prospective clients get a tour of the computer numerically controlled (CNC) machines – next to the race bays of two Formula 1 cars.

Despite the wealth of the parent company, racing enthusiast Gene Haas doesn't want to waste profits on a huge outfit in the same style as other non-manufacturer backed squads, such as Red Bull or Williams. The budget dictates the process of racing is lean and efficient. Perhaps, that is one of the reasons for Haas's relative success in their three years in F1: eighth, eighth and now fifth in the constructors' standings.






## THE BANBURY BUILDING TAKES UP A SPACE 15 TIMES SMALLER THAN McLAREN'S TECHNOLOGY CENTRE, BUT IN 2018 THE MINNOWS OUTSCORED THE ESTABLISHED GIANTS BY 31 POINTS

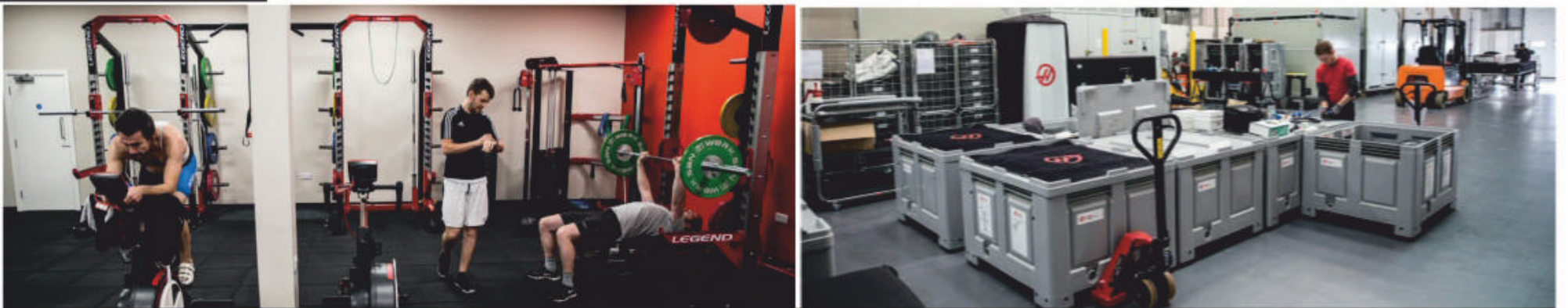
"I would say so," agrees Steiner. "We are more efficient because we have fewer people, so there is less administration – more control of everything. I think we spend about half of what the other teams do."

In 2018, Formula 1 was dubbed a two-tier championship, where the big spenders, Mercedes, Ferrari and Red Bull, competed in a separate league to the competitive, relative minnows – labelled 'Class B'. The problem Haas and Force India have is that they'll never be able to conquer the top three with their current spending, under the existing regulations.

"You should never say it's impossible, but without a special circumstance there isn't a chance for anyone outside of the top three teams to win a race," says Steiner, bringing his tour of the Haas hub to a close.

"The future aim is to create a level playing field by introducing a budget cap in 2021. It's being worked on; it's not up to us, but there are a lot of other teams who cannot achieve the top three either. We are all conscious of it because the gap is too big. If a budget cap comes into place, then a lot of other teams will have to downscale and will arrive at a similar position to where we are. Then being efficient will be important."

Haas have broken the mould of racing in F1. They have managed to be successful without building every aspect of a racing car themselves, instead outsourcing to specialist suppliers, legally sharing parts, and keeping costs to a minimum. If Formula 1 is going to have a healthy future, slimming down to Haas's level will need to become a realistic option for some of the sport's more overgrown outfits. 



Much of Haas's facility is used to store sea freight, but there is also a logistics office and an on-site gym to help keep the mechanics racing-fit





# PICTURES OF THE YEAR



From the trackside to the pitlane, the peerless photographers of *F1 Racing* share their best work from an epic 2018 season of grand prix racing

PICTURES  **motorsport**  
IMAGES





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PONS





1  
2

## 1 ON THE EDGE OF ADHESION

Force India's Esteban Ocon gets as close to the Turn 4 wall as he dares during practice for the Canadian GP back in June. It was another points-scoring race for the Frenchman.

## 2 SUITED AND BOOTED

On the Japanese Grand Prix starting grid, Renault's Carlos Sainz composes himself and looks straight down the lens as he zips up his black Alpinestars overalls.

## 3 FLAT-OUT AT 130R

Despite the creeping influx of modern grand prix circuits, Suzuka retains an old-school feel – its awesomely quick 130R corner still has tyres walls on the exit of the turn.

## 4 SYMMETRY IN MOTION

The inspiration for this Ferrari pitstop snap, taken from a control tower above the Montréal pitlane, was a similar shot captured by Autosprint atop a crane in the early 1980s.

## 5 INTO THE SHADOWS

Fernando Alonso is pictured purposefully striding into the McLaren garage during his final season of F1 – the nifty backlighting captures the former champion in silhouette.



3  
4





**STEVEN TEE**

Since his very first Formula 1 race at Imola in 1984, Steven has attended over 600 grands prix. As McLaren's principal photographer, his highlight this year was Fernando Alonso's final weekend of F1 in Abu Dhabi.



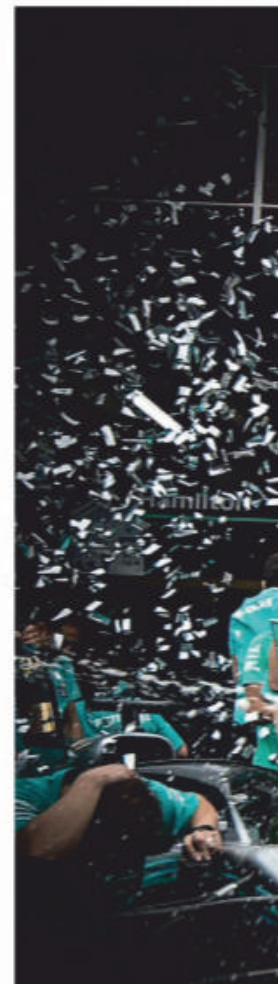


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**GLENN DUNBAR**

Since 2006, Glenn has been Williams' official Formula 1 photographer. But this season one of his highlights was a shoot with Ferrari's Sebastian Vettel, which will appear in the March 2019 issue of *F1 Racing*.





### **1 PRACTICE MAKES PERFECT**

*A Williams practice pitstop session at the US GP is artfully captured using a neutral density (ND) filter, which reduces light to enable a longer exposure in daylight.*

### **2 FALLING ON STONY GROUND**

*As a Williams exits Monza's second chicane, its left-rear wheel kicks up the gravel, sending a shower of stones into the air – the point of focus for the camera lens.*

### **3 MOMENT OF IMPACT**

*The tight La Source hairpin at Spa often invites trouble – and this year was no exception. Here, Alonso vaults over Charles Leclerc after being struck from behind.*

### **4 THE THREE-POINTED STAR**

*Ticker tape falls on the nose of the hugely successful Mercedes W09 in the Brazilian GP pitlane. This victory brought the team constructors' championship success.*

### **5 DOUBLE CELEBRATIONS**

*It's bonus time and they know it! The Mercedes team uncork the bubbly and start their celebrations after securing a fifth constructors' title in Brazil.*





## 1 BLURRED VISION

*It was a brilliant rookie season for Charles Leclerc, seen here piloting his Sauber around his home streets of Monaco. Sadly, brake failure led to his race retirement.*

## 2 ONCE MORE INTO THE DEEP

*Mimicking the famous statue of the diver that stands next to the Monaco GP circuit, opposite the Swimming Pool section, Red Bull's Daniel Ricciardo celebrates his Monaco win in style.*

## 3 OFF-TRACK FIREWORKS

*Kevin Magnussen is never afraid to speak his mind and his exploits off-track are often as exciting as those on-track. A giant screen is his backdrop, here, in the Abu Dhabi pitlane.*

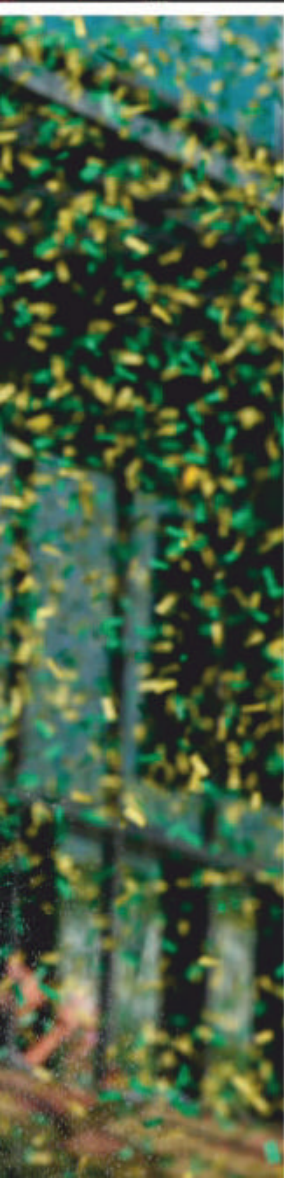
## 4 THE PERFECT BEGINNING

*Ticker tape flies as Sebastian Vettel sprays champagne from the top step of the podium, having achieved victory at the first grand prix of the season in Australia.*

## 5 SIT DOWN NEXT TO ME

*After dominating the Japanese Grand Prix, Lewis Hamilton takes a moment to catch his breath and reflect, resting in parc fermé against the right-front wheel of his W09.*





**ANDY HONE**

Throughout 2018, Newcastle United fan Andy has been dividing his time between the Haas and Toro Rosso garages, the latter in the course of his work for engine supplier Honda.





1  
2



**SAM BLOXHAM**

It's been a busy past season of racing for Bloxham as he has worked across two championships: as well as covering Formula 1, he has also taken in rounds of the all-electric Formula E series.





3  
4



### 1 LOOK HOW FAR HE'S COME

*McLaren new boy Lando Norris holds the helmet he wore in his karting days, with his Carlin F2 helmet at his elbow. He's set to make his F1 debut in Australia this March.*

### 2 DAZZLING PERFORMANCE

*One of the qualifying laps of the year came under the floodlights of Singapore. Lewis Hamilton's drive along the streets of Marina Bay set him up for victory here the next day.*

### 3 A PERFECT PIROUETTE

*Fernando Alonso capped off his final F1 race in Abu Dhabi with a series of celebratory donuts alongside fellow champions Lewis Hamilton and Sebastian Vettel.*

### 4 BRIGHT LIGHTS, BIG CITY

*Now in its second decade of hosting grands prix, the floodlit Singapore street race has established itself as one of the most spectacular highlights of the F1 season.*

### 5 STRIKE A LIGHT

*Captured at full speed through the awesomely fast Eau Rouge, the floor of Marcus Ericsson's Sauber hits the asphalt, sending sparks flying into the air at the Belgian Grand Prix.*



5



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### 1 AUSTRALIAN SPECIAL STAGE

*As the Red Bull charges around Melbourne's Albert Park circuit, kicking up leaves and throwing dirt onto the track, you could be forgiven for thinking this was rallying, not F1.*

### 2 CHAMPAGNE SUPERNOVA

*It was a season of mixed emotions for Sebastian Vettel. After such a strong start, the unforced errors began to creep in – and the celebratory joy of Melbourne was short-lived.*

### 3 THE ICEMAN LEAVETH

*Despite losing his Ferrari seat to rookie Charles Leclerc for next year, Kimi Räikkönen did at least manage to achieve one final victory for the Scuderia at the US Grand Prix.*

### 4 PATRIOT GAMES

*After clinching his fifth drivers' title at the Mexican GP, Lewis Hamilton is seen draped in the red, white and blue of the Union Jack as he celebrates with his mechanics.*

### 5 UNDERGROUND, OVERGROUND

*A strong qualifying performance for Esteban Ocon was scuppered at Singapore when he struck his Force India team-mate Sergio Pérez at the start of the race.*



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4





**ZAK MAUGER**

It's been a busy season for the man from the Bailiwick of Guernsey. As well as F1, Zak has been shooting Formula E and both F1 support series: Formula 2 and the GP3 Series – which becomes 'F3' this season.



# { YOU ASK THE QUESTIONS }

## CHARLES LECLERC

Now listen very carefully: Ferrari's latest star signing might not be afraid of Sebastian Vettel, but he's not keen on snakes – and neither is he very sure of what to make of that 'Allo 'Allo meme that's doing the rounds...

WORDS STUART COOLING

PICTURES



**motorsport**  
IMAGES

**“Brrrrrr!”** says Charles Leclerc, on a chilly late afternoon in a São Paulo that's enveloped in grey and pendulous cloud. Cruelly denied a coat by our photographer, Charles hastens from the back of the Sauber garage to the welcoming environs of the team unit as soon as his duties are concluded. Glenn, our snapper, replaces a lens cap and shakes his head ruefully. “You can't treat 'em like kids,” he says. “Otherwise it starts with you letting them wear a coat and ends with you having to take all the blue M&Ms out of the bowl...”

Perhaps in some cases, but Charles Leclerc is emphatically *not* cut from junior diva cloth. Though F1 star-wrangler Nicolas Todt has steered his career, Leclerc's talent and singular determination has provided the momentum. There is not a hint of the silver spoon about his rise to prominence, and that comes across in the respectful politesse with which he unfailingly conducts himself.

Now seated and beginning to thaw, Charles holds the question deck between finger and thumb and regards it with genuine surprise.

“All these are from fans?” he asks, agog at how an F1 rookie could possibly generate so much interest. Well, there's a reason for that...

**What was it like to see yourself on the front cover of a magazine for the first time?**

Michael Staniforth, UK

**Charles Leclerc:** It was *very* cool. It's a special moment to see yourself on something like that for the first time. ▶

Charles Leclerc makes his debut on our September 2018 cover, just before he signed for Ferrari





PORTRAIT: GLENN DUNBAR



# { YOU ASK THE QUESTIONS }

**What does the underside of Alonso's car look like?**

David Foulston, UK

**CL:** The underside? What's the underside? [The penny drops] Ah! Yes, when he went flying over me [at the start of the Belgian Grand Prix]. I tell you, it happened so

fast that I could barely see anything. I certainly wasn't going to analyse it [technically]. It was definitely black, but that's the only thing I can say.

**F1 Racing:** Surely, given their relative position in the championship, Sauber don't have much to learn from McLaren at the moment anyway...

**CL:** Ah... [He glances in the direction of team PR Mia, who responds in startled fashion to *F1R*'s cheeky query. Charles giggles, though whether this is at the question or its effect on his colleague is unclear]



The view from below: Leclerc has a hair-raising encounter with an airborne Alonso at Spa

**Is there any circuit you would love to see added to the F1 calendar?**

Matt Lloyd, UK

**CL:** Laguna Seca. Even though it's very... yeah, I don't think F1 could go there in reality.

**F1R:** The run-off at the Corkscrew isn't very wide, and there's a cliff on the other side.

**CL:** Yeah? That would make it more, er, challenging...

**F1R:** According to folklore, the corner is how it is because they were driving the bulldozer along, got to the edge of the drop, and then just turned left.

**CL:** Nice story. But is it true?

**What is your biggest fear?**

Severine Covens, UK

**CL:** Oh, snakes.

**F1R:** Is it the creepy dryness of the scales, or their rasping forked tongues that creep you out?

**CL:** I don't really know – I'm just not liking these animals.

**F1R:** Have you ever actually encountered a snake?

**CL:** I did, in Australia. Haven't you seen the pictures? I have it all round my neck. [He shudders at the memory] You'll have to ask the Sauber people why they did it...



**What was the first car you drove?**

Kamil Zajtowski, Poland



**CL:** I really shouldn't say, because I was quite young!

**What is your favourite childhood memory with Jules Bianchi?**

Chloe Hewitt, UK

**CL:** Probably every Wednesday, Saturday and Sunday at his track. [Jules Bianchi's father managed the kart circuit at Brignoles] That and his birthdays in Saint-Tropez.

All the races we did together in karting. Fun times.

**F1R:** Did you get to go to his party after he finished in the points in the Monaco Grand Prix?

**CL:** No, I was too young, and in Monaco they're quite strict with things like that.



Leclerc's late friend and mentor Jules Bianchi, on his way to a first points finish in Monaco in a Marussia in 2014

“ IT IS I, LECLERC! YOU KNOW, I'VE NEVER SEEN THIS PROGRAMME. WHAT IS IT? IS IT SOME ENGLISH SERIES? ”

**In your company car, have you beaten the best commute times from Monaco to Modena set by Gilles Villeneuve and Jody Scheckter?**

Phil Darby, UK

**CL:** [Laughs again] Errrrr... no! I'm not so quick on the road.

**F1R:** In your position, you need to be responsible.

**CL:** Definitely.

**F1R:** Were you aware there was a record each of them tried to break?

**CL:** To get to the grand prix?

**F1R:** To get to the Ferrari factory when Enzo rang up. They'd say, "Okay, be there in five minutes..."

**CL:** [Laughs] For sure, I could never get to the factory that quickly. I'm not really racing on the road.

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**Who is your idol in motor racing?**

Pam Berryman, UK

**CL:** Ayrton Senna.

**F1R:** Have you been to see the shrine to him in São Paulo?

**CL:** Not yet – I've been to Interlagos three times and you know how it is: hotel to track, track to hotel. There's not much time for visits like that. But I've been to Imola.

**F1R:** It's unusual for you to cite Senna. Most people pick someone who was around in their formative years, but Senna was no longer with us when you were born.

**CL:** Yeah, I can see that. My father was a huge fan of Senna, though. He spoke to me a lot about Ayrton, and then I read some books about him, I've seen videos. The onboard lap of him in Monaco in 1989 is incredible. Also the movie. All of these things make me admire him.

Senna is his idol, Ferrari is his next stop, and the world championship is his goal

**What would you most like to have achieved in five years' time?**

Grace Wilkinson, UK

**CL:** [After a long, thoughtful pause] Obviously my childhood dream, since forever, is to be world champion one day. So this is definitely one thing I would like to have achieved in five years.

**F1R:** Is there any particular race you'd like to have won?

**CL:** Easy – Monaco, at home, definitely. That is the most special one, the race I'd like to win.

**F1R:** When you were young, how did it feel to live in Monaco and be part of that whole thing? The residents probably get annoyed with all the roads being shut...

**CL:** Oh, they do. I never did, obviously, because I love it and I think I always have done. Obviously the track action starts on a Thursday, and on those days I was at school on the other side of Monaco. I can remember hearing the V10s, then the V8s, and I wanted to get out of school as quickly as possible to see the cars.

The grand prix has always been a big thing for Monaco because the preparations for the circuit start early. The whole city is building up to that moment. It's special, and definitely the biggest event there is in Monaco. Some people like it, some people don't, but for me it has always been my favourite time of the year.

**Is it you, Leclerc?**

Karol Piatek, Poland

**CL:** [Hooting with laughter] It is I, Leclerc! You know, I've never seen this programme. But everyone has tagged me in this thing on social media, you know, 'It is I, Leclerc.' What is it? Is it some English series?

**F1R:** Yes, it's a long-running comedy programme from when there were only four TV channels, so lots of people remember it. It was set in France in World War II but the actors were all English, just doing crazy accents.

**CL:** Okay...

**F1R:** And Leclerc was an old bloke involved with the resistance who used wear really obvious disguises, so the joke was that when he peeled his false moustache off and said, "Psst! It is I, Leclerc..." nobody was at all surprised.

**CL:** Riiiiight...

**F1R:** Next time you're on TV, you should say it.

**CL:** I will try that! 🇫🇮

**YOU ASK THE QUESTIONS**

Want to get involved? For your chance to ask drivers questions, sign up at: [f1racing.com/global-fan-community](https://www.f1racing.com/global-fan-community)

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Witness the most spectacular grand prix from your grandstand seat – and join Martin Brundle for an exclusive insight into the world of F1

**A** Formula 1 grand prix is more than just a simple motor race. It is a festival of colour, speed, glamour and adrenaline-fuelled excitement. Each is unique, each has its own character, its own vivid sights and instantly recognisable backdrops. And of them all, no other is more spectacular and unforgettable than the Singapore Grand Prix.

For more than a decade, F1 has journeyed each September to one of Asia's most exotic and

intoxicating cities. The streets that usually hum to the hustle and bustle of everyday life throb to an entirely different song on F1 weekends, as the world's greatest racing drivers skim the walls and explore the limits of their vibrant machines. Better still, the spectacle is enhanced by the twinkling lights and close humidity of the city at night. Shining bright in the darkness, the Singapore GP is F1's original – and best – night race.

This year, escape the creeping chill of a European autumn to experience the Singapore Grand Prix for yourself. Join Imagine Motor Sport on a trip of a lifetime, not only to witness every moment of drama on track, but also to taste



the heady delights of Singapore life. There's so much to explore: from the three-mile Orchard Road, packed with designer malls and swanky boutiques; to the tranquil Botanical Gardens and colourful Chinatown. Head to the iconic gardens by the Bay and marvel at the Supertree Grove, spectacularly lit up in amazing technicolour; or discover the world of Hollywood at

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The views of each practice, qualifying and the race itself from your grandstand seats will surely be the highlight, but the action never stops in F1, even when the engines fall silent. Live music from stadium rockers Muse, DJ legend Fatboy Slim, Jamaican reggae icon Toots and the Maytals and American roots band Linkin Poe are among the global acts already confirmed, with more soon to join them.

And if all this is not enough, why not upgrade your holiday to join ex-F1 ace and renowned expert Martin Brundle for an exclusive Gardens by the Bay event on practice day to





## PACKAGE SUMMARY

- 4-night hotel stay in Singapore
- 3-day Grandstand ticket to the grand prix including:
  - Friday 20 September 2019 (Practice Day)
  - Saturday 21 September 2019 (Qualifying Day)
  - Sunday 22 September 2019 (Race Day)
- **Live music** from stadium rockers Muse, DJ legend Fatboy Slim, Jamaican reggae icon Toots and the Maytals and American roots band Linkin Poe – plus more acts to be announced soon
- **All Transfers**
- **All Flights** London departure 19 September 2019 – regional flight departures available at a supplement
- **Prices from £1499pp**
  - Martin Brundle upgrade
  - Why not upgrade your holiday? Include an Exclusive event with Martin Brundle from only £100pp
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    - Exclusive Martin Brundle event
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- **Bali Hotel upgrade**
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Supertree Grove, with its vertical gardens rising high into the sky. Martin will be on hand to give his insights into the race, answer questions and chat about all things F1.

"I really like Imagine Motor Sport's vision for breaking the

mould when it comes to holiday experiences, and their passion for F1," says Brundle, veteran of 158 GPs and respected as one of the best pundits in the paddock. "These are well organised and well thought out packages that not only include race tickets, but also upgrades so

the customer can enjoy a really immersive F1 holiday.

"It's also great to personally meet and interact with the fans at their events – putting them inside the cockpit of an F1 car and explaining the challenges the drivers face, as well as giving them an insight into the characters behind the sport."

Imagine the memories you'll bring home. Better still, join Imagine Motor Sport in Singapore – and imagine no longer.

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**WILL BREXIT BREAK**



# F1?

Amid the endless political wrangling over Britain's biggest constitutional upheaval for a generation, is Formula 1 geared to thrive regardless, or will Brexit wreck it?

WORDS BEN ANDERSON

**T**he 23rd of June, 2016, is the day everything changed in Britain, the result of the EU referendum kick-starting a monumental political shift unprecedented since the Second World War. In March 2019, Brexit will finally happen (we think), and the United Kingdom will never be the same again.

In the meantime, such is the ever-present time-lag between political will becoming hard reality, all we've had is argument – about what Brexit means, why it's happening, whether it should ever have been allowed to happen, how it should look, where it could take us, and whether it should be stopped.

Decide for yourself. But, for better or worse, Brexit is coming, and when it comes it will change things. Arguably, it already has – dividing the country almost 50/50 between 'Brexiters' and 'Remainers' and causing the near-collapse of country's system of government, as it creaks under the strain of managing the fallout.

All the while, the country chokes under the grip of economic austerity, imposed following the global financial crisis in 2008. That seismic event undoubtedly changed Formula 1 as well, as manufacturer teams packed up their toys and left, in some cases perhaps never to return. It arguably also led to Brexit too.

But how will the fast-approaching Brexit affect F1? Given the heart and soul of the sport – its teams – mostly live and work in Britain, fuelling one of the country's most innovative and successful cottage industries, will Brexit strike a fatal blow, or is grand prix racing geared to thrive in the post-Brexit utopia/dystopia that awaits? ▶



## ADAPT, SURVIVE AND SPEED ON

**B**ased in the UK, Red Bull are an Austrian-owned team. Their British 'home town' of Milton Keynes, which houses the F1 operation and Advanced Technologies offshoot engineering business, voted narrowly (51.4%) to leave the European Union.

That's no resounding verdict, and perhaps reflects the general ambivalence of Red Bull boss Christian Horner, who argues Brexit should be no big deal for F1 and his team, and says Red Bull has so far "felt very little effect" from Brexit. In fact, he says, sponsorship deals have become more attractive because of fluctuations in exchange rates for the Pound.

"I'm a great believer that if you're attractive to do business with, people will do business with you," Horner argues. "Formula 1 has grown out of the engineering skillset and entrepreneurship that surrounded the teams and the sport – it's no coincidence that Mercedes' engines and chassis are built in Northamptonshire; Renault are based in Enstone and arguably their engine would have been potentially better consolidated within the UK. Same for Red Bull – we're an Austrian team but we're based in the UK. Whilst the skillset is within the UK, people still want to come and do business with us across many industries.

**"WE'RE A SPORT AT THE END OF THE DAY, NOT INVOLVED IN POLITICS. WE'LL JUST DEAL WITH WHAT WE KNOW. YOU GET YOUR REGULATIONS AND YOU ADAPT. F1 HAS BEEN HUGELY CREATIVE IN DOING THAT."**

CHRISTIAN HORNER, RED BULL



"Maybe the cost of employment may rise if costs of living increase, but maybe it will decrease. You get a lot of scaremongers about Brexit. You could flip it on its head and see it as an opportunity if the guys dealing with it in Brussels don't screw it up."

Horner describes F1 as living in a "bit of a bubble" and urges the UK government to take the Bernie Ecclestone approach to negotiation. "In order to negotiate something, you've got to be prepared to walk away," Horner adds. "I think common sense will prevail. We have to get on with it and deal with it when it all settles, basically. At the moment, it's having very little impact on how we're operating, and the way we're trading. The economy, reassuringly, seems to be doing well: unemployment is at an all-time low, there's been good growth in the UK.

"We're a sport at the end of the day, not involved in politics. We'll just deal with what we know. You get your regulations and you adapt. F1 has been hugely creative in doing that. One of the British teams' strengths – Williams, McLaren, or Tyrrell, for example – is just adapting to whatever obstacles are potentially presented."

Horner's confidence in F1's ability to adapt is shared by ex-Force India deputy team principal Bob Fernley, who will be embarking on a Brexit of his own in 2019, when he becomes involved in McLaren's latest venture to America to assist Fernando Alonso's Indy 500 victory quest.

"We look at a set of regulations and look at how we can get around them and that's our business," says Fernley, who sees no reason why F1's people and infrastructure cannot move around as easily post-Brexit as the days he recalls before Britain joined the EU.

"If you think about what we do, there are probably very few parts on any car that are interchangeable down this pitlane, so that means everyone is working autonomously to produce and operate. The skills and the organisation and the logistics capability in F1 today, if you just take that mindset across to other industries, I'm sure they could cope as well.

"You can look at the glass half-full or half-empty. If you want to look at it half-full, there's no reason why people might not want to invest more into this country to improve our manufacturing facilities and create skilled jobs and do away with unnecessary costs. F1 has always been an optimistic industry, a can-do industry. Whatever obstacles are put in the way we get around. It's that mentality that needs to be driving the thing forward." ▶

Red Bull are confident that F1 remains attractive as a business and will adapt to whatever Brexit will throw at the sport



For some teams there are definite concerns about the potential blocks increased customs and immigration checks could bring



## ROADBLOCKS TO PROGRESS

**F**or Toto Wolff and Cyril Abiteboul, Brexit is inherently something more concerning. Both Mercedes and Renault have bases in the UK, but parent organisations based outside it. Their programmes are beholden to the whims of manufacturers, and this industry

has made plenty of loud noises about the impending perils of Brexit.

“Our motorsport division, call it 1,800 people, has a large percentage of EU citizens working for the team,” explains Wolff. “What this means in the future, whether one can still have such a multicultural workforce, or whether there will simply be certain limits, is already an issue. Definitely logistics and administration, customs clearance, border crossing of goods, will be much more complex. Where all this goes – it’s completely incomprehensible to me.”

For Abiteboul and Renault, there is shared concern about the UK’s ability to move goods and people around easily post-Brexit, as well as potential damage to recruitment done by a political system that looks increasingly ‘hostile’ to immigrants, skilled or otherwise.

“If you look at the way that we structure our operation, we have two separate entities, at Enstone and Viry, chassis and engine, but we

also have functions that are shared between the sites,” explains Abiteboul, who says Britain makes for a natural home for a high-end motorsport operation because it houses “a global industry in that country”.

“My position is shared between the two sides, legal, finance, IT, communications, marketing. All these functions are across the two organisations. That was really part of the philosophy of us returning to F1 as a complete team.

“It is a great opportunity, but only if you seize the opportunity of working as one group. It is all about integration – not just the integration of engine into the chassis, but integration of people. If we had some difficulties, some roadblocks, in the movement of staff from one site to the other that will be a massive hurdle to the philosophy and intent behind our programme.”

McLaren chief operating officer Jonathan Neale is also keen to avoid adding to the bureaucracy involved in employing staff from overseas. That’s one of the pillars of concern McLaren have identified relating to Brexit. Ahead of the final race of 2018 in Abu Dhabi, McLaren encountered a specific example of the kind of stress that could become prevalent for F1 teams in the future, if the fallout of Brexit is not managed carefully.

“As the world speeds up it can’t be effective for us to have friction in movement of skills, talent, markets,” Neale says. “That’s the first pillar. The second pillar is customs and border constraints. F1 is high-speed research and development, and that means time to market needs to be very short.

“We had a hiatus with customs clearance going into the UAE [recently]. Something changed in the declaration of hydraulics or hydraulic parts, and the bureaucracy meant we had pallets held in customs for three days. At one point, we were 24 hours away from not being able to run on Friday.

“One has to assume if the borders get more friction it is going to cost more, so it will be more paperwork, more administration, more time. The term ‘frictionless border’ is something people are talking about for goods and services, and F1 is very dependent on that. There is a strong European or international content, and in some cases, complex systems coming in, going back out and crossing borders, multiple times.

“And when you do that, if you’re having to do the customs forms, pay the VAT, do the trade tariff – again those inefficiencies just cost you. Talent, the just-in-time nature of F1’s putting on the show, as well as getting our supply chain to work, and the working capital requirements, are the things of most focus that we’re looking at.” ▶

**“IF WE HAD SOME DIFFICULTIES, SOME ROADBLOCKS, IN THE MOVEMENT OF STAFF FROM ONE SITE TO THE OTHER, THAT WILL BE A MASSIVE HURDLE TO THE PHILOSOPHY AND THE INTENT BEHIND OUR PROGRAMME.”**

CYRIL ABITEBOUL, RENAULT



## AN ACCIDENT WAITING TO HAPPEN

**P**arts of the F1 paddock harbour grave concerns about where Brexit may take the UK. Williams are one of Formula 1's grand old independent teams, but critically they cannot count on the patronage of an automotive manufacturer, nor (after 2018

at least) a large cushion of financial backing from a rich benefactor. Red Bull has Mateschitz, Force India (now) has Stroll, McLaren has the Bahrainis, but Williams depends solely on business to succeed – and business is worried...

“It's like Groundhog Day – you wake up and there's another discussion about Brexit, and there's still no clarity, still no end,” says the team's chief executive officer Mike O'Driscoll. “We have a broad group: we have our F1 team, Williams Advanced Engineering group, which is actually developing and growing very quickly, a range of bluechip, fortune 500 clients, many OEMs, industrial companies, aerospace companies... it's not good for our customers or clients, [so] it's not good for us. The lack of clarity, the constant iteration, is very unhelpful.

“We need viable and strong businesses that can compete internationally. We are concerned about the different sets of regulations that may impact the sectors that we sell into. In many ways,

**“WE'RE FRUSTRATED WITH THE LENGTH OF TIME IT'S TAKING TO GET A CLEAR DEFINITION OF THE TERMS. AS FAR AS WE'RE CONCERNED, IT'S BAD FOR BUSINESS AND THEREFORE IT'S BAD FOR BRITAIN”**

**MIKE O'DRISCOLL, WILLIAMS**



## VIEW FROM THE CAR INDUSTRY: MCLAREN AUTOMOTIVE

Company CEO Mike Flewitt on what Brexit means for the car industry

“The challenge for us is the uncertainty. With any of the scenarios we've looked at – two, three years post-Brexit – we'll be fine. If we go into a no-deal Brexit, if we don't know how to trade – components coming into the country, cars out of the country, we don't know how to manage the mobility of talent across, we don't know what the homologation standards between Europe and the UK are – there's an interruption to trade which is expensive.

“It's mainly scenario planning at this stage of the game. If we knew the rules, then people could make their decisions based on them. In F1, you design inside the rules. We can probably all work out how to play to the rules, we just don't know what they are yet.

“There will be a deal. It's a case of whether they actually get their act together and do it in time to avoid disruption. Or do they fail to agree, we have the disruption and then we come to a deal, which would be really stupid, wouldn't it?

“Even at this stage, I still sit in a fairly optimistic position. I still find it impossible to believe the politicians will plunge it into absolute chaos. The politicians across Europe should be fired if they allow it to descend into chaos, because that would be so negligent of their responsibilities.”



Instability and a lack of decision-making has Williams very worried for the future of Formula 1 in a post-Brexit world



the homogeneous nature of the EU has made for a very good platform for businesses operating within it. Even when you get past the uncertainty, it's difficult to see any upside for the business, there's only downside. At Williams, we're very frustrated with the length of time it's taking to get a clear definition of the terms. As far as we're concerned, it's bad for business and therefore it's bad for Britain."

Large organisations crave stability. That breeds confidence. Although the brave, we-can-face-anything spirit espoused by Horner and Fernley is rousing, and a key part of going motor racing successfully, it is difficult to see how exactly that will chime with the realities of Brexit, and thus how Brexit will in any way make life easier for F1.

"There's a lot of undefined evidence," says Haas team principal Guenther Steiner. "It seems the British government doesn't really know what to do. If people don't know what to do, then it makes the next decision harder – maybe they walk away because they don't know what is coming. It's a little bit like working on regulations for 2021 – we talked plans but we have no decision.

"At the moment, Brexit is up in the air. Our hope is that it stays similar to now, as that makes our job easiest. There will be complications and our biggest threat is 'will it cost more?' That is the last thing we want, costing more and having more bureaucracy, or difficulty with immigration for people who are not UK residents."

McLaren's Jonathan Neale says the key is for F1 to work closely with politicians, in tandem with F1's logistics partners, to make sure Brexit doesn't produce any harmful unintended consequences.

"I think they are listening – underneath the froth is a lot of people trying to do the right thing," Neale says. "In logistics, we're working with Formula One Management and DHL. We're also working with FedEx and HMRC, looking at getting the latest information from the sources on the ground closest to it, so we can keep an eye on what's happening and what's likely to happen."

But even this is a drain on precious resources. Money, time and effort going out of the sport that could be better spent... "Exactly," agrees Neale, who says there is no upside to Brexit that F1 can see at the moment. "It's just inefficiencies."

Formula 1 is basically keeping calm and carrying on in the face of Brexit, even as all those around it – certainly in the UK government – lose theirs. But it remains to be seen whether Brexit breaks F1, or merely slows it down temporarily. Certainly it will change things and, in the short-term, probably not for the better. 🚩

**CAMEL**

  
**Piquet**  
World Champion

**CAMEL**  


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**NOW  
THAT  
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A  
CAR**

No. 75

WORDS JAKE BOXALL-LEGG  
PICTURES JAMES MANN

# THE LOTUS 100T

The car that marked the beginning of the end for one of Britain's greatest ever Formula 1 teams



One of the sport's greatest innovators in the 1960s and '70s, Team Lotus endured a difficult transition into the 1980s era of Formula 1. Trendsetters in their early days, Lotus couldn't quite fathom the big hair and neon colours of the new decade, taking a backseat as McLaren, Brabham and Williams fought for glory.

Peter Warr had taken over the declining team after Colin Chapman's death at the end of 1982. Ironically, Lotus struggled most in the latter stages of a ground-effect era that they themselves had ushered in, in their inventive prime. Warr stopped the rot by signing up designer Gérard Ducarouge, who duly set about drawing a series of tidy cars that both Elio de Angelis and Ayrton Senna were able to coax to a smattering of wins, without ever quite elevating them to championship contention.

Senna, ready for a shot at the title, upped sticks at the end of 1987 and joined McLaren. Losing their star driver was a hammer blow to Lotus, as the swashbuckling Brazilian ace had carried the fortunes of Ketteringham Hall on his back during the previous two seasons – obliterating subservient team-mates Johnny Dumfries and Satoru Nakajima.

Arguably, Lotus claimed the most high-profile replacement possible in the form of reigning champion Nelson Piquet, who had left Williams with his number-one stickers in tow.

Remaining for a second season, Honda supplied Lotus with turbocharged V6 engines – now also used by McLaren – and politely insisted that Nakajima continue his tenancy in the second seat. Piquet's presence was also sure to placate Honda, thanks to his experience with them at Williams.

## NOW THAT WAS A CAR

No. 75



## THE LOTUS 100T

While Lotus used the twice-victorious 99T as a base for 1988's 100T, there were a few key differences as the team sought to improve upon fourth in the constructors' championship. Marginally increasing the wheelbase by two inches, Lotus hoped to improve the balance of the car despite the removal of active suspension. During its nascent stages as a driver aid, Senna had pushed heavily for its inclusion, but after his departure the team elected to revert to a conventional shock/damper suspension setup – citing cost and development problems with the electronic system.

Honda's engine, despite regulations limiting the boost pressure from 4 to 2.5 bar, remained the strongest on the grid, pumping out 675bhp as the new restrictions shaved a third off 1987 engine outputs. The 100T was also a step up from its predecessor aerodynamically, presenting a lower-slung and more compact front end, with much tighter packaging.

At the season-opener in Brazil, Lotus started encouragingly as Piquet led them to third place. He repeated the feat next time out in San Marino, having qualified P3 – albeit more than three seconds behind polesitter Senna, in a McLaren that was beginning to show ominously dominant form.

Yet the 100T had its problems, its shortcomings proving most evident in Monaco where Piquet could only qualify 11th – almost 4.5s off Senna's pole time. Nakajima, meanwhile, failed even to make the grid. Handling proved to be Lotus's biggest bugbear, due to an insufficiently rigid chassis that flexed under yaw and upset the rear aerodynamics of the car, causing it to squirm. Although not uncommon during the early turbocharged era, thanks to the effects of turbo lag – which could be significant in the days of heavy turbines – the



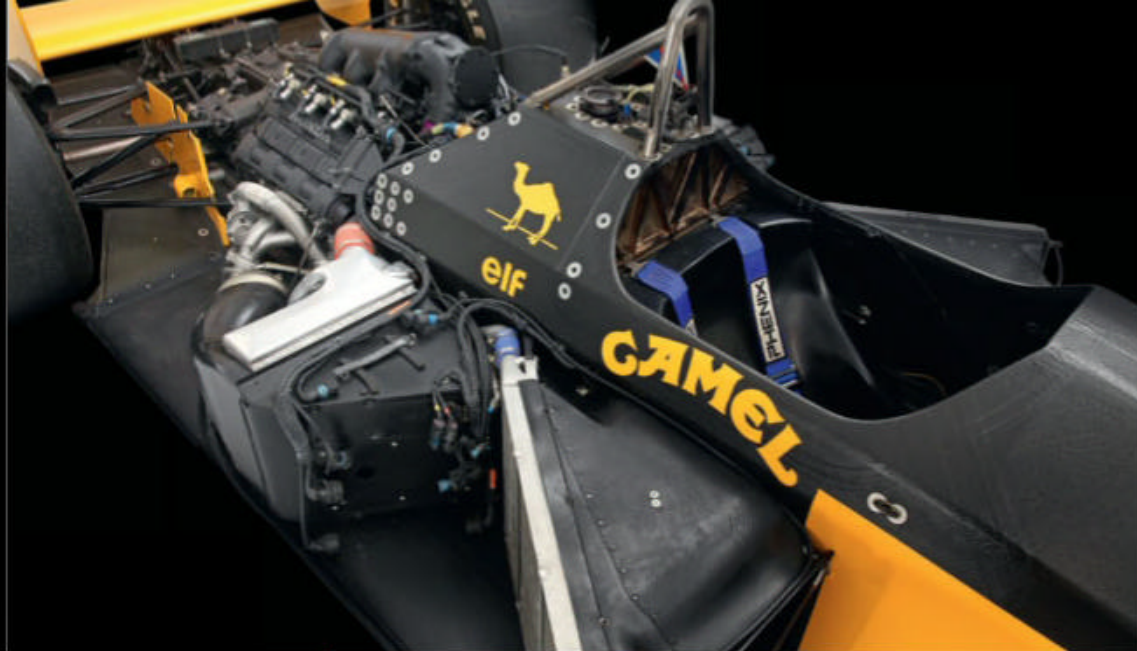
Lotus was particularly nervous and wayward on entering and exiting corners.

When filming his *World of Speed* documentary in 1988, three-time world champion Jackie Stewart took the 100T around Snetterton, concluding the car's suspension and chassis were unable to handle the Honda's forceful power delivery, which would bite abruptly under acceleration and produce a tremendous braking effect off-throttle.

In Mexico, Lotus's deficiencies were less pronounced and both drivers qualified in the top six at a circuit where naturally aspirated cars struggled. The reduced density of the air favoured the turbo runners, and the sheer power of the Honda looked to give Piquet and Nakajima a fighting chance. Ironically, engine problems were Lotus's undoing: both cars stopped before the end of the race with piston-based failures.

Although his motivation was perhaps in doubt, Piquet arguably extracted the maximum from the recalcitrant 100T. Despite the car's shortcomings, he was a consistent points scorer – ending up outside the top six in only two of the nine races he finished. Nakajima struggled in comparison, failing

**“HONDA’S  
ENGINE  
REMAINED  
STRONGEST  
ON THE GRID,  
PUMPING  
OUT 675BHP”**



#### RACE RECORD

**Starts** 32  
**Wins** 0  
**Poles** 0  
**Fastest laps** 0  
**Other podiums** 3  
**Points** 23

#### SPECIFICATION

**Chassis** carbon-fibre and Kevlar-composite monocoque  
**Suspension** double wishbones, pushrod-actuated springs and dampers  
**Engine** Honda RA168E 80° V6 turbo  
**Capacity** 1,494cc  
**Power** 675bhp @ 12,300rpm  
**Gearbox** six-speed manual  
**Tyres** Goodyear  
**Weight** 540kg  
**Notable drivers** Nelson Piquet, Satoru Nakajima



to qualify once more in Detroit as he struggled to wrestle his machine around the US street venue's myriad 90° corners.

As the season progressed, Lotus slowly began to address problems reported in testing by the drivers – also leaning on some of Stewart's feedback from his running at Snetterton – but little changed. Ducarouge left mid-season to join the sophomore Larrousse outfit, yet Lotus's engineers managed to find some balance in the latter stages of the year. Nakajima impressed at Spa with the second-best time in a wet second qualifying, starting P8, ahead of Piquet, and his performance at his native Suzuka (one of the more technical circuits on the calendar) suggested that the car had become much more user-friendly as the season wore on.

Piquet, too, began to reap the rewards with a strong weekend at the season finale at Adelaide. Having struggled on previous street courses, he seized a well-earned third place to complete an all-Honda podium. It would prove to be Lotus's final podium in F1. The late flurry of promise aside, their development was a day late and a dollar short – the sub-par chassis ultimately lacked grip and stability. Lotus elected to start afresh for '89, but the 100T proved to be their first step into an irreversible decline. 🔴



# MIND THE GAP

Williams have won more constructors' championships than anyone else bar Ferrari – but they haven't won a race in nearly seven years. In 2018 the gap between them and the front of the grid grew bigger than ever. Have they learned the lessons that will enable them to bridge that chasm?

WORDS STUART COOLING

**SEVEN POINTS.** *Seven points* In their 42-year life, Williams have endured plenty of barren seasons in between periods of utter dominance. But surely none so chronic, so miserable, so hopeless as 2018.

You might have thought 1988 – when the only noteworthy achievement by a Williams driver was to trip up Ayrton Senna during the Italian Grand Prix – was pretty grim. But the team finished in the points six times (and that was back when only the top six finishers scored). The 1998 season represented a substantial fall from grace, after back-to-back championship doubles, but Williams finished third in the constructors' standings then – albeit way behind the leading two. Apart from a strong 2003 season and a fortuitous win for Pastor Maldonado in the 2012 Spanish Grand Prix, for the past two decades Williams have mostly occupied the status of also-rans.

Only in the barrel-scraping seasons of 2011 and 2013 have Williams scored fewer points than in 2018 – and we can trace a common thread from those seasons, through the brief resurgence at the dawn of the hybrid era, all the way to the stinking comedown of the year just past. It's a story of a well-resourced team, staffed by clever and talented people who have lost their way – with their tools and with their working culture. Only this can explain a commonality of failure that has persisted through sundry hirings and firings and management restructures.

But is the glass, as it were, actually half full? Have the catastrophes of 2018 jolted Williams into a necessary process of self-examination and healing?

"It's been a very tough season for the team, but also for me personally," says chief technical officer Paddy Lowe. "I would say one of the toughest years that I've had in F1. Certainly in the middle of it, as different players started to appreciate what we were dealing with, it was a really tough time. But on the good side I think we found the bottom of the trench in terms of



performance, and that is actually a healthy process for the team to go through for the long term."

Last season's FW41 was the first Williams designed on Lowe's watch, and with the aerodynamics department working under the aegis of ex-Renault/Lotus and Ferrari man Dirk de Beer.

That the car looked radically different from its immediate predecessors was no surprise; Williams had been iterating from the same overall design concept with diminishing returns

from 2014 to '16. Even the FW40 penned for the major rule changes of '17 seemed to take major design cues from its predecessor. The whole point of recruiting Lowe and De Beer was to revitalise the engineering department and bring new ideas in from outside. It was no surprise, either, to see how closely related the FW41 was aerodynamically to the distinctive and super-quick Ferrari of the previous season.

But if we examine the peaks and troughs of Williams' form over the past decade, we see the common threads. In 2012 and 2014 a change of engine supplier delivered immediate uplifts in competitiveness that ebbed away as the team made bad development choices or added components that failed to work as anticipated. From 2014 through to '17, Williams slid from third in the constructors' championship to fifth, so it made sense to try something more radical for '18. But this approach failed to account for existing shortcomings in the team's aero data analysis methodologies – and it became clear the FW41 had fundamental limitations that could not be fixed, or easily understood without going back to basics.

Williams aren't the only team in this situation; McLaren came into 2018 with a development of their '17 car, rather than a clean-sheet design, but they too came to realise their design concept had constraints 'baked in' to its hard points. That's why both teams spent so much time evaluating new parts during free practice at grand prix weekends, sometimes even walking back on developments to try to understand their cars and trace the root causes of their ills.

At Williams, the process of unpicking led the team to ▶



2018: The combination of new rear wing and diffuser elements Williams brought to Silverstone caused both cars to spin off in qualifying, highlighting the depth of the development crisis that the team faced



confront some uncomfortable truths. Chief designer Ed Wood left before the beginning of the European season, followed a month later by De Beer. But when the issues are so deeply ingrained in both team and car, the departure of some senior staff is pretty much by-the-by. F1 cars aren't authored by one hand, so the responsibility (or blame) for failure can't genuinely be borne by one or two people.

"The more we got into solving problems [on the FW41], the more we realised there were more problems," says Lowe. "Part of that healthy progress is to get out of this mindset that there are just two or three things to fix, and then everything will be OK, and we'll be winning races. Which is a mindset I think has been in Williams for a very long time.

"The mindset we need is to say 'everything is available to be challenged' and 'everything has to be done better every year'. Otherwise you're being left behind by a very strong set of competitors. You can't stand still in any area, and this is a mentality we need to adopt and which we are adopting. That was not present before. Even I fell into that trap as a fresh set of eyes to the team, and part of the process has been for all of us to get this new perspective."

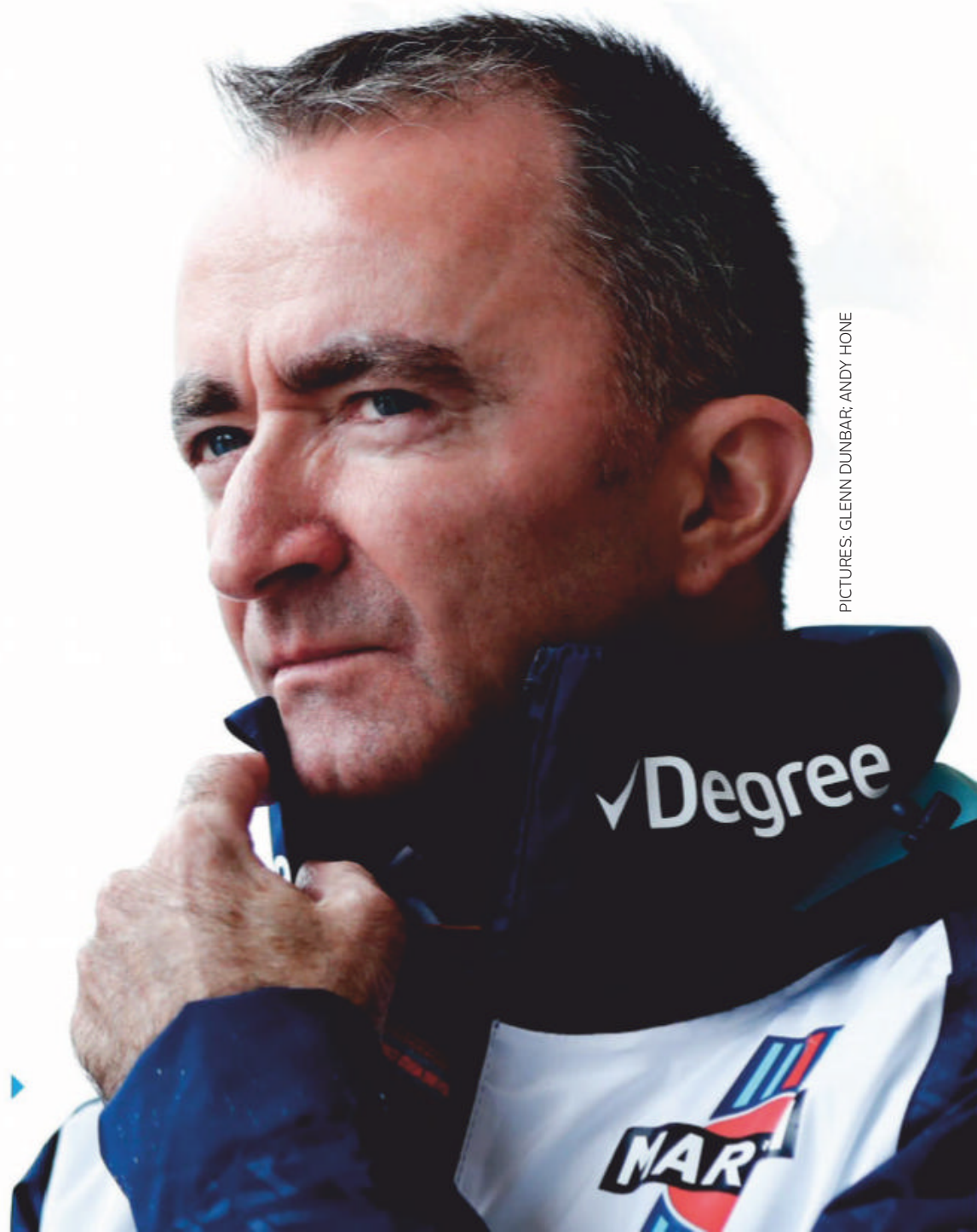
As the season progressed, Williams, like McLaren, found that development parts neither cured their cars' fundamental problems nor added performance in the ways their simulations indicated. Sometimes they actively hindered performance. The FW41's aero was acutely pitch-sensitive and the car suffered a chronic rear-end instability that sapped driver confidence. It didn't help that both Williams pilots lacked experience – Lance Stroll was only in his second year in F1, while Sergey Sirotkin was a rookie with just a handful of free practice sessions for Sauber and Renault under his belt.

To their great credit, Williams never blamed their drivers for the FW41's ongoing wretchedness. It would have been supremely disingenuous to do so. The most illustrative example of the problems they faced came at Silverstone, where Williams brought a new rear wing. Both Stroll and Sirotkin rotated into the gravel during qualifying as a hidden issue manifested itself: occasionally and unpredictably, the airflow would fail to reattach

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EVERY YEAR'"

Paddy Lowe, chief technical officer



PICTURES: GLENN DUNBAR; ANDY HONE



“WE TRIED AND WE TRIED HARD.  
IT WAS JUST THE FLAWS WERE TOO FUNDAMENTAL  
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ON THE RESOURCES WE  
HAVE TO FIX EVERYTHING”

Claire Williams, deputy team principal

when the DRS flap closed. Lowe described the resulting loss of downforce as “really quite catastrophic”.

But the new wing wasn’t the root cause of the phenomenon. The team had also evaluated modifications to the vertical fences within the diffuser during Friday practice. Then, having measured a useful increase in downforce, they retained them for the rest of the weekend. Adding the new rear wing at the same time just made the job of tracing the aerodynamic issue more difficult. Both drivers suffered aero stalling throughout practice, and although the engineers couldn’t understand the reasons for it, they persisted with the new components until Stroll and Sirotkin spun in qualifying. Believing the wing to be the cause, they reverted to the previous spec for the race – which meant both cars had to start from the pitlane.

Here, at the Williams’ home grand prix, where they took their first world championship victory back in 1979, the team’s shortcomings were ruthlessly exposed. Putting so many new parts on the car at once was inviting such disaster. In forcing the pace of development they were ultimately making life more difficult for themselves.

The car remained truculent for the rest of the season, although a new front wing introduced at Hockenheim and designed to be less pitch-sensitive did succeed in making it less edgy under braking. Back at the factory, the ongoing FW41 debacle prompted another structural overhaul that may yet engender the cultural change Lowe envisages. Rather than being based in a separate facility, the aerodynamics department now shares the design office. Former McLaren aero chief Doug McKiernan, who joined as chief engineer last February, has a roving creative brief across aero and structural design. Other changes are ongoing; Rob Smedley, head of vehicle performance, announced just before the Brazilian Grand Prix that he was stepping down, and that he had yet to find a new job.

During an FIA press conference that weekend Smedley let slip a telling piece of insight into how arduous the preceding months and years had been: “I can be a normal husband, a normal dad, and not going away every two weeks and working until 9 or 10 o’clock in the office every night.”



Also during that Interlagos weekend, *F1 Racing* chanced across a small cluster of Williams personnel behind the paddock on Thursday afternoon, enjoying the vista of what remains one of the world's great motor racing circuits. They confirmed, unequivocally, that they lived in keen anticipation of slamming the garage doors down on the reviled FW41 for the last time. Development of the car had long since become an unedifying process of flushing good money after bad, and that is a view shared by the team's most senior staff.

"I think the problems were related to the global car, if you like, we've had issues front to back," says deputy team principal Claire Williams. "So to try and make changes to bring performance to a car that was like that was always going to be difficult. But we tried and we tried hard. It wasn't through a lack of hard work, energy, motivation. I suppose it was just the flaws were too fundamental to rectify halfway through a season. Even if we had tripled the budget I'm not convinced we would have changed its course.

"You don't go from P5 to P10 without quite a few things that have gone wrong in your organisation, and we're in the slow process of resolving all of those issues. We can't tackle everything all in one go. So, we therefore have to temper those expectations as to what we can achieve in 2019 based on the resources we have to fix everything."

This may not seem an encouraging pronouncement, that the team appears to be re-cutting their cloth to fit, as it were, but at the very least it demonstrates an understanding of the scope and scale of the team's malaise – and the long road ahead to cure it. This will not be the work of days or weeks. It will require continuous vigilance. And it must be accomplished on a vastly reduced budget, given the team's reduced share of the prize money and the end of their Martini sponsorship deal.

The legendary Williams technical director Sir Patrick Head was once heard growling down the radio to one of the team's more hapless drivers of the 2000s: "Whatever it is that you do, do it *better!*" You can't help but feel the team's present management should print out that curt directive in large-point text and stick it on the factory doors. 📌



PICTURES: GLENN DUNBAR; ANDYHONE

## SIROTKIN: £15M DOWN THE DRAIN?

According to popular maxim, it's the very definition of stupidity to repeat a failed course of action and expect a different outcome. That, and a feeling he didn't make the most of his limited opportunity, is why Sergey Sirotkin's backers SMP declined to fund a second year for him at Williams.

Sirotkin might lack Lewis Hamilton's rock star persona and searing turn of pace, and he failed to comprehensively defeat Lance Stroll in 2018, but he applied himself diligently to the task of making himself and the car better. He made mistakes, getting involved in first-lap scrapes and spinning out of Q1 at his home race, for instance, but there were other moments (such as at Monaco) where he over-achieved in a very poor car. You *could* argue he deserved a second season on merit.

It's also by no means certain that Robert Kubica – who has put together a sufficiently attractive portfolio of Polish sponsors to get the race seat – will do a better job

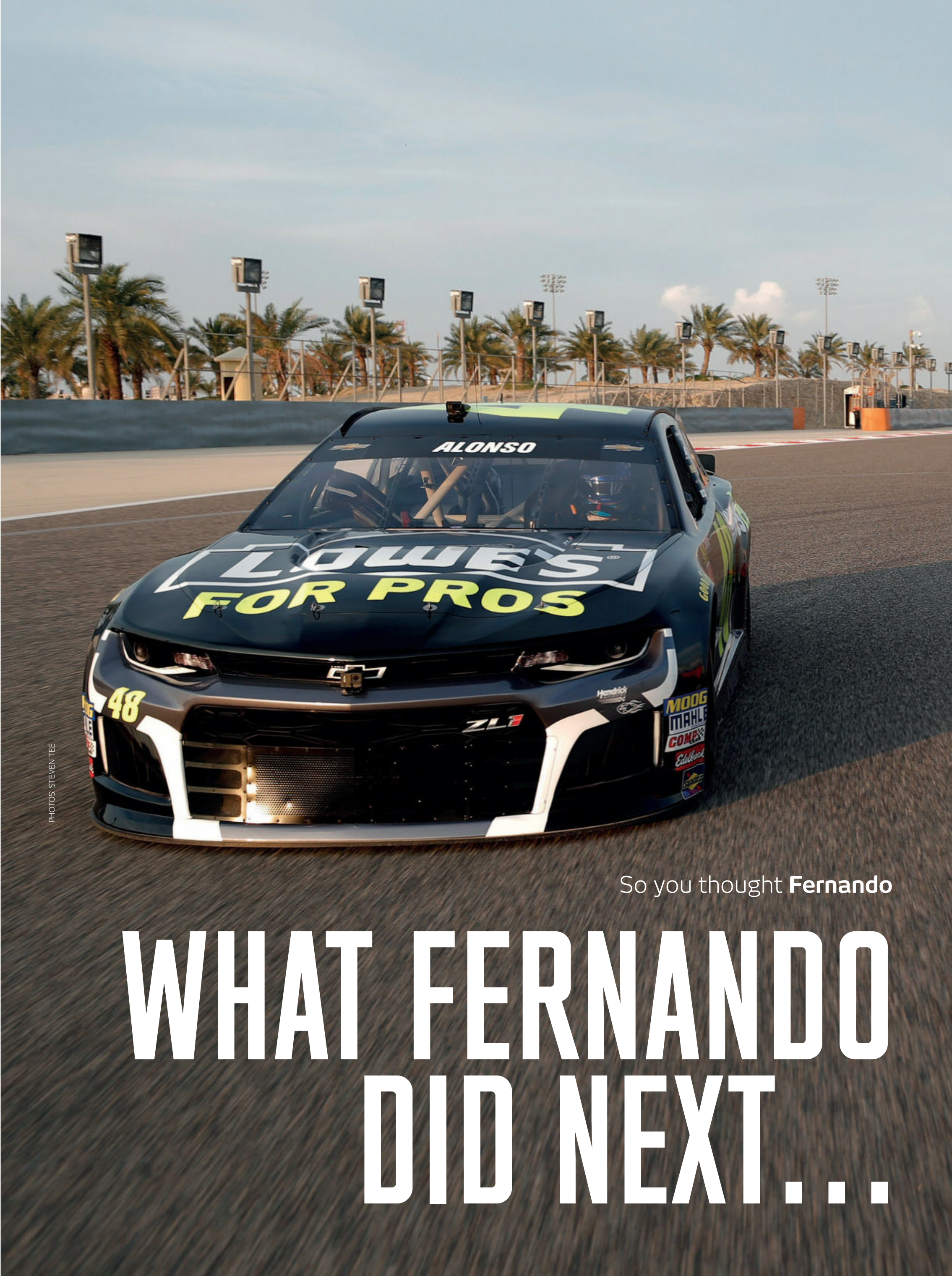
given the tools available.

Though it is chump change in comparison with Cristiano Ronaldo's estimated 2018 earnings of £85m, SMP's £15m is believed to be the biggest budgetary contribution any F1 sponsor has ever made. In comparison, you could buy a season in F3 for £720,000, F2 for £1.7m.

"Sergey is a very strong character, a guy with great values as well as being a very fast racing driver," says Paddy Lowe diplomatically. "He will show his talent in the future, and I think we saw with his human and driving qualities, he is a driver we are going to see around at one place or another.

"It's a shame for Sergey that while the team talk about building a better future as a result of what we've learned from a bad year, he's gone through that and been a very supportive member of the team, a great team player but then not standing to benefit in the future from his contribution to that process."





PHOTOS: STEVEN TEE

So you thought **Fernando**

# WHAT FERNANDO DID NEXT...



**Alonso** had quit? A day after he closed the door on Formula 1 he got behind the wheel of Jimmie Johnson's NASCAR Cup car while offering up his McLaren to the seven-time champion. *F1 Racing* was there to witness the exchange

WORDS JAMES ROBERTS

PICTURES  **motorsport**  
IMAGES

**IN FRONT OF THE McLAREN** garage, a crowd gathers, keen to witness this historic moment. Fernando Alonso is climbing into an F1 car for what is potentially the last time in his career. As he drives out of the Yas Marina pitlane to make his 311th grand prix start, everyone wants to record the moment on their phones for prosperity. And to be able to say: "I was there."

Since the world championship has long since been resolved, Alonso impending departure is one of the season-ending Abu Dhabi weekend's most prominent narratives. It's been an emotionally charged celebration for the double champion, and the final act – performing donuts with Lewis Hamilton and Sebastian Vettel on the start/finish line – is a fitting finale.

The crowds melt away knowing they have witnessed history. When, if ever, will Alonso drive a Formula 1 car again? Little do they know the answer is: about 17 hours later.

The morning after his farewell celebration, Alonso is looking a little sleep-deprived as he boards a Gulf Air flight for the short trip north to Bahrain. Parked in, appropriately enough ▶



garage number 14 at the Bahrain International Circuit, is a 2013 McLaren MP4-28. Owing to testing regulations and the complexity and expense of hybrid engines, this Mercedes V8-powered machine is the most recent car available to the team for demo runs.

On the other side of the garage is a Chevrolet Camaro NASCAR Cup car. The number 48 belongs to seven-time champion Jimmie Johnson and has been shipped over to the Bahrain International Circuit for Alonso to experience. The McLaren has been prepped for Johnson, but before he gets his chance, Alonso wants to run in an F1 car again. A 2.4-litre V8 non-hybrid screamer.

It's a much smaller crowd than yesterday watching Alonso climb into the cockpit, but no less attentive. He goes through the same routine as he did in Abu Dhabi the previous evening. His former race engineer Mark Temple is here to oversee his run, while Jimmie Johnson looks on enviously. One day into his retirement, Alonso is already back behind the wheel of F1 machinery.

As he completes his second flying lap he veers close to the pitwall where Johnson has stuck out his head to have a look. As the papaya-coloured machine blasts past at nearly 200mph, McLaren boss Zak Brown asks Johnson if his adrenaline is building. "It is now!" exclaims the American, stepping back from the edge of the racetrack.

On old tyres, Alonso sets a benchmark time of 1m 40.2s. Meanwhile Johnson climbs aboard his Chevy for a few shakedown laps, also setting a benchmark time. As we approach mid-morning, it's time for the pair to swap machines.

Alonso met Johnson last January when he was competing in the Daytona 24 Hours for Brown's

**Keeping his eye in: having extended his F1 career by one more day, Alonso watches NASCAR champ Jimmie Johnson achieve a life's ambition by taking a turn in the McLaren MP4-28**



United Autosports sportscar team. Johnson had never driven a single-seater before, and despite becoming one of the most successful NASCAR drivers of all time (with seven titles to his name) he had always been keen on F1.

They both pestered Brown to give them the opportunity to try each other's racing cars, and since McLaren Automotive had hired BIC for a track day, this was the perfect location to organise the swap. "What do we want to get out of this day?" asks Johnson, almost hopping with excitement. "A lot of smiles. I also think we'll both learn something that we'll be able to take forward with our driving."

Once Alonso has been persuaded to vacate the F1 cockpit for Johnson, VIPs gather to watch the proceedings. Along with members of McLaren's executive committee, the circuit owner and the Crown Prince of Bahrain are also in the garage. The Crown Prince, having heard Alonso's run in the V8, remarks that it "sounded beautiful".

The number 14 stickers are replaced with decals marked '48', and Alonso gives the NASCAR racer some last-minute instructions as he is strapped into the MP4-28. Johnson absorbs the briefing with rapt professionalism, but it's clear he's itching to take to the 3.3-mile track. Conditions are perfect: warm and sunny.

Johnson was in Woking the previous week, where he was given a seat fitting and spent time on the simulator, getting to grips with an F1 car and a circuit he'd never seen before. But nothing beats the real thing. He blips the throttle to avoid stalling as he rolls out of the garage, up the pitlane and out onto the track, vanishing into the sand and boulders. We hear rather than see his progress, the rise and fall of the V8's signature wail tracing an aural map of his path until he blasts back into view on the main straight, passing the pits at ear-splitting full throttle.

When he returns he's buzzing with enthusiasm, although the wind was causing his

helmet to lift up on the straights. "It was mind-blowing; the sensation of speed is so high," he exclaims. "I tried to wave as I passed the pits on one lap, but the force was so strong I thought it would take my arm off. Towards the end I quit focusing on the braking markers and was looking at the apex for where to hit the brakes, putting together some good laps. It was fun."

What's most impressive is how Johnson, given more time in the seat, is soon lapping consistently in the 1m 40.4s, 40.5s bracket – just a few tenths off Alonso's benchmark. There's no doubt Alonso could have lapped quicker with a fresh set of tyres, but it's an indication of just how good Johnson is, given how much of an F1 car's performance is dictated by downforce – a factor best exploited by a combination of feel, faith and experience. This is, after all, his first time in a single-seater.

"I have driven an open-wheel car before," Johnson recalls. "It was in about 1994. ▶"



The MP4-28 is half the weight of a NASCAR Cup car, but Jimmie Johnson wasn't prepared for the speed or the G-forces, describing the experience as "mind-blowing"



It had a 1,600cc Volkswagen engine – it was an off-road sand buggy!”

“I think he was very impressive,” says Alonso. “He was gaining time with every lap and was able to extract the grip available from each new-tyre run. He had fun, but he also took the test seriously. He’s mainly driven one discipline, but his talent proves that you can adapt quickly, whatever you are driving.”

While the Hendrick Motorsport crew looked on in awe as the McLaren mechanics fettled the MP4-28, now the roles are reversed as the Chevy 5.8-litre V8 is fired up ready for action. The roar of the Camaro is a wall of sound, deep and throaty compared with the high-pitched shriek of the high-revving Mercedes. The time has come for Fernando, and he strides purposefully over and posts himself – *Dukes of Hazzard* style – through the driver’s window.

Compared with the multitude of buttons and dials on a Formula 1 steering wheel, the switches on the dashboard of the Cup car are basic. The first switch, to the right of the wheel, simply says ‘Start’. Others read ‘Wiper 1’, ‘Wiper 2’, ‘Defog’ and ‘Light’. None of these will be necessary today.

Alonso straps himself into the 1,500kg Chevrolet, which is more than twice the weight of the McLaren. While the Spanish flag and colours of his helmet and race suit are all familiar, his surroundings are not. This big, bulky stock car and giant steering wheel are a world away from the precision and poise of his usual single-seater.

Alonso chugs out of the garage and into the pitlane, flooring the throttle, which sends tyre smoke into the air as the Camaro shakes its hips, rear wheels pawing at the asphalt. One of the Hendrick pitcrew turns to his colleague with chuckles of delight as the double F1 champion

roars up the pitlane and onto the track, slotting through each of the four gears he has available.

The McLaren senior management and mechanics head to the pitwall and wait a minute or so until the Cup car slithers out of the final corner and thunders past on the start/finish straight at top speed. With each passing lap, Alonso is quicker until he eventually eclipses Johnson’s benchmark by a few seconds and returns to the pits.

As Alonso sits in the car digesting the experience, Johnson approaches. “It’s not a graceful car, is it?” asks the Camaro’s usual occupant.

“No, not really,” replies Fernando, smiling and stroking his chin. “But it was really, really fun. The power in relation to the grip is a lot higher, so I was sliding the car a lot. But in terms of braking, the car is so heavy it was like stopping ▶



It’s Alonso’s turn to try his hand at a completely new discipline and the grip-to-power ratio of this weighty beast is what strikes him first. Racing in NASCAR isn’t on his to-do list just yet



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a 747. I think the last time I drove with a H-pattern gearbox was in a Nissan World Series car in 1999.

“With the driving style, it wasn’t very clear what was the best way to perform a lap. I had a lot of problems with braking because of its weight, and the steel brakes behave differently from what I’m used to. And with the amount of power these cars have it’s very difficult to manage. In first, second and third gear I was still spinning the tyres, so I didn’t know if it was better to go full throttle and spin the tyres, or control the throttle and lose a little bit of performance on the exit.”

The natural home for a NASCAR Cup car is on a high-speed oval, rather than a stop/start circuit like Bahrain, which is exactly what Johnson tells Alonso he should try next, thereby getting a completely different appreciation for the car’s characteristics.

“With the low grip and problems with traction I had here, it’s hard to imagine what it would be like on an oval,” says Alonso, hauling himself out of the stock car and putting on his signature Kimoa cap. “Jimmie says I should try an oval because they stow a lot of weight on the left of the car, even when it’s set up for a road course. So if I try oval racing, then the perspective on how I feel the car will be different, but I’ve not planned that yet.”

There’s a mutual appreciation of each other’s skill behind the wheel, and the ease with which each proved instantly competitive despite the unfamiliarity of the machines they were driving. For Johnson it was a lifetime’s ambition achieved, while Alonso continues to explore his options beyond Formula 1, and they cement the moment by swapping helmets. Alonso may profess to be keeping his options open, but he clearly experienced great joy in extending his F1 career by one day. You sense he won’t be kept away for long... **F1**

## WHERE WILL ALONSO RACE NEXT?

In 2019 Fernando Alonso will continue to work towards his goal of achieving motorsport’s ‘triple crown’ as he makes his second attempt at adding the Indianapolis 500 to his Le Mans 24 Hours and Monaco Grand Prix successes. To date, only Graham Hill has achieved this feat.

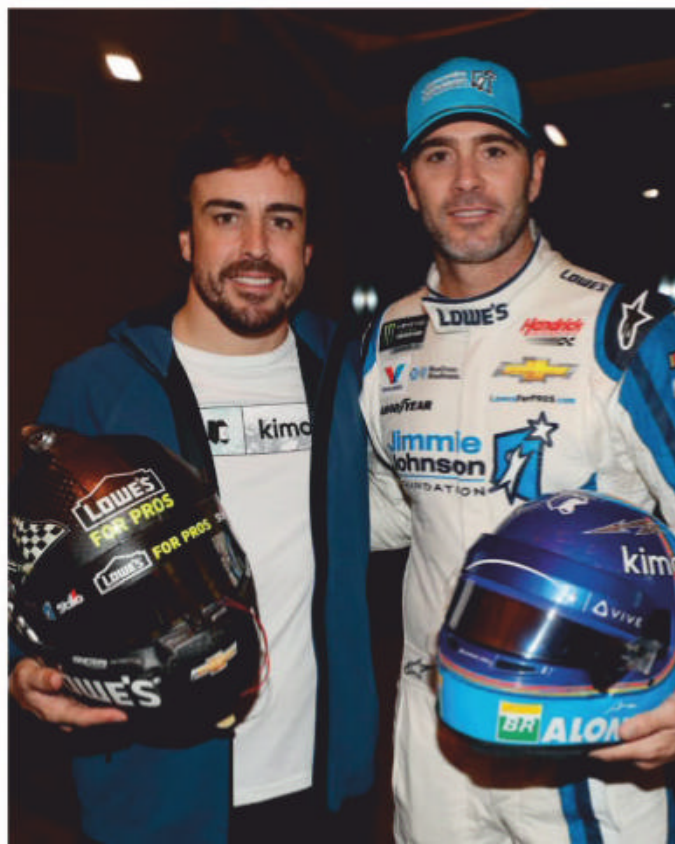
Alonso’s entry at the Indy 500 will be an off-shoot McLaren venture, led by former Force India deputy team principal Bob Fernley. But that’s not Alonso’s only planned campaign for the year; he will also continue to drive Toyota’s LMP1 car in the World Endurance Championship super season, which has races in Sebring, Spa and Le Mans left to run. He will also return to the Daytona 24 Hours in January, teaming up with former F1 racer Kamui Kobayashi in a Wayne Taylor Racing Cadillac, which is considered one of the favourites for the race victory.

Despite trying Jimmie Johnson’s Cup car in Bahrain, racing in NASCAR isn’t on Alonso’s list just yet – although McLaren boss Zak Brown believes he should enter one of the road course events held at either Watkins Glen or Sonoma.

“Most of the performance in the Cup cars comes from experience, with driving techniques gained from following in the draft of each other,” said Alonso. “I’m not up to speed on those techniques, and since the calendar is so intense it will require a lot of commitment. Maybe a one-off, one day, but not the full series. At the moment I’m really focused on the things I want to achieve – the Indy 500, the WEC season – and winning the sportscar world championship.”

And as he said on his final GP weekend about a return to F1: “The door is not closed.”

**Johnson and Alonso cement proceedings by swapping helmets, having discovered a mutual appreciation of two incredibly different forms of racecraft**





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## GIANCARLO BAGHETTI

BY ANY  
STANDARDS  
JACQUES

Villeneuve's Formula 1 debut, in Melbourne in 1996, was striking. Only the third driver (after Mario Andretti and Carlos Reutemann) to start his first grand prix from pole position, Villeneuve came within five laps of being only the second to win it, but at that point the Williams pit warned that his oil pressure was falling, and he needed to back off immediately.

In the circumstances Jacques responded with remarkable discipline, and team-mate Damon Hill duly passed him for the win. That being so, Giancarlo Baghetti's unique place in racing history survived, unlikely ever to be challenged again.

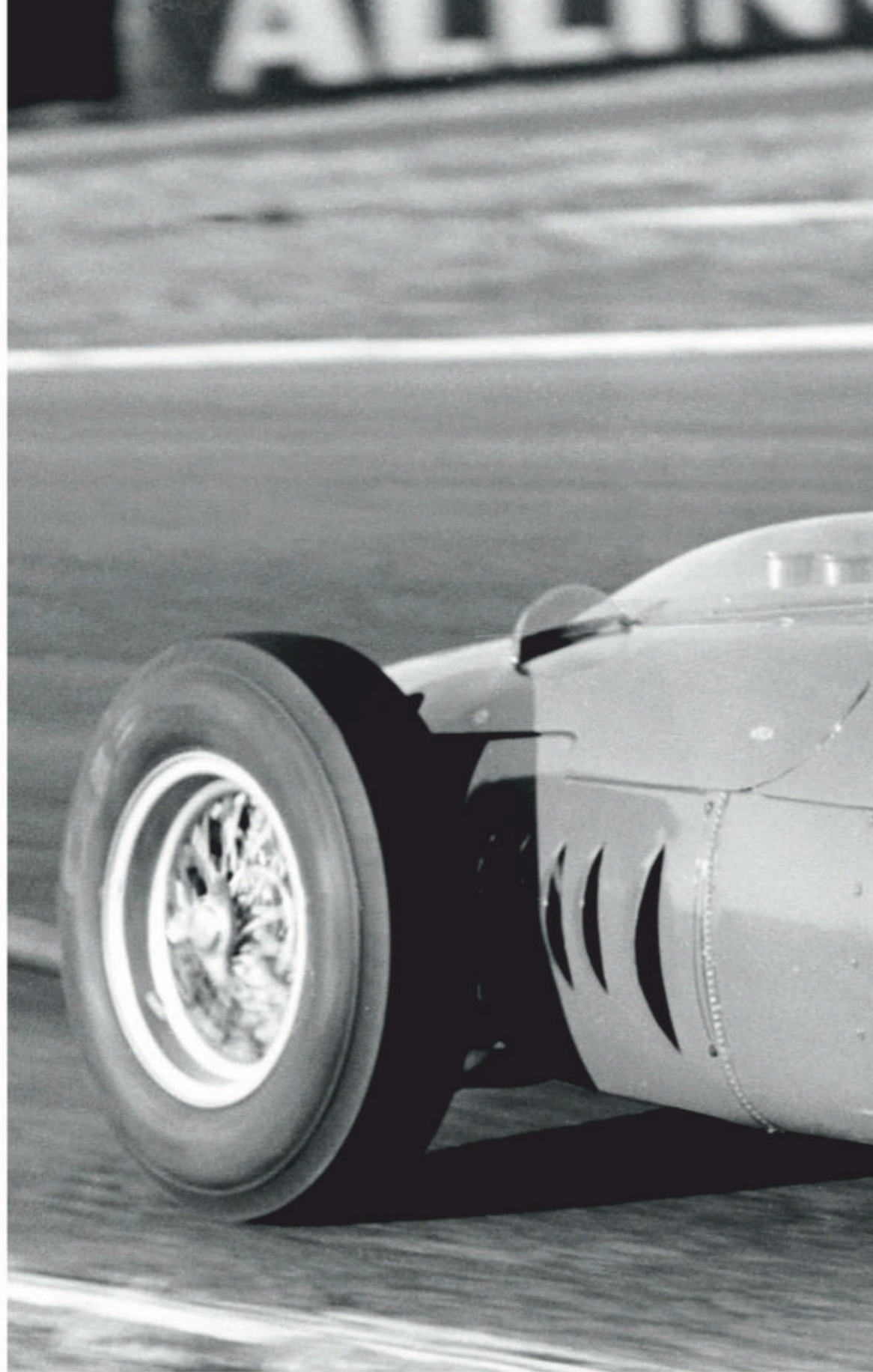
In 1961 this charming, raffish Italian's Formula 1 career began like no other: after victories in a pair of non-championship races, he then won his first world championship grand prix, at Reims. When he crashed in the rains of Aintree two weeks later, the course commentator could barely contain his excitement: "Baghetti," he shouted, "is beaten at last!"

Later in the year, this time driving a Porsche, Baghetti won another non-championship race, at Vallelunga, so the tally for his maiden F1 season was four victories – and he was never to win again. It was, as he smilingly put it, a career in reverse, and my impression from sundry conversations was that it bothered him not at all. For Giancarlo, born into an affluent family, racing was merely one of the good things of life, like opera and malt whisky.

Born on Christmas Day in 1934, Baghetti briefly ventured into the family foundry business, but concluded this wasn't for him: instead he started racing Alfa Romeos and Abarths, and with some success.

For Italian motor racing this was a traumatic period. In 1955 the great Alberto Ascari was killed in a testing accident at Monza, and within three years Eugenio Castellotti and Luigi Musso – both braver than was good for them – were also lost. All died in Ferraris, and Enzo, roundly condemned in sections of the press for building 'killer machines', became disinclined to employ more sons of Italy.

Not, it must be said, that any were in evidence at the time, which was why Count Johnny Lurani, following the death of Musso in 1958, conceived the idea of Formula Junior, his hope to create a breeding ground for the next generation



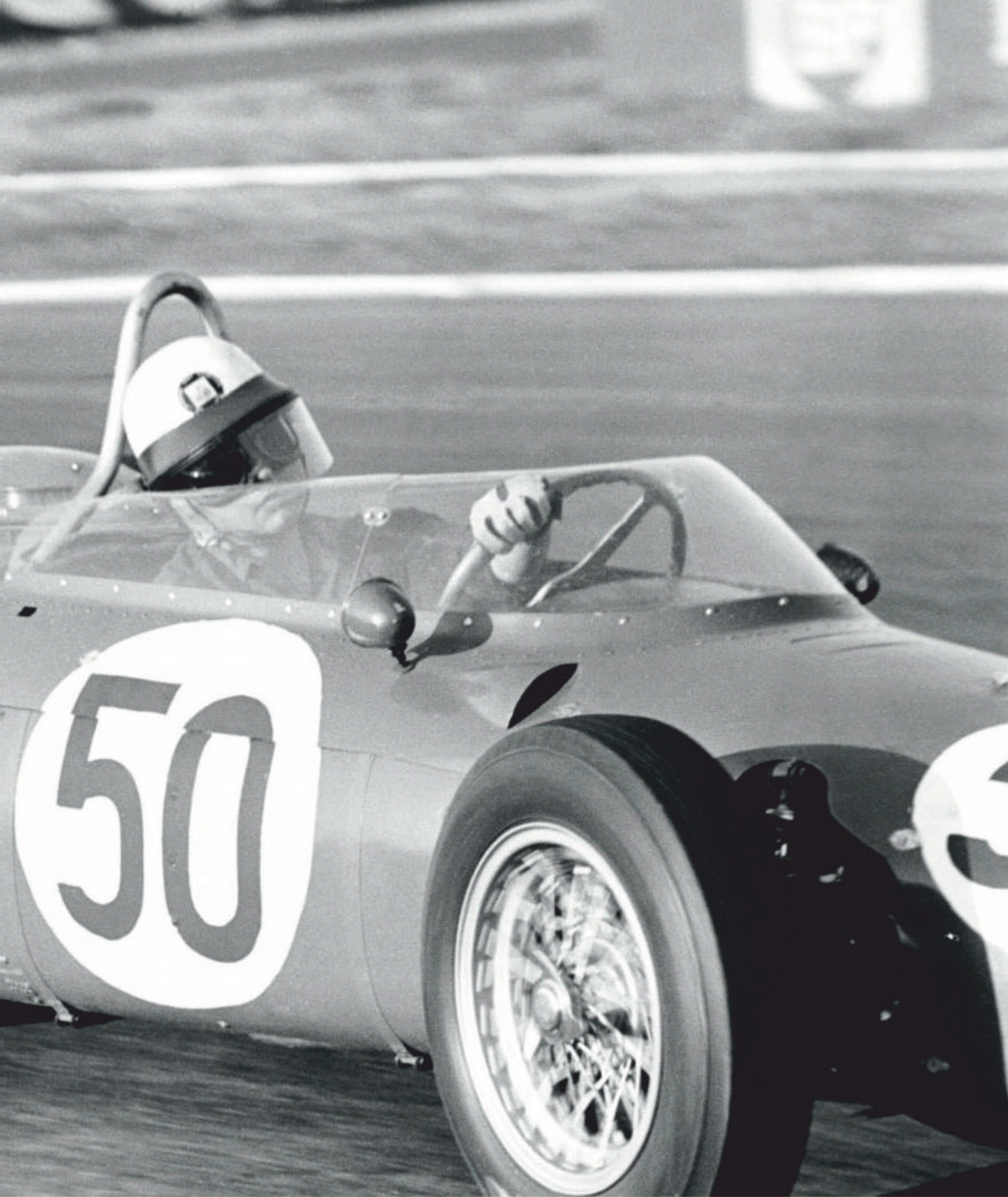
of Italian F1 drivers. In 1960 Baghetti and his Dagrada-Lancia won the Italian Championship.

Unsurprisingly Giancarlo harboured dreams of one day driving for Ferrari, but, given the Old Man's reluctance to recruit Italians, this looked unlikely. At the same time – as so often with this unpredictable man – he was in conflict with himself: in his heart what he wanted most to see was his countrymen winning in his cars.

Not for the first time, a problem was solved by a classic Maranello fudge. For 1961 Ferrari's contracted drivers were Phil Hill, Wolfgang von Trips and Richie Ginther, but it was suggested to Eugenio Dragoni (later a controversial Ferrari team manager, but then operating the small Scuderia Sant Ambroeus) that he might occasionally run an extra car for a promising Italian.

Favoured for the drive initially was Lorenzo Bandini, another Italian who had made his name in Formula Junior, but ultimately Baghetti got the nod. For this, the first year of the new 1.5-litre Formula 1, Ferrari was way better prepared than any other team, and although no works cars were entered at Syracuse, Sicily's classic open road circuit, the 'private' car was there, Baghetti at the wheel.

For the Italian press, this was a field day, for the unknown rookie – and his dramatic new 'sharknose' car – won at their first attempt, with only Dan Gurney's



After dropping to 16th at the start, Baghetti went on to win his debut F1 world championship race at Reims in '61 and remains the only driver to achieve this feat



Porsche offering any real opposition. Ferrari, the papers suggested, were going to waltz the season, and they were right, although twice the factory cars were beaten by the genius of Stirling Moss.

As Stirling scored his greatest victory, at Monaco, that same day Baghetti competed in the Naples Grand Prix where, against minimal opposition this time, he won without problem. Looming now was his first world championship race, where it was widely assumed he would get his first touch with reality.

Not so. Although Giancarlo qualified only 12th at Reims, he quickly made progress in the early laps, and when the works Ferraris for once failed, the French Grand Prix distilled to another battle between Baghetti and Gurney.

As always at Reims, the accent was on horsepower, and Baghetti had more of it than Gurney, but on Dan's side were experience and guile, and on the long run down to the flag he put the Porsche squarely in the middle of the road, and held it there. Feinting left, Baghetti saw Gurney glance in his mirror, and jinked right, timing the move to perfection.

Dan could have blocked him, but didn't: "I've got to admit it crossed my mind, but...you didn't do things like that in those days

– and, anyway, Baghetti did it just right, and deserved the win..."

The following year Giancarlo drove occasionally for Ferrari, but now the V6 cars were overwhelmed by the new V8s from Climax and BRM, and following a disastrous '63 season, with the fledgling ATS team, his career swiftly faded. After toiling with Scuderia Centro Sud's outdated BRMs in '64, he thereafter confined his F1 appearances to Monza, driving first a Brabham, then a Ferrari, then a Lotus. In 1968 he retired for good.

Perhaps, given his wealth, his taste for the sweet life, Baghetti never had the desire of the great ones, and maybe he never had the ability, either, but for all that in the story of Formula 1 his place – as the only man to win a grand prix on his debut (discounting the first world championship race of 1950 and

the anomalous 'F1' Indy 500s of 1950-60) – is surely secure.

After working in later life as a fashion photographer, Baghetti died of cancer, aged only 60. A delightful character, to the end he invariably showed up each September at Monza, which is where I came to know him. Did he have any regrets, I asked him once, about his racing career? "Only one," he laughed. "I should have retired at the end of 1961..."

**I'VE GOT TO ADMIT IT CROSSED MY MIND, BUT... YOU DIDN'T DO THINGS LIKE THAT IN THOSE DAYS – AND, ANYWAY, BAGHETTI DID IT JUST RIGHT, AND DESERVED THE WIN** DAN GURNEY, FRENCH GP 1961





# PROST

THE HISTORY OF MCLAREN

# VERSUS

CHAPTER 4: 1988-2001

# SENNA

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PICTURES  **motorsport**  
IMAGES

WORDS DAMIEN SMITH

The rivalry between Alain Prost and Ayrton Senna came to define McLaren like no other spell in their history. It presaged a period of decline and rebirth as new partnerships were forged that ensured McLaren remain one of F1's most successful constructors

**THEY FIRST MET PROPERLY AT THE OPENING OF THE NEW NÜRBURGRING IN MAY 1984. ALAIN PROST, JUST RETURNED TO MCLAREN FROM RENAULT AND BIDDING FOR HIS FIRST WORLD TITLE, EVEN PICKED UP Ayrton SENNA AT THE AIRPORT, HIS 'ENTHUSIASTIC' DRIVING KEEPING THE ROOKIE AMUSED AND ON EDGE ALL THE WAY TO THE TRACK.**



The 1984 Mercedes 190E saloon race at the Nürburgring, presaged the ferocious Senna versus Prost rivalry to come



Conversation was amiable, Prost would later recall, and in different circumstances the two might even have become friends. But that wasn't the destiny for the two greatest racing drivers of their generation. Not yet.

Prost and Senna were headed to the 'Ring to represent the new guard of Formula 1 in a one-make race for Mercedes 190E saloons, featuring a grid packed full of world champions: Niki Lauda, Keke Rosberg, Alan Jones, Jody Scheckter, James Hunt, Jack Brabham, John Surtees and more. Senna had been drafted in only to replace his countryman, the Indianapolis 500-bound Emerson Fittipaldi.

A bit of fun? Sure... until they pulled on their crash helmets. The Prost-Senna bonhomie ended abruptly when Alain outqualified Ayrton, the pair locking out the front row. In the race, Senna muscled Prost off on the first lap – neatly foreshadowing what was to come – and won, much to the annoyance of Mercedes, who had wanted a 'name' to win their showcase. A few weeks later, Prost's McLaren would win a truncated Monaco GP in heavy rain, the early finish thwarting what would have been a shock victory for Senna in his Toleman. Both races foreshadowed the most dramatic and bitter rivalry in F1 history – and what would become the defining chapter in McLaren's epic narrative.

Four years on, in 1988, as F1 prepared for a final season with turbo engines and McLaren began a promising new partnership with Honda, Prost claimed





he could have vetoed Senna's arrival at 'his' team. Now a two-time world champion and a core component of the McLaren-TAG game-changing superpower, Prost's opinion carried weight. Instead, and to his credit, he advised Ron Dennis to overlook new world champion Nelson Piquet and sign Senna, because, he reasoned, McLaren deserved the quicker driver. It was advice he would quickly come to regret.

At that point, Prost had no reason to fear Senna, despite the younger driver's explosive one-lap pace. Later, looking back at their two combustible seasons together in '88 and '89, Alain would admit that Ayrton did "astonish" him – but only in qualifying. On race day, the pair were equals, sharing the high ground above the F1 support cast. It was all about these two.

For Prost, he found himself in a scenario much like that at McLaren in 1984 – but now transposed to the other role. Back then, he'd been the young charger coming in to unseat the established champion. Team-mate Niki Lauda knew from the off that he couldn't live with Prost's outright pace, but won his third world title through preparation, graft and race-day guile. Alain watched, and learned. Now he was the veteran to be shot at and, like Niki, he'd need all his experience to deal with the upstart threat in the vivid yellow helmet.

That first season, when Honda's power propelled McLaren to an unprecedented 15 victories from 16 races, all was remarkably calm in the camp. Only at Estoril, where Senna almost drove Prost into the pitwall at the end of the first lap, was the accord strained. Yes, Senna had blitzed Prost on Saturdays by 13 pole positions to two, but on Sundays the Frenchman scored more points – 105 to 94. However, on the 11 best scores rule to which 1988 played, Prost's seven victories and seven second places fell short of Senna's eight wins and three runner-up finishes. Ninety points played 87 in Senna's favour. Alain took defeat well. After all, he already had two titles, Senna had taught him nothing new and, again, there was nothing to fear for 1989.

Then all hell broke loose.

The switch to normally aspirated power for the new season changed little at the sharp end of the F1 world order, as Honda's V12 picked up where their V6 turbo left off. On the chassis front, sure, Gordon Murray's low-slung influence from Brabham had contributed to the blitzkrieg MP4/4 designed largely by American Steve Nichols and his team, but as maverick visionary Murray turned his focus to an ambitious McLaren road-car project, strength in depth and best-practice foundations dating back to the John Barnard era meant his diversion caused barely a ripple. McLaren, in Ron Dennis's vice-like grip, were the perfect F1 racing team. But like many an indomitable empire, an all too human factor would now undermine them.

War broke out at Imola, where a pre-race deal suggested by Senna to hold station at the first corner was complicated by a restart after Gerhard Berger's ▶

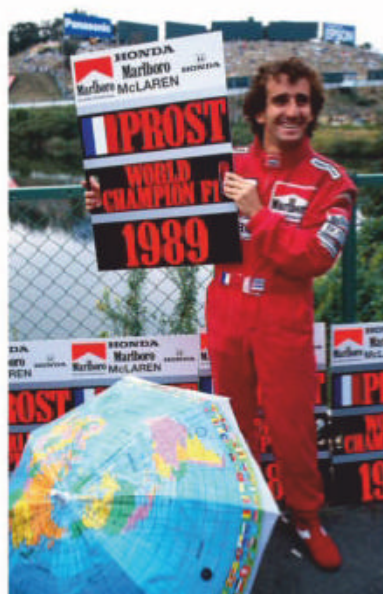


fiery shunt. Senna reneged on the pact second time round, passing a fuming Prost at Tosa. Senna's zealous self-belief, underpinned by a religious conviction that plain scared his team-mate, helped him justify his actions. But once confronted by Dennis, he was reduced to tears. The accord between McLaren's drivers now lay in tatters, and no one – not Dennis, nor even team co-ordinator Jo Ramirez, who had somehow remained a confidant to both – could repair it.

By Suzuka '89, the intensity was unbearable. It was like watching *Jaws*: gripping, yet exhausting to the point you just wanted it to be over. For Prost, it had already become too much. Torn from the fabric of the team he'd done so much to establish, he'd committed to Ferrari for '90, enraging Dennis by dropping his trophy from the Monza podium to the cheering *tifosi* below.

Prost had grown convinced of disparity within the ranks – not on McLaren's part, perhaps, but certainly from Honda, who appeared to favour Senna's samurai ethic over Prost's clinical science. The superteam were divided: Prost a McLaren driver powered by a Honda engine, Senna a Honda driver in a McLaren chassis.

**The aftermath of Suzuka '89 when Prost refused to "open the door" for a lunging Senna, taking him out of the race to collect a third title**



The climax – that clumsy collision at the Suzuka chicane, Senna's recovery drive and trumped-up exclusion for cutting the corner as he rejoined – was unseemly. Now it was Prost's turn for justification through petty semantics. When Senna made his lunge, Prost hadn't driven into him; he'd simply refused to "open the door". Not his finest moment, and you sensed he knew it – but it won him a third championship.

The bitter war raged on into 1990 as Prost now invigorated Ferrari. Amazing performances and race drama again kept us hooked, but the denouement this time, again at Suzuka, would plunge F1 to a desperate low. Senna's calculated decision to drive Prost off the road at 150mph at the first corner, in front of the whole pack, remains the most reprehensible act committed by an F1 driver. The deification of a man justifiably considered by many as the greatest of all time goes on, nearly 25 years after his death. But Suzuka 1990 will forever undermine Senna's monumental legacy. Just as it had following Diego Maradona's 'Hand of God' moment at the 1986 World Cup, sport shifted off its axis as the dust settled in the Suzuka gravel trap.

After Prost moved to Ferrari, the dynamic of their rivalry changed. Senna won titles for McLaren in 1990 and '91



And then it was all over. Ferrari's competitive decline in '91 and a new threat posed by Nigel Mansell's Williams-Renault took the edge off the feud, and the racing world sighed with relief. Senna's third and final world title was perhaps his finest, despite lacking the intensity of a Prost rivalry, because suddenly McLaren and Honda were on the back foot. Not even Senna could hold back the tide of traction control, ABS and Adrian Newey-inspired aerodynamic superiority that carried Mansell to the '92 crown. But as Prost engineered his way into the best seat in the house for 1993, Senna found himself consumed by jealousy. His old foe had got under his skin once again.

Prost had always been Senna's target, from that first encounter in the Mercedes 190E, and now, once again, Prost had the upper hand. Ayrton didn't even have Honda in his corner; the Japanese manufacturer had devastated McLaren by quitting F1 at the end of the 1992 season in the face of a crippling global recession.

Then again, the make-do customer Ford V8 solution, mated to the neat, well-proportioned MP4/8 chassis, at least provided a suitably fiery coda to Senna's McLaren

years. The apparent injustice of his disadvantage brought out the best in him – behind the wheel, at least. After all the pouting and sulking, he got what he wanted for '94: a Williams-Renault, as Prost took his leave with a fourth title, unwilling and unable to stomach a rematch of '88-89. Immediately following Prost's final race, in Australia, on an emotional podium, the friendship that could have taken root in that car journey 11 years before, finally began to blossom – only to be cut short so tragically on 1 May 1994.

For McLaren, the world kept on turning. But the hangover of the Prost/Senna years would prove painful and enduring. In Mika Häkkinen, who piqued Senna by outqualifying the maestro first time out at Estoril in 1993, Dennis and his loyal team at least found a new muse. But they lacked the power to uphold the standards McLaren had come to stand for.

By today's standards, the 1990s wilderness years seem far less barren than they appeared at the time. But it was surely humbling for Dennis to have to resort to Lamborghini's unsophisticated V12 for '94, only to then turn to an unproven Peugeot. If it was, he didn't ▶

**“BY SUZUKA 1989, THE INTENSITY WAS UNBEARABLE. IT WAS LIKE WATCHING JAWS: GRIPPING, YET EXHAUSTING TO THE POINT YOU JUST WANTED IT TO BE OVER”**








show it. The sneer of superiority never wavered: he had faith in what was to come. As Michael Schumacher succeeded Senna as F1's brilliant-but-flawed *enfant terrible*, McLaren's regeneration began, in partnership with another superpower. Mercedes had dominated grand prix racing in the 1930s and mid-50s. Now, 40 years after the 1955 Le Mans disaster that had killed more than 80 spectators and driven a horror-stricken Mercedes from the sport, they were ready to return.

David Coulthard saw what was coming. He gave up a tilt at the 1996 crown by leaving dominant Williams. Newey saw it, too, and made the same move, in a deal that can be counted among Dennis's most significant.

Breakthrough wins for Coulthard and Häkkinen ended a three-year drought for McLaren in '97, and then, armed with Newey's beautiful MP4/13 – finished in unfamiliar West silver after Marlboro ended 23 years of continuous support – Mika would rise in a manner some had doubted he could muster. He'd almost died in a horrible crash at Adelaide at the end of '95, saved only by a trackside tracheotomy. Yet here he was, just three years later, seeing off mighty Schumacher and a rejuvenated Ferrari in another Suzuka season finale. He did it cleanly, too, then repeated the feat – just – in 1999 after Schumacher broke a leg at Silverstone.

Häkkinen versus Schumacher lacked the personal intensity of Senna vs Prost, but in its own way this was also a duel for the ages between two F1 titans. Mika took a different approach to defeating his enemy: simple, straightforward... refreshing. But there's nothing patronising in that: Häkkinen was not a man to be underestimated, as Schumacher would discover. Mika's magical pass up the Kemmel straight at Spa in 2000, the pair flashing either side of poor Ricardo Zonta in the backmarker BAR, should perhaps be considered Häkkinen's defining moment. The conversation between the rivals in parc fermé later, as Mika explained exactly why Michael putting him on the grass at 200mph the lap earlier had been less than advisable, was pure F1 gold. We didn't need to hear the conversation; Schumacher's stony face told the story.

As a new century began, McLaren could reflect on a decade of pogoing fortunes, from the sublime to the ridiculous and back again. As Häkkinen departed, head held high with two hard-won titles, the team focused on yet another Finnish muse to carry McLaren forward. Kimi Räikkönen certainly looked the real deal.

But for Ron Dennis, he had no way of knowing his best days at the helm were behind him. Trouble away from the tracks, and a particularly vindictive FIA president, were set to change McLaren forever. 

**“DAVID COULTHARD SAW WHAT WAS COMING. HE GAVE UP A TILT AT THE 1996 CROWN BY LEAVING DOMINANT WILLIAMS. NEWAY SAW IT, TOO, AND MADE THE SAME MOVE, IN A DEAL THAT CAN BE COUNTED AMONG DENNIS'S MOST SIGNIFICANT”**

The iconic image of Mika discussing that move after Michael put him on the grass at Spa in 2000



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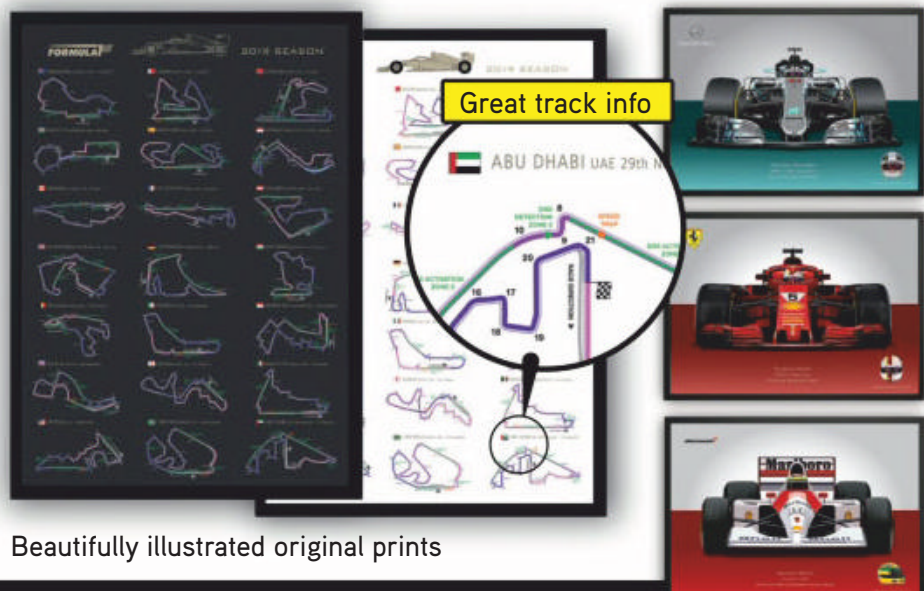
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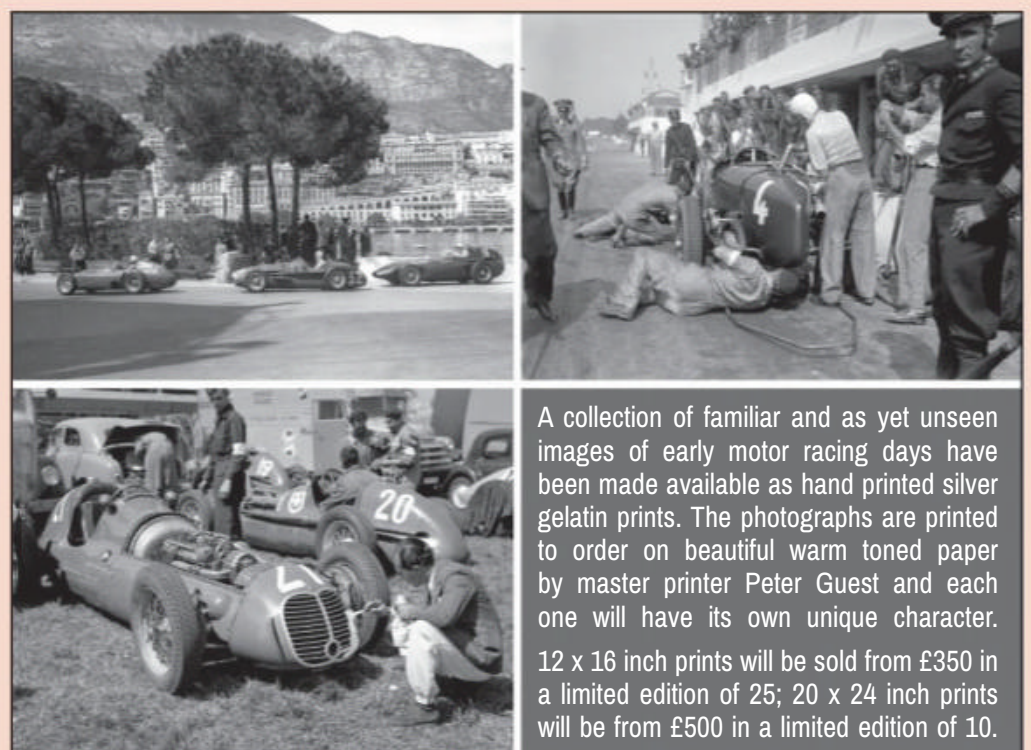
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Some readers think reverse grids wouldn't spice up F1 if Verstappen's US GP performance is anything to go by

**No gimmicks please**

With all due respect to Pat Symonds, I can only say his column [*F1 Racing*, December] offers only more gimmicks. I don't think there's anything wrong with qualifying as it is, so adjusting it probably won't change much anyway.

Tweaking Friday sessions a bit to save money and time is also fine, but hardly crucial for improving F1's appeal. Every now and then we hear even more crazy ideas, along the lines of reverse grids, success ballast, short races, and the like. Is there really anyone out there still believing that this is what F1 needs to become exciting again?

In the US GP, Max Verstappen started 18th on the grid and was in 5th place after six laps. So much for reverse grids. It has been an

open secret for years that three elements ruining competitive racing are the tyre compounds, overly aero-sensitive cars, and revenue distribution that leaves most of the grid hopelessly outclassed, if not downright struggling for survival.

Nothing has really been done about it until now and it is doubtful that much will change in 2021.

**Aleš Norský**  
By email

**Less means more**

I agree with Ben Anderson's editorial [*F1 Racing*, January] regarding drastic changes required to make F1 more exciting and more watchable. However, inverted fields (while intriguing) have no realistic hope of being implemented.

I believe I have a better idea:

fewer teams. Imagine if F1 had only four teams with five or six drivers each, and all four spent approximately the same amount of money.

It would also be easier to level the playing field if required. If one team has a noticeable advantage after a few races, then just simply add some weight to their cars.

Additionally, even if one team is dominating, there would be more competition within each team and that would create excitement.

Gone would be the days of star drivers objecting to some actual competition within the team.

Oh, and keep up the great work at *F1 Racing*, your input has the chance to positively change F1.

**Woody Alverson**  
By email

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**Sir Lewis?**

So what does Lewis Hamilton have to do to get a knighthood? For years he has entertained us, not just by kicking a ball or hitting one with a piece of wood, but by risking his life every time he gets in a racing car.

Five world championships and still not enough. Whoever decides who should be honoured, are clearly not F1 fans.

**Kay Pearman**  
Hook, UK

**Slowly does it**

So Ross Brawn is 'impatient at the speed of change in F1, that he was brought in to lead.

That sounds to me like a classical piece of spin. Ross, given his long history in the sport, must have suspected that it would be a slow process from the start, even if Bernie Ecclestone was no longer part of the hierarchy.

If Ross moans a little bit about the process then that might help deflect some of the criticism that has started to build against Liberty for their perceived lack of action in shaking up the sport.

**Darren Smith**  
By email

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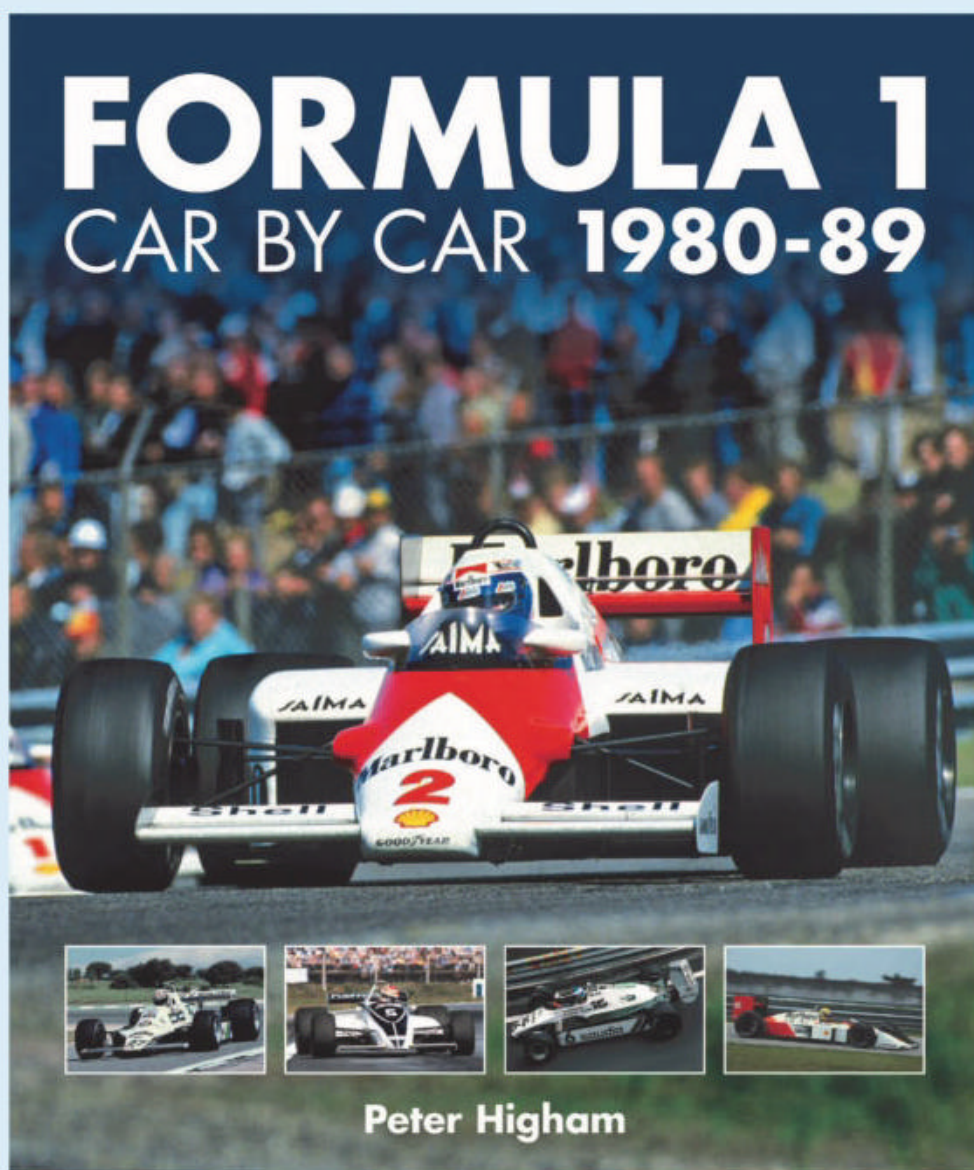
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**Author** Peter Higham

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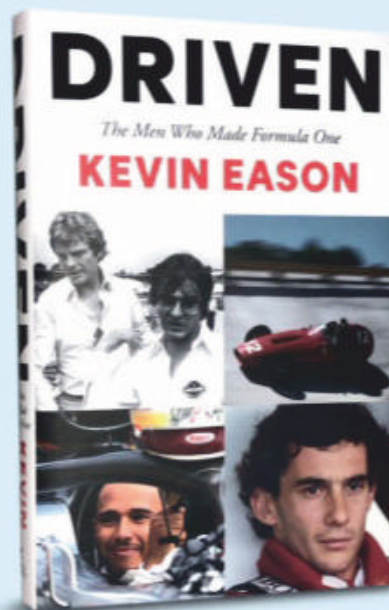
This is the third instalment of the series of books that lists every car from each decade in Formula 1. The format is regimented, focusing on a year at a time with a detailed report on the teams that entered the world championship, enriched with pictures of the different types of model and drivers that raced for them.

In line with author Peter Higham's other works, this is a deeply researched labour of love, which leaves no stone unturned in its quest to report the technical details and

nuances of each entrant.

This book will find particular affection with enthusiasts who grew up watching and reading about F1 in the 1980s. While many of the stories are familiar – the dominant title campaigns of Williams and McLaren and the rise of the turbocharged formula – it is the obscure references that will delight some readers. They include the Pascal Fabre-driven Team El Charro AGS from 1987 and the Oscar Larrauri EuroBrun ER188 pictured at the 1988 German GP.

There are over 600 colour photographs taken from the huge archives at Motorsport Images, and at over 300 pages in length this is a must for any F1 fan's coffee table.



### DRIVEN: THE MEN WHO MADE FORMULA ONE

**Author** Kevin Eason

**Price** £20

[hodder.co.uk](http://hodder.co.uk)

This book, written by former *Times* Formula 1 correspondent Kevin Eason, aims to tell the inside story of the "sporting mafia" of wealthy individuals who transformed grand prix racing from a parochial sport into a global powerhouse.

For much of its length it reads as a rough history of F1 and its disparate personalities, set in the format of a seemingly random collection of personal anecdotes, and presaged by an introductory chapter in which the author is at pains to point out that he used to be a proper journalist before he got involved in Formula 1.

The chronology jumps around and the absence of a cohesive narrative thread makes the book hard going at times. But the author had great access to senior figures and there are some interesting revelations.



### ALPINESTARS CITY HUNTER BACKPACK

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[alpinestars.co.uk](http://alpinestars.co.uk)

Alpinestars supply gloves, boots and overalls to a growing number of Formula 1 drivers, but in addition to clothing the Italian company also produces a range of luggage.

Their City Hunter backpack has ergonomic shoulder straps designed to redistribute weight evenly across the back for comfort. With plenty of external and internal compartment storage options, the City Hunter is ideal for city commuting and has been designed to be aerodynamic for cycling. It includes reflective details on the front and shoulder belts to improve a rider's visibility in poor light.

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Strictly limited to 99 pieces, this 1:8 scale model of Lewis Hamilton's title-winning Mercedes has been crafted by the expert model makers at Amalgam and is available

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The makers at Amalgam have spent almost 2,500 hours on the development of the model, while each one takes two weeks to handcraft. The model measures 697mm x 136mm x 255mm and due to the high demand, in addition to the lengthy process to create, Memento are taking pre-orders for delivery in April.



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A new Casio Edifice watch, made in association with Scuderia Toro Rosso, was unveiled at the end of last year. The ECB-800TR incorporates the Toro Rosso colours and the team's logo on the dial.

The model has an analogue and digital display and a dial featuring a carbon weave design. It is equipped with a lap time indicator which displays the difference between a lap time and a target time, and a function which can calculate average speeds.

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The Styrian mountain backdrop to the Red Bull Ring is stunningly spectacular



PICTURE: ANDY HONE; OTHER IMAGES: SHUTTERSTOCK

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## YOUR GUIDE TO VIENNA

While the racing takes place close to the town of Spielberg, in central Austria, it is Vienna in the east where you'll find F1 fans before and after the grand prix weekend. Sitting on the banks of the Danube, Vienna is the former home to Mozart, Beethoven and Freud, and is one of the most culturally inspiring cities in the world.

Austria's capital has a rich history of art, culture and science which you can explore while wandering through the city's historic old town. In a few hours, you can take in a host of famous sights including the Vienna State Opera

House, the Imperial Crypt, Mozart's Vienna home, the Roman ruins and assorted fascinating monuments within the façades and streets.

Not far from the old town you can find the Kunsthistorisches Museum, the location of some of Europe's most prestigious art. Vienna's Museum of Art History is a also must-see destination where you can immerse yourself in the works of Raphael, Caravaggio, Rembrandt and Pieter Bruegel the Elder.

With St Stephen's Cathedral around the corner, you can learn about Vienna's religious history too. One evening, head up the bell tower

for an incredible view across the city and watch the sun set below the skyline. Alternatively, you can take a trip into the catacombs below, where you can explore the changing face of the burial rituals and ceremonies that have surrounded the death of the rich and powerful throughout the city's history.

Vienna is also home to one of the most spectacular natural history museums in the world. The Naturhistorisches Museum's riches range from dinosaur exhibits to pieces of meteorites, stuffed animals, mineral collections and models. The volume of information is



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Vienna is where a lot of F1 fans choose to base themselves



Visit the Kunsthistorisches Museum to see prestige artworks



A trip up St Stephen's tower ensures a great view of Vienna



The Schönbrunn Palace is home to spectacular architecture



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**Currency** Euro **Time zone** GMT+1

**Temperature** 19°C (average high during race weekend)

extraordinary and it's a perfect venue for those travelling with children. Make sure you obtain an audio guide or sign up for a tour to ensure you don't miss some of the museum's more fascinating sights.

Out of the city centre one area that is particularly spectacular at night is the Belvedere Palace Museum. Just a five-minute walk from Karlplatz underground station, the site is perfect for a short jaunt around the palace or perhaps a full day of exploring the gardens, gallery and museum. The gardens are vast and scattered with incredible works of sculpture, fountains and

iron works, while the museum is home to the works of Gustav Klimt.

And, finally, you must not leave Vienna without paying a visit to one of the city's most imposing sights, the Schönbrunn Palace and Gardens, situated south west of the city's downtown area. The 1,441-room palace has a 300-year history and is home to some of the most spectacular architectural sights and gardens in Austria. Make sure that you also explore the gardens fully to discover incredible works of sculpture, the Gloriette and the famed Roman Ruins.



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Last year as Verstappen won after both Mercedes retired. His fans flooded onto the track as he drove past and watching him celebrate with them was truly memorable.

**The best thing to do away from the track?**

In Vienna, take a stroll around the Belvedere Palace and Gardens, a two-minute walk from the Lindner Hotel which we offer as part of the package. The Volksgarten next to the Parliament building is also a fantastic sight.

**Any local food or drink to recommend?**

Visit Salm Brau. It's an incredible place, which has copper beer tanks in the corner and big plates of traditional Schnitzel and lentil dishes. It's an amazing restaurant with a relaxed and warm atmosphere with a rustic feel.

**How should you prepare for a long transfer?**

The journey to the circuit from Vienna is beautiful, so don't worry about keeping yourself occupied. Eat at the track after the race since you'll arrive back in Vienna late.

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### YOUR BOOKING INCLUDES:

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- ★ Race day general admission ticket
- ★ Return race day circuit transfers
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# ME AND MY LID MARIO ANDRETTI

FINISHING STRAIGHT



PICTURES: MALCOLM GRIFFITHS; MOTORSPORT IMAGES

The 1978 world champion stuck with this recognisable design – born out of an Indycar sponsor request – throughout his F1 career



From my earliest memories of watching motor racing, even before I was old enough to be involved in it, I appreciated the European style – the way drivers kept a recognisable helmet design. That way you could identify most of them pretty much instantly.

From the beginning of my career I raced with a plain silver helmet. Then, in 1972, when I was racing in USAC [Indycars] for Vel's Parnelli Jones Racing, the team's title sponsors – Viceroy cigarettes – wanted to include their logo, which was a red stripe with an arrow. I liked that look

so much that when I was no longer with Viceroy, and racing in Formula 1, I kept the stripe. After that it only changed in detail – trim lines and the occasional new sponsor – and the basic look has stayed in the family as Michael [son] and Marco [grandson] have built on it.

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