

WHEN LEWIS WAS KING Flashback to title showdown that took your breath away

KIMI AND LOTUS Why Kimi really quit and how to rescue the team

MAN OF THE YEAR And the winner is... almost certainly not who you think

F1 RACING



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HOW

RED BULL
CONQUERED
FORMULA 1
AGAIN!

INCLUDING...

LUNCH WITH NEWEY

"We thought maybe we'd win
a race. Four titles is surreal"

THE VETTEL
PHENOMENON

"The team give me so much
power. And the best is yet to come"



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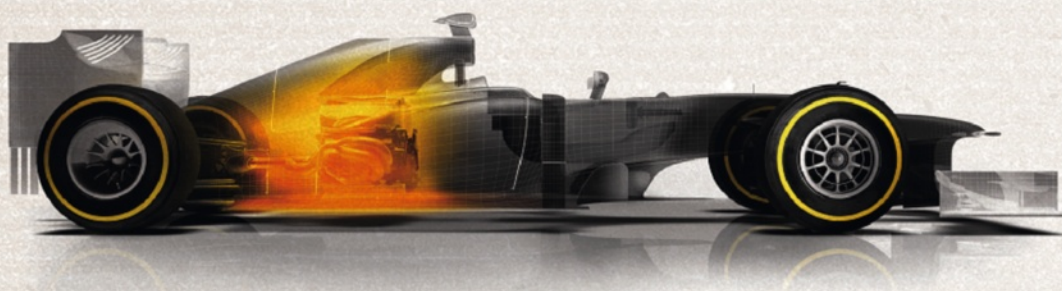
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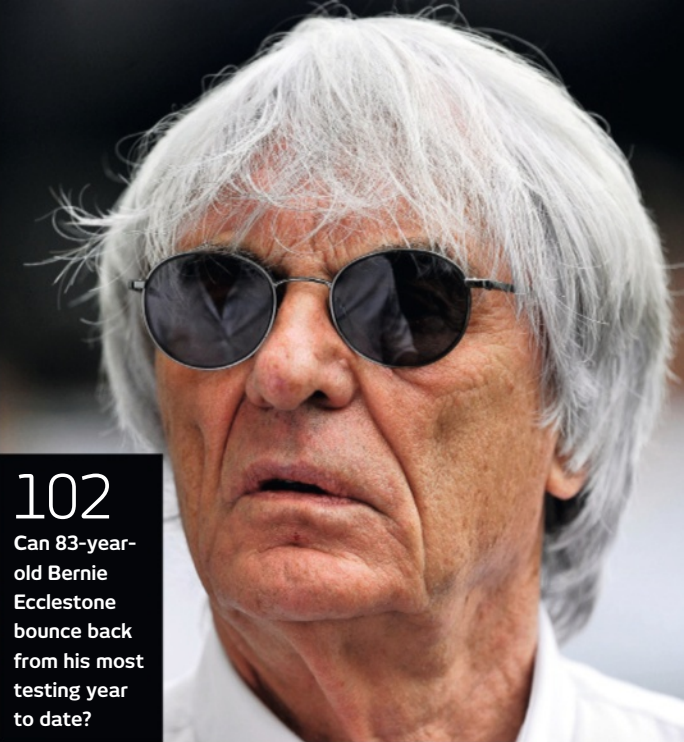
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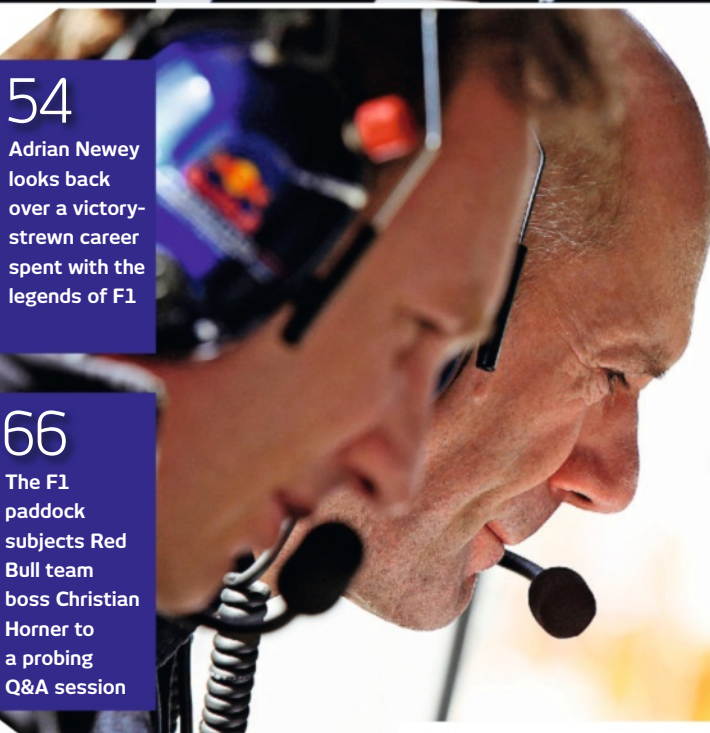
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HOW RED BULL CONQUERED F1



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Seb Vettel opens up to us about his career in F1 – past, present and future



Ignition / Anthony Rowlinson / 01.14

No Bull: we've got the inside line on F1's mega-team

After four seasons of searing, opposition-crushing success, you might think there's little more to be said, or, indeed, written, about the Red Bull Racing winning machine. But, dear reader, we would beg to differ.

We'd direct you, for starters, to one of the most revealing interviews with Adrian Newey you're ever likely to read (page 54). Our man Maurice Hamilton cornered Adrian for lunch in Austin over the US GP weekend and, with another two championships tucked safely into his pocket, this famously reticent but intensely competitive man relaxed, opened up and shared some fabulous stories about how the team once known as Jaguar Racing have been taken from also-rans to world-beaters. "It's gone from that sort of slightly downtrodden but at the same time arrogant feeling to a huge energy through the place," Newey tells us, before going on to entertain with anecdotes about his time working with F1 legends, including Nigel Mansell, Mario Andretti, Mika Häkkinen and Sebastian Vettel.

We'd also recommend you cast an eye over the grilling to which Christian Horner was subjected by his paddock peers for a unique 'They Ask The Questions' feature on page 66. And lest you think we've overlooked a certain young prodigy from Heppenheim, we have an extended chat with Sebastian Vettel, in which he reveals, somewhat ominously for those attempting to find a chink in his armour, that "the best is yet to come". The mind boggles as to how Seb thinks he can top four

back-to-back drivers' titles at the age of 26... but clearly he does, as he explains on page 42.

There is, of course, Formula 1 beyond Red Bull, even if their recent dominance has been enough to make you think otherwise. The position of Lotus, one of 2013's most creditable performers, remains a live off-season topic, as they seek resolution to the financial difficulties that have plagued them throughout the year, resulting in the premature departure of Kimi Räikkönen. Dieter Rencken attempts to unravel their travails on page 80 and one thing's for sure: the arrival of the Venezuelan petrodollars attached to Pastor Maldonado's new contract won't come a second too soon.

Talk of cash leads, inevitably, to Bernie Ecclestone, the man who has done more to enrich Formula 1 than anyone else, but also, now, a man facing more challenges to his absolute authority than ever before.

Veteran *New York Times* foreign correspondent John Fisher Burns, a Pulitzer Prize-winning journalist, met and interviewed Ecclestone earlier this year and we subsequently invited John to commit his thoughts to paper for *F1 Racing*.

"Perhaps the fairest thing to say of the Formula 1 chief," Fisher Burns reflects in his feature on page 102, "is that he is a deeply complex man, if also deeply flawed; widely feared, but also, for what he has made of the sport, widely admired."

Whatever your view of Mr E, it's a right riveting read.

Contributors



John Fisher Burns
Pulitzer Prize-winning *New York Times* bureau chief

As an acclaimed foreign affairs writer, John has met plenty of authoritarian leaders in his time – so who better to examine Bernie Ecclestone's reign (p102)?



Dieter Rencken
F1 Racing's tenacious business reporter

How can it be that one of 2013's grand-prix-winning teams stands at the edge of a financial precipice? Check out page 80 for Dieter's Lotus position



James Mann
Award-winning *Art of the Formula 1 Race Car* snapper

The doyen of in-studio car photography (and regular contributor to our monthly 'Now That Was A Car' feature) worked his magic on Red Bull's RB7 (p48)



Tom Clarkson
Special correspondent and stunt co-ordinator

He's cycled from John O'Groats to Land's End with Mark Webber, so a jaunt up Box Hill with Max Chilton (page 86) ought to be a cinch, right?



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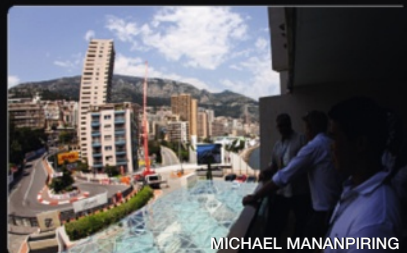
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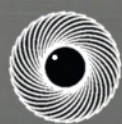
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Parade

Stars and gripes Lewis Hamilton hustles his Mercedes through the high-speed sweeps of the Circuit of The Americas. Running on the harder compound tyre, he sets the third quickest time in the final free practice session before qualifying.

He's fourth on race day – again, frustratingly just off the pace of the Red Bulls

Where Austin, USA **When** 9.12am, Saturday 16 November 2013

Photographer Mark Thompson/Getty Images

Details Canon EOS-1DX, 600mm lens, 1/30th at F18





Parade

Last action hero It was an emotional farewell as Mark Webber arrived at his garage ahead of his final grand prix in Brazil. He was greeted with a rousing rendition of *Waltzing Matilda* and his mechanics wearing cork hats: a fitting tribute to this popular Aussie racer.

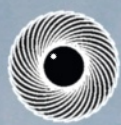
Where Interlagos, Brazil

When 1.20pm, Sunday 24 November 2013

Photographer Steven Tee/LAT

Details Canon EOS-1DX, 20mm lens, 1/250th at F3.5





Parade

No smoke without ire Felipe Massa nails the throttle to create wreaths of tyre smoke, following his final grand prix for Ferrari. The Brazilian was still fuming after being penalised for crossing the white line at the pitlane entry. He was handed a drive-through, which cost him a shot at a podium finish

Where Interlagos, Brazil **When** 3.39pm, Sunday 24 November 2013

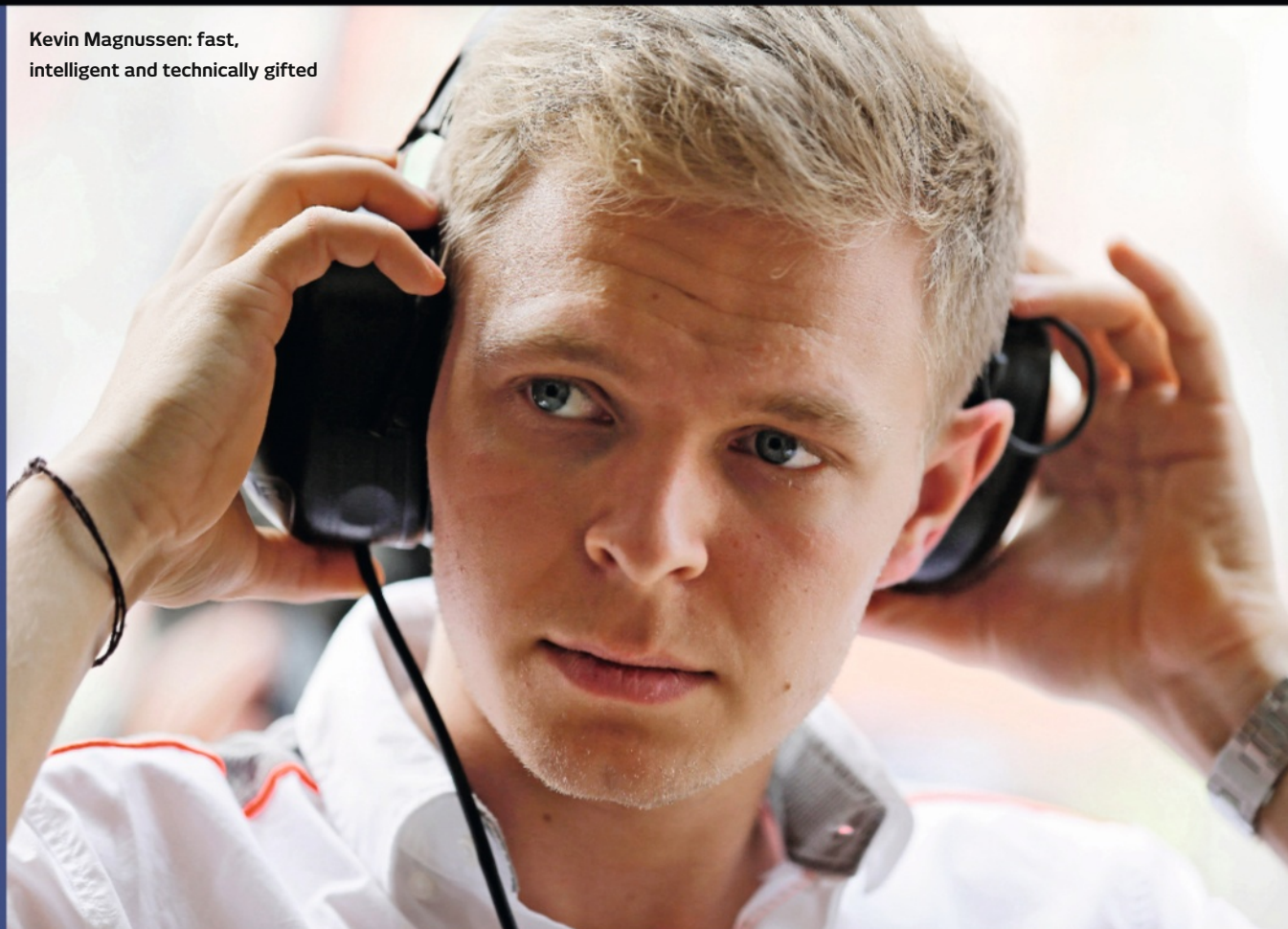
Photographer Charles Coates/LAT

Details Canon EOS-1DX, 300mm lens, 1/500th at F8





Kevin Magnussen: fast,
intelligent and technically gifted



ANALYSIS

Magnussen's move to McLaren: the truth

Why did Sergio Pérez lose his prized McLaren seat to rookie driver Kevin Magnussen for 2014?

The F1 driver market proved particularly volatile as 2013 drew to a close, and nothing illustrated its unpredictability better than McLaren's decision to drop Sergio Pérez for 2014 in favour of Danish rookie Kevin Magnussen.

It is a brave decision based on the team's belief that while Pérez is a competent F1 driver, he is not future champion material. Their logic is simple: Pérez was not as good as team-mate Button. He

was, on average, 0.2 seconds a lap slower in qualifying, and scored 24 fewer points.

And McLaren know exactly how good Button is – he might be the best in the world in mixed conditions, but in terms of absolute pace he is about 0.2secs behind benchmark drivers such as Lewis Hamilton. Not only that, but they believe that to extract the best from Button, he needs to be paired with a benchmark driver.

People who have worked with Button say he occasionally struggles to find the limit of the car. On a day where he thinks he's found the limit but hasn't, a team-mate like Pérez won't push him onwards. But pair him with a team-mate such as Hamilton and Button will realise there is more to be found from the car, and end up around 0.5 seconds faster.

So with the Pérez/Button pairing, McLaren found

themselves in a situation where not only was their car not very good, but their drivers were often leaving at least 0.2 seconds in the garage – sometimes more.

Magnussen, meanwhile, had proved in various tests that he is fast, intelligent and good in terms of technical knowledge and feedback. Pérez might not be a future world champion, but McLaren believe Magnussen *does* have that potential and concluded

they had nothing to lose by bringing him in to replace Pérez.

This conviction was not, however, unanimous. McLaren team principal Martin Whitmarsh implied throughout the summer, right up until the Abu Dhabi Grand Prix weekend, that Pérez would retain his seat. Elsewhere in the team, though, there was a determination that this should not happen. Other staff launched a concentrated push to change Whitmarsh's mind, with the vast majority of them making it very clear that they would be unhappy if Pérez was kept on. One source described the situation as "the middle-management ganging up on Whitmarsh", with some engineers even threatening to resign if Pérez kept his race seat for the following season.

Yet Whitmarsh was unmoved. He even told Pérez early in the week following Abu Dhabi that he had the drive. But then, out of the blue, he phoned Pérez back on the Friday of that week to say that decision had been retracted and they were now taking on Magnussen instead.

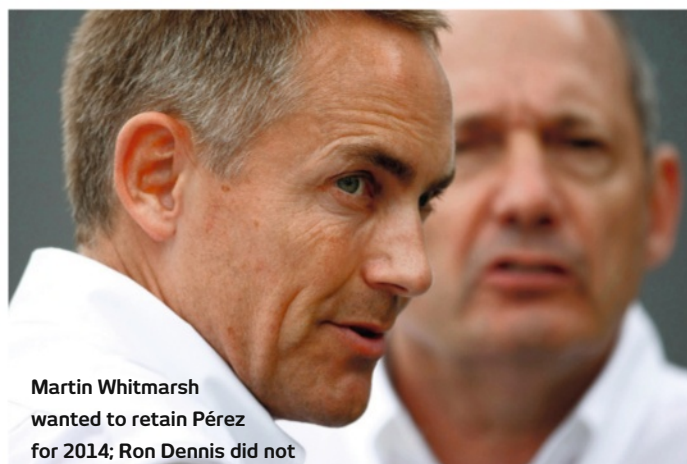
So what actually happened? It's still not entirely clear, but it is widely known that all is not well at senior management level at McLaren. Group chairman Ron Dennis's relationship with

the rest of the board has been fraught for some time; indeed, Dennis no longer has executive status within the team and has fallen out of favour with his fellow board members.

Insiders say Dennis has tried several times to reclaim the team principal's position from Whitmarsh. Could he have seized an opportunity to find favour within the team and get one over on Whitmarsh by mounting some kind of intervention in the week following Abu Dhabi?

This, after all, is not the first time Whitmarsh has been 'saved' from making a questionable driver decision. Back in 2009, he wanted to sign Nick Heidfeld for 2010 to partner Lewis Hamilton; indeed, he had negotiated a deal to do exactly that. He went on holiday before it was signed and while he was away, other members of the senior management team – Ron Dennis being key among them – seized the opportunity to sign Jenson Button instead.

The stakes are high for all involved in the decision to replace Pérez, though. If Magnussen struggles in 2014, those who argued so forcefully for his promotion will not look so clever. But if he succeeds, then fresh questions will be asked about how the team is run.



Martin Whitmarsh
wanted to retain Pérez
for 2014; Ron Dennis did not

WINNERS + SPINNERS

UPS AND DOWNS ON THE F1 ROLLER COASTER

GOOD
MONTH
FOR

The people of Frome

In the week after the Brazilian Grand Prix, Jenson Button surprised the inhabitants of his home town by driving his McLaren through the middle of Frome. Button also had the honour of switching on the Somerset town's Christmas lights.

Current presidents of the FIA

When David Ward revealed he had dropped his challenge for the presidency of the FIA, current incumbent Jean Todt was re-elected unopposed for a second term in office.

Access to the hidden corners of F1

Thanks to Google's Street View, you can now take a virtual tour around part of McLaren's Technology Centre in Woking. Enter through the front door and check out the line of classic F1 cars and trophies in the MTC's boulevard overlooking the lake.



Dr Helmut Marko

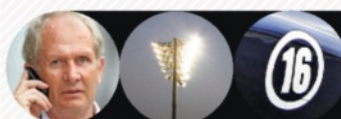
Both he and Jean Todt found themselves the butt of Sebastian Vettel's jokes, as the four-time champion performed impersonations of them during his acceptance speech, on being named International Racing Driver of the Year at December's Autosport Awards.

Electricity bills

It has been announced that as of 2014, the Bahrain Grand Prix will become a night race. The Gulf state successfully trialled a newly installed floodlighting system at a sportscar race in November 2013.

Sensible rulemaking

The FIA have announced for 2014 drivers will be able to choose their own numbers between 2 and 99 to keep for the duration of their careers. Also the F1 season finale will now be awarded double points. More sensibly, a cost cap will come into force for 2015.



BAD
MONTH
FOR

F1 Mastermind

Your chosen specialised subject: the world's greatest sport



- 1 What statistical landmark did Jenson Button reach in Brazil?
- 2 What nationality is Marussia test driver Rodolfo González (below left)?
- 3 In which year did Sauber first enter Formula 1?
- 4 Which former F1 circuit had bends called Double-Gauche de la Bretelle and Courbe de Pouas?
- 5 Which circuit held just one world championship F1 grand prix and had only two corners?
- 6 Which famous racing car designer was born on Boxing Day in 1958?
- 7 Who won the opening round of the 1979 Formula 1 season?
- 8 For which team did Max Papis race in 1995?
- 9 At which grand prix did Fernando Alonso (below right) score his first podium in Formula 1?
- 10 Which driver raced with the number '16' on his car in 2013?



THIS BOY CAN DRIVE

Keeping an eye out for the stars of tomorrow



Marcus Ericsson Who is he?

Ericsson is a 23-year-old Swedish driver, who raced for the DAMS team in GP2 in 2013.

How good is he?

Early on his career, Ericsson won the 2007 Formula BMW championship in the UK driving for Fortec. After spending some time racing in British F3, he moved to Japan and was F3 champion there with TOMS. Since 2010 he has raced in GP2, with varying degrees of success. He has won the odd race, but hasn't been consistently fighting at the front.

Anything else we need to know about him?

Ericsson completed a three day young driver test for Brawn GP in December 2009 at Jerez. And during the 2013 Brazilian GP weekend, Ericsson (who finished sixth in GP2 in 2013) was linked to a Caterham F1 drive for 2014.

F1 chances

It's no secret that Caterham are looking for a driver who can bring greater funding to the team next year. But while Ericsson has the cash, he would still be a surprising choice given that he has so little mileage in an F1 car.

NEWS

Massa's Brazil penalty dropped Ferrari to third in the constructors' championship



Demands made for permanent F1 stewarding

Ferrari boss Luca di Montezemolo seeks consistency in race stewarding, after Massa's Brazilian Grand Prix penalty

The controversial decision to hand Felipe Massa a drive-through penalty at the Brazilian Grand Prix could have far-reaching effects on Formula 1.

That decision cost Ferrari second place in the constructors' championship and £6million in prize money. Their president, Luca di Montezemolo, has made it abundantly clear that he feels the stewards were wrong, describing their decision as "disproportionate and unjust".

It wasn't just the money that motivated Di Montezemolo's ire: he used the same description for the penalty handed to Lewis Hamilton following his collision with Williams' Valtteri Bottas.

Di Montezemolo added: "Every so often, the gentlemen who come to the races to act as stewards make decisions that are a bit ridiculous and anachronistic. One needs to be careful that we maintain

credibility, for the work of the teams that invest money and for the drivers who risk their lives."

Di Montezemolo is a powerful force in F1. He is head of the company that runs F1's most significant team, and Ferrari are the only team with a seat on the FIA World Council, where the rules that govern F1 are adopted.

While di Montezemolo did not elaborate on what changes he would like to see, insiders report that he believes the idea of permanent stewards should be on F1's agenda.

He also made it clear that he was unhappy about what he sees as a too-lenient punishment given to Mercedes for their 'secret' tyre test in May. He said he expects "strong changes" in Todt's second term as FIA president "because for too many years the federation has always been the same and, as in everything, a change is required".



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PORSCHE

NEWS

Ross Brawn leaves Mercedes

But his immediate future in Formula 1 remains unclear



Ross Brawn's departure from Mercedes was finally confirmed a few days after the end of the 2013 season, ten months after its likelihood was first revealed.

Brawn was never going to be able to stay on as team principal in 2014, following Mercedes' decision to bring in Toto Wolff and Paddy Lowe to run their F1 programme. Mercedes were willing to retain Brawn in a different position, but he insisted that if he stayed he needed to be "the reference" within the team. In other words: the person in charge. That option was not available, so he chose to leave.

The question now is what will he do next? At 59, he is nearing retirement age, but the fact that he wanted to stay on as team principal at Mercedes suggests quitting to spend his time fishing, his favourite hobby, is not on his mind.

There have been all manner of rumours concerning Brawn's future, but few of them are realistic. The most recent was that he could return to Ferrari as team principal, with Stefano Domenicali taking on a different role. But senior insiders at the Italian team have

been dismissive of that idea. Another is that he could move to McLaren, who struggled over the course of the 2013 season. But, again, senior insiders say that is a non-starter.

Then there is Williams, who also look from the outside as if they could do with someone of Brawn's experience and expertise. But, again, insiders say that is not on the agenda, and sources close to Brawn say he is not interested in rebuilding a struggling team.

Another suggestion is that he could return to Honda as head of their F1 programme as the Japanese company begin their relationship with McLaren ahead of the debut of their new engine in 2015. Honda are said to be keen, and McLaren insiders believe a man of Brawn's standing is just what is needed at Honda to ensure McLaren deliver their best. But would Brawn want to work with Honda again?

The company left him in the lurch when they pulled out of F1 at the end of 2008, even if that contributed to the launch of Brawn GP. And one of the aspects of working with Honda that Brawn liked least, according to insiders,



Will FIA president Jean Todt make Ross Brawn his F1 commissioner?

was dealing with the senior management in Japan, and frequent trips to Tokyo.

Which leaves the FIA. Could Brawn be reunited with his old Ferrari partner Jean Todt, now the president

of motorsport's governing body? Might Todt think that Brawn is the man he needs as his F1 commissioner – a role he promised to create at the start of his first term but is still yet to fill?

Brawn could sharpen up the technical department, which some believe has lost its grip in recent years, especially in terms of policing Red Bull's developments. He could also be instrumental in helping Todt drive through cost-cutting: after all, at the last race of 2013, Brawn was voluble in his belief that the FIA must get involved in reducing costs.



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TITLE SPONSOR





Maldonado's money will be well received at cash-strapped Lotus

NEWS

Maldonado confirmed at Lotus...

Team choose well-funded Venezuelan over the talented Nico Hülkenberg for 2014

The final pieces in the driver-market jigsaw puzzle are falling into place as it was announced that Pastor Maldonado will join Romain Grosjean at Lotus for 2014.

Lotus were keen to sign Nico Hülkenberg, but the delay in completing their mooted investment deal with the mysterious Quantum consortium meant they had a £40million black hole to fill. The £30m of Venezuelan funding Maldonado brings with him means team owners Genii have to find only an additional £10million, as opposed to £40m plus a salary for Hülkenberg.

The team's preference was for Hülkenberg because they believed they would score more points with him, finishing higher in the constructors' championship and thus earning more prize money. But Genii's cash-flow issues – highlighted by

their inability to pay Kimi Räikkönen in 2013 – mean they need a cash-injection now, not in a year's time.

Hülkenberg will move back to Force India, where he is expected to be paired with McLaren reject Sergio Pérez. Adrian Sutil will swap drives with Hülkenberg, and Sauber are expected to stick with Mexican Esteban Gutiérrez as their second driver. They will use Russian teenager Sergey Sirotkin (who has joined them as part of an investment deal), as their reserve driver while he gains experience. Paul Di Resta, meanwhile, looks likely to drop out of F1.

Marussia's Max Chilton was hoping to move up the grid to Force India, but the arrival of Pérez means he is more likely to stay put. Caterham are still choosing their drivers. Current contenders include 2013

drivers Giedo van der Garde and Charles Pic, both of whom bring substantial income, Swedish GP2 driver Marcus Ericsson and Heikki Kovalainen. Of these, only Kovalainen does not bring money with him.



Hülkenberg: returns to Force India for 2014

OPINION

... but Di Resta set to lose seat?

After three years in the sport, the Scottish racer is struggling to find a seat for the coming season

Paul Di Resta is likely to be missing from the 2014 F1 grid, a situation brought about partly by the parlous financial state of many of the teams and partly by the Scot himself.

Di Resta comes with a small amount of personal sponsorship, but it's nothing even approaching the kind of funding Pastor Maldonado and Sergio Pérez bring with them. This means he has to rely on convincing teams that he is a worthwhile investment.

On that front, he has two problems. One was summed up earlier this year by the boss of a championship-winning team, who said: "Name me one great Paul Di Resta drive."

The other is the way he acts within F1. This is evidenced by his occasionally brusque manner on the car-to-pit radio when the

team make a mistake, and rumours about how he deals with team members behind the scenes. In F1, word gets around.

Deputy team principal Bob Fernley said Force India were not affected by these issues, but admitted others might be.

"In today's world, you've got to have two sides – in and out of the team," said Fernley. "In the corporate world, I don't think it would go down well and could limit opportunities."

Those words were uttered in Canada, after Di Resta's most infamous outburst this season, and since then the 27-year-old has



Paul Di Resta's future with Force India is looking very uncertain

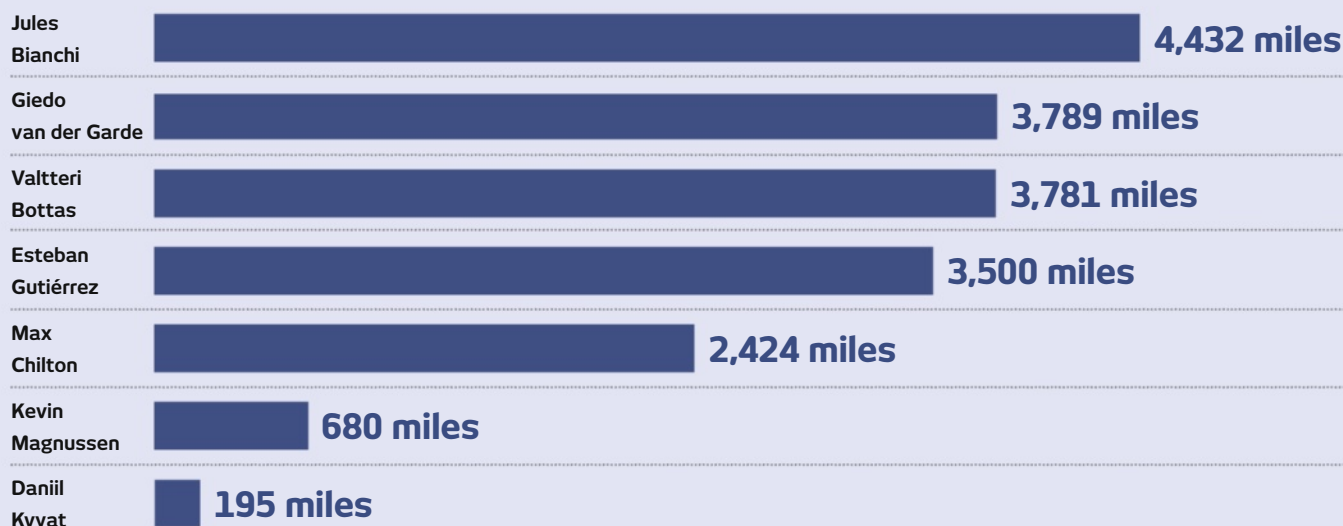
made an effort to present a better image to the media, taking a much more loquacious and amenable approach to news conferences.

Unfortunately, a reputation is easy to win and hard to lose. Having been passed over by McLaren and Ferrari, the man who beat Sebastian Vettel to the German F3 title when they were team-mates looks to be lost to F1.

STATS

Are F1 rookies getting enough mileage?

Lewis Hamilton ran more than 5,000 miles of testing before he started his first grand prix – here's how the novices of today compare...



NEWS



Ecclestone tips Horner as successor

Is Bernie serious about passing F1 baton on to Red Bull boss?

“Who will replace Bernie Ecclestone?”

It's a question that's been asked for at least two decades. But it has become even more pertinent in the wake of the bribery cases that currently envelop Formula 1's boss.

German company Constantin Medien are suing Ecclestone in London's High Court over allegations that he bribed Gribkowsky to undervalue the 47 per cent stake in F1 that was sold to CVC Capital Partners in 2006. That trial was due to end just after this issue of *F1 Racing* went to press.

Donald MacKenzie, co-chairman of CVC Capital Partners, admitted Ecclestone would be fired if convicted. Ecclestone himself acknowledged that was so, and went on to say that he sees Red Bull team principal Christian Horner as the “ideal” successor.

“It needs someone who knows the sport,” Ecclestone said. “People deal with me because they know me and they trust me. They know I am straight with them. That is how it is with Christian. I hope we can do it.”

Horner has distanced himself from the idea. “It's flattering, but my focus is fully on this team for the foreseeable future. I can't see how any individual can replace Bernie. What he does is unique and it will be a sad day for the sport when he's no longer here.”

When Ecclestone makes this sort of remark, it's hard to know if he is joking. Ferrari president Luca di Montezemolo, certainly isn't taking it seriously: “Ecclestone sees Horner as his successor? As the years go by, he more and more enjoys making jokes... I'm happy he still has the desire to do so.”

NEWS

New calendar confirmed

Proposed races in Mexico and Korea have been dropped from the 2014 schedule to leave a total of 19 grands prix

Formula 1 will consist of 19 races in 2014. The news comes after the collapse of plans to hold new races in the USA and Mexico. Korea has also been dropped, following a failure to agree a new deal with F1 boss Bernie Ecclestone.

The mooted New Jersey race had always been greeted with scepticism, and it is still unclear why it's been postponed for a second year. Ecclestone says the organisers failed to raise funds; the organisers say they have the money; and it's also thought there were problems getting the track ready.

Time was the problem for the Mexican Grand Prix – there was not enough of it to reconfigure the Autódromo Hermanos Rodríguez in Mexico City for 21st century F1 and a November 2014 slot.

That means there will now be just two new additions to the calendar, as opposed to the original four. The Russian Grand Prix at the Black Sea resort of Sochi will be held on 12 October, a week after Japan, and the Austrian Grand Prix returns on 22 June at the Red Bull Ring, two weeks before the British race.

2014 CALENDAR

	Australia	16 March
	Malaysia	30 March
	Bahrain	6 April
	China	20 April
	Spain	11 May
	Monaco	25 May
	Canada	8 June
	Austria	22 June
	Great Britain	6 July
	Germany	20 July
	Hungary	27 July
	Belgium	24 August
	Italy	7 September
	Singapore	21 September
	Japan	5 October
	Russia	12 October
	USA	2 November
	Brazil	9 November
	Abu Dhabi	23 November

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Pat Symonds

F1TAPASS TECH

Explaining the hidden brilliance that drives Formula 1 forward

THE SCIENCE BEHIND...

Circuit design

We often hear complaints that the new circuits are not as exciting as the traditional tracks – why is this?

Well, I think I might challenge that statement. Of course some of the old tracks have fabulous features, but equally some of the so-called classics produce some rather unexciting racing. Before the advent of DRS, Monza for example produced very processional racing. Of the new circuits we have had both good and bad, with Istanbul and Singapore among the best, and the Valencia street circuit being the worst.

Monaco is often regarded as the jewel in F1's crown, but that's more because of what's

happening off-track rather than the quality of racing that the circuit itself produces. Personally I think the thrill of seeing something as improbable as the sight of a Formula 1 car threading its way between the narrow ribbons of Armco is spectacular, but as a sporting competition Monaco is rarely exciting.

So why can't every new circuit resemble Spa?

Interestingly, Spa is no longer the challenge it once was and this raises the question of how a circuit can keep pace with the constant improvement in capabilities of F1 cars. It wasn't

so long ago that Eau Rouge was considered a formidable challenge; now it's merely a kink on the straight and is taken flat-out by even the least capable cars. The reason is that cars develop constantly, whereas circuit infrastructure is harder to alter, so eventually even the toughest corner will be handled with ease.

Currently Suzuka presents the greatest challenge to both the engineers and drivers, and even though the infamous 130R corner has been neutered, the complete circuit provides both a technical and a driving challenge.

Hermann Tilke is quoted as saying that building a corner that is right on the limit might work for one set of regulations, but just a year later that same corner could easily be taken flat-out. Does this mean that the fault lies with the car designers rather than the circuit designers?

The car designer's job is to extract maximum performance from a car and to develop that performance in an incremental manner. Unfortunately we can't expect circuits to remain in line with a car's capabilities in quite the same way, since tightening the curvature of a 150-metre radius curve is no small undertaking. Even more importantly, a circuit must remain safe when having to deal with the ever-increasing cornering capabilities of F1 cars.

At maximum speed, a Formula 1 car has a huge amount of kinetic energy, and the circuit designers must, before any other consideration, ensure that in the event of any accident this energy is dissipated in a way that gives maximum protection to the driver and spectators. This means that many aspects of circuit design are far from random. The FIA uses a computer simulation program known as CSAS (Circuit Safety Analysis System), which is designed to calculate the appropriate size of run-off area needed and the type of barrier required in each corner. Of course, the teams use such simulations to predict lap times and handling characteristics of the cars on the racing line, but what is unique about CSAS is that it predicts



The type of barrier used in each corner is selected using a safety simulation program



Run-off areas make it easier for drivers to rejoin the race



WHAT WOULD BE YOUR IDEA OF THE PERFECT CORNER IN FORMULA 1?

Ideally, you want a corner that becomes increasingly difficult, rather than opening up and becoming easier. A tightening radius that requires braking while generating significant lateral force is always difficult.

Turns 13 and 14 in Malaysia and Turns 9 and 10 in Bahrain are good examples of this. It is this type of corner that becomes a 'mistake generator', thereby rewarding the good driver and punishing the less skilled.



Newer Tilke-designed tracks like Austin are required to prioritise safety above exciting racing



Turn 1 at Austin features the wide run-off areas that are now a feature of all modern Formula 1 circuits

the trajectory and impact signatures of a car once control has been lost.

If the topography of the land on which a circuit is built permits, then there is no reason why it should not have fast and challenging corners. These corners will, however, always be bordered by the large run-off areas that in themselves appear to lessen both the challenge and reward for a perfect lap. These run-off areas present both pros and cons; while they do detract from the overall spectacle, they have the advantage of keeping cars in the race rather than beaching them in beds of gravel or smearing them along the walls of Armco.

All fans enjoy watching drivers overtake. So do wider entrances to corners offer more overtaking opportunities?

In theory they probably do make it easier, since they give competitors the choice to enter the corner with a line that goes deep into the apex, followed by a sharp turn, or a more gentle entry that allows the driver to roll the car into the corner and choose a fast exit. In reality, what often negates this opportunity is the very factor that has increased overtaking in general – namely, soft tyres.


Sticky tyres that have high degradation

make for exciting racing when different cars have divergent performance profiles through a race. Unfortunately, the consequentially high rate of wear leaves little rubber 'marbles' scattered all over the racing line. These marbles don't just diminish the grip when a car runs onto them but, as they stick to the tread surface, they can compromise grip for several corners until the tyre is clean again. For this reason, cars tend to stick to a single racing line and the extra track width afforded by a wide corner entry is effectively wasted.



Tilke: unfairly accused of designing dull tracks

We can't really have more than one racing line through a corner then?

It is possible, although it would certainly be difficult. Circuits with high banks, such as Daytona, have different bank angles at different areas across the track, thereby allowing different zones of the asphalt to be used, but it is doubtful that this would work with F1 tyres. The best we see is during wet conditions, when adhesive grip is no longer relevant and increased grip can sometimes be found off-line, where the surface roughness is greater. In addition, wet races have always brought more overtaking since it is much easier for the drivers to make mistakes, thereby allowing a following driver to find a way past. 



Rubber 'marbles' created by softer tyres tend to dictate a single racing line

INSETS: STEVEN TEE/LAT; ANDREW FERRARO/LAT; ALASTAIR STALEY/LAT; CHARLES COATES/LAT



Peter Windsor RACER'S EDGE

Authority, wit and intelligence from the voice of *F1 Racing*

FORMULA 1 MUST KEEP MOVING FORWARDS

Much of this edition of *F1 Racing* is devoted – correctly so – to the brilliance of Infiniti Red Bull Racing-Renault. It's difficult, sometimes, to overstate the quality of their work. The results say it all; the consistent balance and grip and reliability of the car have stunned the motoring world. And whichever way you cut it, I think Red Bull are bound for continued success in 2014. I say this for three obvious reasons.

First of all, the phenomenally successful Adrian Newey-Sebastian Vettel partnership will continue unabated. Yes, there's a new driver in the other car; no, development will not be affected. Daniel Ricciardo knows his role – and Seb, of course, is perfectly tuned to the Adrian way of doing things. He is Schumacher-fast without the tension; he knows instinctively when to be quick and when to relax. If Adrian is your guiding light, nothing else matters so long as you never lose focus. James Allison is good – but he won't slide straight back into Ferrari the way Adrian continues to slide back behind his drawing board, day after day, night after night.

Second, I see little change at Red Bull. Yes, Adrian's lost an important member of his aero team, Peter Prodromou, to McLaren – but then Adrian's always been his own man. It's what's in his head that makes the difference. And his genius is not only in the field of aero. It's also about packaging, aero architecture, having a feel for the right compromise, anticipating problems before they occur and reaching the chequered flag. Any technical team is only as

Other teams take note: the unbeatable Vettel and Newey partnership will continue

good as the leader who has put it together – and in this case, the team leader at Red Bull also happens to be the *world* leader. End of story.

Three, the new regulations are perfectly timed. It's hard to think of any successful engineer with the sustained motivation of Adrian Newey, but I guess even he has a tipping point. I'm not saying he would have reached this in 2014 but I *am* saying that the new engine regulations will bring new creativity. Adrian is more than just an aerodynamicist: 2014 will be as much about systems and packaging as it is about engine efficiency and aero. In all these cases, Adrian's your man. Renault? They're no AMG Mercedes High Performance Powertrains, that's for sure. But then Adrian's team are not Merc, Ferrari or McLaren. Red Bull are more compact, less precocious. So it is with Renault. Discount them at your peril. For they, too, race with Adrian's ethos.

What I *do* see in 2014 are a number of imbalances in the sport as a whole. The new engine regulations bristle with futuristic technology, and yet in other ways F1 continues to drag its feet; the divisions are absurd. What, for example, is being done about an ongoing reduction of costs? Despite earnest words, FOTA and the Resource Restriction Agreement are clearly confined to the past; the new engines cost *more*, not less. Fortunes are being spent at Ferrari and McLaren on windtunnel updates – and you can name your noughts when it comes to guessing the combined engine budgets of the Big Three. The new regulations are going to be sophisticated from within the pitlane and complicated when viewed from the grandstand – or from your living room. Are the on-screen graphics going to be interactive and user-friendly enough for fans to know the exact fuel-flow and ERS rate of every car of their choice? Are there going to be *any* interactive graphics, for that matter? And what's all this ERS/KERS business anyway? I don't know of any major car manufacturer who uses this vernacular. Why can't F1 just call them 'hybrids' like everyone else?

And what of the more mundane aspects about which I have been moaning for far too long? Why don't the most technically advanced racing cars in the world feature something as basic as self-starters? There's even more reason to fit them now because of the massive reserves of battery power stored on-board. Why aren't we learning from the past and





Will there be any graphics to reflect the intricacies of 2014's energy recovery systems?

making greater cuts to aerodynamic downforce along with the new engine regs?

Finally, what about Wing Commander Andy Green? He was there in Brazil, his amazing brain ready to be tapped. My bet is that the F1 people who did take the trouble to meet him spoke only about his specific plans for the build of his Bloodhound SSC, with which

he is seeking to set a new landspeed record by breaking the 1,000mph mark. For me, the best thing about Andy is his approach to *The Show*. Not for him an exclusive, lucrative TV rights deal that will inevitably bind the project to media geo-restrictions; instead, Andy and Richard Noble realise that their programme has a 24/7 life in the 18 months *prior* to the

record attempt. It's a life that will be brought to the world by the internet – just as the recent, amazing, America's Cup attracted millions of new viewers who watched the run-offs livestreamed, for free.

That has to be the future of F1 on a global scale: Andy and his team are even building a special, towering mast on the site of the record attempt – in the middle of the African desert, in the Hakskeen Pan – to facilitate the real-time internet coverage. It is from that free-to-watch global exposure that the sponsorship dollars will come.

It's time, as the new regulations become reality, for F1 as a whole and the F1 teams individually to appreciate that *their* TV show runs from 1 January to 31 December, 24/7. The races are merely the equivalent of 20 or so movie premieres screened on geo-restricted

"F1's human story needs to be told to a new, young YouTube generation as it happens, not when it's over"

platforms prior to major distribution. The beauty of engineering lies in finding the *solution* – and that human story needs to be told to the new, young YouTube generation as it happens, not when the fascinating work is over, the red carpet is unfolding and the lucrative TV rights agreements are swinging into action. It's the F1 sweat – the problem-solving by brilliant people – that will in the future give the technology the respect and exposure it deserves come race day.

Without it, certain Sundays in 2014 could bring more 'technical' victories that are boring to watch (for the world at large) and incomprehensible in the face of the money spent in order to get there. There will be no *depth* to the achievement, no *feel* for the engineering.

And yet that depth and feel are in my view what the new regulations are all about; they are the future of F1. **F1**

Wing Commander Andy Green: taking a forwards-thinking approach to securing sponsorship



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Dieter Rencken

POWERPLAY

The stories F1's bigwigs would rather you didn't know...

WHY THE HIGH COST OF HOSTING RACES IS STRANGLING THE F1 CALENDAR

It's not unexpected that the 2014 F1 calendar – finalised in early December – has 19 rounds when early drafts had listed up to 22. For while there are compelling commercial reasons for the calendar to expand, hard commercial realities are preventing it from doing so – and F1 needs to take note.

For years Bernie Ecclestone has said he gets more race applications than he has slots, yet only once (in 2012) has the list reached 20. Recent seasons have hovered around the 18-19 mark, despite his objective of staging 24 rounds a year. The logic is simple: expanded calendars equal greater income for FOM via hosting fees and peripherals such as Paddock Club, 'bridge and boards' signage and merchandising areas. They also let FOM inflate TV contracts on the basis that F1 attracts incremental 'eyeballs', thus generating higher advertising revenues for broadcasters.

True, there are higher costs, particularly for teams. But these can be recovered via sponsors (through greater exposure in other territories) while marginal costs such as travel are compensated by greater income. On average, FOM net £20m per round, so the 'missing' three races amount to a 'loss' of £60m to F1's commercial rights holder. The sum comes straight from the bottom line of CVC Capital Partners.

Given that they siphon off profits from F1, CVC will find few who feel sorry for them. But F1's 11 teams lose out to a similar degree. The loss is an average of £7m per outfit – money that could do wonders given the parlous state of several squads, what with suppliers and drivers going unpaid at both ends of the grid.

So, from commercial rights holder through teams, sponsors, advertisers and broadcasters, and ultimately fans (who would have more races to watch or even

attend, in some instances closer to home, such as Mexico and South Africa), there are many who stand to benefit from more grands prix. Why, then, did FOM fail to assemble at least a 20-race calendar, given the advantages across F1's spectrum?

For the reason, look no closer than F1's hosting model. Race promoters part with huge fees (up to

£30m per annum) and all trackside marketing, catering and hospitality rights. In effect, they cede their entire facility to FOM for the privilege of hosting a GP – in return for the right to sell tickets, and nothing more.


So promoters cover all operating expenditure, overheads and marketing costs, plus they are responsible for maintaining hugely expensive facilities to FIA standards, and yet must consider themselves blessed to move 100,000 tickets at an average £250 a hit. Do the maths: £25m for a full house, or equal to the fee shelled out to Mr Ecclestone – and that's before promoter expenses and related costs...

That's assuming the promoter gets a full house in the first place. Bad weather, lack of interest in emerging countries, apathy engendered by prematurely won titles, inconvenient calendar slots that clash with local activities, and (increasingly) other grands prix in the same geographic region, can all reduce attendance.

Part of FOM's pitch is to encourage promoters to build space-age circuits; once committed, their operators have little choice but to stage races in the hope of recovering their investments. However, when some promoters realised MotoGP offered better deals, they switched. So F1 began to push for street circuits upon which two-wheelers cannot race safely – hence Valencia, Singapore and the much-vaunted New Jersey, plus semi-street venues such as Abu Dhabi and Korea.

The number of circuits to have disappeared from the calendar is illuminating. Magny-Cours and Imola dropped off after many years. Silverstone, Hockenheim and Nürburgring find their existence threatened by the expense of their F1 contracts – Britain's circuit has been sold and the Nürburgring recently liquidated. Austria's former A1-Ring returns to the calendar for 2014, but only after a massive cash injection from Red Bull.

Since 2000, ten have joined the fray: Indy (2000), China (2004), Bahrain (2004), Turkey (2005), Valencia and Singapore (2008), Abu Dhabi (2009), Korea (2010), India (2011) and Austin (2012). Five have gone in spite of the vast sums spent on their facilities. New Jersey was twice listed and aborted, while Mexico failed to happen. Of the survivors, China came close to being dropped. And why is Africa the only continent without F1, despite a following from Cairo to Cape Town?

The situation is unlikely to change any time soon unless F1 totally adapts its hosting model. As is too often the case, the ultimate losers are the fans – although CVC are also taking a hit... 

"Silverstone has been sold, its existence threatened by the expense of its F1 contract"



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VALTTERI BOTTAS

ROOKIE YEAR

The Williams racer reveals all about his first season in F1

OUR STRONG RESULT IN AUSTIN HAS GOT US LOOKING FORWARDS

My first season of racing in Formula 1 for Williams has come to an end, and I'm delighted with the strong finish we've had to the year. To score those valuable points in Austin was a great boost for the whole team.

We haven't had the most competitive chassis this year, but we made some tweaks to the car in Abu Dhabi, in particular by not running the Coandă-style exhausts, and immediately found more pace. Then we went to Austin and had a pretty much near-perfect weekend. I came third in first practice and finished within the top ten on Saturday morning.

To be quickest in Q1 and fourth fastest in Q2 proved that the car had genuine pace over one lap. This was the first time we'd reached Q3 in dry conditions – the last occasion was at Montréal in the rain.

In Austin, the circuit really suited our car and we managed to get on top of the tyre temperatures and pressures. Our only concern was whether we could maintain that one-lap pace in the race itself. I thought we might find ourselves in a position where we would be able to fight for points but, to be honest, I was slightly concerned about the hotter temperatures on Sunday.

Right from start of the race, everything came together for us: the strategy, the pitstop, the communication with my race engineer Jonathan Eddolls – there were no problems and it was a great feeling to be able to fight for positions.

In the first stint of the race I was delighted to be able to keep up with Fernando Alonso in the Ferrari, and then the move around the outside of Esteban Gutiérrez's Sauber was a great example of the sort

of thing we can achieve with a quick car. At the end of the race I came under pressure from Nico Rosberg's Mercedes. I could see that he was catching up with me, yet I was able to up my pace and keep him behind to finish eighth at the flag.

Crossing the line and scoring my first points in my rookie season felt really good. In the garage after the race, everyone was high-fiving each other and there was such a great atmosphere among the mechanics and engineers. This result came at exactly the right time for us, because it has motivated everyone in the team.


"Right from the start of the race, everything came together for us: the strategy, the pitstop, the communication... it was a great feeling to be able to fight for positions"

Next year is going to bring in such a massive change in terms of the new regulations. But I'm confident that if we keep on working hard then we'll be able to achieve even better results.

Personally I'm delighted that my future with Williams has now been decided and that I will be staying on with them next season. Of course I knew a few races before it was announced, but I'm very happy that the news has been made official now. For me it felt completely natural to continue with Williams. They gave me the opportunity to come into Formula 1, first as a test driver, then as a race driver, and I must thank them for believing in me.

Joining us next year is Felipe Massa, who drove his last race for Ferrari in Brazil. We're all excited about having Felipe at the team, and I'm sure he's going to bring to us a wealth of experience – and speed. I'm really looking forward to working with him.

Having spoken to the engineers about next year's car, it's going to be interesting to see what techniques the other teams will use to try to claim back the downforce we will lose through the regulations; technically it's going to be a great challenge.

Also next year, we will have a new engine supplier in Mercedes. I've only heard good things from them and I have full confidence they'll get everything right immediately. Reliability will be so important next year, so if we can achieve that, and have a car that is on the pace, then hopefully I can repeat what I did in Austin and score some more world championship points. 

Bottas recorded Williams' best result of the year in Austin – finishing in the points in eighth place





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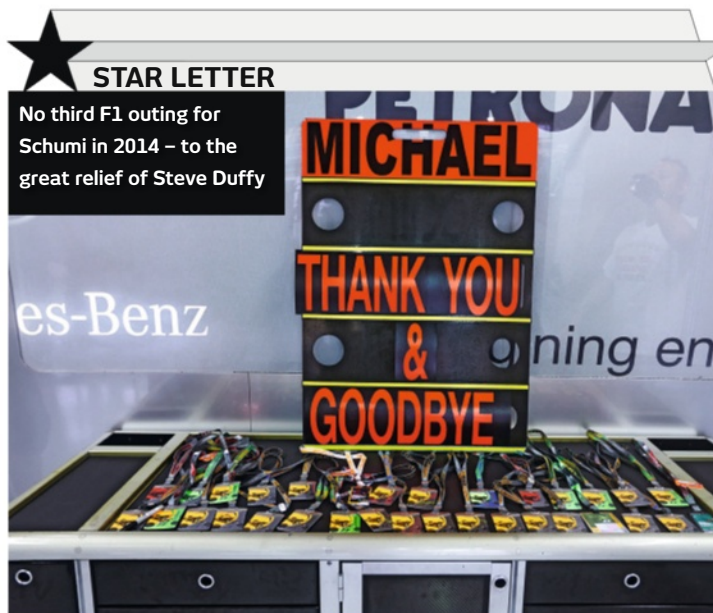


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STAR LETTER

No third F1 outing for Schumi in 2014 – to the great relief of Steve Duffy

It's not *au revoir*, it's definitely goodbye

I can't have been the only person to have breathed a huge sigh of relief when I read that Michael Schumacher had rejected an offer from Lotus that would have seen him come out of retirement for a second time.

While I appreciate that in many situations an experienced hand can help steady a ship (particularly when Kimi Räikkönen has jumped said ship), isn't it about time F1 started looking forwards rather than back?

Today's rookie drivers need to be given more of a chance, or the gap between the likes of Sebastian Vettel and the rest of the field will only grow wider. I mean no disrespect to Michael Schumacher: I understand that the seven-time world champion is still physically fit and no doubt very able behind the wheel of a Formula 1 car.

I sincerely hope, however, that his future attendance at forthcoming races is in corporate hospitality – hopefully, then, his belly will swell to a size that will prevent him from entering the cockpit of an F1 car!

Steve Duffy
Essex, UK



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We go behind the scenes at Red Bull to meet the people responsible for F1's biggest success story

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RENAULT V8

Up close and personal with the engine that powers the team



"THE BEST IS YET TO COME"

He's four world championships into a stellar career – but, as Sebastian Vettel reveals here, in his own words, his greatest achievements lie ahead...

PICTURES VLADIMIR RYS



don't think of myself as standing out. I'm not completely aware of what the achievements of the past few years mean – and I'm happy not to be aware. To drive in Formula 1 has been my dream and I enjoy racing. To be this successful

– of course, I take it and it makes me very proud. Equally, every race is a new challenge, so I'm not lacking motivation because I know how hard it is to deliver when you're inside the car. On the Saturday in Abu Dhabi I was second in qualifying, I'd tried a bit too hard and Mark Webber did a better job than me. Afterwards I wasn't happy.

Now you could argue, 'Calm down, you won the championship,' but it's part of me – I'm ambitious, I want to win and if there's a chance to win I'll take it. That's why I'm always looking forward to the next race. We've had many great moments but I believe the best moment in my life is yet to come. It would be quite sad if at the age of 26 I looked to the future and said my greatest moment was two years

ago, or four, and that there was nothing to look forward to.

Every season is always a big challenge. You start early – January, February – and winter testing wasn't as productive for us as we were hoping this year because the conditions were poor and the tyres didn't last. We went to Australia not knowing how competitive we were, although we knew we'd made a good step over winter. This was the second year with this type of car, and at the beginning of last year (2012) we struggled a bit to understand the concept but we had a strong finish. Then in Australia this season, we started off on the right foot.

Taking care of the tyres has been the challenge throughout 2013, and of course Pirelli changed

them halfway through; the most important thing is that we kept understanding them, designing the car around them and getting more and more performance out of the car. The races after the summer break were an incredible run.

These tyres are difficult to drive: extremely sensitive. It helps when you are in free air; less so in traffic. But we got the hang of them more and more towards the end of the year – looking after them, *really* listening to them and so being able to extract maybe a little bit more performance than the other guys. But I don't think there's any secret genetically.

It's hard to describe the technique of getting the most out of the tyres, difficult to explain what the car needs. But that's part of →

the job. Understanding the car more towards the end of the season made us more competitive; inside the car you had the ability to listen to the tyres, to know what was going on. There are certain things you can do to protect them, but the balance of the car must be right. It's the old thing: when you feel right inside a car it gives you room to play. The mindset is pretty straightforward.

I remember when I was a small kid watching Formula 1, and Michael was with Ferrari and

dominating F1. They had a very strong car, a very strong team spirit for many years and, if you look back, you feel as if he won every second race. But to equal some of the stuff that they managed to achieve is very, very special for me – and also, I think, for the whole team. The spirit inside this team is so strong; it gives me so much power that it's a pleasure to jump in the car, and go out for the guys and try to give it all I have. I'm very thankful for what these guys do.

If you look at their pay cheques at the end of the month, you'd be surprised if you could do the amount of hours that they do. It's a team effort at the end of the day.

I don't like the word 'domination' because it makes things sound easy. People see you win eight races in a row. They don't see the challenge it takes, every single race, to nail it. It's been exceptional. The fact that we got everything right: smooth pitstops, reliability. All these things need to come together. Definitely

after 2011, which was a special year, we said it would be hard to repeat a season like that, and maybe it comes once in a lifetime. Now, we can say it came twice at least.

A secret of the team's success is the way we live in the moment. We love racing. We don't need extra motivation. When I jump into the car I'm not thinking of what has happened before or what is going to happen in the future, I'm just thinking about the practice session, qualifying or race ahead,



FOUR-TIME CHAMPIONS COMPARED

At the point they collected their fourth drivers' crowns, this is what each of F1's four-time champions had achieved

	Age	Starts	Wins	Poles	FL
Fangio	45	42	20	24	20
Prost	38	197	51	32	40
Schumacher	32	156	51	41	43
Vettel	26	117	36	43	21

and trying to get everything out of it. Obviously as a team you have to plan for the future a bit – to prepare for the next season, which is going to be different in many ways – but, nevertheless, you have to focus on and manage what's going on around you. And that will give you a better future as well! Getting good results is a great motivation for the team – for everyone at the factory – because success makes you feel that it's worth every single hour of the hard work you put in.

"A secret of the team's success is the way we live in the moment. We love racing. We don't need extra motivation"

I go to the factory many times a year to prepare in the simulator, which is becoming a more important tool, and occasionally to talk to the people at the factory, to give them some insight into what's happened at the last race – more than the normal feedback. It's important for them, because they put in a lot more hours than I do, and it's nice to give a little bit back.

We take the simulator very seriously, because although it will never be quite like the real car, it →





Title number four at the age of 26: "Right now I'm very happy with what I do"

gives you a very good idea – not just in terms of learning new circuits or getting back in the rhythm for certain tracks – about what new things you can try with the setup. Then you can limit the number of tests you have to do at the track based on what you've learned in the simulator. You end up with a better car on Friday and Saturday, and a great car for Sunday.

There are always new challenges and lots of work to do. For sure

there's next year with the new regulations, but look back at the past few years: in 2009, we were developing a car around a double diffuser that wasn't supposed to be there; in 2010 we were really discovering the power of putting the exhaust in the right place and making use of that – we lost it for 2012 and this year we've been coming back from that. We're always running out of parking space at the factory because we keep growing.

As a driver you always want to work with the best team. I'm not thinking about going anywhere else. When I joined F1 I got a chance with Toro Rosso, and I had to prove myself because my ambition was to be in the best car. To be called up

by Red Bull was a massive upgrade for my career. Next year Daniel Ricciardo arrives; it's hard to judge right now but I think he'll do a good job and try to give me a hard time.

Equally, you look back at the driver line-up in 2009. Mark was already there and was a strong element of the team – if you want a successful future, why take a chance on a young driver? Why not spend more money on a more established driver to guarantee success? Luckily this was not Red Bull's approach, which is why I'm here now.

Mark and I respect each other as team-mates. We've respected each other's ability, even when we've been fighting on track. Over the past five years we've got to know each other very well. I know his strengths and – not *weaknesses*,

always to stay at 100 per cent from the first race to the last.

There's more travelling now, because there are more overseas races. You have to learn to say no and set your priorities to decide what's important. What's important for me is to deliver 100 per cent when I'm in the car.

When I crossed the line in India, I was empty. I took ages to think of something to say. I wanted to say so many things, but I just couldn't. It was not an easy season, even if people on the outside believed we'd had it in our hands for a while. And it was tough for me personally. To receive boos when you haven't done anything wrong – to overcome that, give the right answer on the track, and finally get the acceptance we all look for as racing drivers... it makes me proud to join people like Alain Prost, Juan Manuel Fangio and Michael Schumacher.

Even if I were to move to another team I would still have people who doubt me or don't like who I am or what I do, so it wouldn't change much in the end. You have to be happy with yourself, and right now I can assure you that I'm very happy with what I do.

I must thank my parents because they never put any pressure on me. They spent a lot of time with me and sacrificed their lives in a way, but we had a good time together. Even if I wasn't in Formula 1 and was successful somewhere else – say, studying and having a normal job – I would look back and say we had a nice time we spent as a family. When I was a child, it was a dream to race in F1 but it's wrong to say that it was a target. Later on, when I was 15 or 16, yes, I had a target. But now, looking back, it was difficult to grasp.

As I said, it's a long season, with lots of air travel, so it's important afterwards to appreciate time at home, to calm down and chill out. That's what we're all looking forward to over the short winter that lies ahead. 

"When I crossed the line in India, I was empty. I took ages to think of something to say. I wanted to say so many things, but I just couldn't"

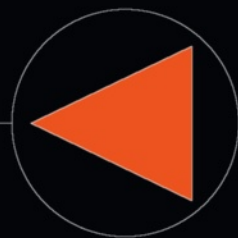
but the corners where I have a bit of an advantage, and vice versa. It's always been close, maybe closer than people remember. I appreciate that and therefore have enormous respect for him. We didn't have the best relationship on a personal level, but we were very successful for the team, winning four constructors' titles in a row by scoring points together.

It's a long season. Other sports have more of a break – we get a few weeks in winter and a couple of weeks in summer now there are more races at the end of the schedule. There's not much time to recover. It's hard to stay at the same level, although your target is





Now that was a car



No 23: The Red Bull RB7

We've now grown used to Red Bull dominating F1, but it was with this car that they established their crushing superiority to earn the second of their four championship doubles

WORDS MATT YOUSON PICTURES JAMES MANN

When the covers first came off the RB7 in Valencia in February 2011, it was a clear evolution of the two cars that had preceded it. For chief technical officer Adrian Newey, this was a vindication of the blue-sky approach his team had taken in response to 2009's rules changes: "Luckily, 2009's RB5 was a sound car and one that we were able to evolve. There were big regulation changes along the way; the double-diffuser coming →





in; KERS coming back; the F-duct; developing the exhaust solution, which we then took a step further. All quite big changes, but changes that we could fit into the basic philosophy of that 2009 car."

While the RB5 and RB6 faced great upheaval during their life cycles – one having a double-diffuser retro-fitted, the other having to accommodate a version of McLaren's F-duct – the effectiveness of the fundamental concept wasn't compromised. Given a more stable environment for 2011, the team were therefore able to focus on optimisation, on integrating KERS into the package, and on adapting to the arrival of a new tyre manufacturer.

Red Bull didn't bother with KERS during 2009, so developing and packaging it was a key challenge for 2011, when the technology returned. "We are a chassis manufacturer," says Newey, "which means aerodynamics and regular mechanical systems, not KERS. So

"Vettel put the RB7 on pole at the first GP of the year even with KERS out of action"

we've been teaching ourselves and learning as we've gone along, without having any specialist support. Most of our problems revolved around trying to get ourselves up to speed and understanding what was quite a complicated technology."

Typically, Newey packaged the KERS aggressively, locating the batteries by the gearbox bell-housing rather than under the fuel tank, as Red Bull's rivals did. This made it difficult to access in the garage, and more vulnerable to extremes of temperature and vibration. But even then, Sebastian Vettel put

the RB7 on pole at the first GP of the year with the system out of action.

Having successfully implemented a more efficient version of McLaren's F-duct during 2010, Newey's group weren't wrong-footed when the FIA enshrined a modified form of the technology in the 2011 rules. But although the drag reduction system (DRS) gave a welcome top-speed boost, Vettel was still able to pass Fernando Alonso and Lewis Hamilton in Korea without using it.

For the past four seasons, one of the dark arts of F1 has been the science of harnessing



exhaust gases to optimise the efficiency of the diffuser, the aerodynamic device below the rear wing. Every year the FIA has tried to clamp down on this area, but the cleverest engineers always find ways around it.

Red Bull's success here can, in part, be ascribed to their close working relationship with Renault – one that has grown even tighter since Renault sold their own team to focus solely on engine development.

"We knew we had to do a good job for Red Bull, but doing a good job with a new team in new circumstances was a learning curve," says Renault Sport deputy managing director Rob White. "As time has gone by, we've learned to work more effectively with Red Bull as the confidence has grown and the commitment of Renault to Red Bull and Red Bull to Renault has increased. We were able to learn with Red Bull how to deploy to good effect things that we learned to do for completely unrelated reasons in the past." →





RED BULL RB7 TECH SPEC

Engine	Renault RS27-2011
Layout	2.4-litre V8 90°
Brakes	Brembo discs
Tyres	Pirelli P-Zero
Fuel	Total
Gearbox	Red Bull seven-speed semi-automatic
Weight	640kg (inc driver)



Sebastian Vettel leads Hamilton in Korea 2011, making the most of the RB7's superior cornering ability



“The RB7 was rarely fastest through the speed trap. Its gains came from cornering fluency”

In tandem with the sleek rear end permitted by Red Bull's pull-rod rear-suspension system, the RB7's blown diffuser proved so effective that some rivals naturally sought to have it banned. The FIA duly announced a clampdown on exhaust blowing in the run up to the British Grand Prix – which was won by Fernando Alonso in a Ferrari – but then had to permit some engine manufacturers certain concessions on reliability grounds. This only exacerbated the arguments within the F1 paddock and the ban was subsequently dropped.

The RB7, like its predecessors and successors in the Red Bull family, was rarely fastest through the speed traps. Its gains came from cornering fluency – through downforce from its cohesive aero package and supple suspension that rode kerbs better – and through the tractability of the Renault engine. Witness, for example, how Seb Vettel nailed Fernando Alonso at Monza: away from the DRS zones, taking a lot of kerb at the Rettifilo chicane, making the most of the traction on exit to draw close through Curva Grande and attack at the Roggia chicane.

“Some work you do is on the offensive – trying to generate performance – and the exhaust work falls into that area. But we also try to be on top of our game with respect to the drivability of the engine,” says Rob White. “Ensuring drivers are fully satisfied with the transient behaviour of the engines, and keeping the drivability of the engine up to speed when we're changing engine modes, for example for the exhaust or fuel saving.

“This is defensive in that drivability is best measured in lap time given away to drivability problems rather than improvements gained. It's a delta between the theoretical best possible lap and the best you achieve, and trying to achieve a torque delivery exactly in line with torque demand from the drivers is absolutely part of our service to Red Bull.

“Anywhere the driver doesn't have absolute confidence will impair his capacity to judge where the limit is. Our mission is to deliver the torque required by the driver at all times.” **F1**



“When I started at Red Bull, it was a team of low morale. It took a while for Christian and I to create the cultural change we needed to get away from the ‘we’re happy to finish seventh’ mentality”

From lucking into a first job due to his choice of motorbike to world domination with Red Bull, **Adrian Newey** has built up a career as F1’s tech powerhouse

PORTRAITS GLENN DUNBAR/LAT

My first encounter with Adrian Newey was in April 1988. Typically, he was sitting quietly on the sidelines during an informal European launch of the Leyton House March 881 at La Vie en Rose, a restaurant on the fringe of Imola. Adrian’s first F1 car had made its debut at the previous race in Brazil. Straight away it was noted for a waisted monocoque and narrow footwell; features that would become a Newey trademark. The turquoise 881 with its Judd engine would become the only non-turbo car to lead a grand prix – albeit briefly – during 1988. It was hint of what was to come from Newey’s drawing board.

Leyton House, like so many small F1 ventures, eventually ran into financial trouble, but Newey’s reputation was continuing a momentum that had started quietly in Group C sportscars and become widely regarded in IndyCar. He had done enough to catch the attention of Williams and then McLaren before his move to Red Bull. The rest – as every other team in F1 knows only too well – is history.

Adrian has not changed one iota, despite the deserved acclaim. His diffidence hides a steely



resolve to do the job better than anyone else, the only issue being his reluctance to talk about it in public. I knew from past experience, when researching a book about Williams, that he can be engaging, eloquent, self-deprecating to a fault – and, as you might expect, possessing full recall of every detail. If only we could find time to sit down for a chat.

After a couple of false starts, it was agreed that we would have lunch together after qualifying for the 2013 US GP. I thought this would be less than ideal. But with a Red Bull on pole and the championship already won, it turned out to be perfect timing. He was on top form – in his own quiet way, of course.

Maurice Hamilton: I’m surprised to see you. I thought, with the championship wrapped up, you’d be full-on back at base with the 2014 car.

Adrian Newey: This is a social race for me. I’ve got friends out here and I’m taking the opportunity to have a look around. But I’m not going to Brazil next weekend. As far as the 2014 car is concerned, all the big bits are done; the monocoque, the gearbox, suspension, radiators and so on. Now we’re onto the bodywork, which means there’s a bit less pressure in as much as we can change that during the year.

MH: Is it hard for you as technical director to have so much at stake with this car and yet, until it runs on the track, you don’t really know if everything works? When you look around, you’ve got a factory, hundreds of people, sponsors and so on... and it’s all hanging on this car.

AN: From my own personal point of view, I’m me and I just get on, do my job and try not to worry about that. One of the most frustrating things is when the car performs in a way in which you don’t understand. I’ve been in that situation from time to time and it’s a bad position to be in because you don’t know what to do next.

MH: I can imagine. Has that happened often? →



AN: I guess there were two main occasions. The first was with Leyton House in 1989-1990. It was partly overambition in as much as we'd come up with a good little car in 1988, one that changed the direction of F1 a little bit. That car was purely conceived around aerodynamics and then the mechanical side was squeezed around it. It was a bit too tight in places – as has been well documented! But considering we were a team of about 50 people with five of us in the drawing office, we were punching above our weight.

Having got that under our belt, we overstretched ourselves. The design was too ambitious, too much on edge, not only from the difficulty of manufacture, but also from the complexity of aerodynamics.

We tried to understand that through the '89 season and, to be honest, we didn't make much progress. I took the view that there would be no point in us doing anything new for 1990 until we understood the present car, because you could easily design whatever the faults were into the next one. We developed the existing car and the season started badly. I was learning a lesson because in '88, we'd come from nowhere with such a bang. I was being interviewed to the point where, technically, I had become the golden child of the paddock. Then '89 happened and I went from hero to zero. The same people who had written glowing articles about this new kid on the block were now sticking the knife in. Which is one reason why I tend to shy away from the public eye, because if you're not prepared to take the criticism you shouldn't be seeking the plaudits.

MH: I assume you got to the bottom of the problem because suddenly the car came good.

AN: Yes, it was a silly problem. We used the Southampton University windtunnel. It sounds ridiculous, but the moving ground plane was a composite of aluminium and wood and it was starting to bend. If we were racing cars that always went over hills, we'd have been fantastic! Once we realised, it led to the new bodywork and, bang, we were right up there again.

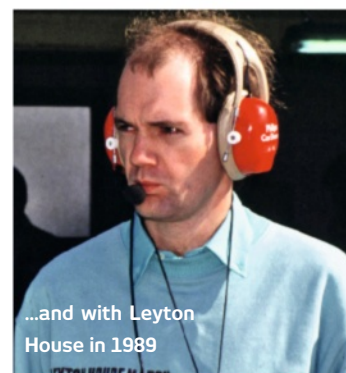
MH: And what was the second occasion when the car didn't work as expected?



The Newey-designed, Leyton House-sponsored March-Judd 881, took 21 points and a podium in 1988. Says Newey: "It changed the direction of F1 a little bit"



Newey with Red Bull in 2013...



...and with Leyton House in 1989

AN: That was the McLaren MP4-19A, which was the 2003 car: the one that didn't race. Ferrari had started their incredible run of success and we didn't feel that the FIA was giving us a fair playing field relative to Ferrari. Every time we came up with something new, it would either be banned or decisions would go against us.

Feeling disillusioned with how things were going, I took the view that we needed to make a big step. So, similar to the '89 March, we were overambitious in the design. We came up with an aerodynamically complicated car that was great in the windtunnel, but just didn't work on track.

Trying to understand why was important. It led to the 19B – which was a much better car; it

won at Spa and should have won at Brazil – and then the MP4-20, with which we won ten races but somehow lost both championships. I still don't quite know how we managed that!

MH: Did you always want to be a designer?

AN: My ambition always was to be a racing-car designer, right from the age of ten or something. When I graduated, I wrote to all the teams I could find addresses for – this was 1980, long before the internet. Most didn't reply and those that did gave the Catch-22 answer: "We only take people with experience." I wasn't sure what to do. Then Harvey Postlethwaite rang up one evening and asked if I could come to an interview at the Fittipaldi F1 team.

MH: Did Harvey know you?

AN: He didn't know me at all. My final year project at Southampton University had been on ground-effect aerodynamics. I put that on my CV. It was a good area to be in at the time because ground effect was starting to take off.

I didn't have a car, so I rode to Reading on my bike and sat in reception in my leathers. Harvey came out, took one look at me and said: "Oh, you've obviously got a motorbike; what have you got?" I said a Ducati 900SS. He said he had a Moto Guzzi Le Mans. When he asked if he could have a go on my bike, I told him to go ahead. It was a noisy bike and you could hear him riding round the industrial estate. He came back about ten minutes later with big grin on his face and asked: "When can you start?" That was the interview! Very different days back then.

I was hired as junior aerodynamicist – which turned out to also be senior aerodynamicist, such was the size of aero teams in those days. It was a huge learning curve for me. I remember getting to the end of the first month, being given a payslip and thinking: 'I've got no idea what I'm doing. I sit here doodling all day – and they've paid me for it. This is fantastic!'

I did a year and a half at Fittipaldi, but they were losing sponsorship and people were

leaving, among them Harvey and a guy called Peter Macintosh. Peter offered me a job as a race engineer on the March F2 car at the weekends and a junior draughtsman during the week.

MH: Did you have experience as a race engineer?

AN: None at all. My first race weekend was at Silverstone, engineering Christian Danner. I'd never worn a pair of headphones before. It was a case of: "Here's your driver, here's the car; off you go." I didn't know what I was doing, but it was a wet race and Christian did a good job. He was leading when the car ran out of fuel about a lap from the end. Christian went ballistic and, assuming I had not put enough fuel in, fired me on the spot. My career as a race engineer appeared to be over after one race! In fact, it turned out the metering unit had sprung a leak.

It was a three-car team and Johnny Cecotto said he'd take me. I race-engineered him for the year and we had a great time; Johnny was super to work with. The championship went to the wire and he came second.

I was then shown a Group C car that had been lying around gathering dust. I approached Robin Herd, the boss of March, and asked what the plans for this car were because I felt I could do something with it. Robin said there was no budget for a windtunnel model or anything like

that. He said I could have a go, but I was going to have to do it all by eye. That's what I did. I managed to get rid of about 50kg by going through it very carefully.

Robin sold the car to a guy in the States. He had a Ferrari Testarossa road car but fancied himself as a racing driver and entered the March for the 1983 Daytona 24 Hours – as you do! Tiff Needell shook the car down and I went off with two mechanics from March, and added a couple of mechanics from the States. Randy Lanier was one of the drivers, along with a guy with glasses that appeared to have milk-bottle bottoms for lenses: you could only see these huge eyes! The third driver lived on Daytona Beach and had dilated pupils. It was a complete shambles.

I managed to persuade the owner to delay his driving ambitions for a year; we put the other three in, and qualified midfield. It had a Chevy engine in the back and we were up all night preparing the thing. I thought it would break down after about an hour and we'd all go home.

About half an hour into the race, the girls doing the lap scoring lost count; we had no idea where we were. The thing kept going round and I tried to keep Randy, a very good driver, in the car as much as possible. Darkness came – and it was still going round. In the middle of the night, I wandered off to the gents. There was a huge vertical score board. It said P1 was car 66. I was standing there, minding my own business and thinking: 'I know that number... Shit! That's us!' We led until the 23rd hour and then it rained. The Chevy got water in the electrics and it finished second. That was my breakthrough.

On the back of that, Robin sold a car to Al Holbert, a highly respected driver who put a Porsche engine in the back. I race-engineered →

"At Fittipaldi in 1980 I thought; 'I sit here doodling all day – and they've paid me for it. This is fantastic!'"



The McLaren MP4-20 won ten races in 2005, but Newey left the team at the end of the season, "needing a new challenge"



to extract from it, Robin put me in charge of designing the 1985 March IndyCar. This was the first car I was responsible for, starting from a clean sheet of paper. It was a big moment for me.

MH: And you had great success with it. I recall Bobby saying you didn't just design the car; you were looking around, very aware of the environment you were in and who you were up against. Is that because of an enquiring mind?

AN: To me, a good engineer should have an inquisitive mind and seek stimulus from everything around; what they see in the car park an airport, or in a furniture shop. Try to get into the minds of other designers: how did they come up with that? There are many sources of stimulation. From the race-car aspect, my interest was always in overall performance of the car. There was no particular area; it wasn't aerodynamics, it wasn't race engineering. It was: 'How do we get this car over the finish line first?'

I was lucky enough to be around in the days when you could get involved very quickly in

"A good engineer seeks stimulus from everything around; a car park, an airport... a furniture shop"

Al and we won the 1983 championship. Robin then put me at Truesports to race-engineer Bobby Rahal for the '84 IndyCar season.

MH: Am I right in saying that you and Bobby really hit it off and it turned out to be a hugely important period for you?

AN: It did indeed. It was a great experience because of the variety of circuits: short ovals, superspeedways, street tracks and road tracks. Ovals teach a discipline that can be applied to normal road racing. Simple things like at Indy where the four turns all go left and do pretty much the same speed. The driver says he's got understeer and there are so many ways you can address that; more front wing, change the springs, change the cross weights, change the stagger of the tyres. The chances are that one of those will be the solution. As a race engineer and, ultimately, as a designer, it was a good discipline to learn how to unpick those problems.

The '84 March wasn't a good car to start with but, because of the performance we managed

the key aspects: design, aerodynamics and race engineering. By the time I was two years out of university, I'd done all three. That helped me take a holistic approach to the whole problem.

MH: Bobby also said you'd managed to develop a rapport in that you barely needed to speak; he would start saying something about the car and you knew what he was trying to describe.

AN: I think it was one of the strongest relationships I've had with a driver through my career. We just seemed to be able to communicate very well. He's a very intelligent guy; very measured, very patient and with tremendous feeling for the car.

MH: And Mario Andretti, who you also engineered in what had become CART?

AN: Mario is fantastic. He's such a character. Our first test together was at Laguna Seca. Mario was 47. We went for dinner in Monterey the night before to a restaurant with low lighting. When he picked up the candle to help him read the menu, I wondered what I had let myself in for.

First time out the next day, he was absolutely on it, from the very first lap. It was a brand new car with the Ilmor engine in the back. Because the car had only just arrived from the UK, the mechanics hadn't had time to fit the radio – which was nearly a fatal mistake.

Towards the end of the day, Mario came past the pits with the rear wing completely askew – but there was no way we could tell him to stop. About 15 seconds later, we heard this 'Boom!' The sound was horrendous. We jumped in the hire cars and, as we came round Turn 1, the first thing we saw was the whole back end and gearbox. And further on, bits of bodywork everywhere and then, eventually, the car upside down in the ditch. It was just the monocoque – there was nothing else left. And Mario was standing beside it. As we got to him, he was tapping his watch with his finger, saying: "Goddamn watch has stopped." He was one tough cookie. A brilliant guy who told you exactly what the car was doing.

MH: Bringing us up to date for a moment, do you have that sort of rapport with Sebastian Vettel? Do you feel there's a sort of extra sense that these top guys have?

AN: Yes there is. The truth is, however, that the last driver I properly race-engineered was Mika Häkkinen in '98. So, nowadays, I listen to what the drivers say; I'm involved with the debriefs and make suggestions. But, ultimately, I'll always defer to the race engineers. It's their decision because if I start imposing, it just doesn't work. If I were to wade in, it wouldn't matter whether I'm right or wrong... it simply undermines.

MH: I want to go back a bit. We were talking about Leyton House and March, but the big step was with Williams. How did it work with Patrick Head? Was he looking over your shoulder all the time? Or did he let you get on with it?

AN: Patrick was very good to me. He always had a great interest in gearboxes and transmissions. He drew the '91 transverse gearbox, which was the first paddleshift for Williams, and I did the rest of the car. I was made chief designer but I was effectively in charge of the aero team and the drawing office. Patrick was transmission, hydraulic control systems and electronics. We divided it up like that. We worked very closely; our offices were next to each other and we talked a lot. He was extraordinarily trusting of me.

MH: That's quite a compliment because I'm sure if Patrick felt something was not quite right, you'd soon hear about it?

AN: He did give me a bit of a tweak about the 1991 car, the FW14, because I kept pinching the chassis ever narrower and almost overcooked it for Nigel Mansell's bottom – so that was a bit of a tight squeeze in every sense. He felt I had pushed it a bit too far.

MH: Looking back, was it good to have someone like Patrick alongside you at that stage?

AN: It was. I was 30 and had never worked in a big F1 team. To have that – steady hand is not the right phrase – but to be given that responsibility and to be able to slot myself into a team that was well established was a great bonus.

MH: You mentioned Nigel. You really got on well with him, didn't you?

AN: He was a top guy from my point of view. Okay, so there was a bit of Oscar-winning showmanship from time to time when he would get out of the car and collapse on the sidepod. But beneath all that, the Nigel I worked with was absolutely top. When he got in the car, he gave everything; his feedback was extremely good. The active-ride car, the FW14B, was absolutely made for him because it was a very physical car to drive. The feedback was not as direct as a passive car would have been; there was a bit of lag in the system; it was a bit spongy. It needed commitment and belief that it would grip and just allow you to nail it. But Nigel had the most incredible self-belief that really allowed him to commit to the car.

MH: Now I want to talk about Red Bull. During your first two or three years with the team, what were you learning in that time?

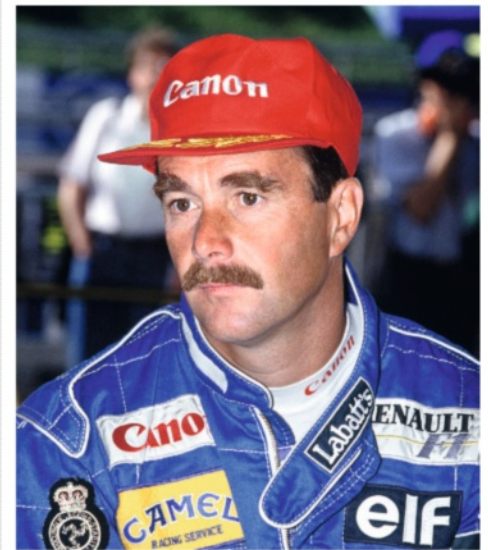
AN: I made a mistake in as much as when I joined Williams and McLaren, they were two great teams that had won many championships and perhaps lost their way a little on the design side. This suited me because my passion and interest, as I've said, is the performance of the car more than management or infrastructure.

When I started at Red Bull, I tried to approach the job in the same way, treating it mainly as a design-based challenge. But there were two main problems; the first was that this was a team of low morale because there had been a lot of hiring and firing of key personnel with different owners through the years. The attitude seemed to be: 'Keep your head low, don't take any chances because Christian Horner and Adrian will be here for another year or so and then it'll be onto the next lot of owners and we'll still be here.'

There was also what I would call a strange Midlands type of arrogance, which I'd seen before. I grew up in Stratford-on-Avon. When I was at college, we used to have trips to Triumph, Norton, Rolls-Royce and so forth. They were making shocking products, but couldn't see it. They thought they were producing the best. They were the opposite of my definition of what a good engineer should be because they had their eyes closed to what was going on around them.

There were a few people at Red Bull with that sort of arrogance. To talk to some of them, it was as if they'd won the title for the previous seven years. It was: "Great that you've joined us, but here at Jaguar" – because they still called it Jaguar – "we have our way of doing things and you've got to fit in." I said: "Well, that's kind of you, but I've got some ideas myself, actually."

It took quite a while for Christian and I to create the cultural change that we needed to get away from the 'we're happy to finish seventh' →



INSETS: LAT ARCHIVE

"There was a bit of Oscar-winning showmanship, but the Nigel Mansell I worked with was a top guy"



Mansell takes the Williams FW14B to victory at Silverstone in 1992 en route to the title. Newey says of FW14B: "It was absolutely made for him"

"Entrepreneur owners don't have a good record in F1, but Dietrich had shown perseverance with Sauber"



With a fourth consecutive title double already in the bag, Newey's RB9 sets a new record in Austin as Vettel takes it to its eighth consecutive win in one season



(L-R) Red Bull team principal Christian Horner, owner Dietrich Mateschitz and Adrian Newey

mentality. I wasn't a believer in setting out that we were going to win the championship next year. But I did want to say: "This is how we'll try to go about things. Let's see where it gets us – hopefully, further up the grid than we are now."

Apart from the challenge of sorting out the infrastructure, the correlation between the windtunnel and the car was poor. The first car I was responsible for, the RB3, didn't perform as it should have according to the windtunnel results. It was a case of trying to develop the culture, the infrastructure and the tools.

We threw away loads of points due to silly things. The timing of the regulation change in 2009 was very opportune for us because we'd got to the point where everything was starting to work better and we could now say: "Right, here's the design challenge for this new set of regulations. Let's get on with it."

MH: And that was it. When you look at what you've got now compared with the situation you've described, it's the complete reverse. Everybody expects to win as a matter of course. How do you describe the atmosphere now?

AN: It's great. It's gone from that sort of slightly downtrodden but at the same time arrogant

feeling to a huge energy through the place. The factory and the race team are incredibly hard working; the work hard, play hard philosophy is very much one our team seems to thrive on. It's very rewarding that many of the people who were there from those very early days at Red Bull are still there today. They are performing at such a high level now. They've been able to really re-invent themselves, and I admire them for that.

MH: You've won the title four years running. Would you have thought that possible?

AN: To be honest, no. I had left McLaren, one of the most successful teams around. We'd just had a good year and won ten races but, nothing against McLaren, I felt I was getting a bit stale and needed a fresh challenge. I also had a feeling of unfinished business from the Leyton House days. So, here was another chance to be involved in a team from the start. But it was a risk and the initial aspiration was to move up the grid and perhaps win a race if we could. The title was a bit of a dream and didn't seem likely; to win four on the trot just seems very surreal.

MH: Leyton House were owned by an entrepreneur who ran out of money. What made you think Dietrich Mateschitz was different?

AN: The brutal truth is that entrepreneur owners don't have a good track record in F1; there've been so many of them. I was conscious of that, but Dietrich had already shown great perseverance with his sponsorship of Sauber. He gave the impression that he wasn't about to get bored and go off and do something different.


MH: And he's been as good as his word?

AN: He has indeed. Red Bull have been good owners in as much as they leave us to it. In the early days, we would be going to Austria and saying: "We'd like to invest in this new bit of kit" or whatever it might be and, providing we put together a good argument as to why it would make the car quicker or more reliable, Dietrich would invariably say yes.

MH: You can't ask for more, can you? And, to top it all off for you, you've been awarded the OBE. Very well deserved. Was that out of the blue?

AN: Completely out of the blue. I guess it's recognition of a lifetime's work.

MH: Blimey, Adrian, you're only 55; you haven't finished yet! But I'll bet the opposition wish you had. Thanks for talking to us; it's been absolutely fascinating.

AN: You're welcome. 



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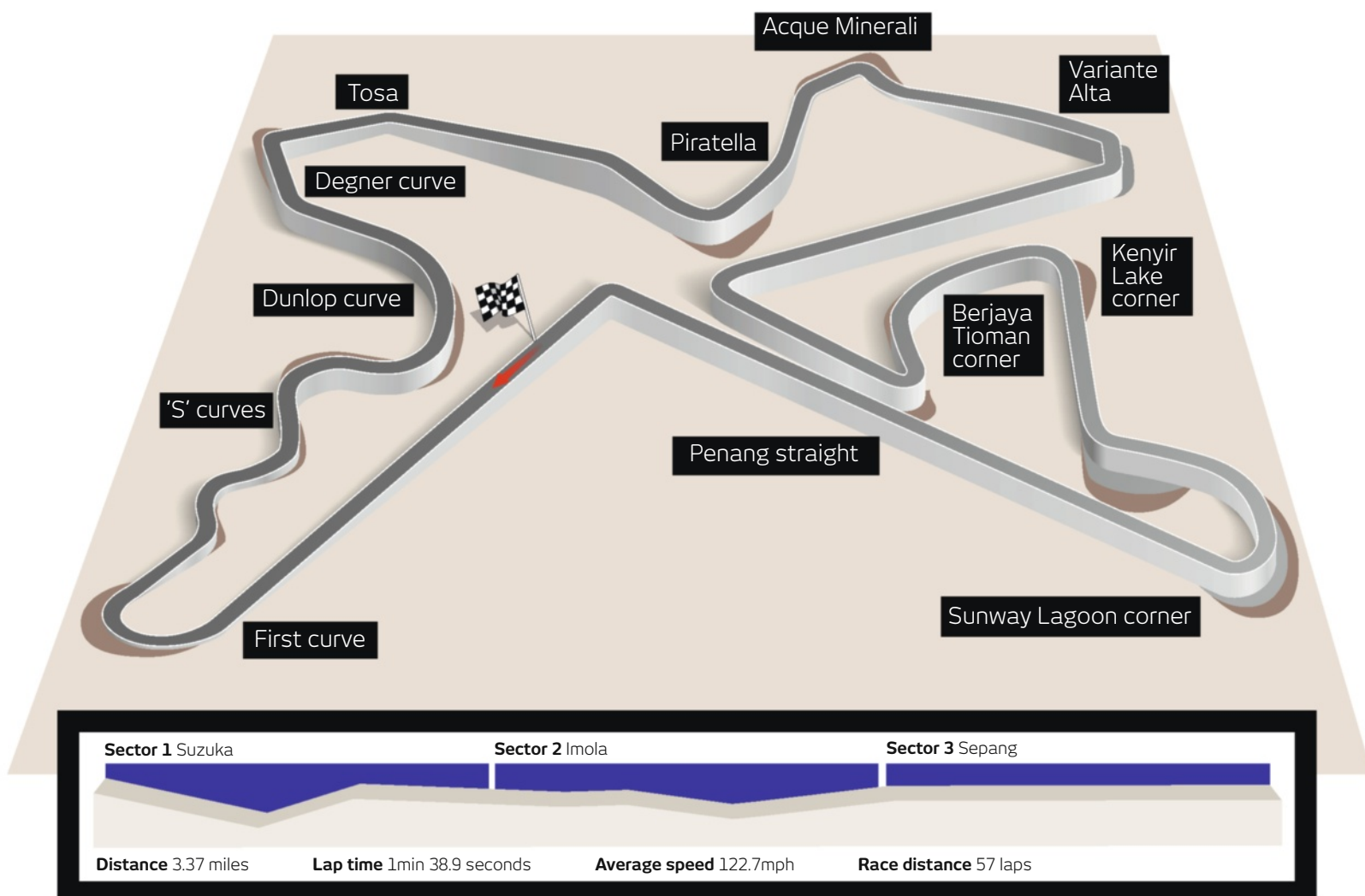
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WEBBER'S ULTIMATE TRACK



We piece together the three sectors from Mark Webber's favourite grand prix tracks to create his dream circuit

WORDS MARK WEBBER **ILLUSTRATIONS** ALAN ELDRIDGE



When Mark Webber's career came to an end in Brazil this year, it was the culmination of 217 grand prix appearances, spanning 12 seasons in 22 different countries.

With a CV boasting victories at such legendary circuits as Monaco, Silverstone and Brazil and poles at two of the greatest driving challenges of all – Spa and Suzuka

– Webber is well-placed to choose his three favourite sectors to create his ultimate F1 racing circuit.

Surprisingly, he hasn't gone for the high-speed rush of Eau Rouge or Copse, or the thrill of the Monaco tunnel. He's chosen corners based on their technical challenge, the undulations of the terrain that demand knife-edge rhythm and delicate throttle and

braking inputs. A true *driver's* circuit, if you like.

So his first sector is the awesome switchback sequence of corners at Suzuka, from Turns 1 to 9, through the 'S' Curves, up through Dunlop followed by the challenging double-apex Degner corners.

Next he switches his lap to Imola's Autodromo Enzo e Dino Ferrari, rising uphill from the Tosa

hairpin, threading his way through Piratella before diving downhill to the tricky Acque Minerali double right-hander (post chicane layout) and onto the Variante Alta.

The final part of the lap is taken from Malaysia. Technical Turn 14 has been described as the hardest corner on the F1 calendar, and the long back-straight allows the speed to build up to the end of the lap.

PHOTOS: ANDY HONE/LAT; CHARLES COATES/LAT

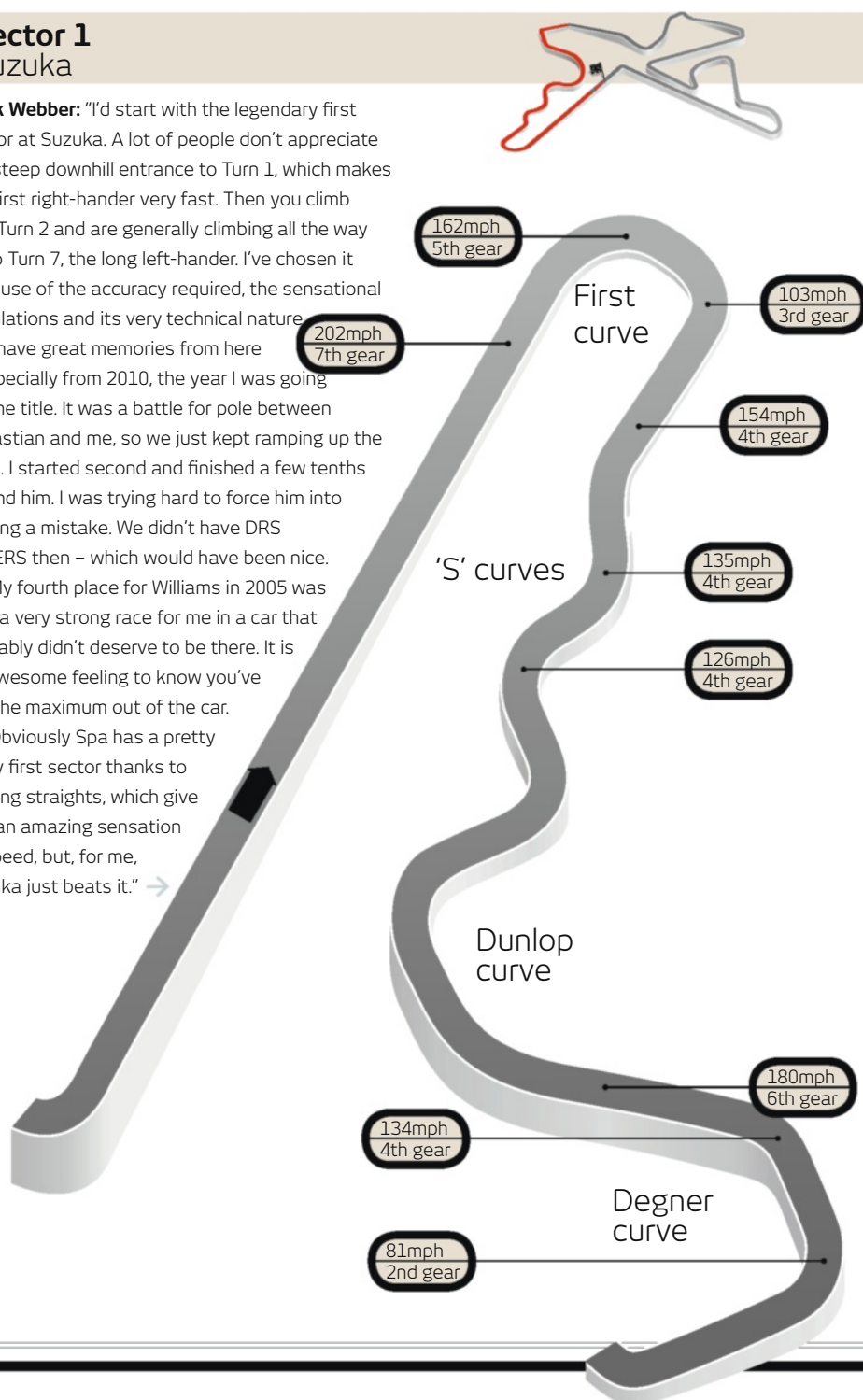
Sector 1 Suzuka

Mark Webber: "I'd start with the legendary first sector at Suzuka. A lot of people don't appreciate the steep downhill entrance to Turn 1, which makes the first right-hander very fast. Then you climb into Turn 2 and are generally climbing all the way up to Turn 7, the long left-hander. I've chosen it because of the accuracy required, the sensational undulations and its very technical nature."

"I have great memories from here – especially from 2010, the year I was going for the title. It was a battle for pole between Sebastian and me, so we just kept ramping up the pace. I started second and finished a few tenths behind him. I was trying hard to force him into making a mistake. We didn't have DRS or KERS then – which would have been nice."

"My fourth place for Williams in 2005 was also a very strong race for me in a car that probably didn't deserve to be there. It is an awesome feeling to know you've got the maximum out of the car."

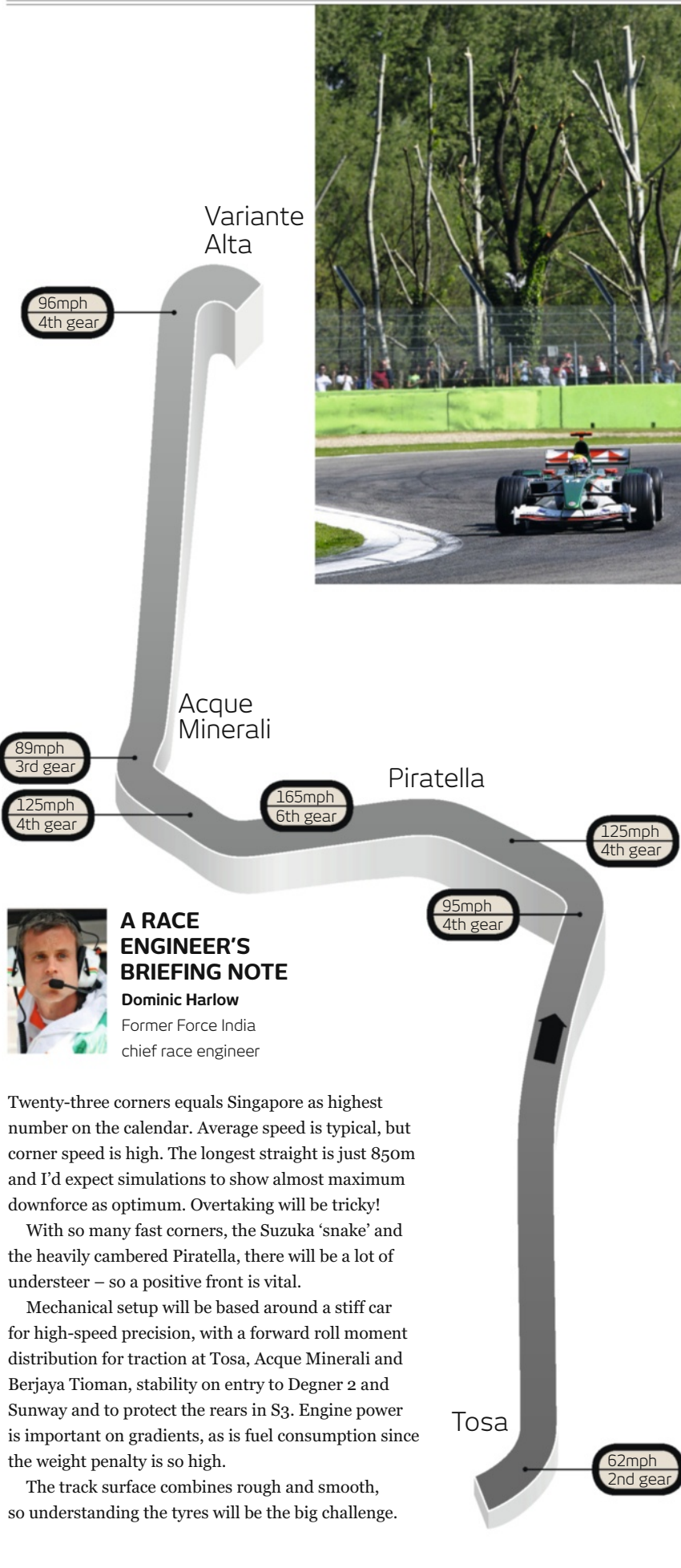
"Obviously Spa has a pretty tasty first sector thanks to its long straights, which give you an amazing sensation of speed, but, for me, Suzuka just beats it."



Webber's record at Suzuka

Year	Team	Grid	Race
1998	Mercedes (FIA GT)	--	(shared drive) 1st
2002	Minardi	19th	10th
2003	Jaguar	6th	11th
2004	Jaguar	3rd	Retired (overheating)
2005	Williams	7th	4th
2006	Williams	14th	Spun off
2009	Red Bull	19th	17th*
2010	Red Bull	2nd	2nd*
2011	Red Bull	6th	4th
2012	Red Bull	2nd	9th
2013	Red Bull	1st	2nd*

*Fastest lap



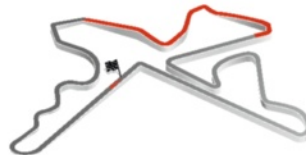
Sector 2 Imola

MW: "Given that I would be looking for a bit more topography, it would have to be Imola next on the lap. After Tosa you've got a left at Piratella, then you go downhill to Acque Minerali and then there's a double right before an uphill climb to the top chicane. There is nice elevation change and you've got to be really accurate."

"I loved racing at Imola and I actually finished on the podium there in Formula 3000, which was my first race back in single-seaters after two years out. In an F3000 car, it was a very physical race."

"I also qualified the Minardi there, which was quite an achievement – and something my team-mate didn't manage. Driving the Minardi around Imola was a bit of a handful without power steering, but you could still appreciate then just how good the track was."

"Obviously the sport has some bad memories attached to it and 1994 was an absolutely tragic year for motorsport. But without doubt, this was a nice little circuit. More than anything I think it's the atmosphere. The Italians are always so passionate about motor racing."




Webber's record at Imola

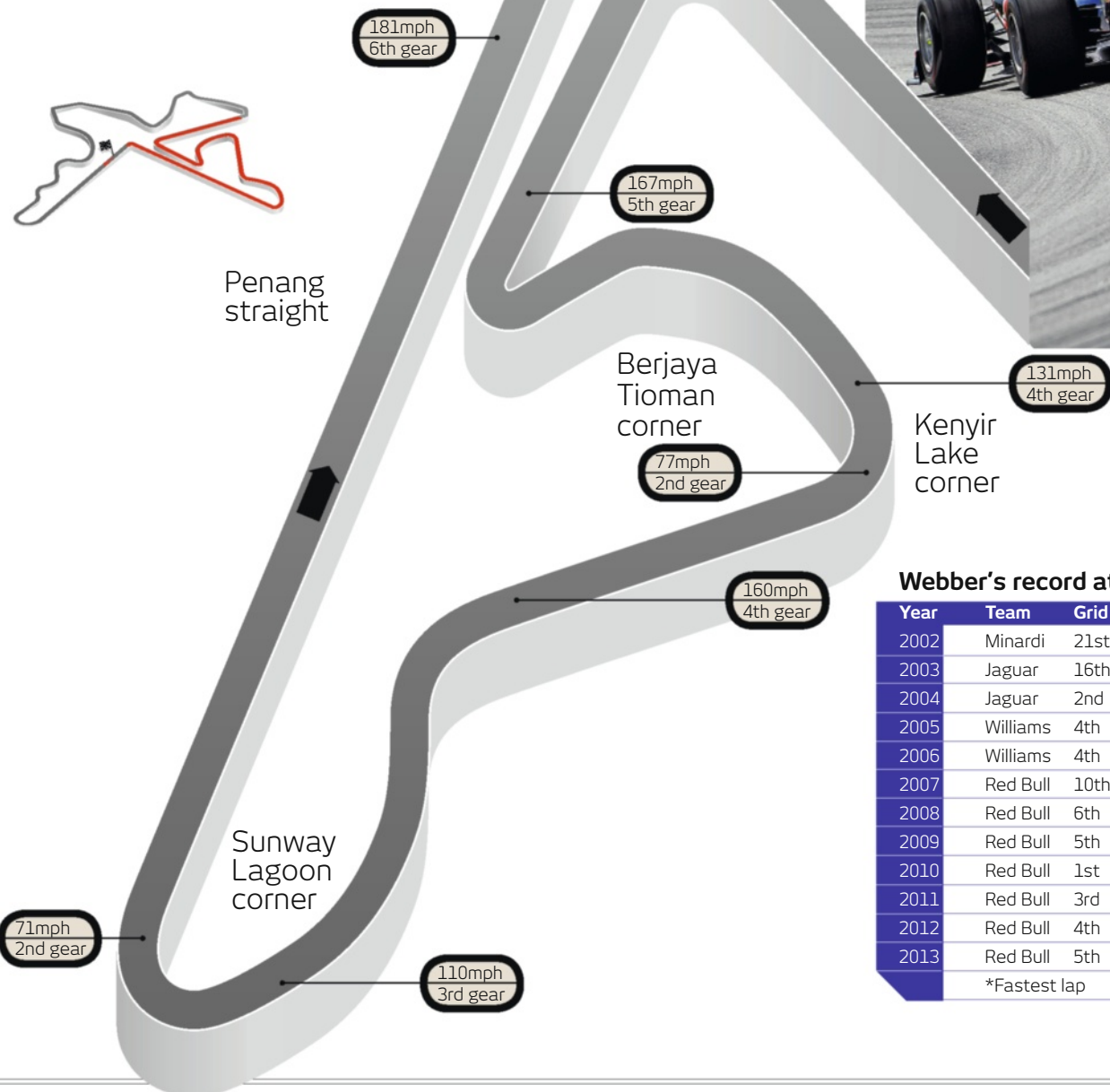
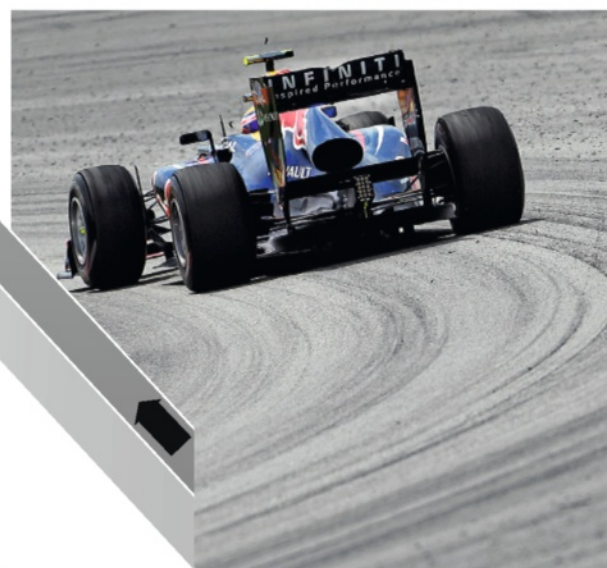
Year	Team	Grid	Race
2000	European Arrows (F3000)	3rd	3rd
2001	Super Nova (F3000)	1st	1st
2002	Minardi	19th	11th
2003	Jaguar	5th	Retired (driveshaft)
2004	Jaguar	8th	13th
2005	Williams	4th	7th
2006	Williams	10th	6th



Sector 3 Sepang

MW: "Although I've been lucky enough to race at some phenomenal final sectors, the one that stands out is Malaysia with its long straights."

"The main reason I love it is Turn 14, Sunway Lagoon, the penultimate corner. This tight right-hander is wide on the way in, which allows for passing moves and technically it's a very tough corner for car setup and driver technique because the apex and exit are so narrow. It is also a super-important corner because you need good momentum for the long back straight. It's extremely rewarding and challenging." 



Webber's record at Sepang

Year	Team	Grid	Race
2002	Minardi	21st	Retired (electrical)
2003	Jaguar	16th	Retired (engine)
2004	Jaguar	2nd	Retired (spun off)
2005	Williams	4th	Retired (collision)
2006	Williams	4th	Retired (hydraulics)
2007	Red Bull	10th	10th
2008	Red Bull	6th	7th
2009	Red Bull	5th	6th
2010	Red Bull	1st	2nd*
2011	Red Bull	3rd	4th*
2012	Red Bull	4th	4th
2013	Red Bull	5th	2nd

*Fastest lap

PHOTOS: CHARLES COATES/LAT; GLENN DUNBAR/LAT; LORENZO BELLANCA/LAT; LAT ARCHIVE

Christian Horner

He's the boss who, like only Ron Dennis and Jean Todt before him, has guided his team to four straight title doubles. Here we give his peers the chance to ask him how he does it...

WORDS ANTHONY ROWLINSON PORTRAITS ANDREW FERRARO/LAT

Life is pretty sweet for Christian Horner right now. Riding a surfboard of success atop a Red Bull tsunami, he and the superteam he oversees seem unstoppable in their pursuit of success, their thirst for victory apparently insatiable.

Away from the track there's the birth of a daughter to celebrate, while back at base the security born of the knowledge that star designer, star driver and star funder are all in place for the foreseeable future gives a peace of mind other team bosses can scarcely imagine. Little wonder Christian's in a buoyant mood as he sits down to chat with *F1R* and answer a crop of questions harvested from paddock rivals. He has nothing to fear, after all: he hasn't been short of an answer since he entered F1 in 2005.

We start with a teaser from none other than Helmut Marko, Horner's colleague and overlord of the Red Bull young driver programme...

What will you do with your bonus?

Helmut Marko

[Horner repeats the question, taking a moment to mull it over. The pause is long enough for us to enjoy the distant thunder of the F1A medical car rumbling around the Yas Marina circuit].

What will I do with my bonus? That's a difficult question. I would think, as Helmut should know, the bonus is *nowhere near* as big as it should be for a fourth world title, so I'm going to sit on that one for a moment. Let's come back to it.

F1R: Okay. We will. Let's move on to a question from Martin Brundle.

What does the telemetry reveal about what makes Sebastian so special?

Martin Brundle

The bigger differences between Mark and Seb tend to be in lower-speed and medium-speed

corners. In higher-speed corners Mark is enormously brave and quick, so at somewhere like Copse, or Becketts, he is very strong. But in technical corners, where you are in the corner for longer, that seems to be where, as a trend, there are differences between Seb and Mark.

F1R: Is that because Seb has mastered throttle-blown technique?

CH: No, it's a characteristic he's had since 2008.

F1R: Is it something he does with the car? The way he manipulates the wheel, for example?

CH: Seb drives the car very much on the rear tyre. And he has tremendous sensitivity, feel and finesse for not over-stressing the tyre.

What's next in your career?

Johnny Herbert

I feel that there's an awful lot more to do and achieve with Red Bull Racing, so I have no →



thoughts beyond hopefully achieving more success with this team.

F1R: No longer-term vision?

CH: It's very difficult to have longer-term visions in Formula 1. Long-term in F1 is about a month.

Who should receive the higher salary: Adrian Newey or Sebastian Vettel?

Pat Symonds

[A longish pause to consider the question] Well they are both doing okay [laughs]! They both contribute massively in different areas. Seb takes his risks on the track; Adrian takes his risks in other areas. And he probably takes bigger risks when he is on track.

F1R: You haven't quite answered the question...

CH: No, I'm going to swerve that one!

With the departure of Peter Prodromou, how do you stop other senior technical staff from leaving, should they want to?

Gary Anderson

Should they want to, which I don't believe any of them do, all our key personnel are on relatively long-term contracts. Even Peter is contracted to the team until the end of next year, should he decide to leave at that point.

Are you ready to be a customer team?

Eric Boullier

If Eric wants to buy one of our cars we would be very happy to sell him one. It might be two or three years old though...

Do you miss racing with me in British Formula Renault and F3?

Pedro de la Rosa

I certainly miss beating him in Formula Renault! I won my first race with Pedro standing next to me in second, so maybe I should make a comeback as a Ferrari test driver. Pedro had more grey hairs when he was racing in the 1992 Formula Renault championship than he does now. So my question to Pedro, actually, is: "How often do you dye your hair? Are you using Grecian 2000?"

What's the worst decision you've made in your career?

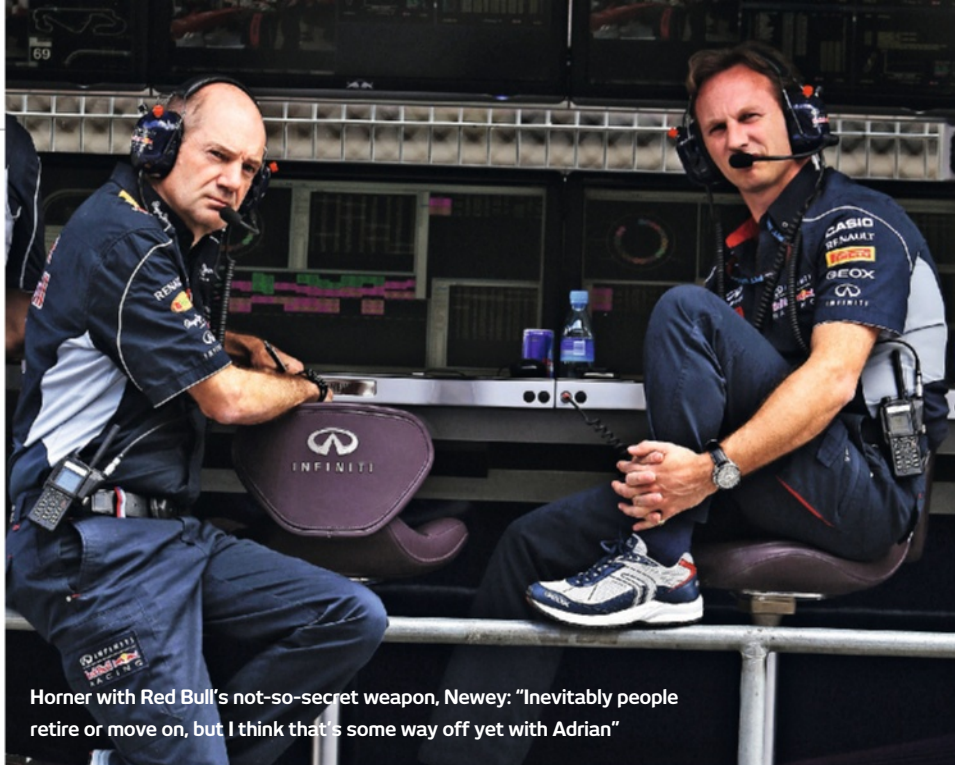
Paul Hembery

[Another long pause ensues while Horner considers whether he can repeat the response that – judging by the broad grin that's crossed his face – has immediately arisen. He decides, alas, it's not fit for print] I haven't made it yet!

Would you like to return to the old GP2 days and sign me for next year?

Heikki Kovalainen

For GP2? If Heikki's free to race in the GP2

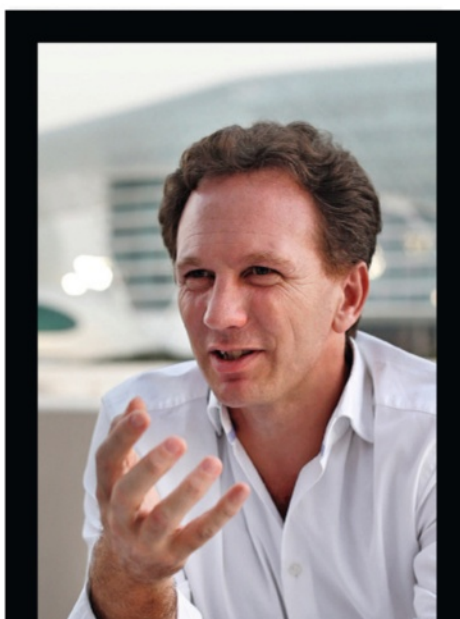


Horner with Red Bull's not-so-secret weapon, Newey: "Inevitably people retire or move on, but I think that's some way off yet with Adrian"

championship and has a budget, I'd love him to run in that championship next year.

F1R: So we take it a Red Bull Formula 1 seat is out of the question?

CH: [Laughs heartily]



"Adrian was simply the best in the business and if we wanted to compete with the best, we needed to have the best"

If there were a budget cap of €20million in place, do you think you would you still be a championship-winning team?

Karun Chandhok

I believe we would, yes, because our success isn't down to the amount of money that we have. It's due to the teamwork and the ingenuity that the team have demonstrated in all areas. Financially, we have only the third-biggest budget in F1.

What single thing would be the biggest loss to the team?

Mika Salo

I think it would have to be if Red Bull fell out of love with Formula 1 for any reason.

F1R: What position would that leave you in?

CH: Well, we are a 100 per cent owned subsidiary of Red Bull. The company has made a commitment to Formula 1 until 2020, which is based on Dietrich Mateschitz's passion and enthusiasm for the sport. Obviously Red Bull have been in the sport for a long time... but I would say that is our biggest risk.

Did being a driver help you in your role today? Particularly in understanding the link between driver, engineer and car?

Allan McNish

Most definitely, yes. I was fortunate to race to a level that gave me insight into some of the emotions that a driver experiences, and what a driver is looking for when he is sitting in the cockpit. Definitely when I was building a team in Formula 3000 I tried to run it with the same principles I use today in Red Bull. F1 is a people sport and it's about empowering people to do their jobs and feeling confidence in the people around you. As a driver you feed off that: you have to feel that the people looking into the cockpit believe in you in order for you to give

your best. So I would say my years racing were an extremely useful experience.

F1R: Now we have one from David Coulthard.

CH: Is it smutty?

F1R: Surprisingly not...

Putting the driving to one side, what did you learn from working with me?

David Coulthard

Having DC as a driver? Well, I learned a huge amount, actually. When I came into F1 in 2005, he had been around for a long time and he was in the autumn of his career. And he was an extremely useful sounding board. I remember when I first discussed with David the idea of trying to recruit Adrian Newey, he gave me the very good advice that I should talk to his wife.

F1R: So David played quite a crucial role in bringing Adrian to the team?

CH: Yes, he helped facilitate the first dinner Adrian and I had. We met at the Bluebird restaurant in London back in 2005. It was a get-to-know-you dinner, just to explain a bit about Red Bull. I could tell Adrian was inquisitive. I was obviously aware of Adrian through his Williams and McLaren times, but that dinner was the first proper introduction I had to him.

Did you know from the very start of your time as a team boss that you wanted to hire Adrian Newey?

Rubens Barrichello

Yes, from the point that I came into F1. I'd always admired Adrian and his cars from a young age. When I was racing I was sponsored, by Autoglass, who also supported Leyton House in the early '90s. That was when Adrian was their chief designer and I sat, once, in one of his early Leyton House cars. I remember attending the 1990 Portuguese GP, and Adrian was the up-and-coming designer and everybody was excited about the potential of this car. From then on I followed his career with interest. Particularly at Williams, because I was a big Mansell fan, and then I watched the success he had at McLaren. For me, he was simply the best in the business and if we wanted to compete with the best we needed to have the best. There was nobody else I had any interest in other than Adrian.

What are you going to do when Adrian Newey leaves?

Ross Brown

[Another of Horner's reflective pauses] Well, I don't think Ross is available, or it sounds like he might have retired. Inevitably people retire or move on to other things, but I think that's some way off yet with Adrian. It's not something I'm too worried about at the moment.

F1R: Now we have an EJ question...

CH: Oh God...

When do you expect Adrian Newey and Seb Vettel to move to Ferrari?

Eddie Jordan

I don't. Next...

How proud are you to be the father to a baby girl?

Susie Wolff

Extremely proud. I think that for anyone fatherhood is something very special. I come from a family dominated by boys [*Horner is one of three brothers*] so it's a real highlight to have a little girl.

How's your baby?

Niki Lauda

Niki has taken an enormous interest in the birth of my child, which is very kind of him because he has been trying to get me married for the past three years! But the baby is doing very well, thank you Niki.

Can I live in your home for a weekend?

Daniel Ricciardo

[Laughs] He would be very welcome to come and stay with me any time.

As the team principal of an Austrian team, when will you have to speak German?

Monisha Kaltenborn

I already do.

F1R: Do you?

CH: No. But how does Monisha know I don't...?

F1R: We could engineer a situation where she asks you a question in German...

CH: But she still doesn't know, just because I don't answer in German, that I don't speak the language...

[Fearing a conversational vortex, *F1R* decides to move on...]

Can you last an entire race without tapping your foot?

Max Chilton

You know, this is not something I'm actually aware is happening... but probably not. →

Why do you persist in blocking access to your cars with walls of mechanics on the grid when we already have all the close-up photographs we need of each other's cars? I'll send you some if you want!

Paddy Lowe

Well it's mainly to annoy Paddy! It became a habit more than anything. Obviously designers like to come around and have a good look at the back of the car in particular. It's a throwback to the double-diffuser days and it just became a habit. I don't think it's something that we've done for quite a few races now.

F1R: So you've nothing to hide?

CH: No, nothing to hide.





F1R: Is it the Red Bull that does it?

CH: It tends to be in the last part of the race that I start tapping, as my mind drifts towards the finish and I start to think of everything that could possibly go wrong. It's nervous anticipation.

F1R: Is there actually an increase in tension or is it pretty tense throughout a grand prix?

CH: It will generally gear up. The better races are when we are racing wheel to wheel, because there's no time for my mind to drift. In races where one of our cars is out front, all the things that could potentially go wrong run through my mind. So I tend to feel more tense than when the driver is under pressure or racing wheel to wheel.

F1R: So it's been quite a tense year then?

CH: Ha ha ha ha...

Are you still angry after I put you into the gravel trap at Abbey in British F3 in 1995?

Alex Wurz

Yes! Because he was a dirty bastard that day, putting a wheel up the inside and having me

straight off at my home GP support race.

Mind you, it might have been an overoptimistic manoeuvre, so I forgive him. I was on the outside trying to go past at the old Abbey chicane. Alex was on the inside and he just tagged me.

F1R: Was it for the lead?

CH: No it was for about 15th.

F1R: And you were trying to pass him?

CH: Of course, naturally.

Was the Nürburgring 1992, driving in Formula Renault, your greatest achievement in motorsport?

John Booth

He should know this because I won driving one of John's cars at Pembrey in 1992. I always enjoyed driving for John. We did it on a handshake, without a contract and it was the most enjoyable year of my driving career: Formula Renault against Pedro de la Rosa.

F1R: What happened at the Nürburgring?

CH: I don't remember... [*He won*]

Do you think the distribution model of F1 revenues among all participating teams is fair and equitable?

Vijay Mallya

It's never been fair or equitable. But it's a results-based business.

Do you enjoy working for an Austrian?

Toto Wolff

I thoroughly enjoy working for Dietrich Mateschitz. He gave me the chance at 31 to run his team for him, and he supported me in difficult moments. It's been a real pleasure.

You're one of the most successful team bosses ever. To what personal qualities do you ascribe your success? Don't be modest!

Murray Walker

I come from a good family who brought me up with strong principles. I enjoy working with people and I'm competitive. Where people think something is impossible, I enjoy the challenge.

Will you promise you won't make the mistake of not concentrating on family?

Stefano Domenicali

[Laughs] There's nothing more important in anyone's life, no matter what industry you are involved in, than family. And of course demands are placed on that in this business, as Stefano knows. So it's a question of finding a balance.

[We prepare to wrap up, before Christian reminds us there's one unanswered question]

CH: The Helmut Marko one, let's go back to that...

F1R: It was 'How will you spend your bonus for winning the championship?'

[Red Bull's head of comms, Katie Tweedle, suggests he buy a new chicken house as the Horner household includes various animals]

CH: That's a good point. I'll buy a new hen house for Helmut the cockerel. Helmut has a son called DC as well. Yes, I'll buy them a new home. 🐔

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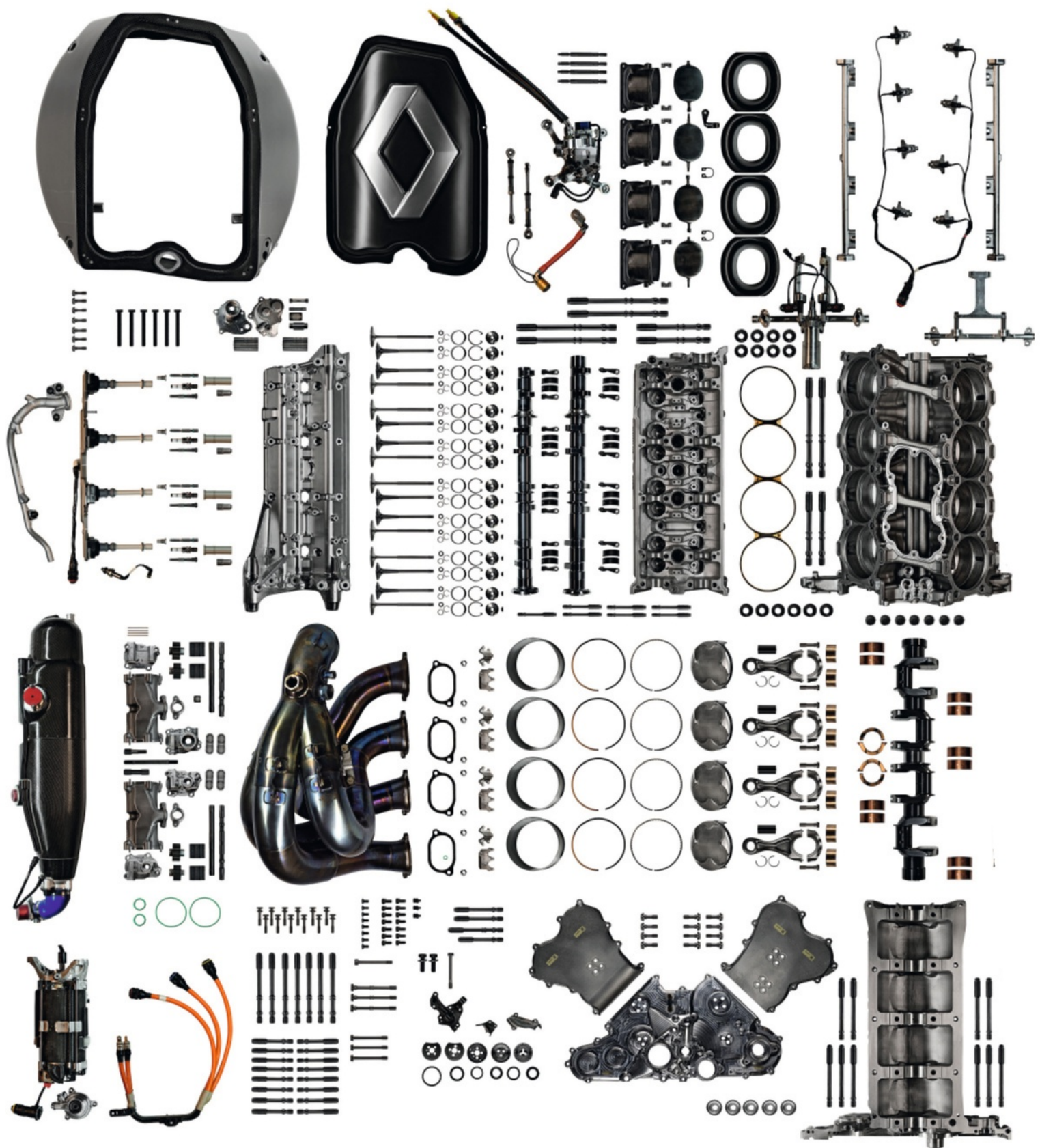
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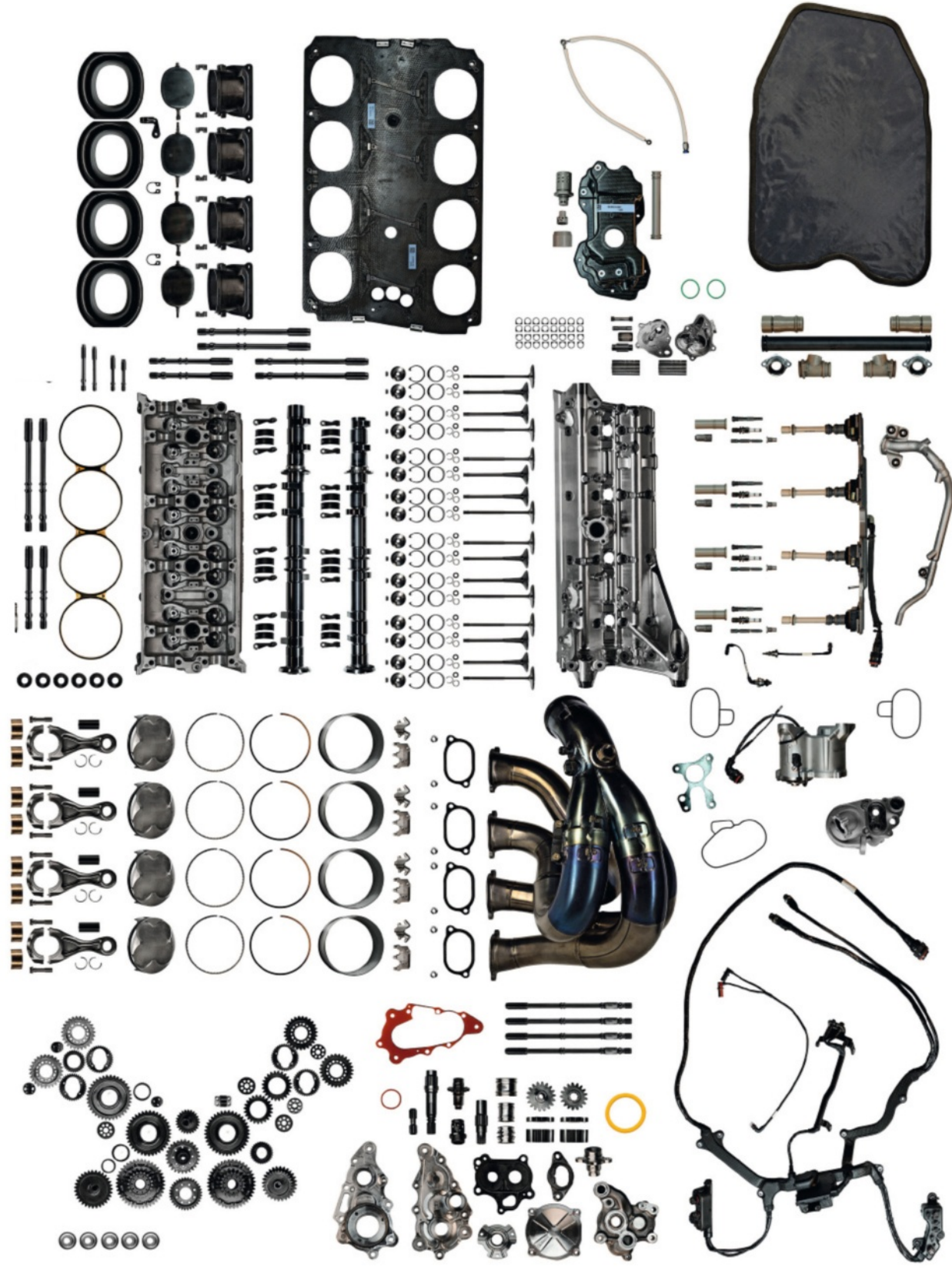


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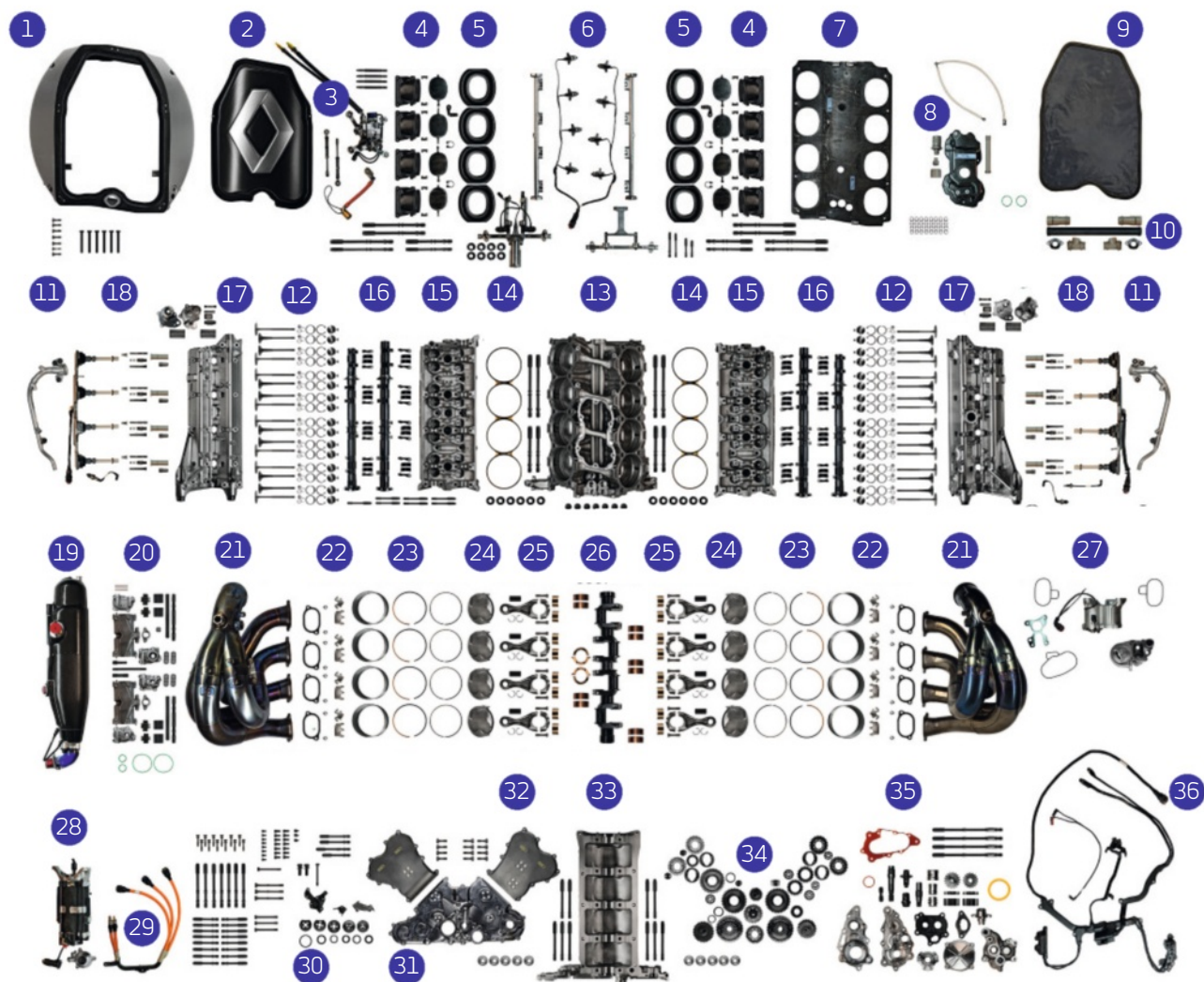




THE POWER BEHIND THE GLORY

Up close and personal, with an exclusive look at the Renault V8 – as you've never seen it before

WORDS JAMES ROBERTS PICTURES RENAULT SPORT



KEY TO COMPONENTS

Top row

- 1 Airbox
- 2 Airbox cover
- 3 Throttle actuator
- 4 Throttle bodies
- 5 Throttle trumpets
- 6 Fuel rail and injectors
- 7 Valley gasket shear plate
- 8 Catch tank
- 9 Air filter
- 10 Coolant pipes

Second row

- 11 Ignition coil
- 12 Inlet and outlet valves and guides
- 13 Engine block
- 14 Cylinder head gasket
- 15 Cylinder heads
- 16 Camshafts
- 17 Cam cover
- 18 Spark plugs

Third row

- 19 Oil tank
- 20 Drain pumps
- 21 Exhaust manifold and gaskets
- 22 Piston oil jets
- 23 Piston rings
- 24 Piston heads
- 25 Conrods and bearings
- 26 Crankshaft and bearings
- 27 Alternator

Bottom row

- 28 KERS motor
- 29 KERS power cables
- 30 Timing gear bearings
- 31 Timing case cover
- 32 Camshaft case cover
- 33 Lower crankcase
- 34 Camshaft geartrain
- 35 Oil pump drivetrain
- 36 Wiring loom

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- During a race, the exhaust manifolds of the RS27 will get hot enough to melt gold
- Special lightweight materials, such as Inconel, are used to make exhausts



- At maximum revs, the engine coolant circulates through the system at 240 litres per minute. That's higher than the pressure of water through a fire hose



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- When running at maximum rpm, a piston will accelerate from 0 to 100kph in less than 1/2000th of a second. The force generated will be more than 8,000 times its own weight and will exert a load of two tonnes on connecting parts



- The machining tolerance of the steel crankshaft is one micron or a millionth of a metre



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Red Bull Racing *IN STATS*

Hot on the heels of their most successful season ever, we look at the numbers behind F1's reigning quadruple champions

47

WINS

57

POLES

41

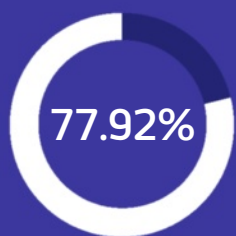
FASTEST LAPS

4 Grand chelems

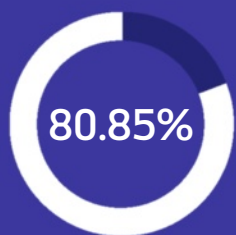
(win, pole, fastest lap and every lap led)
by **Sebastian Vettel**

8 Hat tricks

(win, pole and fastest lap)
by **Sebastian Vettel**



The percentage of races Red Bull have led in the past four seasons – 60 of 77 races



The percentage of Red Bull wins that have been achieved by Sebastian Vettel – 38 of 47



From China 2009, scene of their first win, to Brazil 2013, Red Bull have won just over half the races they have entered – 47 out of 92



22 - 19

The Red Bull fastest-lap score in Vettel's favour over Mark Webber



2,460.5

Total number of world championship points scored by Red Bull to date, leaving them fourth behind **Ferrari**, **McLaren** and **Williams**

8th

Vitantonio's Liuzzi's finishing position at the 2005 San Marino GP gave the team their first world championship point

Red Bull driver starts

Mark Webber	→ 129
Sebastian Vettel	→ 94
David Coulthard	→ 71
Christian Klien	→ 28
Vitantonio Liuzzi	→ 4
Robert Doornbos	→ 3

31,470

laps driven in testing by Red Bull since the RB1 first turned a wheel

30

of Red Bull's wins have come from pole,

15

from 2nd, and the remaining

2

from 3rd

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For your chance to win, go to www.f1racing.co.uk/competition and answer this question:

How many consecutive wins did Sebastian Vettel manage during his record-breaking 2013 season?

a) 7 b) 8 c) 9





From Russia with (tough) love

The latest product of the Red Bull talent school to reach F1 is 19-year-old Russian Daniil Kvyat. And guess what? He's quick, smart and multilingual...

WORDS ANTHONY ROWLINSON **PORTRAIT** ANDREW FERRARO/LAT

"That Kvyat kid... You know, I think he's really very good."

With this passing comment, Toro Rosso team principal Franz Tost offered an insight into his driver selection, the full significance of which wasn't apparent to *F1 Racing* as it was spoken. It was the Saturday afternoon of the Italian GP and we were discussing with Tost the prospects of Daniel Ricciardo, who had just been announced as Mark Webber's Red Bull replacement for 2014. As we chatted, the GP3 feature race ripped noisily away from the grid.

Kvyat drove hard and fast to win and his smooth but notably aggressive style put a twinkle in Tost's eye. Little did we know that this win and subsequent victories to secure the GP3 title would be enough to elevate Kvyat with dizzying haste to F1, ahead of his widely tipped fellow Red Bull Young Driver, António Félix da Costa.

This change of script occurred because da Costa last year made such hard work of his Formula Renault 3.5 campaign, finishing third when he was expected to win. Such are the high bars set by Dr Helmut Marko, who oversees Red Bull's driver academy. Kvyat, though just beneath da Costa in the pecking order, showed enough speed and promise to vault his elder (his house-mate, incidentally) and receive the unexpected call-up.

But perhaps we shouldn't be surprised at the relentless rise of youth. Marko, after all, was Seb Vettel's Svengali, helping him become F1's youngest champion. What, then, of Kvyat, a 19-year-old quadrilingual Russian, who stumbled into motorsport aged nine after trying out a kart 'just for fun' at a local track?

"Well I'm not afraid of F1, for sure," is his amused response to *F1 Racing's* observation that he seems very composed. "This is what I've been working towards. I am *living* for this, so being here is special. But coming to F1 is one thing; staying and winning is another. And that's what I want to do."

He first realised he had a chance of a Toro Rosso drive after winning the GP3 feature race at Spa. "A few other guys from the Red Bull junior team were not having the best

season," he says, "and key people made it clear that if I keep doing well, I had a big chance. And I kept doing what they wanted."

A toothy grin lights up his face as he recounts the phone call telling him he'd got the gig: "It was a great moment," he confides. A great surprise for me – really positive."


A test at Misano on November 8 to secure the superlicence necessary for him to race in F1 was soon followed by his F1 debut proper: driving first practice for the US GP in Austin. He wound up 18th with a 1min 40.065secs best after 20 laps. Encouragingly he was just two tenths off team-mate-for-the-morning Daniel Ricciardo. More telling was the approval of Marko, who offered this: "Daniil is quick, focused and he works hard. These are all the things I look for, and so far he has not disappointed."

The effortlessness of Kvyat's rise hides one or two hiccups,

however. Marko relates that in his mid-teens Daniil grew nine inches in one year, causing difficulties with his co-ordination "as he didn't know what his body was doing for a while." He's topped out now at 175cm, but at a mere 58kg, he is whippet-thin even by the standards of this current F1 generation.

His slender frame proved no impediment to hustling an STR8 around the Circuit of the Americas without physical trauma and he later reported "no problems – even if it is a bit harder for your brain." That he is attuned to the mental aspects of an F1 racer's job at such a young age is perhaps the most revealing window on his success. Possession of sufficient mental bandwidth to process the demands of 2014-spec F1 (tyre management, energy management, fuel management and so on) will be fundamental to his success. So far, he seems well placed to prosper.

"You have to be able to do as many things as possible when you are driving in F1," he notes. "It is multi-task work, so for sure this is something I have been trying to develop in my driving abilities. Nothing stands still: you have to keep upgrading with the times."

An old head, indeed, on young shoulders. 

CV – DANIIL KVIAT

- 2014** Signs to Toro Rosso for the 2014 F1 World Championship
- 2013** Wins the GP3 Series with MW Arden, collecting three wins. Also competes in the European F3 Championship with Carlin, taking one victory
- 2012** Wins the Formula Renault 2.0 Alps series and finishes as runner-up in Eurocup Formula Renault 2.0
- 2011** In Formula Renault, finishes third in Eurocup and UK Final series, and second in Renault 2.0 NEC. Also competes in Toyota Racing Series
- 2010** Competes in Formula BMW and Formula Renault
- 2009** Finishes runner-up in WSK International Kart Series
- 1994** Born, 26 April in Ufa, Bashkortostan, Russia



WHAT'S REALLY GOING ON AT LOTUS?



Race winners dogged by tales of financial woe, Lotus have provided plentiful off-track soap opera in recent months. Gerard Lopez speaks to us exclusively about Kimi's shock departure – and those missing Middle Eastern megabucks

WORDS DIETER RENCKEN

There's a joke in the automotive world that Lotus stands for Lots Of Trouble, Usually Serious. This may be true of the well-engineered but sometimes unreliable road cars bearing the Lotus badge, but Lotus F1 team chairman Gerard Lopez could be forgiven for thinking it applies equally to his team – despite their having nothing in common save for cross-licencing.

For several seasons now, Lotus F1 have appeared to flip between frying pan and fire.

There was the chaos that followed the loss of star performer Robert Kubica after his horrific accident in a rally car; court battles over the use of the Lotus name and logo, which led for a time to two different teams racing concurrently as 'Lotus', albeit with different colour schemes; and, more recently, Kimi Räikkönen, their megastar driver, has in effect gone on strike. Throw in rumours of a fractious relationship with engine supplier and one-time 25 per cent partner

Renault – Lotus have no 2014 power-unit deal yet – plus non-stop sniping about the team's finances, thanks to the non-arrival of wannabe investor Quantum's (promised) gazillions, and Lopez and business partner Eric Lux could surely be forgiven for regretting their entry into F1's Piranha Club. They have, after all, grown accustomed to success through their investment vehicle, Genii Capital, and Lopez had already made his first fortune by the age of 30. →



PHOTO: ANDREW FERRAROLIAT

The noise has intensified over the final race weekends of 2013. In Singapore, Räikkönen disclosed he had not then received his 2013 stipend, an estimated £16m; he arrived late for the Abu Dhabi Grand Prix, missing the team's regular Thursday media commitments; then elected to have surgery to treat a recurrent back problem, missing the final two rounds entirely. In Austin, therefore, the media were clamouring for a slice of Lopez or lieutenant Eric Boullier – the level-headed team principal who also heads up Gravity Management, Genii's driver stable. Likewise, Quantum front man Mansoor Ijaz spoke to a selected few to allay fears that his consortium would not come up with the goods.

Lopez seldom goes front-of-house, preferring to leave that beat to team principal Boullier. When we meet in the Lotus hospitality suite it's clear that Luxembourg-born, Miami-educated Lopez – fluent in seven languages – remains bullish about the previous week's listing of start-up web development platform Wix, from which

Genii Capital reaped a 350 per cent return on an \$8m investment. That is what Genii do. It seems appropriate, then, to kick off by asking Lopez about Kimi Räikkönen – whether the team has been in contact with him since his departure, whether his wages have been settled – and, if not, why haven't the profits from the Wix flotation been used to clear the arrears?

"They're not for that," responds Lopez, pointing out that Lotus operates autonomously, as do all entities in portfolios amassed by Genii and its sister company Mangrove Capital – an early investor in internet comms site Skype.

Lopez whips out his Blackberry, to reveal a trail of text messages from his absent driver. The exchange suggests that relations between the two are good, and Kimi wishes Lotus well in the "last two races" before coming close to an apology for negative media coverage by blaming people "for not liking or respecting" what was said in public.

True, the expletive-filled radio exchanges overheard during the Indian GP hardly helped.

But Lopez says the issue was not so much the messages themselves as their global broadcast: "The number of times the f-word is used on the radio... have you any idea what Romain heard when things weren't going well? Come on, we're not in kindergarten..."

There must be more to it, surely? "We had a similar [money] situation last year," explains Lopez. "Kimi returned [to F1 after a world rally sojourn], nobody knew his performance level and we did a deal that, contrary to what people believe, had a sizeable, fixed amount and also a sizeable amount per point. He did very, very well..."

"He scored a lot of points and a win at the end of the season, because of ongoing development. We never had issues. We didn't see Kimi make a big splash in the press because we agreed we would push the envelope on development, and essentially he would get paid at the end of the season, when we closed

Chairman Lopez with his Lotus team: punching above their weight, despite a mid-grid budget

the accounts and saw what was missing – we [Genii] have to put money in."

The model is little different from other entrepreneur teams: Red Bull covers any losses at its teams, while Vijay Mallya and Andrey Cheglakov plug holes at Force India and Marussia respectively. Only the timing and structure of the cash injections differ.

According to Lopez, there was a tacit understanding that the same payment schedule would prevail in 2013, and that Kimi would remain at the team for 2014. Then Ferrari came knocking, not least because Lotus had provided him with a platform to re-invent himself after most had written him off, while Lotus obviously posed a threat to the Scuderia's position in the constructors' championship.

"There was no going into this year thinking it was our last year with Kimi," says Lopez. "Performance was excellent; we pushed more on development. The only reason we didn't walk all over Ferrari or Mercedes is our bad results over the summer. That was unrelated to development; we just had bad results. Bad results, plus Romain had a number of retirements."

It's hard to argue on the performance front, although the team must surely have expected more, having won the first GP of the year. Still, they are punching well above their weight, as proven by a string of podiums. Räikkönen may have slipped out of title contention mid-way through the year, but he still finished all but one of the races he's started since making his comeback. Has his backpay been settled, though?

"Not all of it," admits Lopez. "Some of it – we reached agreement on payment in Abu Dhabi."

Lopez suggests that the F1 media went for sensationalism after Sebastian Vettel blitzed both titles at the Indian Grand Prix weekend and left little else on the news agenda. He is adamant Räikkönen is not unique in going short, so cannot fathom why Lotus was singled out save that Kimi, being Kimi, spoke out.

None of this, though, explains why Lotus have racked up estimated losses of £60m annually – which they have converted to shareholder loans →

"The only reason we didn't walk all over Ferrari or Mercedes is our bad results over the summer."

That was unrelated to development; we just had bad results"

Swiss movement, English heart



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– despite winning races and scoring podiums, despite having one of the F1's most bankable drivers, and despite Genii investing in some of the planet's highest-tech companies.

There is, Lopez claims, little boardroom appeal for F1 among technophiles. The sport, he says, needs to do some soul-searching about its lack of commercial appeal. No teams bar one or two majors have, he suggests, announced mega-deals in 2013, and those that did, did so in special circumstances.

"I can go to some of the founders [of high-techs] and say: 'I'm going to sell the world 100 million cars that work on solar energy and hybrid-whatever, hydro-energy', and they'll say: 'Wow, let's see if we can do something,'" he says. "If I tell them: 'We cover one of the world's largest sports,' it just doesn't cut it."

Lopez is scathing about some of F1's more sensational financial reporting about Lotus, saying: "Eighty per cent of the teams on today's grid – I really mean 80 per cent – are financially no better off than us. Of that 80 per cent, for half of them it would be enough for one individual to say 'I'm sick and tired of Formula 1' for the whole thing to collapse."

Following rumours that his team have been late in paying staff and settling supplier invoices, Lopez has a ready answer: Lotus had been led to believe that Quantum's funds had hit the bank, and thus had not transferred the payroll into its operating account. Once the issue became apparent, funds were transferred, but the process took 48 hours.

As for suppliers: "I know there were delays with some, for the same reason," he says. "We've always paid everybody. The amounts I've heard are totally ridiculous. I'm not going into details, except to say that the amounts owed are not huge. We pay as we always have."

But other teams haven't announced the arrival of major investors only for the money to fail to appear. Does Lopez think the Quantum deal – in which the consortium would not only acquire a 35 per cent stake in the team but also provide sizeable sponsorship – will happen? Or do the team believe it will because they have no choice?


Although Lopez believes the money is real, he blames the delay in the transaction on

international banking regulations, the team having sought to clear funds through British, Luxembourg and Swiss channels. Post 9/11, large sums of money can't be transferred from the Middle East to other destinations at the click of a button. Surely, though, there is a deadline?

"We will give a very hard deadline," says Lopez. The reason is that we will either continue on our own at the same level of investment, or we will speak to other interested parties. We are hopeful of closing the deal."

At the time of writing, team principal Boullier is adamant that Lotus have three options: to complete the Quantum deal; to find another investor; or to recruit a well-funded driver. So he is not nervous about the future and believes morale at Enstone is good despite the hiccups.

The problem is that Lotus are not major players in F1, despite having the infrastructure of the title-winning team they used to be in their Renault days. And they operate on a mid-grid budget that does not stretch to full-on development, plus a driver of Räikkönen's bank-breaking stature. Formula 1's revenue structure rewards the so-called top four teams (Red Bull, Mercedes, McLaren and Ferrari) to the degree that they earn up to double Lotus's annual income from FOM even if they perform identically on track.

Without further investment, Lotus must cut their carbon fibre according to their cloth. That will limit their potential to mix it up with Red Bull, and there'll certainly be no 'walking all over' Mercedes and Ferrari. And if Lotus are poorer, so, too, will F1 be, a state of affairs for which the sport must share the blame. 

"Eighty per cent of teams on today's grid are financially no better off than us."

Of that 80 per cent, for half of them it would be enough for one individual to say 'I'm sick and tired of Formula 1' for the whole thing to collapse"



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King of the Hill

Max Chilton has faced an uphill battle to establish himself in F1, but as he explains on a training ride in the North Downs, he plans to make it to the top

WORDS TOM CLARKSON

PICTURES SAM BLOXHAM/LAT

Some people have natural ability on a bike, and some don't. In the pictures accompanying these words, you see both ends of the talent spectrum: Max Chilton is riding effortlessly up Surrey's Box Hill, spinning his pedals with silky efficiency; yours truly is relying on brawn to scale the ascent made famous by the 2012 Olympics.

Max looks the part, too. His 5'11" frame carries little excess fat. He weighs in at 66kg, and his long legs and short upper body help create the perfect riding position on his titanium Van Nicholas. But Max is a stickler for detail – "I've got mild OCD" – and perfection is something he seeks in everything he does. His trainer, Sam Village, says he runs as well as he cycles, and he'd have a single-digit golf handicap if he were able to dedicate more time to the golf course.

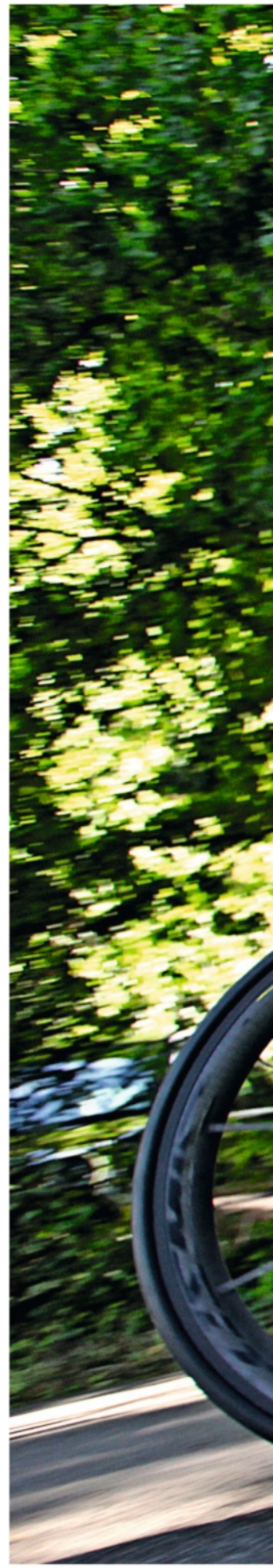
But today is all about cycling and *F1 Racing* has come to Surrey's North Downs, just a stone's throw from where Max grew up in Reigate, to have a spin with the fourth Brit on the grid. Box Hill is one of Chilton's regular training rides, so he's familiar with its five per cent gradient, ultra-smooth asphalt (it was resurfaced before

the Olympics) and the burning sensation in your thighs as you near the top.

"It's not that steep," he says, "and it's only short [4.38km], so you can do it several times – nine times like in the Olympics, if you want! I'm amazed at how popular it's become; you never ride it alone these days, no matter what time of day you're out."

Road cycling was the focal point of Max's training in 2013. He prefers being outdoors to in the gym and feels safer on a road bike than a mountain bike. He did a lot of off-road cycling when he was in the junior formulae and he learnt the hard way about its associated dangers.

"You have much less grip off-road," he says, "and you often don't know what's around the next corner. You can have a big smash if you're not careful. Of course, you can still have a crash on a road bike, but I think there's less chance of it going wrong. My training is now geared towards making me a more efficient athlete and cycling is perfect for that. It's about keeping my heart rate as low as possible, so I can focus on my driving at every stage of a grand prix." →







His heart hasn't had much of a workout today because he's been able to talk all the way up Box Hill. In order to make it a two-way conversation, we stop at the top of Box Hill, in the National Trust café (famous in cycling circles because 'Wiggo' stopped here on a training ride prior to the Olympics). We sit outside in the early autumn sunshine and reflect on his first season in Formula 1 over a cappuccino and a flapjack.

The statistics don't make for great reading. Max has been the slower of the two Marussia cars in every qualifying session this year, bar Monaco and Japan, which has meant back-of-the-grid starts at most races. This has compromised his race pace because he's had to look out for blue flags as early as lap 20.

"It took me time to work out how to get the maximum from the tyres. As a result, I've worked hard and made progress"

But it's not all bad news. If you look beyond these headline stats and bear in mind that he's racing alongside Jules Bianchi, who's being groomed by Ferrari as a future megastar, he's actually made a lot of progress. While slower than his team-mate, Max has closed the gap to him over the year. In Melbourne he qualified 0.8secs behind Bianchi and the gap was down to an average of 0.25s in the four races that followed the August summer break. In Singapore, which is one of the most demanding

Chilton leads Bianchi at Monaco, having outqualified him for the first time this year



INSET'S: STEVEN TEE/LAT; GLENN DUNBR/LAT

racetracks on the calendar, he was just 0.1sec slower – which is a mere 0.004secs per corner.

"Qualifying has always been my strong point in the past," he says. "That wasn't the case early on in the year because it took me time to work out how to get the maximum from the tyres. As a result, I've worked hard at that and made progress. If you look at the telemetry you can't say Jules is better than me in one particular area of performance; it's just tiny bits here and there – usually in the second half of the last sector."

Such is the step up from GP2 to Formula 1. There are a couple of top-class drivers in every category below F1, but everyone is from the top drawer in F1. To beat guys like Bianchi, who have been winning races since they were in short trousers, you need to be perfect around the entire lap, and Max is getting closer.

As a result, the public's perception of Chilton is changing. He's taken more seriously now than he was at the start of the year, when he arrived in F1 with money and just a couple of wins in GP2 and British Formula 3 to his name. He may not be the next Sebastian Vettel or Fernando

Alonso, but he's a match for the likes of Sergio Pérez, whom he regularly beat in F3, or Esteban Gutiérrez.

"Max is definitely quick," says Daniel Ricciardo, his team-mate in F3. "Back then he was inconsistent, but he knows how to drive a racing car."

Other impressive aspects of Chilton's season have been his tenacity and reliability. In Brazil he set a record for the most race finishes by a rookie, having brought the car home in all 19 GPs. He may have been 2013's perennial backmarker, but rarely has he tripped up the frontrunners as they lap him. That said, Alonso and Vettel make a point of speaking to Max on the drivers' parade at each race. Be in no doubt that only part of their mission is to be friendly. ➔



Over the course of the 2013 season, Chilton gradually closed up the gap to his team-mate, Ferrari protégé, Jules Bianchi





"I'm an F1 rookie, but I'm not a racing rookie," says Chilton. "I haven't had to change what I do in races, although I think we all have different ways of keeping motivated. I don't see myself as being in the same race as Alonso and Vettel; I imagine there are 22 Marussias on the grid and that I've got Marussias in front and behind me. That way, even if I'm beaten by Jules, I imagine beating ten other cars if I've had a good race."

Overall, then, Max can reflect on a job well done during his debut season. Spa, where he qualified 16th on a drying track – ahead of both Toro Rossos, both Williams and Gutiérrez's Sauber – is the highlight, but there have been other significant moments, such as when he

"I'm a competitive person, but I keep a lid on my emotions because I see desperation as a weakness"

outqualified Bianchi at Suzuka – the classic driver's circuit.

"I have no regrets about what I've done this year," he says. "Of course I'd like to be qualifying and finishing higher up, but there's no point in moaning. I'm a competitive person, but I keep a lid on my emotions because I see desperation as a weakness. I'm lucky to be in F1 and I'm taking my career one step at a time. I want to be world champion one day, but it's going to take time. First I've got to win a race. Lots of drivers arrive



Malaysia 2013 and Chilton is led by one of the drivers he admires most: McLaren's Jenson Button

INSETS: CHARLES COATES/LAT

in F1 at the back of the grid and work their way towards the front, and that's what I've got to do."

He'll be doing well if he follows in the footsteps of Alonso and Mark Webber, who started their F1 careers as backmarkers with Minardi. They both moved on to other teams after one year, but Chilton has his sights set on a second season with Marussia. The rule changes over the winter at least present the team with an opportunity, if Ferrari can come up with a decent power unit and the team can design a nimble, reliable and efficient chassis.

"We are the smallest team on the grid by some margin," he says. "We do an outstanding job with what we have. If we do a good job over the winter – and we've got some very talented people at our factory in Banbury – there's no reason why we can't get some strong midfield results next year."


Reliability will probably be more of a factor in 2014 than it was in 2013 and the drivers will need to think outside the box to maximise the tools at their disposal. They will have a 160bhp KERS boost for 33secs per lap (as opposed to the current level of 80bhp for 6.6s per lap) and tyre wear will most likely be critical.

"I'm quite methodical in the way I do things," says Chilton, "and that will help me next year when we have a lot of things to do in the cockpit. A lot of decisions will need to be made and

drivers will have to think outside the box to get good results.

"Jenson Button is one of the drivers who can do that because he always does well in races when the unexpected happens. When he was

running last in the wet-dry 2011 Canadian GP, I placed a 50p bet on him to win and he did! It's drives like that which stand out to me, and you can't take anything away from Vettel, Alonso and Hamilton; they're all great drivers, too."

It'll be fascinating to see what happens next. Will Chilton do another year then fade into the shadows, or will he start to climb to the front of the grid? His performance on a bike leaves us in no doubt that he has the athleticism and determination to have a shot at an F1 career. 



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Man of the year 2013

Our expert panel has deliberated, debated and voted for the men, machines and mega moments of last season – and the results may surprise you...



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Car of the year

Red Bull RB9

Every passing year teams aim to make a car stiffer, lighter and more aerodynamically efficient. The basic concept of this year's RB9 has effectively remained the same as that of the RB8, 2012's Car of the Year. Little things have been tidied up, but it's essentially the same machine.

The RB9 runs a lot of rake, so the front ride height is very low and the rear ride height is relatively high. If you get the rake working correctly, which is not easy by any means, you get a flat aero map. By that, I mean the centre of pressure will move relative to the force pushing down on the car, and, as a result of that, you'll have a very driver-friendly machine.

The first thing that hits the air is the front wing, and that is fundamental to the rest of the chassis. If the airflow coming off the front wing is turbulent, then it has a similar effect to an aeroplane hitting a cloud. If you consider that 80 per cent of a car's performance comes from aerodynamics, then 80 per cent of the aerodynamic performance comes from the front wing. It's crucial to get it right and Red Bull have done just that.

At the back of the car, Red Bull were the first team to get a good understanding of the Coandă exhaust system, whereby the exhaust gases attach themselves to the surface of the car and feed into the diffuser. In addition, they have brake ducts that produce additional downforce, so they have exploited the rear of the car very well.

There was a notable change in performance when the tyres switched to the older construction mid-season. With these tyres, the fronts grow

in height with speed, so the car will lift itself off the ground by a couple of millimetres. That allows you to have a different aero map. On the RB9 the aero map is all about maximising the rake with the very low front ride height. The pre-Silverstone tyres didn't grow in height, so Red Bull had to run their front higher than they wanted. With the older construction tyres, they could go back to running a couple of millimetres lower, thereby exploiting their whole philosophy. So the tyre change fell in line with the aerodynamic principle of this car.

As far as the RB9 is concerned, it's all about detail – everywhere. Every aspect of the car is fully optimised and understood. The way I look at it, Adrian Newey will basically sketch out the car, then cut it up like a giant jigsaw puzzle and give each member of the design office one of those pieces to optimise. They'll go away and work flat-out on their piece, then when it comes back to Newey all the pieces neatly fit back together. Other teams will work on their individual bits, too, only they don't have the genius of Newey fitting all the pieces seamlessly back together again.

Gary Anderson

Honourable mentions

• To the Lotus E21, a race winner in spite of its relatively meagre development budget

• And to the Mercedes W04 – blisteringly quick, but just not often enough when it really counted

Moment of the year

Red Bull's internal tensions laid bare

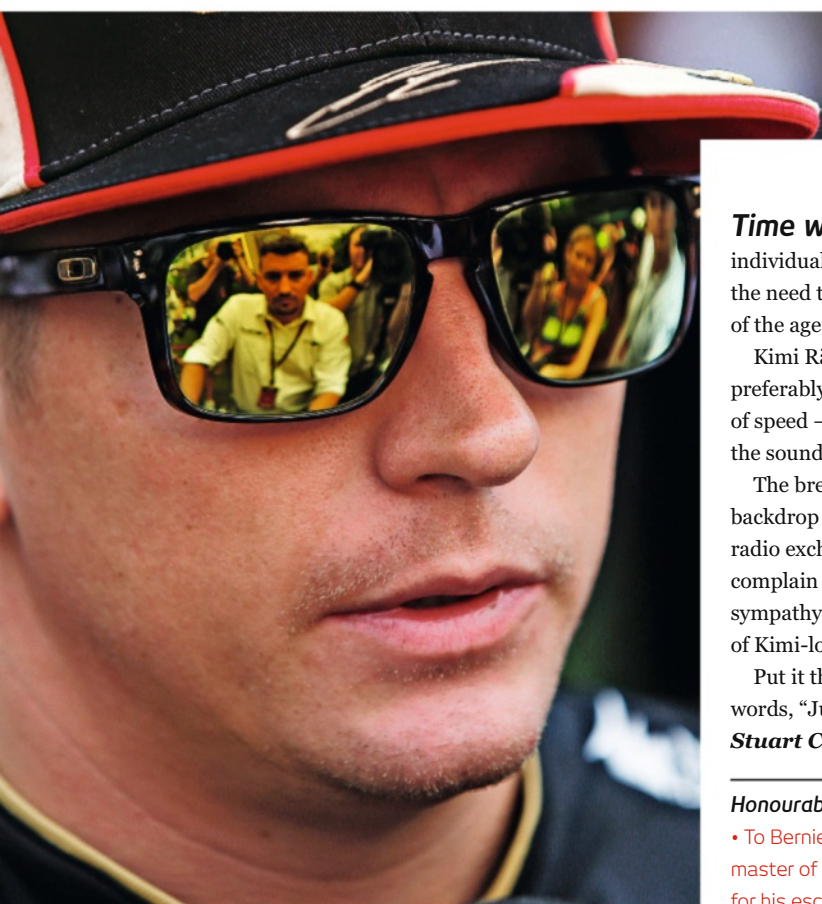
"In the end, Seb made his own decisions today and will have protection as usual and that's the way it goes." BOOM! There it was, Mark Webber laying bare the in-team discord between him and Sebastian Vettel, which had simmered for four seasons and quite frequently boiled over.

The moment was Martin Brundle's post-race Sepang podium interview with Webber and Vettel in the wake of multi-21-gate. We've made it our moment of the year, instead of the intense on-track battle preceding it, because it is so rare for anyone in F1, to tell it like it is *in public*. Off-the-record chats are all very well, and many F1 hacks who have followed the Vettel/Webber tussle since 2009 will attest to having been briefed this way or that about how things *really* were inside the team. For sheer balls, though, this moment took the biscuit and the looks on the faces of senior team personnel, as they watched their carefully constructed media edifice unravel before their eyes, said it all about just how off-message Webber was being. Lord knows we'll miss him.

Anthony Rowlinson

Honourable mentions

- To Hamilton for stopping in the McLaren pit in China • And to Alonso for dodging that flying tyre tread at Silverstone



Personality of the year

Kimi Räikkönen

Time was when an accolade such as this would fall to the most loquacious individual on the block. Things, clearly, have changed. In a sporting environment where the need to service the internet's 24/7 demand for soundbite-based 'news' comes top of the agenda, people are talking too much – but not saying anything worthwhile.

Kimi Räikkönen doesn't seek adulation. He just wants to drive cars quickly – and, preferably, to be paid for it. But his no-nonsense outlook, coupled with his bracing turn of speed – largely unblunted by two abortive seasons in the WRC – and reticence to play the soundbite game have woven a remarkable magic. He now enjoys cult status.

The breakdown of his relationship with Lotus has played out against a public backdrop in *Jeremy Kyle* fashion, thanks to FOM broadcasting those tetchy in-race radio exchanges (and Kimi himself using an FIA press conference as a platform to complain about Lotus's lack of liquidity). You'd hardly expect anyone to express sympathy for a multimillionaire being left slightly out of pocket, and yet still the millions of Kimi-lovers worldwide are held in thrall. We all are.

Put it this way – you haven't seen anyone wearing a T-shirt bearing Lewis Hamilton's words, "Just let me focus, man!" have you?

Stuart Codling

Honourable mentions

- To Bernie Ecclestone, master of comic timing, for his escapades with a revolving door at London's High Court • To Mark Webber, for saying exactly what he thinks (as always)
- And to Niki Lauda – a fellow non-mincer of words

PHOTOS: STEVE ETHERINGTON/LAT; ANDY HONE/LAT; GLENN DUNBAR/LAT



Pit crew of the year

Ferrari

Tough call, this. The speed of the hand may fool the eye, but the stopwatch doesn't lie: Red Bull's pit crew have performed the fastest stops at most of the 2013 races. Anything you can do, they can do faster – as proved at Austin when Fernando Alonso was stationary in the pit for a record-breaking 1.95secs, only for Mark Webber to waltz out of the Red Bull box after a telemetry-recorded 1.92secs.

And yet we must be harsh. This same pit crew made a conspicuous fumble at

the German GP and the result, a loose wheel thundering down the pitlane, struck and injured a cameraman. So we looked towards a crew that has been consistently among the quickest, while making fewest errors.

Ferrari clocked up the fastest stops at five GPs, and were fractions off Red Bull at most others. There's been the odd slip, but no drama – and that, when every nanosecond counts, is what matters.

Stuart Codling

Honourable mentions

- To Red Bull, fast but (very) occasionally fallible
- To Mercedes, quickest at two GPs in 2013 • And to McLaren, level with Merc, but not quite on 2012 form

Qualifying lap of the year

Valtteri Bottas, Canada

It was a lamentable year for the once-mighty Williams. Qualifying in 2013 only highlighted the FW35's performance deficit. And Valtteri Bottas and Pastor Maldonado's grid positions make uncomfortable reading: 16th, 18th, 14th, 16th, 17th, 15th, 17th – you get the picture.

But then one result stands out. Bottas. Canada. *Third* place. That's ten places higher than the best grid slot (also at Montréal) registered by team-mate Maldonado, who has failed to break into the top ten shoot-out this year.

When Bottas sat in the post-qualifying press conference, it was a measure of how unprecedented his performance had been that polesitter Sebastian Vettel turned to him and jokily enquired: "What are you doing here?"

Valtteri didn't waste his opportunity. His engineer, Jonathan Eddolls, made the right call on tyres in changeable conditions, and Valtteri's best lap was no fluke – he was fourth in both Q1 and Q2. It was a performance that made Formula 1 sit up and take notice.

James Roberts

Honourable mentions

- To Webber for a mighty Abu Dhabi pole lap • To van der Garde for gatecrashing Q2 in Monaco • And to Rosberg, inch-perfect in Bahrain and Monaco

Overtaking move of the year

Fernando Alonso, Spanish Grand Prix

In an era of high tyre degradation and DRS zones, it's unusual to see an overtaking move that hasn't been enacted through artificial means. But Fernando Alonso's feisty opportunism in the opening corners of the 2013 Spanish GP was a textbook example of how to position your car to outwit your rivals. And those rivals were none other than Lewis Hamilton and Kimi Räikkönen – two world champions, who he overtook in his Ferrari *around the outside*.

Starting fifth at his home race, Alonso made his customary quick getaway. On

his way to Turn 1 he saw Hamilton, ahead, lock up in his bid to try to pass Sebastian Vettel for the lead. Räikkönen tucked up behind Hamilton, so Alonso cut a tighter line through T1 to get on the power earlier and straightline the corner at Turn 2.

He judged it to perfection, getting a run on Kimi and keeping up the momentum to go wheel-to-wheel with Lewis around the outside of Turn 3. Finally he defended late onto the brakes into Turn 4 to cement third place. This double move past two world champions was simply stunning.

James Roberts

Honourable mentions

- To Kimi Räikkönen (on Pastor Maldonado at Singapore) • To Sergio Pérez (on Jenson Button at Monaco) • To Adrian Sutil (on Fernando Alonso at Monaco) • And to Esteban Gutiérrez (on Pastor Maldonado at Spa)





Technical director of the year

James Allison

Last year, Lotus operated on a budget of around £150m. A big figure, yes, but less than half of that on which the likes of Red Bull, Ferrari, Mercedes and McLaren do their business. So pound for pound, even allowing for the genius of Red Bull, Lotus make a strong argument for being F1's best team.

They are efficient and race-savvy, and also, as proved by the Allison-penned E21, capable of producing a chassis good enough to carry Lotus to a close fourth in the constructors' chase, earning the respect of all their rivals. A race-winner in Australia and a podium finisher at Austin, the E21 lacked nothing in elegant efficiency, and with a bigger budget who knows what Lotus might have achieved this year. The key to the E21's success was a capacity for maximising tyre life – an attribute that, in an era of fragile Pirelli rubber, let Kimi and Romain hold on to their tyres when all around them were losing theirs. Result? Often one stop fewer than their rivals; 20-plus seconds of race time gained.

So how good was Allison? Good enough for Ferrari to come calling...

Anthony Rowlinson



Honourable mentions

- To Mercedes' Bob Bell – getting there with the W04
- And to Pat Symonds for showing Marussia the way forward

Start move of the year

Fernando Alonso, Singapore

The Alonso force-of-nature tsunami at its finest. From seventh on the grid to third by the first corner, this was Fernando still in the fight for the drivers' championship and simply refusing to be denied – whatever the limitations of the machinery beneath him.

On the front row were Seb Vettel and Nico Rosberg, and all eyes initially were on *their* battle, for Nico managed to edge ahead of polesitter Seb into T1. But in doing so he ever-so-slightly outbraked himself, letting Vettel cut back into T2 and T3 and sneak into the lead. From there, the race, in any competitive sense, was over.

But nobody had told Fernando. From the right-hand side of the grid in P7, he initially got the drop on a sluggish-starting Hamilton in P5 ahead, and was a car-length clear by the time he started to turn in to T1. Inside him, to his left, were a squabbling Romain Grosjean, Mark Webber and Felipe Massa, who'd qualified P3, P4 and P6 respectively. As they slowed to avoid colliding with each other into the tight funnel of T1, Alonso came steaming down the outside, ignoring the T1 apex completely, apparently aiming only to make it through T2. Alonso being Alonso, the move came off beautifully, outfoxing the bickering trio alongside and setting him up for an eventual second-place finish as Rosberg faded to fourth. And the best



bit about all this? He revealed later that he'd actually rehearsed it, fully believing such an audacious move was possible.

Alonso's season may have been by and large a disappointment by his exalted standards, but the memory of that start should be enough to keep him warm all winter long.

Anthony Rowlinson

Honourable mentions

- To Felipe Massa at Silverstone, who climbed from 11th to fifth place in the space of just one lap
- And to Romain Grosjean for a sensational getaway in Japan – from fourth to first off the line →



Most improved driver of the year

Romain Grosjean

Perception is everything in F1. A few moments of opening-lap exuberance in 2012 almost cost Romain Grosjean his career; the truth is that the paddock had defined him as a “first lap nutcase” long before Mark Webber gave voice to that phrase after colliding with Grosjean in Suzuka.

It's been a long road back for Grosjean. Behind the scenes, he began to consult a psychologist. Meanwhile, Lotus, who share ownership with his management company, gave him another year in which to prove himself. And now he has, in his own words, “learnt how to put everything together”.

There's no doubt that the mid-season change of tyre construction harmed Lotus's competitiveness. But you have to do the best with the tools available, and Grosjean stuck with the frontrunners while team-mate Kimi Räikkönen began to flounder. And then, a year on from ‘nutcase-gate’, he delivered the perfect riposte: clean start to lead the race at Suzuka.

Stuart Codling

Honourable mentions

- To Vettel, now an unstoppable force
- To Rosberg, who flummoxed his doubters
- And to Ricciardo, who proved himself

Team principal of the year

Ross Brawn

In January 2013, on the day after the news broke that Paddy Lowe was leaving McLaren for Mercedes, ultimately to become team principal, Ross Brawn laid down a marker: “I am the team principal,” he said. “And I am in charge.”

A major management reshuffle followed a disappointing second half to 2012. Norbert Haug and Nick Fry were shown the door and Toto Wolff and Niki Lauda arrived. Wolff, still a Williams shareholder, had courted Lowe to join him there, but it was the offer to run the team that sealed the deal for Lowe to join Mercedes.

As the months went by, it was clear that Brawn was – just as he said – *in charge*. As he adroitly weathered the storm surrounding the Mercedes/Pirelli tyre test, it became clear he was not someone to be trifled with.

What followed was a subtle change of tack from the new management: an agreement that Brawn would remain in charge and determine his own exit strategy.

James Roberts



Honourable mentions

- To Christian Horner, wrangler of F1's most competitive team
- And to Eric Boullier, for keeping Team Enstone in shape

Most improved team of the year

Mercedes

Until the end of 2012, Mercedes' much vaunted return to F1 wasn't looking all that impressive. In three years back, they had just one win (Nico Rosberg, China 2012) and four front-row starts to their credit. Last winter Norbert Haug became a casualty of that poor form, and fresh blood arrived in the form of Toto Wolff, Paddy Lowe and Lewis Hamilton.

Team principal Ross Brawn evaded attempts at ousting him to see his structural changes finally begin to bear fruit. Between China and Spa, only once did a car other than a W04 start on pole. Converting qualifying pace into race wins proved trickier, particularly after old-style Pirelli rubber was re-introduced from Germany onwards. But Rosberg drove a canny race to win in Monaco, and Hamilton, as he so often does, *owned* the Hungaroring.

As Red Bull established superiority over the remaining races, Mercedes could be forgiven for shifting their focus to 2014, given the seismic change in engine regs for next season. With Ross Brawn gone, the pressure is now on Wolff and Lowe to take the fight to Red Bull.

James Roberts



Honourable mentions

- To Force India for making a little go better and better
- And to Marussia: a long way • To Red Bull, who just get getting closer, but no cigar... yet



Drive of the year

Lewis Hamilton, Hungarian Grand Prix

This was the day Lewis and Mercedes got us all excited. In taking his first win for Mercedes, and his first victory since his sassy drive for McLaren at the 2012 US GP, Lewis briefly looked as if he might truly be able to challenge Vettel for the 2013 drivers' title. The Mercedes W04 had been a flying machine all season long, in qualifying at least, and team-mate Rosberg had already recorded two wins, at Monaco and Silverstone.

Hamilton, though, had struggled with setup and braking feel, and the chassis was prone to eating its rear tyres on race day. In the 45°C heat of Hungary, with F1's sternest hustler at the wheel, there was surely no chance of a win. Was there?

Hamilton thought otherwise. On a circuit where he's become nigh on unbeatable (this was his fourth win here in seven starts) he seized his opportunity to win by 11 seconds from Räikkönen and a close-following Vettel – both of whom had cars less critical on rear tyre wear. The margin of victory underlined a perfectly swift and controlled drive by Hamilton. But thereafter a certain Mr Vettel was unbeatable.

Anthony Rowlinson

Honourable mentions

- To Nico Hülkenberg, who drove out of his skin in Korea
- To Adrian Sutil for proving you can overtake in Monaco
- To Romain Grosjean for going from 17th to the podium in India



Driver of the year

Sebastian Vettel

Many cast aspersions on Sebastian Vettel's prowess behind the wheel, muttering that his success is purely down to his car. But it's worth remembering that nine-time GP winner and 2010 title finalist Mark Webber had the same car. And he was no slouch (as his crushing Abu Dhabi pole lap proved); he could still beat Vettel on his day.

But what Webber lacked was the relentless charge of his team-mate. Vettel has a restless, all-conquering desire to top the timing screens, to flee his pursuers in the opening laps before DRS is activated and to nail the fastest lap of the race in the closing stages. In 2013, Vettel was as dominant as ever. Victory in Malaysia – controversially – and Bahrain, Canada and Germany. Then from Belgium until the end of the year, a record-breaking winning streak – nine in a row – totalling 13 across the season.

At the age of 26 (the same age that Alain Prost won his first grand prix) Sebastian has four world titles under his belt and has the time and capacity to eclipse Michael Schumacher's records. As one Red Bull insider said in the midst of his title-winning celebrations in India, "What's impressive is that he's yet to achieve his peak." His rivals need to find a weakness and exploit it. Fast.

James Roberts

Honourable mentions

- To Kimi Räikkönen, who knew (as ever) what he was doing
- To Nico Hülkenberg, for seizing the Sauber by the scruff
- And to Nico Rosberg, quietly maximising every opportunity →



Man of the year

Adrian Newey

'Holistic' is a weasel word beloved of management consultants and other such flim-flam merchants, but when it sallies forth from one man's mouth you *know* what he means. That man is the quietly spoken, unassuming but fiercely competitive chief technical officer of Red Bull: Adrian Newey.

In an era of such increasing complexity that every car on the grid is the work of dozens of designers and aerodynamicists, often working in groups semi-independently of one another, only Newey – or so it appears – is able to take an (ahem) *holistic* view of the car's entire aero map. That's why his design team, now they're in the zone, have been creating pace-setting cars for the past five seasons.

It's Newey's capacity to process the big picture as well as focusing in on tiny details that gives him the edge. Stifled by management interference at McLaren, and ruining – not for the first time in his career – a competitive stumble brought about by trying to take too big a technical leap, he took his drawing board to Red Bull in 2006 and hasn't looked back. It took three seasons to bed in, understand the facilities, work out the windtunnel correlation, and (most importantly) to restructure the design office and instil a greater sense of competitiveness – to purge the not-invented-here syndrome that had plagued the team during its days as Jaguar Racing.

Ron Dennis once described Adrian Newey as the most competitive person he'd ever met. That's the same Ron Dennis, who had worked with the likes of Nigel Mansell (briefly), Niki Lauda, Alain Prost, Ayrton Senna and Mika Häkkinen. Newey does not wear this competitive heart on his sleeve, being guarded and poker-faced in interviews. He permitted a look of mild annoyance to flit across his face as Vettel chopped across Mark Webber's bows at Sepang in 2013. For an outsider to see the fire, they have to stand trackside during one of Newey's irregular outings in historic racing, and witness him spanking his thoroughly re-engineered Jaguar E-type and Ford GT40 (both of which he has crashed, it must be said).

It's a mark of Newey's craft that while the Red Bull technical office have occasionally been caught out by other team's innovations, such as the double diffuser and the F-duct, they have always managed to craft their own solution and improve upon it. That road has led them to master the current set of regulations, such that their rivals have – in effect – folded. Red Bull's dominance in the second half of 2013 can be attributed in part to their closest rivals taking an early decision to 'focus on 2014'. In the development race, that's a euphemism for throwing in the towel.

Nobody else has been able to make such effective use of the blown diffuser and the Coandă exhaust – and that's partly because everyone else has focused on those areas rather than taking a view on how they fit into the car's overall philosophy. Sebastian Vettel was a tough driver to beat in 2013, but he didn't become *unbeatable* until the second half of 2013, when Pirelli reverted to a tyre construction

that flattered the RB9's performance. That, coupled with a few finessing touches to the floor and rear brake ducts, put Red Bull on another plane. Given the tools, Vettel delivered flawlessly.

The chances of any other technician acquiring a similar skill set to Newey are minimal. As he divulges in Maurice Hamilton's excellent interview on page 54, Newey started as a raw graduate and was thrown in at the deep end, learning his trade as a hands-on race engineer, but with the luxury of being able to experiment in a pressure-free environment with an already moribund project (the March GTP car). By analysing this discarded chassis in detail and reaching a clear understanding of how it worked, Newey was able to strip a lot of weight out of it and make it substantially more competitive. Later, supervising a small group designing the March 881 F1 car and its successors, he was empowered to take risks – because budgets were smaller and the team, which became Leyton House, encouraged a more freewheeling approach. Ambition occasionally led him to overreach himself, but he learned through those failures and became stronger as a result – not by becoming risk-averse, but by becoming more ruthless in recognising and discarding ideas that weren't working, no matter how great their on-paper potential. He is, above all, grounded in the real world.

In modern F1, the stakes are much higher than in past decades. Even back-of-the-grid teams operate on such high budgets that they can scarcely afford to take risks, because the consequences of failure are catastrophic. Graduates arrive in design offices without hands-on experience and go straight to the coalface, joining those sub-groups working on individual sections of the car, chiselling away at abstract targets to yield a certain percentage improvement in downforce... and the result is a disjointed overall design that looks as if its constituent elements have been picked and assembled at random.

But there's no going back. The circumstances that enabled this genius to achieve his full potential have been consigned to history. For now, Newey remains energised by the challenge of creating Formula 1 cars – helped, no doubt, by starting again from a clean slate in 2014. When he decides to move on – to yachts, perhaps, or to spend more time fettling his own collection of historic race cars – there will never be another quite like him.

Stuart Codling 📧

Honourable mentions

- To Sebastian Vettel, who knows that the best is yet to come
- And to Ross Brawn, who everyone knew was in charge

The Last Emperor

Bernie Ecclestone has been the biggest of beasts in the F1 jungle for so long it's impossible to imagine the sport without him in charge. Yet rarely has he faced challenges on so many fronts. **John Fisher Burns**, Pulitzer Prize-winning foreign correspondent of *The New York Times*, was granted a rare audience with Ecclestone earlier this year, and here he shares his reflections on the encounter

For a man known for making a high art of the evasive and obscure, Bernie Ecclestone can be engagingly disarming on initial acquaintance.

"Well, what lies would you like?" he said as he guided me into his motorhome at Spa for an interview during a break in practice for the 2013 Belgian GP. Still on the theme of untruths, he added: "I have plenty of them, as you'll know."

As a result of that moment of artful mischief, I found myself warming, at least a little, to the 83-year-old Formula 1 boss. In the years when I watched him from afar, I had felt a deep unease at the way in which his one-man overlordship seemed to have both enriched and imperilled my favourite sport. If this man is anything like the scoundrel his detractors say he is, I thought at Spa, at least he manages to disguise it with an appealing line in self-mockery.

From a distance, Ecclestone had always seemed like Formula 1's Jekyll and Hyde: at once the whip-smart businessman who took a *garagiste*, greasy-overalls sport and moulded it into the financial bonanza F1 became in the 1980s and 1990s, and the ruthless wheeler-dealer whose machinations in buying and selling the sport's commercial rights twice over has earned him a personal fortune of at least \$4billion – while leaving the cash-strapped teams that constitute more than half the current grid struggling race-by-race for survival.

In nearly 40 years spent chronicling the world's most repressive regimes as a foreign correspondent for *The New York Times*, I can't remember any leader who began an interview quite as craftily as Ecclestone. Not in China during the turmoil of Mao's Cultural Revolution; not in the Soviet Union during the Cold War; not in South Africa when apartheid was in its death throes; nor in any other benighted place I've lived and worked, including Taliban-ruled Afghanistan, Kim Il-sung's North Korea, and Saddam Hussein's Iraq.

Through all those years, I had believed my distinction, if there were any, might rest on having survived for longer in many of the world's nastiest places than almost all of my peers. Then, this summer, I won an unsought reprieve when my editors, seeking more →

PHOTO: PAUL GILHAM/GETTY IMAGES





'globalised' sports coverage in an age when millions of our website readers live outside the States, asked me to work closer to home, writing about sports that have a wider following across the world than the baseball, basketball and American football that form the paper's core sports coverage back at home.

It was thus that I found my way back to Formula 1, a passion I embraced as an English schoolboy in the 1950s, sneaking out of Stowe School and scrambling two miles across open fields and under perimeter fencing to reach the paddock at Silverstone, and the Ferraris, Maseratis and Vanwalls then dominating grand prix racing. The sport was a simpler, grittier and, I dare say, purer endeavour then, with Silverstone little changed from the bomber airfield it had been during the war.

The paddock was a tented camp, many of the cars were worked on in the open air, seatbelts and fireproof overalls were unknown, and driver's uniforms and the cars alike were not yet adorned with a forest of sponsors' decals. Drivers shared hotel rooms for economy's sake, and prize money, mostly in the hundreds rather than the thousands of pounds, played an important part in team budgets. Even the crowds seemed different – smaller, of course, than now, but perhaps better informed, at least about the sport's rich history.

No boyhood joy could have been greater than seeing Peter Collins win the 1958 British Grand Prix, his face streaked with oil and rubber dust, his Ferrari team-mate Mike Hawthorn beside him wearing a bow tie. And there was no greater despair than what followed two weeks later, when Collins somersaulted off the track while running second at the Nürburgring's old Nordschleife. With my father, an RAF officer based in Germany, we were encamped a few hundred yards from the crash, and watched as the crumpled Ferrari was brought back to the paddock with its aero screen smashed, its

steering wheel buckled, and other signs that Collins must have been seriously hurt.

Not long afterwards, we watched as Hawthorn, Romolo Tavoni, the Ferrari team manager, and Louise Collins, Peter's wife, emerged ashen-faced from the Adenau Hotel, en route to the Bonn clinic where, we learned as we crowded around the family car to listen to the BBC World Service's nine o'clock news, that Collins had died. Though I couldn't have guessed it then, that experience – of the cruel margin between life and death, triumph and disaster, benign providence and the harshness of fate – gave me a taste of what I was to encounter so often in the years I spent covering distant wars.

But just as the lessons of boyhood carried forward into my adult life, so the years of

in the paddock for Ecclestone, with scant input from the racing teams or others who have made the sport what it is.

It is telling that the image of the F1 chief as the sport's absolute ruler is one Ecclestone himself seems keen to foster. In our motorhome discussion, he claimed not to have read the then current copy of *Autosport* in which Sir Stirling Moss, when asked which living person he most admired, had responded: "Bernie Ecclestone, for what he did in taking control of Formula 1 and putting it where it is today." I took that as coming from the same insouciance in the 83-year-old Moss that prompted him to tell BBC Radio 5 Live earlier this year, to feminists' fury, that he didn't think women had "the mental aptitude to race hard, wheel-to-wheel", and thus to compete in Formula 1.

But when I put the same question to Ecclestone, his pantheon of the greatest men he has met seemed positively wilful in its contrariness. In an encomium about the "dictators" he had met and admired on his travels, he cited the former Italian prime minister, Silvio Berlusconi, and Leonid Brezhnev, the longtime leader of the Soviet Union during the Cold War, who I had observed from close quarters during my years in Moscow.

For good measure, he tossed in Vladimir Putin, the current Russian leader, with whom Ecclestone negotiated for the grand prix to be held at Sochi next October. "A super guy", was how he described Putin. "Could do with him in every country."

As for democracy, he said Formula 1 could never be run democratically because of the "anarchic" nature of the teams.

I wondered if this was another case of Ecclestone mischief. Was he pulling the chain of a reporter who arrived at his door with comfortable pieties, but with no grasp of the realities of running a multibillion-dollar business that involves legions of sleight-handed people in more than 20 countries, a host of hard-nosed multinational companies with roles as sponsors, team owners and engine builders, and 11 teams who have spent years manoeuvring against each other for on- and off-track advantages?

Perhaps. Whimsy seems to run powerfully in his character, along with the exhaustion that any powerful man might feel, judging himself to be a Gulliver among the Lilliputians, when his life's work is under assault. ➔



Bernie with Russia's Vladimir Putin (above left), who he calls "a super guy"; and Ecclestone's paddock HQ (above right), nicknamed 'the Kremlin'



working in difficult places schooled me for a life now lived closer to home. Perhaps the most compelling of those lessons has been how predictably arbitrary authority behaves, and how the accretion of power by one man, and the sustaining myths woven by those who surround him, inexorably fosters a mounting chapter of troubles that end only when the system itself collapses and new rulers build afresh on lessons learned from the old.

Formula 1's current woes, of course, cannot be compared to those of whole societies that have endured the miseries of dictatorship. But is it witty irreverence alone that has led some in the F1 paddock to refer to Ecclestone's motorhome as "the Kremlin"? Modest though that single-storey structure of grey fibreglass seems beside the fold-out palaces that are the bases for teams such as Red Bull, Ferrari, Mercedes and McLaren, Ecclestone's paddock fortress is where many of the decisions that determine the sport's future and the division of its spoils are made – often, to listen to the frustration voiced furtively

But three months after our Spa meeting, I heard him vaunting the virtues of one-man rule and his distaste for sharing power anew, this time in the Chancery Division of the High Court in London. There, he is defending a \$170million civil suit brought by Constantin Medien, a German media company that claims it was defrauded in 2006 when Ecclestone brokered the sale of a controlling interest in the Formula 1 rights to CVC Capital Partners, a London-based venture capitalist firm.

Constantin contend that the price set for that sale, nearly \$900million, fell far below the real value of the rights.

The petitioners' claim is that Ecclestone engineered the undervalued sale because CVC boss Donald Mackenzie had promised to keep him on as the Formula 1 supremo, with a 5.3 per cent stake in the new business, worth about \$120million. No ruling is expected before the spring, but the events under litigation go to the heart of at least four other cases

pending against him. There are two other civil suits, in Munich and New York, where one of the losing bidders in the CVC sale is suing for \$650million, as well as the threat of a criminal trial in Bavaria, where state prosecutors have alleged fraud and embezzlement by Ecclestone in a secret \$44million payment – a bribe, as the prosecutors have called it – to Gerhard Gribowsky, the lawyer who had the decisive role in approving the CVC transaction.

Ecclestone has denied any wrongdoing. But with a candour surprising for a man who has rarely acknowledged vulnerability, he has accepted that the lawsuits, if they go against him, could land him in jail, end his decades as the boss of Formula 1, and cost him up to \$2billion in back taxes in Britain. The taxes might be due, he has said, if the courts rule that he, and not his former wife and two 20-something, property-magnate daughters, as he has maintained, has exercised effective control in the past decade or

"I had control of Formula 1, and I still do. I never lost it. It has upset an awful lot of people. But it is a fact"



Bernie Ecclestone with his wife, Fabiana Flosi, in the paddock at the 2013 US GP

more over a \$3billion family trust fund run from his London headquarters at 6 Princes Gate.

In a word, what Ecclestone faces, by his own measure, is ruin. But this has not deterred him from scoffing at the very notion that he might have done better to involve others in the Formula 1 chain of command before the CVC deal went through. In the London court, he has repeatedly insisted that Formula 1 has been, to all intents, and for 30 years and more, the Bernie Ecclestone show. At no point has he allowed any suggestion that the wrongdoing alleged against him might have involved others in the Formula 1 hierarchy, however expedient that might have been.

"I had control of Formula 1, and I still do. I never lost it," he told the judge, Sir Guy Newey, at one point. "It has upset an awful lot of people. But it is a fact". He followed this with another assertion of his own supremacy. "I didn't work alongside anybody. I did my job exactly the way

I wanted to." And this: "I didn't care who the board was, or who the shareholders were, or anything. The minute I couldn't run the company the way I wanted to, I would have left."


There are powerful men in the world, in crisis, who fall quickly to blaming others, but Ecclestone seems to have chosen to stand or fall on his own. Indeed, much of the comportment seen in court has been a parody of what we have come to expect of the most indomitable men of our age. He began with an almost Chaplin-esque routine, quickly posted on YouTube, that had

him arriving at the courthouse in Fetter Lane for the opening of the hearings and allowing himself to be spun back onto the street by a revolving door, to his pained bemusement and guffaws of merriment among the banks of waiting reporters and photographers.

On the witness stand, that was followed by a pantomime of fluster and confusion in the face of a battery of hostile questions from Constantin Medien's counsel, which the Formula 1 boss explained to the judge, apologetically, as a function of advancing age and failing memory. This was not the Bernie Ecclestone who has held the sport in thrall for so long with his mental acuity and an agility in negotiations

that has had him boast that he's never knowingly been bested in a deal. Nor was it in the tradition of the great dictators who, to the end, have never dared to admit the slightest suggestion of debility or decline.

Perhaps the fairest thing to say of the Formula 1 chief is that he is a deeply complex man, if also deeply flawed; widely feared, but also, for what he has made of the sport, widely admired. Not for nothing does the entire paddock, team principals, drivers and journalists included, call him "Bernie", first name only, like the godfather he has been for so long. So it can scarcely come as any surprise that the possibility of his era coming to an early end raises as much alarm across the paddock as it does expectation.

To borrow a phrase commonly used in China to idolise Mao at the height of his power, Formula 1 without Bernie, if it comes to that, may yet prove to be like sailing the seas without a helmsman. 



CHAMPIONS AUDI

World Endurance Championship



CHAMPIONS BMW

DTM Manufacturers title

CHAMPIONS DEMAND OUR STRONGEST OIL



CHAMPIONS ŠKODA

European Rally Championship



CHAMPIONS VW

World Rally Championship*



CHAMPIONS Honda

FIA World Touring Car Championship



CASTROL EDGE - STRENGTH FOR MAXIMUM PERFORMANCE

IT'S MORE THAN JUST OIL. IT'S LIQUID ENGINEERING.



*Subject to the official publication of the results by the FIA.

BRAZIL 2008

THEY
THINK
IT'S ALL
OVER...





...IT IS NOW!

INTERVIEWS
JAMES ROBERTS

It's five years since that incredible last-lap, final-corner, championship-deciding moment when Lewis Hamilton passed Timo Glock to snatch the world title – beating Felipe Massa by just a single point. Here, in their own words, insiders and protagonists present their recollections of that extraordinary sporting denouement

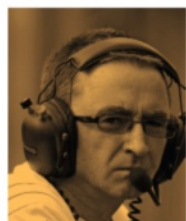
A

fter ten months of crisscrossing the globe, slugging it out on-track and off, weary F1 souls of all stripes traditionally indulge in a drink or two on the Sunday night of the Brazilian GP, a few hours after the chequered flag has come down on another season of racing.

Back in 2008, I bumped into a disconsolate-looking, beer-bottle-hugging Timo Glock at a post-race bash laid on by Red Bull. "Do you know Timo," I said to the then Toyota F1 star, "you're the second most famous Formula 1 driver in the UK tonight?" He looked up, shrugged his shoulders and replied: "Yeah, in Brazil also..."

Hours before, the hapless Timo had run wide on the rain-soaked Interlagos circuit on the final corner of the last lap, letting McLaren's Lewis Hamilton into the fifth place he needed to secure the title. Moments before that, Brazil's Felipe Massa had won the race, sending the packed grandstands into delirious celebration, for, at that moment, their boy had done enough to be crowned champion.

But when Hamilton passed Glock's Toyota, the grandstands and the whole of Brazil fell silent. Their hero had been upstaged by a 23-year-old in only his second season of F1. In a few dramatic moments, F1 had delivered possibly its most dramatic championship twist in 58 years. Now, five years on, the major players at Ferrari and McLaren share their recollections of that unforgettable afternoon...



PADDY LOWE

FORMER McLAREN
ENGINEERING DIRECTOR

Brazil 2008 was one of the most traumatic days of my life. I didn't go back there in 2009 because I couldn't

deal with it. It was like I'd survived an air crash. McLaren have always had a great habit of coming second. We missed out by one point in 2003; in 2005 we threw it away with unreliability and then we had the chance to win the championship right up until the last race in 2007.

In 2007, Lewis had a bit of an off at Turn 3 when the hydraulics played up. A very small piece of metal had blocked the valve and it took 25 seconds to flush itself through the system. If that had not happened then Lewis would have won the world championship that year. So fast-forward 12 months and there I am, thinking that we're going to lose it again and that there's no justice in this world.

When you make a good car, it takes so much effort from so many people, and the day you lose the championship is just so disheartening. You have to pick yourself up and start the whole process all over again.



MARTIN WHITMARSH

McLAREN TEAM PRINCIPAL
We were definitely scarred by the experience of 12 months earlier. A championship got away from both of our drivers

by one point, and the team had a particularly torrid time that season. In 2008, expectations of Lewis had increased and here he was at the home circuit of his principal opponent.

There was a function in São Paulo on the Saturday evening where someone had thrown

a black cat on the stage in front of Lewis to give him bad luck. Understandably, he was feeling the pressure and tension and certainly the will of the crowd played its part that weekend. To cap it all, it certainly wasn't a nice, dry processional race.



ALDO COSTA

FORMER FERRARI
TECHNICAL DIRECTOR

There was a big rivalry between McLaren and Ferrari in 2008 and it wasn't only between

drivers. It was myself against Paddy Lowe; it was engineers and mechanics against each other, too. From the technical working groups, to the legality of the cars, every aspect was a big fight.

Heading into Brazil, the points gap was quite big [Hamilton 94; Massa 87]. So all we focused on was ensuring Felipe crossed the line first to win the race. We thought it was too much to hope for Lewis to finish in sixth place or lower. Felipe started on pole and although race conditions weren't great because of the rain, he pulled away at the head of field.



NICOLAS TODT

FELIPE MASSA'S MANAGER

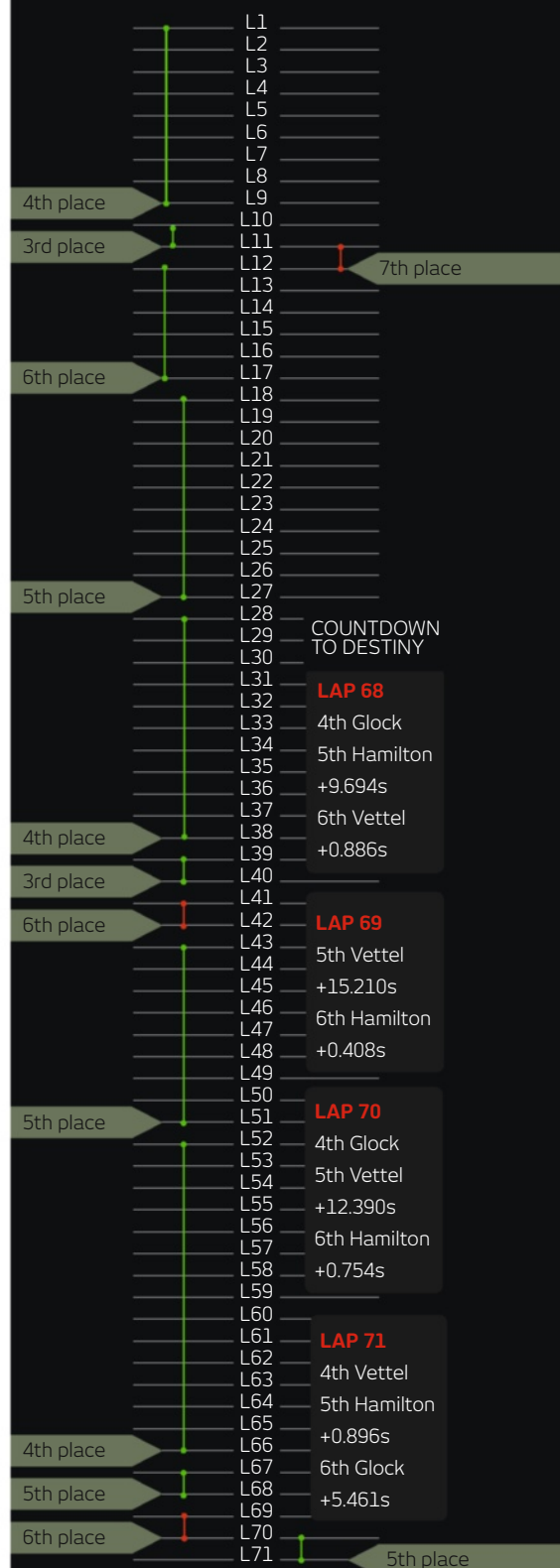
Most of the season Felipe was just a few points behind Lewis and it was a big blow to have the engine failure in Budapest just before the

summer break. In the races that followed he did a very good job, and he was leading again at Singapore before the 'Crashgate' controversy robbed him of victory.

In Brazil, we knew victory would not be enough. But lap after lap we thought it would be possible, and he had a fantastic weekend. Under all that pressure, he was unbeatable. →

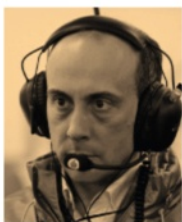
LEWIS'S BRAZIL 2008 LAP CHART

Fifth place finish secures
the championship



Reversal of fortune: the atmosphere in the McLaren garage turns from unbearable suspense to joyful disbelief as Lewis passes Timo to take the title





PHIL PREW

McLAREN CHIEF ENGINEER

My abiding memory of Brazil 2008 is one of: 'This cannot be happening again'. In 2007 we'd had a huge points advantage

but lost the championship. Lewis qualified P4 and despite Felipe being in front of us, we were thinking we just needed P5 in the race to win.

As a result we were quite conservative and perhaps a little cautious in coming in for tyres in the changing conditions, because we didn't need to take a risk at any stage. As the race developed we were quite comfortably in P5, then, with five laps to go, the radar indicated rain was coming.

With three laps to go, everyone pitted for intermediates. But the rain never really came and we started to overheat the intermediate tyre and lost grip. That's when Sebastian Vettel in the Toro Rosso overtook Lewis and suddenly we were in sixth and on the wrong tyre.

The world fell apart. It was a horrible feeling made worse because it was so similar to what happened in 2007. Then we saw the Toyota...

PADDY LOWE

I was tyre-spotting, on the pitwall on my own. I was watching Lewis, wondering if he could re-pass Vettel and the realisation was so depressing. Even though we'd lost the previous year we'd had a fantastic party that night. It was really amazing and I remember at that moment thinking: 'Stuff that party. I'm not doing that again!'

With half a lap to go, I was thinking to myself that I didn't want to be here any more. I could see all the people gathering around the Ferrari garage and pitwall. I needed to get back to my garage, but now there was a wall of people blocking the way and I almost had to crawl beneath them to squeeze past. As I popped my head up the other side I could see a big TV screen showing what was happening out on track...



RICHARD HOPKIRK

FORMER OPERATIONAL ASSISTANT TO HAMILTON

The main thing I remember was Ron Dennis. Ron is quite a micro-manager and he cares about the smallest things: two of which are what's on the pit board and what you say to the driver. All I remember in my ear for the last three laps was: "Tell him to overtake Vettel! Tell him!" So I was doing this juggling act of getting this in my ear what seemed like every five seconds and knowing that each time I spoke to Lewis, it distracted him and he would lose a couple more tenths. The worst way for him to overtake Vettel was to have me telling him to overtake Vettel. And then Phil Prew suddenly said Timo Glock was the guy we should be thinking about...

PHIL PREW

The rain that had been forecast for the last four or five laps had suddenly started to come and the Toyota took the risk to stay on dry tyres. By now

they were very old, they had lost temperature and performance and he was starting to go backwards. Now Glock, not Vettel, was the target. I know there were conspiracy theorists at the time who said that he'd given us the race, but by that stage, he had absolutely no grip.

NICOLAS TODT

On the last lap of the race, my whole body was shaking. I was standing behind Felipe's data engineer and I honestly thought in the last couple of laps that it was going to happen. Then, in the last corner of the last lap we knew the issue that Glock had – and Lewis then overtook him and went from P6 to P5.



MARK ARNALL

KIMI RÄIKKÖNEN'S PHYSIO

I was doing the Ferrari pit boards for Kimi, and when Felipe crossed the line to win, the crowd and the team went ballistic – jumping up and down. I could see Felipe's dad and his family all really excited. And it was bizarre to see that euphoria fizzle out when they realised that Lewis had overtaken Glock to win the championship by one point. It was euphoria followed by a hit of reality and disappointment that he hadn't done it. For Felipe it was an incredibly sad moment. He crossed the line thinking he'd won the world championship, but unfortunately it wasn't to be.

PADDY LOWE

I looked up at the TV to see Lewis overtake Glock and I thought: 'Hello, that's good!' At the same time I saw Nicole Scherzinger running out of the garage: we were the first two people running the right way and realising the same thing. And that was it. There was this amazing moment of two teams both celebrating victory within 30 seconds of each other. Can you think of any sporting event in history where two teams thought they had won for 30 seconds?

RICHARD HOPKIRK

The thing I remember then is the silence. Lewis had overtaken the Toyota – but you are scared to conclude anything because it's so



Massa drove a flawless race at the end of a tough season, to become world champion – for a few seconds only



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BRAZIL 2008

chaotic. Was it the right Toyota? Is there something we don't know? I didn't say a word. It was 15 seconds until he came past. He crossed the line and jumped up to fifth.

Then I remember asking myself: 'Is fifth enough? Are we sure about that before I say anything on the radio?' Lewis went through the next couple of corners saying: "Do I have it? Do I have it?" One of us told him: "Yes!" I can't remember if it was me or Phil because everything was erupting around us.



ROB SMEDLEY

FELIPE MASSA'S
RACE ENGINEER

I wasn't screaming at Felipe that he'd won it and then saying, "No, you haven't." I just talked him through the lap, told him that we were in contention to win the title but that it was going to be close. I told him some were on wet tyres and some on dries, so we were waiting for them all to come through.

He crossed the line and we didn't really celebrate because we were waiting for Lewis. I saw Lewis pass Glock and said to Felipe: "Well, you haven't won the title but you've won the race and you've done it in pretty good style."

He was very emotional, bless him. At the end of the day they're just young lads, not machines, and it had been such a long, hard season. There were times when we lost some easy points. Add on the 28 points we lost and put on Lewis's as well, and Felipe should have won by 15 points.

NICOLAS TODT

Felipe behaved like a true champion on the podium. I don't think that many top athletes would have behaved in such a way after that race. It was almost him who consoled me that evening. He reiterated that the race wasn't lost on that day. Obviously he was very disappointed as he thought that 2009 would be the year – but then he had the accident and it didn't work out that way. He will always have the memory of Brazil, but you learn from bad times and even despite not winning the championship, he showed something to the world.



FELIPE MASSA

FORMER FERRARI DRIVER

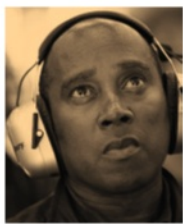
I have zero frustrations with my career. I'm a happy man. On that day I couldn't have done anything better. I was under big pressure but I was on pole, I won the race and I set the quickest lap. I gave 120 per cent. I didn't lose the title in



"On the podium, what I said, what I did, was genuine, it was me – I didn't go into the race with a speech rehearsed"

Brazil – I lost it in Singapore. Hungary, I was leading when I had the engine failure, but that's something that can happen in motor racing. In Singapore [Massa was leading when Nelson Piquet Jr crashed deliberately, enabling Renault team-mate Fernando Alonso to win], that is unacceptable. I had that race in my pocket, you know? But this is history now, I don't have anything bad to say about anybody.

On the podium, it was automatic... It wasn't hard to go out and face the people. What I said, what I did, was genuine, it was me – I didn't go into the race with a speech rehearsed.



ANTHONY HAMILTON

LEWIS'S DAD

It was an absolutely crazy race, but I've got to hand it to my mate Timo. What a nice guy... That was the way the race fell, everybody had their issues, we had ours, and Lewis came home where he needed to. When Lewis crossed the line I couldn't believe it was going to stick. We were getting hit with fines and things, so it wasn't until the stage when the provisional results came out that I was finally able to relax.

Afterwards I wrote to Felipe and his father and we sent them a bouquet of flowers. I knew nothing I could say would make them feel better, but I said "I know how you're feeling and I'm sorry." Between the two families there is a lot of respect. It would have been easy to say: "Yeah, we beat you," but I knew what they were going through. Felipe is a great guy and a great driver.



LEWIS HAMILTON

FORMER McLAREN DRIVER

We had been up against so much, which is why winning the championship felt so great. We went through so much negativity, and yet still won. That's why everyone went crazy. It was a very tough time for Ron, particularly 2007, but he and Martin Whitmarsh were fantastic bosses. I'll always cherish the opportunity I was given.

My relationship with McLaren was different to the other drivers they've had. I'd like to think I'm like the seed from McLaren. The other drivers came from somewhere else, but I grew with McLaren. I was a seed in an empty pot and Ron added the soil and water. It was very special.




TIMO GLOCK

FORMER TOYOTA DRIVER

The weeks after the race were not easy. We did everything right in the race, but afterwards it was hard. People did not understand what had happened, and a lot of commentators asked why I let Lewis by. It is difficult to get negative press and negative emails from fans.

We took the decision to stay out on dry tyres even though the intensity of the rain was increasing. On the final lap the rain really began to come down very heavily and it was just impossible. It was so difficult to just keep the car on the track because it was very wet. I was sliding everywhere, with absolutely no grip at all and it was one of the hardest laps I have done. When you see the lap times, the lap before I did a 1min 28secs, and on that last lap I did a 1min 48secs. It was just not drivable any more.

I didn't even know Lewis was directly behind me. The team told me Sebastian Vettel was catching me and they kept me updated on his position, but I was concentrating so hard on keeping the car on the track. I didn't know Lewis had overtaken me until after the race. I was passed by three or four cars on the final lap and it was not easy to keep track of what was going on. Losing a championship on the last lap is hard – but I tried my best and I cannot change it. 

FORMULA 1 2014 STARTS HERE...

The new Formula 1 season gets off to a roaring start on 9-12 January at the 2014 Autosport International Show, with a stunning collection of cars from all the teams contesting the world championship, and much more...



Ferrari champion John Surtees and Force India's Adrian Sutil (tbc) will be talking to fans at the show



Earlier this year, some 80,000 fans flocked to the NEC in Birmingham to forget the off-season blues and enjoy Europe's biggest motorsport show. At 2014's show, we'll look ahead to a new season that brings great excitement courtesy of a major change to the engine and aerodynamic regulations. We also hope to welcome Autosport International newcomer Adrian Sutil, along with other well-known F1 faces, to explain the changes.

Sky Sports F1 commentator Martin Brundle – whose own career included 12 seasons in F1

with teams such as McLaren and Benetton – will analyse the 2013 season and look ahead to how the radical new technical rules will shape 2014.

Historic Formula 1 will also be celebrated. To mark the 50th anniversary of John Surtees' 1964 world championship with Ferrari, the man himself will headline the guest list, accompanied by a rich collection of race cars and bikes from his illustrious career.

"Autosport International is a major part of the motorsport

calendar, and I'm delighted to be attending the 2014 show," said Surtees. "Having raced for over 30 years in many different disciplines, it will be exciting to pass on my experiences to passionate fans, and share the work of the Henry Surtees Foundation in motorsport and road safety."

Elsewhere, Sky Sports F1's David Croft will host a live 'drive-thru' demonstration in the 5,000-seat Live Action Arena, of the iconic Lotus 79 and 49 – cars that were raced by world champions Mario Andretti, Emerson Fittipaldi and Graham Hill, and which won 18 grands prix, three drivers' and three constructors' championships between them.

Tickets are on sale now, with adult entry priced from £31 and children's tickets from £20. For more detailed information about the show, visit www.autosportinternational.com.

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Reports Previews Analysis Opinion Stats

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It's the end of an era

After 12 years and 215 race starts, F1's oldest competitor, Mark Webber, bids goodbye to the sport, having had to make do with second place in his final GP

REPORTS



120 USA GP REPORT

There's an upbeat atmosphere over at Red Bull as Seb follows up his championship with consecutive win number eight...



124 BRAZILIAN GP REPORT

...then he duly follows that up with yet another record: his ninth consecutive victory at the season finale at Interlagos

OPINION

129 TOM CLARKSON

...hitches a lift to the circuit at Interlagos with departing Red Bull star, Mark Webber



130 MURRAY WALKER

Sebastian Vettel may have his critics – but Murray certainly doesn't count himself among them



RACE DEBRIEF

by Anthony Rowlinson

US Grand Prix

17.11.2013 / Circuit of The Americas



No alarms and no surprises

A drama-free race takes Seb Vettel to a record-breaking eighth consecutive win in a season

After four straight world titles and a record-breaking eighth win (in a season) on the bounce, you might expect Seb Vettel to have become somewhat distant... untouchable even.

And while it's true that an aura is developing around him – an invisible shield against constant demands and incessant attention – the smiling kid who bounced into F1 as a BMW Friday driver back in 2006 hasn't yet been crushed under sheer weight of achievement. Far from it, in fact.

His Red Bull team-mates know this to be true (Adrian Newey told us only recently how "grounded" Vettel remains); get close enough and you can experience Vettel-style normality in person. *F1 Racing's* chance to do so came late in the Austin weekend, post-race. We'd been tasked with securing a Seb Vet signature (the details of our mission needn't detain us here) and when asked for said autograph, Vettel not only obliged, he *engaged*. He enquired what the signature was for, then, satisfied, composed a witty note to accompany it, checking not

once, but twice that he had correctly spelled 'anniversary' and 'honour'. He wanted to make sure, first, of the difference between the French *anniversaire* and its English equivalent, then of the subtle distinction between English 'honour' and US 'honor'.

So what does any of this have to do with the US Grand Prix? Everything. Because in this two-minute exchange, Seb displayed humility, humour, intelligence and perhaps above all, attention to detail.

These qualities were apparent from the moment he stepped into the F1 paddock and they remain intact to this day. And if you want to understand how it is that a man who's only 26 can sweep the record books before him, dominating races with apparent ease and effortless superiority, spend a little time thinking about the human being hidden by the helmet. There's no question Vettel has a remarkable car to drive and a brilliant team who allow him to maximise its – and his own – performance.

Current-generation Pirellis unquestionably help his cause, too. But without the requisite human qualities in the cockpit, none of these foundations and supporting acts would be of any significance. We've written it before and we will write it again: Sebastian Vettel is becoming an era-defining sportsman and if that's rendering F1 a little predictable, well, who's to blame? Certainly not Seb, who once again put together a seemingly flawless and complete race weekend. He recovered in qualifying to take pole when Mark Webber looked to have edged himself into P1, and over 56 race laps he managed a set of medium, then hard, Pirellis with subtlety and efficacy. Yet again it looked so easy; yet again, the margin of victory and crushing 1min 39.856secs fastest lap (as usual against the advice of race engineer Guillaume Rocquelin) proved that what RB-Seb now routinely achieve is anything but. No one else gets close.

"Remember these days," Seb spluttered in a voice cracking with emotion on his cool-down

lap. Not much chance of any Red Bull staffer forgetting them in a hurry, we'd venture.

What of the opposition? In truth, there wasn't any, although that's not to say there weren't drives of enormous merit in Vettel's vapour trails.

Romain Grosjean, who by now would be a race winner were it not for the presence of the Unstoppable Seb Machine, equalled his best-ever F1 finish with second, in the process recording his fourth podium in five races.

This is the same Romain Grosjean who was last year condemned as a "first-lap nutcase" and who received a one-race ban for triggering the first-corner Spa crash that might have killed Fernando Alonso. Less than a year ago, indeed, *F1 Racing* was told with due seriousness by a respected member of the F1 community that Grosjean should have tests on his peripheral vision. These days Grosjean's focus is admirable, not questionable and Lotus bigwigs are swift to praise his growth into the Kimi-shaped vacuum created by the departed superstar.

"It's the little things you see," said trackside operations director, Alan Permane. "He knows what he wants now and he has an air of authority in asking for that. He used to fixate on little aspects of his car that weren't quite right. But these things are never perfect and he gets that now. He's capable of turning in a great performance like he did today without being distracted. There's no question he made a breakthrough round about the German GP, and he hasn't looked back since."

A breakthrough of no less significance was made a little further down the grid by F1's royal family, where, for the first time this season, Williams looked competitive and in the points hunt on merit, from FP1 to chequered flag.

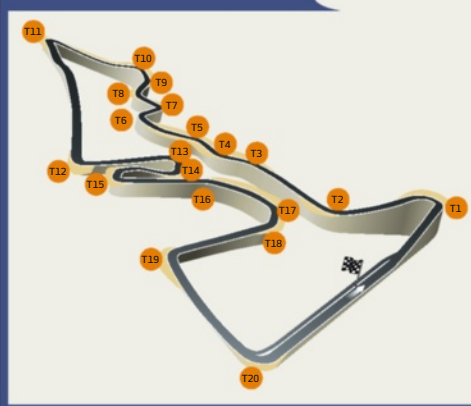
A technical corner was turned at Abu Dhabi, explained chief race engineer Xevi Pujolar, where the team had removed their troublesome Coandă exhaust system. With this strain of aero-trickery banned for 2014, Williams reasoned they had nothing to lose by trying development parts intended for next season on this year's wayward FW35. And lo, shorn of a blown exhaust that had robbed the car of corner entry and exit stability, Messrs Bottas and (less notably) Maldonado were able to fly. Although compromised on traction in Coandă-lite spec, the car had higher top speed and became one the drivers could feel and tease with the throttle. Thus empowered, Bottas topped Q1, qualified ninth and finished eighth, to bag his first four F1 points.

For a team who remain the sport's second most successful constructor, with nine titles to their name, four points are no reason to celebrate. But so often in F1, as Seb Vettel will attest, it's the smallest things that make the difference between success and failure. 🏆

The story of the race

V
Polesitter Vettel holds his lead with Grosjean and Hamilton demoting Webber to fourth

CIRCUIT OF THE AMERICAS



< Sutil collides with Maldonado at Turn 12 on the opening lap, spearing left and striking the wall

^ That collision leads to the Safety Car's debut appearance at Austin. It pulls back in at the end of lap 4



< Webber uses DRS to take third from Hamilton on lap 13



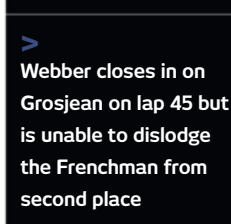
< With a comfortable lead, Vettel pits on lap 28 for the first and only time and rejoins in second place



> Grosjean leads for two laps before his stop and rejoins in second behind Vettel



> Kovalainen misses out on a points finish when he's forced into a third pitstop for a new front wing on lap 33



> Webber closes in on Grosjean on lap 45 but is unable to dislodge the Frenchman from second place



^ On the final lap Hülkenberg passes Alonso for fifth, but Alonso fights back and regains position

> Vettel breaks another record as he collects his eighth win in a row, from Grosjean and Webber




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US Grand Prix stats

The lowdown on everything you need to know from the weekend at the Circuit of The Americas...

THE GRID

	1. VETTEL RED BULL 1min 36.338secs Q3
	2. WEBBER RED BULL 1min 36.441secs Q3
	3. GROSJEAN LOTUS 1min 37.155secs Q3
	4. HÜLKENBERG SAUBER 1min 37.296secs Q3
	5. HAMILTON MERCEDES 1min 37.345secs Q3
	6. ALONSO FERRARI 1min 37.376secs Q3
	7. PÉREZ MCLAREN 1min 37.452secs Q3
	8. KOVALAINEN LOTUS 1min 37.715secs Q3
	9. BOTTAS WILLIAMS 1min 37.836secs Q3
	10. RICCIARDO TORO ROSSO 1min 38.131secs Q3
	11. DI RESTA FORCE INDIA 1min 38.139secs Q2
	12. ROSBERG MERCEDES 1min 38.364secs Q2
	13. MASSA FERRARI 1min 38.592secs Q2
	14. VERGNE TORO ROSSO 1min 38.696secs Q2
	15. BUTTON* MCLAREN 1min 38.217secs Q2
	16. SUTIL FORCE INDIA 1min 39.250secs Q1
	17. MALDONADO WILLIAMS 1min 39.351secs Q1
	18. VAN DER GARDE CATERHAM 1min 40.491secs Q1
	19. BIANCHI MARUSSIA 1min 40.528secs Q1
	20. GUTIÉRREZ** SAUBER 1min 38.034secs Q3
	21. CHILTON MARUSSIA 1min 41.401secs Q1
	22. PIC*** CATERHAM 1min 40.596secs Q1

*Three-place penalty for overtaking under red flags **Ten-place penalty for impeding another driver ***Five-place penalty for replacement gearbox

THE RACE



THE RESULTS (56 LAPS)

1st	Sebastian Vettel Red Bull	1h39m 17.148s
2nd	Romain Grosjean Lotus	+6.284s
3rd	Mark Webber Red Bull	+8.396s
4th	Lewis Hamilton Mercedes	+27.358s
5th	Fernando Alonso Ferrari	+29.592s
6th	Nico Hülkenberg Sauber	+30.400s
7th	Sergio Pérez McLaren	+46.692s
8th	Valtteri Bottas Williams	+54.509s
9th	Nico Rosberg Mercedes	+59.141s
10th	Jenson Button McLaren	+77.278s
11th	Daniel Ricciardo Toro Rosso	+81.004s
12th	Felipe Massa Ferrari	+86.914s
13th	Esteban Gutiérrez Sauber	+91.707s
14th	Heikki Kovalainen Lotus	+95.063s
15th	Paul di Resta Force India	+96.853s
16th	Jean-Éric Vergne Toro Rosso	+104.574s*
17th	Pastor Maldonado Williams	+1 lap
18th	Jules Bianchi Marussia	+1 lap
19th	Giedo van der Garde Caterham	+1 lap
20th	Charles Pic Caterham	+1 lap
21st	Max Chilton Marussia	+2 laps

* includes 20-second penalty for causing a collision

Retirements

Adrian Sutil Force India	0 laps – damage
--------------------------	-----------------

THROUGH SPEED TRAP



Fastest: Jenson Button, 195.65mph

Slowest: Lewis Hamilton, 185.33mph

TYRE COMPOUNDS USED



CLIMATE

Sunny 30°C

TRACK TEMP

37°C



FASTEST LAP

Sebastian Vettel, lap 54, 1min 39.856secs



FASTEST PITSTOP

Mark Webber, 23.537secs (entry to exit)

DRIVERS' STANDINGS

1st	Sebastian Vettel Red Bull	372pts
2nd	Fernando Alonso Ferrari	227pts
3rd	Lewis Hamilton Mercedes	187pts
4th	Kimi Räikkönen Lotus	183pts
5th	Mark Webber Red Bull	181pts
6th	Nico Rosberg Mercedes	161pts
7th	Romain Grosjean Lotus	132pts
8th	Felipe Massa Ferrari	106pts
9th	Jenson Button McLaren	61pts
10th	Paul di Resta Force India	48pts
11th	Nico Hülkenberg Sauber	47pts
12th	Sergio Pérez McLaren	41pts
13th	Adrian Sutil Force India	29pts
14th	Daniel Ricciardo Toro Rosso	19pts
15th	Jean-Éric Vergne Toro Rosso	13pts
16th	Esteban Gutiérrez Sauber	6pts
17th	Valtteri Bottas Williams	4pts
18th	Pastor Maldonado Williams	1pt
19th	Jules Bianchi Marussia	0pts
20th	Charles Pic Caterham	0pts
21st	Giedo van der Garde Caterham	0pts
22nd	Max Chilton Marussia	0pts
23rd	Heikki Kovalainen Lotus	0pts

CONSTRUCTORS' STANDINGS

1st	Red Bull	553pts	9th	Williams	5pts
2nd	Mercedes	348pts	10th	Marussia	0pts
3rd	Ferrari	333pts	11th	Caterham	0pts
4th	Lotus	315pts			
5th	McLaren	102pts			
6th	Force India	77pts			
7th	Sauber	53pts			
8th	Toro Rosso	32pts			



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GRAND PRIX SCRAPBOOK

BlackBerry

Photography Focus

Where top F1 photographers capture the action on their BlackBerry Z10

Abu Dhabi GP

Photographer: James Moy
Caption: Lewis Hamilton drives out of his pit garage to start practice.
Effect: Negative



US Grand Prix

Photographer: Russell Batchelor
Caption: Nico poses for a picture at Austin's Circuit of The Americas.
Effect: Film strip



Brazilian GP

Photographer: Alberto Crippa
Caption: A plume of spray trails behind the W04 Silver Arrow on the main straight.
Effect: N/A



Brazilian GP

Photographer: Emily Davenport
Caption: The MERCEDES AMG PETRONAS team push the car from scrutineering
Effect: Antique & Cartoon



Brazilian GP

Photographer: Mario Chiarappa
Caption: The MERCEDES AMG PETRONAS drivers park next each other after the race.
Effect: Grain



US Grand Prix

Photographer: Lukas Gorys
Caption: Grid girls added glamour to the pre-race ceremony in Austin.
Effect: Film strip



Abu Dhabi GP

Photographer: Lukas Gorys
Caption: The MERCEDES AMG PETRONAS team on the grid.
Effect: Sixties



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MERCEDES AMG PETRONAS FORMULA ONE TEAM

RACE DEBRIEF

by James Roberts

Brazilian Grand Prix

24.11.2013 / Interlagos



Goodbye to all that

Mark Webber bids F1 farewell, finishing his final grand prix in second place behind team-mate Vettel

As the wind swept back his hair, his eyes began to tear. Perhaps that was the force on his unprotected face. Maybe it was the realisation that after 215 grand prix starts it had all come to an end. Mark Webber had spent half a lap wrestling to remove his HANS device, then removed his helmet for the final part of the slow-down lap. It didn't matter if he received a reprimand; this was his last ever lap in F1.

Mark had been given a rousing send-off by his team in the hour before the Brazilian Grand Prix. His garage was adorned with memorabilia from Down Under; an Aussie flag, a boomerang, and a pitboard that read 'Thank you Mark'. And before he was strapped into his RB9 for the last time, there was a rendition of *Waltzing Matilda*. The affection felt for Mark by his cork-hat-wearing mechanics was plain to see. Sebastian Vettel, however, was conspicuous by his absence.

"In this sport, it's not always easy to show the person that's behind the wheel," said Mark after

he finished second – and behind his team-mate – in the 71-lap Brazilian Grand Prix. "We can in lots of other sports, but in Formula 1 we're always wearing a helmet, so it was nice to drive back with it off."

The final grand prix in a long year is a strange place. World-weary travellers are keen to head home. Most of those drivers or engineers leaving their individual teams or F1 for good don't want the moment to end. For others it couldn't come quickly enough. Contrast Felipe Massa's emotional farewell at Ferrari with the no-love-lost-bye-then split between Pastor Maldonado and Williams.

Interlagos also marked the end of the 2.4-litre V8 engine formula that had served the sport so reliably for the past six seasons. For many, this was not the end, rather the beginning of a tumultuous new chapter into the unknown, as the untested 1.6-litre V6 powerplants take centre stage in 2014.

It was also the end of a remarkable streak of victories in a single season. Sebastian Vettel was unopposed in Brazil – once again – to record his 13th victory in a world championship year, equalling Michael Schumacher's tally from 2004. He also equalled Alberto Ascari's incredible nine straight grand prix victories in succession from 1952-53 (discounting the 1953 Indianapolis 500 that Ascari didn't enter).

However, the outcome of this race wasn't entirely predictable in the opening lap. Vettel suffered too much wheelspin off the tricky uphill start and was swamped by Fernando Alonso to his right and Nico Rosberg to his left. He couldn't repel both. After covering the Ferrari, he conceded the lead to Rosberg who outbraked the Red Bull on the inside of Turn 1.

These were the first laps held on a dry track all weekend and it was a trip into the unknown for everyone. For both Mercedes runners, it was evident they were significantly lacking rearward

grip in the opening stint of the race and they quickly fell down the order.

By the second lap, Vettel had powered past Rosberg and reaffirmed his position at the head of the field. Any thoughts that the world champion might have to fight for this win instantly wilted away. Sadly the outcome of this race was sealed at that very moment. Or was it? Could a random element such as rain turn the race on its head?


Throughout the weekend, the São Paulo skies were dark and grey. It had been untypically cool and persistently wet, with heavy rain at times on Saturday. And while the radar indicated that more rain was expected on Sunday, it never materialised – the odd teasing drip aside.

Could a Safety Car jeopardise the race leader? One was expected but never appeared. On lap 43, Valtteri Bottas pitted his Williams for a fresh set of medium tyres and gained a significant performance advantage. Fourth-placed Lewis Hamilton had spent 24 laps on his hard set and so the 17th-placed Finn, not realising he was a lap down on Hamilton (remember he finished ahead of Rosberg's Mercedes only seven days earlier) attempted to challenge the slower Hamilton into Turn 4 on lap 47. When Lewis took his line for the left-hander the pair's rear wheels made contact, giving Lewis a right-rear puncture and sending Bottas spinning into the gravel trap with his left-rear flying off the car.

"As soon as we saw the accident, it looked as if there was going to be a Safety Car and given where Sebastian was on the circuit, he would have done a whole lap behind the Safety Car while everyone behind him would have had a free stop," explained RBR team boss Christian Horner after the race. "So we made a very late call to pit him, but the guys were already expecting Mark on a scheduled stop that lap."

This led to a scramble around the leading Red Bull as tyres were found and his 12-second lead to his team-mate was halved. Of more immediate concern for Mark was his race-long battle with Fernando Alonso, which was finally settled with the Ferrari driver taking the final podium place.

It later emerged that Alonso was all ready to gift his position to his team-mate Massa, to allow him to step onto the podium for his last time as a Ferrari driver at his home race. Unfortunately the Brazilian was penalised with a drive-through penalty for crossing the white line on entrance to the pitlane and finished down in seventh. It was a shame the gesture wasn't able to be carried out.

Likewise, the same thought could have been extended to the Red Bull duo up front. What chance Vettel gifting the win to his long-suffering team-mate Webber? None. It seems that some people in this sport have more of a human side to them than others. 

The story of the race

V Rosberg jumps Vettel off the start to lead into Turn 1, but they swap positions as they move into lap 2



INTERLAGOS



< Rosberg quickly loses position to both Alonso and Webber

^ Grosjean suffers a spectacular engine blow-up and retires on lap 3



> By lap 21 Vettel has built up a 10.4-second lead over team-mate Mark Webber

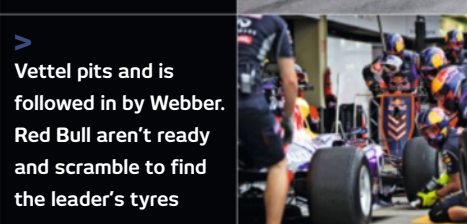
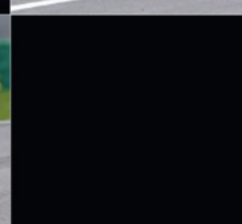


> On lap 31 Massa is handed a drive-through penalty for crossing the white line at the pit entry



> Hamilton clashes with Bottas at Turn 4 on lap 47, forcing the Williams into retirement

> On lap 65, Vergne attempts to pass Maldonado at the first corner. They touch and Maldonado spins



> Vettel pits and is followed in by Webber. Red Bull aren't ready and scramble to find the leader's tyres



^ The final result of the year: Vettel wins; Webber second; Alonso third












> On the slow-down lap, Massa and Vettel perform donuts, while Mark Webber takes off his helmet

MAIN PHOTO: ANDREW FERRAROLI/AT ILLUSTRATION: ALAN ELDRIDGE
INSETS: ANDREW FERRAROLI/AT; GLENN DUNBAR/AT; ANDY HONE/AT;
CHARLES COATES/AT

Brazilian Grand Prix stats

The lowdown on everything you need to know from the weekend at Interlagos...

THE GRID

	1. VETTEL RED BULL 1min 26.479secs Q3
	2. ROSBERG MERCEDES 1min 27.102secs Q3
	3. ALONSO FERRARI 1min 27.539secs Q3
	4. WEBBER RED BULL 1min 27.572secs Q3
	5. HAMILTON MERCEDES 1min 27.677secs Q3
	6. GROSJEAN LOTUS 1min 27.737secs Q3
	7. RICCIARDO TORO ROSSO 1min 28.052secs Q3
	8. VERGNE TORO ROSSO 1min 28.081secs Q3
	9. MASSA FERRARI 1min 28.109secs Q3
	10. HÜLKENBERG SAUBER 1min 29.582secs Q3
	11. KOVALAINEN LOTUS 1min 27.456secs Q2
	12. DI RESTA FORCE INDIA 1min 27.798secs Q2
	13. BOTTAS WILLIAMS 1min 27.954secs Q2
	14. BUTTON MCLAREN 1min 28.308secs Q2
	15. SUTIL FORCE INDIA 1min 28.586secs Q1
	16. MALDONADO WILLIAMS 1min 27.367secs Q1
	17. GUTIÉRREZ SAUBER 1min 27.445secs Q1
	18. PIC CATERHAM 1min 27.843secs Q1
	19. PÉREZ* MCLAREN 1min 28.269secs Q2
	20. VAN DER GARDE CATERHAM 1min 28.320secs Q1
	21. BIANCHI MARUSSIA 1min 28.366secs Q1
	22. CHILTON MARUSSIA 1min 28.950secs Q1

*Five-place penalty for replacement gearbox

THE RACE



THE RESULTS (71 LAPS)

1st	Sebastian Vettel	Red Bull	1h32m 36.300s
2nd	Mark Webber	Red Bull	+10.452s
3rd	Fernando Alonso	Ferrari	+18.913s
4th	Jenson Button	McLaren	+37.360s
5th	Nico Rosberg	Mercedes	+39.048s
6th	Sergio Pérez	McLaren	+44.051s
7th	Felipe Massa	Ferrari	+49.110s
8th	Nico Hülkenberg	Sauber	+64.252s
9th	Lewis Hamilton	Mercedes	+72.903s
10th	Daniel Ricciardo	Toro Rosso	+1 lap
11th	Paul Di Resta	Force India	+1 lap
12th	Esteban Gutiérrez	Sauber	+1 lap
13th	Adrian Sutil	Force India	+1 lap
14th	Heikki Kovalainen	Lotus	+1 lap
15th	Jean-Eric Vergne	Toro Rosso	+1 lap
16th	Pastor Maldonado	Williams	+1 lap
17th	Jules Bianchi	Marussia	+2 laps
18th	Giedo van der Garde	Caterham	+2 laps
19th	Max Chilton	Marussia	+2 laps

Retirements

Charles Pic	Caterham	58 laps – suspension
Valtteri Bottas	Williams	45 laps – accident
Romain Grosjean	Lotus	2 laps – engine

THROUGH SPEED TRAP



Fastest: Sergio Pérez, 194.18mph

Slowest: Romain Grosjean, 175.08mph

TYRE COMPOUNDS USED



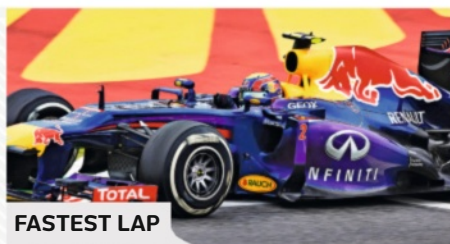
CLIMATE

Misty

19°C

TRACK TEMP

24°C



FASTEST LAP

Mark Webber, lap 51, 1min 14.436secs



FASTEST PITSTOP

Felipe Massa, 22.342secs (entry to exit)

DRIVERS' STANDINGS

1st	Sebastian Vettel	Red Bull	397pts
2nd	Fernando Alonso	Ferrari	242pts
3rd	Mark Webber	Red Bull	199pts
4th	Lewis Hamilton	Mercedes	189pts
5th	Kimi Räikkönen	Lotus	183pts
6th	Nico Rosberg	Mercedes	171pts
7th	Romain Grosjean	Lotus	132pts
8th	Felipe Massa	Ferrari	112pts
9th	Jenson Button	McLaren	73pts
10th	Nico Hülkenberg	Sauber	51pts
11th	Sergio Pérez	McLaren	49pts
12th	Paul Di Resta	Force India	48pts
13th	Adrian Sutil	Force India	29pts
14th	Daniel Ricciardo	Toro Rosso	20pts
15th	Jean-Eric Vergne	Toro Rosso	13pts
16th	Esteban Gutiérrez	Sauber	6pts
17th	Valtteri Bottas	Williams	4pts
18th	Pastor Maldonado	Williams	1pt
19th	Jules Bianchi	Marussia	0pts
20th	Charles Pic	Caterham	0pts
21st	Heikki Kovalainen	Lotus	0pts
22nd	Giedo van der Garde	Caterham	0pts
23rd	Max Chilton	Marussia	0pts

CONSTRUCTORS' STANDINGS

1st	Red Bull	596pts	9th	Williams	5pts
2nd	Mercedes	360pts	10th	Marussia	0pts
3rd	Ferrari	354pts	11th	Caterham	0pts
4th	Lotus	315pts			
5th	McLaren	122pts			
6th	Force India	77pts			
7th	Sauber	57pts			
8th	Toro Rosso	33pts			



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TOM CLARKSON

Inside the paddock from our man on the road

All good things come to an end

Race morning at the Grand Hyatt, São Paulo. Fernando Alonso and Romain Grosjean are eating breakfast on adjacent tables, laughing loudly; various test and reserve drivers are milling about in reception and a string of bulletproof cars are being cleaned in the car park. None of this comes as a surprise. Fernando speaks fluent French and often talks to Romain during the drivers' parade; test and reserve drivers are usually at a loose end; and high-profile celebrities don't take risks on the streets of São Paulo. Memories of Jenson Button's lucky escape in 2010, when his car was ambushed at a set of traffic lights, are fresh in the memory.

But today isn't about Fernando, Romain or road cars – however fortified. Mark Webber's final grand prix is the only story in town and the point is rammed home when, at 9.30am, he walks from the elevator to the main entrance of the Grand Hyatt. Fans approach him for autographs, TV crews report that he's leaving the building and test and reserve drivers shout "good luck in yer last one" across the foyer. Meanwhile Alonso sneaks past almost unnoticed.

This is the last time Mark will drive to a racetrack as an F1 driver and we're hitching a lift with him to Interlagos. Just Mark, *F1 Racing*, a lensman called Iain and Sandro, his highly skilled 'taxi' driver. "You'll be safe with me," says Sandro.

As Mark does up his seat belt in the back of the Merc, it's clear emotions are running high. He's in control of his feelings, but the magnitude of the occasion isn't lost on him. There's none of the jovial banter of a few days ago in Austin, when we went to see Alex Gibney's haunting documentary about Lance Armstrong. This journey is one of reflection.

"Normally I wake up early on race morning," says Mark. "But today I slept right through to the alarm, which was unusual. The first thing I did was check my phone and found about 7,000 good luck text messages, which reminded me what's happening. This is the last time I'll do this as an F1 driver, but I don't see it as a sad moment; it's a proud moment. I'm a lucky man from Queanbeyan, who's managed to tick a few boxes along the way."

Mark is tackling his last GP with the modesty he applies everything in his life. He has an entourage of two people: himself and his physio, Rich. His nearest and dearest (partner Annie, parents Diane and Alan, and his best mate Chopper) bid his F1 career a personal goodbye in Austin.

"I don't see this as a sad moment; it's a proud moment. I'm a lucky man from Queanbeyan, who's managed to tick a few boxes"



PHOTO: ANDY HONE/LAT

Last day in the office:
Webber with colleagues at Interlagos, his final F1 GP

"Actually," he says, "I wish Annie was here this weekend. It's a big one and during the two hours before the race it would be nice to have her with me. We met in '95 and we've been running flat-out since then, first getting into F1 and then trying to achieve something once we'd got here. I'd like to be sharing these final moments with her, but there you go. She doesn't like this race and I'll be able to catch up with her back in the UK tomorrow."

He turns to watch the usual São Paulo shenanigans rush past the window and as I observe him from the front seat, I'm reminded of the European Aviation flight that we took to Melbourne in 2002, when he made his F1 debut with Minardi. As we came into land at Avalon, the city's second airport, Mark was similarly contemplative. He wanted to know if his three-race contract would give him enough time to shine at the top echelon.

Since then he's squeezed every last drop of opportunity from the chances he's been given, which is why he's driven a Red Bull for the past seven years. Other top drivers have thrown their hats into the ring as replacements for him in recent seasons, and they failed.

As we reach the Autódromo José Carlos Pace, you'd forgive Mark some emotion. But he's having none of it. "Looks like you boys need to get back in the nets," he says, referring to Australia's crushing 381-run victory in the first Ashes Test that took place last night. He climbs out of the car and passes through the paddock turnstiles into the melee that's been his office for the past 12 years. Fans descend on him, journalists stick microphones in his face and he deals with it in his usual manner: open, honest and frank.

In just a few hours, it'll be over for Mark. But all good things have to come to an end eventually.

MURRAY WALKER



UNLESS I'M VERY MUCH MISTAKEN...

"My very sincere congratulations to Sebastian Vettel and everyone at Red Bull"

What they have achieved is truly staggering: four successive drivers' and constructors' championships. In the entire history of F1, it has been done only once before (Schumacher with Ferrari and, together, they did it *five* times), but while there has been nothing but praise for the Red Bull team, led so capably by Christian Horner and Adrian Newey, there are those who have sourly maintained that Vettel has succeeded only because he drives the best car.

Well of course a large part of his superiority has been because his car is better than the rest. Unlike almost any other sport, success in F1 depends on far more than the human competitor. If his car, the team backup and race tactics aren't up to it, he won't win, no matter how good he is. Even if he's Alonso. But the decision-makers at Red Bull aren't daft. Like

every team they want the best driver they can afford, and they can afford anyone they want.

So could other top drivers of the day, notably Fernando Alonso, Kimi Räikkönen and Lewis Hamilton, have done as well as Sebastian in a Red Bull? Well, for what it's worth, yes, I think they could – but that's not the point. Red Bull chose to go with Vettel as a product of Helmut Marko's driver development programme, and Seb has more than justified their decision by consistently demonstrating an amazing talent for getting the best out of a series of brilliant cars. In qualifying and on race day, starting from the front, from further back, in the wet, in the dry, being able to catch and pass his rivals and when tactical driving is called for. You name it, he's got it, including that vital ability to make his team *his* team – a characteristic he shares with recent

predecessors Michael Schumacher, Ayrton Senna and Fernando Alonso. Plus, like it or not, a controversial and ruthless will to win that can disrupt and offend.

So now for the big question. Could Vettel have done as well as his rivals if he'd been in their cars? Well, we don't know, do we? But in his one rookie race for BMW at the age of 19 he finished sixth, and the following year he blew them all away in a Toro Rosso at Monza with a dazzling display of wet-weather virtuosity. The rest is history but, for what it is worth I have no doubt that he could do just as well for Ferrari, Mercedes, McLaren and Lotus as their current drivers – which is why I'm sure they'd all move mountains to get him.

There's nothing new about this 'best driver gets the best car/best car gets the best driver' situation, you know. When the F1 world championship began in 1950 the 158 Alfa Romeo was even more superior to its opposition than Red Bull is now and, surprise, surprise, Alfa recruited the best drivers of the day. Result? World championships for Giuseppe Farina and Juan Manuel Fangio. Old bandy legs would only sign one-year contracts to ensure he could choose the best for the following year, and he won four more championships with Mercedes-Benz, Ferrari and Maserati. Phil Hill's sharknose Ferrari was by far the best car in 1961 and the same applies to championship achievements by Jim Clark with Lotus, Jack Brabham with Cooper and Brabham, Jackie Stewart with Matra and Tyrrell, Mario Andretti with the formidable Lotus 79, Ayrton Senna with McLaren, Nigel Mansell with the dominant Williams FW14B, Alain Prost with the Williams FW15C and Jenson Button with the Brawn.

So where does all this get us? Well, for me it all adds up to the fact that I have the greatest respect and admiration for Sebastian Vettel. By any measure he is an outstanding driver whose personality I find to be endearing and attractive. I like his charm, his sense of humour and his skill at the wheel. No, I certainly don't like what he did to his team-mate in Malaysia but I understand *why* he did it. He had to *win* and if that doesn't matter to a grand prix driver he's never going to make it. The greatest ever? Not yet but, in time, maybe yes. 🏆



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