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PORSCHE



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RECIPE FOR SUCCESS

We tour the giant ovens of the Izmit-based Pirelli factory



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MANSELL

Ten incredible tales you'd quite possibly never heard about this British racing legend



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DANIIL KVIAT

So good that the notoriously critical Helmut Marko describes him as "the one"

39

F1 2017: LICENCE TO THRILL

The regs are due a major overhaul for 2017. This is our take on the future

2017



50

VALTTERI BOTTAS

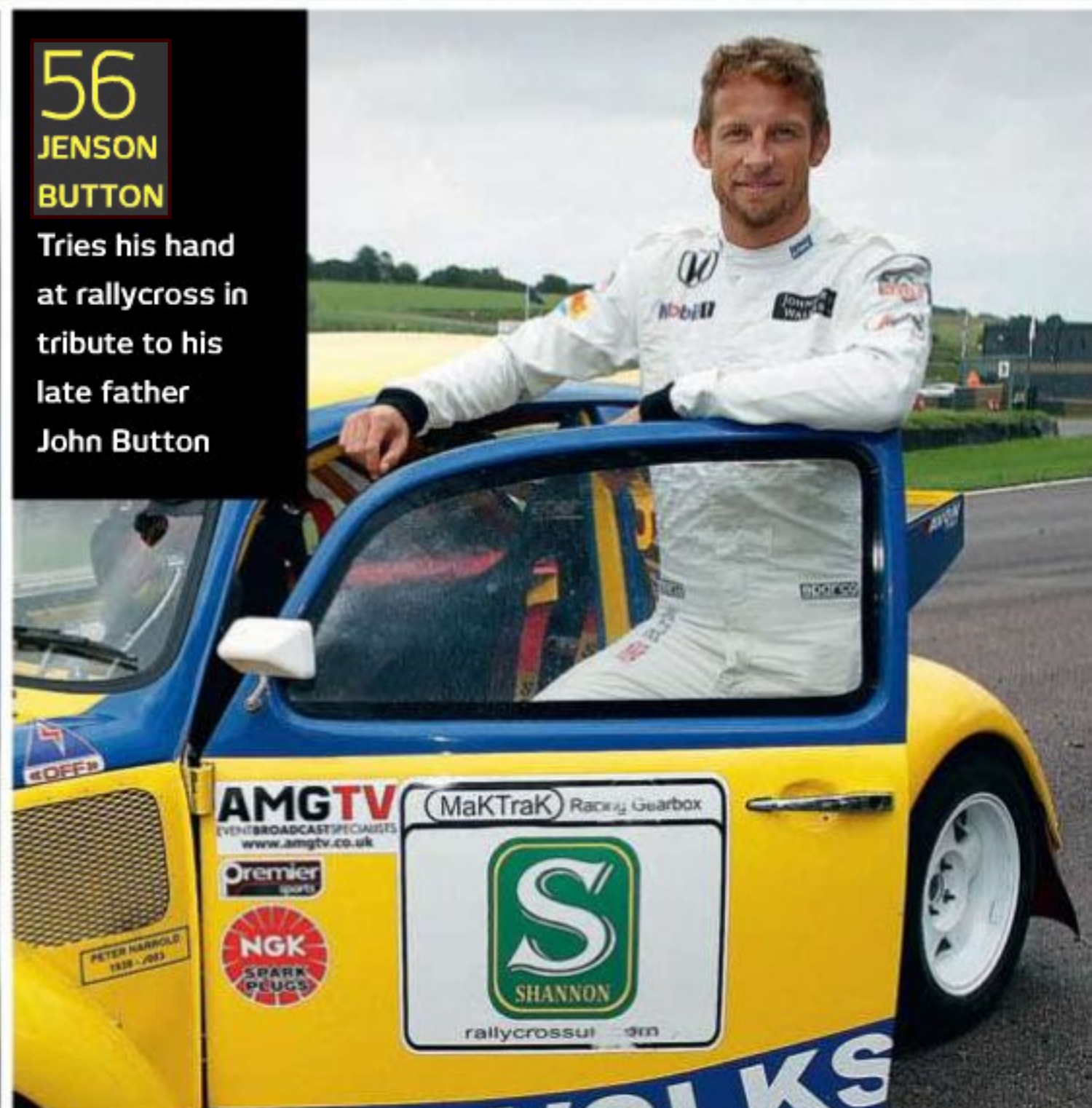
He's keeping schtum about a possible future move to Ferrari



56

JENSON BUTTON

Tries his hand at rallycross in tribute to his late father John Button



What now for destiny's child?



Follow Anthony
on Twitter:
@Rowlinson_F1

Lewis Hamilton, a three-time world champion, says he has no interest in spending the rest of his F1 days trying to emulate the stats record of Michael Schumacher, the sport's most successful driver (seven titles, 91 wins). But as he takes stock of his achievements over the first nine seasons of a remarkable career, perhaps he'll reflect that such matters may not be his to determine.

Who would have thought, for example, that until the end of 2014 Hamilton would have won 'only' one world title, with that dying-moments finale at the 2008 Brazilian Grand Prix? Equally, who would have thought that his Mercedes chapter would produce such consummate domination, given the Red Bull/Sebastian Vettel stranglehold of the preceding seasons? That's just what we're experiencing, though: another era of team/driver harmony so perfectly rounded that it's hard to imagine how it might be challenged, or by whom. Certainly very few would bet against Hamilton crafting a title hat trick in 2016.

Sebastian Vettel and Ferrari will certainly fancy having a crack, after their highly encouraging 2015. And the Red Bull-Ricciardo combo fear nothing and no one; with a competitive PU they'd be right there. Yet every one of Hamilton's putative rivals has an asterisk by their name: for Nico Rosberg, there's the psychological drubbing he has taken from Lewis over

the past three seasons; for Vettel, there's the Ferrari technical operation that's not yet at Mercedes' level; for Ricciardo, Red Bull's endless engine travails.

That leaves Lewis set to capitalise on a historically unusual position for a British sportsman: expected victory. From the perspective of November 2015, Hamilton should enter 2016 as favourite to take another title and join the 'four-or-more' club occupied only by Schumacher, Fangio, Prost and Vettel. What a prospect: a Brit right up there breaking records and aiming for the very highest peak.

Perhaps the forthcoming reset of the technical regs, due for the start of 2017 (this month's cover story, see [page 39](#)) might derail the Hamilton-Mercedes train? They will bring a revamped aero package, fatter tyres and more power, so might, for example, Red Bull gain an edge with a lightbulb of tech inspiration, as their Newey-inspired chassis did from 2009-13?

That's a possibility, of course, but Mercedes' success has not come about by chance: their technical leaders Andy Cowell (Brixworth, engines) and Paddy Lowe (Brackley, chassis) have worked systematically and in harmony to eliminate weakness and maximise performance. And the same is true of Lewis Hamilton. He has banished a reputation for occasional petulance, and done a lot of growing up over the past couple of years, to emerge ever more assured and confident. Always freakishly gifted, he now has the maturity and self-awareness to channel those talents just as he likes. His F1 future is his own to write.

• *We'll celebrate Lewis's success in full, next month.*

Contributors



Justin Hynes

Beyond F1, a talented muso; writes with perfect pitch

When not writing about rising superstars, such as Daniil Kvyat ([p66](#)) Justin is often found coaxing sweet sounds from friends Mr Fender and Mr Gibson



Antonio 'Piccolo' Peacock

Survived a 50-foot cliff fall at Rally Corsica. Yes, really

Multi-lingual and multi-talented, Anthony used his skills as a native Italian speaker to interview cult Formula 1 hero Alessandro Nannini ([p72](#))



Marco van Overbeeke

Formula 1-loving artist-illustrator extraordinaire

Marco asked us to direct you to his website ([www.marcovanoverbeeke.nl](#)) and after he'd done such a great job on our cover, how could we refuse?



Steven Tee

Approaching 550 GPs and showing no signs of tiring

The indefatigability of our principal photographer is legendary. More impressive is his undimmed zeal for shooting a talented rookie, such as Alex Rossi ([p80](#))



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BROOM ROAD, TEDDINGTON, MIDDLESEX, TW11 9BE, UK

THE TEAM

Group Editor
Anthony Rowlinson
Group
Managing Editor
Stewart Williams
Associate Editor
James Roberts
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Stuart Codling
Chief Sub-Editor
Vanessa Longworth
Art Editor
Frank Foster
Designer
Jack Woolrich
Principal
Photographer
Steven Tee
Office Manager
Joanne Grove
Editorial Tel
+44 (0)20 8267 5806

ADVERTISING

Global Partnerships
Director
Chris Gowland
Partnerships
Manager
LeAnne Foley
UK Sales Manager
Ben Fullick
Advertising tel
+44 (0)20 8267
5179/5916

MANAGEMENT

Haymarket
Specialist Media
Group Director
Tim Bulley

LICENSING

Licensing Director
Alastair Lewis
Licensing Managers
Lisa Vernall (Asia)
Ian Porter (ROW)

CONTRIBUTORS

Columnists
Peter Windsor
Dieter Rencken
Damon Hill
Murray Walker
Technical Consultant
Pat Symonds
Photo Agency
LAT Photographic

PRODUCTION

Production & Group
Publishing Manager
Sunita Davies

SUBSCRIPTIONS

Subscriptions
Marketing Executive
Maria-Luisa
Fernandez

PUBLISHING

Group Publisher
Stuart Williams

Missed an issue?

Back issues hotline:
08456 777 818

Email F1racing@Servicehelpline.co.uk
Fax 01795 414 555
Customer Hotline
0844 848 8826

Editorial director Mark Payton
Strategy and planning director Bob McDowell
Managing director David Prasher
Chairman and managing director Kevin Costello

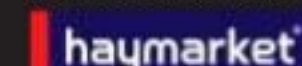
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F1 Racing Subscriptions
PO Box 326, Sittingbourne, Kent ME9 8FA. Tel 0844 848 8826.
Fax 01795 414 555. Overseas: +44 (0)1795 592 990

Email F1racing@servicehelpline.co.uk
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Champion's Parade

Five into one A year after letting the world title slip at the final round of his rookie season, Lewis Hamilton clinched the drivers' championship in equally sensational circumstances. At a rain-interrupted Brazilian Grand Prix, Lewis looked to have lost out to race winner Felipe Massa – only to bag fifth place at the final corner and snatch the crown by a single point

Where São Paulo, Brazil **When** 4.55pm, Sunday 2 November 2008

Photographer Steven Tee/LAT

Details Canon EOS-1D MkIII, 200mm lens, 1/200th at F2.8





Champion's Parade

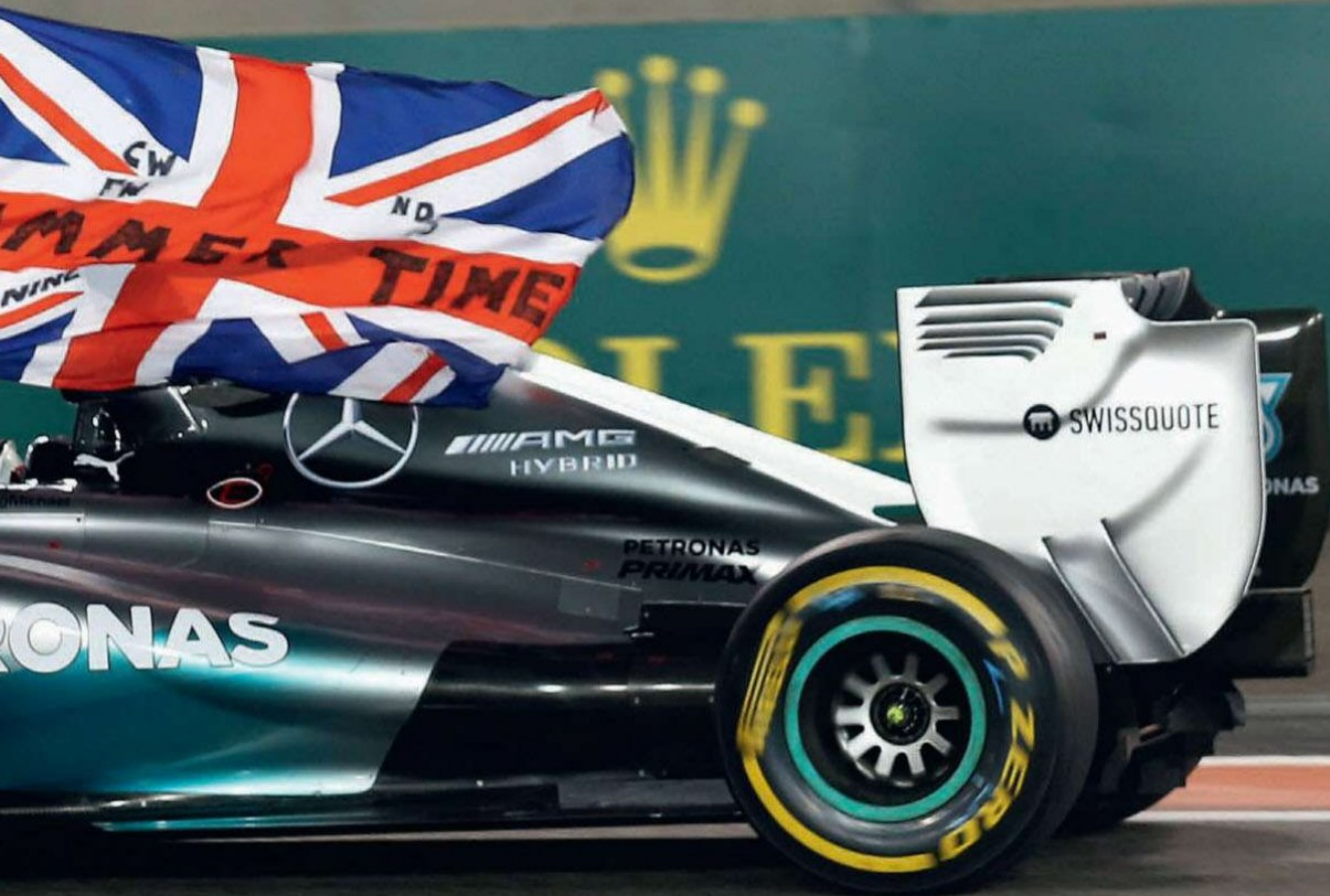
Stop! Hammer time This is the way we roll in Formula 1's hybrid era.

A Mercedes leading from the front, more often than not driven by Lewis Hamilton. Team-mate Nico Rosberg took the world championship to the wire in 2014, but in Abu Dhabi Lewis made it clear: you can't touch this

Where Yas Marina, Abu Dhabi **When** 6.44pm, Sunday 23 November 2014

Photographer Alastair Staley/LAT

Details Canon EOS-1DX, 200mm lens, 1/500th at F4.0





Champion's Parade

'Pagne is a pleasure Sharper than ever before, Lewis has dominated Formula 1's sporting narrative throughout 2015. After a thoroughly wet weekend on track in Texas, courtesy of two aggressive weather fronts, he celebrated his third world title with a shower of a different kind

Where Austin, USA **When** 5.28pm, Sunday 25 October 2015

Photographer Vladimir Rys

Details Canon EOS-1DX, fisheye lens, 1/1000th at F5.6







NO TO MICHELIN

19



McLAREN LINE-UP

20



F1 OWNERSHIP

24

F1 INSIDER

NEWS ■ OPINION ■ ANALYSIS

NEWS

Hamilton joins Formula 1's all-time greats

Over two grand prix weekends, Lewis Hamilton surpassed hero Ayrton Senna's GP win tally and entered the select club of three-time world champions

Juan Manuel Fangio, Jack Brabham, Jackie Stewart, Niki Lauda, Nelson Piquet, Alain Prost, Ayrton Senna, Michael Schumacher, Sebastian Vettel... and now Lewis Hamilton. Victory at October's US GP enabled Hamilton to put the 2015 Formula 1 World Championship beyond the reach of any of his rivals, and in doing so he joined the select group of aces who have won the drivers' title at least three times each.

And this isn't the only significant achievement Hamilton has notched up this season. Two weeks earlier, in Sochi, he passed a landmark that had personal resonance for him: having already matched his hero Ayrton Senna's 41 GP wins, Hamilton made it 42 with victory at the Russian Grand Prix. Senna took his final win on his 158th start – the 1993 Australian GP – while Hamilton hit the 41 mark on his 162nd, at Suzuka this year.

Sebastian Vettel also surpassed Senna's victory tally this season, notching up win number 42 in Singapore. His rivalry with Hamilton may come to define this era, and with the competitiveness of their current machinery, each must now have their sights set on the next goal: Alain Prost's score of 51 wins looks comfortably achievable for both, as the French four-time champion himself has acknowledged. He tweeted after the Russian Grand Prix: "I have to look in both mirrors at the same time – not easy."

Michael Schumacher still leads the all-time F1 rankings with 91 victories, which may be beyond the reach of 30-year-old Hamilton and 28-year-old Vettel. That said, Hamilton in particular is now racking up the wins at a rapid rate – at the time of writing he has added 21 wins to his tally since the start of the 2014 season.

This rate of success, similar to that demonstrated by Vettel with Red Bull in 2011 and 2013, underlines how a driver needs a

dominant car for a number of seasons in order to achieve these sorts of statistics. Fernando Alonso, who has been stuck on 32 wins since the Spanish Grand Prix in 2013 (his 201st start), would not argue with the logic of that argument.

Hamilton's success vindicates his decision in 2012 to 'leave home' and sever his ties with McLaren, who had supported his career since his karting days. At the time this move came as a shock to many, but in truth the patriarchal relationship between McLaren and Hamilton was as suffocating as it was comforting. Hamilton took a risk, bought into the Mercedes growth vision of Ross Brawn and Niki Lauda, and in stepping out of his comfort zone he put himself in a position to develop further as a driver.

Hamilton's McLaren years were chiefly characterised by frustration; the world title slipped through his fingers in his rookie year; the team were wrongfooted by the 2009 technical regulations and only regained frontrunning pace mid-season; and further chances were missed in 2010 and 2012. Had he stayed at McLaren from 2013 onwards, Hamilton would have been part of their humiliating slump in competitiveness.

Lewis joins the nine others who have won the title three or more times: Fangio, Brabham, Stewart, Lauda, Piquet, Prost, Senna, Schumacher, Vettel



At the peak of his powers,
Lewis seals the title in Austin,
with three races still to go

NEWS DIGEST

The month's big stories at a glance

11.10.15 Pirelli secure F1 tyre contract for 2017-19 **14.10.15** FIA approves changes to F1 exhausts for 2016 in a drive to boost noise **16.10.15** McLaren confirms Kevin Magnussen will be replaced as test and reserve driver by GP2 champion Stoffel Vandoorne **20.10.15** FIA race director Charlie Whiting makes his final inspection of the redeveloped Mexican GP circuit in Mexico City

23.10.2015 Jolyon Palmer, the 2014 GP2 champion, is confirmed as Pastor Maldonado's team-mate at Lotus for 2016, replacing Haas-bound Romain Grosjean



25.10.15 The FIA announces the forthcoming test of three different solutions that are aimed at improving F1 cockpit safety **31.10.15** Force India linked to Aston Martin in naming rights deal

Instead, his stock is at an all-time high, and he is arguably driving at a higher level now than at any point in his career. The battle for the 2014 championship with his fast and capable team-mate, Nico Rosberg, went down to the wire, and in 2015 Hamilton found superiority in areas that had previously been Rosberg's domain – chiefly qualifying pace, in which Rosberg generally had the advantage during 2014.

By outqualifying as well as outracing Rosberg, Hamilton gained the upper hand psychologically, too, and sealed the title with three rounds to go. That might not sit well with F1's ringmaster, Bernie Ecclestone, whose preference is always for a dramatic final showdown, but it will suit the latest triple world champion just fine.

The question now, surely, is whether Lewis Hamilton has indeed peaked or whether his best is yet to come?

PHOTOS: GLENN DUNBAR/LAT; CHARLES COATES/LAT; SAM BIRD/LAT; STEVEN TEE/LAT; ANDY HONE/LAT; LAT ARCHIVE

New engine plan could scupper hybrid formula

As Red Bull remain without a 2016 engine deal, F1's bosses announce plans for cheaper – and better – alternatives

Spooked by the lack of competitiveness at the front of the grid, and the growing power of the engine manufacturers, F1 chiefs Bernie Ecclestone and Jean Todt are pushing for a cheaper engine that could kill off the turbo hybrids.

They propose a 2.2-litre V6 turbo engine, with a simple energy recovery system, which could be run in parallel with the current 1.6-litre turbo hybrids. These new engines would cost £4.3million for a year's supply – about a third of the cost of the cheapest customer hybrid deal.

For manufacturers, the risk is that there is an underlying plan for an equivalence formula in which the new engines would be adjusted to ensure turbo hybrids could not win. They would then have no choice but to quit F1 or to build their own simplified engines.

The plan is the brainchild of former FIA president Max Mosley. In a joint interview with Bernie Ecclestone on German TV, Mosley said car manufacturers had too much control within



Ferrari have offered to do a deal with Red Bull to supply them with 'old' 2015 engines for 2016

F1 as a result of their stranglehold on engine supply, describing the need for an independent supplier as "acute". He added: "There's another thing you could do – give the small teams greater technical freedom in return for operating within a budget. Then teams could come in and be competitive. The big teams would complain, and we would say: 'If you want to operate for the same budget, you could have the same freedoms.' It would be difficult to convince them, but in the structure of F1 they could be outvoted."

Any new engine regime would not be introduced until 2017 at the earliest, which would be too late to alleviate Red Bull's current predicament. Their future in F1 hangs in the balance, since they are struggling to find an engine for next season that is competitive enough to satisfy owner Dietrich Mateschitz.

As *F1 Racing* went to press, Red Bull had three options: resurrect their relationship with Renault, take a Ferrari engine, or try to do a deal with Honda. Mercedes have already ruled out a supply deal, despite talks in July that were encouraging enough for Red Bull to sever their ties with Renault. Likewise, Ferrari said they could only supply 'old' 2015 power units, a notion that has cooled Red Bull's enthusiasm. Honda are a possibility, but any arrangement would be opposed by McLaren CEO Ron Dennis.

There's little sympathy for Red Bull in the paddock, following their public criticism of Renault, but their plight does highlight the scarcity of competitive engines.

• Dieter Rencken offers his opinion on the engine manufacturer stranglehold on [page 35](#)

QUIZ

F1 Mastermind

Your chosen specialised subject: the world's greatest sport



RENAULT IN F1

- Q1** Renault scored their first ever grand prix victory at which race in 1979?
- Q2** Which driver has scored the most wins using a Renault engine?
- Q3** A record 213 pole positions have been claimed using Renault engines. Which driver claimed the first of these at the 1979 South African Grand Prix?
- Q4** How many drivers' championships have been claimed by a driver using a Renault engine?

- Q5** What was the nickname given to Renault's first F1 car, the RS01?
- Q6** Renault quit as a constructor after 1985, supplying engines to which three teams in 1986?
- Q7** Who was the first racer to win a grand prix driving a Renault-powered Williams?
- Q8** In which year did Renault start supplying engines to Red Bull?

- Q9** Renault bought the Benetton team in March 2000. But in which season was the squad officially renamed Renault?
- Q10** How many racers have won grands prix when driving a works Renault machine?
- Q11** Fernando Alonso collected his first F1 victory driving a Renault. Where and when did he do this?

- Q12** Which two drivers raced for Renault during the 2007 season?
- Q13** How many races did Ayrton Senna win using Renault engines?
- Q14** Who was the only non-Renault-powered driver to win a race in 1995. And where did he do it?
- Q15** Who was the last racer to win a grand prix when driving a Williams-Renault?

1 French GP 2 Sebastian Vettel 3 Jean-Pierre Jabouille 4 11 5 The yellow teapot 6 Lotus, Ligier and Tyrrell 7 Thierry Boutsen 8 2007 9 10 11 12 Giancarlo Fisichella & Heikki Kovalainen 13 4 14 Jean Alesi, Canada 15 Pastor Maldonado

Michelin lose out on tyre supply to Pirelli

Teams favoured the 18-inch wheel proposal, but Michelin couldn't find commercial traction with Bernie Ecclestone



Michelin have failed in their ambition to become F1's sole tyre supplier from 2017 on. Pirelli have completed their deal with F1 boss Bernie Ecclestone, and it will be officially confirmed once it has been rubber-stamped by the FIA.

The big question is why Michelin were not selected, especially since Ecclestone had come under significant pressure to appoint them. Although they will not say so publicly, privately F1's drivers want tyres on which they can race hard throughout a grand prix, while senior technicians within the teams have cast doubt on Pirelli's capacity to design better tyres than they currently produce.

However, Pirelli's big advantage was Ecclestone's loyalty to them. This is partly due to the fact that they pay around £26m a year for trackside advertising, and partly due to their willingness to step in and rescue F1 in 2010 when Bridgestone pulled out. Not only that, but Pirelli were

also prepared to fulfil Ecclestone's wishes for unpredictable tyres – something Michelin were not keen on.

Michelin, meanwhile, wanted F1 to change its philosophy. They were not averse to supplying tyres that promoted pitstops or that could be used to enhance the spectacle. But they were not prepared to supply tyres of the sort Pirelli have made since 2011: tyres with high thermal degradation, which require careful management by drivers running deliberately below the limit.

Michelin bosses won over the teams with what they were proposing on a technical and sporting level, but failed to impress the commercial rights holder. The company's bosses visited Ecclestone to convince him of their approach and came away feeling the meeting had gone well. But they did not realise they had made a major strategic error.

Sources claim Michelin presented their proposal to Ecclestone and said they would discuss commercial terms if and when they were appointed. Although they were prepared to pay serious money, this is not how Ecclestone does business, which put an immediate end to their bid.

Bernie Ecclestone pictured with Pirelli boss Marco Tronchetti Provera, to whom he is remaining loyal



ON THE TURN

Every corner tells a story...

No 7

Autódromo José Carlos Pace, Interlagos



1 THE SENNA S

The corner is named, of course, after São Paulo native Ayrton Senna. He helped to design the curve, as part of works carried out in a bid to regain the Brazilian Grand Prix for 1990.

2 CURVA DO SOL

Drivers were often blinded by the sun when turning in to this corner, but it's no longer a problem: it was a right-hander, but since the 1990 revamp it is tackled in the opposite direction.

3 RETA OPOSTA

Translating as 'opposite straight', this name predates the 1990 circuit, when it ran parallel to the (no longer used) back straight, but in the opposite direction.

4 CURVA DO LARANJINHA

That's 'Little Orange' in English. It reportedly gets its name because it is a shortened version of the old Laranja corner. That, in turn, was named after a driver nicknamed 'Orange'.

5 PINHEIRINHO

Named after a 'small pine tree' that was originally located near the exit of the curve.

6 BICO DE PATO

The 'Duck's Bill' corner is so named because that's what it looks like when viewed from above.

7 JUNCAO

The 'junction' turn is named because it's where the original course rejoined a now-abandoned high-speed loop.

8 SUBIDA DOS BOXES

This rapid final turn is named 'the pits ramp', because it is a steep uphill left-hander running close to the pit boxes.

Jenson Button to stay on at McLaren for 2016

After much speculation, the veteran Brit's contract is extended. But team-mate Fernando Alonso's prospects are far less clear

Jenson Button is to remain in F1 for at least another year after he and McLaren reached an agreement for him to stay on at the team for 2016. Button, 35, had not wanted to quit, but was having misgivings on account of his treatment by McLaren and their prospects of improving next year. Button's contract had dictated a £3.2m pay rise in 2016 after he took a cut to £6.5m to stay there in 2015.

McLaren had an option to release Button from his contract for 2016. But after initially trying to negotiate down his salary, McLaren chairman Ron Dennis capitulated and agreed to pay the contracted amount. In theory, this means Button will partner Fernando Alonso in 2016, but there are lingering question marks over Alonso's future after a bizarre sequence of events last month.

At Suzuka, Button's contract extension was not yet public knowledge, and that weekend began with a whirl of speculation that he was about to announce his retirement. It was at this point that word began to filter out that all was not well between Alonso and McLaren.

One insider said: "What makes you so sure Fernando will still be here next year?"

Alonso did little to quell the rumours, couching questions about his future at McLaren's news conference in supremely evasive language. Then, during the race itself, he publicly criticised the Honda power unit, likening it to an engine from the GP2 feeder series, later saying in response to a question from the BBC that he "didn't know" whether he would race for McLaren in 2016. On the eve of the Russian GP, he was asked again if he would definitely be at McLaren next season, but this time he replied: "Yes. Of course. And 2017."

However, insiders still question whether Alonso will see out the full term of his deal, which is worth £26m a year. Some believe it depends whether Honda can make a big step forward, thereby fanning his hopes of achieving a third title by 2017.

If Honda can't, then many people will be wondering whether this will mark the end of the career of a man who has arguably been the greatest driver of his generation.

Put out by their lack of competitiveness, Alonso has been giving mixed messages about his future with McLaren-Honda



PASSNOTES

Your essential F1 briefing
#No 21 Baseball cap



Name Baseball cap
Age About 150 years
Appearance
Peaked, ubiquitous, and somewhat déclassé

So, we're mixing sartorial nous with sociology now, are we?

Not in the slightest. I merely allude both to the frequency with which sportspersons bedeck their bonces with this item of garb, and to its well-known property of halving the wearer's IQ instantly when worn backwards.

Ye Gods! I did not know that. So it sucks the brain juice right out of you, yes? How does it hinder the process of ratiocination – signals from outer space?

No need to adopt that mocking tone. Exhibit A: the post-US GP tomfoolery in the 'green room' at the Circuit of The Americas.

To borrow a phrase from Craig David, you're going to have to fill me in. I tend to switch off after the chequered flag so as to avoid all the witless jibber-jabber. And I'd already had to sacrifice Countryfile at the altar of Formula 1 that night. So what, then, went down in the 'room of doom'?

Lewis Hamilton donned his baseball cap, resplendent in black with its neatly stitched Pirelli logo, then casually tossed the one marked '2nd' over to Nico Rosberg, who was sitting nearby. Nico recovered it from his lap, and with an air of irritability and petulance threw it back at him.

Diva fever! Did the missile strike home?

No, he missed.

Story of the poor fellow's year.

...and as Lewis turned away from him, just a hint of a smile passed across his face as he dabbed at it with a towel. Then, as the camera panned around, Mercedes technical boss Paddy Lowe appeared in the frame, fixing Nico with a piercing glare.

What, like the Medusa in Clash of the Titans?

Very similar.

Seems like a non-event event to me. Hardly worthy of cap-ital punishment, what?

If the cap fits...

Do say Hat's entertainment

Don't say What a terrible tosser

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COLUMN

MOTOR MOUTH

What we're talking about at *F1 Racing Towers*

THE BERNIE AND MAX SHOW

Be careful what you wish for. A couple of months ago, in the Monza media centre, conversation at *F1 Racing's* desk turned to the absence in the modern era of F1's big political beasts, who would traditionally use the Italian GP weekend as a platform for some kind of attention-grabbing stunt – think Max Mosley gripping Ron Dennis's hand in faux amity in 2007, for example.

Seems like you can't keep a big beast down, for Max popped up again on the German TV station ZDF last month in a double-header interview with his old mucker Bernie Ecclestone. Mischief in stereo. Amid talk of ripping up F1's rulebook and starting again, and greater fan consultation, there was a 'soft launch' for the low(er)-cost engine proposals described on p18. Dare we suggest that the real agenda here is to wrest some control of the sport back from the engine manufacturers, who currently pack a substantial political punch?

Stuart Codling

Bernie and Max: pushing for an engine revolution



Austin: weather-stricken thriller of a weekend

IT'S RAINING, MEN

So, two into one does go: at least as far as F1 race weekends are concerned. The 2015 US GP, afflicted as it was by rain-laden weather fronts, was forced by Mother Nature to run to a compressed schedule: no FP2, then qualifying on Sunday (but only Q1 and Q2), followed by the race – which started as usual at 2pm prompt.

FP1 was rain-disrupted and FP2 was canned, so when it came to the race, teams were forced to gamble with chassis trim. Red Bull opted for a '60 per cent wet' package, with the result that both their drivers were fastest when the track was wettest. But as the circuit dried, the conventionally quick Mercedes and Ferraris came to the fore.

That the race was a thriller was attributable in part to the imperfections with which teams were forced to deal on the hoof. A lesson to be learned for F1's race logisticians?

Anthony Rowlinson

NEWS

Vasseur tipped to be boss of new Renault F1 team

Lotus sale edges closer to completion, amid speculation over new management structure

Frédéric Vasseur, boss of the ART GP2 team, is poised to lead Renault in their latest outing in F1. The 46-year-old Frenchman will take the helm once Renault's purchase of Lotus is confirmed – which is only a matter of time, according to senior insiders.

Four-time champion Alain Prost, a Renault ambassador and advisor, will take a senior role, mirroring that of Niki Lauda at Mercedes. As a non-executive director Lauda has no authority to take decisions on his own, but advises team bosses Toto Wolff and Paddy Lowe and the Mercedes board.

There is uncertainty over the role of current Renault Sport managing director Cyril Abiteboul, with rumours of friction between the three men who look to be earmarked for senior positions with the team.

Renault have signed a letter of intent to take back control of the team they sold to investment group Genii Capital at the end of 2009.

There have been rumours that Renault president Carlos Ghosn had not signed off on the investment required to take control of Lotus, but he has agreed in principle to a ten-year commitment aimed at returning Renault to the front.

Renault's purchase of a majority shareholding in the team – thought to be in the region of 65 per cent – is not believed to be in doubt. Mercedes only actioned their plan to supply Manor Marussia once they were confident that Lotus would not need their engines, since Mercedes and Renault have close ties at a corporate level and are engaged in several joint ventures. Lotus are now busy designing next year's car around a Renault engine.

Meanwhile, talks between Renault and Lotus owners Genii Capital over the settlement of the team's debt are dragging on. The sale price of the team is under debate, as is the length of the period over which the debts must be repaid.

ART's Frédéric Vasseur is likely to head up the new Renault F1 team, with Alain Prost as an advisor





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^{***}With regular use vs. non-selenium containing anti-dandruff shampoos, against visible flakes seen at 2ft.



Mixed messages over sale and ownership of F1

Bernie Ecclestone claims to have new buyers waiting in the wings, but majority shareholders CVC aren't interested in selling

Bernie Ecclestone has claimed that the commercial arm of Formula 1 could have new owners by the end of the year, saying: "I'll be surprised if one of them does not buy it shortly."

Ecclestone, who turned 85 on 30 October, has said there are three interested parties. The most likely buyer, however, is said to be a US-Qatari-Chinese consortium headed by American billionaire Stephen Ross, the 75-year-old owner of the Miami Dolphins NFL team.

The Financial Times has reported that Ross and F1's current main owners CVC Capital Partners have "shaken hands" on a deal. This agreement would value F1 at \$5.5bn.

High-level sources within Formula 1 say they have been told the US-Qatari deal is real – but they also caution that it is always very difficult to ascertain the truth of such claims, given that whoever makes them always has a vested interest. To complicate the picture further, it is still only three months since CVC announced

that they were not interested in selling their shares in Formula 1.

In July, CVC co-chairman Donald Mackenzie said: "There is no end date. We have 12-year funds, which we have to return the original money. We have already done that. So the pressure's off. We like owning F1, we don't want to sell it."

Bernie Ecclestone has even gone as far as to suggest that he and MacKenzie could go into business together to buy a larger part of the F1 Group. Insiders who attend meetings of the F1 Strategy Group, which comprises the leading teams, Ecclestone and the FIA, say that this tallies with their reading of the situation.

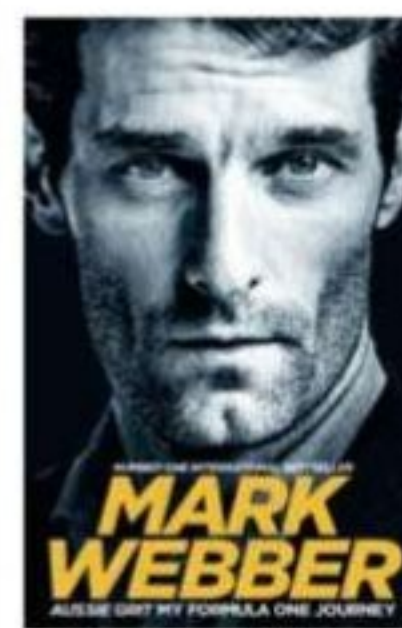
Having been a relatively low-key presence in the sport for several years, MacKenzie has shown far greater engagement of late, being present at Strategy Group meetings and showing an interest in getting involved. Sources say he has grown to enjoy his role and influence within F1.

Bernie Ecclestone has suggested he could join forces with CVC's Donald MacKenzie to buy a bigger share of the Formula 1 business



MANOR MARUSSIA UNDER THREAT

There is conflict between Manor Marussia's management team of Graeme Lowdon and John Booth and owner Stephen Fitzpatrick, with Lowdon and Booth set to resign after the last race of 2015. Fitzpatrick, boss of OVO Energy, took over the ailing Marussia last winter and has spent the past few months seeking a buyer – without success – angering the team's stalwarts in the process. *F1 Racing* understands Fitzpatrick has been offered a buyout deal from a North American consortium, but not at an acceptable price.



LONDON SPORTS WRITING FESTIVAL

Mark Webber and our own Maurice Hamilton will debate the world's finest race circuits – among other F1 matters – at the London Sports Writing Festival on

13 November. Their segment will be chaired by sports writer and occasional *F1 Racing* contributor Richard Williams. For details, visit www.londonsportswritingfestival.com.

IN-SEASON ENGINE DEVELOPMENT

F1 bosses have agreed to open up engine development in a move that gives Honda and Renault hope of closing the gap to the front. It will allow in-season development in 2016, rather than forcing manufacturers to apply all their improvements by 28 February, and will increase the number of engine development tokens from 25 to 32. The decision, agreed between the four engine manufacturers in F1 and the FIA, still needs to be approved by the F1 Commission and the FIA World Council.



FIA MAGAZINE

You may have enjoyed our article on the work of the FIA Medical Car in the November issue of *F1 Racing*. A similar feature appeared in

FIA's excellent in-house magazine, *Auto*. Published four times a year, it features many insights into the often unsung work of motorsport's governing body. For more information, visit www.fia.com/auto.



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F1 STUFF WATCH SPECIAL

**▼ SCUDERIA FERRARI
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This timepiece (£195) captures the thrill of race day, with a bold honeycomb texture inspired by the layered structure of a race car's monocoque. It also features a 44mm black dial with ionic-plated black steel casting and a sturdy silicone strap.

www.scuderiaferrariwatches.co.uk


**▼ TAG HEUER CARRERA
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www.tagheuer.co.uk

**▲ CHRISTOPHER WARD
C9 GT40**

Inspired by the car that twice won Le Mans, this watch (£2,950) incorporates a laser-cut 'wheel' of aluminium from the wheel-spinner of the GT40 P-1075 within the backplate. This is a limited edition of only 40 timepieces.

www.christopherward.co.uk


**▲ THE HESKETH RACING
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www.omologatowatches.com


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www.bulova.com


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www.edifice-watches.eu/


**▲ ORIS WILLIAMS
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With its sturdy stainless-steel case and black rubber strap, this timepiece (£1,970) honours an iconic name in Formula 1, and celebrates the longstanding partnership between Oris and the Williams team that dates back to 2002.

www.oris.ch


**▼ ROLEX OYSTER PERPETUAL
COSMOGRAPH DAYTONA**

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Pat Symonds explains THE SCIENCE BEHIND... The Virtual Safety Car

F1 TECH

What is the purpose of a Safety Car?

The physical Safety Car was introduced in 1993 as a means of controlling the field in the event of an incident that would previously have either caused a race to be stopped, or exposed marshals and competitors to a dangerous situation. Over the years, the rules governing the Safety Car have evolved and improved, but it always suffered from two hard-to-overcome flaws: the time taken to deploy it and for the drivers to react to it.

In 2015, and in response to Jules Bianchi's tragic accident at the 2014 Japanese GP, a new system was introduced as a supplement to the Safety Car: the Virtual Safety Car or VSC. The increasing sophistication of the cars' electronic systems, and the communication between the cars and Race Control, has enabled this to happen. It is a tribute to the pace of F1 development that this system was first tested just 26 days after Jules Bianchi's accident.

So what exactly is the Virtual Safety Car?

When a physical Safety Car is deployed, the drivers must conform to a speed profile that is determined by the driver of the Safety Car. The Safety Car driver practises at each circuit on the Thursday before an event to determine a suitable lap time, although he may have to adapt this in the event of rain or the necessity to reduce speed further at the scene of an incident.

The Virtual Safety Car forces all drivers to follow a similar, predetermined profile, without the need for the Safety Car to be on track. Therefore the race can be neutralised much more quickly than is the case when a physical Safety Car is deployed.

Who has responsibility for deploying the Virtual Safety Car?

The race director, Charlie Whiting, has sole responsibility for triggering the use of either the Safety Car or the VSC. He is in constant communication with all the marshals' posts and can talk with the teams on the pitwall

if necessary. He also has at his disposal a number of video aids above and beyond the normal broadcast cameras. Each circuit has an arrangement of closed-circuit TV cameras, which are coupled with the GPS systems on the cars and are able to follow each car continuously. Thus, in the event of an accident, he can quickly assess its severity and take appropriate actions to ensure that the situation is handled correctly.

How are the drivers alerted to the fact that the Virtual Safety Car has been deployed?

There are a number of methods of communicating this information to the drivers. Each marshal's post will display a VSC board and the signalling lights will also indicate the same thing. A driver would also expect his race engineer to inform him over the radio in response to a message from Race Control displayed on the pitwall monitors.

There could still be a delay with any of these methods though, so it is most likely that the driver will be alerted first by his dashboard changing automatically to a display specifically designed to aid his driving in this situation, with the letters 'VSC' prominently displayed.

What does a driver have to do when the Virtual Safety Car is deployed?

Most importantly, he must moderate his speed and drive to a predetermined profile. Two VSC profiles will have been loaded onto the car before the race, one for dry conditions and one for wet, and the appropriate one will be automatically selected. These are, in fact, time profiles rather than true speed targets, and they are given relative to position on the track. In addition to this, they will start managing their car in a different way, ensuring that they put the power unit in a benign mode with a level of energy recovery that will keep the battery in a suitable state of charge. They must also ensure that their tyres and brakes are kept up to temperature ready for a restart.

When the Virtual Safety Car is deployed, signs are displayed around the circuit, and drivers slow to a predetermined speed

How does a driver judge that he is driving at the correct speed?

Once the dashboard changes to show the VSC sign, the driver has to carefully watch and follow a delta time display, which will increase or decrease if he deviates from the regulated profile. However, if this were the only method of judging the correct speed it would be difficult for the driver to have any awareness of anything else that was going on outside the cockpit, so the delta time is also communicated to him via a tone through his earpieces. The frequency of this tone increases as he approaches zero delta and decreases if he remains positive. This tone will disappear altogether if he is more than one second positive or if he enters the pitlane.



It's obvious when the physical Safety Car is coming in because the lights on top of the car go out half a lap before it enters the pits. So how do the drivers know when a VSC period is ending?


When the VSC period is ending the driver will hear two high-pitched tones. The first is of a long

duration and means that the VSC period is about to end. This is the drivers' signal to prepare himself for the restart. Anywhere from around 10-15 seconds after this, a second tone signifies the end of the VSC period. The driver may accelerate to full race pace when he hears this.

In the event of a more serious incident that endangers lives, the physical Safety Car will still be used



Can a Virtual Safety Car period lead to a physical Safety Car deployment?

Yes, and at the time of going to press, it has happened three times this season – in Monaco, Hungary and Austin. Such an occurrence illustrates the fundamental tactical difference between the two methods. When a VSC is deployed, all the cars reduce their speed but keep a similar spacing between one another as they did when they were racing. This means that a pitstop can often be made with minimal tactical disadvantage. When a physical Safety Car is deployed, however, the cars can close up to form a train behind the Safety Car. It was this that caught out Mercedes in Monaco and cost Lewis Hamilton his victory in that race. 



PETER WINDSOR

RACER'S EDGE

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

Tit for tat is nothing new in F1, as Jim Clark discovered when he came up to lap Innes Ireland at Monza in 1963, but it's time, I think, to draw the line. It's one thing, if you're Ferrari or McLaren, to suggest to the media, and to the FIA power-brokers, that Red Bull's front-wing deflection – or some such – is getting out of hand; it's quite another when every furtive backstab results in another rainforest's-worth of penalty-based regulatory small print. I don't think there's *anybody* who thinks that 25-place grid penalties are good for F1's image.

And yet here's the thing: the teams alone are responsible for the recent, insane explosion of the rule book into the realms of farce and with it the penalties that ensue. They don't want it, but they've created it, and the cycle shows no sign of slowing. It's called 'a democracy'.

The Pérez-Massa collision in Canada, 2014, is a good example. While Sergio was on his back in the Medical Centre, the Williams guys were up there in the stewards' office, pleading Felipe's innocence. The result we know: Pérez was (questionably) slapped with the penalty; Massa was free to race another day.

Fast-forward to Singapore 2015: again it's a Force India crashing into a Williams (Nico Hülkenberg, on a flying lap, crunching into Felipe Massa, emerging from the pitlane).

Drive your own race – and don't tell tales

And again the power is with Williams: the stewards didn't even ask for a deputation from Force India.

The point is what happened next. Valtteri Bottas crossed a white pitlane entry line on the completion of his first installation lap on Friday morning in Russia. The stewards saw it as it happened; they talked about it; and then they decided to let it go, which to my mind was the correct thing to do. It was Friday morning, after all – and it was an installation lap, for Pete's sake.

Enter Force India. They saw it, too. And there was history. There was precedent. And they expected satisfaction.

Thus the incident was revisited. Valtteri was issued with a reprimand. Not the type you give to your four-year-old when he's thrown the rugby ball at the TV set for the third time that afternoon. The kind that adds points to your licence. Three strikes and you're out.

Now I don't think anyone, except, perhaps, the Williams team, can blame Force India for doing what they did. It's the way things work these days in Formula 1. All of the teams – it being a democracy, after all – have a direct line of communication with Race Control and thus with the stewards. And, because of that, all but the smallest of teams employ dedicated, factory-based 'spotters' whose job it is to examine every step made by every other team in the hope of discovering a clear infringement.

The socially acceptable among you will argue that this is a good thing. F1 is so complicated, they will say, that it is impossible for the FIA to be able to police it from every angle. And it's a democracy: the teams must themselves be the watchdogs of their rivals; it's the only way forward.

I disagree. I think that sticky-beaking is demeaning and that F1 needs autocracy. In support, look at what we've been working around in 2015: a ridiculously detailed rule



book riddled with incomprehensible penalty codes. For every infraction brought to the FIA's notice by Team A, Teams B, C and D have wanted 'a clarification' lest the same thing should happen to them. It's endless. And it's very, *very* boring.

What is the solution, you ask? Can there ever be a bulletproof, democratic policing system for a sport such as F1? Of course not. That would be like asking the teams to contribute to something sensible like a promotional fund for the F1 brand in China, India or the USA.

There is, though, another way: cut off the teams' pitwall communication with the stewards. Leave the checking with the

"The teams alone are responsible for the recent, insane explosion of the rule book into farce"



Force India were punished for collisions involving Pérez and Massa at Montréal 2014 (above left), and Hülkenberg and Massa in Singapore 2015 (above right); so it was no surprise that they complained about Valtteri Bottas crossing the white pitlane entry line on his installation lap on Friday in Russia



official observers and the decisions with the stewards. No deputations unless requested. No watchdogging.

As for the stewards themselves, we must go back, I think, to having at least one permanent steward – if not two of them – sitting alongside the ‘floating’ driver steward. Of course there’s enough dosh out there to pay for them: what do you think happens to all that revenue from the fines? Tony Scott-Andrews was F1’s last permanent steward but he was ousted at the start of Jean Todt’s presidency for reasons that were never explained.

Okay. There’s plenty of well-informed new blood out there to do the job that the

permanent rule-enforcers do so effectively within the worlds of golf (the PGA) and tennis (the ATP). Sometimes they make poor decisions; other times they make very good ones. Anyone with a brain knows that. And at least the participants – and the fans – can go to bed knowing that the incident in question hasn’t precipitated five further rounds of tit-for-tat or contributed to yet another new clause in the rule book.

I wasn’t comfortable, in short, with Jenson Button’s complaining at the Russian GP: “I saw Sainz go over the white line!” Yes? And? Why is it your business? Surely you’ve got enough to do with that pesky McLaren-Honda of yours?

Leave it to the observers and the stewards. And if they’ve missed it because they’re busy with something else – tough. That’s sport. Drive your own race.

Of course you can’t really blame Jenson for saying that, given the current setup. That sort of moaning is basically what his team – and the other F1 teams – are *obliging* him to do. I think it’s beneath a driver of Jenson’s stature, though – and I’m sure the requirement to say that sort of thing is not really what gets Jenson out of bed on a Sunday morning.

Time, then, to call a halt to it all. Simplify the regs, freeze them for the year – and let a few good men call the shots. Permanently. **F1**

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DAMON HILL

KING OF THE HILL

Cockpit savvy from the 1996 world champ, exclusively in *F1R*

We hear all the time that F1 is about now and tomorrow. It does not tarry in the past. Like a high-flying aeroplane on a clear day it races towards its destination leaving only a streak of vapour to betray its place of origin. In another very obvious way, it goes nowhere, simply chasing its tale (!) from season to season with ever-increasing intensity and velocity, producing cars that return to the very place they started from, only to be regarded as instantly obsolete. Only in this respect is F1 unchanging. The participants and the players do change, but the essence is always the same; to be the first to tomorrow and the next race.

It is curious then, that we talk of making history. Even in the moment of its happening, when a record is broken, or some new star is born, we want to be able to say that we were there, that we saw history being made, as if this is some validation of our own lives. We want to be the ones able to talk about the 'now' as the past at some future date!

So, here I go.

I've been around for a while now, seen a few things, taken part in a few things, seen history being made and grown up with this F1 thing my whole life. So, naturally, I often wonder about where it is all going,

or where it should be going. Was the Bard right? Is it all sound and fury, signifying nothing? Or was he wrong? Perhaps it signifies us as an amazing species? Perhaps it makes manifest the incredible potential, creativity and determination, inventiveness, competitiveness, tenacity and courage of humans, like some ultimate cave painting, leaving an indelible mark on our minds that says: we were here, we did this, we are alive. I believe there are edifying aspects to our sport, if only we'd spend a little more time advertising them. But then it wouldn't be F1.

My father had a phrase he'd often turn against his occasionally whining kids: "No such thing as can't."

'No such thing as can't,' is the motto of F1.

Surely there has never been a tribe of people who have been as unstoppable as F1 people? Okay. I admit, 66 years is not the Roman Empire, but it is built on the same stuff, heroes and myths. It exalts the most excellent drivers of the past and hails the new champions. It has created its own momentum and is propelled by its history into the future.

But if I may rewind the clock for a second, there is a story I would like to re-tell.

In the early 1950s, there was a man who was destined to be an ordinary man working on a lathe for a company in England. Then he read an advert offering a few laps of Brands Hatch in a racing car for a pound a lap. So he spent what little money he had and did it. Out of the blue. It was in those few laps that 'the bug bit' to use his phrase. What bug? Speed? Power? Adrenaline? Whatever. He gave up the lathe and set his sights on getting more of 'it'. That man was my father and to this day, Graham Hill OBE, is the only driver to have won all three major motorsport titles: the Indy

500, the Le Mans 24 Hours, and the F1 world championship. It is a feat unlikely to be beaten, unless Jacques Villeneuve gets a decent seat at Le Mans, which is unlikely, but if he does, I'll be there. You bet, Jacques!


The date of the last race of 2015, the Abu Dhabi Grand Prix, is 29 November; it marks an unfortunate anniversary – one most likely to send a shiver down the spine of those affected by the accident 40 years ago that ended the lives of Graham Hill and the key personnel in his team: Ray Brimble, Tony Alcock, Terry Richards, Andy Smallman and Tony Brise.

Burns had a good line to describe it: '...grief an' pain for promis'd joy'. The team were going places. They might have been a McLaren or



Lewis Hamilton now has 43 Formula 1 victories to his name, putting him behind only Alain Prost and Michael Schumacher

a Williams of today. But life doesn't always work like that. There are no rules that obey the dreams of man, only infinite possibilities. Graham Hill's team, Embassy Racing, made instant history, but it is part of the whole story of F1 and that story, like the cosmos, is being born and destroyed all the time.

I tease Sir Jackie Stewart that he won three titles and the Hills also have three, but that if we add my 22 wins to Dad's 14, we have won more grands prix [Sir Jackie won 27]. But we are squabbling over second place, since history, being the domain of the victor, is being written by Lewis Hamilton now, with three titles and more wins and poles than all but the very special few. Who knows where his story is going? You see, the story never ends and it doesn't have a script. Wonderful, isn't it? 

"F1 is unchanging; participants and players do change, but the essence is always the same"



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DIETER RENCKEN

POWER PLAY

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

When historians come to record the definitive story of Formula 1 they will surely wrestle long and hard with this decade's defining conundrum. How did F1, a showcase for cutting-edge automotive technology and a trailblazer for sporting sponsorship, manage so carelessly and systematically to rid itself of the most crucial link in its supply chain: namely, its array of engine partners?

In 2009, this sport was powered by Ferrari, Mercedes, Renault, Toyota and BMW, and was about to welcome back Cosworth. Significantly, most supplied at least two teams at a price of less than £8m per annum for a two-car team, despite the season including 24 test days.

Fast forward six years. As things stand, just four brands will grace the 2016 grid – if, that is, Renault do purchase Lotus and reverse their stated intention of not supplying customers, particularly Red Bull, who have been so critical of their performance. Honda, whether through design or non-desirability, will likely partner only McLaren, leaving just Mercedes and Ferrari to service eight (or possibly nine) teams. Independent suppliers? Not a single one, despite stated interest from Cosworth when F1's turbo hybrid rules were announced, and the ultimately ill-fated PURE project.

The engine duopoly that undermines F1

Thus F1 finds itself held to ransom by just two suppliers: Mercedes and Ferrari. That situation is made all the more critical by both operations having parent companies with the financial and political clout to dictate terms. And make no mistake: they do. During those six intervening years engine prices have shot up 300 per cent, albeit for what are, admittedly, exquisitely crafted, green technological masterpieces, while testing has been slashed to a third of 2009 quotas.

The tragedy is that F1 should have anticipated it after the manufacturer exodus of 2009. But, rather than encouraging independent engine suppliers to join, it typically put short-term expediency ahead of long-term strategic planning. Cosworth's return was brief, after they produced an engine to suit a budget-cap regime that never materialised. F1's masters then formed the 'Strategy Group', offering prime seats on board to those very entities able to rock the boat.

That said, F1 appears to have adopted some rather extreme measures to alienate itself from current and prospective suppliers, since the sport's commercial rights holder has been openly critical of both the sound and technology of engines that cost their makers upwards of £100m annually to supply and service, and three times that to develop.

Folk speak wistfully of the era when Cosworth supplied 90 per cent of the grid

Between them, engine suppliers Ferrari and Mercedes have come to dominate the F1 grid




with their legendary V8s. Bernie Ecclestone's Brabham team, for example, won the 1981 title with these units, and he has said he believes a return to commercially available power units for independent teams could be the solution.

This, though, overlooks one salient fact: Ford bankrolled and subsidised the engine, basing its 'Win on Sunday; sell on Monday' product campaigns around F1 (and other motorsport) success. Without such backing, no independent engine company could supply units to the grid without incurring enormous losses.

This matter strikes at the very core of F1's hybrid engine concept, designed to attract manufacturers – not alienate them. Why has there been so little interest at this level? True, there was talk that Audi *may* enter the fray, but the mere fact that F1 *may* have been on the German brand's radar does not imply it *will* hit the grid, diesel-emissions scandal or not. After all, one of the concepts recently pushed by Audi is a lunar vehicle incorporating e-tron/quattro technologies, yet it does not follow that the four-ringed logo will adorn flagship dealers on the Moon or Mars any time soon...

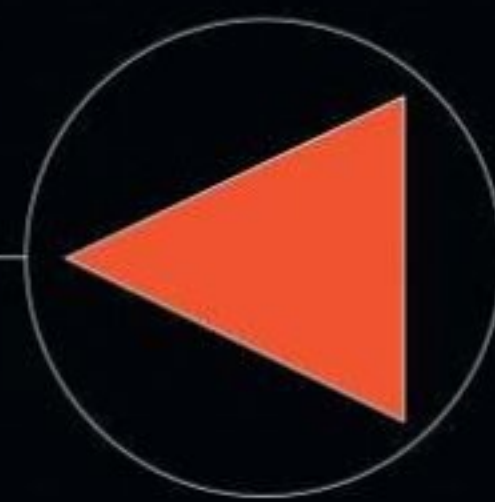
However, backers need not necessarily be motor companies, simply entities with the desire to promote their brands using F1's enormous global platform. Peter Sauber blazed the trail with Petronas branding, followed by Alain Prost with Acer – albeit both with Ferrari engines – so the concept has successful form. Indeed, as they proved, otherwise identical units could well carry different badging – this having been PURE's business model.

And yet partners are increasingly reluctant to embrace the sport, as McLaren can attest. They have sought title sponsors for two years now and, again, F1's commercial controllers must question why brands conspicuously avoid adorning the flanks of grand prix racing cars.

There must be good reason, and it is likely to be related to recent decrees (supporting documentation for which has been seen by this author) that garage backdrops are not to be televised if they bear branding, or to the trend towards selective coverage of dominant teams. Add in constant criticism from up high, and is there any wonder so few brands wish to enter F1 as engine suppliers or badging partners? 

"F1 finds itself held to ransom... since 2009, engine prices have shot up 300 per cent"

Now *that* was a car



No. 45: The Ferrari 500

Not actually an F1 car at all... but it won the world championship twice over



FERRARI 500 TECH SPEC

Chassis	Steel ladder frame
Suspension	Double wishbones (front), De Dion axle and twin trailing arms (rear) with transverse leaf springs and lever-arm dampers
Engine	Ferrari inline-4
Engine capacity	1,985cc
Power output	180bhp @ 7500rpm (est)
Gearbox	Four-speed manual
Weight	560kg
Wheelbase	2,160mm
Tyres	Pirelli
Notable drivers	Alberto Ascari, Giuseppe Farina, Mike Hawthorn, Luigi Villoresi, Piero Taruffi



WORDS STUART CODLING PICTURES JAMES MANN

Shrinking grids. Teams collapsing under financial pressure. Manufacturers withdrawing. Promoters taking flight. Races cancelled. Dispute over the technical format. This is not the history of F1 from 2008 on, but the scene in the late months of 1951 and early 1952 as the new world championship briefly teetered on the edge of extinction.

The great battle for supremacy between Alfa Romeo and Ferrari during the first two seasons of the championship had masked a basic structural flaw: most of the available F1 cars were makeweights based on pre-war technology. The dominant Alfa Romeos were 13 years old – and then, when impoverished Alfa had to withdraw, only Ferrari and the dregs were left. Non-championship grands prix in early 1952 struggled to attract more than a handful of cars because it was obvious nobody could compete with Ferrari. It was a disaster.

New rules were due in 1954, but there were no cars yet built to these specifications. So the governing body decreed that F1 cars would no longer be welcome in world championship races; Formula 2 cars were to be invited instead. Enzo Ferrari was delighted: he already had just the car for the job. Designed by Aurelio Lampredi and based on the successful 375 F1 car, the 500 was out of the blocks and winning its first F2 races before the 1951 season was over. The architecture was simple: a ladder-frame chassis with a sweet and simple four-cylinder, twin-cam, twin-spark, two-litre engine up front, and the gearbox located behind the driver to improve balance.

The first championship race of 1952, the Swiss Grand Prix at Bremgarten, attracted 23 entries including a young Stirling Moss in an HWM. In medical parlance, F1's condition was critical but stable. The 1950 world champion Giuseppe Farina put his 500 on pole, and team-mate Piero Taruffi won after Farina retired. But it was Alberto Ascari (absent here because he was trying to qualify for the Indy 500) who won every other race that year, driving the car pictured here, number 5, and taking a further three consecutive wins in 1953. At Reims, Mike Hawthorn interrupted that winning streak – also driving a 500 – before Ascari returned to the top step of the podium at Silverstone and Bremgarten, while Farina won at the Nürburgring.

Ascari's six consecutive victories on his way to the 1952 drivers' title established a record that would stand for decades. And it was with a win, breaking form (and team orders), that he wrapped up the 1953 championship, overtaking team-mates Farina and Hawthorn in Switzerland when he was expected to hold station.

Ascari might have won the last race of the year, too, in front of his home crowd at Monza, but he went spinning off at the Parabolica on the last lap while duelling with Farina. He would never win another world championship race; a move to Lancia for a better salary left him on the sidelines for much of 1954 because the car wasn't ready, and the following year, while testing a Ferrari sportscar, he was killed in a crash at the Monza corner that now bears his name. **F1**





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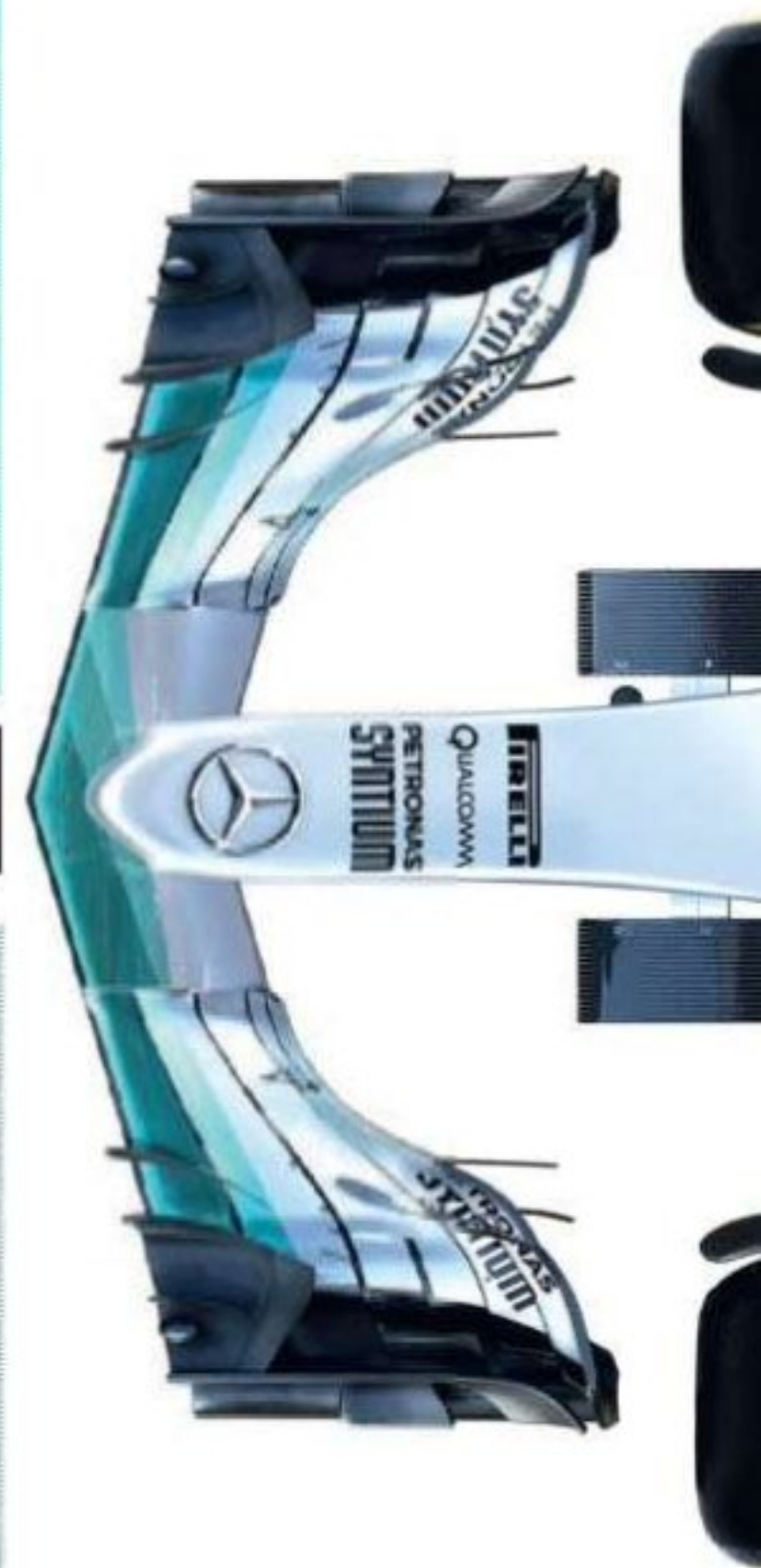
CITROËN prefers TOTAL Model shown: C4 Cactus PureTech 82 manual Flair. OTR price £16,490 (incl. Polar White paint and Chocolate Airbump® at extra cost of £250 and £150 respectively).

Official Government Fuel Consumption Figures (litres per 100km/mpg) and CO₂ Emissions (g/km) (Range). Highest: Citroën C4 Cactus PureTech 110 S&S manual: Urban 5.8/48.7, Extra Urban 4.0/70.6, Combined 4.7/60.1, 107 CO₂. Lowest: Citroën C4 Cactus BlueHDi 100 S&S manual with 15 inch wheels: Urban 3.5/80.7, Extra Urban 3.0/94.2, Combined 3.1/91.1, 82 CO₂. MPG figures are achieved under official EU test conditions, intended as a guide for comparative purposes only, and may not reflect actual on-the-road driving conditions.

20

FORMULA 1'S LICENCE TO THRILL

17



GET SET FOR THE FASTEST F1 MACHINERY IN YEARS,
AS THE SPORT OVERHAULS ITS 2017 REGULATIONS

INVESTIGATION JAMES ROBERTS IMAGINED BY MARCO VAN OVERBEEKE*

It's all Max Verstappen's fault: the way that spindly-but-brilliant rookie, 17 on his debut, has made F1 look so easy. Is it right that *anyone* so young is able to perform with such aplomb at motorsport's highest level? Since the start of 2014, digital-age F1, with quieter, hybrid powerplants, may well have required both manual and mental dexterity, but does it

demand enough resolve? Are the cars spectacular enough? Do they ask drivers to venture far enough into the unknown? Do they *thrill*? Are they breathtaking, or are they merely magnificent monuments to engineering excellence that have forgotten their mission to entertain in what is still, yes, a sport?

Where now can a modern race fan experience, for example, the

scary edge of Keke Rosberg's 1985 British Grand Prix pole lap – the very first to crack the 160mph lap average? Or the drama of Nelson Piquet going *sideways* around the outside of Ayrton Senna into Turn 1 at the Hungarian Grand Prix one year later?

Amid such concerns that Formula 1 has lost something of its essence as the original

extreme sport, there has also been mounting disquiet that since one engine manufacturer, Mercedes, nailed the hybrid engine regulations far better than any other, they have achieved a position of dominance that is detrimental to the sport's overall health.

In the context of these related anxieties, the F1 Strategy Group last year decided a change in →

*PICTURES ARE ARTIST'S IMPRESSIONS FOR ILLUSTRATIVE PURPOSES ONLY. THEY ARE NOT ENDORSED BY MERCEDES

was needed to help recapture some of the lost magic. Antipathy towards the existing regulation package has come from the top: Bernie Ecclestone has long been one of the sternest critics of Formula 1's hybrid PUs, citing their expense and related 'token upgrade' system as being at the heart of F1's alleged lack of drama.

"So we decided we wanted to make the cars look better, make them five to six seconds a

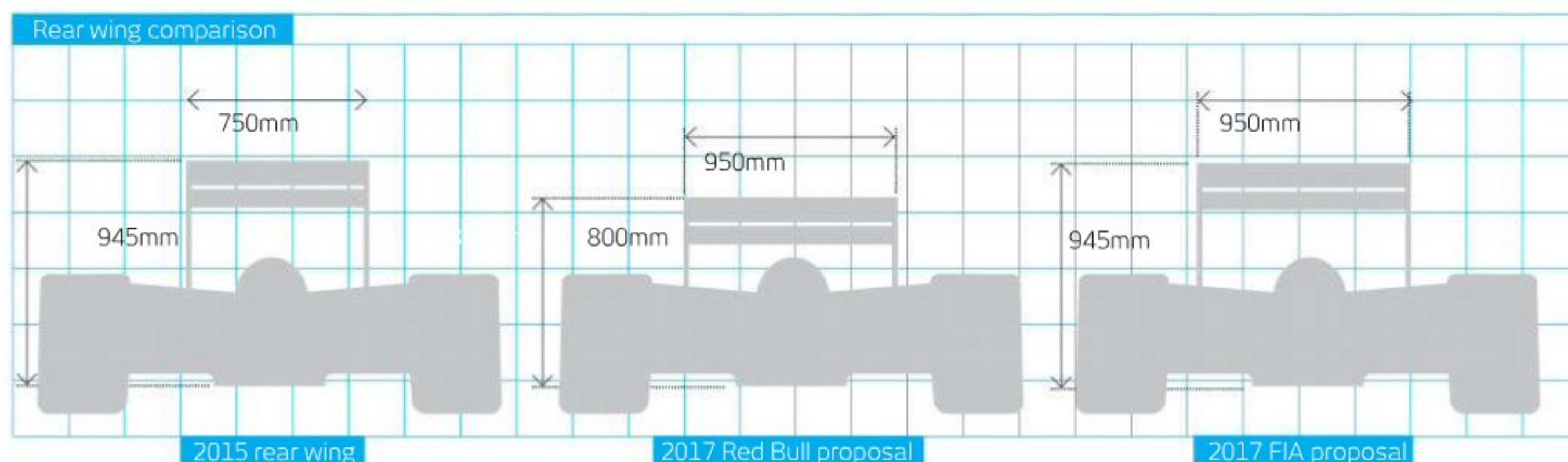
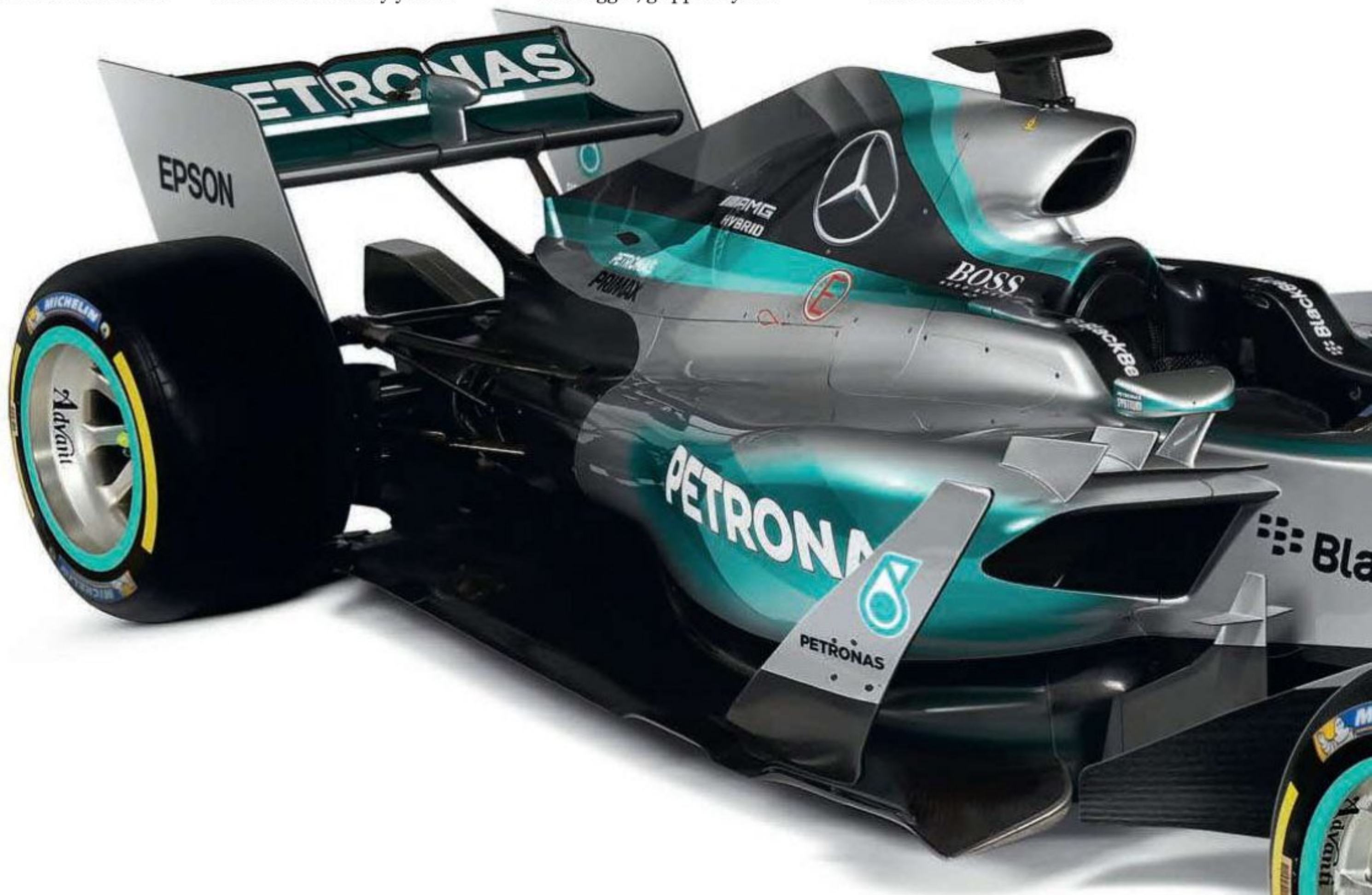
lap faster and make them more physical to drive," says Charlie Whiting, F1's 1 race director.

And thrillingly, if somewhat more expensively, the engine development restrictions in place since 2014 will be loosened from next year to let all manufacturers make in-season performance upgrades.

Fans of hard racing rejoice: these are by far the most exciting developments in Formula 1 for many years.

After two decades of speed cuts, the governing body has now decreed that the current crop of F1 cars are in need of a 'hurry up'. Hybrid PUs will be retained, but there's now the mouthwatering prospect of a nascent 'power war' between Mercedes, Ferrari, Honda and Renault, plus, potentially, independent suppliers, aided by lighter cars, increased downforce, different bodywork and bigger, grippier tyres.

FIA-ratified discussions during Technical Regulation Meetings (TRMs) to finalise the 2017 package were ongoing as *F1 Racing* closed for press, but they can't carry on forever: the final 2017 regulations must be published by 28 February 2016. And, dear reader, we've been able to gain exclusive insights into these discussions to present to you some of the alternative visions for a future, faster Formula 1.



2017

FORMULA 1'S LICENCE TO THRILL

THE RED BULL PROPOSAL

Red Bull team principal Christian Horner told *F1 Racing* earlier this year that Formula 1 should be as follows: "The cars need to be hard to drive and the drivers need to be heroes. The sport should be competitive and the cars should look aggressive. They should be loud and fast. If we get that right, Formula 1 will thrive."

There is, unusually, a broad consensus among the teams on how to achieve a common set of goals for 2017: they all agree that the cars need to look more aggressive and that they need to be five to six seconds a lap faster. As ever though, the devil is in the detail when trying to find the best technical solution to achieve these ends.

"The brief from the F1 Strategy Group was that this was to be evolutionary change rather than revolutionary, because in the early days we were looking at some quite futuristic ideas," says Williams's chief technical officer, Pat Symonds.

"I was worried at the start of the discussions that there was a move to go very retro because people had said how great the cars looked in the 1980s and 1990s. Yes, we should have some of the elements of the older cars – for example, wider tyres – but it shouldn't be too futuristic either. There needs to be a balance."

Red Bull, Ferrari and McLaren provided ideas, and the FIA brought in McLaren's former head →

"The cars need to be hard to drive and the drivers need to be heroes"

Christian Horner



of aerodynamics, Marcin Budkowski, as technical coordinator to chair discussions.

After a meeting on 18 August, the teams were presented with two ideas, one known as the 'Red Bull proposal' and another the 'FIA proposal'. They were given a CFD amnesty to run simulations, with a view to presenting their findings at another TRM on 2 October.

Ideas from the 'Red Bull proposal' are illustrated across these pages. The car's width increases from its current 1,800mm to 2,000mm. A lower, wider rear wing comes down in height from the current 945mm to 800mm; its width increases from 750mm to 950mm; and it angles away from the rear wheel's centreline at 30°. The front wing increases from its current

1,650mm to 1,850mm and is arrow-shaped, with a 12.2° difference between the end tip of the front wing and the leading edge on each side.

There is also extra sculpting to the sidepods and barge boards behind the front wheels. A beam wing is added to the rear wing and the diffuser is similar to those used in 2010. There are also changes to the floor to increase aero performance. Weight savings come from changes to the plank and T-tray beneath the cars.

Our illustrations also show how an F1 car might look with 18-inch wheels. Michelin met with teams in September to discuss proposals for 2017 that would have included an increase in wheel size. The teams rejected an increase from the current 13-inch size, on cost grounds.

2017

FORMULA 1'S LICENCE TO THRILL

THE FIA PROPOSAL

"We're trying to get most of the speed through tyre grip and not rely too much on downforce"

Charlie Whiting



The alternative was the 'FIA proposal', which has a similar philosophy in terms of the cars' width, the increased downforce from the floor and the bigger contact patch for the tyres.

"We're trying to get most of the speed through tyre grip and not rely too much on downforce," says Charlie Whiting. "By increasing the width of the cars, even with the existing tyres, you could gain a second. An extra contact patch would make us confident that we'd find at least half of the five or six seconds with the extra tyre grip."

The differences in this proposal were primarily in the rear and front wings. At the rear, the current height of 945mm would remain, but the width would increase. At the front, a narrower, simpler front wing was suggested, with three

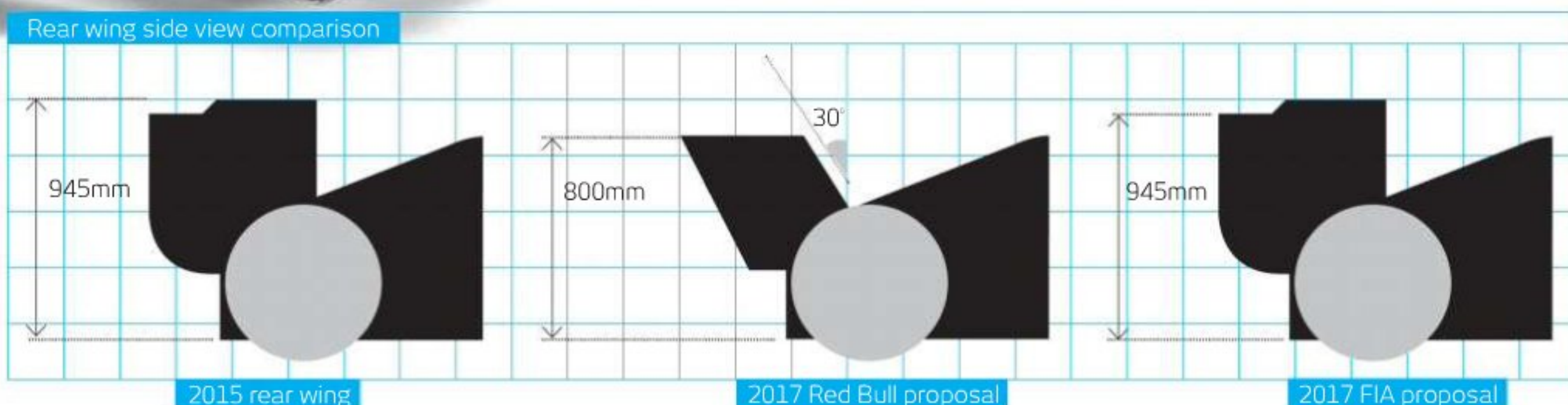
lower elements and one upper element and each edge would stop at the centre line of the front tyres. It, too, would feature an arrowhead shape.

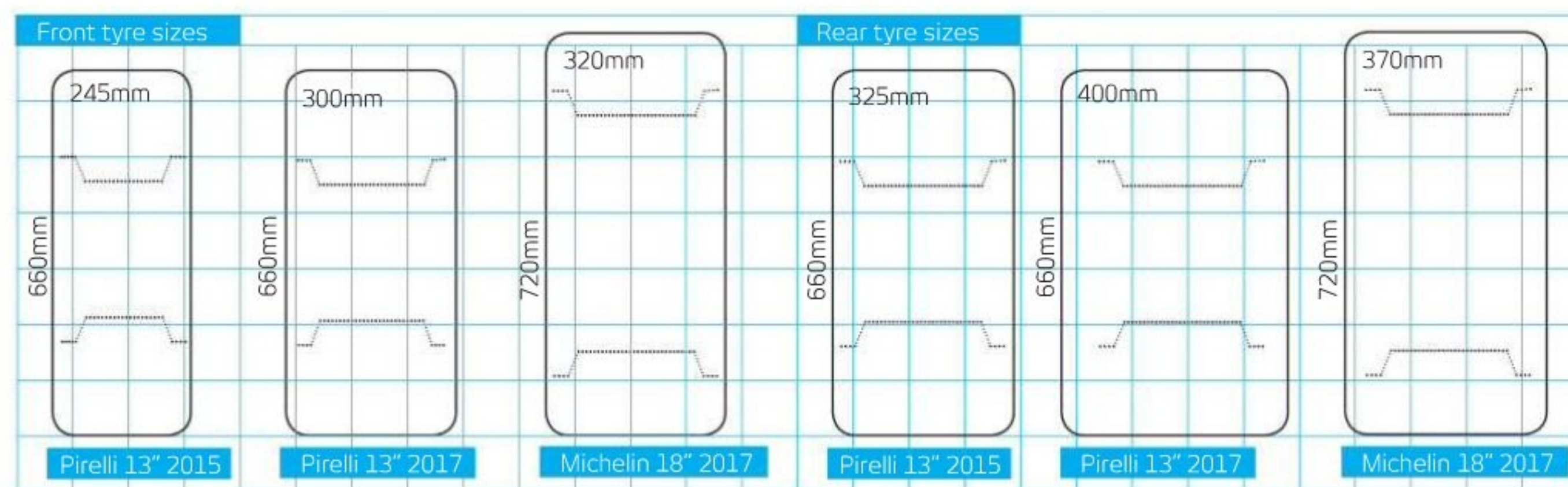
The idea behind the narrower front wing was to alter the direction of airflow over the car to create an in-wash, rather than the vortices of a larger front wing that create an out-wash around the front tyres, complexities that better-funded teams with state-of-the-art windtunnels and CFD facilities have been able to solve.

"Current F1 cars are front-wing dependent; you see how another car washes out when it is close to a car in front," says Force India deputy team principal Bob Fernley. "We should simplify the front wing, make it cost-effective and work to get more ground effect from the floor. If we

want six seconds of performance, do we need to get it all from the chassis? The engines, even this year, have pulled another second or so in lap time, so there's no reason why they won't improve again. If we have wider tyres, there is another two seconds there. Plus, if you have a chassis that is three seconds quicker in 2017, that'll be four seconds in 2018 and it won't be long before we're slowing the cars down again."

When the teams met to share findings on the two ideas, they found the 'Red Bull proposal' had better balance and was more aerodynamically stable. They also found Pirelli's plan to increase front-tyre width to 325mm and the rears to 425mm created too much drag, so suggested instead 300mm and 400mm respectively. →





TYRES

The FIA opened the tender process for 2017 tyre supply in May. By July, it decided that two candidates demonstrated the right technical and safety credentials: Pirelli and Michelin. The latter stated that if they were to supply the sport, it would be with tyres to fit 18-inch wheels, rather than the current 13-inch wheels.

From their simulations, Michelin predicted that they could find three seconds a lap with

bigger tyres and wheels. Their plan was to increase the rear tyres from 325mm to 370mm in width and from the current 660mm to 720mm in diameter. They argued that the increased contact patch would significantly increase grip and thereby slash lap times.

Despite the dramatic promised benefits of 18-inch wheels and bigger tyres, the idea gained little, ahem, traction with teams, who, in the meantime voiced concerns about the extra

spending on brakes and suspension components that bigger wheels would necessitate.

At the Russian Grand Prix, Bernie Ecclestone had a meeting with Pirelli chairman Marco Tronchetti Provera and agreed a commercial deal for Pirelli to continue supplying F1 with tyres throughout 2017-19. The final decision on tyre supply will be made by the FIA at their World Motor Sport Council meeting in December. (For more on this story, see 'F1 Insider', [p19](#)) →



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One of the original suggestions to save weight and therefore increase speeds for 2017 was the reintroduction of refuelling, something that has the support of the fans, as we revealed in August's *F1 Racing* Global Fan Survey.

But while refuelling would improve cars' performance, the worry is that it could reduce on-track overtaking, as teams and drivers would wait until the pitstops to attempt to undercut rivals. There were also concerns about costs. Consequently, refuelling was swiftly rejected.

Increasing cornering speeds by upping downforce is known to cause 'dirty air' and impedes the ability of one car to closely follow

The increased cornering speeds proposed due to the new aero loads would result in Pirelli producing a tyre that was structurally different. Pirelli motorsport director Paul Hembery told *F1 Racing* at the Russian Grand Prix in October that the company would need 30,000km of testing to enable them to prepare the design changes to the rubber for 2017, otherwise "we wouldn't be able to supply the sport".

He added: "There are plenty of question marks over the practicalities. Can you test on the current car, or will we have to use a modified car? Plus the solutions to testing are complex because the rules haven't been agreed yet. The dimensions of the tyre will be set by the aero loads, but we don't know what they are yet, so we can't determine the size of the tyre."

Next season, Pirelli will produce an extra, softer 'supersoft' compound, bringing the total number of compounds up to five. At each race, Pirelli will nominate a prime tyre, which teams must use, but each team will be able to select their own option from a choice of two: one will be a step softer than the prime, and the other one step harder. Hembery says this idea will roll over into 2017 if there is support for it, but adds that the goal is to achieve "three-stop races".

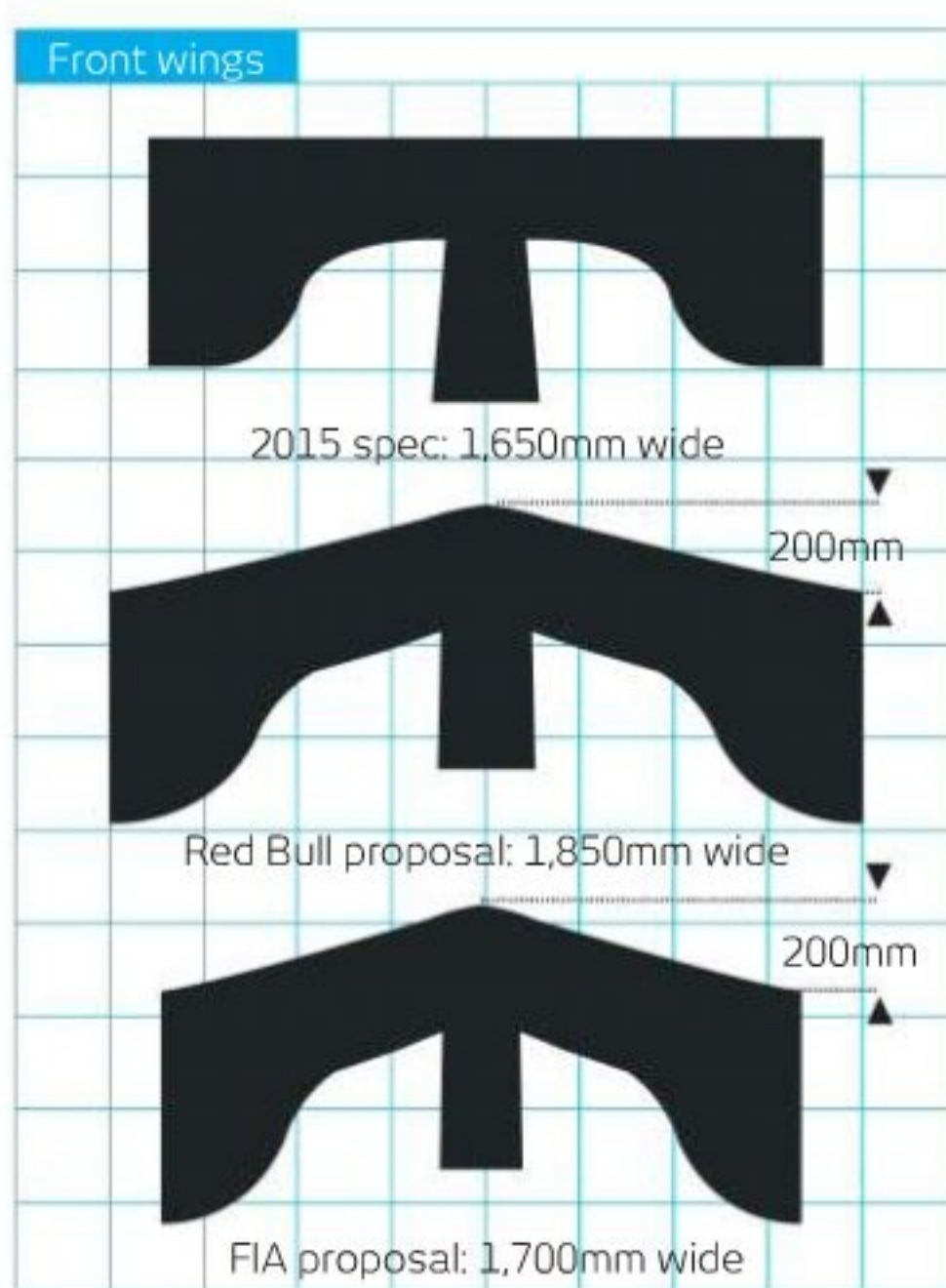
another. So the sport's technical brains have been working on a solution to these problems.

"One of our briefs to the aerodynamicists in the TRM is that we must not make overtaking more difficult," says Charlie Whiting. "So the wake of the car shouldn't be any more disturbing to the car behind than it already is."

But unless downforce is slashed, it will always be difficult for one car to follow another. That's why more emphasis on increasing speed with the floor and diffuser is being looked at. But if F1 does find overtaking a problem in 2017, it can always increase the length of the Drag Reduction System (DRS) zones on the straights.

The most obvious benefit of the proposed changes is that drivers will most likely revel in driving these new machines, which will be more satisfying to drive on the limit than the current knife-edge, torque-laden, skittish, tyre-deg-limited cars in which they campaign today.

"I'm glad people have realised that things need to change and that they're going to change them," says Jenson Button, who is hopeful he can delay his retirement long enough to enjoy racing what are set to be the boldest F1 cars seen since the end of the 3-litre V10 era in 2005. →



Driving Tomorrow



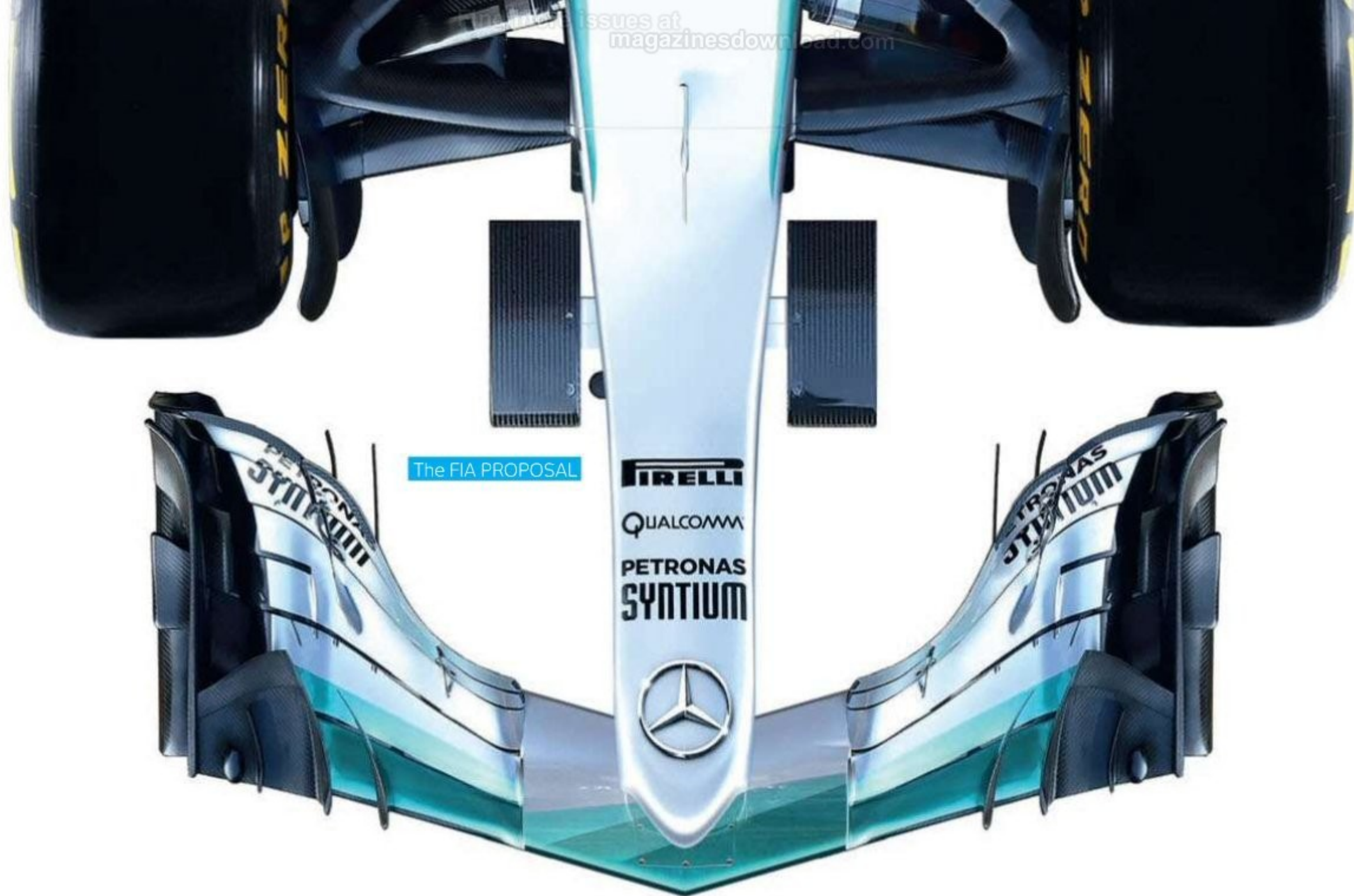
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The FIA PROPOSAL

"It looks as though 2017 is going to be great, and it will probably be the most exciting year for Formula 1 in a long time. Whether you go through a corner as quick as the other guys will be down to how big your balls are and what risks you're willing to take. Currently you turn in and it just falls over and waggles its tail all the way through the corner because there is not a lot of mechanical grip."

CONCLUSION

The general consensus is that F1 must be the pinnacle of motor racing and that there ought to be greater separation in lap time between F1 and its designated feeder category, GP2. But with any significant rule change, it's usual for the better-resourced teams to find a competitive advantage early on. That can lead to a period of dominance on the track (think of Jenson Button's six wins in the first seven races of 2009), but the longer those rules remain in place, the more chance the rest of the grid has to catch up.

"I think the FIA will probably delay the absolute definition of the new regulations until the end of February next year so they can manage the fairness between the haves and the have-nots on the grid," says McLaren's chief operating officer Jonathan Neale. "If they release

them too early, the big teams will shift resources and take an immediate advantage."

The current machines, with their narrow bodies, skinny tyres and tall rear wings look sophisticated, but not aggressive, and it's right to change them. Drivers will relish the increased speed, and will be properly challenged, as these cars should be much harder to drive. We quizzed Max Verstappen, the catalyst for the new regulations, on the effects this potentially seismic shift will have on the sport.

"I don't think it will change anything," he said, with characteristic confidence. "Actually, for 2017, it will make it easier. When you have more downforce on the car, it will be easier to control. Now we have a heavy car with low downforce, it's tricky – it's always moving around: the more downforce we get, the easier it will be for us."

Drivers will have to work on their physiques for 2017, building up core muscles and strength, to be able to cope with the additional G-loadings of cars that are much quicker in fast corners.

"Physically, won't it be much harder for you?" we asked Verstappen.


"You can train. That's no problem."

Finding a way to increase overtaking opportunities is something that is yet to be

resolved by the new rules, but it could be addressed by lengthening DRS zones, or designing a tyre that loses grip. Some radical sporting ideas have also been put on the table, with the aim of shaking up the established order. One such is a cycle-racing-inspired 'devil take the hindmost' approach to qualifying: every driver would leave the pits at the start of the session, and, after ten minutes, the slowest gets knocked out. Then every three minutes the slowest remaining driver is knocked out until, with just five minutes of the session remaining, there's a shootout for pole position.

"If everyone agrees to it, why not?" said one high-level source. "Actually, we can change whatever we want to. There are so many people who say 'this is the way we've always done it' – they're not prepared to think differently.

Formula 1 *can* be better. Let's change it, so it is."

So strap yourselves in. The future of grand prix racing is looking *faster!* 

"For 2017, it will be easier:
the more downforce,
the easier it will be"

Max Verstappen



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YOU ASK THE QUESTIONS

Valtteri Bottas

What he lacks in loquaciousness he makes up for in speed – but despite your best efforts, he's resolutely tight-lipped about a future with Ferrari

WORDS JAMES ROBERTS PHOTOS GLENN DUNBAR/LAT

Like so many Finnish racing drivers, Valtteri Bottas is a man of decidedly few words. He scans the deck of cards, upon which are inscribed the questions that you, the readers of *F1 Racing*, have sent in for him to answer. His look suggests he's wondering how quickly he can rattle through them. Unlike his team-mate Felipe Massa, who can quickly become very animated when talking about a subject, Valtteri remains cool, clipped and to the point at all times.

Williams' Valtteri Bottas works his way through the stack of *F1 Racing* readers' question cards

We've met up with Valtteri outside the Williams hospitality unit in the Russian Grand Prix paddock, on a day bathed in warm sunshine.

At one point this summer, the F1 rumour mill had Bottas *definitely* moving to Ferrari for 2016, replacing compatriot Kimi Räikkönen. But when Kimi was confirmed for one more year in red, Williams swiftly announced that Bottas, too, would be staying put, for a fourth season. For a country with a population of only 5.4 million, it's quite a feat to have placed two of its sons with top F1 teams. Which is something Valtteri tackles head-on as he picks up the first question card...

Finland produces F1 world champions and other very successful drivers, despite its small population. Any ideas why?

Jan Krywawicz, UK

That's the one everyone asks and it's very tricky for me to answer. I think our mentality is a little bit different from some other countries, as we are kind of lonely. What I mean is that we don't mind being alone and we do things as we see best and I think that helps in racing. Plus, the competition in karting in Finland is at a very high level. I remember racing when I was six or seven and there were a lot of very good drivers. Back then, if you wanted to win you really needed to work hard at it.

If you could listen to only one music album for the rest of your life, which one would you choose and why?

Gergely Jaksa, Hungary

It would have to be The Offspring album, *Americana*, because I've been listening to that since I was a kid and, as time has gone on, it's always come back onto my playlist. So that's an easy choice really. →





In a drinking contest between you and Kimi Räikkönen, who would win?

Jan Andersson, Sweden

We've never tried, so I don't know.

FIR: That could be a long day...

VB: I think so.

Has Felipe Massa's speed, will and determination surprised you?

David Zeman, USA

No, because I always knew he was a good driver and he was very close to being world champion. I think that now he is very comfortable within this team. So I always knew he would be a tough team-mate to beat.

Have you ever tried a smoke sauna? Do you like it?

Marek Sawczuk, Poland

Of course I've tried it. When I'm in Finland, I'm in the sauna every day. A smoke sauna is much more traditional and it's something that people could make by themselves much more easily. The only negative is that the whole inside of the sauna goes completely black because it's full of smoke, but it's pretty cool.

Who would you rather have a pint with, Keke or Nico Rosberg?

Stephen Cull, UK

Maybe Keke, because he speaks Finnish.

Is there anything that you have always wanted to ask Bernie Ecclestone?

Carina Grusevska, Latvia

It would be nice to know how much is in his bank account. The exact figure – now that would be very interesting.

Can you describe Frank Williams and Claire Williams in three words each?

Zacharie Duval, France

That one is too difficult [Valtteri tries to replace the card at the bottom of the pile, before he's told he needs to answer *all* the questions]. Well, Frank Williams... he's a racer, a legend and a good guy. He's a very nice guy. And Claire Williams? She is very determined to do well for the team, she's a good leader and... [long pause] she's a woman.

What is the proudest moment of your entire racing career so far?

Jake Nichol, UK

The proudest moment? I don't really know. There have been so very many important moments. Even just getting a simple result in a junior category might mean that someone in Formula 1 will notice you, and this can be crucial to how you proceed with your career. So this is quite a difficult one to answer. Maybe my first Formula 1 podium [at the 2014 Austrian Grand Prix] will be something that I will never forget?

XBox and Forza Motorsport, or PlayStation and Gran Turismo? And which track would you like to race on?

Carl Bunn, UK

I've never had an Xbox so it's going to have to be PlayStation and *Gran Turismo*. It's a good game. And my favourite track to race on? That has to be Deep Forest Raceway. It had undulations, quick corners... it was a great circuit.

What do Williams have to do to become a winning team again?

John Rayho, USA

Well, we still need to eliminate a lot of mistakes in all kinds of areas, including strategy and pitstops. And we need to produce a quicker car with more grip. That's what we need to do. But we are flat-out working on it and getting better all the time. And hopefully we can be good enough to start winning again next year.

Who is the better athlete: you or your girlfriend [Olympic swimmer Emilia Pikkarainen]?

Robbie Lindberg, Finland

Well it depends how you measure an athlete, whether you do it by running, by cycling or by swimming? I would say she stretches herself more to the limit than I do, as swimming is a sport that is purely physical. F1 is physical, but there's a mental aspect too.



F1R: How often does she swim?

VB: Once or twice a day and between one and three hours each time. It is a lot of training, plus there's the time she spends training in the gym as well. So given the hours involved, I have a lot of respect for swimmers.

If money were no object, which classic car would you buy?

Neil Woodward, UK

I've never really been into classic cars, to be honest. I've not really had much interest in them. But if I had to choose one, maybe some old rally car, like a Lancia Delta Integrale – something like that. That would be cool. But in reality I'm more interested in modern cars – something like a Bugatti Veyron would be good.

Would driving for Ferrari be a dream come true?

Graham Prior, New Zealand

I'm not going to answer that one.

I've visited the Williams Collection at Grove many times as, I'm sure, have you. But which historical Williams car would you most like to race and why?

Paul Havell, UK

I remember so well the race of Jacques Villeneuve in 1997 when he won the championship in Jerez. You can see Michael Schumacher's tyre marks on that car in the museum today – so it would have to be that one. I've driven Damon Hill's car from 1996 and Keke Rosberg's car from 1982, but I've never driven the 1997 F1 car.

F1 drivers must have a strict diet, how often do you get to eat what you fancy?

Adam Morilla, UK

Not very often. Maybe on a Sunday night after a grand prix. If you've had a good race then maybe you feel you've earned it and you can have pretty much whatever you want to eat. Depending on the race distance and temperature, I think we burn between 1,000 and 2,000 calories during a grand prix.

Do you follow Lewis Hamilton on Twitter? What do you make of his lifestyle?

Toby Ross-Bryant, UK

No, I don't follow him on Twitter, and everyone is different and if that is exactly what he thinks is best for him then that is fine. His lifestyle is very different to mine, for sure, because I don't mind going back to Finland and my lake house to enjoy the peace of nature. Someone else might prefer to be at a fashion show instead – people are all different.



"In Finland, our mentality is a little bit different. We don't mind being alone and we do things as we see best and I think that helps in racing"

How good a manager is Mika Häkkinen?

Ondrej Sembera, Czech Republic

Yes, he's very good. It's Ondrej who asked this question, right? Ondrej, think about a person who you would like to have advising you from the sport of F1. There aren't many better people to choose from than Mika Häkkinen.

Do you follow any other type of motorsport?

Philip Gould, UK

Not very closely. When I'm not at a grand prix weekend I don't watch TV much. Of course I follow some results in rallying or MotoGP or some of the junior formulae, but not too closely. It's sometimes good to disconnect yourself from racing, so that you are fresh for the next GP.

Describe your perfect Sunday? A bit of clay pigeon shooting and a roast dinner, perhaps?

Dan Shaw, UK

A perfect Sunday for me is racing in a grand prix and getting a good result. Winning on Sunday, now that would be perfect...


F1R: How about a week when there isn't a Formula 1 race – you know, a weekend off?

VB: Then, yeah, this is not far off... [laughs]

A bit of shooting, a swim in the lake in the afternoon... that would be a very nice Sunday away from the track.

Why weren't you a member of the GPDA when you first entered F1?

John Saunders, UK

Actually, I'm still not a member. I never have been. There's a reason I don't want to say. 

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Parked outside a Suzuka hotel in the build-up to the Japanese GP is a CB1300 Honda motorbike. Painted in Honda's red and white corporate colours, this powerful four-cylinder machine, capable of 0-62mph in 3.3 seconds with a top-speed of 143mph has had just one careful owner: Mr Yasuhisa Arai, Honda's motorsport boss, and the man charged with overseeing their beleaguered F1 engine programme.

Honda re-entered F1 in 2015, and have so far been unable to match the pace of their three rival power-unit manufacturers, resulting in much public frustration with the performance of the McLaren-Honda team this year.

At Monza in early September, during McLaren's 'Meet The Team' press conference on Saturday afternoon, Arai became the focus of attack, and was asked whether he would resign and if he was going to apologise to McLaren-Honda drivers, Fernando Alonso and Jenson Button, for wasting a year of their careers.

But Arai has a key ally at the Honda Motor Company and was given the public seal of approval on Suzuka Sunday when president and CEO of the firm, Takahiro Hachigo, came to the racetrack. The pair have kept in close contact throughout their long careers at Honda.

A love of bikes inspired Arai to join Honda in 1981, aged 24. Having studied physics at university, his first job with the company was in road-car development, and by the end of the decade he was working on the control system design of engines. But he was always interested in racing and, following a stint in the US where he worked on emission control, he joined Honda's IndyCar programme in the mid-1990s, when the firm won six straight titles.

"I was always interested in engineering and mainly motorcycles," says Arai. "I used to watch motorbike racing when I was little and also Formula 1. I went to Fuji in the late 1970s and saw the Tyrrell six-wheeler. I thought it was a very strange car and was wowed by the technology. It was one of the things that inspired me to move into engineering."

After returning to Japan, Arai became involved in Honda's robotics programme and oversaw the third-generation ASIMO robot, the talking, walking, step-climbing robot that can recognise faces and talk to people.

"In the beginning it was a dream based on Manga, cartoon animé, where we wanted to create a small humanoid robot," says Arai. "When we started we didn't have the technology, but we pushed very hard to achieve that dream. After 20 years of research we finally made ASIMO and now he is ten years old. But he's still the same size he always was – he's not growing."

ENGINEERING HONDA'S RECOVERY

Honda's return to F1 this year hasn't yet brought the anticipated glory, but motorsport chief **Yasuhisa Arai** is determined to turn things around

WORDS JAMES ROBERTS
PORTRAIT STEVEN TEE/LAT

CV Yasuhisa Arai

Born 19 February 1957 in Saitama, Japan

2013 Chief officer of Honda Motorsports

2010 Chief officer of environmental and technical strategy at Honda

2008 Director of fundamental technology research centre, with work including ASIMO Honda Robotics

2004 Vice-president at Honda R&D Americas

2000 Managed engine development, Tochigi

1997 Managed research at Honda R&D, Wako

1981 Joined Honda R&D. Involved in the first-generation CR-X engine, led the research on engine management systems and exhaust emission regulations in the US

Watch videos of ASIMO online and he looks so simple, but he is so clearly the result of years of painstaking work. For example, pouring a drink into a cup constantly changes the weight of that cup, so ASIMO's fingers must be tuned so they don't crush the cup or let it slip out of his hands. "Yes, something we take for granted every day is very difficult to achieve," notes Arai.


Research and development of ASIMO took place behind closed doors, but the development of Honda's F1 engine project takes place in a very public arena – broadcast to millions globally every fortnight. In F1 there's little patience, and frustration can quickly boil over. Fernando Alonso was very critical of the Honda power unit, at Honda-owned Suzuka, likening it to a "GP2 engine" and describing the performance as "embarrassing, very embarrassing."

When asked about his public grilling in front of the press at Monza over the Honda power unit's lack of performance, Arai laughs and puts both hands around his throat, to imitate being throttled. He then likens the Honda project to the Whac-A-Mole arcade game, where rodents emerge from different holes and you have to bash them with a hammer.

"Technically there have been problems, like in that game, where one problem in one part is solved and then another appears somewhere else," he says, now serious in tone. "This year's biggest problem has been heat rejection. So packaging the car is very important. We're looking for size zero. The PU is a very tiny package, but the more compact it is the better. We've been fighting heat rejection and now the next problem popping up is MGU-H deployment. We don't have enough electrical energy for the tough circuits, such as Spa or Monza. So that's one of our targets for next year."

Communication has also been identified as an area to strengthen, and since Monza, McLaren's racing director Eric Boullier has sought to improve relations between Woking and Japan.

"With the engineers working on the car in the garage, the relationship is very close, like a family," says Arai. "Always there has been good conversation. I talk with Eric every day and we have good discussions about the current race and the future and we have no problem. With Ron Dennis, there is not so much conversation. I understand he is under big pressure from the outside and maybe the shareholders are nervous. Unfortunately he is very busy, so it's difficult to make a long conversation with him."

ASIMO can recognize the faces of people the robot has met in the past. The crucial question now is whether Ron Dennis will recognise the face of Yasuhisa Arai in the years to come... 

LIKE FATHER,



PHOTO: BATH CENTRAL LIBRARY COLLECTION



LIKE SON

Jenson Button is known as F1's smoothest driver. But given the chance to pay tribute to his family's history in a 600bhp rallycross Beetle, he took things a bit more... sideways

WORDS
ROBERT HOLMES
PICTURES
STEVEN TEE/LAT

The scene is one of Stygian murk: gloomy skies, lashing rain, mud. But no matter, for the Kent countryside is cheered by the rorty rumble of a hopped-up flat-four engine, and the gale brings a tinge of hyperactive hydrocarbons. Today Jenson Button's personal and professional lives come full circle in more ways than one.

Not only is Jenson sliding behind the wheel of a monster Volkswagen Beetle rallycross car similar to the one in which his father campaigned during the 1970s, but

we also find ourselves at the Lydden Hill rallycross circuit in Kent, a frequent John Button stamping ground back in the day, later bought by Jenson's McLaren team with a view to developing it into their equivalent of Ferrari's Fiorano test track. This being South East England, the local burghers swiftly dispatched that notion into the long grass, and Lydden, which staged the world's first rallycross event in 1967, retained its status as Britain's home of chaotic multi-surface motorsport. →



"I was very young, so I remember going to Brands Hatch and some other places but I don't remember being at Lydden," says Jenson. "It's been fun making these connections with the past. There's a video on YouTube with Murray Walker commentating on a race from Lydden Hill. My dad tips Paul Springett's Mini into a roll and Murray shouts: 'END over END over END!' They're nice memories to have of the old boy racing."

Jenson isn't the only Formula 1 driver with rallycross roots; former Benetton and Williams racer Alex Wurz, now chairman of the GPDA, grew up watching his father campaign in a Beetle, too, although that one bore scant resemblance to Wolfsburg's finest under the skin. "Super-cool!" Wurz chortles to *F1 Racing* when he hears about today's mission. "My dad's car weighed about 400kg and was mostly plastic..."

The Beetle here is raced by owner James Harrold in the Retro Rallycross Challenge, and it too has been finessed some way beyond Dr Porsche's original design specifications. Harrold's Uncle Peter converted the 1974 1303S model into a racer in the 1980s, running it in four-wheel drive for several years before reverting to two.

"Back then, my old man's Beetle had about 200bhp," says Jenson. "That's all they had in the day. It was normally aspirated. This one has been souped up a bit since then. It's the vee-dub engine with Subaru heads and a turbo. That thing at the back? It's not a wing, it's a radiator. Everything is right at the back in terms of weight. Getting it sideways is easy – it's getting it back that's difficult!"

To illustrate, Jenson scurries out into the rain and jumps into the car. He's joined by the BBC's David Coulthard in the passenger seat, apprehension writ large upon his doughty features. Firing up the flat-four engine, Jenson finds a gear – the ponderous 'box is a vintage item, too, to comply with the rules – applies pedal to metal and bangs out the clutch. The Beetle's rear wheels briefly paw at the slippery asphalt before it twangs forwards like a dragster, DC's face at the window pale as Banquo's ghost.

Towards the scene of his father's aforementioned end-over-end misdemeanour Jenson brakes late and pitches in, slithering sideways. He cannot resist the allure of the dirt loop, slewing right onto the mud and gravel, sending up rooster tails of muck, going sideways once more into the bend and almost skimming the inside barrier with the Beetle's nose.

After a handful of laps he pulls in, smiling broadly, while DC excuses himself to seek shelter and, no doubt, a restorative.

"It was mega because it's wet," Jenson enthuses. "This thing – it's got no power, then it's got absolutely loads of it, because although it's got 600bhp it's turbocharged so it all arrives at once. DC was feeling a bit rough after the first lap. Well, neither of us are experts on gravel. So on the dirt I was driving it with my thumb hooked through the steering wheel, completely crossed up. He's going, 'JB you're going to hit the barrier!' But we didn't.

"I got the launch right, probably more by luck than judgement and by Turn 1 I was totally confused – I'd gone through all the gears, I thought: 'I suppose I ought to brake now...'

Jenson Button (with a slightly nervous David Coulthard in the passenger seat) eschews his famously smooth style in favour of a spot of sideways action in a converted Beetle 1303S





John Button competing in rallycross in the 1970s in his striking 'Colorado' Beetle (left); and making his first appearance on the cover of *Autosport* in February 1978 (below)



INSETS: LAT ARCHIVE

"Then you've got this puddle, then gravel, it's a huge culture shock. I think with these cars you brake when you see the barrier rather than because it's the right place to brake. It's proper old-school racing; just power, no electronics, no weight-based performance balancing, and you're allowed to hit one another provided you don't actually spin anyone round.

"It's just amazing. Awful to drive but amazing at the same time. The gearbox is like porridge. To be legal in the Retro Rallycross series it has to be a period item, and it's the same type that was used in the McLaren CanAm cars in the early 1970s. Five speeds and built to take the torque of a big-block V8!"


The McLaren connections just keep on rolling in, though the famously fastidious and dirt-averse Ron Dennis would no doubt view rallycross as an utterly ghastly business. What's been most peculiar, though, has been the sight of a driver rightly held up as a pillar of smoothness, a veritable latter-day Prost, spending so much time sideways.

"It's funny actually," he says, "because back in 2000, when I first came to F1, I went to a circuit up in Norway owned by Harald Huysman, who was part of my management team at the time. He had these BMW-powered school cars. My dad and I went out on the circuit, it was soaking wet, and every time I saw him he was completely sideways. He just could not drive this thing in a straight line. Afterwards I said, 'How the hell do you do that?' He said, 'What do you mean? That's the only way I've driven a racing car in my whole life...'"

It's at this point you realise that Jenson is now one of Formula 1's elder statesmen. For so many years, he formed a characterful paddock double-act with his father, who, sadly, as of January last year, is no longer with us. John's own racing career largely predated Jenson's life and much of that time is preserved not in Jenson's memories but in family recollections, photographs, and scraps of television footage.

"That's right," says Jenson. "I saw him race in the early '80s but that was in the Golf he had. The Beetle was the car he loved. He built it himself – he did autocross in an orange one, then he built a yellow one for rallycross. He was doing really well so VW gave him a Golf, because that was their newest, most modern car, the new greatest thing – and he hated it. It was front-wheel drive, so he completely stripped it and rebuilt it. He made it better, but he still loved the Beetle more."

Racing drivers are so often called upon to perform tricks for the cameras on their days off, either for television or magazines (or, as is the case today, both). But this gravel-strewn rampage has clearly meant more to Jenson than just a dutiful ticking of the publicity box. It's connected him with his past in more ways than one, hence his beaming grin.

"There's a guy here – Rob Gibson – who used to race with my dad. He runs a 6R4 now, but he was in a Porsche when my dad was in a Beetle. Doesn't sound very fair, does it? It was very interesting to meet him. There's some great footage of a Porsche wiping my dad out at the top of the hill. I said to Rob, 'Was that you?' He said, 'I don't think so...'" 



THE GREAT TURKISH TYRE BAKE-OFF

Pirelli's vast Izmit factory mixes old-school industry, cutting-edge technology and a spot of old-fashioned baking to produce state-of-the-art Formula 1 tyres. *F1 Racing* flew over to Turkey to find out how a tyre is born

WORDS

MATT YOUSON

PICTURES

ALASTAIR STALEY/LAT

When the wind blows

in the right direction, an aircraft descending into Sabiha Gökçen Airport presents an

excellent view of the Istanbul Park racing circuit to those seated on the starboard side. To port, looking out over the Sea of Marmara, the city of Izmit is little more than a smudge on the horizon. It's a place that might excite classical scholars, having served briefly as the eastern capital of the Roman Empire, but few others would get a thrill. Except, that is, for hardcore Formula 1 fans. While Turkey no longer hosts a grand prix, it's still in the game: Izmit is where Pirelli make F1 tyres.

For those accustomed to the clean-room vibe of modern F1, Pirelli's factory delivers a dose of old-school heavy metal. Vulcan's workshop is a maze of pipework and conveyor belts, illuminated by grimy skylights. It smells like the world's biggest bicycle shop, mixed with machine oil and a touch of brimstone.

The motorsport line is only slightly different to the adjacent road-tyre production hall: better lit, more space, a more chemical aroma... and rows of chequered flags hanging from the rafters. This facility opened in 2008, initially producing tyres for the World Rally Championship, then moving up through the gears to add Grand-Am, GP3, GP2 and, as of 2011, F1.

Today the plant is producing supersofts. One glides down a conveyor every few minutes, interspersed with enormous slicks destined for GTs and a batch of touring car rain tyres. For which series? The operator shrugs and grins – the universal gesture for 'how should I know/why should I care?' Pirelli supply hundreds of racing series from Izmit – only the barcodes reveal the final destination.

What's striking is how very similar the process is to baking a cake: there's a recipe to follow and ingredients are measured, mixed, layered and then baked. An alarm sounds, they come out of the oven, decoration is added – and they're done. However, the →





1. MAKING THE TYRE COMPOUND

Raw materials, including mica, carbon black, silica, sulphur, oils and resins are weighed and fed into a Banbury mixer, where they are combined, heated and cooled. The finished product is extruded and run off in large sheets to form the various rubber parts of the tyre.



"There's a balance between the desire for change and the desire for stability – and we're being asked more and more for stability. Teams say they don't want multiple tyre suppliers"

PAUL HEMBERY, PIRELLI

number of lab coats in attendance make it more Heston Blumenthal than Mary Berry.

The start of the process is an industrial Banbury mixer. Onto the scales go a witch's brew of polymers and fillers, mica, carbon black, silica, sulphur (that'll be the brimstone...) oils and resins. They're mixed, heated and cooled in a process that repeats many times, further ingredients being added at different stages.

The entire compound run for any given grand prix comes from the same batch to ensure everyone gets exactly the same thing. The finished tyres are shipped to Pirelli's logistics base in England. FIA-supplied barcodes are embedded during manufacturing and, in the UK, Pirelli's computer system randomly groups the barcodes into blocks of four – two rears, two fronts – which will make up a tyre set. This list of blocks is then sent to the FIA.

There's some good-natured stalling when we ask to take pictures: Pirelli are happy to have the machinery and the tyres photographed – but the weights and measures of the raw product are closely guarded secrets. "It's the same reason we don't recycle the tyres after a grand prix," explains R&D director Mauro Soatto. "We incinerate them to produce energy instead – maybe if we didn't they would go to places we don't want them to go..."

The implication is obvious. Despite usually discussing the prospect of a tyre war with studied indifference, Pirelli have always hinted at a level of preparedness should one land in their laps. In the current climate, tyre wars have caught the imagination. Fernando Alonso has suggested

it. Fan groups seem keen. According to Pirelli motorsports director Paul Hembery, however, it's something the teams definitely *don't* want.

"There's a balance between the desire for change and the desire for stability – and we're being asked more and more for stability," he says. "The teams are struggling to master new technologies and they don't want to be throwing in another variable, such as the tyre. They have been unanimous in saying they don't want multiple suppliers. That might change, but, for the moment, they'd like to keep the status quo."

And this is what Pirelli seem to have got: as *F1 Racing* went to press, it was announced that their tenure as F1's sole tyre supplier had been extended to 2019. Even so, winning a war, surely, is the way a tyre manufacturer makes their mark? Hembery isn't convinced:

"History suggests that when you have battles like this, one supplier wins, the other walks away. It happened in MotoGP, it happened in F1. If they're not winning, they leave. So, yeah, we might end up in competition but one of us would probably walk away after a few years. So a tyre war isn't a permanent fixture. It tends only to be a phase – and a short-standing phase at that."

Once Pirelli have mixed the compound, it is then heated and extruded into strips to form the various rubber parts of the tyre. These are combined with a composite bead to form the tyre carcass, to which the tread belt is added. Pirelli briefly experimented with a steel belt before reverting to a synthetic fibre belt after the events of the 2013 British Grand Prix – if fibre sounds less tough than steel, it's worth

considering that the aramid material used is the same stuff that goes into bulletproof vests.

The events of Silverstone 2013, when a spate of punctures nearly led to the race being halted, were blamed on teams pushing too hard with their rubber, running tyres with pressures lower than recommended and swapping tyres from left to right contrary to instruction. Unfortunately for Pirelli, none of this matters in the court of public opinion; tyre manufacturers always get the blame when rubber explodes at 200mph. Nevertheless, PR calamity or not, Soatto believes that in engineering terms, Izmit had a good crisis.

The facility makes a full set of 1,700-plus tyres for a grand prix in three days. Tyres for a European race might be made a month ahead of time; those for a fly-away race considerably earlier so they can be shipped by sea. Back in 2013, with practice for the German Grand Prix due to commence less than five days after the chequered flag at Silverstone, Izmit went into overdrive to retool and manufacture two new runs of slicks, and get them to the Nürburgring.

"We have a young workforce and we needed that energy," says Soatto. "After Silverstone, that youth and enthusiasm was the only way we could have got the job done. We stopped everything else and made F1 tyres for 20 hours a day. It wasn't a case of pushing a button; we had to go back to an older design. But when I arrived from Silverstone on Monday morning, everything was ready to go. Work had started at 5pm on Sunday afternoon. The reaction was fantastic."

After the tyre has been put together, the final main process it undergoes is curing. →



2. FORMING THE TYRES

The rubber strips are combined with a composite bead to form the tyre carcass and a tread belt is then added. Steel tread belts were briefly used in 2013, but they're now made from the same, tough aramid fibre used in bulletproof vests.



Pirelli in numbers...

Number of tyres supplied by Izmit for the 2014 F1 season	38,168 (26,364 slicks, 11,804 rain tyres)
Tyres used during 2014 race weekends (17,844 slicks, 2,184 rain tyres)	20,028
Combined distance covered by compound in 2014 (including tests)	Hard 28,644 miles Medium 75,167 miles Soft 72,525 miles Supersoft 21,389 miles Intermediate 9,749 miles Wet 3,304 miles
2015 F1 tyre allocations per car	Prime 7 sets Option 6 sets Intermediate 4 sets (+1 if Friday is wet) Wet 3 sets

Izmit factory

Factory footprint	130,000m² (of which 17,602m ² is devoted to motorsport)
First tyre manufactured	1962
Number of tyre types produced	675
Annual production capacity	7 million tyres (currently producing 5 million tyres)
Current motorsport production	250,000 tyres (including around 40,000 F1 tyres)



3. BAKING THE TYRES

Up to a dozen curing moulds are used to bake the tyres to around 150°C under high pressure for half an hour, using steam bladders to ensure they're evenly cooked. Logos and markings are added, and then the tyre is good to go.

The dozen curing moulds heat the tyres to around 150°C, using steam bladders designed to ensure they're cooked from the middle as well as the edge. The pressure inside the moulds is somewhere north of 20bar and the tyres bake for approximately 30 minutes. They go in as a rough approximation of an F1 tyre and come out looking like the real thing. After quality inspections, a final stage adds logos and markings and then the tyre is ready to go.


It's quite a feat. The tyres perform a balancing act: tough enough to endure a hammering from an F1 race; sufficiently fragile to make that race interesting. The latter point is a source of some disagreement. Grands prix have become significantly more interesting since Pirelli replaced Bridgestone, but the policy of creating high-wearing tyres tailored to deliver a two-stopper hasn't been universally popular. Several drivers have been vociferous in their opposition, arguing that it goes against F1's DNA to have drivers nursing tyres to make the distance rather than driving a race composed entirely of flat-out laps at qualifying pace.

Even ignoring the hubris of drivers believing F1 exists for their personal entertainment, there is a genuine feeling that, at some point soon, tyres will change. Whether that means more durable tyres or simply the much-mooted size increase is a matter of considerable debate.

"We could do this – we could build a tyre that you could push on for the whole race – but then you go back to the years where there was no overtaking," says Hembery. "As to size, we're quite open to whatever F1 wants, be that 13-inch tyres, 18-inch tyres or something else. The reality is that 95 per cent of our circuit racing tyres are already 18 inches, so if F1 really wants to

differentiate itself, it should probably go to 20 inches. Likewise moving to a wider tyre.

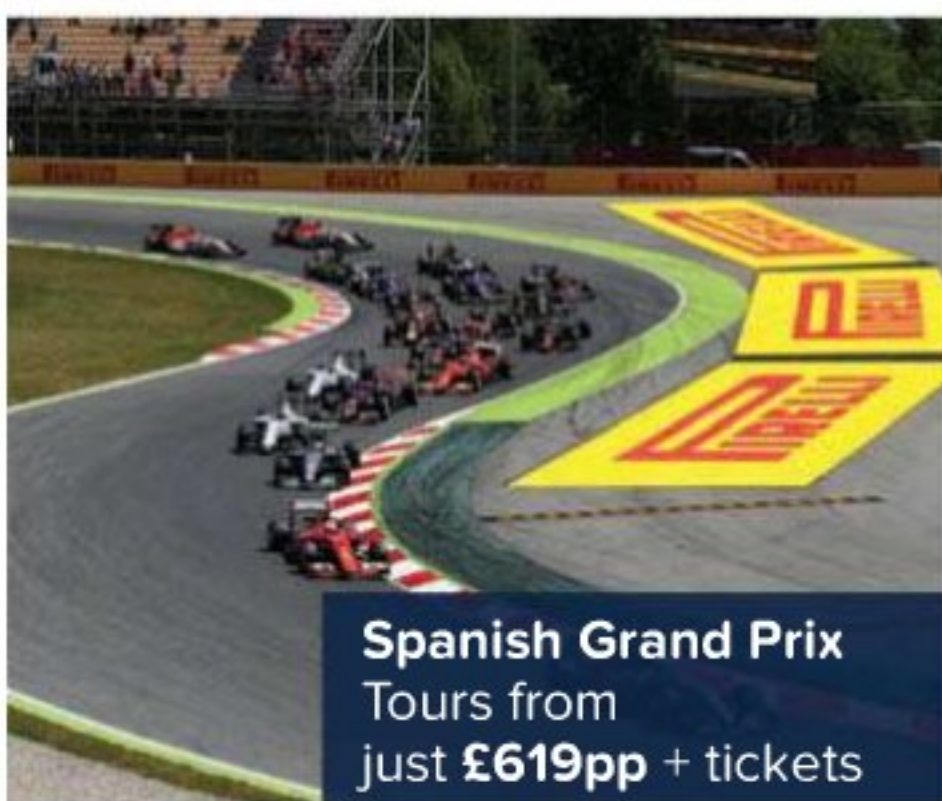
It looks more dramatic and we make wider tyres for road cars so we'd be happy to look at that. As to the size of the hole in the middle, well, that's up to the teams. We'll do what the sport wants."

All this, of course, come with strings attached. Tyre wars tend to be eye-wateringly expensive while drastically reducing lap times, which doesn't bode well for smaller teams or some of F1's classic circuits; wider or taller tyres require a clean-sheet-of-paper approach to car design with very different interpretations of aerodynamics and suspension, and all the implications for cost that implies. These would be big changes for the sport – but the reason Pirelli can greet the prospect with equanimity is that they're not particularly big changes for Pirelli. Whatever Formula 1 needs, Pirelli can provide. 



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THE MAKING OF DANIIL KVYAT

Fast-tracked to Formula 1 stardom by the Red Bull talent machine, Daniil Kvyat has had to dig deep to survive a troubled season with their senior team. Could this adversity be the making of him?

WORDS
JUSTIN HYNES
PORTRAITS
RED BULL
CONTENT POOL

Daniil Kvyat emerges from the players' tunnel at the Bolshoy Ice Dome, swamped in an assortment of pads, gloves and guards, his tall, slim frame hidden under a crimson Red Bull Racing hockey shirt. He takes a few ungainly steps towards the ice, and as he places a skate edge onto the Olympic rink you fear a real-life Bambi-on-ice moment is about to occur.

It doesn't happen however, and after finding his comfort zone he kicks off of the dome once the 2014 Winter Olympics had run its course. It would be overkill to say that the young Russian F1 racer immediately gets stuck in and starts banging in goals with the facility shown by his country's leader, Vladimir Putin, on his 63rd birthday, but Kvyat is soon working as part of a quartet of attackers assaulting the goal of HC Sochi's netminder. It's a loose connection, but Kvyat's swift re-acclimatisation to a sport he admits to not having played since he was a child is a reflection of his path to F1; a stellar ascent in which he hurtled through the junior categories with almost unseemly haste. He accomplished his journey, from his first steps in single seaters in 2010 to the top flight, in just over three years. →



Daniil Kvyat on Helmut Marko-impressing form in F3 at the Red Bull Ring in the pouring rain in 2013



"It was only his third race, without any testing, and he put the car three times on pole. If you see something like that, you can't help thinking, 'Yes, he's the one'" DR HELMUT MARKO



Another string to his bow: Kvyat plays ice hockey for the first time since childhood, having joined the HC Sochi team for the day

Ask him to what he attributes the rapidity of his graduation, and it's as if you've asked him to explain how he draws breath. He looks nonplussed, starts a sentence, stops and then raises his hands, palms up, in the air. "I don't know!" he says with a smile. "To be honest, I never needed much time in any race to understand the car I had – I guess I never had big issues."

He pauses again and readjusts. "Actually, that's not quite true," he admits. "Sometimes you do have issues but you need to sort them out, to overcome them as fast as you can, and I do that. I think that could be one answer, but then again it's also about the people that have been designing the steps. I think it is very important to know their opinion."

Dr Helmut Marko, chief of Red Bull's Junior Team, which Kvyat joined as a young karter, is quick to point to two salient memories of Kvyat's innate talent.

"I first came across Kvyat in karting," he recalls. "I have a system of contacts and his name came up, so I went along to watch him. In those days we did tests in identical cars and every driver got a long run or two, plus qualifying runs. Kvyat

came through that at the same time as Daniel Ricciardo. I would say they had exactly the same attributes.

"Then, in 2013, we put him in GP3 and F3. I went to the Formula 3 round at the Red Bull Ring and it was real heavy rain," he recalls. "It was only his third race in the series, without any testing, and he put the car three times on pole. I watched the start of the first race and thought 'this can't work out', but it did. In the second one it was the same. By the third, I knew. He had eyes in the back of his head. There are some drivers who have this 360° vision and if you see something like that, you can't help thinking, 'Yes, he's the one.'"

The mention of karting brings us back to Kvyat's formative experiences in his home town of Ufa, 800 miles east of Moscow, and an almost chance introduction to motor racing. "It was pretty relaxed," he recalls. "There was a pizza place with a karting track next to it. I tried the kart for the first time and that was it. What made me love it? I don't know, I just know that I got it the first time. It was a feeling of freedom. I forgot about everything and I was just myself."

Kvyat's first taste of competition karts came the following year and he is quick to pay tribute to one of his early mentors.

"My first competitive karting experience was in a small city near Moscow. My trainer was former F3 driver, Pavel Guskov. He's a pretty important name in my career. He was a former driver, but he had an injury and couldn't continue. His father owned a racing team and they saw me doing my first test on a normal karting track and they said they could offer us a test in a real kart on a real track. They liked what they saw." →

The youngster raced locally, but with such limited opportunities for advancement in Russia, it was clear that if his career was to take off, he would need to do likewise. His family took the decision to leave home for one of the centres of European karting – Italy.

Now, pause for a second and consider that. Imagine uprooting your whole life on the distant glimmer of a chance that the fevered dreams of a boy not even into his teens might in some shape or form materialise. Kvyat laughs when the apparent madness of the move is brought up.

“It’s true. My family had nothing to do with racing,” he says. “My dad had a small business in Russia. He had to stay in Moscow for quite a long time when we moved. My mother helped me in Rome with school and normal things, house things. I don’t know how it feels to have a kid, but I guess I would also do quite a lot for my kid. I also know that they made a big sacrifice... I am forever grateful to them.”

The sacrifice was repaid – in spades. A host of major Italian karting wins followed, and in 2008 he finished third in the KF3 European Championship. By the following season he was a regular winner – taking the Margutti Trophy and the South Garda Winter Cup KF3 and once again finishing third in the KF3 European Championship. It was then that the Red Bull Junior Team came calling. The timing was perfect.

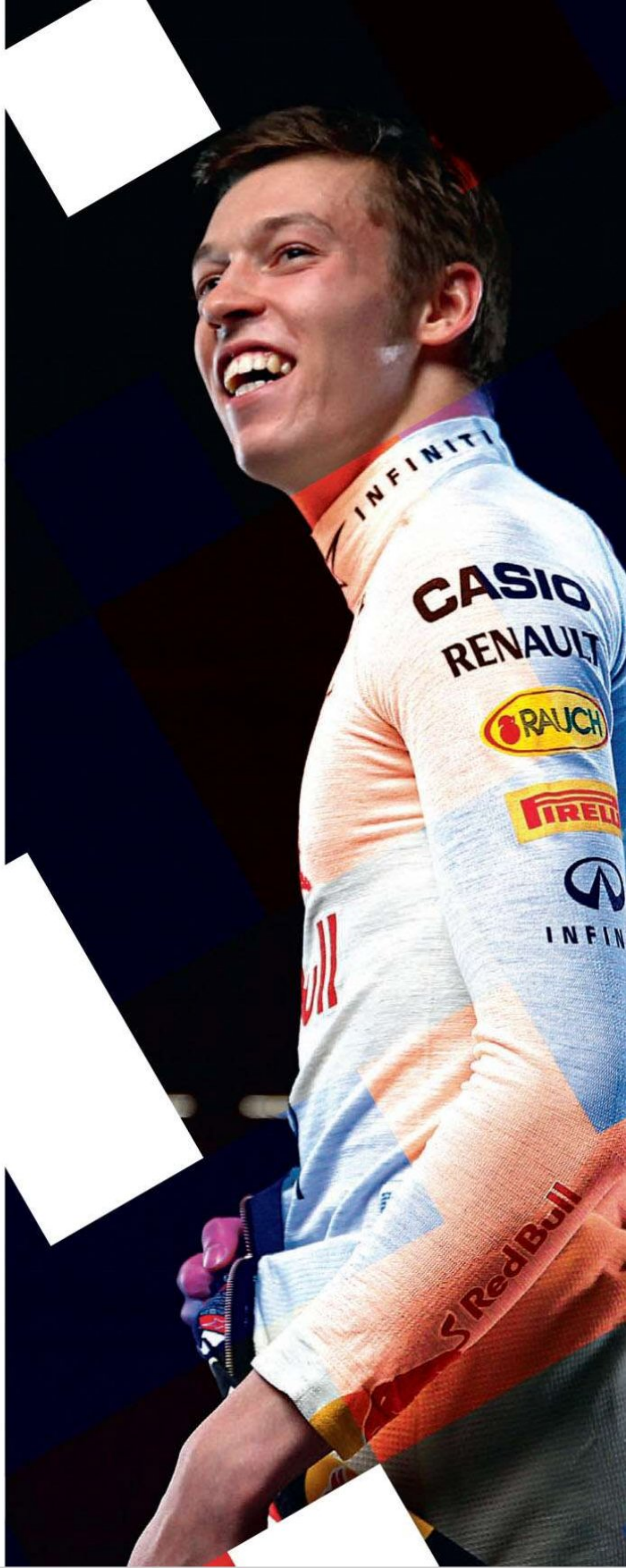
“It is not easy in international karting. In Russia we were okay and initially in Europe, but the closer you get to formula racing the more expensive it becomes – international karting is insanely expensive. When I was finishing international karting it started to be expensive, and it wasn’t easy. But we were lucky; Red Bull stepped in. Without that help it wouldn’t have been great. You just struggle all the time.”

With Red Bull backing, Kvyat’s talent blossomed. Victorious guest drives in Formula BMW Asia in 2010 (alongside Carlos Sainz Jr), led to a full season in Formula Renault 2.0 in 2011, in which he took seven wins and second place in the Northern European Cup, plus two wins and third place in the Eurocup. The next year he was Formula Renault 2.0 Alps champion and runner-up in the Eurocup. The victories were good, but the competition was intensifying and the pressure within the hothouse of the Junior Team was mounting.

“There was pressure, but this is the thing: you have to keep maintaining that bit of fun in you because otherwise... you can’t keep thinking all the time that you are driving for somebody else. It is not the right approach,” he insists. “Obviously I was in Red Bull, but in the end all I can do is my best. It just has to be to my highest level of driving.”

And here he returns to the subject of adaptability.

“You know, when you don’t understand the car it is more difficult,” he says. “But even then you still have to keep driving for yourself. You have to remember why it all started and go on the track and forget all the things that make you feel uncomfortable outside the car. For me, every time has to be



"From Monaco on, when it started to really pay off. It felt like the reward was coming, that it was getting closer. Hopefully we will get a bigger reward soon" DANIIL KVAT



PHOTO: SAM BLOXHAM/LAT

He's had a bumpy ride at Red Bull, but Kvyat's talent and tenacity paid off at Monaco, where he qualified fifth and finished fourth

the same as the first time I tried the car. I find my best racing when I have this mindset."

The ultimate expression of Kvyat's ability to navigate his way through to an understanding of the machinery at hand came in his breakthrough 2013 season in GP3: "It was very difficult. There were a few tests and a few races where I just couldn't understand the car. It was out of my control and that was hard to accept. But then you have that day when it all clicks. It happened at round three in Valencia. It was partly happening through those difficult races but it wasn't so easy to see because the results were okay but not great. Then in Valencia it clicked and it was so good. Every time I was on the track I was confident that I could do exactly what I wanted."

The reward for his eventual title win was a step up to the big league with Toro Rosso, replacing Red Bull-bound Daniel Ricciardo. Paired with the more experienced Jean-Eric Vergne, Kvyat's debut season was a nip-and-tuck affair, but when, at the Japanese GP, Sebastian Vettel announced he would quit Red Bull for Ferrari at season's end, Kvyat was within hours named as the four-time champion's successor.

"It was a strange day, very hectic," he recalls. "It was like signing for the Red Bull Junior Team, but to a bigger extent because it's the big dream coming true. However, the excitement goes away when the hard work starts," he adds ruefully, immersed, as he is, in a season that has gone from 'difficult' to something of an *annus horribilis* for Red Bull. Indeed, if Kvyat's progress to the point of joining Red Bull was linear, the period since has been an altogether bumpier ride.

"It was hard at the beginning. There were a few very tough races. It is much better now, but we also have to understand that the times are not easy. I am probably touching the bottom of the team's history, and we know that to be a very young driver in this kind of situation is very difficult."

Which once again brings Kvyat back to the subject of adaptation, and survival of the fittest in a racing environment in which shouldering heavy new loads in terms of the development duties and in over-delivering in a troubled package would have sunk many other newcomers.

"I do feel that the team is asking more of me. Obviously it is how it has to be and I am trying to do my absolute best," he says. "In the first half of the year I had to find completely new limits; new psychological limits. There was no honeymoon period. But there were moments from Monaco on [where he qualified fifth and finished fourth] when it started to really pay off. It started to feel like the reward was coming, that it was getting closer. Hopefully we will get a bigger reward soon."

One final question. If he looks back at the kid who last October claimed one of the most coveted seats in F1 and compares him with this year's model, how has he changed?

"I don't know, it's just a bigger room," he says. "It's the same room only wider. This is the thing: it has to stay the same room. You take that room early on when you try karting and you have to keep it, because that's where it all started. You have to remember why you started. It's hard to explain... it is the same room but it's no longer a standard double – it starts to be a bit more like a suite!" **F1**

La



Dolce



Vita

Alessandro Nannini's Formula 1 career was cut brutally short in 1990, when his right forearm was severed in a helicopter accident. But that fateful day has served only to heighten his appetite for savouring life's joys

WORDS ANTHONY PEACOCK **PICTURES** MAX PEEF

"This is the music from my era... and this is how I like to listen to it!"

Suddenly we're off, in a dusty Bentley Continental convertible that would eat most Ferraris for breakfast, the Tuscan scenery blurring past to the incongruous soundtrack of a 1980s mega mix: one classic disco anthem merging seamlessly into another at a volume that makes the finely crafted windscreen vibrate.

Then come the tight hairpin corners in the hills above Siena: cue impossibly late braking, with the two-tonne mass of Bentley struggling to slow itself, a violent turn-in, just a slight correction and, in a haze of tyre and cigarette smoke, James Bond's →



Then: Nannini claims his sole win at the 1989 Japanese GP, having been promoted from second place after Ayrton Senna was disqualified

original car of choice launches itself once more at the horizon, as if Blofeld himself were in eager pursuit.

Alessandro Nannini started out in his career as a rally driver – and it certainly shows. The fact that he’s got only one fully functioning hand hasn’t slowed him down at all, even at the age of 56. The good hand is used for smoking; the other hand gets on with the banal business of driving the car.

“I got into rallying when I was about 17, after I did motocross,” Alessandro explains – appropriately enough while going sideways – “but the problem was, you had to be 19. There was this guy called Maggiorelli who won three or four rallies round here; that was me. I faked his licence. But they get to know you, so eventually I’d arrive at the start of a rally and it was: ‘Nannini – get out.’ It’s funny, I never feel tempted to get back behind the wheel of a racing car now, but I still do bits of rallying – and I prefer gravel to asphalt because cars are here to go fast and get treated badly.”

QED. Nannini’s Bentley is no garage queen – and it bears the scars to prove it – but what would you expect from a man who still lives life like he’s in the thick of a Formula 1 grid with tomorrow existing in a different lifetime? The cars have to be fast as they can. The music has to be loud as possible (a love

Alessandro – known simply as Sandro – shares with his ultra-successful pop-star sister, Gianna). The scenery has to be stunning, which is why he returned to Siena after many years in Monaco. He doesn’t sip from the cup of life: he gulps.

The Nanninis are a well-known family in Siena, and it’s all because of baking and coffee. The family business, founded by Sandro’s grandfather, is leased now – but Sandro still takes care of some of the property interests.

Sandro rarely gets into his office before 11am, but he knows all the talented baristas at the family-owned *caffès* in Siena by name and stops to talk to each of them. This beautiful city casually flaunts its history and the tradition of the Palio di Siena, the horse race that runs every year through the central piazza. Nannini is a man steeped in his terroir, seeming to know everyone, stopping to shake hands and chat wherever he goes. And, of course, long before the motocross and rallying (possibly one of the most unconventional routes ever into F1) a young Nannini’s first foray into sport was on horseback: the true hallmark of any Siennese.

His days are filled with conversation, art, cigarettes, wine, exquisite food. He goes to bed a happy man. Occasionally, he drives the course-opening car on a rally – still his favourite form of motorsport, after sampling everything else from F1 to Le Mans (where he set a fastest lap for Lancia in 1984).

And he’s never lost the gastronomic touch. If Alessandro Nannini ever offers you a coffee, don’t make the mistake of automatically complimenting it: you risk a forensic analysis of how it could be better, delivered with the same attention to detail that he displayed when discussing F1 setup.



Now: Nannini is involved with the Nannini Group, which includes a chain of cafés that bears the family name



That's an area where Sandro always had an edge over his team-mates, right from the beginning of his F1 career when he was paired against Andrea de Cesaris at Minardi in 1986. Say what you like about de Cesaris – and people frequently did – but there's no question that he was quick.

"Andrea was instinctive, but had no clue at all about setup," recalls Sandro. "When the new Minardi came out in Austria, Andrea got it because he was lead driver. But with the old car, I was still quicker. Then I had a go in the new car and realised what the problem was straight away: big understeer because there was too much rear wing. I changed that, and was quicker by a second. Still, they gave the new car again to de Cesaris for the next race at Monza; and I was pretty furious. There was no way I could keep his pace around most of the track with the old car, but the kerbs were all mine! And I was half a second quicker than him this time. Do you remember how Andrea had a nervous tic? Well, he was so wound up that he couldn't actually eat his dinner that night. He had a piece of cheese in his hand and he kept on missing his mouth. So I scooped up the piece of cheese and ate that as well, which probably didn't help his mood..."

Generally, as two Italians in an Italian team, they got on very well though. Apart from when they were playing cards.

"At Minardi, we used to play *briscola*, a card game a bit like trumps that you play

with a partner; your partner makes signals to you to indicate the hand he's got. I often partnered Andrea. Here's some advice: never play cards with anyone who has a nervous tic. We always lost."

You never wait long for a distinctive belly laugh – raucous through years of smoking – when you're in Sandro's company, and the recollection of his twitching card partner is one of those occasions. During his racing career, he says, he always found it hard to believe his own good fortune.

That run of good fortune ended on 12 October 1990, when his helicopter crashed just metres from his father's house, a week after he finished third at the Spanish Grand Prix. And Sandro is sombre. Briefly.

"People always get this wrong: it wasn't actually me flying the helicopter. I was flying it in the air, and the pilot landed it. Or rather, tried to land it. Instead of landing at the airport, he wanted to land at home but the ground wasn't flat. Unfortunately, he was more used to flying an Augusta than an Ecureuil, which has a different pedal layout. He hit the ground with the tail rotor; the helicopter tipped up 15 metres and went onto its roof. I put my arms up to protect myself, and I was sliced here and here."

It's a matter-of-fact speech that Sandro ends by indicating a line roughly from his thumb to his wrist on his left hand, and then from his thumb up to his elbow on his right →

CV

Name Alessandro Nannini

Born 7 July 1959

Place of birth Siena, Italy

1993-96 DTM

1990 Debilitating helicopter crash

1988 Formula 1 – Benetton

1986 Formula 1 – Minardi

1984 World Sportscar Championship

1982 Formula 2 – Minardi

1981 Formula Italia

F1 debut Brazil 1986

Wins 1

Podiums 9

Fastest laps 2

Points 65

CV

hand. It was his father who brought the severed limb to the hospital for reattachment, by which time Sandro had passed out, having been conscious during the accident.

“So when I woke up a couple of days later, with the hand attached to my wrist, I was pretty surprised. In the time before I passed out, I had already resigned myself to losing it, and, weirdly, my first thought when I was still in the wreckage was actually: ‘How am I going to go sailing now?’ – because I used to love sailing.”

Groggy from the drugs when he woke up, Sandro assumed that what had been stuck onto his right wrist was some sort of prosthesis. But then he recognised what he describes as the “Nannini family fingers” and realised with delight that the hand was actually his.

Still, as his doctor, Professor Bufalini, warned, there remained a very high risk of rejection. Pasta heir, compatriot and fellow F1 driver Paolo Barilla, who clearly shares Sandro’s robust sense of humour, visited him in hospital a few days later and brought along an artificial hand as a gift – an interesting alternative to grapes and cheap novels.

Sandro loved it. And what he particularly loved was stuffing the hand into the sleeve of his shirt and making it drop out noisily as he was walking along the ward. “From out of nowhere, you’d have five doctors running up in a state of

They made a mistake with the anaesthetic. So I was asleep when they started to saw into my hip, but I heard and felt everything

complete panic,” he remembers, with another one of those throaty belly laughs. “You should have seen the looks on their faces...”

The worst part of the accident though came later and was something that Sandro remembers in chilling detail as something he would not wish on his worst enemy.

“Some bone was being taken out of my hip to help reconstruct my hand,” he recalls.

“There are two parts to every anaesthetic: a paralysis agent, which stops you from moving, and the drug that knocks you out. Unfortunately they made a mistake with the anaesthetic. So I was asleep when they started to saw into my hip, but I heard and felt everything. In the end I managed to beat my eyelashes hard enough to make them realise that something was wrong, but for five minutes I just wanted to scream and couldn’t. I actually felt the saw.”

It was an unthinkable situation for a man who just months earlier had been destined for Ferrari. Nannini was a natural for Maranello, having been supported by the Fiat Group during his early career, and a deal was agreed at the end of 1990 for him to replace Nigel Mansell during the 1991 season.

What Ferrari’s sporting director Cesare Fiorio didn’t tell him was that Jean Alesi was also in the frame, since the French market was particularly crucial to Ferrari at the time. The Ferrari contract Nannini ended up with could actually have obliged him to drive for any Ferrari-engined team on the grid, including Minardi. So the deal was off – and instead he was to stay at Benetton.

“I don’t hold anything against Ferrari, but I do hold it against Fiorio because he took me for an imbecile,” points out Sandro. “If the opportunity had really been there, I would have gone to Ferrari that year. I never really saw it as my future, but it was a box to be ticked, as an Italian.”

In actual fact, Fiorio probably did Nannini a favour by saving him from a car that certainly wasn’t one of Ferrari’s best. The neat and sensible Ford-powered Benetton was far from being the quickest car out there, but neither did it have any particular vices.

Sandro had already won a race in the B189 and the team were competitive enough to attract the services of three-time champion Nelson Piquet, who Sandro says was his favourite team-mate. “We both loved chasing girls. I loved his style...”

But Sandro’s famous – or arguably infamous – sole victory, in the Benetton, at the 1989 Japanese Grand Prix (overshadowed by the Prost-Senna chicane scandal), will forever remain a source of frustration.

“I’m definitely much more proud of my second place at Adelaide in the next race,” says Sandro. “After Prost and Senna collided, I had a margin of what I thought was around 35 seconds, so I was deliberately lapping around four or five seconds off the pace. Nobody told me from the pitwall that Senna was back on new tyres and catching me at the rate of five seconds per lap! I tried to fight back but no chance: my tyres were gone. So Senna won but was then disqualified for missing the chicane. I didn’t like the fact that I won from a disqualification unnecessarily; if they had just told me that Senna was coming I could have gone two or three seconds a lap quicker with no problem and I would have won anyway. →



Despite being a popular and much-missed F1 driver, once he’d recovered from his accident Nannini struggled to get people to believe he was ready for a return







LAT ARCHIVE



Top: His final season of F1 at Montréal in 1990. Above left: Nannini in his 'chasing girls with Nelson Piquet' days. Above: A guest appearance at Imola in 1991, wearing a special glove to protect his injured hand. Left: With the baristas in one of his own cafés

And I don't think it was just because they knew Senna would be disqualified otherwise they would have said so earlier. When I saw Senna in the mirrors, I thought: 'What the fuck?' And by then of course it was too late. So that was my victory."

However, if you thought the 1989 Japanese Grand Prix was controversial, try the 1994 DTM round at Singen. By then, Nannini's rehabilitation as a racing driver was advanced to the point where he was all set to win the championship for Alfa Romeo. It would have been an emotional, scarlet-tinged victory. His only real rival was Klaus Ludwig and to help ensure that the coveted DTM title remained in Germany, Ludwig's Mercedes team mate Roland Asch inexplicably missed his braking point at the circuit's tight hairpin, punting Sandro off. The championship dream was over, one that Nannini had really desired, for all sorts of complex reasons. "Can you imagine what it would have been like if us spaghetti-eaters had socked it to the Germans on their home territory?" asks Sandro. "It would have been like them coming over to us and beating up the Pope."

Mercedes couldn't allow that to happen, but for Nannini it was a declaration of war. Like Senna in Japan five years before, he came in for fresh tyres on the Alfa and then started to scythe his way back up the field. This time, he was looking for Asch. And when he found him, he didn't bother to brake at the end of the straight and instead took the German out at full speed in an impact so heavy that the Alfa caught fire. YouTube captures the moment: search for 'Nannini seeks revenge'.

"Paolo Cantarella, the team manager, went crazy; in fact everyone went crazy," recalls Sandro.



**I've lived my dream
and done a job that
I enjoyed every day.
I've even been paid
to do it. How many
people can say that?**



At the next race, Asch and Nannini qualified alongside each other: a situation that had the race organisers so worried they called both men to their office to promise there would be no funny business. The warning was unnecessary. "Do that again," hissed Nannini to Asch, "And I'll sleep with your wife..."

The hardest part about coming back to racing was not driving the car. It was getting people to believe again. Sandro actually felt he would have been ready to come back to Formula 1 two years after his accident (he tested for Ferrari in 1992), but he struggled to get people to believe in him. "I don't know what it was," he says, sounding genuinely despondent. "Maybe they thought that if I had another accident, it wouldn't look good on them."

And the technology had moved on, too. When he tried out the 1996 Benetton, after four years on the F1 sidelines, he was only two-tenths off Jean Alesi in the slower corners, but a whopping 1.8 seconds off in the fast corners. The car was easy enough to drive – paddleshifts were the norm by then rather than stigmata-inducing H-pattern boxes – but the aerodynamics had moved on so much that it was hard to compute. Given time, he could have learned, but the time was no longer there – and anyway he had something better to do.

Giorgio Pianta, director of Alfa Corse, had given him a drive in the DTM (German Touring Car Championship) Alfa 155 in 1993, which Sandro was able to race using a specially adapted

glove made from silicone [mention of which material prompts Nannini to crack a joke, that is, alas, unprintable...]

It was faith that paid off as Nannini demonstrated championship-winning pace, and when the increasingly popular DTM morphed into the International Touring Car Championship in 1996, the Nannini name was once again going places.

"I honestly thought that this could become the European answer to NASCAR," says Sandro, "but it was becoming a bit too popular for its own good." The fact that it was a potential rival to Formula 1 may well have helped hasten the ITC's demise.

Nannini is not a fan of modern F1. Partly ideologically, partly through personal experience. "The last time I went to see a grand prix was at Monza a while back. And just to get a pass you have to wait for two months – and you can't even bring a friend. I was in Formula 1 for five years, which isn't much. But I think back to a moment before the Australian Grand Prix in 1989 – that second place I was so proud of – because it was run in such torrential rain that at least three of the drivers didn't want to drive. And the organisers said to us all: 'Just get in the car and get on with it because the live TV is starting soon. You're paid to die as well.' Like gladiators! I'll always remember those words. And I didn't actually have a problem with it; what they said was true. But then you also

have to show some respect to the drivers in the years afterwards, once they've stopped. It's just a question of respect and education. And those are the two most important things for me in life."

Clearly Nannini is not a man to dwell on missed opportunities, or bitter memories of a cruel twist of fate. Rather, he's the embodiment of a man who has embraced life's joys and relishes every opportunity still to do so.

"I've lived my dream and done a job that I thoroughly enjoyed every day. I've even

been paid to do it," he points out. "How many people can say that? Compared to that, what might have been or might not have been doesn't really interest me: in Italy we have this saying that goes: 'If my grandmother had wheels, she would be a tram.' You know what I think? I'm the luckiest man in the world. If you look at the statistics, 95 per cent of people involved in a helicopter crash don't survive. Not only that, I've had so many friends who aren't with us because of stupid things that have happened, both in and out their cars. If I hadn't gone down in the helicopter, maybe I would have died in a racing accident the next year. So every day I wake up, I touch my balls [for luck – an Italian superstition] and I say to myself: Thank God! Life is beautiful!"

And if you're Alessandro Nannini, it certainly is. **F1**



Still enjoying life's pleasures, Nannini raises a glass and considers himself "the luckiest man in the world"



CAREER ~~X~~ CROSSROADS

After three seasons in GP2, and a handful of 2015 F1 outings with Manor Marussia, **Alexander Rossi** has some tough choices to make. Which direction does the 24-year-old choose now? *F1 Racing* tracked him down in the centre of Tokyo to find out...

WORDS JAMES ROBERTS **PICTURES** STEVEN TEE/LAT

The Shibuya Crossing, in the heart of Tokyo, is one of the world's most famous intersections. As commuters, shoppers and tourists pour forth from Shibuya's train station, which serves more than two million passengers a day, they gather patiently at the roadside, waiting for the traffic to stop. What follows, as the traffic lights surrounding the junction turn red, has become an iconic sight: up to a thousand people (at peak times) surge across the road like rival colonies of ants homing in on a jam sandwich. After a frenzy of crisscrossing, under a blaze of neon, the flow ebbs as the lights turn green and the road traffic impatiently stakes its claim to the territory once more. All the while the numbers on the sides of the road swell as the next crowd of pedestrians await their chance to cross.

Formula 1's newest grand prix driver, American Alexander Rossi, is taking in the view from the second floor of a Starbucks. In a few moments, Frappuccino in hand, he's going to venture to the centre of the crossing, standing tall in his Manor Marussia team shirt, while the folk of Tokyo go about their morning business. It's two days after his debut at the Singapore GP and we meet before the F1 community (who are enjoying some R&R in Tokyo) board the Shinkansen bullet train to Nagoya, and then a commuter train on towards Suzuka.

Rossi is soaking up the excitement of one of the world's coolest cities, while relishing the chance to show what he's capable of in the final races of 2015. Aside from Singapore and Japan, Rossi will compete in his home race of Austin, and then Mexico and Brazil, while dovetailing his commitments in GP2. The final rounds are in Sochi and Abu Dhabi, and as we write, Rossi is second to runaway leader Stoffel Vandoorne. →







Rossi on the grid at Suzuka, after our interview with him took place. He would go on to finish 18th, ahead of his Manor Marussia team-mate, Will Stevens



“When the opportunity came to do F1 it came out of the blue, to be honest, but I jumped at it because this is the goal. And it’s nice to be able to do it at this team, because there’s a lot of history since I joined them as a reserve driver last year”

Although this story will be published after he’s competed in the US GP, it’s this, his home race that Rossi is most excited about. The last American driver to compete on home soil was Scott Speed (see sidebar on p85) at Indianapolis in 2007.

“The timing of getting into Formula 1 has been good for me, particularly with Austin coming on to the calendar in the last couple of years,” says Alex, as we wander past Shibuya’s sprawling shopping malls. “The enthusiasm for the sport in the US is growing at the same time that I’m trying to get on to the grid in a race seat. In the races I’m doing, I need to represent myself well and show that I’m capable of being in F1, and to try to get the best result possible.”

On two previous occasions, Rossi had come close to getting a drive at Marussia. Ahead of last year’s Belgian GP, he was announced as a replacement for Max Chilton, until a contractual resolution enabled Chilton to keep his seat (although Alex did drive in FP1 for the team). He was again named as a driver at Sochi last year, a week after Jules Bianchi’s terrible accident, although ultimately the car never ran. Fast forward 12 months, and Rossi found out about his drive in Singapore during the week of the race. His father, Pieter, helped put together a late sponsorship deal to let Alex compete in five of the remaining seven grands prix of the year.

“The last six months of 2014 were very challenging and going into 2015 I was just focused on GP2 and doing the best job I could for the championship with a winning team,” he says. “When the opportunity came to do F1 it came out of the blue, to be honest, but I jumped at it because this is the goal. And it’s nice to be able to do it at this team, because there’s a lot of history since I joined them as a reserve driver last year.”

Prior to Manor/Marussia (the FIA and FOM have yet to reach consensus on the precise naming of this team) Rossi had spent a couple of seasons as a reserve driver for Caterham,

making his first appearance in Friday practice at the 2012 Spanish GP, and then making three more appearances over the next two seasons, including one FP1 outing at Austin in 2013.

Racing in Formula 1 is the culmination of a long-held dream, one that began when he was a young boy, growing up in northern California, close to Sacramento.

A few hours’ drive away is Monterey, and back in the 1990s his father would take young Alex to watch the CART/IndyCar races at Laguna Seca. It followed a Rossi tradition, since Pieter’s father used to take him to the Indianapolis 500. And for the record, while the ‘Rossi’ surname is Italian, the generations are far enough removed for Alexander to feel no connection with his forefathers’ Sicilian roots. He is an American through and through.

By the time he was ten, Alex was karting and had a more serious approach to racing. But all he knew was IndyCars until his father made a crucial revelation: “F1 cars are faster...”

“From that point on, I started watching F1 and realised it was a higher level of racing with manufacturer involvement added to the performance of the drivers and cars. So, living on the west coast of America, myself, my mum and my dad would all get up together at four or five in the morning. It felt like we were one of the few American families who were getting up so early to watch the races live on the Speed channel.”

Young Alex’s burgeoning career through karting and Skip Barber single-seaters was funded by his father. Once he was ready to graduate to the next level of racing, Pieter Rossi established a funding programme where he invited individuals and companies to invest in the young Rossi, ultimately to receive a return on investment in the form of future earnings. In total, up to 70 investors have helped Alex come up through Formula BMW, move to Europe and compete on the higher rungs of the single-seater career ladder.

Prior to this season, the highlight of his career was 2008, when he won Formula BMW’s World Final, in which all the global categories competed in a showdown event and the winner got to test a BMW F1 car. Alex emerged victorious.

“That was the point when I knew I could compete on a par with the drivers from Europe, since no driver from the USA →

“We all know how F1 can be in terms of trying to get a drive, but **I’m at a crossroads in my career** and with these outings I have a very good chance to prove myself to be in a good position for 2016”

BMW series had ever won it before,” he says. “That first F1 test was amazing. I did a track walk at Jerez the day before, and you know how Turn 1 is a steep, uphill right-hander? Well, the engineers were making fun of the fact that any young driver who got in the car for the first time always braked way too early, and then had to re-accelerate to the corner. I was so determined that wasn’t going to happen to me that I locked up and went wide at that corner on my first lap in the car...”

Having made an instant impression, Rossi spent the next few years continuing to carve his path towards Formula 1. He was signed as a reserve driver for the stillborn US F1 team and then joined the Caterham outfit in GP2 as a reserve driver. The last time *F1 Racing* featured Alex, was when he tested the new 1.6-turbocharged cars for us on the Caterham simulator [*F1 Racing*, February 2014] ahead of their arrival into the sport. Now we meet again in the heart of Tokyo and take a trip to the top of the Cerulean Tower Tokyu Hotel, overlooking the vast city. Surveying the view before him, Rossi considers the future that lies ahead.

“There is an increasing amount of interest from the US, now Austin is on the calendar, but before that there was very little exposure in America,” he says, peering out at the winking red lights of the skyscrapers and the sodium glow of the Tokyo Tower. “We all know how F1 is in terms of trying to get a drive, but I’m at a crossroads in my career and with these outings I have a very good chance to prove myself to be in a good position for 2016. “My year in GP2 has been quite strong and it wouldn’t be my first choice to do it again next year. I want to be in F1 now, and I think that I’ve proved I’m ready.”

As Rossi points out, US interest in F1 is growing and next year will see the emergence of a brand new team, Haas, expanding from NASCAR into Formula 1 with help from Ferrari. Founder Gene Haas has publicly stated that a ‘home-grown’ driver isn’t necessarily on his agenda, and a week after our meeting in Japan, Haas confirmed Romain Grosjean as one of their racers. Although it would appear to be a natural fit, discussions between Rossi and Haas have so far come to nothing. There is also the concern that drivers with a seemingly unlimited budget are buying up the other seats on the market. Alex, however, remains philosophical.

“It’s the way life works and there’s no point complaining – all you need to do is compete and prove that you deserve a spot that is yours. You have to make it happen and go for it.”

With that, Rossi casts a glance 40 floors down to the many-faceted Shibuya crossing, steps down from the window, and heads to the escalator to wander the neon-lit shops and the noisy Pachinko parlours. It’s been a long journey to get to this point, and now we wait with interest to see which direction he takes next... 





The last five US F1 drivers



Scott Speed
(2005-07)

Team: Toro Rosso
Races started: 28
Best result: 9th



Michael Andretti
(1993)

Team: McLaren
Races started: 13
Best result: 3rd



Eddie Cheever
(1978-89)

Teams: Theodore, Hesketh, Osella, Tyrrell, Ligier, Renault, Alfa Romeo, Lola, Arrows,
Races started: 132
Best result: 2nd



Danny Sullivan
(1983)

Team: Tyrrell
Races started: 15
Best result: 5th



Mario Andretti
(1968-82)

Teams: Lotus, March, Ferrari, Parnelli, Alfa Romeo, Williams
Races started: 128
Best result: 1st (12 times)

INSETS: LAT ARCHIVE; SUTTON IMAGES

MANSELL

UNTOLD

If you thought you already knew everything there is to know about Nigel Mansell, you'd be very wrong. His new autobiography spills the beans about his incredible career, and here he presents ten choice anecdotes for *F1 Racing*...

INTERVIEW JAMES ROBERTS

PHOTOS STEVEN TEE/LAT





Twenty years after Nigel Mansell famously walked out of McLaren and quit F1 for good, he's decided to share some of his life's extraordinary events in a new autobiography.

In the two decades since retiring, he has played and won golf tournaments, guided his sons through short-lived motorsport careers (his youngest, Greg, later switched to competitive cycling), has cycled across the country for the charity UK Youth, and has been inducted into the Magic Circle, the society of magicians that keeps its secrets closely guarded.

So *F1 Racing* boarded a Q400 Dash 8 twin-engined turbo-prop plane for the shortest flight of the grand prix season: a 30-minute hop from Southampton to Jersey, the Channel Island that 'Our Nige' calls home.

In the island's capital of St Helier, Mansell's eldest son Leo now helps run a Mitsubishi dealership, and situated above the garage is The Mansell Collection: a museum containing a vast array of trophies, helmets and even a couple of racing cars, from Nigel's career, including his 1990 Ferrari 641.

After *F1 Racing* was guided into his office, Nigel (complete with trademark 'tache) spoke to us at length, giving us ten unforgettable stories about his life and career. ➔



ON FERRARI

The thing you've got in Maranello, which I don't think any other place in the world could come close to, is the magic. There's an atmosphere and a historic legacy that transforms it. I was speeding in Maranello once, on my way to pick up a teddy bear for my son, and the police pulled me over. I was thinking, 'I'm in the shit now.' Then all of a sudden, they saluted me. You realise the power and prestige of being a Ferrari driver; it was the most wonderful, magical time. Having been a Ferrari driver is probably greater than the legacy of having a Williams winning the world championship.



ON APPLES AND ORANGES

I'm allergic to them both and I almost died one time. A doctor in Harley Street told me it was all in my mind, and when he forced me to eat a Granny Smith I became very ill; he apologised to me. When we moved to America, I went on a two-year immunisation programme that had been banned in the UK after six people died in one year. I also suffered from hayfever and broke out in a terrible rash. I found a guy who had 15,000 patients under his care in Florida, which is one of the pollen capitals of the world. The moustache had to go because the pollen used to collect in it.



ON PUNCHING Ayrton Senna

When Ayrton was racing, it was either his way or no way. He took us both off at 200mph at Spa once, and very fortunately we didn't hit anything. I was furious; he'd put me out of the race. The red mist descended, and I went to pay him a visit in the pits. It was quite entertaining because I didn't realise I had him off the ground, until I was pulled off him – there was somebody restraining me. The amazing thing to this day, and it's quite a big deal what went on, is that the FIA at the time turned a blind eye. It was two top drivers sorting it out: it was life or death. Now there are rules for everything. What was fantastic was that after that discussion, Ayrton and I got on a lot better. He knew that I was prepared to put it out there. He actually said to me, in Barcelona in 1991, "You do realise, you're fucking mad?" I said "Ah, you've only just realised that?"



ON SAVING PETER COLLINS' LIFE

I've only had a couple of moments in my whole life where I can honestly say that I've done something important. I came very close to losing my life that day in the sea in Rio de Janeiro in 1981. Peter was lucky. He went out swimming, got into difficulties and couldn't make it back. His eyes were bulging and he couldn't breathe. I got to him quickly because of the current, I held him up but no one would come in; no one would help. I said: "Unless you try to help, I will leave you." I managed to pull him up, got him to float, and 20 people linked arms to drag him out. I realised then that I didn't have anything left. That's the closest I've ever come to knowing I was probably about to die.



ON BEING LATE FOR COLIN CHAPMAN

I had a 9am meeting with Colin at Lotus's HQ in Norfolk. I set off at 4am, but it was a long journey. The weather wasn't good and there was a huge pile-up on the motorway with a fatality. I just about managed to make it to the meeting, and I was no more than two or three minutes late. Then, I had an education... for life. There is no denying it, whether it was one minute or two minutes, I was late. That was very important to Colin and so it

stayed with me for my whole life. He gave me hell. The next time I had a meeting at 9am I slept in the car at the factory the night before. →





"AYRTON KNEW
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SAID TO ME AT
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**"YOU DO REALISE,
YOU'RE F****ING MAD?"**

I SAID "AH, YOU'VE ONLY
JUST REALISED THAT?"



Mansell pictured with some of the cars he raced during his incredible career, at the Nigel Mansell Collection, in St Helier, Jersey

ON INJURIES

I broke my neck in 1977, and my feet got broken in karting. I broke my back in 1987, and then I damaged it again really severely in 1993 at Phoenix, driving an IndyCar – I had to have 148 stitches and suffered from a lot of internal bleeding. I had to have a 12-inch section taken away from my back because all the flesh was rotten. That tear in my cavity of my back was so rare that it has since been named in medical journals as the 'Mansell Lesion'. Yet in spite of all of that, I have always managed to bounce back. If you look at the people who lost their lives during my career, I look back and think: "I've done better than most."



ON LOSING THE TITLE AFTER CRASHING IN JAPAN, 1987

I think Japan was a hard time for me because I watched a couple of people die in front of me in hospital. I was in intensive care for a couple of nights, and I had internal


bleeding. That tipped me, because no one spoke English. I was really poorly, and I'd watch someone sit up and scream and just croak in front of me. I was powerless because I couldn't really move. And later, on the other side of the hospital bed, someone else goes, and I'd think to myself: "It comes in threes, I'm the next one – shit!"

ON RETIRING IN 1990

The only thing that was specifically upsetting about that year was when I came to the British Grand Prix, and there was the underhandedness of swapping my car with [Ferrari team-mate] Alain Prost's. That's the thing that totally tipped me. My friend, the golfer Greg Norman, told me: "Go out in Prost's car, put it on pole and then ask him which car he wants for the race." I did that, but then my car packed up, so I decided to retire. I'd seen a lot of carnage and I just wasn't prepared to make up the numbers any more. Then I came back with Williams and I reckon I must be the most successful retired driver in the history of the championship because I came back and won a world title.



ON MAGIC

Magic has literally been my saviour. You might wonder what on earth card tricks and magic have got to do with brain injury, but magic has changed my life. When I crashed at Le Mans [racing with sons Leo and Greg] I suffered a massive concussion that damaged my brain and left me unable to talk properly. I didn't know who I was, or who my wife was, or who my children were for a period of time, and that was pretty nasty. But the motor skills you need for card tricks really stretch your brain and you're forced to re-learn how to think. I did three years of practice in 12 months and the regenerative effect it had on my speech was just remarkable. Since then, I have even gone on to do my own magic shows! 



Nigel Mansell's autobiography 'Staying on Track' is on sale now priced £20

ON WINNING THE TITLE WITH A BROKEN FOOT

There was a very wet Australian Grand Prix in 1991 [which was red-flagged after only 14 laps] and I spun, hit the wall and broke my foot. The bone splintered and actually went into the flesh of my foot. I went back to America and discovered that if I wanted it to be properly fixed I would need to take three months out to recuperate. I said that was impossible and walked out of the doctors. Throughout 1992 I had a carbon fibre insert to take pressure off my foot, and there was one pair of boots that I wore for the whole of that year. They stank to high heaven. I did every single race with a splintered and broken left foot. Some races were far easier than others, but one of the worst races was Monaco – it was absolutely exhausting. I didn't want to tell anyone, because I didn't want to have the operation – it was really painful, but I got away with it,



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Greg Tillett is a passionate motorsport fan and professional artist, who has combined his two loves to produce a series of stunning artworks. He was first commissioned to produce a limited-edition painting of MotoGP rider Valentino Rossi back in 2001, and further artworks feature Formula 1 drivers, such as Lewis Hamilton, Kimi Räikkönen and Fernando Alonso. His pieces are available as A3 prints or as original oil paintings on 40x30 inch stretched canvas.

www.gregtillett.com or gregtillett@hotmail.com



MAIN IMAGE: CHARLES COATES/LAT; INSETS: STEVEN TEE/LAT; STEVE ETHERINGTON/LAT; ANDREW FERRARO/LAT



Lewis: the best of British

Victory in Austin took Hamilton's GP win tally to 43 and secured him his third world championship, making him the most successful British F1 driver of all time

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Rosberg fails to halt Hamilton's relentless march towards title number three



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Lewis collects his third crown to universal acclaim at the Circuit of The Americas



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Strategy quibbles hand championship runner-up Rosberg victory over Lewis

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The beloved classic returns and, unusually, it's a track where Lewis has never tasted triumph



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It's not just the three world championships... Lewis Hamilton's global cachet puts him in a league of his own



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Why the return of the fabled Renault F1 team can only be a good thing for the sport

RACE DEBRIEF

by James Roberts

Russian Grand Prix

11.10.2015 / Sochi



Lewis's to lose

Hamilton left Sochi 66 points clear of his nearest rival. He could almost touch that third championship

The sun was about to set on Sochi when news filtered through that Kimi Räikkönen had been given a 30-second penalty for his clash with Williams' Valtteri Bottas. This dropped Räikkönen's Ferrari from fifth to eighth, losing him the six points that would have kept Ferrari – just – in constructors' championship contention.

Mercedes were the beneficiaries, and were duly crowned champions after their rivals had already left for their flights home. In Toto Wolff's own words, it was a "bittersweet" weekend for Mercedes. Lewis Hamilton had won comfortably, taking his 42nd grand prix win, but his team-mate Nico Rosberg (who'd looked quicker all weekend) retired in the early stages, which effectively ended his title challenge.

"I had so many comments before the race asking me if we'd printed championship-winning T-shirts," said Wolff, before he knew of the stewards' decision. "But the T-shirts will go back

into the box and they go back home.

We'll unpack them once it's done."

Had Rosberg not retired and had both Mercedes finished one-two as looked likely early on, team celebrations would have been in full swing late on Sochi Sunday. But Rosberg did retire, from the lead on lap 8, due to a malfunctioning throttle that refused to return to 'zero' when he lifted off.

As the Mercedes drivers left the startline, Rosberg found himself on the inside, but as they approached Turn 1, he judged his braking to perfection to stay ahead of his team-mate. Lewis was back on the attack at Turn 3, but then their race was curtailed when the Safety Car was deployed following a first-corner shunt further down the field. Force India's Nico Hülkenberg had spun into the path of Max Verstappen, puncturing the left rear of the Toro Rosso, and was collected by the Sauber of Marcus Ericsson.

The Safety Car stayed out for three laps, but Rosberg could feel that lazy throttle worsening as the pack toured slowly. Back at race speed, it left him unable to control his W06. Hamilton soon passed him for the lead and Bottas followed. One lap on, Rosberg pitted, his bid for the title effectively over. The once-bulletproof W06 had now failed to finish in three of the last four races.

"After the restart, the problem with the throttle occurred and from then on I couldn't come off throttle any more," said a disconsolate Rosberg. "I was cornering with the throttle on and trying to take my leg off the pedal, but then my knee would come up and I couldn't steer. It's tough, after such a strong weekend. I was looking to close the gap to Lewis, so it's very disappointing."

With Rosberg out, Hamilton's run to the flag was comfortable, despite a late drama with a stalling rear wing, notably when he was in traffic or using DRS. "I've been incredibly grateful for

the car holding together," he said post-race, "and in the last few laps I was just rubbing the cockpit." Turning to look at Sebastian Vettel, he added: "You know what it's like when you're just hoping the car holds together."

"I wasn't rubbing anything in the last couple of laps..." Seb twinkled.

From fourth on the grid, Vettel had fought to second, thanks to a strategy that kept him out five laps longer for his sole stop than the Williams and let him rejoin ahead. The final podium position would thus become a duel between Bottas and his Finnish compatriot Räikkönen... but there was an interloper.

On lap 12 the Safety Car was deployed once more, following a heavy crash for Romain Grosjean. He'd lost control of his Lotus at Turn 3, at 160mph, and connected hard with the barriers, breaking his seat in the impact. He was okay, but it took time to clear up the incident.

At that moment, four drivers decided to make their mandatory stop: Sergio Pérez, Daniel Ricciardo, Carlos Sainz and Jenson Button all changed from supersofts to softs. One lap later, Fernando Alonso pitted, switching from the soft to the supersoft. Their plan was to run the final 40 or so laps without stopping again.

As the frontrunners eventually made their own regular stops later in the race, Pérez found himself in third. His challenge: keep the faster, gaining Williams and Ferrari behind him. This he did with consummate skill, but by lap 52, there was simply no grip left on his hard-worked Pirellis to allow him to repel his aggressors.

Bottas passed Pérez into Turn 13 and Räikkönen nipped through too. A podium finish for Force India seemed to have been snatched away. But on the final lap, Räikkönen lunged at Turn 4, locking up his front right, understeering into Bottas and taking the Williams out of the race. Suspension deranged, Räikkönen was a sitting duck for Pérez, who reclaimed P3.

Other beneficiaries were Felipe Massa, who inherited fourth, and Daniil Kvyat, who took fifth for Red Bull, his team-mate Ricciardo, an earlier contender for third, having retired on lap 47 with suspension trouble. Sauber's Felipe Nasr was sixth, ahead of Lotus's Pastor Maldonado.

With Räikkönen penalised to P8, McLaren were set for a double points finish, but Alonso received a five-second penalty for exceeding track limits, so Max Verstappen took the remaining point. His Toro Rosso team-mate Carlos Sainz had impressed, and was due to bag P7, but retired with a failed left-front brake disc, caused by overheating due to blocked brake ducts.

No such troubles afflicted Hamilton, serene in the lead. With a 66-point buffer to Vettel in the drivers' championship, he left Sochi looking all set for an Austin coronation. **F1**

The story of the race

V Nico Rosberg keeps ahead of Mercedes team-mate Lewis Hamilton into Turn 1

SOCHI



> Verstappen is hit by a spinning Hülkenberg who is struck by Ericsson: the latter two are out of the race



> The Safety Car peels in and Bottas passes Räikkönen for third place at the restart



> The Safety Car is deployed on lap 12 after Grosjean strikes the barriers at Turn 3



< On lap 6 Rosberg runs wide with a sticking throttle and Hamilton takes the lead. Rosberg retires



> During the second Safety Car period, Pérez, Ricciardo, Sainz and Button all pit



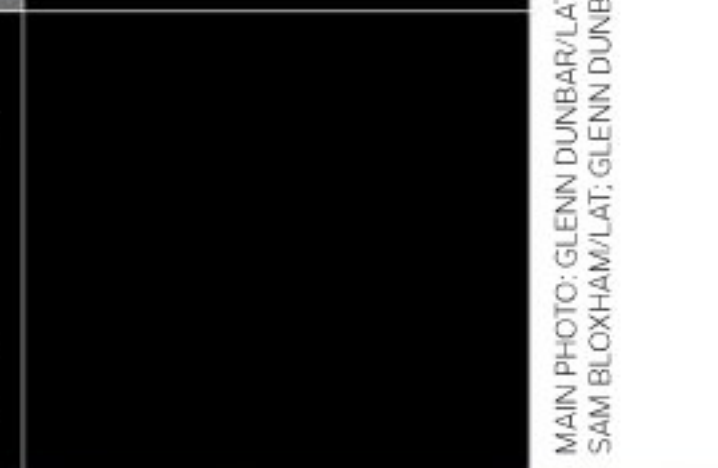
< On the restart, Vettel passes his Ferrari team-mate Räikkönen to take third place



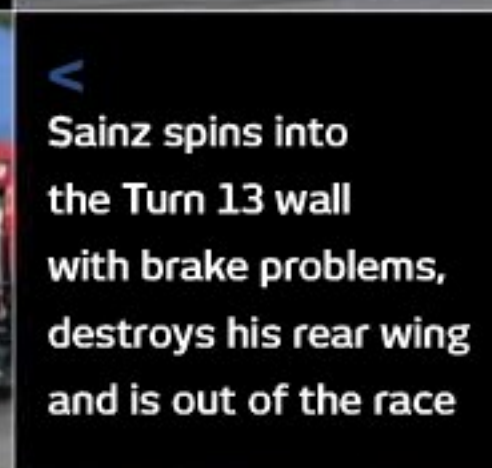
< Sainz spins into the Turn 13 wall with brake problems, destroys his rear wing and is out of the race



V On old tyres Pérez can no longer hold onto third and concedes to Bottas and Räikkönen on the penultimate lap



V On the final lap, Räikkönen attacks Bottas into Turn 4 taking the Williams out of the race



> Lewis Hamilton crosses the line to win his 42nd grand prix from Vettel, while Pérez inherits third



> Verstappen is hit by a spinning Hülkenberg who is struck by Ericsson: the latter two are out of the race



< On lap 6 Rosberg runs wide with a sticking throttle and Hamilton takes the lead. Rosberg retires



MAIN PHOTO: GLENN DUNBAR/LAT; ILLUSTRATION: ALAN ELDRIDGE; INSETS: ALASTAIR STALEY/LAT; SAM BLOXHAM/LAT; GLENN DUNBAR/LAT; STEVEN TEE/LAT; ZAK MAUGER/LAT

Russian Grand Prix stats

The lowdown on everything you need to know from the weekend at Sochi...

THE GRID

	1. ROSBERG MERCEDES 1min 37.113secs Q3		2. HAMILTON MERCEDES 1min 37.433secs Q3
	3. BOTTAS WILLIAMS 1min 37.912secs Q3		4. VETTEL FERRARI 1min 37.965secs Q3
	5. RÄIKKÖNEN FERRARI 1min 38.348secs Q3		6. HÜLKENBERG FORCE INDIA 1min 38.659secs Q3
	7. PÉREZ FORCE INDIA 1min 38.691secs Q3		8. GROSJEAN LOTUS 1min 38.787secs Q3
	9. VERSTAPPEN TORO ROSSO 1min 38.924secs Q3		10. RICCIARDO RED BULL 1min 39.728secs Q3
	11. KVIAT RED BULL 1min 39.214secs Q2		12. NASR SAUBER 1min 39.323secs Q2
	13. BUTTON McLAREN 1min 39.763secs Q2		14. MALDONADO LOTUS 1min 39.811secs Q2
	15. MASSA WILLIAMS 1min 39.895secs Q2		16. ERICSSON SAUBER 1min 40.660secs Q1
	17. STEVENS MANOR 1min 43.693secs Q1		18. MERHI* MANOR 1min 43.804secs Q1
	19. ALONSO** McLAREN 1min 40.144secs Q1		20. SAINZ*** TORO ROSSO NO TIME IN Q1

*20-place grid penalty for first-time use of fifth power-unit element **Ten-place and 25-place grid penalties for first-time use of tenth, and then tenth, ninth and seventh power unit elements ***Permitted to start by stewards and given 20-place grid penalty for first time seventh and sixth power unit used and change of gearbox

THE RACE



THE RESULTS (53 LAPS)

1st	Lewis Hamilton Mercedes	1h 37m 11.024s
2nd	Sebastian Vettel Ferrari	+5.953s
3rd	Sergio Pérez Force India	+28.918s
4th	Felipe Massa Williams	+38.831s
5th	Daniil Kvyat Red Bull	+47.566s
6th	Felipe Nasr Sauber	+56.508s
7th	Pastor Maldonado Lotus	+61.088s
8th	Kimi Räikkönen Ferrari	+72.358s*
9th	Jenson Button McLaren	+79.467s
10th	Max Verstappen Toro Rosso	+88.424s
11th	Fernando Alonso McLaren	+91.210s**
12th	Valtteri Bottas Williams	+1 lap/collision
13th	Roberto Merhi Manor	+1 lap
14th	Will Stevens Manor	+2 laps
15th	Daniel Ricciardo Red Bull	+6 laps/suspension

Retirements

Carlos Sainz Toro Rosso	45 laps – brakes***
Romain Grosjean Lotus	11 laps – spin
Nico Rosberg Mercedes	7 laps – throttle
Nico Hülkenberg Force India	0 laps – collision
Marcus Ericsson Sauber	0 laps – collision

*Includes 30-second penalty for causing a collision **Includes 5-second penalty for exceeding track limits ***Includes 5-second penalty for crossing line at pit entry

THROUGH SPEED TRAP (QUALIFYING)



Fastest: Felipe Massa, 207.79mph



Slowest: Roberto Merhi, 194.86mph

TYRE COMPOUNDS USED



Supersoft

Soft

Intermediate

Wet

CLIMATE

Overcast

18°C

TRACK TEMP

27°C

FASTEST LAP



Sebastian Vettel, lap 51, 1min 40.071secs

FASTEST PITSTOP



Sebastian Vettel, 29.367secs (entry to exit)

DRIVERS' STANDINGS

1st	Lewis Hamilton Mercedes	302pts
2nd	Sebastian Vettel Ferrari	236pts
3rd	Nico Rosberg Mercedes	229pts
4th	Kimi Räikkönen Ferrari	123pts
5th	Valtteri Bottas Williams	111pts
6th	Felipe Massa Williams	109pts
7th	Daniil Kvyat Red Bull	76pts
8th	Daniel Ricciardo Red Bull	73pts
9th	Sergio Pérez Force India	54pts
10th	Romain Grosjean Lotus	44pts
11th	Nico Hülkenberg Force India	38pts
12th	Max Verstappen Toro Rosso	33pts
13th	Felipe Nasr Sauber	25pts
14th	Pastor Maldonado Lotus	22pts
15th	Carlos Sainz Toro Rosso	12pts
16th	Fernando Alonso McLaren	11pts
17th	Marcus Ericsson Sauber	9pts
18th	Jenson Button McLaren	8pts
19th	Roberto Merhi Manor	0pts
20th	Will Stevens Manor	0pts
21st	Alexander Rossi Manor	0pts
22nd	Kevin Magnussen McLaren	0pts

CONSTRUCTORS' STANDINGS

1st Mercedes	531pts	9th McLaren	19pts
2nd Ferrari	359pts	10th Manor	0pts
3rd Williams	220pts		
4th Red Bull	149pts		
5th Force India	92pts		
6th Lotus	66pts		
7th Toro Rosso	45pts		
8th Sauber	34pts		



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RACE DEBRIEF

by Anthony Rowlinson

US Grand Prix

25.10.2015 / Circuit of The Americas



Hamilton's Austin power play

In which Lewis asserted the supremacy of man and machine to take the win and his third world title

Unforgettable: how else to describe the 2015 US GP? Historic Hamilton, now Britain's most successful driver, with 43 wins and a third world title; a breathtaking race with three leaders; blink-and-you'll-miss-it action from lights to flag; a weekend of meteorological extremes; and a vivid exposition of the fine line between success and failure in elite sport.

In the middle stage of the race, the day seemed to be Nico Rosberg's. He had started from pole and looked set to win and extend the title fight to Mexico. But multiple Safety Car periods foiled his escape and allowed Hamilton back onto his tail and into the endgame. A lick of wheelspin exiting T15 on lap 48 was all it took. Hamilton needed no second invitation and he was through and gone, the crown within his grasp.

Rosberg could match Hamilton's late lead pace but he couldn't catch him, and with Ferrari's Sebastian Vettel chasing in third the world title was decided, barring further incident.

They crossed the line in that order, only 3.4 seconds covering the lead trio: to Hamilton the spoils; to Rosberg the most crushing defeat. And to Vettel a podium after a fighting drive and the prospect of a starring role in a tantalising 2016 battle between him and Hamilton – between silver and scarlet.

Yet more remarkable than any of this: the 2015 US GP very nearly didn't happen. Qualifying was abandoned on Saturday, owing to the truly biblical storms that had drenched Austin for much of the previous 48 hours. Given early Sunday's continued Stygian murk, the question was: would *any* track activity take place?

In the event, qualifying did start, at 9am, but only after desperate efforts had been made to clear at least some standing water from the track surface with a jet-powered track blaster of the kind rarely seen outside US oval races.

It was dark and treacherous (Carlos Sainz spun and caused a red flag after just five minutes) but

the 'usual suspects' soon emerged, led on this day by Rosberg. His 1m 56.824s would be the fastest Q2 time, followed by Hamilton, Ricciardo, Kvyat and Vettel. This became the grid order as yet more heavy rain prompted a definitive red flag before Q3. Engine-change penalties for both Ferraris would, though, mean a P13 start for Vettel and P18 for Kimi Räikkönen.

Come 2pm and, miracle of miracles, Austin was drying out. The race would go ahead with no need, even, for a Safety Car start. They managed to blast away, all on intermediates, without incident, but on this most turbulent of weekends there was no chance of the status quo remaining unchanged.

Hamilton attacked Rosberg on the inside into the uphill Turn 1 and, understeering away from the apex, leaned on his team-mate hard enough to push him beyond the track limits in avoidance, after light contact between Lewis' front-right and Nico's front-left. Rosberg later complained about

Hamilton's "extreme aggression", but the deed was done. Hamilton scarpered, Rosberg mugged and then immediately swamped by both Red Bulls and the Force India of Sergio Pérez.

It set the tone for a thrilling, unpredictable 56 laps of close dicing throughout the field, with the two Dans major early players in conditions that allowed them to take full advantage of their RB11s' downforce and chassis balance.

Kvyat, in P2, set fastest lap on his third tour, and tracked the champion closely through lap 5. He took a dive for the lead into Turn 1 at the start of lap 6, briefly getting ahead of Hamilton, only for the move to be annulled by the calling of a Virtual Safety Car Period to clear circuit detritus. This gave Rosberg, in P4, a chance to close up on the Red Bulls and he passed them both in short order on the restart. Ricciardo was having none of that and sailed clean up the inside of Rosberg into T1, as Nico locked a front wheel.

Now clear in P2 to have a run at Hamilton, Ricciardo owned the next phase of the race. In that fabulous-to-watch, energised style, he chased down Hamilton and passed him for the lead on lap 14, then set fastest lap at 1m 55.362s. Had the ambients remained like this, it seemed possible that Red Bull could have scored an against-the-odds one-two in Texas, for both Dans were driving with considerable panache, unperturbed by marginal, unpredictable grip.

Thing is, the track was drying, taking the intermediates beyond their sweet spot and easing the race back towards those cars with this year's must-have go-faster components: Mercedes or factory Ferrari power units. Slicks were needed.

Hamilton came in first of the big hitters, followed by Rosberg. Vettel also stopped for softs, and charging up from P15 announced himself as a threat with a fastest lap of 1m 47.381s. He was still in championship contention and in no mood to give up his title shot without a fight.

By now, we had entered the 'Rosberg' phase of the race – at one point he was ten seconds clear and flying. But a combination of Safety Cars (physical and Virtual) negated his advantage. The Red Bulls, meanwhile, had both been eliminated from contention: Kvyat with a clumsy crash; Ricciardo after an assault from Hülkenberg.

By lap 47, with Vettel having restored Ferrari supremacy in third over a deeply impressive Max Verstappen (who would finish a brilliant fourth), we were left with a Rosberg-Hamilton-Vettel running order. Surely Nico would hang on?

No! That fated T15 exit on lap 48 was, in effect, his final capitulation in the 2015 world championship tussle. Hamilton raced through in pursuit of his destiny and despite Vettel's last-gasp charge to sneak P2 from Rosberg and keep the title chase alive for another seven days, it was all over. **F1**

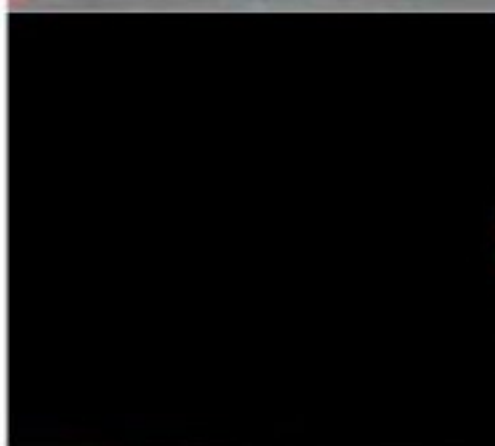
The story of the race

V Hamilton passes Rosberg at T1 after touching wheels. Bottas and Alonso spin after contact

CIRCUIT OF THE AMERICAS



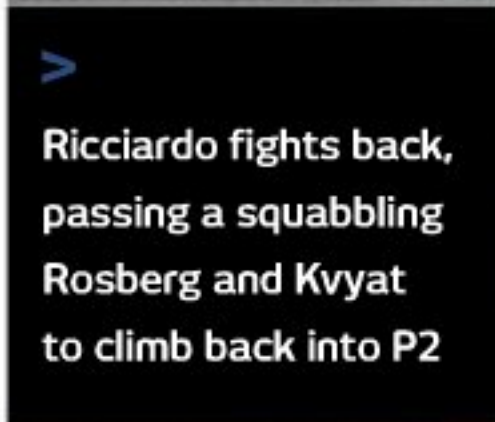
> Bottas pits his Williams and slicks are fitted: his experiment costs him 30s per lap



< Kvyat noses ahead of Hamilton, but his move is undermined by the deployment of the Virtual Safety Car

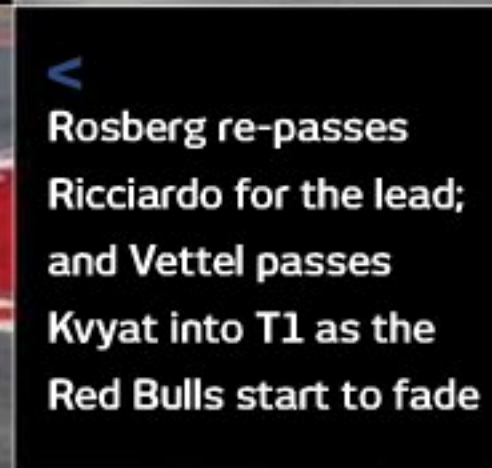


< After the first VSC, Rosberg passes the Red Bulls of Kvyat and Ricciardo to reassert a Mercedes one-two



> Ricciardo fights back, passing a squabbling Rosberg and Kvyat to climb back into P2

> Hamilton pits on lap 18 due to shot rears and prompts a flurry of copy-cat stops



< Rosberg re-passes Ricciardo for the lead; and Vettel passes Kvyat into T1 as the Red Bulls start to fade



< Another shunt puts Kvyat out of the race and prompts a fourth and final Safety Car/VSC



^ By lap 48, Rosberg leads from Hamilton and Vettel, but at T15 he makes an error and lets Hamilton past

> Lewis Hamilton takes the win and the 2015 title to become only the second British three-time champion



MAIN PHOTO: ANDREW FERRARO/LAT; ILLUSTRATION: ALAN ELDREDGE; INSETS: STEVEN TEE/LAT; ALASTAIR STALEY/LAT; ANDREW FERRARO/LAT; ANDY HONE/LAT; CHARLES COATES/LAT; KEITH SUTTON/SUTTON IMAGES;

US Grand Prix stats

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

THE GRID

	1. ROSBERG MERCEDES 1min 56.824secs Q2
	2. HAMILTON MERCEDES 1min 56.929secs Q2
	3. RICCIARDO RED BULL 1min 57.969secs Q2
	4. KVIAT RED BULL 1min 58.434secs Q2
	5. PÉREZ FORCE INDIA 1min 59.210secs Q2
	6. HÜLKENBERG FORCE INDIA 1min 59.333secs Q2
	7. MASSA WILLIAMS 1min 59.999secs Q2
	8. VERSTAPPEN TORO ROSSO 2min 00.199secs Q2
	9. ALONSO McLAREN 2min 00.265secs Q2
	10. GROSJEAN LOTUS 2min 00.595secs Q2
	11. BUTTON McLAREN 2min 01.193secs Q2
	12. MALDONADO LOTUS 2min 01.604secs Q2
	13. VETTEL* FERRARI 1min 58.596secs Q2
	14. ERICSSON SAUBER 2min 02.212secs Q1
	15. NASR SAUBER 2min 03.194secs Q1
	16. BOTTAS** WILLIAMS 2min 00.334secs Q2
	17. ROSSI MANOR 2min 04.176secs Q1
	18. RÄIKKÖNEN*** FERRARI 2min 04.176secs Q2
	19. STEVENS**** MANOR 2min 04.526secs Q1
	20. SAINZ***** TORO ROSSO 2min 07.304secs Q1

*Ten-place grid penalty for additional power unit element used **Five-place grid penalty for replacement gearbox ***Ten-place grid penalty for additional power-unit element used ****20-place grid penalty for additional power unit elements used *****Outside 107% qualifying criteria but permitted to start by the stewards

THE RACE



THE RESULTS (56 LAPS)

1st	Lewis Hamilton	Mercedes	1h 50m 52.703s
2nd	Nico Rosberg	Mercedes	+2.850s
3rd	Sebastian Vettel	Ferrari	+3.381s
4th	Max Verstappen	Toro Rosso	+22.359s
5th	Sergio Pérez	Force India	+24.413s
6th	Jenson Button	McLaren	+28.058s
7th	Carlos Sainz	Toro Rosso	+30.619s*
8th	Pastor Maldonado	Lotus	+32.273s
9th	Felipe Nasr	Sauber	+40.257s
10th	Daniel Ricciardo	Red Bull	+53.371s
11th	Fernando Alonso	McLaren	+54.816s
12th	Alexander Rossi	Manor	+75.277s

Retirements

Daniil Kvyat	Red Bull	41 laps – spin
Nico Hülkenberg	Force India	35 laps – collision
Marcus Ericsson	Sauber	25 laps – electrical
Kimi Räikkönen	Ferrari	25 laps – spin
Felipe Massa	Williams	23 laps – suspension
Romain Grosjean	Lotus	10 laps – brakes
Valtteri Bottas	Williams	5 laps – suspension
Will Stevens	Manor	1 lap – collision

*Includes five-second penalty for speeding in the pitlane

THROUGH SPEED TRAP (QUALIFYING)



Fastest: Lewis Hamilton, 194.99mph



Slowest: Carlos Sainz, 172.55mph

TYRE COMPOUNDS USED



Soft



Medium



Intermediate



Wet

CLIMATE

Overcast, damp/dry 17°C

TRACK TEMP

19°C

FASTEST LAP



Nico Rosberg, lap 49, 1min 40.666secs

FASTEST PITSTOP



Lewis Hamilton, 24.088secs (entry to exit)

DRIVERS' STANDINGS

1st	Lewis Hamilton	Mercedes	327pts
2nd	Sebastian Vettel	Ferrari	251pts
3rd	Nico Rosberg	Mercedes	247pts
4th	Kimi Räikkönen	Ferrari	123pts
5th	Valtteri Bottas	Williams	111pts
6th	Felipe Massa	Williams	109pts
7th	Daniil Kvyat	Red Bull	76pts
8th	Daniel Ricciardo	Red Bull	74pts
9th	Sergio Pérez	Force India	64pts
10th	Max Verstappen	Toro Rosso	45pts
11th	Romain Grosjean	Lotus	44pts
12th	Nico Hülkenberg	Force India	38pts
13th	Felipe Nasr	Sauber	27pts
14th	Pastor Maldonado	Lotus	26pts
15th	Carlos Sainz	Toro Rosso	18pts
16th	Jenson Button	McLaren	16pts
17th	Fernando Alonso	McLaren	11pts
18th	Marcus Ericsson	Sauber	9pts
19th	Roberto Merhi	Manor	0pts
20th	Alexander Rossi	Manor	0pts
21st	Will Stevens	Manor	0pts
22nd	Kevin Magnussen	McLaren	0pts

CONSTRUCTORS' STANDINGS

1st	Mercedes	574pts	9th	McLaren	27pts
2nd	Ferrari	374pts	10th	Manor	0pts
3rd	Williams	220pts			
4th	Red Bull	150pts			
5th	Force India	102pts			
6th	Lotus	70pts			
7th	Toro Rosso	63pts			
8th	Sauber	36pts			



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RACE DEBRIEF

by James Roberts

Mexican Grand Prix

01.11.2015 / Autódromo Hermanos Rodríguez



Day of the dead brings Rosberg to life

Crushed in Austin by an error that handed Hamilton both title and win, Rosberg was flawless in Mexico

Until he'd rounded the 71st and final lap of the Mexican GP, you needed to go back four months to find the last time Nico Rosberg had won a grand prix. It was in Austria on 21 June. Much has happened since then, including the mistake one week ago that meant the title was won by his Mercedes team-mate Lewis Hamilton. But at a packed Autódromo Hermanos Rodríguez during the annual festival 'the day of the dead', a reinvigorated Rosberg found himself once more on top of the podium.

The first Mexican Grand Prix in 23 years was a remarkable engineering test for every team up and down the shiny new pitlane. The rarefied atmosphere of Mexico City (at 2,250m above sea level) had a direct effect on downforce, the cooling of both brakes and engines, and power.

The thin air at the Tilke-tweaked circuit meant there was very low aerodynamic efficiency with a lift over drag ratio of around 1.5. This meant teams ran steep, Monaco-style wings that only created Monza levels of downforce. The minimal

air resistance created less drag, so on the main straight speeds topped a whopping 227mph.

But the increased top speeds put extra strain on the brakes, and the reduced air pressure had a significant effect on cooling. Additional ducts had to be cut around the brakes and engine covers to help keep down temperatures, but that had the knock-on effect of reducing aerodynamic performance. The upshot of that was reduced grip, on a surface that was already very slippery due to the freshly laid asphalt. All in all, the conditions at the high altitude Mexican venue gave the teams a bit of headache.

On Sunday afternoon all 134,000 spectators were eager to see what would happen on the 900m dash down to Turn 1. From pole, Rosberg made a good start from the cleaner right-hand side, and immediately moved across to cover the inside line for the first right-hander. Hamilton was right in his wheel tracks, but couldn't find a way past at the first corner. That was arguably his best chance of the race, since from then on,

Rosberg had his team-mate covered, always by just over a second and out of DRS range.

At Turn 1, just behind the top two, there was an incident. Red Bull's Daniel Ricciardo attempted to carve his way past Sebastian Vettel, but as the Ferrari narrowed the gap there was no option but for the Red Bull to clatter into the SF15-T, causing Vettel to suffer a right-rear puncture. Vettel tumbled down the order and limped to the pits. The stewards investigated, but decided not to take action.

Things only got worse for Vettel. He spun at Turn 7 on lap 17, flat-spotting his medium compound tyres. And 34 laps later he lost it again at the same corner and smashed into the barriers, necessitating a Safety Car appearance.

"There was nothing wrong with the car, I went in at the same speed and suddenly lost it," explained Vettel. "In the end it was my mistake."

His team-mate, Kimi Räikkönen, was also having a difficult day, compounding a pretty miserable weekend. After starting 19th thanks to

a 35-place grid penalty (Jenson Button was in P20, with a 70-place grid penalty), Kimi was working his way back through the field and was up to sixth when Williams' Valtteri Bottas started to breathe down his neck.

As they rounded Turn 4 on lap 21, Kimi defended the inside, while Bottas gave him room around the outside, knowing he'd have the inside line for Turn 5. Räikkönen took his line for the corner and contact was inevitable, the Ferrari's right-rear suspension snapping as it struck Bottas's left-front. Incredibly, the Williams was undamaged and able to continue. This was seemingly payback for their coming-together in Sochi, when Bottas lost out on a podium on the final lap of the race.

Post-race, Kimi was asked whether the time had come for them to sit down with a beer and clear the air over their on-track ructions. "I don't think that would help anyone," said Kimi dryly. "Maybe he [Bottas] feels better now for what happened in Russia, but I have nothing against anyone. This is racing, I lost a wheel and retired. It's been a shit weekend, but we go to the next one and hopefully we can turn things around."

Bottas was able to continue and found himself battling the Red Bulls for the final podium spot. Williams had made the earliest stop of the race on lap 8 to switch Valtteri from the softs to the mediums, and according to Williams' engineering chief, Rob Smedley, the idea was to race to the end without stopping again – but the Safety Car that emerged following Vettel's shunt put paid to that.

When the Safety Car peeled in, Bottas (in fourth, ahead of Ricciardo) was able to use the power of his Mercedes to re-pass Daniil Kvyat on the restart and claim third. Kvyat finished fourth, in what Red Bull team principal Christian Horner called "his best race of the year".

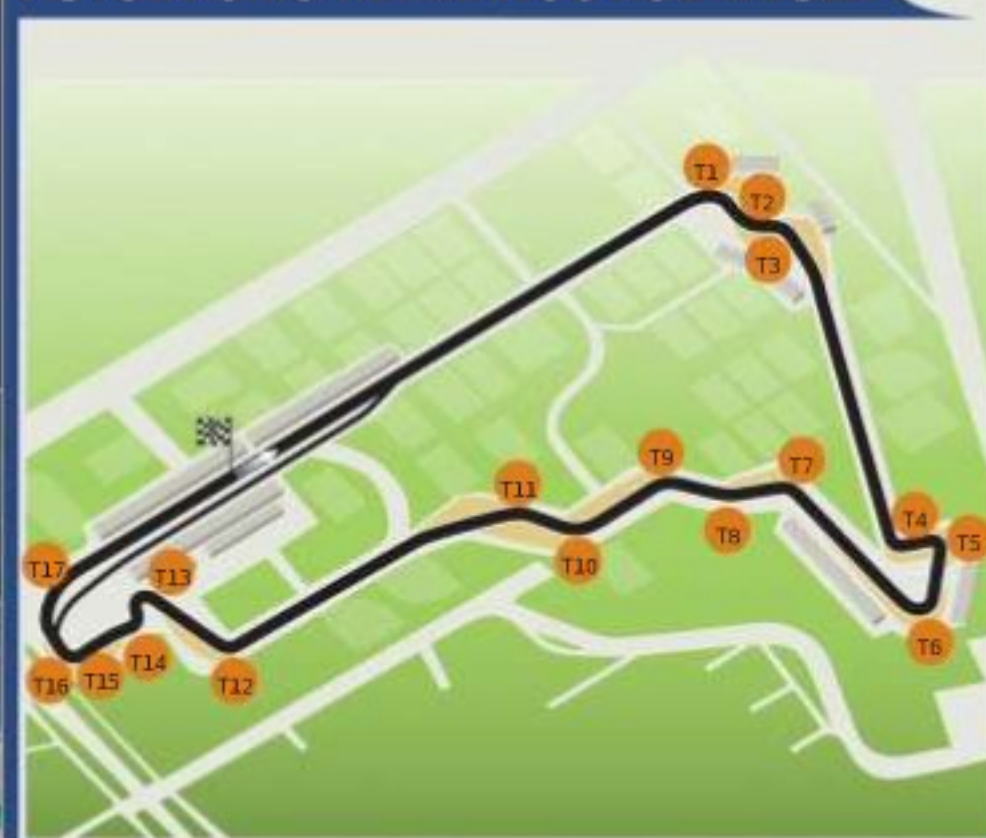
Bottas couldn't challenge the two Mercedes, who were on their way to their tenth one-two of 2015, but all was not as serene as it appeared. The team decided to switch to a two-stopper mid-way through the race and Rosberg pitted for fresh primes on lap 46, while Hamilton was asked to come in the following lap. But Lewis questioned the amount of wear on the tyres, probably thinking he could snatch the win from his team-mate if he stayed out. Both Mercedes had driven only 20 laps on their medium tyres, but it was decided that there was enough of a gap to third to give them a safety net and have fresh rubber. Hamilton dutifully pitted, but the tyre swap was far from a dead-cert: Sergio Pérez, on a one-stopper, managed 53 laps on his primes.

So next stop Brazil, where Lewis has never won an F1 grand prix. Won't it be intriguing if the newly anointed world champion is beaten as resolutely there as he was here in Mexico? **F1**

The story of the race

V Nico Rosberg leads away from pole position into Turn 1

AUTÓDROMO HERMANOS RODRÍGUEZ



> Daniel Ricciardo and Sebastian Vettel make contact at Turn 1 and Vettel picks up a puncture



V Valtteri Bottas is first of the frontrunners to pit, switching from soft to medium tyres on lap 8

V Sebastian Vettel's luck worsens as he spins his Ferrari at Turn 7 on lap 17



> On lap 2, Bottas challenges Räikkönen for sixth and they collide at T5, forcing Kimi into retirement



< Four laps on, Rosberg pits from the lead, followed by his team-mate Lewis Hamilton

> The Mercedes duo pit again for fresh medium tyres on lap 46 (Rosberg) and lap 48 (Hamilton)



> Vettel loses control of his Ferrari again at Turn 7 on lap 51, hits the wall and the Safety Car is deployed



< When the Safety Car returns to the pits, Bottas passes Kvyat for third at the restart into Turn 1

> After 71 laps, Nico Rosberg wins the race from Hamilton by 1.954 seconds, with Bottas in third



Mexican Grand Prix stats

All you need to know from the weekend at the Autódromo Hermanos Rodríguez...

THE GRID



1. ROSBERG

MERCEDES

1min 19.480secs Q3



2. HAMILTON

MERCEDES

1min 19.668secs Q3



3. VETTEL

FERRARI

1min 19.850secs Q3



5. RICCIARDO

RED BULL

1min 20.399secs Q3



4. KVIAT

RED BULL

1min 20.398secs Q3



6. BOTTAS

WILLIAMS

1min 20.448secs Q3



8. VERSTAPPEN

TORO ROSSO

1min 20.710secs Q3



10. HÜLKENBERG

FORCE INDIA

1min 20.788secs Q3



11. SAINZ

TORO ROSSO

1min 20.942secs Q2



13. MALDONADO

LOTUS

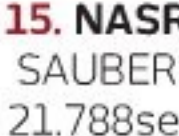
1min 21.261secs Q2



14. ERICSSON

SAUBER

1min 21.544secs Q2



15. NASR

SAUBER

1min 21.788secs Q1



16. ROSSI

MANOR MARUSSIA

1min 24.136secs Q1



17. STEVENS

MANOR MARUSSIA

1min 24.386secs Q1



19. RÄIKKÖNEN**

FERRARI

1min 22.494secs Q2



18. ALONSO*

McLAREN

1min 21.779secs Q1



20. BUTTON***

McLAREN

NO TIME IN Q1

*15-place grid penalty for use of additional power-unit element used and replacement gearbox
**35-place grid penalty for replacement gearbox and use of additional power-unit elements
***70-place grid penalty for use of additional power-unit elements

THE RACE



THE RESULTS (71 LAPS)

1st	Nico Rosberg	Mercedes	1h 42m 35.038s
2nd	Lewis Hamilton	Mercedes	+1.954s
3rd	Valtteri Bottas	Williams	+14.592s
4th	Daniil Kvyat	Red Bull	+16.572s
5th	Daniel Ricciardo	Red Bull	+19.682s
6th	Felipe Massa	Williams	+21.493s
7th	Nico Hülkenberg	Force India	+25.860s
8th	Sergio Pérez	Force India	+34.343s
9th	Max Verstappen	Toro Rosso	+35.229s
10th	Romain Grosjean	Lotus	+37.934s
11th	Pastor Maldonado	Lotus	+38.538s
12th	Marcus Ericsson	Sauber	+40.180s
13th	Carlos Sainz	Toro Rosso	+48.772s
14th	Jenson Button	McLaren	+49.214s
15th	Alexander Rossi	Manor	+2 laps
16th	Will Stevens	Manor	+2 laps

Retirements

Felipe Nasr	Sauber	57 laps – brakes
Sebastian Vettel	Ferrari	50 laps – accident
Kimi Räikkönen	Ferrari	21 laps – accident
Fernando Alonso	McLaren	1 lap – engine

THROUGH SPEED TRAP (QUALIFYING)



Fastest: Felipe Massa, 226.37mph



Slowest: Alexander Rossi, 205.86mph

TYRE COMPOUNDS USED



Soft



Medium



Intermediate



Wet

CLIMATE

Sunny

22°C

TRACK TEMP

54°C

FASTEST LAP



Nico Rosberg, lap 67, 1min 20.521secs

FASTEST PITSTOP



Sebastian Vettel, 22.156secs (entry to exit)

DRIVERS' STANDINGS

1st	Lewis Hamilton	Mercedes	345pts
2nd	Nico Rosberg	Mercedes	272pts
3rd	Sebastian Vettel	Ferrari	251pts
4th	Valtteri Bottas	Williams	126pts
5th	Kimi Räikkönen	Ferrari	123pts
6th	Felipe Massa	Williams	117pts
7th	Daniil Kvyat	Red Bull	88pts
8th	Daniel Ricciardo	Red Bull	84pts
9th	Sergio Pérez	Force India	68pts
10th	Max Verstappen	Toro Rosso	47pts
11th	Romain Grosjean	Lotus	45pts
12th	Nico Hülkenberg	Force India	44pts
13th	Felipe Nasr	Sauber	27pts
14th	Pastor Maldonado	Lotus	26pts
15th	Carlos Sainz	Toro Rosso	18pts
16th	Jenson Button	McLaren	16pts
17th	Fernando Alonso	McLaren	11pts
18th	Marcus Ericsson	Sauber	9pts
19th	Roberto Merhi	Manor	0pts
20th	Alexander Rossi	Manor	0pts
21st	Will Stevens	Manor	0pts
22nd	Kevin Magnussen	McLaren	0pts

CONSTRUCTORS' STANDINGS

1st	Mercedes	617pts	9th	McLaren	27pts
2nd	Ferrari	374pts	10th	Manor	0pts
3rd	Williams	243pts			
4th	Red Bull	172pts			
5th	Force India	112pts			
6th	Lotus	71pts			
7th	Toro Rosso	65pts			
8th	Sauber	36pts			



For comprehensive F1 statistics visit www.forix.com

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<http://www.scuderiaferrariwatches.co.uk/>

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A Malaysia **B** Monaco **C** Hungary

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The Brazilian GP preview

Round 18 / 13-15 November 2015 / Interlagos, Brazil



BRAZILIAN GP RACE DATA

Circuit Name Autódromo José Carlos Pace
First GP 1973
F1 races held 32
Circuit length 2.677 miles
Race distance 190.082 miles (71 laps)
Direction Anticlockwise
Winners from pole 12

TV TIMETABLE (UK TIME)

Friday 13 November
Practice 1 12.00-13.30
Practice 2 16.00-17.30
Saturday 14 November
Practice 3 13.00-14.00
Qualifying 16.00-17.00
Sunday 15 November
Race 16.00
Live coverage BBC and Sky Sports F1

RACE NOTES: THIS PENULTIMATE GP IS AN OLD-SCHOOL CLASSIC

Interlagos has a little bit of everything: tricky sections, flat-out straights, a bumpy surface – and an incredible atmosphere

Here's a rare thing: a Formula 1 circuit on which neither Lewis Hamilton nor Fernando Alonso have won a race. But while Alonso isn't likely to be challenging for victory at Interlagos this year, Hamilton will certainly want to get his revenge on Nico Rosberg after spinning in an attempt to overhaul his team-mate last season.

What's particularly surprising about the absence of Hamilton and Alonso on the list of Brazilian GP winners is that Interlagos is the sort of old-fashioned circuit – bumpy, with flat-out blasts and tricky technical sections – on which both thrive, especially given the frequency of rain. One driver who tends to do well here is home hero Felipe Massa, who has collected two wins and three other podium finishes. Sebastian Vettel has also won at Interlagos twice. **F1**



Felipe Massa: two wins and three podiums on home turf – and counting

PACE NOTES: THE KEYS TO SUCCESS

Compromise is key

Two sectors are dominated by long straights, split by a twisty central section. So they can overtake at the end of the straight, cars are often set up for top speed at the expense of ideal lap time.

Rough – but not tough

Despite a historically bumpy track surface, the predominance of slower corners means tyre wear is low here. Expect softer compound tyres.

Mind the bumps

Those bumps make it hard to find traction, and increase the physical toll on the drivers, which is already heightened by the anticlockwise layout.

Key corner: the Senna S

At the end of the main straight, this downhill sequence (Turns 1-3) is the best passing spot and a common place for drivers to trip over each other.

WHAT HAPPENED IN LAST YEAR'S RACE...?

Winner Nico Rosberg
Margin of victory 1.457s
Fastest lap 1m 13.555s, L Hamilton
Safety Cars 0
Race leaders 3
Pitstops 52
Overtakes 35



Nico Rosberg kept his championship hopes alive with a clear victory, while his Mercedes team-mate Lewis Hamilton spun in his attempts to catch him. It was Brazilian racer Felipe Massa who claimed the third spot on the podium, despite having been hampered by a five-second stop-go penalty for speeding in the pitlane.

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The Abu Dhabi GP preview

Round 19 / 27-29 November 2015 / Yas Marina, Abu Dhabi



ABU DHABI GP RACE DATA

Circuit Name Yas Marina Circuit
First GP 2009
F1 races held 6
Circuit length 3.451 miles
Race distance 189.738 miles (55 laps)
Direction Anticlockwise
Winners from pole 1

TV TIMETABLE (UK TIME)

Friday 27 November
Practice 1 09.00-10.30
Practice 2 13.00-14.30
Saturday 28 November
Practice 3 10.00-11.00
Qualifying 13.00-14.00
Sunday 29 November
Race 13.00
Live coverage BBC and Sky Sports F1

RACE NOTES: THE SEASON ENDS UNDER COVER OF DARKNESS

Whether the championship is decided here or not, tensions will be running high as teams try to eke out their engine allocation

Abu Dhabi is now established as the place where the Formula 1 season ends: this will be the fourth time (out of its seven runnings) that Yas Marina has hosted the finale. And thankfully, there are no double points to worry about this year.

Even without extra points on offer, drivers always want to end the year on a high. And this is a tough place to make that happen: the track is smooth, but the multitude of corners makes car setup difficult and the high fuel consumption and temperatures put pressure on power units that will be nearing the end of their lifespan.

Just three drivers have won here: Sebastian Vettel has a hat trick; Lewis Hamilton has two (including last year's title-clinching triumph), while Kimi Räikkönen took victory here for Lotus in 2012. 🏆



Sebastian Vettel: three times a winner at Abu Dhabi's Yas Marina Circuit

PACE NOTES: THE KEYS TO SUCCESS

Corner combos

Yas Marina is all about corner sequences, with plenty of direction changes that require a chassis to have rapid response and mechanical balance.

Into the night

The race starts late afternoon and ends in the dark, so temperatures fall throughout, altering race strategies.

Keeping it smooth

The smooth track surface means tyre wear is low, although the variety of corner types means they have to meet a wide range of demands.

Key corner

The Turn 7 hairpin isn't great for overtaking because of the tight chicane on entry, but getting good traction out of the bend is vital for exploiting DRS down the following long straight.

WHAT HAPPENED IN LAST YEAR'S RACE...?

Winner Lewis Hamilton
Margin of victory 2.576s
Fastest lap 1m 44.496s, D Ricciardo
Safety Cars 0
Race leaders 3
Pitstops 41
Overtakes 30



Lewis Hamilton clinched his second world championship with victory in the double-points season finale. Nico Rosberg was running second behind his team-mate before he was slowed by an ERS failure, eventually finishing 14th. Behind Hamilton, the Williams duo of Felipe Massa and Valtteri Bottas completed the podium.

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Verstappen and Carlos Sainz when their Toro Rossos are hurtling past you at speeds approaching 200mph. The different colours of the on-board cameras are no longer identified in the programme, so they are of little use.

I saw my first motor race in 1934 and have been a very keen follower ever since. It was only recently that I reluctantly had to give up competitive motoring – so recent in fact that I can still remember when the regulations used to state that numbers had to be displayed on both sides of the car and had to be at least 28cm high. If they didn't, the scrutineer said you couldn't race!

Surely, a small area of advertising space could be sacrificed just to make the on-track viewing more enjoyable for the paying customer?

Robert Goodchild

By email

Let's end the engine war

Criticism that Formula 1 is more or less a one-horse show continues like an unstoppable juggernaut. So here is an idea that would go some way to giving each team a fair chance: abolish independent engine suppliers and have three engine specifications, made on behalf of the FIA, available for the teams to hire.

Each specification would bring its own performance level, available, of course, at varying prices, and could be upgraded or downgraded from race to race, with each team only able to select the highest performing engine for, say, 80% of the season, to prevent the big spenders from using the best engine at every race.

This would ensure that we always see fast cars out there, while reducing the chances of one team dominating a whole season. And just maybe, at a few races, teams such as Manor Marussia or Sauber might have sufficient funds to run the top-spec engine and take a headline-grabbing result.

F1 already has a sole tyre supplier with a range of offerings. I see no reason why the same cannot be done with engines. I see this as a great way to bring some variety to



STAR LETTER

Lewis Hamilton is now a household name, not just in his home country, not just within F1, but worldwide



Lewis Hamilton: global phenomenon

There's no doubt about it, Lewis Hamilton's third world championship makes him a true great in the world of motorsport. Not only that, but his high public profile must make him the most recognised motor racing driver of all time – especially to non-motorsport fans. Not even Ayrton Senna had the worldwide recognition that Hamilton now possesses.

Many have been critical of his extracurricular activities as he travels the world between races, and his persistent presence on social media platforms, stating that this can only be detrimental to his ability to race. I, for one, used to think so. But he's proved us all wrong, and when he took that win in Austin, it was perhaps the first time that a Formula 1 championship was won and truly recognised by a large proportion of, not just the European or American fans, but the whole world.

So enjoy his achievements now. Don't wait until he is retired. Savour the moment – and there should be plenty more to come.

Paul Hayes

Devon, UK



STAR PRIZE

Paul Hayes wins a pair of three-day general admission tickets to the 2016 Formula 1 British Grand Prix.

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F1, with every team at least having the opportunity to use the best engine in the sport, while staying away from F1 being a dreaded single-spec series.

Bernie says he is looking for innovative ideas to put the sport back into F1. I challenge the thousands of boffins working in it to top this idea!

David Herron
Tyne & Wear, UK

No deal; no surprise

So Christian Horner and Dietrich Mateschitz are somewhat perplexed by the refusal of both Ferrari and Mercedes to supply them with engines in 2016.

When I look at the huge amounts spent on the development of these engines, I understand the reason for their refusal. How much have Red Bull spent on engine development? Not much, I'd imagine. Meanwhile, Red Bull have arguably the finest designer in F1, Adrian Newey, who has produced some awesome chassis. So for Ferrari or Mercedes to provide them with a new engine would be sheer madness.

Look at Williams and the lean years they have experienced. I do not recall Frank Williams or any other member of the team complaining about a lack of engine suppliers.

Bill Hughes,
By email

New kids vs the old guard

It's great to hear that Jenson Button has secured at least another year in

Formula 1. Jenson's such a popular driver, and with his experience and achievements I think he's earned the right to leave the sport on his own terms. The same applies to his team-mate, Fernando Alonso, and I really hope that McLaren can move back up to the sharp end of the grid soon.

What I find interesting is that when the McLaren drivers eventually reach the top end of the field, as they and Ron Dennis publicly insist that they will, what sort of competition they will face?

The rise of Valtteri Bottas, Daniil Kyvat, Daniel Ricciardo and the formidable rookie Max Verstappen suggests to me that there has been something of a generational shift, and that the McLaren duo are no longer the yardstick against which drivers are measured.

I'm not doubting the abilities of Button or Alonso, but I think that in a season where they've been down in the doldrums, the sport has moved on and new stars have emerged in their place.

I sincerely hope that McLaren and Honda can resolve their issues and provide these two former champions with a car capable of challenging at the front once again. It will be a great spectacle to see how the new kids on the block measure up against the nous of Button and the doggedness of Alonso. And it will be a fitting send-off for this illustrious and well-decorated pairing.

Adam Berriman
Derbyshire, UK



Aged 34 and 35 respectively, Fernando Alonso and Jenson Button are now part of F1's old guard – and they're up against the next generation

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F1'S NEWEST TRIPLE CHAMP

Peter Windsor on a racer now firmly established as one of the sport's all-time greats – Lewis Hamilton

- > We look back at an action-packed season in our 2015 review
- > Go Figure: the stats behind 2015 champ Lewis Hamilton
- > From grease to glitz: we trace the history of Formula 1

ISSUE ON SALE 17 DECEMBER*

MURRAY WALKER



UNLESS I'M VERY MUCH MISTAKEN...

"So I see that Team Enstone are all set to become Renault F1 once again, and I say: 'hooray for that!'"

The potential Renault purchase of what had previously been, Toleman, Benetton, Renault and then Lotus is returning one of the great names of motorsport to the pinnacle.

I have gigantic admiration and respect for Renault's history and deep involvement with motorsport. As long ago as 1902, when open-road city-to-city races were the name of the game, Marcel Renault won the Paris to Vienna event in a self-named car, taking a mind-boggling 15 hours and 47 minutes to do so. The first ever grand prix in 1906 in France, was won

by Hungarian Ferenc Szisz in a Renault. Renault pioneered the use of turbo engines in F1 and were the first manufacturer to win with them. They had their own multi-race-winning F1 team from 1977 to 1985, and from 2002 to 2010, and have supplied engines to nine other teams. They have won the fabled Le Mans 24 Hours sportscar race and the British Touring Car Championship. Renault-engined teams have won twelve F1 constructors' championships. Ayrton Senna won races powered by Renault, and Nigel Mansell, Alain Prost, Michael Schumacher, Damon Hill,


Jacques Villeneuve and Sebastian Vettel have all won world titles propelled by Renault.

Some of my most vivid memories of F1 involve Renault: Dijon 1979 when Jean-Pierre Jabouille became the first F1 winner in a turbo car ahead of an awesome battle for second place between his team-mate René Arnoux and Ferrari's Gilles Villeneuve; Prost getting it wrong in the 1982 Monaco GP and then losing the title to Nelson Piquet in South Africa in 1983; Portugal 1985, where Senna imperiously won his first grand prix; the battle for victory in Spain '86 where Senna's Lotus-Renault beat Mansell's Williams-Honda by 0.014 seconds; Damon Hill and Michael Schumacher's 1994 collision at Adelaide; the glory years when Renault power gave Williams and Red Bull almost total superiority.

But that was then and now is now. Renault in today's hybrid-power F1 is nothing to get dewy-eyed about. Where, in 1977, they pioneered and persevered with a new technology, they've failed to get the job done with today's complex power units. But at least they've had the guts to try, and no one could have tried harder to close the gap to Mercedes, who started work earlier, devoted more people, money and facilities to the challenge, and are now reaping the rewards.

But it is understandable that Red Bull, devoted to winning, wanted out, and also understandable that Renault boss Carlos Ghosn, should consider leaving F1 in a situation where the substantial Renault investment was seeming counter-productive. All it was generating was abuse.

Renault have got a mountain to climb. Not only must they at the very least match Mercedes and Ferrari in the engine department, but they've also got to bring together their engine people at Viry-Châtillon with team personnel at Enstone to create an integrated unit. Hopefully it's just a matter of time. They have always done a superb job with a loyal and talented workforce. Let us not forget that it was with the sort of organisation they will now be recreating that they won both the drivers' and constructors' titles in 2005 and 2006.

I applaud Renault's decision to rebuild and get stuck in against formidable opposition. We fans have got much to look forward to, and so, hopefully, have Renault. I wish them the best of luck: they deserve it. 



"It's with the sort of organisation Renault will now be recreating, that they won drivers' and constructors' titles in 2005 and 2006"



A Williams Martini Racing Formula 1 car, number 19, is shown from a side profile, angled towards the right. The car is white with blue and red accents. It features several sponsor logos: Martini (on the rear wing and sidepods), Sure (on the sidepods), Oris (on the front wing), Kemppl (on the front wing), and others. The car is surrounded by dynamic, colorful motion blur lines in shades of yellow, orange, and red, suggesting high speed. The background is a plain, light grey.

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