

**RENAULT F1 TEAM**

## ***PRESS PACK 2019***

### **FOREWORD**

At Renault, we are passionate about motorsport. Our history in F1 has continued unbroken for more than 40 years. Formula 1 is a show, a spectacle, pure entertainment, but it is also the highest level in motorsport. A passion for Formula 1 is a metaphor for fighting spirit, determination, resilience but also progress thanks to the limitless innovation that inspires the sport.

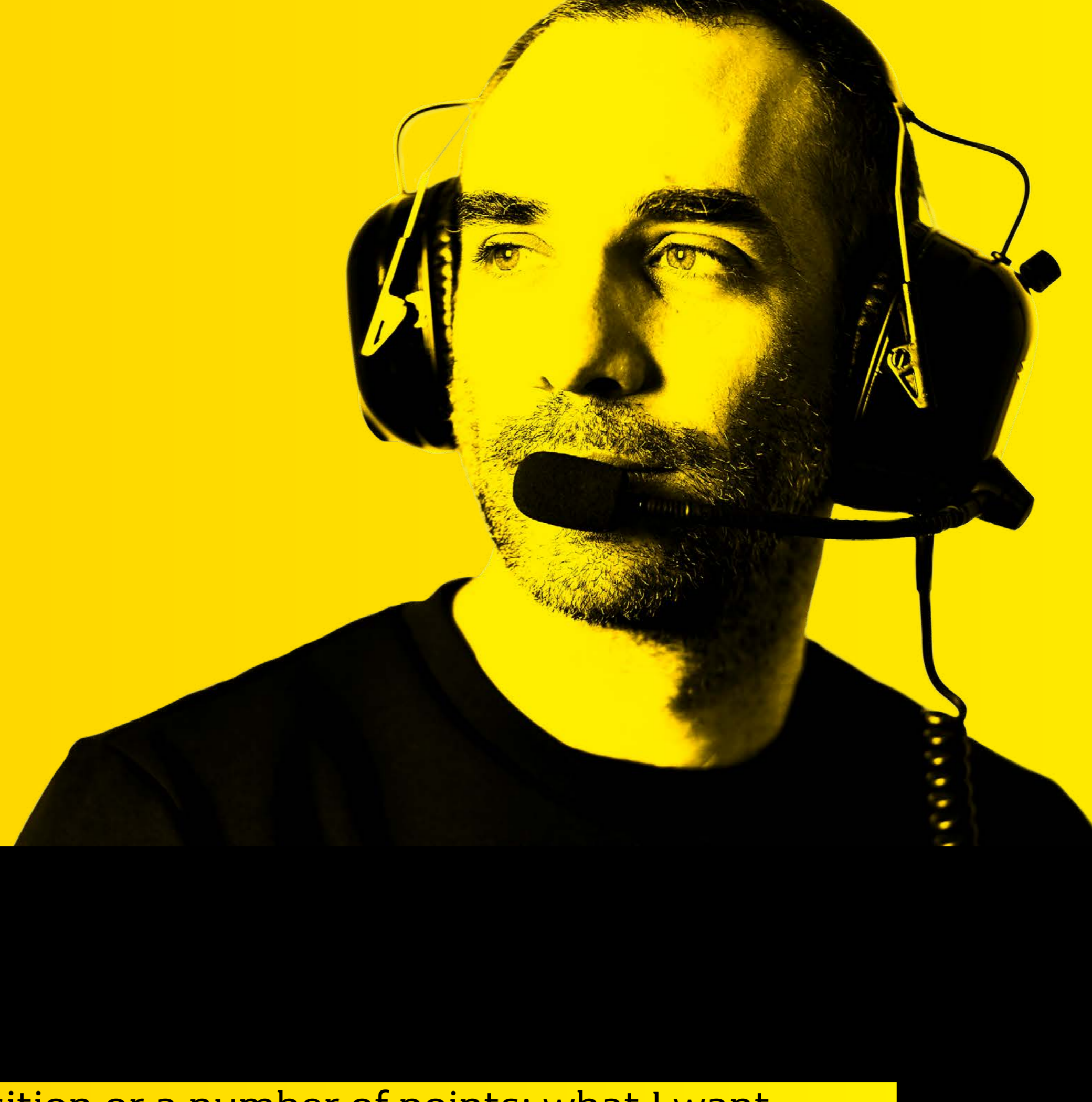
This passion has to be tempered with a healthy dose of reality. A check to make sure the heart is matched by the head. And it still does. F1 makes sense for Renault; it is a laboratory for our future road going technology – as seen by the new engine designation – Renault E-Tech 19. It also visits key markets on the global stage, such as China and Brazil, and continues to broaden its reach in emerging or consolidating markets such as the Middle East and Russia. Under the new owners, Liberty, F1 is more relevant too by attracting new fans that keep it young and fresh.

It is a very exciting time to be part of F1. Over the past three years we feel we have proved ourselves. We have contributed on-track with some great battles and strong performances. Off-track we have delivered innovative PR and marketing activities to help grow viewership and fan engagement.

2019 promises to be an interesting year on and off track. We can't wait to get started.



**Jérôme Stoll**  
President of  
Renault Sport Racing



## CYRIL ABITEBOUL

**We do not target x or y position or a number of points: what I want to see is that the team continues its positive trajectory.**

*Managing Director Cyril Abiteboul ensures all aspects of Renault Sport Racing are structured, resourced and working to their optimum to deliver on their performance potential. He also sets the commercial, marketing and communication targets to ensure Groupe Renault takes full advantage of its Formula 1 activities.*

*Cyril knows the Anglo-French team and Renault inside out. After graduating from the Institut National Polytechnique de Grenoble, he joined Renault in 2001 and worked in various positions at the company HQ in France and at the F1 team in Enstone. His commercial acumen saw him appointed Development Director of the Renault F1 Team in 2007, looking after commercial matters, partners and sponsor acquisition. He became Executive Director in 2010 before moving back to Viry in 2011 when Renault re-centred its F1 activities around engine supply. As Deputy Managing Director, Cyril oversaw all contractual relations, marketing and communications activities with partner teams and created a solid platform for Renault as it re-established itself in its new guise.*

*Cyril's success in the role led to him being head-hunted by the Caterham F1 Team in 2012 to become team principal. He rejoined Renault in September 2014 to become Managing Director of Renault Sport F1 and successfully spear-headed the analysis of reacquiring and restoring a team for the Renault brand to continue its long F1 tradition in 2016.*

*Since then, Renault F1 Team has grown to be the most dynamic team on the F1 grid.*

**2019 is the fourth season of Renault F1 Team. How much has the team progressed since returning to the sport in 2016?**

I'm genuinely proud of the team in Enstone and Viry. Three years ago, we created Renault F1 Team with an ambitious programme, but with realistic hopes. We knew we needed to rebuild many elements of the company: facilities, workforce but also the confidence of the team. We introduced an extensive rebuilding programme in Enstone with new buildings and new production tools including a wind tunnel upgrade, a new ultra-modern operations room, new chassis machine tools etc. A huge recruitment drive has also increased our workforce by fifty percent. Efforts have been made at Viry as well, with new investments in engine dynos and also in construction of a new building due for completion next year aimed to rehouse all engine assembly.

Launching all these projects while participating in the championship was an incredible challenge as was getting the major points finished. The final commissioning of the investments was a tremendous achievement and I'm impressed by how everyone has taken to the task. This shows in the momentum we have gathered: ninth in

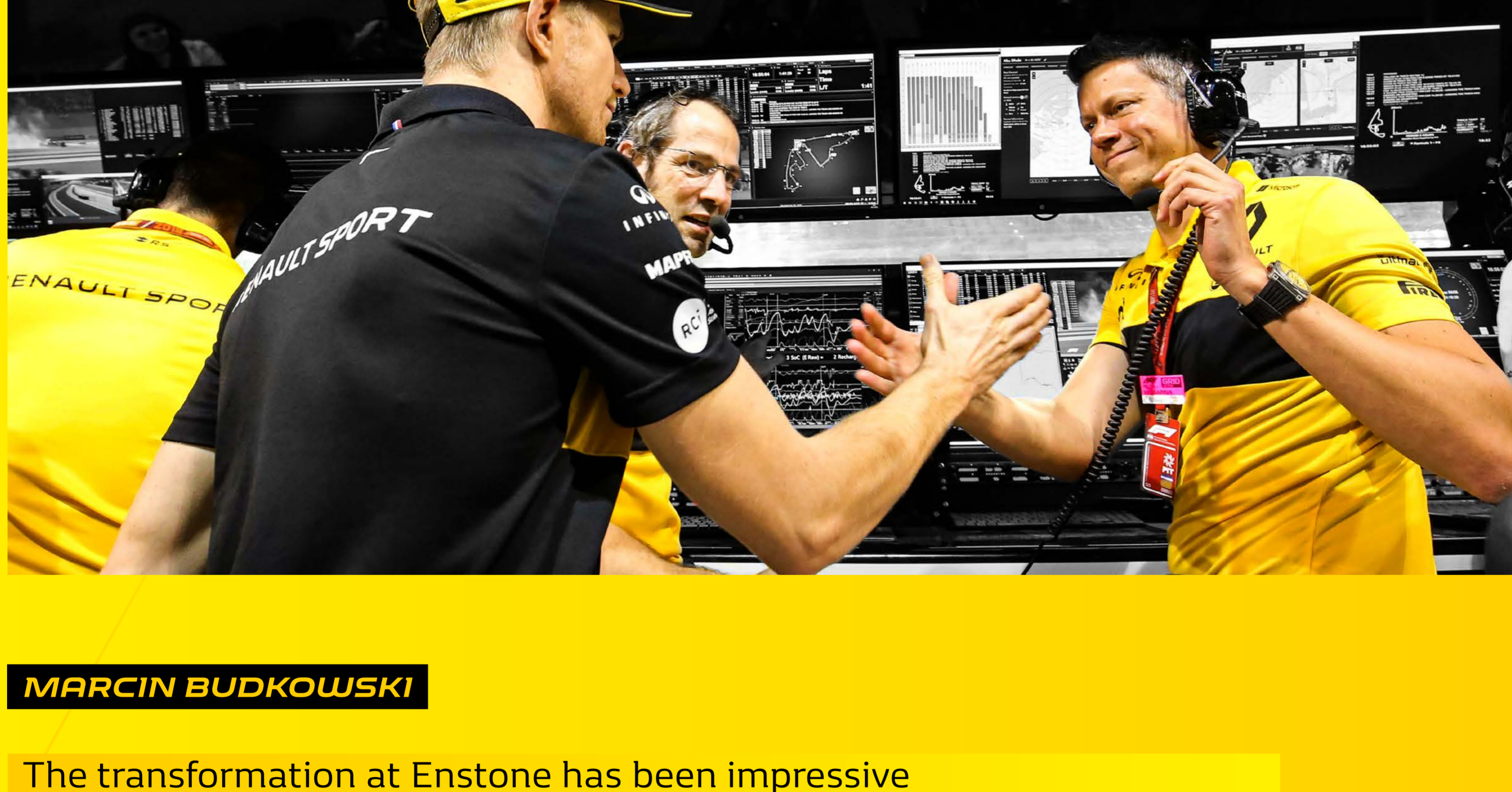
2016 with eight points, sixth in 2017 with 57 points and fourth last year with 122 points. We go into this season aiming to keep this strong and measured momentum. We do not target x or y position or a number of points: what I want to see is that the team continues its positive trajectory. The added momentum of the Daniel-Nico partnership brings confidence to the team this season.

**How much are you looking forward to seeing our driver line-up behind the wheel of the R.S.19?**

I can't wait, and this feeling is shared by the entire team. I believe we have one of the strongest – if not the strongest – driver line-up on the grid. Daniel brings proven race winning experience and knowledge of a top team, while Nico is hungry. He's hugely underrated – he's quick, determined and a team motivator. Individually they are very strong and I feel the two will complement each other extremely perfectly.

Having two experienced and talented drivers is another motivating factor for the team. The energy they have brought to the team is very tangible and I hope we can give them a car to show their considerable talent.

**“I believe we have one of the strongest – if not the strongest – driver line-up on the grid.”**



## MARCIN BUDKOWSKI

**The transformation at Enstone has been impressive and it matches our ambitions.**

*Marcin joined Renault F1 Team as Executive Director in April 2018 after roles at Prost GP, Ferrari, McLaren and the Fédération Internationale de l'Automobile (FIA). He graduated from École Polytechnique, Paris, in 1999 and continued his studies between 1999 and 2001 at the Institut Supérieur de l'Aéronautique et de l'Espace (ISAE SUPAERO) and Imperial College London, specialising in Aerodynamics and Aerodynamics.*

*Upon completion of his studies, Marcin began his career in Formula 1 in 2001 as an Aerodynamicist for Prost GP. Marcin then moved to Maranello, working for Ferrari between 2002 and 2007 in a period that saw the team winning multiple World Championships. He then joined McLaren in 2007, working in a range of technical roles both at the factory and at the track, notably during the 2008 title winning year, before becoming Head of Aerodynamics in 2012. His seven years at McLaren finished in 2014, moving to the FIA as Formula 1's Technical and Sporting Coordinator, subsequently becoming Head of the Formula One Technical Department in 2017.*

*As Renault F1 Team's Executive Director, Marcin is based at the team's headquarters in Enstone, Oxfordshire. He oversees the day-to-day running and operation of the team, working closely with senior management and directors to ensure the team continues to meet its objectives.*

*Marcin is fluent in four languages: Polish, English, French and Italian.*

**How much has Renault F1 Team changed in the past year?**

The transformation at Enstone has been impressive and it matches our ambitions. We are putting the right tools in place for what we have set out to achieve. The change in infrastructure is visible with new buildings, older areas refurbished and new equipment commissioned. The design of the new offices and workshops has focused on every detail that can make a difference. Everything has been planned to ensure a smooth workflow. We have new flow measurement and analysis tools in the wind tunnel and a brand-new gearbox dino that has recently been commissioned, improving our ability to develop the car in modern Formula 1, all the small details add up, and that includes a better working environment for our staff that spend long hours at the factory.

**What are the principal areas of improvement at Enstone?**

We've had a massive growth – almost 100 new staff over the last year and 250 since 2016. The challenge is to integrate these new recruits in the team, but also to evolve our organisation and ways of working to make sure we extract the most performance and efficiency out of the increased headcount.

**What does Renault F1 Team do well?**

There's a good core of people at Enstone who have been here for many years and created a good team spirit and work ethic, that's a clear strength. The Enstone-Viry partnership is also very good having worked together for over 20 years. As a works team, having complete control over both chassis and engine is an advantage, and we are pushing this integration even further by making sure we approach a new car project as a whole with the two sides involved from the very early stages.

**“In modern Formula 1, all the small details add up, and that includes a better working environment for our staff that spend long hours at the factory.”**

## NICK CHESTER

**We're still recruiting, enhancing our work processes and the organisation is strengthening all the time.**

*Nick joined Enstone in 2000 and occupied various roles before becoming Chassis Technical Director in 2013. Nick graduated from Cambridge in 1991 and joined Simtek Research in vehicle simulation. His first taste of Formula 1 came in 1994, with Simtek, before joining Arrows Grand Prix in 1995 for vehicle simulation and later suspension design. Nick was Performance Engineer for Damon Hill and Pedro Diniz in 1997 and then Race Engineer for Mika Salo and Pedro de la Rosa between 1998 and 1999.*

*Nick then moved to Benetton in 2000 as Test Engineer, working with Alexander Wurz, Giancarlo Fisichella and Mark Webber. Nick advanced to Performance Engineer for Fisichella in 2001 and Jarno Trulli in 2002-2004, contributing to the Italian's sole Grand Prix win in Monaco in 2004.*

*2005 saw Nick step up to Head of Vehicle Performance Group (VPG), playing a part in Renault's double championship wins of 2005 and 2006, including the development of the tuned mass damper system, which was a major innovation during that era.*

*Nick became Head of Performance Systems in 2010 and then Engineering Director in 2011, contributing to the development of the race winning E20 and E21. Nick then took the role as Technical Director responsible for the design and development of every Formula 1 car to come out of Enstone since 2013, including 2019's R.S.19.*

**Tell us about the 2019 Renault F1 Team car, the Renault R.S.19?**

There has been significant evolution of the regulations, which were born from last season where cars couldn't race closely together due to large downforce losses in easy water. The main changes for 2019, after discussions between the teams and the FIA over the course of last season, are a 200mm wider and simpler front wing, a change to the front drums, lower bargeboards and a bigger, wider and higher rear wing with increased DRS. It wasn't a straightforward process in terms of interpreting the rules. We lost downforce in the early stages of the development. We've aimed to improve the overall packaging of the car, and notably to make the car lighter. We have a little more ballast to play with due to the minimum driver weight changing to 80kg.

**What new resources has the team been able to harness for the creation of the R.S.19?**

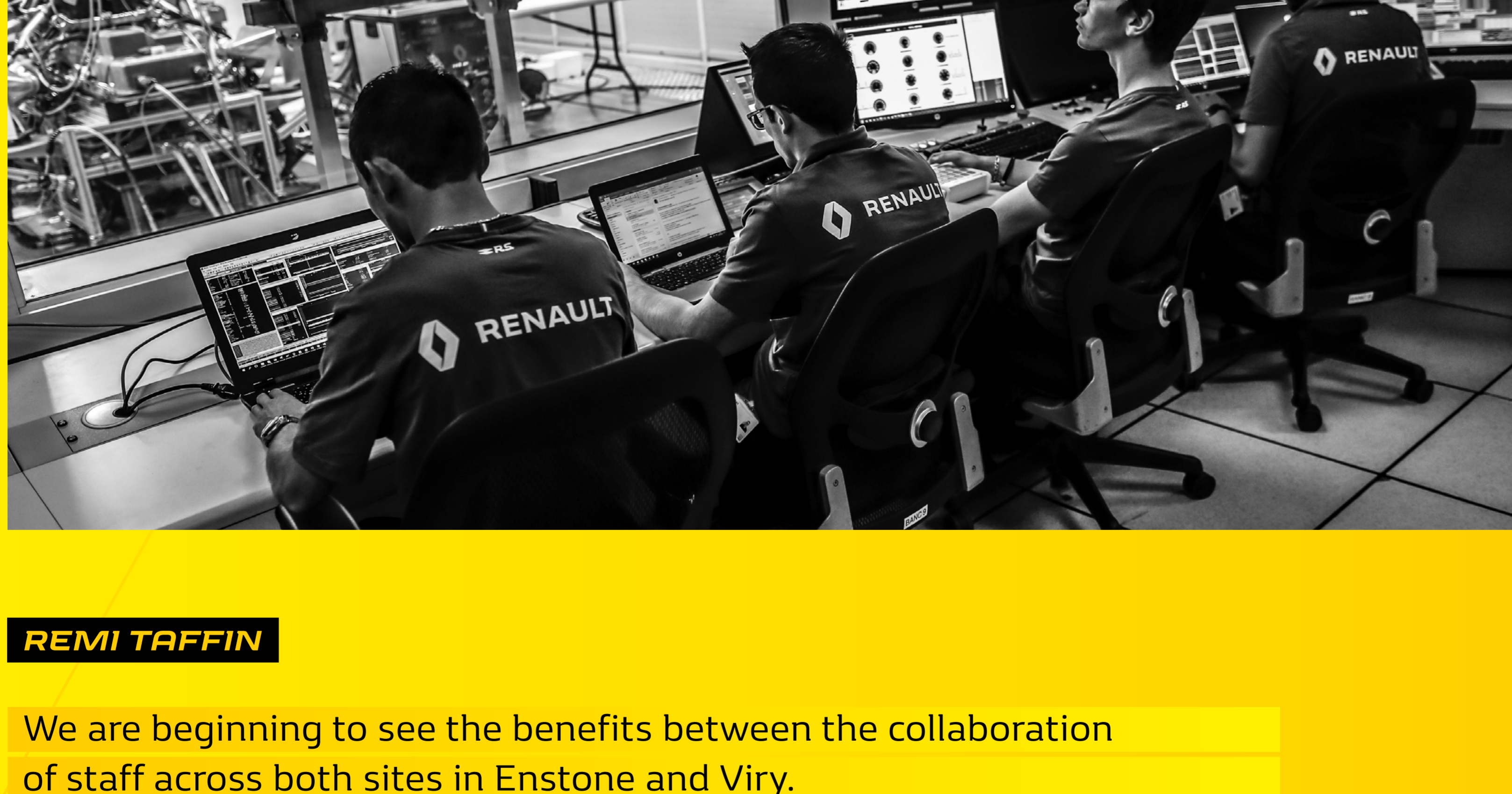
The whole capacity of the team has come up. The current infrastructure is top-level with better machining centres for chassis machining where we can work to tighter tolerances. We've made improvements to the

wind tunnel, we have a paint shop on site, which means we can push things later and still have top quality finish. The new clean room is fantastic, it's double in size from its predecessor, making composite lay-up more efficient and that's helping us push to get the car ready. All over the factory there have been improvements and at the same time, we've been building the engineering capabilities of the team. We're still recruiting, enhancing our work processes and the organisation is strengthening all the time.

**How much have the drivers influenced the development process of the car?**

Nico is very good to work with because he's clear with what he wants from the car. He knows the solutions we can give him but he's very open and his initial feedback is quite close to Nico's. What we're trying to put into the car should work for both of them. The closer they are with feedback, the easier it is to develop the car. It's an incredibly strong line-up. They are both quick, they work hard and have great feedback.

**“We've aimed to improve the overall packaging of the car, and as ever, to make the car lighter.”**



## REMI TAFFIN

**We are beginning to see the benefits between the collaboration of staff across both sites in Enstone and Viry.**

*Remi has been part of Renault's Formula 1 involvement since 1999 and currently takes overall responsibility for the power unit developed at the Viry-Châtillon site. Remi ensures the team of engineers produce an optimised unit that works in perfect harmony with the chassis.*

*After studying as a mechanical engineer at ESTACA, an engineering specialised school in Paris, Remi's first experience of motor-racing was in 1998 as a race engineer for Signature in Formula 3. In 1999, Remi joined Renault working across the roll call of clients, including British American Racing as race engineer to Ricardo Zonta, Arrows as race engineer for Jos Verstappen, Benetton and Renault F1 Team.*

*He has worked directly with two World Champions, Jason Button and Fernando Alonso, engineering the latter to victory in his two title-winning years. Remi continued his race engineering role with Heikki Kovalainen in 2007 and Alonso again in 2008.*

*Remi stepped up to manage Renault F1 track activities in 2009. Then with the creation of Renault Sport F1 in 2011, he took responsibility for the on-track engine performance of Renault Sport F1's partners. Attending all races and tests throughout the season, Remi oversaw customer support for the Renault-powered teams and was instrumental in the four world titles secured by Red Bull Racing in the V8 era.*

*In 2014 he became Director of Operations, managing the teams of engineers and technicians in the dynos and assembly department at Viry and overseeing a smooth transition to track by ensuring the engineers integrated to Renault's partner teams. Since 2016, Remi has managed Renault's power unit development as Engine Technical Director.*

**What has the team learnt from last year with its power unit development?**

We confirmed last year that the direction we were developing the engine was the right method and that meant we could continue our efforts into 2019. Viry has been very busy over the winter and we have worked as late as possible to embed as much performance and reliability. We have now built the test engines and we are about to sign off race engines. We're satisfied with what we've been able to produce. We've pushed on the pure performance element while also keeping a hand on reliability.

**We've seen some major changes in Enstone this year, and Viry will undergo some major building work too. Can you explain?**

We are constructing a new building for all our operational activities in order to improve the fluidity of our organisation. We will continue working on our test tools, ensuring we have the right and most up to date technology. We have a new dino that will be commissioned shortly, which is multifunctional and can test the gearbox with the engine, the engine on its own, the ERS on its own and the engine with the rear end

of the car. We have to keep the future in mind in anticipation of 2021 and looking after our preparation for that.

**What's the feeling within the team ahead of the season?**

We are beginning to see the benefits between the collaboration of staff across both sites in Enstone and Viry. On the surface, we have seen new buildings and tools put in place, but we can't forget the people at the heart of the project. There is a growing feeling that we can fight back at the top and staff are buying into that. There is no fear, we know we can do the job. We have people within the team who aren't shy of the challenge to compete at the top. We know we have what it takes to deliver. Having two strong drivers in Nico and Daniel brings even more motivation and people within the team are convinced they can do a very good job. It delivers inspiration for staff to have an idea and subsequently develop that idea to the race car as quickly as possible.

**“There is a growing feeling that we can fight back at the top and staff are buying into that. There is no fear, we know we can do the job.”**



TECHNICAL SPECIFICATIONS

RENAULT R.S.19

Chassis	Moulded carbon fibre and aluminium honeycomb composite monocoque, manufactured by Renault F1 Team and designed for maximum strength with minimum weight. Renault E-Tech 19 power unit installed as a fully-stressed member.
Front Suspension	Carbon fibre top and bottom wishbones operate an inboard rocker via a pushrod system. This is connected to torsion bar and damper units which are mounted inside the front of the monocoque. Aluminium uprights and OZ machined magnesium wheels.
Rear Suspension	Carbon fibre top and bottom wishbones with pull rod operated torsion bars and transverse-mounted damper units mounted inside the gearbox casing. Aluminium uprights and OZ machined magnesium wheels.
Transmission	Eight-speed semi-automatic carbon maincase gearbox with reverse gear. "Quickshift" system in operation to maximise speed of gearshifts.
Fuel System	Kevlar-reinforced rubber fuel cell by ATL.
Electrical	MES-Microsoft Standard Electronic Control Unit.
Braking System	Carbon discs and pads. Calipers by Brembo S.p.A. Master cylinders by AP Racing.
Cockpit	Removable driver's seat made of anatomically formed carbon composite, with six-point harness seat belt. Steering wheel integrates gear change paddles, clutch paddles, and DRS.



Dimensions and Weight	
Front Track	1600mm
Rear Track	1550mm
Overall Length	5480mm
Overall Height	950mm
Overall Width	2000mm
Overall Weight	743kg, with driver, cameras and ballast



TECHNICAL SPECIFICATIONS

RENAULT E-TECH 19

Engine	
Displacement	1.6L V6
Number of cylinders	6
Rev limit	15,000rpm
Pressure charging	Single turbocharger, unlimited boost pressure (typical 5 bar abs)
Fuel flow limit	100kg/h
Permitted fuel quantity per race	110kg
Configuration	90° V6
Bore	80mm
Stroke	53mm
Crank height	90mm
Number of valves	4 per cylinder, 24
Fuel	Direct fuel injection
Energy Recovery Systems	
MGU-K rpm	Max 50,000rpm
MGU-K power	Max 120kW
Energy recovered by MGU-K	Max 2 MJ/lap
Energy released by MGU-K	Max 4 MJ/lap
MGU-H rpm	>100,000rpm
Energy recovered by MGU-H	Unlimited
General	
Weight	Min 145kg
Number of Power Units	
permitted per driver in 2019	3 ICE/Turbo/MGUH and 2 MGUK/ES/CU
Total horsepower	More than 950hp

## NICO HÜLKENBERG

Key Details	
Date of Birth	19 August 1987
Place of Birth	Emmerich am Rhein, Germany
Nationality	German
Website	nicohulkenberg.net
Twitter	HulkHulkenberg
Facebook	NicoHulkenbergOfficial
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### Key Dates

#### 2018

Nico recorded his best finish in the Drivers' Championship with seventh place in 2018, amassing 69 points. A fifth place at his home Grand Prix in Hockenheim was his best result of the campaign with a further ten points finishes underlining a strong season.

#### 2017

Nico was announced as a Renault Sport Formula One Team driver for 2017 in October 2016 and made his race debut for the team at the season-opening Australian Grand Prix in Melbourne.

#### 2014-2016

Nico returned to Force India for a three-year spell, and after the first three races of the 2014 season he sat in third position in the Drivers' Championship, behind the Mercedes juggernaut of Hamilton and Rosberg. He finished fifth four times that year, ending the season ninth in the standings. 2015 saw Nico finish tenth in the Drivers' Championship. Outside of F1, Nico made his World Endurance Championship debut, driving for Porsche. Pairing Nick Tandy and Earl Bamber, Nico finished sixth in the Spa 6 Hours when the trio took victory at Le Mans in what was Nico's debut at the iconic race. In Nico's final season at Force India, he finished ninth in the F1 Drivers' Championship.

#### 2013

For 2013 Nico joined Sauber, impressing with third on the grid at the Italian Grand Prix for the Ferrari-powered C32, taking fifth in the same race. His best finish of the season was fourth in the Korean Grand Prix and he ranked tenth in the standings that year.

#### 2011-2012

With Williams opting for Pastor Maldonado at the squad, Nico moved to Force India in a reserve position for 2011, driving in Friday practice sessions. He was promoted to a race seat the following year, qualifying for the season-opening Australian Grand Prix six places ahead of team-mate Paul di Resta. In that year's Belgian Grand Prix, he finished a career-best fourth. Nico looked set for glory in the season-ending Brazilian Grand Prix, however a safety car period robbed him of a 45-second lead in the race so he was eventually to finish in fifth. He closed the 2012 season in eleventh.

#### 2010

2010 saw Nico's Formula 1 debut with Williams, racing alongside the highly experienced Rubens Barrichello. In his third race, the Malaysian Grand Prix, he out-qualified Rubens and he scored his first Formula 1 point in the same race. After finishing a season-best of sixth in the Hungarian Grand Prix, Nico secured pole position on a difficult damp Interlagos track, with two of his qualifying laps on slick tyres fast enough for his P1 position. His fastest qualifying lap was over a second ahead of next quickest, Sebastian Vettel. Nico ended the year 14th in the standings.

#### Pre-Formula 1

After a successful karting career, Nico's car racing started in German Formula BMW where he dominated the 2005 season, following in the footsteps of countryman Sebastian Vettel as champion. 2006 saw a graduation to German Formula Three and a race win, but it was the second season of the A1GP series, which started late in 2005 – contested in identical Lola chassis with more than 500 horsepower from their Zetek V8 engines – when people really took notice of the rising star. Driving for A1 Team Germany, Nico claimed nine wins from the season's 22 races, including six in a row. His emphatic performance secured Germany the crown and cemented Nico's position as the most successful driver in A1GP history.

Two seasons in the F3 Euro Series from 2007 onwards followed, with third in the standings and four wins in his first outing, and the championship title and seven wins in the second. In 2009, Nico became one of only three drivers to win the GP2 Series in their first season, following in the footsteps of Lewis Hamilton and Nico Rosberg. He secured his crown with five wins and five other podium finishes.



### Stats

Grands Prix Started	156
Pole Positions	1
Podiums	0
Wins	0
Points	474
Average Points	3.03
(as of Abu Dhabi Grand Prix 2018)	
Fastest Laps	2
Best Finish	4 <sup>th</sup> – Belgium 2012, 2016; Korea 2013
Best Qualifying	1 <sup>st</sup> – Brazil 2010

“We're a strong line-up, driving for a strong team so we're aiming for things to click, go smoothly and target a good season.”

### Q&A

#### How have you spent the winter preparing for your ninth season in Formula 1?

I've been working as hard as ever throughout the winter to be best prepared for the season. I've been doing the usual kind of things, taking a holiday over Christmas and New Year, and after that it was back to the physical preparation and intense training to get the body and mind back in tune.

#### What are you expecting from your third season with Renault F1 Team?

As a team, we've developed a lot since the start of 2017 and that's all part of the process if we want to achieve our long-term targets. When I arrived, the infrastructure was still young, we've come a long way since then with a lot of progress from that point.

#### Are you impressed from what you've seen of the Renault R.S.19?

I've seen parts of the chassis at Enstone and there's been a lot of hard work from the staff across both sides of the Channel to put together a good package. I know what we're doing and what's been changed, so I can't wait to see it and try it out. A driver always wants more power, more grip and a better balance from the car.

#### How well do you know your new team-mate Daniel Ricciardo?

Daniel is a good guy and I've known him for many years from racing in Formula 1. He also lives in Monaco so I see him from time to time there. We both enjoy playing tennis and we've met up for a game on a couple of occasions. We get on well and we've always had a couple of relationships. We're a strong line-up, driving for a strong team so we're aiming for things to click, go smoothly and target a good season.

#### What are your personal targets for the 2019 Formula 1 season?

I always aim to perform at my very best. I want to extract the best from myself and maximise the potential from the team and the car. The important thing is, as a team, we take a good leap forward and perform better consistently. We want the trend to continue upwards and keep the developments coming.

## DANIEL RICCIARDO

Key Details	
Date of Birth	1 July 1989
Place of Birth	Perth, Australia
Nationality	Australian
Website	danielricciardo.com
Twitter	danielricciardo
Facebook	DanielRicciardo
Instagram	danielricciardo

### Key Dates

#### 2018

Daniel was announced as a Renault F1 Team driver in August 2018 and will make his debut at his home Grand Prix in Melbourne, Australia, in March.

#### 2017

Daniel finished sixth in the Drivers' Championship after taking two race wins: the first at the Chinese Grand Prix, the second a famous triumph on the streets of Monaco.

#### 2016

Daniel was back on the pace after a frustrating season in 2015, ending third in the Drivers' Championship. He took his fourth career victory in Malaysia and clinched a maiden pole position in Monaco. He finished second in the Principality, and claimed further podiums in Hungary, Germany, Belgium, Singapore, USA and Mexico.

#### 2015

In 2015 he finished the Championship in eighth place with two podium finishes: third place in Hungary and second in Singapore.

#### 2014

Daniel graduated to Red Bull Racing ahead of the 2014 Formula 1 season under Renault power. He took his first Formula 1 victory in Montréal, Canada, after starting from sixth on the grid. Two more wins would follow that season, Hungary and Belgium, with Daniel recording five more podiums to finish an impressive third in the Drivers' Championship.

#### 2011–2013

Daniel made his Formula 1 debut midway through the 2011 season at the British Grand Prix at Silverstone for HRT.

In 2012, Daniel, as a Red Bull Junior, joined sister team Toro Rosso and scored his first points at his home race in Australia in the opening round. He finished the season with 10 points. He again raced for Toro Rosso in 2013 with best finishes of seventh in China and Italy on the way to doubling his points tally he set the year before.

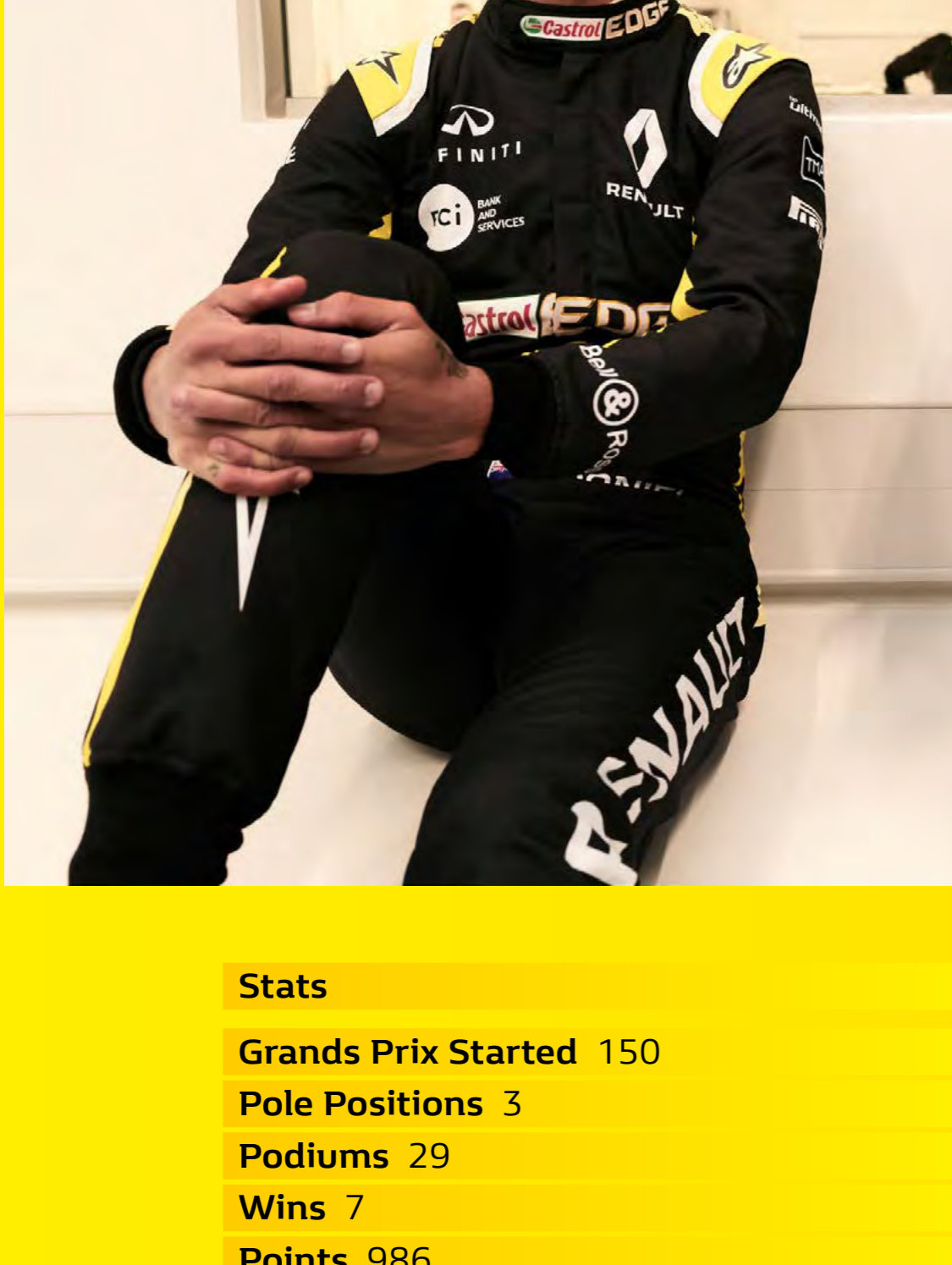
#### Pre-Formula 1

After starting in karting, Daniel moved to single-seaters in 2005, racing in the Formula BMW series in 2006. He finished third in the Asia category with two wins to his name.

2007 saw Daniel switch to Renault-powered machinery for the first time in the Formula Renault Italy series and Eurocup as a wildcard.

He took his first championship title in 2008 in the Formula Renault WEC following eight wins from 15 starts and finished second in the Eurocup with six wins from 18 races. He won the British Formula 3 Championship a year later and in 2010 finished second in the Formula Renault 3.5 Series, while also undertaking duties as Formula 1 Test Driver for Toro Rosso.

Despite missing four races, Daniel finished fifth in the 2011 Formula Renault 3.5 Series before getting his break in Formula 1.



### Stats

Grands Prix Started	150
Pole Positions	3
Podiums	29
Wins	7
Points	986
Average Points	6.57
(as of Abu Dhabi Grand Prix 2018)	
Fastest Laps	13
Best Finish	1 <sup>st</sup> x7
Best Qualifying	1 <sup>st</sup> x3

“I want to see progress from last season and ensure the team keep building on that.”

### Q&A

#### How excited are you to get behind the wheel of the Renault R.S.19?

It's always exciting to get behind the wheel of a new race car and begin a new season. 2019 will feel different because I'm jumping into a totally new car and a new team. There will be a lot to learn: understanding a new steering wheel, sitting in a new seat with new mechanics strapping me in and a new engineer talking to me, but that whole process is an exciting prospect. Obviously, I'd love for the R.S.19 to be the fastest car on the grid, but for now, I want to see progress on the engine from last season and ensure the team remain motivated.

#### What, in particular, will you bring to the team?

I'm here to do a job on track and drive as fast as possible. I would like to bring the team energy. I want to put a spring in everyone's step because that's also part of my job and also my character. I aim to be able to get the team to work that extra bit harder, put in more effort and rally everyone together. I want to be a catalyst for positive energy.

#### Are you looking forward to being part of Renault's racing spirit?

I love racing and that's what I've been doing my whole life. Renault has a massive history in motorsport, so to be part of the next step of their Formula 1 journey is an exciting challenge. People are looking forward to having me on board and I think Nico and myself will be a really good pairing to push the team onto the next step. I'm optimistic as the team will keep growing even more after impressive progress since 2016. I want to be part of this progression to score podiums in yellow.

#### What do you know of your new team-mate, Nico Hülkenberg?

I know Nico relatively well, through racing as well as living in Monaco. We're a similar age and we've been around the same Formula's growing up. I rate him as a driver, I always have. He has won pretty much everything in the junior championships and that underlines his ability. I've always held him in high regard as a competitor and I'm looking forward to having him alongside me.

#### Will there be anything different about you in 2019?

Last year we had some highs and some happy moments. There were also some points of frustration. I was craving a change and everything I learnt in 2018 will make me a better version of myself in 2019. The difference will be a more mature person. I have more clarity of where I'm going and I aim for that to be shown with good results on track. I feel a lot of positive pressure and expectation to do good things, but that's something I'm looking forward to taking on.

## GUANYU ZHOU

Key Details	
Date of Birth	30 May 1999
Place of Birth	Shanghai, China
Nationality	Chinese
Instagram	guanyu_zhou_33
Weibo	@车手周冠宇

### Key Dates

#### 2019

Development Driver for Renault F1 Team, Renault Sport Academy member as well as racing in the FIA Formula 2 Championship with UNI-Virtuosi Racing.

#### 2018

Guanyu finished eighth in the FIA Formula 3 European Championship and contributed to Prema Theodore Racing's Team's championship win with a 203-point contribution. The season began well for Guanyu in Pau, winning the first race of the year, and it also ended strongly with a second victory at the finale in Hockenheim. Guanyu's standout weekend came at Zandvoort, round four, when he claimed two second places and a third across the three races.

#### 2017

Guanyu ended his second season in the FIA Formula 3 European Championship in eighth place after recording five podiums across the season. His first came at Hungary with a third place and his second, at the Norisring. He again ended third in Spa, before two third places in a row at Hockenheim at the final weekend of the campaign.

#### 2016

After finishing second in Italian Formula 4 in 2015, Guanyu took on his first of three seasons racing in the FIA Formula 3 European Championship. He impressed from the start, recording his first podium finish at the opening round at Circuit Paul Ricard, France. He backed that up at the next round in Hungary with a third place in race two. Guanyu continued to pick-up strong points, finishing the season on 103 points narrowly outside the top ten in the Championship. Ahead of the main season, Guanyu competed in the Toyota Racing Series in New Zealand, ending the fifteen-race campaign in sixth after four podium visits.

#### 2015

In his first season in single-seater racing, Guanyu finished second in the Italian Formula 4 Championship. It was a solid year for Guanyu who impressed throughout, including a memorable hat-trick of wins at the legendary Autodromo di Monza. He added a further six podiums on his way to claiming runners-up spot in the Championship.

#### 2007-2014

Guanyu started his racing career as an eight-year-old karter in China. By 2012, he moved to London, United Kingdom, to combine his studying with racing. In 2013 he won the European Junior Rotax and ABK C1 Rotax Junior Series before finishing his karting career in 2014, finishing second in the Rotax Euro Challenge and Rotax Max Wintercup.

### Q&A

#### How does it feel to join Renault F1 Team?

It's amazing to be Renault F1 Team's Development Driver; it's like a dream coming true. As a kid I wanted to be as close to Formula 1 as possible so it's great that Renault have given me an exciting opportunity and I'm really happy to join such a professional team.

#### What were your first impressions of Enstone?

It's great and I've met a lot of great people so far. Everyone is kind and nice and everything is well organised. I'll aim to put the effort in at the factory, use the facilities and ensure I'm prepared for every opportunity.

#### What are your responsibilities as the team's Development Driver?

My main responsibility will be based at Enstone and conducting work on the driver simulator at the factory. I will be doing a lot of development work, working with the engineers and sharing feedback and data to them to improve the car. I will also complete some tests on track in the R.S.17 car, which will be my first time driving Formula 1 machinery.

When I announced the news, there was a lot of excitement in China, and I can't wait to start.

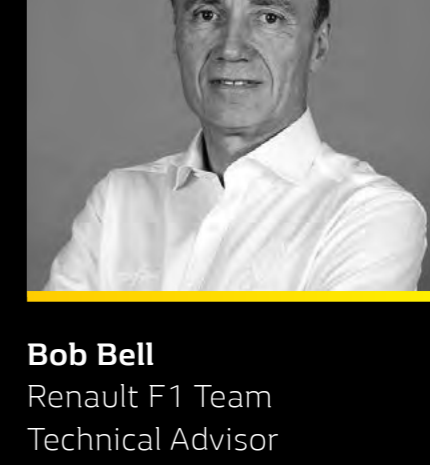
#### How proud are you to represent China in Formula 1?

I'm honoured to be the Development Driver and there are a lot of people in China who are very excited. I'm trying to work as hard as I can to reach my goals and try to make my country and Renault proud. I also have to concentrate on my Formula 2 season, which will be a challenge in my rookie year. Nevertheless, I will be putting a lot of hard work in to ensure I have a successful season in both roles.


**BOB BELL** TECHNICAL ADVISOR

Bob currently works as a Technical Advisor to the Team, participating in strategic projects to support the team's long-term growth and development. After graduating with a PhD in Aeronautical Engineering from Queen's University, Belfast, Bob was initially employed as an Aerodynamicist at McLaren in 1982, eventually working on both F1 and non F1 projects as Head of R&D, until joining Benetton in 1998 as a Senior Aerodynamicist.

A stint at Jordan followed, but Bob returned to Enstone in 2001, first as Deputy Technical Director and later Technical Director, playing an instrumental role in Renault's double world championship winning years. Bob became Team Principal in 2009 and Managing Director in 2010 before leaving in 2011 to join Mercedes as their Technical Director. He departed at the end of the successful 2014 season to work as a private consultant, notably working for Renault on the preparations to return as a full works team. He subsequently joined the team in 2016 as the Chief Technical Officer.

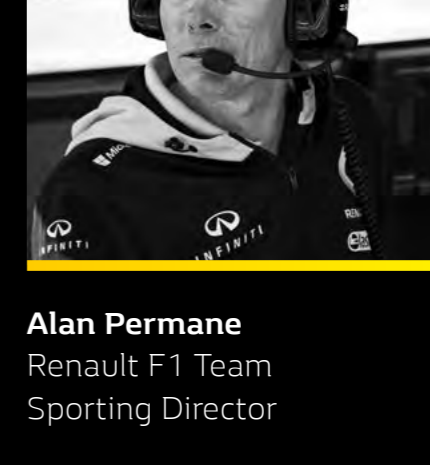


**Bob Bell**  
Renault F1 Team  
Technical Advisor

**ALAN PERMANE** SPORTING DIRECTOR

Alan has worked at Enstone in a number of roles. Currently Sporting Director, he first worked as an Electronics Engineer for Benetton, contributing to Michael Schumacher's first world championship victory in 1994. Alan then worked with Jean Alesi in 1996 and 1997 and later as Race Engineer to Giancarlo Fisichella.

By 2002, Alan engineered Jarno Trulli and again Fisichella in 2005 and 2006 across the two-world championship winning years. Alan then became Chief Race Engineer for Renault F1 Team and Lotus Renault GP between 2007 and 2011. In 2012, he became Trackside Operations Director for Lotus F1 Team until Renault's return in 2016.

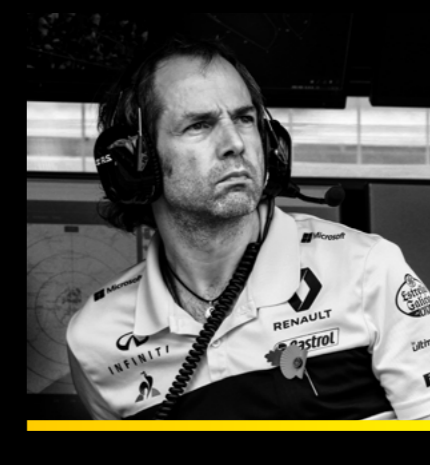


**Alan Permane**  
Renault F1 Team  
Sporting Director

**CIARON PILBEAM** CHIEF RACE ENGINEER

Ciaron is employed as Chief Race Engineer for Renault F1 Team and has worked in Formula 1 since 1998. He first started at British American Racing working in Vehicle Dynamics. A year later, Ciaron worked closely with Jock Clear as Assistant Race Engineer to 1997 Formula 1 world champion Jacques Villeneuve. Ciaron continued working with BAR as Race Engineer to Takuma Sato before moving to Red Bull Racing in 2006 with Christian Klien.

In 2007, Ciaron took on the role as Mark Webber's race engineer, keeping that position for six years. He assisted nine race wins for the Australian and contributed to three world championship titles. Ciaron then joined Lotus F1 Team as Chief Race Engineer in 2013 and then McLaren in an identical role. By 2017, Ciaron returned to Enstone as Renault F1 Team's Chief Race Engineer, working closely with Alan Permane and the engineering team.



**Ciaron Pilbeam**  
Renault F1 Team  
Chief Race Engineer

**RICARDO PENTEADO** TRACKSIDE OPERATIONS MANAGER

Ricardo has worked for Renault in Formula 1 since 2001, specialising in engine performance. Ricardo currently occupies the role as Trackside Operations Manager, responsible for the team's, and its customers', power units at race weekends. Born in Brazil, Ricardo graduated with a speciality in combustion engines from the French Institute of Petroleum in 2001, joining Renault in the same year as Dyno and Track Test Engineer.

In 2007, Ricardo became Race Engine Engineer, remaining in the role for four years, before becoming Chief Engine Engineer for Lotus Renault GP in 2011. In 2012 and 2013, Ricardo worked as Kimi Räikkönen's Engine Engineer and became closely connected with Renault customer Toro Rosso in 2014. Ricardo was Operations Room Leader in 2015 with Renault and Red Bull, before taking on the responsibility of managing all Renault power units at the race circuit ahead of the 2016 season. Ricardo has attended over 200 Grands Prix in his Renault career.



**Ricardo Penteado**  
Renault F1 Team  
Trackside Operations Manager

**MATTHIEU DUBOIS** HEAD OF RACE STRATEGY

Matthieu is the team's Head of Race Strategy and has worked for Renault in Formula 1 for over 20 years. Matthieu finalised his studies in 1997 in Mechanical Engineering from Ecole Centrale, Nantes, and worked as an Engineer with Stena Offshore Limited for his first job.

In 1998, Matthieu joined Renault in Formula 1 as a Dyno Engineer and then as a trackside Test Engineer. Between 2003 and 2006, Matthieu worked as Chief Test Engineer for the engine and continued in a trackside testing role until 2007. Matthieu then switched focus to strategy working as a strategy engineer between 2008 and 2012. He then returned into a power unit specific role from 2013, working as Trackside Operations Manager for all power units between 2015 and 2017. In 2018, Matthieu took on his current role heading the team's race strategy.



**Matthieu Dubois**  
Renault F1 Team  
Head of Race Strategy

**MARK SLADE** RACE ENGINEER (NICO HÜLKENBERG)

Mark has a long and successful career in Formula 1 and has engineered no less than four world champions. Mark is currently race engineer for Nico Hülkenberg. He graduated with a degree in Mechanical Engineering from Heriot-Watt University and from 1989 worked as a Design Engineer for Reynard Racing Cars and later Ralt Racing, before joining McLaren in 1991. Mark took up a trackside role with McLaren in 1994 as Assistant Race Engineer to Martin Brundle. He then became Race Engineer to Mika Hakkinen in 1998, aiding the Finnish driver's two world titles and remained at McLaren until 2010, working with Kimi Räikkönen, Fernando Alonso and Heikki Kovalainen across that time.

Mark moved to Enstone in 2010 to work with Vitaly Petrov and a year later switched to Mercedes to engineer Michael Schumacher. A move back to Enstone followed in 2012, engineering Räikkönen for two years and later Pastor Maldonado. Mark took on the role as Chief Engineer in 2016, before working with Nico from 2017.



**Mark Slade**  
Renault F1 Team  
Race Engineer (Nico Hülkenberg)

**KAREL LOOS** RACE ENGINEER (DANIEL RICCIARDO)

Karel works as Race Engineer to Daniel Ricciardo having previously engineered Carlos Sainz and Jolyon Palmer between 2017 and 2018. Karel studied for five years in various engineering colleges in his native Belgium, completing his education with a Masters in Motorsport Engineering and Management from Cranfield University. Karel first worked in motorsport in 2009 as a Data Engineer with PK Carsport in FIA GT – alongside his studies at Cranfield – and then in the same championship as a race engineer with SRT.

A move to Formula 1 followed in 2011 as a Vehicle Performance Engineer with Lotus F1 Team. Karel remained at Enstone in a number of trackside based roles before becoming race engineer to Palmer in 2016, Sainz in the same year and Ricciardo for the upcoming season.



**Karel Loos**  
Renault F1 Team  
Race Engineer (Daniel Ricciardo)


**Nico Cuturello** Trackside Engine Engineer

Nico has worked for Renault Sport Racing since 2012 and now occupies a trackside role specialising in power unit operations. Nico's first position with Renault was as a Test Engineer, working on the V6 project aimed at the 2014 engine regulation changes. During that season Nico began working trackside as Power Unit Performance Engineer with customer team Toro Rosso. In 2015 he continued working as Max Verstappen's power unit engineer. Nico then worked for the manufacturer Renault entry with Kevin Magnussen and by 2018 for Nico Hülkenberg. In 2019, Nico will manage the Viry track team alongside duties overseeing Hülkenberg's power unit.

**Rob Cherry** Chief Mechanic

Rob is Chief Mechanic and has occupied the role since 2016. His first involvement in motorsport mechanics came in 2004 when he worked for Arden International. Rob moved to Formula 1 in 2006 with Renault as a rear end mechanic on the Test Team. By 2008, Rob was number one mechanic on the Test Team and in 2009 stepped up to the Race Team in a similar position, remaining at Enstone across its different guises until 2016 when he became Chief Mechanic.

**Vincent Hubert** Deputy Engine Technical Director

Vincent has worked at Viry Châtillon since 2000, and in 2016 became Deputy Technical Director for the engine, working closely with Technical Director Rémi Taffin. Vincent studied in the 1990s, specialising in physics, mathematics and technology. He graduated with a degree in Mechanical Engineering in 1994 from the University of Orleans, alongside a placement at Mecachrome. He added to his education in 1998 with further studies in Mechanical Engineering, joining Renault in 2000 at Viry as an Engineer.

**Naoki Tokunaga** Chief Transformation Officer

Naoki has worked at Enstone since 2000 and is currently the team's Chief Transformation Officer. He joined Benetton from Nissan during the new millennium as a Vehicle Dynamics Engineer. By 2001, he was promoted to Head of Control Systems at Renault F1 Team working on the development of traction control, launch control and the quick-shift system and played a vital part in Renault's championship wins in 2005 and 2006. In 2007, Naoki worked as Head of Kinetic Energy Recovery System on Renault's first Formula 1 hybrid system in 2009. As well as Deputy Technical Director followed in 2010 with Renault and Lotus GP and then Technical Director in 2012 overseeing the development of the new power unit in Viry-Châtillon ahead of the 2014 season. Naoki then worked as Director of Programmes, focussing on diversified business development and Renault's Formula E programme, before taking his current role in 2017.

**Martin Tolliday** Chief Designer

Martin is the team's Chief Designer responsible for the design process of the current car. Martin keeps close communication with the large chassis design team as well as the Vehicle Performance Group, the aero department and the engine designers in Viry. After graduating with a degree in engineering, Martin began design work on mobile cranes, flight simulators and Group C racing cars. His first job in Formula 1 came in 1992 with Benetton as a junior designer. Martin continued in a similar position through Michael Schumacher's championship winning years of 1994 and 1995 and later was Assistant Chief Designer in 2005 when Fernando Alonso won the manufacturer's maiden world championship.

**Yannick Rohrbacher** Trackside Engine Engineer

Yannick joined Renault in 2014 as a Trackside Engine Engineer. Based at Viry and attending all races, Yannick is responsible for engine performance at the track. After studying until 2007 in engineering with a speciality in the automotive industry, he worked as an apprentice at the PSA-IPF School. In 2008 he began full-time work with PSA (Peugeot-Citroën) as an Engine Calibration Engineer and later worked in a managing role as well as a project leader. After six years at the company, Yannick left to join Renault Sport Racing.

**Rob White** Operations Director

After working in a range of positions across Renault's Formula 1 involvement, Rob is now Chief Operations Director, predominantly overseeing the development of its Infrastructure at Enstone. Rob has vast experience in Formula 1, with a speciality in engine production. His career began with engine manufacturer Cosworth, firstly on Indy Car engines – boasting a number of race wins and championship victories – and later in Formula 1 as a Chief Engineer. Rob joined Renault F1 Team in 2004 as Engine Technical Director before taking on the role as Deputy Managing Director a year later. He played a leading role in Renault's most successful period in Formula 1 with championship titles in 2005 and 2006 and later four consecutive titles with Red Bull Racing from 2010 to 2013 under V8 power.

**Chris Cooney** Engineering Director

Chris is the Engineering Director at Enstone and has been in the position since 2013. He graduated from Imperial College, London, in 1985 and began working for Ricardo as a consultant engineer. His first job in Formula 1 was with McLaren in 1988 as a Design Engineer, spending some time on the race team, before returning to an office-based position. Chris' final role at McLaren was as a Project Engineer in R&D before switching teams in 1997 to Tyrrell. Following spells at Honda and Jordan, he joined Renault in 2002 in the Advanced Projects Group, which culminated in a position as KERS Project Manager. He led early integration work on the 2014 hybrid power unit with the team in Viry before moving into his current position while under Lotus ownership in 2013, continuing the role through Renault's acquisition at the end of the 2015 season.

**Pierre d'Imbival** CIO Information Systems

After gaining his mechanical engineer qualifications at the ESTP in Paris and the University of Michigan, Pierre matured a strong transversal knowledge of business models through his experience as CIO in diverse environments, from automotive to oilfield services, retail, consultancy and furniture. As CIO at Renault F1 Team, he focuses on bringing added value to the business rather than pure technology implementation. Pierre is responsible for the delivery of IT services to more than 1000 employees and to ensure that, from design and manufacturing to performance related applications, the team is supported by technology partners who can help it stay ahead in the digital transformation race.

**Simon Virrill** Chief Designer – Current Car

Simon joined Renault in 2003 and is now employed as Chief Designer on the current car working closely with the various design teams across departments to develop a competitive chassis package. Simon studied Automotive Engineering at Oxford Brookes University as a Benetton Formula sponsored student, working at Enstone in his placement year. He enjoyed the two championships victories in 2005 and 2006 as a Transmission Design Engineer, moving to a Senior Mechanical Design role in 2009. During the Lotus years at Enstone, Simon was appointed Assistant Chief Designer in 2011, through to the Renault acquisition at the end of 2015 and into his current role in the middle of 2018, overseeing the design of the current car.

**Pierre Genon** Head of Performance Systems

Pierre is currently Head of Performance Systems working closely with the Design Office, Aerodynamics, Transmission and the Race Team to improve the overall performance of the car. After graduating from the University of Liege in Mechanical Engineering and later Aeronautical Engineering at Cranfield, Pierre began working with AP Racing in Coventry. A move to rallying followed and Pierre joined Subaru World Rally Team, working with Colin McRae, Richard Burns, Tommi Makinen and later Petter Solberg. He became Chief Rally Engineer in 2002 and progressed Solberg to his world title in 2003. Pierre made a switch to Endurance Racing with Peugeot in 2009, contributing to the Le Mans 24 Hours win the same year. Pierre then joined Lotus F1 Team before taking up his current role with Renault when the team announced its Formula 1 comeback.

**Audrey Vastroux** Head of Project Support

Audrey joined Renault in 2006 upon graduating with a Masters in Mechanical Engineering with a speciality in engines and currently works as Head of Project Support at Viry-Châtillon. Her first role was a Test Engine Engineer before becoming a Modeller and Simulation Engineer. In 2011, Audrey became Head of Engine Testing and later Head of the Testing department. Audrey continued in a management position between 2016 and 2018 overseeing the planning and strategy of developing a Formula 1 power unit before moving into her current role as Head of Project Support.

**Louis Bordes** Director of Marketing and Communications

Louis leads the Renault Sport Racing Marketing and Communications department. He ensures the team are exposed to global media and orchestrates the marketing strategy for Renault Sport Racing, Renault in F1 and marketing rights for partners. Louis' career began in 1995 as a Strategy Analyst for Aérospatiale, remaining with the company as Head of Multimedia between 1999 to 2000. For five years he worked as External Communications Manager for the MBDA. Between 2007 and 2010 Louis was responsible for the media interaction of the President of Airbus, then Chief of Staff from 2010 to 2016. His career switched to motor-racing in 2016, leading Renault Sport Racing's marketing and communication, covering Formula 1, Formula E and client racing.

**Pete Machin** Head of Aerodynamics

Pete currently oversees aerodynamics at Enstone in his role as head of the department. Pete is responsible for managing the large aero team, which work on maximising the efficiency of air flow over the car. Pete's career began at Bombardier Aerospace as an aerodynamicist and moved to Formula 1 in 1997 with Arrows as a Senior CFD Engineer. From there, Pete joined Jaguar in 2002 remaining at the team until Red Bull Racing bought out the car plant at the end of 2004. Pete played a key role in the wind tunnel, contributing to Red Bull's quadruple title success between 2010 and 2013. He joined Renault in the summer of 2017 as Head of Aerodynamics.

**Stéphane Rodriguez** Power Unit Project Leader

Stéphane has worked at Viry Châtillon for 18 years in a number of positions and currently works as Power Unit Project Leader. He has extensive experience in engine development, reliability and performance. His career in Formula 1 career began working for Prost GP as Quality Manager and later Manufacturing Manager between 1998 and 2001, joining Renault in April of that year. Stéphane first worked as Head of Engine Reliability and Head of the Engine Test Team, enjoying the successes of 2005 and 2006. By 2010, he took on the role as F1 Engine Project leader for the V8 engines, contributing to Red Bull Racing's four world titles. In 2014, with the introduction of the V6 hybrid engines, he continued in his project leading position.

**Antoine Magnan** Director of Partnerships

Antoine works as Director of Partnerships, responsible for acquiring and maintaining sponsors for the team. Antoine has worked with Renault in Formula 1 since 2012. He started his career at HP working within the French market for commercial desktops. Her experience in sport led to assisting Renault in 2009, eventually creating the Renault Sport Racing legal department. Marie worked as Legal Manager between 2012 and 2014, then General Secretary for two years, followed by a role as Head of Legal. From the end of 2018, Marie became General Counsel.

**Marie Jourdain** General Counsel

Marie has worked for Renault Sport Racing since 2012 and is currently employed as the General Counsel. Marie has extensive experience in the sports business industry working as a lawyer in major global firms including at the Rugby World Cup in 2007. Her experience in sport led to assisting Renault in 2009, eventually creating the Renault Sport Racing legal department. Marie worked as Legal Manager between 2012 and 2014, then General Secretary for two years, followed by a role as Head of Legal. From the end of 2018, Marie became General Counsel.

RENAULT SPORT ACADEMY

## 2019 LINE-UP

### INTRODUCTION

The Renault Sport Academy (RSA) enters its fourth year and second phase of development in 2019, on the back of a very promising campaign last season.

Launched in 2016, the RSA aims to find and nurture young racing driver talent and progress such prospects through the junior racing ranks all the way to Formula 1. Renault's goal is clear: for an RSA driver to be in Formula 1 and become world champion with the team.

Drivers are selected for the Academy based on their talent and potential shown in karting and junior championships. Renault is able to draw upon its global markets and racing acumen to scout standout, young racers. For 2019, the Academy will draw benefits from the development of the Formula 1 team, further strengthening the ties between both programmes.

Three familiar faces remain with the Academy as Max Fewtrell, the Formula Renault Eurocup champion in 2018, Christian Lundgaard, runner-up to Max, and Victor Martins are retained from last season. GP3 Series champion Anthoine Hubert steps up his role from Affiliated Driver in 2018 to Academy Driver for 2019.

Two new drivers complete the line-up. Chinese European Formula 3 veteran Guanyu Zhou is joined by Brazilian French Formula 4 champion Caio Collet.

Anthoine (Arden) and Guanyu (UNI-Virtuosi) will go head-to-head in the FIA Formula 2 Championship this year. Max and Christian (both ART Grand Prix) will race in the new FIA Formula 3 Championship with Victor (MP Motorsport) and Caio (R-ace GP) going wheel-to-wheel in the Formula Renault Eurocup.

"I'm confident in the drivers we have because they are capable of competing for wins and championships"

Mia Sharizman

### CYRIL ABITEBOUL

All six drivers have shown themselves to be exciting talents in the junior categories and we look forward to working with them in 2019; both to aid their career progression and benefit the Formula 1 team. Renault is able to utilise its global markets to discover homegrown talent and potential and the 2019 line-up is a reflection of that.

The Academy has been an excellent resource over the last three years and will continue to be beneficial for many seasons to come. For Max, Christian, Victor and Anthoine – already familiar with the Renault family – it's about continuing the hard work behind the scenes and meeting their objectives. We're especially pleased to welcome Guanyu and Caio to the team and will be doing everything to help them, along with the retained drivers, enjoy rapid success.



**Cyril Abiteboul**  
Renault Sport Racing  
Managing Director

### MIA SHARIZMAN

We're convinced the way we're approaching it will bear fruit at the end of the year, heading into 2020 and beyond.

#### What's the outline for the second phase of the Renault Sport Academy?

As drivers get closer to Formula 1 the programme grows tougher, more stringent and the requirement process is much higher. The importance for drivers integrating with the Formula 1 team is also greater. It's a gradual process, but we aim for our drivers to benefit the Formula 1 team, and vice versa, by conducting work on the simulator and attending race weekends. Drivers have to excel at their own level; that's the first clear outline of what everyone in the programme has to achieve.

#### How strong is the 2019 line-up?

I'm confident in the drivers we have because they are capable of competing for wins and championships. In Formula Renault, Victor and Caio have their sights set on the top and going for the title. In Formula 3, we have a strong line-up with Max and Christian, the top two in the 2018 Eurocup. Both will aim to give a good account for themselves in a very competitive category. In Formula 2, Anthoine and Guanyu make up an all-rookie line-up, but both have a good level of experience to mount a challenge for the rookie title, at least.

#### How will Renault approach 2019 in terms of driver development?

The approach has been the same since the start of the Academy. We want to identify, select and nurture drivers through the junior levels and ensure drivers reach an ability to be selected for the Formula 1 team in the future. There are always new ideas to look at for the drivers – individually and as a group – and we know there are things we can freshen up within the Academy. We're convinced the way we're approaching it will bear fruit at the end of the year, heading into 2020 and beyond.



**Mia Sharizman**  
Renault Sport Academy  
Director



# MAX FEWTRELL


<b>Max Fewtrell</b>
FIA Formula 3 Championship, ART Grand Prix
<b>Twitter</b> @Max_Fewtrell
<b>Instagram</b> maxfewtrell
<b>Age</b> 19
<b>Nationality</b> British
<b>2018</b>
<b>Wins</b> 6
<b>Podiums</b> 11
<b>Pole Positions</b> 6
<b>Fastest Laps</b> 5
<b>Points</b> 275.5
<b>Previous Championships</b>
<b>2018</b> 1 <sup>st</sup> , Formula Renault Eurocup
<b>2017</b> 6 <sup>th</sup> (1 <sup>st</sup> Rookie), Formula Renault Eurocup
<b>2016</b> 1 <sup>st</sup> , FIA MSA British F4
<b>2015</b> 11 <sup>th</sup> , MRF Challenge Formula 2000

Max enters a third successive season with the Renault Sport Academy, which he joined through virtue of winning the British Formula 4 Championship in 2016.

The Briton claimed his second championship victory in 2018 after sealing the Formula Renault Eurocup at the final round in Barcelona. That added to his impressive rookie outing in 2017, when he picked up the rookie title after finishing sixth overall in the series.

Max won six times in 2018; at Circuit Paul Ricard, Silverstone, Austria and a memorable hat-trick across Nürburgring and Hockenheim, which meant he had one hand on the championship trophy heading into the season finale.

For 2019, Max will step up to the new FIA Formula 3 Championship with French outfit ART Grand Prix.



I want to go into the season aiming to win the championship. I'm confident in my own ability and the team.

**What's it like being the senior member of the Renault Sport Academy?**

The longer you stay in a programme the better because it shows you're still performing and doing well. It's been a good two years with the Academy and really helpful; I wouldn't be where I am without them. Being here the longest doesn't change my approach as I'm still competing against the other guys and it will be close.

**What can you draw from the Eurocup win in 2018 ahead of the Formula 3 campaign?**

Last year was good for me learning wise. It wasn't a walk in the park and we had to comeback from being behind. I've experienced that and I've learnt not to ever give up and I'll try and use that to my advantage. There's going to be a lot to learn like the Pirelli tyres, DRS, higher downforce, being on the Grand Prix card and the fact I'm up against a strong grid.

**What are your targets for 2019?**

I want to go into the season aiming to win the championship. The team have proved they can do it, so I couldn't be in a better place to be going into Formula 3 this year. I'm confident in my own ability and the team.

**Did you know?**

Max lived in Singapore – close to the Marina Bay Street Circuit – for eight years from the age of three to eleven.



## CHRISTIAN LUNDGAARD


<b>Christian Lundgaard</b>
FIA Formula 3 Championship, ART Grand Prix
<b>Twitter</b> @Clundgaard5
<b>Instagram</b> lundgaardofficial
<b>Age</b> 17
<b>Nationality</b> Danish
<b>2018</b>
<b>Wins</b> 4
<b>Podiums</b> 9
<b>Pole Positions</b> 4
<b>Fastest Laps</b> 3
<b>Points</b> 258
<b>Previous Championships</b>
<b>2018</b> 2 <sup>nd</sup> (1st Rookie), Formula Renault Eurocup
<b>2017</b> 1 <sup>st</sup> SMP F4 NEZ, 1 <sup>st</sup> Spanish F4

Christian is retained by the programme for a third season after impressing in his rookie year in the Formula Renault Eurocup.

Having already won two championship titles in 2017 in his first year in single-seater racing, Christian raced in the highly-competitive Eurocup in 2018, finishing a close runner-up to fellow Academy member, Max.

Christian picked up the rookie title, winning four races at Monza, Spa, Hungary and Barcelona as well as recording a further five podiums.

The Danish teen will race in the FIA Formula 3 Championship in 2019, joining Max at ART Grand Prix.



The Academy has helped massively. They've been really helpful in every category – not only as a driver – but also away from the track.

**How excited are you for your third year with the Academy?**

I'm very pleased to be in the Academy for a third year. I joined in 2017 and it was a really big step for me, so to be kept on for a third year proves I'm doing something right and it gives me higher motivation to do even better this season.

**It's been fast progression so far, so how has the Academy aided your career?**

The Academy has helped massively. They've been really helpful in every category – not only as a driver – but also away from the

track. There are many benefits, we get identical support to the Formula 1 drivers and it's extremely useful. Many Formula 1 drivers get a race seat through being with a young driver programme so I'm certainly in the right place.

**How much are you looking forward to driving the Formula 3 car?**

It's not long until we go to Magny Cours for the shakedown. It's going to be about learning quickly. The track time is limited so you have to perform straight away, that's why it was really good to have three days in

Abu Dhabi testing the GP3 car. Learning the tyres will be challenging, as will adopting a new driving style compared to the Eurocup car. I will have to adapt quickly.

**What are your objectives for 2019?**

My goal is to always do my best. I want to win and I know I have to perform this year. It will be a tough season, we have to be realistic and pick up consistent points at every race weekend.

**Did you know?**

Christian's father Henrik was the 2000 European Rally Champion and competed in 17 World Championship rallies between 1995-2001.




# VICTOR MARTINS

<b>Victor Martins</b>
Formula Renault Eurocup, MP Motorsport
<b>Twitter</b> @MARTINS_Victor_
<b>Instagram</b> victor_martins_officiel
<b>Age</b> 17
<b>Nationality</b> French
<b>2018</b>
<b>Wins</b> 2
<b>Podiums</b> 6
<b>Pole Positions</b> 2
<b>Fastest Laps</b> 2
<b>Points</b> 186
<b>Previous Championships</b>
<b>2018</b> 5 <sup>th</sup> (3 <sup>rd</sup> Rookie), Formula Renault Eurocup
<b>2017</b> 2 <sup>nd</sup> (1 <sup>st</sup> Rookie), French Formula 4

Victor remains part of the Academy for a second season following his maiden campaign in the Formula Renault Eurocup in 2018.

The French teen joined the programme after ending 2017 as runner-up in French Formula 4. His first attempt in the Eurocup was largely successful, finishing fifth in the championship and third rookie after picking up a brace of wins – in Austria and Spa – as well as four further podium visits, which included a third-place double on the streets of Monaco.

Victor will stay for a second season in the Eurocup, switching teams to MP Motorsport.



It's a great opportunity to stay in the Academy. It's nice to be a French driver working in a French team.

**How pleased are you to stay for a second season with the Academy?**  
It's a great opportunity to stay in the Academy. The support was excellent last year and I think it will help me a lot again this year in the Eurocup. We were strong last season, so I'm really grateful to be with Renault again. It's nice to be a French driver working in a French team and maybe one day I can dream about being a race driver in the Formula 1 team.

**How much will your experience in the Eurocup count for your second attempt this season?**  
I'm really excited to race in Formula Renault again. I have more experience than some other drivers in the championship as it's my second year, but I have to stay focused on the job. I can't wait to drive in Monaco. Last year I had two podiums there and I was on the pace for pole position and the win, so I will go there this year to bring home two victories. Abu Dhabi will also be really fun.

**What are your goals driving for a new team, in a new car but in the same championship?**  
I have one goal: to win the title. I want to do my best, have an impressive year and add a championship win to my CV.

## Did you know?

Victor was French champion in gymnastics aged 10.



ANTHOINE HUBERT

<b>Anthoine Hubert</b>
FIA Formula 2 Championship, Arden
<b>Twitter</b> @AnthoineH
<b>Instagram</b> anthoineh
<b>Age</b> 22
<b>Nationality</b> French
<b>2018</b>
<b>Wins</b> 2
<b>Podiums</b> 11
<b>Pole Positions</b> 2
<b>Fastest Laps</b> 4
<b>Points</b> 214
<b>Previous Championships</b>
<b>2018</b> 1 <sup>st</sup> , GP3 Series
<b>2017</b> 4 <sup>th</sup> , GP3 Series
<b>2016</b> 8 <sup>th</sup> , FIA Formula 3 European Championship
<b>2015</b> 5 <sup>th</sup> , Formula Renault Eurocup
<b>2014</b> 15 <sup>th</sup> , Formula Renault Eurocup
<b>2013</b> 1 <sup>st</sup> , French Formula 4 Championship

Anthoine steps up his role with Renault Sport Racing, going from Affiliated Driver in 2018 to Academy Driver for 2019.

The Frenchman earned the graduation having clinched the 2018 GP3 Series title. Consistency proved critical for Anthoine last season, finishing on the podium eleven times, including two wins. He sealed the championship in the penultimate race of the season in Abu Dhabi.

The win meant Anthoine added a second crown to his name having won French Formula 4 in 2013.

Anthoine will race in the FIA Formula 2 Championship with British team Arden for 2019.

I learnt a lot and I've been very grateful for Renault's first year of support. As always, there's a lot more hardwork ahead.



**How pleased are you to step up from being an Affiliated Driver to a fully-fledged Academy member?**  
I'm really happy to continue with Renault. Last year was already a good step for my career but my target was to be fully integrated into Renault F1 Team and the Academy. I also targeted winning GP3, which meant I had the opportunity to join the Academy. As always, there's a lot more hard work ahead.

**What did you learn from being a Renault driver last year?**  
Working with the other young drivers and the Renault staff in 2018 was really beneficial. I learnt a lot and I've been very grateful for Renault's first year of support. Every year you learn and there are many things I can improve.

**What will be the main challenges of Formula 2?**  
I'll have to adjust to the bigger car, there are three more races on the calendar and the races are longer in length. The tyres are different and I will also train for pit-stops. There's a lot of things to prepare – more so than any other step up in racing categories – but I'm working very hard to be ready. I'm really excited for it and the season will come around quickly in March for the first race.

**Did you know?**  
Anthoine began karting aged three, when he and his dad would practice in a supermarket car park.



# GUANYU ZHOU


<b>Guanyu Zhou</b>
FIA Formula 2 Championship, UNI-Virtuosi Racing
<b>Weibo</b> @车手周冠宇
<b>Instagram</b> gyzhou_33
<b>Age</b> 19
<b>Nationality</b> Chinese
<b>2018</b>
<b>Wins</b> 2
<b>Podiums</b> 6
<b>Pole Positions</b> 3
<b>Fastest Laps</b> 1
<b>Points</b> 203
<b>Previous Championships</b>
<b>2018</b> 8 <sup>th</sup> , FIA Formula 3 European Championship
<b>2017</b> 8 <sup>th</sup> , FIA Formula 3 European Championship
<b>2016</b> 13 <sup>th</sup> , FIA Formula 3 European Championship, 6 <sup>th</sup> Toyota Racing Series
<b>2015</b> 2 <sup>nd</sup> , Italian F4 Championship

Guanyu Zhou is one of two new members of the Renault Sport Academy for 2019. Nineteen-year-old Guanyu hails from Shanghai, China, and has a strong record of single-seater racing in Europe since 2015 when he finished runner-up in the Italian F4 Championship.

Guanyu began karting as an eight-year-old and moved to London to study in 2012 while also continuing his racing career. By 2013, he had won the European Junior Rotax and ABKC S1 Rotax Junior Series.

After finishing runner-up in Italian F4 in his first year of single-seaters, Guanyu switched to the FIA Formula 3 European Championship in 2016, finishing 13th. He continued in the series in 2017, ending the year eighth before claiming eighth again in 2018.

Guanyu will drive in the FIA Formula 2 Championship with UNI-Virtuosi for the 2019 season.



I'm already super excited and I can't wait to get it all started soon. My aim is to score podiums and victories throughout the season.

**How much are you looking forward to joining the Renault Sport Academy?**

It's a huge honour to be part of Renault F1 Team by joining the Academy. I'm already super excited and I can't wait to get it all started soon.

**What are the main challenges for the Formula 2 Championship for 2019?**

It will be my first season in Formula 2 so, for me, the biggest challenge will be learning new circuits and the higher downforce, faster car. It's not going to be easy, but three days of testing in Abu Dhabi in November was really positive and I feel ready to secure good results.

**What will your targets be this season?**

My aim is to score podiums and victories throughout the season. I know it will be challenging as a rookie against a very strong field of drivers, but I'm ready for it and I can't wait to begin.

## Did you know?

In his free time, Guanyu enjoys rapping in Chinese.



## CAIO COLLET

<b>Caio Collet</b>
Formula Renault Eurocup, R-ace GP
<b>Twitter</b> @caio_collet
<b>Instagram</b> caiocollet
<b>Age</b> 16
<b>Nationality</b> Brazilian
<b>2018</b>
<b>Wins</b> 7
<b>Podiums</b> 13
<b>Pole Positions</b> 7
<b>Fastest Laps</b> 7
<b>Points</b> 303.5
<b>Previous Championships</b>
<b>2018</b> 1 <sup>st</sup> , French F4 Championship

Caio signs for the Renault Sport Academy as part of his prize for winning the 2018 French F4 Championship.

Born in São Paulo, Caio began his racing career as a karter in Brazil in 2009, moving to the European scene in 2015 where he was crowned CIK-FIA Rookie of the Year.

Caio made his single-seater debut in January 2018 in the Formula 4 UAE Championship. He picked up six podiums from seven races, including a win at Yas Marina.

The Brazilian will compete in the Formula Renault Eurocup in 2019 with champions R-ace GP.



This year the championship will be very competitive with the new car, and I will push hard to reach my goals.

**How pleased are you to join the Renault Sport Academy?**

I'm really pleased to join forces with the Renault Sport Academy, especially with all the history they have in motorsport. It's a big opportunity for me to work with support from a Formula 1 team and use their facilities to ensure I extract the best from myself.

**What was it like winning French Formula 4 last season?**

It was a great achievement in my career, especially as it was my first season in single-seater racing. For it to end in a championship win, shows that we are working in the right direction.

**How much are you looking forward to racing in Formula Renault?**

I'm really looking forward to racing in the Formula Renault Eurocup. This year the championship will be very competitive with the new car, and I will push hard to reach my goals. The calendar has nine Grand Prix tracks and that shows the level of the championship. It's definitely a step forward in my career.

**Did you know?**

Caio was signed by Nicolas Todt's All Road Management in 2017.


**INFINITI**

Premium car manufacturer INFINITI has been a technical partner of Renault F1 Team since the beginning of the 2016 season, when the brand's successful involvement in Formula One entered a new phase.

*As part of the Renault-Nissan-Mitsubishi Alliance and after five years of top sponsorship with Red Bull Racing, the establishment of Renault F1 Team provided INFINITI with the opportunity to evolve its involvement in Formula One and become an active participant in the sport.*

*INFINITI's technical partnership with Renault F1 Team is based around three major projects: the co-development of the second generation of the Team's Power Unit's Energy Recovery System, the INFINITI Engineering Academy and the INFINITI Project Black S.*

#### Energy Recovery System (ERS) co-development

The Energy Recovery System (ERS) underpinning the Renault F1 Team Power Unit is developed by INFINITI in conjunction with Renault Sport Racing.

A team of hybrid specialists from the INFINITI Technical Centre in Atsugi (Japan) have moved to the Renault F1 Team powertrain R&D facilities in Viry-Châtillon (France) to co-develop the Power Unit's Energy Recovery System, which incorporates two motor generator units (the MGU-H and MGU-K) and a battery.

INFINITI's reputation for performance hybrid vehicles is built on its acclaimed 3.5-liter hybrid engine. The Q70 sedan, equipped with this engine, has been recognized by the Guinness Book of World Records as the fastest accelerating full hybrid car. The same hybrid system is also offered on the Q50 sports sedan.

While INFINITI's expertise in performance hybrid is being leveraged by Renault F1 Team, this collaboration will also benefit INFINITI to drive further performance from its hybrid powertrains for road cars.



#### INFINITI ENGINEERING ACADEMY

The INFINITI Engineering Academy is INFINITI's global search for some of the best young engineers in the world to work across automotive and Formula F1 on a 2-month unique training placement.

2019 will be the sixth successive year of this highly successful recruitment program, which provides a money-can't-buy, life changing career opportunity for seven world-class students - one from each of the seven participating regions (USA, Canada, Mexico, Europe, Middle East, China and Asia & Oceania).

The seven winners benefit from a full spectrum of engineering experiences in automotive and Formula One, learning from leading engineers both at INFINITI Motor Company and with Renault F1 Team, thanks to the technical partnership and strong collaboration between the two companies.

A key pillar of the INFINITI Engineering Academy is exploring crossover opportunities and the sharing of technology between INFINITI road car and Renault F1 Team race car projects. With this added depth of knowledge transfer and the enhanced scope for collaboration that the Renault-Nissan-Mitsubishi Alliance brings, the Academy provides an unmatched range of experiences and opportunities to the seven winners.

For more information on the INFINITI Engineering Academy or to register to be a part of the class of 2019, please visit [academy.infiniti.com](http://academy.infiniti.com)



#### INFINITI PROJECT BLACK S

Project Black S is a collaborative venture between INFINITI and its Renault-Nissan-Mitsubishi Alliance partner, Renault F1 Team.

Based on the INFINITI Q60 sports coupe, 'Project Black S' is an engineering test-bed exploring how Renault F1 Team-inspired dual-hybrid powertrain technology could be deployed in a road car.

The Q60 Project Black S development prototype represents the maximum level of performance, dynamic capability, effective aerodynamics and intelligent energy management offered by INFINITI.

The world-first dual-hybrid technology is derived from Formula One and engineered specifically for the road to create a potential new performance flagship. It also illustrates INFINITI's commitment to developing exciting high-performance electrified powertrains.

For more information, images and videos on INFINITI's involvement in Formula One, please visit: [infiniti-gp.com](http://infiniti-gp.com)

## PARTNERS

### Bell & Ross

The story of Bell & Ross began at the end of the 20th century. With a dual Franco-Swiss culture, the watchmaking brand has become a benchmark in the world of professional aviation watches. It defied all codes by designing an icon, the BR 01, inspired by the clocks in the cockpit of an airplane: a circle within a square.

Bell & Ross is an international brand with ten subsidiaries that is a known and recognized throughout the world and present in over 75 countries, through a selected network of 800 retailers and 13 exclusive boutiques.

### Castrol

Castrol, one of the world's leading lubricant brands, has a proud heritage of innovation and fuelling the dreams of pioneers. Our passion for performance, combined with a philosophy of working in partnership, has enabled Castrol to develop lubricants and greases that have been at the heart of numerous technological feats on land, air, sea and space for over 100 years.

Castrol is part of the BP group and serves customers and consumers in the automotive, industrial and marine and energy sectors in over 120 countries. Our branded products are recognised globally for innovation and high performance through our commitment to premium quality and cutting-edge technology.

### GENII

Genii Capital is a Luxembourg based Private Equity and Financial Advisory firm. It holds a minority stake in the Renault F1 Team, having previously owned and controlled the team between 2010 and 2015. During this time the team achieved some exceptional results, beating Mercedes and McLaren in the 2012 and 2013 seasons respectively; earning the reputation of the leading non-backed OEM team.

Today, Genii Capital continues to rely on its relationship with the team to interact with market leaders, opinion leaders, high net worth individuals, global corporate finance players and the Formula 1 community players. Utilising this dynamic business environment, Genii Capital continues to support the team whilst initiating positive dialogue developing its reach across: Impact Investing, disruptive technology, branding, real estate & urbanism, entertainment and sports sectors.

### bp ultimate

BP is a global energy business with wide reach across the world's energy systems. With over 70,000 employees and activities in more than 70 countries, BP finds, produces and transports oil and natural gas; trades oil, gas, products and power; manufactures and markets fuels, lubricants and petrochemicals; and produces renewable energy through its wind, biopower and biofuels businesses.

### EURODATACAR

EURODATACAR, leader in the field of anti-theft marking, protects the vehicles of more than three million vehicle owners. EURODATACAR provides its services through manufacturer dealerships. The identification number marked on the vehicle's windows cannot be erased. This makes the sales of stolen vehicles and the falsification of their papers very costly and risky for resellers. To facilitate the identification of vehicles by the services allowed to do so (insurance companies, customs, police), EURODATACAR keeps each vehicle on its files for six years. Vehicle owners registered at EURODATACAR benefit from technical and financial assistance if their vehicle is stolen.

### INFINITI

INFINITI Motor Company Ltd. is headquartered in Hong Kong with representations in 50 markets around the world. The INFINITI brand was launched in 1989. Its range of premium automobiles is currently built in manufacturing facilities in Japan, North America, United Kingdom and China. INFINITI design studios are located in Atsugi-Shi near Yokohama, London, San Diego and Beijing. INFINITI is in the middle of a major product offensive. The brand has been widely acclaimed for its daring design and innovative driver-assistance technologies. From the 2016 season, INFINITI is a technical partner of the Renault F1 Team, contributing its expertise in hybrid performance.



### le coq sportif

Since 1882, the raised d'être de le coq sportif has led in the close links the blue-white-red brand created with athletes, whether they are champions, passionate amateurs, individual athletes or team members.

This is how le coq sportif today envisions and designs the outfits accompanying the events and the exploits of the France national rugby union team, A.S. Saint-Étienne, A.C.F. Fiorentina, Renault F1 Team and Tour de France leaders, but also several amateur clubs or icons: Yannick AGNIEL, Richard GASQUET, Frédéric MICHALAK, Yannick NOAH, Pauline PARMENTIER and Tony YOKA.... This time-based relationship is based on the demand for quality and elegance, both guaranteed by a unique savoir-faire and French fabrication: near Romilly-sur-Seine in the Aube district, the historic birthplace of le coq sportif, for all the fabrics and their dyeing, and in Lorraine for the "Made in France" shoes.

Its history has been affiliated with French sport for more than 130 years, which has made it a must-have that has now been taken to the streets and adopted for a daily lifestyle use. Around the world, le coq sportif excels today in nearly 60 countries. This international focus is part of its history: when the Argentinean footballer Diego MARADONA raised the Cup in 1986, he was wearing le coq sportif.

With the symbol of a singing rooster a new day dawns, the brand conveys positive and universal values: every single day, win is in sight!

### Microsoft

Microsoft (Nasdaq "MSFT" @microsoft) enables digital transformation for the era of strategic innovation. Its mission is to empower every person and every organization on the planet to go beyond and achieve more.

Microsoft believes in leveraging its technology and its people to help sports teams and organizations solve their toughest challenges. By leveraging the company's predictive analytic tools and productivity solutions, sports organizations worldwide are connecting with fans, optimizing team and player performance, and managing their operations in new, cutting-edge ways.

### RCI BANK AND SERVICES

Created and wholly owned by Groupe Renault, RCI Banque S.A. is a French bank specializing in automotive financings and services for the customers and dealership networks of Groupe Renault (Renault, Renault Samsung Motors and Dacia) worldwide, the Nissan Group (Nissan, Infiniti and Datsun) mainly in Europe, Brazil, Argentina and South Korea and through joint ventures in Russia and India, and Mitsubishi Motors in the Netherlands.

RCI Bank and Services has been the new commercial identity of RCI Banque S.A. since February 2016. With nearly 3,400 employees in 36 countries, RCI Bank and Services financed over 1.77 million contracts (for new and used vehicles) in 2017 and sold more than 4.4 million services.

At end-December 2017, average performing assets stood at €39.6 billion of financings and pre-tax income at €1,077 million. RCI Bank and Services has rolled out a deposits collection business in four countries since 2012. At end-December 2017, net collected deposits totaled €14.9 billion, or 34% of the company's assets.

Find out more about RCI Bank and Services: [www.rcibss.com](http://www.rcibss.com)  
Follow us on Twitter: @RCIBS

### MAPFRE

MAPFRE is a global insurance company with a worldwide presence. It is the benchmark insurer in the Spanish market and the largest Spanish multinational insurance group in the world. The company is the main multinational insurer in Latin America and is one of the Top 5 largest Non-Life European insurers by premium volume. MAPFRE employs more than 36,000 professionals and in 2017, the company's revenues totaled almost 28 billion euros, with net earnings of 701 million euros.

To find out more about MAPFRE, please visit <https://www.mapfre.com/corporate>

### PIRELLI

Established in 1872, Pirelli is among the world's leading tyre producers. It is the only pure consumer tyre company that includes car, motorbike, and bicycle tyres as well as associated services.

Pirelli has a distinct positioning in high value tyres, characterised by an advanced technology with more than 1,900 homologations obtained, thanks to partnerships with the most prestigious car manufacturers in the world. In order to achieve the highest levels of performance, safety and containment of environmental impact, Pirelli has always been strongly committed to research and development, in which it invested 6.5% of revenue from high-value products in 2017.

Involved in motorsport since 1907, Pirelli has been the exclusive official tyre partner of the Formula 1™ World Championship since 2011 and has just renewed the agreement until 2023.

### Tmall

Launched in 2008, Tmall ([www.tmall.com](http://www.tmall.com)) caters to consumers looking for branded products and a premium shopping experience. A large number of international and Chinese brands and retailers have established storefronts on Tmall. According to iResearch, Tmall was China's largest third-party platform for brands and retailers in terms of gross merchandise value in 2016. Tmall is a business of Alibaba Group.

## TECHNICAL PARTNERS

### 3D SYSTEMS

3D Systems provides comprehensive 3D products and services, including 3D printers, print materials, on-demand manufacturing services and digital design tools. Its ecosystem supports advanced applications from the product design shop to the factory floor to the operating room. 3D Systems' precision healthcare capabilities include simulation, Virtual Surgical Planning, and printing of medical and dental devices as well as patient-specific surgical instruments. As the originator of 3D printing and a shaper of future 3D solutions, 3D Systems has spent its 30-year history enabling professionals and companies to optimize their designs, transform their workflows, bring innovative products to market and drive new business models.

3D Systems have enjoyed a Technical Partnership with Renault F1 Team since 1998, when the first SLA 5000 was deployed in Estone with rapid prototyping purposes. Use of Additive Manufacturing developed rapidly to fulfill the team's aspiration to increase the production volume for Wind Tunnel model parts and is now used in a variety of roles, including the production of casting patterns and actual car components.

### HECHTER

Since 1962 DANIEL HECHTER has been the independent, conquering, exciting French player on the international ready-to-wear scene, which has made luxury affordable. Diversifying its products (men, women and children, accessories, home goods, perfumes), over the years, DANIEL HECHTER has remained the brand of open, modern people who expect their clothes to reflect a certain lifestyle. In 1998, Miltenberger Otto Aulbach GmbH acquired the company from its founder. By restructuring the collections, the current owners have continued to consolidate its success throughout the world. Today DANIEL HECHTER has spread its savoir faire to more than 65 countries through 600 own-branded boutiques and 2500 multi-brand stores.

### +GF+

GF Machining Solutions is a leading supplier of advanced and innovative machine tool technologies, high-productivity automation solutions and best-in-class after-sales support services. The company's technology solutions combined with the drive and experience of its staff make it the natural technical partner to precision component and mould tool and die manufacturers operating in a range of high-technology and high-value sectors.

GF Machining Solutions' machine tool range is extensive and, through strategic acquisitions and high-profile joint ventures, is growing and diversifying all the time. The company's machine tool portfolio includes AgieCharmilles EDM and LASER texturing machines, Mikron and Leitz machine tools, micro-machining laser and Additive Manufacturing (AM) machines.

GF Machining Solutions' EDM and 5-axis machines allow Renault F1 Team engineers to push Formula One technology to its limits and to adopt radical approaches to the design and manufacture of strategic car components.

### MATRIX

Matrix Fitness – A total solutions partner - is the commercial division of Johnson Health Tech. Matrix is comprised of a complete range of premium, commercial-grade cardiovascular and strength-training equipment for health clubs and other fitness facilities.

Renault Sport was the first commercial partner for Matrix - joining together over a decade ago. This relationship has been retained throughout the years and continues to grow with Matrix providing fitness equipment to the team's Technical Centre, a purpose-built sports training and sports science facility known as the Matrix Human Performance Centre (HPC).

### PerkinElmer

PerkinElmer is a global leader committed to innovating for a healthier world. Our dedicated team of 8,000 employees worldwide are passionate about providing customers with an unmatched experience as they help solve critical issues especially impacting the diagnostics, discovery and analytical solutions markets. Our innovative detection, imaging, informatics and service capabilities, combined with deep market knowledge and expertise, help customers gain earlier and more accurate insights to improve lives and the world around us. Together, we are making a difference for the better:

- For more effective drugs: PerkinElmer technologies and expertise were instrumental in the development of 22 novel therapeutic drugs.
- For healthier babies: Our neonatal and newborn screening technologies have aided in screening over 520 million babies worldwide for a variety of life-threatening diseases, helping them get a healthier start.
- For better treatment: We touch over one million lives every year through cancer treatment with our advances in digital imaging technology.
- For a cleaner and safer environment: Our instrumentation and solutions test 289 billion gallons of water a year to provide safe drinking water for 1 billion people.
- For a safer food supply: In 2016, we analysed 220 million tons of wheat for quality within the global grain supply chain.
- For more informed scientific decisions: Deploying Spotfire licenses across more than 300 enterprises so researchers can better capture and visualize insights.
- For greater efficiencies: Our OneSource services team manages assets in over 8,000 labs around the world.

For over 20 years the F1 Team at Estone have used PerkinElmer technologies to ensure component safety, quality and integrity. Through our technical partnership with Renault F1 Team, a dedicated PerkinElmer scientific laboratory operates within the Estone facility: the latest PerkinElmer thermal analysis, infrared spectroscopy and imaging technologies are used to support proactive monitoring, issue prevention, reliable quality and enhanced performance of Renault F1 Team race car components.

### VOLUME GRAPHICS

With a market share of around 80%, Volume Graphics holds a leading position in the industrial computer-aided design (CAD) software industry, as recognized by the global business consulting firm Frost & Sullivan with the "2018 Global Industrial CT Software Market Leadership Award". Global customers, e.g., from the automotive, aerospace, and electronic industry use Volume Graphics software when it comes to quality assurance in product development and production. By choosing Volume Graphics software, you can rely on more than 20 years of experience in the development of software for non-destructive testing based on industrial CT.

### ALPINESTARS

Over five decades of pioneering motorsports safety and performance gives Alpinestars an unrivalled track record at the highest levels of professional racing. Continuous research into the world's premier motorsport footwear, apparel and protection maintains Alpinestars focus on giving the performance edge in its technology.

Innovation, design and development, with state-of-the-art facilities in the US and Europe fuelling a worldwide racing development program, Alpinestars is a global force in every major motorsport series: from Formula 1, NASCAR, the World Endurance Championship and Formula E to MotoGP, motocross and the Dakar Rally.

Products delivering comfort and breathability in the high stress cockpit environment, reduce driver fatigue and aid concentration. Combined with ultra-light materials and advanced construction methods, Alpinestars' class-leading auto technology is tested in Formula 1 to ensure it performs in the most competitively demanding environment possible.

With trackside technical support and relentless product development, Alpinestars consistently gives the world's leading driver performance technology to Renault F1 Team's drivers Nico Hulkenberg and Daniel Ricciardo. One Goal. One vision.

### ELYSIUM

Elysium provides interoperability solutions that allow sophisticated, high performance multi-CAD Translation, Migration, Simplification and Validation, Product Data Quality Management, Engineering Change Management, and a number of other tools to achieve 3D digital model collaboration with efficiency and the highest quality. Elysium has remained a global leader in the interoperability industry for 35 years, and pushes the envelope of what's possible in the world of CAD data collaboration and quality.

At Renault F1 Team, the pressure to have high quality data and the fastest turnaround on engineering changes possible while collaborating with multiple divisions and suppliers using CAD, CAM and CAE is enormous to meet deadlines of every race with improvements. This is precisely where Elysium excels and performs and Elysium has been a constant reliable partner to meet this challenge among the Renault F1 Team for over a decade.

Formula 1 enables Ixell to develop the best technologies for all car paints. Ixell colour technologies and tools are designed by and for colour professionals. Ixell proposes a uniquely broad range of products and comprehensive expertise, from bare metal to clear coat. Dedicated Ixell Field teams are specially trained to assist with advice on the best tools and working methods to enhance quality and improve productivity.

### OZ

OZ has been involved in motorsport for more than 30 years as a partner of the most prestigious teams in all kind of World competitions (F1, Rally, Le Mans, DTM, Indy). The incredible number of victories and World titles in the history of OZ represents the essence of excellence and the most reliable evidence of the quality and performance of OZ products.

OZ has been a partner of Renault F1 Team for many years, co-engineering performance wheels by using all the most advanced production technologies and materials to obtain the optimal balance between strength and elasticity, stress resistance and lightness. The result is the highly performing forged magnesium wheels that are competing today with Renault F1 Team.

### SIEMENS

Siemens PLM Software, a business unit of the Siemens Digital Factory Division, is a leading global provider of software solutions to drive the digital transformation of industry, creating new opportunities for manufacturers to realize innovation. With over 140,000 customers worldwide, Siemens PLM Software works with companies of all sizes to transform the way ideas come to life, the way products are realized, and the way products and assets in operation are used and understood.

Renault F1 Team has used Siemens solutions for advanced composite design, for over a decade to design and manufacture parts made of advanced composite materials, including carbon fibre. Engineers at the Estone facility are using Fibersim software to significantly reduce design and production time and improve the accuracy of its composite racing car parts, which make up 85% of a car's parts but only 20% of its weight.

For more information on Siemens PLM Software products and services, visit [www.siemens.com/plm](http://www.siemens.com/plm).

### YXLON

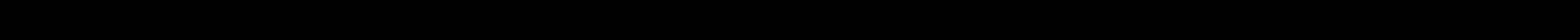
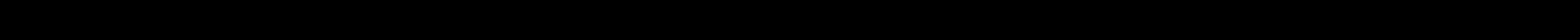
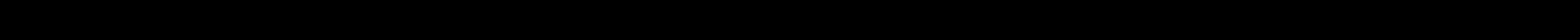
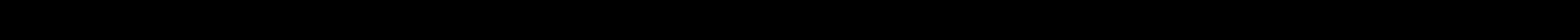
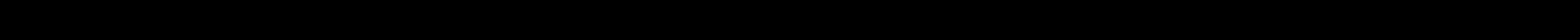
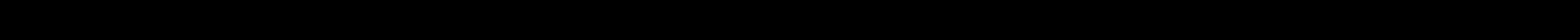
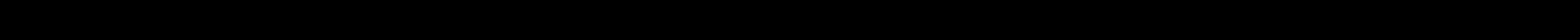
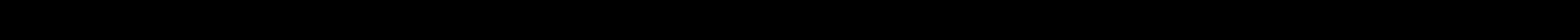
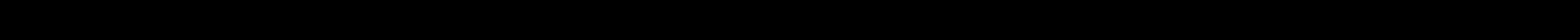
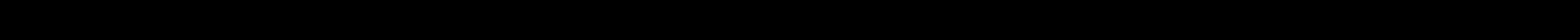
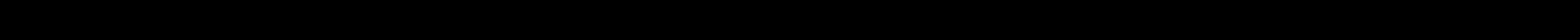
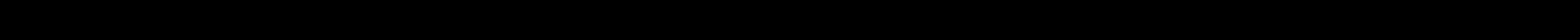
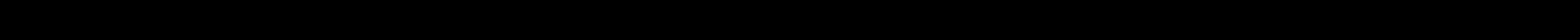
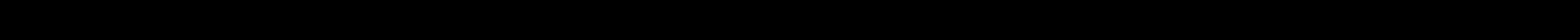
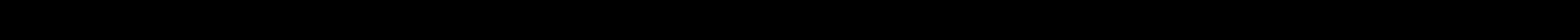
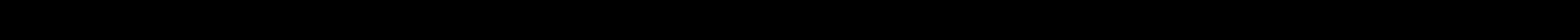
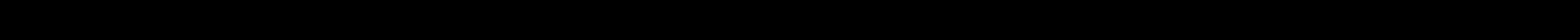
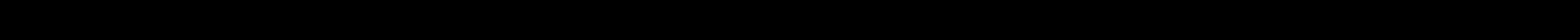
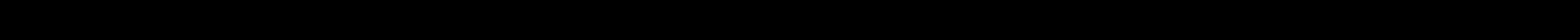
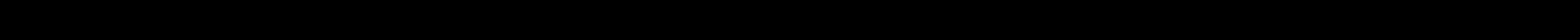
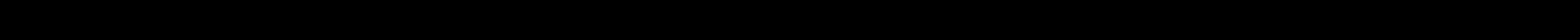
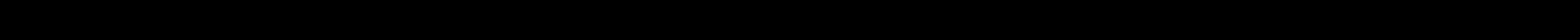
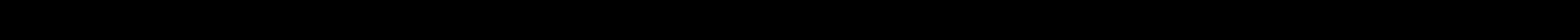
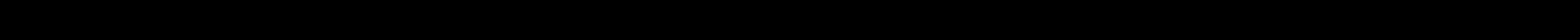
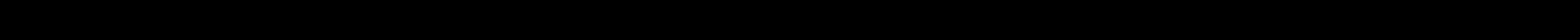
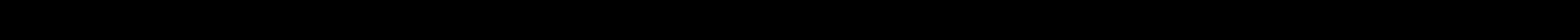
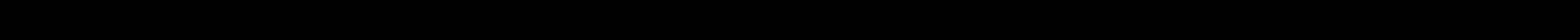
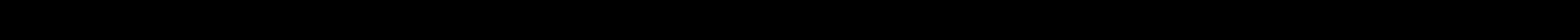
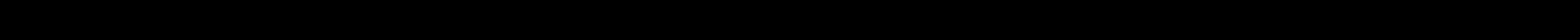
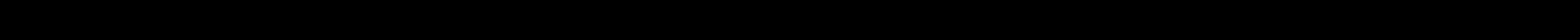
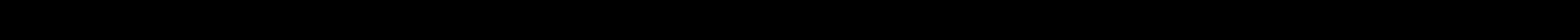
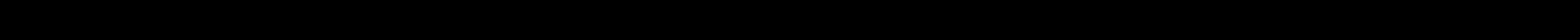
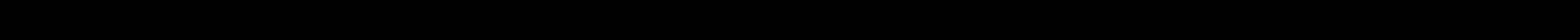
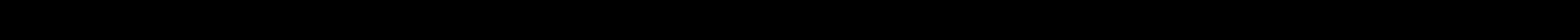
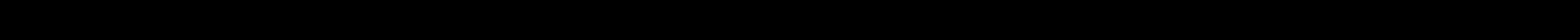
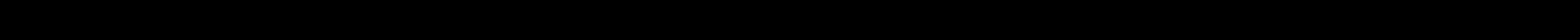
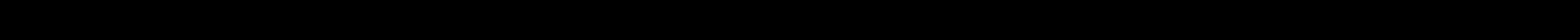
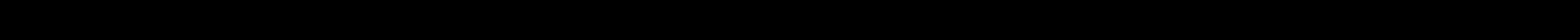
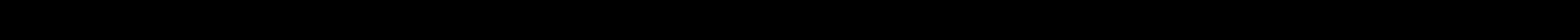
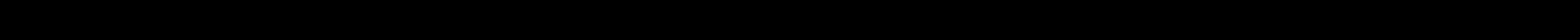
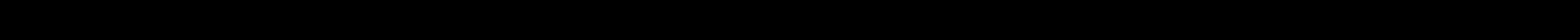
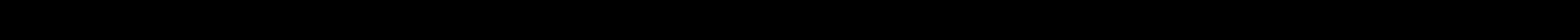
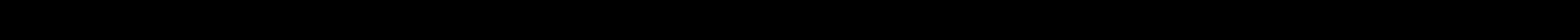
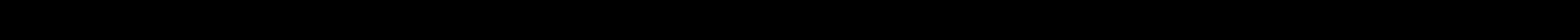
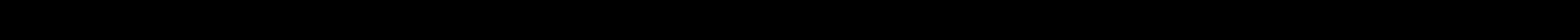
YXLON International, a company of the Swiss Comet Group, designs and produces X-ray and CT inspection systems for the widest variety of applications and fields. Whether situated in the aviation & aerospace, automotive or electronics industry, our customers are among the largest producers, major enterprises that place their confidence in our quality worldwide.

The name YXLON stands for quality assurance and material analysis for a huge bandwidth of products like cast parts, additively manufactured parts of diverse materials, tire, electronic components, etc. Our product portfolio includes X-ray systems for installation in radiological inspection envelopes, universal X-ray inspection systems on the basis of fully shielded devices, as well as solutions specific to a customer. Whether in manual, semi or fully automated operations, our inspection systems are ideal for deployment in research & development and can be integrated into any production process.

CT systems have been an integral part of our product portfolio since as far back as 2003. This enabled tomography provides a three-dimensional insight into inspection items, thus enabling the analysis of inner structures, dimensional measurement tasks in metrology applications or actual-to-nominal comparisons to CAD data, to name only a few examples. Besides delivering a more precise inspection evaluation when compared with radiography, computed tomography also provides valuable information about the production process. Above and beyond such advantages, our microfocus systems permit highly detailed looks into the most intricate structures and tiniest components.

With our headquarters in Hamburg, sales and service locations in Hudson (Ohio), San Jose (California), Yokohama, Beijing, Shanghai, and Hattlingen, as well as a network of representatives in over 50 countries, as YXLON we're local for our customers all over the world.

## RENAULT'S ON-TRACK PARTNERS





Renault will commemorate a breakthrough event in 2019: the fortieth anniversary of its first win in Formula 1. Jean-Pierre Jabouille drove the Renault RS10 to victory in the 1979 French Grand Prix, marking the first win for the brand and the first victory for a turbocharged car.

The story was even more remarkable considering Renault had only entered Formula 1 in 1977 with its ground-breaking RS01, the innovatively powered car that would lead to a revolution in motor racing.

Renault made its debut in the 1977 British GP with the RS01 steered by Jean-Pierre Jabouille. Nicknamed the 'Yellow Teapot,' the car made a big impression. Renault went from strength to strength over the next two seasons.

The 1979 French Grand Prix was held at the Dijon-Prenois circuit to the east of France. Jabouille and team-mate René Arnoux arrived in France having improved results since the season start in Argentina. A big push for the home Grand Prix however played out with dramatically improved on track performance. Jabouille claimed Renault's second pole position of the season with Arnoux locking out the front row.

When the race got underway, Ferrari's Gilles Villeneuve, who had qualified in third, flew off the line to leap into the lead. Jabouille kept in touch and seized an opportunity to retake the lead on lap 46. The Canadian looked vulnerable to the second Renault of Arnoux, who was now closing him down. The pair traded places over the closing laps, in what is now recognised as the ultimate F1 duel.

Jabouille won the race by nearly 15 seconds after a fine drive, with Villeneuve second – just a quarter of a second ahead of Arnoux after swapping positions an incredible six times on the last lap alone.

At the time, the turbocharged engine was something completely new in France, and in motorsport in general. There was a lot of scepticism to start with but, bit-by-bit, the entire team began to recognise its winning potential.

Its development was far from straightforward. Formula 1 is a notoriously demanding sport and coming in with a turbocharged engine only added to that challenge.

*For me, winning that grand prix was a very special achievement. It was a real breakthrough and everybody was surprised and delighted in equal measure.*

*I have always kept a very happy memory of that day although, at the time, I wasn't able to take it all in. I still think back to all the spectators and everybody else who had been waiting so long for that victory – none more so than me. I was congratulated by so many people and truly swept up in the moment. It was amazing, but I wish I had made more of it, because we never experienced that feeling again.*

*Behind me were Gilles Villeneuve and René Arnoux. I assumed their race had been fairly normal, but the reality was they had fought like crazy, clashing wheels at more than 250 kph – fortunately, without consequence. Gilles and René might have finished second and third, but all anybody was talking about afterwards was their battle. It was truly an insane fight. A battle like that – with both of them risking their lives – was really something else and got everybody talking. In the 30 or 40 years since, there has been nothing else like it – and for that, I am very thankful!*

"I have always kept a very happy memory of that day although, at the time, I wasn't able to take it all in."

Jean-Pierre Jabouille



## FROM THE TRACK TO THE ROAD

## A UNIQUE EXPERTISE AND KNOW-HOW

Questions for Patrice Ratti  
Renault Sport Cars Managing Director

How is the collaboration between Renault Sport Cars and Renault Sport Racing being reflected?

The Renault Sport Cars and Renault Sport Racing teams maintain very close ties to keep offering performance-driven technologies, coming directly from racing. Proof of this is found in the Mégane R.S.: from the cylinder head of the 1.8i turbo engine, conjured up by Renault, to the turbine fitted on a ceramic ball bearing system, a technology directly inspired by Formula 1, it is a continued collaboration.

Moreover, it is also important for us to have a link with the drivers, whether it is in their ambassador role around the world or their valuable expertise that they share with us when we develop our cars.

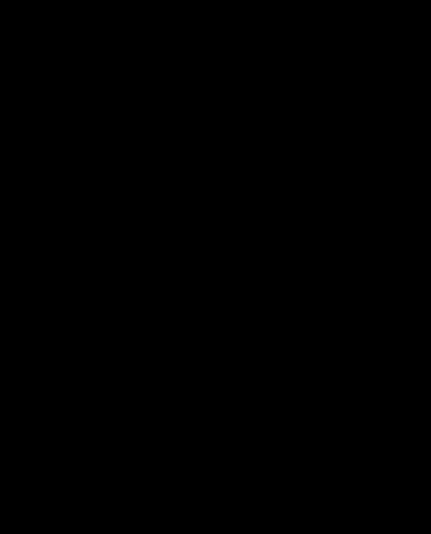
## What can we expect from Renault Sport Cars in 2019?

2019, which will mark the 15th anniversary of the Mégane R.S., will be full of passion and challenges for Renault Sport Cars. New Mégane R.S. Trophy will arrive in the dealerships while a new "R.S. Line" will be introduced with the launch of the New Clio. Launched at the end of 2018, our new "R.S.

"Performance" line of accessories and derivatives will be further developed and expanded to include more models to meet the strong demand expressed by our community. And there will also be a few surprises this year, which promises to be exhilarating.

## What are the upcoming challenges for Renault Sport Cars?

It is important for us to continue to convey the Renault Sport experience to all our customers and to maintain the brand's motorsport heritage in their day-to-day driving. We will have to preserve our know-how in terms of sporting prowess and driving pleasure, while adapting to higher environmental standards which will impose electric or hybrid solutions. We are actively working to meet all these challenges as we have always done for 20 years.



Patrice Ratti  
Renault Sport Cars  
Managing Director

"2019, which will mark the 15th anniversary of the Mégane R.S., will be full of passion and challenges for Renault Sport Cars."

## R.S. LINE

## THERE'S A RENAULT SPORT CAR FOR EVERYONE!

The Renault Sport range is based on a three-tier structure to cover all the needs of the customer.

The new R.S. Line is all about underlining the sportiness to meet growing customers' needs through a strong customization and a dynamic design. R.S. Line boasts the F1-style blade, a R.S. signature feature, as well as identity elements such as the sleek red and black interior or the R.S. double-diamond badged steering wheel.

The GT range is characterised by engine performance and an optimised chassis, as well as a high comfort level for daily use.

The R.S. offer the best performance and an uncompromising driving pleasure: the very best from Renault Sport.

Benefiting from technologies developed on the track, the R.S., GT and GT-Line are the flagships of the Renault range. Behind the wheel, hundreds of thousands of drivers form a border-free community that keeps the Renault Sport passion rolling on the roads around the world.

## FOCUS ON NEW MEGANE R.S. TROPHY

Sports car lovers can look forward to even greater performance and a sportier design, as New Renault MEGANE R.S. TROPHY boosts the Renault Sport line-up by extending the family of Trophy versions deployed since the first generation of Mégane R.S.

New MEGANE R.S. TROPHY comes with a brand-new version of the 1.8-litre turbo engine, delivering increased power output of 300hp and torque of 420Nm. It largely thanks to the use of pioneering technologies, especially for the turbocharger and exhaust system.

This engine can be combined with a manual or EDC dual-clutch gearbox.

Featuring Renault Sport's latest innovations in chassis and suspension systems, including the 4CONTROL four-wheel steering system and four hydraulic bump stop shock absorbers, New MEGANE R.S. TROPHY also comes as standard with the Cup chassis, which boasts stiffer suspension and a Torsen® mechanical limited slip differential. This version is equally enhanced by bi-material front brake discs, specific 19-inch wheels and very high performance Bridgestone tyres, which can be paired with new, exclusive lighter wheels.

And for the best possible feeling in the car, New MEGANE R.S. TROPHY can be fitted with a new generation of Recaro front seats, covered with Alcantara® upholstery.

\*MSD 100 gearbox

Meeting the needs of enthusiasts looking for exclusivity, the TROPHY version remains eminently suited to everyday use, offering all the features of Mégane R.S., particularly:

- The ability to select different driving modes using the Multi-Sense system,
- The exceptional performances of the lighting system, R.S. Vision,
- The telemetry and data acquisition system, R.S. Monitor.

"I have been involved in the Mégane R.S. development process since 2017 and I'm very pleased to see an even sportier version added to the family! Each of the new features on New Renault MEGANE R.S. TROPHY offers greater sports performance and feel. It's obviously positive to have more power and better grip through the tyres and to benefit from improved braking endurance. I also enjoyed the feeling offered by the new seats: the support they provide for sports driving is excellent."

Nico Hülkenberg Renault F1 Team driver and Renault Sport ambassador

## R.S. Performance: the new line of accessories and derivatives designed for the Renault Sport community

Renault Sport customers buy much more than cars; they buy into the burning passion for motorsport that has been part of Renault's lifeblood since its founding days. It is for this reason that Renault Sport has decided to stake their passion further with a new product range designed to allow them to live it to the full.

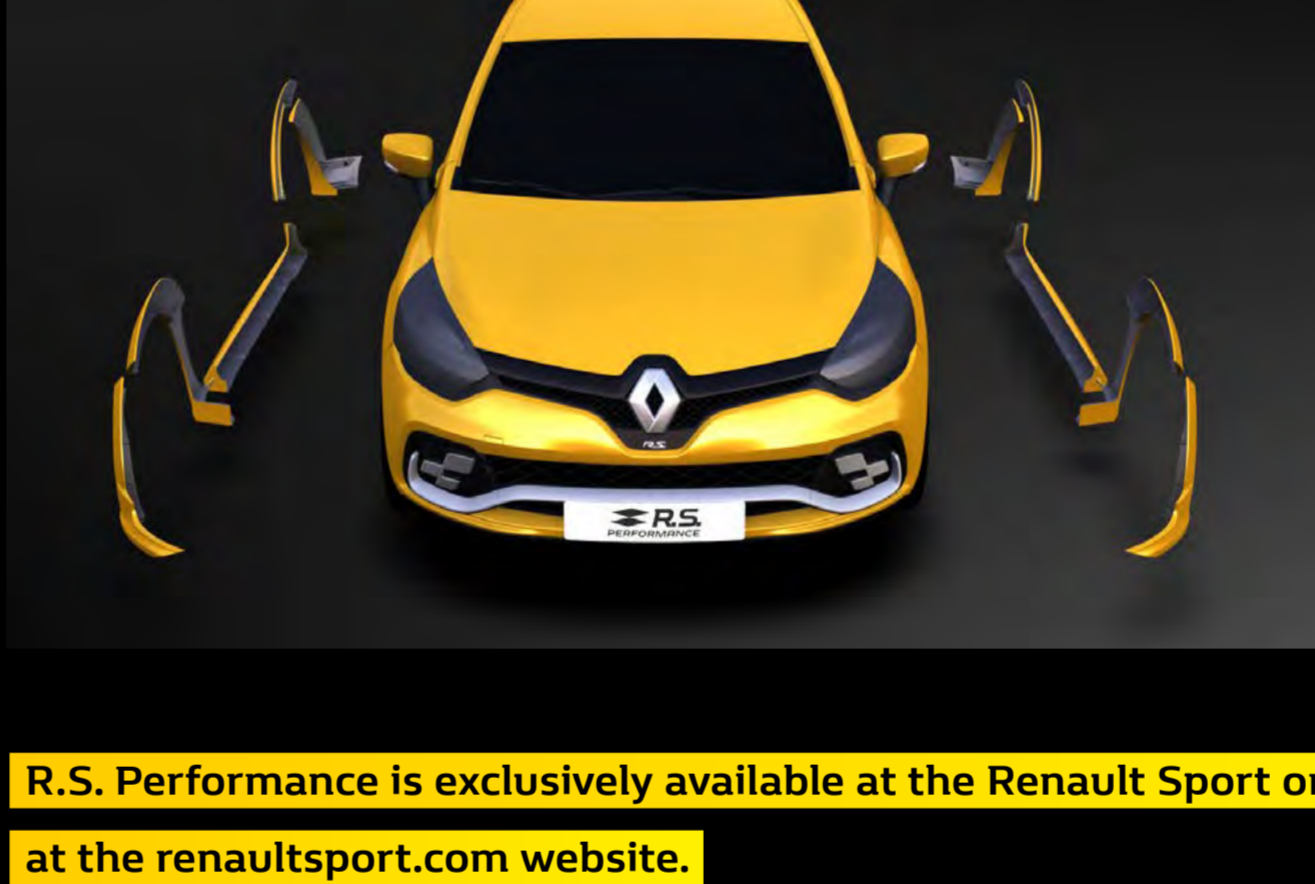
The range showcases the world of Renault Sport in its entirety: on the track, on the road and in the workshop, from design to performance, and from tools to bucket seats.

Renault Sport has launched R.S. Performance for R.S. car owners looking to enhance their Track Day experience. Filling the gap between the sport and competition series, this is a product offering that fulfils the expectations of enthusiasts looking for an extra step in style, performance, and even high performance. It's the essence of Track Days captured to perfection!

This offering is exclusively for track driving only.

Launched today on the Clio IV R.S., R.S. Performance will gradually become available on most R.S. models:

- Style parts: premium and very exclusive products, such as the R.S. Performance bodywork kit, inspired by the Clio R.S. 16 concept car and available in a limited-edition run of 250; and TurfIn rims, available in Brilliant Black and Red.
- Performance parts: a carbon fibre bucket seat, an exhaust line, high-performance brakes and suspension systems, an anti-strut bar, and much more besides. Designed especially for Track Days, these parts deliver on-track performance, or make it easier to achieve.



R.S. Performance is exclusively available at the Renault Sport online store at the renaultsport.com website.

## Renault's technological excellence in F1 for the benefit of all motorists

Renault's excellence on the racetrack has already found its way into the specification of its production engines. A prime example is the latest generation of Energy engines that have benefitted from the input of skilled specialists from the world of Formula 1.

## TECHNOLOGY TRANSFER

Over recent years strengthened ties have been forged between Viry-Châtillon, where Renault's F1 powerplants are designed and developed, and the Technocentre in Guyancourt, the company's new centre of road car engineering development. In addition, even closer ties will now be forged between Les Ulis, home to Renault Sport Cars. The close collaboration that exists between the race engine specialists and their production engine colleagues, as well as the one-off projects that involve both parties, allow breakthroughs in F1 to benefit road going engines, and vice-versa.

The speed at which developments occur in F1 and the analytical skills of Renault's race engine specialists enable the company to explore new technical solutions in extreme conditions. Competing with specialist makes on the racetrack also provides Renault, as a volume manufacturer, with a unique grasp of cutting-edge engine architectures.

This approach enables Renault to constantly improve the energy efficiency of both its race and road going engines in many different ways, including:

- Turbocharging and downsizing
- Direct fuel injection
- Friction reduction
- Shared practices

As such, Renault's customers benefit from a level of powertrain excellence that has been honed in the exacting world of motorsport

## ELECTRIC TECHNOLOGIES

Renault is making a direct contribution to the emergence of electric technologies via a dual sporting and technical commitment. F1 power units now incorporate powerful electrical motors that are capable of harnessing energy lost under braking and in the exhaust. The recovered energy is stored in a battery and released on demand to boost power.

This commitment showcases Renault's determination to step up technological progress in electric and hybrid vehicles. The technologies developed as part of our commitments will contribute to improving the performance of electric motors and the battery range.

## TURBOCHARGING

Turbocharging enables smaller displacement engines to produce greater power despite lower maximum rev limits. Energy that would otherwise be wasted as heat in the exhaust gases is recovered to drive the turbo. This energy is then used to compress the intake air (compressor) and increase the pressure inside the cylinders.

Renault stood out as the pioneer in turbocharging and downsizing in Formula 1 when it debuted the R.S.01 turbo engine in 1977. It gradually made this technology widely available in emblematic high-performance production cars in the 1980s, including the R5 Turbo, R18 Turbo, R11 Turbo and R21 Turbo.

Today, all the power plants that form Renault's Energy range are turbocharged with a view to reconciling the performance and fuel efficiency of its current smaller and lighter engines. Similarly, the E-Tech 19 is a V6 turbo, capable of producing more bang for buck than its engine displacement would normally allow.

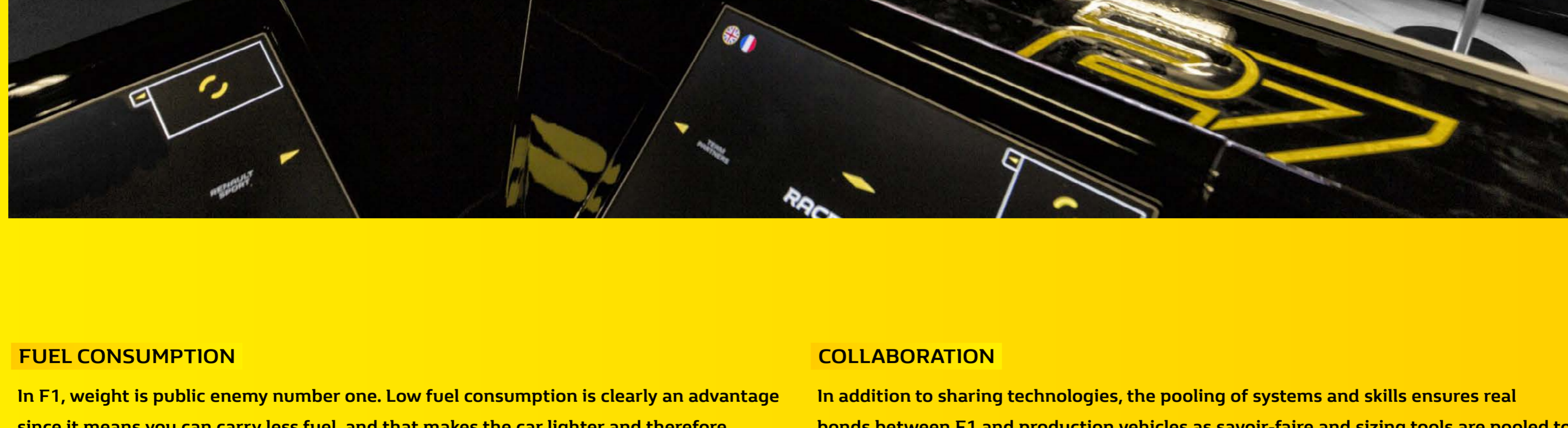
## DIRECT INJECTION

Direct fuel injection permits accurate control of the form and rate of the fuel spray inside the cylinders and not inside the intake manifolds, as is the case with indirect injection. Direct fuel injection in the Renault production cars also stems from the two-way dialogue between Viry and Guyancourt in their respective bids to optimise engine efficiency while minimising fuel consumption. The latter has been cut by 40 percent with the latest generation Formula 1 engine and is down 25 percent in the case of Renault's Energy production engines.

## FRICTION REDUCTION

The Energy engine range benefits from Renault F1 Team's expertise in friction-reducing technologies, including:

- DLC (Diamond Like Carbon) coating of cam followers
- Pressure Vapour Deposit (PVD) treatment of pistons rings
- UFLUX oil control ring technology, which has been used in F1 for more than a decade. The form of the "U" permits the piston ring to adapt to the exact profile of the cylinder wall to obtain the best compromise between efficiency (oil scraped off the lining to minimise consumption) and friction.



## FUEL CONSUMPTION

In F1, weight is public enemy number one. Low fuel consumption is clearly an advantage since it means you can carry less fuel, and that makes the car lighter and therefore faster.

## ELECTRONIC CONTROL SYSTEMS

When it comes to improving powertrain performance in road car technology, electronic control systems play an increasingly important role. High-performance control units, algorithms that incorporate more and more physical models, virtual sensors and so on are critical in reducing energy consumption.

F1 engines are fitted with sophisticated electronic control units that are capable of processing 5GB of data per hour to control fuel consumption, engine modes and hydraulic systems.

## COMPOUND ENGINES

The principle of recovering energy by placing a turbine in the exhaust line of a reciprocating engine and transmitting this energy to the crankshaft is not new. It was even used prior to World War 2 on certain airplane engines and a mechanical form was developed for trucks. The process is known as a "compound" engine.

The advantage of an electric turbo-compound solution is that it enables the released energy to be controlled in real time in order to use it when and where it is really necessary. Depending on the speed of the moment, it can be transmitted to the crankshaft, employed to maintain the speed of the turbine (and thereby reduce inertia during the transient phase), or quite simply stored in the battery until required.

Again, this technology mirrors that of F1's highly advanced power units.

## COLLABORATION

In addition to sharing technologies, the pooling of systems and skills ensures real bonds between F1 and production vehicles as savoir-faire and sizing tools are pooled to optimise both road-going and F1 engines.

Renault F1 Team's experience of high-performance engines proved beneficial when it came to designing the cooling system for Renault's road-going turbocharged engines. An example is the transverse water flow system employed by Energy engines.

Validation processes based on a thorough understanding of engine physics are also one of Renault's key assets. Ensuring reliability at each race is vital to success in F1, while the durability of the brand's Energy powerplant range is recognised in quality surveys.

Last but not least, talent sharing with a view to pooling advanced skills is a vital ingredient when it comes to promoting fruitful, two-way dialogue and fostering the spirit of innovation. Philippe Coblenze, who was behind the architecture of the Energy dCi 130, and Jean-Philippe Mercier, who was behind the Energy TCe blocks, are both former managers of Renault Sport F1's engineering office and architects of the V10, then V8 powerplants, which were successful in F1 in the 1990s and 2000s.

Their personal expertise and exacting approach to their respective road-engine projects. Downsizing, for example, was taken to new limits thanks to technical solutions and processes brought with them from F1. Energy engines now boast an unprecedented technological package for their level of range and, compared with their predecessors, deliver combined-cycle fuel savings of up to 25 percent for the vehicles they power.

The wide variety of skills available across Renault is a major advantage that is also beneficial to Renault F1 Team. For example, the team at Viry-Châtillon makes intensive use of Renault's materials laboratory, as well as tools like the scanning electron microscope.

## Advanced technology developing the vehicles of tomorrow

Formula 1 is an innovation laboratory for Groupe Renault. The sport is constantly evolving but has always used cutting-edge technologies and know-how, including virtual reality, simulation, artificial intelligence, exploitation and protection of data, hybridization, and so on. When harnessed by the technical excellence of Viry-Châtillon and Enstone, the development of these technologies will benefit series models developed for the customers of tomorrow.



## 2019 FIA FORMULA ONE WORLD CHAMPIONSHIP

<b>17 March</b>	Melbourne	Australia
<b>31 March</b>	Sakhir	Bahrain
<b>14 April</b>	Shanghai	China
<b>28 April</b>	Baku	Azerbaijan
<b>12 May</b>	Barcelona	Spain
<b>26 May</b>	Monaco	Monaco
<b>9 June</b>	Montréal	Canada
<b>23 June</b>	Le Castellet	France
<b>30 June</b>	Spielberg	Austria
<b>14 July</b>	Silverstone	Great Britain
<b>28 July</b>	Hockenheim	Germany

<b>4 August</b>	Budapest	Hungary
<b>1 September</b>	Spa-Francorchamps	Belgium
<b>8 September</b>	Monza	Italy
<b>22 September</b>	Singapore	Singapore
<b>29 September</b>	Sochi	Russia
<b>13 October</b>	Suzuka	Japan
<b>27 October</b>	Mexico City	Mexico
<b>3 November</b>	Austin	USA
<b>17 November</b>	São Paulo	Brazil
<b>1 December</b>	Yas Marina	Abu Dhabi

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