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We would like to thank the following for their help with this issue of AUTO: Tom Kristensen, Nathalie McGloin, Benjamin Menard, Caroline Morard, Sam Mallinson, Laura Ngó-Fontaine, Tracy Novak, Liam Parker, Andrew Papadopoulos
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THE FIA

The Fédération Internationale de l'Automobile is the governing body of world motor sport and the federation of the world's leading motoring organisations. Founded in 1904, it brings together 236 national motoring and sporting organisations from more than 135 countries, representing millions of motorists worldwide. In motor sport, it administers the rules and regulations for all international four-wheel sport, including the FIA Formula One World Championship and FIA World Rally Championship.

THE FIA FOUNDATION

The FIA Foundation is an independent UK-registered charity that supports an international programme of activities promoting road safety, the environment and sustainable mobility. It was established in 2001 with a donation of \$300 million from the FIA and is governed by a Board of Trustees. Among its activities, the Foundation participates in various UN road safety and environment-related partnerships and is a member of the UN Global Road Safety Collaboration.

Dear reader, dear friend,

It is often in these difficult times that our strengths are revealed. It is in moments of fear and doubt, of hardship and turmoil that we dig deep and find new levels of resilience that perhaps we did not know we possessed. It is also in this environment that we lean on one another, finding support in common goals, shared hopes. That has certainly been the case for us at the FIA and our Member Clubs in recent months, as we have all grappled with the repercussions of the COVID-19 pandemic.

However, in many countries, we are at last beginning to see a resumption of activity, or what we might refer to as a 'new normal'. Nowhere is that more visible than in the world of Sport and in our cover story we look at the work undertaken by the FIA and by our key motor sport stakeholders to restart competition around the world.

From the development of our Return to Motorsport Guidelines and the COVID-19 Code of Conduct, led by PROFESSOR GÉRARD SAILLANT and the FIA MEDICAL COMMISSION, to the remarkable efforts of FORMULA 1 in becoming the world's first major international sporting series to return, and on to the recommencement of our other major championships and grassroots motor sport, we examine how the protocols put in place by the FIA have ensured that motor sport can take place in the safest possible conditions. We also take a look at the future of motor sport in a post-COVID-19 world with F1 CEO CHASE CAREY, FORMULA E CEO ALEJANDRO AGAG and MOTORSPORT AUSTRALIA and FIA ASN DEVELOPMENT TASK FORCE PRESIDENT ANDREW PAPADOPOULOS.

Elsewhere in this issue, JAGAN CHAPAGAIN, GENERAL SECRETARY OF THE INTERNATIONAL FEDERATION OF RED CROSS AND RED CRESCENT SOCIETIES, tells us about the organisation's COVID-19 relief efforts and how its partnership with the FIA is helping, while FIA DRIVERS' COMMISSION PRESIDENT TOM KRISTENSEN reveals the inspiration behind our recent auction of motor sport memorabilia that resulted in a donation of almost €2 million to the IFRC, including the generous contribution of €1 million from the FIA Foundation. We also delve into how the automotive industry is dealing with the crisis with GENERAL MOTORS CEO MARY BARRA, who outlines how the US firm is planning for a post-Coronavirus world of zero emissions, crashes and road deaths.

Finally, in our Rear View section we celebrate the career of sports car legend HENRI PESCAROLO and we look back at one of rallying's greatest cars - the PEUGEOT 205 T16, of which I have personal and fond memories.

I trust you will enjoy this edition, and while so many human beings are still in the eye of the hurricane of the crisis, I urge you all to remain vigilant, follow your local guidelines and above all to stay safe.



JEAN TODT,
FIA President

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FORMULA E CHAMPIONSHIP
**DA COSTA
CROWNED**

Antonio Felix da Costa has sealed an emphatic victory in this year's ABB FIA Formula E Championship, with second place in Round 9 at Berlin's Tempelhof Airport enough to secure the Season 6 crown. The Portuguese followed home teammate Jean-Eric Vergne – who scored his first win of the 2019/20 campaign – to also help claim the Teams' title for

DS Techeetah. Da Costa took the title with two rounds to spare – a first in the series – on the back of three straight victories in Marrakesh and Berlin, and with a sizeable 71-point advantage over Stoffel Vandoorne. The Belgian won the season finale in Berlin with Mercedes-Benz EQ, thereby denying Vergne the chance to finish second in the Drivers' standings.

CHAMPION HAILS TEAM EFFORT
New Formula E Champion Antonio Felix da Costa was full of praise for DS Techeetah after winning the Season 6 title in his first season with the team. "I have to take my hat off to the team," he said. "The hard work they have put in has been unbelievable. They will do whatever it takes at all hours to win and I am so grateful for it. I thought I was a hard worker until I joined DS Techeetah!"



T.50 SUPERCAR RETURN OF THE FAN CAR

Gordon Murray, the brains behind the 1978 Brabham Formula 1 'fan car', has unveiled his latest design – a 3.9-litre V12 supercar that boasts ground-breaking power and the most advanced aerodynamics seen on a road car, aided by a 400mm rear-mounted fan. The T.50, which comes with a hefty £2.36 million (pre-tax) price tag, weighs just 986kg and, says Gordon Murray

Automotive, revs to a record-breaking 12,100rpm. The Briton's design was the 50th race or road car he's penned over a 50-year career, hence the name. "Just 100 customers will share my vision, a car created to improve on the F1 formula in every way," said Murray of the T.50, which is due for release in 2022. "Producing this British supercar will be my proudest moment."

A LESSON FROM THE PAST
Gordon Murray's new T.50 supercar isn't the first 'fan car' he's designed. That honour fell to the 1978 Brabham BT46B, which used similar downforce technology to such great effect that it was outlawed after just one race – the Swedish Grand Prix won by Niki Lauda by over 30 seconds to his next rival. Both old and new car use suction to reduce drag and increase downforce for more speed and better handling.



The T.50's rear fan helps increase downforce by 50 per cent, reduce drag by 12.5 per cent, add around 50PS to the car's output and cut braking distance by 10m from 150mph.

01

NEWS

NEWS FIA and IFRC join forces against COVID-19

FIA President Jean Todt has delivered a cheque for almost €2 million to the International Federation of Red Cross and Red Crescent Societies (IFRC) Secretary General Jagan Chapagain to support the humanitarian organisation's global COVID-19 response.

The funds were raised in an online charity auction hosted by the FIA and RM Sotheby's with the support of the motor sport community.

The charity auction took place from June 15-22 under the banner #RaceAgainstCovid and raised €1m in sales of memorabilia from famous motor sports drivers. The FIA Foundation matched those funds with another €1m donation.

The FIA and IFRC, which have enjoyed a six-year partnership that focuses on improving global road safety, hailed the success of the COVID-19 initiative. The FIA Road

Safety Grant and Sport Grant Programmes – also part of the long-standing partnership – will continue to strengthen cooperation between FIA Member Clubs and Red Cross and Red Crescent National Societies by scaling up interventions to prevent the spread of COVID-19.

"I am delighted to give a cheque for almost €2m raised by the #RaceAgainstCovid online charity auction organised by the FIA and RM Sotheby's, with the support of the FIA Foundation, to benefit the IFRC's global COVID-19 response. It is a substantial achievement," said FIA President Jean Todt at the handover in July. "Thanks to all those who made it possible. In these difficult times, health, mobility and sport must walk together. We join forces in the fight against COVID-19 and our FIA Sport and Mobility Clubs' network will play an important role in this collective effort."

IFRC Secretary General Jagan Chapagain added: "The generosity of the FIA Foundation, RM Sotheby's and online auction donors is a true

FIA helps raise almost €2m to support Red Cross COVID-19 response; governing body backs F1's drive for greater diversity; new Concorde Agreement confirmed; Audi champions bi-directional electric charging; Ferrari partners with Rising Stars; FIA Smart Cities forum report



IFRC Secretary General Jagan Chapagain and FIA President Jean Todt at the cheque handover.

gesture of solidarity and support for people who are affected by the COVID-19 pandemic. The IFRC is proud of its long-standing partnership with the FIA which brings together the world's largest humanitarian and motor sport networks to help the most vulnerable people access life-saving information, care and services during this pandemic." *See pages 21 and 68.

NEWS FIA donates €1m to promote diversity in motor sport

The FIA has announced that it will donate €1 million to the foundation created by Formula 1 to advance diversity in motor sport.

Following the launch of the FIA's #PurposeDriven movement to accelerate a positive impact in all sectors – including health, safety, economy, environment, education, inclusion and diversity – F1 announced its #WeRaceAsOne initiative as well as the creation of a dedicated foundation.

Prior to July's Austrian Grand Prix, FIA President Jean Todt announced a €1m donation from its FIA Innovation Fund to assist the new foundation.

The contribution will support a range of activities aimed at creating a more inclusive and diverse culture within F1 and other motor sport disciplines, as well as attracting more talent and financing internships and apprenticeships for under-represented groups to ensure they can fulfil their potential and have access to careers in motor sport.

Priority will be given to promoting a diverse driver talent pipeline by identifying and eliminating barriers to entry from grassroots karting to F1, in line with the single-seater pyramid run by the FIA for many years.

"The FIA is guided by the fundamental principles of our statutes which state that we should fight any form of discrimination and notably on account of skin colour, religion, ethnic or social origin," said President Todt. "We must promote diversity in motor sport and that is why we decided to give €1m to the new foundation. That is a first step, and more will come."

F1 CEO, Chase Carey added: "We are delighted the FIA has made this generous donation to the foundation. It is a major step in our goal to support key educational and employment opportunities for under-represented groups."



The FIA is supporting F1's new initiative to promote diversity in motor sport.

NEWS One year on: Tributes paid at Spa to Anthoine Hubert



Anthoine Hubert who was killed in a crash at Spa-Francorchamps in Belgium in 2019.

A year after French racing driver Anthoine Hubert lost his life in a tragic crash at Spa-Francorchamps, figures from across motor sport paid tribute to the FIA Formula 2 driver on the occasion of this year's FIA Formula 1 Belgian Grand Prix.

FIA President Jean Todt said: "We miss you Anthoine. Our thoughts are with you, your family and your friends."

At the circuit, Ecuadorian-American driver Juan Manuel Correa returned to the Ardennes for the first time he was seriously injured in the same incident at the Raidillon corner.

"It's one year since the crash. I felt there was a way for me to kind of close the chapter, but more importantly to pay my tribute to Anthoine," he said.

"Being in Spa definitely brings a lot of emotions, some positive and some negative. It is going to be a difficult weekend in that sense, but I am here, mainly as a tribute to Anthoine (Hubert) but also to see old friends, revisit the paddock and to enjoy the overall race weekend."

Scuderia AlphaTauri Formula 1 driver Pierre Gasly laid flowers at the site of the crash and later recalled growing up with Hubert as a member of the Équipe de France of the Fédération Française du Sport Automobile (FFSA).

"[Anthoine] was one of the guys I spent most of my time with during my childhood," explained Gasly. "We were rivals, but at the same time I know I would never have achieved what I did without growing up with him, because we were pushing each other so much, on or off the track. It made me a better athlete, a better driver and pushed me to deliver well and find more for myself. He's been part of my self-development as a person and as a driver and I can only be grateful for that."

For the Belgian Grand Prix the FIA Formula 2 championship designed a new logo in Hubert's honour featuring his race number 19. That logo ran on all F1, F2 and F3 cars during the weekend, while a minute's silence was observed ahead of the F2 and F1 races.

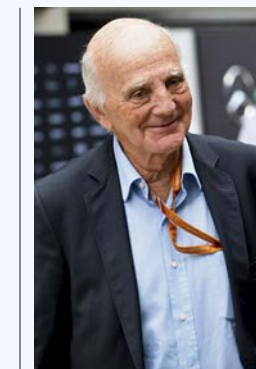
NEWS FIA supports cutting-edge medical study into effects of COVID-19

Supported by the FIA and aided by a €400,000 grant from the FIA Foundation, the Paris Brain Institute, in partnership with the AP-HP, Sorbonne-Université, Medico-University Department of Neurosciences at the Pitié-Salpêtrière Hospital in Paris, is launching a major study to rapidly and accurately assess the potential neurological and psychiatric impacts of COVID-19 on affected patients, with the aim of improving patient management, follow-up and rehabilitation.

Data collected by the study will be the subject of in-depth analysis using artificial intelligence. The information obtained will be exploited in real time in order to draw practical consequences for patients by May 2021.

"At the Paris Brain Institute, our mission is to find in order to cure," said Gérard Saillant, President of the Paris Brain Institute and President of the FIA Medical Commission. "Therefore, the observations of our eminent specialists in this study will be decisive in helping people with COVID-19 to receive appropriate care."

The study will focus on the neuropsychiatric manifestations of the affected individuals, as well as the psychiatric consequences for patients themselves (due to long periods of resuscitation) and their relatives, plus the consequences for



FIA Medical Commission President Gérard Saillant is part of a study on the effects of COVID-19 on patients.

patients already suffering from neurological pathologies such as inflammatory diseases (including multiple sclerosis) and neurodegenerative diseases (such as Parkinson's and Alzheimer's).

Professor Jean-Yves Delattre, Medical Director of the Paris Brain Institute and Director of the AP-HP-Sorbonne University Neuroscience Medico-University Department at the Pitié-Salpêtrière Hospital, added: "The Paris Brain Institute is probably one of the few centres in the world that is able to provide a comprehensive view of the neurology and psychiatry of COVID-19 infection. In the medium term, this will enable us as health professionals to be prepared to face a new pandemic and to have all the weapons at our disposal to better fight it. We can also think that this infection, when it strikes brains already damaged by a neurodegenerative or inflammatory disease, could have unknown effects. It is very important to know whether we are going to observe very atypical developments, for example in patients being monitored for Alzheimer's disease or multiple sclerosis. There's still a lot we don't know."

Saul Billingsley, Executive Director of the FIA Foundation, said: "The long-term effects of the coronavirus on health are only starting to be understood, so this important project will provide vital information to share with the world. We at the FIA Foundation are proud of our long-standing relationship with the Institute and its cutting-edge research."

NEWS Road safety included in call for action on child violence

Global Ambassador for the Child Health Initiative, Zoleka Mandela, joined the heads of UN agencies in launching a new report on ending violence against children as part of the Initiative's advocacy to accelerate action for adolescents.

The 'Global Status Report on preventing violence against children 2020' had a virtual launch in June led by WHO Director General Dr Tedros Adhanom Ghebreyesus and UNICEF Executive Director Henrietta Fore.

The Child Health Initiative has been collaborating with partners including UNICEF, WHO and the Global Partnership to end violence in developing the Call to Action for Adolescent Well-being. This pulls together major and interrelated issues that adolescents face globally. Included alongside violence are issues such as mental health, sexual reproductive health and education, central to which is the interconnected need for safe environments and action on road traffic injury.

Zoleka Mandela gave powerful testimony as a victim of violence and abuse, issues which have informed her advocacy, as has her experience of losing her daughter Zenani Mandela to road traffic injury. "We are joining forces with other groups working on issues such as mental health, issues of sexual and reproductive health, education, safe environments as well as injury prevention," she said. "We're saying that all the main issues affecting our teenagers need to be addressed together if we are to make the progress that is really needed. Let us please take the End Violence agenda and combine it with efforts to ensure that our young people have a better future."



Zoleka Mandela is pushing for an end to violence against children.

NEWS FIA Foundation webinar targets safer streets post-COVID-19

City streets could be safer and healthier in the wake of the COVID-19 pandemic but only with the data, funding and global advocacy to secure sustained political and public support, concluded speakers and participants in the first of a series of FIA Foundation 'build back better' webinars.



More than 90 global mobility experts joined the special online meeting to discuss the implications of the COVID-19 crisis on sustainable mobility, with presentations from C40 Cities and the Greater London Authority (GLA). During the first session in a series organised by the Foundation, participants considered

the emerging evidence and impact of individual cities' policies and identified the resources, action and advocacy needed to embed them into urban decision-making.

The discussion established five key urban mobility challenges: addressing the difficulties between social distancing and the need to continue to promote public transport; how to address public vehicle use; how to promote active mobility; the vital role of target funding as part of every country's recovery; and supporting cities across all regions and stages of development to secure future mobility.

Sheila Watson, Deputy Director of the FIA Foundation, said: "This discussion with leading global mobility specialists crystallises the opportunities for health and life from the darkness of this global pandemic. There is a wealth of positive action taking place in cities worldwide and it is our duty to ensure best practices and practical support are shared with all city leaderships, giving urban citizens the chance for a safer, cleaner and more sustainable future."

NEWS New global clean air resource for students

A new international school learning resource on clean air and healthy streets has been launched by the British Council in collaboration with the Child Health Initiative.

Connecting Classrooms is a British Council Schools initiative, part-funded by UK aid, enabling schools around the world to learn together to deepen understanding about global issues and local action framed through the UN's Sustainable Development Goals (SDGs). The lessons can be adapted to different regional contexts and have been designed to develop critical thinking skills. The clean air resource includes ideas about how to measure air pollution and emissions from vehicles, including the TRUE initiative's real-world emissions rating system.

The resource - 'Connecting Classrooms Cities and Communities: Clean Air' - consists of 12 lessons developed by the Geographical Association in conjunction with the Global Action Plan and the Child Health Initiative, with funding from the FIA Foundation. It focuses on air pollution



Connecting Classrooms, a Foundation-backed initiative, is teaching children about the importance of clean air.

on the journey to school and the school environment as a way of exploring sources of emissions, plus the impact of exposure to dirty air and measures that can be taken for a cleaner, healthier environment, connecting them to the SDGs on health (SDG3) and cities (SDG11).

It also draws on the experiences of the FIA Foundation's Cleaner Air 4 Schools International project, a pilot learning exchange between schools in London, Nairobi and New Delhi, which taught pupils about air quality before helping them become 'citizen scientists' to test air in and around their school. It was developed by LSx, now a part of the Global Action Plan.



NEWS FIA and Formula 1 confirm new Concorde Agreement with teams

The FIA and Formula 1 have confirmed that all 10 teams competing in the sport have agreed to a new Concorde Agreement. The conclusion of the deal follows extensive discussions over the past 12 months with all teams, F1, and the FIA.

The agreement will secure a long-term sustainable future for F1 and, in combination with the new regulations coming into force in 2022, will reduce the financial and on-track disparities between the teams. This will help level the playing field and create closer racing. More intense competition will attract more fans to the sport, benefiting all teams, and continuing to increase the global growth of F1.

"The conclusion of the new Concorde Agreement between the FIA, Formula 1 and all 10 current teams assures a stable future for the FIA Formula One World Championship," said FIA President Jean Todt. "Over its 70-year history, Formula 1 has developed at a remarkable rate, pushing the boundaries of safety, technology and competition to the absolute limit, and today confirms that an exciting new chapter in its

history is about to begin. During the unprecedented global challenges currently facing everyone around the world, I am proud of the way that all of Formula 1's stakeholders have worked together over the past months for the best interests of the sport and its fans to agree a pathway towards more sustainable, fair and exciting competition at the pinnacle of motor sport."

Chase Carey, Chairman and CEO, Formula 1 said: "This year has been unprecedented for the world and we are proud that Formula 1 has come together in recent months to return to racing in a safe way. We said earlier in the year that due to the fluid nature of the pandemic, the Concorde Agreement would take additional time to agree, and we are pleased that by August we have been able to achieve agreement from all 10 teams on the plans for the long-term future of our sport.

"All our fans want to see closer racing, wheel-to-wheel action and every team having a chance to get on the podium," added Carey. "The new Concorde Agreement, in conjunction with the regulations for 2022, will put in place the foundations to make this a reality and create an environment that is both financially fairer and closes the gaps between teams on the race track."

F1's new Concorde Agreement has been designed to level the playing field.

NEWS Jaguar develops contactless touchscreen to help against spread of viruses

New contactless touchscreen technology developed by Jaguar Land Rover (JLR) and the University of Cambridge in the UK will help keep drivers' eyes on the road and reduce the spread of bacteria and viruses in a post-COVID-19 world.

The technology, known as 'predictive touch', uses artificial intelligence and sensors to predict a user's intended target on the touchscreen - whether that's satellite navigation, temperature controls or entertainment settings - without touching a button.

Lab tests and on-road trials showed the predictive touch technology could reduce a driver's touchscreen interaction effort and time by up to 50 per cent, as well as limiting the spread of bacteria and viruses.

Uneven or poor road surfaces can often cause vibrations that make it difficult to select the correct button on a touchscreen. This means drivers must take their attention away from the road, increasing the risk of an accident.

"As countries around the world exit lockdown, we notice how many everyday consumer transactions are conducted using touchscreens: railway or cinema tickets, ATMs, airport check-ins and supermarket self-service checkouts, as well as many industrial and manufacturing applications," explained Lee Skrypchuk, Human Machine Interface Technical Specialist, at Jaguar Land Rover. "Predictive touch technology eliminates the need to touch an interactive display and could therefore reduce the risk of spreading bacteria or viruses on surfaces.

"The technology also offers us the chance to make vehicles safer by reducing the cognitive load on drivers and increasing the amount of time they can spend focused on the road ahead."

JLR says this software-based solution for contactless interactions has reached high-technology readiness levels and can be seamlessly integrated into existing touchscreens and interactive displays, so long as the correct sensory data is available to support the machine-learning algorithm.

JLR's predictive touchscreen technology has health and safety benefits.



NEWS Audi champions bi-directional electric charging

Car maker Audi is developing bi-directional charging systems that will allow owners of electric vehicles to transfer unused energy back to their domestic grid.

According to the German marque, in the first half of 2020 renewable energies contributed more than 50 per cent to the German electricity mix for the first time. However, the increasing percentage is also accompanied by a basic dilemma of wind and solar power: the generation of electricity is not always constant. On sunny days and phases with strong winds, there is often a lack of capacity to store the generated energy that the grid cannot use.

As the number of registered electric cars increases, the number of mobile energy storage units also rises. To exploit the potential of this, Audi has partnered with the Hager Group, a manufacturer of electrical installations in residential, commercial and industrial buildings, to research a solution that creates financial incentives and offers greater security of supply: bi-directional charging.

The high-voltage battery of the electric car is not only charged via the wall box at home but can also supply energy back to the house as a decentralised storage medium. If the customer has a photovoltaic system, the electric car serves as a temporary storage medium for the domestically-generated eco-electricity. When the sun is no longer shining, the vehicle can supply the stored electricity back to the house. Bi-directional charging at home – also known as Vehicle to Home (V2H) – has great potential to

reduce the home owner's electricity costs and increase network stability.

"Electric mobility is bringing the automotive industry and the energy sector closer together," said Martin Dehm, Technical Project Manager for Bi-directional Charging at Audi. "The battery of an Audi e-tron could supply a single-family home with energy for around one week independently. Looking ahead, we want to make this potential accessible and make the electric car part of the energy transition as a storage device on four wheels."



Audi says its e-tron could supply a family with energy for a week using bi-directional charging.

NEWS Volvo limits top speed to promote safety

Volvo is limiting the top speed of all its cars and is also introducing a system that allows owners to set additional limitations when the vehicle is in use by other people such as family members.

The Swedish firm is limiting its cars to 180kph and, according to Malin Ekholm, head of the Volvo Cars Safety Centre, the move fits with the car maker's tradition of safety innovation.

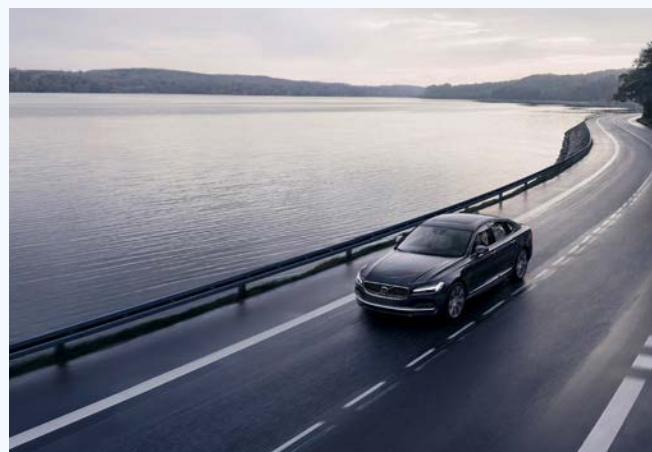
"We believe that a car maker has a responsibility to help improve traffic safety," explained Ekholm. "Our speed-limiting technology, and the dialogue that it initiated, fits that thinking. The speed cap and Care Key help people reflect and realise that speeding is dangerous, while also providing

extra peace of mind and supporting better driver behaviour."

Apart from the speed cap, every Volvo car will now also come with a Care Key, which allows drivers to set additional limitations on the car's top speed, for example before lending their car to other family members or to younger and more inexperienced drivers.

The company believes that the

180kph speed limit and Care Key send a strong signal about the dangers of speeding, underlining Volvo Cars' position as a worldwide leader in safety, with Ekholm adding that both features illustrate how car makers can take active responsibility for striving to achieve zero traffic fatalities by supporting better driver behaviour.



Malin Ekholm of the Volvo Cars Safety Centre says it is limiting vehicle speeds to encourage better driving.

NEWS Electric Volta truck promises greater safety



The Volta Zero has no internal combustion engine, allowing for greater visibility in the driver cab.

Electric truck manufacturer Volta says that by removing the traditional internal combustion engine from its Zero vehicle it has been able to rethink the design of commercial vehicles, with a clear focus on safety.

A fully-electric large commercial vehicle specifically designed for inner-city last-mile freight and parcel distribution, the Zero seats the driver centrally in the cab with a wide 220 degrees of direct vision around the vehicle.

This panoramic view of the surroundings through a glasshouse-style cab is designed to deliver optimum visibility and the reduction of blind spots. Driving safety and visibility is also enhanced by the use of rear-view cameras that replace traditional mirrors, a 360-degree birds-eye camera showing the driver their complete surroundings, and blind-spot warning systems that detect objects on the vulnerable sides of the vehicle.

Thanks to the removal of the internal combustion engine, the driver of a Volta Zero sits far lower than in a conventional truck, with their eye-line at around 1.8 metres. This mirrors the height of pedestrians and other road users in close proximity for easy visual communication.

"Safety is at the heart of the Volta brand for one simple reason," said Volta Trucks founder Carl-Magnus Norden. "In London, as an example, 23 per cent of pedestrian fatalities and 58 per cent of cyclist deaths involve an HGV, yet large trucks only account for four per cent of road miles. This is clearly unacceptable and must change. The Volta Zero reimagines the commercial vehicle, ensuring it can operate safely with all road users and become a friend of the zero-emission city".

NEWS FIA Rising Stars adds Ferrari as partner in search for female drivers

The FIA Women in Motorsport Commission's Girls on Track – Rising Stars initiative aimed at detecting and assisting young female racing talent has announced its first major partner – Scuderia Ferrari

The FIA Women in Motorsport Commission has announced Scuderia Ferrari as the first partner for its FIA Girls on Track – Rising Stars initiative. As part of the commission's project to detect and nurture the female racing talent of the future, Ferrari will assist in identifying the best 12-16-year-old female drivers from around the world and help them reach a professional career in motor sport at the most critical age of development.

With backing from the FIA Innovation Fund, the commission will work with the Ferrari Drivers Academy (FDA) as it builds a strong, long-term pathway to support young females on their motor sport journey.

"FIA Girls on Track – Rising Stars is another immense step forward at the grassroots level of motor sport and, with manufacturer partners, we have a really concrete opportunity to find, develop and support young women drivers," said Michèle Mouton, President of the FIA Women in Motorsport Commission. "To be able to collaborate with Ferrari, our first partner of the programme, is fantastic, and real recognition of

the progress we continue to make after 10 years of our commission's work. It is an incredibly exciting multi-year agreement, which we hope will result in two winning drivers becoming Ferrari's first-ever female racers."

The new partnership will see the commission and the Italian manufacturer commit to a four-year programme resulting in two drivers potentially joining Ferrari for an FIA Formula 4 Championship season.

"We are really pleased to be collaborating with the FIA in this innovative Girls on Track – Rising Stars programme," said Scuderia Ferrari Team Principal Mattia Binotto. "We are firm believers in the value of helping youngsters develop in motor sport. With this in mind, we felt we had to make a further effort to expand our area of operation to include female youngsters who want to get on in motor sport."

Tyre manufacturer Pirelli has also joined the programme to support the progression of young women in motor sport.

"For Pirelli, it's a pleasure to support this initiative that is totally aligned with our tradition," said Mario Isola, Head of F1 and Car Racing at the Italian company. "In fact, Pirelli has been sustaining young drivers' programmes for many years and has been involved with the FIA in several campaigns focused on sustainability and safety. FIA Girls on Track – Rising Stars brings together all of the best of these points and has got many characteristics to write an important page in motor sport history."

Launched earlier this year, the FIA Girls on Track – Rising Stars programme involved a worldwide search among the FIA's 145 national sporting authorities, which nominated promising young



Scuderia Ferrari Team Principal Mattia Binotto with WIM Commission President Michèle Mouton.

drivers with national or international racing experience.

Twenty drivers from five continents have been selected and invited to a shoot-out in October hosted by the Winfield Racing School, based at the Circuit Paul Ricard. The next step will see 12 drivers selected to undergo two different karting and Formula 4 focused training camps in October and November, also hosted by Winfield Racing School along with kart partner, Praga. Just four drivers will then be selected to attend a one-week course at the Ferrari Driver Academy, also in November.

Rising Stars participants will be put through their paces at the Winfield Racing School in France.



'With Ferrari, we can really help support young women drivers'



NEWS **FIA Smart Cities forum examines COVID-19 impacts on mobility**

The 'FIA Smart Cities eForum — Europe' gathered thought leaders from international organisations online in July to discuss how transport is being reshaped in times of a global pandemic.

Welcoming participants to the online discussion, FIA President Jean Todt said: "We must ensure freedom for all road users. There is an ongoing need to guarantee that urban transport is multi-modal and interconnected. In this context, we must think in terms of 'reasoned mobility'. And, more than ever, safety must be the core value in all transport systems."

In the forum's keynote session, Bernhard Wiesinger, Director for Consumer & Member Interests at Austria's ÖAMTC, looked at the direct impact of COVID-19 and preliminary findings. "Immediately after the lockdown, individual transport modes increased while shared

transport modes remained low in usage," said Wiesinger. "However, the need for new mobility has not changed and I expect that shared services will increase again and will reach the level they had before the crisis, as soon as cleanliness issues are solved and people do not feel they are taking a risk when using public transportation."

The discussion then moved on to address the challenge of using 'Real-Time Data to Measure Shifts in Road Users' Behaviour' in the context of a global pandemic, for a panel session gathering Director for Mobility of the World Business Council for Sustainable Development (WBCSD) Thomas Deloison, Secretary General of the International Transport Forum (ITF) Dr Young Tae Kim, RACC Foundation Director Lluís Puerto and Secretary General of POLIS Network Karen Vancluysen.

The COVID-19 crisis has shown how it has become essential to assess current mobility systems with a focus on increasing resilience, improving capacity and planning for a more efficient coexistence among transport modes. Karen Vancluysen said: "We need the integrated multimodal sustainable mobility ecosystem that we have been talking

about for so long. This requires better integration between public transport services and shared mobility services, and that means better cooperation between the public and private sectors."

She pointed to the need to swiftly develop efficient Mobility as a Service (MaaS) platforms, which led to Lluís Puerto talking about City Trips, the MaaS mobile app created by the RACC. He emphasised the importance of continuing the public/private cooperation observed during the crisis. "If we want to see public/private cooperation to establish a shared vision of what the future of mobility means, I think we need a legal framework. Setting out the roles, pushing transparency and openness of data-sharing to the market in order to help new services is absolutely necessary."

Thomas Deloison stressed the importance of putting in place reliable data governance to lift the barriers that prevent efficient cross-sectorial data sharing. He explained how the WBCSD is now working on setting the basis to build that system. "We will create that framework which will foster two essential values of data sharing: trust and the creation of shared value," he said. "This framework is absolutely essential, and we need it urgently if we want to grab the opportunities that are ahead of us."

Dr Young Tae Kim also insisted on the need to act swiftly in adapting our transport systems, and presented a new approach to post-confinement mobility that calls on public authorities to "react, reboot, rethink", with data supporting this idea. "Data is really important, but our approach is more important. Now is the time to think differently by interpreting [the data] we already have. With a holistic approach and new thinking, we can create new approaches to deal with data and information."

The 'FIA Smart Cities eForum — Europe' was the first conference of the entirely digital Season 4 of the initiative. Two other eForums will follow, each one with a regional focus, taking in Asia on September 23 and the Americas on November 12.

ITF Secretary General Dr Young Tae Kim has called for swift action to adapt transport systems.



RACC Foundation Director Lluís Puerto spoke about its Mobility as a Service mobile app.



POLIS Network's Karen Vancluysen wants better integration between public/shared transport.



While WBCSD Director for Mobility Thomas Deloison highlighted the role of data sharing.



'The need for new mobility has not changed'



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Driven to be part of the pandemic solution

01

TEXT / TOM KRISTENSEN

FIA Drivers' Commission President *Tom Kristensen* explains how the stars of world motor sport came together to raise half of a €2m fund to help the International Federation of Red Cross and Red Crescent Societies with its global COVID-19 response



Tom Kristensen helped organise a charity auction to support the COVID-19 response.

Geneva and, while we still could, a number of us were sitting together discussing our desire to do something to alleviate the crisis. We looked at it from a driver's point of view, thinking about what we could bring to the table. It was then that the idea of a charity auction of motor sport memorabilia was first mooted, and in the weeks that followed the concept, which was launched under the #RaceAgainstCovid hashtag, was enthusiastically embraced by the Drivers' Commission and by President Todd.

Also, for us, it was clear from very early on that the IFRC was the right organisation to assist, as the FIA has a long-standing cooperation with the organisation, and the IFRC's global reach and ability to really make a difference on the ground made it an obvious choice.

We quickly got backing from industry promoters, drivers teams, manufacturers and also, wonderfully, the FIA Foundation, which supported us with a donation of €1m. It was incredibly generous and we really wanted to match that figure.

The response from the motor sport community was amazing. We had incredible pieces of memorabilia from right across the sport, from all the current Formula 1 stars as well as legends such as Damon Hill, Michael Schumacher, Emerson Fittipaldi and Nigel Mansell, and from world rallying stars such as Sébastien Loeb and Sébastien Ogier. We received donations from drivers in the World Endurance Championship (WEC) and touring cars, as well as elements of cars, VIP experiences, and one-of-a-kind artworks. We were overwhelmed by the support we received, especially from young

drivers. Their engagement was amazing and that bodes well for the future of our sport. I was proud, also, to contribute in my own way with the race suit I wore during the last race of my career at the Brazilian round of the WEC in 2014.

It would have been nothing, however, without the response of the people who placed bids and we are enormously grateful that in all we managed to raise €944,392. Our dream was to match the €1m donated by the FIA Foundation and we very nearly made it. That is testimony not only to the generosity of those who

to cause hardship and heartbreak around the world. As such, I would urge everyone reading this to continue to be vigilant, to stay safe and to support organisations such as the IFRC in their efforts to reduce suffering everywhere.

However, to take a positive view, motor sport is starting again and it is doing so in ways we might not have thought possible before.

One of the most surprising – and encouraging – things we saw during lockdown was the rise of digital racing. I was inspired by just how quickly competitors and the public embraced online competition, and I feel that motor sport has genuinely reached out to a whole new generation of fans through digital racing.

What I particularly liked was the mix between virtual racers and real-world professionals. The positive exchange was amazing to see and I think we will reap a reward in the future both through acceptance of digital racing and how it translates to increased real-world participation.

Real-world racing is also back on the agenda and we have all been enormously encouraged by the return of not just F1, but also of sportscar racing, regional rallying and grassroots competition, the lifeblood of our sport. Of course, I'm also particularly looking forward to seeing the return of Le Mans in September.

The actions taken by all these series to protect personnel and ensure safety in every country visited, supported by the FIA's Return to Motor Sport Guidelines, have been remarkable and once again highlight our sport's unrivalled ability to rapidly react to problems and to identify and implement solutions. ◀

'A number of us discussed our desire to do something to alleviate the crisis'

donated items and bid for them, but also to everyone at the FIA who put in a huge amount of work in realising that goal in a short space of time.

Their efforts resulted in a great success, but the fight against COVID-19 is far from over. Infection and mortality rates are still on the rise as the pandemic continues

Among the items auctioned were the Dane's overalls from his final WEC race in 2014.



Growing up fast ⁰²

Jack Doohan grew up on tales of his father Mick's incredible achievements at top-level motorcycle racing, but rather than be deterred the young driver is navigating his own route to the top on four wheels, in FIA Formula 3, with a little support from his five-time 500cc champion dad, as they explain...

TEXT

PAUL KEITH

"It's a joke. Two weekends in a row," Jack Doohan shouts over the team radio after an early collision puts paid to his Formula 3 reverse grid race on Sunday at Silverstone. "It starts in qualifying every time and we get stuck among these 'numpties' who can't drive," concludes the young Australian's rant – and in the heat of battle, it sounds like his patience is about to snap.

Doohan has had a frustrating start to his F3 career. He moved into the series with HWA Racelab, having finished runner-up in the F3 Asia championship for the second time.

Despite experience and resources, HWA have struggled to make their cars competitive in the early part of the 2020 season and their three drivers – Jake Hughes, Enzo Fittipaldi and Jack Doohan – have often found themselves mired in traffic.

"Yeah, obviously it hasn't been ideal," Doohan says on the phone, sounding altogether more sanguine. "We've seen how competitive the racing is and how the meetings are run, but my performance and the whole package overall is definitely down from what I had expected."

Speaking with a maturity beyond his years, he adds: "I think it's quite frustrating for us all. Within the team, we all know that we have the potential to be running at the front.

"We have to take it on the chin, work out why we made these mistakes, and make sure we can eliminate them. But we're in a really good place as a team and we'll do better as soon as we get qualifying sorted."

A born competitor, the 17-year-old takes the business of racing very seriously. He's acutely

aware that Formula 1 seats come up once or twice in a young career and that there's plenty of drivers waiting in line. But he's not about to waste time in getting to the front of that queue.

In his corner – and his number one backer – is dad Mick, the five-time MotoGP world champion. "Bringing my son up to be a racing driver isn't something I actually intended on doing," says Mick. "Certainly I had no great interest in revisiting my past or spending the next two decades travelling from race track to race track. But now that I am, to be honest, I'm quite enjoying it."

Jack adds: "He wants me to win and do the best that I can. If I'm not performing to my potential, he's going to get after me because this is not play money; it's a substantial investment of money and time. He's making a huge sacrifice to be on the other side of the world with me and away from my mum, family and friends."

But how does it work having a world champion motor racer for a dad? Does it place additional pressure on young shoulders?

"Not really, to be honest," says Jack. "He really wants me to win – just like him – but I'm my own person trying to make my own way. I try to focus on being Jack and I don't really think about being a Doohan. Although I think it would have been different if I was on two wheels."

The wheels came off a career in racing motorbikes at age five when Jack broke his leg in a dirt bike accident. The youngster had friends who enjoyed karting and he made the transition to racing on four wheels – and proved a natural as well as a race winner.



Red Bull Junior Team member Jack Doohan has his sights firmly set on Formula 1.

'I try to focus on being Jack and don't think about being a Doohan'

"After he won a few Australian karting titles, he said to me: 'If I win another, can you take me to do some racing in Europe?'" Mick explains. "Without thinking it through very clearly, I said yes. Then he won another Australian title and we made the move to Europe. Considering it's a different school of karting in Europe, he adapted quickly. The following year, he got the chance to move to Formula 4. I had intended for him to do another year of karting but we had to make the most of the opportunity."

Mick and Jack both share the mindset of a racer: you have to seize on the slightest chance and you can't hang about.

"In the end, you only get one shot," says Jack. "Three spots at the absolute maximum are going to become available in F1 in the next five years and I need to be one of those drivers, otherwise why else am I here?"

WORK ETHIC

The other characteristic that father and son share is a ferocious competitive streak. "He's always been competitive, whether it be rugby union, athletics or karting," says Mick. "He's not happy to finish second, which is a good trait for a racer."

They're not taking anything for granted either and share the attitude that while talent takes you a long way, it's mostly down to hard work.

"The guys I'm racing only have two arms and two legs, so in the end it comes down to the work," says Jack.

Mick adds: "There's no substitute for having the desire to keep working at it. If he didn't have that desire, then I'd tell him to pack up and go to university. Jack has a good work ethic. He's always willing to up his game. He's pushing himself to do the best he can and find ways to improve himself."

Mick is careful to stick to his role and simply be a good father rather than Jack's manager. "I can share some of my experiences and I can help him achieve the right mindset, but I'm still his father and if I push too hard he'll just end up thinking I'm a pain in the backside. He's got some wise heads around him who've done well in motor sport and who he can bounce ideas off."

Since moving to Europe, Jack's progress has been quick, notching up the miles in F4, F3 Asia



Doohan Jr is racing with HWA in F3 this season, with driver and team both working hard to improve their results.

and now F3. He's also landed a coveted spot in the Red Bull Junior Team. "It's a proven path to Formula 1 and people like Daniel Ricciardo, Max Verstappen and Sebastian Vettel have all been through here before me," says Jack. "Before every race, we get access to the simulator at the Red Bull Racing factory in Milton Keynes. You get three hours, sometimes it's a complete day, where you can go really in-depth.

"You're supported by a top engineer so you can build a base of knowledge before going to the race weekend. You can work out brake points and racing lines and insights. We can also work out how we want the car set up so we can give feedback to the race engineers before going into the weekend. If you perform and get the results, you know that Red Bull want the top drivers and you will get an opportunity."

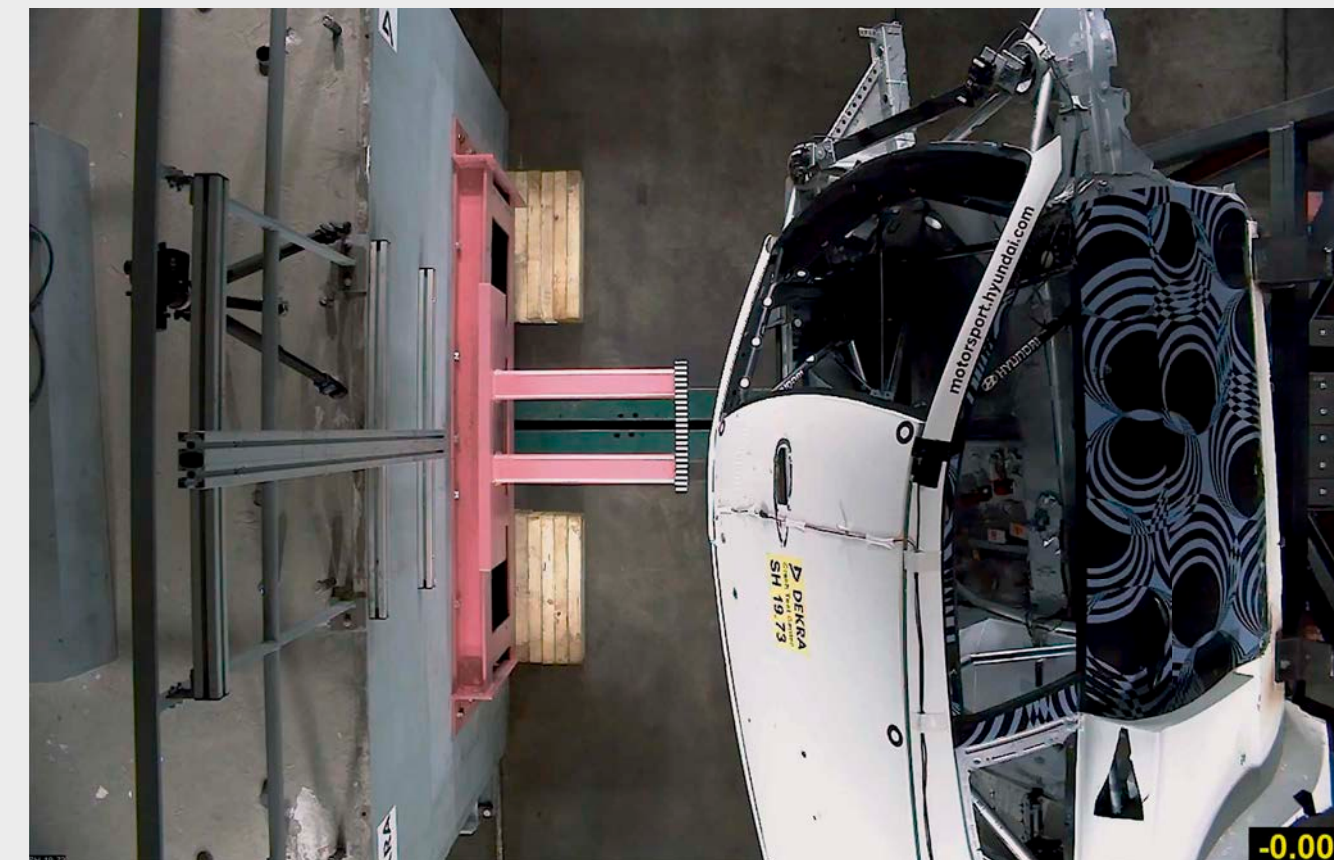
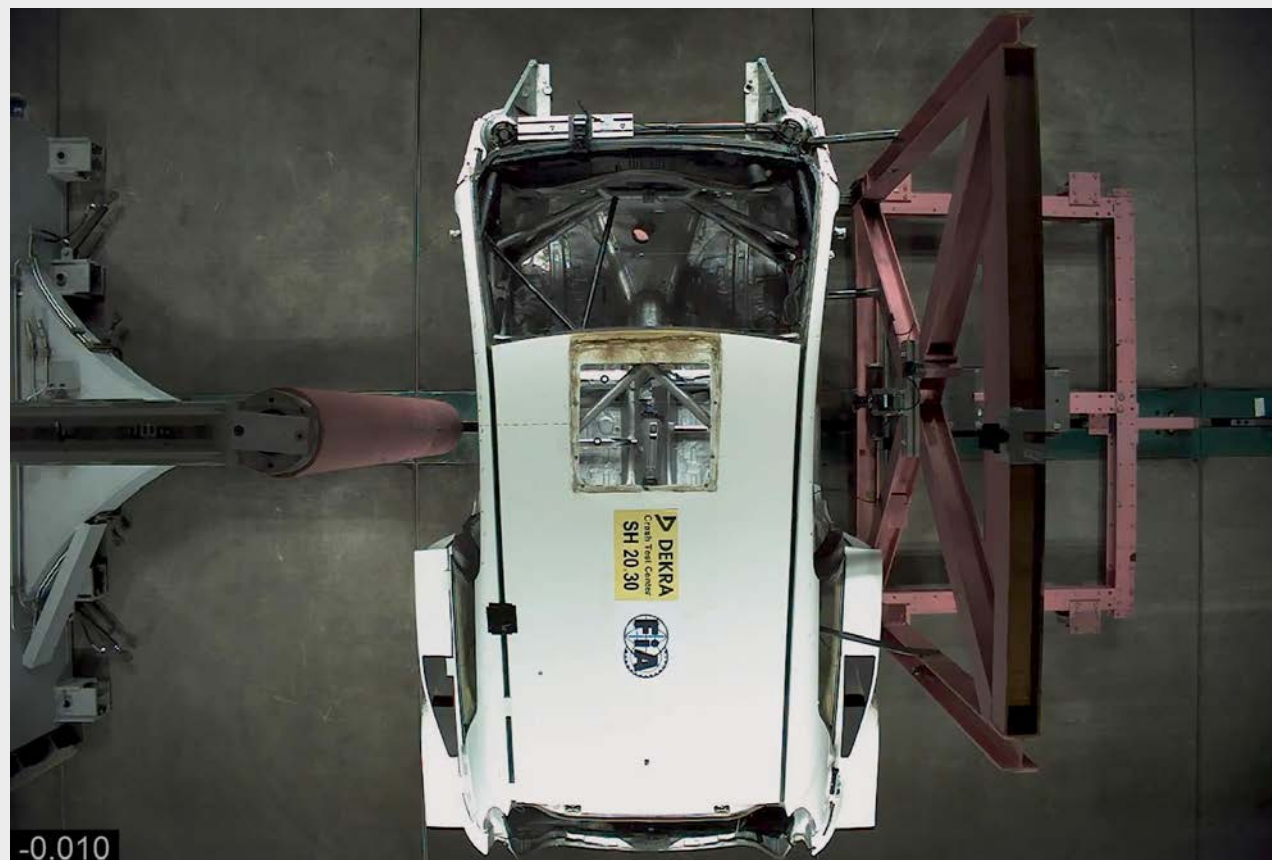
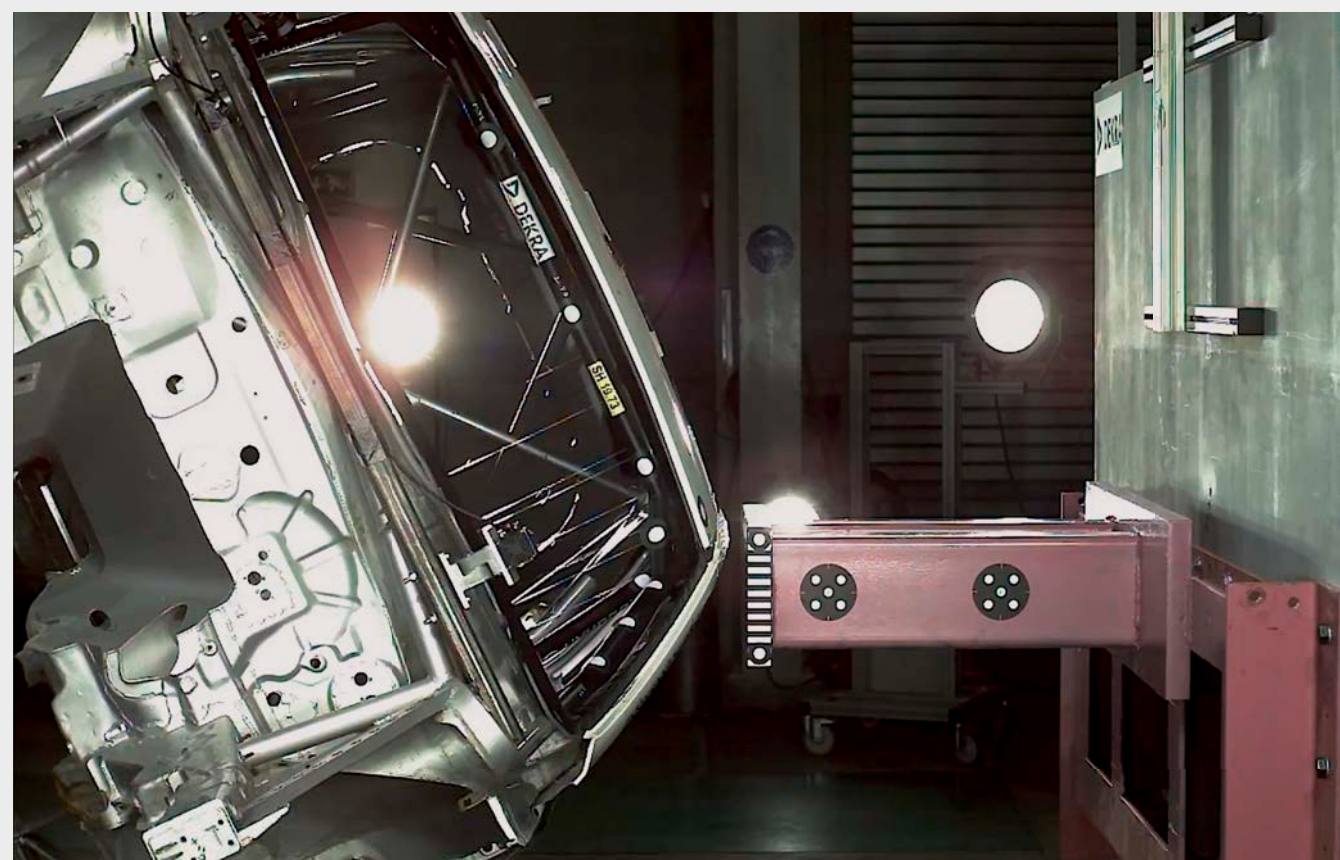
Being part of the new FIA F3 Championship provides a clear path to the pinnacle of motor sport. "It gives you an opportunity during the F1 weekend," explains Jack. "[Red Bull team principal] Christian Horner and the other team principals and managers all get the F2 and F3 races and results on their monitors. It's a great place to make a name for yourself."

The championship also gives Jack the chance to learn the circuits he hopes to one day tackle in a Formula 1 car. Are there any he's looking forward to especially? "I like high-speed circuits and I think Mugello is going to be awesome for the season finale. I'm really looking forward to Spa as well."

There's a sense that Jack and HWA will come good sooner rather than later and, when they do, there'll be no stopping him. ◀

Jack shares the competitive mindset of MotoGP world championship-winning father Mick.





Crash testing for the next generation of prototype Rally 1 cars have included the effects of side and rollover impacts.

CRASH PREPARED

03

World Rally Championship cars are being severely crash-tested to prepare for an impactful future

TEXT
/
MARC CUTLER

It was a dramatic start to the 2020 FIA World Rally Championship when midway through stage four of Rallye Monte-Carlo reigning champion Ott Tänak lost control of his Hyundai i20 WRC and careered off an embankment at approximately 170kph.

As the nose of his car struck the ground the accident data recorder registered 24G of longitudinal deceleration. This then launched the car into a lengthy barrel roll, where it experienced multiple impacts as it tumbled down the side of a cliff colliding with some trees along the way. Remarkably, once the car landed with the rear and front reduced to crumpled cavities, both Tänak and his co-driver Martin Järveoja exited without severe injury or the need for assistance.

The fact that both crew members emerged unscathed is testament to the unremitting research conducted by the FIA in the area of safety, as it strives to maintain the highest standards in motor sport. FIA Senior Research Engineer Marco Petrilli explains that the roll cage and bodyshell in Tänak's car was able to absorb the energy generated during multiple impacts.

"The roll cage and the bodyshell worked properly, absorbing all of the energy," says Petrilli. "The safety package of the car and the safety equipment – HANS, harness, seat and helmet – worked together to enable the crew to come out of the car without any major injuries despite such a spectacular and severe accident."

With new Rally 1 car set to be introduced into the sport from 2022, the FIA is determined not to

rest when it comes to safety. This is why it is carrying out a full crash-testing characterisation of the current WRC car, to see where safety can be enhanced further for 2022.

Petrilli is leading this test programme and explains how the results will form the basis of the designs for the new rally cars, with help from all of the current manufacturers.

"In order to gather a full understanding of the safety performances of the car, we conducted multiple crash tests measuring the different responses of the cars to different types of impact," says Petrilli. "The involvement of all the current WRC manufacturers has been key for the advancement of this project."

FUTURE PROTECTION

The 2022 rules package will see the introduction of new hybrid cars to the WRC, but perhaps the most significant change will be the opportunity to move away from the usual body shell design based on a production version – a concept of scaling will allow for more cars to fit the regulations to maximise participation.

The new survival cell will be based on a prototype tubular frame and the bodywork will be constructed around that, as opposed to retro-fitting the roll cage to the road-going version of the car.

"In 2022, the WRC car design will change completely," says Petrilli. "This is why we are

'We conducted multiple crash tests measuring the car response to different types of impact'

defining the safety performance of the new Rally 1 car starting from the safety performance of the current car, because our target in 2022 is to deploy a safety package that is as strong as possible."

To achieve this, the FIA has been conducting a series of impact tests at the DEKRA Crash Test Center in Germany, with particular focus on examining the behaviour of the survival cell in a controlled crash scenario.

This includes two side-impact tests – the first designed to simulate the car hitting a tree or a pole on the driver's side; the second at the level of the main roll bar. Then there are two roof impact tests – both of them performed with the car fixed on a trolley crashing into a specific impactor in order to assess the characteristics of the roll bar in the impact, followed by the lateral roll bar which is in front of the driver.

"We are not trying to replicate a crash that happened or a crash in which a driver or a

co-driver was injured," says Petrilli. "We are more targeting the definition of the safety performance of the car. These are the six dynamic tests that, in a way, will give us the possibility to have a clear picture, around the occupants, of how the car behaves."

In addition, there is a dynamic frontal impact test and a rear impact test, and intrusion tests have been planned to characterise the mechanical property of the series car bodyshell panels.

"What we will do is perform some quasi-static tests on all the sides of the car," explains Petrilli. "So we will assess how the floor, the doors, the front bulkhead, the roof and the rear bonnet behave in terms of intrusion and energy. ▶

Ott Tänak's huge Monte-Carlo crash proved the strength of the current WRC contenders.





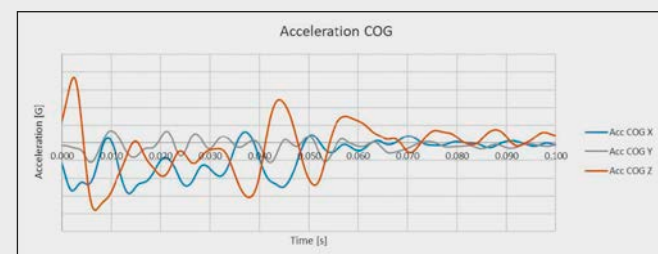
Testing designed to aid development of the 2022 Rally 1 car took place at the DEKRA centre in Germany.

The new car will be built around a survival cell (below left) instead of the roll cage fitted into a production car.



'The main target is to set the safety performance of the 2022 WRC cars'

FIA research engineers will use data from the crash tests to ensure the new Rally 1 cars are the safest yet.



STRENGTH INSIDE

Even though the technical regulations for 2022 are still being finalised, the results of these tests are fundamental for the definition of the next generation of cars. One of the main areas targeted for improvement is the A-Pillar located in the top section of the frame, which is severely tested in a rollover crash scenario. Side impacts are also a key target.

"The most likely impact in a rally environment is the side impact, with a tree or with a pole at door level, and the rollover in which the car experiences multiple contacts with the ground," explains Petrilli.

"The level of the lateral impact from a structural point of view is the weakest point of the car and, as well, is the most dangerous considering the position of the occupants. So, the great improvement that we will target to

deploy for 2022 is relating to side impact and a huge improvement in terms of the A-Pillar on top of the driver and co-driver side."

The next stage will be to present the findings of the research to each of the manufacturers and start defining the new design requirements of the 2022 Rally 1 cars, with the final detailed regulations expected to be delivered this year.

"At the end the main target is to set the safety performance of the 2022 car," says Petrilli. "We are starting to look at the general layout of the 2022 car during the Technical Working Group, so there is already specific consultation between the FIA and the manufacturers in which we are just talking about the 2022 cars."

For the FIA, safety is very much at the centre of these discussions, as it is for the cars themselves. ◀



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03

A model of racing fairness

The FIA is using the latest simulation technology to model the evolving performance of new hybrid and electric race cars in motor sport

TEXT
/
MARC CUTLER

In 2021 the World Endurance Championship will introduce new Hypercar rules to replace the incumbent LMP1 cars, leading to even more classes of car on the track and the need to balance performance in each category.

So how can the FIA know this will work from a technical point of view? It does this before a tyre even hits the Tarmac through thousands of simulations to ensure that each car adheres to a set balance of performance, which maintains fairness and competition.

Simulation is an area of motor sport that is often unseen and overlooked, but it plays a crucial role in the governance of the sport, according to FIA Simulation and Performance Engineer Michele Parmigiani.

"We use these tools to construct the technical regulations, to define the future of motor sport championships, to monitor existing championships or races, to check the performance of the cars, and to contribute to the creation of the the quality score for Balance of Performance in some championships," explains Parmigiani.

Previously the FIA has used tools that were powerful enough to bring in effective results, but as race car technology has advanced the need for more accurate simulation software has become even more important.

It is for this reason that the FIA has partnered with AVL Racing, a company that specialises in

the development, simulation and testing technology for power trains in cars, trucks, racing cars, and large engines.

AVL is the biggest privately-owned automotive company in the world, with 11,500 employees of whom 65 per cent are engineers and scientists. Its global footprint reaches 45 affiliates and 40 technical engineering centres, and just last year it turned over €2 billion, making it one of the biggest automotive companies globally.

AVL works across every area of the automotive and racing industries from power train development to vehicle engineering, but for the FIA it is focused on vehicle dynamics simulation.

Vehicle dynamics relates to lap-time simulation tools, data visualization, data analysis, and cloud simulation. In the case of AVL, its tools can accurately simulate more than 15,000 laps around a circuit in just 90 minutes.

This software can process both in the cloud and locally on a computer, so offers important flexibility depending on the working environment.

"It is one of the few pieces of software that allow this flexibility to simulate everything we need," says Parmigiani. "On top of that it's possible to customise a lot. We can basically simulate any car and also the graphical interface is good to manage for different categories of championships in one piece of software."

PERFORMANCE GAINS

AVL's simulation software is able to take into account a number of factors including the ability of the driver, the vehicle dynamics, and the circuit that it will be racing at. For this they take the simulation data from the real track and then apply their proposed specification, to see what effects it will have on overall performance.

AVL Global Product Manager Guillermo Pezzetto explains: "This is the first step and when you make a correlation you are not only looking at the speed profile, you want to correlate with how the car behaves and its handling, whether it understeers, oversteers, to see what the driveability is like."

The concept is similar to how Formula 1 teams produce updates to their cars for each race weekend, using the information from their wind-tunnel or computational fluid dynamics systems, and then employing simulation tools to validate the performance gains they may have seen.

But where Formula 1 teams can use this data to save time on the track, AVL's software is able to give the user a clear overview of results, without needing to sift through a lot of data that would take engineers many hours to complete.

"The first key task after you run the first simulations is to compare simulation data with

real data coming from track, so the engineers can evaluate the simulation quality.

"AVL provides software called AVL DRIVE™ RACE, that allows the user to open simulated data (coming from office work, cloud, testbeds, DiL) and real track data from several industry standard data acquisition software. AVL DRIVE™ RACE allows not only looking at data in a traditional way, but also provides to users a unique approach of objective data analysis done automatically supporting the simulation engineers on their data analysis and decision-making process.

"As AVL VSM can run multicore and also in the cloud, the quantity of simulations done are really high, counting many millions during a year. To use traditional data analysis software and methods would be impossible with this enormous quantity of simulations, so AVL developed a tool called AVL SIMBOOK that allows engineers to create interactive dashboards to look at these simulations. Our tool chain supports simulation engineers on every stage of their work, from the model creation, validation, data assessment and visualisation in a seamless way."

This is how the FIA has analysed the future performance of the FIA World Endurance Championship cars. "We started with existing categories and asked for the support from AVL

to provide a training seminar for the FIA on how to use AVL simulation and analysis tools," explains Parmigiani.

"The first step was the creation of our own model. We ran the simulation and then wanted to be sure that the results are realistic. We used data from the track from existing cars, compared them with the simulation and judged the quality of the results. After a few adjustments we managed to achieve a very good correlation.

"And from that we could evaluate, for instance for the LMP2 categories, what will be the effect on what will, most likely, be a balancing of engine power, as well as the impact a single tyre supplier being involved might have.

"For example, we wanted to target performance positioning to see how that would be carried out on all the circuits. Then we designed the new category based on the technical regulations, because of course there is no physical car yet and we see the cars are compared to the LMP2 category to see if the lap-time difference is acceptable on all the circuits to avoid any clash."

With AVL's research-led approach to simulation it enables the FIA to produce accurate models for the evolving technology landscape in motor sport and to ensure that racing will be fair and competitive. ◀

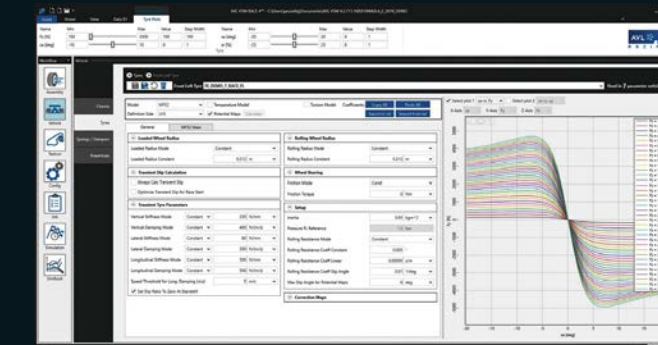


AVL uses real track data which it applies to its proposed specification to see the effects on performance.

'Our tools enable engineers to analyse data very quickly and visualise it in an easy way'



The FIA and AVL Racing are developing the next generation of WEC racers through virtual technology.



AVL's data on tyre modelling (above) showing loads and characteristics, and an overview page used to check the correct operation of simulation functions.

COVER STORY

Racing makes a comeback

P32—33

A strategy for safety

How the FIA created guidelines for racing in a post-COVID world

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Racing with a purpose

Born out of a crisis, the FIA's #PurposeDriven project has global aims

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F1's return in Austria

Careful planning and cooperation allowed F1 to rescue its season

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Re-starting the engines

How international motor racing has set a new path for 2020

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Rebuilding project

AUTO talks to the groups trying to restart grassroots racing

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The new reality

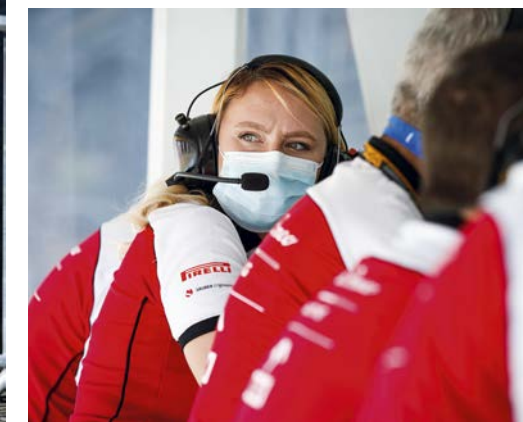
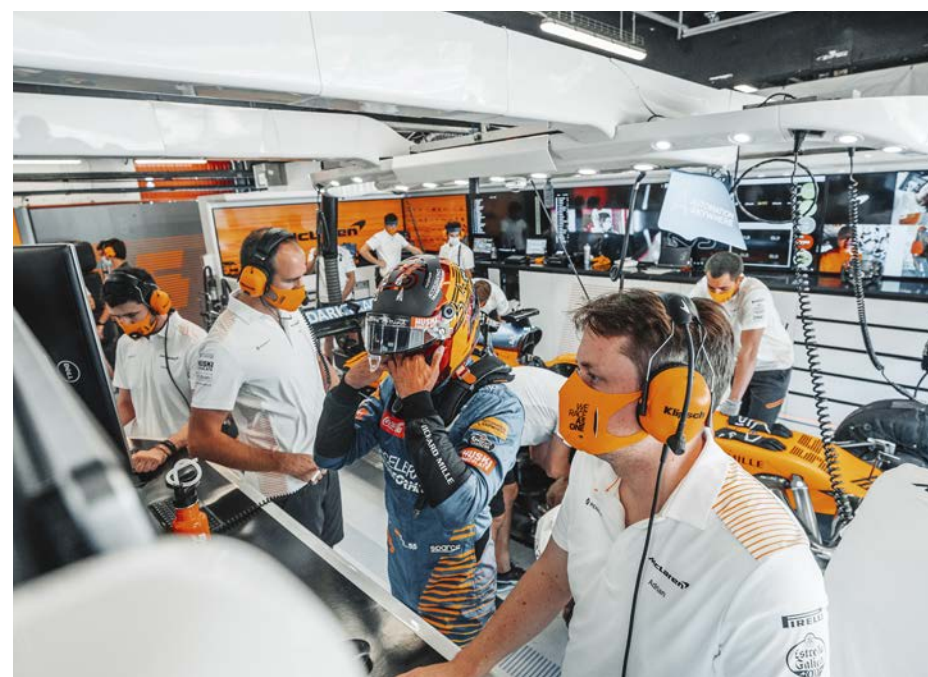
COVID created a crisis for motor sport, but also an opportunity

04

MOTOR SPORT UNLEASHED

Motor racing's organisers have been planning for a return to action ever since the world went into lockdown in March in the wake of the COVID-19 pandemic. AUTO looks at how the FIA developed key guidelines for the resumption of safe competition, how Formula 1 led the way in Austria, the path that other series are following and how motor sport is learning to live with a health crisis





04

Creating a safe race strategy

From the highest levels of racing to grassroots competition, motor sport is back in action. But none of it would have been possible without a concerted effort by the FIA and its partners to establish a comprehensive set of guidelines that provide for racing in a post-COVID-19 world. AUTO looks the protocols that have allowed motor sport to fire up safely

TEXT
/ JUSTIN HYNES

The cancellation of the FIA Formula 1 Australian Grand Prix in March, following a positive COVID-19 test for a member of the McLaren team, marked a watershed moment for motor sport in 2020. Over the following weeks, as the pandemic began its inexorable spread, an unprecedented domino effect took hold that led to an almost complete cessation of motor sport activity around the world.

As lockdown measures worldwide grew in number and severity, doubts remained as to whether an entire year of competition would need to be abandoned. But even as the crisis escalated plans to return to racing were already taking shape – with the formulation of a comprehensive set of guidelines designed to restart the engines of motor sport.

Developed in collaboration with FIA Member Clubs, governments, and the World Health Organization (WHO) and published in June, the FIA's Return to Motorsport Guidelines have been designed to assess the feasibility of hosting motor sport events safely in what is considered to be

a 'mass-gathering' situation during a pandemic.

"It was three or four very difficult months because Coronavirus is still circulating," says Professor Gérard Saillant, President of the FIA's Medical Commission. "For the FIA, it was quite a big challenge, but we changed the impossible to possible due to the fantastic job by the FIA Safety Team, technical department, and everyone who was involved."

Dr Pau Mota, FIA Head of Medical and Rescue, explains that work on the guidelines began soon after the cancellation of the first F1 grand prix.

"It's been a huge amount of work. We started right after Melbourne," he says. "The first thing we did was start contacting other sporting federations, beginning with FIFA, to see what they were doing to get back to sport and we quickly realised that we were facing a different problem to football in that motor sport, and Formula 1 in particular, is more of an Olympic-style [international] event. An F1 race, even without spectators, and a double header of races in a

single territory, involves approximately 2,500 people on-event, the vast majority of them coming from abroad. It's like a small Olympic games. Therefore we turned to the International Olympic Committee and we also got in touch with the World Health Organization, as they were working on the comeback of the Olympics in Tokyo at the time, which they eventually gave up. But we started working together to get our top championship, Formula 1, back racing."

For Adam Baker, Head of the FIA's Safety Department, the guidelines' goals revolve around a quartet of key aims.

"We want to prevent any infection to any attendees on-event, but most importantly we want to avoid any indirect harm to the wider community as a result of a motor sport event being held," he says. "To do that we have four main objectives: to help stakeholders run a mass-gathering event within the laws of the country; to provide health guidance for those stakeholders; to identify and share best practice, as the pandemic situation changes all the time and we need to continually update the protocols; and finally, how to manage a positive COVID-19 case."

An early consideration involved the assessment of risk in staging an event and ensuring that a secure environment could be established. In that regard the FIA turned to Peter Drennan, former Under-Secretary-General for Safety and Security at the United Nations.

"The goal was to assess the environment [in Formula 1], the level of risk and then bring in a systematic way of examining all the things you need to do to stage a grand prix and look at where the vulnerabilities exist. Finally, we needed to assess the most likely outcomes and the impact of those," he says of the security aspects of events.

"One of the really important aspects was that the WHO developed guidelines for mass gatherings including a risk framework, a mitigation framework, and a decision-making framework. Those formed the fundamentals. After that it was about establishing a crisis response framework – you prepare and plan, then you respond, you recover and eventually review, because there is always learning from experience."

PLANS PUT IN ACTION

In order to ensure the robustness of any stakeholder's response to staging an event during the pandemic, the guidelines act as a reference point of relevant information for motor sport organisers and, through the provision of risk and transmission mitigation measures as well as a framework for meeting government and local health regulations, are designed to allow stakeholders to host events safely. Key deliverables within the guidelines include: a standardised COVID-19 risk assessment template for use by key stakeholders; universal minimum

risk mitigation strategies; the expectation that each stakeholder develops and implements a documented plan for their particular role/function at each event; a review, and where required, modified rules and regulations applicable to the sport and risk environment, and a mechanism by which governments and regulatory authorities are empowered to support the resumption of motor sport within their jurisdiction.

Once the guidelines were formulated, the next step, says Baker, was to frame a COVID-19 code of conduct for those taking part in an event, which on June 19 was approved by the World Motor Sport Council as an appendix to the International Sporting Code of the FIA.

"The Code of Conduct defines the responsibilities for event attendees and provides an enforceable legal framework to facilitate action by the FIA against anyone not applying the required COVID-19 mitigation measures," he says. "It extends the regulatory authority of the FIA to everyone attending the event in relation to COVID-19 mitigation measures and it also establishes a structure on-site, grouping attendees so they can be represented collectively by organisations, companies and other entities."

The acid test for the guidelines came just 112 days after F1's Melbourne cancellation with the delayed start of the 2020 season at the Austrian Grand Prix in Spielberg. There, ahead of qualifying for the opening race of the F1 season, and the

The FIA, event organisers and teams worked together in Austria to get F1 back on track amid COVID.

first major motor sport event in more than three months, the FIA and Formula 1 reported that in the seven days leading up to the event more than 4,000 COVID-19 tests had been undertaken on F1 personnel. Not one returned positive.

"You can see that everyone is taking the guidelines seriously, doing the things they should do and there was compliance at all levels quite quickly," says Peter Drennan. "Whether it was that there is a culture of performance and safety connected to F1, I'm not sure, though I'm sure it played a part, but ultimately it worked because it was so important and everyone understood that we need to get it right."

FIA President Jean Todt, in Austria, was similarly impressed with the protocols and their application.

"What has been achieved is amazing. There has been fantastic coordination between the FIA team and the Formula 1 group, along with a very strong contribution from the teams," he said. "It is pleasing and rewarding. It is in stormy seas that you see how solid are the people, not when you have success but when it is tough. How the sport has dealt with the virus has been excellent." ▶

'An F1 race, even without spectators, involves around 2,500 people on-event. It's like a small Olympic games'

Racing with a Purpose

Born out of the FIA's response to the COVID-19 pandemic, the Federation's new #PurposeDriven movement focuses its efforts on actively encouraging and delivering a lasting positive contribution to society in a broader way

The Coronavirus pandemic has had a profound effect on all of society, with the health crisis and its tragic effects leading to economic hardships in almost every country affected by the virus.

However, the crisis has also resulted in positive outcomes, not least a re-evaluation of priorities and aspirations from the individual to the collective at the highest levels.

It is this re-assessment of priorities that in June led the FIA to launch a new movement, #PurposeDriven, aimed at leveraging motor sport's capacity to transform to help bring about positive change in all sectors including health, safety, economy, the environment, education, inclusion and diversity.

Onika Miller, Head of the FIA Innovation Fund explains how the movement hopes to bring about positive change.

Could explain the motivation behind #Purpose Driven, and what the FIA hopes to achieve with it?

#PurposeDriven represents our recognition of our responsibility towards society and the role we can play in creating a better future for all. It's about our long-term commitment to creating a better future for all through the efforts of the stakeholders within our community and encouraging them to take concrete steps and actions towards positive change. We are organising our efforts around four main pillars: diversity and inclusion, environment,

community involvement and development, and health and safety, representing the economic contribution that motor sport bring to communities.

What is the expression of that? How does the FIA achieve action across those pillars?

In the first instance, we create a call to action with our key stakeholders in motor sport or the championship promoters, and we develop a response to #PurposeDriven, because it is a movement and we want it to be dynamic, to constantly evolve, and to reflect the specific community engaged in each action. Formula 1 has created the #WeRaceAsOne campaign, specific to that community, which revolves around their chief issues of concern. Similarly Formula E has instigated #Positively Charged, with an emphasis on the environmental pillar, on health and safety and also diversity and inclusion.



Onika Miller, Head of the FIA Innovation Fund.

How does the movement dovetail with the activities of the FIA Innovation Fund?

#PurposeDriven doesn't fall directly under the umbrella of the innovation fund. However the fund has supported a number of projects, which we feel are emblematic of our commitment to #PurposeDriven. For example, the FIA FIF is financing an impact study of the environmental impact or contribution that motorsport has made to society. The key criteria for FIA FIF-funded projects are innovation and legacy, a substantive contribution to a sustainable future. So the Fund is very much aligned with the principles and goals of #PurposeDriven.

You mentioned Formula 1. Part of their effort is the launch of a Diversity Foundation to which the FIA Innovation Fund had donated €1 million. Why is diversity in sport important and is it a lever for generating greater awareness or diversity in broader society?

It's almost impossible to divorce sport from the fabric of our society. It is an important force for good, and perhaps the one activity that galvanises people within something positive regardless of their diverse backgrounds. Sport and motor sport itself can play a role in helping society to tackle some of the systemic issues and social issues we need to confront to again propel ourselves forward and create this better future we all want. ◀

'#PurposeDriven represents our recognition of our responsibility towards society'



The FIA Formula 1 Safety Car bearing the #PurposeDriven logo.



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Back on track ⁰⁴

Formula 1 was always going to be the first elite-level motor sport series to resume following the COVID pandemic, and while the road back was complex, the sport has demonstrated its renowned capacity to rapidly react, innovate and set standards

TEXT

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JUSTIN HYNES

When Carlos Sainz steered his McLaren MCL35 out of his team's garage at Spielberg's Red Bull Ring and past the light cluster that had just flashed green at the end of the pitlane to open the first practice session for the 2020 Austrian Grand Prix, it marked a moment of triumph for Formula 1 and for global motor sport.

Three months earlier, the top level of motor sport's plans for its most ambitious season yet – a globe-spanning 22-race campaign that added GPs in Vietnam and the Netherlands – were thrown into disarray when the opening round in Australia fell victim to the growing COVID-19 crisis.

Following the cancellation of the race in Melbourne, Formula 1 itself went into crisis mode, as over the following weeks the first nine races of the planned schedule were either indefinitely postponed or cancelled. The FIA, in consultation with F1 and its teams, introduced a series of measures designed to limit the damage caused by the decimation of competition. The Technical Regulations due to take effect from the 2021 season were postponed until 2022. Chassis would be carried over from 2020 to '21 and component upgrades were frozen.

While the immediate concern was to safeguard the sport, parallel work also began to plan for a restart as soon as conditions permitted.

As detailed in the previous pages, the first hurdle was developing a strategy to allow 'mass-gathering' events to take place, and within three months of the cancellation of Australia

the FIA published its Return to Motorsport Guidelines, a comprehensive 81-page handbook designed to enable motor sport organisers to stage events in a safe and secure environment.

In advance of the guidelines' publication, Formula 1 pressed ahead with its plans for the first eight events of a heavily-revised 2020 season, and on May 30 its proposed schedule received a massive boost in the shape of approval by the health authorities for a season-opening pair of behind-closed-doors races to be held in early July at the Red Bull Ring in Austria's largely rural Styria region.

"As well as strict hygiene measures, the concept foresees regular testing and health checks for the teams and all of the other employees, and also a concrete medical concept," said Austrian Health Minister Rudolf Anschober in a statement. "For the Ministry of Health, and following a detailed review by in-house experts, the concept meets the requirements for preventing the spread of the Coronavirus. The decisive factor is the close coordination between the organiser and the regional and local health authorities."

RIISING TO THE CHALLENGE

The sport quickly announced that the double-header in Austria would be followed by a trip to nearby Budapest for the Hungarian Grand Prix and then by a brace of races at Britain's Silverstone Circuit and a standalone Spanish Grand Prix in Barcelona.

"What the [pandemic] created was a sense of urgency," says F1 CEO Chase Carey. "Crises in many ways require a sense of urgency. The issues that arose within the timeframe gave us the impetus; it gave us the momentum to tackle things that would have probably been tackled in the ordinary course over a longer timeframe. It really shows the spirit of the sport... When things got tough they rose to the occasion." ▶

The FIA and F1 established a series of protocols for the season to start safely in Austria.



The next step was to codify the protocols stakeholders would need to adhere to at such events and at the June 19 meeting of the FIA World Motorsport Council Appendix S, a COVID-19 Code of Conduct, was added to the Federation's International Sporting Code.

With F1's logistical juggernaut now running at full speed, a single test remained: would the protocols prove robust enough to withstand motor sport's first major test of the restart? Dr Pau Mota, FIA Head of Medical and Rescue, explained that the Federation was in contact with local health authorities in all of the proposed race locations from early on.

"We set up weekly meetings with Public Health Officers from Austria, Hungary, Silverstone, and Barcelona from the end of May," he says. "It's close work with the testing company, Public Health Officers, and the COVID-19 staff from the FIA to ensure that any suspected case, uncertain case, or positive case is managed in a legal and transparent way."

Chief among the protocols put in place for the new season was a strict test regime that required all personnel attending the event in Austria to return a negative COVID-19 test within 96 hours of arriving at the circuit. Once there, personnel were also required to undergo tests every five days, a regime operated in conjunction with scientific testing partner Eurofins, which has more than 48,000 staff across a network of more than 900 independent companies in over 50 countries, and which operates more than 800 laboratories. "Having the same test provider for the whole season, where they can provide a global agreement for anywhere, enables us to have a common database," says Mota. The testing protocol was also matched by temperature checks at circuit entrance points, the mandatory use of Personal Protective Equipment, such as masks, within the circuit and thorough hygiene recommendations for all personnel at the event.

Also key to the security of the event was the segregation of personnel into team and stakeholder groups, and then into further sub-groups in order to minimise the risk of transmission and to confine any positive cases within a limited circle that could be effectively tracked and contained. Groups were restricted to specific areas – for example garages in the case of teams – with the result that interaction between groups was drastically reduced. In the case of tyre supplier Pirelli, the strict guidelines meant that when delivering the tyres to each team garage their representatives were required to wear full PPE to be compliant. Each race team would be restricted to 80 employees per race, down from anything up to 200 at a normal race. Additionally, teams would only be allowed to have 40 personnel on the grid.

The new protocols extended to officiating at the event, with the FIA putting in place a remote stewarding facility whereby an off-site steward would have access to the same tools as on-site officials and could take over should one of the stewards at the event be forced to withdraw.



"The target we worked to in Austria was 2,000 people on-event," says Formula 1 Race Director Michael Masi. "Within that number I believe we had 57 individual groups over the entire venue. The number of sub-groups within that was in the hundreds".

PROVING RESILIENT

The protocols and the high levels of compliance meant that in the days leading up to Saturday's qualifying session, 4,032 drivers, team members and personnel were tested for COVID-19. Not a single test came back positive.

"It's really incredible," says FIA Medical Commission President, Professor Gérard Saillant. "If you had told me that would be the case three months ago, I would not have believed you. But everybody was very involved in this challenge, from the FIA, to Formula 1, the teams and the staff, and our responsibility was very well understood by them."

The following races, in Austria and Hungary, further tested the robustness of the new protocols, with two people testing positive in Hungary and, at the British Grand Prix, the championship facing its first high-profile positive case in the shape of Racing Point driver Sergio Pérez. However, following swift isolation, thorough track and trace initiatives and strict compliance with local health measures, both events progressed smoothly. Pérez made a full recovery



Sergio Pérez was F1's first high-profile COVID case, but he has since recovered fully.

Valtteri Bottas became F1's first winner of 2020 with victory for Mercedes in the Austrian opener.

and returned to Formula 1 action in Hungary.

Over the first six races of the season, more than 30,000 tests were completed with a total of just four positive tests returned. For FIA Chief Operating Officer Bruno Famin it's testament to the strength of the protocols established by the Federation.

"We have increased a lot the resilience of the system," he says. "This has been achieved, firstly, through testing. By having everyone tested before entering the venue and putting in place a very strict testing plan on site, we can detect any possible case very quickly. Additionally, the FIA's COVID-19 Code of Conduct has given the right information to teams and stakeholders to enable them to prepare very well. We are much better prepared. Of course, the protocols have an impact on the operational side, but the measures are in place to reduce the number of potential cases and, if there is a case, to reduce the impact on teams and stakeholders."

Race Director Michael Masi agrees, adding: "We learned collectively. At the FIA and as a championship we've learned a great deal about the pandemic, and we are far stronger and better equipped than we were in Australia."

The increased resilience of F1 to the threats posed by the pandemic has been borne out in the success of the first six events – with a focus on competition rather than Coronavirus protocols – and the expansion of the calendar, which now numbers 13 events thanks to the addition of races at Belgium's Spa-Francorchamps, Monza and Mugello in Italy, confirmation of a Russian Grand Prix and races in Germany at the Nürburgring, Portugal's Portimão circuit, as well as a third Italian race at Imola. The sport is also targeting a return to Turkey's Istanbul Park for the first time since 2011 and events in Bahrain and Abu Dhabi.

The coming months remain uncertain, however, as the course of the pandemic continues to ebb and flow in countries around the world. And for Professor Saillant, the unpredictable nature of the crisis means vigilance must be maintained. "We have a robust action plan," he says, "but we must be flexible and reactive based on experience."

It's an outlook echoed by FIA President Jean Todt. "Formula 1 has been a global example again of motivation, of engagement to restart racing," he says. "But we must be respectful of the Code of Conduct, we have to be careful."

Formula 1 has made a remarkable return but the fight to stay safe continues. ◀

'We've learned a great deal about the pandemic, and we are far stronger than we were in Australia'

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Re-starting the engines

04

It's not just Formula 1 that has returned to action – across all of the FIA's major championships competition is once again powering up, and doing it as safely as possible

TEXT

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RICHARD RODGERS

Following months of on-track inactivity, a number of FIA international championships and series either resumed, finally got underway or began the process of doing one or the other in late summer as lockdown restrictions across Europe eased.

After the long hiatus, the action began on and off-track with promoters working in tandem with the FIA, local organisers and authorities to implement extensive requirements outlined by strict COVID-19 protocols and since mandated by the expanded Appendix S.

Following ratification of the new regulations via an e-vote by the FIA World Motor Sport Council on 1 September, Appendix S not only applies to Formula 1, which it had since June, but to all FIA Championships, cups, trophies, challenges, series, and international series registered on the FIA international sporting calendar.

Commenting on the preparation and implementation of Appendix S, the FIA's Director of Operations Bruno Famin says: "The purpose was not only to restart the FIA Formula One World Championship but to restart motor sport in general. After establishing Appendix S for Formula 1, the challenge was to extend the regulation to all FIA calendar events."

This meant creating protocols, developed by different working

groups under the guidance of FIA Medical Commission President, Professor Gérard Saillant, that could be applied not just across different categories, but different disciplines as well.

"We had to find the right level," Famin adds. "All the championships and all of the events do not have the same possibility as Formula 1. In parallel, it was important to have some learnings from the opening Formula 1 events to see what worked and what was absolutely necessary to maintain sanitary security. We found that mandatory pre-testing is a good filter. Additionally, the requirements outlined by strict COVID-19 protocols and since mandated by the expanded Appendix S.

"The measures are not so complex and not so difficult to observe, because everything has to be manageable when you see what is at stake. It's not just about the health of the participants but the event has to be allowed to happen and all stakeholders and their assets protected.

"Motor sport is one of the major international sports that has restarted on such a big scale and everything has been very well managed by everyone involved in this project."

'It was important to have learnings from the opening Formula 1 events to see what worked'

FIA WORLD RALLY CHAMPIONSHIP

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The FIA World Rally Championship was in full flow when Rally México was brought to an abrupt halt at the completion of the penultimate leg on March 14, as concerns over flight cancellations and reports of local COVID-19 cases took hold.

Since then, a number of events have been called off and the priority has been to build a new calendar of rescheduled and new events in order to facilitate a resumption of action at the earliest and safest opportunity.

Italy's round was rescheduled to late autumn, while new events in Belgium and Estonia were added to help ensure that the required seven-round schedule can be achieved for the Drivers' and Manufacturers' titles to be awarded.

Measures implemented for the WRC's early September restart in Estonia included mandatory PCR tests before and on arrival in the

country, a service park closed to spectators, plus start and finish podiums minus fans and the usual showmanship.

The event formats have also been tweaked to allow for competitive distances to be trimmed by upwards of 80 kilometres, with the overall duration shortened from four to three days. Turkey's ASN TOSFED was one of a number of organisations to demonstrate flexibility by changing the date of its WRC event to accommodate Belgium's Ypres Rally in the schedule.

"The 2020 WRC restart calendar followed a few months of discussions that required a great deal of flexibility from all stakeholders in unprecedented times," says the FIA's Rally Director Yves Matton. "The revised schedule is thanks to the great commitment and work from organisers."



The WRC's Mexico outing proved to be its last until competition resumed with series newcomer Estonia.



FIA WORLD ENDURANCE CHAMPIONSHIP

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The 6 Hours of Spa-Francorchamps from August 13-15 was the first FIA World Endurance Championship event to take place under COVID-19 protocol conditions. With a 31-car entry list featuring 87 drivers, numbers onsite were significantly larger than at some other FIA events.

But while a total of 25 personnel credentials are allocated to each car entered in the FIA WEC, teams were encouraged to reduce staff numbers where possible with a strict team-by-team 'bubble' system established.

However, under local authority regulations, credentials were only issued on presentation of a completed health check questionnaire, which provided essential details for a track and trace programme. Christian Wahlen, Spa Medical Delegate, played a key role in managing the COVID-19 protocol implementation.

In the interests of promoting social distancing, the podium format was revised. Rather than the top three teams from each of the four categories, just the winning line-up in the LMP1, LMP2, LMGT Pro and LM GTE Am classes visited the winners' rostrum.

With photographer access to the pitlane restricted, a drone was used to capture the photocall organised to highlight the End Racism campaign, with teams assembling socially distant in their respective groups.

The first major test of the series' new safeguards came when a driver taking part in the 6 Hours of Spa-Francorchamps in Belgium, tested positive for COVID-19 in the build-up to the race.

Following a tracing initiative, those with whom the driver had been in close contact – three members of the driver's team, 16 from a team with which he competed in the European Le Mans Series at Spa the previous week, plus three technicians from the LMP2 tyre supplier and one mechanic from another team – were quarantined until test results were known.

Of those tested, three members of the ELMS team previously raced with were confirmed as positive and followed the procedures required by the local government health authorities. ▶

WEC marked the End Racism campaign with a socially distanced photocall at Spa.

FIA WORLD RALLYCROSS CHAMPIONSHIP

Having been due to get underway at the Circuit de Barcelona-Catalunya in April, the FIA World Rallycross Championship began at the Höljes Motorstadion in Sweden from August 22-23, thanks to the efforts of the FIA, promoter IMG, plus the local organiser and health authorities.

The FIA collaborated with IMG on the development of a Return to Racing Event Plan, which is specific to rallycross and in line with FIA procedures.

President of the FIA Medical Commission Professor Gérard Saillant said: "The FIA has undertaken a lot of work along with the World Health Organization

(WHO), our ASNs, event organisers and local health authorities in devising robust COVID-19 protocols to enable the return to motor sport in these challenging times.

"I am delighted that the FIA World Rallycross Championship is resuming. We trust that the measures we have in place will be effective in ensuring the health and well-being of all those in attendance."

More than 340 negative PCR test results were received at Höljes, while circuit entry temperature checks were carried out, the use of face masks mandated and social distancing measures were also put in place.

In addition, teams were asked to reduce personnel numbers, with team groups and sub-groups created to minimise the risk of an outbreak spreading. Trace procedures were put in place along with containment measures in the event of a suspected case.

Changes to the podium procedure and press conferences, which will vary from round to round depending on guidelines and regulations issued by the relevant local health authorities, were implemented. And with Finland hosting the subsequent World RX event from August 29-30, 180 PCR tests were carried out for those moving from Höljes to Kouvola.

The World RX season began in Sweden after the series was given its own event plan.



FIA EUROPEAN RALLY CHAMPIONSHIP

In late July, the Rally di Roma Capitale signalled the resumption of FIA international rallying – and very much represented the sport's new normal.

In a country where tens of thousands had died from COVID-19 just a few months previously, event organiser Motorsport Italia – in tandem with the FIA Rally Department, FIA European Rally Championship promoter Eurosport Events and ACI Sport – worked tirelessly to respond to the demands set out by local and national authorities in order for the event to get the green light.

Together they implemented a track and trace app, introduced a barcode system for entering the service park that was deep cleaned each night, arranged multiple temperature checks and hand-sanitiser points, mandated the wearing of face coverings, restricted access to the event headquarters

and cancelled the spectator superspecials and fan activities among others.

The measures required significant financial investment with the organising team spending a six-figure sum to ensure the rally went ahead with an 87-car entry.

"It was a challenge because the situation was changing almost every day, so the FIA showed flexibility and the organisers showed a big willingness to organise the event," says the FIA's Category Manager – Regional Rally Jérôme Roussel. "The rally was more than a success and a great signal for the motor sport community."

Similar measures were adopted by RA Events, organiser of Rally Liepāja, venue for round two of the FIA ERC season from August 14-16, but with COVID-19 testing made mandatory, largely to negate those competitors travelling from non-exempt countries from



entering a 14-day quarantine period.

All stakeholders were required to arrive in Latvia with a negative test result and then be tested again on arrival at a purpose-built laboratory close to Riga International Airport.

Those tested had to self-isolate before their tests results were known. One driver tested positive and immediately withdrew from the rally in order to self-isolate. There were no other positive test results recorded.

Top: ERC returnee Craig Breen wore a face mask for interviews; competitors also had their temperatures checked upon entry to the service park. This is Italian co-driver Giulia Zanchetta.

WTCR – FIA WORLD TOURING CAR CUP

The third season of the WTCR – FIA World Touring Car Cup was scheduled to begin with the Race of Belgium from September 12-13.

Even before COVID-19 protocols had been finalised, WTCR promoter Eurosport Events, in partnership with the FIA, had made a significant adjustment in response to the pandemic by introducing a Europe-only roster of races. The calendar had been set to a total of 10 events with four in Asia.

Teams and drivers were issued with a detailed COVID-19 protocol document ahead of the season opener at Zolder.

This covered a number of areas including the requirement for PCR testing, virtual drivers' briefings and press conferences, a packed-food system to allow teams to remain within their paddock sub-groups, plus increased use of the WTCR Chat system that enables team managers to communicate with the race director throughout a race weekend.

Like many others, the series also introduced a range of cost-cutting measure to protect organisers and teams during the hiatus.

"A considerable amount of hard work has gone into strengthening the WTCR and making it more accessible through implementing a number of cost-cutting measures," says Alan Gow, President of the FIA Touring Car Commission. "This has led to a demand for registrations and made moving towards the re-opening of entries a sensible course of action." ◀



WTCR champion Norbert Michelisz has had a lengthy delay to his title defence.

BUILDING FROM THE GROUND UP

How do you restart racing at national and local level in the time of COVID-19? It requires organisation, education and a great deal of effort on the part of ASNs

TEXT

MATT YOUSON

Friday, March 13th, 2020. With no little irony, motor sport's COVID-19 hiatus began with a mass gathering. Michael Masi, representing the FIA, together with Chase Carey of Formula 1 and officials from the Australian Grand Prix Corporation gathered at the entrance to the Albert Park paddock and announced to the assembled media and curious team personnel that the Australian Grand Prix was being postponed. It wasn't the first racing event to fall foul of COVID-19, just the most high-profile, marking the start of an extended period where motor sport simply stopped. "See you in Bahrain," said the optimists as the teams began pack-down; "see you at Monza," replied the pessimists. Those with a firmer grasp of what the world was facing simply said "good luck" as they quietly departed Melbourne.

Five months on, and with the world slowly adjusting to accommodate a new reality, sport has become a standard-bearer for the new normal. The F1 season, cancelled an hour before it was due to begin, became the first international sport to return to competition, and most branches of international circuit racing have followed suit. But international events, while consuming most of the attention, represent a very small subset of motor sports. They have the financial strength, organisational muscle and, in many cases, contractual motivation to restart; at the grassroots, things are a little different. It is here that the work of ASNs has proved vital in getting racing going again.

In this, motor sport has certain advantages

over the majority of the sporting world. "We quickly found out that motor racing is rather well prepared for the COVID-19 pandemic regulations," says Dr Julia Walter, Secretary General of DMSB, the German Motorsport Federation. "Racers don't have direct contact with their rivals; all those involved in events are accustomed to the strict regulations regarding the areas they may or must not enter as, for safety reasons, this has been the case for years. Therefore, implementing the distance regulations due to COVID-19 is easier than in many other sports."

DMSB oversees a vast portfolio of events ranging from grassroots amateur competition through to the elite level, taking in single-seaters, saloon cars, rally and motorcycle racing. As with many ASNs, the goal of restarting motor racing safely, while meeting national guidelines, has been very much the focus for the organisation over the last few months.

"DMSB founded a task force as early as March," explains Dr Walter. "The task force has published recommended courses of action for organisers, adapting them again and again, according to the latest situation. As we developed different scenarios, in the past months, we also are able to quickly and appropriately respond to an aggravating situation."

Towards the end of April, DMSB were targeting a return to racing for the start of June. They were initially of the view that it would be easier to start small – though like everything in these unusual times, they revised their opinion as the practicalities of the situation became apparent. ▶



The delayed British GT Championship finally got underway in August at Oulton Park, with limited spectators allowed.

"The first minor slalom and Porsche club-sport events were held in late June, an approach that met our basic idea that realising a minor event in the conditions would be easier than a major race," says Dr Walter. "On the other hand, it quickly crystallised that implementing the extensive rules and regulation proved to be easier for major organisers and race venues. And so, major events such as DTM, ADAC GT Masters or AvD Oldtimer Grand Prix could be held in early August."

The Oldtimer Grand Prix at the Nürburgring saw spectators allowed back into motor racing with 5,000 tickets made available each day. In common with many of the sports that have cautiously restarted activities, there remains much soul-searching about whether the risk associated with organising a mass gathering – with or without spectators – could be justified. Critics have sought to portray the eagerness to resume competition as an example of unseemly haste, driven by an obsession with the bottom line. Rebuttal tends to rely on the care with which distancing and hygiene measures have been put in place – although there is no denial that economic pressures exist and, like every other industry, motor sport needs to find a way to function during a pandemic that shows no signs of simply going away.

"It goes without saying that protecting our health is the top priority," says Dr Walter. "Nonetheless, countries worldwide also realised that you must not neglect the economic consequences caused by COVID-19. Therefore, motor racing should – like every other part of our society – be held within the framework of the current legal regulations. Not more but not less."

STARTING FROM SCRATCH

This point is one that many ASNs have made as they cautiously restart racing activities. More than most, it is particularly prevalent in the UK, where the business of motor sport has deep roots. "It is a sport, but it's also a massive industry," says

John Ryan, Sport, Safety and Technical Director at Motorsport UK. "It's worth billions of pounds and employs almost 50,000 people, so the restart of motor sports was important not only for our competitors but for the industry as well."

The UK represents a good case study of an ASN working through the problem in a methodical manner. A blanket postponement of events went into effect in late March, shortly before the Government-mandated lockdown, with the initial post-lockdown events taking place during the first weekend of July. In between those dates, the ASN launched an extensive period of consultation, protocol creation and, in many instances, healthcare education. Its task was complicated by the 720 or so member clubs that fall under its aegis being spread across four countries – each with a separate set of government guidelines – but also by the situation being one for which there is no precedent: everything had been invented from scratch.

"Back in March, we realised we had big issues to manage, we had to support our membership and we also needed to focus on the future and understand how to unlock motor sport," says Ryan. "The situation is totally new to us all: the UK had a foot-and-mouth outbreak in 2001 which affected motor sport but nothing like this. It has required us to take leadership, analyse the situation, see how we could anticipate government guidelines and work out what couldn't take place and what potentially could, within the parameters of various restrictions on travel, gatherings, and social distancing."

The central tenet of the plan was to ensure it didn't place an extra burden on a healthcare system already creaking. Within that context, Motorsport UK came up with various scenarios to resume racing once non-essential travel was permitted, ranging from closed-doors events with two-metre-plus distancing, through to a post-crisis future in which protocols for good hygiene, regular hand-washing, provision of



Jacky Ickx was among the star names at the AvD Oldtimer Grand Prix, where 5,000 tickets were made available each day of the Nürburgring event, right.

alcohol hand sanitizer and a heightened level of personal protective equipment (PPE) have become the new normal.

"We consulted with various different stakeholders: the circuits, the clubs, our committee members, manufacturers, all sorts of parties, and there were numerous Zoom and [Microsoft] Teams meetings to gauge what was needed within our guidance to make running an event practical and achievable but also with maximum safety in place," explains Ryan. "When we broke those requirements down, we realised there are certain aspects of the sport that could not take place under the strictest conditions. Certainly, anything that would attract gatherings – things like stage rallies, for example – couldn't take place, not only because you have a co-driver but also because spectators would be difficult to control."

Motor sport in the UK restarted with an abundance of caution – rather more caution, in fact, than was strictly required by government guidelines. The initial plan was to maintain the ban on British or national championship events and limit the number of permits. ▶

For bigger series like the BTCC, Motorsport UK has found it easier to establish new protocols than at smaller club events.



'Restarting motor sport was not only important for competitors but the industry as well'



For July, the decision was taken to cap the number of permits to 50 per cent of those granted in July 2019. Some 180 permits were eventually issued in July, down from 430 the previous year. At the time of writing, the intention was to increase the percentage to two-thirds for August.

Of course, allowing racing to resume is only half of the equation. In a sport reliant upon amateur entrants and volunteer officials, there needs to be a will to resume. One of the first jobs for the COVID-19 team appointed by Motorsport UK was to survey officials and other stakeholders, to ensure there was sufficient interest to get racing moving again. Having discovered a surprising level of eagerness to resume events, the team began preparations.

MITIGATING THE RISKS

Dan Carter is Motorsport UK's Safety Executive and COVID-19 Officer, and a primary point of contact between the membership and the governing body. "All clubs had to nominate a COVID-19 officer and we put in place resources to help them," he says. "We had processes and protocols to mitigate risks that we had foreseen, but also reporting mechanisms which would help us assess any issues we hadn't.

"The process is ongoing: reports are coming in to a dedicated staff who highlight any issues we need to follow up. It's allowing us to learn from each other: every club comes up with feedback, and we're using that to update our programme of webinars and our guidance documents. We're also updating those as



Luke Browning was among the podium finishers when British F4 resumed racing at Donington in August, with 26 rounds planned at nine UK venues.

government guidelines are updated – they have been fairly fluid."

The webinars of which Carter speaks have been a key tool in educating and sharing information both before the resumption and now that racing is back on the calendar. As in many walks of life, discovering the benefits of the virtual meeting has been one of the few positives to come out of the Coronavirus saga.

"They're a big breakthrough," says Ryan. "I suppose we've almost been forced to use that format but it's been very effective. We're delivering to a lot more people than we would normally by going around the country presenting sessions. In the live sessions, people are able to ask questions, but we've recorded them too so

'At the end of the day, motor sport is probably safer than going shopping'

The ADAC GT Masters series in Germany has planned seven rounds as part of its reduced 2020 calendar.



anyone can go to the website and look at the videos. It's taken a lot of effort from our experts and an immense number of hours, but it's been a massive step forward for training and education.

One of those experts is Doctor Paul Trafford, Chief Medical Officer for Motorsport UK and COVID-19 Medical Officer. He highlights a lack of familiarity with PPE being one of the key items he's been required to rectify, and argues that the issue can be more pronounced at the level of club events than it is at professional meetings.

"I look after the British Touring Car Championship and it has a professional group of administrators so it's easy to put things in place, whereas club events are smaller, they rely on volunteers and it's harder to convey the requirements," he says. "This is true even for doctors. Those of us working in hospitals are used to what we're doing, but for family doctors coming out to work at motor sport events, they're perhaps not as familiar with the whole set-up and it can be difficult to get protocols in place for masks, gloves, face protection.

"Beyond that, you have marshals and officials, most of whom have never worn a face mask in their lives. You see people wearing them too low, too high... at first it was a little bit frightening to realise we needed to show people how to wear a mask, how to properly wash their hands. We had to go into detail about how to do that, wrestling with what information we needed to put out, how best to get it across in a way people would understand. It's not enough to say, 'wear a mask and gloves'. We've had to be a little more specific with the guidance. It's a question of what sort of gloves? How do you put them on? When do you put them on? Where do you take them off?"

Despite having to begin the education process with some fairly rudimentary steps, Trafford, like his peers, believes the process – along with the undertaking in general – has been overwhelmingly positive.

"The economic impact of the lockdown has been discussed but mental health certainly suffers enormously when people are trapped inside, and getting back to some sort of normality is very important for society as a whole. It may sound ridiculous, but sitting at home all day with no focus and nothing to do can be daunting. We're mindful and respectful of not placing a burden on the health service but getting back out is important. At the end of the day, the majority of motor sport is outside and well ventilated. I think it's probably safer than going shopping."

There still remains, of course, dark clouds in front of these silver linings. While the elite levels of motor sport are busy trying to reconstitute full seasons, lower down the chain everyone is accepting reduced series, if not an abandoned 2020 season. It will affect revenues; it will curtail competition. Venues, championships, teams and businesses will suffer. In this regard, motor sport is no different to any other industry in what we hope is an exceptional year, but planning for the future presents the hope that there is a future. For the moment, it's the best anyone can do. ◀

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RACING TOWARDS A NEW REALITY

The COVID-19 pandemic has presented motor sport with enormous challenges, but as three major figures from the sport explain the crisis brings with it opportunity

04

CHASE CAREY CEO, FORMULA 1

The world has experienced an unprecedented challenge in recent months with a global pandemic that does not respect borders or the lives it touches.

The difficulties faced by motor sport during the COVID-19 pandemic pale into insignificance to those who have experienced grief and despair at the hands of the virus. However, while our woes seem small when set against wider crises, we, as a sport that directly employs thousands, have nevertheless been through a tough period of uncertainty and strain.

Dealing with a very fluid situation across a variety of territories has not been easy, and therefore for all of us in F1 to get back to racing again as soon as it became possible to do so and to return in as safe a manner as possible has been a huge achievement.

Together with the FIA we developed an extensive code of conduct and testing protocols that are being closely followed and have been working well. Our priority has always been to safely transport everyone and to enable those individuals to operate in a safe and secure manner. We have been publishing our testing results each week, as we believe it is good to provide this transparency. At Silverstone we saw first-hand just how robust and effective our safety

procedures are. Sadly, Sergio Pérez tested positive for the virus, but our trace and test procedure handled the situation safely and with efficiency, with no impact on the race weekend or the wider sport. It shows how far we have come since Australia and is a testament to the diligent way we have returned to racing.

Putting together our calendar for 2020 has proven to be a hugely complex endeavour but we are proud of what has been achieved. We have announced 13 races in the revised calendar and expect to get to between 15 and 18 races. The newly-added three races bring exciting circuits that were not part of the original 2020 calendar. Portimão in Portugal will be a



Chase Carey believes F1 fans have been buoyed by the inclusion of new venues to its revised calendar.

completely new circuit, while we welcome back Imola and the Nürburgring which have hosted World Championships in the past. We expect to release the final details of the 2020 calendar in the coming weeks.

The strange situation we find ourselves in is that the uncertainty has generated a great deal of excitement about how the schedule has evolved. This is particularly the case in regard to venues such as Mugello and Portimão, which are new to Formula 1 and which have been received with a great deal of excitement by drivers, teams and fans. Remaining flexible in consideration of scheduling is something we feel will be very important for motor sport in the coming period and it might be that for some series territorial restrictions may open up possibilities that may not have been considered previously, and which may win over a whole new audience energised by the thrill of the new.

A key consideration for us was to ensure sustainability going forward and together with the FIA we took the opportunity to revisit the cost cap of \$175 million announced last October. The new cost cap of \$145m will be introduced in 2021 and will further reduce to \$140m in 2022 and \$135m in 2023. This will advance the objective to improve the competition and action on the track, and at the same time make the sport a healthier and more attractive business for all.

Like many, there is still a highly fluid situation that we face. However, in my time in this sport, there are several attributes we feel define motor racing and they are the ability to quickly react to adversity, to rapidly engineer solutions and to overcome problems. We have no doubt those qualities will help us all to not just survive this current crisis but to thrive in the future.

ALEJANDRO AGAG CHAIRMAN & FOUNDER OF FORMULA E

Returning to competition as soon as possible was always the goal when Formula E pressed pause on racing in early March. However, as shown in our decision to suspend the season, the health and safety of our staff, competitors and the residents and citizens of the cities in which we race is our number one priority.

Our choice to host the most intense season finale in motor sport history across nine days, with six races, three tracks and ultimately one champion, was only possible thanks to the guidance of the German authorities and health experts. It's a clear reminder of how important the strong partnerships we've forged with Formula E host cities are.



Formula E came back in 2020 with a season finale like no other, says chairman Alejandro Agag.

City centre racing is in Formula E's DNA and it's our intention to keep competing on iconic street circuits that typify our exciting, close-quarter competition. We remain flexible to the unpredictable circumstances in which we find ourselves, but we must stay on track, because now more than ever our founding purpose to counteract the effects of climate change by accelerating the development and adoption of electric vehicles resonates globally.

Given the current health crisis and resultant social and economic challenges, the FIA and Formula E together introduced additional cost-saving measures to reduce the financial burden on manufacturers and teams. By extending the homologation phase so that powertrain components can only be changed once over the next two seasons, car development costs decrease significantly.

Motor sport is built on the ability to adapt. Anyone who works in our world, from drivers to those on the ground across a paddock or service park, must plan for every eventuality and be able to react with lightning precision. It's a testament to the team at Formula E how resolutely they focused on overcoming obstacles and finding solutions to get Formula E back on television screens and online around the world. We couldn't have achieved this without the support of the FIA and our wider ecosystem. It's the unique combination of this community, alongside the energy, excitement and positive impact of Formula E, that we call being #PositivelyCharged.

#PositivelyCharged is part of the FIA's #PurposeDriven movement. The intent behind the initiative is clear from the first lines of our recent open letter: we're back, and we want to come back better. We're making that commitment now, for Season 7 and beyond, as we build on strong foundations to unite against discrimination in any form and deliver better futures through racing.

ANDREW PAPADOPOULOS PRESIDENT, MOTORSPORT AUSTRALIA; PRESIDENT, FIA ASN TASK FORCE

As with all sporting organisations around the world, these past months have been very difficult for our clubs and major event organisers as motor sport effectively went into hibernation for a long period of time.

Each state around Australia implemented different restrictions and developed new strategies to deal with the crisis, and there are multiple different requirements for motor sport event organisers to deal with.

In response to that we quickly established a COVID-19 Working Group which meets regularly. This allows us to monitor restrictions and determine what level of events may be able to run in each jurisdiction.

Motorsport Australia has also worked closely with all state and territory governments, and prepared our own detailed Return To Race strategy to allow motor sport to run safely. It allows event organisers to readily see what they are required to run, such as hosting electronic driver briefings, making sure there is social distancing and a cap on people in small spaces, such as pit areas. We also have a dedicated Resource Centre on our website, providing the tools and information necessary for events to go ahead.

Since racing returned, more than 100 events have been staged and the vast majority have been at grassroots level. That level of competition has been the real driver of events in recent months, as these events can be conducted with a small number of officials and competitors, social distancing is feasible and crowds are easily managed.

So far, we've had hillclimbs, motorkhanas, khanacross and some circuit racing, while at the top level, Supercars has been the only national-level event to run and they have done a fantastic job given the border restrictions around Australia.

Of course, there are logistical challenges to overcome, particularly in terms of satisfying government. As the nationally-recognised governing body for motor sport in Australia, we enjoy strong relationships with government at all levels. We have established relationships with the Chief Medical Officers at both the national and state level to ensure we can work co-operatively together. Additionally, our CEO Eugene Arocca, along with the rest of our team, including myself, are in regular contact with Sport Australia as well as our Federal Sport Minister.

Our Return To Race document was sent to government and was extremely well received. It allowed motor sport to restart as soon as the restrictions let us to do so, knowing we had full

government support. Many other sports were complimentary of our strategy and utilised it for their own benefit as well

As the recovery from this pandemic continues, the importance of government support for all motor sport organisations will be crucial in ensuring our sport can thrive, whether it be through government grants, or government sponsorship of events to promote tourism and major events when it is safe to do so.

Going back to grassroots motor sport, for an ASN to grow, especially during this time, we need the grassroots to thrive – not only because it uncovers talent but also because it provides an income stream for clubs. The FIA ASN Development Task Force has developed 10 disciplines at grassroots level that the FIA is looking to put out to our clubs to get them to understand the value and opportunity of grassroots motor sport.

Beyond that it's important we continue to serve our members to the best of our abilities, making sure motor sport at all levels can operate in a safe and sustainable way.

As Winston Churchill famously said, "Never let a good crisis go to waste", and I think that should be the philosophy for all ASNs. We are in the midst of an extremely challenging period, but in our case we have used it as an opportunity, to review, re-evaluate, reinforce and reinvent. We recently unveiled our 2020-2022 Strategic Plan and we will continue to use this in-depth plan as a base going forward. Some of our targets may have changed, but the overarching themes remain relevant and appropriate to grow the sport. ◀



Motorsport Australia president Andrew Papadopoulos says its Return to Race plan was adopted by other sports.

Alternative currents

05

Battery-powered vehicles are widely seen as the future of transport. But what if an alternative route to electric mobility existed, one that was potentially cleaner and simpler, if excessive costs could be contained? AUTO looks at the state of hydrogen fuel-cell technology and why some see it as the future of long-distance driving

TEXT
/
BEN BARRY

Car manufacturers might be grappling with ever-stricter CO₂ regulations for petrol and diesel engines, but sometime between 2030 and 2040 they could be outlawed altogether – so far, 14 countries have pledged to do just that.

That groundswell has given battery electric vehicles, or BEVs, seemingly unstoppable momentum – a decade ago the Nissan Leaf was the only mass-market electric vehicle, today almost every major car maker in Europe sells an electric car or is on the cusp of series production.

But even car makers committed to BEVs have been developing fuel-cell electric vehicles or

FCEVs for years – the Toyota Mirai and Hyundai Nexo are already on sale.

Fuel cells are still electric vehicles, the difference is they're fuelled by hydrogen, not plugged in to charge. Arguably this gives them the best of both worlds in that they emit nothing but water from the exhaust and provide the surging performance and calm refinement of electric vehicles, but with driving range and refuelling times comparable to petrol or diesel.

FCEVs are even refuelled at a similar kind of pump. Once the hydrogen is in the car, it's stored in high-pressure tanks and fed to a fuel-cell stack,

Toyota has been a pioneer of fuel-cell electric vehicles with the Mirai.

in which hydrogen and oxygen react to produce electricity and water. The electricity generated then drives an electric motor, just as it would in a BEV.

Not everyone believes the technology is the future, however. The Hydrogen Council unites more than 80 companies worldwide, with the long-term ambition of encouraging a transition to a hydrogen economy. Its members include BMW, Shell, Hyundai, Honda, Toyota and Daimler. But even Hydrogen Council member BMW isn't convinced that hydrogen passenger cars will go mainstream. ▶



BMW is developing fuel-cell technology with Toyota, but while Toyota launched the Mirai, BMW has no similar strategy. "We don't expect it in our portfolio, nevertheless there might be regulatory requirements in certain markets, so we develop it," said outgoing BMW R&D boss Klaus Frohlich last year.

While hydrogen has many advantages, it also has several significant drawbacks. FCEVs are approximately 10-15 times more expensive to develop than conventional powertrains and it could take two generations to reduce these costs even to today's pricey BEVs. High development costs are compounded by hydrogen's perennial chicken-and-egg infrastructure dilemma: at the end of 2019, there were just 432 hydrogen stations worldwide, and only 330 of those open to the public. Britain has only 16 stations.

The cost of hydrogen is another factor: based on the UK's current £10-15 per kilo price range, a Toyota Mirai would cost 15p per mile as a best-case scenario, comparable to petrol and more than double the typical cost per mile of electric vehicles or the most efficient diesels.

Asian countries, however, have more enthusiastically embraced hydrogen: Japan plans to increase its 111 stations to 581 by 2025, and Korea has a target of 310 hydrogen stations by 2022. European countries also plan to expand refuelling networks. As economies of scale ramp up, the Hydrogen Council predicts pump prices will drop by up to 50 per cent this decade.

Some experts think fuel-cell heavy-goods vehicles are best placed to capitalise on the steadily expanding infrastructure and falling costs. The zero-emissions trucks could deliver goods along key transport corridors, with a relatively small number of strategically spaced hydrogen refuelling stations providing national coverage. The refuelling would take minutes rather than hours, and there'd be no need for huge battery packs, which BMW's Frohlich estimates would weigh six or seven tonnes.

Mercedes-Benz and Volvo are investing in both BEV and FCEV truck technologies, and the two companies recently committed to a joint venture for fuel-cell trucks. "We are convinced that both [BEV and FCEV] can complement each other very well in trucks and buses," says Andreas Gorbach, head of Daimler Truck fuel-cell development. "Fuel cells are a climate-smart technology for heavy loads and demanding long-haul applications, so with these two technologies we can cover all the major applications of our customers, from well-planned urban food distribution to difficult-to-plan multi-day transports of bulk goods in challenging terrain."

Just as start-ups have identified opportunities in the new dawn of electric vehicles, so too have new names appeared in the electric truck market. Nikola, for instance, is a US start-up that will offer three trucks – two designed for North America, one for Europe and Australasia – with a choice of BEV or FCEV powertrains. Volume production is scheduled for 2023.

Nikola is no minnow: it was founded by billionaire Trevor Milton in 2014 and has secured an order of 'up to 800' zero-emissions trucks from Anheuser-Busch, parent of Budweiser, which plans to run a zero-emissions long-haul fleet by 2025. All customers will be offered a 'bundled lease' to include the vehicle loan, plus hydrogen and maintenance costs, with total running costs said to be comparable to diesel vehicles.

Daimler's Gorbach underlines the importance of total costs to its customers. "The total cost over the entire life span of the vehicle is the most relevant factor for our customers. We can't go in to detail because there are too many unforeseeable variables, including hydrogen cost, taxation and government funding," he explains. "Yet it's clear that locally CO₂-neutral trucks won't sell themselves, because even in 2040 the total cost of ownership will still be higher than for diesel vehicles. We therefore need government incentives, uniform standards for the transport and refuelling of hydrogen, as well as a nationwide hydrogen infrastructure."

FINDING ITS CALLING

Just like electricity, hydrogen can be but often isn't a clean fuel when the method of production is taken into account. Today, hydrogen is mostly extracted from natural gas using a process called steam reforming, which also emits greenhouse gasses. Yet it's possible to produce hydrogen on-site at fuelling stations using renewable electricity – wind turbines, for instance, could produce green electricity to be used for the extraction of hydrogen from water.

"In order for hydrogen to be completely CO₂-neutral well-to-tank it is a pre-requisite that the manufacturing processes are operated exclusively with climate-neutral electricity from



Mirai means future in Japanese, with Toyota's ambitions set firmly on zero-emissions vehicles. Right: Hyundai's H2 Xcient fuel-cell trucks are being rolled out across Switzerland.



Mercedes has operated over 30 fuel-cell versions of its popular Citaro bus in cities worldwide to test their feasibility.

Andreas Gorbach, head of Daimler Truck fuel-cell development, says the technology requires government backing and better infrastructure.



'Fuel cells are a climate-smart technology for long-haul applications'

renewable energies," says Gorbach. "We are also convinced that hydrogen production this way will be the cheapest in the long term. However, a transition phase can be expected. The same goes for battery-electric vehicles and their respective sources of electricity."

Switzerland is ideally suited to carbon-neutral pilot programmes, thanks to its small geographical area and because hydropower is used to generate over half the country's electricity. This is why Hyundai, which has developed fuel-cell technology since 1998, has chosen Switzerland for the roll-out of its new fuel-cell truck, the H2 Xcient.

Equipped with seven large hydrogen tanks good for around 250 miles, the first 50 H2 Xcients will be leased to members of the H2 Mobility Switzerland Association, with 1600 planned Swiss registrations by 2025. Because Hyundai is partnering with the Swiss-based Hydros spider refuelling 'network', the Korean maker can guarantee its trucks are truly green when fuelled at those stations – with the significant caveat that only one is currently operational, though a further six will follow. The network is planned to expand to Germany, the Netherlands, Austria and Norway.

Despite promising signs, the success of hydrogen trucks beyond low-volume experiments remains far from certain. "For this vision to become a reality, other companies and institutions need to support and contribute to this development, not least in order to establish the infrastructure needed," said Volvo Group CEO Martin Lundstedt when the joint venture with Daimler was announced.

But with BEVs now the dominant force in zero-emissions passenger cars and long-distance trucks arguably better suited to FCEV technology, hydrogen might be about to find its calling. Who knows, if trucks can drive down development costs and increase demand for a larger refuelling network, maybe they could become the chicken in hydrogen's great chicken-and-egg impasse, and fuel-cell passenger cars could follow after all. ◀



Has the drive for autonomy stalled?

05

TEXT
/
BEN BARRY

For the past five years, auto industry forecasters have trumpeted the imminent arrival of self-driving vehicles, but have technological and legislative barriers as well as the COVID pandemic put the brakes on an autonomous future? AUTO investigates

In 2017, *Fortune* magazine estimated that 95 per cent of all cars sold globally in 2040 would be fully autonomous. Google and Tesla once predicted the first of those cars would be sold in 2018. Advocates were excited that machines could potentially avoid the 1.2 million annual deaths caused by human drivers worldwide, and that autonomous transportation could unlock opportunities to reduce congestion and emissions, and allow workers unshackled from driving to be shackled to laptops instead.

But some obstacles have proved harder for autonomous technology to steer around than first expected – often those of the legislative variety as much as physical objects.

Take the Audi A8. When Audi launched its latest flagship luxury saloon in 2017, it billed it as the first car developed specially for highly automated driving. Ready for Level 3 self-driving, the A8 was equipped with Traffic Jam Pilot, which, once activated, could manage starting, stopping, accelerating and, most significantly, steering at up to 37mph on major roads with a central barrier.

The driver was not required to focus on the road, but would have to be ready to regain control when prompted by the car. As such, Audi's new halo model represented a step from other autonomous technology, which insisted the driver touch the steering wheel every few seconds, even if such systems could self-steer at higher speeds. ▶

Fully autonomous technology remains a long-term goal for car manufacturers. ▶





Autonomous research has already been hit by the COVID pandemic, says simulator specialist Ansible Motion.



'We will likely see a tipping point in this technology similar to mobile phones'

says Cammaerts. "Alongside serious questions regarding shared mobility and mass transport, the financial impact of the virus is forcing some OEMs to consider where best to invest research funds for profit and customer experience. Should you focus on improving driver-assist solutions already available or risk investing in blue-sky autonomous research reliant on new technology, market acceptance, legislation and the connected infrastructure, all of which car makers have little control over?"

Faced with such challenges, Cammaerts predicts OEMs will focus on increasing adoption of Level 2 technology that has become prevalent in the past five years, and the incoming Level 3. "We are seeing customers already using our simulators to achieve this," he confirms.

Indeed, both BMW and Mercedes continue to progress towards Level 3 technology despite legislative uncertainty with the iNext and S-class respectively, both of which are due in 2021 (though the manufacturers recently revealed they would no longer be collaborating on such technology). Tesla boss Elon Musk says Level 5 autonomy can even be ready this year, using hardware already present in its production models but controlled by significantly updated software, legislative issues again the ultimate barrier.

"The transition is likely to be long and gradual rather than binary," thinks Cammaerts.

"Even using technologies that can repeatedly challenge automation systems with many different scenarios, it's simply not feasible to validate every situation in a short period of time. There are other factors: will consumers accept a car could still crash with automated control, even if it is statistically safer than without? Will the legal system be ready for these changes and will manufacturers and insurers be prepared for the liability? Those questions are unlikely to be answered without more experience of these vehicles in the real world, backed up by extensive simulator testing, making Level 5 by even 2040 a real challenge."

Samir Agarwal, head of autonomous driving research at electric-car company Nio, meanwhile, acknowledges the many challenges but offers a slightly different take. "We will most likely see a tipping point in this technology similar to mobile phones," he says. "We expect low adoption, followed by an increasing interest driven by the potential profit, then mass adoption. The shift toward full autonomy is slow and will happen when technology is mature, cheap, and trustworthy. At one time, elevators had human operators to assure passengers of safety, but today that is a rarity. It's highly likely that by 2040, we will see that some driving scenarios, in some regions, will be autonomous."

Full autonomy might still ultimately be on the horizon and it's probable that Level 3 will allow us to remove hands from the wheel and eyes from the road in the relatively near future. But it's equally likely that the dream of handing total control of your car to a computer in all driving environments will still be out of reach, even two decades from now. 4

Audi, however, cited the need to clarify each market's 'statutory framework' before the technology could be gradually phased in. Earlier this year, that process ground to a halt, with Audi's chief of technical development Hans Joachim Rothenpieler telling *Automotive News*: "We will not see Traffic Jam Pilot on the road with its originally planned Level 3 functionality in the current Audi A8... Currently, there is no legal framework for Level 3 automated driving and it is not possible to homologate such functions anywhere in the world in a series production car."

No matter the legal situation, some high-profile fatal accidents have proved that autonomous cars can never be fail-safe, and some OEMs believe Level 3 autonomy to be an inherently flawed concept due to the nebulous 'hand-over' phase between machine and human. Volvo boss Håkan Samuelsson, for instance, has called Level 3 unsafe because an inattentive 'driver' might be summoned to quickly respond to a situation and retake control, despite lacking the situational context that could help inform the correct decision. It is safer, in Samuelsson's opinion, to skip Level 3 altogether and progress

to more advanced technology where the car assumes more responsibility.

There are five basic levels of autonomous driving in total as laid down by the Society of Automotive Engineers, and Level 3 is critical because it is the bridge between lesser driver-assistance systems and full autonomous systems that don't require the driver at all.

Level 1 systems control a single function, such as radar-based cruise control, offered since the late 1990s to hold a set gap to traffic ahead. Today's self-driving functions are classified as Level 2, with multiple driving tasks taken over by the car, but the driver still very much in control – the ability for the car to steer itself for brief periods and maintain a set gap to traffic are typical examples. Tesla's Autopilot is Level 2 technology.

Audi's readiness for Level 3 was a breakthrough because it meant all driving tasks could be managed autonomously on major roads, with the driver not steering or having to look at the road but ready to intervene. To optimists, it seemed the groundwork was being laid to move to Level 4 (fully autonomous in geofenced areas with the driver completely hands- and

Chinese electric car company Nio expects a gradual shift towards autonomous technology over the next two decades.

eyes-off driving duties) and the no-caveats fully autonomous Level 5, where even a steering wheel is optional. Experts often settled on 2030 or thereabouts for these final stages.

This no longer seems so certain. "There has been a reality check," declared Daimler boss Ola Kaellenius recently on the subject of developing fully autonomous robo-taxis in the face of high investment, uncertain returns and the need for total safety. "Ensuring self-driving cars are 100 per cent safe in crowded urban areas is proving to be a bigger challenge than engineers had assumed," he summed up.

THE PANDEMIC EFFECT

Kia Cammaerts is technical director of Ansible Motion, a specialist in automotive simulators used by OEMs to validate autonomous technology. In his view, the legislative and technological challenges of self-driving vehicles have been compounded by the Coronavirus pandemic.

"The likelihood of seeing autonomous vehicles of Level 4 or above in mixed traffic in the near future has been clouded by COVID-19,"

Audi's plans to run Level 3 autonomous technology in its A8 were stalled by legal issues.



05

Ground zero

GM CEO *Mary Barra's* restructuring had already hauled the US automotive giant out of the mire caused by the last global economic crash and established a path towards a better and more sustainable future, but the current crisis has seen her accelerate those plans even further with an agenda focused on zero crashes, emissions and congestion

TEXT
/
JUSTIN HYNES

The scale of the impact made on the automotive industry by the COVID-19 pandemic has been enormous. The rapid spread of the virus and the resulting economic shutdowns resulted in a huge collapse in sales of new cars and the cessation of production plants around the world.

As second quarter results from car makers around the globe revealed a massive slump in demand, industry forecaster IHS Markit predicted a possible 22 per cent drop in light vehicle sales year on year, from 90 to 70 million units in 2020. New car sales have already fallen by 55 per cent in comparison to 2019. With tumbling consumer demand, supply is dwindling. By March 2020, 93 per cent of US automotive production was offline.

The climb back to daylight from the depths of this chasm is one that will challenge every auto maker, but it is one that General Motors CEO Mary Barra insists is winnable for the US giant.

"COVID-19 has impacted us everywhere we do business," she says. "It has changed the way we work, how we sell our products, how we support our customers, and how we care for each other. Many of these changes will influence how we allocate future spending as we move forward.

"While our years of business transformation actions made the company more resilient, we also took additional proactive steps to help offset these challenges. Dealers stayed connected with customers with our online and contactless Shop-Click-Drive tool that we enhanced. Additionally, our employees proudly rallied to build ventilators and personal protective equipment for first responders.

"In the US, we partnered with Ventec to build 30,000 ventilators in our Kokomo, Indiana facility, with the capacity and ambition to build more if needed. In Brazil, our teams repaired ventilators for hospital use. Our global facilities have produced millions of masks, as well as face shields and gowns.

"We have also made targeted financial donations around the world to address acute community needs."

And she points to a safe and structured emergence from lockdown as an indicator of the company's pathway to recovery.

"We used our early learnings in China and Korea to safely begin restarting our operations in North and South America with significant support from our supply chain unions and governments," Barra explains. We continue to collaborate with these stakeholders to ensure the highest levels of confidence in

and execution of our extensive safety measures.

"While we can't predict the trajectory of the virus and its ultimate impact on public health and the economy, we have put all appropriate measures in place to position the company for continued recovery in the third and fourth quarters and beyond."

FUTURE VISION

A large part of that strategy revolves around GM's mission of zero crashes, zero emissions and zero congestion, a triumvirate of goals at the heart of the company's 2019 Sustainability Report.

"Transitioning to all-electric vehicles is central to a zero-emissions future," she says. "By mid-decade, we expect to sell a million EVs a year across our global markets."

Backing up the plans, GM aims to invest \$20 billion from 2020 through 2025 in autonomous and all-electric vehicles, and has promised to bring to market at least 20 new battery EVs by 2023, the first of which will go on sale early next year. Currently, GM offers only the Chevrolet Bolt.

GM will power the EVs on its proprietary Ultium battery cells and has partnered with LG Chem to mass-produce the battery cells in Ohio. It is also working with Qmerit to create a more accessible at-home charging solution.

"On track are the first of our upcoming EVs in North America based on our next-gen EV platform and Ultium battery system," says Barra. "[These include] the Cadillac Lyriq luxury electric SUV [revealed in early August and due to go on sale in 2023] and the GMC HUMMER EV, which we'll reveal in Q4. Our EV sales and portfolio are also growing in China with overall year-over-year deliveries in the first half – up for the first half of the year by more than 25 per cent."

Additionally, GM recently announced a partnership with charging network EVgo to triple the size of the United States' public fast-charging network. The companies will add more than 2,700 new fast chargers at various public venues over the next five years. The chargers will offer access to drivers who live in multi-unit homes, rent their homes and can't install chargers, or might not have access to workplace charging. ▶



The Cadillac Lyriq SUV will add to GM's EV portfolio and is due to go on sale in 2023.





The US giant has ventured into autonomy by buying into self-driving start-up Cruise and the Origin – an electric, shared vehicle.



GM has partnered with EVgo with a plan to triple the size of the US's fast-charging network.



During the pandemic, GM employees turned their attention to mass-producing ventilators.

The ambitions for electric and autonomous vehicles point to a clear model for future business, as well as environmental sustainability, but there is no denying that the short-term, post-COVID outlook remains bleak.

GM's sales were down 34 per cent in Q2 2020 compared with the same period last year. In all, it lost \$806 million during the second quarter of this year, a downturn that contrasts strongly with \$2.42 billion in profit generated in the same spell last year. Revenue during the three months ending June 30 slid to \$16.78bn, a more than 53 per cent drop from \$36.1bn during the same time last year.

Barra, though, remains confident that GM is resilient enough to withstand the pain.

"We recognise that we're at a critical point for General Motors, from an industry perspective and, frankly, the world, as you look at the virus," she says. "We are committed to leading through the current challenges to provide a very strong future. We are determined to run the business in a way that creates the value our shareholders deserve and with outstanding vehicles."

"The past several months have been difficult and our world has changed. As we move through the world in a new way, General Motors is as determined as ever to create solutions that lead to a better future for all. GM remains focused on delivering on our vision of a world with zero crashes, zero emissions and zero congestion, while also becoming the most inclusive company in the world."

"With partners that include utility companies and charging networks, we are working to make sure charging is easy, fast and affordable at home, work and on the go. And we will continue to increase the number of chargers at our facilities," adds Barra.

"We know how important the charging ecosystem is for drivers, one that includes access to convenient and reliable public fast charging. Our relationship with EVgo will bolster the public fast-charging network available to EV customers ahead of increased market demand."

GM is embracing autonomous mobility as part of its sustainability drive and is the majority owner of self-driving car start-up Cruise.

"Our work to develop safe, autonomous vehicles on our way to a driverless future — one with safer roads and zero crashes — continues uninterrupted," says Barra. "In January, Cruise introduced Origin, a purpose-built, electric, shared, self-driving vehicle that GM and Cruise developed jointly with Honda. It is designed to seat six and provide a better, safer and more consistent experience than a conventional rideshare vehicle."

The company's sustainability programme also extends to the production of its vehicles too, with Barra saying that GM is accelerating its climate change goals.

"We will source 100 per cent of our facilities'

electricity from renewables by 2040 globally, and by 2030 in the US. By 2025, we will be 60 per cent of the way toward our global goal," she says. "And in partnership with our suppliers, we are establishing a sustainable material target of at least 50 per cent by 2030 for all our vehicles."

The company's 2019 Sustainability Report also includes an ambitious programme to promote diversity, a topic Barra has been strongly vocal on in recent months.

"There comes a time when we are compelled to stop diagnosing what is wrong and start advocating for what is right," she said in a recent announcement that committed GM to greater inclusion, the condemnation of racism and a stance against injustice.

"We are taking immediate action," she added in a statement. "I am commissioning an Inclusion Advisory Board (IAB) of both internal and external leaders, which I will chair... with the longer-term goal of inspiring us to be the most inclusive company in the world."

"Collectively, and in time, we will be part of the change. For now, my personal commitment is to ensure that the leadership of GM, and by extension the entire GM family, consistently remains aware of our responsibility to bring awareness to injustice. Because awareness leads to dialogue... dialogue leads to understanding... and understanding leads to change."

'There comes a time to stop diagnosing what is wrong and start advocating for what is right'



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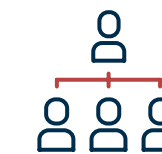
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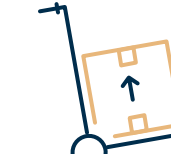
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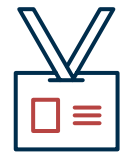
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The FIA Foundation is supporting plans to help health workers in sub-Saharan Africa prepare for COVID-19.

05

Going the distance to save lives

The COVID-19 pandemic is reaching every corner of the world, no matter how remote, and getting medical supplies to those areas is often difficult and sometimes dangerous. However, the FIA Foundation is helping to tackle the problem, through the transformation of transport...

TEXT

/
KATE TURNER

The COVID-19 pandemic has changed how the world moves and interacts, from our personal journeys to the movements of essential goods and services upon which our societies rely. The connection between public health and mobility has never been more explicit: governments and communities have adapted to restrict personal movement while also addressing the vital importance of medical supply transport logistics, a particular challenge for poorly connected communities in low- and middle-income countries.

The sub-Saharan Africa response to COVID-19 is particularly complex, beset with challenges around logistical connectivity between hubs of healthcare services and goods. This is set against ongoing regional health challenges that have not reduced during the pandemic, but may, in fact, be exacerbated by the shift in focus and money away from day-to-day health funding.

"The aim of the FIA Foundation has always been to improve public health and draw attention to the intersection between public health and mobility," says Saul Billingsley, Executive Director of the FIA Foundation. "In this global pandemic we felt it was the right thing to do to seek out ways in which we could strengthen COVID-19 responses through mobility programmes and existing relationships, which can have significant impacts on the current situation but also an enduring legacy for health outcomes in the future."

The final short journeys to deliver healthcare and medical supplies to vulnerable and isolated communities in poorly connected areas – known as 'last-mile' journeys – can be an extreme challenge. Movement at scale with critical

supplies is a logistical challenge for communities most in need across many low- and middle-income countries. Journeys of a few miles across rough, inhospitable terrain, often without formal roads, can take days rather than minutes. This challenge is amplified by the speed, severity, and unpredictability of the COVID-19 pandemic, meaning that delays in health information or medical supply outreach can make the difference between life and death.

SUPPLY CHALLENGE

The health supply chain challenges are particularly profound in sub-Saharan African countries, at that last mile. Using a €300,000 grant, People that Deliver (PtD) – a global partnership of organisations supporting the health supply chain workforce – and UNICEF will provide critical catalytic and seed funding for four programmes. Funding will directly support these new projects in sub-Saharan Africa with local organisations already experienced in transport logistics to strengthen pandemic responses such as emergency logistics and protecting supply chain management.

"As global and national supply chains are disrupted and delayed, health supply chain workers need specialised resources and support to do their jobs," says Dominique Zwinkels, Executive Manager for People that Deliver. "Pharmacists, logisticians, supply chain managers, data managers, warehouse, transport personnel, and many others are the professionals who are collectively tasked to ensure health supply chain management." ▶



Bicycle ambulances and health advice – used in the fight against malaria – will also help to tackle the pandemic.



'Every second counts... The more we can do now, the more lives we can save'

Strengthening and adapting community systems already in place offers another way to bolster the response to COVID-19 while ensuring existing healthcare outreach programmes and infrastructures are protected. Through charity Transaid's MAMaZ against Malaria (MAM) at Scale programme, funding from the FIA Foundation is helping 200,000 rural Zambians prepare for the challenges of COVID-19.

The programme was established as a healthcare community network for volunteer education and interventions outreach, supported by a fleet of bicycle ambulances to provide emergency malaria treatment. These have been adapted to integrate COVID-19 messaging and interventions in a bid to prevent the rapid spread of the disease through a combination of critical information dissemination, including details on infection prevention, and rapid funding; this produces an immediate impact on the ground through the fast expansion of the remit of its life-saving programme.

Outreach included community radio broadcasts, alongside hygiene and social distancing posters in English and local languages. Together with its partners in the MAM at Scale programme, Transaid has also been contributing heavily to the Zambian Community Health Worker National Guidelines, supporting educational talks from district health teams in local communities on prevention and response, while building the resilience of 180 of the most vulnerable communities by stocking up food banks and installing 'tippy-tap' systems to provide low-

contact hand-washing facilities. Face masks, disposable gloves and soap have also been provided to protect community health volunteers and bicycle ambulance riders as they go about their lifesaving work.

Caroline Barber, Chief Executive of Transaid, says: "We have been engaged at the highest levels in-country to support preparations being made on the ground... every second counts. The more we can do now, the more lives we can save." This has a dual benefit, supporting response to the new threat, but also securing the infrastructure for the ongoing work tackling malaria. "Vital services and medicines won't stop reaching the children who need them most," Barber adds. "We are committed to ensuring we do not lose ground in the fight against malaria."

"The logistics of the supply chain in low- and middle-income countries is an often overlooked area of international development but it has never been more critical, which is why, as part of our response, we were so keen to work to strengthen existing mobility work," says Billingsley. "These community health networks have had a huge impact on health outcomes and offer a direct application for the new global challenge of COVID-19. Investment in these systems is essential for the immediate challenge at hand, but also offers a blueprint for governments and multilateral organisations to better understand the value of investment in mobility to strengthen the well-being and health of communities for the future." ◀

Launching the Solidarity Fund /

The FIA Foundation launched a special COVID-19 solidarity fund, totalling €2.4 million, earlier this year across seven projects. The fund supported a variety of programmes with a focus on mobility and with long-term partners working across a range of COVID-19 responses.

The largest donation of €1m was made to the International Federation of the Red Cross and Red Crescent Societies – the world's largest humanitarian network – as part of an integrated COVID-19 partnership between the IFRC and the FIA (see *Opinion*, p21). The donation supplemented the online #RaceAgainstCovid auction of motor sport memorabilia, conducted by auction house RM Sotheby's. The FIA Road Safety Grant Programme and Sport Grant Programme, both supported with Foundation funding, will also strengthen existing cooperation between FIA Member Clubs and Red Cross and Red Crescent National Societies on road safety, by scaling up interventions to prevent the spread of the coronavirus.

Two epidemiology programmes are being supported to research the spread and control of the virus. Vaccine research at Oxford University in the UK, led by the university's Jenner Institute and the Oxford Vaccine Group, is widely seen as one of the most promising in the international quest to find a vaccine. Human testing of the vaccine began in April, and the Foundation's funding

will contribute towards further research. Addressing the spread of the virus, Johns Hopkins Bloomberg School of Public Health in the US is undertaking an urban disease control and map population exposure programme to develop swifter antibody testing to increase the speed of detection.

Long-term road safety partner, the Vietnam-based non-profit AIP Foundation, is to produce face masks at its social enterprise motorcycle helmet factory to address global personal protective equipment (PPE) shortages. A portion of the factory operations will see production lines transformed by specialised machinery and equipment, and will also support the international distribution of 1.5 million masks per month. Not only saving lives globally, the initiative will also contribute to the local and regional economy by purchasing supplies and securing jobs.

The neurological and psychiatric impacts of COVID-19 are the focus of a major new study by the Paris Brain Institute (ICM) to better understand the long-term impact and potential rehabilitation treatments for those affected by the disease. Beyond the respiratory issues predominantly associated with COVID-19, many other organs can be affected; this can lead to neurological complications such as loss of smell and taste, headaches, dizziness, convulsions, stroke, altered consciousness, and muscular issues. The study will focus on the neuropsychiatric and psychiatric consequences for patients and their families, as well as the impact on patients living with existing conditions such as multiple sclerosis and Parkinson's. The data collected will be the subject of in-depth analysis using artificial intelligence to provide insights and potential treatment options.

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05

Global response and local action

TEXT

JUSTIN HYNES



Jagan Chapagain, Secretary General of the International Federation of Red Cross and Red Crescent Societies, explains how the IFRC is dealing with the COVID-19 pandemic by empowering its national societies – including in the collaterally affected area of road safety

The COVID-19 pandemic has had a profound impact on the entire global population and for an organisation like the IFRC it must place incredible strain on resources and personnel. Can you outline how the federation has responded to the crisis on a global level?

This pandemic has pushed nearly all organisations and industries to limits we have not seen in our lifetime. We continue to constantly adapt and find new ways of working while still meeting the unprecedented humanitarian needs this crisis has created. Every country is at risk of COVID-19, but not all countries are affected in the same way. Collectively, we have shifted our Red Cross Red Crescent response to one that is global yet domestic in reach by supporting our national societies in scaling up health, sanitation and community engagement activities to save lives and meet the specific needs of vulnerable people.

What situation does the IFRC now find itself in with regard to the crisis? What are the next steps the federation is preparing for as we contemplate a second wave?

As the number of people infected by COVID-19 drops in some regions, others are experiencing a surge as well as the return of the virus. Red Cross and Red Crescent volunteers around the world are providing medical and mental health care, food and sanitation, and rolling out emergency cash programmes to families who need assistance. They are locals in their own communities engaging in two-way dialogue, building trust and providing life-saving information about protection against the coronavirus.

How has the pandemic impacted on the federation's other activities? Have there been

particular crises that have been exacerbated by the pandemic?

The COVID-19 pandemic has worsened the impact of other humanitarian emergencies. Many countries are facing double or triple crises, as COVID-19 merges with climate change and extreme weather. An alarming number of people face serious food shortages, which puts them at increased risk of malnutrition and disease outbreaks. The pandemic has also disrupted progress made against diseases like malaria, measles and tuberculosis as health services have ground to a halt in some areas. Many immunisation campaigns have been suspended all together. We are working with partners to strengthen routine immunisation in hard-to-reach populations and advocating for the international community to commit to a people's vaccine for COVID-19, when it becomes available. Red Cross and Red Crescent volunteers are providing people with cash, food seeds, tools, malaria bed nets, and medical and mental health care to get them through these multiple crises.

The crisis has stretched resources to the limit everywhere. How important is the €2 million raised by the FIA and the FIA Foundation for the IFRC and its global response to COVID-19 through an online auction in June (see p21)?

The COVID-19 pandemic and associated global recession will worsen health and economic outcomes for vulnerable people in fragile and low-income countries. The funds raised from the online charity auction and FIA Foundation provide an extra safety net and support the important work of Red Cross and Red Crescent national societies around the world to help people affected by COVID-19. Thousands of

families can access medical and mental health care, receive cash to help them buy what they need, and receive support from our staff and volunteers to stay informed and healthy. These funds will also be used to purchase more personal protection equipment (PPE) to protect frontline workers so they can connect directly with the most vulnerable and high-risk communities.

The IFRC is the host organisation of the Global Road Safety Partnership. You were a member of the Executive Committee of the GRSP for some time, so can you explain the work of the partnership and how road safety fits in with the IFRC's overall mission?

The key focus of the GRSP is to improve road safety in low- and middle-income countries. The IFRC was the first organisation to identify road trauma as a man-made humanitarian crisis in the 1999 World Disasters Report. The poor, vulnerable and the young are particularly at risk, and the road fatality and serious injury rates are dramatically higher in poorer countries. Some of the key initiatives of the GRSP include programmes to improve road safety laws, educate and train police to prevent road trauma, and the Global Road Safety Leadership Course run jointly with the Johns Hopkins University – Injury Prevention Unit in Baltimore, USA. The GRSP is recognised as a global advocate for improved road safety and has been operating for more than 20 years with a variety of road safety projects across the world. The GRSP's key strength is bringing together civil society, governments and the private sector in partnerships to improve road safety.

The economic fallout from the COVID-19 pandemic is likely to be profound and there is concern that road fatalities may continue to rise due to an inability by government to invest in much-needed infrastructure, particularly in emerging economies. Is this a major concern for the IFRC and what would you say to politicians about the issue?

Improving road and roadside infrastructure is an important economic investment, but there are many other lower-cost interventions that improve road safety. The most tangible intervention is speed reduction. If a country cannot immediately afford to improve a road's safety infrastructure, it can lower speed limits. The higher the speed, the more likely a vehicle will crash and the more severe the injuries. There are still countries around the world with speed limits that are too high for the safety standards of the road. France recently lowered its rural, non-divided road speed limits to 80km/hour and hundreds of lives were saved. Other countries must show the same courage and commitment to act and invest in evidenced-based road safety measures that work.

The IFRC has been involved in a partnership with the FIA since 2014, with a particular focus on post-crash care. How important is this in helping to save lives on the road?

Post-crash response is one of the key pillars of road safety and involves the safe extraction of victims after collisions by rescue services, immediate trauma care by well-trained paramedics, hospital trauma care and long-term rehabilitation. Many of our Red Cross and Red Crescent national societies operate ambulance services and hospitals, and see the carnage of preventable road crashes every day. In addition, public awareness campaigns that specifically support police enforcement of alcohol-impaired driving, excessive speed and other key risk factors are effective at reducing road trauma. It remains important to focus on these targeted campaigns.

You're also a member of the FIA's High Level Panel for Road Safety, which brings together business leaders, diplomats and NGOs to develop innovative solutions to road safety. How important is this kind of public/private/NGO partnership in creating momentum for change?

Business, civil society and government leaders have an important part to play in improving road safety. Collectively, we must put in place interventions that we know work. Many countries still do not have adequate seat belt, child restraint and motorcycle helmet laws. Some countries have inadequate drink-driving laws and speed limits remain far too high in many parts of the world. Effective road policing is often absent or of a low priority. It takes political will and commitment to fix these problems. We collectively have a role to keep the pressure on for change and the FIA's High Level Panel for Road Safety is an important forum where this can happen.

Looking at the broader road safety issue, earlier this year we had the 3rd Ministerial Conference held in Sweden. Were you encouraged by the outcome and the signing of the Stockholm Declaration?

I was encouraged by the strong commitment

Money raised by the FIA's charity auction will buy PPE for IFRC local volunteers working in high-risk communities.



demonstrated in Stockholm to reduce the road trauma burden with so many ministerial delegations in attendance. Here is a simple and effective message to governments and drivers everywhere, which I quote from Lord Robertson's opening address at the conference: "There is one policy guaranteed to help worldwide: Slow Down!" Slowing down not only reduces serious crashes, but also helps slow down greenhouse gas emissions – another global priority that must be addressed. It is also important that police are supported and encouraged to focus on excessive speed as a primary crash contributor and a key mechanism to keep the world's communities safe."

What do we need to do to deliver on the pledge to reduce road deaths by 50 per cent by 2030?

We already have the solutions to reducing road trauma. The 'Safe System' approach and the integrated way in which it aims to protect all road users is proven to be effective across the globe. As a result of the COVID-19 pandemic, we now face unprecedented health and socioeconomic challenges. Now more than ever before, improving road safety must be a key priority. No country can afford to ignore road deaths and serious injuries and the costs they inflict on health, rehabilitation and social welfare systems. The economic and social costs of road trauma are enormous and will put more pressure on health systems at a time when countries cannot afford this. It is important that people avoid serious injury that requires hospital care and can live valuable and productive lives. Road trauma remains a man-made yet preventable humanitarian crisis.

Finally, how do you see the COVID-19 crisis evolving over the coming months, and what message would you like to deliver to the readers of AUTO and the FIA's members?

I am grateful and proud of the long-standing partnership between the FIA and IFRC. This has been a team effort since day one, and I look forward to continuing that progress in the months ahead. COVID-19 continues to spread exponentially in many parts of the world and will continue to do so in the months to come in the absence of an effective vaccine. The FIA has an incredibly important and ongoing role to help stop the spread of COVID-19. Promoting simple actions can save lives. The three W's – wash your hands thoroughly, wear a mask and watch your distance – are proven to help stop the spread of COVID-19. We should also take care of our community by checking in regularly to make sure our family, friends and neighbours are well and safe. It is important that we work together collectively and in solidarity, and that we stay the course even when it's difficult or inconvenient. If we all play our part, we can defeat this virus. ◀

'Many countries are facing double or triple crises, as COVID-19 merges with climate change and extreme weather'

05

Constructing a new normal

TEXT
/
NATHALIE MCGLOIN

For FIA Disability And Accessibility Commission President *Nathalie McGloin* her own experience of life-changing events has helped her deal with the effects of the coronavirus pandemic. And she believes that in times of volatility, uncertainty, complexity and ambiguity, the only solution is to rebuild – one brick at a time

“It doesn’t have to be any worse, it just has to be different...” These are words I speak to newly-injured patients after suffering a spinal cord injury. Having had a spinal injury myself at the age of 16, I speak with authority on this. Breaking your neck is arguably one of the most devastating physical disabilities that can happen to a person and, if you are unlucky enough to become one of the 500,000 people this happens to each year, the adjustment to living with paralysis can be a lengthy process. It’s life-changing in a way that few people can ever imagine.

During my time in lockdown, I’ve been reading a lot from different organisations about how they are coping with COVID-19 and what their plans are to bounce back and adapt to that ‘new normal’ everyone is talking about. One that resonated with me personally was a quote by Jim Loree, President and CEO of Stanley Black and Decker, when he referenced the acronym ‘VUCA’. VUCA is a military term used to describe periods of volatility, uncertainty, complexity and ambiguity.

After breaking my neck, I went into my own lockdown for a period of 11 months, experiencing ‘VUCA’ on an intensively personal level during my spinal rehab in hospital. Although that situation was completely different to what we are experiencing today, I can find numerous parallels. The skills and resources I have gained from that period are not only what have led me to achieve some incredible things in life, but are also what I will personally draw upon for my own bounce back from this global pandemic.



Nathalie McGloin went through her own 'lockdown' as she recovered from a spinal injury.

When I was first injured, my whole world completely fell apart. Sustaining a spinal cord injury is a bit like demolishing a house, it’s like a wrecking ball comes through, knocks down every wall of the house that is your life and leaves only the foundations in place. Foundations are usually pretty strong but when they are covered in the rubble of your collapsed house, that strength can be pretty hard to uncover. But what I discovered is that the more people help you move the rubble, the faster those foundations can be exposed.

However, at 16 years of age I had no wisdom or life experience to know that ultimately I would be okay and consequently my outlook was extremely bleak. Before my accident, I was a confident young adult starting to make plans for my future. I was a high achiever at school, loved after-school theatre classes, and spending time with my friends. I had a part-time job while I was studying for my A-Levels and was starting to think about university choices. Life was great and I was so independent. In a moment, that was all taken away from me when a car crash left me completely paralysed from the chest down with limited hand function.

BUILDING BLOCKS

As I slowly came off the morphine in ITU and started to learn about the permanence of paralysis, it also exposed some unexpected and unwelcome realities that I would have to learn to live with. Not only would I never walk again, but my hands would never regain any function grip and the hardest thing to come to terms with was that I would never again have voluntary control over my bladder and bowels. There was so much to take in and deal with, I just didn’t know where to begin. The bricks of my house that were on the floor were all misshapen, they didn’t fit together like they used to, and I had no idea how to piece them back together. There were way too many of them to move by myself, so I couldn’t see the foundations and the strength that I so desperately needed to find that I started to think they had been broken too.

That’s when one of the nurses stepped in to help and showed me another house that had been put back together. This house didn’t look like my old house but it looked like a good house and, although I couldn’t see the foundations, I knew they were strong. An ex-patient, Alan Smith, had the same level of injury as me and offered the first small glimmer of hope that I might be okay. He came into the spinal unit and talked to me about the sports he played, the car he drove and showed me how he lived independently. That nurse knew I needed some hope, some proof that life outside the spinal unit could get back to some semblance of normality. Alan was a symbol of that hope and was my inspiration to work together with my NHS family, who helped to uncover the strength in my foundations and towards discovering my new normal.

Spinal rehab was tough while I was learning to deal with having to do things differently. However, it was a safe environment. In there we were all the same, everyone knew about all the issues that go with having a SCI (Spinal Cord Injury) and no one was different.

Spending any time in lockdown is not fun whatever the reason, but for me, I’d become so institutionalised that I was afraid to leave. I knew that being back in the big wide world meant my life would be different to that of others, but more importantly different to my old life that I was still mourning and still desperate to have back. I was anxious to get back to normality and do what I was doing before my accident, but when the first day back at school came around I was scared. What if it was all just too much and I couldn’t cope?

In the spinal unit, I’d managed to find my strength, the foundations of my house. But the walls weren’t yet fully rebuilt, they were only a few courses of bricks high. I didn’t have any confidence that the walls wouldn’t fall down again if any force was placed upon them. The morning of my first day back at school, I broke down in tears and said to my mum: “What if I can’t do this?” She simply replied: “If you can’t do this then you can come back home and we will figure something else out.” I stopped crying, wiped my face and went to school. It was the bravest thing I have ever done in my life.

When I broke my neck I made a promise to myself. I promised that I would not let my injury stop me from doing whatever I wanted to do in life. I kept my promise and 16 years later I became the first woman with a spinal cord injury to compete in a licenced car race against able-bodied men.

Given the choice I would always choose to be able-bodied. However, I will always be grateful for the opportunities that have opened up to me because of my injury, as I’m certain that I would not be racing cars had I not been in that accident. If you can find a silver lining in situations such as these then, in my opinion, you’ve already won half the battle.

However, battles can’t be won by one person. If it hadn’t been for the support of the NHS, my family and the people who believed in me then I wouldn’t be where I am today. Often, we don’t just have one battle to fight in our lifetimes either, and that’s where our allies play such an



McGloin believes she might not have ventured into motor racing were it not for her life-changing accident.

important role in our success. After fighting to earn my right as a respected racing driver for four years, in 2017 a car crash on a race circuit almost saw me give up the sport that I loved for good. If it wasn’t for the support of my motor sport family, I don’t know whether I would still be pursuing my passion. Self-belief is so important, but when it’s denied by emotions that are out of your control, you need someone else to have your back. Having friends, family and supporters believe in me and my vision gave me the motivation to carry on fighting.

Today, my fight is not only for my own ability to follow my dreams, but to give others the same

‘I was anxious to get back to normality and do what I was doing before my accident’

opportunities that I had when starting out in motor sport. In 2016, with my partner Andrew Bayliss, I co-founded Spinal Track, a charity that gives disabled drivers the opportunity to do what I love: driving adapted cars around race circuits.

Our charity doesn’t just provide driving experiences, it gives disabled people and their families the belief that anything is possible. After sitting on the pitwall watching tears of happiness roll down a father’s face as he saw his disabled son driving a racing car around Silverstone circuit for the first time, I honestly believe that motor sport has the power to heal.

Alongside my charity work, I also have the privilege of ensuring that motor sport remains accessible and safe for disabled drivers in my role as the FIA Disability and Accessibility Commission President. I was given so much support and opportunity in my own ‘bounce back’ journey that it’s motivated a passion for me to help others in my position. I believe that privilege should never be taken for granted and I will never feel entitled to it. It’s now my turn to give back.

When I was in lockdown in spinal rehab, I saw no future for myself. During my time at university and even today, I’m petrified of failure. What I have learned through my different stages of recovering from my injury and building a career for myself as a disabled person is that failure isn’t a weakness, it’s a tool to make us stronger.

The more we fall down, the more we learn how to get up bigger, better and stronger for the next challenge. What I’ve also learnt is that in times of great volatility, uncertainty, complexity and ambiguity, when we are supported by others who also have the drive to never give up, we can not only survive, we can thrive. Our new normal coming out of this pandemic doesn’t have to be any worse; it just has to be different. ◀

06

Mister Le Mans

TEXT

/

IAN WAGSTAFF

With a record-breaking 33 Le Mans entries to his name, including four wins, *Henri Pescarolo* is a true legend of endurance racing. But the French racer's epic career encompassed so much more, from adventures in F1 to duels on the Dakar as well running his own team...

It was pleasing to have been French at Le Mans in the first half of the 1970s. Not only had the Vélizy-Villacoublay-built Matra-Simcas dominated the 24-hour race, one of their number, Parisian Henri Pescarolo, had won on three consecutive occasions. He was the second driver to achieve this feat and he remains the only Frenchman ever to have done so.

Pescarolo has become part of the Le Mans legend, winning four times in total, with an additional pair of class victories. He almost added to this as a constructor when one of his prototype sportscars, the favourites that year, led the 2005 race for the first two hours.

His rise mirrored that of Matra. In 1965, the aerospace company turned its attention to motor sport and, abandoning his studies as a medical student, Henri became one of the first to race its Formula 3 cars, winning the French F3 title two years later. He made the move up to Formula 2, still with Matra, finishing second in the 1968 European Championship and winning the F2 class of the German Grand Prix the next season. ▶

Henri Pescarolo rose through the single-seater ranks to F1 before finding his true calling in endurance racing.



Matra gave him his first Formula 1 chance towards the end of 1968. Ken Tyrrell had successfully been running a Cosworth DFV-powered Matra for Jackie Stewart while the company had entered another using its own V12 engine for Jean-Pierre Beltoise. The factory team expanded to two cars for the Canadian Grand Prix giving Pescarolo his first chance in an F1 car. "It was good because it was my first Grand Prix but bad because I had an uncompetitive car," he remembers. "It was the beginning of Matra in F1 and the car was terrible. There were not enough parts for the two cars. If they needed a part for Beltoise, they took it from my car."

He was entered for the last three races of the season but non-started in the United States because of a blown engine. "In the same season I was driving one of the best cars in F2 and in those days there were Grand Prix drivers in that formula. So, I was fighting with the best drivers in F2 but driving the worst car in F1."

It was not until 1970 that the French government-sponsored Matra contested the whole season with two of its V12s. Once again, Pescarolo was paired with Beltoise but was generally outperformed by his fellow countryman. A career-best third place at a very wet Monte Carlo was his highest finish in a World Championship round and he was released at the end of the season.

"When you are very young and you start out in Formula 1, it is enough for your patience," said Pescarolo in later years. However, he was to become "fed up with Grand Prix racing", finding it "impossible to get a good drive". He would, though, soldier on in F1 for another six seasons, spending time with Frank Williams and BRM, having a one-off drive with March and finally driving a privately-entered Surtees TS19 - "the car was not fast and there was not enough money" - but the man in the distinctive green helmet was now to find his lasting fame in another discipline, that of endurance racing.

Matra took Pescarolo all the way to F1, where he made his debut in the 1968 Canadian GP.



The Frenchman's best F1 result was third place at Moncao in 1970, but at season's end Matra released him.

'In the same season I was driving one of the best cars in F2 but the worst in F1'

In addition to launching his single-seater career, Matra also set Pescarolo off towards Le Mans glory in 1966. However, for three years he failed to finish there and then, in '69, his season was curtailed when he sustained facial burns during a practice accident at the track. Despite his loyalty to Matra during those early years, it was with Alfa Romeo that he scored his first major victory in endurance racing, winning the 1971 Brands Hatch BOAC 1000 with Andrea de Adamich. It was also the first win for the Italian manufacturer at World Championship level since its F1 titles in the early 1950s. The following year he would be back with Matra - despite the fact that he had vowed never to drive for his national team again - and the start of a story that would see him transferred from midfield Grand Prix driver to a star of sportscars.

A SERIES OF FIRSTS

With a change in the regulations for 1972 that meant 3.0-litre cars would now be the front-runners, Matra concentrated its sportscar efforts solely on Le Mans. Ferrari decided that its otherwise all-conquering cars were unsuitable for the Circuit de la Sarthe and withdrew, leaving the only opposition the now-uncompetitive Alfa Romeos. Headlined by *Road and Track* magazine, 'Suppose they built an unbeatable team of prototypes - and nobody came to get beat?' four Matras, three of them new MS670s, lined up, each with a Frenchman as one of the drivers. Pescarolo was paired with double world champion Graham Hill.

Following the early demise of one of the new Matras, the lead swapped between the Pescarolo/Hill car and the remaining MS670, the pair never

more than a lap apart. At about noon on the Sunday, with the rain falling heavily, the rival Matra, at that stage in second place, was pushed off the road by a Corvette and the Anglo-French pairing sailed - which was probably the right word - to victory. Not only had Pescarolo scored his first Le Mans victory, but he had also played his part in motor sport history by assisting Hill to become the only person to win the 'Triple Crown' - the F1 World Drivers' Championship, the Indianapolis 500 and, now, Le Mans. Initially, Henri had not been pleased to be driving with Hill, who was now in the twilight of his career. However, he would change his mind once he saw how the Englishman coped with the often-treacherous conditions. "When I looked at his lap times in the night and the rain, I thought, 'OK, I can sleep now'."

Ferrari was back at Le Mans in 1973, which resulted in a dramatic battle between the Italian and French manufacturers. Pescarolo's MS670B, which he was sharing with fellow countryman Gérard Larrousse, hovered among the first four before taking the lead in the 17th hour when the front-running Ferrari was delayed by a broken exhaust. No sooner had he moved up front than Pescarolo suffered a broken brake caliper, leaving the pits only a few seconds ahead of his rival. The latter then lost time with a split fuel tank, but when the Matra suffered a jammed starter motor the game was on again. It remained close until the final 90 minutes when the chasing Ferrari's engine gave up. Henri was on his way to victory number two.

Win number three should have been much simpler. There was virtually no opposition for the Matras in 1974, and Pescarolo and Larrousse were 11 laps ahead by three-quarter distance. ▶

Pescarolo returned to Matra when it switched focus to Le Mans, taking his first win in 1972 and helping Graham Hill to racing's Triple Crown.





The path to victory should have been easy in '73, but technical difficulties almost scuppered Pescarolo and Matra's chances.

Le Mans victories two and three soon followed in 1973-74, again with Matra but this time teamed with Gérard Larrousse.

'When I came back from the Dakar, I took on the challenge of setting up my own team'

Then gearbox malady struck and the car was in the pits for 46 minutes, rejoining the race on the same lap as the then-second place Porsche. Pescarolo, though, was now heading for a third Le Mans victory.

In those days, says the bearded Pescarolo, the Formula 1 cars and sports prototypes "were very similar".

"They were the same to drive, the same to set up, but I was fighting for the pole one weekend with the prototype and fighting to qualify the next in Formula 1."

A NEW CHALLENGE

Pescarolo would continue to race at Le Mans, racking up a total of 33 appearances, a record that continues to this day. His fourth victory there came in 1984 sharing a Porsche 956 with Klaus Ludwig, the tenacious pair climbing from 30th place at the end of the first hour. As if to underline his endurance credentials, he also competed in the Dakar Rally with a best result of ninth place in 2000. It was in 1988, though, that he felt he had the best chance of taking victory, with none other than current FIA President Jean Todt as Peugeot's Director of Racing.

"I should have won with Peugeot but we had a big crash. The car was patched up, and we were miles behind, but we caught up. Across the Ténéré Desert we averaged 200kph," he told *Motor Sport Magazine*.

But despite the desert adventures, the lure of Le Mans was always too great.

"When I came back from the Paris-Dakar in the spring of 1999, I really had to make a decision. I took on the challenge of setting up my own team," he recalls. Thus, at the turn of the century,

Pescarolo became an entrant, basing his operation at Le Mans and initially running Courage prototypes. By 2004, these had been sufficiently developed by his operation to be renamed as Pescarolos. On three occasions between 2005 and 2011 they took the Le Mans Series, a championship consisting of 1000km races for cars that would also contest the Le Mans 24 Hours itself.

In 2005, two Judd-powered Pescarolo C60s, managed by Henri himself, hit the front at Le Mans, pulling away at around five seconds a lap from the rest of the field. One was delayed following an accident and then, in the third hour, the other lost time with a blocked gear linkage. The opportunity was lost, although one of the cars would survive the day to finish second. The following season, Audi would be back with a factory team and, while the Pescarolo team would once more finish runner-up in the 24-hour race, Henri's cars would never again be the favourites – but he would remain a true Le Mans legend. ◀

Pescarolo and Klaus Ludwig rose from 30th place to victory at Le Mans in 1984 driving a Porsche 956.



At the start of this century Pescarolo changed roles from Le Mans driver to team entrant, achieving a best finish of second.

The lion that roared

06

Born to revive the fortunes of the Peugeot car company, the 205 T16 quickly rose to glory on the world's rally stages, where it proved to be the ultimate Group B predator

TEXT

ANTHONY PEACOCK

As the car that dominated at the height of rallying's most evocative era, the Peugeot 205 T16 could make a strong case for being the greatest rally car of all time. Sure, the Audi Quattro was revolutionary, and it certainly looked and sounded the part. Lancia, with its mighty Delta Integrale, also needs no introduction. Ultimately, though, both were defeated by a small French hatchback.

The Peugeot 205 road car was an attempt by the then-ailing company to save itself and shift its image to smaller, sportier cars. To promote the radical new 205, Peugeot saw an opportunity in the increasing popularity of the World Rally Championship and its outlandish Group B regulations in particular.

The company's CEO Jean Boillot didn't have to look far for some rallying expertise to lead the project. A few years earlier, Peugeot had acquired the British Talbot brand, which in 1981 was in the process of winning the WRC manufacturers' title with its Sunbeam Lotus.

Helpfully for Peugeot, there were a couple of talented Frenchmen right at the centre of the Talbot team in the shape of driver Guy Fréquelin and his co-driver and now FIA President Jean Todt, who won that year's Rally Argentina and finished second in the drivers' standings to the Ford Escort pairing of Ari Vatanen and David Richards. It was an astonishing performance, from both the Talbot team and its crew. ▶

Development of the Peugeot 205 T16 was a complex job but worth the effort – it came close to a winning debut in the WRC in 1984.





Timo Salonen became Peugeot Talbot's first world champion in 1985, followed by fellow Finn Juha Kankkunen, seen winning in Sweden in '86, right.



'In the hands of Vatanen, the T16 went fastest on only its second stage in Corsica'

Todt had enjoyed a long and successful career alongside some of the world's best drivers, and was considered the perfect man to establish and manage a new motor sport division within Peugeot. Before the end of 1981, Peugeot Talbot Sport was created.

The development of the 205 Turbo 16 was an incredibly complex project though, and it was three years before the car made its World Rally Championship debut. The process actually started at the Talbot headquarters at Coventry in England but was soon moved to France and afforded a generous budget.

The Audi Quattro, which had started winning rallies in 1981, was the benchmark at the time with its innovative four-wheel-drive system. Peugeot would apply the same concept to its usually front-wheel-drive hatchback but decided that the 1.8-litre turbocharged engine should be located in the middle of the car for optimal weight distribution. To accommodate all this, the tubular chassis was fully purpose-built.

At the start of 1983 – around the same time as the Peugeot 205 road car was launched – Todt's team had a T16 rally car running for the first time in testing. But in order for the car to be homologated and allowed to compete, 200 road-going versions of the T16 would have to be built first.

The target of 200 was a relatively lenient number that allowed the Group B creations to be as wild as they were. But producing that many road cars of such a complex design – complete

with matching bodywork and four-wheel drive – wouldn't be easy. Creating a 205 T16 involved chopping off the rear section of a standard car. Completed bodies were delivered to Simca (Talbot) for the 200-series production cars and to Peugeot Talbot Sport for competition versions.

EARLY SUCCESS

The initial target of unleashing the new rally car in January 1984 at the Monte Carlo Rally was missed, but homologation was passed in time for the Tour de Corse in May. That wasn't actually its competition debut though: what few people remember was that the Peugeot 205 went head-to-head against its rivals for the first time at a small rally in the Dordogne in October 1983, driven by Jean-Pierre Nicolas.

That was very much a development exercise: the car that would take the World Rally Championship by storm only finished second, behind a Citroën Visa Mille Pistes driven by Philippe Wambergue. Nicolas wasn't impressed: neither by the lack of bottom-end torque, nor by its propensity to kick like a mule over jumps (the reason why a tea-tray rear spoiler was added for the second evolution). It was back to work, with Todt drawing up a comprehensive job list.

All that hard work paid off in Corsica, when Peugeot's newest challenger was seen in anger for the first time. In the hands of Ari Vatanen, the 205 T16 went fastest on only its second stage and led the rally until the Finn crashed on the final day, while Nicolas was fourth. Vatanen would make up for it with wins in Finland, Sanremo and Great Britain before the end of the year. The 205's prowess on the stages was now matching its commercial success in the showrooms.

One nation would dominate the driver line-up of the Peugeot 205 T16 over its lifetime – and it wasn't France. The eminently pragmatic Todt simply chose the finest when it came to getting the best out of the 205. ▶

Ari Vatanen had set the early pace in 1985 before a serious accident in the Group B frontrunner hampered his career.



For 1985, Vatanen was joined by fellow Finnish driver Timo Salonen, and another, Juha Kankkunen, would later join the fold too. As a co-driver, Todt had sat alongside two of the early Flying Finns (Timo Mäkinen and Hannu Mikkola) and clearly felt their compatriots would be the right men to tame the Group B beasts. He wasn't wrong.

CHAMPIONSHIP GLORY

Vatanen continued his winning streak at the beginning of 1985, firstly with a famous comeback drive against Audi's Walter Röhrl to win the Monte Carlo Rally, then in Sweden. Salonen claimed his first victory in Portugal and took charge of the championship as Vatanen suffered the first in a series of retirements.

Just a year after the 205 T16's debut, a second evolution was introduced in Corsica with even better aerodynamics at the front and rear of the car. That just encouraged the drivers to go even faster, and Salonen began racking up the wins. Vatanen, desperate to make up ground, came close to losing his life in a crash at Rally Argentina that paused his career.

Salonen went on to claim the title after five wins from 11 starts in 1985, and Peugeot also did more than enough to beat Lancia to claim a first manufacturers' crown: even in Vatanen's absence. For 1986, Kankkunen was recruited (fresh from wins in Africa with Toyota) and went on to win the title at the first attempt.

The increasing performance of the 205 T16 and its Group B counterparts was becoming a concern, however. It was no surprise when the fatal accident of Lancia driver Henri Toivonen and his co-driver Sergio Cresta in Corsica led to Group B being banned at the end of the season. But only after Peugeot had claimed yet another manufacturers' title.

The 205 T16 may have been outlawed from the World Rally Championship, but Todt didn't let the effort, expense and engineering that had gone into the all-conquering car go to waste. Instead, the 205s were modified to tackle two of the greatest off-road events outside the World Rally Championship: the Paris-Dakar Rally and the Pikes Peak hillclimb.

With the 205 T16 strengthened and made longer, Vatanen returned to action to claim

'The 205s were modified to tackle two great off-road events: Dakar and Pikes Peak'

Led by Peugeot Talbot team boss Jean Todt (above), the T16 won the Paris-Dakar twice in 1987 and '88, first with Ari Vatanen (right) and then Juha Kankkunen.

victory in Dakar at the beginning of 1987; a result repeated a year later by Kankkunen.

As a sprint rather than a marathon, Pikes Peak provided a very different challenge, but in the end only a turbo boost issue stopped Vatanen and the 205 T16 from beating old rivals Röhrl and Audi.

The 205 T16 evolved to become the 405 T16, which took two more Dakar victories and two wins at Pikes Peak. Todt then took Peugeot Sport into circuit racing and sportscars, where two wins at the Le Mans 24 Hours would lead him to be hired by Ferrari as the first non-Italian to lead its Formula 1 team.

But the story all began with Peugeot and the giant-killing 205 T16: probably the greatest little car ever made. ◀





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07

Growing in strength

The impact of a global health pandemic has not stopped the Royal Automobile Association of Thailand from planning for a bright future, with the focus on road safety and digital motor sport to help encourage more new members to the fold

TEXT

GAIA PELLICCIOLI



The COVID-19 pandemic has had a profound impact globally, but often at differing levels of severity, depending on exposure, reaction and mitigation. Thailand can be seen as one of the success stories in controlling the spread of the virus, and as of mid-July just 58 fatalities had been recorded from a little over 3,200 confirmed infections.

But, while the effect on the country's healthcare system was relatively slight, the impact on its economy was far more serious. The tourism sector, responsible for almost 17.7 per cent of GDP, collapsed after the outbreak escalated and international travel all but ceased. In 2019, Thailand welcomed 39.8 million foreign tourists. Projections for 2020 put the figure as low as 14 million people, a drop of almost 65 per cent.

The economic downturn precipitated by lockdowns and unpredictable recovery rates have provoked businesses to not only batten down the hatches, but also plan for a new reality in the wake of the pandemic, with many adapting the lessons of home working and remote services to move to towards a more innovative,

digital and sustainable economy.

Embracing that philosophy, the national automobile club, the Royal Automobile Association of Thailand (RAAT), has been busy positioning itself for the future. It is focusing on the digitalisation of its processes and the development of innovative competitions, such as digital motor sport, to attract a younger membership base.

"The Coronavirus has seriously impacted our club's activities, both in mobility and motor sport, but we shall be restarting soon," says RAAT spokesperson Theera Bunnag, Board of Director & Motorsport Committee Member. "However, over the last number of years, due to competition with other car clubs, RAAT realised there was a need to restructure its operations to improve efficiency and gain a wider membership base.

"Our objective is to attract a younger generation with a more diversified interest in the motoring lifestyle. As for motor sport activities, they would become more attractive with new categories added to the list that are in tune with the changing world, such as the promotion of digital motor sport and other technology-related activities."



Thailand's latest motor sport star is Alex Albon, racing with Red Bull Racing in F1...

'We want to attract a younger generation with a more diversified interest in the motoring lifestyle'

While the club is looking ahead, however, its values are solidly anchored in the past.

The RAAT, affiliated to the FIA 70 years ago, is one of the Federation family's oldest clubs. It was initiated in 1933 by Prince Birabongse Bhanudej Bhanubandh, better known as Prince Bira, a member of the Thai Royal Family, Olympic sailor, pilot and Formula 1 racer who took part in 19 world championship grands prix between 1950-54.

"In the beginning the club's main aim was to promote motor sport at a professional level among the growing motoring community in Thailand, in line with what was happening around Asia in neighbouring countries," explains Bunnag. "After the Second World War there was an immediate surge in the number of the club members and that hasn't stopped. We now have over 6,000 members."

Today, Thailand has 37 million registered vehicles and motorisation continues to grow at a rapid rate. Motorcycles are a hugely popular choice for Thais, but while

registered motorcycles make up 36 per cent of all vehicles, millions more are unregistered.

IMPROVING SAFETY

In order to represent the concerns of motorists, the club has, in the past few years, advocated with government and private sector, particularly on road safety issues and the rights of a growing motoring population.

"The rights that the RAAT has been focusing on are related to the reduction of speed limits, the wearing of helmets, concerns over environmental issues, supporting motoring tourism, and the fostering of the freedom of mobility," Bunnag explains.

Thailand's roads are currently ranked the second most lethal in the world by the World Health Organization. The country's rapid development has resulted in a network of 462,133 roads in the region, nearly all paved, many of which are multi-lane highways.

In a bid to improve road safety in the country, and lower the growing number of accidents, injuries and deaths on the roads, the club has in recent years accelerated its activities in conjunction with the FIA's road strategy.

"The RAAT's activities have been arranged through stand-alone training sessions and advertising, or by working hand-in-hand with related government agencies and also with a selected few companies from the private sector that share our desire to improve road safety in Thailand," says the RAAT spokesperson.

Additionally, the club has been disseminating the messages of the #3500LIVES global road safety campaign on more than 1,000 panels in Bangkok since 2017.

"The government has acknowledged the fact that road safety is of great concern for Thailand and it has increased its attention on the issues in order to decrease the number of accidents, injuries and deaths on the roads. The aim of the government is to lower the current levels by 10-20 per cent in the coming years with stricter access to driving licences, better road safety enforcement, vehicle inspection to ensure safer cars are on the roads, and more awareness on the use of road safety equipment."



Digital motor sport – supported by the RAAT – is proving increasingly popular in Thailand with the younger generation.

'The government has acknowledged the fact that road safety is of great concern'

Another major part of the RAAT's programme is the promotion of sustainable mobility. In Thailand, approximately 75 per cent of greenhouse gas emissions come from the energy and transport sectors, and RAAT is keen to contribute to their reduction as well as making the whole transportation system more sustainable.

"The club is taking action to promote sustainable mobility through two initiatives," explains Bunnag. "Firstly, promoting the deployment of electric vehicles, in partnership with a local vehicle manufacturer, and secondly, working with local institutions to encourage car-pooling and better public transportation systems at urban level."

In addition to traditional mobility services such as roadside assistance, car service centres, car registration and checking, and driving license processing, the major revenue of the RAAT – which is also Thailand's National Sporting Authority – comes from the issuing of racing permits and the organisation of motor sport activities.

"The club has regulated all motor sport activities in Thailand for 88 years," says Bunnag. "The different categories that the club oversees ranges from grassroots competition with go-karts to the high end, such as Formula 3. The club takes an active role in the organisation of all local and international motor sport events with the showcase being its own RAAT Endurance race,



The RAAT is also focused on road safety initiatives in a country with notoriously dangerous roads.

...But its first grand prix star was Prince Bira, who started the RAAT in 1933.





FIA President Jean Todt (left) attended the FIA Sport Regional Congress held in Bangkok in 2019, which also promoted digital motor sport.



RAAT spokesperson Theera Bunnag was also among the speakers at the regional congress.

plans for the club to organise a national championship in 2021 for e-kart within the e-Project format."

Another grassroots project launched by the club is 'Karting-To-Schools', held on various occasions at public and private schools throughout the year in Thailand.

"The age of boys and girls getting a chance to go karting is between eight to 12 years, and after a year of running the activity the club has recorded a greater number actually committing themselves to try to race go-karts."

Apart from promoting sporting events, the RAAT is keen to develop close links among members of the FIA family – which was the aim of the FIA Sport Regional Congress

held in Bangkok in 2019, a unique opportunity for Bunnag to share information and ultimately promote the accelerated development of motor sport within the region.

"The club would need to pull some international motor sport events, perhaps targeting Formula E or even F1," says Bunnag. "The FIA's help would be beneficial to the club with the hosting of some high-end events such as the Motorsport Conference or even its annual Prize Giving here in Bangkok."

Raising the standard of motor sport events at a national and international level is a major goal for the association over the next five to 10 years, as well as creating awareness among the public for

improved road safety.

"The club's main goal for the future is to attract a larger number of members from the local motoring community with the revamping of its motor sport and mobility activities, which would in turn create a higher rate of attraction," concludes the RAAT spokesperson.

The world maybe be undergoing remarkable changes as a result of the global health pandemic, but thanks to a forward-looking philosophy that embraces the increased rise of digital culture, as well as an outlook that promotes youth involvement, it seems that the Royal Automobile Association of Thailand is well placed to meet the challenges a new normal will bring. ◀

held over a weekend every year in the last quarter. ▶

"The club gets involved with the motor sport careers of many local professionals who have gone beyond the borders of Thailand to compete in the international motor racing scene and have continuously been successful at all levels. The latest Thai star is Alexander Albon Anusinha, racing in Formula 1 under the Thai flag with Red Bull Racing."

DIGITAL DRIVE

In order to help young talented drivers rise up the motor sport pathway, the club has recently launched a series of digital projects involving three motor sport activities (e-kart, e-motorkhana and digital motor sport) held at the same time during six events throughout the year.

"The club understands the importance of promoting motor sport in a sustainable way at the grassroots level. It is the

'We need some international motor sport events, perhaps Formula E or even F1'

fastest-growing segment in Thailand and even more rigorous with the recent expansion of digital motor sport," explains Bunnag.

"Started in 2019, the RAAT's e-Projects have already attracted thousands of young motor sport fanatics," he adds. "The Digital Motorsport local championship has been particularly successful and it has led the club to send the champion to compete in the FIA Motorsport Games 2019 with a favourable result being achieved.

"We are expecting the conversion rate from digital motorsport to actual racing to be higher each year in order to pave the way for a more sustainable future of motorsport in Thailand, and we would love to host a regional championship for digital motorsport in 2021."

In parallel, the e-Project has also been promoting e-karts and grassroots motor sport with the younger generation.

"The younger generation is very interested in e-technology and have embraced e-kart at an impressive level. There are already

The RAAT has run popular grassroots motor sport projects to get youngsters involved in karting.



Held annually, the RAAT Endurance race is the club's showcase motor sport event.





Hans Mezger was a master of innovation for Porsche through a long and glittering career.

Engineering greatness

The world of automotive engineering lost a true great in June, with the passing of *Hans Mezger*, the visionary behind Porsche's 911 engine and its mighty 917 Le Mans winner

08

Few engineers have made as great an impact on the history of road and track performance as legendary Porsche designer Hans Mezger, who died in June at the age of 90.

Born in 1929 on the outskirts of Stuttgart in Germany, Mezger's early obsession was aeroplanes, but in 1946, at the age of 16, he witnessed his first motor race and the direction of his life was set. "It was at Hockenheim where old pre-war race cars lined up. Along with Hans Stuck, whom I photographed with my old camera," he said.

He studied mechanical engineering at what is now the University of Stuttgart and went on to a glittering career at Porsche, where he was responsible for the design of the world-famous air-cooled, six-cylinder boxer 'Mezger engine' for the 901 and 911 in the early 1960s.

In 1965 he was promoted to head of the department for race car design initiated by Porsche boss

Ferdinand Piëch. There, Mezger's imagination was allowed to run free. "Sometimes we worked around the clock – like in 1965 when we created the Ollon-Villars Bergspyder in just 24 days and shortly thereafter the 910," he recalled.

With its construction of a tubular frame, fibreglass body and design for new Formula 1 tyre technology, it became the blueprint for all of Porsche's race cars in the years that followed, including the 907, the 908, and the mighty 917 that dominated Le Mans in the early 1970s.

In the mid-1970s Mezger was responsible for the design and development of six-cylinder turbo engines for the similarly successful 935 and 936 models, while the 1980s saw him mastermind the design of the Group C 956 and 962 sports cars and the 'TAG-Turbo – made by Porsche' engine for use in Formula 1.

"The news of his death represents a very sad loss for us," said Michael Steiner, Member of the Executive Board, Research and Development at Porsche. "Hans Mezger's innovations for our series sports cars will remain unforgotten forever."

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