

From circuit to street: the testbed of Le Mans and beyond

14/06/2025 For Porsche, racing is much more than wheel-to-wheel duels and champagne celebrations. As a rolling technical laboratory, its aim is also to advance the sports car manufacturer's road-going cars. Over the years, Le Mans has been the perfect testbed.

The poet Hermann Hesse wrote that magic dwells in every beginning. The following story demonstrates that every end can hold something magical, too. And to tell this tale, a trip to the Württemberg home of the car-loving writer is in order – and more specifically, to Weissach.

When Porsche's RS Spyder LMP2 project came to an end in the late 2000s, the engineers at Weissach began looking for a suitable follow-up project. Their solution was to electrify the sports car racing world – literally. One of the pioneers of the project was the engineer Jens Maurer: "We were tasked by our board [members] with designing a GT3 car with a hybrid drive system. The core team consisted of just a handful of people."

At first, they were given the freedom to get on with it, but then things suddenly got very serious. "When

the car was built, the development director sent us to the Nürburgring. Only a few weeks later, we were standing there on the Nordschleife." Once again, Porsche's favourite wisdom applied: only motorsport can prove what really works.

A lesson for Formula One

Maurer, who was in charge of the technical management of the overall car, explains how the otherwise conventional Porsche 911 GT3 R was adapted: "The flywheel came from Williams. It was originally designed for Formula One. We saw even more potential in it and developed it further with the British team at Williams." When asked if it was down to Porsche that the engineers in the highest racing class managed to get the most out of their package, Maurer just smiles.

The car's first race was in 2010, in an experimental class of the German endurance-racing championship, VLN. Porsche's aim, above all, was to prove how effectively hybrids could save fuel. This was achieved in two ways. "Coming out of the corners, the electric boost took some of the load off the combustion engine, and on the straights the car was then able to coast, so to speak," says Maurer. In the second year of the project, even weight was no longer an issue. "We weighed exactly the same as the other cars," he continues.

Jörg Bergmeister was one of those selected for driving duties. The Leverkusen native was brought into the project by renowned racing engineer Owen Hayes. "It was our baby," Bergmeister recalls. "I was involved every step of the way, from the first test drive to the finished race car. Over the course of this, there was a particular focus on functionality. A good example is the button for recuperation. As a driver, you can come up with lots of ideas for such projects and contribute them directly to the car."

Except for the sound of the flywheel, which reminded him of an oversized vacuum cleaner, Bergmeister only has positive things to say about his old racing car. "At first, the hybrid was like a push-to-pass system," he says. "Especially on the Nordschleife, which isn't blessed with many overtaking spots, it's quite special to be able to pass other GT3s." Unsurprisingly, they weren't quite as happy about being overtaken by a test racer.

From a competition point of view, the electrified Porsche should go down in history as rather unlucky: its first 24-hour race in 2010 ended dramatically when it dropped out of the lead shortly before the finish. "During my entire career, that was the most painful technical failure. Everyone had tears in their eyes," recalls Bergmeister. But rather than demonstrating that hybrids are no good, it was a conventional valve spring that had broken. The second attempt at success did not bring any subsequent redemption: the Porsche was the fastest on the track, but other cars and further technical problems brought it to a halt.

Nevertheless, the Weissach 'wonder car' would go on to win a VLN race and enjoy successful guest appearances in the US and Asia during its career. After the 2011 season, it was all over. However, the project partners had no time for nostalgia. Now technical head of special projects at Porsche

Motorsport, Maurer smiles: “We were completely immersed in LMP development.” Every end has a beginning …

Helpers become hearts

Before the 919 Hybrid shook up the scene, Porsche played an admittedly modest role in Audi's pioneering success with its E-Boost. As befits siblings within the same group, the know-how gained was shared with Ingolstadt. The informal exchange quickly turned into fierce competition. Le Mans' latest golden age of technology had begun – and Porsche was right in the middle of it, in keeping with its own standards.

Stefan Moser, one of the main people responsible for the LMP1 engine, explains: “Compared to the GT3, the requirements were different. The prototype was designed around its additional electric drive source. Although weight is always a big issue in hybrid racing, it was even more important to us back then. As a result, we decided on a small, lightweight V4 engine. The hybrid system was to be given priority.” From today's perspective, this line of thinking seems simple. At the time, however, the engineers in Weissach were – once again – breaking new ground.

They also had a bit of luck. In their search for suitable battery technology to replace the flywheels, parallel efforts by F1 teams opened up opportunities. At the time, the battery cells were unsuitable for 24-hour races due to the rapid ageing process. But a US specialist was able to convince Porsche of his innovation and although the technology was tied to a Formula One team, Porsche was able to obtain a license to use it through its own special project. The rest, as the say, is history. “Our LMP1 proved that hybrids can be competitive. We started from nothing and were able to realise our vision,” says Moser. Both in terms of technology and people, the team was able to show a lot of initiative. The extremely demanding energy recovery from the exhaust tract was the ultimate test for the team.

The programme was not only high-speed training for the engineers. It also demanded a lot from the drivers. Like Bergmeister in the GT3, Timo Bernhard was an integral part of the 919 development from the very beginning. He looks back: “The engineers predicted well over 800 hp of system power, and even 1,000 hp should be possible. At the time, this idea seemed crazy to me. The abstract then gradually became reality.” Performance and acceleration were, of course, key.

But it went far beyond that. “With the electric motor on the front axle, you could influence the balance. The possibilities of all-wheel drive were huge,” says Bernhard, who, together with his colleagues was able to play a decisive role in shaping the technical concept by giving their feedback. “Previously, classic factors such as the lines and styles shaped the driver's job. Now we could draw on additional technical options – for example, in special traffic situations – via the steering wheel in a fraction of a second. Driving became like playing chess. You had to get to grips with the system in order to be able to use it to its full potential.” Bernhard was exactly the right man for this challenge. The Le Mans winner and double world champion was able to crown the project with the Nordschleife record. As a huge Stefan Bellof enthusiast, no one better could have been given the honour of translating his Group C escapades

into LMP1 modernity.

Stefan Moser, now technical director at LMDh, says of the magical ending: “Before that, we had to develop the car within the regulations year after year. For racing, it was already quite open. But changes such as active aerodynamics showed what opportunities still existed in the technology.”

Between the years

At Porsche, it’s unlikely that anyone would disagree that the innovation curve reached its peak here. Subsequently, the focus in Weissach turned to Formula E. The electric world championship may have well-known, documented weaknesses but the engineers – including the now extremely important breed of software specialists – found an enlightening new challenge. In contrast to the LMP1 hybrid era, which was more of a boundary-pushing experience that inspired series production, the lessons learned in Formula E can be transferred more consistently to the road.

The Le Mans comeback in 2023 with the 963 LMDh racer nevertheless felt absolutely right. From a technical perspective, there were leaps forward in the details. The team's task this time was to make perfectionist use of the narrow framework of standardised parts. Motorsport boss Thomas Laudenbach explains his view of things: “When we engage in motorsport as a car manufacturer, we want to see relevance for the road. You can talk about what this means in detail. However, the laboratory aspect plays an important role in this regard. Sport can give us the opportunity to try something bold. If it doesn't work, you go back and find a new direction. In series development that's much more difficult. That's why we have to remain relevant.”

Laudenbach knows better than most that motorsport is not decoupled from economic reality. “Our lives would be a lot easier and cheaper if we stuck with the combustion engine status quo. But electrification is coming in larger forms,” he says. “This has to be reflected.” How exactly this is done is being discussed by brands and regulators. Until then, the current technical compromise is providing plenty of action.

So perhaps there is also magic between the beginning and the end.

Info

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Consumption data

911 GT3 (WLTP)*: Fuel consumption combined: 13.8 – 13.7 l/100 km; CO_2 emissions combined: 312 – 310 g/km; CO_2 class: G

*Further information on the official fuel consumption and the official specific CO_2 emissions of new passenger cars can be found in the "Leitfaden über den Kraftstoffverbrauch, die CO_2-Emissionen und den Stromverbrauch neuer Personenkraftwagen" (Fuel Consumption, CO_2Emissions and Electricity Consumption Guide for New Passenger Cars), which is available free of charge at all sales outlets and from DAT (Deutsche Automobil Treuhand GmbH, Helmuth-Hirth-Str. 1, 73760 Ostfildern-Scharnhausen, www.dat.de).

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Path: From circuit to street: the testbed of Le Mans and beyond/Images/img_1.jpg
Title: Unveiling Porsche 919 Hybrid, Porsche LMP1 drivers and management, Porsche 918 Spyder, 911 GT3 R Hybrid, Panamera Turbo S E-Hybrid (back), Monza, Porsche AG
Subline: The niche hybrid GT3 project became the nucleus of Porsche's electrification of motorsport: its subsequent Le Mans successes and the 918 super sports car legend were direct heirs to the iconic 'Ring racer, which would go on to enjoy a VLN victory.

Path: From circuit to street: the testbed of Le Mans and beyond/Images/img_2.jpg
Title: Jörg Bergmeister, Porsche Brand Ambassador, 911 GT3 with Weissach Package, 2024, Porsche AG
Subline: Jörg Bergmeister: "As a driver, you can really think things through in projects like this and contribute ideas directly to the car."

Path: From circuit to street: the testbed of Le Mans and beyond/Images/img_3.jpg
Title: Earl Bamber (NZL), Nico Hülkenberg (DEU), Nick Tandy (GBR), Porsche Team (#19), Porsche 919 Hybrid, Le Mans, 2015, Porsche AG
Subline: From 2015 to 2017, the 919 Hybrid and the further developments thereof, enjoyed three Le Mans victories and won three world championships. Technical refinements such as the air-conditioning system for the intake air temperature briefly even surpassed the innovative power of Formula One.

Path: From circuit to street: the testbed of Le Mans and beyond/Images/img_5.jpg
Title: 919 Hybrid
Subline: Timo Bernhard: “Driving became like playing chess. You had to get used to the system in order to use it to its full potential.”

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