PORSCHE 911

60 YEARS

RANDY LEFFINGWELL

Foreword by Harm Lagaaij

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PORSCHE 911 60 YEARS

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1970–1979

1980–1989

1990–1999

2000–2009

2010–2019

2020–2023

FOREWORD

By Harm Lagaaij

Looking across the 911's 60 year history and evolution, one thing becomes clear: The R & D teams of Porsche, and many outside engineering and tuning companies, are always eager to change, modify, update, and optimize the 911. But this is never undertaken by deviating from its clear essentials: its design, identity, technical lay-out, traction advantages, special driving feel, performance-to-weight ratio, and the enthusiast's irresistible desire to drive and own one.

Because the 911's essentials are so strong, other sports car manufacturers have tried to equal its success, but none have truly succeeded.

Its success and strengths lie in its specific development history and motorsport achievements, and that's where the 911 continues to shine and hold its dominant position in the highly competitive field of sports car competition.

The 911's specific history and evolution is pure in its execution and authenticity. The effervescent wish to change every new 911 generation was and is driven by the desire to improve it, even though each time we think it's near perfect.

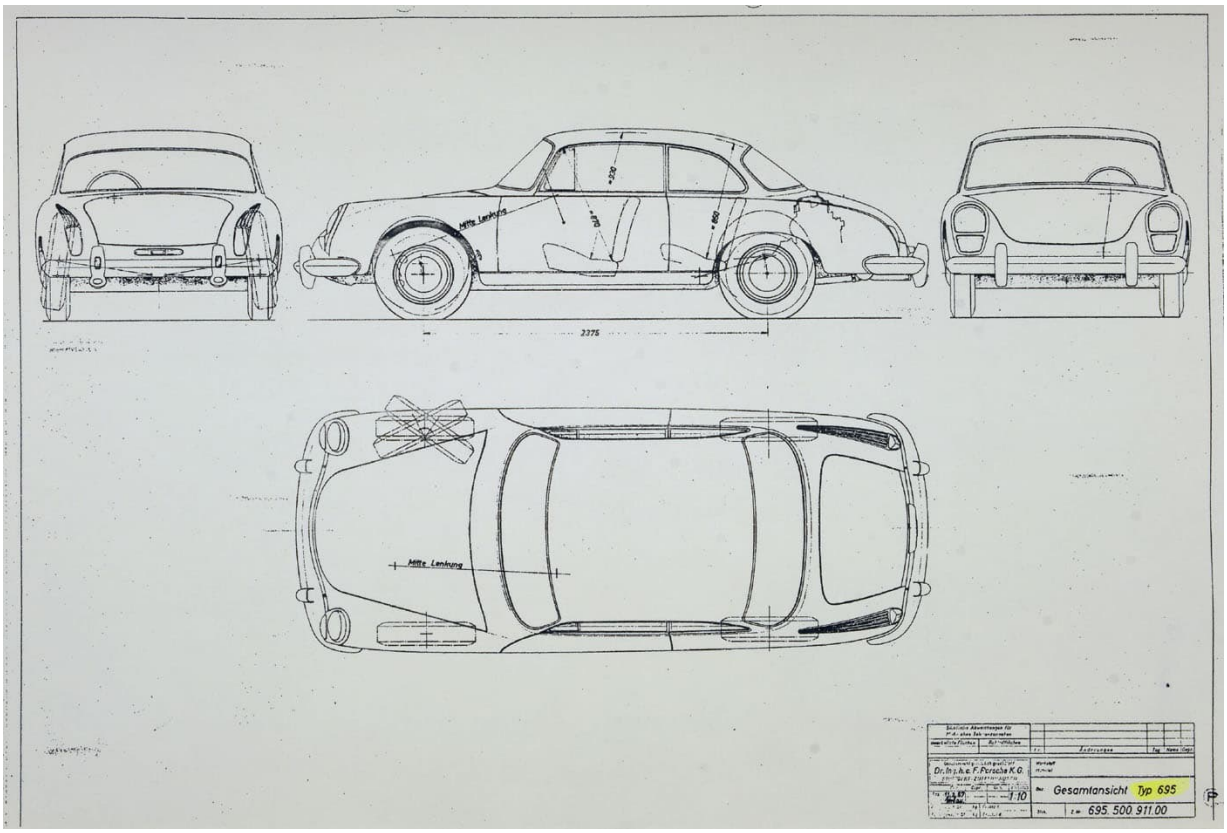
As a designer with a strong sense for engineering, I was involved in four 911 generations: the G-model (as a young designer in the early 1970s) and the 993, 996, and 997 (including the many derivatives) as head of the Design Studio ("Style Porsche") from 1989 to 2004.

Our motivation was always to work on one of the 911's strongest foundations, which is its form language. Our creative dream was to ever improve it, move it ever closer to the boundaries of its essential Design DNA.

Of course, this sophisticated level of automotive design is always a creative challenge, but as my predecessors and successor have proven, it's possible to make the 911 even more beautiful and desirable every time.

The 911 will continue to be the most iconic sports car because, even after 60 years, it is still as essential as the dreams on which it is based.

INTRODUCTION



Designations proliferated. Some numbers referred to different body designs, while others were attached to platforms of differing wheelbase engine variations. Through all this Ferry Porsche moved steadily in the direction of a compact, nimble 2+2, design that his son Butzi's design team were regularly updating. ***Image courtesy of Porsche Corporate Archives***

So far, the 1950s had been good for Ferry Porsche. His crucial decision to return to Stuttgart from Gmünd, Austria, and his brave order of 500 car bodies from Reutter Karosserie proved smart. By late March 1951, he'd sold those 500 cars. His 1,000th went in late August that year, and his company grew onward, upward, and outward from there.

His Frankfurt dealer, Walter Glöckler, had begun putting Porsche engines in his shop-built mid-engine sports racing cars, and he met continuing success with each subsequent year's improved and enlarged-displacement engines. Glöckler's racing results encouraged Ferry and his engineering staff to develop their own high-performance race car, the Typ 550, introduced in 1953. Unlike Glöckler, Ferry turned racing into a business as well, and the

550 evolved into the Typ 718 in 1958. Each of these cars was entirely Porsche, from chassis to engine to car body, and those car designs came from the body construction department and its boss Erwin Komenda. Komenda believed part of his job was to keep new ideas for new products flowing across Ferry's desk. As early as 1952, Erwin began creating successors to the 356, but to Ferry, these "new" cars all resembled just slightly larger versions of the existing model.

Porsche admitted later to several historians that with the success of the early 1950s, he had not yet given any thought to what might replace or supplement his 356. He had formulated a straightforward philosophy about his auto business: Make a car that will sell, and then, think of a new variation. But without specific input, Erwin could only guess what direction to pursue. He attended international auto shows with Ferry and regularly noted his boss's admiration of big American cars. With that guiding him, Komenda delivered a Typ 534 in late 1952 and the Typ 555 in 1953. Modeler Heinrich Klie gave these "somewhat plump variants"—as one historian described them—alternate rooflines and rear window treatments. In early 1955, Komenda offered another four-seater, the Typ 656. Meanwhile, Porsche delivered its 10,000th car in March 1956.

By this time, Ferry had begun thinking about that "new variation," but nothing from Komenda suited him. On advice of his United States distributor Max Hoffman, in February 1957, Ferry hired Albrecht Graf von Goertz, a German who had emigrated to the United States in 1936. Goertz made initial sketches for Porsche in his New York office and then moved into Klie's Zuffenhausen Work 1 basement studio to make his model. He created a fastback coupe, Typ 695, on a 2400 millimeter (mm), or 94 inch (in), wheelbase. This offered more interior and front trunk space than the current 356 that was assembled on a 2100 mm (83 in) wheelbase. But it was too "American" for Porsche's conservative Swabian tastes. Quad headlights and sharp creases with square edges seemed to take the "Porsche" out of this car.

Goertz began a second concept while chief modeler Heinrich Klie developed his own idea. A clever system allowed them to mount half-models on a single chassis for comparison viewing. This two-faced model carried on the project 695 designation.

Erwin Komenda's 1948 Porsche Typ 356 was a design miracle, a modern breath of fresh air. Many carmakers recycled their old designs, adding some engineering updates and brighter colors. But Komenda's 1952 Typ 534 concept looked like something from the 1940s. ***Image courtesy of Porsche Corporate Archives***

When Goertz arrived, Ferry's eldest son Ferdinand Alexander was 22. Formally he was referred to as "F. A.," though he was better known as "Butzi." In autumn 1957, Butzi had entered a prestigious art and design school but left after one semester. It's a common story: "dropouts" who go on to make history. Within Porsche it was a family legacy. Although Ferry had studied mathematics, physics, and engineering, the luxury of completing formal university education had eluded him, his son, and his father, Ferdinand, before him.

Throughout Butzi's youth, he had watched his father run the family business. Ferry was not a graduate engineer, nor an artist, nor an accountant, nor a salesman, yet he knew how to find those people, how to keep them challenged and satisfied, and how to respect and appreciate them. Ferry was

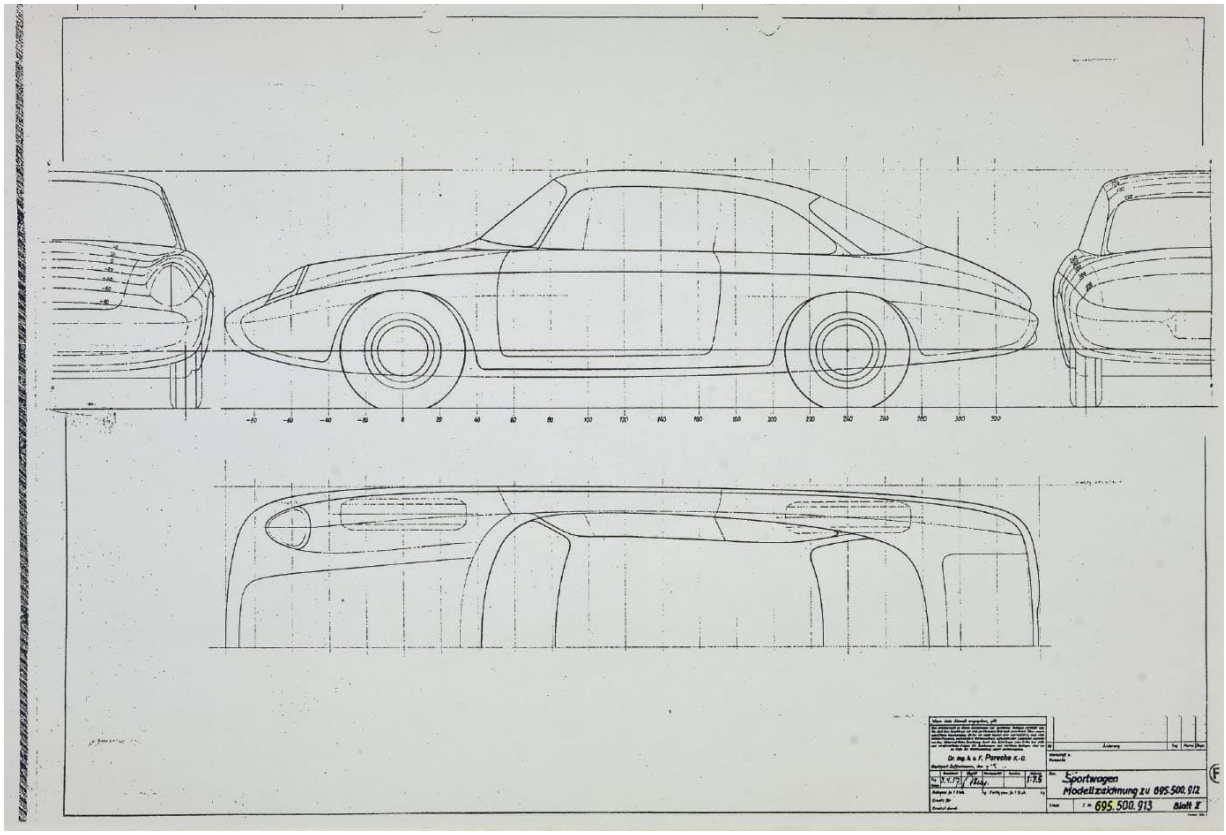
perceptive, imaginative, and knowledgeable, possessing an ability to influence a body line or a suspension alternative and to discuss an engine configuration or financial terms for an international distributor. He became a jack-of-all-trades and a master of managing people.

Klie adopted Goertz's tubular front fenders. These emerged from the low sweeping front deck lid. They improved the fastback roofline that developed during the Goertz/Klie side-by-side collaboration. At some point, they realized that although Komenda continued to offer proposals for *the Next* Porsche, they were actually developing *the New* Porsche.

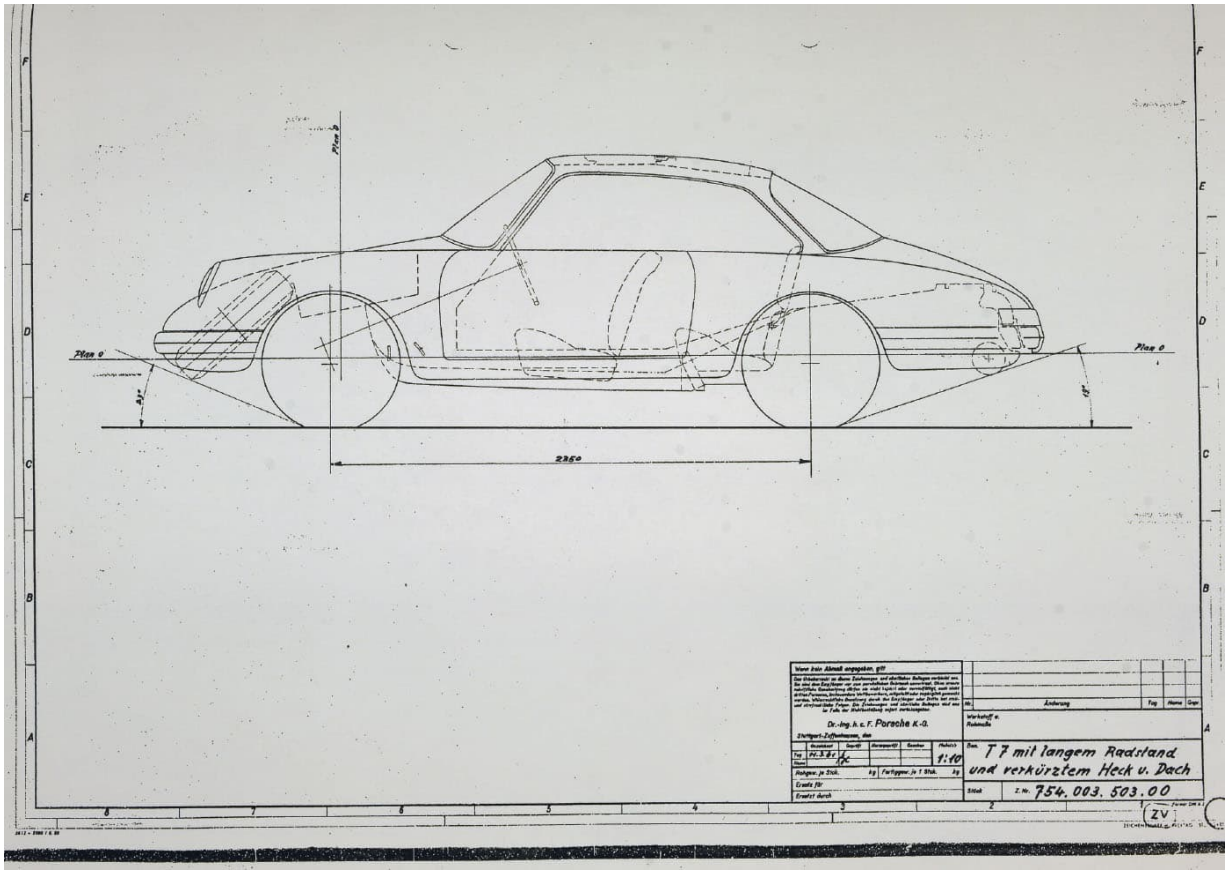
The 695 experiments gave way to the 754 series around the middle of 1959. Whatever development procedures Komenda's staff followed, Klie's designers had developed a smoothly polished routine. Designers Gerhard Schröder, Fritz Plaschka, and Konrad Bamberg were part of Klie's studio. They and modelers Ernst Bolt, Hans Springmann, and Heinz Unger (nicknamed "the Three Musketeers") worked together on scale models. Plaschka drew the new car's roofline by hand. His steadiness formed the profile of *the New Porsche*.

Klie showed Ferry their latest concept on October 9, just weeks after the 1959 Internationale Automobil-Ausstellung (IAA) show closed and one month after the chairman's 50th birthday. Designated the Typ 754, Klie had quickly cast a resin model made from their original, which they finished in blue paint. Ferry authorized a full-size model, and Plaschka and Schröder raced to complete it. On December 28, after viewing the 1:1 presentation, Porsche immediately authorized advancing the concept to the next phase—a see-through model.

The rapid pace of activity around Zuffenhausen continued into 1960. The company grew so much that despite the new Plant 3 completed the previous September in Strohgäustrasse, Ferry sent finance manager Hans Kern and corporate secretary Ghislane Kaes on a mission to find land for a separate research and development facility. Expansion around the Zuffenhausen Works was impossible with the land occupied by Reutter and other manufacturers.



Designations proliferated. Some numbers referred to different body designs, while others were attached to platforms of differing wheelbase engine variations. Though all this, Ferry Porsche moved steadily in the direction of a compact, nimble 2+2, designs his son Butzi's design team were regularly updating. *Image courtesy of Porsche Corporate Archives*



Ferry's daily business considerations left little time for philosophical discussions with his chief body engineer Erwin Komenda. As a result, Komenda clung to rounded organic shapes similar to the 356, while Ferry's son Butzi's team drew ever close to the future with this 1961 Typ 754 T7. ***Image courtesy of Porsche Corporate Archives***

Klie and Porsche's long-time aerodynamicist Josef Mickl took the blue-painted 754 model into Stuttgart University's wind tunnel. The body required a few minor tweaks based on that exercise. Throughout this time, Butzi Porsche's role was evolving. As a design team member, he offered nudges and suggestions in their projects as they morphed from a three-dimensional miniature to two dimensions in life-size on paper and then onto the full-size Plasticine for final approval and first body molds. He changed the rear side windows from pointed ends on the 754 to the horseshoe curve that became an element of the production car's silhouette. He recessed the top of the rear window not only to provide ventilation but also to break up the large roof surface. The time Mickl and Klie spent in the wind tunnel located the optimum placement for that inset, which improved airflow over the car body.

Klie's designers showed Ferry a new series on the shorter 2100 mm (83 in) Typ 644 chassis under Technical Program 8, the so-called T8, in March 1960. They showed these to Ferry in March 1960 even as engineering work advanced on the T6 series 356B models for introduction in mid-1961. By year-end, the Typ 695 T7, designed on a 2375 mm (94 in) wheelbase, emerged. Investigating how passengers and the rear-mounted engine fit inside the bodywork was a recurring theme in their efforts.

On December 2, 1960, Hans Kern met Ferry to inspect a piece of property midway between Weissach and Flacht, some 20 kilometers (km), or 12 miles (mi), from Zuffenhausen. It was more than three times the area Porsche had wanted. In a moment of astute foresight, however, he moved ahead on the purchase. Ten months later, on October 16, 1961, Ferry broke ground on the new testing, research, and development center near Weissach. The first thing on his engineers' agendas was a proper skid pad—190 meters (m) or 623 feet (ft) in diameter—for chassis, suspension, and tire testing.

Ferry, the 52-year-old chairman of a multivehicle manufacturing concern, faced broad challenges. Porsche's new Typ 804 competing in Formula 1 was far down on power compared to competitors. In road racing, the Fédération Internationale de l'Automobile (FIA) changed the rules for Grand Touring cars once again, affecting those who planned to compete in 1962. Ferry decided his 356B series must continue until late 1963 when he could introduce his *New Porsche*. But first he had to stop the internal bickering so he could decide exactly what that car was going to be.

By May 1961, Butzi's team had earned Ferry's approval for the essential shape of the *Next* Porsche. When Klie finished this Typ 695 model, he had it cast in blue resin as a gift for Ferry. But countless details remained, including questions of engine, transmission, and suspension. *Photo by Randy Leffingwell*

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1964 TYP 901

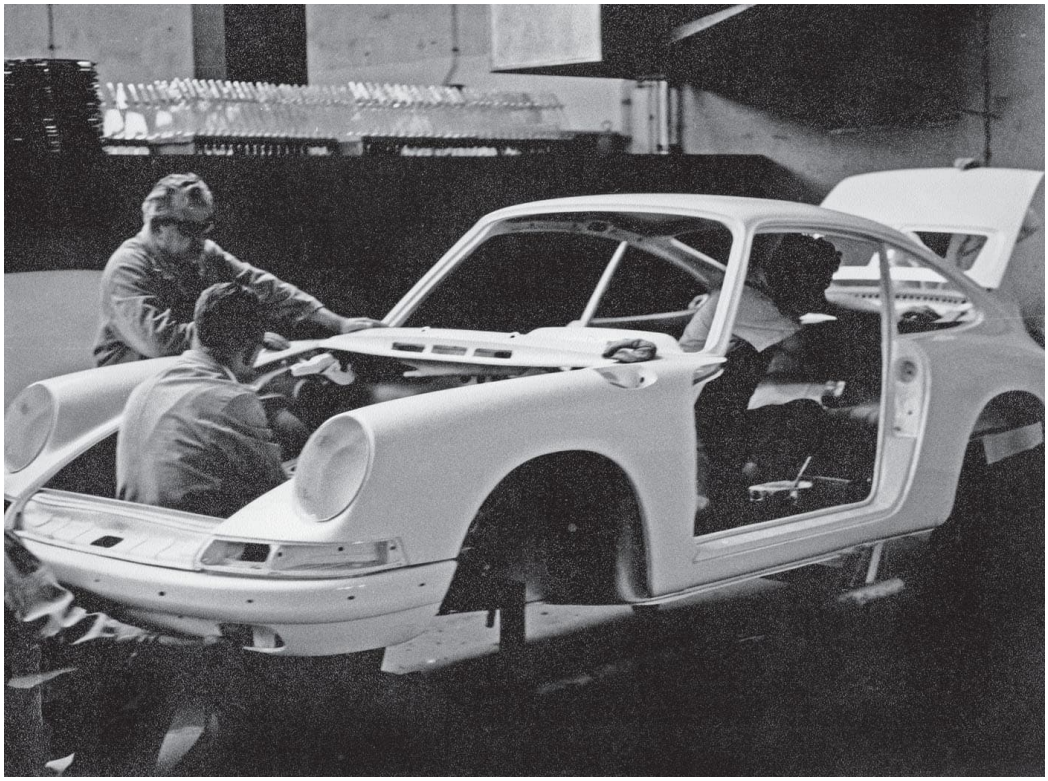
Porsche design teams offered two full-scale drawings of cars for Ferry's final verdict in mid-October 1961. Komenda's latest notchback four-seater was one.

Simultaneously, Porsche developed the 902/912. This decontented sibling used the 95 hp (70 kW) 1582 cc four-cylinder engines left over from 356C production engines. The suspension, wheels, brakes, and body of the 902/912 were virtually identical to the 901/911, but Porsche, aware its six-cylinder car was too expensive for some customers, priced it at DM16,250 ($4,073) at introduction in April 1965. *Image courtesy of Porsche Press Database*

The other was the Klie/Schröder/Butzi Porsche 2+2 with its long, sloping roofline. Ferry, Butzi, Schröder, and Eugen Kolb were already in the room, and as Kolb recalled, "Komenda walked in, stepped behind the 2+2, measured the rear seats and wrote new dimensions for them as everyone watched. Then Komenda said, 'How do you choose now? This or this?'" For two years, Ferry had emphasized his preference for the 2+2. "Here at once he recognized the problems between these two guys and the bodies," Kolb continued. "Ferry said, 'We make this,' and it was the [2+2] version."

Reutter had its own design and development studio. To head off any further interference from Komenda, Ferry arranged to rent space there for the 2+2 team to complete their work developing the 2+2 design toward a production start in July 1963, 20 months away. Three weeks after this, Ferry named Butzi head of design. Heinrich Klie, "the Three Musketeers," and Gerhard Schröder moved into Butzi's department. Ferry also transferred engineers Theo Bauer and Werner Trenkler to produce accurate engineering drawings (without Komenda's alterations) and confirm engineering practicalities. Komenda remained in charge of body construction.

Ferry wanted the *New Porsche* costs reduced to match the current 356B production. This temporarily reined in ambitions for the car. When a new front suspension system proved impossible to perfect by July 1963 production start, engineers updated the 356 system by replacing kingpins with ball joints to increase suspension travel. But this compromised front trunk space, forcing them to relocate the fuel tank to beneath the rear seats. Ferry relented because he believed that a *new* suspension was crucial to making a *new* car.



With the body design battles nearly finished, Butzi's team worked on the details. Soon prototypes appeared in metal, giving engineering the opportunity to wage some battles of their own. Ferry's desire for 130 hp (96 kW) and his urging that the car wasn't new if the suspension was not, led to a few detours. *Image courtesy of Porsche Corporate Archives*

Days later, racing engineers concluded their rack and pinion steering not only improved response but also provided Porsche left- or right-hand drive without changing the chassis. Progress continued despite desired cost restrictions.

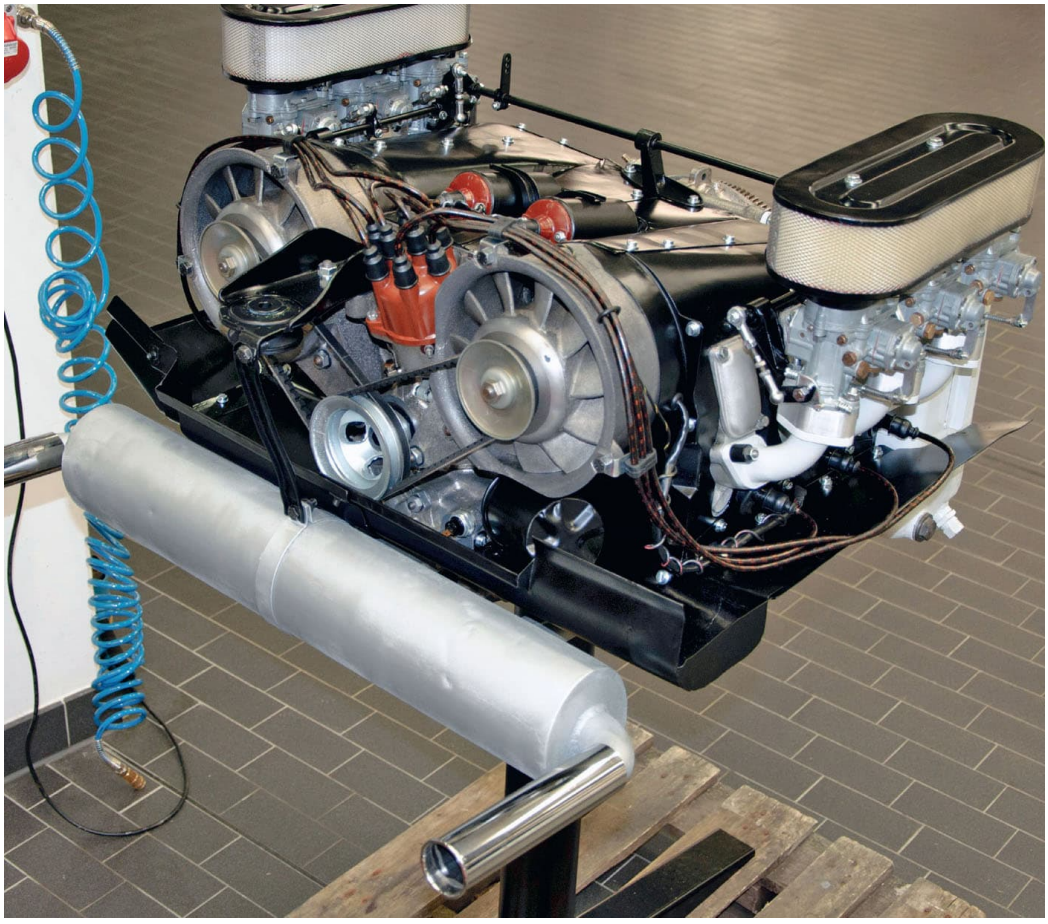
Wheelbase length remained a moving target. In January 1962, it grew from 2100 mm to 2200 mm (83 in to 87 in) to allow for rear jump seats. This and front suspension changes repositioned the fuel tank up front again. Each of these changes forced body redesign. Meanwhile Komenda refused to give up, offering Ferry three new full-size four seaters.

There was another big question that needed to be addressed: What sort of engine will drive this car? Ferry's target of 130 horsepower (hp), or 96 kilowatts (kW), dictated a minimum 2.0-liter (122 cubic inch [cu in]) displacement to his engineers. Porsche's production development chief Leopold Jäntsche came from Czechoslovakian carmaker Tatra, where he

developed their 2545cc air-cooled overhead-valve hemispherical-head V-8. For road use, it produced 95 hp (70 kW), but in racing applications, it developed 175 hp (129 kW).

For Porsche, Jäntsche and assistant Robert Binder designed a 2.0-liter (122 cu in) Typ 745 opposed six-cylinder. It used pushrod-activated valves and a small vertical fan cooled each bank of cylinders. Three-barrel side-draft carburetors fed fuel into each cylinder bank through the valley between the valves. This established the engine's low, wide profile. But in early tests, the pushrods limited engine speed. Output never exceeded 120 hp (88 kW) at 6500 revolutions per minute (rpm). Jäntsche and Binder enlarged the cylinder bore from 80 mm to 84 mm (3 in) to reach 2195cc displacement. This produced 130 hp (96 kW). Then one night in early November 1960, testing engineer Helmuth Bott took a 745 prototype for a test run. He was stunned: "Do not make this car," he reported. While he had no problem with the body, suspension, or its handling, he explained, "It is as loud as a threshing machine!" Racing engineers also vetoed the design because their only means to increase power was to enlarge displacement, not an option in national or international racing.

It became clear that only overhead cams would do. Ferry pulled racing engine designer Hans Mezger into production work. Mezger disregarded gear-driven cams. They were too complicated and too noisy for the road. Mezger and fellow engineer Horst Marchart developed a chain-driven overhead cam configuration that functioned with a hydraulic tensioner Marchart invented.



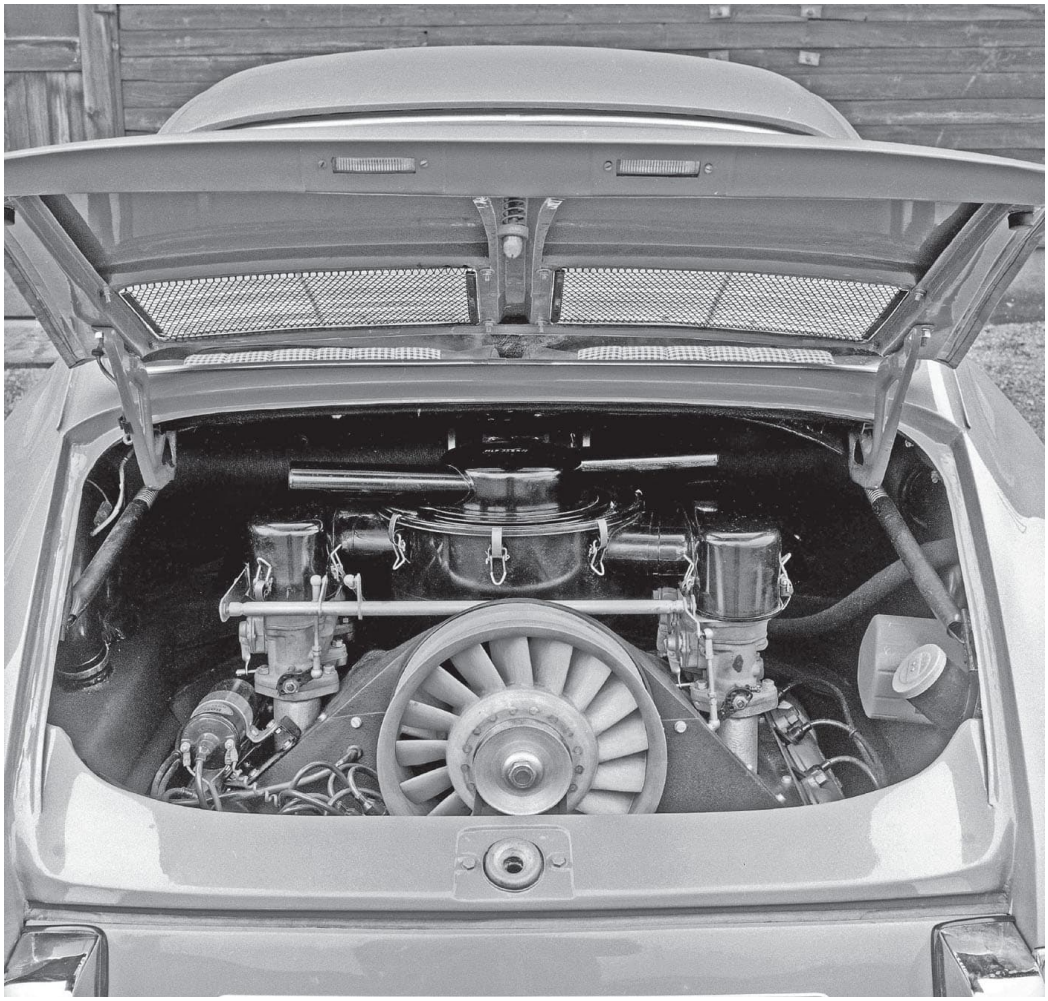
This was Helmuth Bott's "threshing machine." Clattering pushrods operated overhead valves and twin air fans roared as they gulped in air. It produced 120 hp (88 kW) but engineers knew the only way to increase output was to enlarge the engine. That killed any possibility for racing, which strictly limited engine sizes and modifications. *Image courtesy of Porsche Corporate Archives*

An engine's ability to rotate fast relies on crankshaft stability. The initial 745 had four crankshaft main bearings. But Mezger and Marchart wanted one on either side of each connecting rod. As the design progressed, this new engine used the Typ 821 designation. By June 1, 1963, Mezger and Marchart had determined that they needed seven main bearings. This new engine entered the record books as Typ 901/1. But extreme testing demonstrated that oil moved between cylinder banks in hard cornering, a disaster for racing—so much for a July production start.

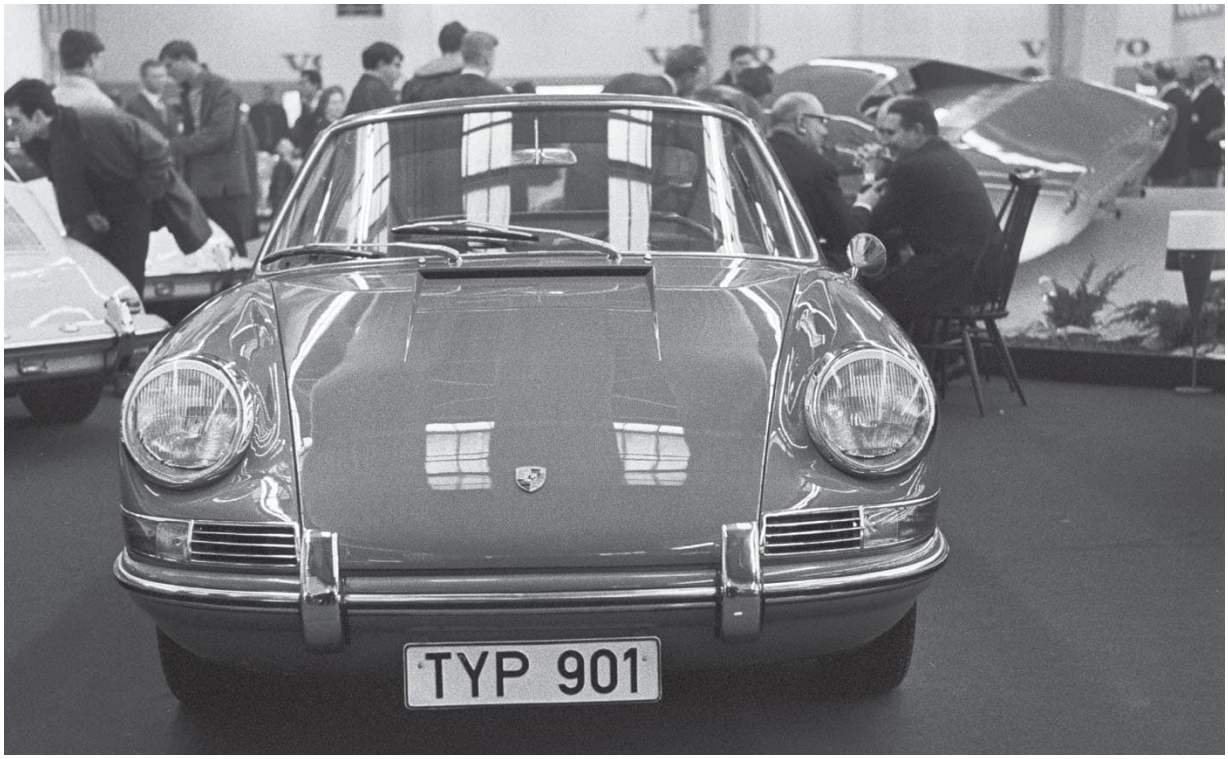
Ferry Porsche's nephew, Ferdinand Piëch, who had graduated from the Swiss Technical Institute in Zurich in 1962, soon joined the company. By April 1963, he was a full-time Porsche engineer. Combining lessons learned

from his grandfather Ferdinand Porsche and others he absorbed in Zurich, he pushed for the highest-quality materials from suppliers and matching work from his colleagues. Despite the protests of his uncle's cost-conscious purchasing department, Piëch's preferences generally prevailed. At his insistence, Typ 901/1 adopted dry-sump lubrication, the optimum solution for lubrication problems.

This system required a separate oil reservoir, lines, and pumps, but it ensured even oil distribution throughout the engine revolution per minute (rpm) range and at any cornering force. In addition the dry-sump system eliminated the deep oil pan, letting engineers mount the engine lower in the chassis to improve handling. The Typ 901 designation—for the new seven-bearing four-cam engine *and* the complete car with 2211 mm (87 in) wheelbase—first appeared in Porsche's internal documents on January 9, 1963. The engine produced 130 hp (96 kW) DIN using *Deutsches Institut* für *Normung* standards and 148 hp (109 kW) SAE according to Society of Automotive Engineers (currently SAE International) calculations.



The Typ 901 designation—for the new eight-bearing four-cam engine *and* the complete car with 2211 mm (87 in) wheelbase—first appeared in Porsche's internal documents on January 9, 1963. The engine produced 130 hp (96 kW) DIN and 148 hp (103 kW) SAE.
Image courtesy of Porsche Corporate Archives



The process to create the 901/911 had taken up one fifth of Ferry Porsche's life. He turned 55 on September 9, 1963, five days before 901 production commenced. Porsche delivered the first 901s on October 27, 1964. The 356 had established the company and racing had brought them international attention, but this 911 was going to take them places they never imagined. *Image courtesy of Porsche Corporate Archives*

Ferry debuted the 901 in Hall 1A at the IAA International Automobile Exhibition in Frankfurt. Journalists got in as early as Tuesday evening, September 10, 1963, and briefings introduced new cars to writers and photographers through Thursday. Porsche exhibited three 356s, a C Cabriolet, an SC coupe, and a Carrera 2 coupe, and the 901, shown in a special yellow paint. It carried a price of DM23,900 ($5,990 at the time.) Buoyed by positive feedback, Ferry prepared for the Paris Auto Show (Salon de l'Automobile) from October 1 through 11.

Nearly everyone in France loved the car as well, although Automobiles Peugeot was clearly less enthused. Starting In 1929 with its Model 201, Peugeot had used three-digit model designations with a zero in the middle. Peugeot had protected this with the French office of copyrights and patents. On October 10, Peugeot notified Porsche that it could not designate its new

car a 901 in France. Porsche's press director Huschke von Hanstein, still in Paris, sent a telegram to Ferry.

France was a good market for Porsche cars. Porsche had begun 901 manufacture on September 14 and now they interrupted it on October 10. By this time, barely a dozen cars were complete. Rather than antagonize an entire nation, Ferry made his decision on October 13 to renumber the car as the 911 for all markets effective November 10.

2

1965 TYP 901 CABRIOLET PROTOTYPE

In mid-October 1961, barely a week after Ferry Porsche's showdown with Erwin Komenda over the Heinrich Klie/Gerhard Schröder/Butzi Porsche 2+2 fastback, Reutter (Stuttgarter Karosseriewerk Reutter) opened its basement studio doors and Gerhard Schröder and the clay model of the 901 prototype rolled in.

The Cabriolet shape was the work of Butzi's designer Hans Ploch and engineer Werner Trenkler, finishing two prototypes in mid-1964, when Ferry gave up on Reutter and Karmann, whom he had asked to do this work. Removing the top was the easy part. Making it drivable was nearly impossible. *Photo by Randy Leffingwell*

Schröder made the shape ready for production, beginning in July 1963 as Ferry had approved it. Then in late October 1961, Ferry asked Reutter general manager, Walter Beierbach, to devise a plan for manufacturing a cabriolet version of the Typ 901. On November 10, Ferry codified this request in an interoffice memo by describing the car as a two-seater. He asked for the rear window assembly to function as a hatchback for luggage loading. He dismissed the need for a sunroof but emphasized his desire for a cabriolet option. By moving Schröder and the 2+2 to Reutter, Ferry meant to insulate them from Erwin Komenda's meddling. This move had profound effects.

One such consequence arose quickly. As Ferry prepared his order for steel bodies, Reutter raised a high hurdle. Despite renting Porsche studio space, Beierbach, as representative of the Reutter company, balked at the expense of producing new tooling to stamp body panels and new facilities for assembly. Beierbach had managed the company well, but now the family owners decided to sell out. Reutter knew too much about Porsche's business, leaving Ferry no choice. He invested DM6,000,000 (nearly $1,500,000 in 1962) to acquire Reutter Karosserie.

Meanwhile Ferry's request for a Cabriolet got lost. Furthermore, Komenda and Beierbach convinced Ferry that an opening hatchback on the new 901 was sure to rattle. Ferry abandoned the hatchback, and he took his Cabriolet idea elsewhere.

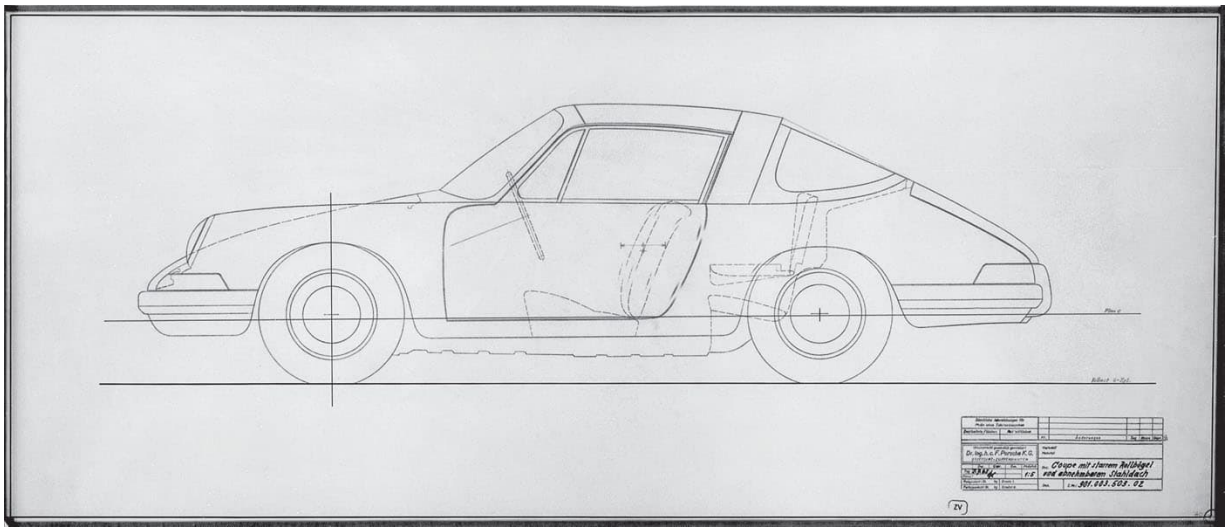
In mid-October 1962, he approached automobile manufacturer Karmann in Osnabrück. Butzi's design team provided three scale drawings with the model and Ferry asked Karmann to evaluate their concepts. One showed a 356-style padded cabriolet top with a zip-out plastic rear window. Another proposed a collapsible top on which the top material snapped off for storage. The third pictured a roll bar fixed inside a main top bow with a rigid removable steel top over the front seats and a zip-out cloth back panel with a clear plastic window. Butzi advocated a Roadster appearance, content that the cabriolet roofline differed from the 901 fastback.

The overhead view reveals other problems: Where to stow the folded top? Is the car still a 2+2, or is it now strictly a two-seater? Chassis stiffness remained most critical, and it dictated the overhead Targa bar. This prototype still bears the scars of mounting and removing the prototype Targa structure. *Photo by Randy Leffingwell*

Unfortunately no one considered a cabriolet while designing the 2+2. Whether a roll bar collapsed or a soft top folded, there was no place to stow it. One solution simply sacrificed rear seats for the top and its hardware. Crucially, estimated costs to redesign the body and make new steel stamping molds for this Roadster body killed any chance.

Still, after the September 1963 Typ 901 Frankfurt debut, sales boss Harald Wagner reported that many visitors asked about an open version. Over the next months, development continued on more concepts until early June 1964 when a prototype "open car" emerged from the shops. During an interview in November 2012 with the author, Gerhard Schröder remembered that Franz Ploch and engineer Werner Trenkler had gotten a car on which to work. Ploch had worked with Schröder on cabriolet development for the 356 models.

By June 12, 1964, Schröder and engineer Werner Trenkler had completed their first mock-up, chassis #13 360, and Ferry had it photographed that day. On the 24th, a group convened to review the car. Ferry Porsche, Butzi, chief engineer Hans Tomala, Hans Beierbach (now running Reutter from inside Porsche), Erwin Komenda (whom Ferry had put in charge of completing the 901 technical drawings), body designer Fritz Plaschka, and Harald Wagner, Ferry's sales chief, examined the car. Unfortunately for the cabriolet, Trenkler and Schröder were missing from the review, leaving those who were asking questions to receive answers from the wrong people.



Inside the studio, designers', modelers', and engineers' drawings considered and confirmed configuration of an open 911. This drawing from May 23, 1964, established the position and angle of the roof band and shape and configuration of the removable rear window, a shape that influenced 911 design for decades to come. *Courtesy of Porsche Corporate Archives*

Wagner argued vigorously for the fully open car, expecting it to match the 356 Cabriolets in sales. Beierbach and Komenda, however, stressed

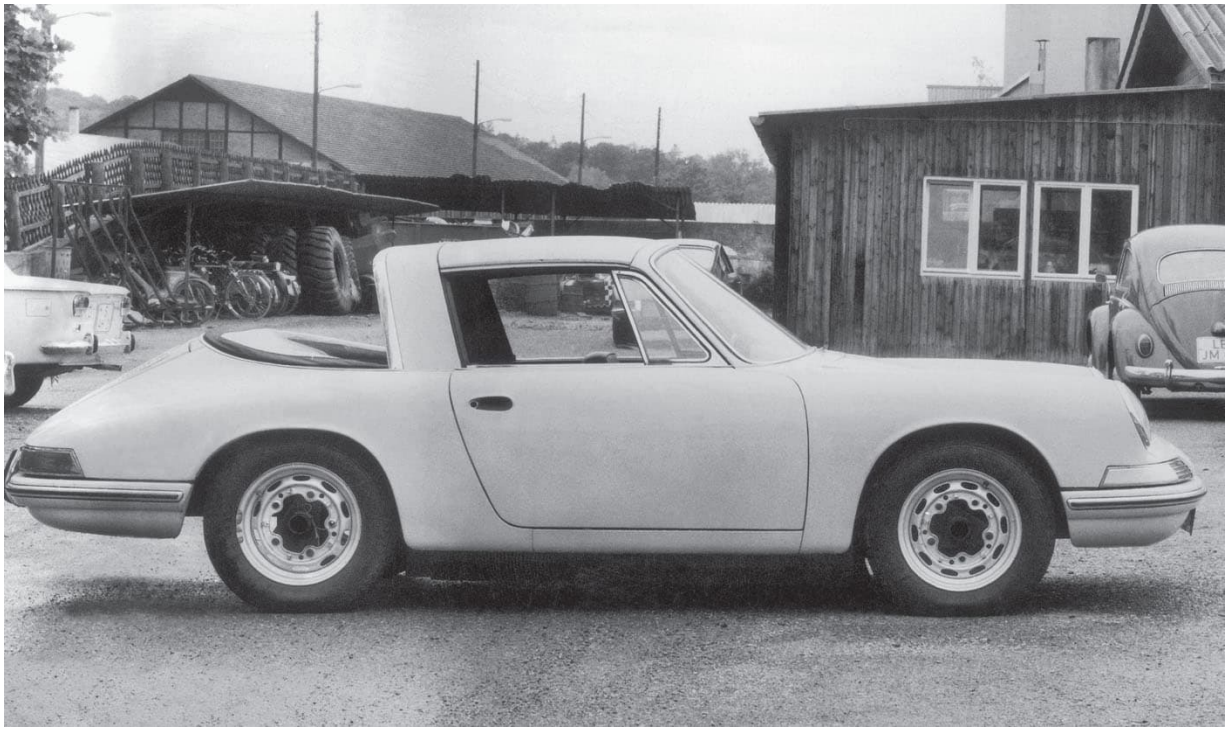
extensive work and costs to Porsche to stiffen the platform and redo rear bodywork. Over the next few days, Ferry looked again at the roll bar version.

In the United States, automobile safety advocate Ralph Nader had publicized his objections to vehicle design and engineering in his book *Unsafe at Any Speed*. Inside Porsche, decision makers worried that legislators in its largest market might outlaw convertibles all together.

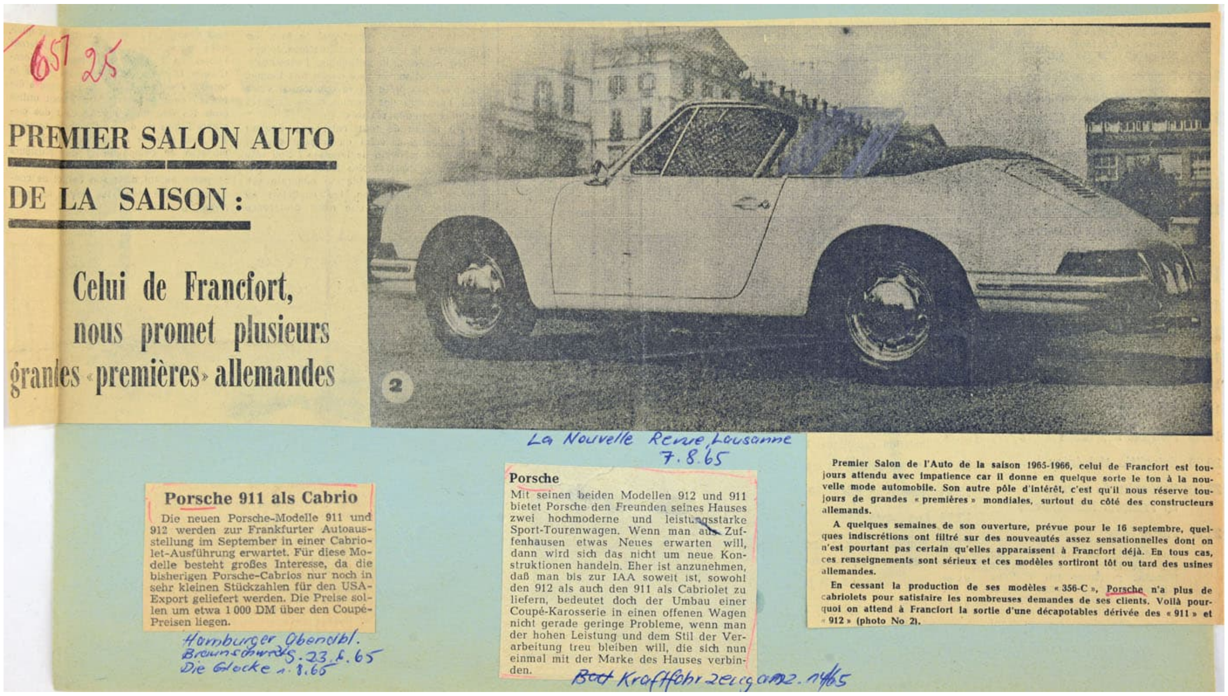
Hearing no response from Karmann, Ferry asked again. Then he shipped the prototype, #13 360, for study with the objective of production. It returned to Zuffenhausen, and four days later, on September 14, 1964, Porsche began 901 production.

Production start-up—and model designation—problems occupied Helmuth Bott's attention, and it wasn't until late in January that he took a long test-drive in #13 360. He paid particular attention to chassis stiffness (which, after Karmann's work, he found no worse than the 356 Cabriolets he had driven) and to the soft rear window flapping and fluttering. A few days later, testing the car with the removable roof panel in place, the wind noise was so great that he could converse with a fellow engineer only by shouting.

On February 1, 1965, the car emerged as the subject of a joint memo to two dozen managers, engineers, and designers discussing a 912 for testing, a right-hand drive 911 prototype, and the Cabriolet #13 360. Bott and his staff had installed bracing ahead of and behind the doors and along the rocker panels. A judiciously disguised roll bar would restore a great deal of rigidity and stiffness to the car. But where to mount it? What was it to look like? And how could they announce it? All those problems were for another day—and, ultimately, another model.



This is the same red Cabriolet—#13 360—shown elsewhere, but this illustrates another moment in its life. The Targa bar restored suitable stiffness to the chassis and suggested several options for opening or closing panels. *Image courtesy of Porsche Corporate Archives*



PREMIER SALON AUTO DE LA SAISON :

Celui de Francfort, nous promet plusieurs grandes «premières» allemandes

La Nouvelle Revue, Lausanne 7.8.65

Premier Salon de l'Auto de la saison 1965-1966, celui de Francfort est toujours attendu avec impatience car il donne en quelque sorte le ton à la nouvelle mode automobile. Son autre pôle d'intérêt, c'est qu'il nous réserve toujours de grandes « premières » mondiales, surtout du côté des constructeurs allemands.

A quelques semaines de son ouverture, prévue pour le 16 septembre, quelques indiscrétions ont filtré sur des nouveautés assez sensationnelles dont on n'est pourtant pas certain qu'elles apparaissent à Francfort déjà. En tous cas, ces renseignements sont sérieux et ces modèles sortiront tôt ou tard des usines allemandes.

En cessant la production de ses modèles « 356-C », Porsche n'a plus de cabriolets pour satisfaire les nombreuses demandes de ses clients. Voilà pourquoi on attend à Francfort la sortie d'une décapotables dérivée des « 911 » et « 912 » (photo No 2).

Porsche 911 als Cabrio

Die neuen Porsche-Modelle 911 und 912 werden zur Frankfurter Autoausstellung im September in einer Cabriolet-Ausführung erwartet. Für diese Modelle besteht großes Interesse, da die bisherigen Porsche-Cabrios nur noch in sehr kleinen Stückzahlen für den USA-Export geliefert werden. Die Preise sollen um etwa 1 000 DM über den Coupé-Preisen liegen.

Porsche

Mit seinen beiden Modellen 912 und 911 bietet Porsche den Freunden seines Hauses zwei hochmoderne und leistungsstarke Sport-Tourenwagen. Wenn man aus Zuffenhausen etwas Neues erwarten will, dann wird sich das nicht um neue Konstruktionen handeln. Eher ist anzunehmen, daß man bis zur IAA soweit ist, sowohl den 912 als auch den 911 als Cabriolet zu liefern, bedeutet doch der Umbau einer Coupé-Karosserie in einen offenen Wagen nicht gerade geringe Probleme, wenn man der hohen Leistung und dem Stil der Verarbeitung treu bleiben will, die sich nun einmal mit der Marke des Hauses verbinden.

In advance of the Frankfurt, Paris, and Geneva motor shows, newspaper writers in Germany and France speculated on rumors of a Porsche 911 Cabriolet. The texts asked if “we will see at Frankfurt a Porsche 911-912 convertible? It’s unlikely but the demand however is strong.” *Courtesy of Porsche Corporate Archives*

3

1966 TYP 911 BERTONE ROADSTER

In October 1965, a Porsche transporter pulled into Nuccio Bertone's designs studios near Turin, Italy, and unloaded an incomplete Porsche 911. It had its engine, running gear, and full electrics, but no doors, front or rear decklids, and neither paint nor interior.

Prototype creation is fabulously labor intensive. "It took us between 5,500 and 6,000 man hours," Bertone said. "The cost of materials did not add up to much. This was not a project that I took in order to make money," he added. "But it was a personal satisfaction that I wanted." *Photo by Randy Leffingwell*

It was there because designer Bertone and western United States distributor Johnny von Neumann had an idea for an open 911. Von Neumann was a racer, and he was an entrepreneur. He had previously convinced Porsche's United States distributor Max Hoffman to ask Porsche to produce a run of 20 lightweight 356 America Roadsters during 1952 and 1953. This gave Porsche ideas, and the next time von Neumann wanted another lightweight open Porsche for racing, they gave him the 356 Speedster. Von Neumann knew Ferry felt the lack of an open 911 in the lineup, but this time, von Neumann took on the challenge by becoming a manufacturer himself and licensing the cars back to Porsche for sales.

Bertone and Von Neumann discussed whether the car should bear any resemblance to the new production car, and they concluded that it should not. Bertone turned the project over to his designers and modelers, but never drifted far away.

"At different stages of this project, all of our specialists took their turn working on this car: stylists, draftsmen, model makers, metal beaters and workers, fitters, painters, upholsterers, trimmers and detailers," Bertone recalled in an interview in 1991. That was because the project had a deadline. From the start, Bertone and von Neumann agreed to unveil the car on Bertone's stand at the Geneva International Auto Show in March 1966.

Bertone had nearly 50 employees in his prototypes department. The model and the drawings grew and evolved side by side, each one influencing the other every day in the manner of design studios everywhere.

"We kept only the floor of the Porsche," Nuccio Bertone explained. "The rest of the car was all Italian." Bertone, long known for his clean lines and close supervision, was equally known for his ability to train promising apprentices: Giorgetto Giugiaro was his chief stylist until 1968 and influenced the Porsche Roadster.

Johnny von Neumann, a California racer-entrepreneur, and Nuccio Bertone, an Italian car designer in Turin, hoped that customer demand for a Porsche Cabriolet *was* high and that the company did *not* have one ready for Frankfurt because they had their own and planned to introduce it at Geneva in March 1966. *Photo by Randy Leffingwell*

Both participants had goals. For Bertone, it was an opportunity to further enhance the prestige of his company. For von Neumann, it was business; "I was going to try to sell this car," he explained during the same 1991 interview. But there were unforeseen problems ahead. "At that time, we were not in the position since we could not build the car in the prototype department at a price that could have been accepted by possible customers," Bertone said. Von Neumann remembered Porsche telling him they had to sell this car for about $7,000. "My idea was to have them deliver the platforms to Bertone with, let's say, wiring and that stuff in it. That's not such a big deal. And then Bertone would ship it back to Stuttgart and let them put the engines in it."

Von Neumann believed he—not Porsche—could sell as many as 100 a year as exclusive distributor. He felt certain customers "would pay $7,000 for something particular, if it was good looking . . ."

"I talked with Mr. Porsche. He said, 'Well, you know, it has our name on it, so we are concerned to be sure it is going to be right . . .'" Johnny had imported a few of Porsche's Typ 756, the tiny Abarth Carrera coupe. He knew Porsche Zuffenhausen Werks undertook numerous modifications and

repairs on each one before they could deliver them to their customers: body panels leaked rain, engines overheated, front wheels couldn't turn to full lock. Porsche abandoned plans for a second run to of cars after Abarth delivered the original 20. It soured Ferry on outside fabricators.

"But the thing that killed it was something they already knew," von Neumann said. "When you make a convertible out of a coupe, there is some chassis movement, flexing. And all the time they were already working on that problem. With their own solution. For their chassis, reinforced by a roll bar. They named it the Targa."

74

MOTOR ITALIA

L'interno dell'abitacolo è rifinito e imbottito con l'accuratezza propria della **Bertone**: per una felice trovata l'estremità dell'appoggio-braccia si trasforma in maniglia d'appiglio; e vi sono due appoggia-testa. Sui lati di esso corre una profonda gola per convogliare verso due prese, aperte sull'alto delle fiancate dopo le portiere, l'aria per il motore

BERTONE

Porsche "911"

A Ginevra nel grande stand della **Bertone** alla favolosa "Miura" si affiancavano, quali novità assolute, i modelli illustrati in queste due pagine, entrambi su autotelai stranieri: uno spider su **Porsche** "911" destinato al mercato U.S.A. e assai piacente nelle sue forme compatte e arrotondate. Da notare nella fronte i pannelli mobili che durante il giorno mascherano i fari e portano in corrispondenza di questi delle scannellature per consentire eventuali lampeggiamenti

Motor Italia, Milano Nr. 74/66

When Bertone and von Neumann discussed the body design for this prototype, von Neumann emphasized that it did not have to adopt 911 shapes, so Bertone's designer Giorgetto Giugiaro developed a very Italian-looking Porsche 911 Spider, which carried over only the platform, engine, and running gear. *Image courtesy of Porsche Corporate Archives*

The Bertone design lowered the 911 by reconfiguring the dashboard instrumentation. They eliminated the Klie/Schröder rear-deck fresh air intakes, introducing Nuccio Bertone's low window sill air intakes. Giugiaro concealed the headlights behind a slotted cover, which echoed the design elements from the rear taillights and exhaust. *Photo by Randy Leffingwell*

Porsche made in Italy

Dieser neue Porsche 911 Roadster stammt nicht aus Zuffenhausen. Er wird in kleiner Serie in Italien von dem Karosseriekünstler Bertone montiert und vorerst nur in Amerika verkauft. Besonderheit: geschlitzte Klappen vor den Scheinwerfern, die sich elektrisch öffnen lassen

Stern
13. März 1966

Exklusivität ist Kontosache

Morgen
Express
Wien
19. März
1966

Eine internationale Automobilausstellung ohne Prototypen ist nur eine halbe Sache. Das wissen die Veranstalter, und verabsäumen es deshalb nie, bestimmte Firmen zum Ausstellen von Fahrzeugen zu animieren, die lediglich für das Auge bestimmt sind. Kommen solche Autos von italienischen „Blechschneidern", so handelt es sich natürlich in vielen Fällen um Sonderbestellungen extravaganter Kunden mit prallen Brieftaschen oder um Karosserien, mit denen die betreffende Fabrik den Chassislieferanten zur Auftragserteilung für eine kleine Serie animieren möchte. Oder es ist einfach eine Eigenwerbung der Karosseriefabrik, die ihren Stil der internationalen Fahrzeugindustrie anbietet. Bei den Traumgebilden aus den Hexenküchen der US-Autoindustrie, die auf europäischen Ausstellungen gezeigt werden, handelt es sich aber fast immer um „Lockvögel", die das Publikum zum Stand der betreffenden Firma leiten sollen.

Die General-Motors-Tochter Vauxhall zeigte in Genf einen „Experimentierwagen" mit der sinnigen Bezeichnung „XVR (siehe Titelseite dieser Beilage). Man könnte ihn ja auch Charly oder Johnny nennen! Ein ultraniedriges Coupe ohne Motor und Getriebe, dessen Genfer Präsentation Vauxhall-Chefingenieur J. H. Alden so formulierte: „Wir wollen der Öffentlichkeit einen Eindruck unseres vorwärtsblickenden Denkens vermitteln und die Einstellung der Besucher gegenüber einem derartigen Zukunftsmodell kennenlernen."

Ford zeigte eine Styling-Studie seines italienischen Geschäftspartners OSI, einer Karosseriefabrik, die den Aufbau der italienischen Anglia-Version herstellt. Der schönste Ford „20 M", den es je gab, könnte man sagen. Man nahm die Mechanik des „20 M", Stilelemente der amerikanischen „Mustang"-Karosserie sowie die Ideen italienischer Karosseriformer und baute den OSI-Ford.

Meisterwerke italienischer Karosseriebauer stellte Star-Blechgestalter Bertone vor. Ganz entgegen der stilistischen Linie des Hauses Porsche baute er ein Kabriolett auf der Basis des „Porsche 911" (siehe nebenstehende Bilder). Mit versenkbaren Scheinwerfern, in bullig wirkender Gesamtkonzeption und mit nicht zu verkennenden Stilelementen bereits bekannter Fiat-Sonderkarosserien.

"Exclusivity is a Matter of Costs" Bertone's artisans finished the Roadster, painted burgundy with tan leather, barely hours before its Geneva debut. Once unveiled, it received very encouraging reactions. But by then, Porsche had revealed the Targa. After the show, Bertone's transporter delivered the sole prototype to a home Von Neumann owned in Geneva. *Image courtesy of Porsche Corporate Archives*

4

1967 TYP 911 S, TARGA, 911 R, AND 911 RS

Chassis engineers had already recognized the necessity of a roll bar for support on the 901 in order to be realized as a cabriolet.

Engineers changed the series-production Typ 901/02 Typ S engine with the 901/22, the flat-six from the new racing Typ 906 Carrera 6. This twin spark plug 210 hp (154 kW) engine incorporated a forged crankshaft, aluminum alloy cylinder heads, light-alloy cylinders, and a second electric fuel pump (each feeding a Weber 46 triple-throat carburetor). *Image courtesy of Porsche Corporate Archives*

Fortuitously a coupe appeared in the studio one day. Gerhard Schröder and Eugen Kolb gathered up some transparent materials and laid them over the top of the car. They roughed in some lines in pencil. To make them more obvious, Kolb retrieved some black tape from the studio and remade the lines. "And then we began to move lines back and forth to define the bar. Butzi thought it was ugly. We changed the shape, some, just a little, Butzi said okay, and then I started to make the drawings. And the idea of using stainless steel came from Butzi, right at the very beginning.

"Mr. Bott insisted on the removable soft rear window," Kolb continued. "He wanted as much as possible to enhance the open car feeling. Then of course, discussions came about what to call it and how to market it. Was it Porsche's 'open car?' Feelings about the American market prevailed. We promoted it as our coupe with a safety item, as 'Porsche's Safety Car.'" On August 11, Porsche had registered the patent for the Targa, #1455743, listing designer Gerhard Schröder and engineer Werner Trenkler as its inventors.

As Ferry had done with the 901, he debuted the Targa nearly two years in advance of first deliveries, at the IAA show in Frankfurt in September 1965. Just prior to the show, Porsche announced the new model and its name. The Targa debut was a tremendous success. Crowds were as excited as when they first saw *the New Porsche*. Marketing promoted this as four cars in one and named each. With its roof and rear window removed, this was the "Targa Spyder." It was the "Bel-Air" with its rear window zipped in place but the top open. Reversing that order, with top on but rear window collapsed, earned the vehicle the name "Targa Voyage," and completing the lineup, with all panels in place, marketing called the car the "Targa Hardtop." Porsche 356 cabriolet manufacture ceased, except for a limited run in 1965 for the Dutch highway police.

Within days of the end of the IAA, Bott took a Targa prototype to Wolfsburg's test track for endurance testing. He learned the car needed further reinforcement at the rear door sills and along the heater tubes. An even more demanding durability test took place in Zuffenhausen on November 10. Bott and Werner Trenkler supervised a "drop test" on the Targa, inverting a car, hanging it by a crane and releasing it from 2 meters (7 ft) above the pavement. If Porsche was going to promote the car as a safety vehicle with rollover protection, Bott wanted to be certain it could handle more than a mere rollover. It didn't.

Trenkler reworked the roll bar, its mounts, and the surrounding structure as well as the windshield frame, and in early January 1966, Bott returned to Wolfsburg with the improved prototype where drivers ran it longer and harder over the endurance test without any failure. One year later, on January 23, 1967, Porsche began production of the Targa as a 911 and 912 model.

If the 911 S was Ferry's progeny, then the 911 *Rennsport* (racing sport), 911 RS, was Ferdinand Piëch's brain child. He worked through four prototypes and then initiated a run of 20 "production" versions during 1967 to understand the competition limits from an automobile derived from series production roots. These 24 examples became case studies in Piëch's obsession with vehicle weight. Starting with basic 911 coupes, mechanics virtually stripped the cars to bare chassis and then mounted only items necessary for racing. They examined—and weighed—each piece, frequently replacing something originally in steel with the same in aluminum, magnesium, or titanium—or plastic, in the case of deck lids and bumpers.

Porsche delivered double impact at Frankfurt, revealing the new open car, now officially named Targa, and the rumored Super model, or 911 S. Introduced at DM 24,480 ($6,135) for the S Coupe, the Targa added DM1,400 ($351) to the price. By its debut, it had made this jump nearly 1,000 times. *Image courtesy of Porsche Corporate Archives*

Piëch kept tight control of "his" four prototypes, and he rejected an internal proposal to enlarge "production" to 500 vehicles to classify the 911 R for production classes in racing. Selling these to the masses didn't interest him. He was an experimenter. Those 20 "production" RS models remained

prototype-category competitors all their lives and accomplished impressive results including one memorable run at Monza in October 1967.

Several long-time Swiss Porsche race car owners along with works driver Jo Siffert had begun a World Record attempt in their Typ 906 Longtail (906 L) on the oval circuit at Monza. But the uneven concrete banking collapsed the rear suspension, ending the attempt. One of the owners called Piëch, asking to borrow a car to retry the run. After a few hours of meetings, calculations, and discussions, Porsche dispatched three 911 R's to Monza, one for the record, one as a spare, and the third as a sacrificial parts car because all spares needed for repair had to be carried on board.

Racing director Peter Falk and engine production chief Paul Hensler drove the record car, 911 R-001 the 625 miles (1,006 km) from Zuffenhausen to Monza. But shortly after leaving Zuffenhausen, they learned the engine in their car had just completed a 100-hour test-bench run, equivalent to the trial ahead. It had been dismantled, inspected, and reassembled, but no one could confirm whether mechanics replaced parts or simply reused them. The engine proved durable beyond imagination.

The 911 R's were Porsche’s first series-based long-distance runners. Vic Elford, Hans Herrmann, and Jochen Neerpasch won the 84-hour Marathon de la Route in August 1967, completing 350 laps of the long Nürburgring circuit for a total of 6,153 miles (9,902 km) in an R fitted with Porsche’s new semiautomatic Sportomatic transmission. Later Gérard Larrousse and codriver Maurice Gélin won the 3,060-mile (4,925-km) Tour de France Automobile in September 1969 in one of Piëch’s 911 R's.

Mechanics performed hundreds of changes transforming a 911 S into an R. They had reduced weight from 1,080 kg (2,381 lb) for the base coupe to 800 kg (1,764) for the R. This helped Herbert Linge fly it around Nürburgring as *Marschall* or safety car. *Image courtesy of Porsche Corporate Archives*

Engineers fitted larger anti-sway bars as well as torsion bars front and rear. Wheel widths grew from 5.5 inches (14.0 cm) to 6.0 inches (15.2 cm) front and 7.0 inches (17.8 cm) in the rear, wearing Dunlop 185 HR 15 racing radials. Here Jo Siffert waited impatiently during a routine tire and wheel change. *Image courtesy of Porsche Corporate Archives*

The team or four drivers ran around the clock for 96 hours through rain, thick fog, and lovely slanting autumnal sunlight. At the end, they established 16 new records, including 96 hours at 130.77 mph (210.45 kph) and covering 12,505.38 miles (20,125.46 km). And after the records, they drove the car back to Zuffenhausen for another thorough examination. *Image courtesy of Porsche Corporate Archives*

5

1968 TYP 911 S/L/T AND TYP 912

This new 911 Super or 911 S, introduced in 1967, fit precisely into Ferry Porsche's plans. Engineers had abandoned the difficult-to-tune Solex carburetors they used on early 911s for Weber 40 IDAs, one triple-throat model per cylinder bank starting with the 1966 model.

The S and L suspensions incorporated anti-roll bars front and rear, wishbones and McPherson struts in front, semitrailing arms and one transverse torsion bar in back, Koni shock absorbers all around, as well as front and rear ventilated disc brakes, new 5.5J x 15 forged aluminum wheels from Fuchs, and 165VR15 radial tires. *Photo by Randy Leffingwell*

This Typ 910/05 engine developed 130 hp (96 kW) at 6100 rpm, enough to propel the car to a top speed of 225 kilometers per hour (kph), or 140 miles per hour (mph). Faithful to tradition, Porsche expanded its model line for 1968, adding a 911 Touring (911 T) as the entry-level base 911. In trim it was similar to the four-cylinder 912, now in its fourth year of life. Both came fitted with Porsche's four-speed transmission. The 912 carried over its Typ 616/36 opposed four-cylinder 1582cc engine that produced 90 hp (66 kW) at 5800 rpm and provided a top speed of 115 mph (185 kph). It weighed in at 970 kilograms (kg) or 2,138 pounds (lb). Interior and exterior trim were identical except for the 911 or 912 designation badges.

In contrast, the Typ 911 T introduced the Typ 901/03 opposed six-cylinder, still at 1991cc and in this tune, delivering 110 hp (81 kW). Porsche quoted its top speed at 124 mph (200 kph) and its weight at 1,080 kg (2,381 lb). The company offered all the models, 911 T, 911 S, 911 L, and 912 with the optional Sportomatic transmission and in either coupe or Targa bodies.

The 911 L came into existence in response to ever-stiffening exhaust emissions restrictions in the United States. Its Typ 901/06 engine delivered 130 hp (96 hp) at 6100 rpm. Trim and interior appointments paralleled the flagship Typ 911 S, but anticipating driver's needs in America, engineers replaced the 13 mm (0.5 in) front anti-sway bars with 11 mm (0.4 in) and increased the 911 S to 15 mm (0.6 in) bars. The S carried on with Koni shock absorbers while the 911 L, 911 T, and 912s relied on Boges. Both L and S models fitted ventilated-disc brake rotors. Prices climbed from DM17,538 for the 912 coupe to DM20,735 for the 911 T, to DM24,480 for the 911 L, and capping out at DM24,970 for the 911 S. (In 1968 US dollars, they were $4,395 for the 912; $5,197 for the 911 T; $6,135 for the 911 L; and $6,258 for the 911 S, at the factory). The Sportomatic added DM990 to the price ($248), and ordering the Targa instead of the coupe boosted the total by DM1,480 ($371).

The 1991cc S engine for Europe, Typ 901/02, developed 160 hp (118 kW) at 6600 rpm and produced 132 lb-ft (79 N·m) of torque at 5200 rpm. Unable to get its exhaust clean enough to meet United States emissions standards, Porsche blended the luxury of the S with the platform of the US-legal 130 hp 96 kW) base model and exported it as the 911 L. *Photo by Randy Leffingwell*

But just as Californian Johnny von Neumann had done with his 1965 Bertone Roadster, Porsche's Texas/Oklahoma distributor William Dick went another direction. Although he drove Ferraris and Maseratis, he and his wife wanted something more practical for her. On his frequent travels to Europe, he interviewed several coachbuilders with his idea but none stepped up to it. It took the hot-rod/road-racing fraternity in Los Angeles to embrace his challenge: a four-door 911 S. Coachbuilder Dick Troutman and mechanical

engineer Tom Barnes and their artisans and mechanics had a history of designing and assembling winning race cars for a number of owners and teams, and they agreed to build the car.

In late December 1966, a production 911 S arrived at their Culver City, California, shops. Stylist Chuck Pelly had sketched lines of the new car on plywood and metal, just as he'd done countless times for racing teams. He angled the headlights farther back and made a number of other subtle changes, including adding rear doors. Metalsmith Emil Diedt set to work on the existing car, removing the roof and bisecting the chassis. He then fitted a 21-inch (533 mm) insert just ahead of the B-pillar. Then, he began the careful process of putting it back together. He added significant reinforcement to the floor pan and hung front-opening rear doors (the so-called "suicide doors"). Just before Troutman and Barnes completed assembly in August 1967, they received a set of new Fuchs five-spoke alloy wheels and Porsche's new four-speed Sportomatic transmission. When it was all together, the shop painted the car dark green.

The interior was upgraded with a leather-covered steering wheel and a woven-texture dashboard panel. Even with the new standard-equipment leather-covered steering wheel, traditionalists still could order wood versions, as shown here. Its top speed of 225 kph (140 mph) was limited primarily by its aerodynamic drag, a factor Porsche was starting to take seriously. With 30 hp (22 kW) fewer, the 911 L reached 210 kph (130 mph). *Photo by Randy Leffingwell*

Troutman and Barnes extended the 911 S platform 533 mm (21 in) just ahead of the B-pillar to accommodate full-size rear seats and adequate leg room. The builders ordered a second set of doors and mounted them backwards—so-called "suicide doors"—to restrain the car's dimensions. *Photo by Randy Leffingwell*

Within a year, the car made an appearance before Porsche's Supervisory Board, which had considered once more the idea of a four-seater. It resulted in a commission to Italian coachbuilder Pininfarina for a prototype four-seat two door that appeared and was rejected in November 1969. Another internal candidate, the Typ 915, emerged from Porsche's Styling studios but it proved even less appealing than what Pininfarina had proposed. The idea went back into the drawers.

It’s worth considering for a moment what might have Erwin Komenda thought of this? For nearly a decade, he pushed for a true four-seat Porsche (though never with four doors). But even when Porsche’s Supervisory Board saw this (and later the four-seat prototypes), they politely declined. The marketplace just was not ready. *Photo by Randy Leffingwell*

6

1969 TYP 911 GTS

Model year 1969 brought significant changes to the 911 lineup and signaled the end of the 912 series. Engineers tamed 911 S exhaust emissions to comply with US regulations, so the company discontinued the 911 L. It introduced a mid-level 911 E (for *einspritzung*, or injection) and it and the 911 S engines now used a Bosch/Porsche mechanical fuel injection system.

Originally known as the Liège-Rome-Liège Rally for its origin and turn-around points, this was a brutal 80-to-100-hour non-stop sprint over the Alps and back. When participating nations balked at racing speeds on public roads, the RMU reconfigured and renamed the event. *Photo by Randy Leffingwell*

Fuel injection had appeared on Porsche's 906 race cars in 1967 to mitigate the fuel feed problems that drivers experienced in extremely hard cornering. But translating racing's needs for full-throttle/hard braking to the wider varieties of driving conditions on public roads was not easy. Dialing in all the variables not only eliminated cornering fuel cutout and improved fuel efficiency, but it also added 10 hp (7 kW) to the injected engines for model year 1969. The 911 E arrived with 140 hp (103 kW) at 6500 rpm as well as 129 pound-foot (lb-ft), or 175 newton-meter (N·m), of torque at 4500 rpm. 911 S owners got 170 hp (125 kW) at 6800 rpm and 134 lb-ft (182 N·m) of torque at 5500 rpm. Along with the mechanical injection came capacitive-discharge ignition systems, devices that helped decrease emissions.

To improve handling, Porsche engineering lengthened the wheelbase 57 mm (2 in) from 2211 mm (87 in) to 2268 mm (89 in). The E and S models rode on wider Fuchs alloy wheels. These grew from 4.5J x 15 on the 901 and early 911s, to 5.5J for 1968 and to 6J x 15 for 1969. This required a slight flare on front and rear quarter panels to accommodate the wider wheels and tires.

Lastly Porsche introduced a hydro-pneumatic strut front suspension system. While it was standard on the 911 E, it was optional on the T and S models. The system automatically compensated for changes in front loads from fuel use and luggage loads.

With so many innovations, a final shakedown trial before production started was crucial. Conveniently the Royal Motor Union (RMU) of Belgium staged their annual long-distance competition in August each year, timing that corresponded with Porsche's annual holiday and model changeover. A Porsche 904 won the GT class in 1965, and a prototype 911 R using the Sportomatic transmission took overall victory in 1967. For the 1968 run—August 20th to 24th—Porsche entered three heavily modified pilot-production Typ 911 E coupes. These cars took Ferdinand Piëch's obsession with weight much further. For example, the steel used for the headlight buckets weighed too much, so mechanics fabricated them in hand-hammered aluminum. They had the full run of Porsche's parts bins for its Sport Kits and Rallye Kits. These were options available to known competitors to enhance performance, handling, braking, and safety—in short, every function a racing or rally car needed to master.

"We stopped at the normal filling station at the Nürburgring. Just like on the road. That was where we filled our tank, not in the pits," Herbert Linge recalled. Pit stops were for driver changes, fresh tires, brake pads, and to add engine oil. *Image courtesy of Porsche Corporate Archive*

Each entry had three drivers. Porsche development driver Günter Steckkönig codrove one of the cars. He generously called the rules *special*. "We only could fill up, clean the windows, and check the engine oil," he remembers. "That's all. When you stopped at the pit off the scheduled times, every minute in there costs you one lap penalty. Driver changes cost you penalty. Pits were meant for repairs. However drivers had available only tools and parts they carried with them in the car."

Typical of Porsche organization, Steckkönig and others filed an 8-page "test report," a post-mortem on the event, packed with information: The winning three car team was credited with 356 laps or 6,230.63 miles (10,027.24 km) at 9.62 miles per gallon (mpg), or 24.4L/100 km, average; replaced five pairs of front tires and nine pairs of rears; the average speed was 74.17 mph (119.37 kph); and average lap time over the 29.29 km (18.2

mi) course was 14 minutes 9.4 seconds over 84 hours. One note criticized the Boge front struts.

Known internally as the 911 GTS model, the three cars used ultralight 0.7 mm (0.03 in) aluminum panels on front and rear deck lids and doors. Side and rear windows were thin plexiglass, and the front windscreen, while still safety glass to meet European road regulations for the transit stages from Liège to Nürburgring and back, was 0.5 mm (0.02 in) thinner than production specifications. *Image courtesy of Porsche Corporate Archives*

With this event running three and a half times longer than Le Mans, Piëch wanted durable output more than high horsepower. His staff selected three engines within the range of 168 to 170 hp (124 to 125 kW). ***Image courtesy of Porsche Corporate Archives***

"We didn't like this front suspension too much," Linge explained with a laugh. "We adjusted it but it never was stiff enough. In the night when the car was floating up and down from the suspension, the lighting was miserable. Sometimes you see the tops of the trees, the next time you see the road 2 meters (7 feet) in front. But you never see where you are driving."

Porsche lost one of its cars, #29, in the first night when the fuel pump balked. Later Herbert Linge lost time alongside the circuit at night bleeding air from fuel lines. When he pitted for the next driver change, he counseled his teammates: "We are two hours behind now," he recalls. "Tonight we're going to start a real race here! We begin at 10 o'clock in the night just like we are in a sprint." Steckkönig's test report revealed the sprinters' fastest lap was 12 minutes 29 seconds, roughly two-thirds their conservative nighttime pace orders.

After 84 hours, the surviving cars lined up for the “transit-run” back to the official start/finish in Liège, Belgium. It could not have been an easy run, driving some 28 two-hour stints with four-hour breaks from 1 a.m. August 20th until 1 p.m. August 24th.

“Liège-Rome-Liège,” Linge said, “was very good for publicity. Porsche always was in the top cars for this rally. And for us it was very good timing. It always was the last test before we start production. The self-leveling suspension, plus injection. The first series engine with mechanical injection. And it was the long wheelbase! For us it was a test track.”

Winning the Marathon de la Route represented three engineering successes: It was the first international victory of the new longer wheelbase 911. It was the first win using Porsche’s new fuel injection for the 911. And while the drivers weren’t enthralled, the 84 hours proved the durability of the new suspension. *Image courtesy of Porsche Corporate Archives*

1970 / 1979

7

1970 TYP 911 T/E/S AND TYP 915

After politely rejecting yet another American suggestion for their model line—in this case, the Troutman & Barnes 911 S Sedan—the four-passenger 911 concept briefly returned from the dead in 1969 and then again in 1970.

In January 1970, Porsche sent a team of three Typ 911 ST coupes to the Monte Carlo Rally. The ST, as its designation suggests, was a hybrid of the 911 T lighter weight floor pan and the 911 S stronger running gear. It proved to be a good combination as this car won the Rally outright. *Photo by Randy Leffingwell*

The roof was thinner-gauge metal as were both rear side panels. The ST competed with Porsche's 2195cc engine tuned to produce 180 hp (132 kW) at 6500 rpm. By the end of the ST run in 1973 to 1974, works mechanics and private teams were running with 250 hp (184 kW) 2.5-liter (153 cu in) engines. *Photo by Randy Leffingwell*

However these two proposals demonstrated that certain proportions are, if not inviolate, at least not elastic. Butzi Porsche contracted with Pininfarina in Italy who developed the four-seater B17 prototype, a car that the Porsche Museum displays on its main floor. Pininfarina added 192 mm (8 in) to the wheelbase behind the B-pillar, allocating the extra space to slightly longer seats and foot room for adults. In some ways this was reminiscent of Erwin Komenda's ambitions, only Komenda was never able to leave behind the 356 shape he had created. In this case all this additional steel and glass pushed the prototype's weight up to 1,133 kg (2,498 lb). In Pininfarina's hands, Fritz Plaschka's "big line" roof slope swelled awkwardly.

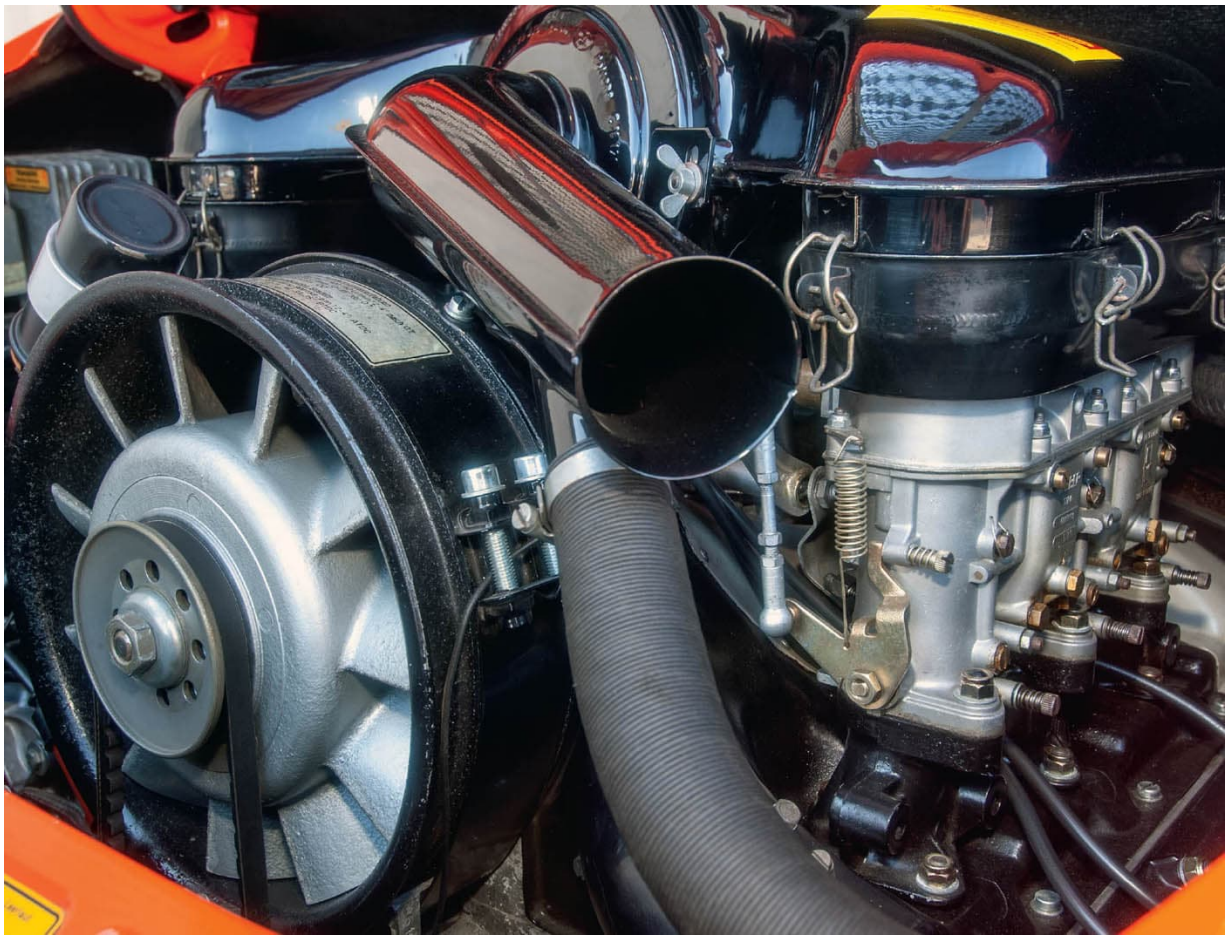
A year later Butzi's staff took a try at it with the 911 C20. Pushing the wheelbase out 347 mm (14 in), Heinrich Klie, Gerhard Schröder, and the rest of his team turned the already-iconic 911 coupe into an elongated two-door with an overall length of 4,510 mm (178 in). This was 356 mm (14 in) longer than the 911. Visually the car was more successful than Pininfarina's. Both Plaschka's and Schröder's input and Butzi's sense of proportion were evident. However with no changes to the front suspension or steering geometry, its maneuverability and drivability suffered. And because there was little impetus from the Porsche Supervisory Board for such a vehicle,

this one entered Porsche's growing "vehicle archive." Someday a future museum was sure to welcome it.

For the regular series models for 1970, production engine chief Paul Hensler enlarged displacement on the 911 engines, increasing bore from 80 mm to 84 mm (3.1 to 3.3 in) to bring the engines to 2,195cc. To control weight, Porsche cast the engine cases in magnesium and used forged steel crankshafts, forged aluminum pistons, and Biral cylinders. Horsepower rose to 180 (132 kW) for the S model, 155 (114 kW) for the E, and 125 (92 kW) for the T. Torque outputs increased as well: it was 147 lb-ft (199 N·m) at 5200 rpm for the 911 S; 141 lb-ft (191 N·m) at 4500 rpm for the E; and 130 lb-ft (176 N·m) at 4200 rpm on the 911 T. Weights had remained steady. After nearly five years in production, Porsche discontinued the 912 model. Zuffenhausen shops had assembled 28,333 of the 912 coupes and 2,562 Typ 912 Targas. In its place, the company unveiled the mid-engine 914, from a joint project between Porsche and Volkswagen (VW). The standard 1,679cc opposed four-cylinder modified Volkswagen engine provided 80 hp (59 kW) at 4900 rpm and 98 lb-ft (133 N·m) of torque at 2700 rpm. A sportier version, the 914-6 offered buyers 110 hp (81 kW) at 5800 rpm and delivered 116 lb-ft (157 N·m) of torque at 4200 rpm in a strictly two-seater weighing 940 kg (2,072 lb).

Model year 1970 introduced a new series of engines. The original 1991cc opposed six-cylinders had been designated Typ 901. The new Typ 911 engines displaced 2195cc, and Porsche used this across the lineup for its 125 hp (92 kW) Typ 911 T, the 155 hp (114 kW) Typ 911 E, and the 180 hp (132 kW) Typ 911 S. *Photo by Randy Leffingwell*

Series car prices crept upward, a result of the innovations on board and deutsche mark to USD exchange rate shifts. Porsche had listed the 1969 Typ 911 S Coupe for DM26,918 ($6,867) at Zuffenhausen. The 1970 model went for DM27, 193 ($7,450). The Targa added DM2,220 ($608). *Photo by Randy Leffingwell*



The Porsche 911 T engine carried over its fuel induction through triple-throat Weber 40 IDT 3C carburetors. Both 911 E and S models relied on the Bosch two-row mechanical fuel injection, introduced so successfully at the 1969 Marathon de la Route. *Photo by Randy Leffingwell*

8

1971 TYP 911 T/E/S

Minor upgrades in ignition and injection systems went into the 1971 model year cars to meet evolving emissions restrictions. However this caused no change to horsepower and torque output across the lineup.

Zuffenhausen paint shops expanded the number of standard colors from 13 in 1970 to 22 for 1971. Burgundy Red joined Bahia Red. There were now six greens available: Irish, Metallic, Conda, Signal, Leaf, and Green Turquoise. Some of these migrated from the Special Order list, which was shortened from 17 to 9 choices. *Photo by Randy Leffingwell*

The economy had a larger effect. Porsche watched the value of the deutsche mark (DM) climb against the US Dollar (USD), rising from DM3.92 in 1969, to 3.65 in 1970, to 3.48 in 1971. Model prices rose in the United States because dollars bought fewer deutsche marks and a recession there made it worse. As employees waved off the 150,000th Porsche from the assembly line, a 911 S bound for a seven-time buyer in the United States, Ferry cut production and then shortened the work week. Output fell to 11,715 cars, the lowest level in five years.

That was the public news. Inside Zuffenhausen Works, a bigger problem loomed. As each of Ferry's and his sister Louise Piëch's children finished university, they expected a job in the family business. Among those already inside, disagreements challenged the direction the products were going and soured relationships among family members in the company.

Ferry was 61, and he was not yet ready to step away from the company he had built. To better manage the rivalries, he called a family meeting in the fall of 1970 at the family farm in Zell am See, Austria. An outside consulting firm orchestrated the agenda. The result was startling considering Porsche was a firm whose founders, Ferry and Ferdinand, had resolved to keep the company family owned and controlled. To restore peace and improve profits, family members vacated their jobs in Germany and at the Piëch family holding in Austria. Only Ferry remained at his post as chairman of the Porsche Supervisory Board. Within a year, all the family members were out or nearly so, opening these positions to professional outsiders. Butzi Porsche left almost immediately to establish an independent industrial design firm, Porsche Design, in Zell am See, Austria. Ferdinand Piëch transferred laterally at Weissach and directed Porsche's engineering work for outside clients. He joined Audi in 1982 as an engineer. But now, Porsche needed new managers.

Louise's son, development chief Ferdinand Piëch, believed 911 series engines demanded dual overhead camshafts. Ferry's son, Hans-Peter, head of production since 1965, felt the single cam system was fine, and for racing, he advocated increasing displacement to fill future needs *despite* Board approval for the twin cams. *Photo by Randy Leffingwell*

Mechanics increased bore to enlarge displacement to 2395cc. The Tour de France Auto competed in races and hill climbs while traversing French roads at normal speeds. For appearances, the car ran a production muffler. For the Tour de France, mechanics had hollowed it out. *Photo by Randy Leffingwell*

Ernst Fuhrmann returned to Porsche, soon becoming head of the company's Executive Board. He had designed the complex four-cam Carrera engine for 356s and racing cars, but left in 1957, frustrated by not receiving a promotion he believed he deserved. In September 1971 he returned to a better job but one with big headaches.

Fuhrmann inherited a joint project with VW to replace the aging Beetle. Porsche's concept fitted a low profile under the rear seat to maximize space inside the compact sedan. Piëch and Helmuth Bott, with stylists from Tony Lapine's design studio (another new arrival, from Opel at Russelsheim) took it further and developed a handsome low-engine variation to replace the 911. This sports car used an opposed six-cylinder engine for power. Piëch also conceived a double flat-six either as a pair of stacked sixes or an opposed twelve-cylinder as an ultrahigh performance variation. Volkswagen had a sports car on their drawing boards as well.

But then VW's board fired its general manager, Kurt Lotz, and the new chairman, Rudolf Leiding, reviewed all upcoming projects. Leiding killed the Porsche-designed car, which meant Porsche no longer had a ready

successor for its 912 nor a longer-term 911 replacement. Porsche had an agreement with VW, using Weissach as their development center. These fees had covered the entire costs of Weissach. In light of tightening emissions regulations, VW's top management made the decision to abandon air cooling and rear drive. The aim for the future was a water-cooled front-engine with front-wheel drive, and Porsche did not fit in to that plan. Now at Weissach there was neither work nor revenue!

Fuhrmann had watched the winds of automotive politics blowing across the Atlantic Ocean. Ralph Nader's vendetta against General Motors (GM) for penny-pinching Corvair's engineering development had blurred the lines between fault and fiction, and rear-engine, air-cooled design shouldered the blame. Was Porsche the next target in Nader's sights?

One year remained on the existing contract with VW. Porsche's Supervisory Board had scheduled the 911 to disappear in 1973 or perhaps in 1974 when strict new emissions and safety standards went into effect in the United States. VW's Rudolf Leiding threw Weissach a bone, asking them to develop an economical front-engine water-cooled sporty coupe. The idea paralleled one Fuhrmann had quickly conceived for a luxury 911 successor.

Work reenergized Weissach. Project EA425 for Volkswagen entered the registries, appearing in a second column as Typ 924, an entry-level sports car with a Porsche badge, reminiscent of the 914-4 and 914-6 models. A luxury GT car was another automobile Fuhrmann wanted, and he meant it to remain purely Porsche. But with years of development ahead of the new cars, Fuhrmann reconciled his need to keep the 911 alive.

The race shops relied on a 911 S series production floor pan, body structure, and rear fenders, but replaced front fenders, deck lids, doors, and bumpers with fiberglass. Side windows were thinner-gauge plexiglass. It weighed only 789 kg (1,739 lb). *Image courtesy of Porsche Corporate Archives*

When works driver Gerard Larrousse learned mechanics had trimmed his Tour de France Auto entry to 800 kg (1,764 lb), he offered them one bottle of champagne for every additional kilogram (2 lb) to go. When they finished at 11 kg (24 lb), Larrousse delivered a case of champagne, setting off a great celebration. *Photo by Randy Leffingwell*

9

TYP 911 T/E/S AND BRUNO KREIBICH'S RSR 3.0

The Porsche's 911 production for the 1972 model year introduced the new 2341cc engines, with its increased displacement achieved by lengthening the stroke from 66 mm to 70.4 mm (2.6 to 2.8 in) via a new crankshaft.

Aside from unique rally car re-creations, the series line gained some improvements with new 2,341cc engines. This resulted from more stringent exhaust emissions standards and the steady disappearance of premium fuels with tetraethyl lead. In a one-year experiment, body engineers relocated the dry sump oil reservoir to the passenger side B-pillar for vehicle balance. *Image courtesy of George Reilly Collection*

United States emissions regulations and the requirement that American cars run on unleaded fuel dictated these engine changes beginning in 1973. Power Output increased by 10 hp (7 kW) across the lineup. The 911 T, using new Solex-Zenith carburetors, produced 130 hp (96 kW) at 5600 rpm. Output for the Bosch mechanically fuel-injected Model E increased to 165 hp (121 kW) at 6200 rpm, and the flagship Model S delivered 190 hp (140 kW) at 6500 rpm. Torque increased as well, benefitting drivers who faced traffic more frequently than open roads. The new Typ 915 four-speed transmission revised the shift pattern into a simple *H*, with first ahead of second rather than back and to the left (the dogleg shift pattern). Racers and rallyists welcomed this in every tight corner that demanded a two-one-two shift to make maintain the best cornering speed.

Other innovations emphasized weight, balance, and competition. Ferdinand Piëch had wanted to move the dry sump oil reservoir from its rear fender location, and for 1972, it settled into the bodywork behind the passenger door. A trapdoor on the B-pillar below the back window gave access to the filler. Lastly Porsche fitted the new chin spoiler to the front valance of the Typ 911 S and offered it as an option on the T and E models.

Porsche charged DM22,980 ($7,204) for a base 911 T coupe for 1972 model year. The E went for DM25,980 ($8,144) for a 1972 model. The 911 S sold for DM30,680 ($9,618). All these prices were ex-factory. The Boge hydropneumatic struts and suspension system that was standard through 1971 now became optional across the 911 lineup, although so few customers ordered it that it disappeared before the model year ended.

This car is actually a mix of the rally car from the East Africa Safari Rally and a Marathon de la Route racing car. The engine was powerful, for racing the Marathon de la Route, and the suspension and the rest of the car was made for navigating the East Africa Safari Rally. *Image courtesy of George Reilly Collection*

"The funny story was the revelation that we had to use a *used* car from the United States to do this business," Schmid said. Bruno essentially wished Porsche to build him a brand new 1972 RSR 3.0 in 1978. This way the engine had only to meet emission regulations for 1972. *Image courtesy of George Reilly Collection*

Those US emissions regulations mentioned above reduced 911 performance for several years and led to the creation of our feature car, the 911 RSR 3.0, the result of a rather amazing going backwards to go forward tale.

The coming US emission regulations reduced performance of the cars for several years. And they led to a kind of we-could-do-this-then-but-not-now tale.

In New Jersey, Bruno Kreibich was a successful competitor in the Sports Car Club of America (SCCA) ProRally Series, running a heavily modified 911 T. After damaging it during a rally in 1978, he wrote to Gerd Schmid, Porsche's Customer Motorsport rally specialist. Their initial contact exchange was confusing.

"For us, nobody understood what Mr. Kreibich wanted to do with this car," Schmid explained in an interview with the author in 2022. "He just

said, "'I will have an off-road rally car from Porsche.' Bruno had a lot of information about the Safari car of 1974—I had been with the Porsche team in Kenya for the East Africa Safari [Rally]—and as the customer he made all the decisions regarding the car's exact specifications." It was clear to Schmid that Bruno knew precisely what he wanted. "The car is actually a mix of the rally car from East Africa and a route racing car. The engine was powerful like for a racing car, and the suspension and the rest of the car was like for the Safari.

"The funny story was the revelation that we had to use a *used* car from the United States to do this business," Schmid said. Bruno essentially wished Porsche to build him a *brand new 1972* RSR 3.0, but do so in the year 1978. This way the engine had only to meet the emission regulations in effect for 1972. But the car also had to carry a USA vehicle identification number (VIN). "It was amazing to have Porsche build a 1972 car in 1978," Schmid went on. "It was a special job." Porsche, naturally, could not assemble a new car in 1978 to 1972 specifications. So Bruno found a donor 1972 911 T coupe and shipped it to Zuffenhausen. "At Werk 1 we took everything off the car, even the wiring and the carpet, and we employed an outside company to clean the bodyshell through glass media blasting. Then we repainted the body to be as new and then put everything back on the car. Bruno was explicit in his instructions that the data plate never be removed from the car.

"When the car left Porsche,. It was like a brand new–built car with the old bodyshell," Schmid said. "It was *very* expensive. Today Porsche cannot do this; it does not have such a facility any more. There's no workshop like we had in those days. Porsche has not built, again, such a car for any customer in the world. The transformation of this car was so expensive . . . it's a unique car, a hand-made Porsche race car/rally car." It was expensive indeed. The parts list to construct the car ran 11 pages, listed 372 items, and represented DM74,465.60 in parts alone ($37,232.80 at the time and about $174,234 today). It's reasonable to estimate labor at two-to-three times that cost.

Kriebich's unique rally car ran with a 2998cc high-butterfly throttles that developed 280 hp (206 kW) at 6300 rpm with Bosch mechanical fuel injection. A rally-geared five-speed transmission coupled to a limited slip differential. The car relied on four 917-type ventilated disc brakes and calipers. Kreibich campaigned the car in SCCA and Canadian national rallies from 1979 through 1981 and won the North American Road Racing

Association (NARRA) Atlantic 200 in New Jersey with Jeff Becker navigating in November 1980. Kreibich switched to Audis in the early 1980s when their four-wheel-drive proved advantageous. He retired the RSR. Some years later a rally car collector acquired it, participated in some track days and vintage events and then retired it to his collection. He sold it on Bring-A-Trailer in late 2022.

The parts list to construct the car ran 11 pages, included 372 items, and represented DM74,465.60 in parts alone ($37,232.80 at the time). It's reasonable to estimate labor at two to three times that cost. *Image courtesy of George Reilly Collection*

Kriebich's unique rally car ran with a 2998cc high-butterfly opposed six-cylinder that developed 280 hp (206 kW) at 6300 rpm with Bosch mechanical fuel injection. A rally-geared five-speed transmission coupled to a limited slip differential. The car relied on four 917-type ventilated disc brakes and calipers. *Image courtesy of George Reilly Collection*

10

1973 TYP 911 T/E/S AND CARRERA RS

After watching a local race soon after returning to Porsche, Ernst Fuhrmann was shocked to see BMWs and even Ford Capris outhandling the 911s, indeed passing them in turns.

Porsche restored the dry sump oil reservoir to the extreme rear of the car. Ferdinand Piëch had argued the B-pillar position improved vehicle balance and handling. Unfortunately its exterior filler cap encouraged service station attendants to believe this was the fuel tank yielding disastrous results. *Image courtesy of Porsche Corporate Archives*

He challenged a young engineer on the spot to devise a solution, and many sleepless weeks of design, experimentation, and wind tunnel work eventually yielded a small front lip now affixed to the nose of every 911 S and optional on T and E models. Holding the front of the 911 down to the ground clarified its other aerodynamic problem: rear lift. Seen in profile, Fritz Plaschka's long, curved roofline resembled an airfoil too much for its own good. And just as an airplane wing relied on flaps at the rear to control rise or descent, the 911 also needed a flap.

On Fuhrmann's orders, the aero team went back into the wind tunnel with masses of heavy cardboard, tape, and a warning not to come out until the back end stuck to the ground as well as the front did. Days later, the *burzel* appeared. This was the ducktail spoiler that revolutionized the car's handling, changed its appearance, and influenced car designers, engineers, and marketing and sales staffs everywhere. Peter Falk's test department ran countless laps to determine its best placement and height.

Once satisfied, Falk transferred the burzel to Lapine's studios to prepare production drawings. But Lapine hated it, believing that this outgrowth destroyed the beauty and simplicity of the 911 form. This led to a moment reminiscent of the studio modifications that occurred between Erwin Komenda and Butzi Porsche. Lapine himself stood over his chief modeler's shoulder, and they steadily chopped away at it by centimeters. When Lapine's styling department presented the first actual vehicle just before production started, Falk was shocked. Lapine had sliced more than 100 mm (4 in) off to improve its appearance to Lapine's eye. It went into production much lower than what Falk and his drivers had specified.

It was a curious product. Not only did Lapine hate it but so did marketing who called it, in so many words, "ugly." They feared not only would it not sell but it might frighten away past customers.

The new model established benchmarks and trends. The Sport version, with a spartan, gutted interior, weighed 960 kg (2,116 lb). Its new 2687cc Typ 911/83 engine with bore and stroke of 90 mm by 70.4 mm (3.5 in by 2.8 in) developed 210 hp (154 kW) at 6300 rpm and produced 188 lb-ft (255 N·m) of torque at 5100 rpm. *Image courtesy of Porsche Corporate Archives*

Others had a cooler assessment and recollected a memory from autumn of 1967, marketing and sales—of all people—urged Porsche to manufacture a "Touring" version of the experimental 911 R. Sales chief Wolfgang Raether and press and motorsports manager Huschke von Hanstein felt certain Porsche could sell 500 of these special R Touring cars to their customers, whether they raced or not. Five hundred was the magic number the FIA, racing's main sanctioning body, needed to *homologate* (legalize) the car for a production-based racing class where the car could dominate.

Now, Motorsports urged for at least 200 of *this* new car for homologation purposes. Von Hanstein resurrected the arguments for a Touring version, and after probing dealers and repeat customers for reactions, the Porsche Supervisory Board approved it. It proved very wise. Marketed as the 911

Carrera RS, it generated a frenzy among Porsche's most loyal customers. It went on to score innumerable victories.

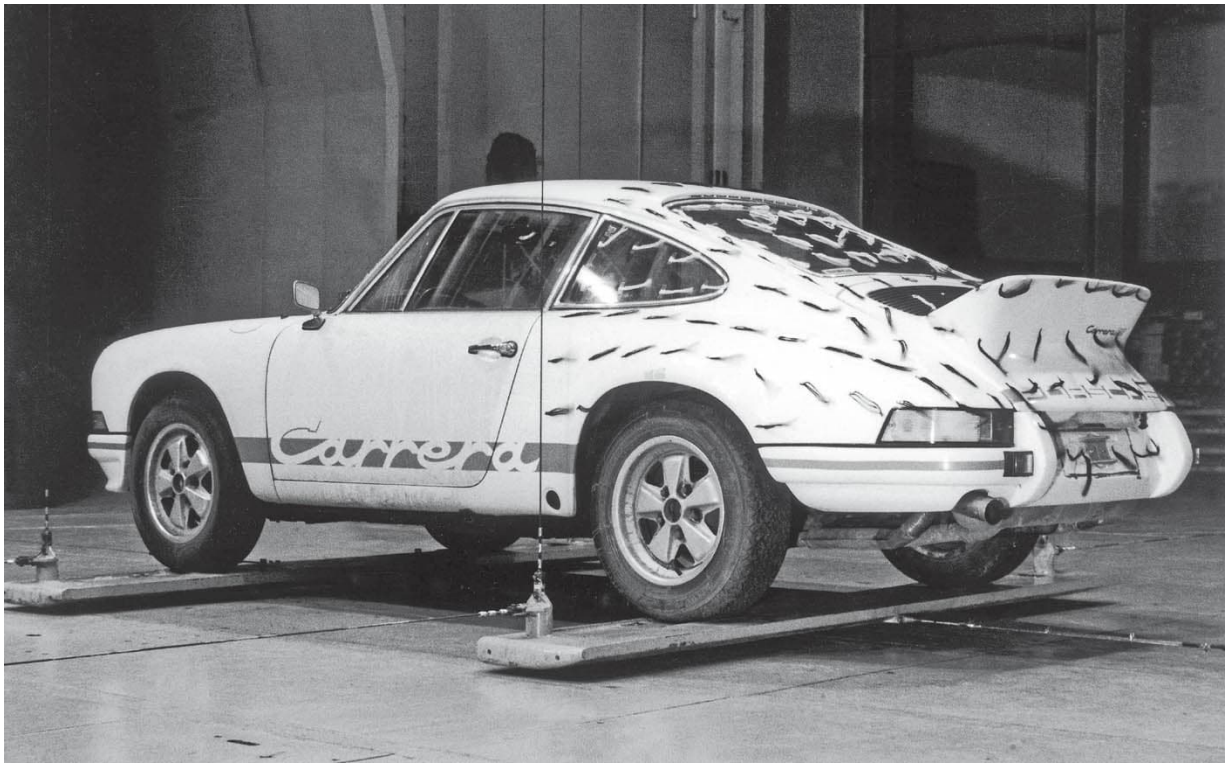
Bosch calibrated its mechanical fuel injection for maximum performance, resulting in exhaust too dirty for US emission standards. Porsche declined to retune and certify it for the United States, leaving American customers to initially wail and then to order parts to build the best replicas they could produce.

Porsche's Carrera RS Touring was marketing's salve to conservatives on the board who worried about selling such a car. The extra weight slowed the car by half a second to 100 kph (62 mph), getting there in 6.3 seconds.

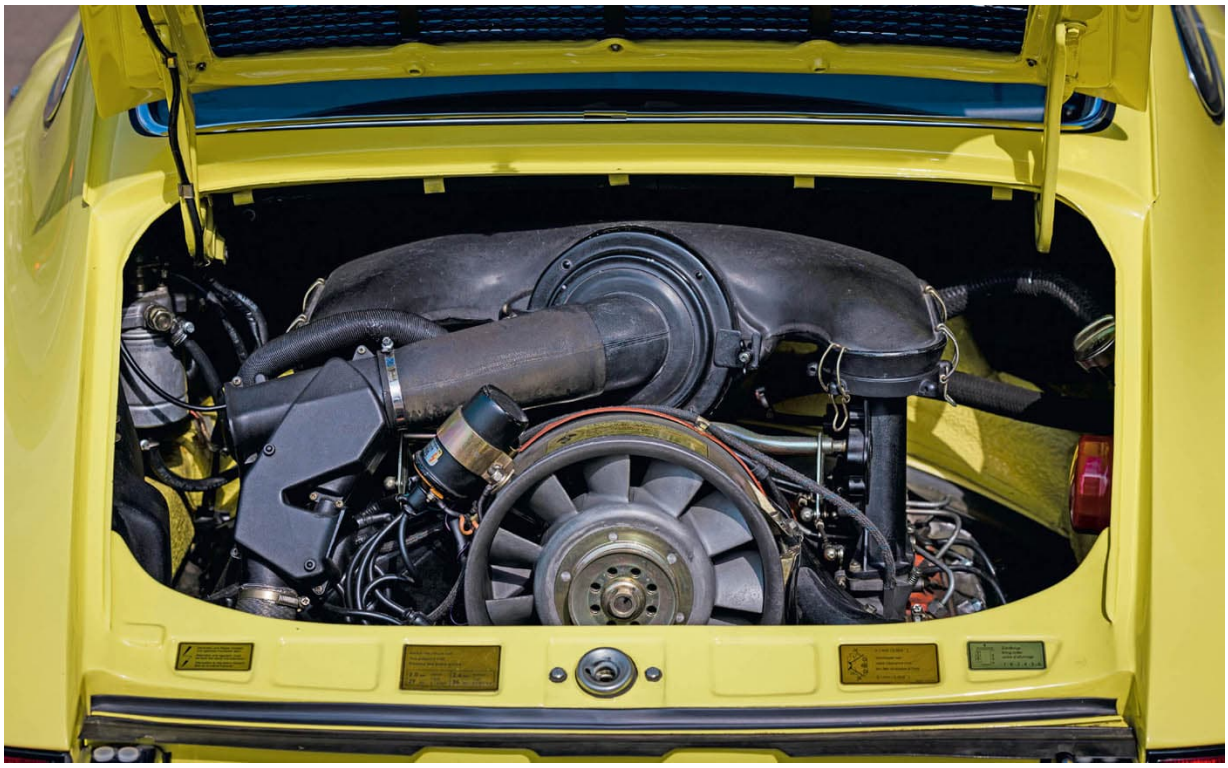
The T, E, and S models retained their 2.4-liter (146 cu in) engines, although engineers fitted Bosch K-Jetronic mechanical fuel injection to the T. This upgrade gave the engine 140 hp (103 kW) and cleaner exhaust. The E and S received new 85-liter (22.5 US gal) plastic fuel tanks and space-saver spare tires, which were optional for T customers.

At the other extreme, Motorsports produced a short run of 49 Carrera RSR 2.8s. These racing-only coupes made even the Lightweights look luxurious. Stripped and lightened, they then received an infusion of 2806cc 300 hp (221 kW) to the engine. In a car pared down to 900 kg (1,984 lb), the racing Carreras sent the racing engineers at Ford and BMW back to *their* drawing boards and slide rules.

The company delivered 200 as “Lightweights” for Group 4 homologation and another 17 completely stripped. These sold quickly and ultimately another 1,308 went out in Touring trim. When the FIA finished its count, it certified the Carrera RS as a Group 3 car, racing against a far broader spectrum of cars and manufactures. *Image courtesy of Porsche Corporate Archives*



The wind tunnel revealed the positive benefits of a rear tail. With its standard five-speed transmission, the car accelerated from 0 to 100 kph (0 to 62 mph) in 5.8 seconds and on to 245 kph (152 mph). Porsche charged DM34,000 ($12,830) at the factory. *Image courtesy of Porsche Corporate Archives*



Fitted with the full 911 S interior and optioned with an entire list of creature comforts, the 1,075 kg (2,370 lb) Touring sold for the same DM34,000 ($12,830) price ex-factory. Buyers received sound insulation, leather seats, and an electric sunroof as well as the 210 hp (154 kW) 2.7-liter (165 cu in) opposed six-cylinder, five-speed gearbox, and exterior graphics. *Image courtesy of Porsche Corporate Archives*

11

1974 TYP 911 CARRERA RSR TURBO 2.1

Late in 1970 Ferdinand Piëch dispatched one of his most trusted lieutenants, Valentin Schäffer, on a top secret mission.

Despite Ernst Fuhrmann's horror over the size, the car's rear wing is that scale because engineers and designers such as Singer, Kolb, Reitter, and others understood a second important value it gave the car beside aerodynamic stability—simple intimidation. It was outrageous by design. *Image courtesy of Porsche Corporate Archives*

By this time they knew the ultimate output of their new Typ 912 opposed twelve-cylinder engine in their Typ 917 K and 917 LH models (K for *kurz* denoting short tail and L for *langheck* denoting long tail) at 630 hp to 650 hp (463 kW to 478 kW) was nowhere near enough to compete in a no-holds-barred racing series in North American, like the Canadian-American Challenge Cup (Can-Am). Entries from McLaren, for example, used highly developed American V-8s producing 820 hp (603 kW) or 830 hp (610 kW). Schäffer and his colleague Hans Mezger already had completed one experiment, but with disappointing results. They had redesigned the flat-twelve as an opposed-sixteen. In theory adding one-third to the twelve-cylinder engine should have increased output to around 835 hp (614 kW). Unfortunately it ran out of steam at 760 hp (559 kW). But it did add a third to the weight and a third to the length, and these significantly unsettled the handling. Piëch needed power with fewer liabilities.

"You have to take care," Piëch told Schäffer, Valentin explained during an interview with the author in 2011. "Nobody should know that we are going to turbocharge the 917." "Nobody," Schäffer soon understood, extending even to those who manufactured the exhaust superchargers another name for them. This led to a near comic moment inside the conference room at Eberspächer, a firm 10 miles (16 km) away in Stuttgart. They asked Schäffer for the application for the turbocharger. Sworn to secrecy, Valentin hesitated, then gave them a number—800 hp (588 kW). It impressed the engineers who quickly saw through it: "Ach, so you are building a boat!"

In those days, turbochargers found use on piston aircraft, diesel ships, boats, trucks, and Indianapolis racing cars. Each of those was a kind of set-it-and-forget-it application. That is, once you reach speed it's steady-throttle from there on, virtually the opposite from automobile racing on European road courses. Schäffer and one trusted mechanic read everything available on exhaust supercharging and then tried it. The boost seemed limitless, and they blew up engines. Hoping to determine the instant before that, they connected a two-meter (7 ft) mercury-filled barometer to the intake side of the engine. On start-up, it shot the mercury up to the ceiling where it rained down on them. But Piëch's secrecy meant Schäffer couldn't go outside for help.

Fenders flared out to cover the 15-inch diameter and 10.5-inch wide front wheels and either 15- or 17-inch wide rears with 340/575-15 racing slicks at the back. At 2,000 mm width (79 in), the 2.1 Turbo was 348 mm (14 in) wider than the new series 911 Carrera coupe, which was 1,652 mm (65 in) wide. *Image courtesy of Porsche Corporate Archives*

The engine specifications evolved from the success Porsche achieved in the United States Can-Am series. This compact opposed six-cylinder displaced 2,142cc. Bore and stroke were 83 mm by 66 mm (3.3 by 2.6 in). With its large KKK turbo on boost, the engine produced 500 hp (368 kW) at 7600 rpm and developed 408 lb-ft (553 N·m) of torque at 5400 rpm. *Image courtesy of Porsche Corporate Archives*

Slowly, steadily, they learned to control the turbos, picking up hints here and there. During a visit to Gulf Oil Research in Pennsylvania, Schäffer watched several Penske Indy cars measured on shock dynos. Each engine had a wastegate that automatically released excess boost. Schäffer bought one on the spot and returned home with it in his hand luggage. That was the turning point.

Piëch's Typ 917 racing program to win the International Championship for Manufacturers had been so expensive that after Porsche won the Can-Am series in 1973, there was no money left for any other racing. Yet racing was ingrained in Porsche's DNA. Each deutsche mark invested provided accelerated development testing and enhanced publicity simultaneously. Things were dire inside Porsche, but like Schäffer's turbos in 1971, no one could know. Facing the challenge of persevering with their bread-winner, the Typ 911, Chief Executive Officer (CEO) Ernst Fuhrmann challenged them to

turbocharge it for racing. The result was the first of a series of ever-more outrageous race cars: the Carrera RSR 2.1 Turbo.

FIA regulations—conservatively—calculated turbos as worth 40 percent more displacement. Thus, a 3.0-liter (183 cu in) class limited actual engine displacement to 2.1 liters (128 cu in). Porsche already had developed a 2994cc naturally aspirated engine for racing, the Carrera RS 3.0, along with a series production offering due in 1976. Reducing cylinder bore from 95 mm to 83 mm (3.8 in to 3.31 in) and shortening piston stroke from 70.4 mm to 66 mm (2.8 in to 2.6 in) gave Hans Mezger 2142cc overall displacement. By the end of the 1974 season this 2.1-liter (128 cu in) turbo was developing 500 hp (368 kW) at 7600 rpm, and the car weighed only 750 kg (1,653 lb).

With such a power-to-weight ratio—3.31 lb/hp (2.04 kg/kW)—Norbert Singer took drastic steps to keep the car on the ground. With a top speed of 300 kph (186 mph), the rear always fought with gravity. Ultimately Singer hung a massive 2 meter (78.7 in) wing off the back. “It was too big, too ugly. Paint it black so no one will see it . . .,” Fuhrmann told Singer. He was outraged. Black seemed instead to highlight it, but it made the car manageable through corners. Porsche revealed that the 2.1 Turbo accelerated from 0 to 100 kph (0 to 62 mph) in 3.2 seconds and reached a top speed of 300 kph (186 mph).

This new Carrera, a member of the soon-to-belegendary G-Series, carried over the 2687cc opposed six-cylinder Typ 911/83 with 210 hp (154 kW) at 6300 rpm. The S moved to the middle of the lineup with 175 hp (129 kW) at 5800 rpm. The base 911 coupe and Targa—with 150 hp (110 kW) at 5700 rpm—replaced the T and E. Bosch’s K-Jetronic mechanical fuel injection system controlled these 2.7-liter (165 cu in) engines. Porsche’s new front runner, its RS Carrera 3.0 coupe, was the natural successor to the limited-edition RS 2.7. It offered customers 230 hp (169 kW) at 6200 rpm, via the Bosch Continuous Injection System (CIS).

The Carrera RS 3.0 was essentially a racing homologation model. Porsche manufactured only 110. Porsche priced the RS 3.0 at DM64,980 ($25,186). The Carrera coupe was DM37,980 ($14,721). The S sold for DM30,980 ($12,008), and the 911 was DM26,980 ($10,457). *Image courtesy of Porsche Corporate Archives*

The G-Series introduced subtly revised bodywork incorporating 8 kph (5 mph) "safety impact" bumpers required by US regulators. Style Porsche director Tony Lapine began replacing chrome trim on the 911s with anodized black or pieces painted in body color. This extended from headlight surrounds to "brightwork" around the taillights. *Image courtesy of Porsche Corporate Archives*

12

1975 TYP 930

Porsche's successful 911 Carrera RSR 2.1 Turbo aimed a spotlight along their future racing path. Valentin Schäffer and Hans Mezger developed a car for FIA Group 5, a so-called "silhouette" class of motorsports. These cars allowed substantial modification but still had to fit within a shape resembling the series production models.

Porsche had a history of nicknames. Sometimes the monikers leaked out and other times, they remained in-house. Outsiders, especially in the United States, came to call this turbo spoiler a *whale tail* design, but employees knew it as *the antlers. Photo by Randy Leffingwell*

The FIA required 200 examples, and Porsche designated the race car the Typ 935. A less-modified version, the Typ 934, was destined for the broader-production Group 4. But for both of these, the FIA demanded a series production model. So while Schäffer and Mezger worked on the 935 and Wolfgang Berger tackled the 934, a third engine designer, Herbert Ampferer, got the assignment for the Typ 930, the series from which the racers were to emerge.

Robert Binder was head of the engine design department. He assigned Ampferer to "layout" the new turbo engine (Typ 930), that is, figure out its location and plan its plumbing. Turbo technology in those days, 1970 and 1971, was unsophisticated. Turbos served needs—boats, trucks, and airplanes—unrelated to any kind of rapid throttle response.

The 930 reached its first European buyers in late 1974. The new 2,994cc engine returned Porsche to aluminum alloy crankcases. With normally aspirated compression at just 6.5:1, when the KKK turbocharger spooled up to its 90,000 rpm operating speed, it forced air into the cylinders at 0.8 bar (11.3 psi, or 77.9 kPa). *Image courtesy of Porsche Corporate Archives*

Michael May, an engineer who had worked briefly for Porsche during the mid-1950s, was producing a turbocharging kit for Ford Capris. The car suffered lengthy turbo lag, the response time from throttle pedal input to engine reaction. Porsche acquired a Turbo Capri for testing. Ampferer remembered one drive where, by the time the Turbo input reached the engine, he was headed toward a concrete wall. Fortunately the Capri also had good brakes. But it was a wide-eyed introduction to turbo response. As Ampferer thought—and Schäffer confirmed—exhaust feed length to the turbo and its compressor output to the cylinders directly affected turbo lag. Hoping to mount the turbo close to the intake manifold, Ampferer asked Binder what factors he had to consider in his design. Did they need air-conditioning or a rear window wiper? Both systems consumed space in the compact engine compartment. Binder assured him this was simply a car for homologation—neither air-conditioning nor the wiper were needed. But then, sales and marketing started considering factory upgrades such as a sunroof and luxury options like leather interior. Ampferer had no choice but to start from scratch.

They experimented with prototypes. One used a 2.7-liter (165 cu in) engine. Earlier, in 1969, Schäffer had mounted turbos on 2.0-liter (122 cu in) 901 engines. One turbo sat *on* the rear deck lid of a 911 coupe, while another protruded from the engine compartment of a 914-6. Despite external mounting, both suffered critical cooling problems. The 3.0-liter (183 cu in) series engine developed from the 2.7 had seemed a good place to start.

Porsche revealed the Typ 930 at the 1973 Frankfurt IAA. With so much work remaining, that car appeared on the stand with a wooden mock-up of the turbocharger and all its tubing. The undrivable show car appeared at Paris a month later. But to emphasize the new bits, Lapine's stylists copied an idea from the RS Carrera 2.7, writing *Turbo* in bold script lettering on the side. Deliveries began in-house in early 1974. Assembly-line workers paid special attention to production number 001, now wearing a script *PORSCHE* on its doors.

On August 29, 1974, Ferry Porsche personally presented 001 to his sister Louise Piëch as her 70th birthday gift. Styling painted the body silver. A red-and-black plaid, a favorite combination of Louise's, finished the interior, and styling repeated it for the outside lettering. The car was unique. It used a turbocharged 2.7-liter (165 cu in) prototype engine. And because Louise was

a *plein-air* painter who wished always to see landscapes as they were, none of the windows used tinted glass. What's more, her car was a narrow-body prototype, similar only to a handful of others. Ernst Fuhrmann also had a narrow-body prototype, but he, who had been scandalized by the 2.1 Turbo rear wing, ordered manufacturing to delete the standard whale tail spoiler. No doubt Louise's son Ferdinand Piëch assured her of its usefulness, and her car wore its whale tail proudly. Porsche debuted its new leader at the 1973 Frankfurt show and deliveries began early in 1975.

The engine developed 260 hp (191 kW) at 5500 rpm. Porsche quoted acceleration from 0 to 100 kph (0 to 62 mph) in 5.5 seconds and a top speed of 250 kph (155 mph), making the coupe with its prominent rear wing the fastest German production car of its time. Buyers paid DM65,800 ($26,748) at the factory. *Image courtesy of Porsche Corporate Archives*

Despite the Turbo's distinctive width and wing, trim on all the 1975 models was otherwise subdued. Headlamp bezels and exterior mirrors matched body colors. The Targa bar went flat black. In addition to the high-performance Turbo, the company offered base 911, 911 S, and 911 Carrera models as well as a special 25th-anniversary edition painted silver with blue/black leatherette inside to commemorate a quarter century of manufacturing automobiles in Zuffenhausen. Carrera and Turbo coupes ran on Fuchs wheels. While base and S models introduced cast aluminum wheels from ATS that quickly earned the nickname "cookie cutters."

Porsche widened almost every Turbo body by about five inches (13 cm) to accommodate much wider wheels and tires. But Ferdinand Piëch gave this one—production number 001—to his mother Louise for her birthday. As a painter, she requested non-tinted glass.
Photo by Randy Leffingwell

Not only were Ampferer's dreaded air-conditioning and rear wiper standard equipment, but sales and marketing added full-leather upholstery, a four-speaker stereo system, electric window lifts, and automatic heat control. For this gift, Louise Piëch also received her favorite plaid interior. *Photo by Randy Leffingwell*

13

1976 TYP 935, TYP 934, AND OTHER WONDERS

FIA regulations defined Group 5 as “Special Production,” series production with significant modifications. For project manager Norbert Singer, weight control was critical.

Even with its substantial overhanging tail, the Typ 935 measured just 4,680 mm (184 in) in length. Because its racing class was derived from series production vehicles, this had to retain the 2,271 mm (89 in) wheelbase of the 911 models. *Image courtesy of Porsche Corporate Archives*

Singer replaced steel torsion bars with titanium coil springs surrounding front and rear dampers. Drivers adjusted the rear anti-sway bar while moving. Norbert adopted Typ 917 brakes with drilled, ventilated rotors and four-piston alloy brake calipers. One-piece magnesium-alloy wheels measured 11 x 16 inches up front and went as large as 14.5 x 19 inches for the rear wheels. *Image courtesy of Porsche Corporate Archives*

Mechanics gutted the interior, removed rustproofing and soundproofing, and replaced steel fenders, doors, and deck lids with fiberglass. Body engineer Eugen Kolb designed a one-piece nose of thin fiberglass incorporating a front air dam and fenders. Removing this nose gave mechanics quick access to suspension, steering, brakes, oil coolers, and other front end functions. Rules required carmakers to retain the original rear of the bodywork but allowed longer tails to improve aerodynamics. Singer cleverly mounted a revised rear window and roof assembly *on top of* the original. The windshield and driver's window remained in safety glass but all others were swapped out for plexiglass.

Valentin Schäffer and Hans Mezger reworked the series 930 Turbo. Reducing cylinder bore from 95.0 mm to 92.0 mm (3.7 in to 3.6 in) but retaining 70.4 mm (2.8 in) stroke gave them 2806cc overall displacement. With a single massive KKK turbocharger at 1.5 bar (22 pounds per square inch [psi], or 152 kilopascals [kPa]) boost, the engine developed 590 hp (434 kW) at 8000 rpm. For most racing purposes, engineers reduced boost to

1.3 bar (19 psi [131 kPa]), rewarding them with a relatively frugal 4.38 mpg (53.7L/100 km). A new four-speed transmission allowed complete gear-cluster exchanges without removing it from the car.

Since Porsche was the only team ready for the 1975 Group 5 season, the FIA postponed those regulations till the 1976 season to encourage others to join the grid. Meanwhile it had established minimum weights based on calculated displacement, that is, the actual 2,806cc multiplied by 1.4, for a total of 3,928cc. This 4.0-liter (244 cu in) figure dictated a minimum of 970 kg (2,138 lb). Singer's hard work paid off: their prototype weighed 900 kg (1,984 lb)! He had to *add* 70 kg (154 lb) ballast to the car. Following its 1,000 km (621 mi) rough-road tests at Weissach, Singer and his team took the car to Circuit Paul Ricard in southern France and ran another 6,000 km (3,728 mi) of tests. Singer optimized ballast placement—some in the nose and the rest in the passenger footwell, the weight balanced at 47/53 percent on front and rear tires.

During this extra year, racing engineers helped in the series 930 launch, provided support to privateers who raced normally aspirated RSRs, and worked on their Group 4 Typ 934. This class adhered more closely to production origins. Still this Typ 934 was a capable race car. A gutted interior, all black, with a rigidly mounted roll cage eliminated any doubts. Weissach fitted plastic wheel extensions instead of a one-piece plastic fender/air dam structure to accommodate the wider wheels and tires. Rules required stock window glass and the 934 weight minimum was 1,120 kg (2,469 lb).

Group 4 regulations limited Singer's chassis creativity to altering the suspension stiffer springing, different dampers, use of some reinforced parts and racing brakes, and more precisely locating moving parts. Cleverly these 934 improvements enabled engineers to revise the series production 930 during the year.

Rainer and Dieter Buchmann founded b+b Auto in Frankfurt in 1973 to modify customer cars. In 1976 Polaroid of Germany asked them for a Porsche Turbo Targa (Porsche didn't do this yet) painted in their rainbow logo scheme for display at Photokina, Europe's most important photo trade show. Afterwards, the car toured widely. *Image courtesy of Porsche Corporate Archives*

The 934 ran a turbocharged 2993cc engine. Mezger and Schäffer substantially modified the Bosch K-Jetronic injection system to meet racing demands in contrast to the road-going Typ 930s. Because 934 bodies had to follow production lines, tricks that Singer and Eugen Kolb used to improve aerodynamics and accommodate the 935's massive air intercooler were impossible. They adopted a water-cooled system instead, mounting radiators in front with plumbing and pumps to move the water around. Engineers calculated the weight addition at 20 kg (44 lb). This was no problem. The 934's minimum weight requirement even let it use the electric window lifts of the production 930s.

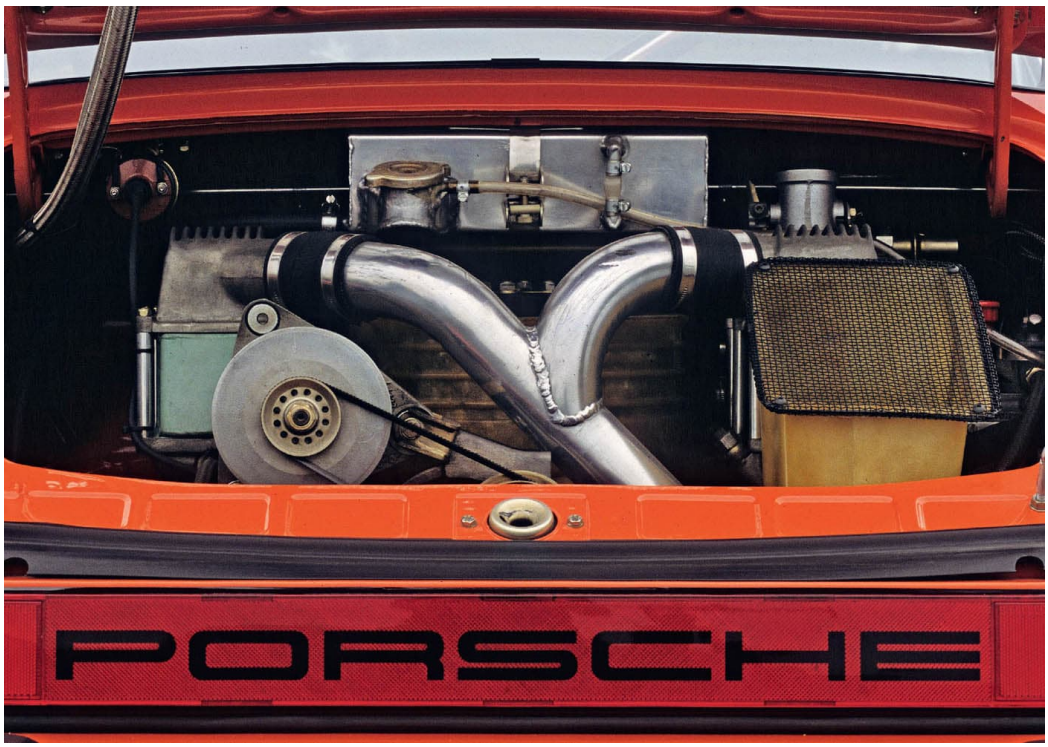
The same regulations applied to the Typ 934 as the Typ 935. Based on the series production Typ 911, the wheelbase was 2,271 mm (89 in). Its slightly different appearance, a bit boxy, somewhat cobbled-together, disguised another detail: the 934 was the same length as the 935 at 4,680 mm (184 in). *Photo by Randy Leffingwell*

When the 1976 season began, only Porsche had a true 935 Group 5 car—and it had only one. The FIA required no minimum production in the Special Production category. So it homologated the 935 in Group 5 and the 934 in Group 4. In an effort to flesh out the starting fields, Singer's competition group developed a kit to upgrade 934s into a 935. Known as 934/5 or 934.5, privateers Georg Loos, Egon Evertz, and others were competing with them by mid-season.

In the United States, a shoving match between the SCCA and International Motor Sports Association (IMSA) challenged Porsche and car owners alike. SCCA's Trans-Am series accepted the 934, as built, for the 1976 season. When IMSA opened its doors to the 934, it allowed owners to run the cars with the 935 conversion kits, and Weissach responded with an IMSA package that racer Bruce Canepa called the 934 1/2. This meant that for his team and others contesting both series, they needed two cars with two sets of spares.

At the other end of the spectrum from the silver, red, and blue Martini-liveried Typ 935s and multicolored private 934s, a designer named Rainer Buchmann, who was manager of b+b Auto-Exklusiv-Service in Frankfurt,

responded to inquiries from his customers for something different, something special. His mechanics converted a Porsche 911 coupe into a Targa, added a new Turbo whale tail, and painted it in the rainbow color scheme of the Polaroid Corporation. Buchman displayed the car in Polaroid's booth during the biennial Photokina international photo equipment trade show in Frankfurt. Buchmann referred to himself as a car "couturier," in the style of the French fashion houses at the time.



The intercooler system reduced fuel temperature from roughly 300°F to 120°F (149°C to 49°C), dramatically improving charge density. The 2,993cc engine, with its 1.4 factor, "displaced" 4190cc and developed 485 hp (357 kW) at 7,000 rpm. By late 1976 privateers achieved as much as 580 hp (427 kW). *Photo by Randy Leffingwell*

His company installed a lavish interior in the Polaroid car, and it caused as much attention as any camera innovation in the show. For the next several years, b+b Auto innovated liberally on Porsche and Mercedes-Benz models, performing a customer service—and spawning a number of similar outside "tuners"—that Porsche in Zuffenhausen watched very closely.

14

1977 TYP 935 2.0 “BABY”

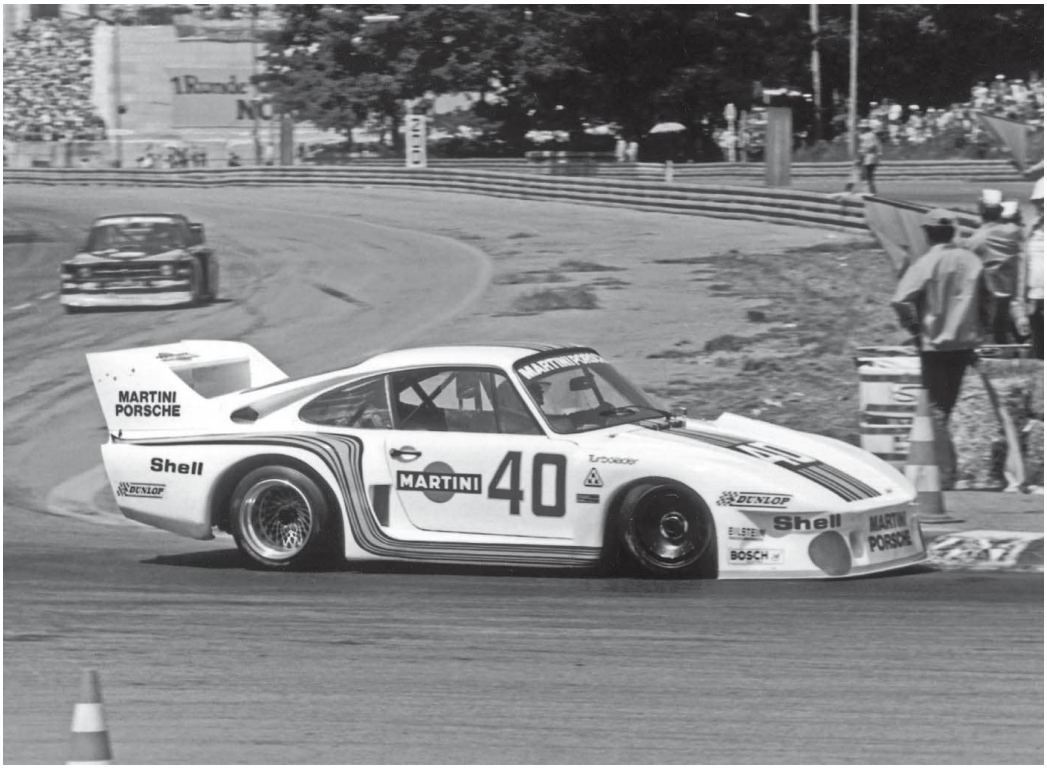
Porsche introduced *twin-turbo* versions of the 935 for the 1977 racing season, and it increased support of private teams. Weissach prepared three new Typ 935/77 models.

Smaller front and rear tires on “Baby”—11 x 16 inches front and 13.5 x 16 inches rear—improved her aerodynamics. This was a significant factor in her second race at Hockenheim that incorporated a pair of gently sweeping high-speed straights out to a large, gentle hairpin. The slippery body helped Ickx create his 52-second lead by the finish. *Image courtesy of Porsche Corporate Archives*

It proved essential as the works-entered 935s won four of the nine championship points races, while five privateers, Dave Helmick at Daytona, Georg Loos at Nürburgring, Ludwig Heimrath at Mosport, Canada, the Kremer brothers at Hockenheim, and Scuderia Vesuvia in Italy at Vallelunga earned the other necessary points to the totals. And it was largely Norbert Singer's doing: FIA regulations allowed aerodynamic enhancements so long as the original silhouette remained unchanged. Singer's solution shrouded the original body with an aerodynamic shell that mounted a second rear window—at a flatter angle to enhance laminar airflow—outside the first. Throughout 1977 and 1978, Weissach sold 935/77 models to a variety of customers.

Porsche had dominated the World Championship for Makes (WCM) in 1976 with its initial Typ 935-01. The Typ 935/77 early in the second season was so successful that Porsche found itself discriminated against in several unusual ways. It motivated BMW to regroup as a 2-liter (122 cu in) competitor in the Deutsche Rennsport Meisterschaft (DRM, the German Racecar Championship), running against well-prepared Ford Escorts. Spectators and journalists had begun to suspect that each marque had its own series: Porsche owned the WCM, and Ford had the DRM. As Belgian journalist and former Porsche racer Paul Frère explained in his *Porsche 911 Story*, "The press was not always very kind to Porsche for not joining the Ford-BMW battle, sometimes even implying that they were afraid to do so." The truth was simpler, but only Frère had asked the question. The answer was Porsche had no car for that class.

And then came the discrimination: In early April Fuhrmann learned that German television planned to broadcast *only* the 2-liter (122 cu in) race, ignoring the larger-displacement Porsche parade at the Norisring in early July. Fuhrmann told his engineers to think about this and tell him what they planned to do.



This "Baby" was conceived in March 1977. Porsche, by this time, was known for quick gestations, often in fractions of the time humans needed for the same process. The birth date was set in advance, July 3, just four months. To race in this 2.0-liter (122 cu in) class required an extreme weight loss. *Image courtesy of Porsche Corporate Archives*

Neither Singer nor Mezger had planned any such activity. However, over the next two months, the two developed a car. To meet the displacement limit, Mezger created a 1425cc version of their existing engine using bore and stroke of 71.0 mm by 60.0 mm (2.8 in by 2.4 in). This yielded 1425cc, equal to 1995cc with the multiplier, just within the 2.0-liter (122 cu in) limit. Singer found ways to pull a further 240 kg (529 lb) out of their 970 kg (2,138 lb) Typ 935/77 race cars. This brought one down to the 735 kg (1,620 lb) minimum for the 2-liter (122 cu in) class. In fact, just as he and body designer Eugen Kolb had done with their 935/76, they went too far, reducing weight to 710 kg (1,565 lb). This gave Singer 25 kg (55 lb) of ballast where he wanted it. The smaller engine case allowed Mezger to mount a much smaller air-to-air intercooler that fit inside a standard rear deck lid. With turbo boost at 20 psi (138 kPa), the engine developed 370 hp (272 kW) at 8000 rpm.

The development schedule left no time for the usual testing. Frère learned that "The engine had been bench tested only and [it] turned out to lack flexibility to the point of being almost undriveable, which was made worse by gear ratios that were much too high." Norisring ended badly. Two weeks later at Hockenheim, Singer and Mezger had sorted out everything. Jacky Ickx lapped the 6.82 km (4.24 mi) circuit two seconds quicker than anyone else, and he finished the race nearly 52 seconds ahead of 2nd place. With his point made, Fuhrman had the Typ 935/2, or "Baby" as Singer's staff had christened it, retired to the museum collection.

Out on public roads, Porsche's 1977 model year represented a transition year. It carried over the 2993cc Typ 930 Turbo, the base 2687cc 911 Coupe and Targa, and the Carrera 3.0 Coupe and Targa. But more rigid exhaust emissions standards in the United States, Canada, and Japan required all new engines to comply with their demands. Potential safety regulations still loomed in Fuhrmann's imagination, and his front-engine, water-cooled 924 and 928 seemed to distract the company from its origins. Purists heard rumors he planned to end 911 manufacture. Fuhrmann countered that, authorizing developmental updates. For 1977, these included quieter but more powerful fuel pumps and changes to the clutch system for easier operation on 3.0 and Turbo models. And among other minor but important changes, engineers and interior staff designed rotary knobs set into door panels to operate the door lock, and the door buttons dropped flush with the window sills to thwart coat-hanger entry.

No matter what “Baby” became, she started life as a Porsche 911, so the FIA demanded the series production 2,271 mm (89 in) wheelbase. Hans Mezger and Valentin Schäffer hurriedly developed a 1425cc engine to fit the 2.0-liter (122 cu in) class limits. It developed 370 hp (272 kW) at 8000 rpm. *Photo by Randy Leffingwell*

”Baby” was narrower than her sibling, 935-01, the prototype, or all her successors. The full-size 935 relied on 1,558 mm (61 in) rear track, “Baby” circulated on a rear track of 1,457 mm (57 in). This paralleled wheel and tire choices: 19 x 14 inches for 935, compared to 13.5 x 16 inches for “Baby.” *Photo by Randy Leffingwell*

It's not a good idea for one company to anger another company's chairman and to turn their corporate back with barely a shrug of shoulders. German television learned this and so did Porsche engineers Singer, Mezger, Reiter, Kolb, and the rest. The result was something much bigger than its nickname—"Baby"—suggests.
Image courtesy of Porsche Corporate Archives

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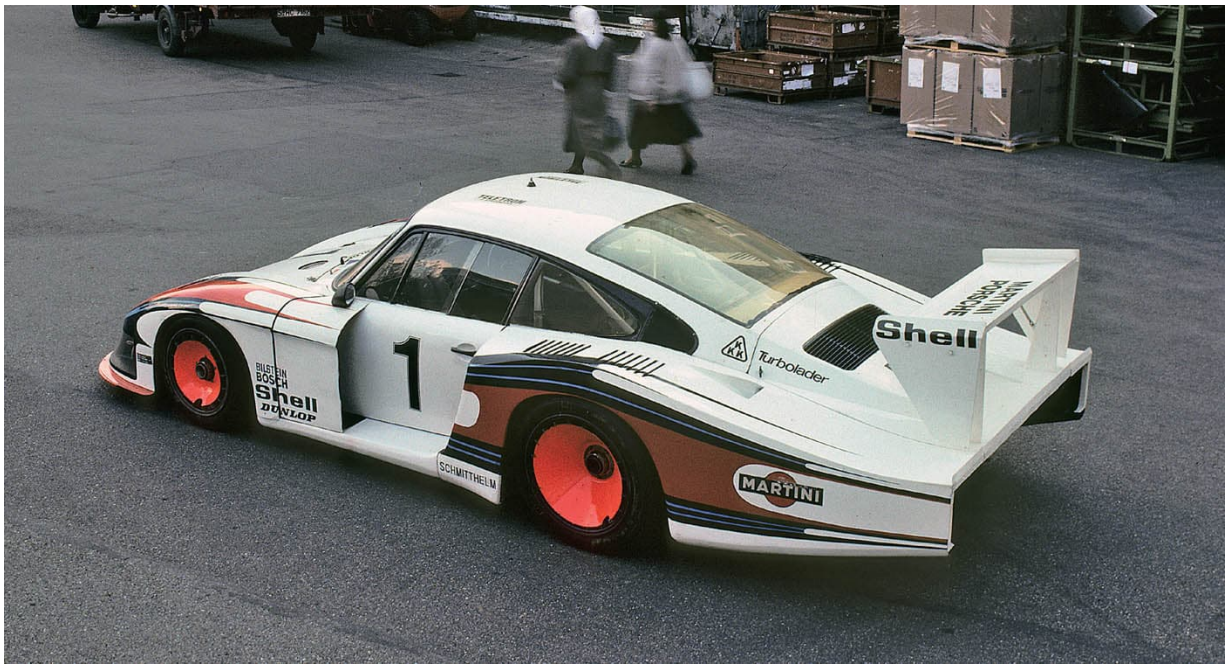
1978 *MOBY DICK* AND TYP 911 SC

When Porsche revealed its model lineup for 1978, observers noticed further consolidation. The 911 became the new SC model: S for Super and C for Carrera. The Carrera and base 911 disappeared.



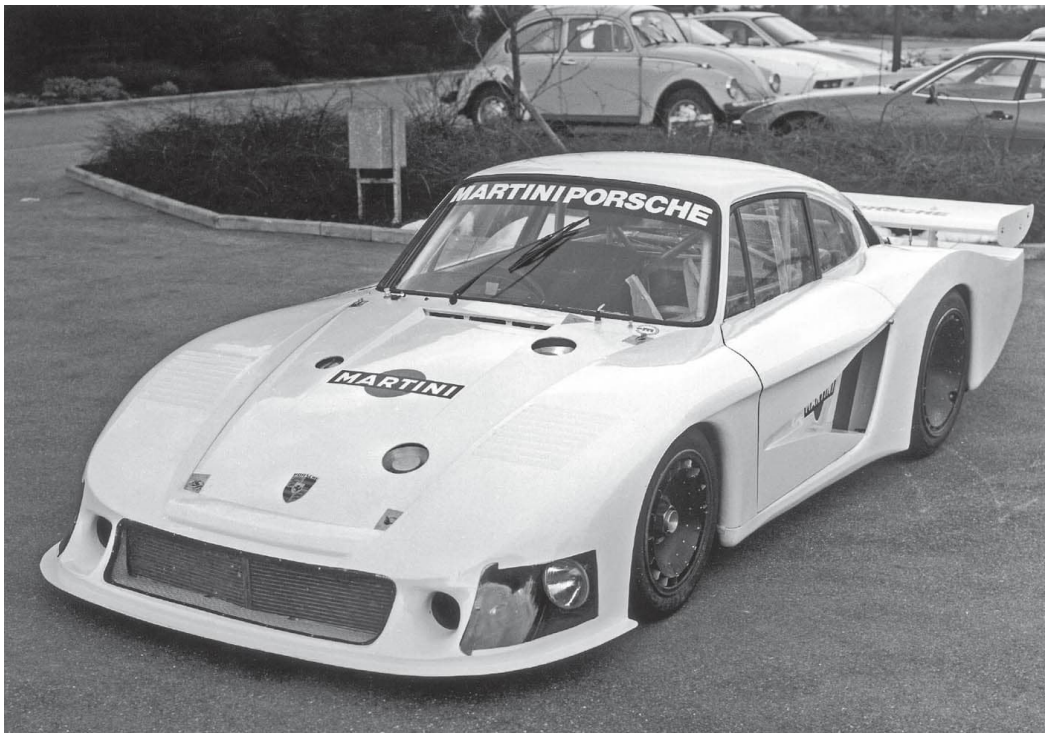
Mezger water-cooled the new four-valve cylinder heads though the cylinders remained air-cooled as Group 5 rules required. Its 95.7 mm (3.8 in) bore and 74.4 mm (2.9 in) stroke yielded 3211cc actual and 4495cc calculated displacement. At 20 psi (138 kPa) boost through two turbos, output reached 750 hp (552 kW) at 8200 rpm. *Photo by Randy Leffingwell*

The Turbo continued as company flagship. But to some observers, these two were just the *Next* Porsche, while the new front-engine, water-cooled 240 hp (177 kW) Typ 928 and 125 hp (92 kW) 924 were the *New* ones.

For the SC, Weissach reworked its 2994cc electronics to provide drivers with greater torque at nearly all engine speeds. The increase was noticeable, rising from 173 lbft to 195 lb-ft (235 N·m to 264 N·m). This improvement masked a hard fact: output on the new engine, 180 hp (132 kW) at 5500 rpm, was down 20 hp (15 kW) from the 3.0 Carrera, which had offered buyers 200 hp (147 kW) at 6000 rpm. Despite this, while overall power decreased, urban drivability improved. Customers in the United States wailed in frustration on learning the mandatory catalytic converter and unleaded fuels further reduced output of their engines to 180 hp (132 kW) at 5500 rpm. In its earliest iterations, trim on the SC returned to bright work, with door handles, window frames, and headlight frames all chrome plated. 15-inch ATS aluminum wheels were standard, while 16-inch Fuchs were optional.

Engineers increased Turbo engine cylinder bore to 97 mm (3.8 in) and stroke to 74.4 mm (2.9 in) with a new crankshaft. This took overall displacement up from 2994cc to 3299cc. With compression set at 7.0:1, output rose to 300 hp (221 kW) at 5500 rpm. Emissions requirements and the need to operate on unleaded fuel in Japan, the United States, and Canada, reduced engine output for those countries to 265 hp (195 kW) at 5500 rpm. Wisely Porsche's product planners and marketing and sales staffs still believed that nothing should eclipse the output of the Turbo as company treasure.

The two new cars provoked comment. Throughout 1977 and 1978, Fuhrmann, as chief of engineering and company spokesman, answered or avoided questions concerning this apparent evolution. In early 1978, with 928 models on the road, he quantified the future of the 911. At that time Porsche 911 manufacture averaged 45 each day. Most inquisitors naturally lacked Fuhrmann's understanding of engineering, of the challenges to cleaning the emissions from air-cooled engines, and of reinforcing the 911 platform to withstand even more demanding impact tests. Nor did they possess the kind of information and insight available to a CEO. By 1978 the 911 was a teenager, 14 years at that point, the same age at which Ferry launched the 356 replacement. Were Fuhrmann's engineers and designers expected to make something this old seem fresh and new?



Because fenders were free of regulation, Singer and Kolb widened them to the limits during their hours of wind tunnel work. This early version widened fenders and doors. FIA inspectors did not accept the covered doors. *Image courtesy of Porsche Corporate Archives*

"The car was still selling," he explained in an interview in 1991. "We still made money from this car. So I set a low limit at which we no longer make money. I told journalists if we ever go below 25 cars, some number each day, 6,000 a year, we stop."

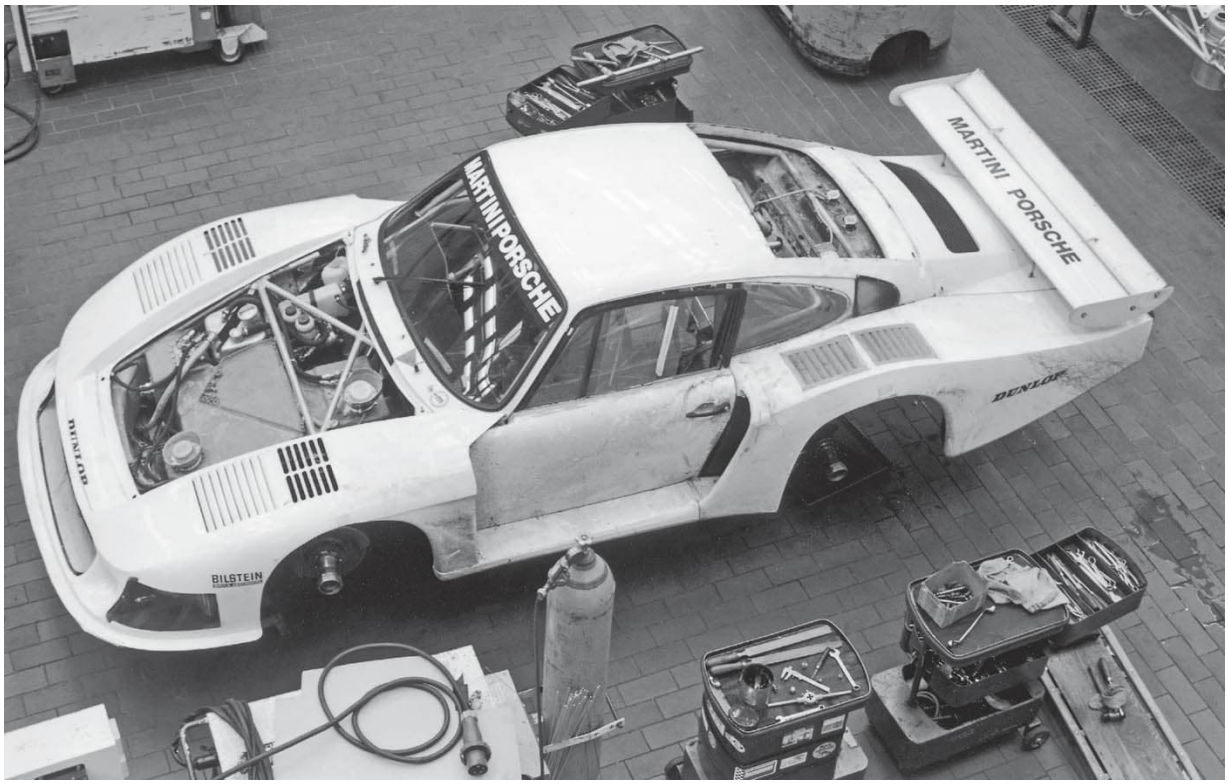
In some sense, though, Fuhrmann already had stopped. He halted any further engineering other than what the United States required to continue importing cars. Sales in the United States still accounted for half of 911 production, so, depending on exchange rates, half or more of Porsche's profits came from American customers. Fuhrmann couldn't ignore them. He only hoped to entice them into 924s and 928s.

This displacement dictated a 1,025 kg (2,260 lb) minimum weight. Singer's staff fabricated an aluminum alloy tube frame welded to the full roll cage. Regulations allowed lifting the floor pan to the height of the door sills. Instead Singer mounted a fiberglass floor pan on the tube frame and dropped an extremely modified body on it so the sills met the floor. *Photo by Randy Leffingwell*

Meanwhile, Porsche's next racing effort centered on their Typ 935/78. Singer and his team steadily improved the existing 935/77 and shared ideas with customers, developing an updated 935/77A. But the 935/78 applied everything Singer, Mezger, and Kolb knew or imagined. It was Porsche's most radically innovative race car yet.

Porsche had developed *Moby Dick* for the 24 Hours of Le Mans, aiming to decrease works participation and increase customer success. Singer used the Six Hours at Silverstone for its introductory trials, a crucial shakedown one month before the Le Mans. The car walked away from the rest of the 30-car field and finished seven laps ahead of a Kremer Brothers' 935/77A. In June at Le Mans, *Moby Dick* in Martini livery ran 354 kph (220 mph) along

the Mulsanne Straight. It frequently led the Group 5 pack until around 10 a.m. Sunday, 18 hours into the race. Then a minor oil leak slowed the pace. Mezger feared a crack in the crankcase. Because of several precautionary pitstops, it finished the race in 8th overall. Back at Weissach, engineers determined the leak was minor and inconsequential. *Moby Dick*'s sister chassis ran the 6 hours at Vallelunga in September but retired with ailing fuel injection. The wild white whale experiment ended there. The championship title went to Porsche because of *Moby Dick* at Silverstone and its customers in their 935/77As everywhere else.



With new doors, the car spent days at Circuit Paul Ricard in France for testing. With all its aerodynamic bodywork fitted but not yet painted in Martini colors, it was a very large white car. It earned the nickname *Moby Dick. Image courtesy of Porsche Corporate Archives*

Tire sizes as well as front and rear wheel track varied from normal with the ultralong *Moby Dick*. Front and rear track measured 1,624 mm (64 in) and 1,575 mm (62 in). Wheel sizes matched other 935s: 11 x 16 inches front and 15 x 19 inches rear. At Le Mans, darkness beckons. *Image courtesy of Porsche Corporate Archives*

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1979 TYP 911, 911 TURBO, AND TYP 935

Norbert Singer had conceived *Moby Dick II* for 1979; however, management decided instead to increase support to their private customer teams.

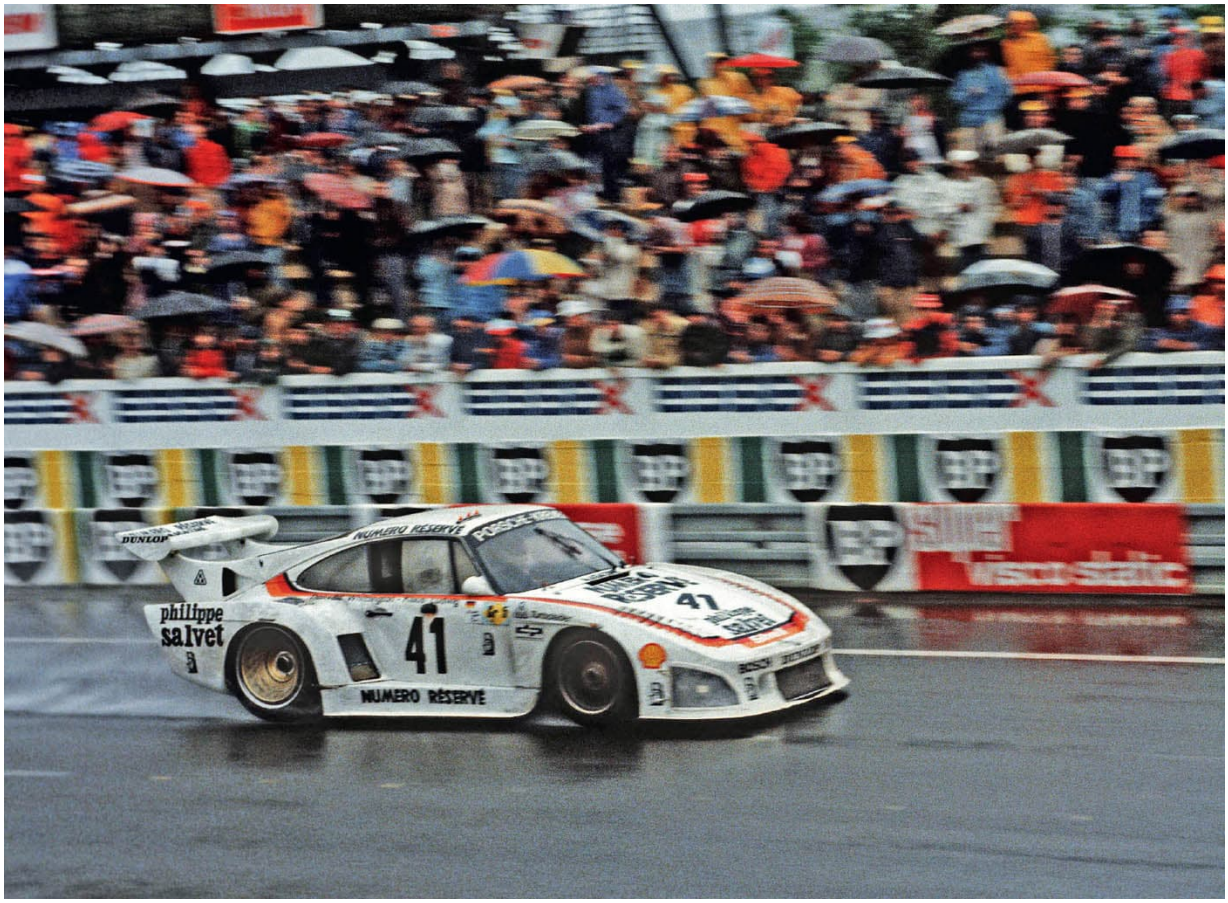
Ekkehard Zimmermann's wind tunnel–tuned bodywork for the Kremers gave them a body of 4,820 mm (190 in) overall length, 1,985 mm (78 in) width, and 1,150 mm (45 in) height. The cars—with fiberglass and Kevlar bodywork—weighed 1,025 kg (2,260 lb). *Image courtesy of Porsche Corporate Archives*

Weissach assembled a small run of 935/79 single turbo models with the transmission inverted, as they had done on *Moby Dick*. Because the 935 remained the best game in town, the Cologne-based Erwin and Manfred Kremer began delivering their own highly developed aluminum tube-frame 935s, designated the K3, using sleek Kevlar bodies designed by Ekkehard Zimmermann. The Kremers built complete cars for several customers and sold K3 kits to others to update earlier factory 935s.

Historically the year's most important endurance race is the 24 Hours of Le Mans. Porsche had introduced two prototype Group 6 Spyders in 1976 and won with them in 1976 and 1977. It entered two for 1979. But Porsche also counted nine 935s in Group 5 and 11 in IMSA GTX class to its customers. With 22 of the 55 cars on the grid, Porsche had good odds of class victory. But overall victory was the stuff of Group 6.

Two American brothers, Bill and Don Whittington, had run several seasons in IMSA in the United States. Like many Yanks, they dreamt of winning Le Mans. They typically brought three things with them to every race: a transporter of superbly prepared cars, teams of highly capable individuals, and suitcases full of cash.

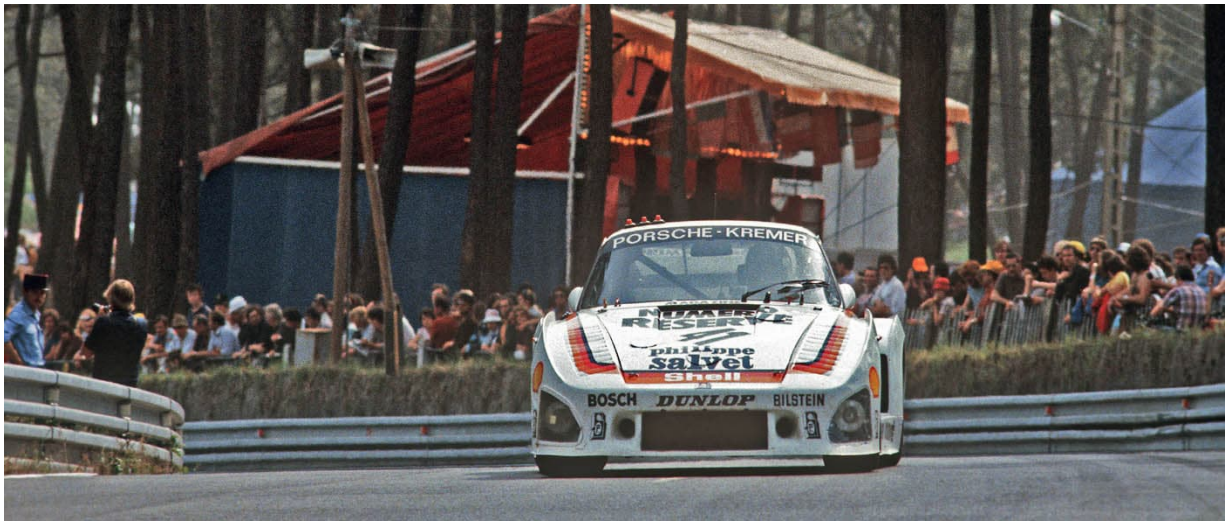
The Whittington brothers were what team owners called "pay drivers," buying seat-time in someone else's car. This was welcome revenue to the Kremer Brothers team. They had conceived, designed, built, and tested their two entries and hired Klaus Ludwig to drive the important sessions including the start. The brothers had booked their rides with Kremer by telephone and were largely unknown outside the United States. Ludwig qualified the car third on the grid. His time, 3:34.64, was some 10 seconds quicker than Don Whittington and 18 seconds better than Bill's, who had never driven the circuit before. However, Bill had his own ambitions. He wanted to drive the start. Manfred, as car owner, refused. His Typ 935 K3 represented their third generation and most aerodynamically advanced package yet.



The Kremers not only seriously modified the body—with Zimmermann's help—but they were best known as engine men. Their version of the single overhead camshaft 3164cc engine produced 750 hp (552 kW) at 8200 rpm and developed 553 lb-ft (750 N·m) of torque at 5500 rpm. *Image courtesy of Porsche Corporate Archives*

Bill asked him how much the car cost. The question perplexed Manfred, but he talked with brother Erwin and came back with a figure: $290,000 USD. Bill handed over a suitcase filled with cash. Manfred counted it out, explained the new ownership to Klaus, and told Bill to climb in.

After four hours, the Whittington/Ludwig/Kremer K3 was third. Their K3 ranged from second to third to first through the eighth hour. Around midnight, light rain became a downpour. Everyone slowed and five cars hydroplaned into guard rails. Around 5 a.m. the tight race in Group 5 fell apart. Four major competitors retired. By this time, the 15th hour, Bill, Don, and Klaus had led for nine hours.



McPherson struts and lower wishbones characterized the front suspension, while the rear incorporated semitrailing arms. They used coil-over-spring dampers on all four corners. *Image courtesy of Porsche Corporate Archives*

Then just before 11:00 a.m., when the race had just three hours to go, a recurring problem with 935 injection pump belts struck again. The Automobile Club de l'Ouest (ACO) had started the race at 2:00 p.m. Saturday to allow race fans enough time after the race to cast their vote on Sunday in the European parliamentary elections. By this point, their K3 had a strong 16-lap lead over the second place 935. When the belt failed, it sidelined Don on the Mulsanne Straight, miles from the pits.

Manfred had Don on their two-way radio and told him where to find tools, the spare belt, and how to replace it. But every two minutes Don radioed back lack of progress. He crawled under the car into a big puddle. Finally he managed to put it on while his head was halfway under water. After an eternal 79 minutes, he limped the car, misfiring badly, into the pits. He had guessed at engine timing and later told a journalist, "There's not a chance in hell that'll work."

Magazines reported that the crowd cheered Don into the Kremer pits where the mechanics pulled off the engine cover and went to work. It took Manfred's crew another 15 minutes to undo Don's patchwork fix, re-time the engine, and get it going. Don had driven in. Bill drove it out amid more cheers. The car returned to the race with, almost incredibly, a four-lap lead.

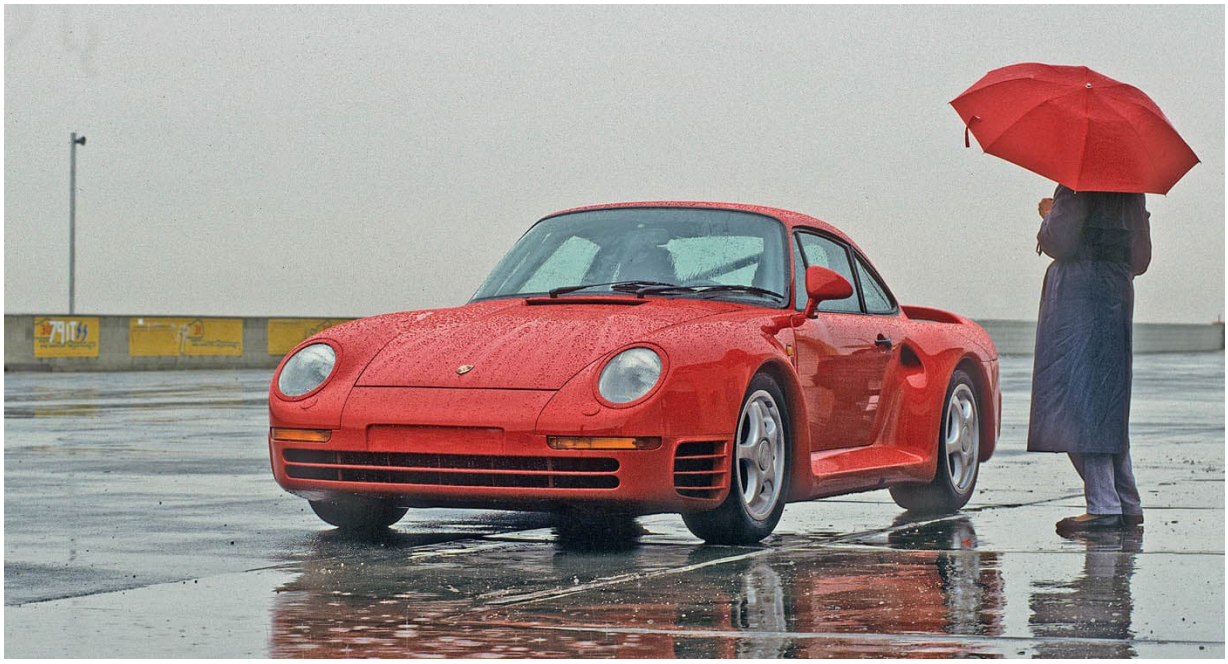
The Kremers relied on conventional wheel and racing tire configurations for their K3 variations for their own use and their customer racers such as this Dick Barbour team car. The 11 x 16 front wheels raced with 275/600-16 tires while the rear 14.5 x 19 wheels carried 350/700-19 tires. *Image courtesy of Porsche Corporate Archives*

At Le Mans, corner workers step onto the track and wave all their flags in salute to the cars that survived the 24 hours. Bill Whittington told *Road & Track* magazine's John Lamm, that "he had tears in his eyes as he drove under the flags on that last lap and when he and the other drivers returned to the front straight they were enveloped by the massive crowd that traditionally storms the straight."

Bill, Don, and Klaus won overall, completing 307 laps and racing 4,173.93 kilometers (2,593.565 miles). It was not only the 94 minutes lost on the injection belt that slowed the average but also the hard rains that held the 1979 pace to 173.84 kph (108.02 mph), compared to a record 210.20 kph (130.61mph) in 1978. The Kremer K3 also claimed the victory in Group 5.

With selected tires and gearing specifically matched for Le Mans, the 935K3s reached top speeds of 350 kph (217 mph) along the Mulsanne Straight. The cars were successful in the DRM and in IMSA in the United States, as with this Dick Barbour team entry. *Photo by Randy Leffingwell*

1980 / 1989



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1980 TYP 911 SC, WEISSACH EDITION, AND TURBO

Modest engineering changes for 1980 gave the 911 SC engine an 8 hp (6 kW) increase to 188 hp (138 kW) at 5500 rpm for rest of the world models, and the 300 hp (221 kW) Turbo gained a new exhaust with twin pipes.

As Peter Schutz investigated his new employer, Porsche released a limited-run 911 SC that celebrated Weissach's 20 years of accomplishments in research, design, engineering, development, and testing of its own production and racing cars, as well as hundreds of outside clients. *Photo by Randy Leffingwell*

SC models destined for the United States received catalytic converters and oxygen sensors that sapped away the 8 hp (6 kW) gain, and adding insult to injury, new speedometers read only to 85 miles per hour (137 kph) as the States enforced the widely ignored 55 mile-per-hour (88 kph) national limit. The Turbo's electric window lifts and center console migrated to the SCs. Porsche installed a light in the engine compartment, offered an optional alarm system, and dropped the Sportomatic transmission. At year-end, it also stopped distributing Turbos to customers in Japan or the United States.

The question of the 911's continued existence divided groups in Zuffenhausen and Weissach. Budget for engineering and design, advertising, and promotion compromised the 911 because available deutsche marks had to be shared with 924 and 928 models. The 911 faithful were outspoken in frustration that engineering development and design updates were perpetually shelved. In a vivid illustration of the divisions, design chief Tony Lapine drove a new 928 but Wolfgang Möbius, who had designed the 928, stayed with his 911 as his company car.

Fuhrmann acknowledged that he had enemies, and he recognized he had brought that enmity on himself during an interview with the author in 1991. Some people resented him for usurping Ferry Porsche's role as company spokesman, but those who knew Ferry spoke of a quiet, diffident man who shunned the limelight. Ferry moved his office from the upper floor of Zuffenhausen Werk 1 to another building several miles away in Ludwigsburg. People questioned whether he was pushed out or left to give Fuhrmann room to manage.

A decade younger than Ferry, Fuhrmann looked forward to his 60th birthday in 1979. Sales of his 924 and 928 were growing. By 1980 Ferry's 911 was heading to its 16th anniversary. Fuhrmann recognized the company needed a new car, but he didn't want to work till the end of his life. He knew a new car took seven or eight years to reach the market, and he wanted to stop at 65. He was prepared, he said, to leave the day Ferry had a new man who could launch a new program.

Named the Weissach Limited Edition and designated M439, Porsche limited manufacture to 468 cars and in a nod to United States car buyers and research customers, 408 were exported to the United States. Porsche delivered the coupe in either Platinum Metallic or Metallic Black and fitted a Doric Grey leather interior contrasted with burgundy piping. *Photo by Randy Leffingwell*

Ferry wasted little time hiring a headhunter who attacked Ferry's candidate list. One of Ferry's targets was 47-year-old Swiss-born and American-educated Robert A. Lutz who had worked for General Motors from 1963 through 1971. Lutz also had been BMW executive VP of Global Sales and Marketing in Munich from 1971 to 1974 and chairman of Ford from 1974 onward in Cologne. His biggest seller, the compact Ford Fiesta, had greater sales in the United States than Porsche's combined production. Lutz spoke German, English, and French fluently. He had much to offer Porsche. Ferry could offer only labor problems and disappointing sales. Because it had essentially been Fuhrmann's company for nearly a decade, Ferry was unable to effectively articulate the future that he saw for his company. Lutz was among a dozen candidates who declined.

Planners incorporated the Turbo tea tray–style spoiler, the rubber-trimmed chin spoiler, power sunroof, fog lights, upgraded audio with door and rear package shelf speakers, power radio antenna, and passenger side exterior mirror. *Photo by Randy Leffingwell*

The car rode on Bilstein dampers and Fuchs alloy wheels with Pirelli 185/70R 15s in front and 215/60R 15s on the rear. The coupe weighed 1,250 kg (2,756 lb), and Porsche dealers sold the car for $32,000 in the United States. Those US cars delivered 180 hp (132 kW) while the rest of the world had 188 hp (138 kW). *Photo by Randy Leffingwell*

Ferry initiated the next round of possibilities. By April 1980, he clearly understood his company and its needs. At a reception on the terrace of his family home in the hills above downtown Stuttgart, he was clear and straightforward with another of his candidates.

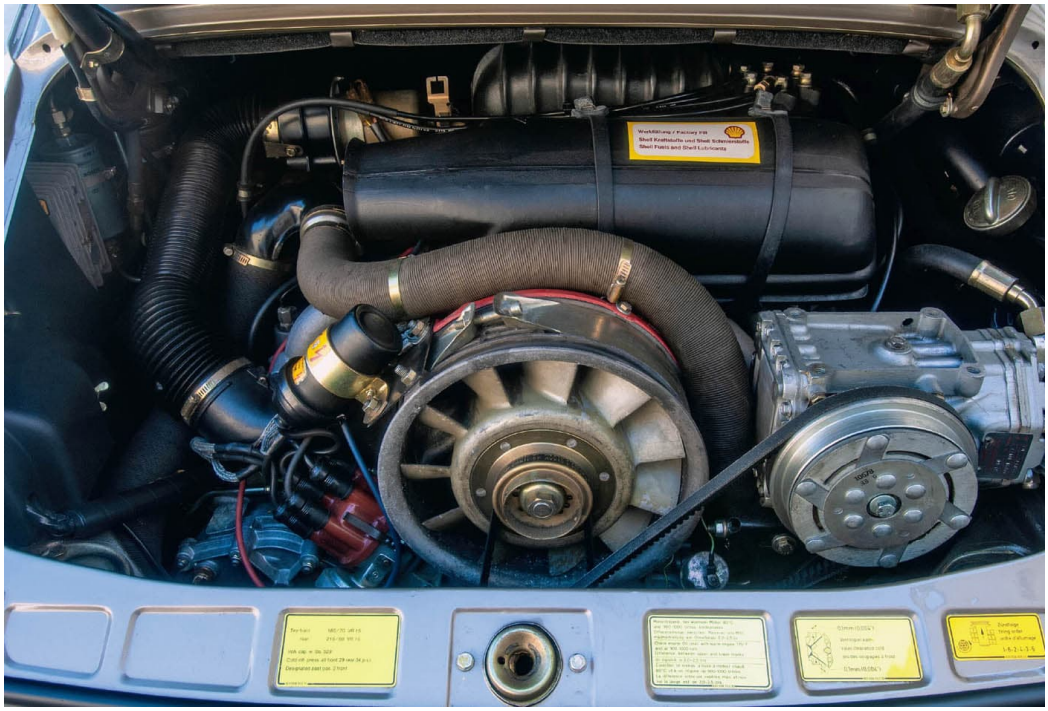
"We have people who know how to design automobiles, how to build them, to sell them and service them. Our problem is that we are not making any money," Ferry told Peter Schutz, a German-born American, who completed his mechanical engineering degrees in Illinois. With vast experience in sales, making money was one of Schutz's talents. At Caterpillar and at Cummins, he not only made money but also improved relations with labor at Cummins so much the Teamsters Union invited him to deliver their national convention keynote address.

"When we look for the reasons for our poor earnings," Ferry continued, "we've got manufacturing and sales and engineering all working against each other. We are looking for someone who can get this whole organization unified and working together."

Unifying a workforce was Peter's other talent. After Cummins in Indiana, he managed Klöckner-Humboldt-Deutz (KHD), the heavy diesel engine manufacturer in Cologne. He improved working conditions through employee

empowerment, which increased productivity and raised company profit, astonishing the owners, employees, and observers alike.

Schutz accepted Ferry's offer and then spent months learning about the company and its products before he arrived with his wife Sheila in January 1981. Dealers everywhere told him that Porsche's cars were too expensive and they had quality-control issues. He heard morale was low in Zuffenhausen and Weissach because Porsche was discontinuing the 911 and moving toward more 924- and 928-type automobiles. Peter figured there was more to this story.



Long-anticipated exhaust emissions hardware appeared for the first time on these 1980 Typ 911 SC engines. This included oxygen sensors and catalytic converters that could only operate with unleaded (therefore lower octane-rated) fuels. *Photo by Randy Leffingwell*

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1981 TYP 911 SC AND 930 TURBO

Peter Schutz learned that hydraulic camshaft drive-chain tensioners routinely failed in the 911s. It was the origin of all quality complaints. During his first meeting with production engineers, he asked if they had a cure for this problem.

The Flachbau was perhaps *Sonderwunsch*'s first package. A number of outside tuners were doing versions of the 935 racing nose, but all were in plastic—theoretically, this kept them out of the United States because they could never pass the crash test. But their sales throughout Germany and Europe pushed Porsche to act. *Image courtesy of Porsche Corporate Archives*

“Oh yes, but the car is going out of production,” they told him. “And the repair kits have become a profit source for the company.” Schutz saw this as a cynical compromise. When had compromising engineering become a profit center? Still the basis of it all was the engineers’ first sentence: the 911 was going out of production mid-1981. Yet Ferry’s finance people had proven the 911 remained Porsche’s most profitable automobile. Thousands of drivers seemed to love the cars.

That evening, he visited engineering director Helmuth Bott at his office in Weissach. On the wall, Bott had a large bar graph that traced out production life spans of Porsche’s products. The 928 ran for five years. Around that time, the 924 became the 944, and that ran another five years.

“The 911 was just a short bar and it stopped,” Schutz recalled in an interview in 2012. “I thought about everything I had heard. I walked to Mr. Bott’s desk, picked up an indelible marker, and I ran the line off the end of the graph, kept going on the wall to the corner, around the corner, and onto the next wall.” The future suddenly had no end.

Now Bott and Schutz needed to let the automotive world know. Bott had drawers filled with proposals, ideas, drawings, and notes he never could show the former CEO. For Fuhrmann threats of United States regulations dictated the end of the anachronism that was Porsche’s 911.

Bott envisioned a different future. From piles of sketches, he pulled an open 911. He offered another with all-wheel drive. He led Schutz downstairs to his hidden prototype “Speedster.” Two years earlier, Fuhrmann threatened to fire Bott if he put any more time into it.

The show car, cobbled together on a hastily fabricated all-wheel drive Turbo 3.3 platform, was the sensation of the show. Visitors knew Porsche, however, and they understood that whatever they saw, what some were ready to order on the spot, still was 18 months away. *Image courtesy of Porsche Corporate Archives*

The Turbo body Cabriolet introduced customers to Porsche's new Special Wishes, or *Sonderwunsch*, department for those who wanted their Porsche a little more special, more their own, and modified to their individual tastes. The first customer was chairman Peter Schutz, who enjoyed the car on left for several years. *Photo by Randy Leffingwell*

Because Fuhrmann authorized development on 911s only when critical, the cars only received minor running changes. Engineers replaced the rubber-centered clutches with their rapid failure rate with those using steel springs. Cold starts sometimes caused engine backfires that often destroyed airboxes. A relatively simple program change in Bosch's K-Jetronic injection had solved the problem. But these and other changes were just Band-Aids. Nothing in the pipeline indicated to Schutz what he did on Helmuth Bott's wall. Something dramatic was essential. They made their choices, remarkably combining the open 911 with all-wheel drive!

Porsche unveiled drama at the 1981 Frankfurt IAA, Porsche 's "home" show. Schutz had blessed the idea in March. On April 15, the two men saw a white prototype Cabriolet with a red leather interior. The next day Bott drove

it, enjoying the wind in his hair, and 18 days later, Porsche's Supervisory Board added its blessing. Porsche was going to produce a 911 Cabriolet.

Initially Special Wishes had no sales brochure illustrated with elegant glossy photos of what each modification looked like. Instead, a multipage price list provided simple identification along with a recommendation to speak personally to Special Wishes staff for clarification. *Image courtesy of Porsche Corporate Archives*

During 1982 and 1983, *Sonderwunsch* designers, engineers, and technicians began to assemble all the elements of the Turbo-Look option. Foremost, these included steel front and rear fenders. Initially technicians welded panels onto standard SC bodies, but by the time Option 491 became official, new wide stampings had been created. *Image courtesy of Porsche Corporate Archives*

During this time when Schutz was finding his way, Zuffenhausen engineer Rolf Sprenger was instigating another shift in Porsche's direction. Emissions regulations had just forced Porsche to end Turbo sales to customers in the United States. This inspired outside shops to modify non-US-legal European performance cars to "meet" US emissions and crash safety standards. This "gray market," so nicknamed for its ability to weave a fine line through otherwise black-and-white regulations, blurring the path as it went, first emerged in Europe in 1977. It appealed to North American customers who knew the European Turbos delivered more power than Americans and Canadians got because of US unleaded fuels, catalytic converters, air pumps, and exhaust gas recirculation systems. While Porsche complied with these standards in normally aspirated 911s, the 930 variations simply couldn't cope. However dozens of after-market converters claimed they could do the work. Some did, but others simply took the money and did little modification.

Soon after Sprenger took over Customer Service, Ferry Porsche called him into his office just above Sprenger's service bays. "I want your people to understand that whenever a Porsche customer comes to Zuffenhausen with

a technical problem or a special wish, you shall help and solve the problem," Sprenger recalled Ferry telling him.

Sprenger's department had full workshops in those days for engine, chassis, and bodywork repair, painting, and interior. He knew anything these outsiders could do with Porsche's cars Porsche could do better at the factory. "If we could *rebuild* an entire car so we also could build one," Sprenger said. "We could take a body shell from production and an engine which we modified, and build up a unique car."

He and his colleagues brainstormed what their department could offer. They named it *Sonderwunsch*, the Special Wishes Program. It started as an idea with no budget and therefore no brochure. They typed a few pages and listed a dozen or two dozen things they could do. The customers loved it. "These people wanted something unique" Sprenger recalled. "They were patient—cars took four, six, even 12 weeks longer and the options were costly. Yet customers said, 'That's all right, don't worry. Because now I'll get the car I want.'"

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1982 TYP 911 SC, 50TH ANNIVERSARY, AND ROW TURBO

The world had seen Porsche's 911 Cabriolet *studie* at Frankfurt and then again at the Geneva show in early March 1982. Observer response was as enthusiastic as in Frankfurt during its debut at the IAA in September 1981.

By 1982 the SC was in its fifth year. The year brought welcome changes. The Turbo tea-tray spoiler was optional, and Porsche delivered cars on five-spoke wheels painted black. *Photo by Randy Leffingwell*

Porsche finished the 1982 SCs with a leather-and-fabric interior. Seat side cushions and the steering wheel were wrapped in the leather. Following two years when US bound cars had speedometers reading only to 85 mph (137 kph), the 150 mph (241 kph) dial returned in 1982. *Photo by Randy Leffingwell*

"Schutz said, 'Build it. Put it into production,'" body testing engineer Hans-Peter Bäuerle recalled during an interview in 2012. "And the guys who had to build it said, 'Oh, my God!' Even so, they expected to have five years to develop it." But Peter Schutz was not a five-year man. The near-overnight speed with which styling and model engineers fabricated a Cabriolet prototype left a huge obstacle for production teams. You could push around a

show car, but Porsche customers expected their open 911 to perform reliably and identically to the serious coupes.

"Everyone knew it was not possible to make a convertible out of the 911," Bäuerle recalled. His assignment from Helmuth Bott was "to find a way to make a convertible out of the 911 that *must* work." In the early 1980s, he developed methods to measure the stiffness of car bodies. Until this time, Porsche only had done the so-called "one wheel drop test." With a car secured on a test bench on one stand at each corner, engineers lowered one. They measured the twist or torsion on the body and judged it: It's good or it's not good. With Hans-Peter in place, Porsche installed equipment to measure the whole body.

"So we took a 911 Targa and cut away the rollover bar. From a body-in-white, welded the axles stiff, mounted it without any rubber into the body, and put it on a rigid bench. Then we glued and screwed some measuring arms —about ten of them—all along the body. We used mechanical gauges—this was before electronics," Bäuerle continued. "We measured that by putting weights at the middle of the car, under the seat area. And you can calculate the bending stiffness of the body."

If the coupe was 100 percent stiff, their goal with an open car was 60 to 70 percent. If they simply cut off the roof, they had 10 percent, a vehicle not drivable. When they cut off the Targa bar, they had 20. "And that is absolutely not sufficient" Hans-Peter explained. "And maybe that is why they stopped any convertible development before this time. Because it couldn't work."

Air injection pumps appeared on all of the 3.0-liter (183 cu in) 180 hp (132 kW) engines. However US models also required catalytic converters. All US–delivery SCs included air-conditioning as standard equipment. Central Locking was optional, as was a theft alarm. *Photo by Randy Leffingwell*

His team reinforced behind the front wheel, the rocker panel, and in the footwell. Combining front sheet metal with the rocker panel gave them 60 percent, their minimum. Now Bott demanded the usual tests: 8,000 km (4,971 mi) on the rough road driven by professionals around the clock with no problems. This compared to roughly 180,000 km (about 111,847 mi) on a normal road.

"And we had a big surprise!" Hans-Peter laughed. "After a thousand kilometers (621 mi), the engine fell out. Broke the mounts from vibration. And when we put in the engine and the gear box, we found that as the body rotated left-right-left, the engine and gearbox rotated right-left-right. This was a resonance catastrophe.

"We had with us a good design engineer in our chassis department and he did something that is now in all convertibles if you open the engine compartment and look inside. The normal 911 is mounted with a *schwert* on the backside, we call it a sword. The convertible has a lever with a gas

spring, like a shock absorber, mounted at the body and connected to the engine. It serves as a torsion damper and eliminates the engine working against the body.

"So we put that in and we had no problems at all with the 8,000 kilometers (4,971 mi)." But that was only one of the big challenges facing the convertible crew. They still needed a top.

Even without a new Cabriolet—yet—Porsche had something new for its 1982 lineup. The company commemorated Porsche Engineering's birth in 1931 with a 50th-anniversary 911. Zuffenhausen assembled only 200 coupes in Meteor Metallic with burgundy leather and cloth interior.

Meanwhile, even as Peter Schutz continued solidifying the rank and priority of the 911, he tackled other rescues, reestablishing Ferry as Porsche's most important asset. When Schutz reached Zuffenhausen in January 1981, accountants filled the large room across the hall from his own office. Aware that Ferry worked in a modest space at Ludwigsburg, he moved the accountants and had the area remodeled into a comfortable glass case–lined office for Ferry.

"I moved Ferry in there," Schutz explained in 2012, "and every morning, shortly after 9 o'clock when he got there, I'd walk across the hall and have coffee with him." It became a routine that taught Peter the history from the man who had made much of it. "But he didn't like talking about the past," Schutz continued. "He was much more excited about the future." For Ferry and for Porsche, there appeared to *be* a future.

The SCs worldwide rode on 6J x 15 front and 7J x 15 rear wheels with 185/70VR15 front and 215/60VR15 rear tires. The 16s were optional. As noted earlier, power brakes now were standard worldwide. *Photo by Randy Leffingwell*

Porsche produced a run of 200 commemorative models, celebrating the 50th anniversary of Ferdinand Porsche opening his Stuttgart design office in 1931. Anniversary cars were painted Meteor Metallic, a dark grey, whereas this option color for 1982 was Chiffon White. *Photo by Randy Leffingwell*

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1983 TYP 911 SC AND MANSOUR OJJEH'S 935

Cabriolet development continued, with its engineers as dedicated as any working in Weissach. The collapsible top was as big a challenge as stopping that destructive vibration.

Porsche assembled 4,096 of the new open cars in its first year, increasing total 911 production by nearly 50 percent. Porsche introduced the new 911 SC Cabriolet for DM64,500 ($26,543) at the factory. The coupe sold for DM55,690 ($22,918), and the Targa was DM58,910 ($24,243). *Image courtesy of Porsche Corporate Archives*

“Eugen Kolb was the one who made the convertible top,” his colleague Hans-Peter Bäuerle explained. “He had the idea to make a top that does not deform so much in the wind as other convertibles. When you drive fast, other convertible tops blow up like a tent over you.” All it took was kinematics, sometimes called the ‘geometry of motion.’

“The 356 top is like an umbrella,” Kolb said in an interview in 2016, “To stow the 911 top behind the seats, you need a [different] kinematic [mechanism] that makes it close and fold and everything.” Longitudinal arms supported transverse bows spanning the cockpit. These arms had to fold back under themselves and then do that again, all of this just an instant after another pair of arms with bows folded in on *themselves* to direct the back of the top down into the cavity behind the rear seats. Tops, bows, and even the cavity were mocked up for the Frankfurt and Geneva shows.

Kolb went to chassis engineers for help finding metal suppliers for lightweight bows and arms. Kolb’s colleague, Gerhard Schröder, who had designed the 911 coupe and then the Targa with modeler Heinrich Klie for Butzi Porsche, designed the main bow. This was an aluminum diecast piece nearly 8 inches (20 cm) wide on which assemblers glued the top cloth. It’s shape defined the cabriolet roofline, and with inside retaining straps attached to the cross bows, it kept the shape even at high speed.

“For Professor Bott it was important to be able to open the rear window without taking down the roof,” Kolb added. “Like Bott’s idea of the first Targa, for the open feel, but also, if you have scratches on it, you can change it without having to replace the entire roof. Schröder made a prototype with electric window lifts and that was the basis for how we could do the Cabrio electric roof.”

From Schutz’s discovery of Bott’s Speedster to its Frankfurt debut on September 4, 1981, was barely 7 months. And the 18 months from project approval to the Cabriolet introduction in spring of 1983 was considerably less time than the engineers routinely needed. However both Schutz and Bott were correct in understanding that the open 911 was what the company needed.

For designer Gerhard Schröder and engineer Eugen Kolb, the Cabriolet roof posed great challenges. It had to look right and fit tight to keep weather out, even at high speeds, and yet it had to collapse. *Image courtesy of Porsche Corporate Archives*

Porsche's "Special Wishes" department emerged soon after Turbos appeared on the market. While manager Rolf Sprenger recalled that roughly 30 to 40 percent of their customers owned Turbo cars, his staff accommodated ever more inventive requests. Then came a pivotal customer.

In early 1982, although Turbos were not available for US buyers, worldwide demand increased. Special clients ordered cars that pushed and excited Sprenger's staff. Mansour Ojjeh, whose technology firm Techniques d'Avant-Garde (TAG) was funding development costs of Porsche's Formula One engine for McLaren, wanted to buy a 935.

"This was not possible, because the 935 was not legalized for the road in Germany," Sprenger explained. "He wanted to have this car registered in

France. We decided to modify a production Turbo as much as possible to be a 935. And while the car we did for Mr. Ojjeh was much more than just putting a Slant Nose on a Turbo we realized right away that other customers may want to get this shape too."

Tony Lapine was no fan, accusing Sprenger's department of ruining the lines of the simple 911, and with his animosity to their bodywork modifications, Sprenger and his team got no official help in designing the Ojjeh Flat nose.

Ojjeh's car and several immediately after it mounted pairs of rectangular headlights below the front bumper of the steel bodywork, straddling a large oil cooler. But customers complained that the low lights didn't project far enough and also vibrated badly over rough roads. The new 944 was ready for introduction and Special Wishes mounted these pop-up lights higher in the bodywork.

Behind Lapine's back, stylist Roland Heiler and chief modeler Peter Reisinger lent their expertise. All of these inputs gave birth to the M505, which Norbert Singer put in the wind tunnel and emerged with a list of improvements. In the end, quality improved and modifications to make a Flatnose were only skin deep. They did, however, offer upgrades that improved not only the Turbo's *show*, but also its *go*. One performance option fitted a larger turbocharger, an increased-flow intercooler, and a four-pipe exhaust system. Eventually known as the X51 Powerkit, this increased output to 330 hp (243 kW) and with its slightly more aero-efficient front end, raised Slant nose top speed to 275 kph (171 mph).

At first it was just enough that the top worked successfully by hand. While it required practice, it did not demand an engineering degree. But from the start, Peter Schutz and his Weissach team intended to give it electric motors to do the job. *Image courtesy of Porsche Corporate Archives*

"The frame was always the same," Sprenger explained. "We didn't touch this. We only modified the skin. Remember, the Slant nose—and all our major projects—had to pass the US Department of Transportation crash test." Ojjeh's car emerged in early 1983. Many European orders followed.

“Some people do not like this conversion so much,” Sprenger acknowledged several years ago. “And others are very much enthusiastic about it. It is a matter of, how do you say, personal tastes?” He hoped to incorporate a bespoke rear wing and did this unique version for racing sponsor Mansour Ojjeh. *Image courtesy of Porsche Corporate Archives*

While Germany's TÜV vetoed the idea of selling a true 935 to motorsports sponsor Mansour Ojjeh, Sprenger and *Sonderwunsch* undertook hundreds of modifications to make the effect convincing. Ojjeh's company, Techniques d'Avant Garde, was principal engine sponsor for Porsche's successful Formula One efforts for McLaren Racing. *Image courtesy of Porsche Corporate Archives*

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1984 TYP 911 CARRERA 3.2 AND TYP 954 SC/RS

Porsche introduced the E-Programme Carrera 3.2 series for 1984, responding to steadily increasing exhaust emission limits. These improved G-series models utilized the 3299cc Turbo's longer crankshaft stroke—74.4 mm (2.9 in)—with the 2994cc SC engine's 95 mm (3.7 in) bore.

After Helmuth Bott convinced engineers Roland Kussmaul and Peter Falk of the potential for a four-wheel drive Typ 911, the two called his bluff. Telling Bott they needed a development "mule," they asked Bott for his car, a personal project of the Weissach director. It was also Bott's daily driver. *Image courtesy of Porsche Corporate Archives*

Porsche introduced the 3.2 Carrera with a 3164cc opposed six-cylinder. United States and Japanese emissions regulations restricted power output to 207 hp (152 kW) at 5900 rpm, while customers elsewhere enjoyed 231 hp (170 kW) at 5900 rpm. Porsche also introduced the Turbo-Look, fitting the Turbo's suspension, brakes, wheels, tires, and bodywork to the standard Carrera coupe. *Photo by Randy Leffingwell*

This combination yielded 3,164cc total displacement. Bosch connected its latest L-Jetronic system with its new Digital Motor Electronics (DME) Motronics 2 engine-management hardware to increase performance and fuel economy while cutting exhaust emissions. The Carrera 3.2 provided offered Rest of the World buyers 231 hp (170 kW) at 5900 rpm and 209 lb-ft (283 N·m) of torque at 4800 rpm with 10.3:1 compression. However the changeover to regular unleaded fuel throughout the United States meant American customers had to live with 9.5:1 compression. This produced 207 hp (152 kW) at 5900 rpm but ran well on regular unleaded fuel. Both the 3.2 normally aspirated Carrera engine and the 3.3 Turbo introduced new oil-fed camshaft drive-chain tensioners.

The 330 hp (243 kW) Turbo remained unobtainable for customers in the United States while the rest of the world enjoyed its power and exclusivity. Many independent tuner shops stepped into the void created when Porsche discontinued distributing Turbos in America, becoming involved in the ubiquitous gray market. The shops had a considerable amount of work to

complete on each vehicle to meet United States Department of Transportation (USDOT) and Environmental Protection Agency (EPA) regulations. Some cars worked well, others did not. The motto for the marketplace seemed to be *Caveat Emptor*: Buyer Beware.

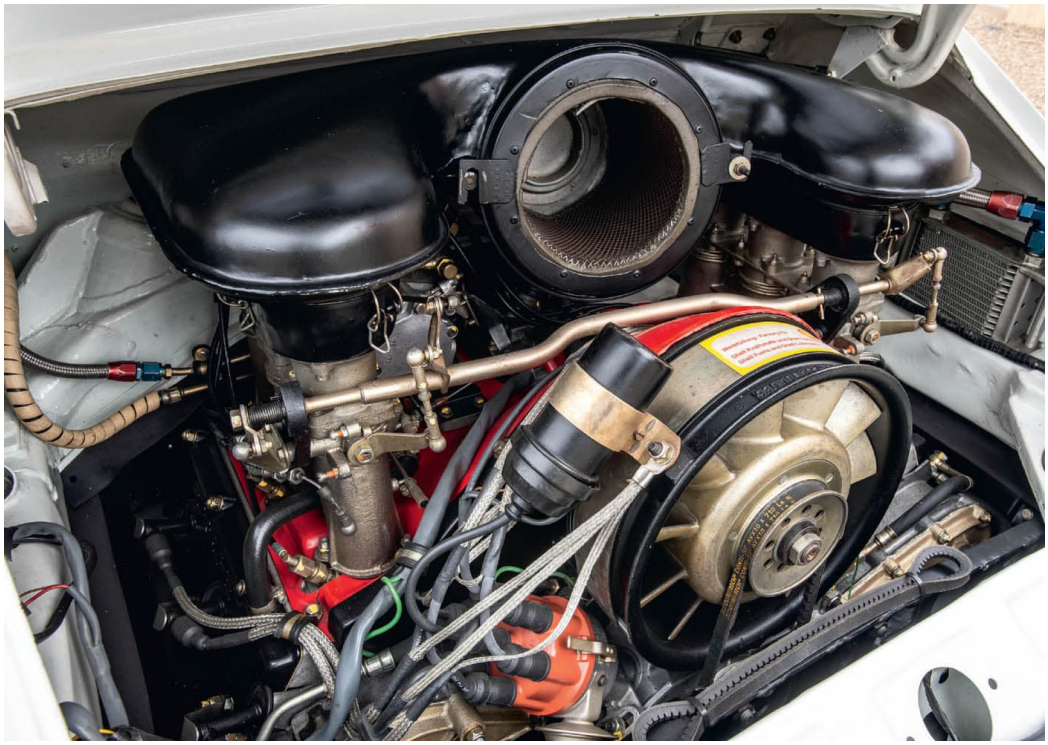
Weissach engineers Jürgen Barth and Roland Kussmaul had competed in the Monte Carlo Rally (Rallye Automobile de Monte-Carlo) in 1983 where they finished 11th behind a rash of Group B Lancia Beta 037s. Group B rules allowed that once a model had been homologated, manufacturers could update it each year with a series of no more than 20 "evolution" models, and Barth proposed that Motorsports "evolve" a group of the G-series coupes for competition. Their goal was to enhance reliability and durability as well as meet an FIA requirement that all such cars had to be road-legal in the countries in which they competed. Between rigid efforts at lightening and massive appropriation of ultralightweight racing parts, the SC/RS soared in price, each of the 20 selling for DM188,100 at Weissach ($66,000). David Richards in Silverstone, England, took six of them to prepare a rally team for Rothmans International, the tobacco products manufacturer who had come to Porsche in 1982 as sponsors for its Group C Typ 956 endurance racers. Richards' crews dismantled the cars and reassembled them in ways that expedited in-field service and repairs.

During this time, Helmuth Bott launched a more ambitious program. He intended to mount the Cabriolet concept car's four-wheel drive system across the entire 911 lineup. Since its beginnings, Porsche proved and promoted its products through competition. Ferdinand Piëch embraced competition during his days at Porsche and at Audi, was developer and champion of the all-wheel drive Quattro rally and road cars. For Bott, this was essential technology for the 911.

Bott had joined Porsche back in 1952. In an interview in 1991, he explained himself: "I'm a *machinenbauer*, an engineer who makes machines. And you know the engineers who build machines are sometimes fighting against the electricians, against the engineers from other faculties. However, when I first saw what you could do with electronics on the engine management, I was so impressed. It thought this was a revolution for the whole car. For everything."

Barth and Kussmaul adopted 911 R ideas. They started with a Turbo body, retaining its brakes and strengthening the suspension. They fitted underbody skid plates, replaced steel panels with aluminum where possible, and used thinner glass for the windshield and plastic for side and rear windows. *Photo by Randy Leffingwell*

Electronics enabled Bott and a phalanx of engineers and development drivers to create their first all-wheel drive Porsche, the 953 for off-road racing and later the 959 for paved roads. These vehicles gave new meaning to the objective of distributing power and cornering forces onto all four wheels. Bott's engineer Manfred Bantle managed the staff that investigated every technology available at the time, from tires to engine fuel delivery to prototype gearboxes. But Bott wasn't looking 20 years ahead to some far-off, far-out technology. He knew his engineers' capabilities. And they understood him. When Bott targeted a point 10 years out, they frequently had already reached it in 2.



Designated the Typ 954, these were also known as the SC/RS, the “evolution” version of the just-discontinued SC. Through relentless effort, engineers created a 1,057 kg (2,330 lb) race car, some 103 kg (227 lb) lighter than a production SC. Race shop mechanics modified the normally aspirated 2994cc engines to develop 225 hp (165 kW) at 7000 rpm and 184 lb-ft (250 N·m) of torque at 6500 rpm. *Photo by Randy Leffingwell*

Barth and Kussmaul, both rally drivers themselves, knew that quicker, predictable throttle response and cooler cockpits were worthwhile tradeoffs and went without the turbo. Thus, the car avoided the FIA displacement 1.4 multiplier, which dictated a higher weight requirement. *Photo by Randy Leffingwell*

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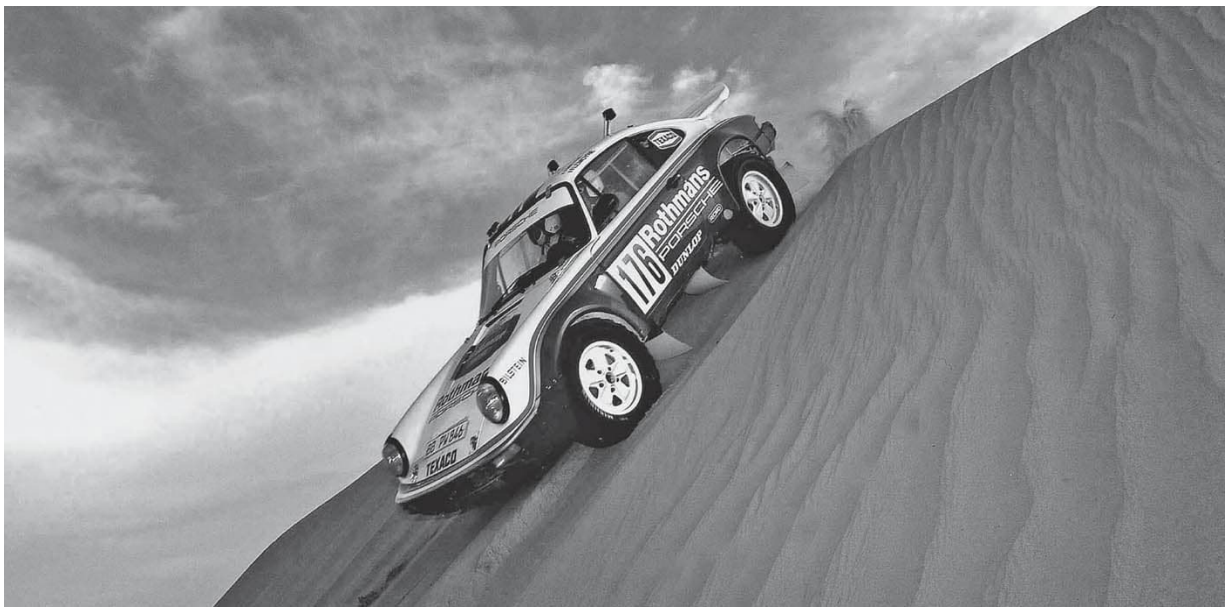
1985 TYP 911 CARRERA "TURBO-LOOK" AND TYP 953

The 1984 Typ 953 was the prototype that proved Helmuth Bott's ambitious concept. He envisioned mounting the entire 911 lineup on four-wheel drive platforms.



The Typ 953 was Porsche's prototype 4 x 4. After extensively testing Helmuth Bott's personal all-wheel drive prototype, engineers Roland Kussmaul and Erich Lerner developed three cars for the Paris–Dakar Rallye. Brutal conditions dictated raising ride height 270 mm (11 in), nearly a foot above series production Carreras. *Image courtesy of Porsche Corporate Archives*

For Bott, while there was no class yet for four-wheel drive, he viewed it as essential technology for safety and handling. While Manfred Bantle managed the staff that investigated future technologies, Bott moved toward widespread adoption of new capabilities that electronics now permitted. Ideas that once seemed 20 or 25 years away, now appeared closer than 10 years. And Bott always moved faster.

Styling department staff designer Dick Söderberg won the competition to create Bott's 911 for ten-years away. Söderberg hoped the Porsche Supervisory Board would allow a new roof, one of costliest elements of any automobile. He, Bott, and four-wheel drive project manager Manfred Bantle wanted the 959 to function without spoilers and wings. With no new roofline or floor pan, a rear wing was an aerodynamic necessity, especially for a car with the speed potential the engineers envisioned. This car was likely to be an engineering showpiece, a tour-de-force not only to show off but to actually demonstrate what the Porsche 911 can do.

Aerodynamicist Herman Wurst designed a breadbasket-handle wing that created a design language that many other car stylists adopted. Best of all, while it was aesthetically beautiful, it also functioned extremely well. A long, slender black lip, sometimes referred to as a Gurney Lip after its innovator, former Porsche racer Dan Gurney, added onto the rear deck lid just before production started, improved the aerodynamics and reduced the coefficient of drag of 0.39 for the production Carrera coupe to 0.32 for the 959.

Porsche steadfastly supported the Frankfurt IAA show, and once again, chose the event to unveil its pearlescent-white painted show car in September 1983, identified as *Gruppe B*. The company promised production for 1984/1985. But Porsche was not completely alone in exploring lighter, stronger materials and new mechanisms. However, with all the complex systems, Porsche frequently had to get in line at the shops doing this kind of prototyping. The production target slipped again and again.

Porsche broadened its Turbo-Look program, including both Cabriolet and Targa models. As Porsche historian Marc Bongers explained, "Targa and Cabriolet models with Turbo-Look bodywork needed extra body reinforcement, since the turbo suspension could generate higher [cornering] forces." *Photo by Randy Leffingwell*

In the meanwhile, Porsche's Special Wishes department broadened it visibility by offering Turbo bodywork as an option the 3.2 Carrera coupe late in the 1984 model year, and expanding it to Targa, and Cabriolet for 1985. However, this included not only the bodywork but also the tires, wheels, brakes, and suspension, measurably upgrading cornering ability. As it was with the 3.3 Turbo, this was a pricey option, raising the price of the coupe from DM72,000 to DM99,950 ($24,490 to $33,997) at Zuffenhausen. The Cabriolet increased similarly from DM82,000 to DM109,950 ($27,891 to $37,398). Both the Turbo-Look Targa and Cabrio also gained additional reinforcement to handle the Turbo suspension capabilities. Body width grew as well, from 1,652 mm (65.8 in) to 1,775 mm (70 .7in). The extra steel bodywork increased overall weight by 50 kg (110 lb).

Porsche, through racer Jacky Ickx, entered the Paris-Dakar Rally for a second year, delivering three Typ 959s to the start at Versailles, outside Paris, France. These were substantially different from the 1984 Typ 953s. The bodywork resembled the coming "production" 959s with the breadbasket-handle wing. Now the engine was twin-turbocharged, with the turbos working sequentially, that is a smaller one speeding up very quickly and pressurizing the main, large one more rapidly. This effectively reduced turbo lag to something near typical throttle response. The 3,164 cc opposed six-cylinder engine, derived from the series 3.2 Carrera, raced the African desert 230 hp (169 kW) at 6000 rpm. The output reflected a compression ratio lowered to accommodate African desert—quality fuels.

As clever as its engine was, the new transmission and drive systems exceeded it in sophistication. A six-speed manual gearbox included first gear as an ultralow speed "creeper" for crawling out of sand. However the front and rear transaxles also incorporated four electronically controlled drive programs. In "Traction" setting, the system fully locked front and rear axles. The "Ice" setting locked the rear but allowed the front a range from zero, or free, to 100 percent, locked as the rear. The third and fourth functions activated automatically and reacted to engine power, the speed difference between front and rear axles, and actual road speed. But a tap on the brake pedal instantly reset the transaxles to fully, equally locked "Traction."

The Turbo-Look package increased coupe, Cabriolet, and Targa prices by an average DM27,950 ($9,510) for factory delivery. Coupe owners typically ordered the Turbo-Look for its improved handling, though the wider body decreased top speed slightly. *Photo by Randy Leffingwell*

To complete the Dakar's longest legs, Kussmaul and Lerner filled every available space with fuel. A tank in front carried 120 liters (31.7 US gal) and a 150-liter (39.6-gal) tank filled the space behind the seats—just leaving room for a pair of mounted spare tires. *Image courtesy of Porsche Corporate Archives*

The 1985 Paris–Dakar Rally proved that Porsche was not invincible. The 14,000 km (8,699 mi) rally encompassed 7,487 km (4,652 mi) of timed

special stages. A total of 552 vehicles started—cars, trucks, and motorcycles—and 22 days later, 146 finished. None of the three 959s made it.

Their Dakar debut resulted in an unexpected Porsche win for rally veterans René Metge and Dominique Lemoyne. Team captain Jacky Ickx and TV actor Claude Brasseur finished sixth, and Kussmaul and Lerner, serving mainly as technical service, placed 26th. *Image courtesy of Porsche Corporate Archives*

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1986 TYP 911 CABRIOLET AND 959 PARIS–DAKAR

“Customers asked if we could do an open Turbo,” Special Wishes department manager Rolf Sprenger recalled.

In Africa, service is where you can find it. Trees suggested a watering hole and those were favored. At the end of the 14,000 km (8,699 mi) Paris-Dakar Rallye, Porsche’s three 959s finished first, second, and sixth in 1986. *Image courtesy of Porsche Press Database*

"No! We had to tell them the chassis was not strong enough. 'Well, we would pay whatever additional amount of money because I want to buy my wife a nice cabriolet with all the chic features, with all the trim, and of course with a powerful Turbo engine . . .?'" So Sprenger went to his friends in Weissach, and they began a strenuous reinforcement regimen. Ironically Special Wishes had delivered the Turbo-Look for normally aspirated Cabriolet and Targa models in 1985. Now the actual Turbo versions arrived one year later.

And what a market it met! Weissach engineers had mastered the catalytic converter to meet United States emissions for their flagship. Other necessary underhood hardware reduced engine output to 282 hp (207 kW) for American customers, but the joy—and ease—of getting a Turbo with a factory warranty —in coupe, Cabriolet, Targa, and Flatnose body styles—led to the demise of some of the gray market modifiers.

It benefited Porsche substantially. Exchange rates between the US dollar and the deutsche mark still rendered America sales valuable and for Porsche's Supervisory Board, such continued investment on Cabriolets and catalysts made sense. A $48,000 Turbo sent home 60 percent more deutsche marks than that sum provided in 1980. Company profits for 1985 rose 30 percent above 1984. US markets consumed almost two-thirds of 1985's total production of 54,458 cars. With deutsche marks in the bank, chairman Peter Schutz approved the 959 launch at the September 1985 IAA show. The company promised deliveries of two versions, a Sport and a Komfort model, in August 1986, priced at DM420,000 ($193,548). Porsche demanded DM50,000 deposits ($23,041). Some 250 potential buyers hurried into line. The intentional oversubscription allowed that some customers might step away. From many viewpoints, Peter Schutz looked like a savior.

Through all this 959 development, the company made small, steady changes to the Carrera 3.2 and Turbo 3.3 models. Profits not only had encouraged the showpiece 959 but also allowed development of the next 911, an evolution necessary because of continued safety and emissions regulations updates from a number of governments.

"With the G model, every year we made new things on the car," Bernd Kahnau explained. Kahnau literally grew up inside Porsche. His father was head of 356 production and drove him and his mother home in his 356 from the hospital after his birth. "We did new things every year, new clock, vents, mirrors, seats, tires, steering wheels." But the G-model platform could never

accommodate either anti-lock brakes (ALB) or airbags. Those innovations and requirements dictated a new structure. Lessons, developments, technologies, and features spilled over from the 959 to this new vehicle, designated the 964.

The biggest news for Porsche loyalists was Weissach's successful development of its potent Turbo on either a Cabriolet or Targa platform. The cars carried a roughly 35 kg (77 lb) weight penalty in additional stiffening to handle the forces the Turbo engines generated. *Image courtesy of Porsche Corporate Archives*

Through 1984, 1985, and 1986, the Carrera provided buyers a 231 hp (170 kW) engine at 5,900 rpm for everyone but US and Japanese buyers whose nations had the strictest emissions limits. Those two got along with 207 hp (152 kW). Side impact door beams of high-strength steel, new this year, obstructed the intrusion of vehicles into the passenger compartment in broadside accidents. The list of small changes year after year kept specifications writers and advertising copy creators busy counting words as they filled pages with what was "New! New! New!"

The 959 models began production. Engineering prototypes, 16 in all, had emerged in 1985 and went through exhaustive testing. Another 21 pilot production cars appeared in late 1986. The 959s were actually produced at

Karosserie Baur in Stuttgart, with Porsche inspectors closely monitoring the operation. Baur, with inadequate space in their own shops, acquired a former bakery near Zuffenhausen and converted the space to 959 assembly. It was, in nearly every sense of the word, a hand-built automobile.

Jacky Ickx and company took their Porsche show to the African desert for a third time in 1986, this time with further modified 959s. Some 488 teams braved New Year's Eve traffic to stage overnight inside the secure parc fermé near the start at Porte de Versailles outside Paris. With a year to analyze 1985's shortcomings and modify and repair suspect systems, the three cars left Paris with reworked engines, a bit of hope, massive preparation, and a good sense of the realities ahead. After 22 days and 14,000 km (8,699 mi), the Porsche team finished first, second, and sixth.

The cars were very successful, the Cabriolet especially. Zuffenhausen assembled some 918 of the 300 hp (221 kW) 3.3-liter (201 cu in) Turbo Cabriolets and 193 of the Targas. Selecting the Cabriolet added DM20,000 ($11,111) to the price of the Turbo, reaching DM147,850 (about $82,140) The Targa sold for DM134,850 ($74,917 at Zuffenhausen). *Image courtesy of Porsche Corporate Archives*

The Typ 959/50 engine produced 400 hp (294 kW) at 6500 rpm and 289 lb-ft (392 N·m) of torque at 4500 rpm. The engine was capable of greater output, but "desert-quality" fuel rating only 86 Octane dictated lower compression (8.0 to 1) and output. Engineers water-cooled the dual overhead camshaft cylinder heads, while the cylinder barrels remained air-cooled. *Image courtesy of Porsche Press Database*

The team had experienced hostility their first year in 1984. The crew and drivers heard jokes behind their backs—"Sports cars in the desert! We'll be towing them out before the first stage is done"—and insults to their faces —"Go back where you belong. You've got no business here." But team manager Roland Kussmaul set the tone for team behavior and soon earned gratitude and then affection. One of Porsche's support trucks, which by the regulations also entered as a contestant, carried a mini machine shop and crates of spare parts. Kussmaul and his mechanics never turned away a fellow competitor with a broken part or mechanical problem, often losing precious sleep to help others. When Porsche retired the effort after 1986, they left Dakar as popular winners.

The engine's innovative twin-turbo system relied on a small turbo to spin up quickly and force boost into the much larger main turbo. The goal was to eliminate the lag between pressing the throttle and feeling the boost. Bott, pleased with this "sequential" system, said the six-cylinder Turbo "drove like an eight-cylinder naturally aspirated engine." *Image courtesy of Porsche Press Database*

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1987 TYP 959 SPORT

Porsche's borrowed assembly facility got busy, turning out the "series" 959 cars. It delivered 113 in 1987. The price remained DM420,000; however, because the DM to USD exchange rate slipped from 2.2 to the dollar down to 1.8, the relative price in American currency rose to $233,333.

The 959 entered development at a time with other makers—McLaren, Ferrari, and Bugatti—were also pushing envelopes. This sometimes left Porsche standing in a waiting line for prototype pieces from small shops already committed to others. *Photo by Randy Leffingwell*

Another 179 cars emerged during 1988. (After a several year lapse, Porsche assembled a final 8 in 1992, fabricated from extra parts.) This brought the total to 337 cars. In retrospect, calculating a price in United States dollars (USD) proved a pointless exercise. Bott and Schutz understood that meeting USDOT and EPA regulations meant additional delays and expenses. Porsche had oversold the production without accounting for deliveries to those 50 American buyers with deposits. Some 30 of those individuals had arranged for delivery and service through Pennsylvania Porsche racer and dealer Al Holbert. Holbert had contracted with the new Porsche A.G.–owned distribution organization called Porsche Cars North America (PCNA) to import these vehicles. Zuffenhausen began the process, stripping the cars of all interior appointments. PCNA identified these vehicles on shipping and customs documents as race cars not legal for road use. But when the first eight reached the United States, the EPA did its inspections. Each car had a VIN, not just a simple racing chassis tag, and so failed inspection and were refused entry.

Subsequently Porsche delivered something like 16 of the cars to American buyers under strict qualification that the cars remained outside the United States. Over time, all these and a few more entered the United States via various arrangements, fabrications, and the passing of the “Show and Display” law. This law allowed the EPA and USDOT regulators to approve the 959 imported by Porsche 935 racer and car collector Otis Chandler that was destined for his automobile museum in southern California, the Chandler Vintage Museum of Transportation and Wildlife.

Some of Porsche's greatest cars have emerged from a committee brainstorming a solution to a driving or racing problem. The Typ 959 was the product of a Helmuth Bott's singular vision, one imagination that saw the 911 not only as a car for any driver but also any condition. *Image courtesy of Porsche Press Database*

Once out of Bott's mind and in the open, the 959 became a test bed and development vehicle for technologies not yet in place elsewhere: electronic traction control; automatic ride-height adjustment; a smaller turbo used to accelerate a larger one to full boost; and a tire pressure monitoring system. *Image courtesy of Porsche Press Database*

No 959s in the United States

In a post mortem on the cars within months of those final 1992 deliveries, Helmuth Bott admitted he was not unhappy by the US restriction. “Your system in consumer protection goes 100 percent against the product and the company. And I really am glad to have all the years of so much strength and safety in our cars. But we had stupid things, like a NASA engineer who was stopped at a red light. And a woman in a Cadillac drove into the 911. Afterwards he couldn’t use his legs any more. We really had no responsibility for the accident. And what did we have to do?

“We bought a Cadillac the same age. We found a 911 the same year. We took dummies the same weight like the man and his wife. We put them in the car and we made the accident at Weissach. And we could tell people that there is no possibility for any system to be safe if you get [hit by] a Cadillac from behind at 50 kilometers [31 mph] speed onto a car standing at a red light.

“The whole thing cost us I think one and one half million because we had to do so many things to show there is really no fault from the car. At the end it was a compromise. The Cadillac driver didn’t have money so they said, “Well, there is Porsche who makes the seat. They have to pay.’ There were other incidents. A young girl with a Turbo. Others.

“And so if we were going to bring the 959 to the United States and anybody would drive at 320 [kph] top speed and have an accident . . . . That was the thinking behind the decision.”

The engine combined water-cooled dual-overhead camshaft and four-valve heads with air-cooled cylinder barrels and crankcase. With twin turbos, the engine developed 450 hp (331 kW) at 6600 rpm from its 2849cc displacement. Torque reached 369 lb-ft (500 N·m) at 5000 rpm. *Image courtesy of Porsche Press Database*

By the time production of the Porsche's 959 ended, enthusiasts and journalists recognized that this vehicle had defined a new type of automobile: the supercar. Mastering the various technologies that appeared in it and functioned on it brought Weissach engineering consulting clients for another decade. The cars appeared on the cover of every automobile magazine and hundreds of other publications that seldom paid attention to cars. But that weighed against the world economy as it shifted gears and continued to take the German currency down against the US dollar. The exchange rate balloon and other business dreams popped on October 19, 1987. The Dow Jones Industrial average lost nearly 23 percent of its value in a day, dropping 508 points. Porsche production had floated along in 1987, slipping to 48,520 cars with US sales dropping below half, at 23,632, for the first time anyone cared to remember. For 1998, the American sales numbers dropped a third again, to 15,737. Consequently Peter Schutz made profound cuts to production.

Its six-speed manual gearbox enabled it to reach a top speed of 315 kph (196 mph) and to accelerate from 0 to 100 kph (0 to 62 mph) in 3.0 seconds. Production delays and currency devaluations led to a selling price of DM420,000 (about $234,000) although Porsche declined to sell it in the United States. *Image courtesy of Porsche Press Database*

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1988 TYP 911 CARRERA 3.2 CLUB SPORT

Porsche introduced the 911 Carrera 3.2 M637 for the 1987 model year. Designated the Carrera Club Sport, production and distribution plans included a very limited run over two models years for non-United States buyers.

Tony Lapine's Style Porsche design department devised a clever optional model identification treatment. While script along the doors was available, the more innovative treatment contoured the name *Clubsport* over a front fender. *Image courtesy of Porsche Corporate Archives*

Assembly began on examples for Rest of the World (ROW) Markets—that is, for those nations not requiring a catalytic converter—and by July 1988 Zuffenhausen had turned out 81 of these. The M637 package was more about what it deleted than what it added—because that was extremely subtle. The deletions included air conditioning, central locking system, front fog lamps, power seats, power window lifts, radio, rear seats, rear wiper, sound insulation, and undercoating. Bundled in a pile, this lot weighed roughly 50 kg (110 lb). Zuffenhausen assemblers installed Porsche's short-shift kit. And for the 81 non-United States buyers, engineers tweaked the Bosch Digital Engine Management system to increase the redline from 6,520 rpm to 6,840. In addition they fitted lighter-weight intake valves to enable higher engine speed. The Typ 930/20 engine delivered 231 hp (170 kW) at 5900 rpm and developed 195 lb-ft (264 N·m) of torque at 4800 rpm. For comparison, catalytic converter equipped cars produced 217 hp (160 kW) at 5900 rpm. While this was not substantially different from all the 1987–1988 series production Carrera 3.2s, the benefit of removing weight improved acceleration and handling. To further that goal, all versions utilized Bilstein dampers, and engineers settled on Pirelli P6 tires. In front the 195/65VR15s rode on 6J x 15 front Fuchs wheels while the rear combination was—initially—215/60VR15s on 7J x 15s. However, later in the manufacturing run, engineers changed the front and rear tires over to 16s. Their preference was Dunlop D40s in 205/55VR16 at front and 225/50VR16 in back.

From the outside, the Club Sports were distinctive. While most were Grand Prix White, a few other colors slipped out. The basic whale tail was common to all, and the only model designation could be viewed from overhead: a stylized *CS Club Sport* logo stretched out along the top of the left front fender (as seen from inside the car). Buyers had the option of black, red, or white wheels.

The Club Sport M637 carried on through the 1988 model year, with Porsche discontinuing the limited run model along with the entire Carrera 3.2 line at the end of the 1989 season. The final count was somewhere between 190 and 340, depending on the source. Of these, 28 made it to the United States. Another 50 were delivered to buyers in the United Kingdom. The rest were scattered around the map. All were coupes except for a single special-order Targa Club Sport. Porsche initially priced the coupe at DM80,500 or

$45,739 ex-factory for the 1987 model. This rose to DM82,000 for the 1988 model year, the equivalent of $46,590 at the Zuffenhausen Werks.

The 1975 Turbo was probably Porsche's first homologation model sold to the public. Customers who acquired one of the rare 1987 Typ 959 Sport versions got something similar. Porsche followed up with its 1987–1988 Clubsport, proving that some Porsche costumers are captivated by the possibility of a "near" race car. *Image courtesy of Porsche Corporate Archives*

Across the entire Carrera lineup, Porsche replaced its Typ 915 transmission with a new one designated G50. This reinforced gearbox made use of a Borg-Warner synchromesh system. It reconfigured the shift pattern into four vertical planes. The full-synchromesh reverse gear was far left and forward, with fifth gear far right. This new transaxle required new rear axle tubes. Through 1987, 1988, and 1989 Porsche continued to offer the Carrera and the 3.3-liter (201.3 cu in) Turbo in coupe, Targa, and Cabriolet body styles. On June 3, Zuffenhausen assemblers took a brief break to celebrate another milestone: they had completed Porsche's 250,000th 911. Product planners commemorated the occasion—and the 911's longevity—with a 25th-anniversary special edition. Where the Club Sport deleted equipment, planners reversed course with this model, restoring central locking and adding a power adjusted passenger seat and a new system that not only washed the windshield but also squirted the headlights. Blue leather seats incorporated an *F. Porsche* autograph into the headrest. Painted Marine Blue

metallic, Porsche offered it in coupe, Targa, and Cabriolet body styles with production limited to 875 examples. Of these 250 remained in Germany, another 325 were distributed worldwide, and 300 were delivered to the United States. American buyers had a choice from 120 coupes, 80 Targas, and 100 Cabriolets. As production managers looked into the future, they spied a few too many Cabriolets in the assembly schedule and already in new-vehicle storage. With help from design chief Tony Lapine's and his stylists, they devised a clever plan—an appealing new open car intended to remind everyone of Porsche's long history. The company unveiled the car during the 1987 Frankfurt IAA show. It already had a name: Carrera 3.2 Speedster.

On Clubsports, the list of deleted items is far greater than those added: sound insulation, rear seats, side and rear trim, radio, power windows, fog lamps . . . even coat hooks and door pocket covers came out. *Image courtesy of Porsche Corporate Archives*

Minimal internal changes to the 3164cc opposed six-cylinder engine kept the car legal for United States customers, but the car just seemed quicker. Maybe it was the 50 kg (110 lb) weight savings. *Image courtesy of Porsche Corporate Archives*

The late 1980s broke new ground for what Porsche might offer its customers and what they, in turn, will pay for. All-wheel drive and model names evoking the company's racing history, including an open model coming for 1989, established new—and lasting—patterns. *Image courtesy of Porsche Corporate Archives*

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1989 TYP 911 CARRERA 3.2 SPEEDSTER

Porsche product planners, designers, and engineers had refined the art of Special Editions since its first stumbles in early 1968 with proposals for a Typ 911 R Touring, different from the spartan sports model due to hundreds of pounds (kilograms) of reinstalled equipment.

To better embody the Speedster spirit, designers and interior planners deleted the rear occasional seats. Because the idea from the start had been to adopt Bott's lowered windscreen idea, they reduced its height by 90 mm (4 in), dropping overall vehicle height from 1,310 mm to 1,220 mm (52 in to 48 in). Naturally this required a new convertible top. *Photo by Randy Leffingwell*

Lessons learned, they turned a 1973 homologation special, the 911 RS Carrera 2.7, into a startlingly successful series by offering a decontented Lightweight version for sporting drivers and a deluxe Touring model for its higher-end customers who wished to *appear* sporty but also wished all the creature comforts of their most recent 911 S model. The Porsche team employed this same ingenuity with the G-Series Carrera 3.2 platform, and a Cabriolet finally appeared. Turbos adopted race car slanted noses, and then Turbo bodies migrated to normally aspirated models. Among these was perhaps Porsche's third cult classic, the 911 SC/RS, in 1984. But a broader audience learned they could *appear* turbocharged for about DM13,000 ($6,915) less than *being* turbocharged. What's more, this Turbo-Look spread in both directions. Not only could a normally aspirated Carrera 3.2 Coupe masquerade as a Turbo, but starting in 1987, Porsche offered Turbos in Targa and Cabriolet body styles.

However, as fanciful as these cars may have been, Porsche manufactured automobiles for the real world. And this real world was set to introduce stringent new regulations, going into effect with the 1990 model year. For Porsche engineers and designers, this meant an all new car, internally designated the Typ 964. It gave them opportunities to do not only the things they must but also some that previously had been, well, fantasies, such as all-wheel drive for a series production 911.

But first there was the matter of a few too many G-series Cabriolet bodies in inventory. By now Porsche planners and designers had seen the same unique 911 Cabriolet that Helmuth Bott had shown Peter Schutz one evening, Bott's Speedster. Bott's one-off incorporated a rigid tonneau cover over the passenger area, rendering it nearly a single-seater. Fabricators had chopped the windscreen down to a wind-cheating minimum. Peter Schutz fell in love and ordered development and production of a series Cabriolet immediately, and as is the way with all good ideas at Porsche, Bott's Speedster slipped back into a desk drawer. A few extra G-Series platforms was all it took to unearth it.

Give creative product planners, marketers, designers, and engineers a couple thousand Carrera 3.2 Cabriolets and what they created was much more than an update of a beloved classic. The Speedster founded a philosophy based on reinterpreting the good old days for Porsche loyalists and then delivering it with a full warranty. *Photo by Randy Leffingwell*

Tony Lapine's styling staff launched hundreds of design proposals. While they honored the character and legacy of the Typ 356 Speedster from the 1950s, many of the sketches illustrated a widened, more aggressive open car. Planners and Porsche's Supervisory Board approved a limited but significant run of Speedsters assembled on Turbo platforms.

Its slightly elevated rear tonneau cover was perhaps the identifying styling feature of the new Speedster. Modelers carefully sculpted a double bubble shape. This, however, was no mere styling exercise. Through 1959 and 1960, Porsche raced open two-seaters designated RS60 and RS61. Mandatory full-width windscreens introduced terrific turbulence that decreased the cars' tops speeds. Racing engineers fabricated rear bodywork that raised rear deck height to near the top of the drivers' heads. This eliminated the turbulence and increased top speed. Hinges at the rear of the massive aluminum

bodywork allowed it to pivot open for engine or gearbox work. The Speedster's fiberglass double bubble served similar functions in managing airflow as well as covering the collapsible top and hiding anything occupants had placed on the rear platform.

Some production records indicate that Zuffenhausen assembled 2,065 Speedsters. Other sources quote 2,103. Of these, 1,894 were ordered with Turbo-Look bodies, while the remainder were ROW special orders with standard Cabriolet bodies for those who thought the wide bodies were too flashy. Some sources report that Porsche delivered only Turbo-Look Speedsters to its German and United States customers. Reportedly 823 went to United States. Porsche set its price at DM110,000 at the factory ($58,511), and they sold for $65,480 in the United States.

In Porsche's new Zuffenhausen Werk 5 assembly hall, other Zuffenhausen employees were manufacturing Porsche's new all-wheel drive 911 Carrera 4 coupe. Emission regulations demanded a new engine, and Porsche developed the Typ M64, a 3600cc opposed six-cylinder that produced 250 hp (184 kW) at 6100 rpm and 229 lb-ft (310 N·m) of torque at 4800 rpm. On this model, known as the Carrera 4, Porsche introduced all-wheel drive, which recently retired engineer Helmuth Bott had long been advocating. An electronically controlled front differential typically channeled 31 percent of power to the front axle and delivered 69 percent to the rear axle. This system required an all new suspension, and Porsche fitted coil springs front and rear, a first for a series production car. MacPherson struts dampened the front end while aluminum semitrailing links supported the rear. Anti-lock brakes—a legal requirement in many markets—were standard, an innovation painstakingly proven on the Typ 956 race cars. And the central locking system now incorporated a vehicle alarm.

To maximize production feasibility while containing costs, Porsche carried over the complete instrument panel and seats from the series production Cabriolet. There were no modifications to the engine or running gear. Power output for United States buyers remained 217 hp (160 kW) with a catalytic converter cleaning up exhaust while the rest of the world ran engines with 231 hp (170 kW). *Photo by Randy Leffingwell*

Porsche carried over the 3.2 Carrera engine unchanged for the Speedster. With 3164cc overall displacement, the engine produced 231 hp at 5900 rpm. These Turbolook Speedsters weighed 1290 kg (2,844 lb) and Porsche assembled 2,103. *Photo by Randy Leffingwell*

The double bubble hinged at the rear. It complicated raising the cloth top and demanded dexterity and practice from driver and passenger. However, many of the Speedsters went to owners as second cars, and they simply decided to never drive the car in inclement weather. *Photo by Randy Leffingwell*

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1990 TYP 930 S TURBO SLANT NOSE CABRIOLET

Around the time Zuffenhausen managers and Weissach engineers and designers were preparing to retire the G-series, a Porsche 911 customer entered a New York dealership.

Some of what is visible and much of what is invisible was bespoke to this one-of-a-kind Turbo Slant Nose Cabriolet. With nearly 500 non-standard items on board, the build sheets numbered 32 pages. *Photo by Randy Leffingwell*

He wanted to order a coupe, standard in every way except that he wanted a leather dashboard in his car. Porsche had discontinued them because of warranty issues. Owners parked them outside and repeated exposure to high heat led the leather to crack. When a Porsche Cars North America's vice president repeated the verdict, he was stunned. He owned other German-built autos with leather dashboards, why not Porsche?

The New Yorker doubted what he'd heard. He called Porsche in Zuffenhausen, connecting quickly with Harry Bergst in Porsche Sales in their Ludwigsburg headquarters and was told, "Of course we can do a leather dashboard; we do them for years." He then double-checked with PCNA where they said, "technically it doesn't work." So the New Yorker sent a letter by FedEx to Ferry Porsche and another to Porsche chairman Heinz Branitzki, explaining his dilemma and concluding with, "I'd like to become a Porsche customer if only I could find a way to start."

Within days, he heard from Hans Wolgemuth, PCNA's vehicle distribution manager, who said Porsche's worldwide head of sales "was considering his request." A couple weeks later, he learned his request was approved. By now it was January 1989 and Wolgemuth confided in him: Porsche was discontinuing the Typ 930 Turbo, information not yet public. Did he want to upgrade to a Turbo?

The New Yorker was looking for a weekend pleasure. The Turbo was more than he needed, but another month later, Wolgemuth updated the New Yorker to let him know that not only was it the end of the 930 Turbo, but it was the end of Turbo Cabriolets. And the Flatnose was going as well.

"I'd seen these things, but I didn't realize Porsche actually did this . . . Okay, let's make a flat nose Cabriolet!" But just what else could Porsche do for his flat nose Turbo Cabriolet? He sent a wish list to Bergst, who responded by introducing him to Rolf Sprenger, founder of *Sonderwunsch*, Special Wishes, and his staffers Elmar Willrett and Edgar Zeller. "Sure, we can do that and this and that and that" they told him. They scheduled work through the summer of 1989, the time of the typical model changeover. This led to a pertinent question: is this possibly the last Typ 930 Turbo? Well, yes. Parts of Zuffenhausen assembly already had been producing the new Typ 964, and Porsche had plans for a Turbo model. But it was years away and no one had committed to a Cabriolet version. And so dozens of people, certain this was the "last" of its kind, got very excited.

This work had to be done during car manufacture, however, and that was taking place in Germany. This led to a conundrum: Porsche was a union shop and there was no way they could allow outsiders into their plant to work on a car. *Photo by Randy Leffingwell*

”The objective became to make this the best thing possible,” the New Yorker recalled. “They said, ‘We can do this, that, try this, that . . . .’” Since its introduction, the Turbo had been Porsche’s flagship, the fastest, most daring-looking, most expensive, most luxurious—yet with just a hint of bad boy because of the level of skill it demanded to drive it hard. Now, not only the Special Wishes team but others inside Porsche “set out to make the interior as luxurious and elegant as possible,” he learned. And how to do this best? With lots and lots of leather, the material that sparked the inquiry in the first place. It appeared *everywhere*.

Chassis engineers got involved, bringing in special Bilstein shocks and replacing series torsion bars and sway bars with pieces from racing. Brakes grew in size. BBS modified wheels were used to create a one-of-a-kind version for the car. Under the rear decklid, engineers and mechanics adapted technology and parts from motorsports, ultimately delivering 480 hp (353 kW). They fitted the six-speed transmission from the 959. The New Yorker moved to Zuffenhausen to monitor progress and answer last-minute

questions. He watched as engineers and test drivers totaled up 24 hours in testing, registered on a leather-faced dash-mounted Hobbs meter.

As the transporter loaded the car to leave Special Wishes in early May 1991, an engineer on the project, Udo Ohler, told the owner, “This is no longer a car. This is automotive sculpture.”

“That was the day,” the New Yorker recalled later, “that I realized I probably never can drive this thing!” The build sheet ran 32 pages, identifying more than 325 pieces in leather. Technicians fitted some 500 nonstandard items, something like 240 of them designed, invented, and fabricated for this car.

Oddly, because authorization *seemed* to have come from Heinz Branitzki and possibly Ferry himself, an awful lot of people started asking questions: “What was possible?” “Why not do it?” Ultimately nearly everyone in Special Wishes offered ideas and contributed craftsmanship to make the car significant and unique. *Photo by Randy Leffingwell*

To comprehend this car, one must remember the times and understand the “last hurrah” exuberance it represented. The stock market had crashed in October 1987. The deutsche mark had lost half its value in the 18 months before the crash. Porsche’s Supervisory Board, frustrated by 959 cost

overruns mostly fueled by world economics, sent its America chairman home to Florida and pushed Weissach chief Helmuth Bott into retirement a year early. And those weren't the only two. Dozens of craftsmen, technicians, engineers, and others retired, and with them, the skills and the expertise needed to create a car like this also left the buildings.

Leather technicians covered the trip odometer reset button in leather. They wrapped the headlight washer switch in leather. A magnesium turbo-boost control knob on the center leather-covered console was itself leather covered. The rear window zipper pull disappeared into a small leather sheath. Vents breathed through perforated leather. Seat belt anchors sunk into leather. *Photo by Randy Leffingwell*

Porsche's leather specialist Erwin Schäffer devised the electric center console to house the audio rack. Schäffer had never before produced one with three electric doors: one, yes, but never three. *Photo by Randy Leffingwell*

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1990–1991 CARRERA 4 LIGHTWEIGHT AND 1991–1992 TYP 964 CARRERA RS

These proved to be two cars at war with each other. Perhaps that's too strong a term. Certainly they were at odds with one another, as were their "fathers."

Here was another innocuous-looking but quite potent Porsche. The Zuffenhausen Werks assembled these to meet homologation requirements for the Typ 964 RSRs competing in FIA GT series as well as the DRM. *Image courtesy of Porsche Corporate Archives*

Like many of Porsche's effective weapons, the Carrera 4 Lightweight was plain-looking. But for its whale tail, no badges or side paint promoted this as a fully mechanical reissue of the 1984 Paris–Dakar Typ 953. When its specifications reached an early audience, its mystique began to grow. *Photo by Randy Leffingwell*

Back in the early 1980s, Customer Racing manager Jürgen Barth and works team manager Peter Falk had proposed a kind of über-914 to engineering director Helmuth Bott as their candidate for a Group B racer. Bott resisted, reminding them that Porsche's from the 550 through its latest Group C 962 champion had explored mid-engine configurations. Bott urged his two engineers to imagine all-wheel drive underneath a 911. As written above, Barth, Falk, and fellow engineer Roland Kussmaul developed an all-wheel drive Typ 953 and then the Dakar desert–conquering Typ 959, turning all three men into deeply devoted all-wheel drive supporters.

Now Barth began investigating a kind of customer 959. While the FIA had no international racing class for all-wheel drive, Barth had seen the regulators following prevailing winds. Barth hoped to brew up a storm.

Barth blended elements of the soon-to-arrive rear-wheel drive 964 Carrera RS, conceived for GT races, and the series production all-wheel drive Carrera 4. He managed to strip 350 kg (772 lb) from a car he named the C4 *Leichtbau*, or Lightweight, replacing steel doors and decklids with thin gauge aluminum and substituting thin plexiglass for tempered glass in side and back windows. There were hundreds of other changes, exchanges, and deletions, including replacing the series C4 four-wheel drive with leftover 953 gear Barth had unearthed. The car weighed 1,105 kg (2,436 lb).

The all-white coupes appeared completely stock except for its basic white whale tail rear spoiler. The parts and modifications were not cheap. Barth contemplated a limited run of no more than a dozen cars selling for DM225,000 ($138,889). Ultimately there were 21. However, as time passed, delays shoved the price up to DM285,000 ($175,923).

Meanwhile, down the hall, the plot was thickening. With Helmuth Bott pushed out in 1989, Barth had lost a champion. Porsche hired Ulrich Bez to replace Bott, and Bez named Helmut Flegl to be his Number Two. He assigned Flegl to develop the very lucrative Carrera Cup cars. But as Flegl did so, he and Bez began to question Barth's C4 Lightweights. The questions became more pointed when Porsche announced its 964 Cup cars at DM123,000 ($75,926). Was the 953 platform really worth an extra DM100,000 ($61,728)?

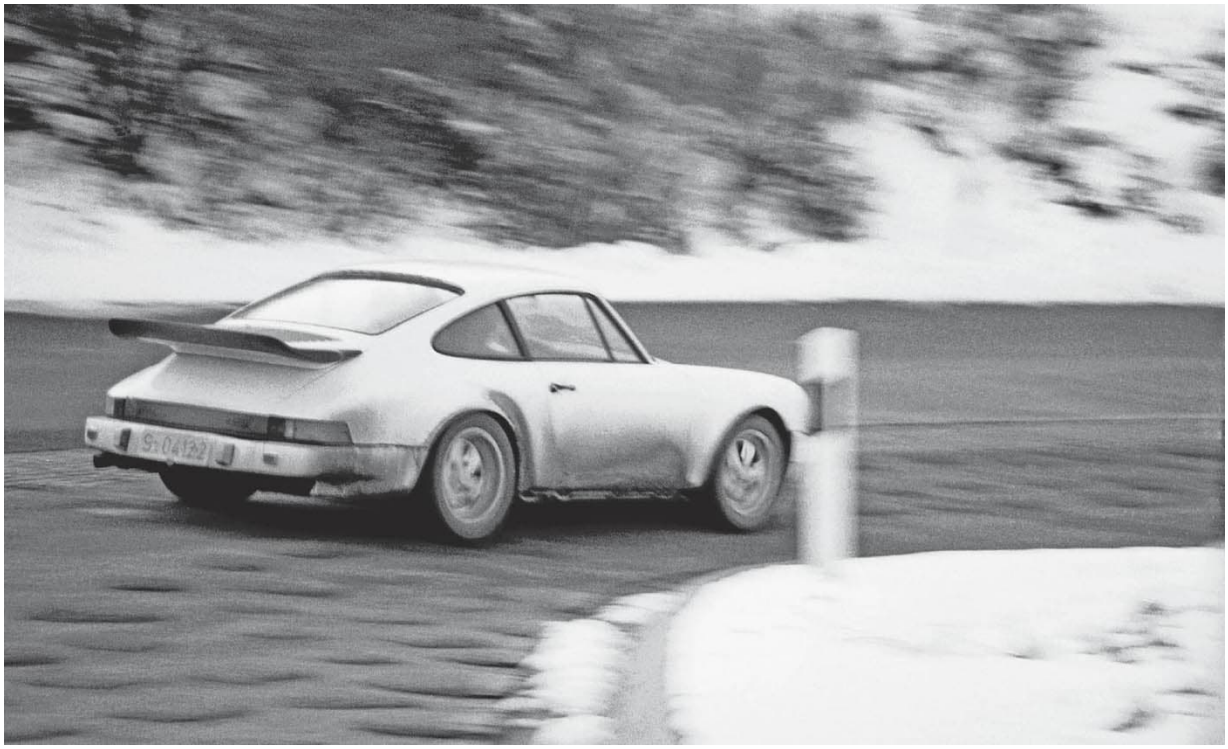
But a strange thing happened on the way to the marketplace. Almost independent of any outside economic reality, the collector-car-as-investment market had replaced real estate and stocks as the darling of the wealthy. Barth's car may not have had a home in any racing series, but it was a genuine, extremely limited production Porsche race car. Crucially Barth convinced German officials to number the cars 964001, 964002, and so on, and not saddle them with the series car WP0ZZ sequence that had kept 1973 Carrera RS 2.7s and 959s out of certain markets, including the United States. With a race car number, sales were recorded on a bill-of-sale. Even Flegl's 70 Cup Cars raced with WP0ZZ serial numbers.

So Barth's first C4L went to a US buyer, as did several more. Others scattered to the four winds, though just like the last of Ferdinand Piëch's 1968 Typ 911 Rs, they did linger. The last 911 R sold in 1970, and the final C4 Lightweight left the customer sports department in late 1992.

Porsche 964 Carrera RS was another of those limited run models with a WP0ZZ serial number, which made it easy for United States Customs Inspectors to identify and deny entry. The popular Carrera Cup series inspired this production run, meant for buyers who planned to run their cars in GT events. Porsche planed an initial run of 1,000 rear-wheel drive Carrera 2s, lowered 40 mm (2 in) on specially tuned dampers and springs and riding on magnesium 17-inch Porsche Cup wheels—7.5J x 17 in front with 205/50ZR17 tires and 9J x 17 in back with 255/40ZR17s.

Two large, knurled knobs at the top of the picture protruded from the instrument panel. Turbo racers used these to dial boost up or down. But this car was naturally aspirated: no turbo, no boost. These dials replaced the 959's fabulously expensive electronic drivemanagement system, letting the driver manually adjust front-to-rear and left-to-right traction. *Photo by Randy Leffingwell*

The RS Coupe's popularity surprised many—even considering the car did not sell in the United States. By the time technicians assembled the final one, they'd put together 2,282 left-hand-drive examples. This was exactly the effect organizers such as DRM and FIA and carmakers intended with the GT racing class. *Image courtesy of Porsche Corporate Archives*



Modifications to Bosch's engine-management system and an all stainless-steel exhaust system increased the 3600cc engine output from 250 hp to 265 hp (184 kW to 195 kW) at 6700 rpm. The almost straight-through exhaust made it one of the loudest 911s in history. From the outside, its innocent looks were deceiving. *Image courtesy of Porsche Corporate Archives*

Its GT ambitions led Porsche to keep it road-legal. Still the works eliminated nearly every comfort consideration, ultimately trimming the weight to 1,240 kg (2,734 lb). With 260 hp (191 kW) available at 6100 rpm, acceleration from zero to 100 kph (62 mph) took 5.4 seconds and top speed was 260 kph (162 mph). Popularity drove production, and by the end of 1992, the works had delivered 290 "Sport" N-GT versions at DM160,000 ($102,564). N-GT represented Near-Grand Touring, suggesting only minimal work was necessary to sit on the grid. In addition, they assembled another 1,916 "Basic" M003 versions—imagine the 1973 RS Carrera 2.7 Lightweight—and another 72 right-hand drive basics, selling for DM145,450 ($93,237). Finishing out the offering, Porsche also provided a Touring version, M002—76 left-hand drive and 14 right-hand drive.

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1992 TYP 964 TURBO S AND 1993 TYP 964 TURBO S LE MANS

"In these times, outside shops were doing things to our cars and our engines that gave them more power but shortened their lives," the late engineer and *Sonderwunsch* founder Rolf Sprenger recalled in an interview in 2016.

Bigger brakes went on the car as did an anti-lock braking system (ABS). The car rode 40 mm lower (1.6 in) to further enhancing handling. The final touch was three-piece 18-inch wheels—8J x 18 in front and 10J x 18 in back, on 235/40ZR18 tires up front and 265/35ZR18s on the rear. *Image courtesy of Porsche Corporate Archives*

Sprenger had seen independent body shops and tuners splash outrageous paint schemes on 911 bodies, install outrageous interiors in Porsche's coupes, Targas, and Cabriolets, and perform outrageous engine modifications on their cars, often without any accompanying engineering or safety upgrades. Back in 1981, with Ferry Porsche's blessing, Sprenger approached engineering chief Helmuth Bott about going after this work and bringing this lucrative business in-house. Bott and the Porsche Supervisory Board agreed and Special Wishes was born. As mentioned previously their first project was the Slant nose for the Typ 930 Turbo Cabriolet.

Porsche's plans for its next Turbo, the Typ 965, similar in looks and complexity to the Typ 959, encountered cost overruns, prototype parts delays, and engineering stumbles. As project costs soared, engineers searched for alternatives for the single most expensive element—the engine. Engineers and fabricators assembled a development series of Typ 965s and ultimately sourced an Audi V-8 engine to power the car, still from the rear! This introduced countless new challenges. When its projected sales price topped DM200,000 ($123,457 in 1990), management cancelled the 965. This left them without a Turbo for the 964 product line, an untenable situation because of its popularity, profitability, and visibility.

Weissach engineers set two performance targets. It had to be faster, and it had to be cleaner, that is, meet and if possible, exceed the world's strictest emission standards. Universal sales were not just desirable, they were imperative. They settled on a 3299cc opposed six-cylinder of 97 mm by 74.4 mm (3.8 in by 2.9 in) bore and stroke. With a single intercooled Turbocharger, the engine developed 320 hp (235 kW) at 5750 rpm and 332 lb-ft (450 N·m) of torque at 4500 rpm.

For 1992 Porsche offered a Performance Kit option. This raised engine output to 355 hp (261 kW) at 5750 rpm, decreased 0 to 100 kph (0 to 62 mph) time to 4.7 seconds, and allowed top speed to reach 280 kph (174 mph). The Performance Kit, not available for United States buyers, added DM19,500 ($12,500) to the price. *Image courtesy of Porsche Press Database*

But even this was not enough for some of the Special Wishes customers. They became aware of a model destined for Le Mans, the 964 Turbo S Le Mans, and another already campaigned with great success in the United States in the IMSA Supercar Series. The Brumos team, based in Jacksonville, Florida, had won the championship in 1991 and were on their way to a follow-up success for 1992. Customers told Sprenger—essentially —I want one of *those*!

Porsche and Special Wishes—renamed *Porsche Exclusive Manufaktur* by now for easier recognition worldwide—responded and in Geneva in

March 1992, unveiled a concept model named the 911 Turbo Lightweight. The competition version raced with a highly developed 3299cc opposed six-cylinder developing 381 hp (280 kW) at 6000 rpm. The *Turbo Lightweight* boasted the same output!

But living up to its name required a weight loss and parts exchange regimen. Typical of its Lightweight predecessors, air-conditioning, central locking, insulation, power seat adjustors and windows, rear seats, and undercoating were sacrificed to the scales. Technicians replaced steel decklids, doors, and rear spoiler with identical items in carbon composite. Ultimately the Lightweight was 180 kg (397 lb) lighter than the series production Turbo, weighing 1,290 kg (2,844 lb). Acceleration from 0 to 100 kph (0 to 62 mph) took just 4.6 seconds and top speed was 290 kph (180 mph). Reaction at Geneva was immediate and enthusiastic, and Porsche's Supervisory Board ultimately authorized assembly of 86 of the cars designated 911 Turbo S Coupe. It sold for DM285,000 ($182,692).

Stylists carried on the Turbo body tradition with broadly flared fenders and a permanent spoiler. Wind tunnel testing revealed a benefit of pronounced edges on the tail in channeling the air, and where the original flat tail had been known as the whale tail, this was nicknamed the *tea tray*. *Image courtesy of Porsche Press Database*

With a weight of 1,470 kg (3,241 lb), the 964 Turbo S accelerated from 0 to 100 kph (0 to 62 mph) in 4.6 seconds and on to a top speed in fifth gear of 270 kph (168 mph). Porsche introduced it for DM178,500 ($107,530) at the factory. *Image courtesy of Porsche Press Database*

But the crossbreeding of the Turbo S had one last incarnation. Le Mans regulations had alternately favored or discouraged Grand Touring-class racing for many years. Organizers argued that spectators wanted to see prototypes, basically land-based spaceships bearing no resemblance to anything outside of their fantasies. Manufacturers argued that crowds wanted to see cars they could actually own. For 1993, regulators decided to invite Grand Touring classes for the first time since 1982 and the beginning of Group C.

Porsche worked on its 3164cc opposed six-cylinder, coaxing 474 hp (349 kW) out of it at 6900 rpm. Its own brutal weight-management program had brought the car down to 1,000 kg (2,205 lb). Porsche had used the Twelve Hours of Sebring as a shakedown, letting Brumos enter and race it. This proved worthwhile. The 964 S Le Mans won its class, finishing seventh overall. At Le Mans Porsche entered the car, with the Sebring drivers: 1991 Supercar champion Hurley Haywood with 1992 Supercar champion Hans-

Joachim Stuck and endurance veteran and rally ace Walter Röhrl as codrivers.

Stuck qualified on the GT class pole, lapping at an average of 305 kph (190 mph). From the start on, Stuck led the GT class by such a great margin he was unnerving the prototypes. But the throttle stuck in the second hour, which cost 20 minutes in the pits. With engineer Norbert Singer directing the race, his drivers managed to regain two of the five laps they had lost. But at 10:00 p.m., as Röhrl was heading into the first chicane, he pulled out to pass a slower 911, only to smack hard into the back end of a black painted prototype. The impact damaged the right front and split open the oil cooler, coating the track and causing several other cars to spin. Röhrl lifted off but only made it as far as the Porsche Curves before his oil-less engine seized. Leading his class, he was running 20th overall and had completed 79 laps.

Porsche sold the car to privateer Jack Leconte who raced the Daytona 24s in 1994 and finished second overall. Then he came in first at Circuit Paul Ricard, again at Circuito del Jarama in Spain, once more at Suzuka in Japan, and again at the season finale at Zuhai, China.

After years without GTs, Le Mans ran a Grand Touring class in 1993. The Turbo S Le Mans fit ACO regulations and with 474 hp (349 kW) in a 1,000 kg (2,205 lb) coupe, and three top drivers, it excited Porsche engineers. A crash ended its Le Mans hopes early. *Image courtesy of Porsche Corporate Archives*

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1993 TYP 964 AMERICA GS HARDTOP ROADSTER *GREEN SLIME*

Never say never.

The New Yorker was back. He had commissioned and acquired the last-ever Typ 930 Slant Nose Turbo Cabriolet.

Porsche expects it cars to be driven, but this customer previously had turned a Turbo Cabriolet into a work of art. Understanding his goals made an even greater number of modifications, upgrades, and changes possible. *Photo by Randy Leffingwell*

Recently he had seen photos of the 1989 Porsche Panamericana—this was the bright green two-seater concept roadster that Harm Lagaaij's styling department had designed as an 80th birthday gift for Ferry Porsche. While Stephen Murkett's concept established many design cues and form languages Porsche incorporated into the series production Typ 964s (and further future products), it was never one of Ferry's favorites. But it struck the heart of the New Yorker, and he reached out to his friends at Porsche to see if they might just sell it to him. No, he was assured. The company could not sell such a prototype. With that, many inside Porsche who had vowed they never again would undertake so complex a project, hoped that was the last they would hear from New York City. These proved to be famous last words. Murkett's Panamericana inspired a run of open cars assembled on the rear-wheel drive Carrera 2 platform called Turbo-Look Cabriolets in Europe. Through the 1992 and 1993 model year, Zuffenhausen assembled 702 of these cars. Porsche distributed 250 in the United States called the America Roadster, striking a nostalgic note with early 356 racers.

Three years after completing his 1990 Typ 930S Turbo Cabrio Flachbau, one of Porsche's more particular customers sought to buy or commission a duplicate of Ferry Porsche's Panamericana concept. He was directed to the Turbo-Look Cabriolet known in the States as the America Roadster. *Photo by Randy Leffingwell*

When this customer expressed a desire to acquire Ferry Porsche's Panamericana, Porsche design chief Harm Lagaaij got involved. He re-created its color palette and supervised interior and exterior design changes to a series-production cabriolet. The project took 44 months to complete. *Photo by Randy Leffingwell*

Unlike special editions that Porsche decontented, this took on a more Touring approach. Both US and Rest of the World versions received an enhanced stereo system, the better to hear one's music choices at speed. The car had automatic climate control and power seats with in-seat heaters, a new onboard computer, and full leather. The drive train was untouched, the standard 3.6-liter (219.6 cu in) opposed six-cylinder delivering 250 hp (184 kW). This wide-body cabriolet was targeted for grand tourers. The standard Carrera 2 Cabrio was 1652 mm wide (65 in), while the Turbo-Look car stretched out to 1775 mm (70 in). The Carrera 2 Cabrio weighed 1,350 kg (2,976 lb), while the Turbo-Look model came in at 1,420 kg (3,131 lb). This additional 70 kg (154 lb) and width slightly compromised performance. Both the C2 and Turbo-Look Cabriolet accelerated from 0 to 100 kph (0 to 62 mph) in 5.7 seconds, but where the C2 reached a top speed of 260 kph (162

mph), the Turbo-Look ran out at 255 kph (158 mph). That, however, did not deter the New Yorker. He ordered one in green metallic paint.

He blended the idea of Murkett's aggressive open roadster with a history lesson, re-creating the 1950s and early 1960 cars racers drove to the track and raced all day. Groups within Rolf Sprenger's Porsche Exclusive Manufaktur department soon designated his car the America GS Roadster. Based on the New Yorker's show-and-demonstration-only uses of his Slantnose Turbo Cabriolet, engineers began considering the possibilities for this new car to demonstrate Porsche's thinking on wheels.

The standard 3.6-liter (219.6 cu in) engine and five-speed manual gearbox came out, and a competition-bred 3,746cc, 300 hp (221 kW) RSR engine mated to a specially created racing Sportomatic. They decontented this one: no insulation, undercoating, climate control, heated power seats, or power steering. There was one concession to style: Porsche Exclusive Manufaktur upholstered a pair of RSR competition seats in green leather. Naturally the car also got a leather dashboard. He started referring to his car as the *Green Slime*.

But this was all the easy stuff, the so called "low hanging fruit," easy for picking and revising. Now, it was time for things to get complicated.

Sprenger's engineers had devised a rain sensor for the New Yorker's Slant Nose Turbo Cabriolet. Within the first few drops of rain, the sensor messaged the owner's pager, raised the power top and side windows, and relocked the vehicle automatically.

The New Yorker learned that Porsche delivered America Roadsters in the United States with an auxiliary hardtop. The dealers mostly hated them because they ended up storing the tops for owners who never used them. But between Porsche Exclusive Manufaktur and the New Yorker, this top became more useful.

Not only did *Sonderwunch* technicians remove insulation and undercoating in the style of race car preparation, but they also fitted a Carrera 3.8 RS engine coupled to a racing Sportomatic. Inspiration came from the 1950s America Roadster and Speedster models. *Photo by Randy Leffingwell*

Perhaps the car's most distinctive feature was its removable hardtop. But unlike those option on 1950s Speedsters, this one incorporated an electrically operated sunroof and rear glass heater, necessitating inventive means to connect and disconnect power. *Photo by Randy Leffingwell*

It took the better part of a year to engineer it, the primary challenge coming from locating the electric contacts between the top and the car body. Those were necessary to operate the electric sliding sunroof and the electrically-heated rear window defogger. When they were done, they settled on the windshield A-pillars and a pair of robust mounting posts that secured the top at the rear of the passenger compartment.

In the more than 30 years since Porsche Exclusive Manufaktur finished this car, the New Yorker kept close contacts with Porsche, returning the car frequently for new inventions and innovations. In a kind of partnership with the Motorsports Department, the car has become a test platform for ultralightweight and ultrastrong materials. In the process, the car has shed more weight and according to several sources, the car is hovering right around 1,000 kg (2,205 lb), a stunning reduction from its published standard weight at more than 3,000 pounds (1,361 kg). And the work continues. . . .

31

1994 TYP 993 CARRERA

The late 1980s had witnessed house cleaning in the executive suite. If the dictionary defines *iconoclast* as "someone who questions beliefs, customs, and opinions that most people accept," the portrait above the word would show chief designer of Style Porsche Tony Lapine, Porsche's merry prankster who, with Ferdinand Piëch's blessing, sent a race car to Le Mans painted as pink pig, complete with dotted lines indicating pork cutlines for a butcher. Given time off to recover from cancer treatments, he was eventually told not to come back.

By the time Porsche closed for the 1993 Christmas/New Year holiday, Zuffenhausen had manufactured 2,374 of the new 993 coupes, plus 221 pilot production cars. Labeled as 1994 model cars, European customers began taking deliveries in April 1994. Customers in the United States received 1995 models beginning in September 1994. *Image courtesy of Porsche Press Database*

Chief executive Peter Schutz, praised for courageously saving the 911 and introducing a long-awaited Cabriolet was nonetheless dismissed when the world's economy forced the revaluation of the DM and subsequent recession and was invited to leave with a year remaining on his employment contract. And chief engineer Helmuth Bott who, during the 1980s authorized the all-conquering racing 956s and 962 as well as the media darling Typ 959, itself a victim of the sour economy, was sent into early retirement.

Former Chief Financial Officer (CFO) Heinz Branitzki inherited the CEO job. His ultraconservative fiscal practices inspired him to introduce the 1989 Typ 964 as Porsche's 911 for the next 25 years. The first one having lasted from 1964 until then. But this decree terrified engineers and stylists who saw in the new car only its numerous compromises. To address these, the Porsche Supervisory Board hired two former BMW men: engineer Ulrich Bez to replace Bott and designer Harm Lagaaij to step into Lapine's studios. Both men understood what Porsche needed, and each brought fresh air into the company in their different ways.

"They definitely cannot go on with the 964. . . . Nothing was right anymore," Lagaaij explained, this despite the fact that some 87 percent of the car was new. "It had to change radically. We started the 993 immediately after I arrived." This was 1989. To change the appearance of the 911, Lagaaij assigned Anthony Hatter to style its exterior and Hatter pulled cues from the ill-fated 965 Turbo.

With the 956/962 program complete, Porsche had returned motorsports manager Peter Falk to his earlier job as development and testing engineer. The Porsche Supervisory Board assigned him to examine the 964 and define its successor in a document known as the *Das Lastenheft*, or design specification including technical and performance specifications. Ordered to "Get it right," Falk punctuated his 20-page report with the word *Wendigkeit*, meaning agility or nimbleness. Falk maintained that in the evolution from G-Series to the 964, a sense of balance had gone away, leaving the car visually and actually heavy in the front. Adding all-wheel drive was Porsche's attempt to tame the 911s handling quirks, but the system sacrificed agility. Agility referred to responsiveness, while maneuverability was about controllability in direction change.

Engine designers had examined the emissions and noise advantages to water-cooling the 911 engine. But there was no time. Forced to use the

existing 3600cc engine, they improved everything they could. These modifications helped reduce noise and improve fuel economy.

During this time, Bez had championed the idea of a Porsche four-door sedan, the Typ 989 as a new champion. He loaded it with every innovation imaginable. "At that time we had the idea in Germany that all cars needed steering on the rear axle, all-wheel steering," Bernd Kahnau recalled. "We had designed the rear suspension for the 993 based on the 964. Despite two years testing and development, it was still too heavy and far too costly." But shelving it left them with no alternative. Fellow chassis engineer Georg Wahl approached them. Working for Bez on the 989, he and his team had developed the steering rear axle for the sedan. But after it was cancelled they had to develop a replacement. He offered this alternative to Kahnau's group.

Herbert Ampferer's engine group carried over the 3600cc engine from the 964 but made significant improvements. They eliminated a troublesome torsional vibration damper from the crankshaft. They reduced valve train weight and incorporated self-adjusting hydraulic valve lifters. They revised the entire exhaust system. *Image courtesy of Porsche Press Database*

"We threw away the idea of rear steering. We had the subframe that was necessary to make the rear-[wheel] steering work, and this new axle was

alloy, lightweight, and it made for a very comfortable ride. It improved the handling." Because Wahl's group had developed it under budgets for Bez's 989, it cost Kahnau's 993 team nothing. The new rear axle assembly yielded another benefit.

"With the new axle, the new platform, the rear engine, you don't need four-wheel drive even in Switzerland in the snow," Kahnau explained. "But we went into special markets, like Austria, Switzerland, like Sweden, and they said, 'We need four-wheel drive.' They didn't, but we redesigned the front drive system for the Carrera 4 models for them." The engineers replaced the 964 configuration with a viscous coupling at the transaxle, connecting a torque tube to a compact, exposed front differential that sent power to each wheel. The new system saved 50 kg (110 lb) over the 964, further benefiting agility and maneuverability.

First-year production reached 7,865 coupes and 7,074 cabriolets. The base price was $5,000 less than the 964. The new car helped rewrite Porsche's financial statement as the economy finally returned to solid footing in 1995. By this time Porsche also had begun delivering all-wheel drive 993 Carrera 4s. *Image courtesy of Porsche Press Database*

Stylist Hatter intended to address the proportional balance of the 911, something he and others felt had gotten slightly off with the 964. “I always like to compare the forms to muscles,” he explained, “forms with a lot of surface tension to them, not just rounded biological forms. There are no shapes or forms on the cars that don’t have to be there. The bulges, that’s where the wheels are. You can see where the people sit.”

“It was a fantastic time for us,” Kahnau continued. “Mr. Bez. He had the F1 [efforts with Footworks] . . . and all the executives, the first team, paid attention to the 989. And nobody paid any attention to those of us who made the 993. We had it all to ourselves. We all knew something important: If it is not good, we are dead. It was not very simple for us. But what I know now is that the best years we have made the 911 is when the rest of the company is making another car.”

Weissach updated and revised the Tiptronic transmission, renaming it the Tiptronic S, but it was available for only rear-wheel drive models. And on July 15, 1996, technicians drove the one-millionth Porsche, a 993 Tiptronic coupe, off the Zuffenhausen assembly line. Porsche donated it to the regional state police district of Stuttgart. *Image courtesy of Porsche Press Database*

This gave them 272 hp (200 kW) at 6100 rpm and 243 lb-ft (329 N·m) of torque at 5000 rpm. It was quieter than any 911 engine before it. Engineers reconfigured the G50 transmission to add a sixth gear, lowering the ratio on first and stretching the new top gear to get the car to 270 kph (168 mph). *Image courtesy of Porsche Press Database*

The cabriolet roof presented challenges to Tony Hatter and the design engineers he worked with. Gerhard Schröder's top system designed for the 1983 SC passed largely unchanged through the 964 models. Hatter was not a fan.

"I never liked the look of the early cabriolets. The classical 911 shape is the coupe. With the 993, we tried to get some of that form into the roof." The 993 was the first time designers or engineers had been allowed to revise the cloth top.

32

1995 TYP 993 GT2

A new Typ 993 Turbo arrived, delivering 408 hp (300 kW) at 5750 rpm and 398 lb-ft (540 N·m) of torque at 4500 rpm to all four wheels. This introduced a new Porsche philosophy that any of their automobiles providing the customer with more than 400 hp (294 kW) was available only through each tire.

This was partial 959 technology available to a broader audience. The Turbo reached more than 290 kph (180 mph) and accelerated from a standstill to 100 kph (0 to 62 mph) in 4.5 seconds. The new brakes were equally capable, hauling the Turbo coupe down from 200 kph (124 mph) in 130.3 m (427 ft) in just 4.5 seconds. *Image courtesy of Porsche Corporate Archives*

The 3,600cc engine used twin KKK Model K-16 turbochargers and a pair of dual-charge air-to-air intercoolers. Weissach's engineers coupled the six-speed manual transmission to a dynamic limited-slip differential with active braking. A new three-slot nose piece fed air to the brakes and oil coolers. A thoroughly redesigned fixed rear spoiler was an evolution of the previous tea tray, now contoured with the rear body work and painted in body color.

A Carrera RS model appeared for model years 1995 and 1996. Fitted with subtle front corner spoilers and a flat rear wing, all in body color, this package for the serious enthusiasts shaved 100 kg (220 lb) off the standard C2 coupe, and engine designers sweetened the package by increasing displacement from 3,600cc to 3,746cc via the 3.8-liter (232 cu in) engine. This increased displacement, along with other tricks and treatments, delivered 300 hp (221 kW) to some 1,100 customers. Another key to this additional power was an innovative air-induction system called VarioRAM. This utilized long intake tubes to broaden the torque performance at low and medium engine speeds, automatically switching to short ones at high engine speeds to produce greater horsepower. Vacuum-operated sliders manipulated all of this technology. The system had debuted a season earlier on the competition derived 993 GT models. An even less common Clubsport package provided slightly closer gear ratios for those intending to be racing or performing serious track-day activities. Out of a total of 1,014 Porsche RS manufactured for 1995, only 227 were Clubsports. Porsche priced the RS (not for United States consumption) at DM147,900 (roughly $103,430) and the Clubsport at DM164,700 ($115,175).

When Porsche opened the order books for this car, it was known simply as the 911 GT. While its destination was clearly the BPR GT racing series, and while this clearly fit the GT2 class regulations, that number *2* was added to the designation sometime later. *Image courtesy of Porsche Corporate Archives*

Manufacturing and assembly records suggest Porsche—who assembled those only on special order for known racers—produced something like 172 of these, including seven in right-hand drive for United Kingdom competitors. *Image courtesy of Porsche Corporate Archives*

The meanest and leanest of the 993s came in the GT2 model, a true purebred vehicle with little pretention and clear ambition for the winner's circle. Where the standard C2 coupe weighed 1,370 kg (3,020 lb) with 285 hp (210 kW) for 1996 and the RS Clubsport came in at 1,270 kg (2,800 lb) and 300 hp (221 kW), the GT2 put 430 hp (316 kW) into the same weight range for DM278,875 ($185,917). As only 172 of these cars emerged from Weissach's shops, it was clear, with their plastic wheel arch flares, aluminum doors and massive three-piece Centerline 9 x 18 and 11 x 18 composite wheels, that the GT2 was not intended for mass consumption.

In fact the GT2 was strictly intended as a homologation special, fabricated to meet minimum production requirements for Grand Touring racing, which was enjoying a healthy renaissance in the young BPR Global GT Endurance Series. Three racers, Jürgen Barth, Patrick Peter, and Stéphane Ratel, founded the BPR in 1994, stepping into the void left as the FIA repeatedly ignored GT racers. In Germany the Allgemeiner Deutscher Automobil-Club (ADAC) had been sponsoring and sanctioning motorsports almost since its founding in 1903.

A complicated, clever front lip channeled air from the nose through two narrow alleys, one on each side, swerving out for the bolted-on fender extensions. This represented typical painstaking work by Weissach mechanics who attached these plastic add-ons with hex-key screws into nuts on the inner fender. *Image courtesy of Porsche Corporate Archives*

BPR had reorganized class designations from the FIA's previous categories with GT1 encompassing what were essentially prototypes: a GT2, the ultimate turbocharged Grand Touring racers, and a GT3 for naturally aspirated GT models. When Porsche's new candidate, the twin-turbocharged GT2, was born in March 1994, it was imagined as a kind of super 993 Carrera RS Clubsport. Homologation called for 100 examples completed within 24 months of introduction.

It didn't take long before the opportunities in the BPR regulations dictated changes in the car. For instance, BPR allowed the GT2 to race with 12-inch (30 cm) wide rear wheels. But these could never fit within the series-production 993 Turbo body (on which they hoped to base the GT2). Remarkably with simple 30 mm (1 in) wide add-on fender flares (tacked onto the already 30 mm [1 in] wider Turbo and Carrera 4 fenders), Porsche

was able to slip the new GT2 into its homologation of the standard Typ 993 Turbo. Internally, designations varied depending on who was writing the memo: Turbo GT and GT2R appeared regularly.

Specifications began to solidify: Porsche specified three-piece Speedline aluminum wheels with fronts measuring 9J x 18 and rears 11J x 18. Tires were appropriately wide: 235/40ZR18 in front and 285/35ZR18 in back. While the rear tires were squat enough to give the GT2 a slightly higher overall gearing, acceleration remained very quick with 0 to 100 kph (0 to 62 mph) needing just 4.4 seconds, while top speed rose to 295 kph (183 mph). Introduced at DM268,000 ($187,413) as a 1995 coupe, the price climbed to DM278,875 for 1998. However, shifts in DM to USD exchange reduced the US dollar price to $158,452. Porsche assembled 172. By the end of the 1998 season, GT2s worldwide had accumulated nearly four dozen outright victories.

The engine, all but invisible beneath its large turbo intercooler and air intake vents, developed 424 hp (312 kW). And the car itself, stripped of everything but racing essentials (which *did* include air-conditioning) weighed 1,293 kg (2,851 lb). This was roughly 205 kg (452 lb) lighter than the series 993 Turbo. *Image courtesy of Porsche Corporate Archives*

33

1996 TYP 997 GT1

The BPR Global GT Endurance Series first raced in 1994. To simplify organization they carried over GT1 and GT3 from the ACO (at Le Mans) and GT2 and GT4 from the FIA. BPR required at least 100 cars for GT2 class approval and Weissach complied.

Hatter's body reflected the forms of his curvaceous series 993, presenting a drastic contrast between it and the recent 956–962 Group C cars with their vertical sides, flat surfaces, and tight-radius curves. The GT1 appeared as if a 993 coupe were stretched and then allowed to melt in hot afternoon sun. *Photo by Thomas Loeser*

Rules for 1996 allowed Porsche engineers to introduce an evolutionary—or EVO—version of the GT2 intended to compete in GT1 class. Porsche had offered a GT1-equipment option for the 1995 model. It delivered 550 hp (405 kW) from its 3,849cc twin-turbo engine. The 1996 Evo used the 3,600cc engine with changes to camshafts, intercoolers, turbochargers, Motronic engine management, and oil cooling and tanking. The engine developed 600 hp (441 kW) at 7,000 rpm and 479 lb-ft (649 N·m) of torque between 4,000 and 6,500 rpm.

A year before, in 1993, as they prepared concepts for the coming BPR series launch in 1994, racing project manager Norbert Singer and racing chassis designer Horst Reitter considered how a Porsche-engined car could compete successfully against the endurance-race prepared McLaren F1. "Horst Reitter and I already believed we could make a mid-engine 911 if we turned the engine around and put it right behind the driver," Singer recalled in 2005.

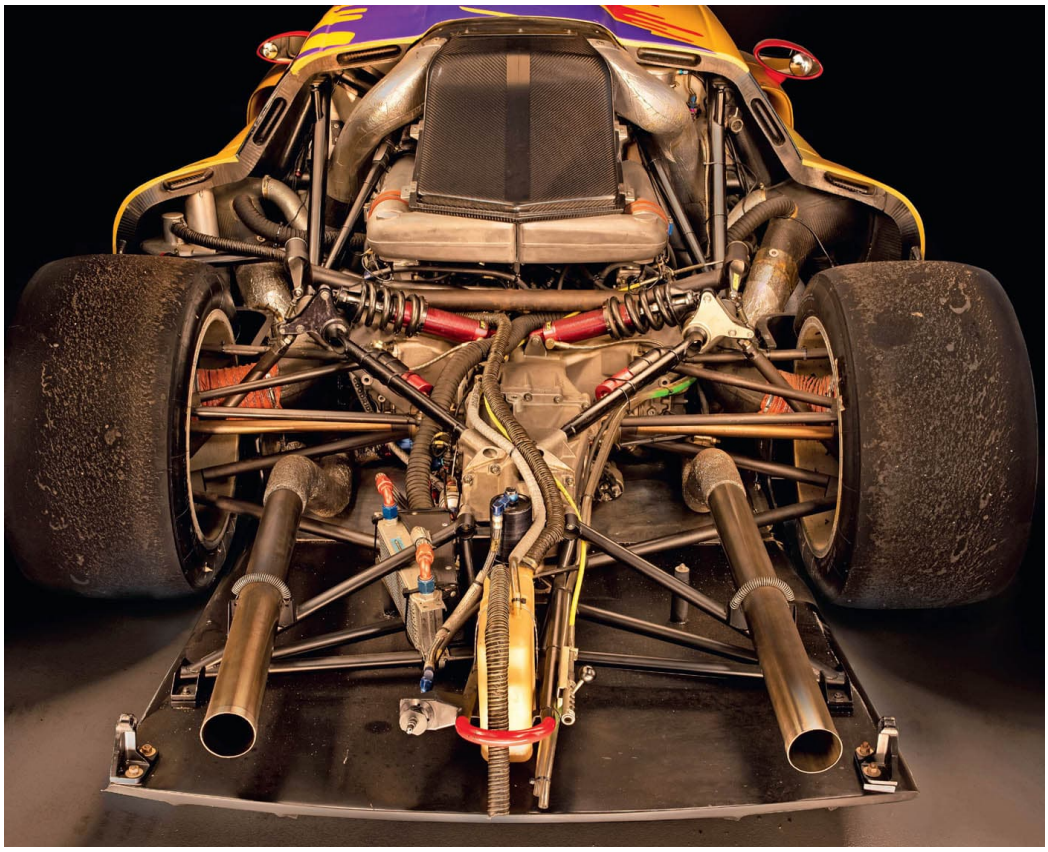
"We knew a longer wheelbase would improve high speed stability. We had to keep the car's basic steel monocoque but we put a wall behind the driver, put the engine behind that, and put the gearbox behind that."

Le Mans in 1994 was a Porsche disaster. Only three Porsche 911s finished among 15 total. And 12 had failed to qualify at all. Competition director Herbert Ampferer told Singer to develop his mid-engine concept for GT1. "We had to remember," Singer explained in an interview in 2016, "that even if the engine was in a different place, this still was a production car, a 911, not a prototype where we had a free hand."

During the summer of 1995, Porsche's Supervisory Board approved a GT1 based on reversing the engine orientation, turning the 911 into a true mid-engine racer. BPR's regulations were in some ways compassionate to carmakers. They needed a single road-going version to homologate it. Singer, Reitter, and body stylist Anthony Hatter immediately got to work. Porsche planned to enter this car at Le Mans in 1996, giving Motorsports an impossibly tight deadline for a car they had barely conceived. That was why Singer involved series production designer Hatter. Style Porsche had the most powerful Computer-Aided-Design (CAD) and Computer-Aided-Manufacturing (CAM) computers in the entire company. Hatter had styled the 993, and Porsche's GT1 had to resemble the series car very closely. Hatter's work enabled Singer to get their first one-quarter scale model into a wind

tunnel in mid-September, incredibly quick even for Motorsports standards. Another 45 days later, modelers completed their full-scale model with all the latest wind tunnel improvements. Three days later, modelers and body engineers began measuring the body for the body-manufacturing tools, stamps, presses, and forms. Body panels of a Kevlar, carbon fiber, and epoxy resin compound surrounded the sheet-steel unibody, and the roll cage provided reinforcement. As a road-legal homologation model, it had to undergo a number of tests. On January 2, 1996, the first road-going chassis arrived in Weissach, and fabricators hurried to work assembling the car's running gear. The second chassis came in two weeks later. Body work began to arrive on March 1.

In another part of the Weissach campus, engineers worked on the engine for the new car. They settled on a 3164cc opposed six-cylinder with water-cooled dual overhead cams, four valves per cylinder, and twin turbos and intercoolers. The engine developed 544 hp (400 kW) at 7200 rpm and produced 443 lb-ft (601 N·m) of torque at 4250 rpm.



Reversing the running gear influenced the length and shape, stretching the wheelbase from 2,272 mm to 2,500 mm (89 in to 98 in). The GT1 measured 4,710 mm (185 in) long, 1,980 mm (78 in) wide, and 1,173 mm (46 in) tall, whereas in comparison, the series coupe was 4,245 mm (167 in) by 1,735 mm (68 in) by 1,300 mm (51 in). *Photo by Thomas Loeser*

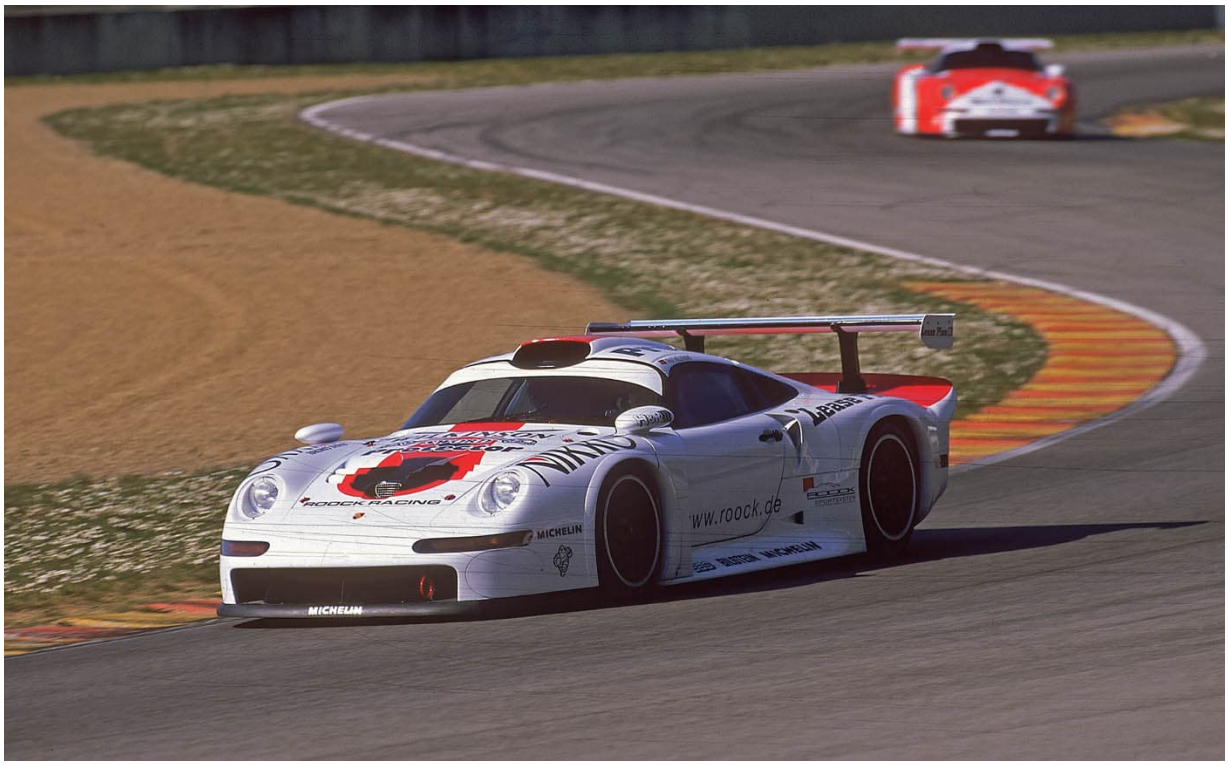
The Porsche GT1 drove a wedge into the organization sanctioning these races, BPR Global GT Endurance Series. BPR was the brainchild of founders Jürgen Barth of Porsche customer racing, Patrick Peter, a racing promoter trying to breathe life back into the classic circuits of Europe, and Stéphane Ratel, a classic car salesman with enormous ideas and bigger ambitions. The Challenge was a private, almost renegade series for individual GT drivers and their cars but with no FIA sanction.

The FIA regarded Formula One as its premier series and let its World Sportscar Championship run itself into the ground by late 1992, requiring teams to use only versions of their 3.5-liter (214 cu in) F1 engines. This eliminated several teams and manufacturers. Crashing economies kept new

blood from investing in an already 10-year old Group C series, and the same realities kept spectators home.

Jürgen Barth had been working with German and Japanese organizers to establish a new international GT racing series to continue racing at venues nearly abandoned when the World Sportscar Championship collapsed in late 1992. At this point Barth joined Peter and Ratel to found BPR. They found a very hungry audience from both sides of the spectator fencing. By early 1994 BPR races were starting with as many as 50 cars, a far cry from the anemic 28-car grid at Le Mans in 1992.

Between its ground-hugging shape and its running gear, the GT1 accelerated from 0 to 100 kph (0 to 62 mph) in 3.7 second and on to a top speed of 310 kph (193 mph). The GT1 weighed 1120 kg (2,469 lb), while the series coupe weighed 1370 kg (3,020 lb). *Photo by Thomas Loeser*



For the 1997 season Singer, Reitter, and Hatter updated the cars. Where 1996 rules had required one single street car for homologation, 1997 regulations insisted on 25. Porsche responded with 21 customers cars and 4 retained for works entry. Porsche charged DM1,550,000 for the cars (about $891,000 at Weissach). *Image courtesy of Porsche Corporate Archives*

"The arrival of the Porsche was the problem," Ratel explained to BPR historian Andrew Cotton for their book *30 Years of GT Racing*. "It was the first car in the series that hadn't been built for the road and instead was a race car that fulfilled the minimum homologation requirements." That minimum requirement was that only one car had to be built in road-legal form. Because the race car preceded the road car, some felt Porsche's GT1 violated the spirit of the regulations. But McLaren, which had developed its GT1 in the proper sequence, was unbeatable. Only the Porsche had any chance. In a sense, the BPR needed the Porsche but didn't want it the way it arrived.

Porsche's two racing chassis arrived at Weissach in mid-March and underwent extensive testing. By mid-April, both competition cars had qualified for Le Mans, earning start numbers 25 and 26 and settling in at second and fourth on the start grid.

The race was a kind of fairy tale. Porsche's longtime friend Reinhold Joest had acquired two one-year-old open racers, and one of them won overall. The works GT1s took second and third, giving them class victory as well. The cars took overall victories at Brands Hatch, England, in early September, and Spa, Belgium, two weeks later, followed by a first overall at Zuhai, China, in early November, knocking McLaren off the top of the pile.

Months earlier, Porsche customers had started lining up to order GT1s. Meanwhile, the FIA had assumed operation of the BPR series, renamed it the FIA GT Championship, and welcomed Porsche's 600 hp (441 kW) "Customer GT1."

Roock Racing's drivers learned the finer points managing their GT1 under acceleration and as shown here, deceleration into the turns. They qualified 11th overall at Le Mans in June 1997 but did not finish. *Image courtesy of Porsche Corporate Archives*

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1997 Ruf TURBO R COUPE AND TURBO R CABRIOLET

Alois Ruf was born into and grew up in the automobile business. In 1939, 11 years before he was born, his father Alois Sr. opened Auto Ruf, a mechanical and general automobile repair shop in Pfaffenhausen, Germany, roughly 100 km (62 mi) due west of Munich.

In the magazine test, Ruf's Turbo R earned the title "World's Greatest Sports Car." The two very experienced, very professional testers noted that "the Turbo R is superb sports car that requires professionals to explore its limits." Sounds like these guys just wanted more seat time. *Photo by Randy Leffingwell*

During a summertime multicar comparison test staged at VW's test track, *Road & Track* magazine test drivers Paul Frère and endurance racer Wayne Taylor reported Ruf's Turbo R "absolutely pulverizes everyone else in the 0–100 mph trials." *Photo by Randy Leffingwell*

In 1949 Auto Ruf added a fuel station to the business, so it could be said, as with Ferry Porsche, Alois Ruf, who arrived in January 1950, was born with petrol in his veins. But where Sr.'s business contended with Volkswagens, Fiats, and other small-displacement cars, Jr. was fascinated with sports cars —and particularly Porsches—from an early age. When he was 13, his father became a sales and service representative for BMW, but they also took in their first Porsche 356 for service. When Sr. died in 1974, Jr. stepped in and soon made his Porsche intentions very clear. In 1975 he "built" his first car, a 911 Carrera 3.0. Its modifications were small and subtle. But two years later his next project made a real statement. At the time, Porsche sold its Typ 930 Turbo fitted with a 260 hp (191 kW) opposed six-cylinder mated to a four-speed transmission. In 1977 Alois Jr. introduced his 3.3-liter (201 cu in) Turbo with 303 hp (223 kW) and a five-speed Getrag transmission. Thereafter, almost every year, he introduced an upgraded, improved version of Porsche's series cars. For the 911 SCR he provided his customers with a 217 hp (160 kW) 3.2-liter (195 cu in) naturally aspirated engine to compare with Porsche's own 3.0-liter (183 cu in) 180 hp (132 kW) 911 SC. His next SCR—using the wide Turbo body, introduced his two piece "T-roof" Targa system. A Ruf-designed and assembled five-speed transmission followed in 1981 as did his most important acknowledgment yet. The German Federal Bureau of Motor Vehicles certified Ruf Automobile GmbH as an automobile manufacturer. When he introduced the 374 hp (275 kW) Ruf BTR Turbo in

1983, it was the first to wear a Ruf chassis number. He offered BTS on either narrow- or wide-body chassis. Then, in 1987, the Ruf legend was born. Alois introduced CTR, a narrow-body 469 hp (345 kW) twin turbo, painted a vibrant yellow. The car, soon known as *Yellowbird* reached 342 kph (213 mph) in comparison test at Nardò in Italy against such competitors as Ferrari's F40, an AMG Mercedes, and a Porsche 959. In the United States, both the USDOT and the EPA certified Ruf as an auto manufacturer. His cars were legally welcome and warmly embraced in the United States. Ruf introduced his own six-speed gearbox a year later.

Alois Ruf and his ever-growing team of engineers, innovators, and fabricators became something of a thorn in Porsche's side. Because of his modest size and independence, he could adapt to market input more quickly than Porsche was able to, and this annoyed some Zuffenhausen managers and engineers. But to others, he was a creative engineer who broke new ground. Staff inside Weissach couldn't exactly let on their support or admiration for Ruf, but from the early 1990s on, there seemed to be at least one member of Porsche's Supervisory Board who drove his Ruf Turbo to board meetings.

Porsche's 993 was a vehicle very much to Ruf's liking, and he developed three variations. First was the 3.6-liter (220 cu in) 420 hp (309 kW) BTR 2. It accelerated from 0 to 100 kph (0 to 62 mph) in 4.1 seconds and reached a top speed of 308 kph (191 mph). Next came his update of *Yellowbird* designated the CTR II, a twin-turbo 3.6-liter (220 cu in) 520 hp (382 kW) coupe in a rear-wheel drive narrow-body. For an extra charge, Ruf also offered the CTR in all-wheel drive. The car also introduced carbon brakes. It weighed 1,380 kg (3,042 lb), accelerated from 0 to 100 kph (0 to 62 mph) in 3.6 seconds, and reached a top speed of 340 kph (211 mph). The Turbo R sat at the top end of Ruf's lineup. Also based on Porsche's 993 Turbo, the R offered customers 490 hp (360 kW) in an actively controlled all-wheel drive wide-body coupe or cabriolet. The R boasted stiffer springs, larger anti-sway bars, and shock absorbers with revised damping characteristics. Between large carbon composite brakes, 18-inch alloy wheels, and Bridgestone Potenza tires, the Rs were capable of 0 to 100 kph (0 to 62 mph) acceleration in 3.6 seconds and top speeds of 329 kph (204 mph). Ruf sold the Turbo R coupe for DM298,000 ($193,380) at Pfaffenhausen. The Turbo coupes and Cabriolets were popular among United States customers.

The business-like instrument panel looks familiar. Carbon fiber stretched from door to door and onto the door panels. *Photo by Randy Leffingwell*

Ruf's drilled pedals—including the dead one—not only save weight but contribute to the technical appeal of his cars. The speedometer reads up to 200 mph (322 kph). *Road & Track* got their test version to 205 mph (330 kph). *Photo by Randy Leffingwell*

To make the engine his own, Alois Ruf and his engineers exchanged a number of 993 standard issue parts for proprietary turbochargers, camshafts, exhaust systems, an additional oil cooler, and modifications to the chassis and engine management. The result was 490 hp (360 kW) at 5500 rpm. *Photo by Randy Leffingwell*

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1998 TYP 996 GT1 LE MANS WINNER

For the 1997 season Singer, Reitter, and Hatter updated the car and its appearance using the distinctive headlights from the new Typ 996 series production model. Called the 911 GT1 EVO, the new front end accompanied a new front suspension.

Fully water-cooling the 3164cc engine decreased the engine weight, improved its fuel economy, and enhanced durability. Tuned for Le Mans, the engine, racing with mandatory 33.9 mm (1.3 in) diameter air flow restrictors, developed 550 hp (405 kW) at 7200 rpm and generated 465 lb-ft (630 N·m) of torque at 5000 rpm. *Image courtesy of Porsche Corporate Archives*

The annual racing series changed names, becoming the FIA GT Championship, and Porsche delivered five customer racers as well as new factory team cars. Competition from a not-quite rules compliant Mercedes-Benz CLK GTR model (they assembled just 20 with a number of features unsuitable for road use) compelled Porsche to vigorously support their customers and take on more races than originally planned. By season end Mercedes had taken the team championship, followed by BMW-McLaren. Porsche fared no better than fourth in the title race.

Following such a season, it took all of Ampferer's persuasive power to convince Weissach director Horst Marchart—and more importantly chairman Wendelin Wiedeking—to renew support for GT1 for 1998. That finally came at the end of November! But then it multiplied, literally, when Porsche welcomed Erich Zakowski's Zakspeed Racing as a its second and semiofficial team. Two identical cars went to Zakspeed, virtual twins of the pair the works planned to run. This was a practice Porsche had followed for many years. The benefits had been clear several times in the past when works cars retired and the semiworks privateers took overall victory, adding points to Porsche's season championship quest.

Porsche had learned from Mercedes and McLaren—following regulations and playing fairly is for others. Singer understood the company needed a pure racing car underneath a familiar badge. Regulations demanded the GT1 was derived from current series production. Porsche was poised to introduce its new Typ 966 with its first fully water-cooled opposed six-cylinder engine. However the lightweight ultrastrong front structure of the Typ 933—which had allowed Porsche to bypass a crash test for the road-legal 993 GT1—was discarded. The 996 GT1 road car had to pass the crash test!

Singer put the 1996 and 1997 versions on a severe diet, setting a target weight for an all-new 1998 GT1 at 950 kg (2,094 lb), roughly a 10 percent reduction. Horst Reitter designed Porsche's first-ever entirely carbon fiber monocoque. Depending on the generation weighed, this saved between 50 kg and 70 kg (110 lb to 154 lb). *Image courtesy of Porsche Corporate Archives*

Reitter set a 100-liter (26.4 gal) fuel cell dead center in the car, directly behind the cockpit. This stretched the wheelbase from 2,500 mm (98 in) for the 993 versions to 2,700 mm (106 in) for the new car. Wind tunnel work led to a body that measured 4,890 mm (193 in) overall, 1,990 mm (78 in) wide, and 1,140 mm (45 in) tall. *Image courtesy of Porsche Corporate Archives*

But even this presented possibilities. Modifying the front suspension of the 993 for the highest speed handling always forced on Reitter and Singer innumerable compromises. This new 996 was essentially a clean sheet and the two engineers ultimately settled on a system serving racing needs best with little concern for how the series suspension looked or worked.

Producing these cars was a sprint race inside Porsche Motorsports. From Wiedeking's approval, jobs quickly ratchetted up to double or faster pace. And so it was that at 9:12 p.m. on a cold February 23rd, veteran Porsche racer and development driver Bob Wollek took 996 GT1001 out for its first drive. Never one to waste words, he summed up his first nighttime drive: "The new GT1 is clearly more of a racer than its forerunner. It reacts with more precision and agility to the steering. Now we just need to collect loads

of kilometers and impressions," he told Porsche's Motorsport press officer Jürgen Pippig.

Then, in May, Porsche passed the next hurdle with its 1998 version. It passed the rigid European road car homologation, including its high-speed impact with a wall. The stark white *Strassenversion* resembled some craft from the farthest reaches of outer space even more than its predecessors. It became even more otherworldly when Porsche's outside graphics firm Becker Design began transferring Anthony Hatter's organic linear paint scheme to the car.

In preparation for Le Mans, Singer put each team car through three 24-hour race simulations, performing subtle modifications to each car after each test. And then came Le Mans.

Just after 6:00 a.m. Sunday morning, codriver Allan McNish pitted with a leaking coolant pipe. Worse, his teammate was in the pits as well, having gone off course and damaging the undertray during a rain squall. Both cars were parked for 30 minutes.

When McNish got back into the race, he trailed the leading Toyota by three laps. Incredibly the Toyota parked along the circuit with a broke gearbox at 12:35 p.m. For the remaining 85 minutes McNish and teammate Uwe Alzen circulated cautiously and crossed the finish at 2:00 p.m. in a two-car squadron.

Le Mans divided a rough season, and the 24-hour race pitted Porsche against many serious competitors and difficult challenges. At the end they finished 1st and 2nd overall. McNish crawled out of the car, took one look at it, filthy with dirt and oil pounded in after the long race and "wanted to give it a big kiss," he recalled.

While the car was bigger than the 993 GT1, this new design was superior aerodynamically. New front and rear ends improved down force and did a better job balancing it front-to-rear. Overall, the 1998 GT1 was 100 kg (220 lb) lighter and significantly stiffer than the 1996/1997 versions. *Image courtesy of Porsche Corporate Archives*

Car No. 26 completed 351 laps of the *Circuit de la Sarthe*, travelling 4,783.8 km (2,972.5 mi). This was a single lap (13.65 km [8.48 mi]) ahead of their second-place teammates in No. 25. It earned them first and second overall and in the LM-GT1 class. *Image courtesy of Porsche Corporate Archives*

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1999 TYP 996 GT3

After more than a decade of contests outside the brightest spotlights, or perhaps just under second billing, Grand Touring racing regained center-ring status in the motorsports circus due to the BPR Global GT Endurance Series. BPR, as explained previously, was formed when Jürgen Barth, Patrick Peter, and Stéphane Ratel came together with the goal of restarting privateer Grand Touring class racing.

Series Carreras rode on 17-inch wheels, while the GT3 relied on 18s. But the GT3 carried no spare, only a tire repair kit with an inflator bottle. This change made room for a new 89-liter (23.5 gal) fuel tank and the new dry sump oil reservoir. However its front and rear bumpers sat too low to meet US regulations. *Image courtesy of Porsche Press Database*

Racers and fans were thrilled. Their inaugural season, 1994, they raced at eight venues throughout France, Spain, Belgium, Italy, Japan, and China. Crucial elements of each race were excellent accommodations and superb food! Races ranged from 500 km to 1,000 km (311 mi to 621 mi).

Barth remembers it clearly: "GT3 was the basis of our thinking," he explained in an interview in 2016. "The cheapest way for teams to run the cars was to have road cars and balance them." This did not refer to equalizing weight at all four corners, but developing a way of equalizing performance—Balance of Performance—that came into effect many years later.

Gordon Murray of McLaren was perhaps the first to adopt their cars to these GT3 regulations, starting after the first ray in May 1994. He also began to develop a GT1 version, which then motivated Mercedes-Benz and Porsche to develop cars for this premier category (see **here**). But while Porsche had private teams seeking GT1 cars, a greater number wanted into the GT3 group.

By this time, many manufacturers were well aware of the enthusiastic response the return of GT racing was drawing from spectators and sponsors as well as drivers and manufacturers. BPR had simplified its calendar and ran races for GT1 and GT2 cars. But the FIA intended to fully incorporate GT3s into its FIA GT Championship. With Porsche planning its replacement for the Typ 993, its final car with an air-cooled engine for its RS models, the timing was perfect to incorporate some modifications into the new 996 in order to (relatively) easily manufacture a GT3 version.

Making a Grand Touring race car from a grand tourer—the interior design team who created the 996 had targeted BMW 633 or Mercedes-Benz SLC owners, making them feel at home in plenty of leather and creature comforts—naturally required paring back much of the good work of the interior team. Multifunction front seats came out, replaced with leather-covered sport bucket seats. This saved 20 kg (44 lb). Deleting the rear seats pulled another 8 kg (18 lb) from the car. A new nose more aggressively managed airflow into or over the car, supplemented by a dual plane rear spoiler with an adjustable wing.

Porsche introduced its new water-cooled 3598cc M96/76 engine, the additional 283cc achieved by enlarging cylinder bore from 96.0 mm to 100.0 mm (3.8 in to 3.9 in). The engine, incorporating Porsche's VarioCAM

engine-management system, developed 360 hp (265 kW) at 7200 rpm and 273 lb-ft (370 N·m) of torque at 5000 rpm. Racers learned they could rev that engine to 7800 rpm and that, incredibly, it survived occasional spins up to 9000 rpm. In "series production" configuration, the GT3 weighed 1,350 kg (2,976 lb).

Porsche went one step further, then one more, and eventually further still. For customers wishing to race their cars in a recognized series, Weissach offered a GT3 Clubsport. This eliminated side airbags, substituted the standard dual-mass flywheel with a single-mass unit, and installed a welded-in-place roll cage using the rear damper towers as rearmost anchor points, significantly stiffening the body.

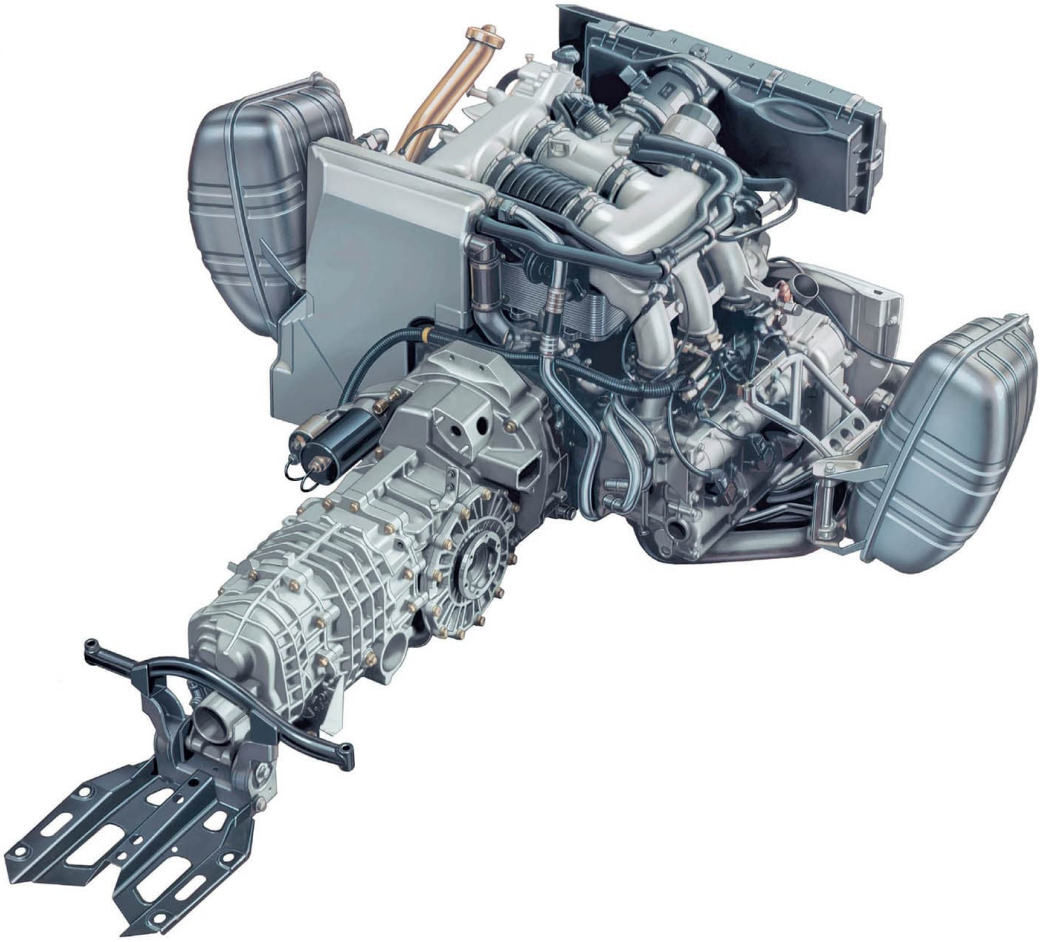
Almost before Porsche released the Clubsport model to its customers, it had developed and distributed around 70 Typ 996 GT3 Cup cars. Slight modifications to the Typ 96/75 engine gave it an additional 10 hp (7 kW), bringing the total to 370 hp (272 kW) at 7200 rpm. Weissach intended the Cup cars for its next-generation Porsche Carrera Cup series. Introduced for the 1998 season, the new Cup cars weighed 1,145 kg (2,524 lb).

For further comparison the series production 996 coupe sold for DM136,790 ($82,653) at the beginning of the 1999 model year, the first for the GT3. In contrast Porsche set prices for the "base" GT3 *and* the Clubsport at DM179,500 ($108,459). And from this point, as various series changed various regulations, the GT3 lineup proliferated. Sales were robust. Porsche manufactured around 1,358 road-going GT3s.

For racing year 2000 Porsche developed and sold something like 66 examples of the Typ 996 GT3R. Weissach engineers tuned the 3598cc opposed six-cylinder to produce 400 hp (294 kW). Adjustable shock absorbers allowed privateers to tune their car's handling to each circuit, a feature long possible with works cars and works mechanics. Carbon fiber replaced numerous aluminum panels for the R. It proved to be a nearly indomitable package, winning its class at Le Mans, Daytona, Spa, Sebring, and Nürburgring and taking the FIA GT Championship.

Porsche unveiled its Typ 996 at the Frankfurt IAA in September 1997. Despite tight design and development budgets, the 996 dramatically reduced its coefficient of drag from 0.34 for the 993 to 0.30 for the new car. *Image courtesy of Porsche Press Database*

Porsche's GT3 set a lap record at the Nürburgring, the benchmark racing circuit used to test both the manufacturers' new metal and the driver's mettle. Veteran Walter Röhrl knocked one off in 7 minutes 56.33 seconds, cutting some 40 seconds off his best time in a series 996 Carrera. *Image courtesy of Porsche Press Database*



The 1999 GT3's 3600cc six-cylinder engine produced 360 hp (265 kW) at 7200 rpm. This engine evolved from the 3.6-liter (220 cu in) Mezger engine dating back to the 964 series. Upgrades included titanium connecting rods, plasma-nitride crankshaft, water-cooling to allow four-valve cylinder heads, and VarioCAM for ignition timing. *Image courtesy of Porsche Press Database*

Porsche covered the driver's and passenger's bucket seats with leather. To conserve weight, rear seats came out as did the rear console. It was, as *Car and Driver*'s Peter Robinson wrote, "A race car disguised as a daily driver." *Image courtesy of Porsche Press Database*

2000 / 2009

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2000 TYP 996 CARRERA 4 MILLENNIUM COUPE

Y2K.
The New Millennium.
The New Year's Eve/New Year's Day transition had millions of people concerned.

Precisely controlling pigment layer thickness produces different colors. "To maintain tight color tolerance, the layer thickness much be controlled to within a few atoms." Several years after Porsche's successful test on the Millennium Coupe, Porsche Exclusive Manufaktur began to offer ChromaFlair as a $50,000 to $100,000 custom paint option. *Image courtesy of Porsche Corporate Archives*

This was the date, the nearly instantaneous transition from 11:59:59 on 1999/12/31 to 00:00:00 on 2000/01/01 when nearly everything in the world was going to stop, seize, freeze, fail, or malfunction because of a long-ago computer programming "error" that forgot to account for the fact that what followed 1999 was 2000. More particularly, an industry that was barely 50 years old and had simply shortcut any calendar representations into the last two digits was very concerned. This was because, in its earliest days, computer memory was so expensive that saving two digits here and there made a difference. Thus 1956 was 56, 1984 was 84, and so on. Back in '97 some in the programming field became concerned if their machines could figure out that 00, as in 2000, came after and not well before 99, as in 1999. Governments and businesses took the question seriously, and some say the budget for researching—and fixing—the so-called Y2K bug ran between $300 and $600 billion worldwide. In October 1998 the US Congress passed the Year 2000 Information and Readiness Disclosure Act. The United Nations held a series of international conferences as a way for its nearly 200 member nations to share information and results of their own remediation attempts.

A year after the United States introduced its Information and Readiness Disclosure Act, Porsche demonstrated its readiness. Historically Porsche had introduced its new model year vehicles just after employees returned to work from their August holiday break. The previous year had seen the launch of the all-wheel drive 996 Carrera 4 and the GT3. Now in autumn, Porsche was laughing in the face of Y2K with its 2000 Millennium Special Edition Carrera 4.

Perhaps to avoid confusing every computer system, Porsche limited manufacture to 911 examples and offered it only in a single color, which it named Violet ChromaFlair. This was a clever paint innovation that appeared to change color depending on the angle of view and the angle of the light striking the car, ranging from violet through dark green to black. In contrast Porsche fitted its highly polished *911* designation badge to the rear engine cover. Sparkle also came from the car's polished stainless-steel exhaust tailpipes. But like all other 996 models, all other trim remained muted soft black.

The Millennium Coupe was a comfortably optioned Carrera 4 made remarkable by its exterior paint. Porsche called it Violet ChromaFlair. Hot-rodders and car customizers in the United States have used something similar for decades in preparing cars for special shows. They called it "flip-flop" paint. *Image courtesy of Porsche Corporate Archives*

Product planners made the sunroof standard equipment along with their Litronic headlights with the built-in cleaning system, a rear wiper, and plenty of natural leather inside. Dark brown leather covered front and rear seats, door panels and roof pillars, dashboard, center console, steering column, and the hands-free telephone console. Carpeting was matching dark brown, while the headliner was black Alcantara.

The heated front seats were electrically adjustable, and the driver's seat incorporated a variable lumbar support and a three-driver memory for seat and outside rearview mirror positions. Electronics engineers made the Porsche Communication Management (PCM) standard equipment, including the navigation system. In addition to cruise control and PCM's onboard computer, the car contained a CD changer and its Digital Sound Processing system.

The Millennium Edition car sat slightly lower, dropped 10 mm (0.4 in) and reconfigured for 18 inch wheels and tires. The highly polished Monobloc wheels measured 7.5J x 18 in front and 10J x 18 at the rear and rode on 225/40ZR18 tires in front and 265/35ZR18s in back. Porsche's six-speed manual gearbox was standard, and the automatic Tiptronic S was one of few options customers had to pay for.

JDS Uniphase originally created ChromaFlair. Uniphase was a California company manufacturing lasers for chip manufacturers specializing in, among many other things, "decorative coatings for brand enhancement and differentiation." They merged in 1999 with JDS, a Canadian fiber-optic and optical connector maker. *Image courtesy of Porsche Corporate Archives*

JDSU describes ChromaFlair as "unique multilayer pigment . . . created from revolutionary thin-film technology each flake exhibits a wide range of hues depending on the angle at which it is viewed and the angle of incidence of light." *Image courtesy of Porsche Corporate Archives*

The car as typically delivered weighed 1,375 kg (3,031 lb) or 45 kg (99 lb) heavier with the Tiptronic S. Porsche quoted acceleration from 0 to 100 kph (0 to 62 mph) at 5.2 seconds for the manual and 6.0 for the Tiptronic S. Top speeds also differed slightly, with the manual offering 280 kph (174 mph) compared to 275 kph (171 mph) for the Tiptronic S. Marketing priced the car at DM185,000 ($97,522) with manual, DM190,610 ($100,480) with the Tiptronic S.

As of this writing, there are no confirmed reports of any of the Millennium Special Editions—or for that matter any of Porsche's cars—failing to start because of Y2K computer programming troubles on New Year's Day, 2000. For some people the great mystery was whether that multibillion dollar investment successfully cancelled the disaster or perhaps there was never a risk and that mighty pile of cash simply helped a few thousand computer wizards to acquire a Porsche themselves.

JDSU's website explained, "ChromaFlair pigment is opaque, thin, flat, and highly specular [mirror-like]. ChromaFlair pigment is manufactured by the disposition of ultrathin layered structures similar to those sometimes found in nature, such as soap bubbles, butterfly wings, or sea shells." *Image courtesy of Porsche Corporate Archives*

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2001 TYP 996 TURBO

This scenario was getting to be an unhappy fact of life. Porsche developed, manufactured, and marketed a wonderful 911, the greatest of the series production line, and then they won't sell it to some of their most loyal, fervent customers—the United States consumers.

Performance differences were interesting: the Turbo accelerated from 0 to 100 kph (0 to 62 mph) in 4.2 seconds, while the GT3 required 4.8 seconds for the same drag race. Top speeds were closer: 305 kph (190 mph) for the Turbo versus 302 kph (188 mph) for the GT3. In the price race the Turbo pulled far ahead, going for DM234,900 ($123,827 at Zuffenhausen) compared to DM181,295 ($95,569) for the GT3. *Photo by Randy Leffingwell*

To develop its 415 hp (305 kW) at 6000 rpm, Porsche relied on a pair of K64 turbochargers boosted to 0.83 bar (12.3 psi [84.8 kPa]). With further assistance from the latest VarioCAM Plus ignition system, the 3600cc opposed six-cylinder produced 413 lb-ft (560 N·m) of torque between 2700 rpm and 4600 rpm. *Photo by Randy Leffingwell*

It started with the 1968 Typ 911 S when Americans got the 911 L instead, and next the 1973 911 RS Carrera 2.7, for which US buyers received only apologies. Then there were the 1973 Carrera RS 3.0 and 1975 Typ 930 Turbo, where Yanks were advised to wait a year for both. It was probably only because Porsche Chairman Peter Schutz had some ties to the United States—for example, his university education, and then his first dozen years of employment—that he and Helmuth Bott were able to get Americans their earliest chances to buy the new 1983 Typ 911 SC Cabriolet. But what about Turbos with Performance Kits, SC/RS coupes, or the all-conquering Typ 959?

Admittedly engine exhaust emissions and vehicle impact safety laws were the main cause of such exclusions. Now with Porsche's latest Turbo, its first on an all water-cooled 911 series production car, it was actually front bumper impact that delayed importation.

Porsche introduced the new Turbo Coupe in January 2000. In some ways, since the first 930 in 1975 with its outsized rear whale tail spoiler and oversized front and rear—and especially rear—fender flares, it seemed that Style Porsche attempted to constrain any overenthusiastic body treatment. But

this was all functional. That horizontal rear deck spoiler performed an essential duty of pressing the back of the car onto the roadway. There the 8J x 16 rear wheels and 225/50VR16 tires did their best to hold the car in place in everything except the most egregious driver errors—coming into a corner too fast and abruptly lifting off the throttle was a reliable way for drivers to learn the laws of physics concerning centrifugal forces.

Subsequent engineering work steadily improved handling, and Style Porsche demonstrated with the 959 that wide fenders can appear as part of the car body. When Porsche had planned the previous generation 964 Turbo, designated 965, it adopted a body derived from the 959. When cost overruns killed the 965, everyone held onto their ideas. And the most important reemerged with the new 2000 Typ 996 Turbo: all-wheel drive utilizing a viscous multiplate clutch installed just behind the front transaxle. This allowed Porsche to offer the Tiptronic S as an option to Turbo buyers.

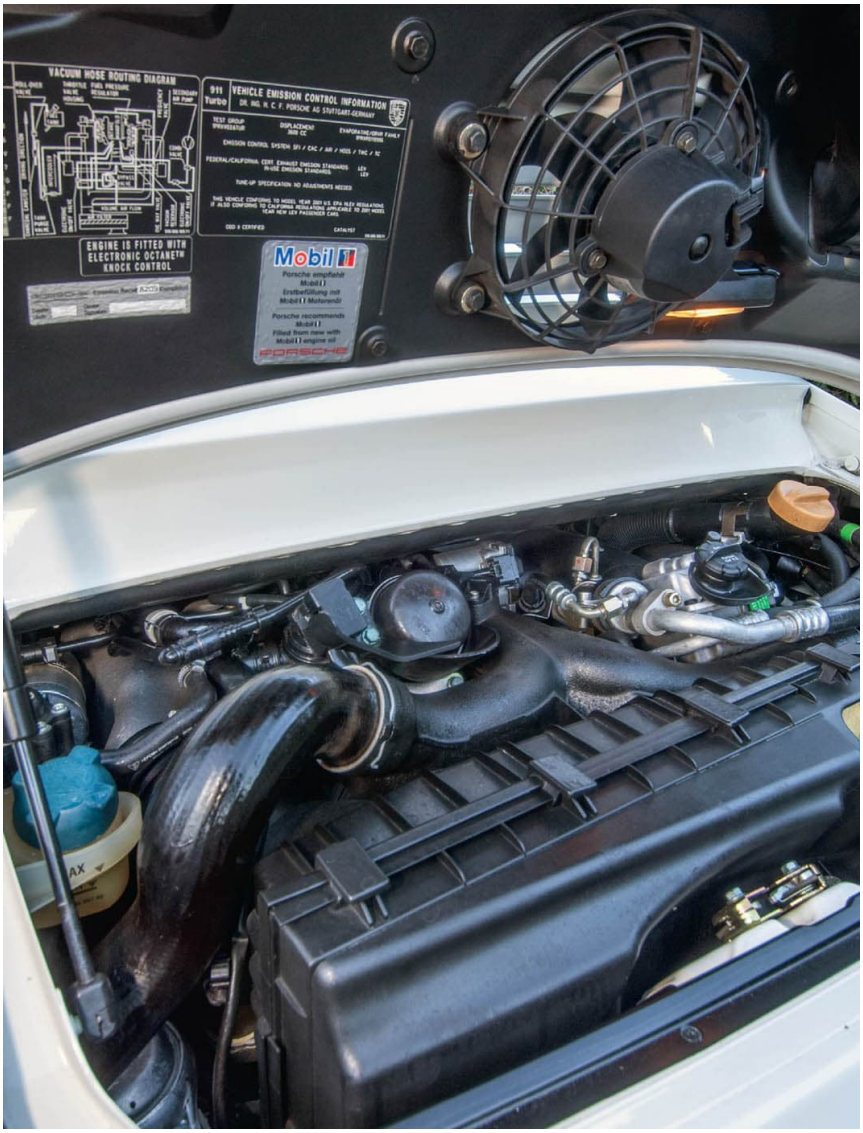
Porsche relied on its M96 engine series, already so legendary for its performance and durability that it is forever known as the "Mezger Motor." With bore and stroke of 100.0 mm by 76.4 mm (3.9 in by 3.0 in), overall displacement was 3600cc. The engine, without turbos, drove the GT3, producing 360 hp (265 kW) at 7200. With twin turbos, intercoolers, and its updated VarioCAM Plus valve-timing system this M96/70 developed 420 hp (309 kW) at 6000 rpm and generated 413 lb-ft (560 N·m) of torque between 2700 rpm and 4600 rpm. The VarioCAM Plus not only adjusted intake valve timing but also altered intake valve lift. The Turbo weighed 1,540 kg (3,395 lb) and offered every creature comfort to buyers that GT engineers removed from the GT3s, which as a result weighed in at 1,350 kg (2,976 lb). But any meeting of Turbo and GT3 drivers demonstrated this comparison is irrelevant—their purposes of ownership are as different as a race circuit is from a tree-lined suburban parkway.

But what exactly delayed the model-year 2001 Turbo from reaching US dealers? Apparently it was almost as simple as a misunderstanding. Both cars relied on a front suspension comprising light-alloy wishbones, McPherson struts and coil springs, dual-tube gas-filled shock absorbers, and an anti-sway bar. According to US Department of Transportation examiners at the port of entry, the nose of the Turbo sat slightly too low to position optimum impact protection at the mid-point of the molded-in front bumper/bodywork. Rather than reset front ride height, a move sure to induce

front lift and compromise handling, Porsche hurriedly fabricated a remedy that comprised mounting a pair of kidney-shaped bumper pads at the presumed points of impact. It was unattractive, but it worked, and Porsche had begun distributing Turbos into the United States before the end of the manufacturing year. By year-end, with no changes from Porsche, the USDOT had dropped its objection and buyers of the last of the 2001s found the blocks in a sealed plastic bag with mounting instructions. Eventually even these disappeared. Many but not all early 996 Turbo owners removed the pads, filled the holes, and repainted the bodywork. For others, it's just part of the history of the car and as several owners have noted, "You don't see it when you're driving the car!"

Car and Driver magazine's reviewer wasted no time delivering his warning in his first sentence: "The bad news about the new Porsche 911 Turbo is that its owners are probably going to get a lot of speeding tickets." *Photo by Randy Leffingwell*

Only intercooler scoops interrupted the understated rear fender flares. They swallowed wider wheels and tires without breaking a crease, easily housing 11Jx18 cast aluminum alloy hollow spoke rear wheels and their 295/30 ZR18 tires. The model year 2001 Turbo was 1,830 mm wide (72 in), compared to the 1975 model at 1,775 mm (70 in). *Photo by Randy Leffingwell*



Industry-wide, journalists pointed out one disappointment with the new flagship. With horsepower and torque figures rivaling American muscle cars of the last 1960s, this new Turbo seemed eerily quiet. Between water-cooling the engine and turbocharging and intercooling its intake, engineering improvements had swallowed the noise. *Photo by Randy Leffingwell*

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2002 TYP 996 TARGA

Since its debut in 1965, Porsche's Targa has been a popular and successful compromise. From the earliest moments, when the Typ 356 successor was just a spark in his imagination, Ferry Porsche wanted a Cabriolet in whatever came next.

The greenhouse effect of the Typ 996 Targa was visible from overhead. Nearly the entire top is glass and this was the latest version of the car Butzi Porsche described as "neither coupe nor convertible." *Image courtesy of Porsche Press Database*

As the 901/911 advanced through various iterations, as reported above, the designs and concepts that Ferry's chief body engineer Erwin Komenda presented were consistently losing favor to those Ferry's son Butzi and his design team offered. It wasn't simply familial loyalty nor blatant nepotism. It was the fact that Butzi's team was giving his father sporty 2+2s, while Komenda was drifting into Ford, Opel, and Daimler-Benz territory with comfortable four-seaters. Through this time, sensing his power and influence were waning—and distracted by the onset of lung cancer—Komenda never alerted Butzi's team to problems in their designs that rendered Ferry's cabriolet impossible. Ultimately Ferry appointed his son head of design, supervising the designers and modelers who created the 901/911. Komenda remained at Porsche as head of body engineering until his death from cancer in August 1966.

While not exactly the Cabriolet that Ferry desired, it was the Targa that was introduced at the IAA in Frankfurt in September 1965. With its fully-removable top panel and rear window, it provided nearly all the benefits of a Cabriolet plus one significant one: it considerably increased chassis stiffness, improving handling and vehicle safety. Porsche assembled 236 Typ 911 Targas for model year 1967, and then it caught hold. Porsche offered it on the 912 platform as well, and from 1967 through 1969, nearly one in ten 912 buyers ordered Targas. The percentages were much higher among 911 customers. In all Porsche delivered 4,419 Targas and 11,424 of its 911 Coupes in T, E, L, and S variations. During this time, the rear window became fixed in place, eliminating complaints about wind buffeting, rain leakage, and difficulties in zipping the rear window back into the body. And from there, percentages increased! Through model year 1973, Zuffenhausen assemblers manufactured 20,281 Targas and 28,354 coupes.

The roof operated within a pair of tubular arches that carry rearward from the A-pillar to the C-pillar location on the rear bodywork. Recognizing that on hot, sunny days too much light might reach occupants, the assembly included a retractable sunshade on its own framework for optimum placement. *Image courtesy of Porsche Press Database*

Over the 16-year period beginning in 1973, sometimes referred to as the G-Series era, the Targa continued to capture Porsche buyers' hearts and imaginations. In some years the totals were as great of 80 percent of Coupe production. With the announcement in 1981 that Porsche planned to introduce its 911 SC Cabriolet for 1983 model year, that percentage dropped to only 60 percent. Then incredibly, with an actual Cabriolet available in showrooms alongside a Targa, the two "open" cars seemed engaged in a match race. From model year 1984 through 1989, Zuffenhausen manufactured 35,571 of its 911 Coupes, 18,468 of the Targas, and 19,987 of the Cabriolets. But customers ultimately made their preference dramatically clear. From model year 1987 through 1989, Porsche Zuffenhausen Werks manufactured 297 Targa-body Turbos and 1,342 Turbo Cabriolets.

In the Zuffenhausen Werks, robots inserted the entire top up into the 996 Cabriolet body to protect the rubber weatherproofing seals that bond the top to the car body from damage. CTS Car Top Systems manufactured this modular sliding roof unit that used two motors to open and close the 1.54 square meters (16.6 square feet) glass panel in just 8 seconds. *Image courtesy of Porsche Press Database*

The Targa fell from favor among Typ 964 buyers who, between model year 1990 and the end of model year 1994, purchased 11,013 Cabriolets but only 3,534 Targas. When the Typ 993 appeared as a 1994 model, Porsche introduced it in both Coupe and Cabriolet bodies. The Targa was nowhere to be seen. Then when it did appear at the 1995 Frankfurt IAA as a 1996 model,

it redefined the model significantly. Gone was the removable roof panel and roll bar structure. With the 993 this all happened internally.

Stylists and engineers used the 993 Cabriolet body as the basis for the new Targa. They mounted a pre-assembled structure onto the Cabriolet body using large bolts and bonding materials. Glass formed a significant portion of the roof. There was the large opening panel, a wind deflector, and a fixed rear window. These elements fit within two body-color longitudinal steel structures that assumed rollover protection duties. Opening the roof panel first raised a small glass wind deflector. Then the large roof panel dipped slightly into the interior and retracted inside the rear window. With the panel closed, an electrically operated retractable sunshade kept the hot sun off the occupants. Porsche upgraded its air-conditioning to provide higher output. The 993 Targa was available only on the rear-wheel drive Carrera 2 platform. Over its three-year life, Zuffenhausen produced 4,583 of the cars.

But the bolt-on roof presented problems. It did nothing to stiffen the more flexible Cabriolet chassis, and some owners reported incidents where, parking on uneven terrain, the roof jammed while opening or closing. Porsche received rare complaints that the driver or passenger door could not close securely in similar conditions. When 993 production ended, engineers and designers stepped back and reconsidered the Targa.

With the Typ 996 Targa, body engineers essentially inverted their procedures from the 993. Instead of bolting a top structure *onto* a rear-wheel drive Cabriolet from the outside, factory robot arms gently inserted the 996 top through the windshield and welded it in place against the inner bodywork. Any aerodynamic lift that tended to pull the 993s apart, pulled the 996s tighter together.

The first 996 Targas emerged from Zuffenhausen in December 2001 as 2002 models. Porsche manufactured them through model year 2005, the start of the Typ 997 era. In all Zuffenhausen assembled 2,693 Targas. The contrast between this output and the more than 40,000 Typ 996s Cabriolets produced once again set engineers, product planners, and stylists to wondering about its future.

In the 996, engineers gave Ferry Porsche his long-awaited “opening hatchback” had he lived to see it. Sadly he died at age 88 in his family home, the Schüttgut estate in Zell Am See, Austria. He had retired in 1989 but remained active long afterward. His death came 74 days before his car company’s 50th anniversary. *Photo by Randy Leffingwell*

Porsche 996 Targa carried a couple of premiums over its standard rear-wheel drive Carrera coupe. The roof mechanism added 95 kg (209 lb) to the coupe and a €7,772 ($8,603) price increase. As Porsche sorted out what to do with its previously popular Targa, it seemed okay with production of just 2,693 during 2002. *Photo by Randy Leffingwell*

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2003 TYP 996 GT2 CLUBSPORT

At some point in the future, when serious 911 enthusiasts tally up the truly great series production 911s, Porsche's GT2s will be near or at the top and those rarest Clubsports may even merit reverential tones of voice. The model originated as a vehicle with which to homologate a 911 Turbo for racing within BPR and then FIA GT championships.

The face of the Clubsport made its aggressive, competitive purposes clear. There were simply lots of air intakes shoving cooling air into the oil cooler and air intercoolers. The front spoiler lip grew more prominent even as it appeared toned down in flat black. *Image courtesy of Porsche Press Database*

Porsche had assembled a parking garage full of 993 versions, with something like 172 of the version offered between model year 1995 and 1997. This rear-wheel drive 1,295 kg (2,855 lb) coupe came with the Mezger Motor boosted with twin turbos, chilled with twin intercoolers, and producing 430 hp (316 kW) at 5750 rpm. In the spring of 1995, Porsche offered it at DM268,000 at Weissach. This equaled $187,413, but only a handful made it into the United States. The second 993 version was even more exclusive. Engineers had boosted output to 450 hp (331 kW) at 6000 rpm and production managers had cut output to just 21 examples, priced at DM287,500, which due to an ever-changing exchange rate cost only $165,230 at Weissach. Again only a handful reached the United States—mostly intended for racing.

Porsche reintroduced the GT2 with its 996 platform as a model year 2001 offering. It remained rear-wheel drive only despite Porsche's efforts at encouraging an all-wheel drive competition class or even a series during its 959 days a decade earlier. The FIA's experience with all-wheel drive Group B rally cars showed them getting into twice the trouble twice as quickly as two-wheel rear-wheel drive competitors. It put the fear of lawsuits into the organizing body, and it was decades before any sanctioning body accepted them. Even though the latest GT2 provided drivers 463 hp (341 kW) at 5700 rpm and 457 lb-ft (620 N·m) of torque between 3500 and 4500 rpm, this got them a top speed of only 315 kph (196 mph).

The front lip flared out for the front wheelhouse but then carried on along the sides as skirts. These did the same for the rear fenders, pushing airflow out past the 12 x 18 inch rear wheels or upwards to the air intakes. *Image courtesy of Porsche Press Database*

From certain angles, the standard equipment ten-spoke alloy wheels almost hide the Porsche Ceramic Composite Brakes with their easily identifiable brilliant yellow calipers. The fixed carbon fiber rear wing was manually adjustable for angle of attack. *Image courtesy of Porsche Press Database*

Porsche needed to assemble and sell more than 500 for homologation. But to many customers this was a car with the mystique of the RS Carrera 2.7, the SC/RS, the C4L, and even the 959. Porsche was offering something closely akin to a racing car for the street. As the saying went, "The line forms behind me." In fact between August 2000 and December 2002, Porsche assembled 963 GT2s. For serious racers they offered a Clubsport at the same price—DM339,000 ($178,703)—for either configuration. This version included a bolt-on roll bar that was easily converted to a full competition roll cage; racing seats upholstered in flame-resistant cloth; three-point safety harnesses as well as a single six-point harness for the racing driver, delivered with the car but not installed; a fire extinguisher also user installed; and a kit to retrofit a battery kill switch on the exterior cowl. Another item that was standard was air-conditioning. Sports medicine had come of age. Ferdinand Piëch's efforts with water-cooled suits and similar attempts from other teams had become codified as medical personnel dealt with drivers who suffered heat stroke from 175°F (79°C) plus interior temps in contrast to those who raced in 70°F (21°C) comfort.

Porsche updated the Typ 996 GT2 for 2003. Regulations dictated the basis of the car had to remain Porsche's series production Turbo (even though Porsche now assembled the Turbo only on all-wheel drive platforms). A bit more magic from the engineers raised the Mezger Motor's output to 483 hp (355 kW) at 5700 rpm and torque climbed to 472 lb-ft (640 N·m) across the range from 3500 to 4500 rpm. Acceleration from 0 to 100 kph (0 to 62 mph) took 4.0 seconds, and the car reached a top speed of 319 kph (198 mph). Ride height sat 20 mm (0.8 in) lower than stock, and the car drove on similar 18 inch 10-spoke alloy wheels as the GT3: 8.5J x 18 with 235/40ZR18 tires in front and 12J x 18 wheels carrying 315/30R18 tires at the rear. This left room for 350 mm (14 in) diameter Porsche Ceramic Composite Brakes (PCCB).

Although various sources offer different numbers, the most reliable information suggests Porsche fabricated just 70 of its Clubsports, but an unspecified number of "standard" GT2s. Of these some 20 were right-hand drive. ***Image courtesy of Porsche Press Database***

Porsche again offered a Clubsport for racers. It came equipped similarly to its predecessor but now also provided a large carbon fiber rear wing and carbon-colored outside rearview mirrors. The six-point harness, fire extinguisher, external battery kill switch, and full roll cage remained factory delivered but user-installed equipment.

As most of Europe had switched over from their own currencies to the new Euro, Porsche priced the 2003 GT2 and GT2 Clubsport at €184,674 ($193,700). The European Union (EU) began to phase in the Euro on January 1, 1999. The Euro resulted from a 1991 treaty signed in Belgium between the original 12 founding nations of the EU. The objective was to tighten

economic, social, and political relations in order to enable economic growth and enhance military security, with the ultimate goal of establishing a permanent reconciliation between France and Germany. The idea behind the Euro was to create a common currency with a universally accepted rate of exchange to promote trade and investment among members and across the continent. Individual member nations continued to circulate their own currencies as late as 2001, switching over en mass on January 1, 2002, and the United Kingdom never adopted the Euro.

The standard GT2 provided a comfortable, familiar interior. Clubsports destined almost exclusively for the world's race tracks lost some space to a roll cage. An onboard fire-suppression system placed the fire bottle in a significant proportion of the passenger footwell. *Image courtesy of Porsche Press Database*

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2004 TYP 996 40TH ANNIVERSARY COUPE AND GT3 RS

Late summer 2003 Porsche introduced a significant run of Carrera 2–based 911 coupes to commemorate the 40th anniversary of the 911. Porsche let production run 1,963 vehicles.

The GT3 RS used its deep front spoiler not only for stability but also to channel air through and past the radiator. At the tail, the exposed carbon fiber wing could be set to attack the air at four or eight degrees, depending on the circuit. *Image courtesy of Porsche Press Database*

The 40 Jahre 911, limited to 1,963 examples, was a popular trophy in North America. Some 800 made it to United States and Canadian customers. In addition Porsche delivered some 125 right-hand drive versions to United Kingdom customers. *Image courtesy of Porsche Press Database*

The treatment for this special 911 was the opposite from what product planners did to Sport models. Here they added content and upgraded materials, appropriating as needed from Turbo and GT3 parts list.

The 40th-anniversary 911 Coupe relied on the 996 Performance Kit–fitted Typ 96/03S engine. Series Carreras had 320 hp (235 kW) on tap, whereas the Performance Kit boosted output to 345 hp (254 kW) at 6800 rpm, although the torque remained the same at 273 lb-ft (370 N·m) at 4800 rpm. Porsche fitted its standard G96/01 six-speed transmission upgraded with a limited slip differential providing 22 percent lockup in acceleration and 27 percent when coasting. The Porsche Stability Management (PSM), an active electronic suspension-management system, also incorporated anti-lock brakes. Engineers lowered ride height by 10 mm (0.4 in) to improve handling, aerodynamics, and its overall stance. The car rode on 18-inch Carrera wheels, 8J x 18 with 225/40ZR18 tires in front and 10J x 18 wheels mounted with 285/30ZR18s on the rear. Porsche quoted acceleration from 0 to 100 kph (0 to 62 mph) in 4.9 seconds and a top speed of 290 kph (180 mph).

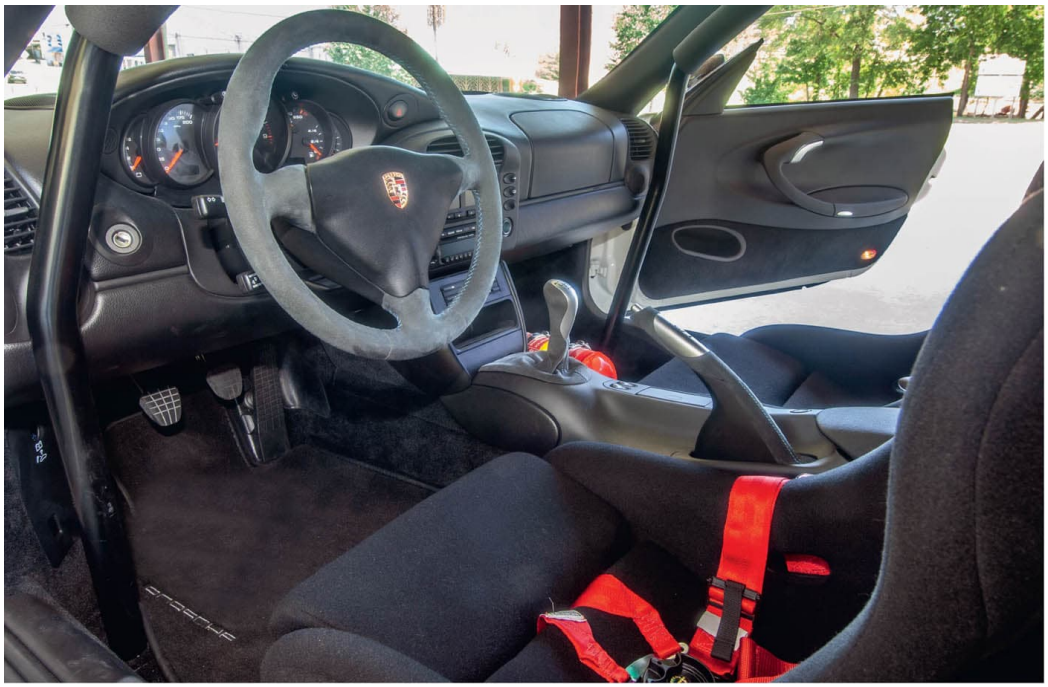
Porsche offered a single exterior color, GT Silver Metallic, and a single interior. The heated sports seats were trimmed in dark grey natural leather,

while interior designers specified a specially embossed leather for seat centers, the gripping surface on the steering wheel, and other areas. Each 40th-anniversary 911 arrived ready for travel, complete with a complimentary luggage set that included one large and one medium size Porsche Exclusive Manufaktur suitcase, a briefcase, and a key fob, all covered in matching grey embossed leather. Porsche sold the 40th-anniversary model for €95,616 ($120,605) at Zuffenhausen.

In contrast the new GT3 RS was far more exclusive. The Motorsports department needed 200 examples of its latest GT3 for homologation for various GT racing series. As production historian Marc Bongers described it, this was "conceived as a street-legal purebred race car, meeting the FIA N-GT (near–Grand Touring) and ACO (the Le Mans organizers) rules." Cars were available only in Carrera White, but styling chief Harm Lagaaij resurrected the bodyside graphic treatment from the 1973 Carrera RS and offered bold *GT3 RS* script in either red or blue spanning the lower bodywork between the wheels. The front deck lid was fabricated in carbon fiber–reinforced plastic. Body engineers replaced the glass rear window with a plastic one.

The GT3, GT3 Clubsport, and GT3 RS all used the M96/79 variation of the now-legendary Mezger Motor. Displacement remained unchanged at 3600cc from bore and stroke of 100 mm by 76.4 mm (4 in by 3.0 in). The engine developed 381 hp (280 kW) at 7400 rpm and generated 284 lb-ft (385 N·m) of torque at 5000 rpm. This plus the gearbox and brakes were identical to the other versions of GT3.

In the United States, this was forbidden fruit and therefore all the more desirable. The problem was engine exhaust emissions. They did not comply with regulations in effect starting 2001. *Photo by Randy Leffingwell*



Porsche needed to homologate its full-competition version 911 GT3 RSR, and this required 200 examples produced with one year. This GT3 RS provided customers with the classic GT formula—road-legal for travel to the track and with no change, near race-ready track capabilities. *Photo by Randy Leffingwell*

However the suspension was different. The engineers tuned it for racing circuit conditions and demands. What's more, individual owners and team

mechanics were able to dial in their own race setup, varying toe angle, wheel camber, and anti-sway bar stiffness.

As had been the case with the GT3 Clubsport, Weissach delivered the car with a roll bar bolted in place and the materials for a full roll cage included, as well as a fire-protection system. Such weight management diligence paid off with scales reading 1,360 kg (2,998 lb), exactly 20 kg (44.1 lb) lighter than the series 996 GT3. Porsche published the GT3 and GT3 Clubsport price at €102,112 ($128,799) and the track-ready GT3 RS sold for €120,788 ($152,356) at the Zuffenhausen Werks. The GT3 RS was not available to United States customers. Porsche assembled only 200 GT3 RS models.

While engine output was identical between the 911 GT3 and the GT3 RS, Weissach's weight-loss program pulled some 50 kg (110 lb) from the GT3 for this lightweight. With a need for only 200, Porsche declined to crash test it, eliminating the possibility for US import. *Photo by Randy Leffingwell*

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2005 TYP 997 CARRERA S

If anyone still doubted Porsche's commitment to the 911 Cabriolet, August Achleitner dispelled that in a single sentence. At the time Achleitner was director of product line management for the Carrera and prior to that, from 1989 through 2000, he was responsible for new vehicle concepts and packaging for all Porsche vehicles. Their latest 911, the Typ 997, was largely his creation.

The base Carrera 3,596cc engine developed 325 hp (239 kW) at 6800 rpm, while the Carrera S used a new 3,824cc opposed six-cylinder that produced 355 hp (261 kW) at 6600 rpm and 265 lb-ft (359 N·m) of torque at 4600 rpm, enough to accelerate the S from 0 to 100 kph (0 to 62 mph) in 4.8 seconds and on to a top speed of 293 kph (182 mph). *Image courtesy of Porsche Press Database*

"The main product of this new line, the *lead* model of the 997, was the convertible," he explained in an interview in 2005. This hinted that product planning had reversed the entire 911 planning process. And it made sense. Truthfully the first 911 Cabriolet attempts back in 1964 had been afterthoughts. Then 17 years later new management arrived with fresh eyes and no preconceptions about the 911. Weissach chief Helmuth Bott and his coconspirator chairman Peter W. Schutz agreed to introduce an open 911. But they recognized that they and the body engineers were starting a giant game of catch-up.

Porsche had introduced its first new 911, the so-called G-Series, for 1974. This mainly addressed engine emissions and vehicle impact safety regulations primarily from the United States. They nearly paralyzed Schutz's predecessor Ernst Fuhrmann. He dragged his feet on authorizing or enacting most of the 911 update and upgrade proposals that crossed his desk. What's more, Porsche had watched US popular opinion virtually kill Chevrolet's rear-engine air-cooled Corvair, a car they had helped General Motors design, develop, and nurse into production. Fuhrmann worried the US Congress might outlaw the 911, and he concentrated the company's efforts on, as he called them, "the kind of American-like sports cars they couldn't outlaw, those with water-cooled engines in front driving rear wheels." Morale within the company sunk, disputes arose between divisions, and Porsche accepted Fuhrmann's resignation. Ferry, as written above, hired Peter Schutz who knew nothing about auto manufacture but he had a proven record of uniting fractious employees within divided companies.

Schutz approved Bott's Cabriolet and naively expected to see it in production within a few short months. It took nearly 20. As previously mentioned they had to start with a coupe. First they removed the roof. That took with it a surprising amount of the body stiffness, so much that they nearly had to reinstall a top's worth of steel underneath and inside the open car. It proved fantastically successful. Cabriolets constituted 25 percent of sales.

Porsche followed the same process planning the Typ 964. In fact while Porsche introduced all-wheel drive on the new car, customers for the Cabriolet (and Targa) had to wait another six months for engineering and production to catch up. But delays seemed merely to increase desire. When the 964 ended production in late 1993, nearly 40 percent had been Cabriolets.

Playing Cabrio catch-up was the story again with the 993, as acknowledged throughout this book. With economic and management climates through this period, the 993's numerous innovations, and the fact it was Porsche's first new 911 body since 1964, the planners, dealers, and customers expected Cabriolet introduction to follow the Coupe. It arrived in the spring of 1994. And again, the 993 Cabriolet accounted for more than one-third of all 993 sales during 1994 and 1995. It nearly reached parity between 1996 and 1997, with sales of 7,769 Cabriolets compared to 8,586 Coupes.

The 996, conceived in an extremely weak economy, confronted the mandatory shift from air-cooled engines to water-cooling for exhaust emissions and noise standards. Again the Cabriolet grew out of coupe development. With the 996 introduction both body styles appeared, fitted to all-wheel drive Carrera 4 chassis. And again in the first three years Cabrios counted for more than 40 percent of sales. What's more, following the mid-series "face-lift," that is, the subtle body styling and engineering updates, Porsche manufactured more Cabriolets than Coupes, with 7,254 open cars to 6,621 closed ones in model year 2002 alone.

In the meantime Porsche had introduced a fabulously successful entry-level mid-engine two-seater it called the Boxster, available from 1996 on. Then in 2002 Porsche rocked the auto world by introducing its sport utility vehicle (SUV), the Cayenne. Conceived not for Beverly Hills, California, or East Hampton, New York, but instead for nations with far more dirt roads than country clubs, the SUV met considerable success in those markets. All this turned Porsche fortunes, literally, and gave engineering time to reconsider fundamentals: how do we plan our cars?

"We didn't talk about this," August Achleitner explained. "This strategy came from the engineers point of view. The convertible is the more difficult car because of the stiffness that is necessary. Your work is easier when you consider some of these special parts, some of the reinforcements right from the beginning." For the Typ 997, engineers developed the cabriolet and coupe simultaneously.

As Wolfgang Dürheimer, Porsche vice president for research and development, explained it, chassis engineers innovated a "so-called third load path in terms of passive safety, an upper load path that can take forces of an accident through the upper door section into the back of the car." This new

load path relied on a strong beam inside the door's sheet metal, originating from the base of the A-pillar at the instrument panel and extending across the top of each door. At the back of the door opening, this beam engaged a three-corner aluminum piece mounted on the B-pillar. Simply put, this third load path kept the passenger compartment from folding in on itself in a front—or rear—end collision. It also benefited handling, providing the Cabriolet five percent more torsional stiffness and nine percent greater flexing stiffness than the 996 Cabriolet.

The third load path provided stiffness benefits throughout the entire lineup into 997 Coupes, the GT3s, the GT2s, and the Turbos. As if this were not enough to boast about, Porsche planners resurrected an idea from the late 1960s, offering two separate trim and power levels for the 997. *Image courtesy of Porsche Press Database*

Traditional round Porsche headlights reappeared. The 997 weighed in at 1,395 kg (3,075 lb), which was 75 kg (165 lb) heavier than the comparable 996. However the car was more slippery through the air. The coefficient of drag for the 996 had been 0.30. The 997 S posted 0.29, and the base model was 0.28.
Image courtesy of Porsche Press Database

Significantly both engines met the United States' Low Emissions Vehicle (LEV) Standards and the Euro 4 Emissions Standards for exhaust emissions through the use of a two-stage catalytic converter. An innovative two-channel oxygen sensor—stereo lambda control—monitored and controlled left and right cylinder banks. *Image courtesy of Porsche Press Database*

A new six-speed transmission and a long-awaited PASM—an innovation updated from the Typ 959s nearly 20 years earlier—delivered power to the ground and road feel to drivers through standard 18-inch wheels. But to save weight, the 997 provided no spare tire. *Image courtesy of Porsche Press Database*

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2006 TYP 997 "50TH–ANNIVERSARY PORSCHE CLUB OF AMERICA" COUPE

In 1954 Ferry Porsche exported nearly one in three cars his company manufactured to the United States. The actual breakdown registered in fractions of cars.

When *AutoWeek* magazine published its brief announcement of the PCA Coupe, it displayed its trademark cheekiness: "For now . . . this is the most exclusive 911 available—well, barely available. Porsche will offer just 50 copies of the Club Coupe and PCA members get first crack at writing the checks." *Photo by Randy Leffingwell*

At nine per day total, 75 percent exported equals 6.75 cars. Of these, 40 percent were destined for US customers, which equals 2.7 cars *per day*. The car was an absolute cult favorite. Owners flashed their lights at one another, and when several owners encountered others, conversations nearly always centered on their cars.

William J. Sholar, a commercial artist near Washington, DC., was one of Porsche's early customers in the United States. He acquired a new 356 Coupe in 1953. As he encountered more and more owners, the idea struck him that this crowd might benefit from some kind of regular encounter. They represented a broad age span and wildly diverse personal and work backgrounds. Sholar invited a small group to his home on February 8, 1955. From there the group agreed to contact others and meet again later in the spring. By summer this had coalesced into the idea of a Porsche Club of America (PCA) and Sholar and the others placed an ad in the August issue of *Sports Cars Illustrated*, explaining their plan to found a Porsche club in the United. States. The group also contacted Zuffenhausen to seek recognition of their club. PCA set annual dues at $10.

This was hardly an alien idea to Porsche. The company had given its blessing to a group of owner enthusiasts near Essen, Germany, who had founded such a club—Westfälischer Porsche Club Hohensyburg (currently Porsche Club Westfalen e.V.)—nearly three years earlier on May 26, 1952. Between Essen and Washington, the idea already had spread to Belgium, with the Porsche Club of Belgium founded in 1953. Today there are Porsche Clubs in 86 countries.

PCA holds the distinction for establishing the first multiday Porsche Parade, which occurred over four days in Gaithersburg, Maryland, at the end of August 1956. It was first announced in the debut issue of PCA's new magazine, *Porsche Panorama*, which appeared in December 1955. Nearly 100 cars registered. The fee was $13, and a room at the event headquarters, the Washingtonian Motel, with air-conditioned rooms and a pool, cost $12 per night. The Saturday night victory dinner was $3 per person including drinks.

The PCA Coupe was one of the first chances buyers in the United States had access to the desirable X51 Powerkit option for the S engine. Owners described this 26 hp (19 kW) boost—perhaps the wrong word since the engine was definitely naturally aspirated—as a recognizable addition. *Photo by Randy Leffingwell*

Porsche and the Porsche Club of America unveiled the Coupe during the Porsche Parade in late June 2005 in Hershey, Pennsylvania. Hans-Peter and Wolfgang Porsche attended along with racing legend Vic Elford. The PCA also inaugurated a legend, staging its first Gimmick Rally, a regular element each year since. *Photo by Randy Leffingwell*

Through the 50 years that followed PCA founding, the Club grew and dispersed across the United States. In order to honor and commemorate the Club's birth and its innumerable contributions to owner enjoyment, entertainment, and education, Porsche's product planners approved a limited run of just 50—one for each year of its life—50th-anniversary Porsche Club of America Commemorative Coupes. Access, because many more than 50 Club members wanted one, was settled by lottery. PCA gifted car 01/50 to the Porsche Museum for its permanent collection, and the terms of the raffle/lottery were such that car 15/50 went to the raffle winner. The remaining 48 sold through local dealers.

Porsche named the car color Azzurro California and described it as an update on the Azure Blue that was popular on 356s at the time. But Azzurro California? If the Club founders were all from the Eastern United States, did Porsche consider Azzurro Washington? Or Azzurro Maryland? *Photo by Randy Leffingwell*

For this commemorative car Porsche selected the current Typ 997 Carrera S painted in Azurro California, a modern update of the classic Azure Blue often seen on 356s during the 1950s and 1960s. Planners equipped the S with Sport Seats, the Sport Chrono Package Plus, and a driver-operated performance adjustment system that incorporated the Porsche Active Suspension Management (PASM), which offered a variety of electronically

adjust suspension settings. What's more, Porsche included the X51 Powerkit. This was a set of engine and electronic modifications that, before this, was not offered to US buyers. It increased S engine output from 355 hp to 381 hp (261 kW to 280 kW) and boosted torque output from 295 lb-ft to 306 lb-ft (400 N·m to 414 N·m). This made the PCA Coupe Porsche's most powerful non-turbocharged engine available in the United States at the time. Riding on standard 19-inch wheels and tires, the X51 accelerated from 0 to 100 kph (0 to 62 mph) in 4.5 seconds and reached a top speed of 300 kph (186 mph). Porsche established the sale price at $99,911 and because the PCA welcomed members across North America, the company also listed a price in Canadian dollars at $131,883.

"Not part of the PCA?" *AutoWeek* asked. "Well here's a reason to join: One of the 50 911 Club Coupes will be randomly given away to a lucky member." It was No. 15 of the 50. Serial No. 1 went to Porsche's museum in Zuffenhausen, a gift from the Club. *Photo by Randy Leffingwell*

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2007 TYP 997 GT3 RS AND TYP 997 TARGA 4 AND 4S

The FIA's GT racing program was once again in trouble, though this time Porsche was not the troublemaker. That distinction fell to Maserati who had assembled a nearly unbeatable GT car, the MC12.

A new system incorporating electronically operated butterfly valves and control flaps in both intake and exhaust systems maximized engine output across the entire engine range. Addressing a number of owner comments, engineers tightened the ratios between gears on the six-speed manual transmission, improving acceleration and enhancing driving enjoyment. *Image courtesy of Porsche Press Database*

It led the FIA to do something it had been considering since it took over the BPR series. It established a Balance of Performance (BoP) among the entrants. Nearly every time an FIA series had gone under, it could be traced to a years-long dominance from one team or manufacturer. On the one hand this seems unfair. Why shouldn't the best team with the best drivers and fastest cars be allowed to win? Well, over time this costs the sport due to the loss of entrants whose absence discourages spectators, subsequently discouraging sponsors and devastating circuit owners. Balanced racing means very close, extremely competitive contests for all participants.

"You can use a number of different methods to balance a car," Peter Wright explained on the FIA website (**www.fia.com**). Wright was the president of the GT Commission, charged with figuring out how to balance the capabilities of perhaps a dozen different race cars to provide match races instead of one-marque parades. "Weight restriction or ballast, power restrictions or aerodynamic restrictions," Wright continued. Over six months in 2004 his commission managed to balance the Maserati (nearly as authentic a racer as Porsche's GT1s had been) to Ferrari 550s, a lovely grand touring car but no purebred. "It was a bit of negotiation, but we did it and this set the way for GT racing ever since.

"Balanced performance has also enabled the creation of GT3 racing, which uses unmodified road cars," Wright added. "The idea of GT3 was to be a commercially viable formula for manufacturers to get involved. The concept was that a manufacturer could bring an existing car and then we would balance it." Computers captured reams of data for cars they analyzed and compared to the others. The program prescribed the modifications to bring it in balance.

Because homologation requirements had to be met, United States customers were pleased when Porsche decided to release its Typ 997 GT3 at the same times as its European customers saw it as a 2006 model. The latest tune on the Mezger 3.6-liter (220 cu in) motor developed 415 hp (305 kW) at 7600 rpm and a redline set at 8400 rpm. *Image courtesy of Porsche Press Database*

To better keep it all on the road, Porsche added its PASM, as well as an electromechanical limited slip differential and traction control. Porsche claimed acceleration from 0 to 100 kph (0 to 62 mph) was 4.3 seconds and a top speed of 309 kph (192 mph). *Image courtesy of Porsche Press Database*

“We used to try to balance lap times to a quarter of a second, which was our target, and only make changes when the gap was definitely more than half a second,” Wright said. “We used to get grids where the top 12 were within a second, even though we had differences in driver ability, but we had some very tight qualifying sessions.

“An aspect of Balance of Performance was the disincentive to develop a car, but what started to make a difference in GT3 was that manufacturers realized there was quite a good business to be hand selling cars.” Human nature among engineers and racers worked overtime during and after the season. “People racing the cars, particularly those who couldn’t win whatever cars they had, wanted new versions after a year or two, and they might wonder which was better, the Ferrari or the Porsche? So the manufacturers, wanting to see more cars, made upgrades. . . .”

Weissach happily fed the hungry racers, offering new 1,150 kg (2,535 lb) 3.6-liter (220 cu in) 997 GT3 Cup cars with 400 hp (294 kW) at 7,300 rpm. For 2007 Porsche assembled 233 Cup cars. In addition it turned out 37 of its latest GT3 RSR, a performance balanced 1,225 kg (2,701 lb) race car with Porsche 3.8-liter (232 cu in) engine delivering 465 hp (342 kW) at 8,000 rpm.

Dual motors opened the roof 0.48 square meters, bringing 5.2 square feet of sky to occupants. The twin-drives ensured ease of opening and closure at any road speed. To visually announce that something was different—not your average 997 Coupe—Porsche's designers inset a polished anodized aluminum strip running the full roof length. *Image courtesy of Porsche Press Database*

A year later Porsche addressed the GT3 owners dedicated to track days and organized motorsport, introducing the latest version of the GT3 RS. The rear platform, wheel track, and bodywork were 44 mm (1.75 in) wider, the better to accommodate the variations racers needed to introduce to their cars for any given circuit. With an adjustable carbon fiber rear wing, thin plastic rear window, and lightweight bucket seats, Porsche saved 20 kg (44.1 lb) over the GT3, bringing the GT3 RS in at 1,375 kg (3,031 lb) with full tanks. As in the past, a Clubsport version included a bolted-in roll bar, a kit for eternal electric cut-off, the parts to complete a roll cage, and a fire extinguisher.

If yin and yang is an ancient Chinese symbol for harmony and balance, then perhaps this symbol might be an appropriate illustration of the Porsche GT3 RS and its Targa 4S. Some definitions go further, suggesting that Yang is positive, active, and masculine, whereas Yin is negative, passive, and feminine. If this is the case, that is where the comparison ceases. While

Porsche made a very significant chassis choice to its Carrera 4 and 4S all-wheel drive platforms in contrast to the GT3/GT3 RS rear-wheel drive platforms, this decision—if anything—opened up opportunities for the Targa that otherwise may not have materialized. Product planners explained that, after observing—and actually *surveying*—recent model Targa buyers, they found that the owners were often highly active individuals whose outside activities had little or nothing to do with automobiles and race courses. They were skiers, hikers, equestrians, boaters, and racket-game players, for whom the certainty of getting to the slope or trail head or seashore was a very high priority.

So as a result of this new awareness, for the first time, Porsche limited the Targa to strictly all-wheel drive platforms. To improve handling, Porsche changed the glass material used for the wind deflector, sliding roof panel, and opening rear hatchback to one that weighed 1.9 kg (4.2 lb) less.

Engine output, gearbox availability, and options were common between the rear-wheel drive Carrera 4 and 4S and the Targa 4 and 4S. The 4s operated with Porsche's 3596cc opposed six-cylinder, offering 325 hp (239 kW) at 6,800 rpm, while the Carrera 4S and Targa 4S each relied on the 3,824cc engine that delivered 355 hp (261 kW) at 6,600 rpm. *Image courtesy of Porsche Press Database*

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2008 TYP 997 GT2

When executives pulled the cover off their 2008 GT2 show car in the autumn of 2007, there were gasps of relief from two camps of Porsche customers. One of those was the group that actively raced the Turbos in FIA GT championships.

Porsche's press release accompanying the GT2 during its 2007 Frankfurt show debut announced it was "the fastest and most powerful 911 to ever see the light of day." *Image courtesy of Porsche Press Database*

They immediately understood that Porsche planned to assemble enough to homologate it for the next season. But the second group was equally relieved, for these customers mostly raced each other on the autobahns and back roads of Germany where this über-Turbo was also König, the King. American website **Edmonds.com** described the GT2 as "a track prepped GT3 RS with a nuclear reactor in its rear end." In terms of its new technology, they weren't too far off. Its new turbos were perhaps its most remarkable feature.

The M97/70S, the current designation for this, the final development of the 3600cc opposed six-cylinder Mezger engine, produced 530 hp (390 kW) at 6500 rpm and generated 492 lb-ft (667 N·m) of torque between 2200 and 4500 rpm. Porsche had introduced their variable turbine geometry (VTG) exhaust turbochargers on the latest 997 480 hp (353 kW) Turbo coupes and Cabriolets. These devices were part of the secret to this significant power output. Adopted from the low-speed truck diesel industry, VTG turbos functioned as a variety of diameter turbines in a single housing. Prior to this, the best available technology incorporated a small diameter turbo that reacted quickly to engine exhaust gas flow, accelerating the turbine blades, which sped up the compressor blades because they are mounted on the same shaft. At the instant when the smaller turbo generated enough boost, a valve opened, directing pressure to the larger turbine blades in the big turbo. This was the system engineers perfected for the 450 hp (331 kW) Typ 959 twin-turbo installation. But the trucking industry had developed a technology that combined the small and large turbines into a single housing. They accomplish this by means of a system of adjustable guide vanes that react to the quantity of flow as they direct the incoming engine exhaust at the turbine blades. Initial development tests with diesel truck VTGs proved to be instantly fatal for the turbos. Exhaust gas temperatures soared hundreds of degrees hotter than diesels generated. In early tests they simply melted the turbos into a lump. Replacing an outer collar and the variable blades with extremely heat-resistant pieces—engineers learned they had to handle up to 1,000°C (1,832° F)—each of the upgraded turbos performed as if it were the early 959-type twin-turbo configuration.

With this much new air flow into the engine, Porsche engineers revised the entire engine intake airflow plan, starting with ram-air inlets in the rear wing uprights. From here, after passing through an air filter, air flowed into one of the two VTG turbos. But once out of the turbos, the compressed air

encountered a nearly age-old obstacle, a pulsing airflow that builds up between the throttle butterfly and the rapidly opening-and-shutting intake valves. The turbos continue to ram air into the intake tubes, and further compression has the unwanted effect of further heating this charged air. To reverse this effect, engineers shortened the intake runners and lengthened the plenum while reducing its diameter. This fed into the charge air intercoolers and to the engineers' surprise, reduced the fuel-air mix temperature *below* that on the series production Turbos. This reduced the risk of "knock," spontaneous pre-ignition of the mix, and allowed engineers to spark the mix earlier. This generated more power and reduced fuel consumption at full throttle. Taking advantage of all the improvements in charge temperature and engine output, Porsche engineers introduced another first: the tail pipes and muffler were titanium, a first for a Porsche road car. Titanium's ability to withstand high temperatures and its great strength enabled engineers to reduce the muffler weight and size by nearly 50 percent. This and the lower back pressure of the new muffler further improved GT2 performance and enabled the engine to produce a very satisfying road-legal-anywhere exhaust sound.

The GT2 represented Porsche's finest balancing act, that is, how to add power while removing weight. By the time Flacht engineers finished they had removed some 145 kg (320 lb) of bits and pieces from the series production Turbo to reach 1,440 kg (3,175 lb) for the GT2. *Image courtesy of Porsche Press Database*

Flacht engineers balanced the scale working on the 3600cc Mezger opposed six-cylinder. They ultimately drew out 530 hp (390 kW) at 6500 rpm and 492 lb-ft (667 N·m) of torque, available between 2200 and 4500 rpm. What was one trick to gain that 50 hp (37 kW) over the series car? They increased turbo boost from 1 bar (14.5 psi [100 kPa]) to 1.4 bar (20.3 psi [140 kPa]). *Image courtesy of Porsche Press Database*

How was the performance? With its twin turbos operating at 1.4 bar (20.3 psi [140 kPa]) boost, the GT2 accelerated from 0 to 100 kph (0 to 62 mph) in 3.7 seconds and carried on to a top speed of 329 kph (204 mph). Porsche mounted the car on 19-alloy wheels and fitted 235/35 ZR19 tires on the front and 325/30 ZR19 in the rear. It offered the car for sale at €159,100 ($233,970) at introduction at the Zuffenhausen Werks. The car was subject to a 19 percent value- added tax (VAT) which took the initial price to €189,496 (or about $249,995) in November 2007.

Acceleration numbers on a car such as the 997 GT2 are extremely impressive. But Porsche even balanced these. *Motor Trend* magazine put their electronic fifth wheel onto the car and recorded 0 to 60 mph (0 to 97 kph) in 3.2 seconds. Equally impressively, the car braked from 60 mph (97 kph) to a halt in 98 ft (29.9 m). *Image courtesy of Porsche Press Database*

Pity the life of auto journalists. One best left unnamed—after months away from home—was told he *had* to fly to Germany for the GT2 introduction. "How much better—or faster—could this one be? I yawned . . . Well, an indicated 331 kph—206 mph—on the autobahn can wake a guy up." *Image courtesy of Porsche Press Database*

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2009 TYP 997.2 CARRERAS

The company had introduced a strategy in which it launched new body styles every several years. These always necessitated platform changes, so each came with a new Typ number: 993 to 996 to 997, for example.

Car and Driver magazine's reviewer Jens Meiners suggested their readers "Look closely and memorize the subtle changes to the exterior. Otherwise you may overlook the new 2009 Porsche 911 when it appears. . . . Let's describe the changes to the exterior as inoffensive. . . ." *Image courtesy of Porsche Press Database*

Sometime in the middle of this span, Porsche provided marketing, sales, and customers with a "face-lift," that is, a freshening of the car's exterior. But it was underneath the skin where the real changes were hidden. The mid-term 993, that is model year 1996, introduced the VarioRAM induction system, the sliding glass roof Targa, and the Carrera 4S, an all-wheel drive Turbo-Look coupe (minus the rear wing). On the Typ 996 the face-lift significantly changed the face through substantially redesigned headlights. A variety of aero-fixes reduced the front lift by 25 percent and lift at the rear by 40 percent. A new 3,596cc opposed six-cylinder replaced the existing base 3,387cc engine, and it introduced an updated VarioCAM Plus that actively managed valve timing and lift—second by second. With a new crankshaft, pistons, and connecting rods, output rose to 320 hp (236 kW) at 6800 rpm.

No auto manufacturer more than Porsche operates under the principle that racing improves the breed. Through the mid and late 1980s, the company introduced two important innovations: Direct fuel injection (DFI) and Porsche DoppelKupplungsgetriebe (PDK) or Porsche dual-clutch transmission. Each traced a direct line from an engineer's brainstorm to Ferry Porsche's approval, then into development and years of testing perfecting them in competition, and finally, to Ferry Porsche's conclusion these were ready for series production.

DFI had shown its benefits in motorsports through increased power output, and series production engineers were well aware of the possibility for big gains in fuel economy and engine emissions output. As former racer/engineer Jürgen Barth explained it, "The fuel injector for each cylinder is mounted between the two intake valves and the nozzle directs fuel between the two incoming air streams. In past systems, fuel and air mixed in the intake runners but now, mixing completely inside the combustion chamber—and because the injectors shot fuel in a small fraction of a second ahead of the cylinder's power stroke, the engines reacted quicker, more spontaneously to throttle inputs—both opening and closing the throttle. Deceleration now made engine revs drop faster," Barth said.

"Direct injection eliminated what is called 'wall wetting,'" Barth continued. This occurred when the fuel-air mix entered the cylinder on angles through the valve ports, wasting fuel and engine output energy. With DFI fuel vaporization takes place inside the cylinder, and this has several benefits including reducing chamber temperature and condensing the mix, which then

allows more air, increasing volumetric efficiency and increasing power output. Its overall efficiency allowed engineers to increase the compression ratio from 11.3 to 1 to 12.5 to 1. Porsche rated the new MA102 base Carrera engine at 345 hp (254 kW) at 6500 rpm and the 3824cc MA101 engine for the Sat 385 hp (283 kW) at 6500 rpm.

The mid-generation "face-lifts" typically present only minor appearance changes. It's under the skin—and in the case of 997.2—in running gear that Porsche made its biggest leaps. DFI shot fuel directly into the cylinder, resulting in improved performance, fuel economy, and cleaner exhaust. *Image courtesy of Porsche Press Database*

As if this weren't improvement enough, the company also introduced the long-awaited PDK. This replaced the thoroughly developed Tiptronic S gearbox and was an option for all 997.2 customers. The PDK offered drivers seven forward gears with the ability to operate it in a manual/sequential mode or fully automatically. There was no longer a clutch or clutch pedal for the driver, though there were electrohydraulically operated clutches inside the transmission. In fact the genius of the system was that the PDK engaged two gears simultaneously. The PDK was really two gearboxes in a single

housing, each linked to the engine and the drive axles by its own multiplate wet-clutch pack. The first clutch handled the even gears and the second handles the odd gears," Jürgen Barth explained. “Only one of the clutch packs was engaged at any given moment. As one pack disengaged, the other simultaneously engaged. It was nearly instantaneous because each gear had been preselected—and already in mesh, that is rotating at working speed—so the ‘shift’ took microseconds. This is imperceptible to the driver who feels no interruption of power to the rear wheels.”

Unlike the DFI the PDK was a highly controversial introduction. Porsche owners—with the exception of Sportomatic and then Tiptronic customers—had been shifting their own gears since 1948. Other premium carmakers were publicly phasing out manual transmissions from their sports cars, citing customer preferences for effortless cruising. A vocal group of loyal Porsche enthusiasts feared a similar move from Porsche. They argued passionately about losing “points of driving contact” with a mandatory PDK. A manual gearbox required two feet and two hands. The derrière, a brain, and eyes fit somewhere in their equations, but with the PDK, the left leg and right hand were in danger of becoming passengers. Porsche responded quickly, assuring loyalists and potential buyers that manual shifting was in Porsche’s sports car DNA and there were no plans to alter that formula.

The 997.2 face-lift brought animation and emotion onto the faces of 911 buyers with the introduction of the long-awaited PDK. One could characterize it as seven-speeds-no-waiting as electrohydraulics keep two gears but only one clutch engaged. In an instant, clutches open *and* close, powering the next gear. *Image courtesy of Porsche Press Database*

The PDKs initiated an ongoing discussion comparing driving (with three pedals) to pointing-and-steering (with only two pedals.) Porsche let buyers make their own choice, although the PDK was an expensive option. Improvements to the manual gearbox made the choice harder. *Image courtesy of Porsche Press Database*

After introducing the PDK and explaining DFI, Meiners found "the inevitable kid stuff. For stoplight races enter Launch Control: put one foot on the brake, flat foot the throttle with the other, let the engine automatically rev to 6500 rpm, and quickly take your foot off the brake!" *Image courtesy of Randy Leffingwell*

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2010 TYP 997 SPORT CLASSIC

The Sport Classic may be a Porsche “first.” Since the design of the aluminum Typ 356 coupes, the roof has been sacred territory. It has nearly been an element of faith: “Thou shalt not touch the roof!” Cutting it off for reasons of Targa or Cabrio required painstaking discussion and engineering.

Porsche Exclusive Manufaktur ended production of the Sport Classic at 250 examples. It sold out almost instantly, verifying and confirming the *Classic* in its name. Based on an already competent Carrera S platform, Porsche Exclusive Manufaktur fitted an encyclopedic inventory of modifications, changes, and options available nowhere else in Porsche’s 911 Configurations. *Image courtesy of Porsche Press Database*

And yet, the Sport Classic introduced a bit of whimsical heresy into the 911 body form, the so-called *doppeldomesgerufe*, sometimes referred to as the double bubble. These rooflines appeared repeatedly on small 1950s Italian racing coupes whose bodies Emilio Zagato designed for Fiat and for Abarth. Porsche certainly has its own history with double bubbles, with both Stephen Murkett's Porsche Panamericana and the Larson/Hatter 2004 Carrera GT (though these tops were removable). And flip-up double bubbles covered half the cockpits of Carrera 3.2 and Typ 964 Speedsters. But the Porsche Exclusive Manufaktur department had power and influence it was just beginning to recognize.

Chairman Wendelin Wiedeking had led Porsche back to prosperity, and he challenged employees to increase revenue from existing in-house services and products. In response they brought Porsche Classic, Porsche Tequipment, and factory delivery into Porsche Exclusive Manufaktur. Three new strategies emerged. They assembled a logical collection of options for each vehicle line and gave customers access via online configurators as well as regular order forms. They broadened Porsche Exclusive Manufaktur access to all markets and named Porsche Exclusive Flagship Dealers with better trained staff who even hosted customer-introduction events. Lastly the two new Porsche Exclusive Manufaktur directors Karl-Heinz Volz and Ingo Frenkel resurrected the "lighthouse," or bellwether, vehicle. This was an idea Hans Riedel, board member for sales and marketing, had adapted from the designer fashion industry. Porsche engineers and designers could create one-off vehicles for display at international motor shows just as the high-fashion houses staged their own runway show to introduce ideas and gauge interest, the so-called *haute couture* collections. When enough potential customers spoke up, Porsche Exclusive Manufaktur could offer these in small-volume runs, similar to fashion's prêt-à-porter, or ready-to-wear, selections. Logically the most popular of the ideas filtered down to become regular production options or even standard equipment.

By roughly 2006 the Porsche 997.1 series was approaching maturity and product planners were busy organizing the Targa and Speedster. To this traditional mix, directors Frenkel and Vogl added one new idea and one young enthusiast: a retro coupe and a successful sales executive at Porsche's main Stuttgart dealer, Boris Apenbrink. A variety of reasons delayed the Targa until the 997.2 next generation. And while the Speedster advanced

quickly, the retro coupe kept Apenbrink up late. He had no clear direction to follow, and the restomod phenomenon emerging in the United States had not yet crossed the Atlantic. So Apenbrink went into Google and assembled a picture file of what he considered Porsche's best 911s. He made a list on paper divided into two columns even as he downloaded research photos. He labelled one column "Sport" and the other "Classic."

He polished his presentation and in December 2006 showed it to Frenkel and Volz. They liked it and moved it along to Porsche's Product Council. Apenbrink had thought through his retro coupe very carefully. For instance he took from the 911 RS 2.7 only the rear ducktail spoiler and the Fuchs five five-spoke wheels. In an interview in *000* magazine, he explained, "The genes of the 2.7 RS would lead to the GT3 but we were always thinking about the retro coupe from the Exclusive perspective . . . we never wanted to do a lightweight puristic car. While GT models are track oriented, Exclusive cars are design oriented. Which is why it was more natural to put in a high-end interior with the highest level of leather covering and attention to detail." Soon after Product Council approval, Design chief Michael Mauer pulled Grant Larson into the discussions, and Grant quickly became a fan of Apenbrink's ideas. Their brainstorming and intermixing of ideas further defined the car. They unveiled the car at the 2009 Frankfurt Motor Show, and in the best tradition of *haute couture*, their entire ready-to-wear line sold out within days.

As Porsche does with its special editions, its engineers tweaked the 3824cc Carrera S engine. They developed a new intake manifold that introduces six vacuum-controlled flaps. In concert with the precision of the direct fuel injection metering, this provides a crisp, clean cut-off to incoming air supply as well. In the process of perfecting their latest X51 Powerkit, engineers found another 23 hp (17 kW), taking the opposed six-cylinder to 408 hp (300 kW). In addition engineers installed Porsche's carbon ceramic brakes, a locking rear differential, and the sport suspension.

Incredibly the group of outsiders who had caused Porsche to establish *Sonderwunsch* and Porsche Exclusive Manufaktur still constituted a threat to Porsche's supremacy in "customizing" its own cars. These outside tuners, often small shops, responded within weeks to trends—especially in engine, gearbox, and suspension developments—that took Porsche months to design, test, and crash. Smaller shops didn't legally export to the United States, so

they had none of these concerns or costs. It was the matter of crash testing that kept the Sport Classic from US buyers.

The car had no name yet, and "retro coupe" was just not suitable. But when Apenbrink went back to his first notes, his inventory of ideas and pictures, he found he already had written it across the top of the page: Sport Classic. *Image courtesy of Porsche Press Database*

For the aerodynamic improvements, Larson and his design team added a lip spoiler to the nose and a fixed ducktail at the rear on the 1972 911 S and 1973 911 RS 2.7. Black headlight rings and outside mirror brackets evoked memories of Porsche styles from the past. *Image courtesy of Porsche Press Database*

The interior of the car presents an interesting contrast from the exterior greys. Espresso-colored leather is everywhere except for the woven leather seat inserts and the Alcantara roof liner. Porsche press materials emphasize that the car took three years to develop. *Image courtesy of Porsche Press Database*

"When we created the Sport Classic, we wanted to integrate something third parties and tuners would not be able to copy easily," Apenbrink explained to *000* magazine. "After looking into several possibilities, we focused on integrating a double bubble shape into the roof. No series production 911 had this feature before."

For economic reasons, Porsche had decided to export one single roof configuration to United States customers. Because the percentage of sales with optional sunroofs had been so high, the Porsche Supervisory Board decided to export *only* sunroof cars to the United States. The double bubble form made a sunroof impossible, and the costs to crash test a limited run car —a completely handmade prototype worth €5,000,000 ($7,200,000) or more —were impossible to support, so the Sport Classic could not come to the United States.

Some well-known collectors managed to import one under the limited-driving Show and Display exemption. Porsche priced the car at €169,300 at Zuffenhausen ($225,733). That's a lofty price tag, floating up there in GT2 territory. But everyone acknowledged the GT2 required experienced race car driver–level skills to get the most from the car. Writer Michael Harley (**www.autoblog.com**), who does race and has vast experience in Porsches, summed up this one: "It terms of sheer driving enjoyment, it could be the best street car on the planet."

Evo magazine reviewers noted, "There's a lot that sets the Sport Classic apart from other 911s, most of which are highly desirable cosmetic tweaks. New clock faces, a new gearlever, new seats. . . ." all guaranteed to put a very long face on the individual standing 251st in line to buy one. *Image courtesy of Porsche Press Database*

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2011 TYP 997 GT3 RS 4.0

During the months that Boris Apenbrink, Grant Larson, and Porsche Exclusive Manufaktur management were working their way through the myriad design, materials, and manufacturing questions for their Sport Classic, off at the other end of the Weissach campus, in the Motorsports World Center called Motorsport Centre Flacht, director Andreas Preuninger's engine designers were busy disproving a long-held claim of Porsche.

This one only racers tested and they agreed: it was the best race car they'd driven. Porsche's unique, highly experimental Typ 997 GT3 Hybrid sliced through the Nürburgring rain, nearly winning a 24-hour race and convincing Porsche their technology was solid. *Image courtesy of Porsche Corporate Archives*

It was said—and reiterated repeatedly over more than a decade—that, because of the internal design of the 911 engine, achieving an overall cylinder displacement of 4.0 liters (244 cu in) was impossible. The fact that at least one of those pesky outside tuners had developed one and offered it for sale did not help the case Hans Mezger continually made for making slow, steady advances on the target he personally encouraged.

Weissach had developed a new flat crankshaft for the 997 GT3 RSR race car, achieved by lengthening the engine and cylinder, along with fitting a new set of forged titanium connecting rods. This was the only means available. It was *not* possible to enlarge bore any further. Weissach engineers transferred these innovations directly from the longer-stroke RSR engine into the RS 4.0. It became a kind of commemorative and celebratory package because once it was fully assembled, the 3995cc M97/74 engine developed 500 hp (368 kW) at 8,250 rpm and achieved another goal considered impossible: 125 hp, or 93.3 kilowatts (kW), output per liter. The engine produced 339 lb-ft (460 N·m) of torque at 5,750 rpm. The exhaust system channeled all gases out through a single center rear pipe—something common on Porsche's four-cylinder racers of the 1950s and 1960s and still an aesthetic goal. As with Porsche's GT3 RS variant, the only gearbox was the six-speed—it is, after all, lighter—and Flacht engineers determined gear ratios for this car by considering a number of racing circuits. Acceleration from 0 to 100 kph (0 to 62 mph) took 3.9 seconds. Porsche quoted a top speed of 311 kph (193 mph). Depending on gearing, the car reached 200 kph (124 mph) in 12.0 seconds.

Relying on the now-common combination of carbon fiber for the front deck lid, front fenders, and bucket seats, Preuninger's engineers managed to hold vehicle weight to 1,360 kg (2,998 lb) with a full fuel tank. A radio and air-conditioning were standard equipment. However there was a no-cost option available to delete devices to decrease weight. An optional lithium-ion battery saved buyers another 11 kg (24 lb). This severe diet awarded the car another distinction. Not only was it the first Porsche 4.0 liter (244 cu in) opposed six-cylinder displacement and the first 500 hp (368 kW) output, its weight to power ratio is 2.72 kg/hp (1,360 kg ÷ 500 hp), dipping well below the almost mythical threshold of 3.0 kg/hp. In SAE calculations, this yielded 5.99 lb/hp (2,998 lb ÷ 500 hp).

In keeping with other recent Porsche limited editions—this one restricted to 600 units total—the RS 4.0 was available only in white or black with a

contrasting grey spear trimmed in red. Preuninger told *Car and Driver* writer Jens Meiners that he preferred the white, "'It is innocent,' he said, barely able to conceal his grin." The car took a number of aerodynamic cues from its RSR sibling, including an elevated rear wing with end plates, and a front spoiler configuration known as "flics," for lateral front air-deflection vanes. The combination of these two generated 190 kg (419 lb) downforce over the car body at its top speed.

Deliveries in Germany started in July 2011 where it sold for €178,596 including its 19% value added tax. Porsche exported approximately 126 to the United States, where it cost $248,050. The US car arrived configured slightly differently from its home-market kin. To meet safety regulations, Porsche had to replace the 8.2 kg (18.1 lb) carbon seats with sport seats, the polycarbonate side windows and backlight with USDOT-approved safety glass, and to delete the roll cage.

"The Four Point Oh looks so tough," *Evo* magazine writer Jethro Bovingdon wrote of the worn test car he drove. "It's as authentic as a hand grenade and all I have to do is twist the key to pull the pin," adding, "Its charisma is innate, not applied." *Image courtesy of Porsche Press Database*

"Nothing paints a picture of the road surface quite like a 997 GT3 RS, and with the 4.0-liter [244 cu in] there's even more detail and greater immediacy thanks to the additional torque and that fabulously direct rear axle," Bovingdon noted. *Image courtesy of Porsche Press Database*

"The RS is resolute," Bovingdon stated. "There's just so much quality here. The steering has characteristic 911 noise here and the tiny bit of play around straight-ahead position creates a tangible sense of this car's engine location." *Image courtesy of Porsche Press Database*

Bovingdon summed up the 4.0 tidily: "Considered by many to be one of Porsche's finest achievements, the 997 GT3 RS4.0 was the ultimate 997, and just might be the ultimate 911." High praise indeed as *Evo* magazine had already declared the GT3 RS the best car they *ever* had tested. *Image courtesy of Porsche Press Database*

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2012 TYP 991

In the tradition of evolutionary stages past, the arrival of the seventh generation 911, the Typ 991, delivered more or less those things customers had come to expect: horsepower, weight, interior comfort and luxury, and electronic handling and communications. And yet no one judged the car “just as expected.”

The 991 was the brain child of an impressive group of parents. August Achleitner, head of 911 development, worked for Wolfgang Dürheimer, who was director at Weissach. They answered to Wendelin Wiedeking as chairman. And then when VW took over, Ferdinand Piëch added his input. *Image courtesy of Porsche Press Database*

AutoWeek's Road Test Editor Jonathan Wong let the car's roadholding grow on him. "I will say the biggest improvement to the 991 is ride quality. Being able to handle bumps and potholes as well as this car can on 20-inch tires is nothing short of impressive." *Image courtesy of Porsche Press Database*

For instance, Porsche's 3824cc Carrera S engine now delivered 400 hp (294 kW) at 7,400 rpm, while the base Carrera introduced a new 3436cc engine that developed 350 hp (257 kW), also at 7,400 rpm, five higher than the previous generation 3.6-liter (220 cu in) opposed six-cylinder. A new induction system fitted pressure sensors in the intake manifold, replacing the hot-film mass airflow sensor. This improved airflow into the cylinders. New aluminum camshaft positioners saved precious grams and helped both engines register 7,800 rpm redlines. A controlled resonance flap, adopted from some of Porsches GT engines to the S engine, extended and evened-out the torque band. And a clever innovation from Porsche's engine sound engineers—yes, there are such people—introduced a series of acoustic channels that directed engine sound to the rear parcel shelf, which served as a kind of engine "woofer," and all at the push of a button. It addressed customer laments that the 996 and even 997 had become too quiet! This was not deafening, but it did return the smile (and occasional laughter) to the face of someone driving a 991 vigorously. As project manager Bernd Kahnau explained during the 991 launch, "Our sound engineers? They are our Mozarts!"

Porsche claimed a 16 percent improvement in fuel economy, achieved in part by an automatic start/stop system. What's more, the PDK introduced a coasting function that disengaged the gearbox from the engine when coasting to a stop or down a long hill. Each of these generated some grumbling from the older generation purists, but this was nothing compared to the outburst over the new steering system: think fighter jet fly-by-wire. Porsche introduced an electromechanical power steering system. It drew electrical energy only during active steering and saved a minimum of 0.1 L of fuel per 100 km. The debate over loss of immediate control, turn-in crispness, and rapid lane change accuracy was much louder than start/stop or coasting, and it rivaled reaction to PDK.

Those reactions quieted considerably when Porsche introduced its new manual gearbox with seven forward gears. A lower third-gear ratio than the PDK and a higher (longer) seventh gear ratio guaranteed plenty of engagement for residents of the five-points-of-contact camp. Porsche took the liberty of installing a sequential shift lock that made it impossible to select the wrong gear—say downshifting from fifth into second or upshifting from third to sixth. Still the fact was the PDK shifted gears one to two-tenths of a second quicker than even professional racers. And so the two camps simply agreed to disagree: Seven gears with three pedals for nonurban rush-hour drivers and back roads racers and seven gears with two pedals for urban commuters and track-days obsessives.

All this electronic wizardly required a bigger package, a.k.a. a bigger car. So the 991 car body length grew 64 mm (2.5 in) from 4,427 mm (174 in) to 4,491mm (177 in). Cleverly Porsche engineers put most of this length within the wheelbase, which they stretched from 2,350 mm (93.6 in) to 2,450 mm (96.5 in). This kept overhangs in check. The new wheelbase demanded new front and rear suspension, and so, as they had done with the 997 and its step up to 18-inch wheels, the 991 adopted 20-inch wheels and tires as standard and increased front rack on the base Carrera by 38.1 mm (1.5 in) and by 50 mm (2 in) on the S. This gave chassis engineers the opportunity to introduce a handling option most often ordered on the Panamera sedan and the Cayenne SUV—the Porsche Dynamic Chassis Control (PDCC). This system used its electrohydraulic actuators on each damper to sense body lean and increase pressure to keep the car body flat while cornering. PDCC also acted on the

anti-roll stabilizers, evening out road undulations and imperfections during straight line driving.

Journalists adjusted to electronic steering. “The steering feels too light to me at low speed. Firms up nicely at speed,” Wes Raynal wrote in *AutoWeek*. “The car still felt plenty light on its feet and like it was ready to spring out of a crouch at any minute.” *Image courtesy of Porsche Press Database*

Douglas Kott reminded his *Road & Track* readers that "the 911 came into the world as an anti-establishment punk of a sports car whose torsion bar suspension, six horizontally opposed cylinders, rear engine location, and tapered tail were far from the mainstream paradigm." *Photo by Randy Leffingwell*

Another electronic handling option, Porsche Torque Vectoring (PTV), had appeared without much notice on the 2010 Typ 997.2 Turbo face-lift. It reached the regular production options list for the 911. In conjunction with PSM and PASM, the latest version of PTV Plus for PDK-equipped cars enhanced stability and handling by braking the inboard rear wheel. This was an electronically controlled fully-variable differential lock that essentially pivoted the car around its inner rear wheel during cornering, greatly reducing understeer.

When Porsche introduced its supercar Carrera GT in 2004, one of its most eye-catching design elements was its interior cockpit, a feeling that designers

Grant Larson, Anthony Hatter, and their boss Harm Lagaaij had created by incorporating a prominent center console that swept up dramatically—and seemingly unattached—from the floor. It held a perfectly placed gearshift lever, most of the interior functions controls, and a touch screen for the early PCM. After detouring through Panamera and Cayenne bodies, the cockpit entered the 991 and was warmly welcomed.

To some it seemed the new 991 offered more—and better—of everything yet seemed to have eliminated nothing. The new platform combined high strength steel with aluminum alloy, giving the car greater stiffness and stability. The 991 base Carrera weighed 1,435 kg (3,164 lb), while the Carrera S came in at 1,495 kg (3,296 lb). Porsche unveiled the 991 Carrera and Carrera S coupes in August 2011 in Santa Barbara, California, and deliveries started December 5 as a 2012 model year car.

Invention by committee—Achleitner, Dürheimer, Wiedeking, and Piëch—and considering this was the seventh generation 911, turned out well. Kott concluded, "When it comes to improving on the seemingly unimprovable, the engineers at Zuffenhausen have a 7-0 record." *Image courtesy of Porsche Press Database*

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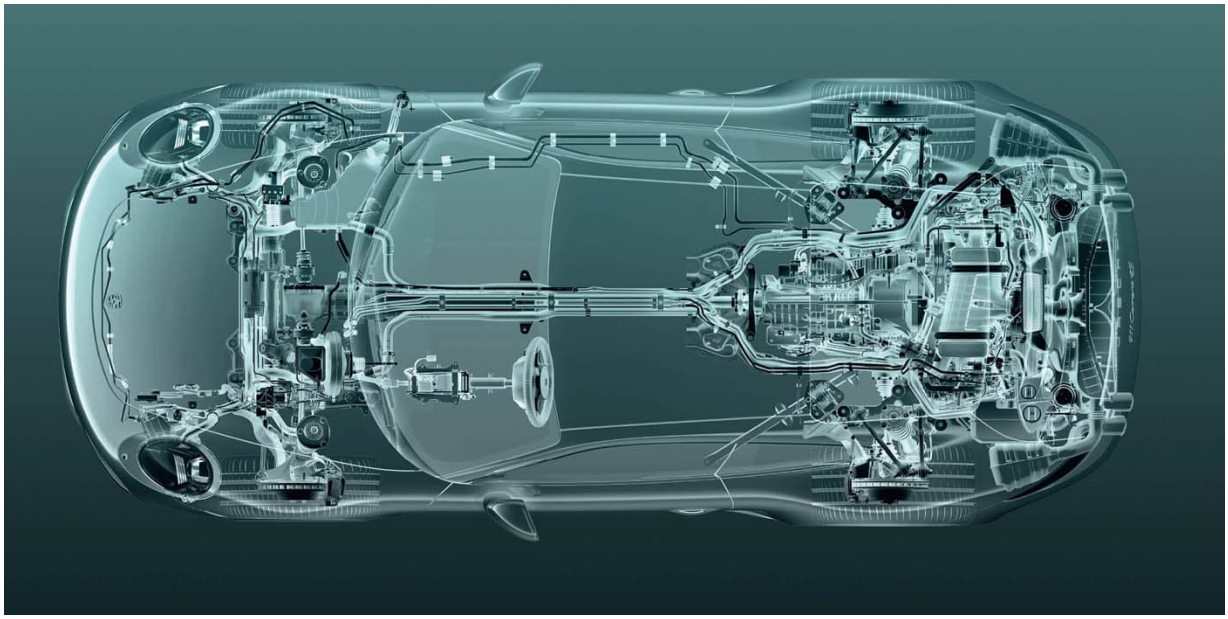
2013 TYP 991 CARRERA 4 AND CARRERA 4S COUPE AND CABRIOLET

After debuting the 991 Carrera and Carrera S coupes in August 2011, Porsche unveiled the Cabriolet versions in November and deliveries followed in the spring. The Cabrio introduced a new roofline that much more closely honored the shape of the coupe. Much of the top structure was magnesium to manage weight.



Remarkably, with all its improvements, the 991 C4 and C4S weighed some 65 kg (143 lb) less than the previous 997.2 generation cars. The secrets of weight management are in there if one knows where to look. *Image courtesy of Porsche Press Database*

Late in 2012 Porsche rolled out the all-wheel drive coupes and cabriolets. Style Porsche and engineering added visual emphasis to the various C4s, as it had just done with the 997.2 predecessors. To further emphasize this, Style Porsche revised the rear taillight panel, creating a kind of illuminated bridge between left and right sides when the lights were on. A seemingly unbroken band of light began on one rear fender and led the viewer's eye all the way around to the opposite rear fender.

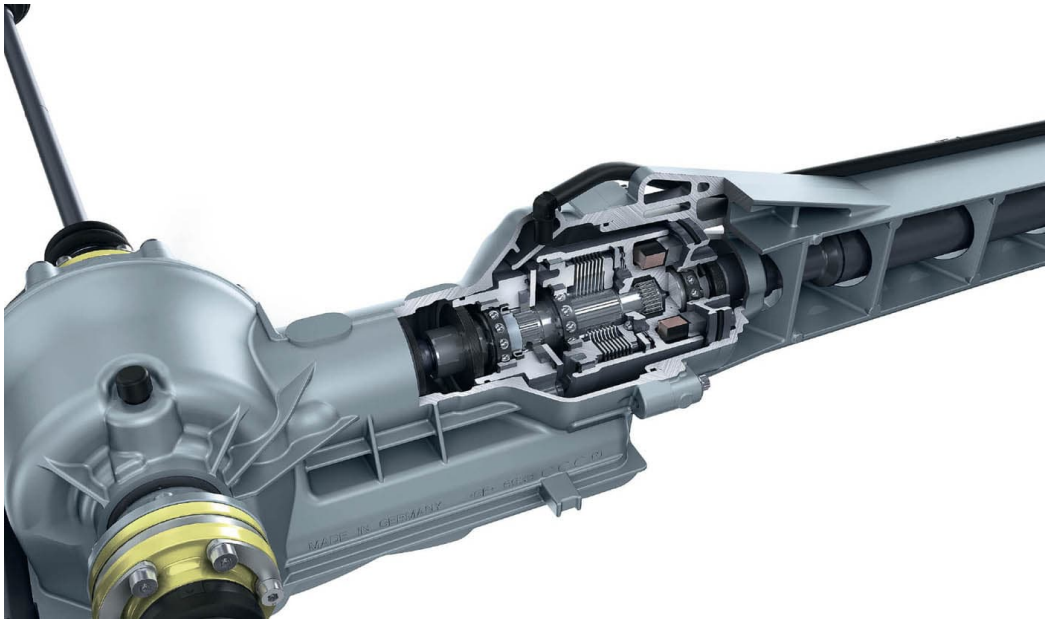
To many 991 admirers, one of its most significant improvements was the completely redesigned convertible top. This assignment fell to Grant Larson who admitted he had been very dissatisfied with virtually every generation of Cabriolet all the way back to the first 911 SC of 1983. The 911 coupe roofline followed one very complicated sweeping arc from the top of the windshield to the rear bumper. With the cabriolets—because of technology available at the time—that arc was broken once, twice, even three times on some generations. A safe, secure, watertight fit at the windshield often led to the first break in the curve. In order to provide coupe-like headroom for rear seat occupants in a closed cabriolet, the rearmost cross bow interrupted the gentle arc for the second time. And the rear window, whether zipped in plastic or rigid glass, had to deliver the rearmost point of the convertible top to the rear deck storage. It had to lead the top into the cavity. This, not the rear bumper, was the target. In the earliest days neither Ferry Porsche nor his son Butzi as head of Style Porsche necessarily believed that rooflines of the Targa and early Cabriolets had to mimic the coupe. But over the years it had become a challenge to the succession of designers and engineers assigned to do each new generation's collapsible tops. With the 991, with the lengthened wheelbase, the time had come as had the space and the technology.

Porsche had introduced its "Z-fold" convertible top on its Typ 986 Boxster in model year 1997. This innovation brought the front third of the top straight back before using it to compress the middle third. Levering the middle panel in this way forced the rear window down into the storage well. Then the frontmost panel came down on the folded pile and cleverly relied on this outside-facing piece as the compartment cover, as the removable tonneau covers had done up to this time. The Boxster introduced the flip-up metal panel that opened from the rear. On closing, it captured and protected the otherwise loose and exposed top material.

Each subsequent generation improved on concept and execution, to the point that drivers were able to lower or raise their convertible top while moving at speeds up to about 30 kph (18.6 mph). But all of this convenience flew in the face—pun intended—of the convertible top's greatest weakness. The effect of air traveling at high speed over the cloth top was to lift the top—sometimes referred to as ballooning—the same kind of lift that dictates the 1973 ducktail as a means of control and the same kind of lift aircraft rely on. But at certain speeds, a kind of lift-release effect caused the top to flap in the wind. The ballooning stretched the cloth, the flapping stressed it, and together, these shortened its life. For a certain period of time, Porsche inserted spring-tensioned cables in the cloth, but even this was a compromise.

Designers and top engineers understood that the cloth had to sit on the cross bows. But what if it were bonded to them? What if the cross bows were enlarged to comprise a major portion of the top? What if the only "free" cloth was in the two areas that folded as the *Z* opened and closed? Yes, this added weight to the car, even in aluminum. However magnesium was lighter and stronger still, and the top team designed what is essentially a three-panel, cloth-covered collapsible roof. Larger structures in magnesium allowed the team to faithfully replicate the coupe roofline. With the top raised, the insulated roof allowed pleasant conversation. To finish off the top-down wind management, the team added an electrically deployed wind deflector, the mesh screen behind the front seats that arose or retracted at the push of a button. Porsche advised is customers they could raise or lower the top while underway at speeds up to 50 kph (31 mph).

Engineers increased rear track 42 mm (1.7 in) for the 2013 Carrera 4, 4S coupe, and Cabriolet, fitting rear wheels 10 mm (0.4 in) wider than used on 997s. The rear fender bodywork swelled 22 mm (0.9 in) on each side of the C4 models and 36 mm (1.4 in) on each of the 4S rear fenders. *Image courtesy of Porsche Press Database*



Product planners included PTV on C4S models and offered it optionally on C4. Customers ordering PASM were upgraded to PTV Plus, the system with the electronically controlled variable differential lock. The PTM multidisc clutch was the secret ingredient. *Image courtesy of Porsche Press Database*

"Porsche's dynamic engine mounts (included in the $1,850 Sport Chrono package), and Porsche Dynamic Chassis Control ($3,160) help the car ride and handle like the world's most agile Hovercraft," *Car and Driver*'s Jeff Sabatini points out in his review of the 4S Cabriolet. *Image courtesy of Porsche Press Database*

Having referred to the 4S Cabriolet as “a tanning booth that can hit 60 in 4.3 seconds,” Sabatini exposed another of the car’s successes: “You can comfortably carry on a phone conversation at 70 mph [113 kph] with the top down. Seriously, the automated wind deflector is that good.” *Image courtesy of Porsche Press Database*

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2014 TYP 991 TURBO S

Incredibly it was 40 years since the series production Porsche Turbo had emerged from great uncertainly. The middle-eastern Organization of Petroleum Exporting Countries (OPEC), in protesting Western hemisphere support of Israel, initiated a steady—and painful—reduction in petroleum supply on the eve of Porsche's Typ 930 Turbo introduction.

The mighty Turbo S engine makes good use of a pair of variable-vane geometry turbochargers. When the boost reaches peak at 1.2 bar (17.4 psi [120 kPa]), the engine delivers 560 hp (412 kW). Overboost shoots an extra 0.15 bar (2.2 psi [15 kPa]) into the cylinders. *Image courtesy of Porsche Press Database*

Fortunately for history, Ernst Fuhrmann concluded the development process was far too advanced to react to such an uncertain threat. No one could guess how long or severe the shortages might become and so Weissach engineers persevered. That resulted in Porsche celebrated its 40th birthday for model year 2014 with an entire new series—the Typ 991 Turbos.

Porsche continued offering two levels of boosted excitement. The "base" Turbo provided buyers 520 hp (382 kW) at 6000 rpm out of its 3800cc twin VTG turbochargers and twin-intercoolers in the opposed six-cylinder. It generated 487 lb-ft (660 N·m) of torque over a vast range from 1950 rpm up to 5000 rpm. For those customers for whom 520 hp (382 kW) was not enough—and Weissach and Porsche Exclusive Manufaktur engineers and planners knew they existed—they retuned the Turbo S to produce 560 hp (412 kW) at 6500 rpm. Torque output from the S ventured into the region of railroad locomotives at 516 lb-ft (700 N·m) at 2100 rpm, seemingly capable of pulling the owner's garage off its foundation.

Seven-speed PDK transmissions handled the task of getting power to the ground, taking over duties from the competent but not beefy-enough seven-speed manual gearbox. Tires and wheels varied slightly between the base model and the Turbo S, with 8 1/2J x 20 wheels with 245/35ZR20 tires on the front and 11J x 20 wheels with 305/30ZR20 for the base Turbo. While engineers did not change the tires on the S Turbos, they went for 9J x 20 wheels in front and 111/2J x 20 at the rear of the more powerful model. It's possible the difference in weight between the two models—1,605 kg (3,538 lb) for the base and 1,627 kg (3,587 lb) for the S—may originate with the wheels. But it was the horsepower and torque that affected top speeds: 325 kph (202 mph) for the base Turbo coupe and 319 kph (198 mph) for the S model. Engineers had revised the all-wheel drive system, incorporating an electronically controlled multiplate coupling to distribute the torque. But with such output, engineers innovated a water-cooling system for this torque distributor, and this permitted a higher percentage of total torque to the front than previously possible.

The best argument for purchasing the 991 Turbo S was that Sport Chrono package, a $4,090 option that comes standard on the base Turbo S. This offered overboost for brief periods, shoving the torque up from 516 lb-ft to 553 lb-ft (700 N·m to 750 N·m) between 2200 to 4000 rpm. It provided the perfect stress relief against many situations. *Image courtesy of Porsche Press Database*

Engineers and Style Porsche further enlarged the rear fenders, taking them beyond Carrera 4 body dimensions for the first time, gaining 14 mm (0.6 in) per side for a total 28 mm (1.1 in). This resulted from the introduction of Porsche's active rear-wheel steering—the rear wheels needed room to maneuver. The wheels reacted, depending on vehicle speed. For example, at speeds up to 50 kph (31 mph), when drivers steered into a turn, the rear tires aimed in the opposite direction, effectively tightening the turn circle considerably. Effectively it reduced the Turbo turn circle diameter from 11.2 m (36.7 5ft) to 10.7 m, (35.1 ft).

Between 50 kph and 70 kph (31 mph to 43 mph), there is no effect. However at speeds greater than 70 kph (43 mph), the rear tires steer parallel

to the fronts. This provides a noticeable stability, especially in highway-speed lane changes.

Another group of stylists and engineers developed active aerodynamics. The rear wing progressed through three positions, again dependent on road speed. The more clever innovation was their three-stage front spoiler. In its most retracted position, it missed curbs and was scarcely affected by steep driveway approaches. In its most extended, coupled with the effects of the PASM suspension in Sport Plus mode, the spoiler and the rear wing—with full 25 mm (1.0 in) extension—generated as much as 132 kg (291 lb) of downforce.

Turbo S stress relief also came in the way of vented and drilled Brembo carbon ceramic brakes, a $9,210 option on the base Turbo. With 16.1-inch (40.9 cm) diameter front and 15.4-inch (39.1 cm) diameter rears, a heavy foot could haul this 1,430 kg (3,153 lb) coupe from 97 kph (60 mph) to a standstill in 30.5 meters (100 feet). *Image courtesy of Porsche Press Database*

Even with its new Panamera sedan, these technologies, this level of luxury, guaranteed that Porsches Turbos retained their distinction as 911 flagships. With its all-wheel drive and massive torque, acceleration was equally impressive: 3.2 seconds from 0 to 100 kph (0 to 62 mph) for the Turbo and 3.1 seconds for the Turbo S. These cars certainly delivered performance that was not for the faint of heart—and nor were Porsche's

prices at the time. In the United States the Turbo S went for $161,500 at introduction in late 2013, and the Cabriolet added roughly $12,000 to the price. A distracting detour through the Porsche Exclusive Manufaktur shop in the dealership sometimes added another $100,000 to the price of the Turbo S in pursuit of personal preferences.

"It's swathed in enough leather to make it a legitimate grand tourer yet comes packing enough gumption that it remains one of the best performing supercars that you can buy," William Walker noted in his review of the car in *Motor Trend. Image courtesy of Porsche Press Database*

"It brutal yet great to drive," *Motor Trend*'s Walker continued. "as well as luxurious and sexy in that Germanic way. You get all the goodness now found in the 911 Carrera S, now complete with one of the mightiest engines found anywhere on earth." *Image courtesy of Porsche Press Database*

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2015 TYP 991 TARGA 4 AND 4S

Porsche's decision to assemble its Targa models exclusively on its all-wheel drive Carrera 4 and 4S platform beginning with the 2007 model year was a turning point. It represented a multilayered effort to pull the Targa out and away from the standard coupe/cabriolet variations, to grant it differences and distinctions long inherent in the Turbo and recently introduced to the GT3 and GT3 RS, that is, making them their own brand.

A famous American automaker once described his corporation's goal was to make a car for every purse and purpose. It is clear Porsche has embraced the idea of an ever-expanding 911 sports car line. The company listens to its customers. *Image courtesy of Porsche Press Database*

What the successful business executive or the sports hero or the powerful entertainer and producer sought—and found—in the Turbo was not available elsewhere in Porsche and barely offered by any other carmaker. Similarly the decades-long driving enthusiast and the track days devotees delivered unmatched driving capabilities and excitement. Porsche recognized that it often was selling these automobiles into multivehicle households. Barring significant life alterations or financial setbacks, once customers became a Turbo or a GT3 owner, they always were an owner, and often a repeat customer.

The shift to all-wheel drive with the 997 Targa formalized Porsche's commitment to touring, road travel, and comfort among buyers with an understanding of vehicle engineering, technology, and design as well as a strong desire to "get there and come back." Significantly company marketing research indicated that most Targa owners used their cars as daily drivers and was their sole automobile. So Porsche gave them a stunning surprise when it unveiled the Typ 991 Targa at the North American International Auto Show (NAIAS) in Detroit, Michigan, in January 2014. Gone were the large sliding-glass roof panels. Instead auto show visitors and then tens of thousands of YouTube viewers marveled at the New Targa. Instead of a panel that inconspicuously settled inside the rear window, this new version demanded attention.

There's "a 911 with a robot in the back that eats part of the roof," Travis Okulski wrote in his Targa review for *Jalopnik*. Porsche has a 911 with a roof, another with a fully removable top, but nothing like this. "Until now." *Image courtesy of Porsche Press Database*

Unlike the Targas of old where drivers lifted out a panel, "the new Targa uses motors to create a mechanical ballet wherein the roof is slowly devoured by the rear of the car," Okulski continued. "It's mesmerizing to watch." *Image courtesy of Porsche Press Database*

Michael Mauer's Style Porsche had tackled, refined, and redefined the cabriolet top form, with designer Grant Larson managing the effort. Mauer and Larson had numerous discussions about the next Targa and what they might do that was new. The answer was to do something that was very old instead, to return to the fully open roof supported by a transverse roll bar—the so-called B-pillar hoop—set out in aluminum. But did they really expect owners in the second decade of the twenty-first century to stop, get out of the car, remove a panel, stow it, and then resume their journey? No! That's what kinematics, electronics, electric motors, and push buttons are for.

Watching the car stow its own top is one of the most entertaining free shows on any street. Porsche assembled the Targas on reinforced Carrera 4 and 4S platforms, and the cars were identical up to the window sills. As with the fully closed coupes, the Targa 4 buyer got the 350 hp (257 kW) standard 3436cc opposed six-cylinder engine and 4S owners had the 400 hp (294 kW) 3800cc engine. Porsche offered both transmissions: the seven-speed manual or the seven-speed PDK. With the Targa's emphasis on touring and traveling, engineers selected 19-inch wheels front and rear, although 20-inch were optional. The materials and equipment to move the top boosted the weight of the Targa 4 manual gearbox to 1,540 kg (3,395 lb), up from 1,380 kg (3,042 lb) for the Carrera 4 with the same transmission.

The motors, the flying panels in this "mechanical ballet," added about 45 kg (99 lb) to the weight of the car. But obsessive weight management was the province of GT3s and other products that followed this introduction. *Image courtesy of Porsche Press Database*

“This is a car that is at its best on a back road on an autumn day with the top down (or eaten), and being driven at a spirited pace,” Okulski went on. “But not drifting. Not finding the limits of adhesion. Not setting record times.” *Image courtesy of Porsche Press Database*

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2016 TYP 991 GTS

To some observers, it seemed Porsche slipped a best-kept secret into the tail-end of the Typ 997 production lineup with its GTS model.

The second-generation 911 GTS, assembled on the much updated and improved Typ 991 platform, took everything buyers and journalists loved about the original and made it better. Porsche provided drivers with 30 hp (22 kW) more than Carrera S versions. *Image courtesy of Porsche Press Database*

The **2010 Sport Classic** grabbed all the headlines, and with its tightly limited production run, it soon elevated two of the supposedly seven deadly sins into facts of life. Specifically *pride* and *envy* appeared in equal doses whenever a Sports Classic drove past or even came up in conversation.

Then Porsche introduced its 997 Speedster and in certain circles the appraisal was "too much." It was a car that few had asked for and set at a price only collectors could afford. And then the GTS appeared, slotted nicely between the ever popular Carrera and Carrera S and the equally popular GT3 and GT3 RS. What's more, Porsche launched the new line with both coupe and cabriolet models, each mounted on the Carrera 4 and 4S platform with its handsome widened rear flanks.

Under the rear decklid it got an important upgrade: the S Powerkit option that boosted output to 402 hp (296 kW), coupled to either the seven-speed manual gearbox or optional PDK transmission. More than a few enthusiast magazines noted that if a buyer scoped the options pages with a critical eye and checked off the sport suspension, limited slip differential, and Fuchs-style alloy wheels, your dealer delivered to you a Sport Classic with a flat roof, missing a ducktail. And that burzel *was* available, if perhaps not through the dealer. They also pointed out even more subtle differences as writer Richard Meaden explained in *Evo* magazine, "You can sense its broad-shouldered stance and self-assured hold of the road, but it's less full-on than the GT3, with a more rounded ride and better isolation from road and tyre noise."

Fast-forwarding to 2016 and the Typ 991 models, Porsche has broadened the GTS lineup to include not only coupes and cabriolets but now also the Targa 4 GTS. The line still fits comfortably between Carrera S/4S models and the GT3, though now it adopts more of the GT3 features: center lock 20-inch wheels; Sport Chrono Package (including the dynamic engine mounts—also standard only on the Turbo S); dual-mode exhaust (offering a polite in-town mode and, as one journalist explained it, a true-annoy-your-neighbor-snarl); unique outside mirrors and front spoiler; Sports Plus seats; and vast swaths of simulated suede and Alcantara. That *S* in the name *GTS* certainly does mean *sport*.

As the GTS evolves into its own product line, certain character traits are becoming clear. For one: wide hips sell. So coupes and cabriolets on rear-wheel drive and all-wheel drive platforms now wear wider rear bodywork, unblemished and uninterrupted by any intake scoops or outflow slashes. *Image courtesy of Porsche Press Database*

The engine delivers 430 hp (316 kW) at 7,500 rpm and 320 lb-ft (434 N·m) of torque at 5,750 rpm. This occurs as a result of manifold tuning to increase airflow by 15 percent and intake port polishing, all coupled to a slightly more aggressive camshaft lift profile. This is sufficient to provide 0 to 100 kph (0 to 62 mph) times of 4.1 seconds with the manual gearbox and a top speed of 311 kph (193 mph). These were performance figures for the 1,425 kg (3,142 lb) two-wheel drive GTS coupe. *Top Gear* reviewer Stephen Dobie determined it to be "a monstrously fast car . . . and certainly as fast as you really want (or need) for your road car to be." He added, it's "a car that's both extremely competent and lots of fun. The two aren't always compatible."

Car and Driver reviewer John Pearley Huffman summed it up concisely, referring to the GTS as "The 911 to have if you'll only ever have one." Then he went further: "The GTS is neither a rabid-track-attack dog like the GT3 nor a ground-bound Millennium Falcon like the GT2. It's more muscular than both the base 911 and the fortified 911 Carrera S, but its robust torque production is even more forgiving in everyday use. The ride is comfortable, the tires are wide, the brakes phenomenal, and the cars turns into corners with startling immediacy." That is its standard-equipment Porsche Torque Vectoring at work. But Huffman hadn't finished: "This is the 911 you buy the moment you can afford [it] and you drive it every day until you die and then you're buried in it."

The price step from Carrera S to GTS masks the number of options standard on the GTS: PASM, Sport Chrono, dynamic headlights, a leather and suede interior, and black center-lock 20-inch wheels. A buyer needs Porsche's Car Configurator, a calculator, and a beverage of choice to see how the prices compared. *Image courtesy of Porsche Press Database*

In a highly visible nod to enthusiasts, Porsche offered the GTS with either its seven-speed PDK gearbox or their seven-speed manual. Published acceleration figures supported theories that the shifters inside the PDK were inhumanly fast, but humans who chose to manual deliberately chose to experience each shift themselves. *Image courtesy of Porsche Press Database*

Prices at introduction ranged from $115,195 for the rear-wheel drive GTS coupe to $133,795 for the all-wheel drive Cabriolet. No matter how fully Porsche equipped its cars, there always were options, and Porsche Exclusive Manufaktur was always happy to personalize your paint color. *Image courtesy of Porsche Press Database*

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2017 TYP 991 R

In 1967 Ferdinand Piëch made it abundantly clear that he saw serial production run of his lean, purposeful Typ 911 R as a distraction from his purposes, which was research, most predominantly vehicle weight.

Car magazine's Ben Berry spent enough time in Porsche's 911 GT3 RS and R to make sense of it. He wrote, "The R's lower limits and insistence that the driver does more of the work is just an alternative way of getting a hardcore 911 fix." *Image courtesy of Porsche Press Database*

Although press director Huschke von Hanstein and most of the managers in sales and marketing felt the idea had merit, factors such as market demand for a kind of feisty 911 S needed another few years to mature. When the 1973 RS 2.7 Carrera appeared and sold and sold . . . and sold . . . some in the company scratched their heads in disbelieving wonder. Von Hanstein and others muttered "I told you so" under their breath.

Porsche learned from this experience and several years later the *Sonderwunsch*—Special Wishes—department arose from the work bays on the ground floor of Zuffenhausen Plant 1. With Special Wishes customers learned that just about anything was possible. Another several years later, the wisdom of having such a department met the need for a name anyone anywhere in the world could pronounce. Porsche Exclusive Manufaktur replaced Sonderwunsch. After a number of years continuing to help customers match paint to their partner's eye color, the department was creating its own cars. The evolution was logical—Exclusive perceived market holes that Porsche had the technology, staff, and motivation to fill. Grafting the back ends of Turbo coupes and Cabriolet onto uprated all-wheel drive 4S models emphasized muscularity and capability.

Each time the company reached another anniversary, the occasions came to demand a commemorative edition. Perhaps had the Typ 959 appeared as a *Sonderwunsch* or a Porsche Exclusive Manufaktur product, not just a super high-tech new star, it might have generated fewer jealousies, made fewer enemies, survived the economic downturn, and preserved a few top-management jobs. At the other end of the spectrum Speedsters, reflecting the appeal if not the spirit or drawbacks of crude open cars, arrived regularly as production series wound down. But when the Sport Classic appeared (see **chapter 47**), recalibrating both "Sport" and "Classic" in a single automobile, this was a big step. Its startling roofline, its bristling performance, and its exclusivity ensured that Porsche Exclusive Manufaktur and the Porsche Supervisory Board planned to revisit this concept in the future.

An observer might be excused for wondering about the real motives behind the 991 R. Afterall, the Motorsport Centre Flacht had polished its GT3 and GT3 RS into fine jewels. These rewarded skilled drivers with high-level excitement. Porsche assembled enough examples to be certain anyone who really wanted one got it. The Sport Classic was different: a

radar-blip, a rare earth element, a superb-handling piece of kit conceived for immediate consignment to secure storage. With the 911 GTS (see **here**), engineers calibrated handling and performance of a GT3 RS and a fully-option Carrera S, split the difference, and defined the GTS from that point. In the meantime Motorsports Centre Flacht had concluded it was best to limit GT3 customers exclusively to PDK gearboxes because it shifted so much quicker than they could. The PDK decision ignored the fact that for many GT3 customers, part of the joy of ownership was the perpetual pursuit of the perfect shift. To prove PDK superiority, Motorsports engineers extensively tested a manual transmission GT3 "mule." Decision made, the mule, nicknamed *Schalter*, or "Shifter," disappeared into storage—stored, but not destroyed.

One day months later the Flacht parking area was packed with GT3 Cup cars awaiting shipment. To protect their large rear wings during travel, each was stowed inside the race car, revealing a sea of purposeful wingless GT cars. Several of the team looked out and said, "What if . . . ?"

When Porsche introduced the 911 R in March 2016, the car with red stripes or green, based on the C4 platform, weighed just 1,370 kg (3,020 lb). This was 10 kg (22 lb) less than the base rear-wheel drive 991 C2 and 60 kg (132 lb) less than the PDK-equipped GT3 at 1,430 kg (3,153 lb). *Image courtesy of Porsche Press Database*

At the end of 2012, GT Cars manager Andreas Preuninger asked Porsche aerodynamicist Mathias Roll to calculate the driving effects of a wingless GT3 and to consider ideas to keep the car in balance. And engineers reexamined Ferdinand Piëch's 911 R playbook: How can we reduce weight? How can we make it as light as possible?

With Preuninger's blessing, *Schalter* savior Henry Freude got the car into the Porsche Classic workshop in Freiberg, where Freude had *stored* a magnesium roof and two big carbon fiber panels, the front and rear decklids. Classic swapped out the roof panels and even sketched out the location of the series-production 911 retractable rear spoiler. They finished the car in Motorsports white and what with everything the car had experienced to this point, it almost named itself.

The development team really wanted *this* car in production! Scouring old photos, they came across black-and-white photos taken during a late 1967 world record run at Monza, showing the car with two bold longitudinal stripes. No color images existed so far as they knew. A number of sources had assumed, incorrectly, that these were green, the corporate colors of primary sponsor British Petroleum Switzerland. In June 2014 a series of phone calls opened the opportunity for this 991 R, the *Schalter*, to go before the Porsche Supervisory Board on 30 minutes' notice. Unfortunately that was the day they examined Cayenne, Macan, and hybrid models, which did not set a proper stage for the R. Met unenthusiastically by its jurors, Freude returned to plan A: stored, but not destroyed.

Attitudes changed after the Geneva Motor Show in March 2015 at which the PDK-equipped GT3 RS debuted. The overall warm reception was not universal. "No manual transmission in a GT car? Are you kidding?"

Preuninger was serious, but the broader reaction released the *Schalter* from storage and earned it a green light for production development starting January 2015. As this process advanced, Preuninger questioned production realities. The Zuffenhausen Werks were booked nearly full, and another 1,000 cars was not possible. "Fine," Preuninger said, "Let's do 991." By then Peter Falk's color photos of the Monza run had been found. The stripes were red on a white car. The combination was the Swiss racing colors in honor of the four drivers.

When Porsche introduced the 911 R in March 2016, the car with red stripes or green and based on the C4 platform weighed just 1,370 kg (3,020

lb). This was 10 kg (22 lb) less than the base rear-wheel drive 991 C2 and 60 kg (132 lb) less than the PDK-equipped GT3 at 1,430 kg (3,153 lb). The R used Porsche's 3,996cc water-cooled opposed six-cylinder, rated at 500 hp (368 kW) at 8250 rpm, and Porsche quoted its top speed at 323 kph (201 mph). The car sold—and sold out in a day—at €189,544 ($206,603), including the applicable 19 percent VAT.

The R used Porsche's 3996cc water-cooled opposed six-cylinder, rated at 500 hp (368 kW) at 8250 rpm, and Porsche quoted its top speed at 323 kph (201 mph). The car sold—and sold out in a day—at €189,544 ($206,603), including the applicable 19 percent VAT. *Image courtesy of Porsche Press Database*

The 991 R's purity pays an homage to its 1967 predecessor. The two seats are covered in classic Pepita cloth, the steering wheel in leather, and air-conditioning is optional. The six-speed manual gearbox has one more than 1967, but one less than its series production contemporaries. *Image courtesy of Porsche Press Database*

"Five hundred horsepower is enough for the road," Andreas Preuninger said at the R's introduction in Geneva. "It really is," *Car* magazines Ben Berry concurs, adding, "and it means the R can deploy all of its power without relying heavily on stability systems." *Image courtesy of Porsche Press Database*

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2018 TYP 991 TURBO S EXCLUSIVE

Steady input from Porsche's most loyal customers helped Porsche Exclusive Manufaktur broaden its horizons and extend its authority. With the 200-unit Sport Classic, it had become a mini automaker under the corporation's giant umbrella.

Porsche's 3.8-liter (232 cu in) twin turbo produced 607 hp (446 kW) at 6750 rpm and generated 553 lb-ft (750 N·m) of torque starting at 2250 rpm and continuing all day. This delivered the Exclusive Turbo S to 100 kph from standstill (0 to 62 mph) in 2.8 seconds and on to its top speed of 330 kph (205 mph). *Image courtesy of Porsche Press Database*

The Turbo S was a natural playground not only for department manager Boris Apenbrink but especially for his clientele. They wanted something that was faster than their friends had and it *had to be different*. Porsche Exclusive Manufaktur gave it to them with their newest Turbo S.

Unlike the earliest days of *Sonderwunsch* when stylists and modelers had to work behind Anatole Lapine's back to aid Rolf Sprenger, Porsche Exclusive Manufaktur, based on the wild success and reputation the division earned with the Sport Classic, found Style Porsche chief Michael Mauer much more amenable to personnel loans. For this next Turbo S this included exterior and interior designers. The cabin managed somehow to incorporate a new level of sportiness and performance with elegance and luxury. They managed to mix, match, and combine leather, carbon fiber, and metal in black, grey, and yellow that did not scream "Look at ME." There certainly *was* entertainment for the eye, but it followed Porsche's decades' long interior design philosophy of less is more. For example product planners integrated ultrafine strips of copper wire into the carbon fiber trim panels. What's more, the fine-gauge yellow stitching proved beneficial when entering or exiting the car at night. These subtle highlights delineated areas of function and interest. Porsche's 18-way seats guaranteed a comfortable, supportive fit, and Porsche covered them with two layers of perforated leather, better for ventilation and for grip.

The exterior on the other hand was not so modest. Just like the Sport Classic, rumor had it there was only one color choice and this one *did* scream "Look at ME!" It was a color found in nature, but only in spring in well-watered gardens. Porsche described it as Golden Yellow Metallic. Porsche carried over the interior black here and there around the exterior. The car rode on black 20-inch center lock alloy wheels highlighted on their outside edge in yellow gold. A pair of flat black longitudinal stripes commenced near the front edge of the front decklid and carried on over the top. There was no need to continue them because the engine breathing slats on the rear decklid already did that.

Beneath that decklid, Porsche Exclusive Manufaktur's friends in engine development produced a special power kit that further boosted the twin-turbocharged, twin-intercooled opposed six-cylinder from a mere 580 hp (426 kW) at 6,750 rpm to 607 hp (446 kW), into GT2 RS territory but with the added comfort and security of all-wheel drive. Porsche quoted a top

speed of 330 kph (205 mph) and claimed the car accelerated from 0 to 100 kph (0 to 62 mph) in 2.8 seconds. Active aerodynamics operated a three-way front lip spoiler and the rear spoiler/wing combination. Naturally PASM and Sport Chrono Package Plus were standard equipment, along with curve-flattening PDCC and rear-wheel steering, included in the general specification.

By the time a customer graduated to the Turbo S level of purchase, there were few options remaining. After all, if they included rear-wheel steering, Porsche's composite carbon brakes are pretty much a given. But this is Porsche Exclusive Manufaktur, after all, and Boris Apenbrink and the others do exist in a pretty rarified environment. So naturally there is a four-piece set of leather travel cases available, in black leather and woven carbon with trim and stitching to match the car. The set included two holdalls, that is, good-sized duffle bags, plus a folding suit/long dress bag and a day bag. The designers matched bags, dimensions, and capacities to the space available in the Turbo S. Another option required much less space: that was a chronograph from Porsche Design. Its colors replicated the car, and its dial face repeated the woven carbon pattern of the seats and of the exterior arm-air-induction scoop.

Despite rumors to the contrary, Porsche Exclusive Manufaktur did offer the Turbo S in other colors beyond the Golden Yellow Metallic, although, with production limited to 500 examples, it's not known the breakdown of colors they delivered. And what did this treasure cost? Porsche suggested $258,500 for the car. The watch and luggage were extra.

Months earlier Porsche introduced the "face-lifted" Typ 991.2. With this they launched the concept of "right-sizing" engine displacement to improve fuel economy and decrease exhaust emissions. For the 991.2, Porsche scaled the engines down to 2,981cc. But to improve performance, engineering added turbochargers. While the 911 Turbo remained Porsche's flagship, every 911 carried a pair of them with modest but effective intercoolers. With this clever engineering, output increased to 365 hp (268 kW) and torque production rose to 331 lb-ft (449 N·m) on the base Carrera and 420 hp (309 kW) and 368 lb-ft (499 N·m) on the S. Engineers set boost at 13.1 psi (90.3 kPa) for the base model and 16 psi (110.3 kPa) for the S, helping explain the difference in output from the same engine. What was the benefit? Each model improved fuel economy by 2 mpg in both highway and city driving conditions.

"From a brand standpoint, the Exclusive Series makes a worryingly large amount of sense." This was Conner Golden's verdict, writing about the car in *Car and Driver* magazine. Why sense? Because Porsche knows its customers. *Image courtesy of Porsche Press Database*

"Turbo buyers tend to focus more on how the world perceives them rather than them knocking fractions of a second of their lap time." *Car and Driver's* Conner Golden continued. *Image courtesy of Porsche Press Database*

In the earliest days fast cornering in a Porsche Turbo relied on exceptional skill and prayer. Turbos such as the Exclusive S rely on Porsche's well-proven all-wheel drive, rear-wheel drive steering, and a few electronic minders such as PTV and PSM. Skill is welcome, but prayer is no longer required. *Image courtesy of Porsche Press Database*

With Porsche's big news coming in the engine compartment, customers and enthusiasts might be forgiven if they missed another earth-shaking introduction: electromechanical power steering. Already available on higher-end 911s, such as the Turbo, GT3, and GT2, it had required critical advances in electronics technologies, but Porsche's effort to perfect it made, well, perfect sense. In most driving situations, the car is going straight and little-to-no steering wheel input is required. Replacing the usual hydraulic cylinder with tiny, powerful motors saved weight, and weight has great impact on fuel efficiency. Duplicating, or mimicking, Porsche's legendary road feel through an electronic system took extraordinary amounts of testing —in the tens of thousands of kilometers.

From the Turbo's confused beginning in 1976—homologation car vs. luxury coupe—"the Turbo badge has carried a weight the GT3 just isn't able to match."
Image courtesy of Porsche Press Database

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2019 TYP 935 CLUBSPORT

If you're a major motorsports participant such as Porsche, suppose every several years, you host an international reunion. You select a location with reliably good weather, a well-tested and thoroughly proven motorsports venue, abundant hotels, loads of fine restaurants, excellent shopping, and plenty of activities to engage those in attendance who are not car enthusiasts.

Its water-cooled opposed six-cylinder engine displaced 3,800cc from bore and stroke of 77.5 mm (3.1 in) and 102 mm (4.0 in). With VarioCAM Plus activating the four valves per cylinder and twin turbochargers boosting air feed, Porsche claimed the engine developed 700 hp (515 kW) at 7,000 rpm. It developed 553 lb-ft (750 N·m) of torque between 2,500 rpm and 4,500 rpm. *Image courtesy of Porsche Press Database*

With its long tail and a nose modified and extended as the original had been, the 935-19 measured 4,865 mm (192 in) in overall length and 2,034 mm (80 in) in width. It stood 1,359 mm high (54 in) and operated on a 2,457 mm (97 in) wheelbase. It weighed 1,380 kg (3,042 lb). *Image courtesy of Porsche Press Database*

You make certain to have plenty of up-to-the-moment product on hand, and you develop an infrastructure to allow potential clients an unaccompanied test-drive over a nearby mountain pass, along a stunning coast line drive, or out-and-back runs on nearby country roads with dozens of first- and second-gear turns.

You invite dozens of the living legacies of your past and present racing programs and encourage them to mingle with the faithful fans who have come to see them and to listen to and watch history come alive on the race course. And you make certain to plan events that go into the evening. Even though local noise restrictions prohibit nighttime speed events, you can host a barbecue for participants and show films—documentary and theatrical release.

Your event is so well-conceived that you not only entice the paying public to come but also your board members to come and witness the love your customers have for your products. And then for the pièce-de-résistance, with some of your highest visibility celebrity guests on stage to tell stories and when the moment is right, to grab a corner of a large shimmering cover and unveil the newest piece of your history.

And because you are Porsche your audience knows your history in detail. And because you have named these events Rennsport Reunion, which translates to "Race Sport" in German and not, say, Serial Production Reunion, when you reveal something redolent of Porsche's numerous past triumphs, the crowd simply goes wild.

Such was the case during the late September 2018 Rennsport Reunion when Porsche unveiled its Typ 935-19, a car so clearly playing on appearance, forms, and dimensions of a 1978 model nicknamed *Moby Dick*, that by the following morning there were two *Moby*'s, the original on display nearby and the homage. But unlike the original—of which Porsche fabricated only two and had enough spares for two more—this New *Moby Dick* was part of a small series run of 77 cars, and these were for sale!

Porsche has limited production to just 77 of the 935 Clubsports, priced at €701,948 (or about $828,300 at the time they set the figure). This is a near identical sibling to Porsche's GT2 RS Clubsport, at least under the Evo fiber outer skin. *Image courtesy of Porsche Press Database*

Based on Porsche's extremely potent GT2 RS, designers, engineers, and fabricators followed history and replaced most of the bodywork with carbon fiber composites. As with the original 935-78, the new 935-19 incorporated an extended tail to enhance aerodynamic downforce and air flow.

The aluminum-steel composite bodyshell incorporated carbon fiber–Kevlar parts to improve aerodynamics and stability. Front and rear suspensions relied on McPherson struts and forged suspension links. Both front and rear axles employed electromechanical power steering. Porsche set the price at €701,948. One might consider those final four digits as a reference to Porsche's birthyear as a carmaker. This was roughly $828,300 at the time. This price did not include value added taxes, but did include a single Recaro racing bucket seat with six-point harness inside a welded-in safety cage. A passenger seat was available from the options list, but air-conditioning was standard equipment. The only transmission offered was the

dual-mass flywheel version of the seven-speed PDK, equipped with a limited slip differential designed for racing conditions.

But what were these 77 cars for? Porsche named it the Clubsport, and its literature made it clear there was no racing series in effect—or planned—for these cars. A handout at the Laguna Seca raceway unveiling described it as a "single-seater near-standard non-homologated." This kind of mirrors the description of the GT2 RS Clubsport, which may have carried a couple of advantages over the 935. First it sold for $478,000. Second Porsche assembled 200 in order to homologate it for international competition. On the other side of the scales, literally, there is the weight matter. Even though both cars are GT2 RS derived, the road-legal GT2 RS weighs nearly 300 pounds (136 kg) more than the 935. Deliveries commenced in June 2019.

Porsche chose to unveil the 935 Clubsport during its Rennsport Reunion, on September 27, 2018, at Laguna Seca Raceway in Monterey, California. There Motorsports vice president Dr. Frank-Steffen Walliser described the car as "a birthday present from Porsche Motorsport to fans all over the world." *Image courtesy of Porsche Press Database*

Grant Larson, who seems to get all the really fun jobs in Style Porsche in the twenty-first century, was in charge of the body design and decoration. The basic livery is a pale grey, but there are "heritage" liveries available to feed any driver's fantasies: Martini and Rossi, Gulf Oil, Giampiero Moretti's MOMO, the black-and-gold of the John Player Special cars, and others.

And so what is it really? Frank-Steffen Walliser who was head of Porsche Motorsport and GT cars at the unveiling recalled in an interview months later, “This is a birthday present from Porsche Motorsports to fans all over the world. Because it wasn’t homologated, engineers and designers didn’t have to follow the usual rules and there was so much freedom in the development!”

This was entirely good enough for well-known collector Bob Ingram. He and Jeff Zwart took the car to the Pikes Peak International Hill Climb (PPIHC) for the 2020 run. There, Jeff, cognizant of his friendship with Bob and aware he hadn’t raced there for five years, started cautiously. Still he set the fastest overall time of the day on the final sector and finished the 20 km (12.42 mi), 156-turn climb in 9:43.92—a personal best on this his 17th run—for fifth overall. “It’s the most comfortable race car I’ve ever driven,” Zwart reported. “The combination of the turbo, the bodywork, and the motorsport chassis is wonderful!” Any problems? “Yeah, I forgot to turn off the air-conditioning at the start,” he said with a laugh. “I was probably just too comfortable at the line!”

With no racing category in any of the major sanctioning bodies worldwide, its uncertain where this car will reappear. But with deliveries that began in June 2019, it was likely at least some would gather at Porsche's next Reunion at Laguna the last weekend in September 2023. *Image courtesy of Porsche Press Database*

2020 / 2023

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2020 TYP 992 COUPE AND CABRIOLET

Even after 56 years of engineering and appearance improvements, Porsche's 2020 model year 911 remains a wonderful dichotomy. Though dimensions have increased, the profile remains so familiar it's instantly identifiable.

A significant increase in the car's dimensions in the twenty-first century is due to ever taller, larger wheels and tires. The 901 rode on 4.5J x 15 wheels and 165-15 radials. The 992 sits on 8.5J x 19 in front and 11.5J x 20 at the rear, wearing 235/40ZR19 tires up front and 295/35ZR20s on the rear. *Image courtesy of Porsche Press Database*

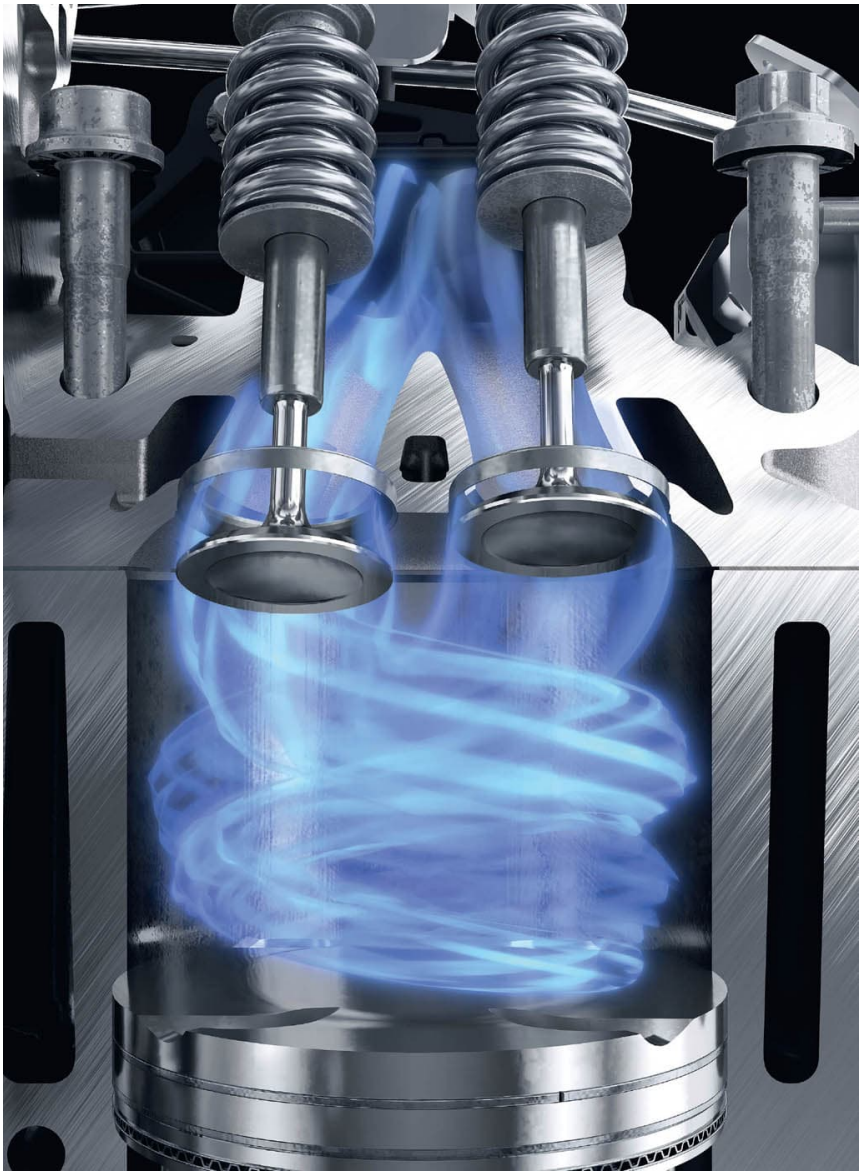
The 901 weighed 1,080 kg (2,381 lb). The base 992 Carrera with manual transmission is 1,339 kg (2,952 lb) and—by law—must contain passive passenger restraints (air bags), energy absorbing front and rear bumpers, and significant amounts of exhaust emissions controlling equipment including catalytic converters. *Image courtesy of Porsche Press Database*

From the faintest silhouette on the darkest night under the dimmest lighting, even people who aren't auto enthusiasts recognize this one. Try that with any recent Italian high-end sports car—or even the American one. Though engineering has tamed and subdued any of the 911 earlier driving and handling challenges, it's still the only one in which the engine sits behind the drive axles. Meaning, if you work your way through the myriad push-button handling programs to disable them all, you can still scare yourself with a 911. And unlike nearly all the others, you can still shift gears yourself. One might even consider that a kind of theft deterrent: how many bad guys can operate a foot clutch?

Throughout years of development, the car has just gotten better and better without sacrificing any of its character that makes it a joy to drive. As *Motor Trend* writer Chris Walton put it recently, "The result is you never really think about *driving* the car, [italics were Walton's], you think about how *best* to drive the car, best line, best place to brake, best to roll on the throttle, and so on. . . ."

A great deal of the precision implied in this thinking comes from Porsche's ever-greater reliance on electronics. The capabilities of the car—and naturally, by the driver—rely on the lightning-fast transfers of input data

to processors on board the car. It has, if anything, become a self-perpetuating cycle. The *what-ifs* of the 959 era are now standard-equipment on 911s of comparable performance that sell for less than half the 1988 price of the 959. Turbochargers, all-wheel drive, and Cabriolet and Targa tops the driver can raise and lower at speeds up to 80 kph (50 mph) don't begin to imagine the electronics and computer capacities necessary to operate the highly entertaining Launch Control without destroying engines, panic stop from 100 kph (62 mph) to a standstill in 27 meters (88 ft 7 in) in the GT2 RS, the active suspension capabilities of PASM, the variable rear-wheel braking of PTV, and the body-leancancelling skills of PDCC.



The 2,981cc engine for the 992 produces 379 hp (279 kW) at 6,500 rpm. The 901 accelerated from 0 to 100 kph (0 to 62 mph) in 9.1 seconds and reached a top speed of 210 kph (130 mph). The manual transmission 992 accelerated from 0 to 100 kph (0 to 62 mph) in 4.0 seconds and reached a top speed of 293 kph (182 mph). *Image courtesy of Porsche Press Database*

One doesn't have to tick all these boxes on the order form. Porsche is not commanding customers to adopt every innovation it offers on the 992, but it is making them available to those drivers and customers with the desires and the means. It comes from engineers who still ask "What if . . . ?"

What started as a low grumble during the first days of 991 has found a few louder voices to make their arguments. “The 911 has grown too big and too heavy,” and “The 911 has gotten too expensive.” Addressing the latter complaint first, inflation and various currency fluctuations can take the blame for some of this assessment. Porsche introduced the Typ 901 at DM21,900 in 1964. This was roughly $5,502 at Zuffenhausen at the time. That is approximately equal to $54,152 today. The manual transmission rear-wheel drive 992 Carrera sells for $98,750.

And then there’s size. The Typ 901 sat on a 2,211 mm (87 in) wheelbase and measured 4,163 mm (164 in) in length overall; 1,610 mm (63 in) in width; and sat 1,320 mm (52 in) tall. The 992 uses a 2,451 mm (96.5 in) wheelbase, which is 240 mm (9 in) longer, and the body is 4,519 mm (178 in) overall, which is 356 mm (14.0 in) longer. The 992.2 is 2,024 mm (79.780 in) wide, which is the biggest change at 414 mm (16 in) wider. And the latest model is 1,298 mm (51 in) tall, which is 22 mm (0.9 in) lower. The 1991cc Typ 901 engine developed 130 hp (96 kW) at 6100 rpm.

But there has been a solution in place for those who dislike the newer cars. Since 1965 there has been a robust market for preowned Porsche 911s. Porsche has helped, by faithfully supported older parts manufacturing so the cars have maintained high values compared to current production—or to those vintage models from other manufacturers. With proper dedication and funding, anyone disappointed with 991 or 992 models can find a manual transmission, manual window, manual seat coupe with four fully lockable disc brakes and a semitrailing arm rear suspension certain to accelerate your blood flow as you brake hard and downshift into a corner. The choice is all yours.

Engineers and stylists explain that the 911 grew for two reasons. First, besides wheels and tires and corresponding larger suspension pieces, there is mandatory safety equipment and technology. Second, as human beings have grown taller and heavier, so have their desires for creature comfort, communications capabilities, safety, and security. *Image courtesy of Porsche Press Database*

Cabriolets typically sacrifice handling, security, and comfort to the coupe. *Car and Driver* reviewer Elana Scherr noted the Porsche 992 Cabriolet feels nothing like a coupe on which "the top has been torn off." Drivers can lower the top in 12 seconds at speeds up to 50 kph (31 mph). *Image courtesy of Porsche Press Database*

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2021 TYP 992 GT3 AND GT3 TOURING

It's important to remember that "GT3" is not only a Porsche brand, it's a racing class with titanium-clad regulations. Until the next revision in FIA international GT championship rules, Porsche's GT3 remains normally aspirated against a racing field predominantly turbocharged.

Incredibly, following lengthy wind tunnel tests, the subtle, retractable GT3 Touring rear wing (foreground) comes very close to the effects of the cantilevered external wing in the background. *Image courtesy of Porsche Press Database*

Following its brief hiatus, manual-shifting transmissions were back for Porsche's GT3. Andreas Preuninger developed data confirming that high proportions of GT3 buyers used their cars on track days opportunities. Preuninger and others demonstrated that even a highly-experienced driver accelerated from 0 to 100 kph (0 to 62 mph) in 3.0 seconds with PDK and 3.5 seconds with the manual. *Image courtesy of Porsche Press Database*

As many as 14 manufacturers have homologated cars for FIA GT3, totaling some 30 models since October 2006. Homologation is good for seven years unless a manufacturer petitions for an extension. In precise wording, the 2012 FIA Appendix J explained: "identical examples [produced] within a certain period of time . . . and which are destined for normal sale to the public."

Porsche has a turbocharged GT2 and does not need a turbocharged GT3. Motorsport Centre Flacht received homologation for its 992 GT3 on December 1, 2022. Competition came from Acura, Aston Martin, Audi, Bentley, BMW, Cadillac, Callaway, Honda, Lamborghini, McLaren, Mercedes-AMG, Nissan, and a new 3.0-liter twin-turbocharged V-6 Ferrari 296 GT3 approved January 1, 2023. Across the class, engines ranged in displacement from BMW's 3.0-liter (183 cu in) twin-turbo inline 6 M4 GT3 up to the naturally aspirated 6.25-liter (381 cu in) V-8 Callaway Corvette.

Clearly, the GT3 entry is the manufacturer's decision. But the FIA has the last words on performance. Those words are *Balance of Performance*. And this BoP is what makes the series work.

FIA GT technical director Peter Wright explained it to Andrew Cotton in his history of the BPR series (see **chapter 36**), *30 Years of GT Racing*: "If Porsche produced a better car, we had to balance it back so it was no quicker than the previous year's and they got upset. People cannot resist making their cars go quicker!. Of course, that's a fundamental part of racing, but it shouldn't be part of GT racing." The BoP was their tool for the full range of GT3 class cars, analyzing them in extreme detail, fitting flow-restrictor plates onto engine intakes and adding ballast to car bodies to bring the cars within eight-tenths of a second of so of each other's lap time! The FIA intended to tighten up racing and excite participants and spectators.

While such tests produced real results, they discounted another reason customers purchase GT3s—in order to sharpen up and improve every aspect of their own performance driving. Linking perfect clutch work and shifts to corner entries and exits meant more to these drivers than setting the fastest lap of the day. *Image courtesy of Porsche Press Database*

So there is one side of the debate, why Porsche cannot dramatically, drastically evolve the GT3 into, say, a pseudo GT2 RS. The FIA would require a grand piano in each as ballast. Naturally there are the other voices in the conversation. If Andreas Preuninger, as director of the GT cars programs, is the father of these cars, writer/racer Chris Harris with *TopGear* is the head cheerleader.

”Marinaded in Porsche’s monumental motorsport genius, the GT3 is traditionally the sweetest of sweet spots and equally devastating on road and track,” Harris wrote in his review of the latest Typ 992 GT3 for **www.topgear.com**. “Porsche is clearly prepared to go to astonishing lengths to keep the hardcore faithful happy. The engine is a naturally aspirated 4.0-

litre [244 cu in], has little in common with the unit found elsewhere in the 992 range and a lot to do with the one found in Porsche's GT3 Cup racing car. Power is up from the last gen car—but only a modest 10 bhp to 503 bhp [7.5 to 375 kW], torque to 347 lb-ft [470 N·m]. That's ample," Harris says with his usual understated humor. "It'll accelerate to 62 mph [100 kph] in 3.4 seconds and onto a top speed of 198 mph [319 kph]. Also ample."

It's also sensible. Porsche's typical practice of giving the car an extra 20 or 40 hp (15 or 29 kW) as a Generation change forces the FIA to install more ballast and smaller diameter restrictor plates. That certainly sounds discouraging for the racers, and it might be for street car buyers were it not for the fact that increasing horsepower is not the only way to make the car quicker. Harris again:

"Weight-saving is one of the obsessions that makes this car what it is . . . The carbon fibre roof is 1 kg [2 lb] lighter than the regular steel one, the full carbon buckets are 15 kg [33 lb] lighter than the standard four-way sports seats. Stripping out some of the 992's sound deadening material loses another 1.9 kg (4.2 lb), and if you pony up for the ceramic brakes, you'll save another 17.7 kg [39.0 lb]. This methodology informs every aspect of the car, and ensures that the GT3 with PDK weighs 1,435kg [3,164 lb], only 5 kg [11 lb] more than the outgoing car . . ."

The car's exterior provides a master class in airflow management. Start with a four-stage adjustable splitter at the nose, a devilishly complex fully paneled underbody, an equally effective rear diffuser, and, as Harris called it, "possibly the most elaborate rear wing ever seen on a road-legal Porsche. . . . It sits on a four-way manually adjustable so-called 'swan neck' which improves airflow across the underside of the wing." In aggregate this generates 385 kg (849 lb) of downforce at 200 kph (124 mph).

For those with little enthusiasm for a big wing, lessons from the recent 911 R applied here (see **chapter 54**). It's called the GT3 Touring. Rumors persist that the Touring is a clipped-wing version of the "real" GT3. That's not true. Engineers replaced the swan-neck wing with the elevating wing of the full 992 lineup. There's a different engine cover and exterior "brightwork" is aluminum instead of black. And where the interior is covered in Race-Tex, the Touring gets leather.

This may be Porsche's most dangerous street weapon ever. Having GT3 performance, handling, and braking capabilities in an innocuous-looking coupe may tempt naive owners of lesser machines to what law enforcers describe on their citations as "illegal speed events." *Image courtesy of Porsche Press Database*

Even legal matches on enclosed race circuits will be instructive. The lesson: not *all* GT3s need big wings. Porsche GT engineers and aerodynamicists worked hard to retain typical GT3 handling. The cars rely on a subtly reconfigured automatically extending spoiler. *Image courtesy of Porsche Press Database*

The choice of models rests on the customer's sense of visual appropriateness. Porsche priced the GT3 and the Touring identically. What's more, if one isn't counting the grams and no need for lightning shifts exists, buyers can add back 17.7 kg (39 lb) and order the heavier six-speed manual gearbox.

Back in the formation days of the BPR program, the three founders intended the series to attract a variety of teams racing a variety of cars—at one point, cofounder Stéphane Ratel boasted he could deliver a grid with 24 entries: four teams each driving six different autos. The manufacturers, not only Porsche but all the others, balked at the rules, especially the Balance of Performance. The FIA had blessed the series with championship status, and Ratel presented his biggest bargain chip: "I was able to say to the manufacturers, 'If you don't want to do it, we can do it with tuners.' The manufacturers didn't like that."

From its beginnings, Porsche respected the demands and regulations of motorsport. As Porsche has expanded into a full-line automobile manufacturer with everything from SUVs to fully-electric sedans and station wagons, and in a world, as Harris sums up, “that has looked and felt very far from certain in recent years, it’s a relief to know that our performance car lodestar is as sensationally good as ever.”

Past denials to the contrary, it turns out there was more room in the 992 engine. At the beginning of the season, Porsche introduced the 992 GT3 R with a new 4,194cc engine with bore and stroke of 104.5 mm by 81.5 mm (4.1 in by 3.2 in). Porsche quotes 565 hp (416 kW) output weight at 1,250 kg (2,756 lb), all managed by the FIA BoP. Porsche and Pfaff Motorsport’s GTD Pro team were well satisfied and scored a season debut win at the 2023 Twelve Hours of Sebring. Sensationally, good just got better.

It has to. The 911 GT3 has equally serious competitors just waiting around the next corner for it.

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2022 TYP 992 HERITAGE DESIGN SPORT CLASSIC

Evolution is a good thing, or at least it has proven to be throughout Porsche's series production car history.

Its 3745cc water-cooled opposed six-cylinder developed 542 hp (399 kW) at 6750 rpm and produces 442 lb-ft (599 N·m) of torque across a stunning range from 2000 to 6000 rpm. It includes a number of standard Turbo bits such as rear-wheel steering, torque-vectoring, dynamic chassis control, and carbon ceramic brakes. *Image courtesy of Porsche Press Database*

But the company also recognizes their customer's sentimentality for nostalgia and cleverly invites them to revisit the Memory Lanes of the 1960s and 1970s in limited production carefully curated retromobiles, each delivered with a full new car warranty. Take just the most recent 15 years as a case study. The Typ 997.2 Sport Classic, launched in 2009, conceived and born in the new Porsche Exclusive Manufaktur, was a semipublic offering that plucked hard at the heart strings of the fortunate 250 individuals who presented the right credentials to purchase one. It offered enough pleasures to even slightly confuse its audience to ask, "Do I drive it or simply park it and stare at it?" Its front and tail end treatments and its unique double bubble roof design were irresistible. Many of its design and engineering features led to a new 911 line, the GTS.

Several years later, as Porsche's Motorsports and GT cars staff surveilled a lot full of their latest GT3 Cup cars, parked with their massive rear wings dismounted and stuffed inside the cars for shipping, the purity of the bodywork—along with their insider knowledge of just what wonders lurked beneath those carbon surfaces—stopped them in their footsteps and gave them ideas that could have thrilled Butzi Porsche and Anatole Lapine: the pure 911 form devoid of outgrowths and appendages. But those pure forms had top speeds in the 200 to 250 kph range, (124 to 155 mph). Even those cars suffered from aerodynamic lift. With cars capable of speeds one-third-again faster, the GT team had plenty of work to do keeping their idea on the ground. Solving those challenges led them to resurrect a Porsche name from history, the 911 R, a limited edition in its purest form. Porsche offered 991 of the contemporary R and noticed a lingering desire for more of the same. Porsche scratched this itch with its wingless GT3 Touring.

For model year 2022 Porsche has again satisfied its restomod-hungry loyalists with an updated Sport Classic from its Porsche Heritage Design operation. (This is actually their second effort, as a Targa 4S inaugurated the program in 2021.) It pulled the double bubble roofs (with hand-painted double stripes) from the ideas bank and fitted them, this time, to an updated chassis—this one a C2-front end grafted the Turbo back end! The similarities to and differences from the 2010 original include the ducktail spoiler, and the engine is Porsche's 542 hp (399 kW) twin turbo, detuned from the all-wheel drive version with 572 hp (421 kW). But unlike the rest of the Turbos and turbocharged engine in the 992 product array, meaning those called Turbo

and those that only rely on them, the latest Sport Classic arrives equipped with three foot pedals and a seven-speed manually shifted transmission. And it has rear-wheel drive only. Is it similar to Porsche's 992 GT2? Yes but the Club Sport restores some of the creature comforts the GT2 shuns for weight and racing homologation considerations.

And what exactly are those "comforts? Here interior chief Thorsten Klein had fun reintroducing senses and styles from Porsche history. As *TopGear* reviewer Rowan Horncastle noted, "The cabin has a fantastic ambiance, one like a trendy members' club. The seats are sensationally comfortable (if not a little high) and in front of you sits a glistening analogue rev counter with white hands and dayglow green markings behind, just like an old 356. Either side, two seven-inch [18 cm] digital displays blend old and new perfectly." And for the purists and loyalists, this:

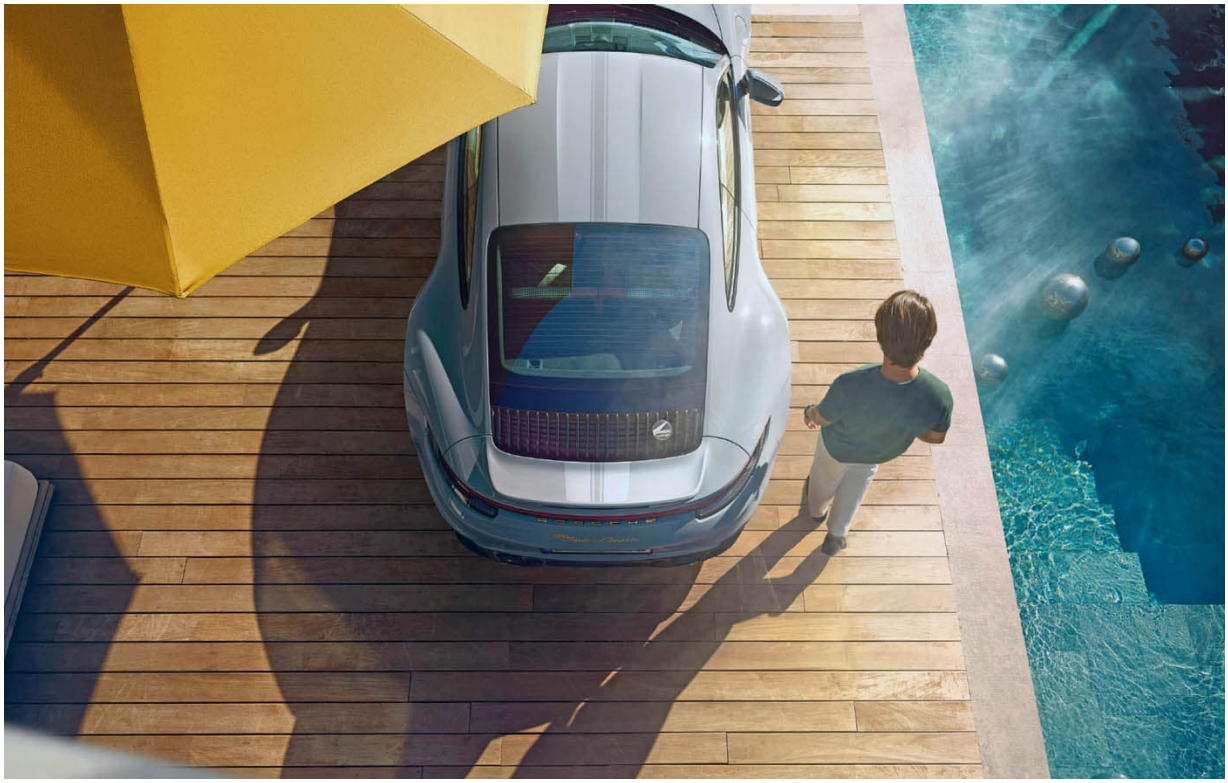
"Fire it up and the car chunters quietly with a light clutch and effortless, precise steering," Horncastle continued. How genuine is the retro experience? The first generation turbos with their manual gearboxes taught owners the meaning of "lag." Porsche has done miracles in minimizing lag and levelling the effects of boost through electronics, but the PDK is decidedly a tool in that kit. ". . . not having a PDK swap cogs for you makes turbo lag more present and adds a sense nostalgia to the driving experience that is exciting," he wrote.

With its Heritage Design Sport Classic, Porsche boasted: "The 60s are back." In what it characterizes as a blend of "the flair of the 1960s and early 70s," they explain, "The unforgettable look of the swinging 60s can be found in many of the 911 body shapes." *Image courtesy of Porsche Press Database*

"Where a PDK wants to rush up the gears, with this seven speed, you get to decide. You can chase the revs in a lower gear or surf the torque in later cogs—it becomes instantly more experiential." Deft engine, clutch, and gearshift management help accelerate the car from 0 to 100 kph (62 mph) in 3.0 seconds and carry on to a top speed of 315 kph (196 mph). "With the manual gearbox you have to manage where the optimum performance is, using all three pedals (or the spectacular auto-blipper) to prod the engine into a yowl with every downshift and find the power," Horncastle noted.

Unlike the original, buyers in the United States had access. And, as with anything extraordinarily good and rare from Porsche, it commanded an impressive price: $273,750.

There are vintage 1963 Porsche badges throughout: a new two-tone interior mated black Nappa and cognac Nappa leather; a new wood dashboard was trimmed with gold emblems (in real gold); and the legendary Pepita cloth, Porsche's version of the traditional houndstooth, covered doors and seats. *Image courtesy of Porsche Press Database*



Porsche's Heritage Design planned to manufacture 1,250 in solid Black as well as Agate Grey Metallic, Gentian Blue Metallic, and the Sport Grey Metallics and offered Paint to Sample. Strictly rear-wheel drive eliminated front driveshafts, saving 70 kg (154 lb). This left the car at 1,570 kg (3,461 lb). *Image courtesy of Porsche Press Database*

Its distinctive body-styling came from mating the back half of the all-wheel drive Turbo platform to the front half of the rear-wheel drive Carrera. Eliminating the forward-facing rear fender air intakes emphasizes but does not exaggerate its rear-wheel drive only aggressiveness. *Image courtesy of Porsche Press Database*

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2023 911 DAKAR

Porsche almost *had* to do this car for its customers. After all, it had been doing them for its competition department—and some motorsports clients—since November 1968.

Pirelli Scorpion All Terrain Plus are standard tires for the Dakar. Fronts are 245/45ZR19 riding on 19 x 8in wheels. In the back, 295/40ZR20s cling to 20 x 11.5 wheels. Buyers can option, at no extra cost, Pirelli P Zero "summer tires." They are much quieter than the Scorpion All Terrain Plus but betray the owner as someone who never will take their car off-road. *Image courtesy of Porsche Press Database*

At the urging of Sobieslaw Zasada, one of Porsche's rally crew, and two privateer teams, the *Rennabteilung* (Porsche's racing department) prepared 2.0-liter (122 cu in) 911s for the London–Sydney Marathon. This was a 16,000 km (9,942 mi) adventure jointly sponsored by one newspaper in London and another from Sydney. Nearly half the route ran over unpaved paths. Two of the three Porsches finished.

This encouraged the ever-courageous Zasada to team up with the ever-adventurous Porsche engineer/racer Jürgen Barth to take a Porsche 911 to Nairobi, Kenya, for the East Africa Safari Rally. Their 1970 effort ended early with a holed crankcase, but Porsche returned in 1971, this time bringing three 911 S 2.2s and two practice cars. Zasada managed to finish fifth. Then again in 1972, Zasada and Barth tried again in one of the year-old 1971 cars. Zasada scored a second overall.

Attempts followed in 1974 with a three-car works team of Africa Safari-–prepared 911 RS Carrera 2.7s. Swedish driver Björn Waldegård finished in second. Then in 1978 came perhaps the real progenitor of this new twenty-first century model. The works sent two 911 SC 3.0s, to Nairobi, Kenya, both carefully prepared based on past experiences. The lightened cars weighed 1,200 kg (2,646 lb) including the full-length skid plate meant to protect everything underneath the body. To help with that, engineers gave the body 280 mm (11 in) of ground clearance and detuned the 2993cc engine to produce 250 hp (184 kW) at 6,800 rpm. But this was more than enough to propel the African Safari cars to 200 kph (124 mph). Again Porsche was vexed with suspension failures—calculating the impact load of hitting a half-buried rock at 160 kph (99 mph) was done using slide rules in those days and Porsche still relied on outsiders for special parts production.

The Dakar has two understated standard colors, white and black, as well as optional metallics in Shade Green, Shark Blue, or Ice Grey metallics, for an extra $3,270. For $28,470, one can order a near clone of the 1984 Rothmans Typ 953 (but without cigarette advertising or licensing fees). Martini livery and others were also available. *Image courtesy of Porsche Press Database*

And then, at veteran endurance racer Jacky Ickx's urging and with the enthusiastic blessing of Weissach chief Helmuth Bott, Porsche took on the already legendary Paris–Dakar Rally. Bott had long believed the 911 should be an anything-and-everything car, equally at home racing at Le Mans, driving to the opera, going for groceries, or with all-wheel drive, racing in the desert. His engineers developed a series of prototypes, Typ 953. For 1984 factory engineer Roland Kussmaul (Barth's partner on several earlier adventures) supervised a team of three 953s. The cars were stripped and strengthened with reinforcements now calculated on computers and exhaustively tested, including yet another underpan, this one of carbon fiber

and Kevlar. The 953 ran with 270 mm (11 in) ground clearance to protect the running gear. The 3,164cc engine developed 225 hp (165 kW) at 6000 rpm. At the end of the 11,000 km (6,835 mi) desert trial, the 1,247 kg (2,749 lb) Typ 953 startled everyone by winning outright!

For 1985 and 1986, Porsche returned to Dakar with its ultimate weapons, the all-wheel drive twin-turbocharged Typ 959. The car represented an extreme update to and improvement on the 953s. The 400 hp (294 kW) cars had variable ride height and variable drive switching between front and rear axles. But racing is racing, and the desert is unforgiving like nowhere else. One of those incalculable rocks took out one of the three entries, another burned to the ground when an oil line ignited, and the third crashed. But Porsche's commitment was three years, and in 1986, the 959s returned and taught everyone a few lessons about all-wheel drive sports cars racing in the desert: Porsche finished first and second. Engineer Kussmaul, driving the third 959 as the high-speed service car was the sixth-place finisher.

The Dakar's 2981cc opposed six-cylinder developed 473 hp (348 kW) at 6500 rpm and 420 lb-ft (569 N·m) of torque from 2300 rpm up. In a vehicle weighing 1,611 kg (3,552 lb), the engine and eight speed manual will get the car to 100 kph (0 to 62 mph) in 3.3 seconds. Its aggressive tires limit stop speed to 240 kph (149 mph). *Image courtesy of Porsche Press Database*

Porsche's decision to assemble the Dakar on the 911 GTS platform opens the mind to many off-shoots. Not only are there Cayenne and Macan GTS but also Panamera and Taycan and Boxster and Cayman. Lamborghini's Sterrato is headed toward sunset, but the new Dakar may be a warning to other makers: Porsche owns the desert. *Image courtesy of Porsche Press Database*

So with the 2023 Dakar, the only real question is what took Porsche so long? Even outsiders were doing them. Porsche's Supervisory Board approved the concept and engineers began developing a prototype on an early 991 generation one. However the company got very busy with many other, higher priority models. What's more, no one had really asked for a high-clearance off-road four-wheel drive 911. Plenty of engineers deflected questions, telling potential buyers, "Go drive the wheels of a Macan and then come back to me." Brilliant as the Macan was, it was not an off-road 911.

The Dakar is an outgrowth of the Carrera 4 GTS. The 2,981cc water-cooled twin-turbocharged and intercooled opposed six-cylinder was tuned for 473 hp (348 kW) at 6500 rpm, and it produced 420 lb-ft (569 N·m) of torque from 2300 rpm up to 5000 rpm, having relied on numerous parts and

ideas from the GT3 (including its passive engine mounts to add strength and rigidity).

The Dakars rode on Pirelli Scorpion All Terrain Plus tires with 9-millimeter tread depth (0.35 in). Front wheels were 19 x 8 with 245/45ZR19 tires and the rears were 20 x 11.5, wearing 295/40ZR20s. The car incorporated the GTS suspension including Porsche's alphabet soup of PASM, PSM, PTS, PVCC as well as other technologies adopted from Cayenne/Macan donors. At rest the car parks at 160 mm (6 in) ride height. Touch some switchgear and the car rises another 30 mm (1 in), reaching 190 mm (7 in). That is lifted Cayenne/Macan territory and admittedly it's perhaps not adequate for the Africa Safari, but it's entirely suitable for beach dune romps, or donuts in snow-covered parking lots, and delivering one of your middle-schoolers to class in something guaranteed to turn heads and start talk. (To accommodate rear mechanical bits, the rear "temporary seats" were not available.)

Porsche stated the Dakar accelerated from 0 to 100 kph (0 to 62 mph) in 3.3 seconds. Tires limited maximum speed to 240 kph (149 mph). The company announced plans to assemble 2,500, and while the percentage allowed for United States customers was not set, they published a price in dollars: $223,450. This is up in the territory of the GT3. Truthfully that's where it belongs. It can be a daily driver that will insure a smile on your own face as well as the driver's around you.

One appeal of such a 911 is freedom. Jacky Ickx, six-times Le Mans winner, seven-time Formula One race winner, Paris–Dakar winner in 1983, and founder of the Porsche team that won again in 1984 and 1986, has explained it during an interview in 2016.

"I love the freedom of racing in the desert," Ickx said. "In formula One, in Endurance, you must put the car in precisely the same quarter-inch in the same turn one hundred times or more. In the desert the instructions say, 'Go to such-and-such mountain. Continue another 20 miles.' And you have the freedom to decide if you will go around the mountain on the left or the right."

But such freedom as this has a price. You've probably spun off inside or outside a turn on a racing circuit. Helpful corner workers are called it in, and by the time you come to a rest, help is already on the way. When you go off-roading in your GT3, it will be a different situation in the desert or the high mountains. Your navigation system will show you as a small dot in a blank

screen. It might be prudent to never leave home without your best friend who also owns a 911 Dakar. That way, the two of you can help one another, and you'll each know exactly where the other one is. It's likely that it's a long way from the nearest cell phone tower.

So the time to carefully consider some extra options for your Dakar is when you order the car. Find the program for your nav system that also reads out in latitude and longitude, degrees, minutes, and seconds. Add a compass, maps on paper, and a survival kit including water, water-purification tablets, extra food, blankets, and a medical bag including snake and insect bite kits. And don't forget a satellite phone.

It's difficult to comprehend this car. Many Porsche owners—in the United States especially—obsess about how clean they can keep their cars. Yet here is a 911 intended for the dirt and sand. As Steven Ewing summed up in *Panorama* magazine's cover story, "This one's all about rampant excitement and making a dusty mess." *Image courtesy of Porsche Press Database*

AFTERWORD

What does the Dakar say about Porsche and its 60-year-old 911? The car reflects—or perhaps exudes—a corporate self-confidence and self-assuredness that, so long as the vehicle is cleverly conceived, exactingly researched, exhaustively developed, and precisely marketed, there may be a Porsche customer for absolutely anything the company dreams up. And if it has a motorsports link, the bond is somehow amplified.

It is long-practiced behavior around Porsche to save ideas that don't meet immediate approval. Porsche engineers and designers have a great ability to think and work in the long term, to accept delayed gratification. This book is evidence that managers and staffers have been opening and up-ending file drawers, especially so in the recent decade.

Porsche's design and engineering legacy extend back not just 60 years for the 911, nor 75 for all its company-badged vehicles, but approaching 100 years (since 1931) as an independent firm. The Dakars, the Sport Classics, the Tourings, those vehicles from Porsche Exclusive Manufaktur and from Heritage Design, as well as series production Carreras, Targas, and Cabriolets, hold up a mirror to the company's history. Perhaps the clearest way to see the 911's future is to look ever closer at its past. Then do what Porsche does best: give profoundly intelligent, deeply creative, intensely skillful engineers and designers the time it takes to bring it into the future.

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First and foremost, I want to thank Frank Jung, Porsche's director of the Corporate Archiv in the Porsche Museum, and his colleague Jens Torner, manager of the exceptional photo collection. The encouragement and the great support that they give me is really what makes these books possible. My thanks also to Jörg Thilow and Tobias Mauler for their help.

Over more than 30 years of gathering information and reporting stories about Porsche and its 911, a number of the company's designers, engineers, and managers have patiently answered my questions. I wish to acknowledge them here: August Achleitner, Herbert Ampferer, Jürgen Barth, Hans-Peter Bäuerle, Helmuth Bott, Tilman Brodbeck, Peter Falk, Ernst Fuhrmann, Jacky Ickx, Anthony Hatter, Bernd Kahnau, Eugen Kolb, Hartmut Kristen, Roland Kussmaul, Harm Lagaaij, Anatole Lapine, Grant Larson, Herbert Linge, Horst Marchart, Stephen Murkett, Klaus Parr, Ed Peter, Ferdinand Alexander "Butzi" Porsche, Andreas Preuninger, Valentin Schäffer, Gerd Schmid, Gerhard Schröder, Peter W. Schutz, Norbert Singer, Dick Soderberg, Otto Soeding, Rolf Sprenger, and Gunter Steckkönig.

Over the years, a number of generous, kind-hearted enthusiasts have opened their collections to me and let me photograph their cars to help tell this story. I am grateful to Dick Barbour, Howard Barker, the late Otis Chandler, Bob DeVries, Rob Heyne, the late Robert Ingram, Ray Jordan, Peter Kitchak, Peter Lech, Jeff Lewis, Nick Liakis, Marco Marinello, Steve Michaelson, Steven Murray, Gil Ranney, George Reilly, Chris Roman, Fred Rosenbloom, Marv Tonkin, Myron Vernis, Roy Walzer, Ranson Webster, and Chester Yabitsu.

For their work on this book, I am also grateful to Tom Loeser for his images of the 1996 GT1 in bright yellow Rohr Racing livery, and to Warner Hall and José Pessis for reading and questioning everything I wrote here.

I am deeply grateful to every one of you.

Randy Leffingwell
Santa Barbara, California

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Since 1990, **Randy Leffingwell** has authored more than 60 titles, many of them automotive-oriented. These include a dozen Porsche titles ranging from general overviews—*Porsche 75 Years: Expect the Unexpected* and *The Complete Book of Porsche 911*—to deeper explorations in *Porsche Turbo* and *Porsche 911: 50 Years*. During this time, he has regularly traveled to Germany to continue his research regarding Porsche's history. To date, Leffingwell has interviewed more than 200 Porsche engineers, stylists, model makers, racers, and managers.

While he has tackled other subjects including John Deere tractors, Harley-Davidson motorcycles, and West Coast lighthouses, Leffingwell admits he is almost addicted to the Porsche story. In addition to his book work, he is historical editor for *000* magazine and *Porsche Panorama*. And for the past decade he has been researching and writing an encyclopedic history of Porsche's motorsports endeavors.

Leffingwell lives near Santa Barbara, California.

Harm Lagaaij was born in The Hague, Netherlands, in 1946 but spent his youth in Ecuador and Venezuela, then attended English-language grade school in Brunei through 1960. He returned to the Netherlands for high school, then studied at the IVA (Institute for Automobiles) at Driebergen, Netherlands.

Lagaiij joined Porsche in September 1971. He had designed the 924 by the time he left in mid-1977. He then spent eight years as Advanced Design Studio Manager at Ford, in Cologne, then three more as chief designer at BMW Technik.

Lagaaij returned to Porsche as Director of Design in January 1989, where he encouraged fresh thinking and experimentation. He set the style for Porsche's extraordinary product expansion, including the 993, 996, Boxster, Cayman, Cayenne, and 997. He retired from Porsche in September 2004.

In 2013, Lagaaij received the "Officer in de Orde van Oranje-Nassau," the Netherlands equivalent of the Order of the British Empire (OBE). Since 2021 he has been an independent automotive design consultant.

Dedication

With this book, I hope I have honored the accomplishments and the memories of those who have, over 60 years, infused their hearts and souls into this unorthodox sports car. So let me dedicate this book to the now-departed brain trust that created the first one:

For Ferry Porsche; “Butzi” Porsche and his designer Gerhard Schröder and chief modeler Heinrich Klie and their antagonist Erwin Komenda; aerodynamicist Josef Mickl; engine designers Leopold Jäntsche, Robert Binder, Hans Mezger, Horst Marchart, and Ferdinand Piëch; and chassis engineers Helmuth Bott, Wilhelm Hild, Hubert Mimler, Franz-Xaver Reimspiess, Helmut Rombold, and Leopold Schmid.

Thank you, gentlemen!

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