

PORSCHE • 70 YEARS

THERE IS NO SUBSTITUTE



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1953 PORSCHE 550 SPYDER

RACER: DEVISED



It was increasingly clear to Ferry Porsche that his business idea was succeeding. But it could not do so in Gmünd, where the nearest railway station was 15 kilometers away, a fact that to Allied bomber strategists made it seem inconsequential. Most of what Porsche

needed to expand his business was 500 kilometers away in Stuttgart. In Germany, the economic recovery had begun. As Herbert Giersch, Karl-Heinz Paqué, and Holger Schmieding wrote in *The Fading Miracle: Four Decades of Market Economy in Germany*, the revaluation of currency and the new American, English, and French attitude toward reindustrializing Germany sparked 24 percent industrial growth in 1949 and about 12 percent in the first half of 1950. Between June 1948 and the end of 1949, some eighty thousand new jobs appeared beyond

the expansions and contractions of wartime industry shutdown and peacetime industry resurrection. Still, the systems of business financing and the infrastructure of worker housing were a drag on growth.

By mid-September 1948, Porsche was engaged with Volkswagen in Wolfsburg, concentrating on beginning series auto production there. Ferry had moved much of the Gmünd operations to his sister, Louise Piäch's, facility in Salzburg, which, by late spring 1949, was Austrian distributor for VW

OPPOSITE AND ABOVE: Porsche's own 550RS-1500 Spyder took some styling clues from the Glöckler Spyder, above, shown here with US importer Max Hoffmann racing it in Bridgehampton, New York in 1952.



(while Blank still handled Switzerland and elsewhere for Porsche). Gmünd cars sold; however, they brought too little profit to the tightly run company. Ferry wanted to return to Porsche's larger facilities—and a much larger pool of skilled workers and parts suppliers—in Zuffenhausen. He contacted Stuttgart's Lord Mayor Arnulf Klett and another friend, Albert Prinzing, about regaining access to their shops that the US Army had commandeered as motor pool headquarters for its occupation forces. Klett and Prinzing were encouraging, so Ferry took the bold step of inviting subcontractors to bid on car body production. Reutter Karosserie—a neighbor at Porsche's shops in Zuffenhausen—signed on for five hundred units in November 1949. Buoyed by ambition and burdened by the large commitment, Ferry sent Prinzing and another friend off in a Gmünd coupe and a Beutler

ABOVE: Heinrich Sauter's 1951 Spyder is one of several special racers assembled outside Porsche that inspired Porsche's own Typ 550 Spyder.

RIGHT: Belgian driver Gilberte Thirion tests her 356 SL, the 1951 Le Mans class winner. Thirion, with her father as navigator, took second in class in the 1952 Paris-San Rafael Rally in the car.

OPPOSITE: The instrument panel of the 550 Spyder was businesslike.



BELOW: This 1953 Typ 540 America Roadster, one of twenty-one assembled, led to the 1955 Typ 540 Speedster.

OPPOSITE: Porsche's Typ 550 RS at the start of the 1954 Carrera Panamericana was one of history's first race cars with sponsorship decals. Hans Herrmann (right) won his class in this car.

RIGHT: Hans Herrmann swings this 1954 Typ 550-1500 RS Spyder through the Karousel at the Nürburgring in August 1954.



cabriolet to sell cars throughout Germany. Orders came in with dealers paying in advance. Porsche was solvent at last.

But nothing happened easily in those days. In June 1950, as Ferry planned a year-end relocation to Zuffenhausen, war broke out in Korea; the US Army held on to the Porsche shops. To make do, Ferry acquired a cramped building next to Reutter. Porsche delivered its first Zuffenhausen-assembled coupe in the spring of 1950. Body manufacture continued at Reutter.

In January 1951, Ferdinand Porsche died at age seventy-five following a stroke he suffered the previous November. The company his son, Ferry, had rebuilt was growing, and the cars he made



and sold increased in number. Back in Gmünd, they had entered the midengine open prototype 356-001 in local "round-the-houses" races in 1949, and Ferdinand's competition gene carried on in Ferry. Father and son recognized that racing forced engineering improvements and, with corresponding newspaper coverage, helped promote the abilities of Porsche's car. This brought sales.

The 356 models competed. But it was purpose-built racers, constructed by Porsche's dealers and other outsiders, that inspired the company's next development. In 1951, Stuttgart businessman Heinrich Sauter commissioned a local body shop to fabricate a lightweight open racer using a Porsche chassis and its new 1,500cc engine. Porsche acquired the car in 1952, and engineers used it as a test mule for the new, more potent 1,500cc Super engine, the Typ 528. In Frankfurt, well-known VW dealer Walter Glöckler created a series of ultralightweight open cars using ladder-type tube frames and a sleek body. Starting with 1,100cc VW pushrod engines in





1950, he achieved success and steadily graduated up the line of Porsche engines to their 1,500cc standard. Ferry and others within the company supported the outsiders' efforts, but they also wondered if those efforts might be more successful as a marketing tool in a full-fledged Porsche race car. The final run of Gmünd coupes—the so-called SL models—no longer were competitive against those racers like those by Sauter and Glöckler, who used Porsche's superior engines in cars of their own sleek design. A lightened open car, Porsche's America Roadster Typ 540, appeared in 1952 in limited numbers, but it still came up short against the outsiders.

Porsche's chief body engineer, Erwin Komenda, had expanded his staff when the company returned to Zuffenhausen, and among new hires was a local baker, Heinrich Klie. Klie had made his talent and

RIGHT: August Veillet and Zora Arkus-Dunton won first in class at Le Mans in 1955, driving 2,053 miles in twenty-four hours.



imagination known to Ferry with a birthday present he and his brother made for him—a loaf of bread baked in the shape of the 356. When asked how they formed the shape, they explained the process. "Can you do this with clay?" Porsche asked.

The first two Typ 550 Spyderys appeared in early spring 1953, and at their competition debut in May at the Nürburgring Eifelrennen, Walter Glöckler's nephew, Helm, won the 1.5-liter class in a Porsche-engined, Porsche-badged race car. Two weeks later, Porsche entered

both racers at the 24 Hours of Le Mans, where one of the new cars placed first in class and set a record for distance traveled. This set the legend in place, and by the time the factory updated the first model 550/1500 RS with the second-generation 550 A, and the successor Typ 718 RSK, the Porsche Spyderys tallied hundreds of outright victories and class wins throughout Europe and North and South America in attention-getting international events such as Sicily's Targa Florio and Mexico's Carrera Panamericana.



1964 PORSCHE TYP 904 CARRERA GTS

NEW MATERIALS



Porsche learned from its 550/1500 RS Spyders that purpose-built race cars brought success, notoriety, and revenue to the company. As the 550s evolved into the Typ 718 generation of RS 60 and RS 61 racers, the engineers developed a lighter, more shapely

version of their 356 B 1600 with help from an old Austrian friend, Carlo Abarth, living in Italy. Erwin Komenda's designers and modelers created the body shape; Abarth farmed out fabrication to a couple of carrozzerie in Italy to create the 356 B 1600 GTL Abarth, the Typ 756. Porsche completed and sold twenty of these cars in which drivers such as Paul Strähle, Herbert Linge, Ben Pon, and others made considerable racing history.

Additional closed factory cars followed on the 356 B platform, including the 1962 Typ 718 GTR and 1963 Typ 356

B 2000GS Carrera GT, the so-called three-edge scraper, or *Dreikantschaber*. Forms and shapes from this car hinted at Porsche's next racer for FIA's Group 3 Grand Touring class, the 1964 Typ 904 GTS.

Ferry Porsche's son Ferdinand Alexander, F. A.—or Butzi, as his family and co-workers knew him—had left design school and returned to his father's firm. He entered the design department and followed Erwin Komenda's prescribed training program in early 1958. He watched and assisted Komenda's designers and

OPPOSITE: During the Grand Prix of Germany at the Nürburgring, a 1964 Typ 904 GTS lands after a jump.

ABOVE: The second 904 GTS prototype appeared in late 1963 and added air intakes to the first car's unperforated rear quarter panel.



modelers work through variations on the 356 replacement under studio chief Heinrich Klie. In the midst of this came the hurry-up assignment to create the Group 3 race car.

Everything about the Typ 904 represented something new. Previous Porsche race cars had used tube frames with ultrathin lightweight aluminum or steel shells. The racing department under Wilhelm Hild and Hubert Mimler had already worked with fiberglass for seating shells, and they quickly embraced the concept of making an entire fiberglass car body. Hans Tomala, in charge of this new project, led his engineers to develop a platform of two large variable-section box members with crossbracing reinforcement. According to Porsche historian Jürgen Barth, the frame weighed about 100 pounds. Engineers used double-wishbone and coil-spring suspensions front and rear, and they adapted rack-and-pinion steering from the Typ 804 F1 car. As with the 550 Spyders, engineers mounted the 904's Typ 587 2-liter four-cylinder 185-horsepower engine ahead of the rear wheels and drove them through a five-speed transaxle.

By this time, Ferry had promoted F. A. as head administrator of design while Komenda remained chief body engineer. The new 904 was more modeled than drawn, most of its slippery-looking shape resulting from Klie and his fellow sculptors working through concepts and suggestions under a severe time constraint. "That was the beauty of this product," F. A. Porsche explained in an interview in 1992. "Because we were told nothing could be changed. This car was four months, working days and nights from the first Plasticine model to completion of the driving prototype" in order to meet its racing debut. Design "freeze" occurred in November 1963 because the car was entered in the 12 Hours of Sebring in February 1964.

Porsche selected Ernst Heinkel Flugzeugbau, an aircraft manufacturer, to fabricate the fiberglass body panels. The rear of



OPPOSITE: In the race-car assembly shops, mechanics install an engine in a 1964 Typ 904 GTS while an engineer explains details to two visitors.

LEFT: During an August 1965 hill climb at Freiburg-Shauinsland, Gerhard Mitter corners hard in Porsche's Typ 904-8 Bergspyder to finish second overall.

BELOW: Porsche engineers shoehorned this potent 2-liter, 270-horsepower Typ 771 engine into the tiny lightweight Bergspyders, nicknamed *Kängurus* (kangaroos) for their lively handling.



the car, a massive single piece, swung up to allow access to the engine, gearbox, and rear suspension. Heinkel's fiberglass technique was inconsistent, but the lightest entire bodies weighed barely 220 pounds. Ready to race, some cars came in at 1,433 pounds, though overall weights did vary.

As Barth reported, the first twelve examples went to the United States for the Sebring races and customers. By the beginning of 1964, Porsche had orders for 102 cars, shipping them to the States, the United Kingdom, Belgium, France, Switzerland, Holland, Italy, Spain, and Argentina. At Sebring, privateers won the 904's 2-liter class by a wide margin, and soon after, factory-entered 904s took first and second overall in the Targa Florio. Dozens of class and overall victories followed. Over succeeding months, the factory installed its racing six-cylinder (Typ 901/20) engines and its flat eights (the Typ 771) in a succession of late-manufacture cars. By the time assembly ended, Porsche had produced 109 of the four-cylinder versions, including a few road-going cars that never saw a starting grid. It was the first of the "plastic" Porsches, and its success issued a challenge—and sounded a warning—to its competition.





1982 TYP 956/962

COMPETITION DECIMATED



The racing and road-car world readjusted quickly but unhappily to oil price increases in late 1973 and early 1974. When angry Iranian protesters forced US-supported Mohammad Reza Shah Pahlavi of Iran into exile in January 1979, this triggered a religious-based

revolution that elevated anti-Western cleric Ayatollah Khomeini to power. Near year-end, Iranian students took over the US embassy and held fifty-two diplomats and civilians hostage for fourteen months. During the revolution, oil production virtually stopped, and panic drove the price of crude oil from nearly \$12 per barrel to \$39.50. It was during these turbulent times that the FIA wrote regulations for its racing series through the 1980s, introducing Group B to replace Group 4 and Group C to succeed Groups 5 and 6, starting with the 1982 racing season.

Clearly, the extravagance of Porsche's 935s—and other high-fuel-consumption racers—was a thing of the past. Engineer Roland Kussmaul, talking with fellow engineer Craig Watkins for his biography on Kussmaul, pointed out that at Le Mans in the era of the 235-mile-per-hour, 850-horsepower 935s, these cars consumed 80 liters of fuel per 100 kilometers. That was 2.94 miles per gallon while averaging 150 to 155 miles per hour during the race. Evidence of this profligacy was visible on trailing-throttle deceleration into turns when the large turbos



ABOVE: Lined up for technical inspection, Porsche's new Typ 956 Group C endurance racers wait their turn just before the Le Mans race in June 1982.

OPPOSITE LEFT: Porsche had won Le Mans before the arrival of the Typ 956 in 1982. But nothing prepared competitors for the domination these cars brought to endurance racing.

OPPOSITE RIGHT: First year, first twenty-four-hour race. Jacky Ickx and Derek Bell shared driving duties at Le Mans and won the 1982 debut race, covering 3,044 miles and finishing 26 miles ahead of second place, another Typ 956.

trailed long tongues of flame. Group C regulations limited teams to 600 liters of fuel (158 gallons) for races of 1,000 kilometers, and 2,450 liters (647.3 gallons) for twenty-four-hour races. It was, as Derek Bell called it, the "consumption" formula. The car Porsche developed for the series, however, was the most radical thing the racing department had ever devised.

They started with an engine they had developed for a stillborn Indy 500 entry for 1980, an alcohol-fueled 92.3-millimeter bore and 66-millimeter stroke 2,649cc, 630-horsepower turbocharged flat six. On this new car, cooling new dual-overhead cam four-valve cylinder heads was more than air could handle; water-cooling was mandatory and it was a new challenge. Converting it from alcohol to run regular fuel was less so, and engine wizard Valentin Schäffer attached turbochargers to each cylinder bank.

The earlier Group 6 race car, the Typ 936, had been successful several times at Le Mans, but project manager Norbert Singer,

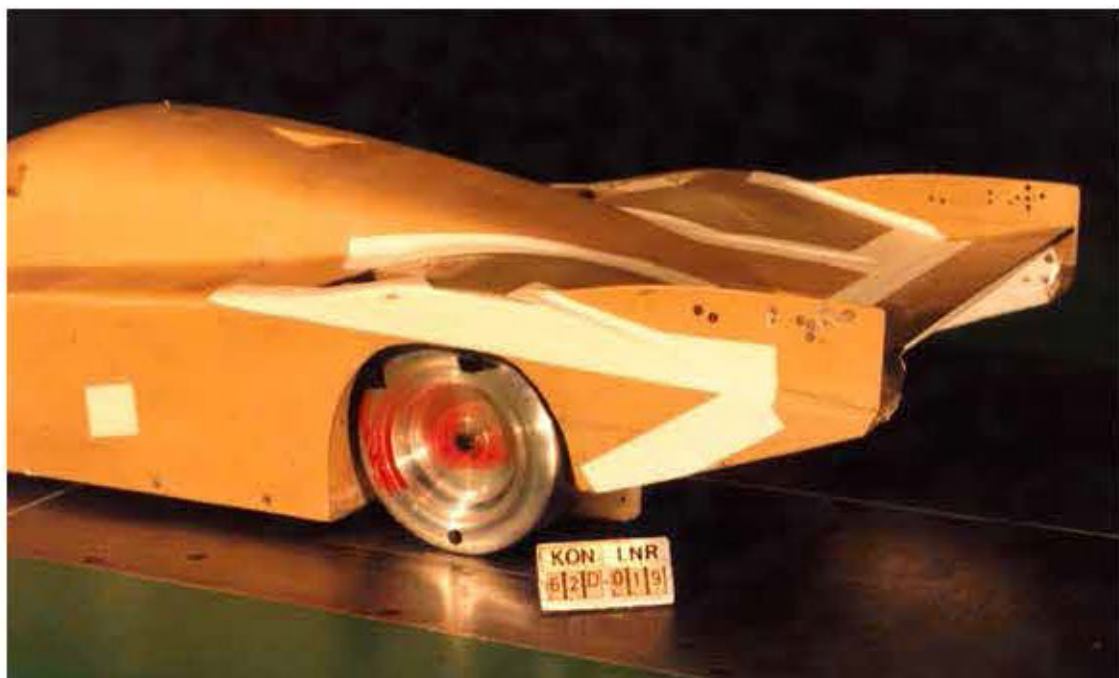
chassis designer Horst Reitter, and body engineer Eugen Kolb had spent days in wind tunnels on 935 and 936 development and learned that sheet-metal bodywork forming the basis of the 935 provided much greater stiffness than the tube-frame 936s. They concluded an innovative aluminum monocoque offered the greatest potential. They placed the fuel tank immediately behind the driver to minimize any handling effect from a full tank versus an empty one. Then they bolted Schäffer's engine onto that platform, adding a spacer tube between engine and transaxle to improve rear-axle alignment and car balance. The midengine placement enabled them to design in underbody tunnels creating downforce to maximize road holding. In his wind tunnel model testing, Singer introduced a small hump beneath the front axle that helped create an undercar Venturi effect. The car ran on a 2,650-millimeter (104.3-inch) wheelbase and measured 4,800 millimeters overall (188.9 inches), making it Porsche's longest racing vehicle up to that time.



So: New water-cooled four-valve cylinder heads. First-time monocoque construction. First-time downforce. What could go wrong introducing so many big innovations into a single car? Amazingly, nothing did. Jürgen Barth was first to test-drive the car, and after its initial five laps around Weissach, he pitted for the engineers to check it. No one had driven ground-effects sports cars before; engineers developed the technology for Formula One racing, so Barth's first laps were a surprise. "The cornering forces were simply incredible," he recalled. "When I came in to check fluids, Dr. Bott saw the back side of the car and accused me of going off the road!" Bott saw dust in the tunnels. "We figured out that the tunnels under the car had vacuumed the track," Barth explained.

Jacky Ickx and Derek Bell loved the predictability and consistent feedback the car provided them. In the April 1982 Le Mans tests, the 1,764-pound car reached 220 miles per hour along the Mulsanne. This, as Singer explained, was less than 1 mile per hour slower than the 936, but the ground effects gave them much higher cornering speeds. However, fuel consumption was the name of this new racing game. Turbo boost during the race was strictly limited to 1.1 bar. Roland Kussmaul recalled the tricks and techniques drivers had to adopt to finish races: "The best evidence is when you lift the throttle before





you brake," he told Craig Watkins, "because that reduces full throttle percentage for one lap. Normally you brake at 200 meters [from the apex of the turn], and if you lift the throttle at 300 meters and let the car coast a little, and then in the latest moment you go on the brake, that means you have two seconds maybe without full throttle, and if you make that six times or ten times at Le Mans, it's maybe 15 seconds without throttle. And that's a lot of fuel." In racing conditions, the 956s ran 5 miles per gallon, better than double the thirsty 935s.

In the 956's first season, the cars finished second at their debut in Silverstone and won at Le Mans, Spa, Fuji, and Brands Hatch, giving Porsche and Jacky Ickx the championships. "The fuel rules," historian János Wimpffen wrote about the 1982 season, "were subject to complaints about the necessity to reduce speeds, but the response of Porsche and others was to effectively tailor their program to meet the demands set by the regulators." In 1983, 956s won nine of the season's races, again claiming championships.

To compete in American races at Daytona and elsewhere, Porsche redesigned the 956 as Typ 962 for the 1984 season, reconfiguring the car to reposition the driver's feet aft of the front wheel center to compete in a new GTP class in the States. Porsche won Daytona and another nine US contests that year, and 956s and 962s won every race but two in the 1985 and 1986 seasons, setting in stone the indomitability of Porsche's Group C family.

TOP LEFT: The 956 advanced Porsche engineering with its monocoque chassis and underbody tunnels to create downforce. Hours in wind tunnels with models such as this perfected the car.

LEFT: At Porsche, cross-pollinating ideas was standard procedure. Here they test their 1982 Formula One engine in the 956 endurance racer.

OPPOSITE TOP: The 956 became the 962 when Porsche created a version for the North American IMSA series along with European Group C. This 962C won Le Mans in 1986.



