Take Five

Flow dynamics:
Even Norbert Singer's part is aerodynamic

History

Interview by
Michael Sönke

Photos by
Stefan Warter, Porsche archive

After thirty-five years in the service of the Porsche Racing Department, Norbert Singer is retiring at the end of the year. The engineer, as good at tactics as at aerodynamics, leaves behind him several successful race-car generations. And he has selected five of his favorite models for this issue of *Christophorus*.

1998

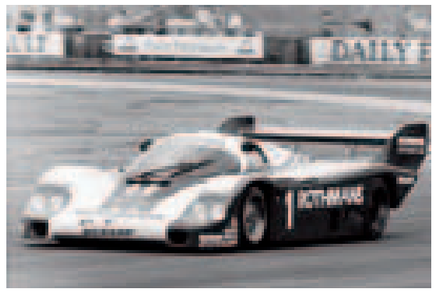
911 Carrera GT1

Engine: six-cylinder boxer Turbo
Cubic capacity: 3200 cc
Output: 400 kW (550 hp) at 5000 rpm
Maximum speed: 350 km/h

"Building a modern race car with a carbon-fiber chassis—that was new ground for us. For that reason alone, the GT1 version was a far cry from the 911 that had given it its name. I have high regard for this car, even if it didn't win anything, apart from Le Mans. But that victory at the 24 Hours was a triumph. It was pretty much the best Le Mans field ever, with manufacturers like BMW, Mercedes, Nissan and especially Toyota. Like the Japanese, we, too faced the decision of whether to use a sequential transmission. It permitted very fast shifting, but it wasn't as durable. Porsche had therefore decided against it, and accepted slower lap times. Toyota justified the risky option with the argument that they could replace the transmission within six minutes. That worked in the pit—but the Toyota broke down on the track. Porsche won."

1982

956/962

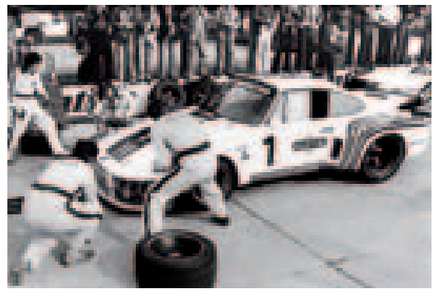


Engine: six-cylinder four-valve boxer Turbo
Cubic capacity: 2649 cc
Output: 456 kW (620 hp) at 8200 rpm
Maximum speed: 350 km/h

“On the 956, only the engine was tested, which was derived from the Indy Porsche that had never been used. Up to that time, Porsche had only manufactured pipe frames for vehicle design; for the 956, we for the first time built an aluminum monocoque. We didn’t buy the know-how, we taught ourselves. The aerodynamics was also completely new. We defined the ground effect anew for sports cars. It wasn’t easy, but it worked. Moreover, we had to design a long-tailed car for Le Mans again. We converted a 956 chassis, and reequipped it with a different tail end. The joke was, the long tail and the short one had the same total lengths. The difference was in the height of the wing and the shape of the sub-floor. The 956/962 won in Le Mans in 1982, 1983, 1984, 1985, 1986, 1987 and, as a GT, also in 1994.”

1976

935 Coupé



Engine: six-cylinder boxer Turbo
Cubic capacity: 2857 cc
Output: 434 kW (590 hp) at 7900 rpm
Maximum speed: 340 km/h

“In those days, the rules for Group 5 allowed some leeway. That’s how the new front end appeared, the so-called flat schnauzer. It didn’t accomplish much, but it looked spectacular. After all, we did win the production-car World Cup and Le Mans 1979 with this 935. The crowning conclusion of this vehicle series was actually the Moby Dick of 1978. True, this was a wild interpretation of the rules. We had widened the body extremely and also covered the doors completely. Where the competition merely milled exhaust holes into their sillboards, we sawed our whole vehicle floor off and dropped the car. When the car, designed with maximum breadth, stood there on wheels for the first time with its white paint-job, the dimension provoked the mechanics to comment: It looks like the Great White Shark. That later turned into ‘Moby Dick’.”

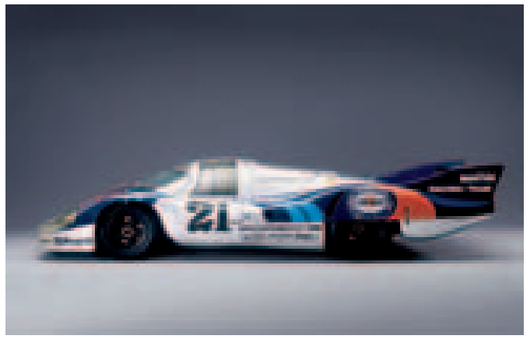
1974

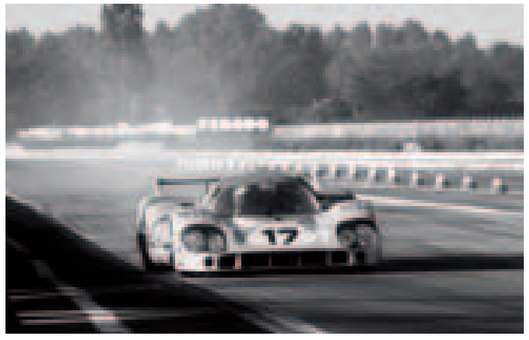
911 Carrera RSR Turbo 2.1

Engine: six-cylinder boxer Turbo
Cubic capacity: 2142 cc
Output: 368 kW (500 hp) at 7600 rpm
Maximum speed: approx. 300 km/h

“The occasion was the production-car world championship, which was to be based on road vehicles. For us, it was the first six-cylinder Turbo on the racetrack. So basically, it was a prototype. With the 500 hp engine with its charged-air cooling, the transmission and the thick tires, almost the entire weight was on the rear axle. Under the hood up front, there was a void. At first, we put the tank up there, but the emptier it got, the more dramatically the driving behavior changed, so we moved it to behind the front seat. The handling was steady after that. And we did come in second in the overall rankings at Le Mans and Watkins Glen.”

1971





917 Long-Tailed Coupé

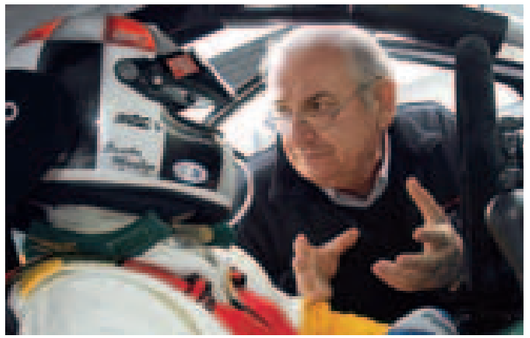
Engine: twelve-cylinder boxer
Cubic capacity: 4907 cc
Output: 441 kW (600 hp) at 8400 rpm
Maximum speed: 386 km/h

“June 27th 1971 was the first time that I was the chief engineer for Porsche at the racetrack. Pedro Rodríguez and Richard Attwood drove the 917 to its last victory in Zeltweg. As a test engineer, I had been looking into the aerodynamics of the 917. We had recognized that the vehicles should have negative lift—even if it wasn’t much, by today’s standards. We succeeded in increasing negative lift and also lowering air resistance for an increase in maximum speed. I was in the wind tunnel with the 1:1 vehicle for days. For example, that’s how the fins on the tail part of the short 917 (1971) got there.”

Come with the Wind

By
Elmar Brümmer

Photos by
Ulrich Upietz



Success for the grasping: Norbert Singer is a friend of racers and race cars

This has always been exactly our image of a mathematics professor: a strict but good-natured look over his glasses, patient and willing to consider even the most unusual approach to a solution, if the result is correct in the end. Norbert Singer chose a far bigger lecture hall after completing his studies at the Technical University of Munich in 1970: the racetracks of this world.

For almost thirty-five years, Singer was the fixed point in the whirlpool of 24-hour racing. He was involved in the design of all sixteen Porsche victories in Le Mans, from the 917 up to the 911 GT1. In the face of this unique success story, doesn’t the excitement get toned down a little? “Inside, it was hectic, all right,” the engineer confesses in his gentle baritone. “But somehow, you’re a fixed point on the team. If I had shown my excitement, I would only have increased the general hectic atmosphere.” He became a respected figure, too, because he never lost respect for the matter at hand.

Norbert Singer’s recipe for success involved accompanying a race car from its design in theory through to practical implementation. The necessary intuition and inspiration for this difficult terrain is to be found in the pit lane. And in turn, the experience gathered there flowed directly into the next development. Not only Norbert Singer has that kind of professional history; many do. And the pit lane, too, is a fast lane. “The pace is faster here than in other areas; that’s what racing is all about,” he says. “But that’s all I know.” That he never worked for anyone but Porsche also reflects his distinct preference for clear lines. And this man, who wants no storm around himself, finds it in the wind tunnel. He needs air for breathing—and for work. His handwriting on innumerable racing and road models is proof of that.

And it’s a good thing that his dreams have never had to stay behind in the process. Starting with his first one, which brought him into the world of aerodynamics: Even in school, Singer had already dreamt of the infinite distances of space. And that was the same curiosity which drove him on, from one race-car creation to the next. He had been on the team for hardly four months before he was already among the Le Mans winners. The toughest race of all—it fascinates him like none other. In 2003, he won the “Spirit of Le Mans” prize. He may return to the Sarthe as a retiree—but only if there’s something there for him to do: “You can only really experience Le Mans by living it.” And just as he values the individuality of race cars (“In a certain respect, it’s a relationship like with people. Cars have their strengths and weaknesses of character, too.”), he is certainly a team player: “The team is really important, not only at the track.”

His new priority is to return to old loves. Masses of motorsports photos and super-eight films need to be sorted. The space-ship of the lecture circuit lures. And then of course he will form his own picture of the world beyond the track. Singer is an enthusiastic photographer, preferably in black-and-white, and in the style of the natural-light imagery of Ansel Adams. For years, friends have been trying to talk him into holding an exhibition. But that would involve a storm that, we suspect, he’d rather leave in the wind tunnel. It’s somewhat embarrassing to him that North American enthusiasts have dedicated a fan club of their own to him, complete with an Internet tribute (www.adpix.biz/singer.htm). Sorry, Mister Singer. Some heroes find honor in their own time. ◂