

# 918 SPYDER

## TWICE THE POWER INTO THE FUTURE

*A vehicle. And a promise. The 918 Spyder pushes the limits of technological know-how. Now it's time to introduce theory to the reality of the track. The super sports car was tested in the Italian town of Nardò—and it passed with flying colors.*

By Götz Leyrer  
Photos by Christoph Bauer

*The heart of the 918 Spyder is already beating; the team's pulses race as the historic moment in Nardò approaches.*



*With an indefatigable attention to detail and a healthy dose of respect for the task, test-engineers ready the 918 Spyder for function tests. Preparation is everything.*



*A moment deserving of a brighter spotlight: The 918 Spyder rolls onto the test track in Nardò, Italy. Go, Spyder!*

**T**he clock is ticking. A display in the office of Dr. Frank-Steffen Walliser, head of the 918 Spyder project, counts down the days to Day X—September 18 of the coming year. Production of the 918 is to begin exactly on 9/18.

The 918 team at the Porsche Development Center in Weissach is working full tilt to complete what is the most sophisticated and complex design in the storied history of Porsche. Its numeric predecessor, the 917, with which Ferdinand Piëch once turned the sports-car world on its head, comes to mind. But so does the technologically extraordinary 959 and, a more recent genus, the Carrera GT.

Porsche's goal with the 918 Spyder is nothing less than to leave all these legends behind, with a super sports car that performs brilliantly at the very limits of the technologically achievable. The target numbers are a testament to Porsche's ambition. More than 770 hp (566 kW) will propel the two-seater from zero to 100 km/h (0–60 mph) in less than three seconds and push it to a top speed of over 325 km/h (202 mph). But what could really set the Porsche apart from all other sports cars in

the elite ranks is its fuel consumption: Porsche aims to achieve a norm value of just three liters per 100 km (78 mpg) according to the New European Driving Cycle (NEDC). A miracle? One with a very down-to-earth background, at any rate. The 918 Spyder is conceived as a plug-in hybrid and therefore profits from the laws of the driving cycle. Two electric motors complement its combustion engine. One of them, 90 kW strong, is positioned at the rear axle and is coupled with the combustion engine as a hybrid module. The other one drives the front axle independently and puts out 80 kW. Both are powered by a liquid-cooled lithium-ion battery with a capacity of 6.8 kWh.



The 918 Spyder will thus be able to drive on electric power alone—gas consumption zero—and yet, astonishingly, post acceleration times that are adequate even by Porsche standards, and a top speed of 150 km/h (93 mph). The vehicle's range in this driving mode will be about 25 kilometers (15 miles). The battery is charged by a completely new system of recuperation that delivers more than three times the amount of energy when braking than did previous designs. The Porsche also can be con-

nected to the power grid. In fast recharging mode, a full battery recharge takes two hours (a normal recharge takes four hours).

The complex hybrid technology adds weight to the car which has to be balanced out elsewhere. Porsche engineers are working feverishly to do just that—for instance by using completely new wheel mounts that alone shave off roughly 8 kilograms (18 lbs.). And by adapting the oil pumps of the dry sump lubrication, made from a high-grade plastic for the first time. The 918 is slated to weigh in at less than 1,700 kilograms (3,747 lbs.). A major contributor to this highly respectable result is the carbon fiber-composite monocoque of the 918 Spyder.

The actual heart of the 918 Spyder will be positioned in the middle of the vehicle in an engine mount that is also constructed of carbon fiber-reinforced plastic: an eight-cylinder engine specially designed for the top Porsche. Because all auxiliaries are driven electrically, there are no longer any belt drives. Extremely light construction characterizes the power unit, which includes titanium connection rods, the thin-walled low-pressure casting at the crankcase, and the steel crankshaft, which, unlike those of all other Porsche V8s, which are positioned at



*The 918 Spyder comes to a halt—but just long enough for a brief inspection. Porsche board member for Research and Development Wolfgang Hatz (right) and project leader Dr. Frank-Steffen Walliser know exactly where the project is headed.*

a 90-degree angle, has a “flat” 180-degree design. This typical race-car construction brings a notable performance boost at higher rpms.

Among the more obvious features of the 4.6-liter V8 is its exhaust system. Located in the middle of the cylinder V, the short pipes stick out just above the engine. The design recalls Formula One classics in which the exhaust pipes were positioned higher for reasons of space. The reasons are different in the 918: through the top pipes of the HSI engine (hot side inside), the ambient temperature in the engine compartment drops, which in turn promotes the active cooling of the lithium-ion battery, also positioned in the middle of the car at the center of gravity.

The combustion engine will provide the lion’s share of the enormous power of the 918. With a projected output of 570 hp (419 kW), the 918 is designed for a maximum engine speed of 9,000 rpm. Yet it will be among the most economical engines in the elite class. Its consumption values should be roughly 40 percent lower than the ten-cylinder engine of the Carrera GT.

Hints as to what awaits the future driver of the 918 can be gleaned from the test vehicle with

which the engineers test the interaction of all technological components. The task of coordinating fifty control devices to combine the power of the combustion engine and the two electric motors in order to create a harmonious whole is a daunting one. In addition to the electric driving mode, three other modes will be available to the driver at the press of a button.

In “Hybrid” mode, the drive ensures the highest-possible efficiency—ideal for a consumption-oriented driving style in urban traffic. In “Sport-Hybrid” mode, the V8 engine kicks in only when needed, otherwise leaving the work to the main drive and letting the electric motors add some punch when a bit of extra performance is required. “Race-Hybrid” kicks it up yet another notch. The electric motors provide more boost, and the seven-speed double-clutch transmission adopts a decidedly sporty posture. The 918 lays it all on the table in “Hot Lap” mode. In this mode, the battery is pushed to its limits for a few fast rounds.

Acceleration is impressive even in electric mode. The torque provided by the two electric motors is available immediately, and provides the kind of punch that Americans in particular, accustomed as they are to big engines, can

appreciate. When the driver steps a bit more firmly on the pedal, the eight-cylinder engine springs to life. It seamlessly takes over as the dominant drive, pressing the occupants deep into their bucket seats with immediate force and underscoring the extraordinary, technologically advanced acceleration with a roar from the two exhaust pipes. The ultimate composition of the sound is still in the works, but initial test-drives in Nardò have kindled appetites for the finished menu of seemingly inexhaustible torque, lightning-fast acceleration, phenomenal traction, and braking to match.



The 918 has not yet run the track that is the litmus test for any sports car: the Nürburgring’s Nordschleife. But modern computer simulations enable highly precise forecasts of what the hybrid technology and the suspension with adaptive rear-wheel control will make possible. Porsche engineers expect lap times of 7:22, roughly ten seconds faster than the Carrera GT! For aficionados, this number alone says it all: the 918 Spyder will usher in a whole new sports-car world. ■

