

THE 911 WITH A KICK



Once again a 911 is ahead of its time. Porsche presents the 911 GT3 R Hybrid—a type of laboratory in a racing car that will subject hybrid technology to the toughest of conditions. The ultimate test will occur May 15 and 16, when the 911 Hybrid will compete in the 24-hour race on the Nürburgring.

By
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Photos and illustrations by
Porsche

PREMIERE

911 GT3 R HYBRID

The launch of the 911's international racing career in 1965 is closely associated with the names Herbert Linge and Peter Falk. These two young members of the Porsche testing department drove the 911 to a class victory and a fifth-place overall in the Monte Carlo Rally. Since that start, Porsche 911 models have won more contests on racing circuits, rally courses, and desert tracks than any other competitor. To maintain this position, Porsche's racing department is seeking to produce even more power for the GT3 R than the six-cylinder horizontally opposed engine produces on its own. The latest version of the GT3, with a 4.0-liter displacement, generates 480 horsepower (353 kW). To make its operations not only more dynamic but also more fuel-efficient, the engineering experts have developed a special hybrid system. They are convinced that success will soon also be measured by the careful handling of contestants' fuel needs.

During each of the many braking procedures that constantly take racing cars to their physical limits, a huge amount of energy is converted into heat. Porsche's hybrid system enables a large part of this energy to be recovered and stored, and then used to boost the gasoline engine when under acceleration. The Porsche engineers are working with two 60-kW (81.5-hp) electric motors that drive the front wheels by means of axle shafts when the vehicle accelerates. During braking maneuvers, the motors' function reverses; instead of driving, they now are driven. Serving as electric generators, they send a large part of the energy that would otherwise be wasted in braking to a storage unit.

The role of the storage unit in the 911 GT3 R Hybrid is handled by an electric flywheel; it operates as an electric motor and can both store and release energy. When this flywheel attains a rotational speed of 28,000 to 40,000 rpm and full power during a braking phase, it can offer full output for six to eight seconds to the two 60-kW electric motors that drive the front wheels.

In contrast to other hybrid technologies, the system in the 911 GT3 R Hybrid does not require a battery. The flywheel's capacity suffices for the short, powerful sprints in racing when drivers push the boost button. Every recharge gives the driver supplementary power for a short period.

There are also environmental reasons for not having a battery. The system's maximum number of cycles, which exceeds a million, is much higher than that for batteries. Moreover, it is no longer necessary to dispose of the toxic waste in spent batteries.

The 911 GT3 R Hybrid is thus a perfect example of the "Porsche Intelligent Performance" philosophy, a principle found in every Porsche—namely, more power using less fuel, and greater efficiency with lower CO₂ emissions—both on the track and on the road.

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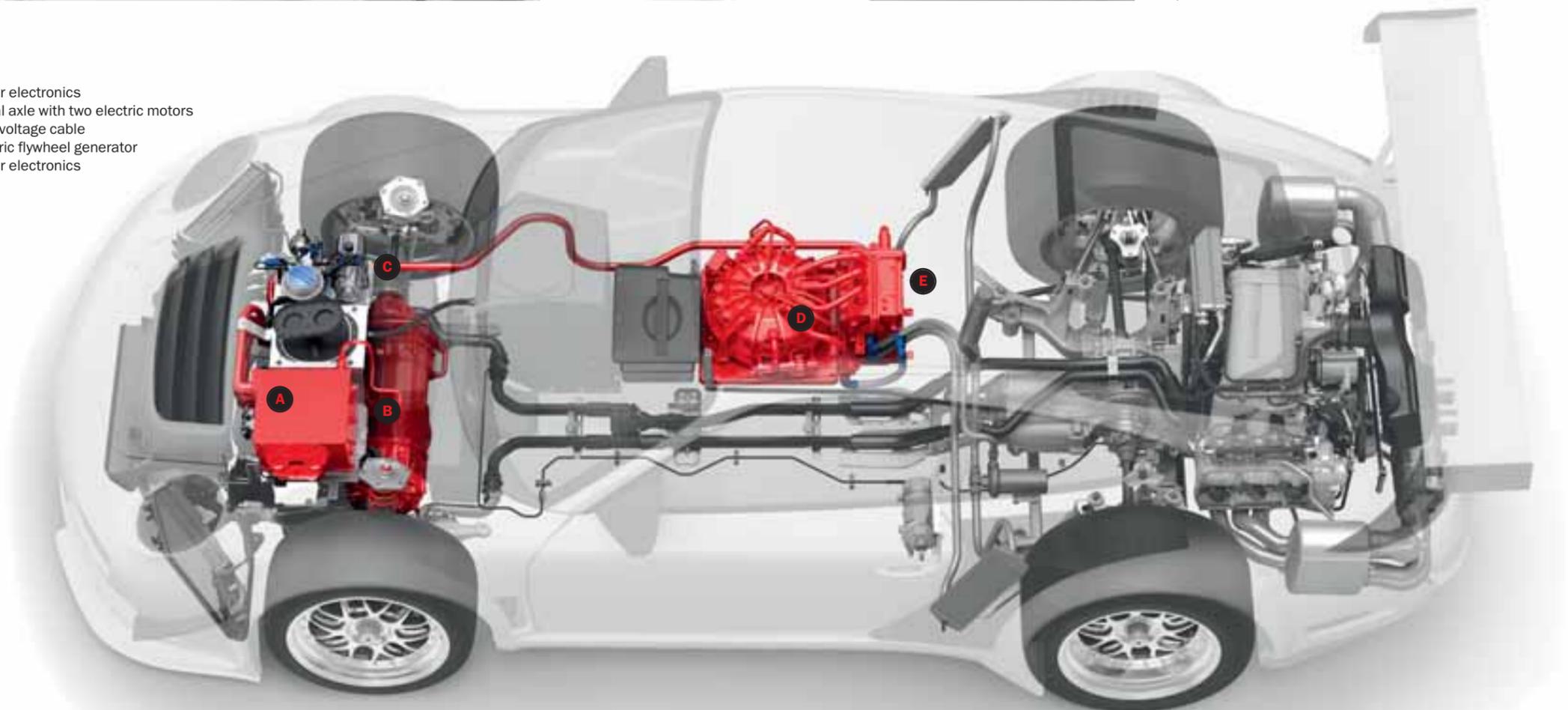
- 1 Transmission reduction
- 2 Multi-disc clutch
- 3 Electric motor
- 4 Power electronics



- 5 Rotor
- 6 Stator
- 7 Power electronics



- A Power electronics
- B Portal axle with two electric motors
- C High-voltage cable
- D Electric flywheel generator
- E Power electronics



In resolutely following this development strategy, the engineers were not focusing primarily on having the 911 GT3 R Hybrid win every race it enters. Rather, they view the vehicle as something of a laboratory on wheels, demonstrating the potential of a new technology on the racetrack. When it enters the 24-hour contest on the Nordschleife ("North Loop") of the Nürburgring on May 15 and 16 in the E1 XP class (experimental vehicles), this hybrid sports car is expected to show its competitive edge not only in power, but also in enhanced efficiency. This in turn will raise the performance level of the 911 GT3 R Hybrid, for example by lowering its tank weight or even lengthening the time between pit stops.

At Porsche, success on the racetrack is a precondition for deploying new technology in its production vehicles. Porsche technicians are carrying on this tradition by monitoring the 911 GT3 R Hybrid for potential contributions that its hybrid technology can make to street-legal racing cars.