



## New Stratos on track: Stoschek's dream comes true

**The one-off sports car drawn on heritage of the Lancia Stratos was engineered and built by Pininfarina for German business man Michael Stoschek**



*Le Castellet, november 29, 2010* – The dream of a collector and European Rallye Champion, and the mastery of a legendary designer and coachbuilder have come together to write a new chapter in the history of supercars. The result is the New Stratos, a one-off engineered and built by Pininfarina for the German business man Michael Stoschek and unveiled today at the Paul Ricard Circuit of Le Castellet, France.

This is a dream Michael Stoschek had been pursuing since 2003, first by participating in the Fenomenon project conceived by Mr. Chris Hrabalek, which presented a Fenomenon concept study for the first time at the 2005 Geneva Motor Show. Then, Stoschek decided to commission Pininfarina to build a one-off vehicle just for himself and his son, Maximilian, requesting them to design and build a modern recreation of his favourite car, the legendary Lancia Stratos.

Inspired by the Fenomenon Style Model, Pininfarina translated the original Stratos styling theme of the Bertone Stratos of the 70's into a modern day one-off through some styling implementation and style feasibility activities. What is more, the car was tailored on Michael and Maximilian Stoschek's technical and formal specifications.

The New Stratos explores the theme in a contemporary formal approach, without neglecting a single aspect in terms of function or performance. While this is quite literally a dream car, the New Stratos is a living, breathing car with a beating 4.3L V8 horsepower heart to propel it – where permitted – to 200 km/h in less than 10 seconds. Since late 2008, the car has been engineered and manufactured at the Cambiano style and engineering centre of Pininfarina. The project was managed by Pininfarina's Special Project Division confirming Pininfarina's intention to offer special cars among its range of services, in response to an increasing demand for unique cars from enthusiasts and collectors.

Special projects allow Pininfarina to fully express its coachbuilding traditions as well as its styling and engineering skills. Pininfarina has always had a natural vocation for custom-built motor cars. It was thanks to its exceptional capacity to interpret its clients' dreams, creating unique or limited series, that the fame of Carrozzeria Pinin Farina spread rapidly in Italy and abroad throughout the 1930s and 40s. Even in the case of the New Stratos, the client has been the project's real protagonist, intervening in all the phases that lead to the creation of the final custom-built car: from style implementation to engineering, from the selection of materials to the final assembly.

### Source and inspiration for a new dream car

The very first inspiration source of Michael Stoschek's Special Project is the legendary Lancia Stratos HF that was without any doubt the most spectacular and successful rally car of the 70's.

The project result, the contemporary New Stratos, is an innovative supercar made for Michael Stoschek and his son Maximilian. Michael Stoschek is chairman of the Brose Group shareholder's meeting. He is also a collector and driver of historic racing cars as well as a successful entrepreneur in the automotive supply.



The decision to develop and build a new, ready-to-run Stratos was inspired by a meeting with Chris Hrabalek, with whom Michael Stoschek became acquainted at the 1986 World Stratos meeting organized in Alta Badia by Stoschek. This was also the impetus behind Stoschek's involvement in the 2005 Fenomenon Stratos project, as well as his acquisition of the Stratos trademark rights.

In September 2008, Michael and his son commissioned Pininfarina to the fulfilment of a long-held dream and to the build of a one-off vehicle the technical concept and design of which were largely determined by the two car enthusiasts.

In respect of the Lancia Stratos of the 70's, the New Stratos is a newly developed, independent sports car that, as in the 1970s, integrates several components from the Fiat Group's production vehicles.

The roll cage – made from 2.5 mm thick tubing, with a 40 mm diameter, and welded into the shortened aluminum chassis – has been manufactured to current FIA standards. This not only improves safety for the vehicle occupants, but also significantly enhances the handling precision. Despite the cage structure and the built-in air conditioning, by keeping the body, interior and almost all the components lightweight, the weight of the base vehicle could be kept at an absolute minimum. Overall, engine performance was only slightly increased; however, thanks to the New Stratos' minimal weight, excellent balance and new set-up, the vehicle delivered a truly extraordinary performance and unbelievable driving pleasure.

Today, the New Stratos is one of a kind. Whether or not an exclusive, limited run will be manufactured, depends upon demand.

## **The Design**

Classic products are Style icons forever. The Bertone Lancia Stratos, with its avant-garde design, is still an inimitable Style icon. Michael Stoschek thought that, "because the design of the Lancia Stratos was characterized by the contrast between round and rectilinear elements, I wanted to see that tension to be carried over into the New Stratos as well."

The assignment was to find a contemporary interpretation for all the quintessential design characteristics of the Lancia Stratos, including: the wedge-shaped body, the semi-circular windshield, the front end with its central radiator, the rear end with its round tail lights, roof and rear spoiler and the five-star rims. Since the project began in late 2008, all of Michael and Maximilian Stoschek's, as well as Chris Hrabalek's, conceptual and formal specifications for the body and interior have been implemented by Pininfarina in order to make the car feasible.

"It was Mr. Stoschek's dream to recreate a car like that, and it was our job to interpret it" said Luca Borgogno, part of the Pininfarina's team designers, who followed the styling implementation and style feasibility of the New Stratos Project. "In the end, the role of a design house like Pininfarina is to contribute creativity and expertise that goes beyond the client's expectations. We handled the whole process right up to the construction of the finished car. Following this process, the client lived an absolutely unique experience. He got the chance to witness the birth of his own car, a very personal environment that we make to measure for him".

Once the styling implementation had been approved, the New Stratos went through all the steps necessary to become a real, fully functioning car ready to be driven on the road. This was a complex and comprehensive process that goes beyond the mere construction of a prototype and included the whole engineering of the car with mathematical modeling, the design and testing of each component, wind tunnel testing.



## The Test Drives

To use the potential of the light, torsionally rigid and well-balanced vehicle to full advantage, the vehicle height, camber, toe and caster were redeveloped and, above all, the whole setup. Uniball joints and stiffer springs were employed, as well as a new damper calibration, allowing greater differentiation of the damping force, adjustable via the steering wheel. Optimum wheel / tire combinations were explored via testing of various tire brands, dimensions and rubber compounds. The Brose-sponsored, Portuguese WTCC pilot and former Formula 1 driver, Tiago Monteiro, contributed significantly to the chassis development together with the engineers from ZF Sachs.

## The Aerodynamics

Starting from an initial assessment of the aerodynamic performances of the donor car, the development of the new Stratos has been carried out in the Pininfarina wind tunnel through sessions in the style phase, to validate the base shape of the car and in the final test stages of the project, to refine the aerodynamic details.

The aerodynamic development has been concentrated in the verification of several ride heights of the car axles, together with many variants of front and rear spoilers and front lips, in order to determine the best balance of drag and downforces.

Flow visualizations techniques and pressure measurements have been applied to optimize the efficiency of the air intakes and outlets, for the front cooling pack, the engine and the brakes.

## The Engineering

The goal for the development of the Lancia Stratos HF's successor was to once again create a mid-engine sports car with a short wheelbase, low weight and superior agility. Just as the Lancia Stratos, with its Ferrari Dino V6 engine, was nevertheless a distinct sports car in its own right, the New Stratos is also a distinct development, using components of the Ferrari 430 Scuderia. Almost all of these components have been modified and, as necessary, customized to their new purpose. However, it should also be pointed out that the Ferrari Scuderia really sets the standard amongst the current super sports cars and, as such, provides an excellent base for the New Stratos.

The chassis, composed from aluminum extrusions, was shortened by 20cm and welded to a roll cage made of FIA-certified, 40mm-thick steel. This method significantly increases rigidity, and this, combined with the shifting of the center of gravity towards the front, provides the basis for the vehicle's extraordinary handling characteristics. Both the body – which is 33cm shorter than the Scuderia's – and the interior are constructed entirely of carbon fiber and aluminum.

The 4.3L V8 engine, which draws its intake air from the roof spoiler's side openings, has been equipped with a new control unit and a high-performance exhaust system, including manifold and sports cat.

The 6-speed transmission received a new mechanical differential lock, and the modified control electronics allow for even faster gear changes at less than 60 milliseconds.

The chassis was completely reengineered, including integration of new electronic damper calibration, adjustable via the steering wheel, modified springs and optimized camber and toe values. The 9- and 11-inch wide by 19-inch center lock wheels are fitted with Dunlop Sport Maxx tires, sizes 265/30/19 and 315/30/19.

The Brembo brake systems, comprised of 398mm-diameter ceramic discs and 6-piston calipers at the front axle, and 350mm-diameter and 4-piston calipers at the rear axle, are equipped with Brembo racing brake pads and steel flex lines.

Finally, the steering has been converted to electro-hydraulic, the new smaller steering wheel displays the shift points via multi-colored LEDs and the paddle shifters are from the Ferrari 430 racecar.



The battery is a lithium unit in a carbon casing, with a weight of 4.2kg and a capacity of 84 Ah. Despite the approximately 55kg steel roll cage and the 28kg air conditioning unit – which it was necessary to take on due to the large glass surfaces – the New Stratos weighs about 80kg less than the base vehicle.

### **The Chassis**

The base chassis of Ferrari 430 Scuderia has been modified, shortening the wheelbase by 200 mm at the rear firewall section and rebuilding the upper structure, now made of a steel roll cage instead of the original aluminium extrusions. The combination of above modifications together with the carbon fibre inner structure of the roof, bonded to the roll cage, have led to a significant improvement of the torsion and bending stiffness of the body, as well as to the roof crush resistance. All the above customizations have been supported by CAE simulations during the engineering phase and certified by experimental verifications performed on our test rigs.

### **The Body**

The engineering development of the car has been performed in order to obtain CAD data suitable for tooling and parts manufacturing. All legal requirements for the European certification of the car have been fulfilled. In the meantime, the car obtained official approval and homologation for road service by the German TÜV. The exterior is completely manufactured in carbon fibre panels, with integrated low density structural foams inserts, to create a light weight and highly stiff composite sandwich. The roof and the body side are the only fixed parts, bonded to the chassis structure. The big front bonnet and engine hood, together with the doors, are hinged in the same way of the original Stratos.

The completely redesigned interior features a new dashboard and new instruments, new door panels and custom racing seats, all made in carbon fibre, including the other new trim panels. The original Ferrari air conditioner has also been integrated in the new cockpit. The door trim panels have been conceived with a dedicated space for 2 carbon helmets storage. All exterior and interior carbon fibre parts have been painted with a special clear-coat, added with pigments, to create a uniform black look and keeping the carbon matrix visible.

### **Technical specifications**

Length 4181 mm  
Width 1971 mm  
Height 1263 mm  
Wheelbase 2400mm  
Front track 1668 mm  
Rear track 1682 mm  
Dry weight 1240 kg