FERRARI F1-2000

MICHAEL SCHUMACHER

The Formula I world champion in 2000

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FANHOME

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SCHUMACHER AND TODT ALMOST BROTHERS

From the moment he arrived at Ferrari, Michael Schumacher established a very deep relationship with Jean Todt, both professionally and personally. Schumacher was a great champion, but he also had some weaknesses. Todt understood this and created an environment in which the German driver could give his best and win the F1 World Championship in 2000.

When Michael Schumacher arrived at Maranello at the end of 1995, he was just 26 years old and fresh from his second consecutive Drivers' World Championship he won with Benetton, an important team that had prospered with him. But Ferrari was another planet, a world heritage site of motorsport. Welcoming the German driver was Jean Todt, Ferrari's sporting director since July 1, 1993. A Frenchman from Pierrefort, Todt was almost 50 years old and boasted 30 years of experience in the world of racing, which began in 1966 as a rally driver. After winning the 1981 World Rally Championship for Manufacturers with Talbot (where he was the co-driver of Guy Fréquelin), in 1982 he took over the sporting management of Peugeot Talbot Sport, where he revealed his formidable organizational skills by winning two World Rally Championships, four Paris-Dakars, and two 24 Hours of Le Mans. Todt had been experiencing for some time the weight of being at the head of *the* racing team par excellence – he was already



under scrutiny, public opinion was rather cold towards him and, above all, in two and a half years with Ferrari he had won only two races. Too few.

Brotherly relationship

Schumacher and Todt hit it off immediately, perhaps due to a certain affinity of character. The German has above-average analytical skills and technical knowledge, he is a perfectionist to the point of implausibility, and at the wheel he shows extraordinary competitive viciousness. Outside the cockpit, however, he is not very sociable and, at least at the beginning, he struggled to win over fans. Soon the relationship between the two was cemented and went beyond professional esteem and common ambitions: it became a deep friendship, almost a brotherhood. When the team manager went through a particularly difficult time, Schumi declared: "If Todt leaves, I'll leave too." For his part, Todt didn't hesitate to defend the German even when he made serious mistakes, as in the 1997 Jerez race.

A second family

Privately, Schumacher is an open, sincere person, but also shy and not without fragility: a shyness that some mistake for arrogance. Born and raised in a family of modest means – the German revealed his prodigious talent in the go-kart track run by his father – and with his parents separated since he was a child, Michael found his peace in the world of Formula 1 and a second family in Ferrari. The mechanics had a driver who always defended them, the technicians a champion who listened to them and was ready to experiment with new solutions. Todt, in particular, was like an older brother to Schumacher: he protected him and showed the way to the driver in the most difficult circumstances. This was also one of the secrets of the extraordinary season that brought the world title back to Ferrari. ■



Jean Todt in civilian clothes talking to Schumacher at the Mugello circuit, in 2006. The deep friendship between the two lasted even after Schumi's definitive retirement from racing.



Jean Todt joyfully welcomes Schumacher to the pits after the German's victory in the 2000 United States Grand Prix.



FERRARI F1-2000
THE IMPORTANCE OF AERODYNAMICS





The aerodynamic profile of the F1-2000 was studied in detail, particularly in the wind tunnel at the Maranello factory.

During the presentation of the Ferrari F1-2000, engineer Rory Byrne emphasized the fact that the new car's improved performance compared to the F399 would depend largely on its aerodynamics. In fact, for the 2000 season the Scuderia had created a single-seater that, while recalling the essential lines of the previous season, presented a series of significant modifications.

The main architects of the new project were Nikolas Tombazis, responsible for aerodynamics, and James Allison, chief designer, who were able to make use of the new wind tunnel built in Maranello to a design by Renzo Piano.

A "cleaner" tail

The major innovation of the F1-2000 from an aerodynamic point of view was due to the engine. With the cylinder banks of the 10-cylinder V engine now set at 90° (instead of 80°, as on the F399), the car had a lower center of gravity and a lower rear end, a crucial area because this is where the air flows from the front end come together and must "slide" as quickly as possible along the shape of the car.



A "SIGNATURE" GALLERY

Designed by architect Renzo Piano and built in the second half of the nineties, the Maranello wind tunnel was the result of a huge investment made by Ferrari to equip itself with a facility essential for the design of cars intended to compete in Formula 1. On the outside, the building, with its futuristic design, clearly revealed the signature of one of the world's most famous contemporary architects.

Inside, the wind tunnel stood out for its moving walkway, which allowed the simulation of the car's movement. This was a fundamental improvement on tunnels with fixed floors, because it allowed for a much more accurate analysis of the flows that run beneath the car. The tunnel itself was 262 ft (80 m) long and 230 ft (70 m) wide, and the air was generated by a fan with a diameter of 16 ft (5 m).





In this image you can see the two fins located just behind the driver's head, under the central air intake.

The optimum flow makes the most of the downforce guaranteed by the large rear wing and therefore increase the grip of the rear tires, which tend to slip less and, consequently, perform better and wear out more slowly. Again with a view to keeping the rear end as clean as possible and limiting turbulence as much as possible, the so-called "chimney" exhausts were used (as on the F399), which direct the exhaust gases upwards.

High nose

The front end of the F1-2000 had a sinuous and streamlined "nose", and was much higher than the F399. This was to increase the air flow directed toward the lower part of the car, which is exploited to increase ground effect. The front wing had an arrow-shaped profile and the side bulkheads had a more complex shape than those of the F399. Another design feature (which can be seen clearly if you look at the car from the front) was the side wings above the driver's head, which were slightly separated from the body of the car, thus creating two additional air flows. The sides also had a squarer and lower attachment: compared to the F399, they appeared almost horizontal and were shaped in such a way as to create a sort of "invitation" to effectively convey the air flows toward the rear area. ■

DURING THE SEASON, SEVERAL MODIFICATIONS WERE INTRODUCED, INCLUDING SOME TO BETTER ADAPT THE CAR TO THE CHARACTERISTICS OF THE TRACKS.

BRAZIL 2000
SCHUMACHER WINS AGAIN

After the inaugural race in Australia, which ended with a one-two for Ferrari, the second round of the 2000 F1 World Championship was scheduled for March 26, on the Interlagos track in Brazil. The circuit had been completely resurfaced in a not entirely successful attempt to eliminate the numerous irregularities caused mainly by the marshy ground on which it stands. Some teams had already made some modifications to their single-seaters, in particular McLaren-Mercedes, who tried to remedy the valve problem that caused the failure of the engines of both cars in Australia. There was a great feeling of optimism at Ferrari after the triumph in Melbourne. Barrichello, who was extremely motivated because he was racing on his home circuit, was among the fastest in the free practice sessions, while Schumacher had to replace his engine on Saturday morning.



On the right, Schumacher on the Interlagos circuit. As well as winning, the German also recorded the fastest lap in the race.

McLaren still on the front row

Schumacher was also unlucky during qualifying: the German went off the track and damaged his chassis, thus having to resort to the replacement car. On the Brazilian circuit it rained intermittently and, as if that wasn't enough, three advertising billboards collapsed, causing as many interruptions during practice. In the end, the first two rows of the starting grid were identical to those in Australia: Mika Häkkinen, who had secured pole position, was flanked by his teammate David Coulthard, while behind them were the Ferraris of Schumacher and Barrichello, 4 and 5 tenths of a second behind the Finn





Barrichello in the Ferrari pit for refueling and tire changes.

AFTER THE ONE-TWO IN AUSTRALIA, FERRARI WENT TO BRAZIL FEELING CONFIDENT, KNOWING THAT IT HAD EVERYTHING IT NEEDED TO WIN THE WORLD CHAMPIONSHIP.

FINAL RANKING

1 - M. Schumacher
Ferrari

2 - G. Fisichella
Benetton-Playlife

3 - H-H. Frentzen
Jordan-Mugen Honda

4 - J. Trulli
Jordan-Mugen Honda

5 - R. Schumacher
Williams-BMW

6 - J. Button
Williams-BMW

7 - J. Verstappen
Arrows-Supertec

8 - P. de la Rosa
Arrows-Supertec

9 - R. Zonta
BAR-Honda

10 - G. Mazzacane
Minardi-Fondmetal



The greatest: Pelé, the legend of world soccer, congratulates Schumacher, winner of the Brazilian GP and future Kaiser of Formula 1.

respectively. Schumi wasn't able to complete his best lap because there wasn't enough fuel in the spare car.

Schumacher lays down the law

The two top teams adopted different strategies for the race: McLaren planned only one pit stop for fuel and tires, while Ferrari opted for two stops in an attempt to impose a higher pace and force its rivals to push their cars, which had proved unreliable in Australia. At the start, Schumacher immediately passed Coulthard and on the following lap he also passed Häkkinen, taking the lead of the race. When he made his first pit stop, after only 15 laps of the 71 scheduled, the German already had a 22-second lead and this allowed him to return to the track immediately behind the Finn, who stopped on lap 31 with a broken engine. Unfortunately, the same thing had happened to Barrichello shortly before then, with the Brazilian forced to retire in front of his home crowd. At that point Schumacher managed the race perfectly and won his second GP in a row, finishing ahead of Coulthard, who was later disqualified due to irregularities found in his car. On the podium, waiting for the winner to receive his prize, was a Brazilian soccer icon: the legendary Pelé. The championship standings saw Schumi in the lead with 20 points, 12 more than Fisichella in second place. ■

1950 F1 WORLD CHAMPIONSHIP A YEAR OF EXPERIMENTATION

For the first F1 World Championship, held in 1950, only two types of engines were allowed: naturally aspirated (maximum displacement of 4.5 liters) or supercharged (maximum displacement of 1.5 liters). Ferrari began the season with the 125 F, equipped with a supercharged 60° V12, but this car proved to be unreliable and difficult to tune. It also consumed too much fuel and didn't perform as well as the Alfa Romeo 158 – also powered by a supercharged 1.5 liter engine but with eight in-line cylinders – which would dominate the season, winning the first World Championship title with Nino Farina.

A naturally aspirated engine

Disappointed by the performance of the 125 F1, Enzo Ferrari decided to go down the naturally aspirated engine route. The new engine

AFTER ABANDONING THE 125 F1 WITH A SUPERCHARGED ENGINE, FERRARI QUICKLY DEVELOPED NEW V12 ASPIRATED SINGLE-SEATER CARS TO COMPETE IN THE FORMULA 1 WORLD CHAMPIONSHIP.



The 275 F1 makes its debut in the Belgian Grand Prix, valid for the 1950 F1 World Championship. At the wheel is Alberto Ascari.



Luigi Villoresi's 275 F1 after a nasty crash in Geneva, during the Grand Prix of Nations.

was designed by Aurelio Lampredi, who developed a series of power plants starting from a 3.3-liter 12-cylinder 60° V unit, called the "type 275" (the value of the unit displacement). This engine was installed for the first time in two 166 MM cars (renamed 275 S for the occasion) with a Touring barchetta body, at the Mille Miglia on April 23, 1950. The 275 F1 made its debut in the F1 World Championship at the Belgian Grand Prix on June 18, 1950, driven by Alberto Ascari. Qualifying on the third row with the sixth-fastest time, the Milanese driver finished the race in fifth position, behind Fangio and Fagioli (both in Alfa Romeos), Rosier (Talbot Lago), and Farina (Alfa Romeo). Two weeks later, a 275 F1 was taken to Reims for the French Grand Prix. Luigi Villoresi tested the car for a few laps, but judged it unsuitable for the very fast Marne circuit and didn't even take part in the qualifying; Ascari also did a few laps in the 275 F1, but was disappointed. The 3.3-liter engine made its last appearance on July 30 at the GP of Nations in Switzerland, a race not valid for the F1 World Championship. The 275 F1, driven by Villoresi, was forced to retire after going off the road while in fifth position. Also on the Geneva street circuit, Ferrari debuted the 340 F1, which had a V12 60° increased to 4.1 liters, installed on a new chassis with a slightly longer wheelbase. At the wheel, Ascari remained in the lead for a long time but had to retire a few laps from the end due to engine failure. The competitive life of the 340 F1 was also very short: after its debut in Geneva it only reappeared at the end of the season, on October 29, at the Penya Rhin GP (also not valid for the F1 World Championship). The 375 F1,



with the "definitive" 4.5-liter engine that debuted with encouraging results in the Monza GP, was also lined up on the Catalan track of Pedralbes. In Spain, the only 340 F1 was entrusted to Piero Taruffi, who finished the race in third position behind the 375 F1s of his teammates Alberto Ascari and Dorino Serafini.

Solid third place

The first Ferrari single-seater specifically designed for F1, the 275 F1 was based on a traditional chassis: a tubular steel structure with side members and cross members. It was equipped with independent front suspension composed of deformable quadrilaterals, a lower transverse leaf spring, and Houdaille hydraulic shock absorbers, while at the rear it had a De Dion axle, double attachment struts, lower transverse leaf spring, and Houdaille shock absorbers. The fuel tank was at the rear, behind the driver.

The engine of the 275 F1 was designed from scratch by Aurelio Lampredi. It had a light alloy monobloc and a double-walled crankcase, to save weight. Powered by three Weber carburetors with single-shaft distribution, it was capable of delivering 300 hp at 7,300 rpm. After just a couple of races Lampredi decided to increase the bore of the V12 from 2.83 to 3.15 in, while leaving the stroke unchanged at 2.68 in: this gave him a 4.1-liter 340 type engine. A similar operation a short time later saw the stroke increase from 2.68 to 2.93 in (the bore remained at 3.15 in). The result was the 375 engine with a displacement of 4,493.73 cc, a compression ratio of 11:1, and a power output of 350 hp at 7,000 rpm. ■



The start of the Belgian Grand Prix. In the lead are the Alfa Romeos of Juan Manuel Fangio (left) and Nino Farina, followed by the Ferrari 125 F1 of Villoresi. Further back, on the left, is the third Alfa of Luigi Fagioli and the Ferrari 275 F1 of Ascari.

FERRARI 275 / 340 / 375 F1 COMPARISON



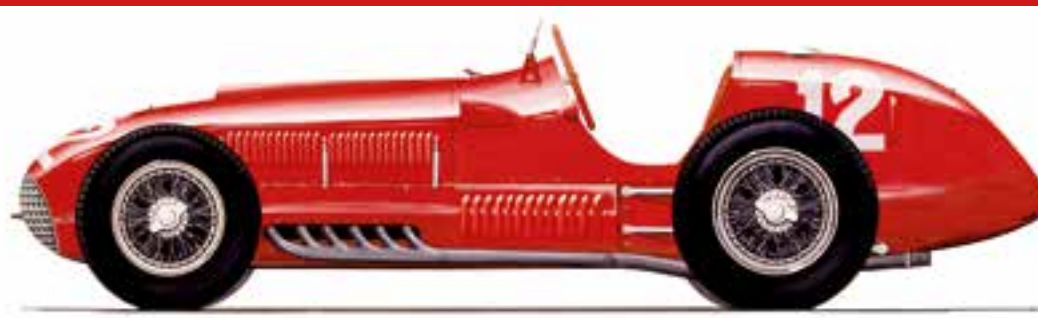
275 F1

Engine	Displacement	Bore × stroke	Maximum power	Maximum speed
front, longitudinal, 12 cylinders V 60º	3,322.34 cc	2.83 × 2.68 in (72 × 68 mm)	300 hp at 7,300 rpm	approx. 174 mph (280 km/h)



340 F1

Engine	Displacement	Bore × stroke	Maximum power	Maximum speed
front, longitudinal, 12 cylinders V 60º	4,101.66 cc	3.15 × 2.68 in (80 × 68 mm)	335 hp at 7,000 rpm	approx. 186 mph (300 km/h)



375 F1

Engine	Displacement	Bore × stroke	Maximum power	Maximum speed
front, longitudinal, 12 cylinders V 60º	4,493.73 cc	3.15 × 2.93 in (80 × 74.5 mm)	350 hp at 7,300 rpm	approx. 186 mph (300 km/h)

003 | THE FIRST FRONT WHEEL



PARTS LIST

3A Front tire

3B Outer part of the front rim

3C Inner part of the front rim

SCREWS*

4 **AM** screws 1.7 x 4 mm (+ 1 spare)

** The screw codes end with the letter **M** or **P**: the former are for metal and the latter are for plastic. It is advisable to use lubricant for type M screws that are difficult to insert and to screw them in progressively, unscrewing and screwing them back in one or two turns at a time.*





1 Take the front tire **3A** and check it carefully. In addition to the Bridgestone and Potenza inscriptions, the outer side features the FIA barcode and the code K18 (highlighted in the two details of photo **1a**); the inner side, on the other hand, only features the Bridgestone and Potenza inscriptions (photo **1b**).



1a



1b

2 Take the outer part of the front rim **3B** and place it on the work surface next to the front tire **3A**; both pieces should have the outer face upwards, as shown in photo **2a**. Next, place the outer part of the rim **3B** into the tire **3A** and apply slight pressure to insert it correctly into position (photo **2b**).

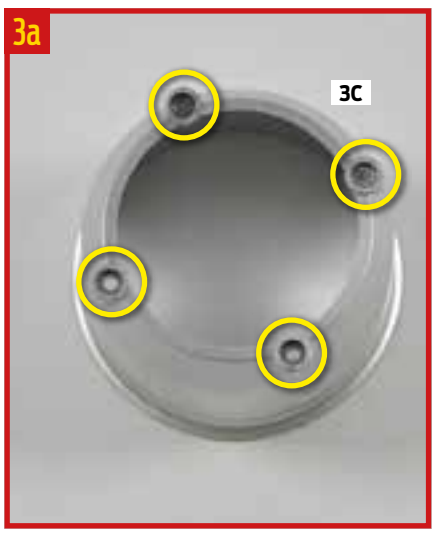


2a



2b

3 Now select the inner part of the front rim **3C**: you will see that it has four holes (highlighted with circles in photo **3a**). Turn over parts **3A** and **3B** assembled in step 2, fit the inner part of the rim **3C** into the tire, and align the screw holes on both parts of the rim. Secure the tire and rim assembly with four **AM** screws (photo **3b**).





FINAL RESULT

