



# FERRARI FORMULA 1

CAR BY CAR



EVERY RACE CAR SINCE 1950

STUART CODLING













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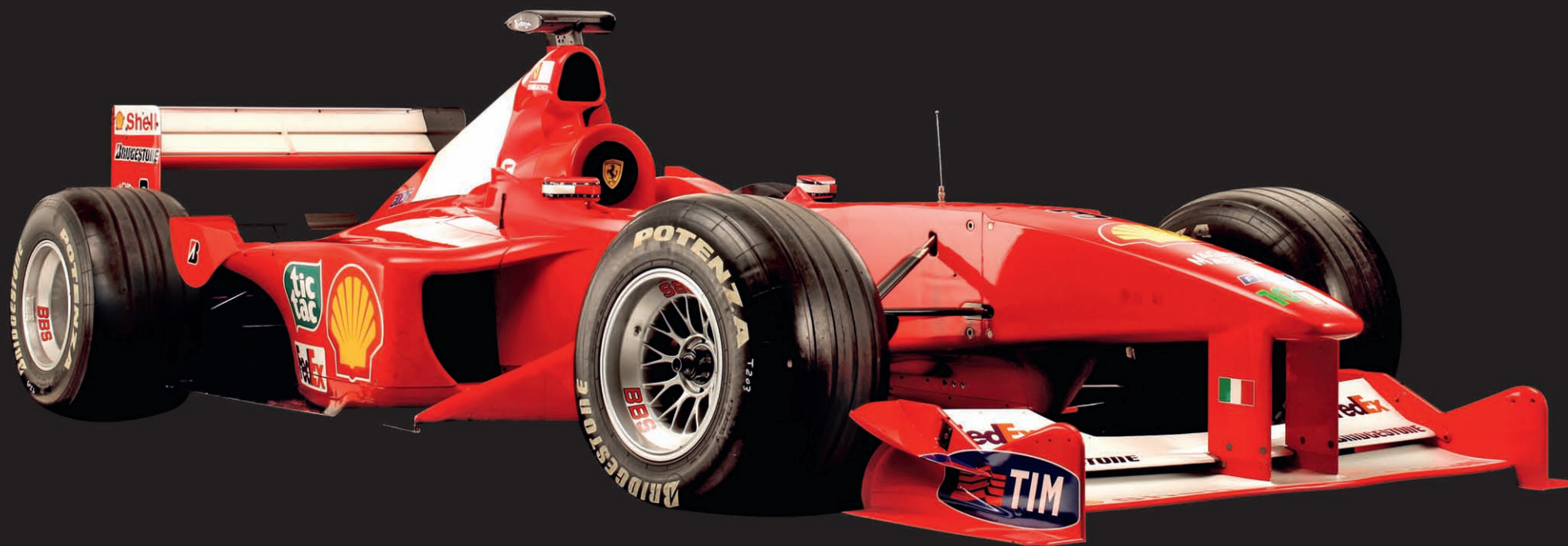
I'd like to pay tribute to the diligence of my colleagues at *Autosport* magazine, past and present, for documenting the ongoing developments within Formula 1 in great and accurate detail, and to Kevin Wood for superintending its archive. My thanks also to John Barnard, for agreeing to an interview at the launch of his excellent book *The Perfect Car*, and to my esteemed colleague Giorgio Piola for his patience and generosity. Last but indubitably not least, thanks to my wife, Julie.



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## INTRODUCTION

Enzo Anselmo Ferrari—and the cars carrying his name—were embedded in the rich tapestry of motor racing history long before 1950, when the postwar Grand Prix racing scene coalesced around what we now call the Formula 1 World Championship. Born in 1898, the second son of a foundry owner, Enzo nursed dreams of becoming a racing driver . . . or a sports journalist, or an opera singer. The death of his father and brother during an outbreak of influenza in 1916 brought the family business to its knees and forced Enzo to set his dreams aside—for a while. Those who like to associate a person's psychology with their formative experiences point to this phase of Ferrari's life as the wellspring of his tendency to be harsh, cynical, intolerant, controlling, and, above all (in his own words), “an agitator of men.”

Discharged from the army during the Spanish flu pandemic of 1918, Ferrari scratched around for a job before finding a position with CMN, a small Milan-based manufacturer that was converting war surplus vehicles into cars. Initially his job entailed driving the bare chassis to the coachbuilder. Later he would enter hillclimb events, and by the end of 1919 the Targa Florio, the famous road race around the island of Sicily.

Through a friend he gained an introduction at Alfa Romeo, then Italy's preeminent force in motor racing, and at the wheel of a 6-liter Tipo 40/60 he finished second in the Targa Florio in 1920. Though he continued to race with enough success to be honoured by the Italian state, first as a *Cavaliere* and then as a *Commendatore*, during that decade he gravitated toward team management, allying himself with Alfa Romeo and establishing Scuderia Ferrari in 1929. Alfa had

undergone one of its periodic withdrawals from racing as a works force and Ferrari's organization serviced the demands of the many wealthy Alfa Romeo owners who wished to compete. It would later become the company's de facto racing division.

By then Ferrari had already adopted the symbol of the *Cavallino Rampante*—the prancing horse—and, as is fitting for a man who spent much of the second half of his life concealing his eyes and intentions behind dark glasses, the origin of this is enigmatic. It's widely believed he was gifted it by the parents of the late fighter pilot Francesco Baracca, whose squadron carried that as an emblem.

It's also claimed that Ferrari ceased to attend motor races in the late 1950s after the premature death of his son, Dino, but in truth he had long since withdrawn to his workshops, from where he could pull the strings with impunity. It added to the sense of mystique and, for those





John Gabriel Collection

charged with ensuring Scuderia Ferrari's Alfa Romeos performed on track, the perils associated with failure.

The Grand Prix racing scene of the 1930s became an arms race between the fascist government-backed German manufacturers Auto Union and Mercedes, as Alfa Romeo pitched in from the fringes. There was never quite the money, the political will, or the technological resources to tackle the Germans meaningfully or consistently. In 1937, under pressure from Italian dictator Benito Mussolini to be more on par with his Axis partners, Alfa Romeo became a majority shareholder in Scuderia Ferrari and folded it into the larger corporate organization as the official competitions department. Enzo's plan to build a new car for the voiturette subclass—in effect not really



racing against Mercedes and Auto Union—didn't align with the new objectives and he was duly edged out. Not only that, but his severance agreement also included a four-year non-compete clause.

World War II rendered that largely irrelevant, as Ferrari's new company, Auto Avio Costruzioni, was pressed into munitions and machine tools manufacture. Postwar privations made motorsport an unaffordable luxury for a time. But soon Ferrari summoned his old engineer, Gioacchino Colombo, to his Modena works, where he said, with admirable understatement, "I've had enough of utilities. I want to go back to racing."

The Ferrari company as we now know it was founded in March 1947. Two months later, Franco Cortese won

the grandly titled Rome Grand Prix—40 laps around the historic Terme di Caracalla site—in a Ferrari 125 S roadster. In supercharged form, that car's engine would power Ferrari's return to Grand Prix racing—and take it into Formula 1 as we know it today.







## CHAPTER 1

Although it's easy to look back at 1950 as the genesis of the Formula 1 (F1) World Championship we recognize today as the pinnacle of international motor racing, in the context of the time it was rather less exciting. Motorsport for the most part was about making do: postwar material shortages and economic privation militated against the development of sophisticated new racing cars. Sports car events were often more popular and offered better prize money.

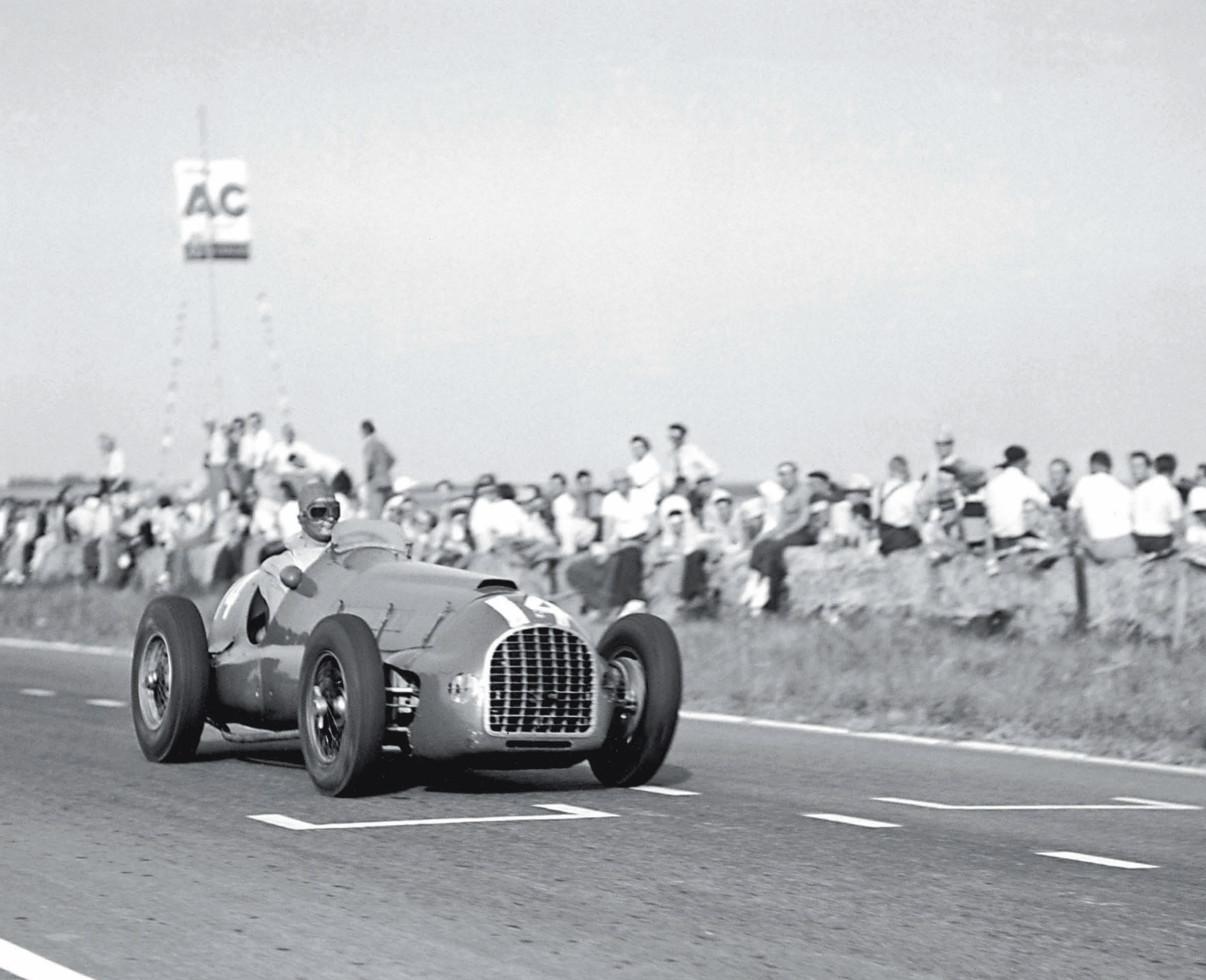
By the middle of the decade, though, F1 was beginning to establish itself as a leader in technology and was attracting greater interest from major manufacturers. Ferrari's journey to becoming one of the preeminent automotive marques began here, as Enzo Ferrari fought to survive against wealthier opposition. Well before the phrase "Win on Sunday, sell on Monday" was coined, Ferrari was building and selling cars on the back of his racing success.

As the architect of prewar victories with Alfa Romeo, he knew his value. The notion of receiving prize money for participating in a racing season would remain an alien concept until the 1980s. During this period, entrants would negotiate fees individually with race promoters—hence, famously, Ferrari did not participate in the first World Championship Grand Prix at Silverstone in 1950. They just weren't offering enough—world championship or not.



Juan Manuel Fangio didn't mind swapping teams if it meant accessing the best car. After Mercedes withdrew from racing in 1955, he moved to Ferrari, who had obtained the mold-breaking D50s from bankrupt Lancia.





Ferrari's first Grand Prix car was living on borrowed time, even as the world championship began in 1950. Though the 125 F1 was nimble on account of its relatively short wheelbase, this same characteristic made it twitchy and unstable in a straight line, as the varying surface quality of certain tracks overwhelmed the 125's crude suspension.

Work on the 125 F1 began shortly after Enzo Ferrari founded Ferrari S.p.A in Modena in 1947, though the 125 S sports car was the initial focus of development, perhaps because Ferrari was reluctant to compete against Alfa Romeo, his old employers. But since they were widely expected to step back from racing their aging prewar 158s—developed by Gioacchino Colombo at Ferrari's behest when Enzo ran Alfa Romeo's competitions department—there was no reason not to proceed with a single-seater racer.

Both the sports car and the monoposto were built around iterations of a 1.5-liter supercharged 60-degree V-12, also designed by Colombo. It was notably compact, with a single chain-driven camshaft actuating two valves per cylinder, a single carburetor mounted in the vee, and a single Roots-type supercharger mounted at the front. The five-speed gearbox was a bespoke Ferrari design driving an open propshaft to the final drive at the rear.

Colombo's chassis followed similar principles to the 158 "voiturette" he designed at Alfa Romeo and was

entirely conventional for the time: a ladder-frame layout based on longitudinal oval tubes braced by tubular cross members, with a box section at the front. The suspension, too, adhered to common practice, with unequal-length wishbones and a transverse leaf spring up front, and a torsion bar arrangement at the rear, all damped via Houdaille lever-arm shock absorbers. This early design of the damper relied on the resistance of oil against rotary vanes within a cylindrical vessel, and was therefore prone to losing effectiveness as the oil heated up under prolonged duress.

Appearing for the first time at the 1948 Italian Grand Prix in Turin, Alfa Romeo's last before taking a short sabbatical from Grands Prix, the 125 F1 proved sporadically competitive but not consistent front-running material. In its initial form, the engine was massively outgunned—producing in the region of 220 bhp, while the Alfa's made well over 300 bhp—and the gearbox proved temperamental. The car itself was brutally tail happy.

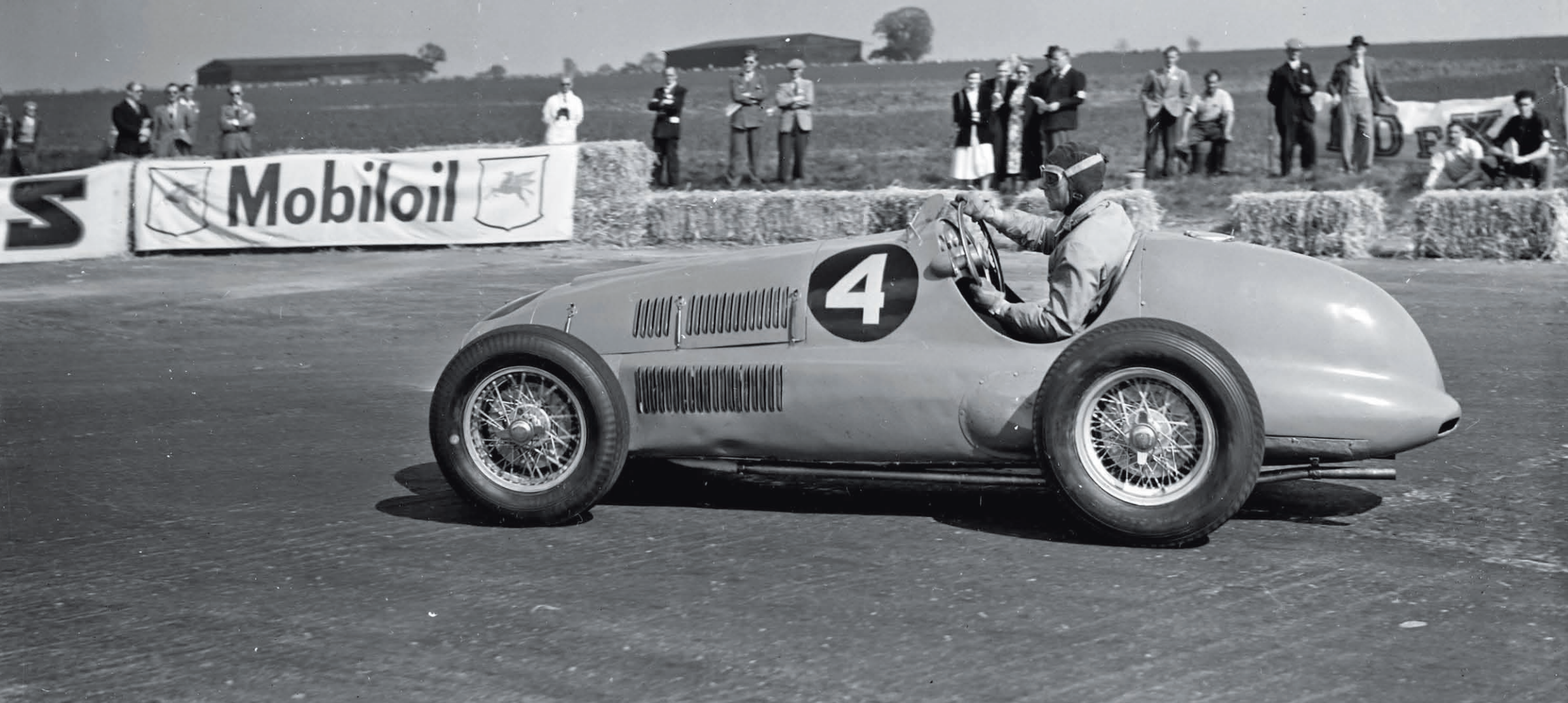
## 125 F1 SPECIFICATIONS

<b>Engine</b>	1,497 cc 60-degree V-12, dual-stage supercharger	<b>Suspension</b>	Double wishbones (front), swing axle/De Dion beam axle (rear), transverse leaf springs, lever-arm dampers
<b>Power</b>	300 bhp @ 7,000 rpm	<b>Brakes</b>	Drums f/r
<b>Gearbox</b>	Five/four-speed manual	<b>Tires</b>	Pirelli, Englebert
<b>Chassis</b>	Steel tube frame with twin longitudinal beams, aluminum body	<b>Weight</b>	700 kg



Peter Whitehead's 125 was the sole Ferrari to contest the 1950 French Grand Prix after the works team decided their new 275s weren't fast enough and withdrew.





Ferrari's first Grand Prix car was a handful. "Any attempt to take corners with the power on resulted in the tail chasing the front wheels," wrote Raymond Mays of his experience racing it at Silverstone in 1949.

By the end of 1949, Colombo had rebodied the 125, lengthened the wheelbase by 10 inches, widened the track by 3.5 inches, replaced the torsion bars with swing axles, and substantially revised the engine. The V-12 now had gear-driven twin overhead camshafts, new cylinder heads with centrally located spark plugs, and a two-stage supercharger. The works team and customers still fielded the short-wheelbase, single-stage 125s at certain events, and the disparity in performance was remarkable.

Ferrari skipped the first World Championship F1 race, at Silverstone in May 1950, because he judged the

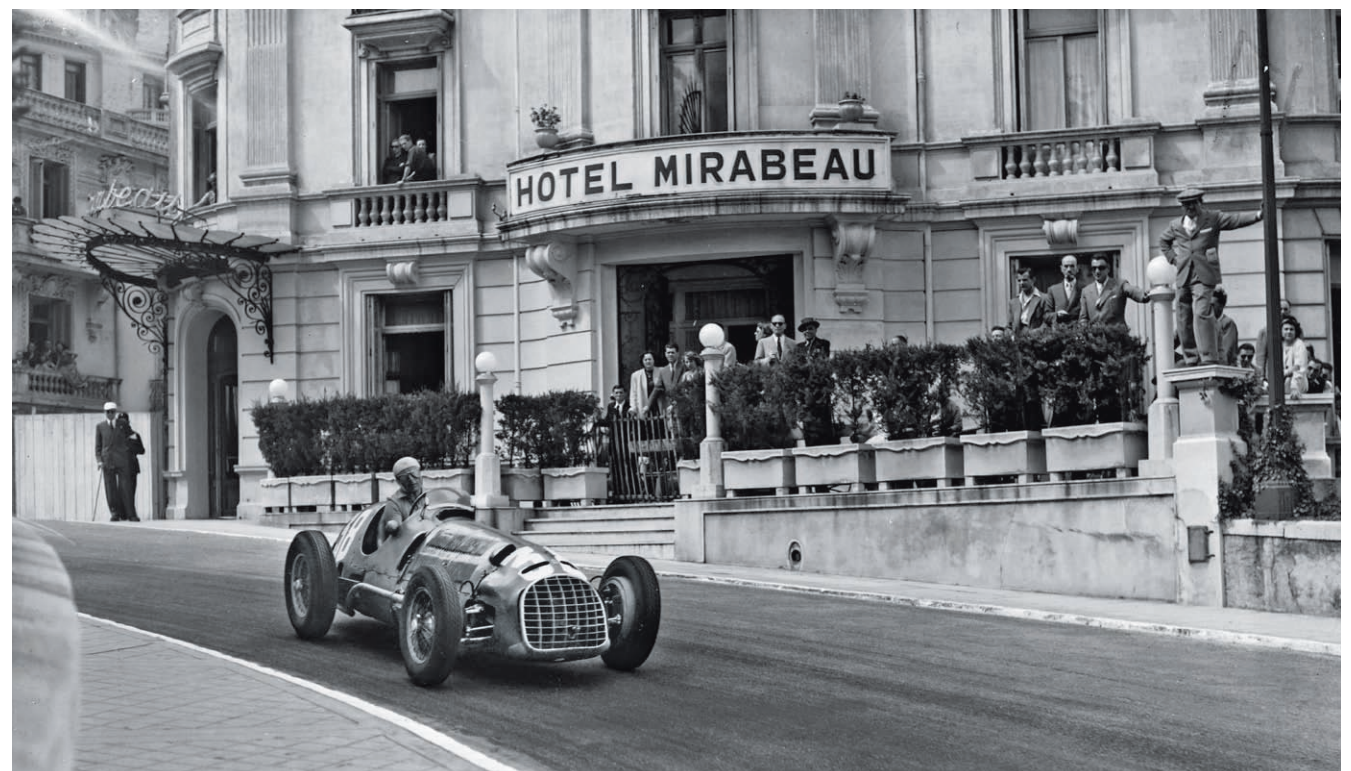
money on offer insufficient to merit the disruptive effect it would have on preparations for the more lucrative Monaco Grand Prix a week later. There Alberto Ascari finished second in a two-stage 125 to Juan Manuel Fangio's Alfa Romeo. Next time out, in the Swiss Grand Prix at Bremgarten, the 125s appeared with De Dion suspension (and a four-speed gearbox integrated with the final drive) at the rear in place of swing axles, but all the works entries retired. The 125 made just two further world championship race appearances as Ferrari phased it out in favor of naturally aspirated machinery.



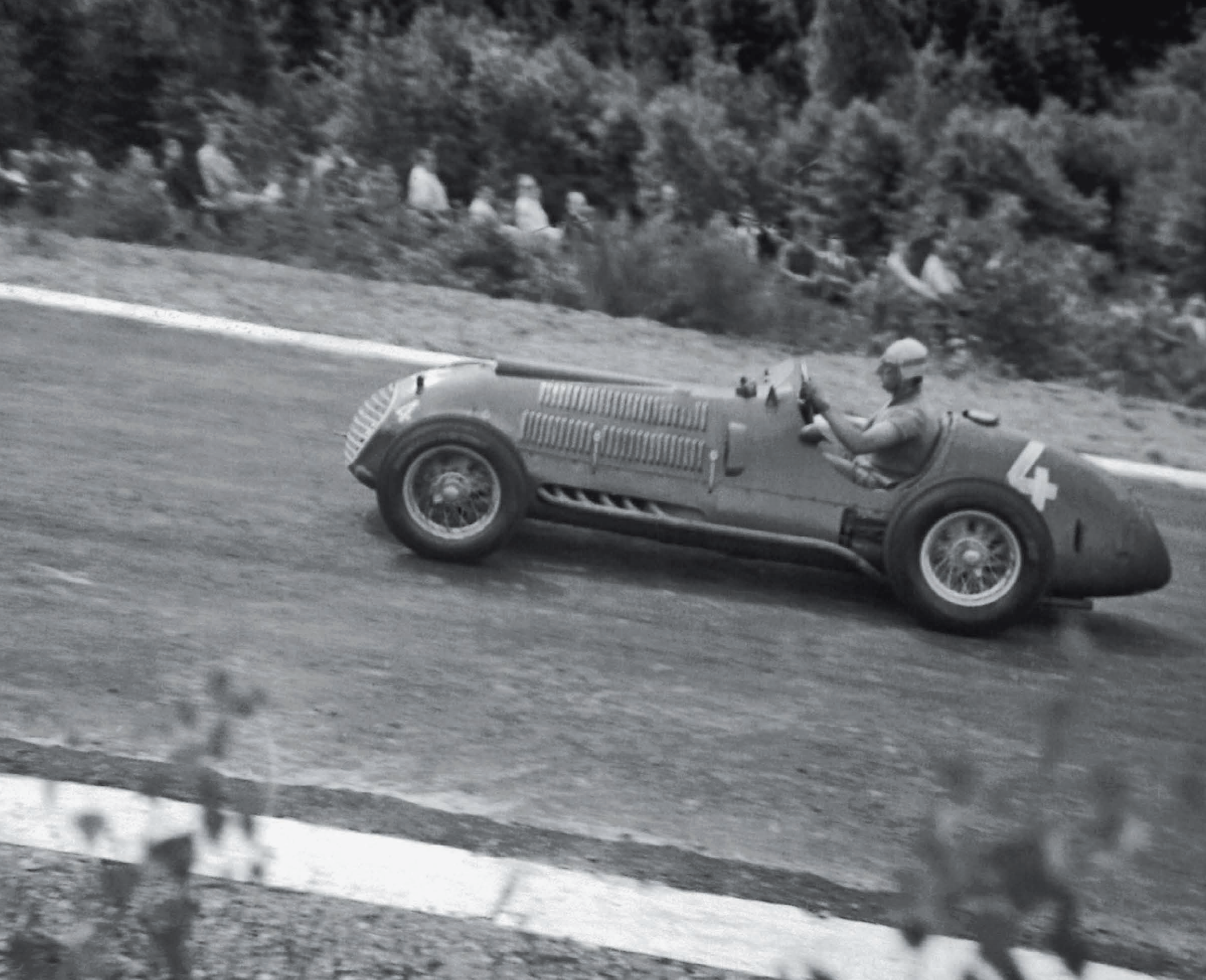


←  
Having skipped the 1950 British Grand Prix, Ferrari appeared for the first time in a world championship race at Monaco a week later. The 125s now had two-stage superchargers, but a first-lap shunt at Tabac delayed the Ferrari drivers; Ascari (car No. 40) threaded his way through to finish second.

→  
Luigi Villorelli charged back into second place at Monaco in 1950 after stalling his 125 while negotiating the aftermath of the famous accident at Tabac, but the car's rear axle broke before the end.







Accounts differ as to why Ferrari switched to natural aspiration when the dominant cars in Grand Prix racing tended to be supercharged. One theory has it that the decision was prompted by the Scuderia's disappointing 1949 Belgian Grand Prix, in which Luigi Villoresi led from the start in a works 125 only to be passed in the pits by Louis Rosier's unblown 4.5-liter Talbot-Lago while the Ferrari's prodigious thirst was being serviced.

It's more likely that Enzo Ferrari's thought processes were influenced by the febrile form of Grand Prix racing at the time. What was initially known as Formula A was coalescing into Formula 1, and a world championship was in the offing, but motor racing's international governing body had yet to alight on a firm set of rules for the future. The present regulations—1.5-liter blown, 4.5-liter unblown—were in effect a fudge to ensure healthy grid sizes.

Aurelio Lampredi, Gioacchino Colombo's assistant at Ferrari, proposed that a larger-capacity, naturally aspirated V-12 would offer a degree of future proofing. Ultimately, his concept proved so successful that he was appointed as technical director and his mentor returned to Alfa Romeo.

Lampredi's V-12 shared its 60-degree angle with Colombo's but architecturally it was very different—5 inches longer overall, with the bore centers further apart, and taller. Though the goal was to reach 4.5 liters, the Lampredi V-12 first saw action in 3.3-liter form. At the Belgian Grand Prix in 1950, Luigi Villoresi drove a 125 while Alberto Ascari gave the 275 its debut. Despite the new designation, it was an existing chassis (one of the long-wheelbase 125s) with the 3.3-liter engine installed. Ascari finished fifth, a lap down on the leading group.

The next round of the World Championship was at the high-speed Reims-Gueux, where Ferrari entered two 275s but withdrew before the race, not expecting to be competitive. The 275 raced again only in non-championship events. It was time for a new chassis as well as a larger engine.

## 275 F1 SPECIFICATIONS

<b>Engine</b>	3,322 cc 60-degree V-12	<b>Suspension</b>	Double wishbones (front), swing axle (rear), transverse leaf springs, lever-arm dampers
<b>Power</b>	270 bhp @ 7,200 rpm	<b>Brakes</b>	Drums f/r
<b>Gearbox</b>	Four-speed manual	<b>Tires</b>	Pirelli
<b>Chassis</b>	Steel tube frame with twin longitudinal beams, aluminum body	<b>Weight</b>	720 kg



The short-lived 275—an early 3.3-liter version of Lampredi's V-12 engine fitted into a long-wheelbase 125 chassis—made its race debut in the 1950 Belgian Grand Prix, where Alberto Ascari elevated the ill-handling car to fifth place.







By the end of 1950, Ferrari's definitive naturally aspirated F1 car was ready. Initially raced in the non-championship Swiss Grand Prix with the 340 type number, powered by a 4.1-liter version of the V-12 (achieved by widening the cylinder bores), the new car was based on a revised but still very conventional chassis design. Rectangular tubes replaced ovals for the main longitudinal members and, in an effort to save weight, rather than an elaborate box section up front, a single plate helped provide rigidity and locate the suspension. Another broad beam braced the rear, and the suspension was carried over from the latest iteration of the 125, including the De Dion axle and the four-speed gearbox.

While the performance of the new car had been promising on the Geneva street circuit—only Juan Manuel Fangio in an Alfa Romeo 158 ran ahead of Ferrari's Alberto Ascari—the 340's engine failed before the finish and Ascari's teammate Luigi Villoresi injured himself, badly shunting his 275 on oil. Ferrari didn't enter another Grand Prix until the final world championship round at Monza a month later, by which time the 4.5-liter V-12 was considered ready. Aurelio Lampredi and his engineers created the additional displacement by lengthening the stroke, and in combination with larger twin carburetors, this boosted power to a claimed 330 bhp.

Now known as the type 375—taken prosaically from the swept capacity in cubic centimeters of a single

cylinder—the new Ferrari enabled Ascari to take the fight to Fangio and Giuseppe Farina both on single-lap pace and in the race itself. The supercharged Alfa Romeos were unable to shake off Ascari and, because he would need to make fewer refueling stops, he was almost certain to win—until his engine blew with barely a quarter of the race gone. Still, having walked back to the pits and taken over teammate Dorino Serafini's car, he rose from sixth to second place despite a truculent gear change.

This performance, on a circuit where lap times rode on outright power, convinced Alfa to redevelop their 158s over the winter to squeeze yet more grunt from the engine. But this came at the cost of even greater



Having introduced the 375 at the 1950 Italian Grand Prix, Ferrari entered two of the cars in the non-championship Penya Rhin GP, held on the Pedralbes street circuit in Barcelona, Spain. Test driver Dorino Serafini, pictured here, substituted for the injured Luigi Villoresi.

### 375 F1 SPECIFICATIONS

Engine	4,494 cc 60-degree V-12	Suspension	Double wishbones (front), De Dion beam axle (rear), transverse leaf springs, lever-arm dampers
Power	350 bhp @ 7,000 rpm	Brakes	Drums f/r
Gearbox	Four-speed manual	Tires	Pirelli, Firestone (in 1952 Indy 500)
Chassis	Steel tube frame with twin longitudinal beams, aluminum body	Weight	720 kg



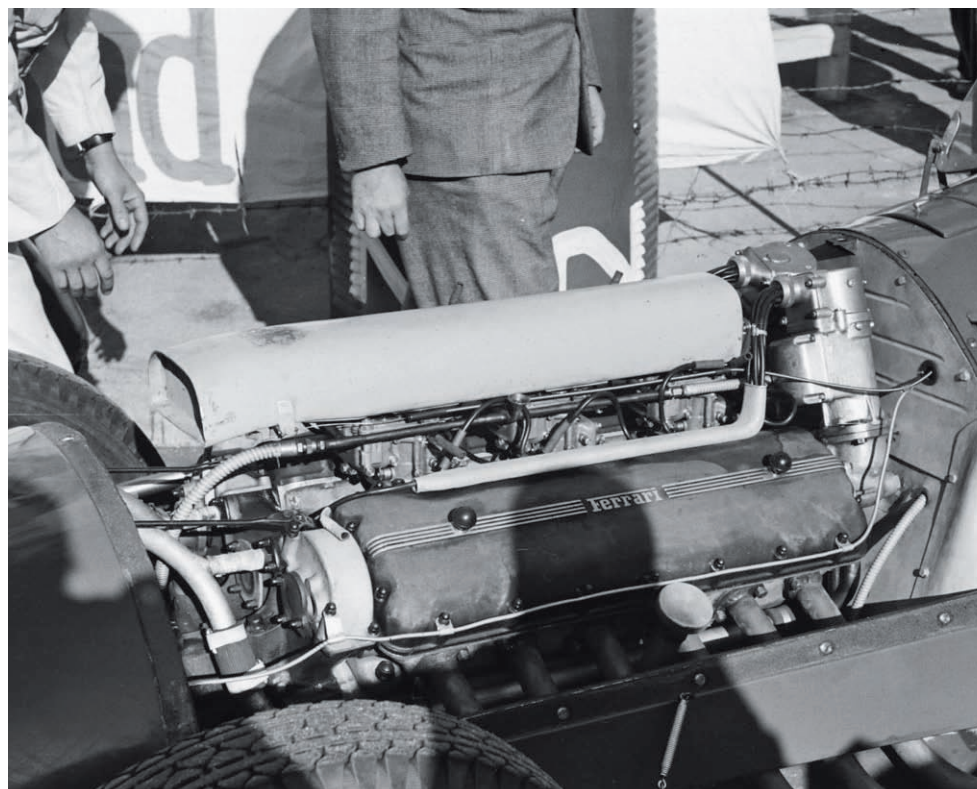
Alfa Romeo's absence from the non-championship Penya Rhin GP in 1950 meant Ferrari's only meaningful opposition was the temperamental BRM. Alberto Ascari averaged nearly 94 miles per hour on his way to victory over teammate Dorino Serafini in the new 375.



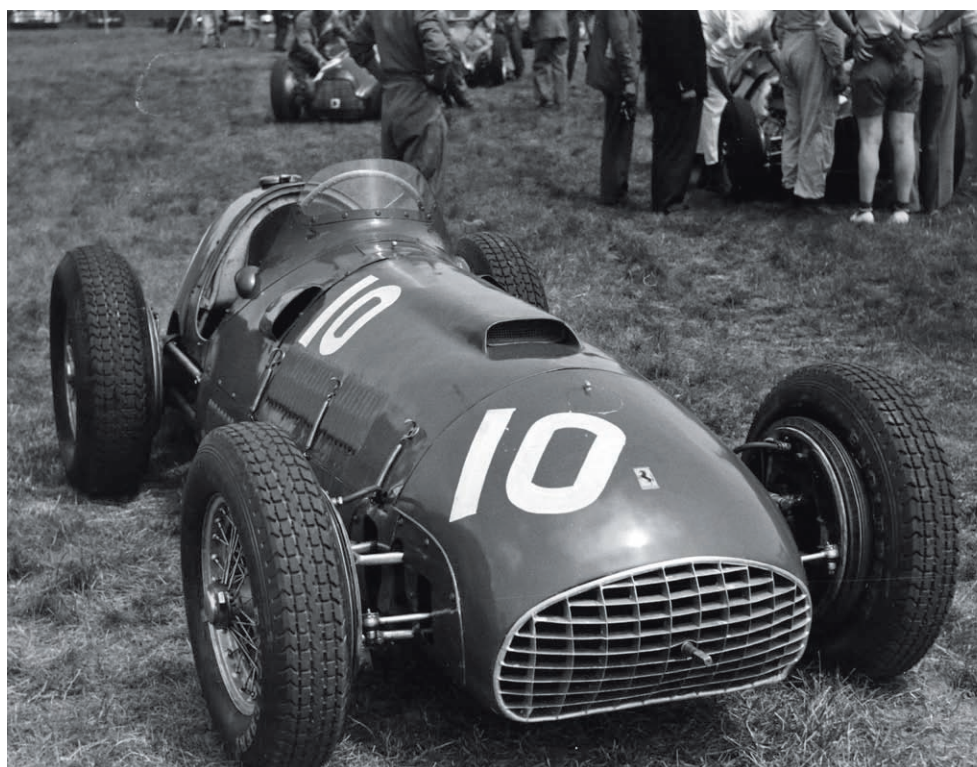
thirst, plus additional weight in the form of larger fuel tanks. Ferrari developed new heads for their V-12 with two spark plugs per cylinder, improving power (Ferrari optimistically claimed an additional 50 bhp) and efficiency. A 375 could perhaps travel 8 miles on a gallon of fuel, while a 158 could barely manage two.

The 1951 World Championship became an epic scrap between Alfa Romeo and Ferrari. Other manufacturers barely figured—which would soon become an existential threat to Formula 1 as a category. Alfa's developments just enabled them to stay ahead of Ferrari until Silverstone, where the pugnacious José Froilán González—a third entry in a single-plug 375—took pole position and an unexpected victory. Pitting from the lead on lap 60, Gonzalez prepared to hand his car to Ascari, whose 375 had halted with gearbox failure. Ascari generously declined and waved him back out.

Ascari won at the Nürburgring and was in contention for the title at the final round, only for Ferrari to squander the opportunity by running smaller-diameter wheels than would have been prudent and suffering a string of tire failures.



The full 4.5-liter version of Aurelio Lampredi's unblown V-12 didn't appear until the end of the 1950 season. It was immediately competitive, although reliability was questionable early on.



Roadside fields had to make do as garages at circuits such as Reims-Gueux; this is Luigi Villoresi's twin-plug 375, left briefly unattended during the 1951 French GP weekend.