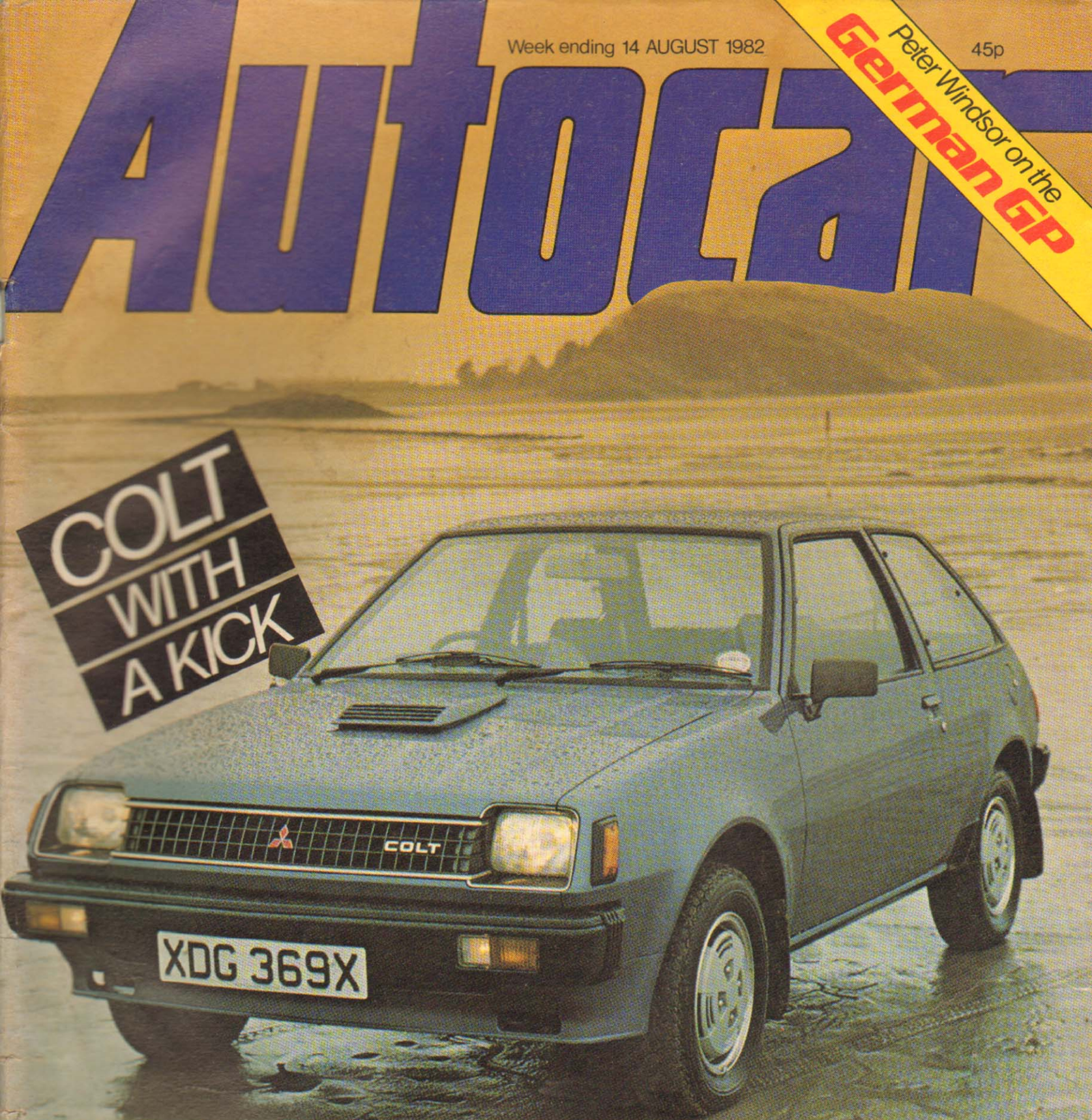
Autocar

Week ending 14 AUGUST 1982

45p

Peter Windsor on the German GP

COLT WITH A KICK

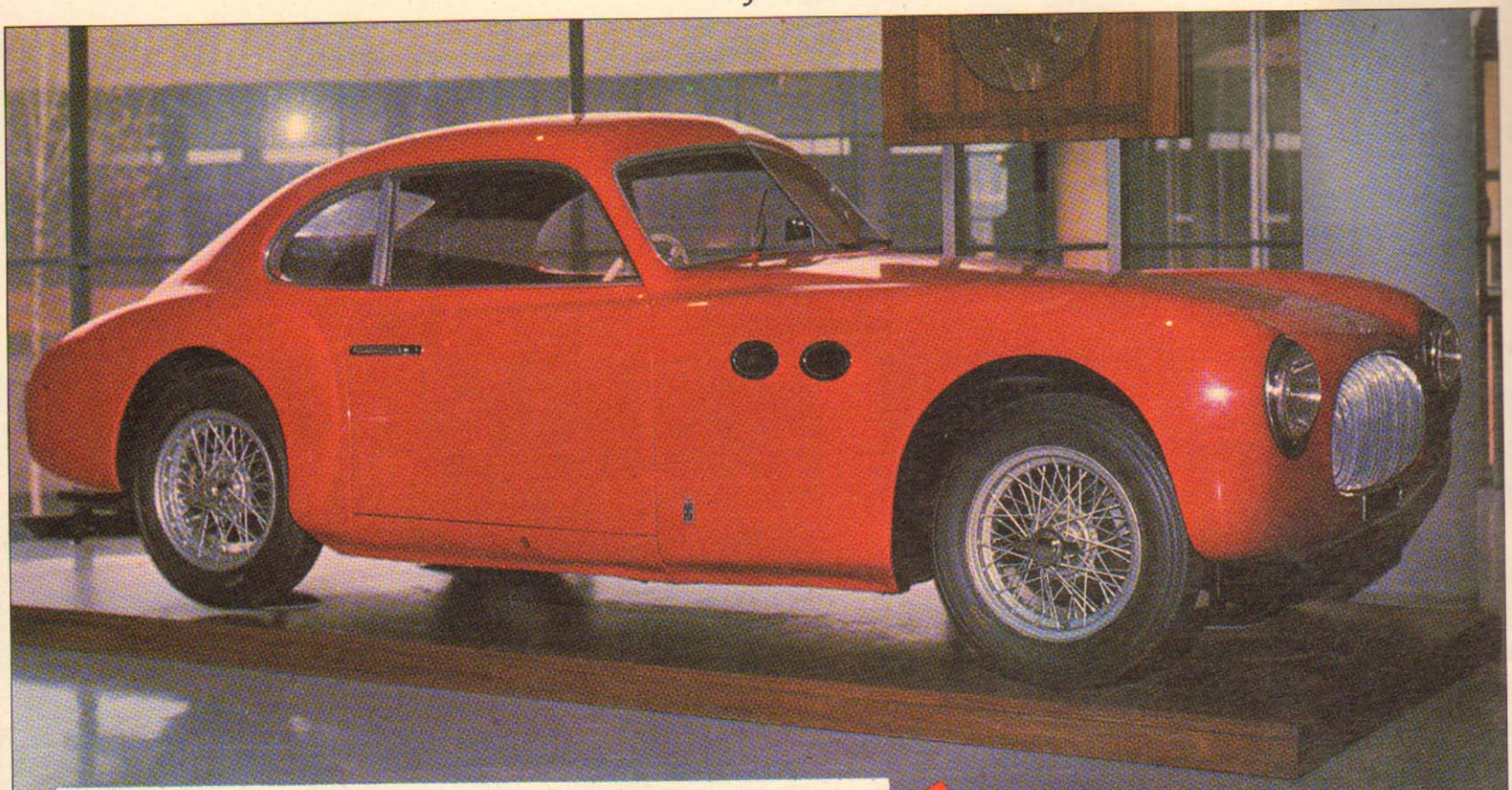


New Turbo Mirage Tested

Classic GT: Cisitalia An automotive work of art

TURNING POINT

By Edward Eves



THE GT COUPÉ Cisitalia 1947

The classic European Gran Turismo coupé, as typified by the Porsche 356 or higher up the power scale by the Ferrari 250GT, is now taken very much for granted. The archetype was a post-war phenomenon spawned by Italian enthusiast and entepreneur, Piero Dusio, in a vain attempt to establish himself as a manufacturer of single seat racers and high performance sporting cars. The Cisitalia was a brilliant but shortlived marque which had a permanent influence on sports car body and chassis design.

HISTORY has not dealt too kindly with Piero Dusio. Some accounts leave the impression that he was a kind of get-rich-quick black marketeer who made a fortune during World War II and squandered it on building fast cars while between times dallying with fast women. The latter is not an un-Italian-characteristic; the former does deviate somewhat from the real picture. Dante Giacosa, the great Fiat designer, who created the Cisitalia as a spare time job in the closing months of the War, puts Dusio's birth date as 1889. I prefer 1899 which fits in well with a meritorious racing career before the War. Forced to give up a promising career in professional football in his twenties, Dusio was introduced to an Italo-Swiss textile company by influential admirers and very quickly, by sheer ability, rose to head the sales force and then to form his own very successful textile and sports goods company. By all accounts this seems to have been a prototype for Adidas. Politically, he must have gone along with the Fascist political system for we are told that he was sole supplier of uniforms to the Italian Army. But it is significant that his Swiss backers stayed with him right to the end; and the canny Swiss are not in the habit of putting their money on temperamental losers. As motoring enthusiasts, our hearts have to warm to his persistent enthusiasm for the sport. An ardent supporter of the Mille Miglia, he took part in eight of the 11 events between 1929 and 1939 with Fiat 521, OM3000 and Alfa Romeo cars. His worst placing was 50th, in 1935. The highlight of his sports car driving career must have been third place in 1939 driving an 8C/2900 Alfa-Romeo with Bonsegni. At the same time he was participating in Grand Prix and voiturette racing, as an amateur, with considerable success.

One feels that it was enthusiasm rather than the prospect of a quick profit which caused Dusio, indirectly, to approach Dante Giacosa at Fiat with the proposition to design a racing car. Because of German dominance of motor racing in the latter half of the 1930s the Italians had turned to voiturette racing, in the 1,100 c.c. and 1,500 c.c. categories, in a big way. Dusio's proposition was to foster this theme post-war with a one-design class of cheap-to-build and cheap-to-buy, single-seater racing cars based on easily obtained components – which in Italy meant Fiat.

Dusio's approach to Giacosa, in October 1944, could not have been made to a better man, or at a better time. Maybe times were not good for Italy. Mussolini had been deposed, Marshal Badoglio had taken over and declared war on the Germans. They in, their turn, had taken over the whole of the country not in Allied hands and industry, except that making war material for the Wehrmacht, was at a standstill. Allied bombing had caused the Fiat design office to be moved out of the factory and into a school, the Duca degli Abruzzo establishment, where they occupied their time doodling design studies of post-war replacements for existing models. They had plenty of time on their hands, enough for the industrious Giacosa to agree to work evenings on Dusio's racer – he had always dreamt of designing a racing car – after clearing the idea with his boss, Bruschi. No doubt they agreed between themselves that there would be some spin-off for Fiat in the extension of Giacosa's experience. Moreover, it did ensure that most of the components would be Fiat. One might be cynical and say that Fiat were gaining the experience of designing and building a small racing car at Dusio's expense.

Left: 1950 production version of the Pininfarina coupé with one-piece windscreen, styled wheels and "portholes" in the side of the bonnet

Giacosa's solution, using available materials, was a brilliant one for the period. His decision to use a frame fabricated from small diameter tubes was conditioned as much by the fact that Dusio had large stocks of chrome molybdenum tube in his cycle factory as by the desire to try something new. But the Cisitalia frame – the name is derived from Dusio's Consorzio Industriale Sportivo Italiano – set a pattern for Italian racing car chassis for some years to come. Basically it consisted of two deep, fabricated girders joined top and bottom by cross tubes and a certain amount of diagonal bracing. It has been loosely described elsewhere as a space frame, which it patently was not. A true space frame is built up from straight tubes all of which are in cmpression or tension. In the Cisitalia frame for the D46 Monoposto, there were a number of unbraced rectangles and a few curved tubes as well. Nevertheless it was strong and light, very rigid at the front end and, in the Italian tradition of chassis design, slightly flexible aft of the bulkhead.

Suspension was a transverse leaf spring and wishbones at the front on the lines of the same designer's Fiat 500 Topolino but at the back he broke new ground by suspending the live axle on coil springs and locating it with two lower trailing radius arms and an upper, rear-facing, A-bracket whose apex picked up with a ball joint on the rear cross-member. In laying out what was, in effect, a Watts linkage in elevation Giacosa failed to allow for the twisting effect on the axle endemic to this layout when one wheel is up and the other is down. This problem was later cured by Giovanni Savonucci, who succeeded him as chief engineer of Cisitalia, and Piero Taruffi, by replacing the rigid radius rods with laminated springs whose sole purpose was to introduce resilience into the system and absorb twisting loads.

The choice of a live axle was dictated by the need to keep the selling price of the car down to a reasonable level. This would normally have meant a high seating position to clear the propeller shaft in the full bump condition. Giacosa ingeniously overcame this problem and gained advantage from it by turning the axle round so that the nose piece faced rearwards, running the propeller shaft underneath it and correcting the rotation with a pair of step-up gears between the shaft and the bevel pinion. This lowered the shaft line by three inches and at the same time gave the facility to change final drive ratios at the cost of a slight increase in unsprung weight.

Power was provided by a modified Fiat 508 1,100 c.c. engine whose mundane 32 bhp at 4,000 rpm was doubled to 65 bhp at 5,800 rpm. To achieve this called for a major rework of the 68×75mm engine which included a new light alloy head with compression raised from 7 to 9.8 to 1, enlarged valves and new inlet manifold to take a vertical Zenith 36 VIF/C carburettor. A vertical Marelli MVE 4 magneto provided the sparks. To withstand this vastly increased output a new crankshaft, machined from a solid billet, polished all over and fully balanced was designed by Giacosa and his draughtsman Grosso. With it went redesigned connecting rods also machined from the solid, and highly polished. Lubrication was changed from wet sump to dry sump with oil contained in a handsome riveted tank on the scuttle and cooled by an oil radiator mounted low down inside the nose cowling. An added advantage of the dry sump system was that it allowed the engine to be mounted lower in the frame thus dropping the front end of the prop shaft and reducing the height of the centre of gravity.

An ingenious three-speed gearbox, originally designed by Angello Mosso for a Fiat prototype passenger car, was used in the single seater. Its main feature was that, after forward or reverse had been selected from neutral by means of a small level, gears were selected simply by pressing the clutch pedal. The first pressure after selecting first gave second gear, the next pressure engaged top, the one after that second and then back to top. First had always to be selected by the special lever. Obviously this arrangement allowed the driver to concentrate on steering, but it called for a flexible engine and would work only with a three-speed transmission.

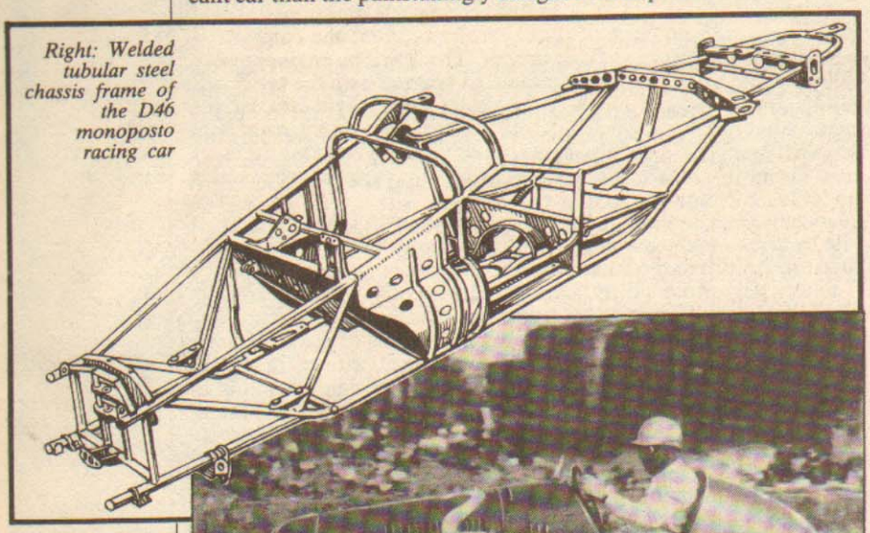
Construction of the cars, including building the frames and all the special machining in the engine and transmission was done "in house" at a works owned by Dusio in Corso Peschiera, Turin, whose normal product was specialized tools for automobile maintenance.

The D46's first outing was an outstanding success. Seven cars were prepared for the Coppa Brezzi voiturette race run in conjunction with, and two days after, the Circuit of Turin race for Grand Prix cars in September 1946. The drivers were Tazio Nuvolari, Louis Chiron, Raymond Sommer, Piero Taruffi, Cortese, Biondetti and, of course, Piero Dusio. There was minor drama when the steering wheel, intentionally made detachable, inadvertently came off in Nuvolari's hand. Typically he threw it into the pits and continued for two laps steering with the boss before retiring. Out of the field of 27 starters, including three Gordinis, Cisitalias took the first three places and fifth. Appropriately Dusio was the winner.

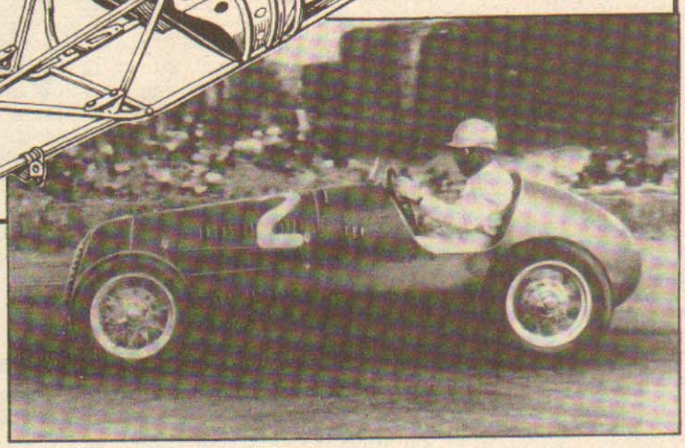
The D46 went on to score a number of successes in the 1947 season which included fourth place in two Grands Prix, at Barcelona and Comminges. But the Valentino Park race can be seen as

Colour Page: *Prototype of the GT car, Pininfarina's Cisitalia fastback coupé*

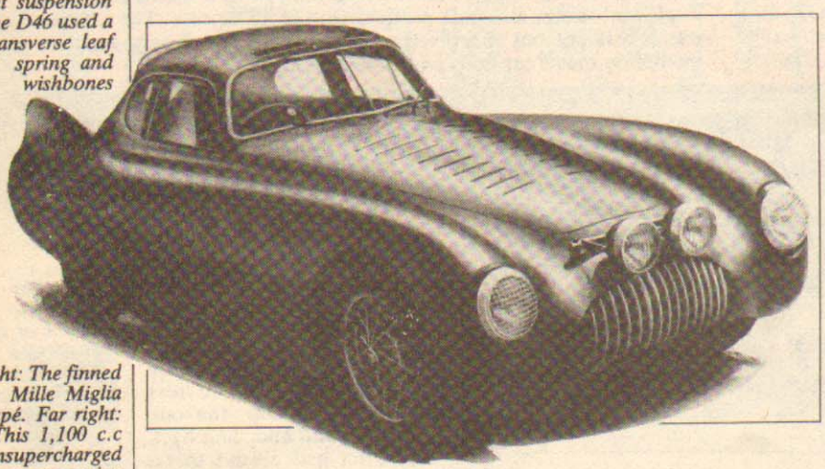
the turning point in Dusio's fortunes and the end of Giacosa's brief. Spurred on by this one success Dusio decided that he had the makings of a firm of the stature of Lancia in the little Cisitalia outfit and promptly approached Giacosa to become the technical Director. Giacosa, wise in the ways of industry and a Fiat man through and through, rightly saw this project as a pipe dream and, he says uncharacteristically, turned down the offer without hesitation leaving the job to Giovanni Savonucci, an old colleague and brilliant engineer who had joined Cisitalia some months previously at his behest to get production of the single-seater under way. His last job for Cisitalia, was to sketch out ideas for a two-seat version. Completed during one weekend it was destined to be a far more significant car than the painstakingly designed monoposto.



Right: Welded tubular steel chassis frame of the D46 monoposto racing car



Right: Piero Taruffi won the Circuit of Caracella race, near Rome, in an unsupercharged 1,100 c.c. D46 in June 1947. Far right: Faired-in independent front suspension of the D46 used a transverse leaf spring and wishbones



Right: The finned Mille Miglia coupé. Far right: This 1,100 c.c unsupercharged sports racing model appeared in 1948 with trailing arm front suspension and was one of the works team cars

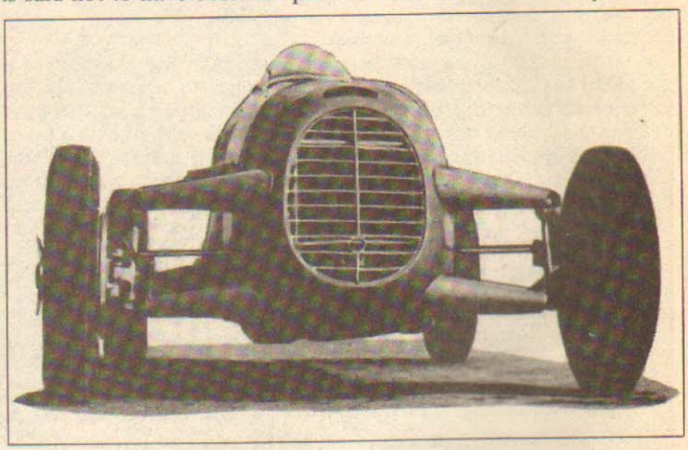
It is interesting to dwell briefly on the origins of the two-seater Cisitalia because, if we are to believe Giacosa's book *Forty Years of Design with Fiat,* he did a chassis layout for a coupé as early as July 1945 before the D46 design was finalized. This seems to indicate that there was always the intention to make a two-seater car, which is hardly surprising bearing in mind Dusio's passion for the Mille Miglia. One feels that it is likely that the design sketched out one afternoon in mid-1946 was for the chassis of an open car for the 1947 Mille Miglia. This theory is backed up by a picture of Giacosa examining the chassis of an open two-seater. The 1945 coupé design is interesting because the chassis to the rear of the bulkhead consists, in principle, of two fore-and-aft tubes per side, the lower one passing down the body sills and the upper one going up the screen pillars and over the tops of the doors. There is an extra pair of tubes in line with the edges of the transmission tunnel and splaying out behind the seats to pick up with the main sidemembers. The propeller shaft tunnel in this design appears to be a stressed sheet metal member with a multiplicity of stiffening ribs.

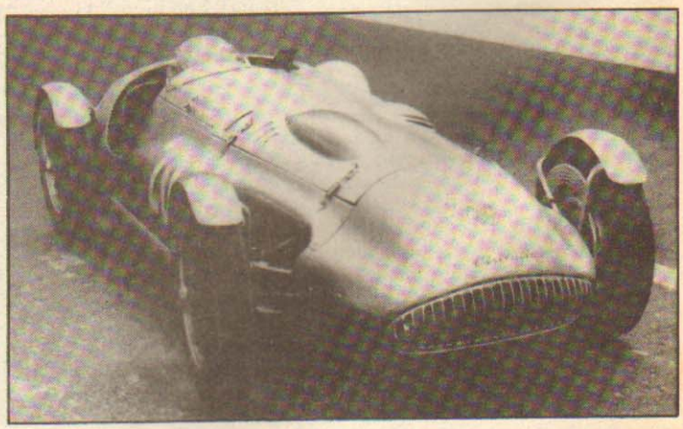
On the open car chassis aeronautical practice is very evident, the sidemembers being deep lattice girders with Warren bracing joined by large diameter curved tubes forming the front and rear edges of the scuttle. They in turn are stiffened by a form of Warren bracing.

The mechanical elements of these road cars do not have the same exotic appeal as the single seaters. The same engine was used – when production got going it was supplied in three stages of tune – and the dry sump system was retained, on the works racers at least. From the engine backwards it was mainly Fiat with a four-speed, manual-change gearbox and a standard back axle with the drive arranged normally. Coil spring and radius rod rear suspension of the D46 were also abandoned in favour of semi-elliptic leaf springs.

The object was to win the Mille Miglia and it very nearly succeeded. Six prototypes were built and five allocated to the race. The first of these carried an enclosed body designed by Savonucci – he was an unexpectedly brilliant body designer – and built by Rocco Motto, a Torinese coachbuilder specializing in lightweight competition bodies. Incidentally Stanley Nowak, writing in *Automobile Quarterly,* attributes construction of this body to Carrozeria Colli and credits Savonucci with giving it fins which are not apparent in photographs. The second chassis was sent to Alfredo Vignale who had just left Stabilimenti Farina, run by Giovanni Farina, Pinin's brother, to set up on his own. He had been Giovanni's bodyshop foreman. The lightweight body, based on the Savonucci shape, which he created, did have fins and a couple of portholes which are said to have been copied by Buick.

The third chassis, later to be known as the Nuvolari roadster, was clothed with a lightweight two-seater, open body by Garelli. Dusio is said not to have been too pleased with the rather clumsy finned





rear wings of this car and sent the next two chassis to Giovanni Farina at the Stabilimenti for a refined version of it.

The sixth and most significant chassis was sent to Pininfarina early in 1947 with instruction to fit a sporting coupé body.

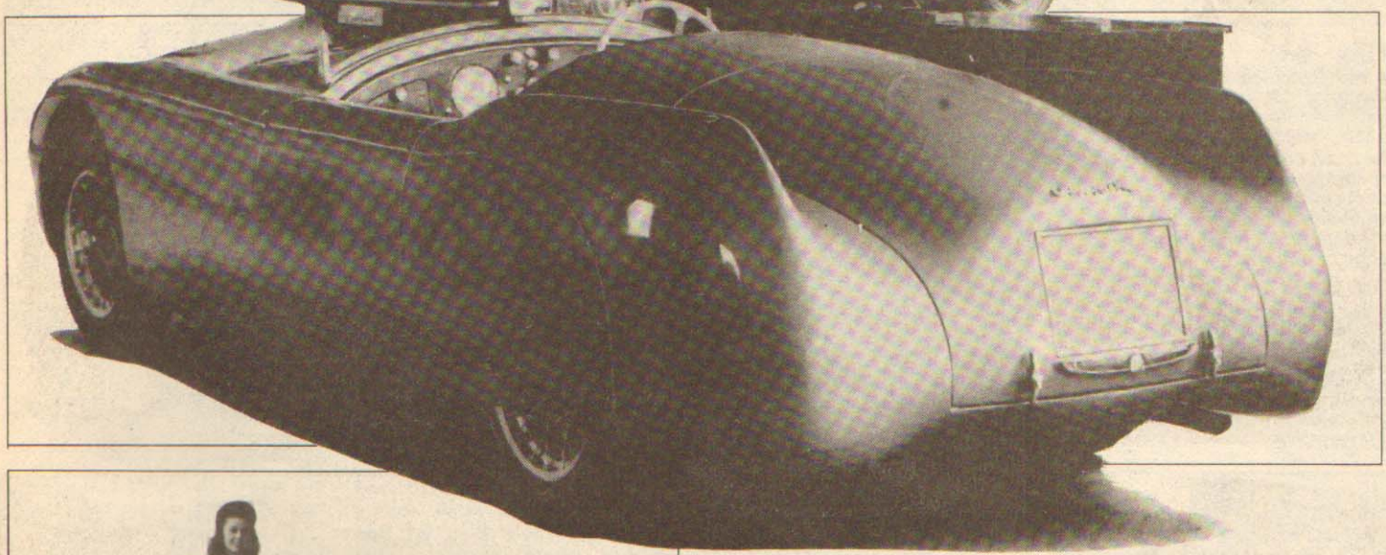
Nuvolari's drive in the 1947 Mille Miglia, almost his last motor race, is one of the epics of motor racing. Prior to the race the engines of the team cars had all been calibrated and the cars carefully weighed. One of the Stabilimenti Farina roadsters was found to have the best power-to-weight ratio and was allocated to Dusio. Who can blame him. Taruffi, who was working as a consultant to Dusio, was given the Vignale coupé, Minetti and Facetti had another of the Nuvolari roadsters and Bernabei and Pacini took the first two-seater prototype with the Motto (or Colli) body. Poor Nuvolari, a sick man, was brought from a resthome at Riva Gardone to drive the Garelli built roadster. The fact that he had the heaviest car with the least powerful engine in no way deterred the lion-hearted little man from Mantua. The likely winner was Clemente Biondetti, twice victor driving an 8C/2900 Supercharged Alfa Romeo. When the times to Rome started to come in, Nuvolari was in the lead having covered almost 500 miles in six hours 24 minutes, 11 minutes less than Biondetti, despite the best part of this being in

the dark and the rain. It was a measure of the car, incidentally, that Bernabei in the prototype was only four minutes behind Biondetti. Taruffi and Dusio were out before Rome. It was rain which dashed Nuvolari's chance of winning. A larger puddle than usual dowsed the engine and his mechanic took 25 minutes to diagnose the problem. Nevertheless the little Fiat-engined car finished only 16 minutes behind the larger Alfa Romeo in second place, with Bernabei third and Minetti a worthy fifth.

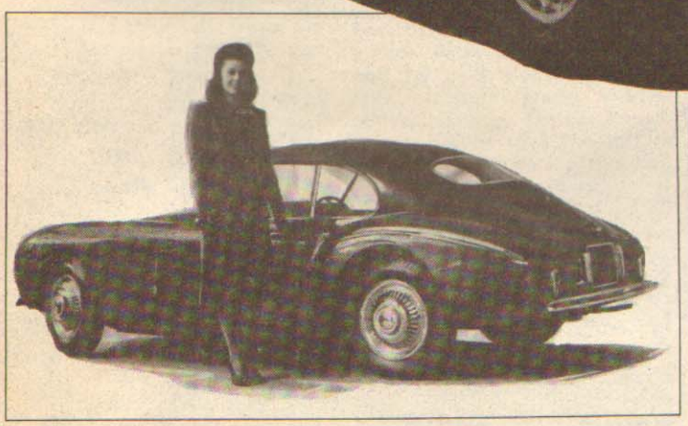
It was a result Cisitalia were never to repeat but it established the marque better than any advertising programme could have done. Inevitably the roadster model was christened the Nuvolari roadster and the production Vignale coupé was christened the Mille Miglia. It was the ideal background for the introduction of the Pininfarina coupés. The motoring world had to wait until September 1947 for the first of them to appear. This happened at the Coppa d'Oro styling show at the Villa d'Olmo, Como shortly before its first international showing at the Milan Coachwork Show in October 1947. At Como it won first prize overall, won its share of awards in Milan, and, when it reached the truly international Paris Show, was hailed as the sports car shape of the future.

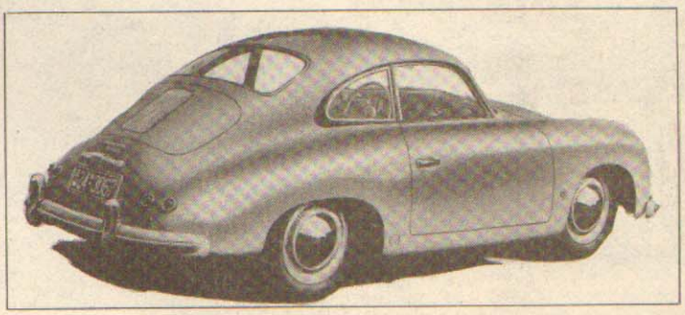
of the 202 coupés of both types were built to which must be added two type 202Ds with 2.77-litre BPM engines. Cisitalia production between 1946 and 1953 also included 31 monopostos, the two aerodynamic prototypes, 15 Nuvolari roadsters, and 50 303F coupés and cabriolets, which were developed versions of the 202. There were also two spyder models built in 1948-49 by Carlo Abarth to designs by Rudolfo Hruska. Nuvolari is said to have won his last event at Palermo, in one of these.

Dusio's undoing was his passion for racing cars. Besotted with the ambition to be another Lancia he took up the Porsche 1½-litre, supercharged, four-wheel drive design which had its origins with Auto-Union in 1939. Hruska came over from Porsche at Gmund to supervise design and Abarth was hired to supervise construction. Escalating costs and Dusio's inability, through delusions of grandeur, to halt them, finally brought the company to its knees. The Porsche engineers went back to Gmund with the inspiration to build small, light, streamlined sports cars from production components. There are many who believe that the Porsche car was born out of the ruins of Cisitalia.

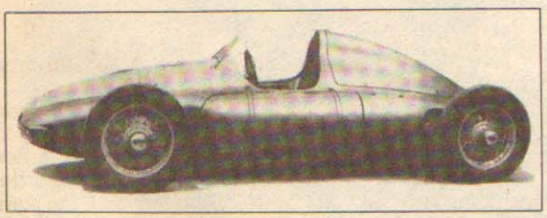


Left: The Nuvolari roadster and the Pininfarina coupé were shown at Geneva in 1948

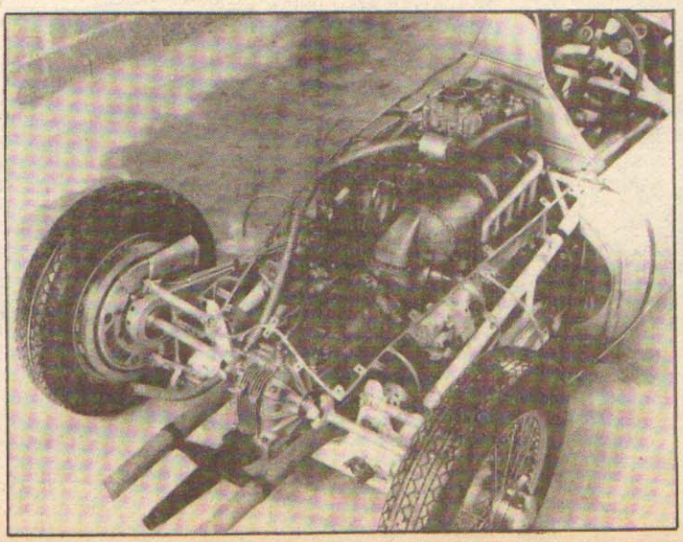




Far left: The Pininfarina coupé was very low – only 4ft 1¼in. high. Left: The Porsche 356 which carried on the Cisitalia GT design theme



Left: The 1950 1½-litre Grand Prix car, designed by Porsche, had a rear engine and fuel tanks alongside the cockpit



The 1½-litre GP car had a flat-12 supercharged engine developing 296 bhp at 8,500 rpm and four-wheel drive

Photographs of the Pininfarina coupé show a shape which is all too familiar today. In 1947 the low bonnet line, below the tops of the wings and bridging them with a gentle curve, the high front wing line just flirting with the root of the screen pillar, the humped rear wing line and the graceful, fastback coupé top were sensational. Some of it, the oval grille and coupé top, had been seen on an aerodynamic coupé built on a Lancia Aprilia in 1936. In the Cisitalia Pininfarina brought all the elements together in perfect proportion.

Construction of the 202SC coupé, and the 202B drophead version, kept Pininfarina busy for some months and in more ways than one was a turning point in his career. The volume of work was so great that some of it was farmed out to brother Giovanni just up the road. The very active Cisitalia Owners' Club in Italy tell me that 170