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APRIL 1961 • 50¢

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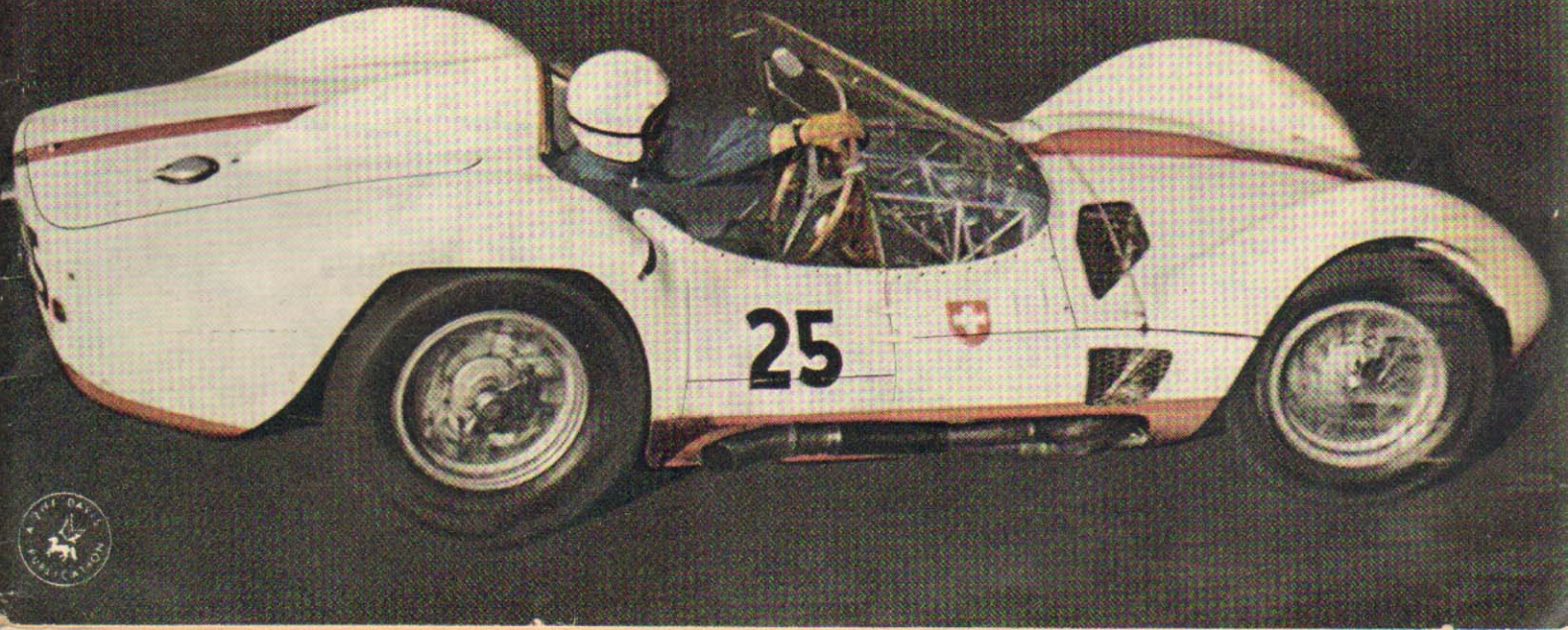
THE MOST FANTASTIC GRAND PRIX CAR... page 50

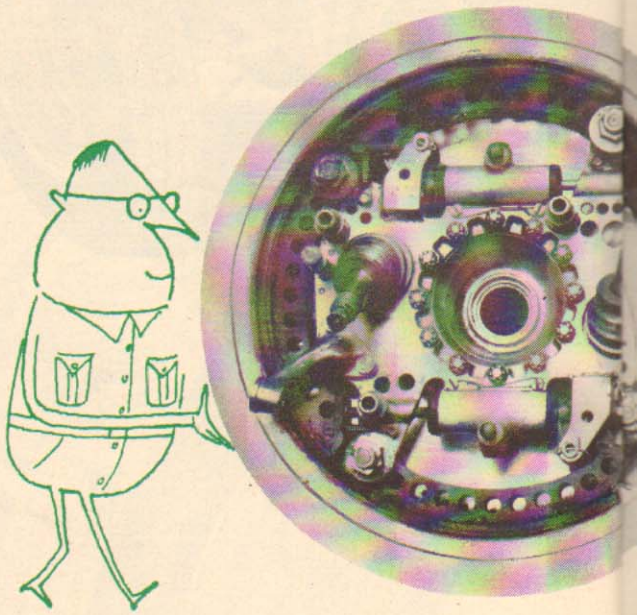
TRACK-TESTING THE BIRDCAGE MASERATI



Call it what you will, Cisitalia or Porsche Type 360, this ambitious Grand Prix machine frustrated countless engineers on two continents. They knew it would be vividly fast if they could only make it run — but they couldn't. Is it just coincidence that it's now back at Porsche, where another fantastic Grand Prix car is being built?

THE FANTAS GRAND CAR

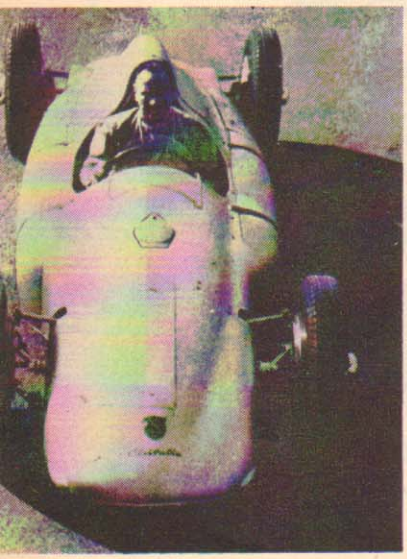
by Gianni



► This is the story of one of the most remarkable cars ever built. With its ingenious engineering and inspiring potential, it was a four-star flop. The Porsche-designed supercharged 1500 cc four-wheel-drive Cisitalia G.P. car was a washout. It was never successful because it was never raced. We can't help wondering what would have happened if . . .

This story, however, will not deal with conjecture; it will deal with the car, the men and the company. In the classic mode, it's a tragedy.

The Cisitalia saga started in 1945 in Turin. Piero Dusio, director general and co-owner of the Cisitalia factory, was producing a very successful racing car based on Fiat 1100 components. Discontent, he gave his attention to G.P. racing and looked for a designer. Late in 1946 he had drawn contracts with the experienced Porsche group which at that time had its headquarters in Gmünd, Austria. With the elder Porsche being held hostage in Dijon, France, a large part of the contract money was used to ransom him in 1947. His son, Ferry, and chief engineer Rabe quarterbacked the negotiations for the Porsche concern. Two others participated in the early talks. They were engineer Hruschka and Carlo Abarth. Hruschka had been serving as Porsche liaison in Italy, overseeing tractor production at another factory. Abarth, while not affiliated with the Porsche factory, knew several men there and may have served to introduce them to Dusio, aiding him in negotiations.



Piero Dusio sat behind the wheel for early publicity shots of his promotion, the Type 360 Porsche.

While Dusio gave top priority to the G.P. car, it was but one of four contracts between Cisitalia and Porsche. The others were for a 1500 cc sports car (Porsche Type 370), a tractor and a water turbine. Porsche was to handle the designing, Cisitalia the production.

The 1946 contracts called for first drawings of the G.P. car to be delivered to Dusio in the spring of 1947, with the first car to be built about September.

Details of the car included an opposed 12-cylinder engine with a 56 mm bore, a 50.5 mm stroke and a displacement of 1492.6 cc. A maximum of 10,000 rpm was aimed for, but initial performance was hoped to be 300 bhp at 8500 rpm. The engine had four overhead cams, two for each bank of six cylinders, driven by a system of shafts like today's Type 550. An 18 mm plug and two valves per cylinder were provided. The crank was a Hirth unit and dry-sump lubrication was used. Two vane-type blowers replaced the three Roots superchargers originally planned. They were driven at a reduction of 10:17, that is, 8500 engine rpm corresponded to 5000 for the blowers. The maximum boost was about 45 pounds. Two dual-throat Weber carburetors were mounted on the superchargers. Internally, the valves were at 90° to each other.

The four-wheel drive was planned to be engaged or disengaged at will by a lever under the steering wheel and was intended to increase traction during acceleration. With a weight-to-power ratio of 4.5 to 1, the Cissie needed all the traction it could get. The 4 w.d., rare in race car construction because of its added weight and reputed poor handling, was but one of the unusual features of the car.

(*Continued overleaf*)

MOST
STIC
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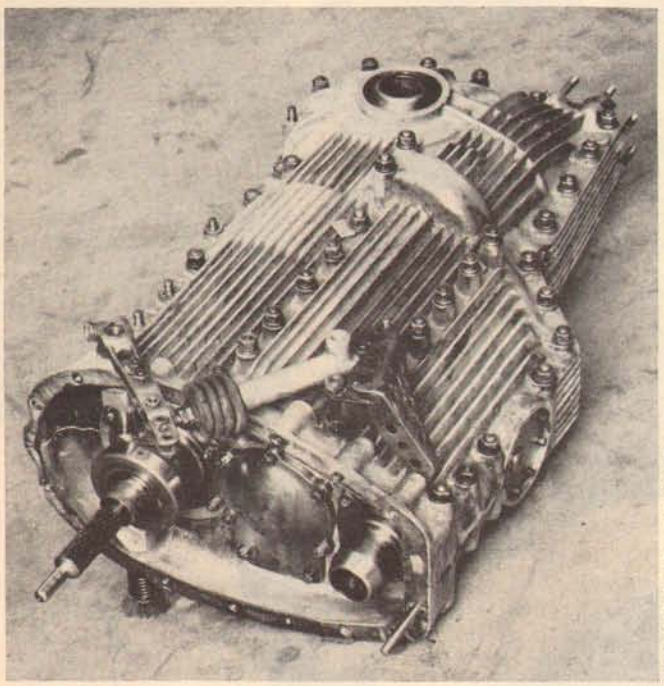
Rogliatti

Other interesting details included the very accurate and intricate alloy castings of the blocks and heads, and fitting of wet cylinder sleeves without gaskets.

Use of the rear-mounted engine reflects experience the Porsche team gained in the 1934-1937 Auto Union, which was reasonably successful. In the Cisitalia, contrary to the Auto Union and the arrangement on the later Porsche Spyder, not only the engine and clutch, but also the transmission was mounted ahead of the rear wheels, so that the rear wheels were actually at the rear end of the car.

The five-speed transmission was progressive, requiring drivers to use the gears in sequence; i.e., the driver could not shift, say, directly from second to fourth. It represented the first use of the Porsche servo synchronizing ring, but because of the progressive shift, the ring assembly had to be small and thus was not too powerful in action. Only two rings were needed, one for upshifts and the other for downshifts. Shifting was much like a motorcycle's: pushing the lever ahead shifted up and pulling back, the opposite. Lotus, of course, uses the same principle today. First plans included the possibility of either hand or foot shifting.



PHOTOGRAPHY: WEITMANN

Beautifully-finned gearbox unit is viewed from front. Splined shaft is input from engine; shaft at right (bottom of box) drives front wheels.

In the front the traditional Porsche trailing arm suspension, with torsion bars, left room for the front-drive shafts and the constant-velocity joints used at the outboard ends only. Torsion bars were also used at the rear, but the suspension geometry – like the genuine space frame and the effective use of a rear engine – was about 15 years ahead of its time. Each rear hub was located fore-and-aft by a very long trailing radius arm, and was located laterally by a pair of parallel arms that produced a very low roll center and eliminated the drastic camber changes that had affected Porsche swing-axle layouts, without going to the weight and complication of a de Dion axle. Certainly this suspension would have made the 360 the first rear-engined G.P. car with completely satisfactory, highly-usable handling.

A carryover from the 1938-39 Auto Union was the use of four leading shoes within each brake drum, the diameter being smaller at 13¼ inches but the width being greater at 2.15 inches. The backing plates carried air scoops, especially large ones at the rear. Track was set at 50.7 inches both front and rear, and wheelbase was 101.4 inches – long even by 1948 standards. Without fuel and oil the car weighed 1580 pounds, with a front/rear distribution of 48/52. When the centrally located fuel tanks received their 44-gallon load, the distribution became exactly 50/50.

Von Eberhorst, former professor at the Dresden College of Technology, joined the Porsche group in the spring of 1947 to serve as an advisor. He and his wife had fled from East Germany to Austria with virtually no possessions. His talent was warmly received by the Porsche group since he was the only immediate source for data on the 1938-39 Auto Unions and their high-pressure supercharger techniques. It was he who supported strongly the controversial four-wheel drive. He argued successfully that its complexity and weight were overshadowed by its tractive advantages. His clinching argument in favor of 4 w.d. over a two-wheel-drive version was in plotting anticipated performance over one kilometer with a standing start. The 4 w.d. car was expected to cover the distance at a speed of 117 to 119 mph while a similar car with rear-wheel drive only would do it in 107 to 113. The then-current world record for the distance, set by Rosemeyer in a six-liter Auto Union, stood at 117.9. And von Eberhorst pointed out the traction advantage of four-wheel drive increased as the track became slippery.

While one-cylinder engine testing had revised the power unit's output upward to 450 bhp at 10,500 rpm, Cisitalia had no dynamometer big enough to handle the full-scale engine. A second-hand test stand bought from Fiat was used for break-in and partial-load testing, but no flat-out readings were obtained.

Dusio, meanwhile, abandoned hopes of seeing the Cisitalia G.P. car in action by the spring of 1948. He also overestimated his financial resources and underestimated the high material and labor investments needed for production of six cars, the figure he and Ferry Porsche agreed was needed to field a complete stable. Early reports appeared in the Italian press that the first car was almost complete when such was not the case. The financial troubles grew worse through 1948 when Dusio began negotiations with parties in Argentina. Government-subsidized Autoar assumed in 1949 the financial obligations of suit-besieged Cisitalia. In addition to creditors' suits of about $350,000, the 400 employees sued for $37,000 in back wages. Despite assurances by now-deposed dictator Juan Peron that the Argentine government would back the G.P. enterprise, cash was slow in coming and it was about a year before operations were finally shifted to South America.

Porsche all but abandoned the project at that time since it was in the process of moving to Germany and setting up production of the Type 356. Prior to this, photos appeared showing Nuvolari at the wheel of a Cisitalia G.P. car, but that was apparently done for publicity purposes since, although the first car had been delivered, it had never been driven. In the spring of 1950, instead of six cars as ordered, there was one complete car, a second almost ready and only some parts for cars three to six – not enough to build a complete car.

Autoar ultimately involved itself in assembling station wagons and the G.P. car gathered dust in a warehouse. In mid-1952, someone remembered the machine and launched a campaign to have it cleaned, tested and, if possible, raced at the new Buenos Aires track the following January. What followed was a struggle against lack of funds, lack of time and lack of counsel with the result that a perfectly good car was ultimately discarded and later sold at auction.

Engineer Martinez de Vedia, chief professor at the Buenos Aires College of Engineering, in the department of thermal

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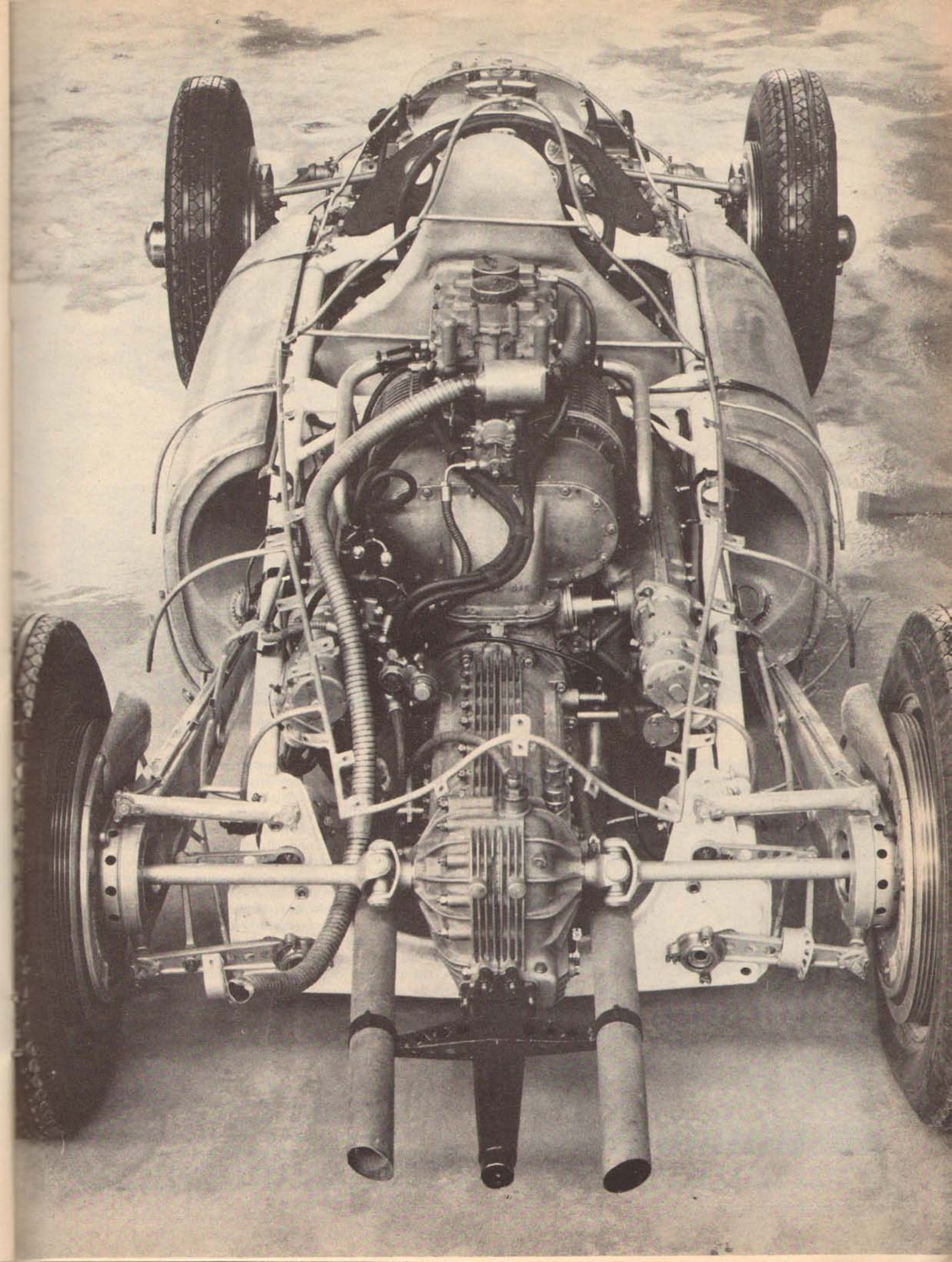
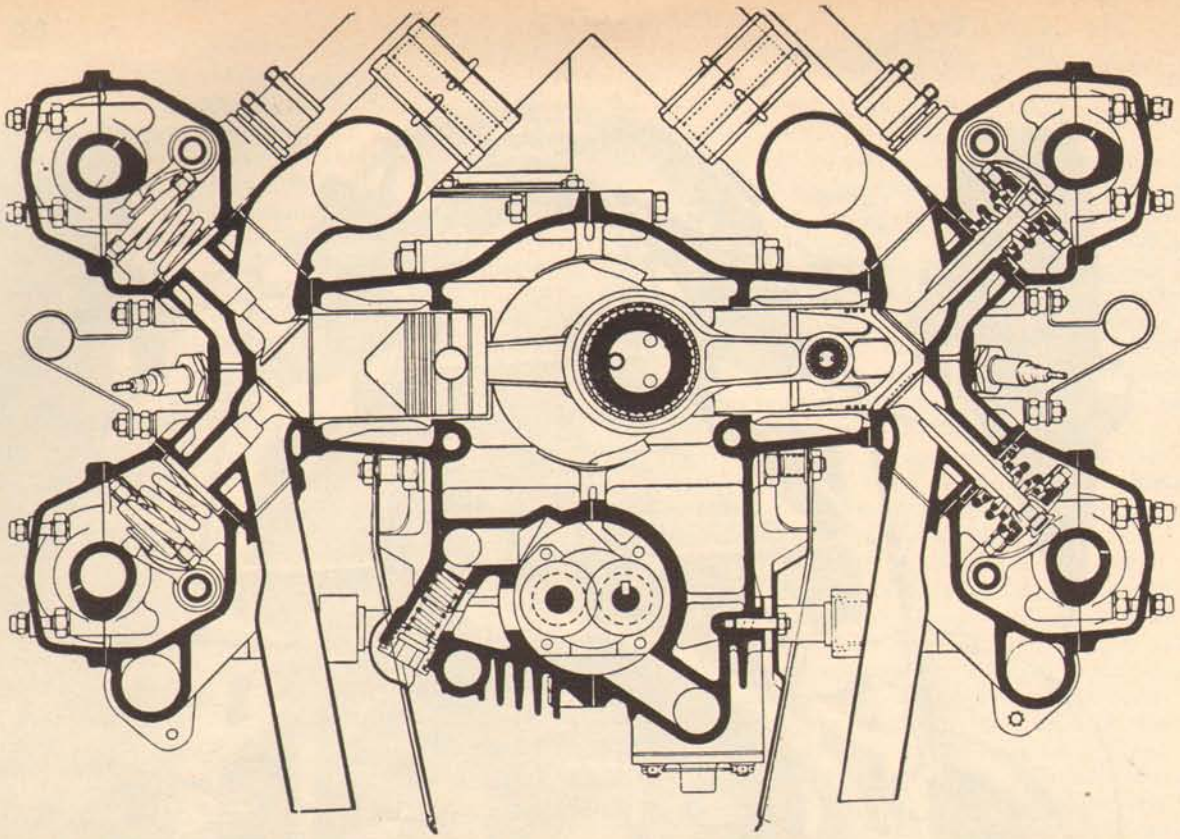
Cisitalia's rear suspension, fully independent with near-parallel arms, was very advanced. Two big superchargers dominate top of flat engine.





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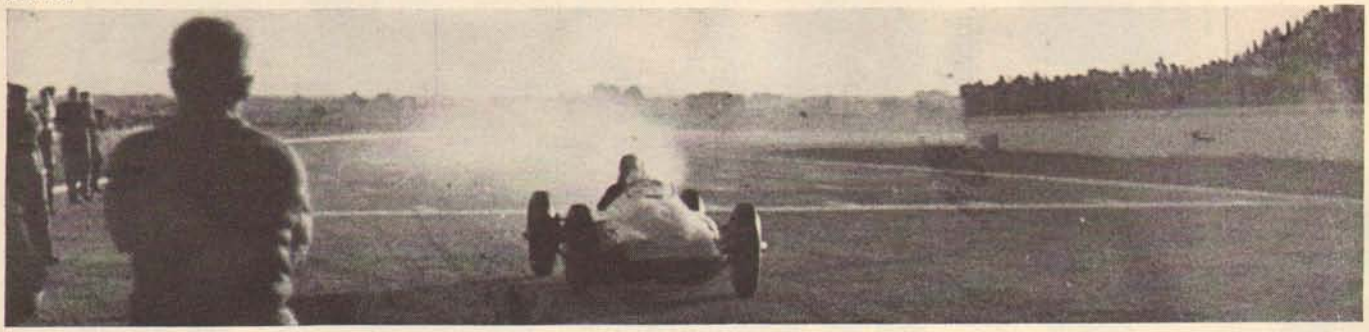
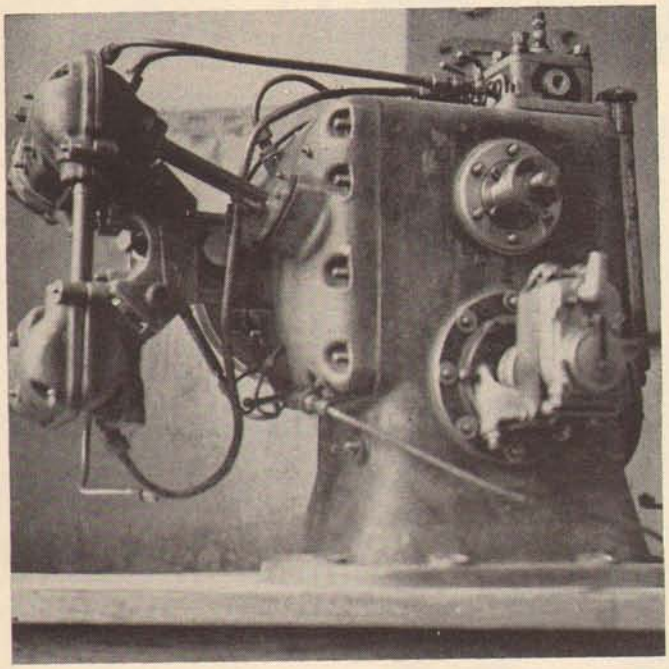


The only public appearance of this most fantastic Grand Prix car was anything but impressive, though drivers did comment on its excellent handling.



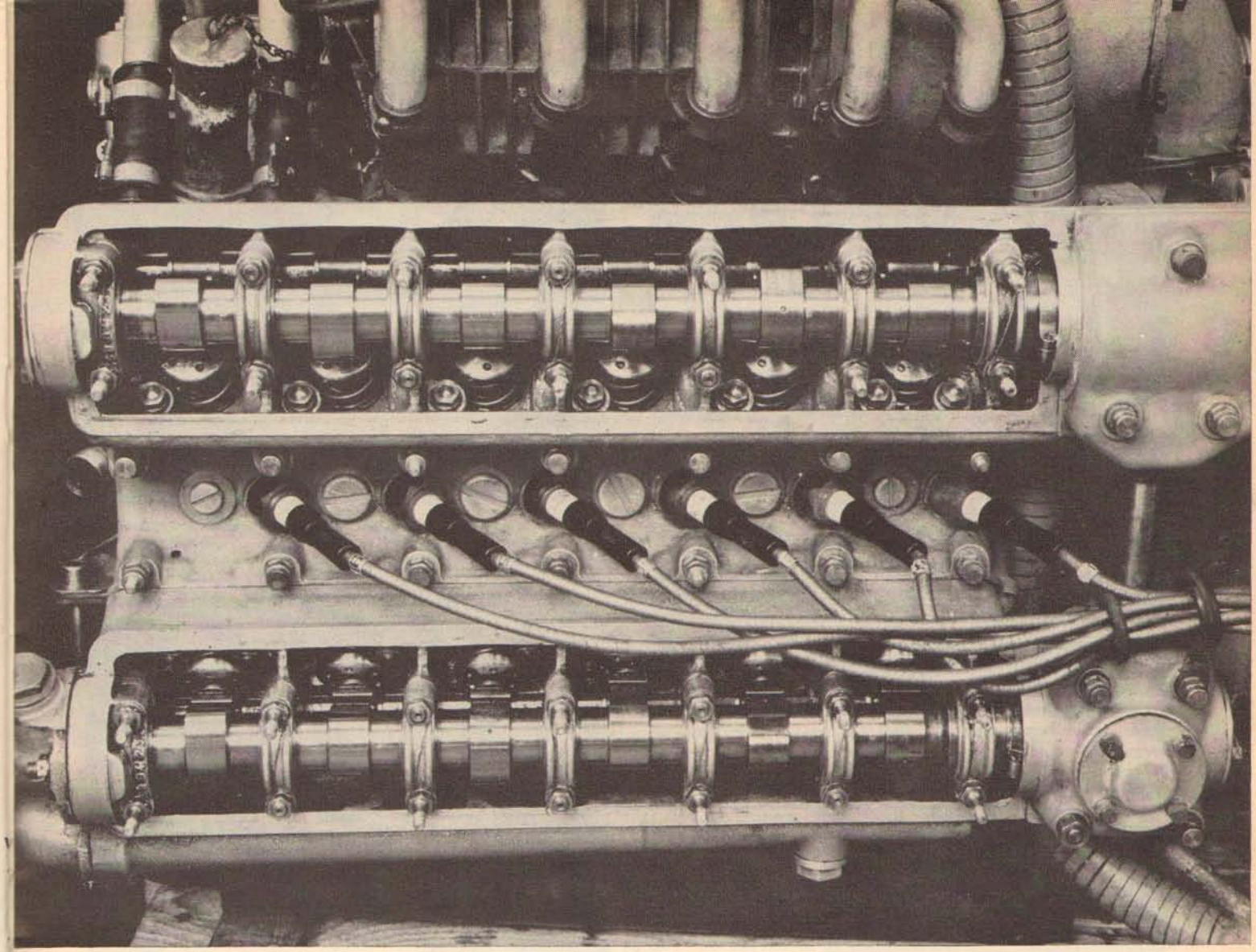
Single-cylinder test engine aided Argentine experimenters. Multiple pipe arrangement allowed precise metering of oil supply to valve gear.

machines, looked over the hundreds of drawings and began experiments with the single-cylinder test engine. Soon work began on the car with Clemar Bucci as the projected driver and his brother Roland as mechanic. But this venture ended after an argument with the Autoar management and the Italian engineer Giovanni Rossi took over while January, 1953 and the race rapidly approached.

The engine was put on a test stand, started easily and ran smoothly. Given full throttle for the first time, it gave a reading of 385 bhp – more than four bhp per cubic inch – at 10,000 rpm. The car was hastily assembled and taken to the autodrome for testing three days before the race. At first, the vane-type fuel pump refused to work at low revs. In the first few laps driven by Bucci and Bonetto, the drivers were astonished at the phenomenal road-holding. At a relatively low rpm, and using two-wheel drive, the car turned in a time of 2:30 for one lap, comparing favorably with a best time of 2:22 made by Ascari on a 4.5 Ferrari.

It has been said the four-wheel drive did not work well. It was, in fact, easy to use, but the identical drive ratio in the two differentials was difficult to achieve since the car used different tire sizes front and rear.

Joy over the performance lasted but a few minutes for, after a couple of laps, the car went by in a smoke screen. The trouble was traced to oil foam from the crankcase vent dripping on the hot manifold. It was subsequently discovered that the two oil scavenging pumps were extracting



Left-hand cylinder head of flat-twelve displays wide cam lobes and finger followers. Spark plugs (Champions fitted here!) thread in at steep angle.

oil slower than the main pump was delivering it to the engine. Since it was not possible to change the pumps or the drive ratio, the problem was temporarily solved by using a flexible pipe to lead the oil away from the exhaus• pipe. It was also evident that using straight methanol for fuel was not what Porsche had in mind. Persistent carburetion problems ended in several burned pistons.

The engine was torn down and rebuilt. This time it showed 416 bhp on the dyno, a very respectable figure considering the dearth of facilities and absolute lack of advice the men had to go on, not to mention the scarcity of cash they had to work with as Autoar was all but uninterested in the project.

It was decided that rather than try to race the car, an attempt would be made at record-breaking. They felt that if the runs were successful, the car could be sold and Autoar would reap publicity value. Under pressure from the company's directors, the car was readied by removing the front drive, lightening the car by a couple of hundred pounds.

After some false starts, on the cold morning of June 18, 1953, the Cisitalia made its last runs. The Buenos Aires winter is damp, cold and windy and the engine, fed with straight methanol, wouldn't warm up since the oil kept flooding the crankcase and fouling the spark plugs. At 7000 rpm, the highest speed was 147 mph; at a full 10,000 it should have been at least 210. The tests were stopped, an argument arose among members of the management and the car was sold for peanuts to someone who didn't try to use it at all. It was at this time that the specifications for Formula 1 were being changed and the car was outdated even before it had a chance. Bonetto, after his drive at the autodrome, had recommended building an unblown 2.5-liter version with two-wheel drive, but this was never attempted.

This then is the sad saga of the Cisitalia, the potential winner that never got the green flag. It's the story of missed opportunity, of people who had possession of the most advanced car of its time and for several reasons couldn't or wouldn't use it. The car lay for some time in a garage near Buenos Aires. All it needed to make it run properly was the proper fuel blend and an insight into the problem of the oil pumps. The suspension, steering and braking and generally the whole car were perfect right from the start. The Bucci brothers still get excited when they remember "the car" and sadly recall they were denied permission to carry on tests of their own.

The Cisitalia G.P. car has been returned to the Porsche works where it is now being repaired for a museum. Perhaps someone could be spared from more mundane matters to do a little internal work on the Cissie and, if successful, the factory could stage dramatic demonstration runs similar to those made not so long ago with the pre-war Mercedes. It's likely they'd show that the Type 360's performance is as far ahead of its time as its very advanced design.—*GR*