THE FIRST FERRARI

Franco Cortese drives the first Ferrari at Piacenza, May, 1947.

Chapter Two

The war did not treat Italy well. Apart from being beaten by the Allies, she was occupied by the Germans in 1943. They moved into Ferrari's factory at Maranello on September 8th and removed many of Ferrari's grinding machines for use in the Fatherland. To add insult to injury, the Allies bombed the factory on November 8th, 1944 and again in February 1945.

Legend has it that Ferrari insisted upon a twelve-cylinder engine for his forthcoming racing cars during his meeting with Colombo, after watching a similarly-engined American Packard racing car during the Twenties. This may be so. Another reason was probably that one of the wealthiest of his Scuderia Ferrari drivers, Count Trossi, had bought many twelve cylinder Packards in the Thirties, telling Ferrari just how wonderful they were. Whatever, what Ferrari did possess in abundance was a talent for publicity. He knew that with no other maker being so daring as to produce a Vee-twelve engine, he would attract headlines in the sporting press, which would bring to him the best drivers of the day, ergo, the greatest chance of success on the track.

Furthermore, Ferrari had attempted (and failed) to hire his old friend from Alfa Romeo, Vittorio Jano, before turning to Colombo. It turned out that Colombo was a good choice, having designed the 12 cylinder 312 Grand Prix car before the war for the Scuderia Ferrari, as well as the flat 12 Alfa 512GP whose career had been cut short by the war. The advantage of using a twelve-cylinder engine was plain to see from an engineering point. Provided the designer could overcome the complexity and increased internal frictional losses from such a design, an oversquare bore to stroke ratio would produce a much increased piston area over a four, six, or eight cylinder engine of the same capacity. Piston area is directly proportionate to brake mean effective pressure (B.M.E.P.), which is crucial in brake horsepower production. Therefore, Ferrari, with his own and machine shop, (and later a foundry), was in an excellent position to make use of just such a design.

Ferrari met with Gioachino Colombo in Modena, together with Enrico Nardi. Nardi was still, in 1945, in charge at Auto Avio Costruzione, the Company, which had produced the 815 in 1940. Enrico Nardi later on, in 1947, produced the Nardi-Darnese sports-racing car which had an engine identical to that of the 815 except that the valve cover had the legend: "Nardi-Darnese" stamped into it. It is likely that Nardi took over the A.A.C.'s engine design for his own car but the car was unsuccessful and Enzo Ferrari was upset about this particular "borrofender!" Later on, during the 1960's, Enzo Ferrari bought Nardi's wood-rimmed steering wheels for use on his own cars and so the association persevered, despite minor problems.

Ferrari had known Colombo since 1924 when Vittorio Jano, the great Alfa Romeo designer, had taken him on at age 21 to help with the design of the P2. Colombo had started work at age 14 as a technical draftsman at the Officine Franco Tosi di Legnano, working on diesel engines, steam turbines and even submersibles. In 1928, Colombo was appointed Head of the technical department there, dealing with both road and race cars.

In 1937, Colombo had been seconded to the Scuderia Ferrari in Modena to oversee the design of the Alfa Romeo 158 and returned to the Alfa Romeo works in 1938 as the head of the design department of Alfa Corse, the race team, which Enzo Ferrari had managed. At Alfa Corse, he took part in the development of the Tipos 312, 316 and 512.

During this period at Portello, both Ferrari and Colombo had access to the designs of Wilfredo Ricart, the Spanish designer, (who would later go on to design the Pegaso in his native homeland), and Bruno Trevisan, the head of the design group. Amongst their designs was an engine known simply as the S10, a 60 degree V-12 with a single overhead camshaft per cylinder bank and seven main bearings. This engine was designed between 1938 and 1940 and was intended to power a Gran Turismo car. It was planned to produce three cars to contest the 1941 Mille Miglia but, of course, the war overtook events and that edition of the race was never run. Two engines were built and tested, the S10 giving 140 bhp and the “SS” version giving 165 bhp, both at 4700 rpm. This S10 and a smaller V8, the S11, were the only two engines using the Vee configuration that were designed at Alfa Romeo during this period although, in 1937, a racing V-12, known as the 12C, had been developed. This differed in many ways from the S10, having four overhead camshafts to open and close the two valves per cylinder.

Whilst your author is not claiming that Colombo copied Trevisan’s S10 design, it must have dawned upon Colombo, as he discussed with Ferrari that man’s desire to produce racing, sports and GRAN TURISMO cars, (author’s italics), that this S10 probably embodied all the virtues of multi-cylinder activity allied to simplicity of service which would be needed for Ferrari’s future.

As an aside to the above, a drawing came this author’s way in April, 1999 date stamped ‘3-3’40’ (presumably 3 March 1940.) This drawing, with the initials, ‘A.A.C’ (Auto Avio Costruzione) on it and entitled ‘516’ showed an end view of what appeared to be a further development of Ricart’s Alfa Romeo 512. There are the characteristic mountings for the twin superchargers on the top of the block but the cylinder arrangement looks extremely compact, (see drawing). Could it be that Ferrari, although effecting extreme distaste for Ricart was not above using his ideas for a 5-liter, sixteen cylinder Grand Prix car with which to challenge German domination? Obviously, this extremely ambitious project was brought to naught by Italy’s involvement in the War.

There is one facet of the Ferrari story, which needs clarifying at the start; Ferrari was, first and foremost, a racer. He really was just not interested in road Ferrari calculated that a tuned-down Vee-twelve engine would attract wealthy buyers of his road cars and thus pay for his passion, racing.

On the 15th August 1945, at a small villa in Castellanza, near Varese, Colombo drew up the cylinder heads of the new engine with their characteristic inside-plug location. He had been invited to the villa for lunch, as it was his sister's house. The car itself was designed in the bedroom of his temporary lodgings in Milan. At this time, Colombo was suspended from his job at Alfa Romeo. The rivalry of his colleagues had resulted in Colombo being investigated by the "purity" committee, to see whether he had sided with the Fascists during the war. His employment contract was still in force, so he was being paid although he took on Ferrari's commission as a "sideline".

After the three summer months in which Colombo drew up the 125's V12 engine, Colombo was re-instated at Alfa Romeo. Ironically, the head of the left-fender trade union had backed his re-appointment, saying that the re-creation of the Alfa Romeo racing team was paramount to reviving Alfa Romeo's sporting image. Colombo was assisted in the design of the 125 by Angelo (Lino) Nasi, who drew up the 5-speed and reverse gearbox and rear axle of the car. Nasi had been the head of the Alfa Romeo industrial vehicle division but was out of work during this period. Colombo finished the drawings of the new twelve cylinder engine in November 1945.

Colombo then returned to Alfa Romeo yet again to bring the Alfetta 158 up to date. He returned to Ferrari for another "consultancy" spell in late 1947 but left for good in 1950.

This time, Colombo went back to Alfa Romeo to develop the 158 into its final flowering, the 159 and would see Aurelio Lampredi's design of the four and a half liter Ferrari 375F1 finally defeat his beloved Alfa Romeo. After this, Colombo moved to Maserati where he designed the 250F Grand Prix car and the 450S Sports-racing car engine. Colombo then acted as a consultant on many more projects, including the ill-fated Bugatti 251 Grand Prix car and the 750 cc twin-cam engine for Abarth.

At the Ferrari factory the drawings of the new car, known internally as the '125' denoting a single cylinder's capacity, had gone out to component manufacturers sometime around late December 1945 to early January, 1946. From then on until June when Giuseppe Busso was hired as technical director, little progress was made. In November, when Colombo recommenced work at Alfa Romeo, he had recommended Enzo Ferrari to hire Busso but Ferrari thought his own technical staff could develop the engine themselves. When Ferrari saw that this was not happening, he accepted Colombo's advice.

On the 15th May, Enzo Ferrari met with Busso to arrange for him to become his new

technical director. Ferrari's objectives were to control development of the 125 road car project and to design the four-cam, two-stage supercharged 1.5 liter V-12 Grand Prix car that would first race in September 1949. Busso had also been a designer for Alfa Romeo, having only recently been laid off from that company. He had worked at Alfa Romeo since 1939 as a calculator/designer in the aircraft engine department. When the war finished, in 1945, Busso had worked as a researcher in the special design office. Busso joined Luigi Bazzi in a factory still occupied in producing machine tools, in order to generate capital for the new car company entitled simply: Ferrari; Modena; Italy.

Luigi Bazzi had been born in 1902 and had worked in the racing department of Fiat during their "golden days" of the 1920's. He had left Fiat in 1923 to go to Alfa Romeo and had then joined Enzo Ferrari in the running of the Scuderia Ferrari before the war, helping to develop such cars as the twin engined "Bimotore".

During the early part of 1946, Alessandro Calzoni, whose foundry made all of Ferrari's blocks, heads and timing covers started to make deliveries to the Ferrari factory of the necessary parts to build the new engine.

Attileo Galetto was in charge of machine work at the factory and noted that parts for the new engine were amassing by April, 1946; indeed, the timing cover of the first engine of 01C is stamped with the date: April 22 1946. On the 1st of June, Luciano Fochi joined Ferrari. As a very young man, he had been with Alfa Corse in 1940, working under Colombo. He helped to refine the original design of the 125 and ensured that Colombo's original drawings were translated onto paper carrying the Ferrari factory's official name before these drawings were sent to outside suppliers. On the 10th June, Busso started his job and noted the delivery of the first unmachined components of the 125 in his diary. These parts had been ordered by Frederico Gilberti, the head of purchasing.

Aurelio Lampredi said, in a later interview; "Busso knew everything because he read everything, because he was a scholar, because he was in charge of publications for Wilfredo Ricart, (at Alfa Romeo), and was very clever with his calculations. He knew everything but he could not build; he had only seen others build and he lacked the direct experience of dimensioning and practical building. Consequently he designed things that were difficult to build and put together. And the disagreements... In the office, I found Fochi, who was little more than a boy. He was not yet 20; he later became my right arm. There was also Bellei, Farina, (Not Nino!-Ed), Paglia..."

Considering the ravages of the war all around the northern part of Italy in which Maranello is situated, it is not surprising that the first Ferrari car did not see the light of day until early 1947. Later in June 1946, the drawings of the chassis, dated 5th June, were sent to Gilberto Colombo, (no relation), in Milan who worked for his father's company which was called "Gilco Autotelai". Gilberto Colombo had approached Ferrari

during this period to try and buy some machine tools. When Enzo Ferrari told him that he was no longer producing machine tools, only racing cars, Colombo had pointed out the advantage of using the high quality steel tubing which his father's company produced for the aircraft industry for use in Ferrari's projected chassis.

Upon receipt of the drawings, Gilberto Colombo took them to a local engineer, one Cantafora who suggested a few detail changes to help the torsional rigidity of the frame and these suggestions were incorporated into the finished chassis. The first chassis delivered weighed some 56 kilograms and Ferrari asked for a lighter version. Colombo suggested a change in the weight and tube shape of the chassis, also lengthening the wheelbase to 2420 mm. The second chassis weighed in at 44 kilograms. It is not known if the original chassis was ever used or was scrapped. Whatever, the first two chassis are noted as having been delivered in September.

As an aside, there is a photograph in existence, which shows a chassis without the transverse cross-bar bracing the center "X" which connected the two chassis side members. This could be the lightened chassis; if so, it does not appear to have been used in any car inspected so far by your author.

Not until July 25th were the final drawings finished for the engine; the drawings for the block, which were used in the machining work, show this date. On August 5th, the full-size drawings of the Tipo 125's engine were dated and sent to the machine shop. By a miracle of hard work by the machine shop of Ferrari, the first engine was assembled in less than two months.

Sometime in September, Aurelio Lampredi was contacted by Ferrari and officially started work as Busso's assistant on 2nd October. He was, however, in the test shop on September the 29th, 1946, when the new engine ran on a dynamometer for the first time with Busso and Lampredi in attendance.

Imagine their disappointment when the dynamometer showed just 60 bhp at 5600 rpm, a disaster in view of the hopes with which Ferrari had imbued this engine. The engine would not rev any higher due to ignition problems. Pre-war ignition equipment was still in use at this time and it was incapable of supplying enough sparks at the higher revolutions of which Ferrari's new V-12 was capable. Also, the engine featured Colombo's "fully floating" bearings, which proved to be a failure.

Much development work was called for and the first fully floating bearing design was scrapped, Lampredi substituting needle rollers and thickening the crankshaft journals to strengthen them as they had proved weak and likely to distort or, even worse, break.

There is, in existence, a very early engine stamped "46-1", built up with all magnesium castings. It is possible that this is one of Ferrari's first experimental engines. The choice

of magnesium is curious; although very light, it is not as strong as the Silumin from which subsequent engines were built. Of course, with the end of the war, there was a lot of magnesium about; in ravaged post-war Italy, there would have been a lot of scrap aircraft from which to melt down the light weight metal. It is possible that this was the very first, experimental, Ferrari engine and that Ferrari's engineers decided after the first tests that they needed a stronger material for the engine, bearing in mind the power that was expected from the forthcoming Grand Prix engine when that was supercharged.

Aurelio Lampredi came from the aircraft design section of Reggiane-Caproni of Reggia Emilia. Previously, he had worked at Piaggio, aircraft manufacturers of Pontedera. A man brought up in the aircraft industry where failure of an engine meant the possible destruction of a valuable aircraft and pilot, Lampredi was very much an engineer with his feet on the ground, used to checking and re-checking all his (and others) calculations. Coming from this background, Lampredi would almost certainly have had a condescending attitude towards car designers, seeing them as people who did things in, possibly, a hurried and cheap way. What he discovered when he started work at Maranello did not surprise him. On his arrival, he found that the people in the technical department were... "Little boys... in particular Fochi". In later years, Lampredi said about Fochi: "Now, he can put his hand to anything. If there was a gearbox to be made, I had him make one, if there was an engine to be made, I had him make it. Later on, at Fiat/Lancia, I designed and built, with Fochi, the Volumex compressor used in all Lancia rally cars (of the period-Ed), and subsequently in some mass-produced Fiats and Lancias".

It was not until Guilio Ramponi, an ex-Scuderia Ferrari mechanic, came back to Maranello from England and introduced Ferrari to the new, detachable plain bearings of Thinwall design and manufacture that this particular problem was later resolved. Guy Vandervell, the autocratic boss of the Thinwall bearing Company, (later to build the Vanwall racing cars), was a man very much cast in Ferrari's style. In the coming years, he would buy several Ferrari Grand Prix cars to run as his "Thinwall Specials" and had frequent arguments with Ferrari over the standard of workmanship displayed.

Lampredi said in the same interview: "Colombo's idea of a needle-roller bearing crankshaft was 'an extraordinary idea.'" Still, Lampredi made it work, despite the crankshaft distorting due to the small main bearing journals. The journals had to be machined oval (!) and the rollers alternated between 3 mm and 2.98 mm to fit this ovality.

Ferrari then issued details to the press of the car(s) he intended to build. In November 1946, an article in "Inter Auto" gave very precise details of the engine and chassis. In Britain, the "Autocar" published an article entitled "New Italian Make" on December 13th, which reiterated this article and gave brief details of the new make. Over the

winter of 1946-47, work went on at Ferrari's factory assembling the suspension, steering, brakes and the radiator upon the two chassis.

In December, Colombo left Alfa Romeo once again due to a disagreement with Orazzo Satta Puliga, the head of design and production, apparently a strict disciplinarian. Colombo had been working in his free time as the designer of the "Volpe" car, just as he had worked on Ferrari's engine design in 1945. It is possible that the bosses of Alfa Romeo (or Satta himself) disapproved of this "part-time" activity.

Built around a "ladder" type frame of twin oval steel tubes, the new car had a cylinder capacity of just 1496.77 cc. Each cylinder was a mere 124.73 cc in capacity, thus giving the Tipo it's name, the 125. Bore and stroke were 55mm x 52.5 mm, giving the engine the oversquare bore/stroke ratio which would become Ferrari's trademark, and allow merely boring out of the cylinders to increase the size of the engine.

Ferry Porsche once said of his immortal 911 flat-six design: "If I had known what capacity the (original) two-liter engine was capable of being increased to, I would never have bothered with such a small capacity to start with". Enzo Ferrari must also have felt the same over his original Vee-twelve in later years.

Ferrari announced that there would be three variations of the new car: A "super sports", to be fitted with open, two-seater bodywork, and with a three-carburetor engine developing 118 bhp at 7,000 rpm; a "touring", version with three-seater coupe bodywork with a single-carburetor engine developing 72 bhp at 5,600 rpm; and a supercharged Grand Prix car which had an unspecified power output but which would rev up to 8,000 rpm. This last, when it first appeared in 1948, was to prove a disappointment, the engine not being able to rev as high as its intended target due to high internal friction losses.

Returning to the chassis: At the rear, this arched over the rigid rear axle and was suspended by twin longitudinal leaf springs, shackled at the rear and fixed to the chassis at their front mounting. An odd feature of this design was an anti-roll bar, which ran, enclosed, through the rear chassis cross-member.

At the front, the suspension featured unequal length wishbones, the lower one being much longer than the top and a transverse leaf spring was mounted below the chassis and linked to the lower wishbones. The dampers were hydraulic piston-type, specially designed by Colombo but Houdaille dampers were substituted at the production stage. The brakes were finned, steel-lined aluminum drums. Oddly enough, the steering was shown as being right hand drive.

"The Motor", (issue of February 5th, 1947), printed a very complete article, based upon that which had appeared in the Italian magazine "Inter Auto". Besides accurately

describing the new engine and chassis, the article also printed a drawing of the proposed coupe design that was seen on the 1948 Mille Miglia-winning car, 003S that would be driven by Biondetti. Taking into account the lead time for the article's preparation, it is obvious that this design must have been finalized sometime in October 1946. There was also the specification table shown below:

	FERRARI TYPE 125S
ENGINE DIMENSIONS	Cylinders Twelve Bore 55mm Stroke 52.5mm Cubic capacity 1497cc Piston Area 44 sq. in. Valves Inclined, overhead Compression Ratio 8.0: 1
ENGINE PERFORMANCE	Maximum BHP 72 at: 5,600 rpm BHP per sq. in. piston area 1.64 Peak piston speed, ft. per min 2,570
ENGINE DETAILS	Carburetor 3 downdraught Ignition 2 Marelli Magnetos and 2 Superpotente Coil
CHASSIS DETAILS	Brakes Hydraulic Brake drum diameter 11.75 ins. front Brake drum diameter 11.75 ins. rear Suspension, front Transverse leaf Suspension, rear Semi-elliptic Shock absorbers Piston type hydraulic anti-roll bar at rear Wheel type Steel disc with light alloy rim and Rudge-type knock off attachment Tire size 6.50 x 15 Steering gear Worm and sector Fuel pump Mechanical Fuel capacity 16 1/2 gallons Cooling system Pump
TRANSMISSION:	Clutch Single plate
GEAR RATIOS	Overdrive 4.5 Direct 4.9 3rd 6.45 2nd 10.9 1st 15.2 Final drive Spiral bevel
DIMENSIONS	Wheelbase 7 ft. 11 1/2 ins. Track, front 4 ft. 1 1/2 ins.

PERFORMANCE DATA

Track, rear 3 ft. 11 1/2 ins.
Overall length 14ft 10 1/2 ins.
Overall width 5 ft. 1 in.
Ground clearance 6 1/2 ins.
Weight of 3-seater coupe 15.7 cwt.
Piston area per ton 56 sq. in.
Direct gear mph per 1,000 rpm 15.9 mph
Overdrive gear mph per thousand rpm 17.3 mph
Piston speed at maximum claimed speed of 96 mph
Overdrive: 1,930 ft./min.
Direct: 2,100 ft./min.
Direct gear mph at 2,500 ft. per min. piston speed 114 mph
Overdrive mph at 2,500 ft./min. piston speed 124 mph