FALCONE (translation made in May 2002 by Laurie North)

Publisher's footnote

In the course of its history the Moto Guzzi factory has produced a great variety of models, each one of which has helped the reputation of the House of Mandello del Lario to take root in the minds of the 'apposionati'. No-one however, quite realised in Italy in the 1950's , an era that was slowly proceeding towards prosperity, of the many dreams and great esteem that were to be awakened by the arrival of the Falcone .

This brilliant and fast 500, handsome, robust and untiring, was in fact much more than an excellent motorcycle. It was, above all, the symbol of an epoch which helped to define the spirit of that age.

The author summed it up succinctly with these words ***"He who rides a Falcone can truly compare himself to a cavalier of the past - tall and unreachable, above the mass of common men and their meagre aspirations !"***.

Today, the aspirations and, perhaps, the men have changed, but the Falcone continues to be a collector's dream. The unique, unforgettable sound of its engine still causes the highest admiration and it truly deserves its accolade of 'The most romantic of all motorcycles'

This book is more complete than any other written on the Falcone. Besides delineating the history and examining every particular of it, the author calls upon his valuable experience as a Moto Guzzi specialist to provide for enthusiasts everywhere, generous chapters dedicated to Falcone overhaul and upkeep.

FALCONE (translation made in May 2002 by Laurie North)

This first 6-page section corresponds to the narrative on Pages 7 to 19 of the original book.

HISTORY

FALCONE: THE PROPOSED MOTO GUZZI IN THE 500 CLASS

The history of the Falcone started virtually with the first bike conceived of by Carlo Guzzi, the G.P. of 1920, which represented the evolutionary extreme. The G.P. never got beyond the prototype stage, but its design contained all those resolutions and principles that would characterise the production of the Moto Guzzi for 50 years, from the horizontal cylinder to the external flywheel, from separate lubrication of the gears in the block, up to the double cradle frame.

Falcon : a bird if prey that always flies alone, ready to descend like a lightning flash on to its quarry. The fastest in flight of all the birds and a symbol of freedom and power, with its masculine name, stronger than the [feminine] eagle. A name that evokes memories of the past implying strength and gentleness at the same time. Times of fair maidens, knights, castles, tournaments and hunts reserved for the nobles of rank.

But the name "Falcon" also takes us back to the fabulous epoch in the history of motorcycling, those "Golden Age" years of the 1950's, during which all the motorised two-wheelers enjoyed unprecedented popularity. When mopeds and scooters flourished alongside the motorcycles. For the most part the motorcycles were utility models, economic to own and within the reach of all incomes In consequence they were also of modest performance. In the midst of this setting, those who rode a Falcone, the 500 Moto Guzzi, could truly feel like a cavalier of the past — tall and untouchable, above the reach of the mass of common mortals and those of meagre aspiration.

Only a few could afford to buy a 500, which at the time was a synonym for a 'superbike'; and there were, in fact, few 500's available on the market. Amongst them the Falcone was without doubt the most desired by true motorcyclists, by the *appassionati* that bought the bike by deliberate choice, and not from mere economic considerations.

They were looked upon with disapproval and mistrust by 'sensible' people that would have plumped for a second hand FIAT Topolino - naturally costing less money !.

The Falcone was a brilliant fast machine, and even if the ride was not entirely intuitive, it was - and remains - the sports bike *par excellence*. More for its comfort - like all other Moto Guzzi of the time - on the long straights rather than on the more 'mixed' going., A robust and indefatigable devourer of miles, steadfast in its enduring strength on the long runs, it could be ridden flat out for long periods. Its strong engine put out 23 HP, sufficient to reach 135 Kph with ease in standard form. Because of this inherent strength it lent itself well to later enhancements and Falcone's were very easily modified to reach 160 Kph. This today, may not seem a lot, but 40 or 50 years ago, 160 kph was indeed fast. Only a very few production cars i.e. the costliest of the Alfa Romeos or the first Cisitalia, were able to outperform a 'mildly tuned' Falcone.

Very expensive even at the time of its launch in the Spring of 1950, the Falcone sold for 842,000 Italian Lira and became the 'ultimate' if unattainable motorcycle' for a whole generation. At least for those in the right financial situation, who could afford the indispensable cachet necessary to be included among the supermen of motorcycling. It represented the ultimate in evolution — at least for a road-going, production

bike — of the motorbike first conceived by Carlo Guzzi during the First World War which he produced from 1921, after joining up with the Parodi family.

Carlo was a true *avant garde* motorcyclist, with some ideas that only became commonplace many years after he introduced them - from the frame with double cradle from the good ride, from the short stroke engine to the "unit" engine and gearbox , from the geared primary drive to the recycled lubrication. Above all, it was one of the first motorcycles that was safe and reliable by virtue of its impeccable functioning, with which arrival at the destination was no longer a hazard subject to breakdowns and entrusted to fate.

Historical notes on the House of Mandello del Lario and on its production.

The birth of the Moto Guzzi has been told many times, but it is worth while to summarise it again here, because it is the start of the long road that leads to the Falcone.

The Guzzi family, originating from Milan, had two houses in Mandello, then a little fishing village, about 10 kilometers to the north of Lecco, to where they moved permanently at the start of the first skirmishes of the First World War.
Here Carlo Guzzi, an innately gifted technician with great powers of observation and practical sense, fell in love with engines and motorcycles, for which he set up a home workshop.
But the motorcycles of the period, so full of faults and therefore somewhat unreliable barely satisfied, so he decided to sort out the problem on his own, designing a machine, according to his own personal views and precepts.

The motorcycle that he had in mind when he had to leave for the war, had a four stroke engine of 500 cc, considered to be of average size at that time, but sufficient for the needs of the great majority of the potential clients.
The cylinder was horizontally placed, facing forward so offering the head - the hottest point of the machine - to the wind, and with undersquare travel, as is normal today, but in those years an absolute novelty in the field of motorcycling !

His chosen dimension of 88 by 82 mm. served to reduce the speed of the conrod, and is thus less stressed while the large piston diameter allowed the use of larger valves, with undoubted advantage for engine breathing.

This latter had a large external flywheel, to drastically reduce the vibrations and to allow a more compact and robust design for the crankcase. The cylinder was not on line with respect to the crankshaft, so diminishing the lateral movement of the piston during expansion phase, and therefore, the wear on the bearing. The unique crankcase, in aluminium, housed the crankshaft and the gears, so using only one oiling cycle and enabling Moto Guzzi to dispense with the primary transmission chain and all its associated problems. In its place a couple of helical gears were provided, a solution somewhat unusual for the period but very sensible. Since the three speed gearbox- with a balladeur train – was in direct connection, the result was that the engine turned in reverse to that of the wheels, this considered at the time very original.

Apart from reasons related to the design, the inverted rotation was an advantage for lubrication, since the oil that left the head was spurted on the upper wall of the cylinder – otherwise very difficult to get at – from where it fell by gravity on the lower wall. The usual rotation, instead, would have caused the oil to end up directly lower down, leaving the upper walls under-lubricated.

It is worth noting, since we are talking about it, that one of the secrets of the extraordinary long life and resistance to stress of the single cylinder Guzzi – obviously including the Falcone – really resided in the abundant and logical lubrication, combined with an oil reservoir in the best position to be cooled. On an engine with such air cooling the aid of a generous circulation of oil is essential to ensure a long life.

To place an engine of this type so low, Guzzi designed a frame to improve the stability of the motorbike and the comfort of the rider who could take up a position similar to that of a person comfortably seated in an armchair. A tubular frame, rigid, cradle, capable of a high resistance to stress matched with forks in parallel the design of which was also considered to be in the vanguard.

At the war front Carlo Guzzi was assigned to the new-born branch of aeronautics that brought together the best of the army. And here fate, which so often plays an important part in human life, brought him into contact with two pilot officers, young as he and, like him, passionate about engines. Giorgio Parodi and Giovanni Ravelli. Giorgio Parodi belonged to an ancient and famous family of Genovese armament manufacturers with business acumen in the blood, Giovanni Ravelli, from Brescia, was one of the best motorcycle racers and before the war had won many important races.

Carlo Guzzi confided in his two new friends, raising their great interest, that he was developing a project for a motorcycle with very different characteristic from the conventional layout both because of the configuration of the engine and the structure of the frame. The three discussed it at length, deciding that at the end of the conflict, they would combine their efforts to realise the project and they decided the tasks for each one. Carlo Guzzi, the technicial one, would be in charge of construction; Ravelli, the rider, would be the standard bearer of the machine on all the race tracks; Parodi would guarantee the indispensable financial backing.

The company started with a loan given by Emmanuele Vittorio Parodi, Giorgio's father, with a letter of January 1919, containing the words that have since passed into legend ***"...the reply that you should therefore give to your colleagues is that, in principle, the sum of 1500 or 2000 lire for the first test is at your disposal on condition that the sum must, in no way, be exceeded. And that if later..... I should be pleased, I am prepared to increase the sum without limitation".***

Guzzi and Parodi started work and in 1920 the prototype of the new motorbike was born and took form. Those two only because Giovanni Ravelli, unfortunately, was killed in a flying accident a few days after the end of the war. And it was in his memory that above the Moto Guzzi logo was placed the symbol of the airforce, the eagle with outspread wings. This first machine called G.P. (Guzzi and Parodi of course) reflected the aeronautical experiences of its designer. In fact the first design was a four valve head controlled by a camshaft also in the head, driven in its turn by the engine via a shaft and two pairs of helical gears. Other aeronautical characteristics were the valve returns by a forked spring and double ignition with two plugs fed by a single Bosch magneto. With the modest compression ratio of 3.5:1 – the maximum possible for the petrol of the period – this engine produced about a dozen HP and allowed the motorbike to touch 100 kph. It was complex and expensive so that when serial production was considered, Guzzi preferred to put aside, at least for the moment, the four valve design, which besides the cost was delicate and easily broken.

Guzzi, however, was not contented with an orthodox solution and so the Normale model, placed on sale in the first months of 1921, had the engine with valve distribution in opposition; that of a side valve inlet operated with a cylindrical spring and an overhead exhaust controlled by a shaft with rocker and a forked return spring. The 'valves in opposition' solution was not new in itself, but it was a novelty to have placed the exhaust valve in the head rather than the inlet valve, as had always been done. In this way the valve subjected to the greater heating was directly exposed to the air; not only this, the exhaust pipe had a more regular route, with a more rapid and complete removal of exhaust gases.
The cylinder was in cast iron, with radial fins, as well as the head; the piston was in aluminium and the conrod in nickel steel. The crankshaft, also in nickel steel was in one piece with counterweights fixed with screws and it was completed by that big external flywheel (280 mm in diameter) in pressed steel, which became very quickly one of the characteristics of the Guzzi, and a source of ironic comments, like that which compared it to the Berkel bacon slicer.

The crankcase was made in two parts, divided on a vertical plane. On the left case it was completed by a lid that covered the pair of gears with shock absorbing device in the primary transmission and the clutch of a type with multiple metal discs, fitted directly in the rim. On the right a vertical cover enclosed the timing gears, the magneto drive and also contained the oil pump. The right side the engine crankcase was completed by a bell shaped cover that included the two concentric springs to

provide pressure for the clutch, the kick start quadrant and the final transmission pinion. Only the rear wheel was braked. It had a drum with shoes operated by two cams one of which was controlled by a lever placed on the right of the handle bar and the other by a pedal on the left.
The rear hub mounted in ball bearings with spindle removable from the right was very interesting. The available power was about 8 HP, sufficient to exceed 80 kph.

The first substantial modifications to the Normale modal occurred in 1923, for sport reasons. Carlo Guzzi was not much interested in racing (unlike Giorgio Parodi), but competitions were the major advertising means for the motorcycle, and therefore to participate - and win – was indispensable to commercial success.
So the official debut of the Moto Guzzi really occurred in a race. The North-South Milano-Napoli race in 1921, in which the first two machines built were registered.

The Normale model, no matter how much it was highly refined and tuned was not however fast enough to obtain outstanding results, especially on circular tracks and so it was decided to build a livelier engine, with both the valves in the head so that the rest did not require large modifications.
The two parallel valves were controlled by a shaft and covered rockers, with forked return springs; the rockers were fitted with greasing screws. The frame was also modified; it was slightly lengthened to improve road holding on the straights and the flat springs were substituted under the saddle with a tubular element which served to reduce the weight. The new machine called Corsa 2V (also abbreviated C- 2V), had a victorious debut at the Lario circuit in 1923 and took, in the same year, a number of other laurels in the more important endurance competitions. Towards the end of 1923 it was decided to use the new frame as well for the touring version bike with Ex over In valves. The Normale model was thus removed from the list and substituted by the Sport which remained in production until 1928. The Sport could be supplied with Bosch electric lights and with an optional front brake as well.

For your information we remember that in 1924 a new racing machine was built with single shaft distribution in a four valve head, the Carlo Guzzi prototype in fact, now updated and improved to overcome the ever more aggressive competition, especially in the international field. The Four valves, as the C-4V became called, for some years was the fastest and most efficient half litre; it won the Lario circuit, the first Championship of Europe in 1924, establishing various world records. It was sold also to private individual, and with various modifications remained in the list up to 1933.

We now turn to the mass production, strictly speaking, for which 1928 was a year of most important innovation. First of all the sprung frame. The motorcycle was, by now, a reliable and safe means of transport, but it lacked one important thing for it to be considered complete - rear wheel suspension. Not that the problem had not been thought of for some time, but all attempts tried up to then failed to achieve the necessary torsional rgidity (due mainly to the mediocre quality of the materials available) with the result that for a while a motorbike without rear springing gave a greater guarantee of stability and road holding.

Carlo Guzzi thought that the moment to resolve this problem had arrived and, helped this time by his engineer brother, Giuseppe, he modified the frame of his motorbike. In place of the engine mount he fitted an element in sheet metal pressed in the shape of an L, that in the front ended with a rectangular box and behind went up almost to the saddle. To this element a fork in tube and sheet metal that supported the wheel and was connected to two tie rods which held in place a pack of four helical springs contained in a rectangular box was swung. From the saddle support tube two other triangular elements went out, one on each side of the wheel, that held the mudguard at the rear and a couple of shock absorbers, of an adjustable type, connected to the open rear end of the oscillating fork. This scheme offered a well sprung ride with a very smooth and progressive movement, and Guzzi remained faithful to the design for many years, so much so that, apart from minor details, this same layout can be found on the Falcone. It is obvious that the road holding was finally acceptable and comparable with that of a motorbike with a rigid frame.

The new motorbike with sprung frame was called simply G.T and it used the engine with opposite valves from the Sport. But at the end of 1928 there appeared a notably improved engine, with bigger fins on the cylinder and head with increased power; 13.2 HP at 3800 revs. To this engine a new version of the motorbike with a sprung frame was added – the GT16 and the motorbike with rigid frame remained in the catalogue; the Sport 14, boasting also a new frame, new parallelogram forks with shock absorbers, new wheel hubs, rear drum brake, larger mudguards.

A further step forward was taken in 1931 with the Sport 15 fitted with an "I" section conrod mounted in rollers and a saddle tank. Despite all this however the Sport 15 was still strictly related to the primitive Normale; same engine arrangement, same frame line, same riding performance and, more or less, the same angular and spartan line, where rectangles predominated both in its drive and ride.

From P 175 to series V

The great revolution, technical and aesthetic occurred in 1932, with the presentation of a new light motorbike of 175 cc., the model P, displaying the now typical Mandello build, but including numerous and substantial innovations. In fact the motor had two inclined valves in the head – and therefore a hemispherical combustion chamber – driven by shafts enclosed in a tubular cover on the right side of the cylinder, while the crankcase had all the angles and corners rounded in a modern manner, with a look that made the previous engines look prehistoric. It was a brilliant machine, with a specific power unusual for a touring engine (40 HP per litre, more than double that of the Normale !) that placed it in the forefront of its category. It also had beautiful lines, a very beautiful tank, still of triangular section but lower, sleek and rounded compared to the previous models. The P 175 generated various other models with more ccs. 232 and then 250ccs. Right up to the Airone. It was also the general dress rehearsal for the new 500 cc. Machine of the V series that was presented at the end of 1933 which must be considered the true forerunner of our Falcone.

The engine of the V series had in fact inclined valves in the head hemispherical combustion chambers, tubular cover for the pushrods, cylinder and head in nicromised cast iron fixed to the crank case with four captive bolts, radial fins, crank case with rounded corners; the gear box was four speed with two balladeur trains; worked by a pedal with external preselector. A twin exhaust system was fitted according to the modern fashion as it was then considered very elegant to have a silencer each side.

The frame was in two parts bolted together; the front part in brazed steel tubes, two plates in L shaped sheet that formed the rear part and the seat under the engine. Forks still parallelogram (girder) had a biconical compression spring and adjustable friction shock absorbers on the sides. The wheel rims were 19 inch. There were however two types of frame, one still rigid for the traditionalists and one sprung in the Guzzi fashion, lightened and made more elegant with the placing of the springs and in the parts that held the mudguard. The engine also was available in two forms; one for touring of 19 HP and one, more sporty, that provided 22HP. In all, therefore, there were four new 500 cc. models; V with rigid frame and 19 HP engine; W again with rigid frame but with 22 HP engine; GTV and GTW with sprung frame and endowed respectively with the two types of engine.

The series V motorbikes were immediately a great success as expected for machines so modern and brilliant, whether for ordinary or sporty clients. To meet the wishes of this latter category, in 1937 a more sprightly version was built; the GTC with a 26 HP engine, capable of reaching 150 kph. = 95 mph. It was a motorbike destined specifically for "gentlemen" racers who chose to compete with a standard "production" motorbike. The Condor then followed, a motorbike expressly built for competitions with crankcase in electron and a frame of mixed steel and light alloy, important in our Falcone history above all because instead of balladeur train gears permanently engaged gears with front linkage, functioning more rapidly and precisely, that would then be fitted to the Falcone as well.

The Astore and the Falcone

At the end of the Second World War Guzzi represented his 500 in the sprung frame version only with one important modification in the head that is a single exhaust pipe on the right. The developments restarted very soon and at the end of 1947 the GTV was put on sale with unique sheathed telehydraulic forks fitted high personally designed by Carlo Guzzi; an "upside down" system fully acceptable these days but then constituted an absolute novelty. The rear friction dampers were also substituted by a pair of hydraulic shock absorbers while the suspension principle remained unchanged i.e. an oscillating fork with compession springs under the engine.
The next step was the adoption at the end of 1949 of a cylinder and head in light alloy with valves and rockers enclosed in an oil bath. But this important innovation was an excuse for the birth of a new model the Mandello half litre assumed the new name of Astore (Goshawk) - a powerful bird of prey.
At this point everything was ready for the birth of the Falcone, a motorcycle that the more sporting Guzzi clients cried out for.
The Astore was an aristocratic machine, refined, most comfortable, a true gran turismo, but not very fast (it reached 120 kph). The GTW, still catalogued at the end of 1948, had little more performance whereas the Dondolino, on the other hand, that had replaced the Condor after the war, was the fastest production motorbike still on sale in Italy (it achieved a genuine180 kph = 110 mph). However, the Dondolino cost over a million Italian Lira - well over twice the average annual salary at that time ! It therefore remained a pious hope for those who did not have the means and the serious intentions of dedicating themselves really and truly to competition.

Furthermore Gilera, the eternal rival of the Guzzi in all areas of racing and in all Bar Room discussions, had just produced for their fans the Sport version of the Saturno which proved agile, responsive, manageable and much faster than the Astore and the GTW. Mandello fans, humiliated and beaten at every turn, coped badly with this position of evident inferiority in which they now found themselves.

The Falcone saw the light of day in the spring of 1950, at the Geneva Car & Motorbike show, at the same time as another Guzzi creation destined to become a best-seller, the Galletto [Cockerel] scooter. The general appearance of the Falcone was not too far from the classic "House of Mandello" line, but a few touches gave it a streamlined and dashing aspect that fascinated at first glance and immediately brought to mind a greyhound ready to fly round the track. The mudguards had been reduced and slimmed down, the 17 litre tank had a more rounded and harmonious profile, the rear shock absorbers returned to compass form, not so modern but at the time considered more sporty, the handlebars were narrower and flatter and the footrests set back to allow for a typically sporting riding posture. Other differences relating to the motorcycle compared to the Astore consisted of light alloy wheel rims, dispensing with the leg-shields and the presence of a small pillion pad fixed directly on the rear mudguard in place of the luggage grid.

The engine retained a few modifications with respect to the previous models, to start with, as already noted, from the gearbox of the Condor and Dondolino type: it had then bigger valves, a more domed piston, a camshaft with greater lift and a bigger carburettor. In total, these changes translating into a greater power, producing 35HP at 4500 revs, and hence greater speed: a minimum 135 kph = 85 mph, without effort, from the standard machine.

Above all the legendary Mandelliane characteristics of robustness were not sacrificed by any means and – for those seeking more performance – a few simple upgrades could be made without much difficulty or expense to produce with ease a decisive and attainable 160 kph = 100 mph top speed.

The Gilera fraternity finally had to accept the unpalatable truth [but, literally... 'see green mice' as the Italians used to say at that time!] that the Falcone was now the top bike !

(End of first chapter - HISTORY)

FALCONE (translated in May 2002 by Laurie North)

This 2-page section corresponds to the narrative on Pages 28 to 32 of the original book.

Page 1

All The Modifications, Year By Year

1952
The Korean war, that flared up in 1951/2, caused a drastic reduction in the use of chromium, Italy having become a strategic producer.

The Falcone shown at the Milan Motosalone in January 1952 had the tank painted all in red; the two oval knee-rests were now painted black. Also the two protuberances of the oil tank were painted black. The edges of the dust shields on the brake plates were painted red, and no longer chromed. The brake and valve lifter levers were burnished but not plated. Also at the Milan Motosalone of November 1952 the Falcone was equipped with the new Marelli magneto MCR 4-E with fixed windings, rotating magnet and a built-in automatic advance and retard unit.. So the little control for the advance disappeared from the handlebar, which was now reduced to 22.5 mm. The dipswitch, and horn button are reunited in one item, on the left of the handlebar.

1953
At the Milan Fiera Campionaria of April 1953 the Falcone appeared with a new oil tank still in triangular section, but with rounded edges, and dispensing with the chromed circular protuberances. The pillion seat on the back mudguard, formerly mounted with a slight forward inclination, is now perfectly horizontal and therefore a little further back. At the Milan Motosalone of November 1953 the Falcone Turismo was introduced as a replacement for the Astore. The Falcone Turismo had the Falcone gearbox with sliding gears, but with the camshaft, valves, compression, and carburettor of the Astore, so retaining the Astore performance (for the details see the relevant chapter). Notice that to retain the same gear sequences (first behind, the others in front) the control disc of the pre-selector was fitted with the arm above rather than below. The ride was that of the Falcone: the wheel rims were however in steel, the footrests are further forward, the handlebar is wider, legshields are fitted once again, in place of the pillion seat on the rear mudguard a carrier is fitted. The Falcone Tourismo retained the red painted tank with black ovals. From that point on the Falcone with the original "lively" engine specification was designated the 'SPORT'; its tank had the oval knee rests chromed again rather than in black, and the number plate was larger.

1956
During this year the typical fish-tailed silencer which had been a feature of the Guzzis from the 30's, was substituted by a new cylindrical silencer, longer and in one piece, without the facility to detach the rear section. It was very quiet, allowing the noise level to fall within the limits, then being applied, of 84 decibels. Needless to say the performance of the Sport suffered and 135 kph was no longer possible with the standard set-up - though that top speed figure was still quoted in the factory brochures ! The traditional black finish for the nuts, bolts and fixings was changed to cadmium plating.

1958
The attachments for the headlamp on the forks were raised, to be able to fit, between the light and the front mudguard, the siren destined for the Polizia Stradale.

1961
the 30W dynamo was changed for a 60 W Marelli type DN36 C 60/6-2100 with external voltage regulator, held in place by a stirrup above the battery. This gave a more powerful unit for police use.

1966
The various models of the Falcone Sport and Tourismo provided the Polizia Stradale and other militarised Corps with strictly standard motorbikes, except for the paint (first amaranthine [purple] and latterly, grey-green) and the presence of some accessories (wind shield, siren etc.). In 1966, instead, a special version of the Falcone was assembled, destined virtually exclusively for the

Polizia Stradale that could be considered as a transition between the Tourismo and the Sport. In fact the Falcone NT (Nuovo [new] Tourismo) adopted the bodywork of the Turismo – apart from a new shaped petrol tank, that reminded one of the contemporaneous V7, the 'anatomical' saddle, fitted on a bridge and a wider and higher 'American' handlebar– but the engine was fitted with valve gear (camshaft, tappets, pushrods and valves) piston and crankshaft of the Sport. The carburettor however, remained 27 mm. The result therefore was a machine with performance intermediate between the Tourismo and Sport, both in power, speed and pick-up, and with a better drive. The assembly included a tachometer + odometer (without the telescopic drive), plus siren, windshield and sidestand on the left. On the luggage grid was placed the radio transmitter. The motorbike was painted grey-green; some were also painted in the newer white-blue Police colours.

Special Versions

In the first years of production, various examples of the Falcone "Sport" were supplied to the Customs officers with a precise assembly but without any real "make-up" work. Very interesting, instead, were the motorbikes supplied to the Corps of Cuirassiers for fast escorts, always painted in 'ministerial blue' and put together in two forms.

The **1952** version has tubular fenders on the sides, with smaller leg guards; a saddle and pillion in white leather; siren; arms of the corps on the front mudguard.

More radical were the modifications to the **1957** model. There is a 12V electric starter motor, placed where the magneto was; ignition is therefore by coil, for space reasons. Supplementary batteries are placed in boxes on the sides of the rear mudguard, with big sides like that of the front. Also the central part of the engine is enclosed in metal panels. The tank is more capacious and bellied, with chrome also on the front. The old oil tank is used, with chromed protuberances.

The side bumpers and leg guards are chromed. The saddle is raised to accommodate the notable stature of the Cuirassiers. The headlamp has a built-in speedometer. There is a siren and two supplementary chromed headlights at the sides of the main lamp. Twin exhaust pipes, with a silencer each side, and other trim is that of the Sport.

The numbers on the register

From **1921** to **1954** all Guzzis had a unique (!) numbering system - progressive but random. The *frame* numbers went from 51 to 33864, and these numbers were allocated to the machines, as they were produced on the production lines and not necessarily batched for particular models. The same procedure applied to the 250's while the numbering was unique for the engines, excluding the racing models (like the Quattro Valvole) and the 65. It is impossible to indicate a sequence of numbers that refers to the Falcone model. From 1954 on, a system of letters with numbers was adopted, distinct for each model. For the Falcone Sport this new numbering goes from FS 00 AA up to FS 88 AB; for the Falcone Tourismo it goes from F 00 AA up to F 72 CP. The complete production run for all versions of the Falcone totalled 12,405 examples.

List prices

The production of the Falcone coincided more or less, with the so-called Italian "economic miracle", a period of relative stability in the value of our [Italian] money and therefore prices. In effect the price of the Falcone never varied much, with a certain tendency to become lower, as happened in those times for all motor transport.

1950	"The Falcone" Italian Lira 482,000
1953	Sport - Italian Lira 482,000
	Tourismo - Italian Lira 462,000
1954	Sport - Italian Lira 419,000
	Tourismo - Italian Lira 399,000
1957	Sport - Italian Lira 419,000
	Tourismo - Italian Lira 399,000
1965	Tourismo (Nuovo F) 423,000

To these prices was added IGE [like VAT] of 3%.

In the last years virtually the only model in production was the Tourismo; however in this period the "Sport" was still supplied on a built-to-order basis.

FALCONE (translation made in May 2002 by Laurie North)

These 2 pages correspond to Pages 47 to 49 of the original narrative.

The Falcone on the Road

Fast but with poor brakes, comfortable but somewhat unstable, manageable but a cantankerous ride. Much has been said about the Falcone: but how did it really function, setting aside all the romantic memories, but not without unforgettable comparisons with which today we are so familiar?

The Falcone always aroused a certain apprehension (fear even) in motorcyclists unless they were experienced. Also in modern riders, in spite of the fact that they are used to four times the power and almost twice the speed. This because of the Falcone's unique construction which imposes a particular style of riding requiring an indispensible apprenticeship.

For example, its drive is affected, in good and bad ways, by the presence of the famous bacon-slicer flywheel – and by its not inconsiderable mass. The acceleration is not brilliant – and in general the "guzzisti" [Guzzi riders] were beaten off the line by the "gileristi" [Gilera riders] – really because of the time needed to get the eight kilo plus of the flywheel spinning, but also because gear changing is somewhat lengthy due to the need to overcome the pronounced flywheel inertia before the engine falls back to the necessary revs. A certain obstinacy in the sliding gears in the gearbox contributes to making the gearchange manoeuvre laborious.

On fast corners, also, the flywheel effect manifests itself as a type of gyroscope that goes against the lean of the motorbike and is responsible in part for the swaying that afflicts it in these conditions.

The advantages are displayed instead by an easy start even without the valve lifter and invariably with the first kick (because the flywheel, once moving, tends to make the engine turn over many times after the kick has finished). By much reduced vibration, down to levels unthinkable in a big single cylinder, and naturally by the famous, unmistakable and unbeatable "least Guzzi" (*?... not too clear whether the translator has got this right . The Book itself says "minimo Guzzi".*).

In addition, the Falcone engine boasts - even today - an excellent record under prolonged stress, thanks to the oversizing of many parts, to its low revving quality, to the abundant lubrication and the excellent cooling of the head, directly in the air-flow when running. Really surprising is the absence of oil leakage despite the many external tubes, remaining oiltight obviously so long as the various joints are checked every now and again.

The clutch is strong and puts up with a heavy use pretty well. Noteworthy is the flexibility of the engine, especially in the Tourismo model, with which one can attack steep climbs and narrow hairpins in top gear.

A definite weak point is the carburation of the Sport, with the SS carburettor causing hesitation in pulling away which is almost impossible to eliminate, and the clutch control arm with its accompanying "button" thrust bearing which is too small for the sizeable force to which it is subjected, so the small ball bearings become worn out after only a few thousand kilometres (*). The mechanical noise is somewhat obtrusive, especially that of the tappets.

(*) *(I would also add that the gearbox layshaft bearings are on the small side – 15 x 35 x 11 mm. Mine failed completely – and expensively ! – on the final drive side in June 2003 whilst out on a run. Bike locked up solid, couldn't be pushed).*

The forks have a limited travel and it is easy to bottom them during running - occasionally jerking the handlebars. The rear suspension once you have learnt to adjust the shock absorbers correctly gives a very comfortable ride for daily use, soft and capable of levelling even the most uneven paving.

The downside of this compliance in operation is a certain amount of tail wagging. Though stable in a direct line, in effect the Falcone is not easy to take round a corner, either as a result of a fault in the frame or as a result of the above-mentioned gyroscopic effect of the flywheel. After a bit of practice, it does call for some methodical research to find the optimum set-up.
Even rider movement on the saddle, back or forwards, causes the bike's behaviour to change noticeably. In general, however, in fast corners it tends to understeer, whilst in narrow ones one can feel the length of the stroke - no different from that of the big single cylinder bikes of today.

A "modern" style of riding with knee wide and the body moved towards the centre of the corner gives the best results. The handling at low speeds is first class thanks to its low centre of gravity.

The braking is far from exceptional, particularly on the front wheel. The fact is that the brakes were designed for the Airone, a much lighter less powerful 250 cc machine, and on the heavier and faster Falcone the brakes do show their limits. **(*)**

The transmission ratios are a bit long (*the gearing is high !*) – and this further penalises the getaway and consequently it requires a bit of time to reach maximum speed.

In compensation, it puts up with over-revving in low ratios. The Tourismo will not exceed 120 kph, but it gets there rather more easily than with closer ratios. Consumption is maintained within the limits published by the CASA.

The final positive note, that may seem of secondary importance, but is not, is that the Falcone can be hoisted onto its stand with two fingers, thanks to its rational design something that is not always possible today even with a much lighter "125".

(*) *(The brakes can be upgraded with better linings. The re-lined shoes are then mounted on the brakeplate and the assembled shoes 'skimmed' in a lathe to ensure maximum contact with the drum. Needless to say, it also helps if the drum lining itself is machined – if appropriate- to achieve concentricity).*

This 5-page section corresponds to the narrative on Pages 50 to 61 of the original book

GUIDE TO OVERHAUL

The dismantling and servicing of the Falcone is not particularly difficult, nor does it require a large number of special tools but there are some special items which greatly facilitate an engine strip down. For example, a pair of universal pullers for the bearings, a special Guzzi 4-pin box spanner and tommy bar - included in the toolbox provided - to undo the locking ring nut on the mainshaft/flywheel connection ***(left-hand thread !),*** a toothed "C" spanner for the chain nut pinion, a long box spanner for the shock absorbers of the forks and a pair of slim spanners for the wheel hubs (which, on the other hand, can be obtained by grinding down ordinary spanners). The only tool which is really quite special is the one for dismantling the valves and springs and it can be somewhat difficult to find. Even this can be replaced with a universal clamp, but the particular shape of the head and the loading of the springs render the operation rather difficult without the help of the purpose-made valve spring compressor.

It is worth while remembering that the presence of the external flywheel permits an efficient check of the state of wear of the main bearings without taking the engine apart, this is very useful, for example, before making a purchase. Taking the flywheel in the hands, try to move it axially and radially: if you notice radial play replace the roller bearings (on the left side), while if you note axial play replace the ball bearings on the right side. A radial play of 0.03-0.05 mm is permissible, and a maximum axial play of 0.1 mm.

It is possible, when necessary, to ease out the clutch control rod (from the right) unscrewing it from the thrust plates, without dismantling all the clutch; on reassembling it, however, take great care— proceed with great calm— when screwing it back on, to avoid pushing the plate out of the four prongs of the clutch carrier, which would necessitate opening the primary transmission case to re-assemble everything. It is quite possible to replace the push rods without removing the head: it is enough to remove the cam cover, the valve covers and the adjuster caps and remove the rocker arms.

It is **not** possible to remove the whole engine from the frame without undoing the control wires and cables, the oil pipes, the chain, the exhaust, the foot pedals, the kick-start pedal, it is also necessary to remove the flywheel, the preselector, the carburettor with its associated pipe and the complete head. After having undone the nuts on the three fixing studs attaching it to the frame (either from the right or left) you remove the engine from the right, first pushing it forwards a few centimetres and then withdrawing it from behind.

The flywheel is removed by unscrewing the castellated lock ring by about three quarters of a turn (left hand thread), and then undoing the large central retaining nut (right hand thread) - using a bit of force - because as this large nut unscrews, and backs onto the shoulder of the lockring, it acts as an extractor and pulls the keyed flywheel off the tapered mainshaft. To remove the primary drive cover, the special retaining screws must be loosened a turn at a time (and a similar procedure adopted for tightening to replace the cover i.e. each screw turned a little at a time). This procedure is necessary because the engine pinion, no longer retained in place by the flywheel, presses against the cover driven by the spring behind the mainshaft-mounted gear and could possibly deform it. If not already marked, it is well to make a paint mark or a mark with an engraving tool on each of the timing gears before removing them, which will greatly simplify their replacement without having to go through the lengthy procedure of retiming valves and ignition from scratch. It is a good idea also to mark the piston, to avoid replacing it 180° out.

Obviously after removing all the accessories, the crankcases are opened holding the motor with the right hand case (timing) upwards and hitting it with a wooden mallet, alternately on the end of the preselector fork and on the gearbox mainshaft (take great care of the catch* of the clutch control), On opening, in the right hand half of the case (timing) will be the complete engine shaft and the direct drive gear (constant mesh pinion), whilst in the left half of the case (primary side) will be found the gear cluster, the desmodromic selector drum and the preselector shaft.

The engine shaft with the con-rod and the direct drive gear are removed from the right half case by driving it out with a mallet; from the left half case the desmodromic drum, the sliding first and second gear pairing, the control shaft of the drum and the reverse shaft. Take care not to reverse the spacers when dismantling. In the left half case the gearbox mainshaft remains bolted to the clutch body; having removed the latter by undoing the nut, you remove the mainshaft (that comes out with two gears and thrust bearing) knocking it out from the outside towards the inside with a mallet and aluminium drift. Support the large ballrace which houses the clutch carrier during this operation

Check the wear on the bearings and the bearing itself to ensure that it fits perfectly in its seating, a very important point to avoid irreparable damage to the crankcase, just in case blue it accurately. If it is worn, before changing the very costly crankcase one should try aluminium welding or, perforce, a bronze seating. It is obvious that it is essential that there is great precision in the linearity and centring. The motor of the Falcone has six felt oil seals including that of the rods. Despite their antiquity, these felt seals do excellent work and are not subject to dripping even after long inactivity, as happens to more modern types. However, when changing the bearings it is a good idea to change them at the same time: they are relatively easily obtainable from the usual merchants of the perio

Our table shows all the measurements and tolerances for checking the most important parts and we recommend them to the reader. Furthermore, reassembling the motor presents few problems.

One thing requiring particular attention is the gearbox, and here it is well to use a factory exploded diagram. In any case all the parts are reassembled in the left half case with the exception of the constant mesh pinion which is fitted into the right half. First operation is to assemble the shouldered clutch carrier into the left hand crankcase. Tap the carrier into the large ball bearing inner race until fully home. The ball race must be supported during this fitting to ensure that it remains firmly in its housing. Then insert the gearbox main shaft - **with the special washer ready fitted** - and the free second gear; screw on the fixing nut of the clutch body. Mount the selector shaft with the toothed quadrant (the part that operates the grooved desmodromic selector drum and forks) in position 4a. To do this, you need to place the sector shaft in a position such as to be able to see the number 4 stamped on the case. Ensure that the profile of the sector superimposes on the line engraved on the casing. Place the washer and first gear on the floor of the casing and then introduce the layshaft with light blows of the hammer. Take the selector barrel group and forks and place them such that the upper fork (right) is in line with with the upper edge of the barrel and the lower forks (left) is at the end of its movement. To check this, you need to check that the difference in levels between the fork and the barrel is 8 mm. The two moving gears can then be slipped into the forks. If it had been necessary to change something, it will be necessary to check the play between the front of the groove of the first shaft and the strike/engagement* of the bush of the direct drive* (secondary shaft). If you slip this latter on the mainshaft and it goes to the front of the grooves, leave a distance of 0.2 - 0.3 mm. You then measure carefully the distance between the right end of the primary shaft and the external plane of the direct drive* gear (that is the threaded end where the chain pinion will be inserted).

Mount the gear of the direct drive* in the middle of the right crankcase, not forgetting the washer that is mounted with the flat side turned towards the seat, close temporarily, but carefully, the crankcase and remeasure between the end of the mainshaft and the flat of the gear of the direct drive-boss* of the pinion, that obviously now protrudes from the crankcase. If the measurements remain the same, it signifies that the play is that which is established (0.2-0.3). If it is less, it means that the internal play has increased, and therefore you must change the washer between the direct drive and the seat; however a reduction of up to a maximum of 1 mm may be tolerated. If it has increased, which means that the internal play is reduced it is necessary then to replace the washer with another which is, obviously, thinner.

There are two concentric springs on the clutch. The outer spring has a length of 45 mm and needs 86 Kg to close it to 25 mm; the internal is 43 mm long and needs 70 Kg to close it to 25 mm. With loadings of less than about 10 Kg, change the springs. In action, the springs have to be compressed with the knurled plate to 27.5 mm. If the clutch slips, it is possible to increase the load by screwing the knurled plate.

It is fairly easy to verify that there is a play between the flywheel and the engine pinion, play that reveals itself by a rhythmic tapping in phase with the intake or outlet of gas. In this case it is possible to place material - with an electric soldering iron - on the groove of the flywheel that can then be accurately "reconstructed" with a fine cut file.

The only component of the moving parts that require some attention in removing and replacing are the telescopic forks: in particular, an error in mounting the various internal gaskets and washers can impede the flow of oil and so completely prevent the spring movement.

To dismantle, remove firstly nut 1 (see diagram), the cap 2 and the spring 3; then— with box/socket spanner— the ferrule 4 and then withdraw slowly upwards the body of the damper, leaving the liquid a while to run out of the sliding shaft. Raise the wheel and detach the fork from the steering gear and then slide out the sliding shaft pulling it with one hand whilst slowly. turning it with the other. Take care not to tip out the liquid. Remove the mudguard, open the roller box and remove everything. To remove the main spring 14, the washer 15 and the guide 17, unscrew the nut 16. All these parts are remove from the top. Repeat for the other fork. In the case of slight wear, it is possible to correct the running shaft up to 30 – 0.10. If the wear is in excess of this, it will be necessary to thicken by rechroming and then take down to a diameter of 30 mm by correcting. If there are grooves, it will be necessary to replace the part.

In assembly, check that the ring 15 has the flat side against the spring, that the spacer of the roller is towards the inside of the casing and that the regulatory washer 10 is assembled towards the outside. If the roller does not turn properly, replace the washer with another thicker or thinner. Slide in the shafts and hold them temporarily closing the rollers. Mount the fork onto the steering head followed by the mudguard and wheel. Introduce the liquid using a rubber tube, to avoid it getting between the sheaths and the shafts. Remember to mount the lining ring onto guide. After having assembled the fork completely proceed with its adjustment, lifting the wheel and holding the shafts as indicated in the photo. Adjust the eccentric cams, firstly up to the point on no play, and then in the reverse direction, that enough to obtain the minimum play possible, which corresponds, in practical terms, a movement of the rotating disc of 3–4 mm measured around the circumference.

The brake pads when new are 4 mm thick. For maximum efficiency of the brakes it is important that the internal surfaces of the drum, where the pads function, are perfectly uniform and centred with respect to the axles. Since the centring of the wheel and the draught* of the radii* can become deformed, even only minimally, of the drum, it is a very good idea to rectify this with the wheel on. It is a job that few garages are capable of doing, should it happen that a lathe of suitable size is available it is a job well worth doing.

Up until 1955 the original paint of the Falcone needed two distinct techniques. The mudguards, the tanks, the chain case, and the tool boxes were painted with nitro-cellulose, The front and rear forks, the frame, the footrests, the brakes and flywheel were baked. The decals were of the flatting type.

From 1956 all parts were sprayed with synthetic paint and dried with "Infra Red" lamps.

(End of "Guide to Overhaul" Chapter)

FALCONE (translation made in May 2002 by Laurie North)

This single page corresponds to the narrative on Page 41 of the original book .

Use in Sport

Although undoubtedly a fast and brilliant machine, the Falcone was not particularly suitable for racing at grand prix level, where at that time, there were engines with at least double the power of that which it had at its disposal.

Its use in purely sporting events was thus limited - in general - to races of secondary importance, i.e. "Clubman" events, flying kilometre tests (very popular at the time), hill climbs, races around the streets of provincial towns, and from time to time "audax" events [Latin for 'audacious' – as you will all know!]'

One sector, instead, in which it was used with notable success was that of the long distance race, like the famous "Milano-Taranto", which in the very first years of the 1950's enjoyed amazing popularity.

This was a race of out-and-out speed, on roads open to normal traffic (*theoretically !*), that in one long single lap joined the two great cities by a race of about 1400 km across the straight stretches of the Valley of the Po and Puglie, and the more difficult Appenine passes. Riders set off at midnight in very cold temperatures and then endured the torrid heat of the South.

What counted in this race, more than sheer power and absolute speed, was the gift of stamina to overcome the prolonged hardship. Official Guzzi riders triumphed many times on their "works" machines. Among these were included, however, the Falcone, which were always numerous at the start, in the hands of privateers. Invariably, they finished every time - right on the shoulders of the absolute winner thanks to their really competitive engines.

The best results of the Falcone in the "Milano-Taranto" were the first place in the Sport category in 1953 with Arnaldo Alberti on board (he was placed sixth overall) and again with Mario Bagli in 1955, and first places in the sidecar races in 1953 and 1954, with an outfit driven by Guido Borri. The last Falcone victory in a race of national importance was that obtained in the mixed formula of Reliability/Speed Trials, where a squad of Falcone riders was placed first in their class. Riders of the FIAMME GIALLE di ROMA team were Demetrio Bonini, Aldo Passerini and Giovanni Terni.

To recall one particular motocross with the Falcone, in the early years of the 1960's by the (then) Turin concessionaire for Moto Guzzi, the firm of Gamba and Dolza. The power unit – modified with some parts from the Dondolino racer – was placed in a tubular frame with double cradle and hydrotelescopic suspension. In the first example the engine was placed horizontally, as per original practice, but in the second version appearing in 1962, the engine was now inclined upwards, with the head practically under the steering column, to reduce the length of the motorbike.

In the hands of Vincenzo Soletti and other riders, the machine obtained some high placings - even in national races.

FALCONE (Translation made in May 2002 by Laurie North)

TECHNICAL DETAILS, REPLACEMENTS AND MAINTENANCE

(This 4-page section corresponds to the narrative on Pages 62 and 63 of the original book).

TECHNICAL DETAILS

Engine.

Four stroke horizontal single cylinder, with enclosed overhead valves operating in an oil bath. Cylinder of light alloy with liner of special cast iron and radial cooling fins spaced at 10°.
Head in light alloy with space for rockers and valve springs incorporated. Valve guides in bronze and valve seats ..... Crankcase in two parts divided in the vertical plane, in light alloy.

Bore and travel	88 x 82 mm
Capacity	498.4 cm^3
Compression Ratio	6.5 : 1
Power	23 HP at 4500 rpm

.....crankshaft in special steel, one piece with counterbalances, mounted in ball bearing on the RHS and roller bearings on the LHS. The engine rotation is "backwards" (i.e. clockwise when viewed from the flywheel side) with respect to the gears of the motorbike. External flywheel, diam. 280 mm (***MINE IS MACHINED DOWN TO 268 mm -- WEIGHT UNKNOWN)*** weight 8.200 Kg. (approx. 18 lbs)
Split conrod in special steel with end cap held by two special bolts/nuts. Mounted with uncaged roller bearings at the big end and bronze bearings at the small end. Piston of light alloy with domed head, two compression rings and two oil scraper rings.
Camshaft runs on uncaged needle rollers, followers with pinned hardened steel rollers running on bronze bushes, pushrods in light alloy, with steel ball-ends. Valves are inclined at 60° between them, with double hairpin springs bathed in oil. Inlet valve diam: 43 mm; exhaust valve 40 mm. Bronze guides.

Valve timing

With play on the inlet valve equal to 0.20 mm (8 thou) the inlet valve must start to open when the arrow on the flywheel is 110 – 115 mm before the arrow on the primary drive cover on the exhaust stroke (the two arrows, sometimes arrow and punchmark, should coincide at top dead centre). Measurement taken on the periphery of the flywheel. Inlet valve clearance during normal functioning: 0.05 mm. (2 thou) cold. Exhaust clearance is 4 thou

Fuel Supply

By gravity. The petrol tank is provided with two taps. There are gauze filters above each tap and in the horizontal tube between the taps.

Carburettor

Dell'Orto type SS 29 A. Diffuser diameter 29 mm; main jet sizes, 128 summer and 132 winter; idle jet 55; throttle slide 100; needle jet 265; conical needle M 13 fixed at the 2nd notch from high summer, 3rd for winter; float needle type D; float type14; float chamber type VV-PI; air inlet by short horn; linked by sleeve.

Ignition & Ignition Timing

Early models - to 1952
By Marelli magneto type MLA 53 with fixed magnet and rotating armature, with advance regulatable by hand (opening the lever retards, closing, i.e. slack wire, advances). Maximum advance 45° measured on the motor axis. Timing: at full advance, the points of the contact breaker must start to open when the arrow on the flywheel is 95 mm before that on the crankcase .. on the compression stroke .., measured on the periphery of the flywheel. Gap between contacts when opened by cam ring 0.4 mm. (15 thou)

From November 1952: Marelli magneto type MCR a-E with fixed armature and rotating magnet, with automatic advance. Timing; the points must start to open when the flywheel arrow is 21 –22 mm from the crankcase arrow, measured on the flywheel periphery (magneto retarded !). Contact gap: 0.4 mm. Plug type Marelli CW 225, gap is 0.6 mm.

Lubrication

Forced with separate tank and double pump, by grouped gears and by recovery paddles; automatic interception valve. Functioning fully at 60 litres per hour. Two gauze filters, at the exit from the tank and at the return well.

Engine cooling - By air

Primary Transmission

By gears with helicoidal teeth, ratio 1.77:1 (teeth 44/78). Shock absorber by helical spring inside the mainshaft mounted pinion. Lubrication by oil mist.

Clutch

Multiple plates, lodged in the rim of the primary drive; Five steel discs alternating with 5 in bronze, plus two "Ferodo". Two concentric helical springs on the right hand side of the bike controlled by moving rod in the hollow gearbox main shaft. Lubrication by oil mist. Hand control by lever on the left of the handlebars.

Gears*

In a block of cylindrical gears always ….. with frontal engagement and …. direct; 4 ratios. Shift with rocking pedal on the right, activating external pre-selector and splined desmodromic drum internally.

Internal ratios: 1st 2.293 : 1
2nd 1.732 : 1
3rd 1.317 : 1
4th 1.0 : 1

Final Transmission

By roller chain 5/8" x 1/4', on the right, ratio 2.25 : 1 (teeth 16/36). Rear wheel cush drive by rubber rings.

Total ratios of transmission/wheels:

1st 9.15 : 1
2nd 6.90 : 1
3rd 5.25 : 1
4th 3.98 : 1

Starter

By pedal on the left, with quadrant and toothed gear on the right

Frame

Double closed cradle, in two parts: front in tubular steel, rear/lower in pressed sheet.

Forks

Telescopic with arms fixed at the top, internal hydraulic damper. Movement 65 mm. Adjustment of action by steering damper knob in the centre of the handlebars.

Rear Suspension

Tubular oscillating forks with triangular profile, with 4 spiral springs working by compression and fixed horizontally under the engine in tubes. Friction dampers on side of the wheel regulated by wing nuts

Wheels

Front with tangential spokes with rim in light alloy 19 x 2.5; 36 spokes, 18 long and 18 short. Rear with tangential spokes with rim in light alloy 19 x 2.5; 40 spokes, 20 long and 20 short. Axle with shaft removable from the right.

Brakes

By expansion, side drum in light alloy, with internal surface of cast iron, diameter 200 mm (8 inches); the front on the right, incorporated with the hub, controlled by the right lever on he handlebars; the rear is on the left hand side, bolted to the axle, controlled by the pedal on the left using the point of the foot.

Tyres

Front measures 3.25 – 19" with ridged treads; rear measues 3.50 – 19" with sculptured tread.

Electrics

Fed by Marelli dynamo type DN 19 G 30/6-2000 D with regulator incorporated. 6 volts. Power 30 watts. Rotation to the right. Driven by a gear running on the clutch gearwheel /basket. Ratio 1.33 ; 1. Maximum output at 2000 revolutions.
Battery 6 v. 12 Ah
Headlight with three bulbs with parking light 5 W. Main double filament 25/25 W. Indicator light 3 W. fused at 8 A. Rear light with 3W. bulb.
Electric horn Marelli type T 38.
From 1959: rear light with twin filament bulb 3/15 W.; mechanical stop light switch actuated by the pedal of the rear brake.
From 1961: dynamo Mirelli type DN 36 c 60/6-2000 D with external Marelli regulator. 6 V. power 60 W. Rotation to the right. Maximum power at 2100 revs. 6 V battery, 13.5 Ah.
Headlight parking light 5 W. twin filament lamp 35/35 W. indicator lamp 1.5 W. two fuses of 8 amps (for lights and horn). Electric horn Marelli type T 6 CA/RCN 1.

Machine dimensions

Wheelbase	1475 mm
Length	2240 mm
Width	705 mm
Height	945 mm
Clearance	150 mm
Weight	170 Kg (375 lbs)

Performance

Maximum gradients for each gear:
45% in 1st
24% in 2nd
14% in 3rd
6% in 4th
Consumption 20 Km/l (= 55/60 m.p.g.)
Maximum speeds for each gear:
60 Km/h in 1st = 37 m.p.h.
80 Km/h in 2nd = 50 m.p.h.
105 Km/h in 3rd = 65 m.p.h.
135 Km/h in 4th = 85 m.p.h.

Fuelling & Maintenance

Petrol tank: 17.5 litres, (4 gallons) of which circa 2 litres (3.5 pints) are reserve.
Oil tank: 3 litres (5.5 pints)
Lubrication: use 2.5 litres (4+ pints) of SAE 30 oil in the winter and SAE 40 in the summer. Change every 2000 Km (1250 miles). To drain remove the union of the feed pipe. Then remove the double gauze filter unscrewing the plug of the union and the filter in the crankcase, after having removed the knurled union with the pump. Tilt the bike to the right to ensure complete drainage.
Every 1000 Km (625 miles) inject grease into the grease nipples of the front and rear forks . Grease the button at the bottom of the clutch actuating lever. Check the play in the forks (raise the bike) and if necessary adjust, slackening the locking nut and turning the eccentric cam on the rear roller bearing.
Every 2000 Km (1250 miles) check the magneto points gap and grease the cam.
Every 10,000 Km (6250 miles) grease the wheel axles and the steering head, and check the fluid level in the forks: raise the bike; remove the top plug of the arms, the supplementary spring and the internal plug with a box/socket spanner; withdraw the shock absorber, letting it drain; introduce a rod to check the level of the liquid, that must be 26 – 28 cm (between 10 & 11 inches) from the bottom of the moving arms; Top up with S.A. fluid as required.

Tyre Pressures

Front: 1.4 Kg/cm2 = 20 lbs / square inch
Rear; 1.5Kg/cm^2 one up, 2.0 Kg/cm^2 for two up = 21 and 28 lbs / square inch respectively.

Rear Dampers

Moisten the friction discs with castor oil, especially if noisy.

TABLE OF BEARINGS

Engine crank:

1 ball bearing at 35 x 80 x 21 mm
1 roller bearing at 35 x 80 x 21 mm

Con Rod:

33 needles rollers at 3 x 23.8 mm

Gearbox primary: (Mainshaft)

1 ball bearing at 30 x 62 x 13 mm
1 ball bearing at 33 x 66 x 13 mm

Reverse shaft: (Layshaft)

2 ball bearings at 15 x 35 x 11 mm

Button of clutch control:

8 balls at 1/8"

Gear forks:

2 balls at 3/8"

Gearbox breather/primary transmission:

1 ball at 3/8"

Steering head:

36 balls at 1/4"

Front wheel:

2 cone bearings at 17 x 40 x 12 mm

Rear wheel:

2 ball bearings at 20 x 47 x 14 mm

VARIATIONS IN THE TURISMO MODEL

Engine

Compression ratio 5.5 : 1
Power 18.9 HP at 4300 rpm
Piston in light alloy with flat head.
Diameter of exhaust valve 42 mm
Timing: with play on the inlet valve of 0.20 mm, the inlet valve must should start to open when the flywheel arrow is 55 – 60 mm before the crankcase arrow. Measured along the periphery of the flywheel. Normal functioning play: 0.05 on inlet and 0.1 on exhaust.

Carburettor

Dell'Orto type MD 27 F. Diameter of diffuser 27 mm; maximum jet for summer 118, for winter 122; minimum idle jet 50; Throttle valve 70; needle jet 270; conical needle L5 fitted at the 2nd groove for summer, at the 3rd for winter; float needle D; float 14; float chamber in mono-block with the body; air intake by short horn; linked by sleeve..

Ignition

Only the Marelli magneto type MCR A-E with automatic advance was fitted. Timing: the points should start to open when the flywheel arrow is 34 – 35 mm from the arrow on the crankcase, measured along the periphery of the flywheel. Plug type Marelli CW 200 L (according to the new catalogue substituted by type CW 5 L).

Final transmission

Ratio 2.437 : 1 (16/39 teeth)
Total ratio between engine transmission and wheel:
1st 9.90 : 1
2nd 7.48 : 1
3rd 5.96 : 1
4th 4.52 : 1

Wheels

Front and rear wheels with tangential spokes and rims in chromed steel 19 x 2.5

Brakes

Rear controlled by pedal on left, worked by the heel

Tyres

Front and rear 3.50 – 19" with sculptured tread

Size

Width	750 mm
Weight	176 Kg

Performance

Maximum gradients for each gear:
35% in 1st
25% in 2nd
15% in 3rd
9% in 4th
Consumption: 23Km/l
Maximum velocities for each gear:
52 kph in 1st
69 kph in 2nd
91 kph in 3rd
120 kph in 4th

Maintenance

Tyre pressures: front 1.25 Kg/cm^2; back 1.5 Kg/cm^2 one up, 2.0 two up.

VARIATIONS FOR THE NEW TOURISMO MODEL (1966)

Engine

Compression ratio; 6.5 : 1; power 19.4 HP at 4450 rpm; piston in light alloy with raised crown, Sport type; diameter of exhaust valve: 40 mm; timing; as for Sport

Carburettor

Dell'Orto type MD 27 F. Same specification as the Tourismo

Ignition

Timing: as for Sport. Plug: Marelli type CW 225 L (substituted, in the new catalogue by CW L).

Size

Width: 830 mm, height: 1050 mm; weight; 192 Kg.

Performance

Consumption	22 Km/l
Maximum speed	125 kph in 4th

Capacity of patrol tank

18 litres, of which circa 2 litres are reserve.

FALCONE (Translation made in May 2002 by Laurie North)

(This 2-page section corresponds to the narrative on Pages 44 to 46 of the original book).

Page 1

TUNING FOR SPEED

It was — and still is — fairly easy to tweak the engine of the Falcone with satisfying results, for many reasons. First, because of the notable margins of robustness (the valve rockers, for example, would do well in a slow diesel !), secondly, there is the possibility of adapting some parts of the Dondolino (remember, this was the single cylinder 500 cc racing machine of the Mandello factory), that still today are to be found — original, or made as new — in the shops catering for these period machines. We list here the commonly practised modifications; naturally they can all be done or just parts, according to the extent of tune wanted.

A change producing noticeable results is that of substituting the standard cam with a Dondolino type. Dondolino cams exist in various versions and with different lifts, and everything depends on the luck that you have in locating them.

It is absolutely necessary, however to change the cam followers at the same time, otherwise the pushrods will work at an incorrect angle and they break in no time.

(*) A less expensive but still effective change consists in the substitution of the hardened rollers of the cam followers with rollers of a larger diameter (one or two mm.): with this 'simple' modification you will obtain (using your original camshaft) a more prolonged firing, with advanced opening of the valves and later closing, plus an improved "lift" of the valve itself. The main work on the head, must be the judicious lightening of the rockers which are then to be polished to a mirror finish to eliminate any surface irregularity that could cause breakage. It is not possible (nor strictly necessary) to increase valve sizes too much, for reasons of space: note that even the racing Dondolino uses an exhaust valve of 40 mm. (just like the Falcone) but with an inlet valve of 44 mm, as against that of the Falcone which uses 43 mm. in Sport trim.

In the 1960's (that is when the parts were easily available, tuners used to substitute the valves from the competition Aermacchi Ala d'Oro – still today reasonably available — because the stem is much slimmer and therefore lighter permitting higher revs. with more safety. You should also change the valve springs, always using the Aermacchi type, that above all, are less rigid and, obviously, replace the valve guide with an Aermacchi part.

It is always useful to increase the compression ratio, either by using a piston with higher domed head (that of the Dondolino), or reducing the cylinder height by a couple of mm. When altering the compression ration and the lift (or diameter) of the valves, it is well to check that the valves themselves do not hit the piston. An empirical but efficacious system is that of applying a layer of putty or plasticene to the piston head, fit the head with its gasket and nip tight. with the plug removed turn the engine over a few times by hand. Remove the head carefully and measure the thickness of the putty where the valves open. It is easy to note the remaining thickness of material, which must be at least a couple of mm.

The flywheel may be modified by removing the semicircular part of the rim - from 280 mm standard diameter down to 265 / 270 mm. You will lose up to one and a half kilos in weight with undeniable advantage in starting, even if it increases the vibration a little. For the record, we would say that the flywheel of the Dondolino weighs circa 6.6 Kg against the 8.2 Kg of the Falcone. (14.5 lbs and 18 lbs respectively)

Increasing the engine revolutions and the brake horse power of the motor will obviously increase the loadings on the bottom end. To cope with the extra power the best thing would be, therefore, to find a Dondolino crankcase, incorporating a third bearing to support the mainshaft.

It is not advisable however to attempt a 'DIY' modification to your own standard crankcases unless you have access to extensive workshop facilities, including the means to make a casting. !

It is not necessary to modify the con rod or the mainshaft, both being very strong and sufficiently robust under racing conditions.

When short of parts, it appears that, on occasions, racing engines - and even engines in the official "works" Dondolinos - used both Falcone and GTW shafts without any mishap since both were considered good enough by the factory to comfortably survive three or four races.

The size of the carburettor can be increased by a couple of mm with advantage from the original 29 mm. One could go right up to the 35 mm bore of the Dondolino carburettor. It is vitally important however to make corresponding changes to the inlet manifold, but any increase you make will be limited by lack of material in the standard item.

Naturally the manifold must be accurately polished and aligned both with the carburettor stub and the cylinder head inlet tract (this too must be carefully widened and polished).

It makes no sense, in fact, to increase the diameter of the carburettor if then the flow of the mixture is restricted by a too narrow manifold. If there is no wish to change the original SS A type instrument, it is possible to enlarge its mixing chamber on a lathe, by a maximum of 2 mm, resetting then the main jet. The carburation must then be adjusted individually throughout the range: the main jet limits are - for the standard Falcone (132) and for the Dondolino (160). Bear in mind however, that with the Dell'Orto carburettor type SS-A it is very difficult to get smooth and perfect carburation under all circumstances.

It would be useful to use a slightly cooler plug (240 on the old Bosch scale and 7 in the actual catalogue) and slightly retard the ignition; by two or three degrees perhaps, but here also it is not possible to give precise information, and you must treat each case individually with the ultimate test on the road against the clock.

The final transmission ratio (16/36 teeth) is already slightly 'long' even as original; it may therefore be appropriate to "lengthen" afterwards (to 16 teeth on the final drive sprocket matched with 34 on the rear wheel sprocket) but higher gearing is advisable only on machines that have been extensively upgraded, so that an appreciable increase of engine revolutions and available power is there to be exploited.

NUOVO

The Falcone Nuovo Turismo, provided virtually entirely for the Street Police and therefore with the windscreen as standard, maintains the "short' ratio of the Turismo (16/39 teeth), using it without windscreen or leg shields, and with a more narrow handlebar, will support a slightly "longer" ratio, that is 16/38 or 16/37, as maximum.

Falcone "Sport" - PSU 576

(*) *Doug ..... please note that this modification has been made to my own Falcone cam follower rollers by Alan Brown. The overall diameter of the new hardened rollers is now a couple of mm greater than standard and although top speed is only marginally improved (5/10 mph) the real gain is much better acceleration and low down punch. (He completed the job by fitting new pins and bushes so, effectively, the Falcone now has new cam followers !)*

FALCONE (Translation made in May 2002 by Laurie North)

(This 6-page section corresponds to the narrative on pages 20 to 27 of the original book).

Page 1

THE FALCONE ' X - RAY'D'

The moment for detailed discovery of the construction characteristics and design of the Falcone has arrived. We start with the first version and in the following pages we shall illustrate the modifications carried out over the course of years.
As already on the Normale, the light alloy crankcase is in two parts divided in a vertical plane. With respect to that of the GTV and the Astore, from which it is directly derived, there is a difference in the rear parts of the cases as a result of a different arrangement of the gears. The right hand case houses a vertical valve gear train and magneto drive and is completed by the timing case cover and a bell-shaped cover for the clutch spring. The left hand case houses the primary transmission (gears) and the all-metal clutch behind a cover secured by special screws located inboard of the external flywheel.. The light alloy cylinder with return pipe (available as a separate spare) has radial fins spaced at 10° intervals; the head, in light alloy, incorporates (by welding) the chambers for the rockers and valve springs, closed by light alloy covers. There is a copper /asbestos gasket between the cylinder head and barrel and a paper gasket between the barrel and crankcase mouth. The crankshaft is in special steel, and of one piece construction. The first examples had two counterweights fixed with bolts to the shoulders of the crank; later crankshafts had counterweights incorporated retaining the same catalogue number. As a result it is not difficult to find the latter type of crankshaft even on the older engines. The mainshafts have a diameter of 35 mm and rotate on a ball-race of 35x80x21 on the right hand side (timing) and on a roller bearing of 35x80x21 on the left hand side (primary transmission). The crank shaft ends have a diameter of 29 mm and width [length?] of 24. ..... *(? accuracy of translation)*. Still on the right hand side, the half time pinion is keyed to the mainshaft and fixed by a nut.; on the LHS we find the felt oilseal, the helical spring of the shock absorber and the helicoidal dentate pinion of the primary transmission. Outside the primary transmission cover, the flywheel is fixed by a right hand thread shouldered nut which is secured in position by a left hand threaded castellated locking ring.
The conrod, with split big-end eye, rotates on thirty three 3 mm needles at the big end and a 23.8 bronze bush at the small end. The piston, in aluminium, is mounted with a 20 mm gudgeon pin; it has a domed head and has three compression rings and an oil control ring at the base. The correct play between the piston and cylinder at the top of the skirt is a remarkable five tenths of a mm. (20 thou)

CAMSHAFT. The inlet and exhaust cams are one-piece on a common camshaft and the drive gear is direct from the engine pinion. It is enclosed in a space on the exterior of the right half crankcase, protected by a cover. The camshaft acts on two pivoted followers that are each provided with a hardened roller running in contact with the cam profile. The followers activated light alloy rods with hardened steel "balled" end caps. The follower of the exhaust has a little attachment, which extends beyond the pushrod seat, upon which the valve lifter cam operates to release compression for starting. The valves have a diameter of 43 mm inlet, and 40 mm exhaust, opened by rockers each has a pair of very short hairpin springs.

CARBURATION Fuel feed is by a Dell'Orto carburettor type SS 29 A (29 mm is equivalent to just under one and three sixteenths inches). A float chamber on the side is incorporated with the mixing chamber body with the usual screw top and enrichment device (tickler), plus a short bellmouth without filter. In other words a typical carburettor for sports motorbikes of that era, characterised by an air control slide, regulatable while running via a handlebar-mounted lever to adjust the amount of air reaching the mixing chamber. This device enabled the rider to adapt the mixture to varying conditions whilst on the move..

The overall effect of this 'correction' is equivalent to a modification of 3 to 4 points on the measurement of the main jet. **N.B. Contrary to common belief this air control does not affect the enriching for a cold start:** to obtain this starting enrichment the rider must momentarily depress the tickler button in the float chamber cover.

IGNITION For ignition there is a Marelli magneto type MLA 53 with fixed magnet and rotating coil, with manual control of advance (maximum 45°) - *Note, some books say 45 degrees and others give a linear flywheel measurement which, when converted, corresponds to something nearer 39 degrees for a Falcone. It is true that the lower compression, iron-engined GTV used a 45 degree full advance but it is debatable whether this amount of advance applies to the more efficient Falcone. My own Falcone operates fine on 40 degrees.* The advance and retard lever is on the left handlebar and uses a slack-wire advance, so pulling the lever towards you retards the ignition. The magneto drive pinion runs off the camshaft pinion. The plug, 14 mm with long thread, is 225 thermal grade on the old Bosch scale. *(In practice, the Falcone is not especially sensitive to plug grades and the usual common sense rules apply to a low-output, alloy, air-cooled 500 single).*

LUBRICATION. Lubrication by a bronze housing pump – double geared for delivery and a collection chamber – fitted on the outside of the timing cover and driven by a gear running from the engine pinion. The oil pump draws down oil from the oil tank through union fitted with a gauze filter and down a copper tube with a connecting anti-vibration pipe in synthetic rubber, and injects it into the hollow timing side mainshaft. A canal carries it to the crank pin, where it flows out and is flung onto the upper wall of the cylinder, on the timing gears, on the camshaft (via some holes) and finally on the gears of the gearbox. It then collects in a well at the base of the crankcase from where it is drawn up again by the return side of the pump, via a second (smaller) gauze filter located right at the base of the timing side crankcase and a short external coiled tube. From the pump the oil returns to the tank on the nearside, via a copper tube. From this left hand side connection on the tank a branch takes the oil to the rocker pivot of the inlet valve; a canal in the head allows surplus oil to reach the exhaust rocker. There, it collects in the exhaust valve seat is returned to the crankcase through another copper tube.
From the uppermost part of the rear of the crankcase, above the gears, a copper breather tube conveys the oil vapours to the oil tank, bringing about an ecological recycling, and this in a period in which this words "ecological" and "re-cycling" were virtually unknown in the automotive world ! Adjacent to the breather is an internal canal with an unsprung ball valve capped by a threaded plug which conveys some of the oil vapour to the primary transmission and to the clutch, so as not to actually bathe in oil, but more precisely to "semi-bathe" or "moisten". The oil pump – which can pump at 60 litres per hour – has an automatic valve to interrupt the flow of oil to the engine when switched off.; so the ON/OFF tap at the exit of the oil tank, on models up to the GTV etc., is not a fitting on the Falcone. *(On a practical note - some automatic non-return valves operated with rather less than 100% efficiency with the result that wet-sumping did occur. Many Falcone owners have retro-fitted the oil taps to overcome this inconvenience).*

TRANSMISSION The primary transmission is formed by a couple of gears with helicoidal teeth; the driven crown is hollow, bell shaped and encloses the clutch. The clutch is made up of a "fixed friction body" in steel, bolted to the extreme left of the gearbox and having the form of a disc with four axial appendages; a driven crown, a series of friction discs and a "pressure plate pan". In more detail, working from the inside outwards, we find threaded on the clutch body: a big ferodo disc; the driven crown; a small ferodo disc; 5 stainless steel discs with internal teeth alternating with 5 bronze discs with external teeth; the pressure plate. Into the centre of the clutch pressure plate, a pushrod is screwed that runs in the hollow gearbox mainshaft - it starts from within the bell-housing on the timing side of the crankcase. On this end two concentric helical springs are placed that hold, compressed, the "friction pack" the tension of which is regulated by a L.H threaded knurled nut that screws back and forth on a threaded sleeve.
The springs are protected from dust – together with the kick starter gears, and the pinion of the final chain – by the bell-shaped cover, already

mentioned, at the centre of which is mounted the clutch release lever on a clevis pin. This lever, with its hardened adjustment screw, acts on a "button" of tempered steel fitted to the end of the clutch shaft and the "button" contains inside a race of 8 x 1/8" balls; the whole thus constituting a thrust race.

(The "gearbox" part of this translation is a brave but flawed attempt on the part of a non-technical translator. Please don't be too disappointed if much of what follows in this section is rather impenetrable. I suspect that Mario Colombo's Italian original is, itself, not absolutely explicit either. Nonetheless, there are useful bits and pieces to be picked up here even though the whole is not easy to get to grips with .)

GEARBOX The 4 speed gears are of the direct drive, constant mesh type, sliding and engaged at the front by a direct link. The movement, therefore, is on three shafts, main, reverse and secondary, this latter in practice formed by the fourth gear which has a splined part that exits the R.H. side crankcase, and to which is connected the final drive sprocket which takes the rear chain. On the gearbox mainshaft you find, from the left, the fixed first gear (splined); the idler second gear; the sliding (splined) third gear with front engagement on two sides, that with its axial sliding brings about the engagement of the second (on the left) and the fourth (on the right); finally there is the constant mesh gear for the fourth, which functions as the secondary shaft.
On the reverse shaft is found (always on the left): the driven idler gear of the first; the splined sliding driven gear of the second with front engagement on two sides, that with its axial sliding engages the first (on the left) and the third (on the right); the driven idler gear of the third, fitted with front linkages only on the left side; The fixed splined gear always engaged with the secondary-fourth and that transmits to the latter the movement to the reverse shaft, related differently, according to the direction engaged.
Gear changing is by a splined desmodromic plate *(drum ?)* on which is screwed two forks: the left one (clutch side) brings about the axial movement of the driven gear of second and therefore the linking of the first and third; the right one causes the axial movement of primary gear of the third and so the engagement of the second and fourth.
The drum, that has a small gear is made to rotate by a shaft with a toothed segment that in turn is worked by the external pre-selector on the crankcase – one of the typical characteristics, aesthetic, of the old one-cylinder Guzzis – the [radial jump] type that engages in the grooves of an integral ring on the shaft of the toothed segment. The primary shaft of the gears rotates on a ball race of 30x62x13 on the clutch side, and on one of 33x66x13 on the chain side, the reverse shaft rotates on two ball races of 15x35x11; the grooved drum rotates on bronze bushes. *(Phew !)*

FRAME, FORKS & FINAL DRIVE etc. The final transmission is by chain, on the right; the rear sprocket is fixed to the hub with 8 bolts, with synthetic rubber shock-absorbing washers. The Falcone frame is in two principal parts, bolted together. This, besides making maintenance easier, helps to lessen the vibrations created by the engine which, in reality, are inherent in this engine type and almost inevitable. The front part is in forged steel, forming the head tube, to which are brazed the tubes of the upper triangle and of the double front cradle. The steering head rotates on two ball races (36 uncaged ball bearings in total of 1/4"dia)
The rear part is made from two steel plates, L-shaped joined transversely by a tubular sleeve, that forms the cradle under the engine. The triangular rear swinging fork, tubular, is hinged at the plates, below by two long shafts that traverse the rear suspension springs, placed under the engine: there are four springs, helical (in pairs) and enclosed in a tubular metal sheath. The springs, when the forks rise, are compressed behind. From the upper part of the L-shaped engine plates, under the mono-post 'Terry" type saddle, two tubular arms in stamped metal plate arise that hold the rear mudguard and the uppermost part of the dampers. These latter are formed by a "compass" of two aluminium arms the have locked between them 4 cork friction discs. A wing screw, with a star spring, serves to control the tightening. The other ends of each "compass" are fixed to the swinging arm
The telescopic hydraulic fork is without doubt unique of its type. The fixed carrying sheaths

(i.e. sliders) on the top, are in steel tube, with a diameter of 46 mm joined to one another by a transverse steel plate; the lower shafts (i.e. stanchions) supporting the wheels, are in tubular steel with a diameter of 30 mm and heavily chromed. At the top the shafts run in bronze bushes (each shaft) and at the bottom in a pair of small bronze rollers enclosed in covers welded to the lowest part of the sliders. The rear one of these roller-shaped bearings, rotates on an eccentric shaft that can be set from the outside with a key in such a way as to take up the play occurring during use. The springing is by two helical springs; inside the springs is the hydraulic damper. The steering damper is by friction, with hand adjuster.

WHEELS etc. The spoked wheels, with rims in light alloy are not interchangeable. The front hub, in aluminium and is part of the brake drum (on the right) which contains a pinned/interference fit steel liner and runs on two conical bearings of 17x40x12. On the outside face of the brake plate is the fixing for a speedometer drive box, to be driven by an annular gear that is fixed to the hub, inside the drum. To drive the speedometer instrument there was provided – as an optional extra – a special rigid transmission, with telescopic movement, designed exclusively for Guzzi by Veglia-Borletti (and today somewhat rare and a collectors item).
The rear hub is in steel: the brake drum, in aluminium with inside surface in cast iron, is fixed with 5 bolts on the left hand side. Both brakes are provided with two brake shoes with unique opening cam and pivot. The rear hub, with spindle removable from the right, runs on two ball races 20x47x14.

ELECTRICS The electrics comprise a Marelli DN 19 30/6-2000 D dynamo, driven by a gear (fibre or aluminium) which is driven from the clutch chainwheel (above). The battery placed beneath the saddle, between the plates of the frame, the front headlamp with three lights, the rear light and the horn. It lacks a stop light, then not obligatory.

CONTROLS The controls of the Falcone are arranged according to the classical anglo-european format of the time. On the handlebars of 25 mm tubing, one finds: on the right a throttle control with its operating mechanism enclosed within the handlebar - including part of the throttle cable. Also the mixture control (air lever) which has a slack cable for "slide closed" i.e. richer mixture and tight cable, pulled towards the rider for all normal operation i.e. leaner mixture. The front brake lever completes the right hand assembly. On the left is the clutch lever; the [underside] valve lifter; the advance and retard control lever (remember-pulling retards) and the dipswitch/horn assembly. On the headlamp shell the three position lighting switch (side, off, main bulb); the red dynamo indicator; the removable key . This key has no affect on spark production which is powered by a completely independent magneto but the key should be pushed right home in the central position when the engine is running to ensure that the battery is receiving a charge. At the centre of the handlebars is the knob for steering damper control. On the top of the tank: the filler cap (rapid opening), racing style. On the left of the oil reservoir: the screw filler tap. On the rear part of the petrol tank are two taps. Normally one is opened, the other is for the reserve. (Slack lever is fuel "off", tight lever is "on") **(*)**. On the float chamber of the carburettor: the tickler for cold starts. Beside the right footrest is the rocking, heel and toe gear pedal. Going from neutral, pressing the rear part down selects first, pressing on the front part down selects the other three gears. Beside the left footrest is the front brake pedal, worked by the toe and nearby, the kickstart pedal. On the rear shockers: the wing nuts for their adjustment, according to load, the speed and nature of the road(tightening hardens the ride). On the sides of the rear mudguards the lockable tool boxes.

(*) *(Most petrol taps fitted to the Falcones I've seen are of the horizontal "swivel-lever" type as described above. Note, however, that some early Falcones came with the conventional all brass spring loaded taper taps as fitted to the G T V's and earlier models).*

Finish

Forks, mudguards, frame, tool boxes, footrest hangers, rear brake pedal, hubs, rear brake drum, front brake drum (except the ribbed band), chain cover, exhaust pipe support are painted in "Guzzi Red". The mudguards and the tool boxes have a double lining, external black and internal gold. **The chain case does not have linings, contrary to what is believed by some restorers**. The early petrol tank is painted in red, with two knee sections in chrome; also in chrome is the "V" panel at the front of the tank. The painted part is bounded by red linings (on the chrome and quite thin), black linings (in the middle, the thickest of the three linings) and gold lining (outermost with a width somewhere between the black and red lines). The oil tank is painted red, with two side protuberances in chrome and linings as per petrol tank. The flywheel is painted red, with outer band and spindle chromed. The brake shoe holder plates are in red with dust covers chromed. The headlamp cover, rear lamp, horn, saddle springs, dynamo cover and spokes are painted black.

The headlamp rim, handlebars and levers, gear change pedal, pushrod tube and rocker inspection cover, linkage and pre-selector, clutch release lever, valve lifter lever, brake actuating arms in the brake plates, saddle supports, rear brake rod and adjuster, covers of the lower fork rollers, fork stanchions, exhaust pipe and silencer are all chromed. The front brake anchorage plate is painted red, with a chromed border. The nuts and bolts, star spring of the rear shockers, the magneto band, the straps of the battery and of the dynamo, the stand and its spring, battery platform, cover of the springing, discs of the tensioners are burnished. Wheel rims, edge of the front brake drum, back brake drum, rear shockers, petrol tank tap (all in aluminium) are polished.

There are large decals on the sides and top of the tank, and small ones on the mudguards. Note that the eagles always look forward, so that the decals on the two sides of the tank are different.

Falcone: a marvellous idea

Contrary to what happened to the vast majority of motorbikes, the Falcone, throughout its almost 20 years of the existence, has undergone very few modifications and each of them is considered to be minor. So a motorbike born perfect? Without being biased, we can say that this could be true at its moment of birth - in 1950. As we have already remarked in the opening, in an era dominated by motorcycles from the "two-stroke light utility models" including scooters, all vehicles that at a maximum could only reach 70 kph - the Falcone was without doubt one of the most powerful motorbikes in the world. Fast, comfortable, and, in a word, the most complete that was to be found on the market. It had very few defects and these included, with hindsight, the none-too-marvellous braking, and the less-than-perfect road-holding. Both these defects were of course common to 99% of all other machines from that era and therefore not seen as especially bad at the time.

Five years on from 1950 however, and the situation had changed radically. The light (cheap) motorcycle, strong in a market, that had maximum popularity, and on a wave of sporting success (the Milano-Taranto, the Motorbike tour of Italy etc.) had grown in importance and prestige. The 98-125 cc buyers were changing up to the 175 and 200 cc class; the humble two strokes traded in for more sophisticated four strokes with twin cams in the head, and performances equalling, sometimes surpassing, that of the classic 500's, most of which were, let it be said - "pre-war" concepts.

On the road, the lighter weight and smaller sizes and more modern frames produced a tremendous advantage in control, acceleration, road holding and braking. Against this was a certain fragility, because they were all constructed at the limits of the materials, but that's been the way of things ever since. We were entering into the period of consumerism and the majority of motorcyclists were more interested in a "quick getaway" at the lights than in tradition, build quality and durability.

From this point on, profound changes would have been necessary to ensure that the Falcone returned to its pre-eminent position as "King of the road". The designers and the staff at the Mandello factory would certainly not have lacked the capacity to bring about the required changes given that at the Grands Prix level, Guzzi single cylinder racers were in the avantgarde developing an unbelievable 90 HP per litre from the engine, in a frame of the most modern conception, accompanied by an ultra light weight of around 220 lbs. Remarkable even today.

Those in control lacked the will, or possibly the courage, to lavish all the technological treasures and experience they already possessed in commercial production, and so the projected modernisation of the Falcone (amongst which was proposed a single shaft driven valve operating system) remained on the drawer board forever.

Despite everything, the Falcone remained in production for some years, for the dwindling number of fans of the big single cylinder and its unforgettable sound. It continued to be produced above all, thanks to the fact that it was regularly supplied to the various Police and Interior Departments, and other Military Corps, all of whom looked in the first place for a comfortable motorbike, robust and reliable under all conditions. The last examples of the Falcone left the production lines in 1967 and with these ended the adventure of the most classical motorbike ever produced and a direct descendant of Carlo Guzzi's original single cylinder concept.
The Falcone will always remain in the hearts of the 'appassionati' as a symbol of that golden age, the epoch when motorcycling was still human and romantic. The Falcone was the highest expression of a marvellous idea that flowed years before from the mind of a man who was as modest as he was pleasant.

FALCONE (translation made in May 2002 by Laurie North)

CAPTIONS TO THE VARIOUS ILLUSTRATIONS

P6 [1] Today the Falcone is one of the most desired and sought motorbikes by collectors, not only for the glamour that emanates from it, but also because its ride produces great satisfaction. In the pictures, two Falcones in a display of period motorbikes

P8 [2] Above and adjacent, two other views of the G.P., that boasted 4 valves operated by an overhead camshaft driven by a shaft, crownwheel and pinion with twin sparks by magneto and three speed gearbox. The mark G.P. derived from the initials of Carlo Guzzi, the engineer, and from Georgio Parodi, the financier of the new industry.

Below, the beginnings of the firm Moto Guzzi at Mandello del Lario

P9 [3] The first model entered into production in 1921, the Normale, with the definitive Moto Guzzi insignia of an eagle with outstretched wings in homage to the aeronautical past of both Guzzi and Parodi. For reasons of economy the valves were exposed rather than in the head; the first examples maintained the double ignition. The gearbox is still three speed. The frame with double cradle is a mixed structure of tube and pressings, the wheels have tyres of 26 x 3. Maximum speed was 85 kph.

P10 [4] On these two pages, two diagrams of the Normale engine that clearly show its simplicity and its principal characteristics, such as the shape of the combustion chamber with the exhaust valve in the head, the flat headed piston and tubular conrod with bronze bearing. The cylinder, in cast iron like the head, is offset with respect to the main shaft to reduce the lateral force of the conrod during the expansion phase of the 4-stroke cycle. The crankcase, although cast in one piece, has two compartments - one for the crankshaft and one for the gears, divided by a wall that was eventually eliminated on the later models. Note also the arrangement of the gears and the gear selector fork.

P11 [5] The timing side with the gear train that operates the magneto and the double oil pump together. The exhaust valve is controlled by a tappet , the side inlet valve by a bare helical spring [*Ed. It looks more like forked hairpin type spring!]* and pushrod. The Normale engine is undersquare (88 x 82 mm); the later examples giving 8.5 HP at 3400 revs/min with a compression ratio of 4:1

P12 [6] The first step in the evolution of the Guzzi is represented by the C 2V built in 1923 (below), that can be considered the first sports motorbike of the firm and as such was used by works riders. The engine was changed to two parallel valves in the head driven by shaft and rockers, a very simple modification that produced a notable increase in power, rising to 17 HP at 4200 revs. The frame was also modified, lengthening the wheel base and replacing the pressing under the saddle with a tube. The motorbike won the circuit of Lario in the same year. In the photo above, the Guzzi squad: from the left, Cavedini, Guzzi, Parodi, Mentasi, the winner Gatti, the mechanic "Moretto" ["little Moor"] and Ghersi

P13 [7] Above the C 2V engine. The valve rockers are lubricated through grease nipples. In addition to the forked springs, some examples were supplied with helical springs – visible in the lower photo in the page opposite – for the valve return. Also the finning and the gear ratios varied from the Normale. The C 2V was able to reach 120 kph. Here adjacent, the C 4V or "four valve",, that appeared in 1924 and was the first "gran premio" motorbike of the firm, recalling the first design ideas of Carlo Guzzi.

P14 [8] The c 4v was for some time the fastest "half litre" of all the international production machines and was seen at important exhibitions, like the first Championship of Europe in 1924. It was regularly listed in the catalogue, permitting private racers to figure well in many competitions. As the official machine it had a very long career: in 1932 it won again the Milano-Napoli [Milan-Naples], with Carlo Fumagalli, with an average speed of 93 kph. Above, Terzo Bandini with the fast circuit version – note the solid rear wheel – in a 1932 photograph. Adjacent, a detail of the head, with the aluminium double camshaft and rocker housing. The valves are closed with four simple forked springs. You can also see the valve lifter control.

P15. [9] In 1928 an innovation of fundamental importance was introduced - the rear suspension. Before then a few firms had tried to resolve this problem, but with empirical solutions that had worsened the stability without increasing the comfort. The sprung Guzzi with oscillating forks with springs under the engine revealed itself to be efficient and rational, pointing the way forward to all other constructors. The first model with integral suspension was the GT 500 known also as the "Norge". It was built with Sport engine and then with Sport 14, as in the top photo. In the picture, below, the lightweight P175 of 1932. It represents a very important model in the evolution of the Guzzi because it introduced a number of mechanical and aesthetic innovations that were then extended to the rest of the production lines.

P16 [10] At the end of 1933 new half litre motorbikes appeared in the wake of the P175 design: inclined valves in the head, pushrorods enclosed in tubes, crankcase with rounded corners and four speed gearbox es with foot change. They were constructed in standard (V) and up-rated (W) versions.

P16 [11] At the side, the 1949 Astore. Compared to the Series V models it boasted cylinder head in light alloy with valves bathed in oil, hydro-telescopic forks, hydraulic rear dampers (the springs of the suspension remain under the engine) and a more powerful front brake. It is the most powerful touring Guzzi.

P17 [12] Destined for private racers but adopted on a number of occasions by official riders, the Condor 500 appeared in1938. Although deriving from the Series V models, it is a completely new motorbike, built with generous use of special light alloys: electron for the engine and brakes, hydronalium (?) for the frame. Permanently engaged gears with front linkage made for more rapid changes than were possible with the preceding balladeur train. The wheels are 21" and weight 130 kg. From the Condor was born in 1946 the Dondolino (top photo), improved in some particulars and with more power: producing 35 HP at 5500 revs/min and reaching 180 kph. Finally in 1950, came the arrival of the Falcone (below), the extreme evolution of Carlo Guzzi's original idea, that builds on the experiences of the previous touring and sports models - Astore and Dondolino – in a powerful and energetic form.

P18 [13] Above, the Falcone in the original version of 1950-1951. On the left, and on the opposite page, two typical details: the oil tank filler cap and one of the tool boxes. Below, the engine , flywheel side.

P19 [14] Adjacent, the Falcone has a double frame with detachable cradles in two parts, the front in tubes and the rear pressed, bolted together. Tubes and pipes are brazed in copper. In the photo at the bottom of the page, the engine from the timing side.

P20 [15] The valve and rocker housings are welded onto the head. The large hexagonal inspection plug allows for access to the tappets to adjust the valve clearances.

P20 [16] To the side, the engine of the Falcone in sectional view. Showing the crankshaft, the domed piston, the timing gear train, the gears with the clutch on the left and the associated spring on the right of the primary shaft.

P21 [17] To the side, the Dell'Orto SS-A carburettor, designed for sport use. It has a detachable float chamber, the bell mouth and the manual mixture control (Not to be used for cold starting). Behind the flywheel is the Marelli type MLA 53 magneto with manual advance, substituted from November 1952 by the type MCR A-E with automatic advance. Below [18] the control arranged on the right side of the handlebar: the twisting throttle control with direct cable action, the brake lever, the air lever, and the dip switch.

P22. [19] Above, the external gear pre-selector and the clutch actuating arm. The two screws with locknuts at the end of the slot serve to allow the exact centring of the movable plate with respect to the fixed drum. The clutch actuator acts on the shaft via a small thrust ball race. Behind can be seen the cover of the dynamo regulator and cut-out. In the picture on the left [20] the valve lifter lever and the double oil pump, sending and returning. The small black cylinder encloses the automatic non-return valve to prevent "wet-sumping".

P23 [21] On the right, a view of the return tube of the oil to the inlet rocker shaft, and with a channel made in the casting to the exhaust rocker. From here the oil returns to the crankcase along a second pipe. Below [22] the rear axle with the tubular triangular swinging forks of the suspension and the friction dampers, compass type. Friction is increased by means of the central wing nut that tightens or loosens the aluminium arms and the interposed cork discs. Also showing is the typical Guzzi fish tail silencer.

P24 On the left [23] the rear brake bolted to the steel spindle; the spoked wheel with light alloy rims and side drum brakes, also in light alloy and fins to improve cooling. The correct diameter is 200 mm. Below is the front brake, this time incorporating the spindle and including the flange for attachment of the spokes. On the brake shoe plate can be seen the attachment for the speedometer gearbox. One should note also the fixing of the wheel spindle and the placing of the guide plates of the forks.

P25 [25] Above, the handlebars on which we find, on the left, the clutch lever, the valve lifter, the advance/retard lever, and horn push; in the centre, the hand wheel of the steering damper, and on the headlamp the switch and the ignition switch. In the picture on the right [26] the tank. Below [27] the gear lever.

P26 [27] Above, the big flywheel, for decades one of the most typical and noticeable characteristics of the Guzzi. Its considerable weight (more than 8kg) brings many of the good things and some of the defects of the Falcone, from the minimal, almost total, absence of vibrations, to the difficulty of gear changing and the entry to a fast curve - both defects attributable, primarily, to the flywheel's inertia and its gyroscopic effect. Here beside [28] the bakelite oil filler cap. The eagles of the decals always looking forward and therefore are different on the two sides of the tank

P27 [29] On the right, the tele-hydraulic forks of the Falcone are without doubt unique of their genre; they have fixed sliders which enclose and move up and down the stanchions (a system which has returned to popularity in the motorbikes for motor cross !) and driving plates adjustable for play and wear.
[30] On the left side beside the footrest, we find the rear brake pedal and the kickstart pedal. The very well-designed form of the centre-stand requires only minimal effort to bring into use. To this day, the best designed stand ever made.

P28 [31] Above the Falcone of January 1952 without chrome; below [32] the Falcone Turismo, that replaced the Astore from November 1953. On the page on the right (P29) from top down, [33] the Falcone Sport of 1956 (cylindrical silencer), in the Police trim, [34] the Turismo engine and [35] the Falcone Sport of November 1953, again with chromed tank.

P30 On this page from top down [36] the Falcone Turismo of 1959 seen from the flywheel side, [37] a version for the police prepared on very few examples (with raised headlight to make room for the siren and incorporating the tachometer) and [38] the 1964 version with cylindrical silencer. On the next page (P31) from the top down, [39] a propaganda photograph of 1965, [40] the Falcone Turismo in Police trim of 1964 (with 60W dynamo with external regulator) and [41] the Falcone Nuovo Turismo of 1966 more powerful and upgraded. It was supplied more or less exclusively to the Police

P32 the Falcone in special trim for the Corps of Cuirassiers. Above [42] the 1952 version with saddle in white leather and rubber buffers; below [43] the most luxurious edition of 1957, with electric starter, double silencers, streamlined mudguards, supplementary lights and larger tank

P34 [44] The Falcone first version, as it was presented at the Geneva Salon in 1950. It is distinguishable from the later models by the greater richness of its chrome-work, the 25 mm handlebars and the pillion slightly inclined forwards. Despite its size, the line is slim, as may be seen from the front view in the preceding page (P33).

P35[45] The three quarter view shows the particular finish of the tank of the first series, with its chrome panel at the front and chrome at the knee rest areas. Also in chrome are of the edges of the brake shoe carriers which were unplated in later versions. The tyre pump was part of the specification.

P36,37 [46, 47, 48] The Falcone did not betray its illustrious origins, only a few touches were enough to give it a modern look, racy and slender. This in particular regard to the lines of the mudguards, the tank and the structure of the steering gear allowing a narrow handlebar and footrests further back

P38, 39 [49, 50, 51, 52] On these pages, the powerful engine and a few particulars of the Falcone: the gear selector placed on the left side of the handlebar and the original tele-hydraulic forks.

P39 [53] On the following page, the rear view shows the shape of the saddle, the tool boxes, the silencer and the "compass" style shock absorbers.

P41 A sports machine though certainly not for Grands Prix events, the Falcone was used however in competitions, particularly in long distance races. On this page, two moments of the most classic of these races, the Milano-Taranto. On the right [54] the marshal of the CC Piero Ghiazza, was classified fifth in his class and 12th overall in the 1950 race with a virtual production model. Below [55] Guido Borri and passenger Lenzi, winners of the sidecar class in 1953 and 1954: note the special front brake the reinforced forks and the larger handlebars.

P42 [56] Above the Fiamme Gialle (Yellow Flames) squad (Demetrio Bonini, Aldo Passerini, and Giovanni Treni), who received first class awards in the Moto Giro d'Italia in 1967. Here beside [57] the motorbike for moto cross assembled in 1962 by "Gamba and Dolza" from Turin with a Falcone engine modified with Dondolino parts.

P43 Above [59] A group of Guardie di Finanza (Custom Officers) on their Falcones during a riding lesson in the early 1950's: on the right [60] test driver Renzo Alippi

P 44 [61] The camshaft of the Falcone with its followers, these ride on the cam with rollers mounted on bronze bushes, below the exhaust follower with its nib which is actuated by the handlebar valve lifting lever. By using rollers with 1 or 2 mm larger diameter - obviously tempered and corrected – you get a broadening of the timing curve, a greater lift of the valves, with a good increase in power. On the next page (P45) at the top, the lightening of the rockers increases the rotational speed and the pick-up. It is necessary to finish off with emery cloth to remove every scratch that could initiate a break. Also useful is the substitution of the original stubby forked springs with helical ones, that with equal load produce lower inertia.

P45 Here beside [63] using a Dondolino piston, with a bigger dome (check its shape) produces an increase in the compression ratio of about 1.5 units. It is always useful to polish the ports and faces of the head and cylinder. Using a carburettor with larger diameter obviously means that the inlet port and air pipe must be enlarged and blended in..

P46 [64] Using a carburettor with larger diameter obviously means that the inlet port and air pipe must be enlarged; better then at the same time to work on the timing. For those who do not want the expense of a new carburettor it is possible to ream out the existing one by a maximum of 2 mm. In that way you can get a carburettor of 30 or 31 mm, enough to produce an appreciable gain in performance .

P47 [65] In its time a motorbike for expert riders, the "Sport" still produces pleasant sensations for those who know how to tune into it properly and understands its complex character. On this page, a photograph from a demonstration of period motorbikes.

P48 More "modern" pictures from a demonstration of period motorbikes. Below [66], a 1953 Falcone Sport, with new type oil tank and petrol tank in red and black. On the next page (P49) on top [67] the first version dating back to 1950, fitted with a telescopic speedometer drive; built exclusively for Guzzi by Veglia-Borletti, and today a much sought after rarity; at the bottom [68], the 1952 version.

P50 [69] To be able to remove the engine from the frame, besides the removal of various attachments, it is also necessary to remove the head. The engine can then be pushed forward and slid out from the rear right side.
Here beside [70] before removing the engine from the frame it is necessary to also remove the gear pre-selector, taking care not to drop the pawls and the springs. Take note of how they are fitted.

P51 Here is how the two crankcase halves look after separation. On the right half [71] the crankshaft and the direct drive gear remain; in the left half (below [72]) the rest of the gears with the selector forks and the desmodromic drum.

P52 [73] Removing the valve springs requires the use of the correct tool, during its production run the tool supplied by Guzzi to authorised workshops. However with a little ingenuity it is possible to remove the valves by makeshift means.
Here [74] and the top left figure on the next page (P530 [75], the dimensions, the tolerances, and the permitted wear of the valves, seats and valve guides for the Sport and the Turismo

P53 In the diagram on the right [76] and the table below [77] are the tolerances and permitted wear to the various parts of the valve gear.

P54 [78, 79] Dimensions, tolerances and permitted wear for the cylinder/piston combination and pin for the Sport and the Turismo. Note the differences between the Mondial and Borgo pistons.

P55 [80, 81] Dimensions, tolerances and permitted wear for the engine shaft/conrod of the Sport and Turismo

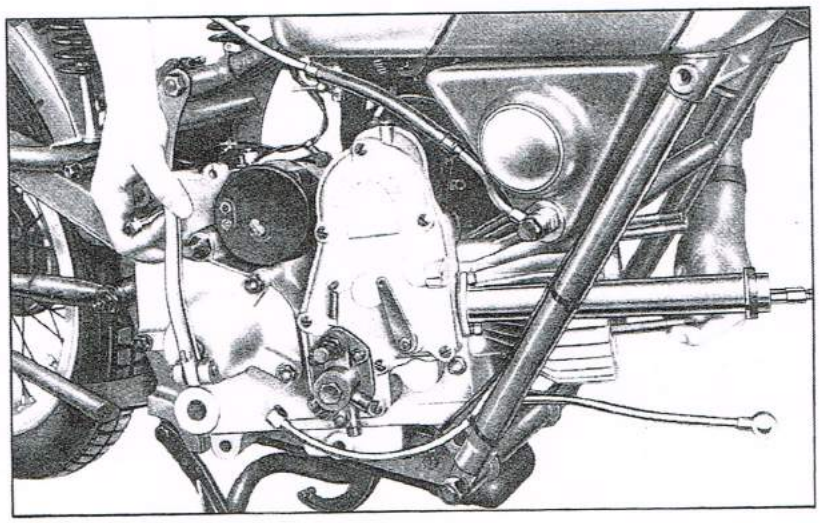
P56 Here [82] the clutch taken apart: note the order of mounting of the various parts and the sequence of driven and drive plates. Below [83] exploded view of the gears, for the Sport, from the spares catalogue. The Turismo differs only in the pedal, in the tie-rod and the selector drive lever (Nos. 10, 20, and 23)

P57 [84] Here, how the gears must be placed in the left half of the block, below [86] dimensions and tolerances of the gear shafts and of the sliding gears. On the right [85] The parts of the oil pump reduced to its various components: from the top the drive gear, the cover, the sending pump gear, the bronze body, the little shaft on which is fitted the second gear of the sender, the vanes of the return pump; on the left, the automatic regulator and non-return valve.

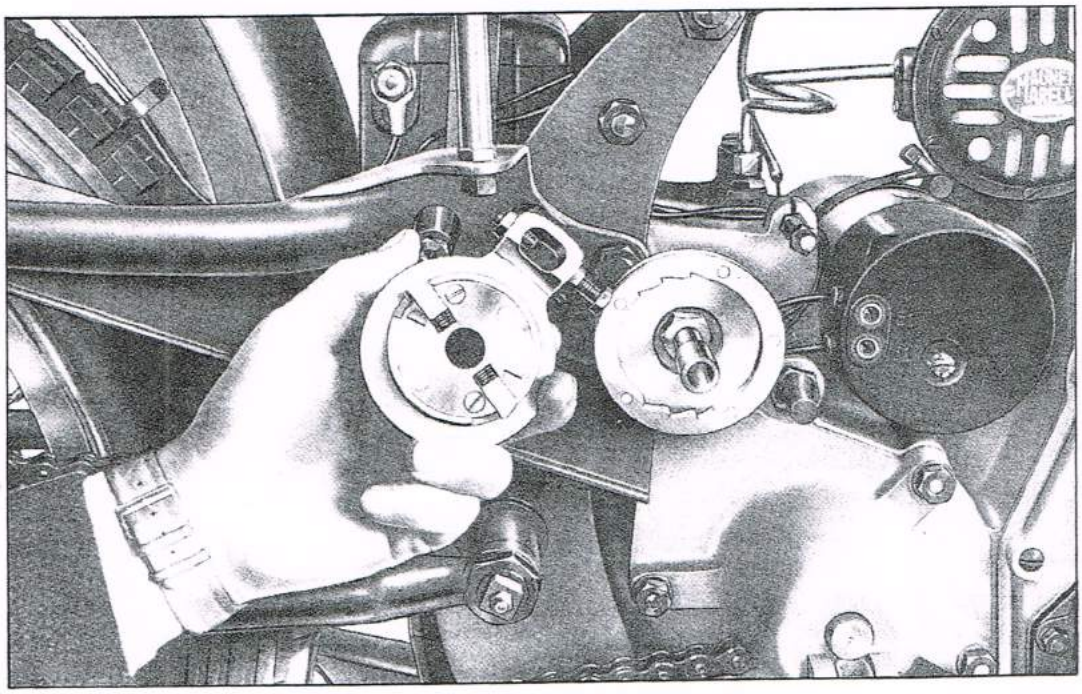
P58 [87] Dimensions for timing the engine. A: inlet valve; B; firing advance. N.B.: with manual magneto fitted B = 95 mm, measured fully advanced.
Above [88] Dimensions for checking the frame, and here beside [89] the rear cradle of the frame with the rear suspension set-up. The springs, compressed by the plate (No. 50) and by the bar (No. 37), are four in number.
P59 Here beside [91] exploded view of the forks. The parts numbered 14 to 25 are of the hydraulic shock absorber. Above [90] how to check the play between shafts and plates.

P60 Here beside [92] dimensions for centring the wheels. Contrary to most, the rims of the wheels of the Falcone are displaced sideways with respect to the hubs, and therefore it is very important for wheel-builders to know and adhere to these measurements.
Below, [93] the sectional view and dimensions of the telescopic fork. Each arm of the forks contains a helical spring, working under compression, unloaded length when new is 310 mm ± 7; they need 49 kg ± 3 to compress the length to 247 mm.

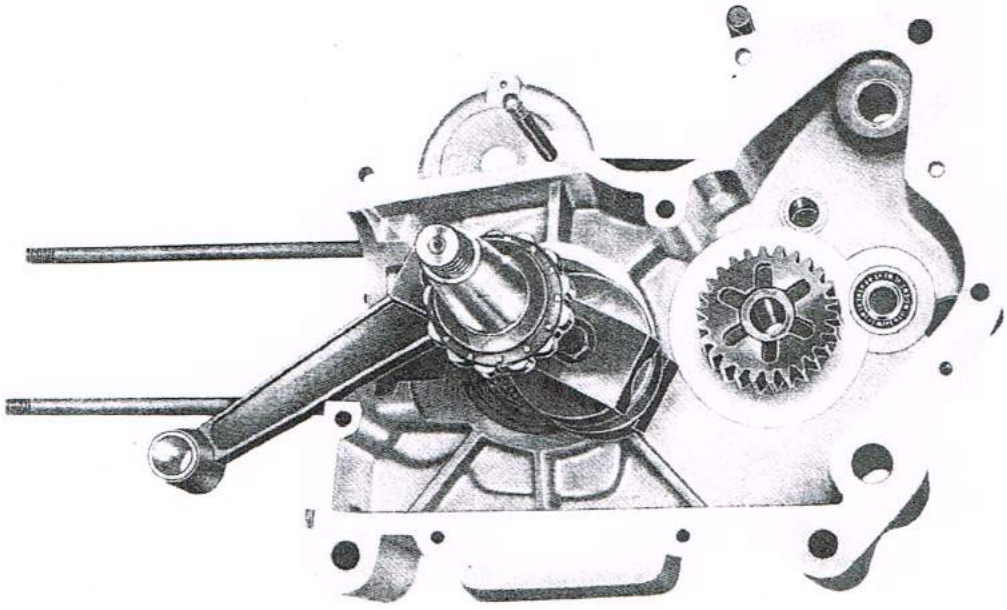
P61 Here beside [94] the plan of the electrics for the Falcone with the 6V-60W dynamo with external regulator (from 1961); below [95] the plan for the electrics of the first versions, from 1950 to 1960, with 6V-60W dynamo with incorporated regulator/cut-out assembly and without stop light.

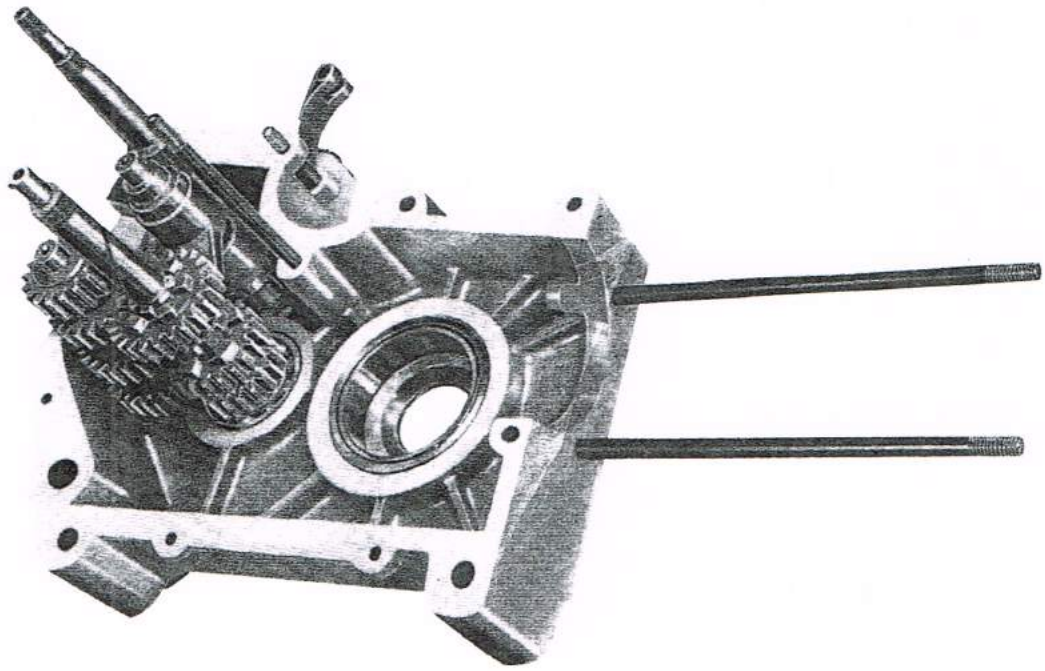


To be able to remove the motor from the frame, together with the various accessories, it is necessary to remove the head as well. The motor can then be pushed forward and slid out from the rear right side

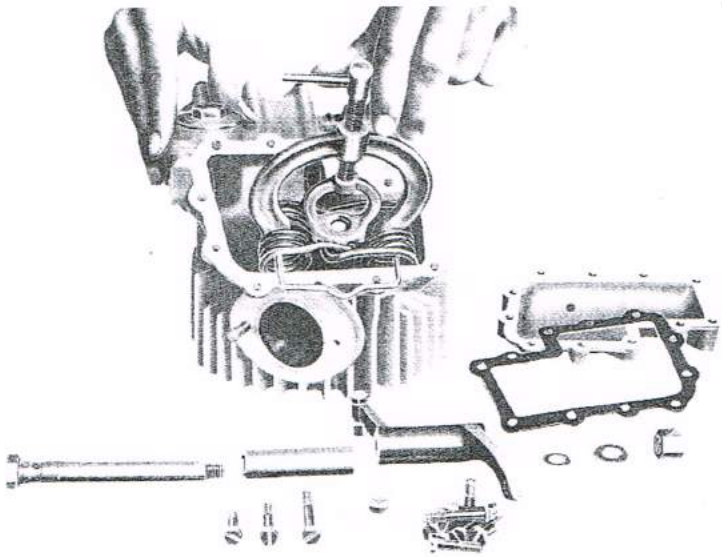


Here, before removing the motor from the frame it is also necessary to remove the gear pre-selector, taking care not to drop the little ratchet and the springs. Note also their way of assembly

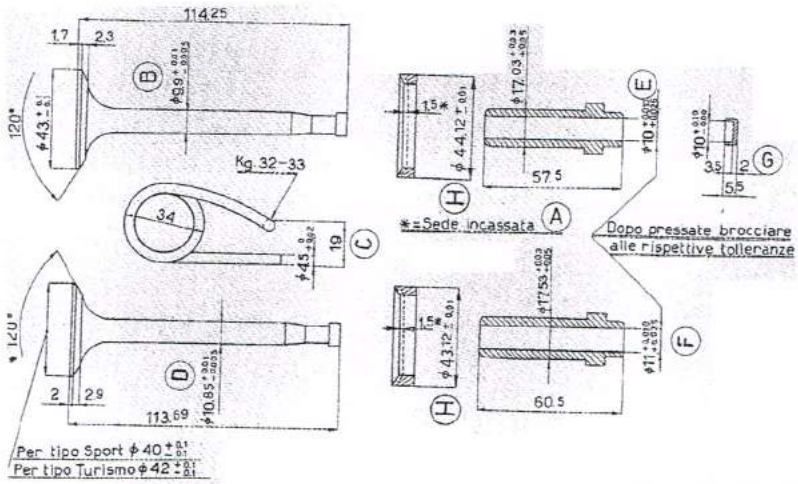




Here are the two crankcase halves after separation. Above (right half) the crank shaft and the gear of the direct drive remain in situ.*
Below (the left half) shows the rest of the gears with the gear change fork and the desmodromic drum.

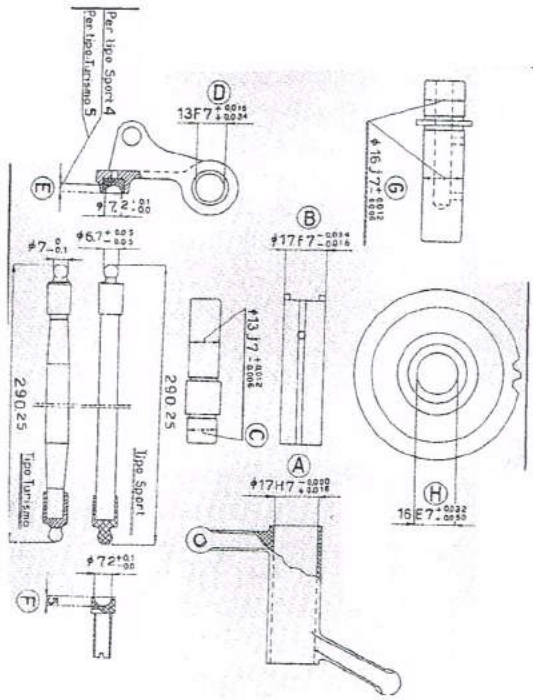


Removing the valve springs requires the use of the correct tool, available from authorised suppliers. However, with a little ingenuity and a bit of luck it is possible to do it.



Values for tolerances and wear for valves, seats, and guides for Tipo Sport and Turismo

Part	Measure	New in mm.	Tolerances +mm	Tolerances –mm	Max. Wear in mm.	Notes
Inlet valve seat 120°	B	10.85	0.010	0.005	– 0.05	The thickness of the edge of both types of valve must not be less than 1 mm. When new the thickness of the edges are 2 mm (exhaust) & 1.7 (inlet)
Outlet valve seat	D	9.90	0.010	0.005	– 0.05	
Inlet valve guide	E	10.00	0.010 0.025	–	+ 0.10	
Exhaust valve guide	F	11.00	0.010 0.025	–	+ 0.10	
Valve head	G	2.00	–	–	– 0.80	
Seat Insert I major	A H	0.00 43.62 44.62	– 0.010 0.010	– 0.010 0.010	1.50 – –	Only for exhaust valve
Seat Insert II major	A H	0.00 43.87 44.87	– 0.010 0.010	– 0.010 0.010	1.50 – –	Only for inlet valve
Seat Insert III major	A H	0.00 44.122 45.12	– 0.010 0.010	– 0.010 0.010	1.50 – –	Only for exhaust valve Only for inlet valve



Values for tolerances and wear various parts of the rocker system

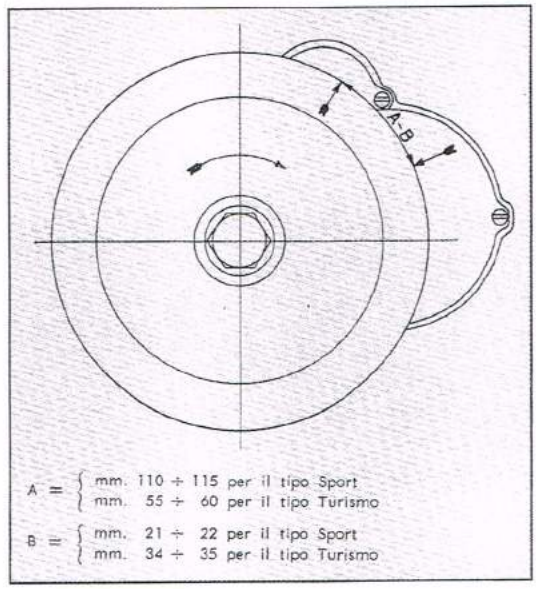
Part	Measure	New Part in mm.	Tolerances		Max. Wear in mm.	Notes
			+mm	– mm		
Exhaust & inlet rockers	A	17	0.018	–	+ 0.05	
Bushes for rockers	B	17	–	0.034 0.016	- 0.12	
Pivot levers inlet & exhaust	C	13	0.012	0.006	– 0.05	
Cam levers, inlet & exhaust	D	13	0.016 0.034	–	+ 0.10	
	E	4	–	–	+ 0.50	For sport
	E	5	–	–	+ 0.50	For Turismo
Rocker Adjusters	F	5	–	–	+ 0.50	
Pivot of the cams, inlet & exhaust	G	16	0.012	0.006	- 0.010	
Bushes for cam lever	H	16	0.032 0.050	–	+ 0.12	

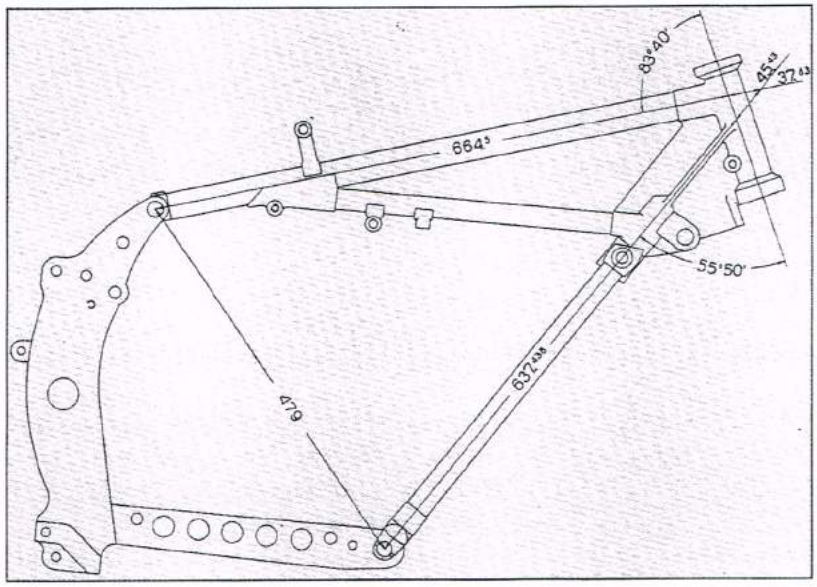
Setting the motor phases : -

A: inlet valve opening points

B: firing points (retarded position) for "auto advanced" magneto

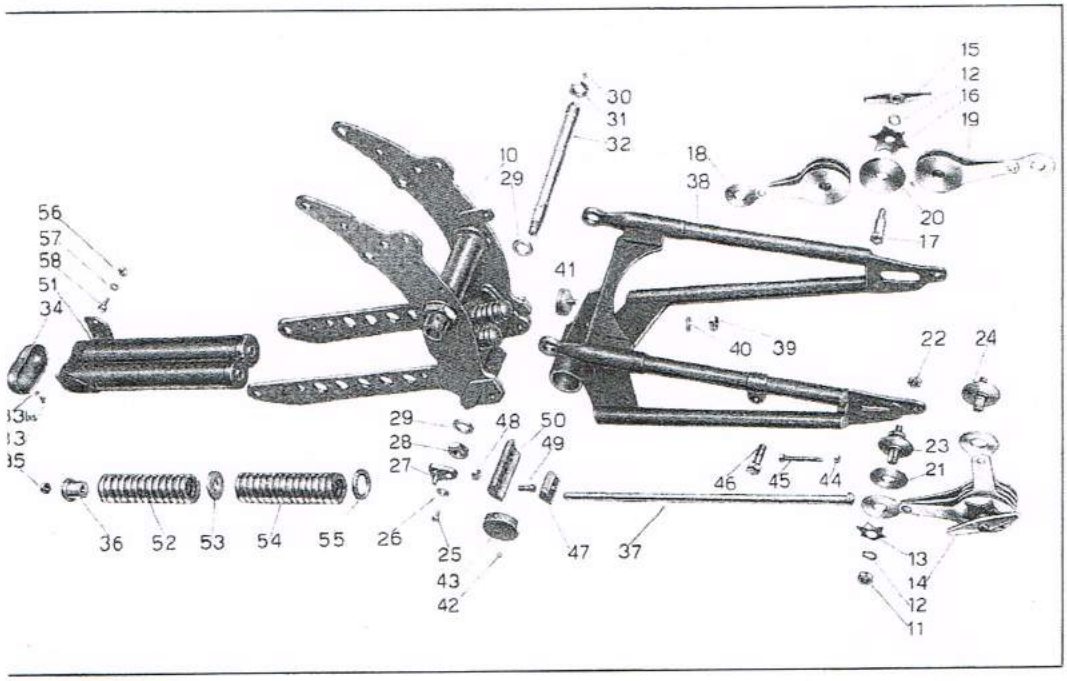
N.B. fitted with manually advanced magneto B = 95 mm measured in the fully advanced position.

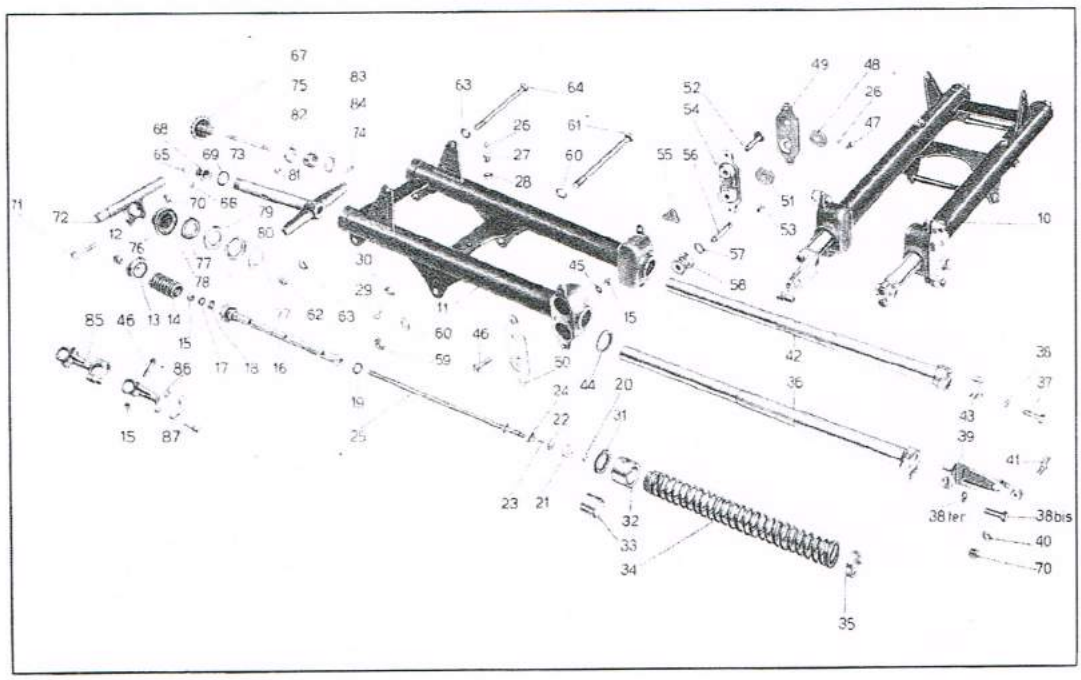




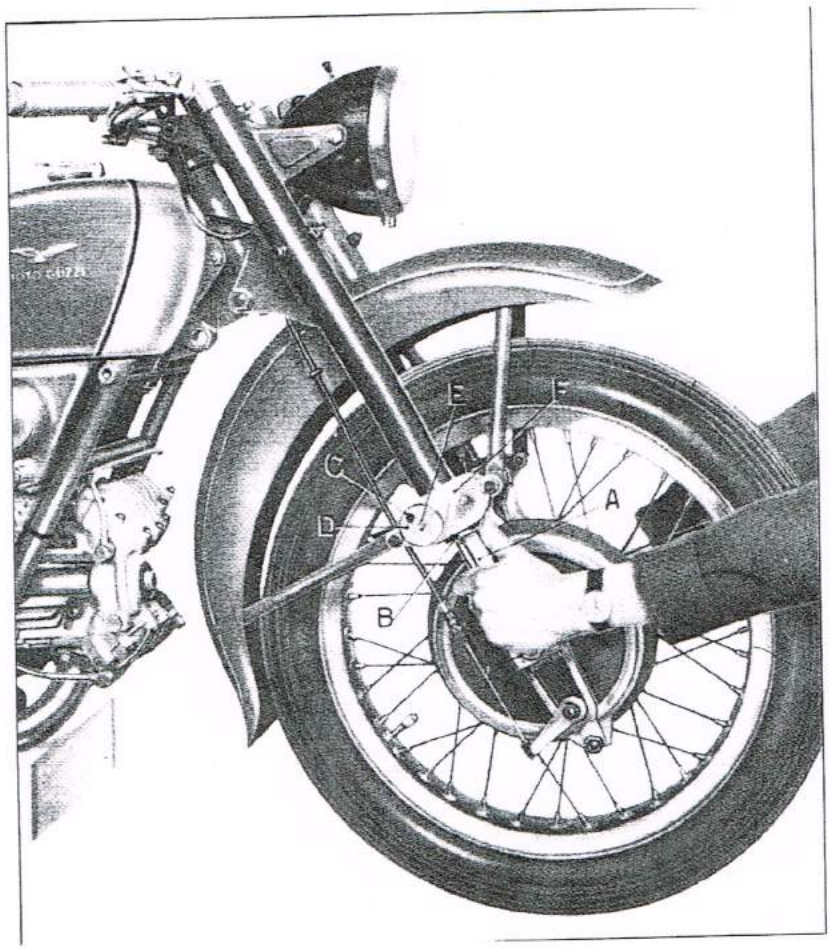
Dimensions for the frame

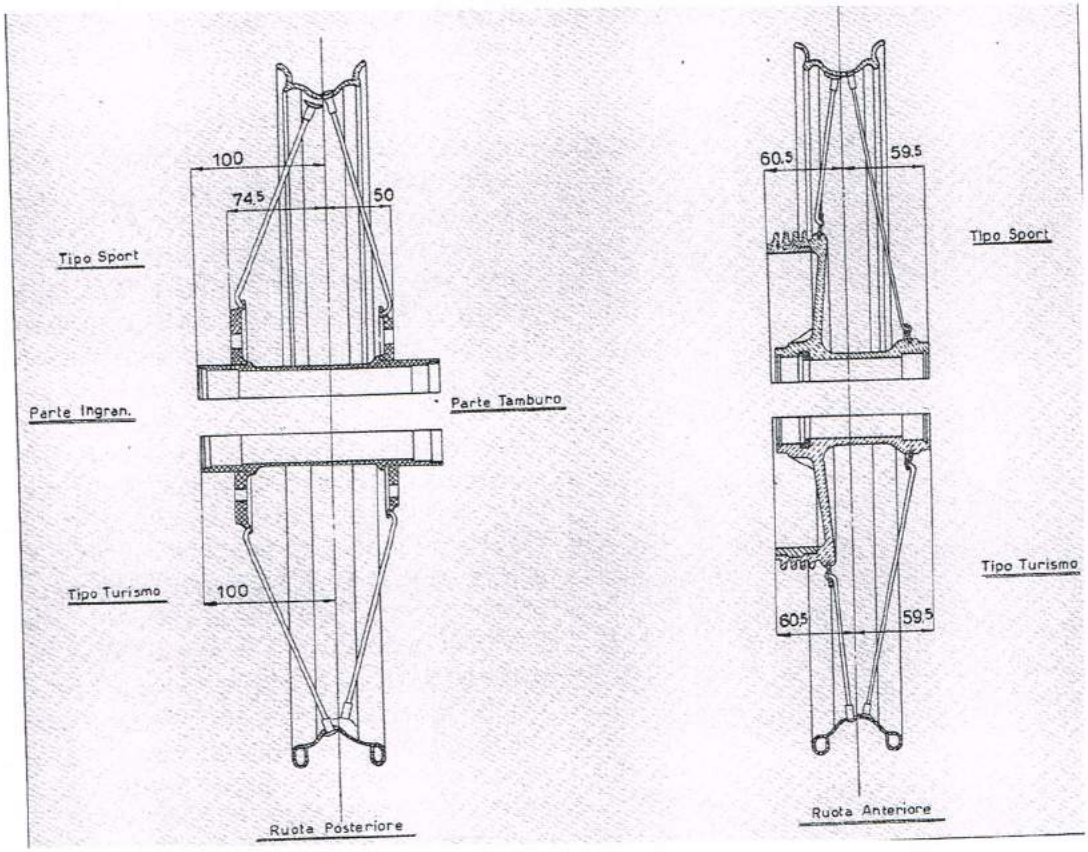
Rear cradle of the frame with the rear suspension. The springs, compressed by the plate 50 and the shaft 37, are four in number, in pairs.





Exploded view of the forks. The parts numbered from 14 to 25 refer to the hydraulic damper.

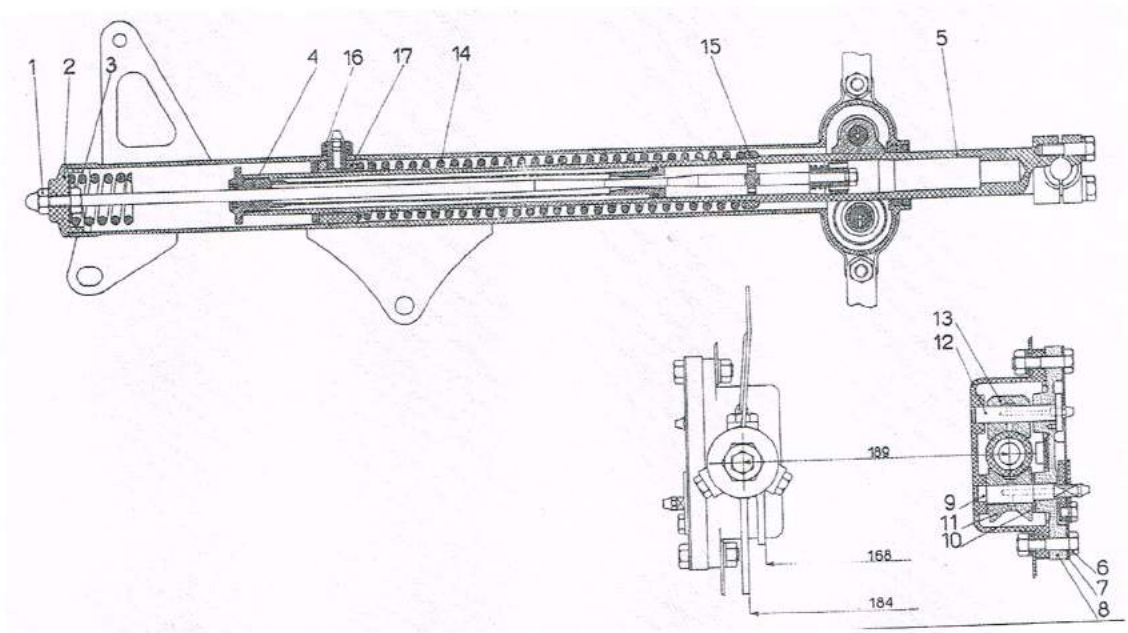

A
B
C
D
E
F



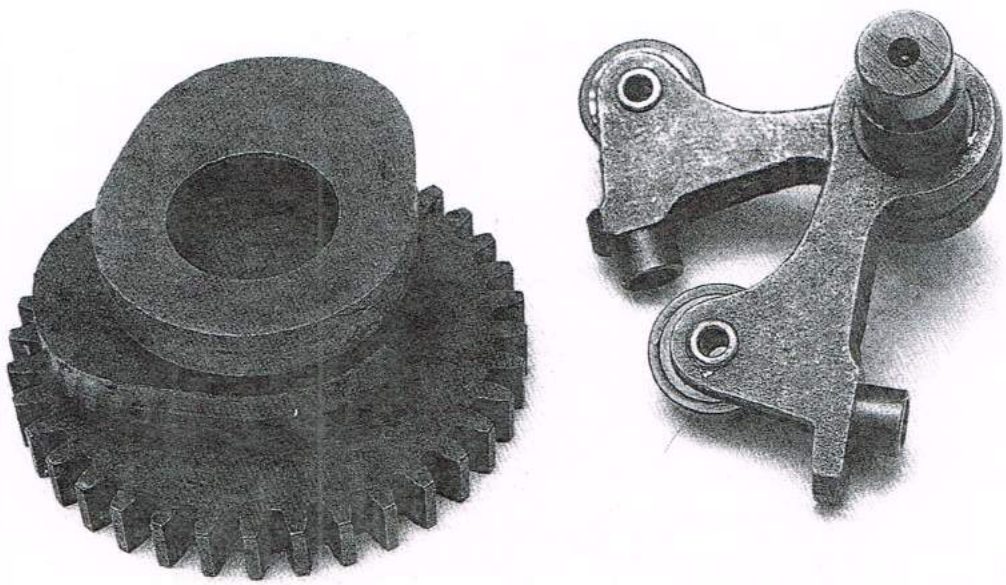
Measurements for wheel centring. Unlike the majority, the circles of the wheel of the Falcone are displaced laterally with respect to the hubs, and therefore it is very important to recognise and obey these measurements.

(WHEELS ARE DISHED !)

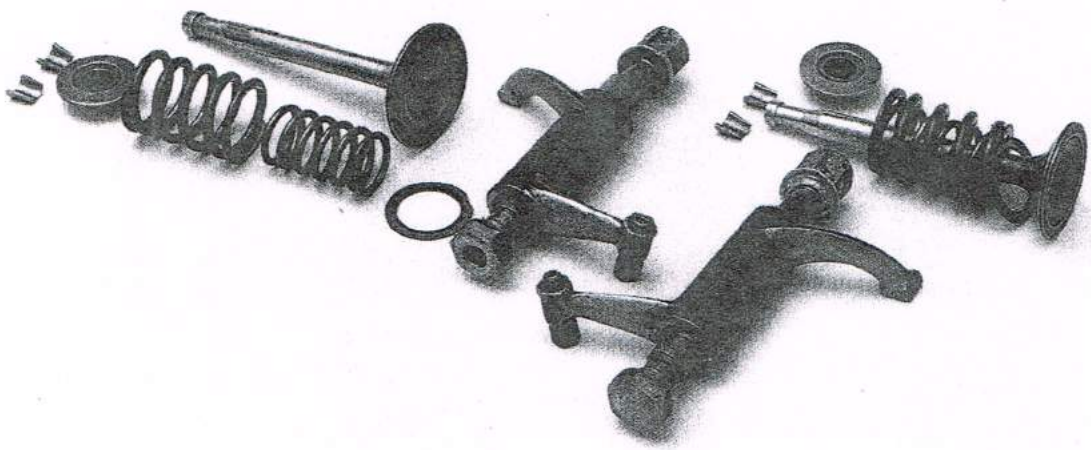
Each arm of the forks contains a helical spring, a compression lifter, which when new and loaded is 310 mm ± 7; it should need 49 Kg ± 3 to reduce the length to 247 mm

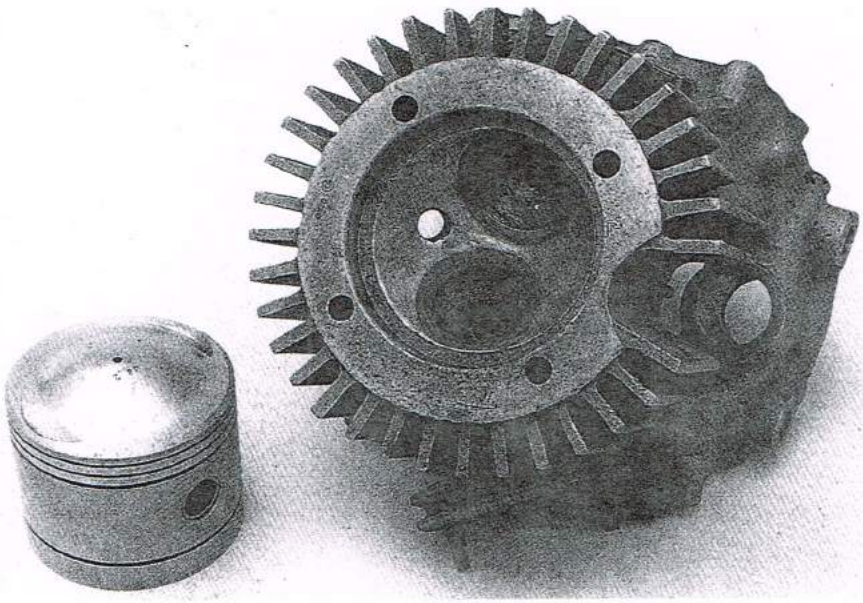


The camshaft of the Falcone and its cam follower. The latter ride on the cam with rollers mounted on bronze bushes. Beneath, on the first level, the exhaust pushrod, with its "nose" that is actuated by the valve lifter cam / handlebar lever. By using rollers enlarged in diameter by 1 or 2 mm – obviously tempered and ground – one obtains an increase of the timing and an increase lift of the valve, with a corresponding good increase in power.

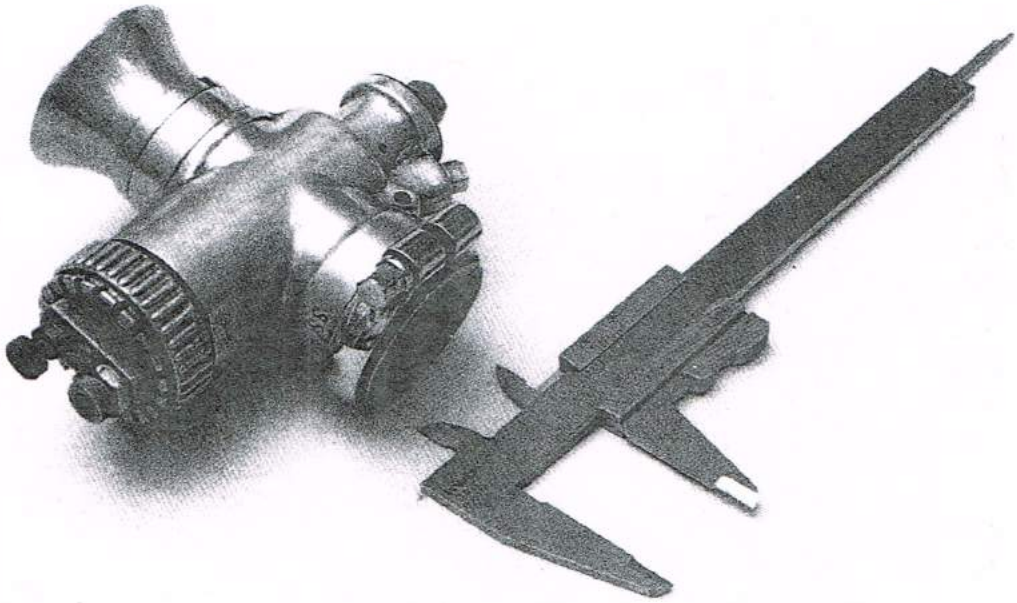


Below, the lightening of the rockers increases the rotational speed and the power. It is necessary to polish with emery cloth to check for any sign that could initiate breakage. Also useful is the substitution of the stubby return springs with other helical springs, that of equal load produce lower inertia.

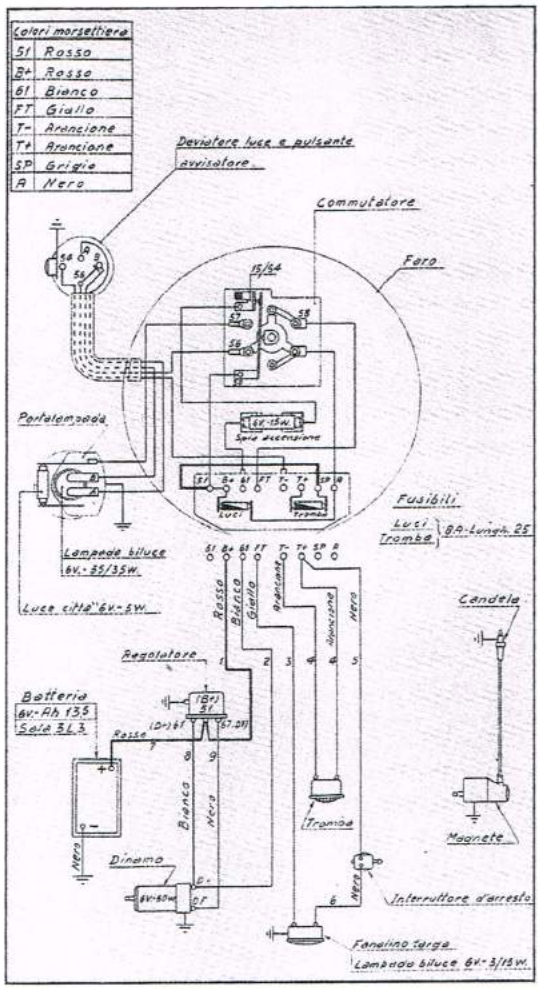




Adopting the Dondolino piston with bigger dome carries with it an increased compression ratio of ca. 1.5 units. It is always useful to polish the ports and the faces of the head and cylinder. With the adoption of a carburettor of larger diameter it is necessary, obviously, to have enlargened (proportionately) the inlet port and induction pipe so as to blend the various bores and avoid steps.

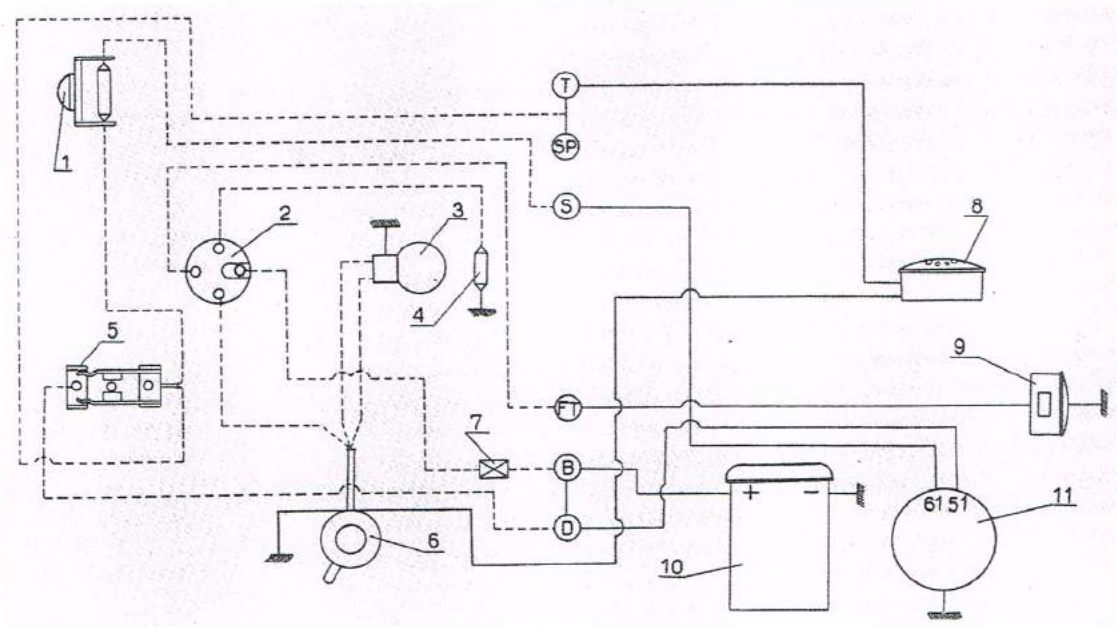


For those who do not want the expense of a new carburettor it is possible to ream out the existing one by a maximum of 2mm. In that way you get a carburettor of 30 or 31 mm, enough to produce appreciable results



Electrical system for the Falcone with dynamo of 6V – 60W with external regulator (from 1961).

LATER MODEL



The electrical system of the first versions, from 1950 to 1960, with dynamo of 6v-30W with internal regulator/ cut-out and no stop light fitted.

1. Charging light
2. Light switch
3. Riding light
4. Side light
5. Switch (key with barrel)
6. Dip switch, flasher and horn button
7. Fuse
8. Electric horn
9. Number plate light
10. Battery
11. Dynamo

D. Dynamo
B. Battery
FT Number plate light
S Charging light
SP Ignition coil
T Horn