

□ He is the keeper of the Golden Book, a man whom all motorcyclists should recognize instantly, yet most American riders don't even know his name. For more than 20 years he was the force behind such champions as John Surtees, Mike Hailwood and Giacomo Agostini, the leader of the winningest race team in the history of motorcycle road racing. And when that team withdrew from competition in 1975, Arturo Magni, now 60 years old, quietly left his post of two decades, taking with him memories enough for several lifetimes, and softly faded into the Italian countryside.

Today Arturo Magni sits at home, the perfect gentleman, quiet, relaxed, unassuming. But ask him about motorcycle racing, racing strategies, about race bikes and their engineering and about his lengthy tenure as team manager for MV-Agusta—the stubbornness, fire and determination that earned this man the epithet of “iron-fisted” surface immediately. Arturo Magni still believes every choice he made in his days with MV was right. He'll instantly produce the Golden Book, his gospel of motorcycle racing, a volume recording every aspect of his racing experience. It's a work unequalled and irreplaceable, a cornerstone of motorcycle racing history. Here are the dyno readings for ev-

ery engine he worked on, engines which powered Magni's machines to more World Championships than any other racing team has won. Here are the shock settings for each bike on each track on each outing, for more than 20 years. Here, page upon page, are the steering and chassis geometries favored by scores of world-class champions. Rider weight. Track conditions. Clear, thorough, compendious. Quite likely the world of motorcycle racing will never see another man like Arturo Magni, but he's not ready to leave yet.

Arturo Magni was born on September 24, 1925, in Arcore, Italy, a small town near Monza but more notably the base

of production for Gilera. Upon young Arturo those facts were lost—he cared little for motorbikes, preferring aircraft to two-wheeled transport, designing and building his own air models, mostly gliders. In 1942 Magni won the Italian powerless endurance title using a glider of his own manufacture with a 10-foot wingspan. His first job in those war years was with a company overhauling powered airplanes for the Italian military. Arturo's budget was limited, and in order to pursue his hobby during the war, he took advantage of his friendship with another aircraft enthusiast, Giuseppe Gilera's son. Young Gilera would provide the expensive materials needed, and Magni would design and build the planes. Arturo's job as an aviation mechanic disappeared along with the Italian air force, and Magni asked his friend if Moto Gilera might have some work for him. Sure thing—plant service and maintenance department.

At this time, 1947, Gilera's designer Pietro Remor was working on a most fascinating machine, a four-cylinder, 500cc racing bike; the engine had a stratospheric level of technological sophistication for the time. Remor was more a mathematician than a mechanical engineer, and most motorcycle builders thought the new engine would require unrealistically high levels of pre-

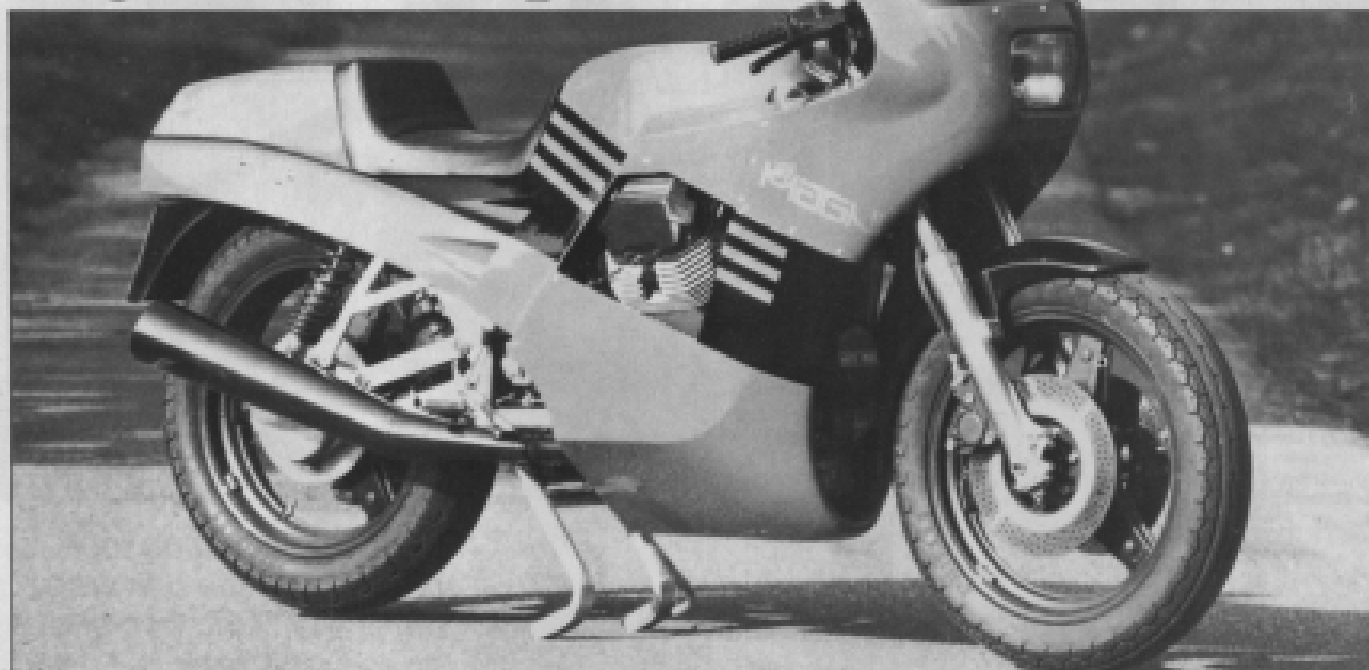


*For 18 years, MVAgustas ruled the racetracks of Europe. Arturo Magni ruled those bikes.*

*By Bruno de Prato*

## MASTER AND MASTERPIECE:

# Arturo Magni And The Magni/Le Mans Special



# Arturo Magni

cision and absurdly tight tolerances. Remor wanted to have it assembled by a skilled technician, yet one uncontaminated by the prejudices abounding regarding what could and couldn't be done in motorcycle engine production. Magni applied; Remor found him to be everything he had hoped for.

The Gilera four was a smashing success. Count Domenico Agusta, head of rival MV, went to Remor and offered him any position he wished, so long as Gilera's designer moved to MV. By 1949 Remor was working for Agusta, and by 1950 had brought Magni along. MV's racing department at that time was a magic place, full of innovation. Magni's first job was assembly and racing development of Remor's shaft-driven, parallelogram rear-suspension 500cc four, a bike planned not only for the track but for the street as well. Highly praised by team rider Leslie Graham, the bike was too radical for the other MV riders, and consequently ran from only 1950 to 1951. Yet the basic design was so sound, this big MV, sans its shaft and rear suspension, remained the backbone of all MV racing activity in the large-displacement classes from 1952 until 1965. Though that era had more technological stability than ones following it, think of that in terms of current engineering: Would Honda's single-cam 750 of 13 years ago have even a ghost of a chance against Spencer's '86 NSR500? MV wasn't losing many races on the 500cc four.

Magni had been responsible for all MV's 350-500cc development and racing activity, and by 1959 he ascended to management of the entire racing department; Remor stood in the position of chief project engineer, retiring in the mid-1960s. By that time, based on the knowledge he had acquired in 15 years of racing and his close association with Remor's fours, Magni brought forth one of MV's most successful designs ever, the 350-500cc triple. Starting in 1965 as a 350, the engine was far narrower than any other configuration of its day. With double overhead cams and four valves per cylinder (this was a first for Magni; all the designs he had worked on previously were two-valve setups) the triple started winning from the start. By 1966 the engine grew to 420cc, and by 1967 up to 492cc, increasing its horsepower by one third over the original version. Trophies filled the racing department at MV.

All of this success is laudable. Students of motorcycle racing know of MV's golden years, of the company's lock on GP wins. For less-initiated followers it may seem quaint that some Italians won some races before the engineering giant of Honda or the race-wise instinct of Yamaha came on the scene. Let's put this in terms more readily understood: From 1956 until

1974, MV won every 500cc World Championship GP title save one (in '57)—eighteen 500cc Championships total. Cycle has a staffer who was born in '58 and graduated high school in '74. Mighty Honda? They've won two. Savvy Yamaha? Five. Suzuki? Four. Norton and AJS one each. Second, with six wins compared to MV's 18, is Gilera, Magni's old outfit.

And Arturo Magni has no university diplomas hanging on his walls. His text is his Golden Book.

"The propulsion for all this research and development activity came from Count Domenico Agusta and his enormous passion. He was no technician, but he was the booster of the entire effort, and not just in terms of financial support. There were three of us," Magni explains. "Mario Rossi was a most talented and experienced draftsman. Engine tuner Ruggero Mazza came from that highly qualified school that has always been Dr. Fabio Taglioni's racing department at Ducati. And myself. No graduated engineers in the bunch."

This attitude partially explains Magni's frictions with MV's Dr. Bocci in the race team's closing years. The only mechanical engineer with a university background whom Magni admits to learning from is Remor.

Magni and one of the greats, John Surtees.



Below: Magni and Linori, 1974.



*Magni's education took place not in the university, but in the workshop and on the racetrack.*

Magni with the MV giants Pietro Remor and Count Domenico Agusta, 1955.



A very young Magni with the Italian 500cc champion Umberto Masetti.



"My technical education took shape under his guidance. From Remor I learned that a structure should not be too rigid, even an engine crankcase. Any structure must be allowed to flex, to yield a bit, but without incurring permanent deformation of itself. I have seen patched-up engines performing at incredible levels, levels they could not reach in their original, perfectly sound state."

Magni has golden rules not only for bikes but for riders as well, and for those who remember him at the paddock, these underline well why he earned a reputation for dictatorial authority over his team. He has led an unbelievable collection of personal talent to the finish line, and not all of these racers were easy to live with. Rule number one: Give a rider your most dedicated technical assistance and cooperation, but nothing more. Team managers should never be nursemaids. Agostini once came to the grid without his helmet, screamed and yelled at Magni to get it, was put back in his place, then demanded that the race marshal delay the start. "That would never have happened to Carlo Ubbiali," says Magni of the man who clinched three 250cc World Championships and six 125cc crowns, all but the first on Magni's MV bikes. "He used to care very meticulously for his personal equipment. And today there are riders who have lost a race because of a fogged visor. Ridiculous!"

Magni is already warm under the collar, and now he begins to steam, expounding on frustrations he encountered during his GP career, some of which sound familiar. The essential problems in racing never change, only the solutions: "There have always been people who want to introduce a bureau-

crat into every minor aspect of racing, just to boost their personal image of great leaders and organizers. In MV's low times a fellow named Fredmano Spairani came over to MV from Ducati. MV had been running a smooth and efficient racing organization for more than 20 years based on a handful of dedicated men. This new chap imposed an absurd manpower increase in the racing department, not in terms of real technicians who could help get the job done, but by hiring bureaucrats by the dozen. He wanted us to have an interpreter along with us. None of us could speak much more than Italian, and even that not too polished, but we got through fine just about anywhere in Europe. We sure won races. And now we are to have an interpreter. We're working like hell, and this bum will be on the payroll chatting and showing off. I got to Count Corrado Agusta and squared things off real sharp, and the interpreter was gone the next day."

Arturo calms down and talks about the riders who raced MVs. The list itself is astounding. Magni refuses to call one the best. "There are not more than one or two riders every five years or so who are worth the world title in the 500cc class. Leslie Graham (500cc Champion in 1949) was a super technician and a real gentleman, great at sorting out the bike but very shy at asking you more than you would naturally offer. John Surtees (500cc Champion in 1956, '58, '59, and '60, 350cc Champion in '58, '59, and '60) was a fantastic talent, a born engineer, but a man who respected the separation of tasks. I still recall his handshake—he had the strongest grip of anyone I've known. He could adjust shock preload with his bare hands, without the usual tool. He was very sharp, but humble enough to accept advice and respond to requests.

"At the time Surtees joined the team, we were experiencing a sequence of mechanical failures; when he arrived he began recording sensible answers and we got things straightened out. At Nurburgring he noticed that a number of seizures were occurring in the portion of the track where it went through the woods. He went off for his practice lap, went into the woods flat out, and then shut the bike down, coasted to a stop and pulled the inner and outer spark plugs, checking the bike's carburetion where we in the pits could not. He had realized those seizures came about because the air in the woods was richer in oxygen, and carburetion set in the pits was too lean for the wooded section.

"Gary Hocking (500cc and 350cc Champion in 1961) was a fantastic athlete and a fantastic personality. He may have been the best of all, but he was killed too soon to know.

"Mike Hailwood (500cc World Champion on MVs in 1962, '63, '64, and '65, 350 Champion in 1966 and '67, 250cc Champion in 1961, '66, and '67) was another great athlete. He had a great heart and a great love of racing, but very little interest in the technical aspect of it.

"Giacomo Agostini (500cc Champion in 1966, '67, '68, '69, '70, '71, '72, and '75, 250cc Champion in 1968, '69, '70, '71, '72, '73, and '74) was very meticulous but not particularly capable in terms of technical knowledge. He made up for this with a unique ability to sense impending troubles. He was very professional, but not very friendly. This last point served him well, because he never got involved in those 'little mafia' activities that always take place inside of a racing department. He had his negative side too—he could not stand another rider in his team who was faster than he was.

"Phil Read (500cc World Champion on MVs in 1973 and '74, 250cc Champion on Yamahas in 1964, '65, '68 and '71, 125cc Champion in 1968) was the one Ago could not live with inside the same team. Phil was another real gentleman, and very smart too, smarter than any of the other riders. He brought a great deal to the racing department because he was very talented at bringing a prototype up to its ultimate potential. In 1973, when the old 500 triple appeared obsolete compared to the new Yamahas, Read did not hesitate to take the 500 four that Ago had rejected."

Magni has only one further comment, and it concerns Kenny Roberts. It's also his only regret. "I knew he was good, and I tried to have him on the team, but there just was not enough money to pay him. Who knows, maybe if Count Domenico had still been alive . . . ."

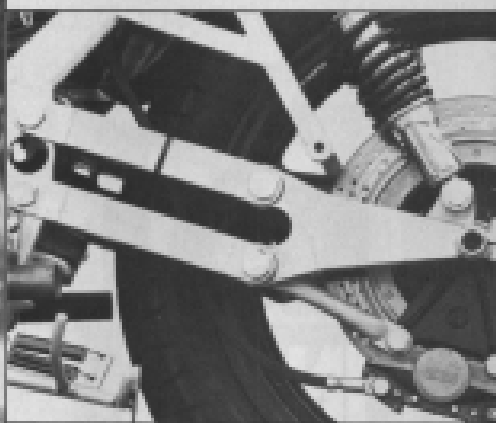
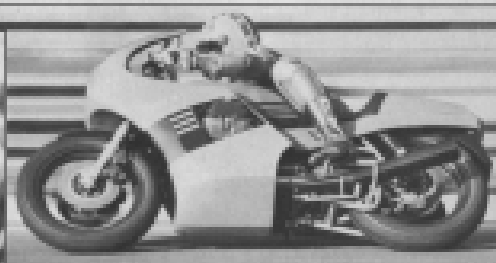
MV Agusta folded its racing tent at the close of 1975, having fielded the last four-stroke to ever win the 500cc World Championship. That year Agostini ran a two-stroke Yamaha to victory (and his last championship), and the GP die was cast. Magni remained with MV, keeping the old racers alive for exhibition here and there, a kind of semiretirement which allowed him to stay close to his marvelous machines. Yet he had too much experience, was too active to be content with puttering. Many MV faithful would pay anything to have their 750 Sport tuned by the master, so Arturo invested his capital of experience and his two sons.

Officially, Magni's independent activities started in 1977: his first project was a kit converting the MV 750 from shaft to chain final drive. In the process the bike shed some 45-plus pounds, a savings due in part to the EPM wheels available in either aluminum or magnesium alloy and designed by Magni's eldest son Carlo, a mechanical engineer



What would you give to pose with three racers like Giacomo Agostini (wins, 1972) and the duo of Gary Hocking (left) and Mike Hailwood (right)?





## Arturo Magni

with the benefit of a university education. That first kit gained instant popularity, and Magni's shop came under immediate pressure for more: hotter cams, bigger carburetors, more displacement. Who better to deal with such hot-rodding? In 1979 he offered a frame patterned after MV's racing chassis. It, again, proved to be a smashing success.

But there were simply not enough MV 750s around for business to go on forever. When the majority of MV survivors had been transformed into Magni specials, Arturo cast about for an alternative powerplant, finding it in the Honda 900 Bol d'Or engine. The frame for this Japanese/Italian mix was mostly original MV, adapted to host the new crankcases. Again, Magni's Honda Special was a great success—more than 250 units were produced in two years.

Germany had always been one of the most responsive markets for Magni's projects, and Germany wanted a specially-framed BMW boxer-twin. The prototype was ready in 1981, and production began in 1982, just as the new K-series fours came to market. Despite its superb handling characteristics, Magni's Beemer paled in the K-bike's shadow, and only slightly more than 100 units were built. Now we have something new.

All of the previous Magni boxer units used a "conventional" frame layout, a double-cradle design with a stiffened steering-head area, rear suspension via two shocks in the normal position connected to the swing arm and frame. But

the Magni/Le Mans Special changes that, reaching back to the first pages of the Golden Book, a solution applied over three decades ago to a problem still largely unsolved. The Guzzi engine in its latest offering, you see, uses shaft final drive—as did Remor's 500cc four back in 1950. That first Remor MV featured a most unique parallelogram rear suspension with double universal joints at the drive shaft. Leslie Graham raced that bike and found it blessed with unmatched handling characteristics. Magni remembers that—he can show you where he wrote it down. When requested to design a special frame for the current-production Moto Guzzi 1000, he knew where to find the answers.

We had a chance to test the Special at Monza, the day before the first units were slated for delivery. Of course, the four-link parallelogram rear suspension is the eye-catcher; rather than a conventional swing arm, the bike has four arms, each pivoting on a uniball joint fore and aft. The arms' pivoting axes are perfectly aligned with the centers of each of the drive shaft's two universal joints, one exiting the gearbox, the other entering the final drive's ring and pinion assembly. Using a parallelogram instead of the regular swing arm has allowed Magni to optimize the action of the double universal joint, thus creating a perfectly homokinetic transmission of power.

Here's the problem for which Magni has found a solution: when a universal joint's output shaft is in anything other than perfect alignment with its input side, the output shaft's rotational speed is not constant. To compensate for this irregular transmission of force, a

second universal joint must appear between the output shaft and the original source of power. Properly timing the two U-joints will make the rotational speed of the output shaft perfectly constant, as smooth as that of the input shaft—only the intermediate shaft is stuck with the jerky motion caused by the misalignment of input shaft and pinion gear as the suspension compresses and rebounds. The only other solution is a Rzeppa or constant-velocity joint, and for the most part such a feature is both too costly and too bulky for special, low-volume motorcycle applications.

Despite its highly sophisticated suspension, the Magni/Le Mans Special uses traditionally positioned twin rear shock absorbers. The frame design likewise follows traditional pattern with the added feature of removable lower cradle tubes for eased engine service. Chassis tubes are thick, 32mm-diameter pieces, rolling on 18-inch wheels front and rear. For a sporting bike, the riding position is very comfortable, the clip-on-to-seat dimension well conceived.

The unique chassis holds a dead-stock 1000cc Guzzi engine—high-performance kits are sure to come later. At 460 pounds dry the Magni Special is about 45 pounds lighter than the production Guzzi, and you'll feel that from the smarter acceleration alone. The engine seems to shake much less than before, a result of the new frame's stiffer bracing. The transmission shifts smoother as well, again a result of the frame—there's no more yo-yoing at the rear end whenever you open or shut the throttle.

The Magni/Le Mans responds immediately.  
*(Continued on page 79)*

**Magni** Continued from page 69

diately and precisely to the rider inputs, yet holds a straight line at high speed without difficulty. The combination of nimbleness and stability is fascinating. Monza's "Junior" track includes two fairly long straightaways, the famed Parabolica curve and a sequence of sharp esse bends, offering a good combination of riding situations. In only two laps we feel perfectly in tune with the Le Mans Special, and begin looking for its limits. With the standard-engined Le Mans it's obvious there's more frame than power, and the limits are hard to find. The absence of any pogging at the rear certainly lends to the surefootedness of the bike, and a pair of Pirelli Phantoms help—the production bike will use Pirelli's MP7 Radials which should enhance transitions from straight up to full lean with increased smoothness. The lack of power is regrettable, yet the handling is reward enough. The bike invites lean angles on the street which are usually limited to the racetrack, so long as pavement permits.

The Special uses a Forcella Italia fork and Koni shocks. Given the machine's extreme ability yet forgiving smoothness, you might expect to see hot rake and trail numbers akin to Yamaha's FZ750. Wrong—fork rake is a slowish 28 degrees, trail an equally substantial 4.9 inches. The engine is not mounted particularly low; its crankshaft centerline hits 17 inches above ground level. All this should add up to rather heavy steering, but that's not the case at all. Frame rigidity and weight distribution (47 percent front, 53 percent rear) must be of some merit here, but ultimately what we are experiencing with the Magni Special are the pages from the Golden Book, proven ideas blended into a homogeneous creation by one man and not a committee. This very original Guzzi is a world apart.

At a tentative price of \$9300 the Magni/Le Mans Special offers the most balanced ride in the trade—the razor-sharp handling of a GP bike with the comfort, reliability and easygoing nature of a stock twin. In its new wrappings the Guzzi engine is good for some 143 miles per hour thanks to the lighter weight and the superior aerodynamics of the new machine. Magni will offer a wide range of engine-tuning kits for the current two-valve twin, and if the long-rumored four-valve head is delayed further, he may develop and produce one himself.

The genuine Italian GP racer is back, and by no less a man than Arturo Magni, the winningest team manager ever. Handle them carefully if you get the chance, for each one is worth almost 40 years of history, and they all hold pages from the master's Golden Book. ■

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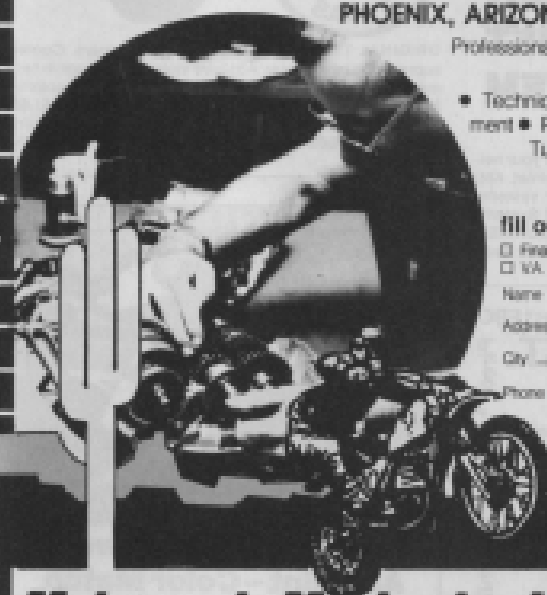
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