



Doing it differently

With the majority of the rest of the world opting for parallel twins, particularly at middleweight, the Moto Morini provided a breath of fresh air.

Words: ALAN CATHCART **Photographs:** KEL EDGE

Just over six years ago, the historic Italian Moto Morini marque narrowly avoided ending up on the scrapheap of motorcycling history, when in October 2018, Chen Huaneng, the owner of Chinese scooter and minimoto manufacturer Zhongneng Vehicle Group/ZVG, rode to the rescue to save Moto Morini from extinction, by acquiring 100% equity in it from the previous Italian owner.

Since then, ZVG's route map to Morini's recovery has proceeded at pace, initially with a range of five models powered by 650/700cc DOHC eight-valve parallel-twin motors sourced from rival Chinese manufacturer – but near neighbour – CFMOTO.

With 15,400 examples of its X-Cape ADV model alone sold around the world in the past three years, Moto Morini's ride down the comeback trail under Chinese ownership is becoming ever-more assured, with a 1200cc X-Cape V-twin, three models powered by Morini's own Italian-designed 750cc 90° V-twin motor, and two by a smaller 350cc 72° V-twin engine all appearing at last November's EICMA Milan Show, and due to reach the growing number of Morini dealers worldwide later this year. Each of these was designed, styled and developed in Moto Morini's plant at Trivulzio, 30km outside Milan, to be then manufactured in China.

One of these is a cleverly designed, born-again version of the best-selling bike in Moto Morini's history, the iconic 3½, which debuted in 1973. The new 2025 version gets the approval of 80-year-old 3½ designer Franco Lambertini, who was present for its unveiling. "It's a very clever piece of styling, and the engine looks magnificent," he said. "I'm looking forward to riding it myself, to see if it goes as well as it looks!"

Founded in Bologna in 1937 by Alfonso Morini, who'd previously partnered with Mario Mazzetti to build

two-stroke MM lightweights on which Morini, a skilled rider, won numerous races, Moto Morini was formerly a small but prestigious family concern whose sporting flair brought it widespread respect as an underdog capable of defeating much larger brands, leading to deserved commercial success.

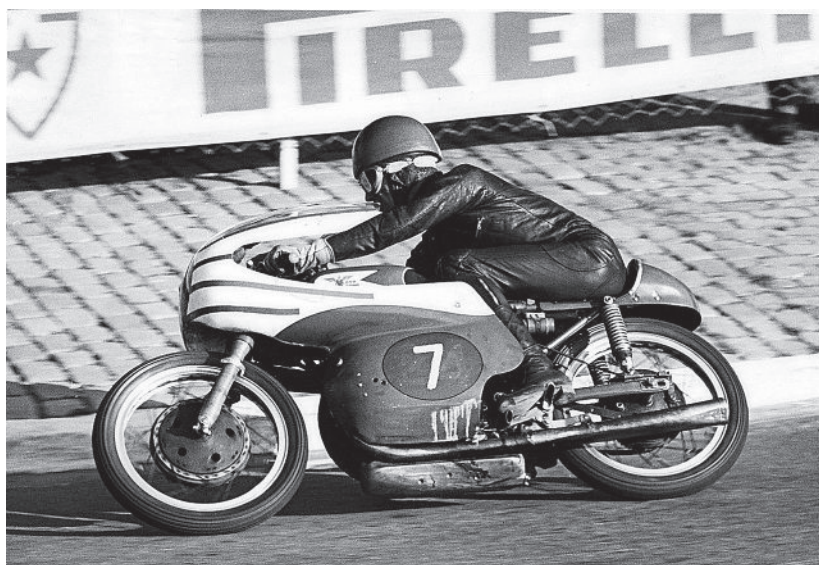
The most famous Morini racer was the bike widely recognised as the world's ultimate four-stroke racing single – the 12,000rpm 37bhp twin-cam 250cc Grand Prix contender on which in 1963 Morini's solitary works rider Tarquinio Provini came so close to wresting the 250GP World title from Honda, finishing two points behind Jim Redman's four-cylinder machine, despite Provini missing two rounds for financial and visa reasons. By then, Morini had established a loyal following for its 125/175cc sporting singles like the Rebello, Settebello, and Corsaro. Giacomo Agostini actually began his racing career on a Morini, attracting the attention of Count Agusta by winning the 1964 Italian 250cc title on one, before switching to the much wealthier MV team for 1965. By the time he passed away in 1969, Alfonso Morini could be well satisfied with a lifetime of two-wheeled achievement.

After Alfonso's death, Moto Morini's management was taken over by his daughter Gabriella, who wisely diversified the company's model line upwards in 1971, by introducing a family of bikes powered by an ultra-distinctive 72° V-twin engine developed by the firm's new chief engineer, Franco Lambertini. Debuting in 350cc form with the 3½ GT (known as the Strada in export markets), with later 250/500cc V-twin and spinoff 125/250cc single-cylinder variants, over 85,000 of these groundbreaking motorcycles were built over the next 20 years, gaining Moto Morini a loyal following around the world.

As a sign of its unique qualities and the advanced engineering it incorporated, the Morini 3½ was the first

Right: The 500cc Moto Morini V-twin, this example dated to 1978.





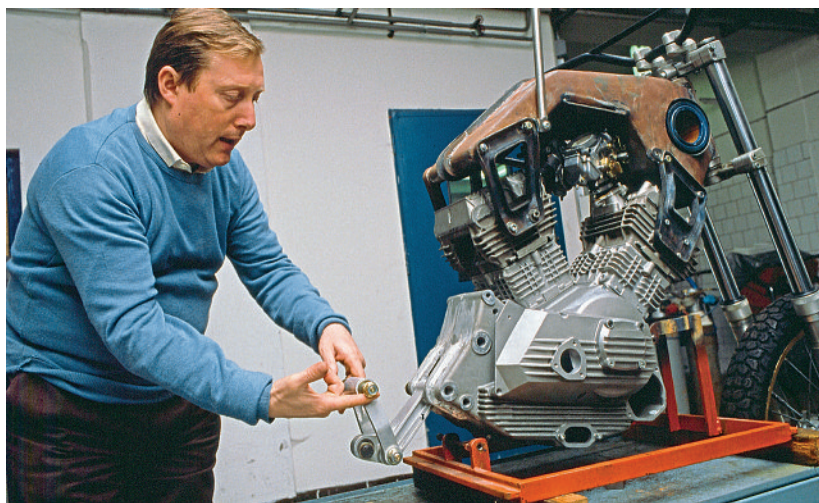
volume production streetbike sold by any manufacturer to be fitted with electronic ignition, toothed belt camshaft drive, a dry clutch, a six-speed gearbox or Heron-type cylinder heads (see later). The Kangaro trailbike which followed later caught the same dual-purpose off-road wave as Honda's Africa Twin, and surfed the company to secure showroom success. But, although profitable, Morini's small production volume of around 10,000 mid-sized bikes a year wasn't sufficient to generate enough capital for the rising costs of developing a new range of models, and after an abortive attempt in 1981 to produce an 84bhp Turbo version of the 500cc V-twin, Gabriella Morini sold the company to the Castiglioni brothers' burgeoning Cagiva empire in 1987.

The Castiglioni couldn't resist the chance to acquire such a historic marque, especially when it came with such a fine piece of real estate attached to it as the Moto Morini factory located in the midst of what was by then a prime Bologna residential suburb, just a couple of kilometres from the Ducati plant they already owned. They duly commissioned design guru Massimo Tamburini to produce a modern sportbike addition to the V-twin Morini range, which arrived in 1988 as the full-enclosure 350 Dart, closely modelled on the same designer's Ducati Paso 750.

But while Morini's Excalibur custom models continued to sell well, the Dart's air-cooled OHV pushrod V-twin engine seemed too archaic to appeal to the sportbike customer, and although Lambertini already had its successor up and running on the dyno in the form of a liquid-cooled, fuel-injected 668/720cc otto valvole 67° V-twin of advanced design, the rival Ducati faction in the Cagiva empire headed by Massimo Bordi ensured all the Castiglioni's development cash was directed towards its own 851cc desmoquattro V-twin platform. Starved of funds, the new Morini V-twin motor died a death, Lambertini joined Piaggio to design Vespas, the Morini factory was knocked down and redeveloped (netting a tidy profit for Cagiva, helping fuel Ducati's revival), and Moto Morini production petered out in 1992. A brief revival from 2004-2009 bankrolled by the Berti brothers, successful local industrialists who were also motorcycle fans, saw 4000 bikes manufactured using a Lambertini-designed 1187cc 87° V-twin Corsacorta engine, before the company finally went under in 2010. ZVG has now resuscitated it successfully.

Above: Probably the most famous Moto Morini of all, the 250cc single-cylinder racer on which Tarquinio Provini almost beat the might of Honda.

Below: Franco Lambertini in 1988 with the 668cc Morini prototype motor. Internal politics within the group of companies Morini was part of ensured it never made production.



The imminent revival of Moto Morini's historic 72° V-twin 350cc platform prompts a hands-on look in the rearview mirror of history at the original 3½ which debuted at the Milan Show in 1971, attracting major attention as the company's first ever model with more than one cylinder or over 250cc in capacity. This was because Italian youth could then ride a 350cc bike from 18 years old onwards, whereas they had to be 21 before they could ride anything larger. Moreover, there was a beneficial tax break, with 350s or smaller subject to 12% VAT, while anything larger attracted an 18% tax.

The sportily-styled Morini 3½ not only looked the part, it had passenger space to give the prettiest girl in town a ride home from your local cafe where Italian youth congregated each night in mid-1970s provincial Italy, plus it cost less, too. And then when deliveries finally began in March 1973 after a period of intense development, it turned out to be the fastest four-stroke model in the 350cc sector, and handled like a dream. Job done!

"I wanted to produce a model which was practical as well as sporty, had sufficient performance to thrill the owner without being too extreme, had good fuel consumption even when ridden hard, and which, above all, was faithful to the Morini marque's sporting traditions," says Franco Lambertini, who joined Moto Morini in 1970, aged 25, having previously worked in the Ferrari design office at nearby Maranello. "But above all it had to be affordable, so for this reason I discounted my initial design for a V-twin with belt-driven single overhead cam and four valves per cylinder, with the swingarm pivoting in the crankcase. Instead, I settled on an OHV design, but with belt drive to the single camshaft serving both cylinders, and only a two-valve head. But I turned this to my advantage by adopting Heron-type cylinder heads, which deliver efficient combustion with good fuel economy, as well as reduced manufacturing costs through the less complex machining required, as well as simplified valve-gear and compact dimensions. I must modestly admit that I'm surprised that more motorcycle engines didn't adopt this layout, given the significant success of our Morini V-twins."

Indeed, so – especially given that the Heron-headed Repco V8 motor designed by ex-Vincent motorcycle engineer Phil Irving powered Jack Brabham and Denny Hulme to successive Formula 1 World titles in 1966-67, and Jaguar, Audi, Rover and Alfa Romeo have all used this format in various production car motors.



So the Morini $3\frac{1}{2}$ engine measuring 62x57mm for a capacity of 344cc featured a forged one-piece crankshaft running on ball bearings set in the light, vertically-split, diecast aluminium crankcases, surmounted by well-finned cylinders with cast iron liners. The bolted-up steel conrods carried three-ring Sciam pistons each with a dished crown which acted as the combustion chamber – a design invented in the 1920s by US-based British aviation engineer Sam Heron. This meant that the Morini's 30.4mm inlet valves (each fed by a 25mm square-slide Dell'Orto carb) and 22.4mm exhausts – one each per cylinder, remember, running in cast iron guides, and each carrying a single coil spring – were positioned vertically parallel to one another in a flat-faced cylinder head, and were operated by a single camshaft via rocker arms driven by short duralumin pushrods with steel tips. This camshaft was mounted high up in the crankcase between the vee of the cylinders, and driven off the crankshaft via a Pirelli toothed belt – the first time ever on a motorcycle engine.

Moreover, the Morini $3\frac{1}{2}$ V-twin featured an unusual desaxé engine layout aimed at giving the pistons, and

Above: The outlandish Moto Morini Dart, with the same-aged engine housed under late 1980s bodywork.

Below: The Moto Morini factory in Bologna, 1988. It was sold soon after, and redeveloped for housing.

especially their rings an easier life. The desaxé format sees the cylinders slightly offset – it's the French term for 'off-centre' – rather than positioned with their bore axis centre directly above the centre line of the crank, as on most engines. This has the effect of reducing the degree of piston side thrust against the cylinder wall during the power stroke, in turn reducing friction and consequent power losses, and also wear, while promoting torque thanks to increasing the leverage applied to the crankshaft. The best current example of such an engine is the Kawasaki ZX-10R motor which powered Jonathan Rea to six successive World Superbike titles, and which also equips today's Bimota KB998 Rimini Superbike – while Germany's innovative Horex VR6 motor is also desaxé, mainly for packaging reasons.

On the Morini $3\frac{1}{2}$ the cylinders were offset by 50mm to allow the con rods to sit side-by-side on the single big end journal. This in turn helped facilitate cooling of the rear cylinder, which never ran more than 15° hotter than the front one in tests.

This completely innovative engine also set another landmark as the first series production model anywhere in the world to utilise electronic ignition rather than conventional points or a magneto, via a CDI produced by Ducati Elettronica, then the bike builder of that name's no-relation next door neighbour. The ensuing 35bhp at 8200rpm was transmitted to the tarmac via a six-speed transmission and a dry, multiplate clutch – both further firsts in the production arena. Peak torque of 25 ft-lb/34 Nm was delivered at 6300rpm, with the engine safe to 8700rpm.

This motor was installed in a lightweight all-welded Verlicchi-made double-cradle tubular steel chassis with twin downtubes and quite conservative geometry – rake was 29°, and trail 101mm. With a 1445mm wheelbase via 18-inch wheels front and rear, and a pretty low 764mm/30in seat height, the riding position, while not exactly spacious, did permit taller riders to feel at home.

Wire wheels, Grimeca drum brakes and a 35mm Marzocchi fork plus twin-shock rear suspension from





the same brand were fitted to the debut model, before cast wheels and disc brakes duly replaced them as the decade wore on. A single-seat Sport version of the 3½ appeared in 1974, with raised 11:1 compression delivering 4bhp more as well as improved acceleration. It was also subtly restyled with more sporty allure versus the Strada aka GT standard version.

In 1975 Moto Morini bowed to market pressures and introduced a 500cc version of its 3½ model, mainly aimed at export markets, and especially the UK, USA and Germany. This finally reached production in 1978 in both Strada and Sport versions, and was visually identical to the 3½ except for the badges and the now black-painted engine. But it was more than a stroked version of the same motor, with larger bore and stroke measurements of 69x64mm (versus 62x57mm) and 1mm bigger 26mm carbs. The result only measured 479cc, so not a full 500 presumably owing to space in the shared crankcase, but power was now up to 46bhp at 7500rpm running a higher 11:1 compression ratio – another advantage of the Heron heads – with the rev ceiling lowered to 8200rpm. Peak torque was also raised to 32 ft-lb//43 Nm at 5100 rpm, and alongside the left-side kick-start an electric starter was now standard, albeit a rather convoluted chain-driven affair bolted on to the rear of the crankcase. Furthermore, Morini initially reduced the number of ratios in the gearbox to five, perhaps fearing that the increased torque would be too much for the narrower pinions in the six-speed transmission, but they later thought better of it and reverted to the original six-speed gearbox.

Finding a 1970s Moto Morini with which to celebrate the imminent revival of its engine format by riding it wasn't too difficult, since thanks to the large number of such bikes built

Above: Lambertini and Morini's Alberto Monni, with the new 3½ at the EICMA show, 2024.

Above right: The 500cc engine – actually of 479cc – produced 46bhp in Strada specification, as here.

Right: There are 35mm Marzocchi forks, with twin 260mm Grimeca cast-iron discs and twin piston Grimeca calipers.



and their high survival rate, plus the enthusiasm they seem to generate among their owners, there are lots in circulation, in Britain at least. It's a usable classic that attracts owners who want to ride it rather than just polish it. That's very much the life led in the USA today by the 1978 500 Strada which earns its keep in SE Pennsylvania as one of the fleet of street classics, mostly twins, available for hire from Retro Tours www.retro tours.com for rides of up to seven days in length through the northeast USA and the Atlantic seaboard, guided by Retro Tours founder, Joel Samick.

We'll let Joel explain how he came to acquire the Morini on which I spent an enjoyable 120-mile day riding round SE Pennsylvania with him:

"Each spring, in nearby Chadds Ford, Pa, there used to be an annual classic motorcycle auction. I usually attended this event, not so much as a buyer, but as a looker. In 2003, a 1978 Moto Morini 500 Strada came onto the block. This was a model that I had not really considered collecting,



Above: Footrests are a little too far forward, reckons Alan Cathcart, but there's plenty of room on the spacious Morini.

Left: Neat motif on the rear of the seat.

Right: Air-cooled, wet-sump hi-cam engine featured Heron cylinder heads, allowing the high 11.2:1 compression ratio.



as they were never very popular in the States, and are on the small end of the 'big twins' range. Still, they enjoy a big following in Europe and England, where people really appreciate fine motorbikes. As I looked over the Morini, I began to feel a familiar nervousness in the pit of my stomach! I wanted it, so I ended up buying it. It fired up okay, so I rode it home, and in doing so discovered

it was put together a little bit loosely – I heard this weird noise, and the valve covers were jumping up and down, so somebody hadn't tightened things up properly! But it wasn't far to ride and I got home okay.

"The condition of this bike, as bought, was better than most, especially considering the chance one takes at any auction. As usual, I went over the mechanicals from



Left: The 500 was Morini's biggest model to date; retrotours.com in Kennett Square, Pennsylvania, is the company it belongs to.

front to rear, replacing tyres, tubes, battery, fork seals, brake pads, cables and handgrips. One problem that had to be solved involved the foot controls. To make a bike legal in the US in 1978, controls had to be standardised for a left-foot change, so the rear brake pedal and shifter were reversed from standard. The resulting linkages may have let the Herdan Corporation in nearby Port Clinton, Pa, import and distribute the Morinis, but they did nothing for the control feel. The shifter required too much lever travel, and sat at an awkward angle. The long, spongy rear brake cable made the hydraulic disc ineffective. Reverting to original Italian foot control locations was necessary.

"The combination of a clever design with quality components makes the Moto Morini an effective, lightweight motorcycle. Acceleration is pleasing, although the motor must be kept on spool [revving hard - AC]. The five-speed transmission makes this easy and fun. With its decent suspension and brakes, this little bike can stay right with its larger stablemates on a group ride, making up for less power with heavy late braking and hard cornering. The European sport style handlebar and broad, long seat give a comfortable upright seating position. All in all, this

machine is totally non-intimidating, and the ride is lots of fun. No wonder the factory saw fit to put a cartoon-like decal on the tail section. It depicts a blonde witch flying across the sky on her jet powered broom, with a huge grin on her face. That about sums this bike up!"

My day aboard the Morini 500 confirmed that in spades - this is a ground-breaking 3½ on steroids, with notable extra power and a welcome increase in torque delivering improved acceleration without sacrificing the sweet steering and capable handling of the smaller V-twin. It's a really rideable bike, and cleverly designed to be j-u-s-t big enough for a 5ft 10in/180cm tall rider not to feel cramped when riding it, yet small and light enough to be truly flickable riding along twisting country roads. It feels low and slim when you climb aboard it, and the relatively low 764mm/30in high dual seat, with ample space for a passenger, gives space when riding solo for you to push your body backwards so as to crouch down for a wind-cheating stance on a long stretch of straight road.

The more upright handlebar mounted to the Marzocchi fork's upper tripleclamp compared to the Sport variant's clip-ons gives a comfortable all-day riding stance, albeit with footrests that are a little further forward than I'd have preferred. Compared to the much heavier, and not a lot more powerful, Laverda 750SF that Joel was riding alongside me, the Morini was like night and day in terms of rideability and ease of handling. With very little undue vibration from the 72° V-twin motor it was also a much friendlier ride than the vibratory Laverda, with its two-up 360° crank format.

I didn't miss the absent sixth gear ratio, because the extra torque keeps the engine pulling nicely as you shift up through the gears, although it pays to rev the motor out to at least 6500rpm in the gears to keep it on the boil. However, if Joel reckons that the US-mandated crossover left-foot gearshift was flawed, the revised Euro-style right-foot gearchange on the bike today has a rather

Below: The new and old; brand spanking new 3½ on left, the old (in 1973 form) on the right.





floppy action, with lots of travel on the lever, so isn't very precise. It's not helped by the way the rather crude-looking aftermarket two-into-one exhaust fitted today (the bike would have come with separate twin Lafranconi exhausts) crowds out the gear linkage.

Moreover, after firing up the motor on the very noisy electric starter which sounded like a junior concrete mixer, and leaving it to settle to a 1400rpm idle, I discovered that the clutch engagement is an on/off light switch-like affair, meaning you will stall it repeatedly in trying to obtain forward motion from rest until you learn to use lots of revs to get it off the mark – the clutch doesn't like being slipped. But once underway the throttle is light and responsive, and its crisp pickup in the next highest gear more than

Above: Heat shield on the aftermarket exhaust does nothing for the aesthetics of this already-less-pretty-than-earlier example of the Morini.

Below: "A middleweight marvel that punches above its weight," reckons Alan Cathcart, of the Moto Morini.

compensates for the less-than-ideal gearchange. Cruising at 75mph/120kph with the left-side Veglia tachometer's needle parked on the 5500rpm mark still leaves room for quite acceptable top gear roll-on to help you pass a slower car or truck.

Still, the 500 Morini isn't a particularly long-legged bike, more of a real world back roads ride that revels in being hustled through a flowing series of third-gear bends. It asks you to exploit the good grip of the TT100 tyres Joel has fitted to it, and the trio of 260mm Grimeca cast iron discs gripped by twin-piston calipers from the same company do their job well in hauling the bike down from high speed. Their smallish diameter is doubtless a contributory factor in the Morini's crisp handling, thanks to their reduced gyroscopic effect on the steering. The ride quality from the twin rear Marzocchi shocks is pretty firm, but the Morini didn't bounce around too badly over the bumps in the frost-ravaged Pennsylvania back roads.

My ride on this motorcycle that's heading towards its 50th birthday was an avid reminder of the inherent qualities of Franco Lambertini's completely unique Moto Morini 3½ design, which no other manufacturer has ever sought to emulate. More fool them – for flawed gearchange and light-action clutch aside, this is a user bike par excellence, a middleweight marvel that punches well above its weight. It's going to be interesting to see if today's Moto Morini company can achieve the same outcome with its born-again 3½ model – the only V-twin in a sea of parallel-twins in the single most competitive sector in today's global marketplace, the 300-500cc segment. It's going to be fun watching them try!

End

