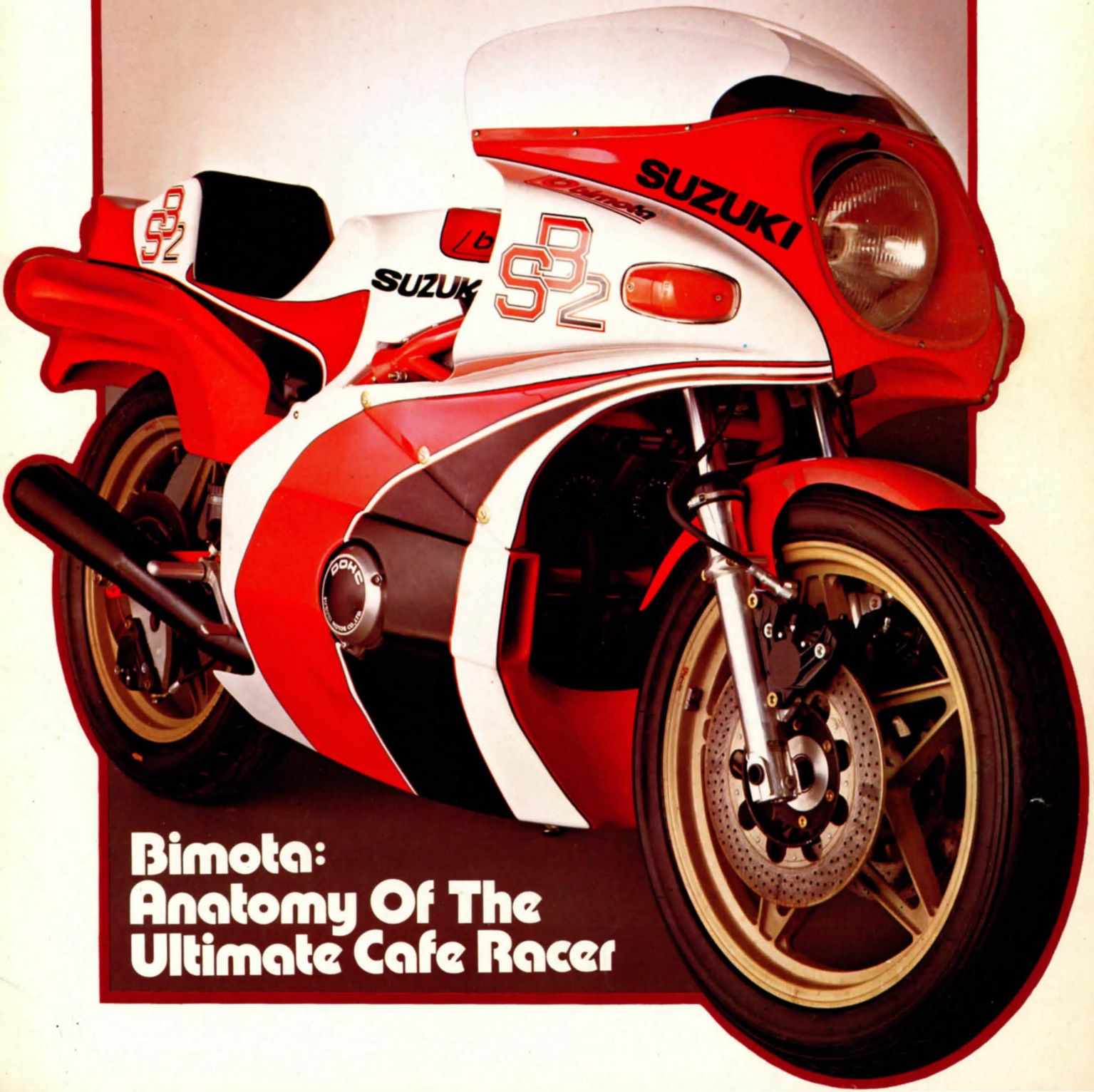
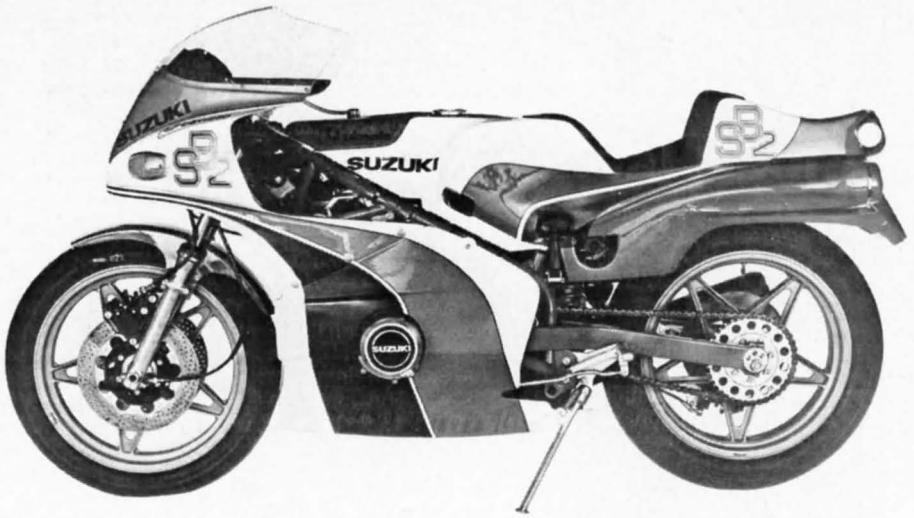
bike

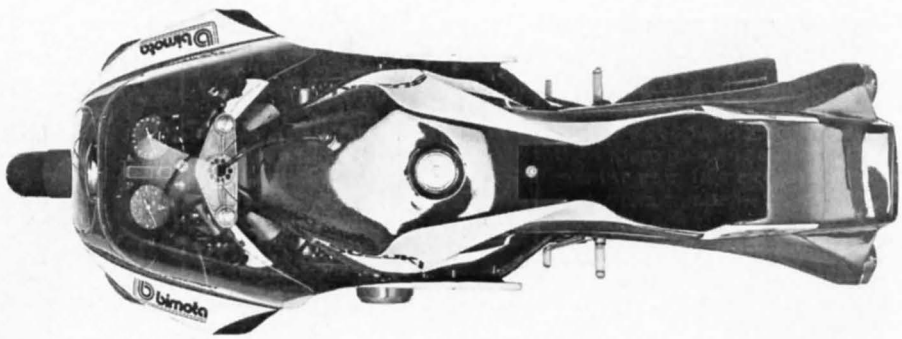
APRIL 1978 50p

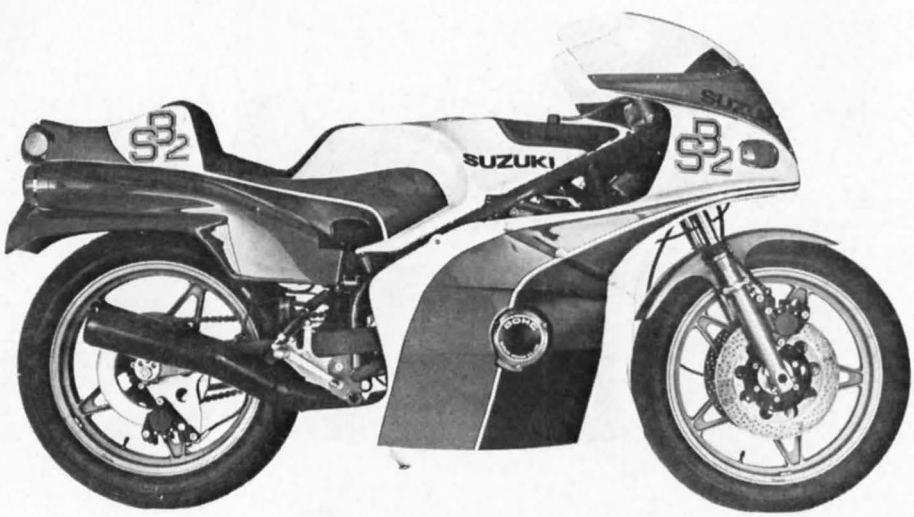
Britain's Flat Twin



Bimota: Anatomy Of The Ultimate Cafe Racer







Bimota SB2: Beauty To The Last Nut And Bolt

LJK Setright exposes the secrets of an Italian masterpiece. Photography John Wallace.

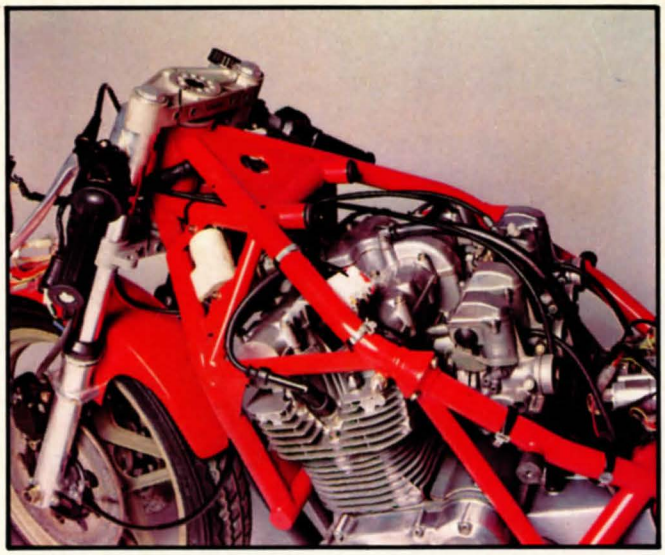
YOU MAY be forgiven for thinking that the name Bimota has something to do with a motorised bicycle; after all, there have been plenty of more fatuous names for motorbikes since the early days — remember the Scootavia, the Welbike, and the XL-A1? But it is not like that, not even in Italian; the name comes from the names of three partners. Look at Bimota stationery today and you will still see two of them, Morri and Tamburini; but to start with, literally and figuratively, there was Bianchi as well. Two letters from each, and there's the name.

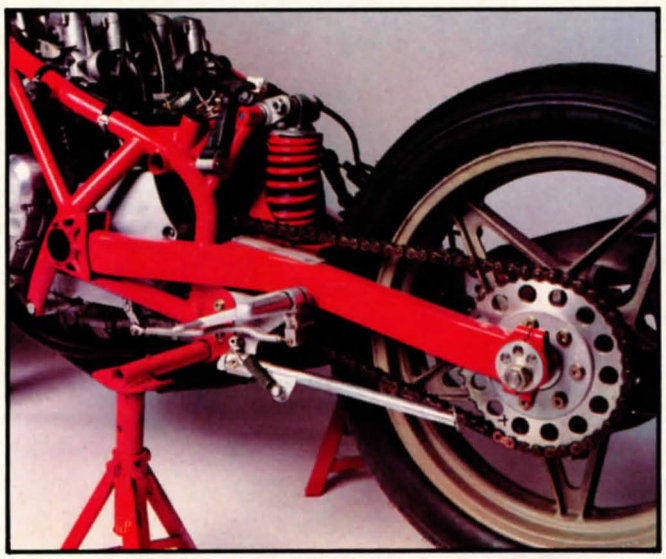
To build a name is one thing. To build a reputation is another, and very much more difficult. It is all very well, the Bimota KB1 being the rage of the last Milan Show; all very fine and large, the Bimota SB2 making an impressive debut a year ago, and being the star of London's Racing and Sporting Motorcycle Show last January, where it appeared on the Dixon Racing stand. To make a good-looking bike is one thing, to put it on the market is another, but to prove that it is good demands a lot more achievement, or else a lot more faith. Nobody that I know has ridden one enough to take its measure, but people are forming queues (short queues, admittedly, but long enough at Bimota prices) to buy the things. Why?

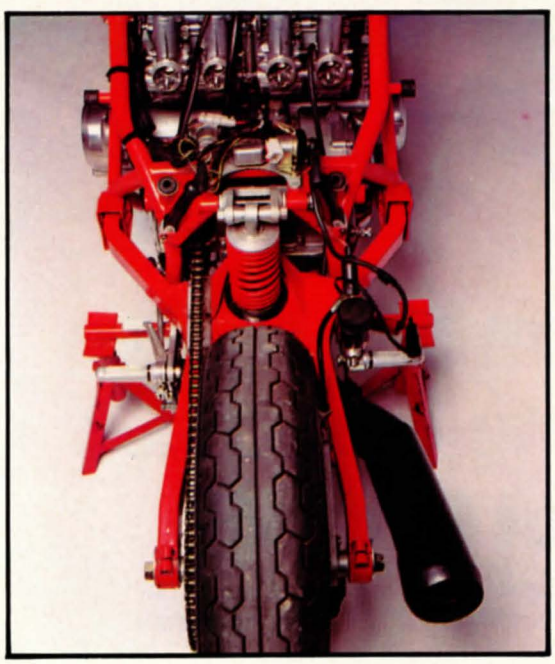
Perhaps because the 250 and 350 Harley Davidsons on which Walter Villa won his world championships in 1976 had Bimota frames. (You did not, surely, think they were made by Harley Davidson?) Perhaps also because the 350 Yamaha on which Johnny Cecotto won his world championship in 1975 had a Bimota frame too. (You did not, surely, think that Yamaha . . .?) It rather looks as though Bimota know something about motorcycle chassis design, at least for high-speed riding. You have only to look at the KB1 and the SB2 for it to be perfectly obvious that they know more, and have thought far more, about the subject than almost any other firm in the business. You must look hard and deep, however, or you will very probably be misled by what looks like conventionally snazzy high-style glassfibre draped around that chassis as a dolphin fairing, seat unit, tank cover and unashamed eye-catcher. Yet even these panels carry the makers' ingenuity to levels not commonly seen outside endurance racing prototypes: they are held on and together with quick-action fasteners that permit rapid release of the panelling around the engine, and almost instantaneous removal of the complete tank and seat unit for inspection or servicing access or, in the case of racing, replenishment by replacement.

It is an impressive start to an examination of the Bimota, but it is a pale shadow of the cunning displayed behind the panels. The whole engine, the hefty 750 Suzuki four of the SB2 (or a Yoshimura-tuned 850 version of the Suzuki, if you want to be thorough), can be out of the frame and on the floor in twenty minutes. Putting it back takes no longer, even though it involves bolting together the front and rear halves of the frame where they were separated in the course of the dismantling job. Where the front and rear halves come apart, on either side of the row of carburettors, there are conical couplings with male and female ends on the mating ends of the frame tubes, and they can be bolted together as easily as they can be unbolted because they align themselves naturally, without distortion upsetting the truth of the frame when its parts are relieved of stress.

I never realised, until this very moment of







Left: although closely wrapped in bright red tubing the engine can be out of the frame and on the floor in 20 minutes. Note the neat coil location and the conical frame coupling to the left of the carburettors.
Centre left: the box section swinging arm pivots on bearings located on brackets at each side of the gearbox casing. Thus the pivotal axis of the rear suspension is concentric with the final drive sprocket, maintaining constant chain tension throughout the whole range of suspension travel. Chain adjustment is by eccentrics.
Bottom left: the 16swg swinging arm reveals a beautiful hour-glass figure from above. But also note the superb diecast rear-sets and the neat plate for electrical components above and in front of the rear suspension unit.

Bimota SB2: Beauty To The last Nut And Bolt

writing, why George Brown christened that Vincent special of his *Gunga Din;* but suddenly it all comes as clear as the recollection of Kipling's words:

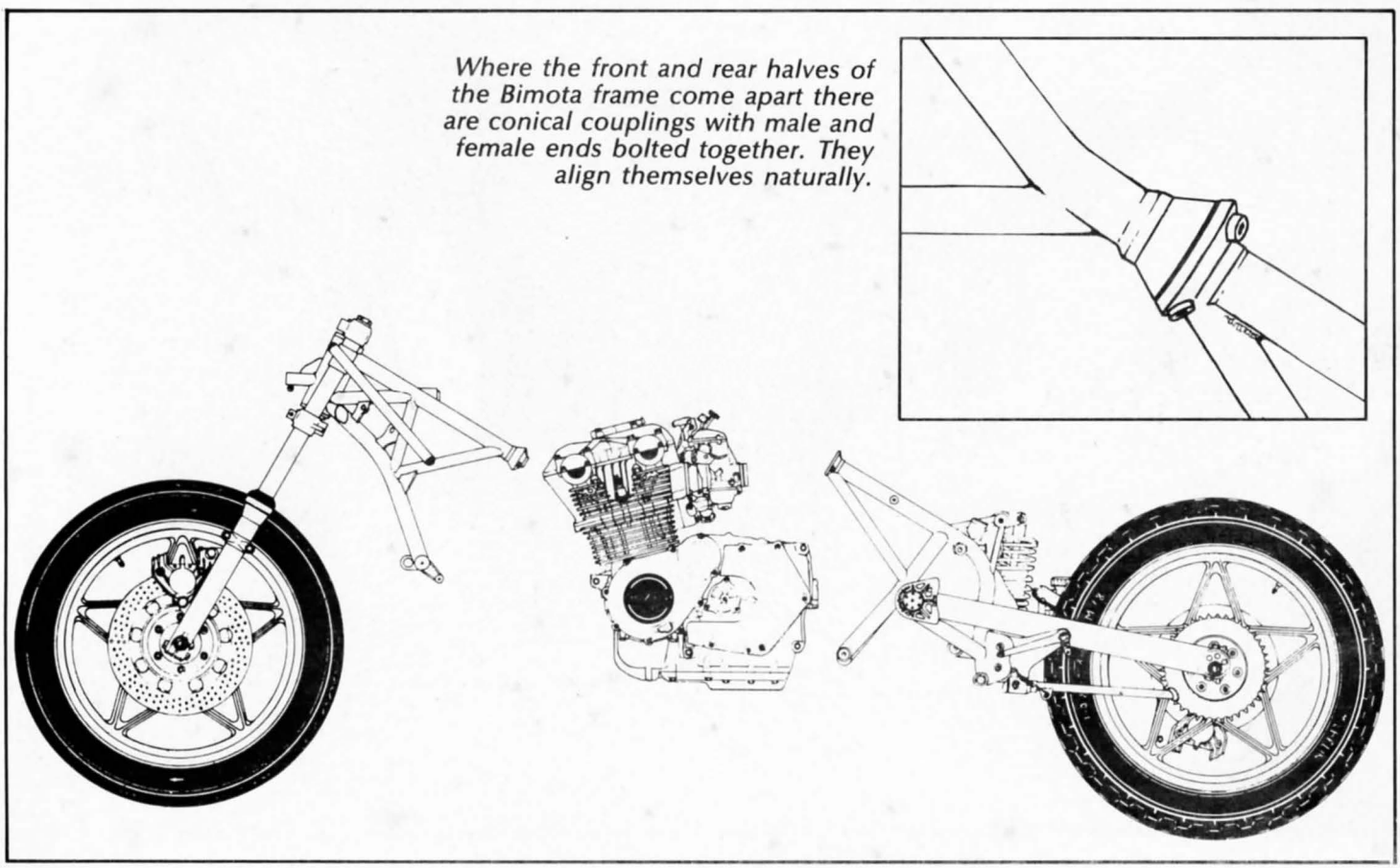
The uniform 'e wore
Was nothin' much before
An' rather less than 'arf o' that be'ind.

Of course! The Vincent had scarcely any frame, and the assembly method was much the same as with this Bimota: stand the engine on a box, bolt the front of the bike to one end and the back of the bike to the other, and there you are. There are differences: the Vincent's frame, such as it was, was a sheet steel box overhead, whereas the Bimota frame, such as it is, amounts to a couple of tubular confections carefully arranged so that nothing goes over the head. Everything is kept low: the frame tubes splay out widely from the steering head, bracing it with a stiffness that cannot be matched by the less widely divided tubes of conventional slimline frames, and they literally embrace the engine by passing alongside the Suzuki cylinder head before converging again to escape the rider's knees, and finally to bracket the single central suspension unit that controls the motion of the trailing rear fork. That rear suspension is the most attractive single feature of the whole machine, but we have not finished with the basic frame yet, and must not be distracted. The point remaining to be made is that the 21lb frame looks like a pretty effective truss in elevation, except that its only continuity is provided by the single pair of top rails passing left and right of the head and split by the conical couplings aforesaid. Yet it is a good truss, for the engine itself does the rest, being bolted in at the front and rear of the crankcase to complete the triangulation. It is a pity that the load pattern looks less convincing in plan, when the curvature of so many tubes can be seen to degrade the purity of the structure.

There is solace to be found in that rear suspension, where the geometry is the purest to be seen. The fork is a particularly sturdy pressing in 16swg steel sheet formed into box section, and revealing a beautiful hour-glass figure in plan because it widens appreciably at the forward end to pivot about bearings located on brackets each side of the gearbox casing. This allows the pivotal axis of the rear suspension to be concentric with the final-drive sprocket, thus maintaining constant tension in the chain throughout the range of suspension travel. Chain adjustment is by eccentrics at the wheel spindle, and the wheel itself looks as racy as the rest of this clearly race-inspired bike. It is a magnesium alloy wheel with spokes cast in a rather Masonic pentangle, and with a very wide rim that looks quite convincing holding the new Michelin M48 tyre.

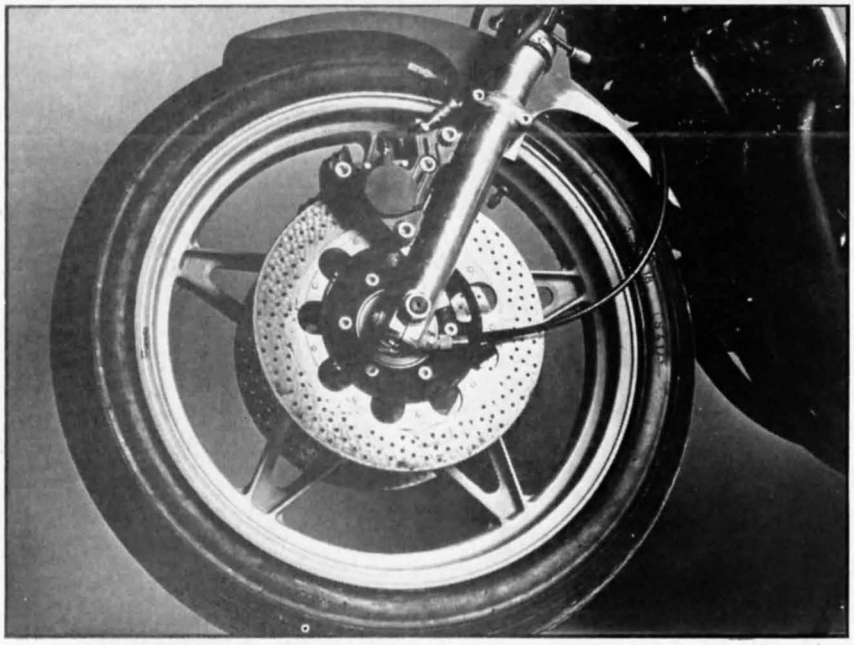
No, the M48 is not in Britain yet, but as the very latest high-performance Michelin it is worth a thought before it arrives in the Land of Uk. It looks rather like the TV10 racing tyre, if you remember that one — and if you do not, then Michelin's code ought to tell you something about it. T is for *tout-temps* or all weather, so the tyre is lightly patterned rather than slick, while a heavily channelled rain tyre would be coded P (for *pluie*) instead of T. The V implies a certain form of construction, but I have not cracked that code yet; it would be interesting to know whether the V and Z encountered in motorcycle tyres are as graphically informative as the X — familiar as a code for radial-ply car tyres. Be that as it may, the Michelin rubberware on the Bimota is impressive, chosen with rain/racing compounds for grip rather than ordinary roadster polymers compounded for wear resistance. Not the very stickiest wet-weather racing rubber, mark you, for that could hardly last for as far as the Bimota could be ridden on a good hot dry day; no, the compound is number 2 rather than number 4, so the PZ2 code may be seen on the tyres at front and rear. The M48 at the back is size-coded 130/80V18, telling us that its section width is nominally 5.1 inches and that it is a low-profile tyre of about 80 per cent aspect ratio. The S41 at the front is more familiar, a 3.50 H18; but the suspension that carries it is probably the most interesting part of the whole bike.

Look at the top yoke of the forks and you will see that it is unusual in being virtually straight: the steering head and the tops of the stanchions are practically in a straight line. A good thing, this, for it puts the mass of the forks at the minimum radius from the steering axis and thus minimises the moment of inertia of the whole steered mass about that axis. If you were to look at the bottom yoke, however, you would find that the line was not so straight: the fork legs are tilted forwards at a

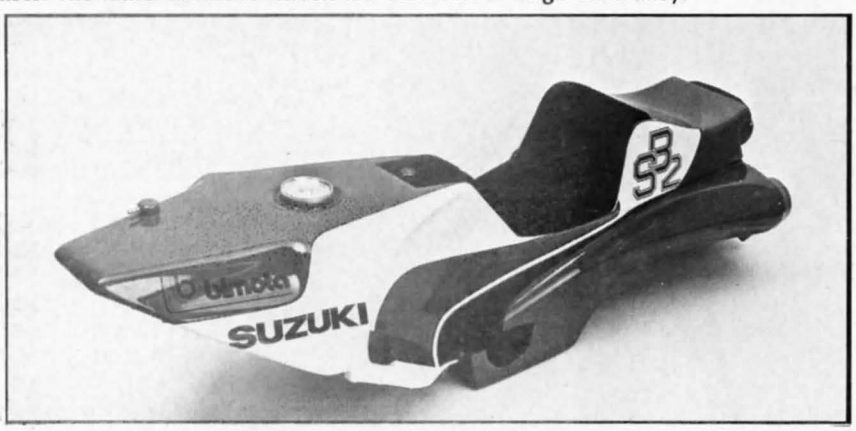


Where the front and rear halves of the Bimota frame come apart there are conical couplings with male and female ends bolted together. They align themselves naturally.

Beauty To The last Nut And Bolt

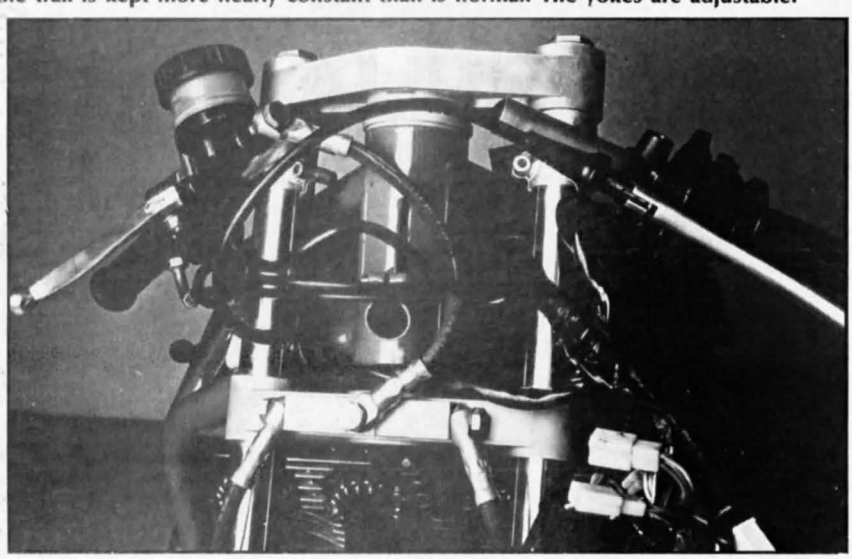


Bimota front end features Ceriani forks, Brembo calipers and twin perforated cast iron discs. The rather attractive wheels are sand cast in magnesium alloy.



Above: the curvacious seat/tank unit is off in seconds — just release two rubber fasteners. Beneath the glass fibre is a steel tank and under the seat a battery.

Below: cunning steering geometry is revealed by an examination of the virtually straight top yoke and the curve of the bottom. As the forks are not parallel to the steering head the trail is kept more nearly constant than is normal. The yokes are adjustable.



more rakish angle than the steering head. It is an old trick, but a good one, popular among Italian makers of high-speed motorcycles but familiar from others as long ago as the 1930s, when BMW started using telescopic forks. On the Bimota, the rake of the steering axis is 24 degrees from the vertical, rather less than usual, and the rake of the fork legs is 28 degrees. The effect is to modify the change of trail that accompanies suspension deflection.

On the Bimota, the deflection is considerable. The front wheel travel is 4.5 inches, but that central suspension unit at the rear (derived from racing car practice, it comprises a progressive-rate helical spring and a coaxial adjustable damper) allows the rear wheel to rise and fall no less than 5.5 inches. It follows that, from full tail-squat to full nose-dive, the Bimota can keep its tyres on the road through a pitch range of 10 degrees, which is a lot. Just think of what it means to the steering geometry: it means that the steering head angle or rake also varies by 10 degrees. When the front forks are fully compressed and the rear spring fully extended, the front-wheel trail (measured at ground level, from the centre of the tyre tread contact patch to the intersection of road and steering axis) would normally be reduced by nearly an inch; but because the greater rake of the forks allows the wheel to move back by a greater distance when the forks are compressed, the reduction of trail is reduced. Likewise when the bike is sitting down on its back wheel and the front tyre is barely touching the ground, what would normally be a gross increase in trail is reduced. In other words, the trail is kept more nearly constant than it would be if the forks were parallel to the steering head.

Given this control, it becomes feasible to offer the rider just the amount of trail he wants. Bimota do not do that, quite, but they do give him a choice of two settings. The top and bottom yokes are mounted on eccentrics clamped around the steering swivel: loosen their setscrews and turn them through 180 degrees and the trail is altered by the amount of eccentricity, a matter of about 20 millimetres. Thus the trail can be set at a nominal (static laden) length of 3.9 or 4.7 inches — short for twisty roads, long for heavier but more stable steering on fast open roads. We have seen other ways of providing a trail adjustment: MV Agusta fire-engines had alternative fork legs with the wheel spindle carried in or ahead of them, and I recall that while Surtees rode with one type his teammate Hartle preferred the other. Vincent went one better and provided adjustment by eccentric bushes in his Girdraulics. Now Bimota have built the same facility into their telescopics, completing a list of fascinating details in what must be the most elegant piece of motorcycle engineering offered to the public. Whether the customer chooses a Kawasaki-compatible frame (KB1) or the version for the Suzuki (SB2), the complete bike minus engine is going to cost him at least £2,500 in Britain, and probably more anywhere else; but he will get something marvellous for his money.