

Breaking new ground

**Mighty Moto
Guzzis: part two.
Mick Walker relates
how the Le Mans
v-twin evolved
into 'best of breed'**

Top: First of the new breed – the linked braking, triple disc 850T3 from 1975.

In part one, I covered the large capacity Guzzi v-twin from its inception as a military/police motorcycle in the early 1960s, through the various 'civilian' models such as the V7, V7 Sport, 850GT and original bulky California through to the 750S and 850T of 1974.

We restart with the introduction of the new breed of linked brake system models which were launched for the 1975 season.

The first British enthusiasts saw of these came in May that year, when the newly appointed importers, Coburn and Hughes, unveiled five Guzzi models at a ceremony attended by the trade (including myself) and the press. This line-up not only included the 850T, (available previously in limited numbers from former concessionaire Barretts of Redhill), but also the new 850 T3 and T3 California. The balance was made up by the 750S replacement – the 750S3 (three denoting it to have

the linked brakes) and finally the 250 TS, a two stroke twin.

The T3 was priced at £1599.50, and the T3 California at £1699. The extra £100 brought a package which included a toughened, tinted perspex screen, a pair of braced, laid back western handlebars, a hydraulic steering damper, knee protectors on the cylinder heads, a black and white 'buddy seat' with chrome grab rail lockable fibreglass panniers on substantial frames, a chrome carrier, and front and rear crash bars. The Cali, as it was widely known, had its specification completed by a pair of rider's footboards, a set of revised controls which included a heel-and-toe gear lever, and an effective prop stand which could be operated by the rider from the saddle. This latter component was a vast improvement over the awful 'mousetrap' design employed on the balance of the big twins.

BOTH the T3 and California were clearly based on the 850T, but the biggest difference was in the braking department. For the first time, the new models carried Guzzi's exclusive patented integral triple disc set-up. This was rapidly claimed to provide more stopping power and braking safety than any other conventional system.

Applying the footbrake pedal did not only operate the rear brake in the normal way, but instead, it applied *both* the 242mm rear disc *and* the 300mm left-hand front disc. The braking pressure was automatically balanced to produced bias needed to bring the rider to a steady, even stop. For emergencies, or simply to hold the bike while stationary, the front brake lever could also be used to apply the right front disc only. The front master cylinder had been changed for one of a smaller capacity, which had a plastic cap instead of the previous metal item. Unfortunately, this was not an improvement, because the cap could split if overtightened.

There were several other, but less significant, changes. Attention had been given to improving the oil and air filtration for the engine. The disposable car-type oil filter which had made an appearance on the last batch of 850Ts was housed in the sump, so that both this casting and its gasket were revised. And for the first time, the Dell'Orto carbs had a throw-away paper air filter – vitally important for an engine employing chrome-plated cylinders which could not be rebored.

The Bosch alternator now had an increased output, at 280 watts. Although the headlamp was still an Aprilia product, it now had a black-painted shell. The American version (some were sold in Britain) came with a sealed beam unit, much deeper rim, and a thick rubber gasket between the rim and shell. The idiot lights and instruments had a plastic console in place of the alloy type, and the ignition switch now had *three* instead of four positions. The clutch cable also incorporated a cut-out switch, which meant that the engine could not be started unless the clutch lever was pulled in.

Other changes included handlebars (850T3) some four inches higher than before, and rear suspension units with either three or five preload adjustment positions – the three-position type featured built-in operating handles. The side panels were retained by rubbers and were no longer lockable. Also, the shape of the exhaust pipe and the design of the balance pipe running under the engine changed.

Although readers may be tempted to imagine that the 750S3 Sportster was more likely to be a linked braked version of the earlier 750S they would be wrong. Mechanically (and in its running gear) it was much more closely related to the 850T3. Apart from its smaller capacity, the carburetors, and their manifolds, crankshaft, clutch flywheel, and the whole drive chain was pure T3. The cylinder heads were T3 castings which retained the exhaust pipes with bolt-up clamps (like the T3) rather than the screwed ring nuts on the 750S. This meant that the new exhaust pipes (in the V7 Sport/750S shape) were needed. This was actually a considerable improvement, because as related in Part One the old nuts had a habit

of working loose, and if allowed to chatter in the port would ultimately ruin the thread casting.

As on the 850T, there was no replaceable air filter element – just a large rubber connecting the carburetors but not the breather box. And just like the 850T, the 750S3 was rightly slated by the road testers of the day for loud induction noise, which was 'higher than the level of mechanical noise', as one press hack so aptly put it.

THE new sportster making its debut at the same time was the most expensive Guzzi ever imported at £1749. The price remained constant for the whole eighteen months it was on sale.

When comparing a 750S3 with the 750S, it becomes all too apparent that the two machines have much more than a production run to separate them. For a start, the riding position on the S3 was compromised by the loss of the adjustable swan-neck clip-ons and the substitution of fixed clip-ons that were too far forward and too low for most purposes, plus a new position for the once well-placed footrests that took them much further forward. The result could prove agonizing for a rider who was anywhere under six feet tall. And as *Motor Cycle* found when they tested an S3 in 1975, performance didn't somehow match expectation, with a maximum one-way speed of 115.8mph, and a mean (two-way) figure of 114.2mph.

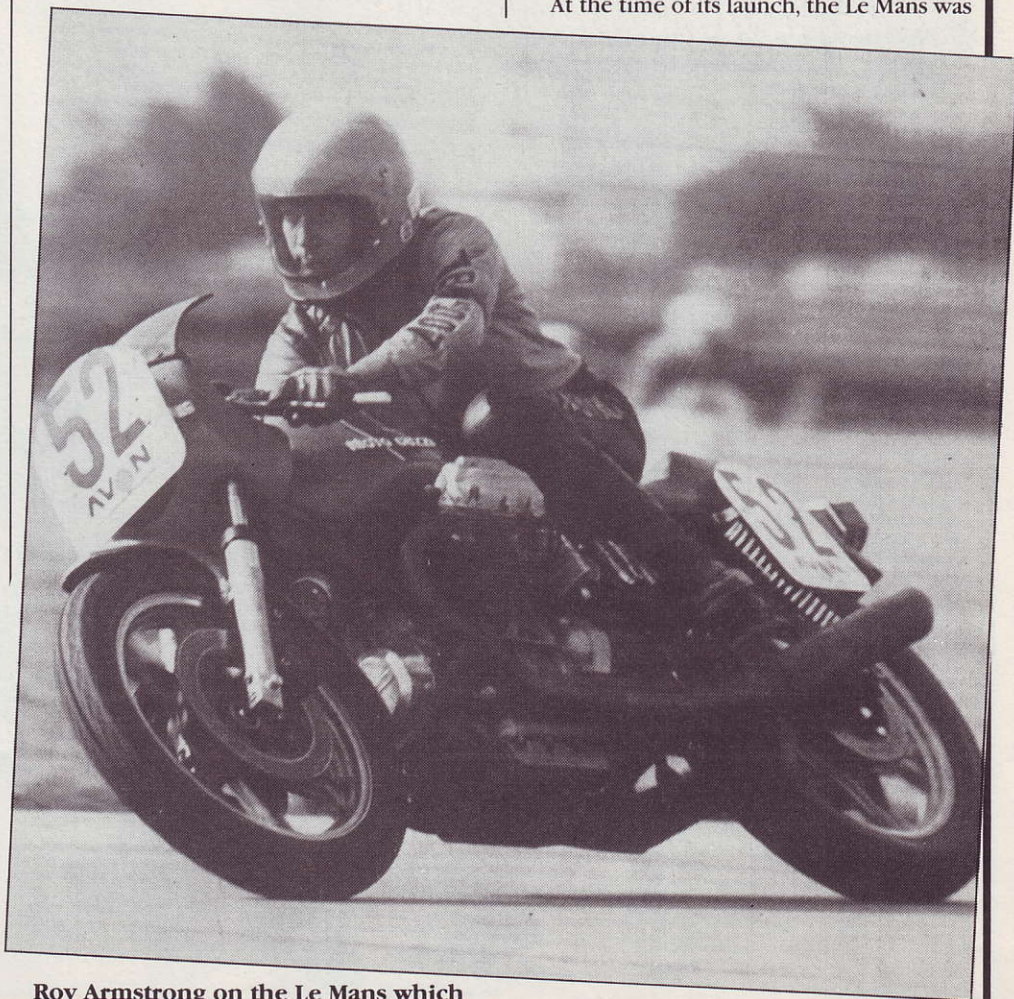
1976 (August in Britain), saw the arrival of the S3's replacement, the 850 Le Mans and of all the V-twins produced by the Mandello factory over the years, the Le Mans (or Lemon as it was sometimes nicknamed) is unquestionably the best known. Strictly speaking the Le Mans made its debut at the Milan Show in late November 1975 but customers couldn't buy one until the following year.

Named after the famous French endurance racing circuit, the machine was clearly aimed at the enthusiast with street racing aspirations. But in reality there was far more to the Le Mans than this, for it could attract the sporting rider who might have brought a Ducati or Laverda, but needed a mount with civilized enough manners to double as a tourer.

Where the Le Mans really scored was in its appeal to a whole new clientele – in much the same way as the V50 did a few years later.

Technically, the new sportster drew heavily on the 750S3 and 850T3. In fact the engine assembly and transmission was essentially only a tuned version of the touring 850 – with identical cylinder dimensions, gearbox and final drive. To achieve the extra performance needed in its new role, the Le Mans had higher compression 10.2:1, pistons with *three* rings (the early 850T3 had four rings) larger valves (37mm exhaust, 44mm inlet), a more sporting camshaft profile and a pair of Dell'Orto PHF36 pumper carbs, with large plastic bell mouths.

At the time of its launch, the Le Mans was



Roy Armstrong on the Le Mans which won the 1977 Avon production series.

quoted by the factory sources to offer a whacking 81bhp and achieve 134mph. The truth was rather less on both accounts – 71bhp and 124mph. Even so for a couple of years its combination of engine performance, reliability and most of all its racer-like handling meant that it ruled the roost in the world of production racing, even at the highest level, when Roy Armstrong's Le Mans won the 1977 Avon Championship.

However, it must be said that like the vast majority of Italian machines of the period (including those with four wheels!) the finish was best described as poor. *Motor Cycle's* John Nutting summed it up nicely with the following comments: 'So under the skin the Le Mans is a motorcycle of indisputable quality. The surface lets it down, for the finish is very poor. The seat, a single moulding in foam rubber split soon after the bike was picked up. The lining on the tank soon peeled after fuel was spilled on it and the matt of the exhaust pipes was soon tarnished'.

Nutting's comments regarding the seat were well founded. Virtually all the Le Mans sold in 1976 had to have their seats replaced under warranty. The seat was in fact a rubber moulding which as soon as it became hard through use started to crack. The design was changed and cured for 1977, however many owners chose to buy a 750S3 item which fitted straight on and looked nicer into the bargain.

Another item which caused problems

was the battery, a miserable 12 volt 20 amp hour affair, compared to the much heavier duty 32 amp hour type on the other big v-twins. Just why Moto Guzzi fitted the less powerful battery to the Le Mans is uncertain, but whatever reason it was a bad move, for after extended use with the lights on, such as a typically cold, wet British winter's day, this frequently failed completely. Without a back-up kickstarter, and with a bike which was far from easy to bump start, quite often the irate Le Mans owner was simply stranded. The only real way out was to invest in the more powerful 32 amp hour battery.

EVEN with these failings the Le Mans soon established itself as the factory's top selling model. And what achieved this is summed up by one word – style. With clip-ons, rear set footrests, the infamous racing style bump stop saddle, bikini fairing, drilled discs, matt black frame and exhaust system, the silver cast alloy wheels, this was the bike which *looked* the part.

Befitting the name and the image, the machine could be bought in a bright red but was also supplied in metallic light grey/blue (a few were also even available in white from March '77). But above all it was the red, applied to the tank, mudguards, side panels and fairing which really enhanced the Le Mans' appearance. The

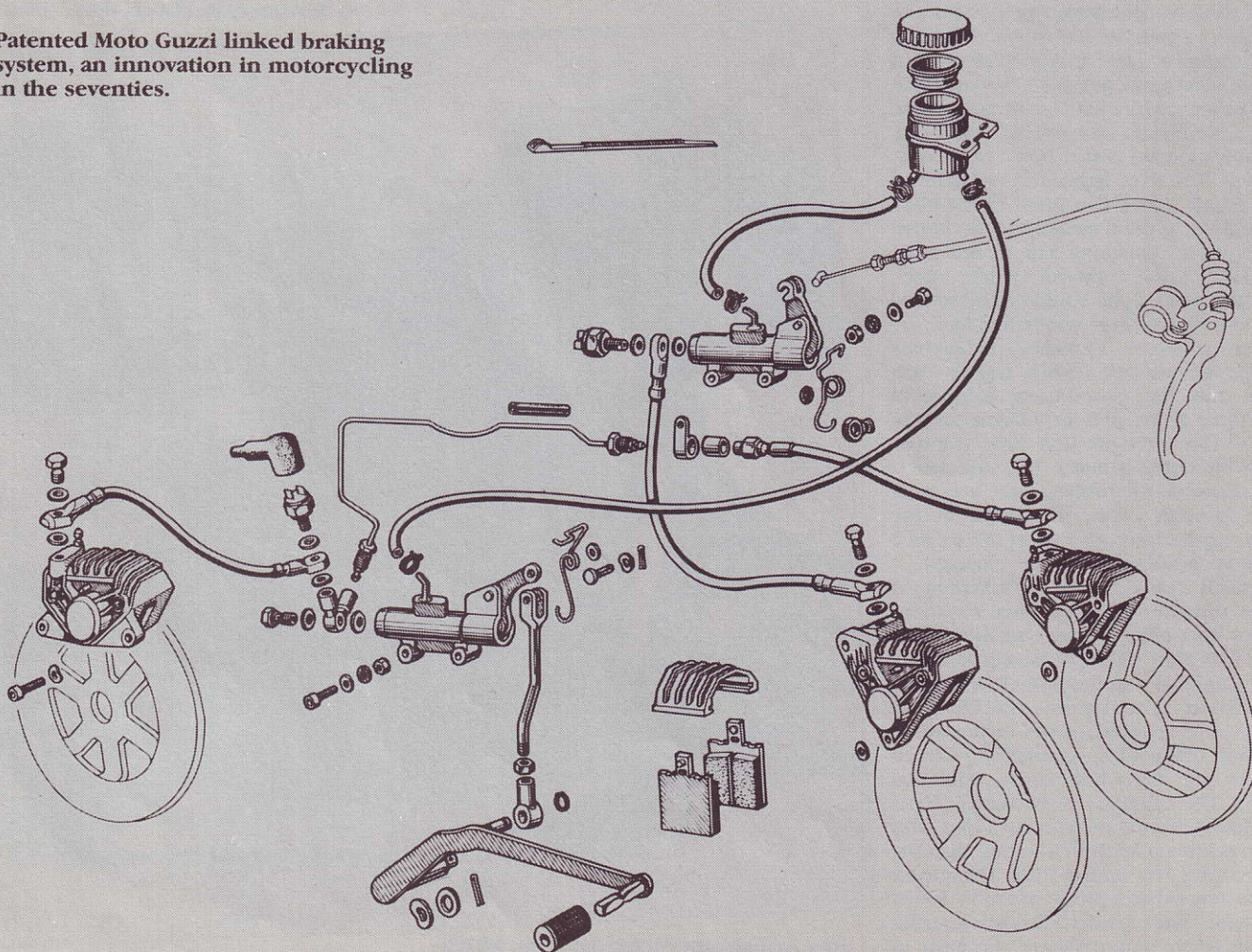
early models had a distinctive 'dayglo' orange section below its tinted screen and surrounding the 170mm headlamp, somehow this unlikely colour combination contrived only to further the image.

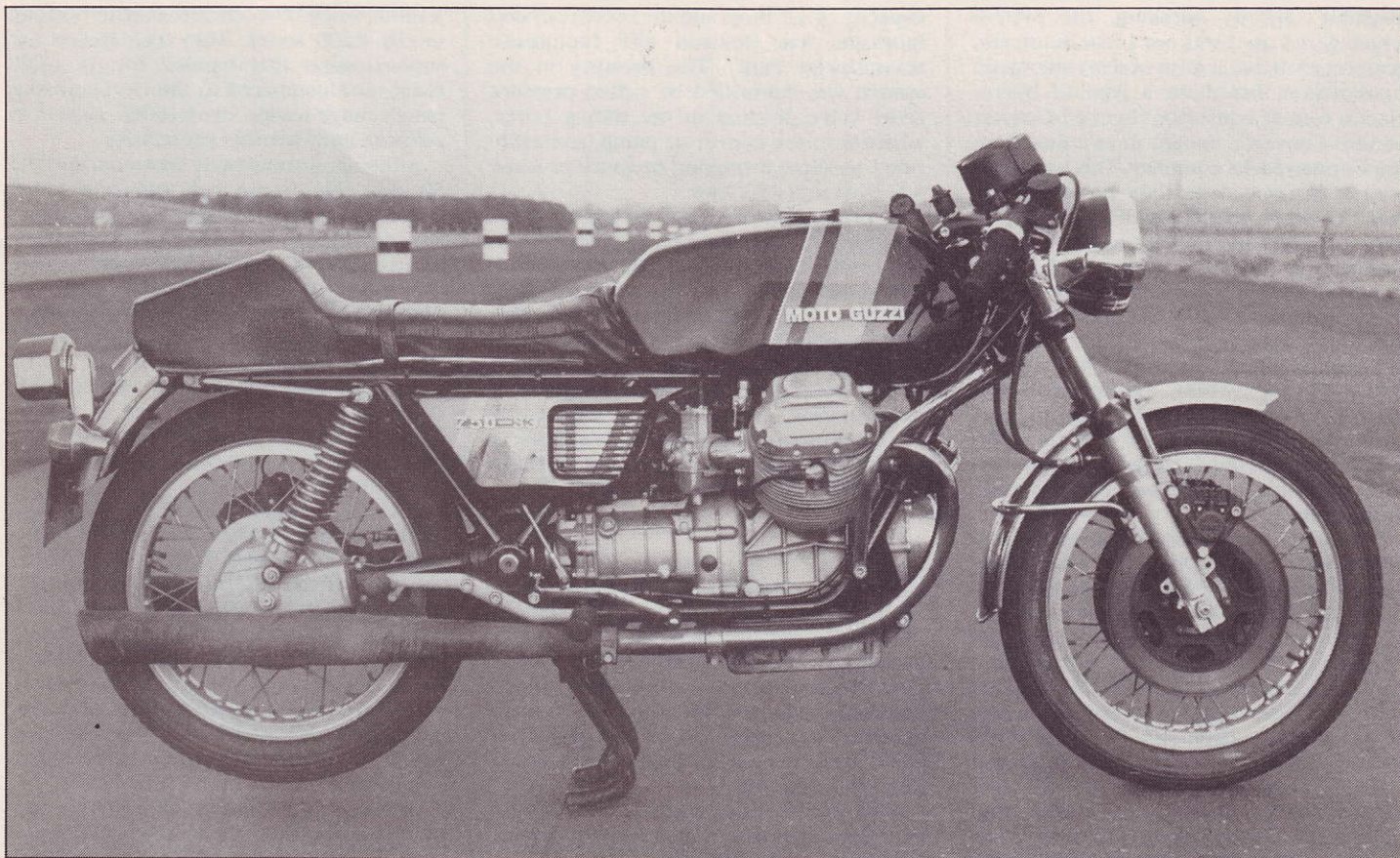
1976 also saw a cheaper version of the California, known as the Rally. This had white painted mudguards and a large speedometer and no rev counter.

Then of course there was the strange V1000I Convert, which first appeared in late 1975. Moto Guzzi have over the years built a reputation for promoting innovation, and their introduction of a large capacity motorcycle with shaft drive and automatic transmission was no exception. When the V1000 was launched into the superbike era of mid-1970s, it was the only one of its kind. Subsequently only Honda, with special versions of their 400 twin and 750 four have tried to tread the same path. It must be said neither Guzzi nor Honda were to make a success of this type of motorcycle. Guzzi boss De Tomaso (at heart a car man) imagined that the 'luxury' fitment of the automatic tag would have the same effect as it does in the four wheel world quite simply, it didn't.

Like most automatic cars, the automatic Guzzi was closely based on an existing, manual gear change model, in this case the 850T3. As is also the case in the car world, the V1000 was given a larger capacity than the manual. The Convert also gained several tou... extras from other models in the

Patented Moto Guzzi linked braking system, an innovation in motorcycling in the seventies.





The 750S3 used a surprisingly high number of parts from its 850T3 sister.

Guzzi range, including the T3 California's tinted screen, panniers, footboards, side-stand and crashbars. Outwardly the only brand new parts were the grab rail, rear light and tail fairing, the instrument console, front master cylinder, and miniature aerofoils mounted on the front crashbars. But, of course the *real* changes were out of sight, tucked away behind the engine and gearbox casings.

The engine was essentially the same 90 degree v-twin which powered the 850 models with cylinder bore increased from 83mm to 88. With the stroke remaining the same as the 850's at 78mm, this gave the new engine a capacity of 948.80cc. On a 9.2:1 compression ratio, the maximum power output at the crankshaft was 71bhp

at 6500rpm but a lot less at the rear wheel, with the bought-in West German Sachs torque converter consuming several bhp alone. Unlike the chromed bores of the earlier v-twins, the three-ring pistons of the Convert ran in steel cylinder liners. Although the factory still adhered to their method of matching the original pistons and cylinders on new machines, with Class 'A' between 88.000 and 88.009mm, and

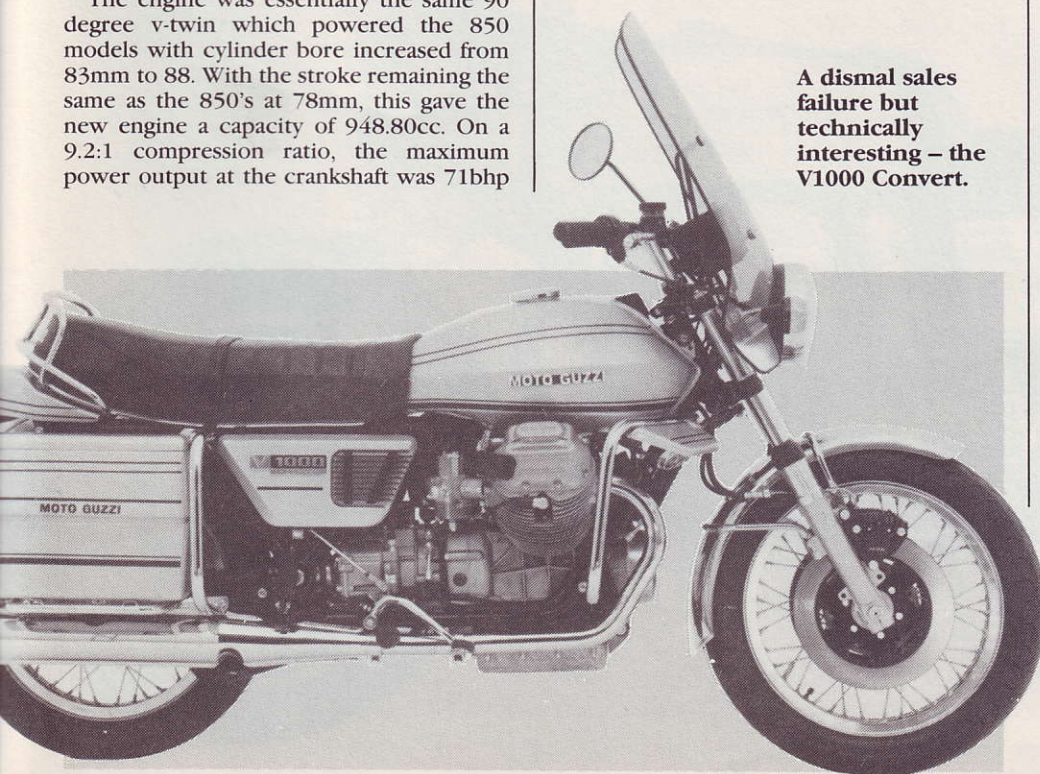
Class 'B' from 88.009 to 88.018mm, the use of steel liners meant that for the first time it was possible to rebore the v-twin engine. For this purpose oversize piston assemblies were available in 0.4 and 0.6mm.

The con-rods and crankshaft were the same type as the post-1972 850 engines following a spate of broken rods which had resulted in the stroke being increased from 70 to 78mm (with the introduction of the 850GT back in 1972); and similar care went into matching these at the factory, depending on the crankpin diameter. Factory markings were put on each con-rod and on the flywheel side of the crankshaft shoulder. Blue markings indicated a crankpin diameter between 44.008 and 44.014mm, while white was for a pin between 44.014 and 44.020mm. Undersize split bearing shells were available in three sizes - 0.254, 0.508 and 0.762mm. The remainder of the bottom end was virtually the same as on the 850, although the camshaft was modified to accommodate a drive for an automatic transmission fluid pump (the profile remained the same) and the timing cover was also modified. Because of cylinder bores, the crankcase mouths into which they fitted had to be enlarged, although the cylinder base gasket remained the same.

There was even less modification to the top end of the engine, just a new type of head gasket and different jets in the carburettors. And it is because of this that in later years many 850 Guzzis have been modified to 948cc V1000 capacity and above.

But on the V1000 all these changes, of course, were insignificant compared to what happened to the clutch and gearbox

A dismal sales failure but technically interesting - the V1000 Convert.



assembly. Strictly speaking, the system which Guzzi used was not a true automatic gearbox at all, but a form of *semi*-automatic transmission, based on a type of hydrokinetic torque convertor (hence I-Convert or Idro-Convert), bought in as a unit from the German Sachs company. This was fitted with a two speed gearbox on which the ratios could be selected with a heel-and-toe lever operated by the left foot. To complicate matters there was also a clutch but its sole purpose was to swap between the two ratios, unlike a conventional gearbox, where it is also necessary for the clutch to be used to allow the engine to take up drive. On the V1000, this function was taken over completely by the torque convertor and since, in practice, changing ratio was virtually redundant, the machine was to most people as nearly automatic as made no difference.

The Sachs torque convertor itself was a sophisticated development of what sometimes is known as a fluid flywheel (or, less politely, a slush box). These names are apt because they approximately describe its operation, in which the transmission medium is oil, a fluid. Instead of there being a direct link through the transmission as in a conventional system, the fluid provides a slightly 'loose' connection and a gradual take-up – somewhat akin to the effect of slipping a friction clutch, but without the problems caused by doing this all the time. In effect, it provides a sort of continuously-variable transmission ratio, within the limits of the design specification.

On the V1000, the maximum converting ratio (akin to a gear ratio) was 1.60:1. The other end of the scale was direct 1:1 drive.

A separate convertor fluid tank had a

capacity of 1.7 litres and the recommended lubricant was Dextron ATF (automatic transmission fluid). The pressure in the system was controlled by a fluid pressure relief valve, located in the timing cover, adjacent to the convertor pump, and calibrated to allow a running pressure of some 1.8-2Kg/cm² (25-29 psi).

In practice the net effect of this transmission system was too energy-sapping with the result that even with the extra cubes maximum speed was reduced to only 108mph. This allied to the strange feeling when riding the machine (like piloting an overlarge automatic moped) doomed the V1000 concept to the very backwaters of motorcycling. And in the end even Guzzi were forced to admit that the whole project had been a defeat and offered the V1000 in manual form as the G5 from 1978.

IT WAS at the Milan Show in November, 1977, that Guzzi enthusiasts were to witness the first benefits of the larger capacity of the V1000 on another model. This was in a brand new concept for the Italian company and one which owed much more to its northern German neighbour at BMW. This was the SP, known as the Spada (Sword) in Britain.

With the SP, Moto Guzzi set out to offer a viable alternative to BMW's virtual monopoly of the long haul, luxury touring market. For although models such as the 850T3 were close to a BMW style package, as a true competitor they fell short in several vital respects of the standard set by the top-of-the-range German flat twins. Most importantly, Guzzi (except the unpopular

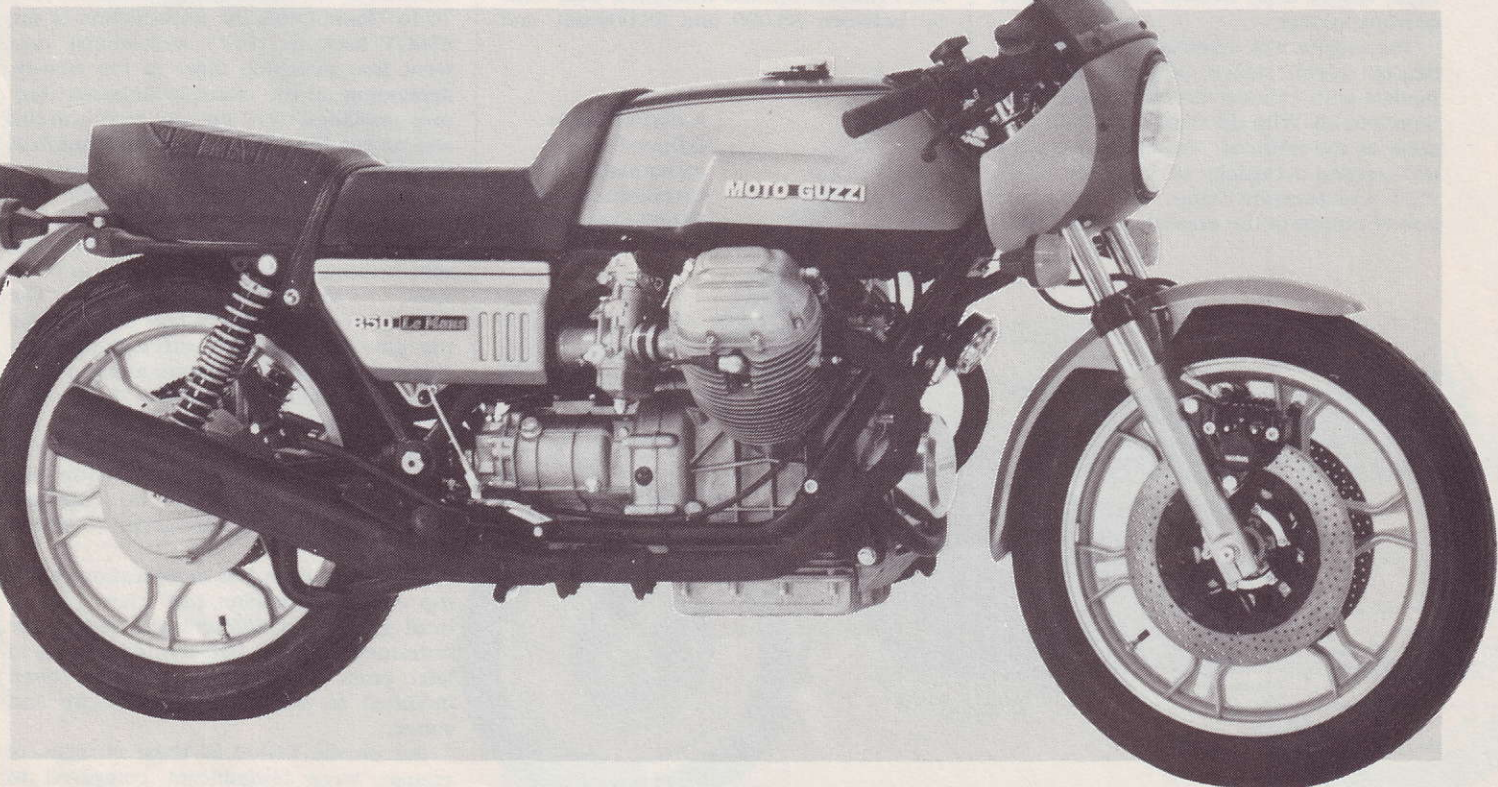
V1000) lacked the one litre engine capacity of the R100 series. They also lacked the sophistication that typified the Teutonic twins, and compared to the German company's range leader, the R100RS, lacked its purpose built weather protection.

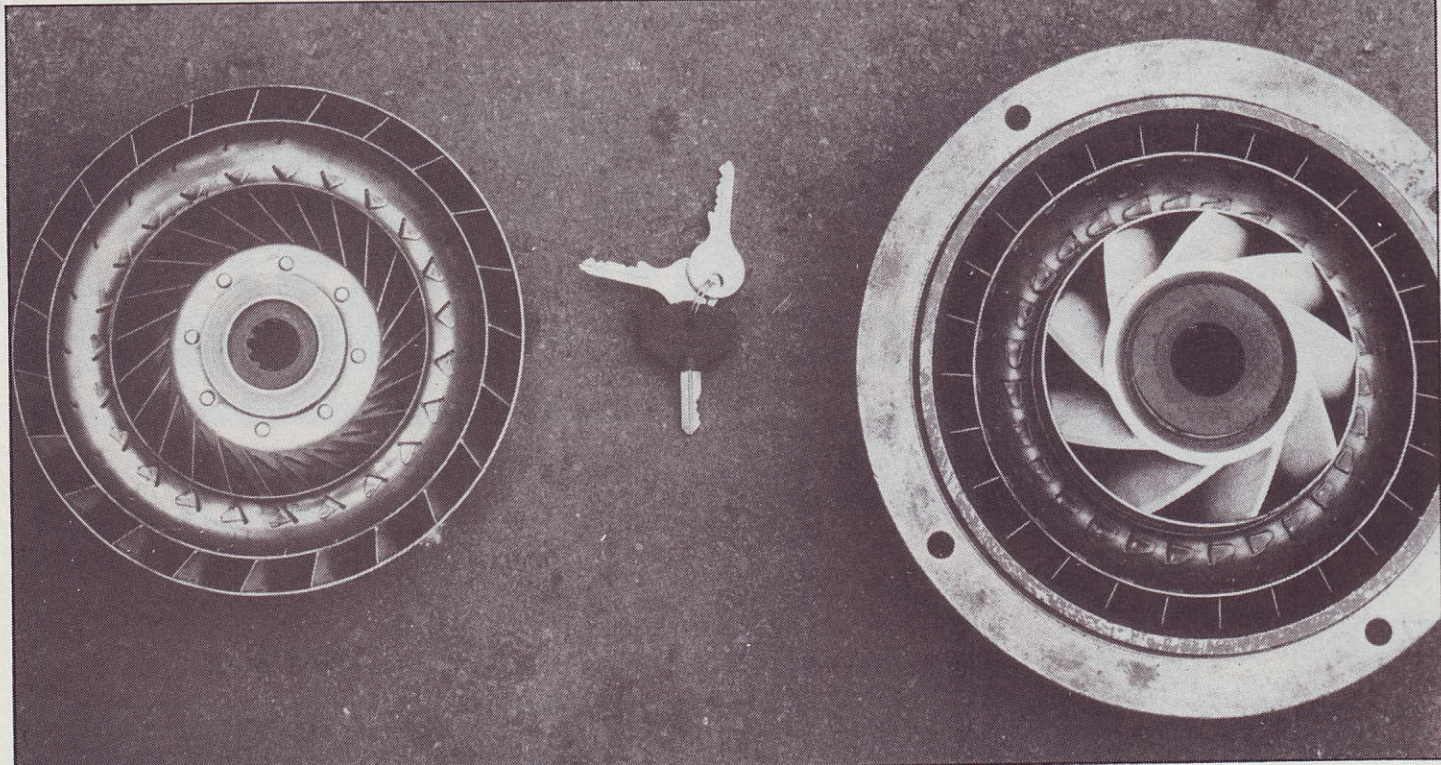
Although a completely new concept, the SP was able to be put into production extremely quickly because it used, so far as the main chassis and engine parts were concerned, many components from the existing T3 and V1000 models. The increased engine capacity utilized the work already carried out to produce the '1000' class for the failed automatic and this was simply given a conventional clutch and gearbox, courtesy of the T3, and housed in a frame and suspension package that was again comprised of existing components from the 850 machine.

If these measures smacked of pure convenience engineering in order to boost the otherwise outclassed T3 this was because the bulk of the R&D budget was concentrated on those areas in which BMW dominated. Mandello's planners correctly perceived that their basic engine and chassis were sound enough, so it made both economic *and* practical sense to concentrate on those areas which Guzzi were currently not able to match BMW, in particular rider protection.

Although the Spada's fairing was conceived in the factory's famous wind tunnel it was not particularly aerodynamically efficient. The thinking behind the design was practical. The separate top section could turn with the handlebars, allowing it to be mounted much closer to the rider than a conventional fairing, which needs to be mounted far enough away to allow clear-

Legendary 850 mark one Le Mans with bikini fairing, clip ons and bump stop seat.





Innards of the Sach torque converter. Keys show size similar to a dinner plate.

ance for the handlebars on full lock. As a result, the Spada fairing offered an improved level of protection for the extremities of head and hands, areas which tended to be sacrificed for reasons of style or design compromise.

There was also a bonus in that the lower side panels (leg shields), which were firmly fixed to the frame, could be removed individually with very little effort and without the need to disturb the main top fairing. This greatly simplified routine engine maintenance work.

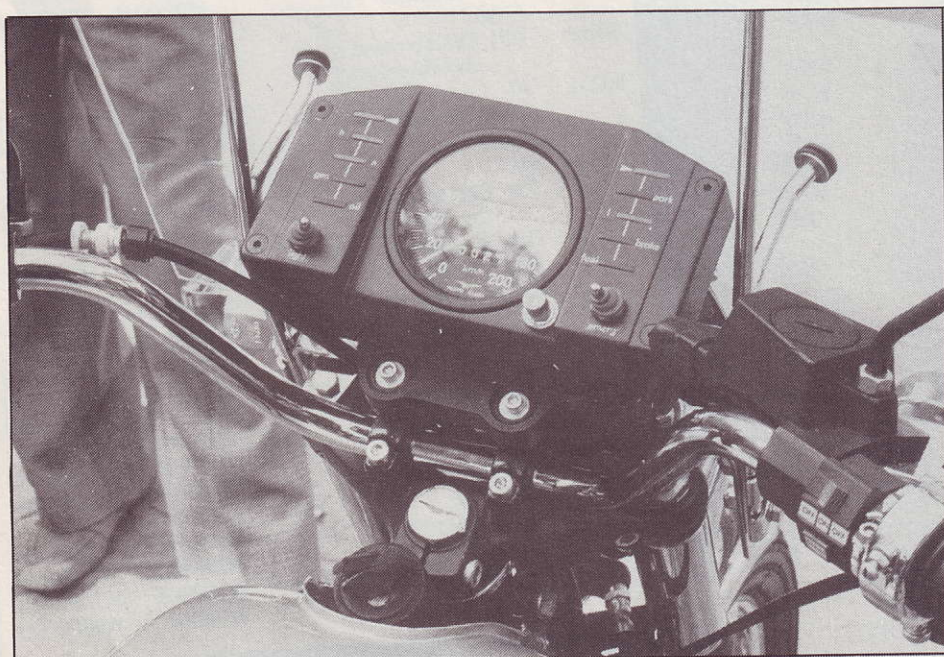
Even though it had debuted at Milan in November, 1977, it was not until the following July that the Spada was first available

in Britain. This was not that production had taken that long, rather that the success at home and demand in other export markets, notably North America.

ANOTHER internationally important show heralded in the Mark II variant of Guzzi's best selling Le Mans sportster. This was at Cologne, in September, 1978. To many the more angular Mark II was a backward step on the ideal big v-twin. The obvious change was the adoption of a Spada-style three piece full fairing, which although offering far more protection

robbed the bike of its aggressive look. At the same time, the Le Mans had gained most of the fairing mounted equipment from the Spada. This included the complete instrument layout and switchgear, including a quartz clock and voltmeter. Like the Spada, the Le Mans II had a large moulded rubber dashboard. And, again like the Spada, the front indicators were now integral to the fairing, whilst the clip-on bars were changed to suit the fairing's upper section. The red finish was as before, except that there was now more of it, and the frame continued to be painted matt black (the only Guzzi to have this). But the metallic blue/grey and white finishes were dropped, and royal blue became the other colour option.

So, as the new decade drew near, the Guzzi range of big v-twins consisted of Le Mans II, 850T3 (now with cast alloy wheels and other smaller changes), T3 California, Spada and the V1000/G5 models. And because this magazine has *Classic* in its title, I feel the line should be drawn at this point. There have of course been very many variations of the theme since then, mainly cosmetic it must be said, during the 1980s.



Instrument layout of the V1000 (shared with the manual G5) with massive speedo, no tacho and a mass of idiot lights.

● **Next issue: looking after your Guzzi**

● The final part of my large capacity Guzzi v-twin saga will cover the various pitfalls to watch out for and a range of useful hints and tips to make the ownership of one of these bikes that much more worthwhile and act as a guide for potential buyers of one of these Italian Classics.