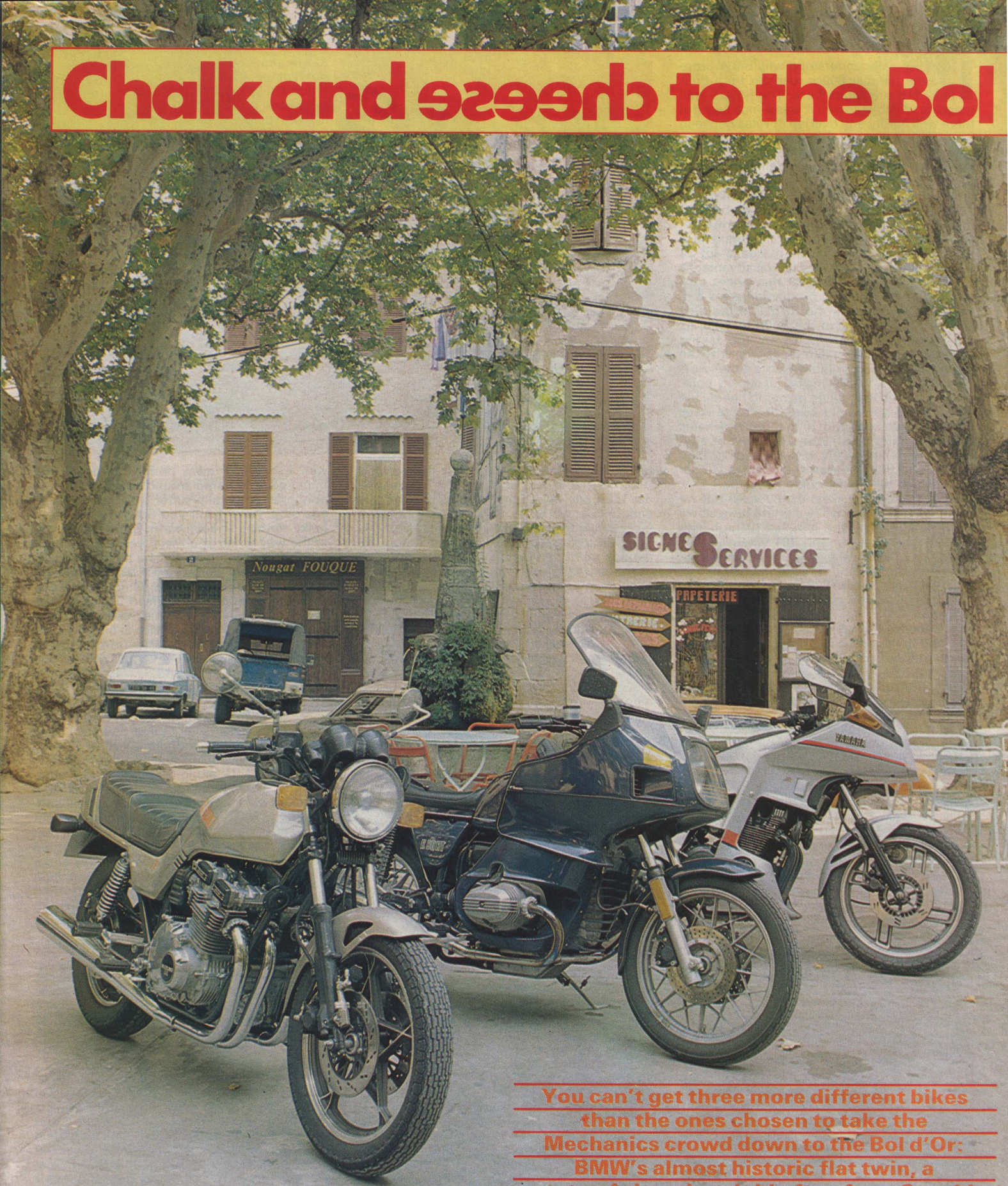
Chalk and cheese to the Bol



You can't get three more different bikes than the ones chosen to take the Mechanics crowd down to the Bol d'Or: BMW's almost historic flat twin, a state-of-the-whotsit big four from Suzuki and Yamaha's newish Turbo. Here is how they shaped up across France — Testers: John Robinson, Peter Hughes and Malcolm Gough.

BMW R80RT

I NEVER really understood why BMW dropped the popular 800cc roadster from their line-up a few years back. The R80GS trail machine which followed it was a nice bike but there was hardly any overlap of roles between the two. And they were already producing four variants of the 980cc machine, one of which, the R100RT, had a very comprehensive set of touring equipment.

One disadvantage of the RT was that it was very expensive. Another was that the big fairing made a joke of maximum performance. Now they have given the RT treatment to a new 800cc machine which makes a lot of sense because it sidesteps the disadvantages of the bigger bike. I suspect that prices owe more to politics than to production costs but, whatever the reason, the R80RT is the best part of £1000 less than the R100RT. And, as top performance is crippled by the fairing anyway, it makes little difference what size the motor is, within a few hundred ccs either way.

At the price, 800cc makes a decent compromise. It has the pulling power to handle the sort of loads you might need on a three-week holiday; it can cope with long motorway hauls without getting breathless; and most of all it can compete financially with the likes of Californias and fully dressed Gold Wings, something which the 100RT could never do.

Performance isn't what the 80 is for but we need to know where we're starting from so we took it to MIRA anyway. It pulled 101mph with the rider bolt upright and 104 when he was completely screened, but only managed 91mph in the upwind direction. This isn't so different from the R100RT, and the 80 was only half a second slower over the quarter-mile, too.

Its effective top speed is somewhere in the 90s, and it was reaching this at the end of the quarter-mile run, but it will also cruise easily between 70 and 90mph, often needing less than half throttle to hold speed. The performance figures do not show how easy it is to get up to this speed and keep it, even in quite difficult road conditions. It is noticeable in other ways, though. The BMW was often travelling 10 to 15mph faster than I thought, a deception which is partly caused by the fairing and partly by the way the suspension and tyres don't get too bothered about bumps and other surface irregularities. Over regular, cross-country journeys, the R80 would also knock anything up to 10 per cent off the usual travelling time.

Perhaps that is the real measure of a touring bike's performance, along with the comfort which is needed to soak up long distances, day after day. When the R80RT was suddenly announced, we were planning to take some bikes down to the Bol d'Or, near Marseille — the ideal sort of journey to evaluate things like fairings and luggage carriers which are only useful extras for normal daily commuting. In addition it would make a direct comparison with two very different machines — the 650 turbocharged Yamaha and the 1100EZ Suzuki — but ironically all three are roughly in the same price bracket.

From a performance point of view the BMW was — theoretically — some 20mph down on the other two. In practice, during the 2,400 miles the bike was ridden, the only time it was against the stop looking for more power was at MIRA. On the open roads we cruised in the 80s, with the occasional high-speed blast, but if you're hoping to cover three or four hundred miles a day, that's the quickest way to do it. Higher speeds are more tiring and eat up the fuel much more quickly — stopping for fuel, oil and coffee is what really slows you down.

Here the BMW was at no disadvantage and brief showers of rain or swarms of insects soon showed one of its big advantages. The all-embracing fairing and screen keeps pretty well everything away from the rider. You might get a bit damp around the edges but the only time you really suffer from rain is when you stop. As a result you don't need a lot of bulky clothing to keep warm or dry and to get in the way when you reach your destination.

In fact the fairing could be a bit too good, as the weather got warmer a full face helmet was stifling even though the air behind the screen was calm enough not to need the visor. The fairing has adjustable fresh air vents but these made no noticeable difference at all. There are two small, locking compartments built into the fairing, sealed by rubber strips. One of the strips came unstuck and leaked while the other stayed watertight, even through a torrential storm.

The fork gaiters — which have come unstuck on practially every other BMW we have tested — stayed securely in place.

Quickly-detachable, suitcase-type panniers round off the RT, along with a small rack-cum-grabrail around the back of the seat. The panniers will take a surprising amount of stuff, although BMW stick little warnings about high-speed instability on them. We found that it didn't make any difference; the bike tended to get a bit light on the steering anyway and it would set up a slow, rolling weave at high speed. It wasn't bad enough to get worried about although I, a firm disbeliever in steering dampers, switched the BMW's damper to the hardest setting.

The RT has other stowage places, like all the BMWs. There is enough room for a good toolkit (plus pump and puncture outfit), another compartment with a first aid kit, handbook and a guide to every BMW dealer in the known world, and a lockable chain to thief-proof the bike when parked. Under all that there is the usual BMW, with more or less the same motor as the R80G/S.

Where BMWs usually score over other touring bikes is in the range of their fuel tanks. On the first leg of the journey across France it was no surprise when Peter Hughes came past on the Suzuki pointing at his fuel tank after we'd covered 150-odd miles. Malcolm indicated that the Yamaha was also getting low on fuel and then the BMW spluttered and cut out as it too went on to reserve. It seemed to have the usual BMW-size tank and we were expecting it to be good for another hundred miles; in fact it did have another gallon rein serve but it was also using fuel at a much greater rate than the other two. Under identical conditions the R80 fluctuated between 35 and 45 mpg compared to the Suzuki at 47 to 56 mpg.

There is obviously a lot of fairing to push along and this saps a proportional amount of power, but even a low-speed economy run only gave 52 mpg, so what is the R80RT doing with all this petrol? This is perhaps its biggest failing and it looks like BMW just haven't developed the engine and carburation very well at all.

We pause at this point to compare things with our test on the R80G/S which appears to have the same engine spec. The first thing is that this only managed 109 mph and a 13.55 second standing quarter. Running the same gearing, the G/S is claimed to be over 100 lb lighter and it's beginning to look as if we shouldn't be blaming the fairing for all the bike's shortcomings. Further down the list, the G/S also used fuel at a rate of 45 miles to the gallon. Mr. Fairing Designer, we take it all back. We still don't know what it does with all that petrol, but at least we know what it doesn't do with it.

Fortunately BMW's ride and handling people have got a better grip on things and the 80 steers smoothly and precisely enough to take the effort out of all kinds of roads. The fairing helps keep the weather off, but it does it too well and they have had to make the riding position very upright, presumably to keep the strain off the rider's arms. Unfortunately it is not the best position for steering control — the R100CS has got that — and it emphasises any deficiencies in suspension. Here the R80 is about what its price suggests. It is better than the R45 and not as good as the R100.

The self-levelling Nivomat suspension is an option which the R80 needs. Ours had the ordinary suspension — which has a fair amount of travel — and considering the wide variety and distribution of loads that such a bike could take, it would at least be nice to have some rapid means of headlamp adjustment. The present means is considerably other than rapid. The lowest of the three rear pre-loads left the 80 with a ground clearance problem; on ▶


SUZUKI
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◀ the highest pre-load bits of the stands would touch down on left-handers which was only a temporary problem as the offending pieces soon got broken off. But when a passenger was carried the bike would once again touch down all too easily.

Otherwise the steering and handling, on Metzeler tyres, was excellent on wet roads as well as in the dry. We checked the tyre wear over the period that the three bikes were running together; on average the Metzelers were marginally better than the Phantoms used on the Yamaha, but it was too close to be decisive. Both sets of European tyres showed less wear than the Inoues fitted to the Suzuki.

The Metzelers gave surprising grip under braking, allowing more and more brake to be used, further and further into corners. Maybe it was as well that the front hydraulics gave me a pretty heavy action, just as a reminder to the rider of how far he was pushing his luck. The front brake would produce so much weight transfer, coupled with the very direct shaft drive, that it needed very little in the way of back brake or downshifts to get the back wheel locking and hopping in staccato bursts that felt as if the bike were leaving a dotted line to mark the approach to every corner.

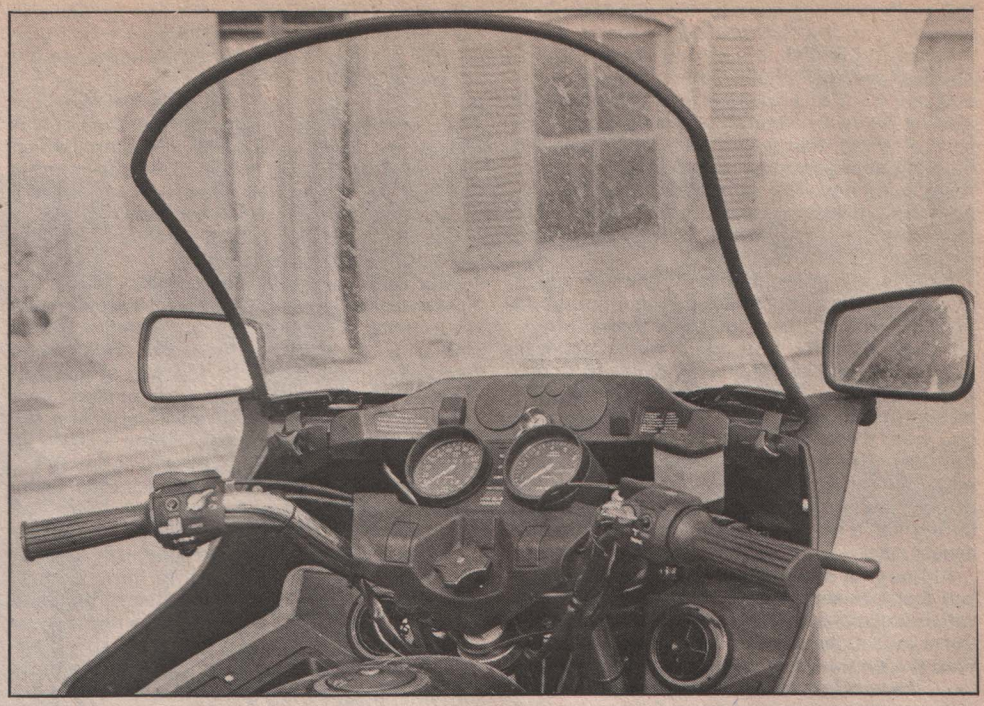
During heavy braking it was as well to leave the back brake alone; in normal use it was controllable enough and could be eased on gently to lose speed while the bike was banked over.

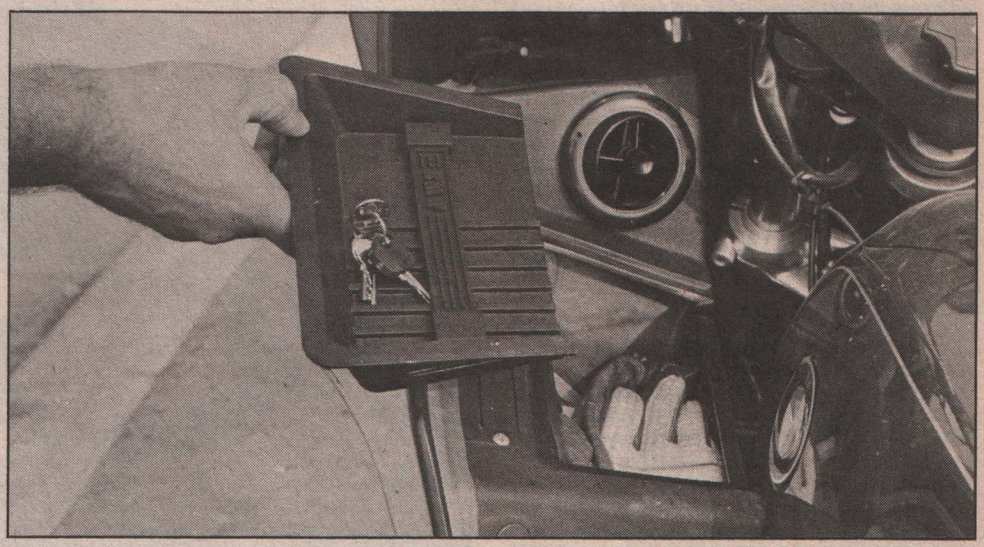
The riding position and the simple presence of the fairing make this the wrong sort of bike to throw around, anyway. The thick black beaded edge to the screen forms a strong artificial horizon which could be both amusing and startling, depending on when it caught your attention; it also prevented the wind blowing blobs of water up the screen and over the top into the rider's face.

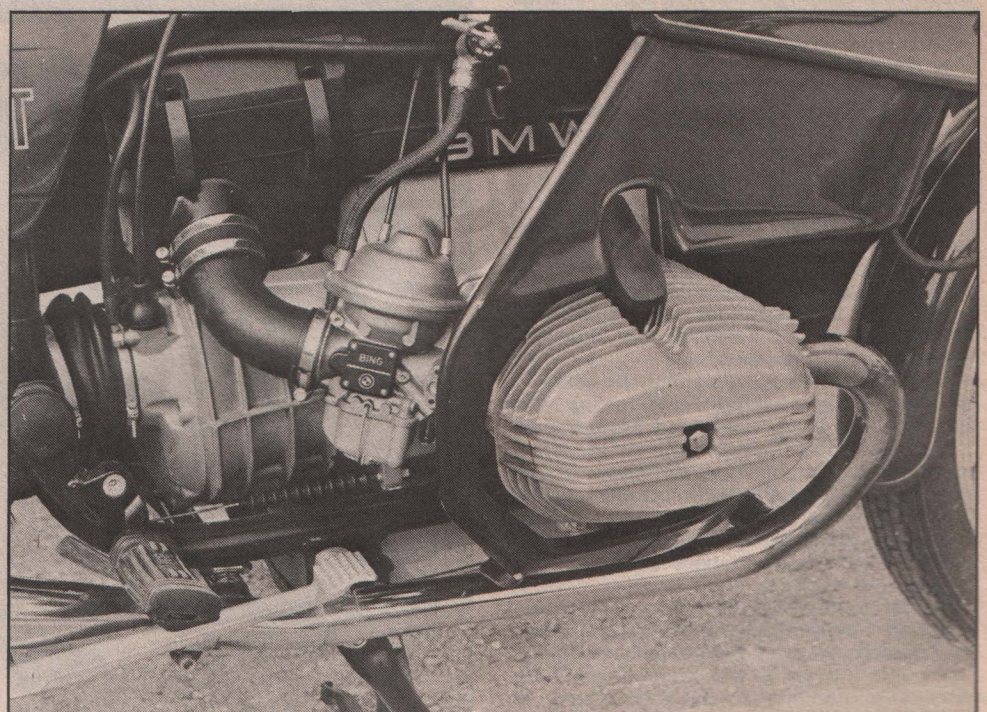
It was better to be able to look just over the top and the screen can be raked to adjust to different sizes of riders, although anyone who varies more than two inches from the norm would either be peering through perspex distortions or would be up in the turbulence above the bike.

Within the comfortable region, the fairing was efficient, with no turbulence, hardly any wind noise and not too much engine noise. A following rider reported less jacket flapping on the BMW than on the also faired 650 Yamaha.

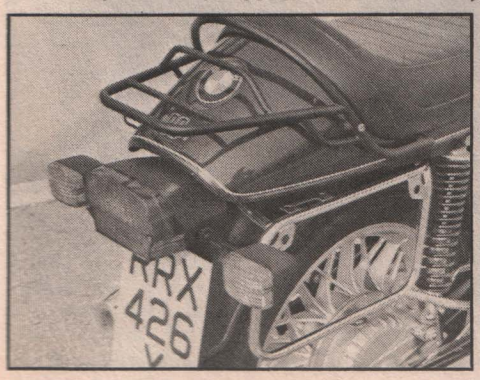
If the BMW didn't make much turbulance, it was sensitive to other people's. Catching the draught from another bike would set the R80







Top: ***The substantial fairing adds to long distance comfort but the price is, alas, one of high fuel consumption.***
Centre: ***Lockable compartments are large enough to be useful but unfortunately, one of them leaked during the test.***
Right: ***Bing CV carbs are notoriously awkward to set up. The engine is virtually the same as that of the R80GS off road model.***
Below: ***Rack is handy for carrying small items but not up to heavy luggage.*** ▶



rolling; following high-speed trucks too closely could turn the BM into a fairground ride.

While the R80RT is a strong contender for anyone making regular long distance runs, and has a lot of attractive detail design, it is also let down by several details. They are the sort of thing that seem petty but become niggling annoyances when you have to suffer them every day. The stands are top of the list, both are difficult to use and neither is particularly stable on anything less than a smooth and level surface.

Next is the passenger arrangement which includes a seat to perch the pillion higher than the rider and footrests too close to the rider's, although there is a good grab rail. Of less importance, the switchgear is awkward to use and is not laid out in a way which is conducive to emergency reactions — unless, of course, you want to flash an indicator at every errant motorist. The twistgrip is heavy and of a soft material which rubs stiffly against the throttle drum. Finally, there is no clock, although the fairing has a blank panel which would readily accept one.

Although it sounds like there is more criticism than praise, the R80RT is still a useful and satisfying machine. It is *different* from most other machines; it has a completely different feel, the engine delivers in a totally different way, the comfort and even the equipment are different. In the world of Guzzi Californias and Gold Wings, the RT is a potential winner; however it is also in, or a shade above, the price range of much more potent performers, like the 1100s. Here we are comparing apples and oranges and the buyer needs to make an honest decision about what he really wants from his bike. But whatever the outcome, the R80 has a £1,000 start over the R100RT — and I suspect that that is what made the original 80/7 so popular in the first place.

John Robinson

SUZUKI GSX1100EZ

If you plan to spend a lot of money on your motorcycling — and get a good return for it — you've got a choice of several routes to follow. There's the purpose-built machine, like the R80RT, which is totally biased in one direction, in this case, touring. Or you could go for something special — like the XJ Turbo. Or you could head for the raw performance of a big sportster — which is how the 1100 Suzuki got roped into this long-distance, transcontinental test. *(Apart from being a convenient way to keep Peter Hughes quiet when he discovered that we were going to the Bol d'Or and he wasn't. — Ed)*

Whatever your choice, you presumably want to ride it and this is about how three vastly different bikes coped with the same roads, speeds — and riders. The 1100 is a good example of the big sportster mode; it isn't short on power and there are those of us who prefer its functional appearance to the more gimmicky (and crumpled) looks of the Katana. It looks upright enough, but in fact the bars tip you forward into a racey crouch that immediately gives the sensation of sitting in, rather than on, the bike.

At first it puts a lot of weight on the wrists — at speeds above 40mph this feeling disappears but during low-speed around-town riding I was uncomfortably aware of the strain on my wrists. On the subject of general comfort, I would have liked the footrests a little further back which wouldn't have helped the low-speed problem but would have better matched the seat and bars for open-road riding.

Rubber mounting took out almost all the vibration through the footrests and there was no vibration at the handlebars, leaving the rider with only the engine's smooth forward thrust to remind him of what was going on at the end of the control cables. I particularly liked the finish to the bar ends, a nice touch which presumably incorporates some weight to damp out the vibration.

The mirrors gave good, clear vision — but only at speeds up to 70mph. In excess of this speed the image just became a blurr (which defeats a lot of the purpose...). All the controls were easy to find and use except for the combined indicator/dipswitch which could be a problem with a heavily gloved hand, particularly in the cold.

Suzuki's love of little gadgets shows up clearly in the instrument panel which contains four dials, ten tell-tale lamps and a digital indicator. As well as the tacho and speedo (with a button to re-set the trip which got re-set every time the bike was parked), two smaller instruments give information on the oil temperature and the state of the fuel. While the fuel gauge took a long time to come off the F mark, it seemed to be pretty accurate at the other end of the range — although there was also the reserve tank to be used.

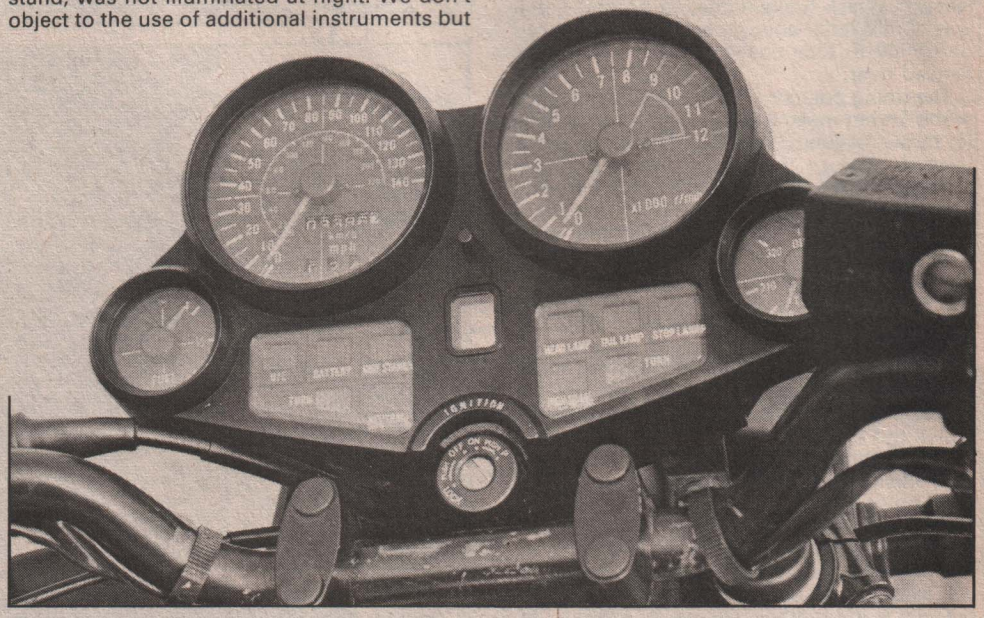
A mass of other lights provide warnings for oil, battery, sidestand, neutral, turn signals, tail and stop lamp and main beam. Between the two clusters of lights there is a digital gear indicator which, for reasons I fail to understand, was not illuminated at night. We don't object to the use of additional instruments but we feel they could have been a bit more useful — like a clock and a voltmeter. The left hand cluster of lights suffered from condensation inside the plastic lens.

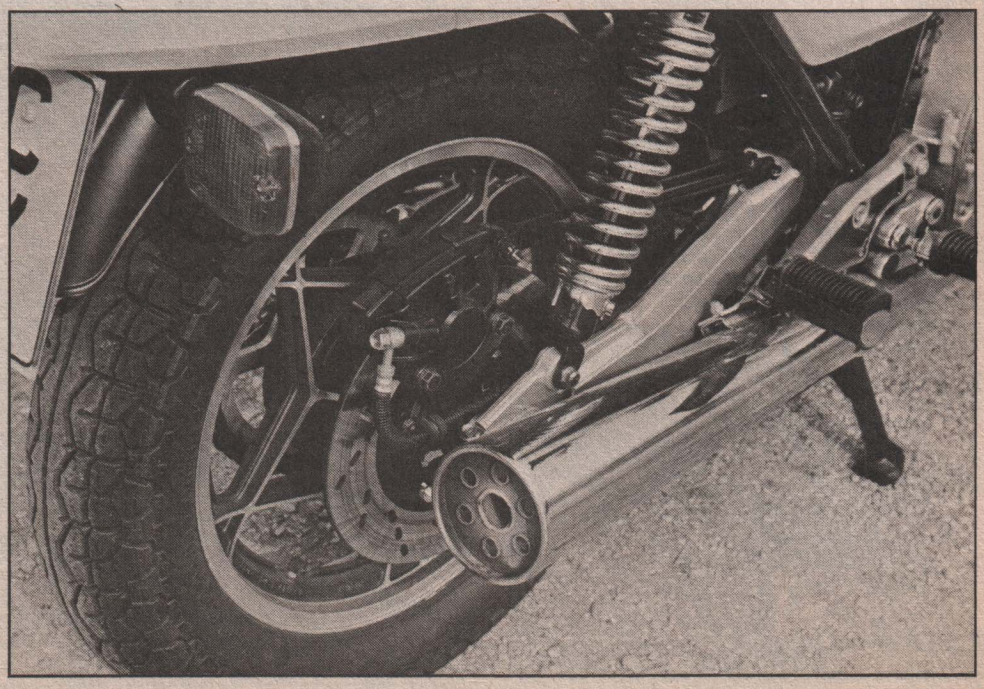
Useful or not, we now know that the oil runs at a steady 270 degrees F in the UK and reached a peak of 320 degrees on the hottest stretches of autoroute. Which, after 1000 miles in two days, was what the seat was beginning to feel like, as well. Normally it was pretty comfortable but this took it beyond its normal limits — although the same journey brought no complaints from the BMW. (Or its rider!)

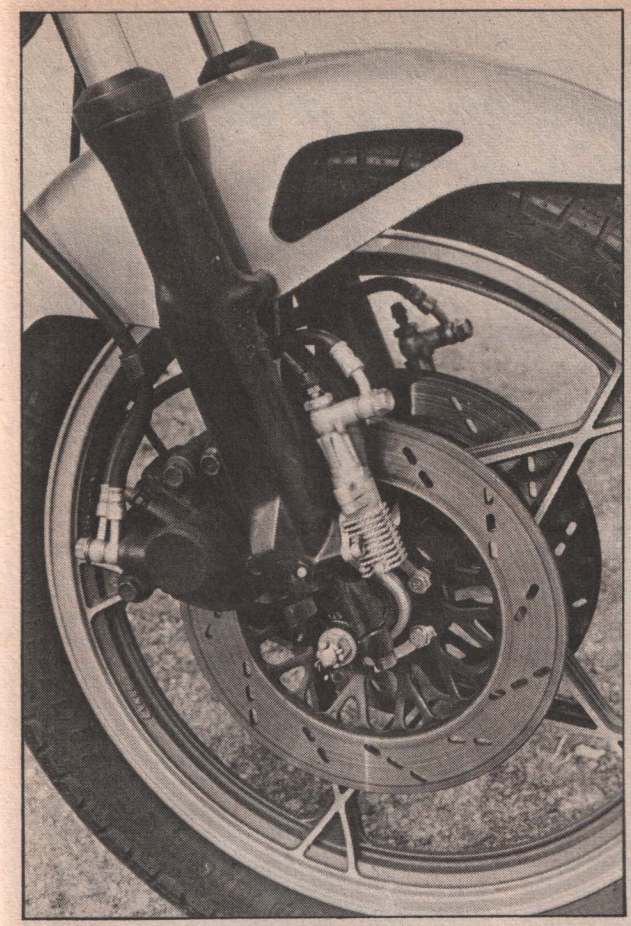
Pillion passengers found the seat quite comfortable for short journeys but noticed vibration through the footrests and had the major complaint that there was nothing to hold on to. On a bike producing as much power as this one, I would have thought that a grab rail was an essential minimum (and as a passenger for all of 400 yards, JR went away muttering that a Martin Baker seat would not have been in the overkill class).

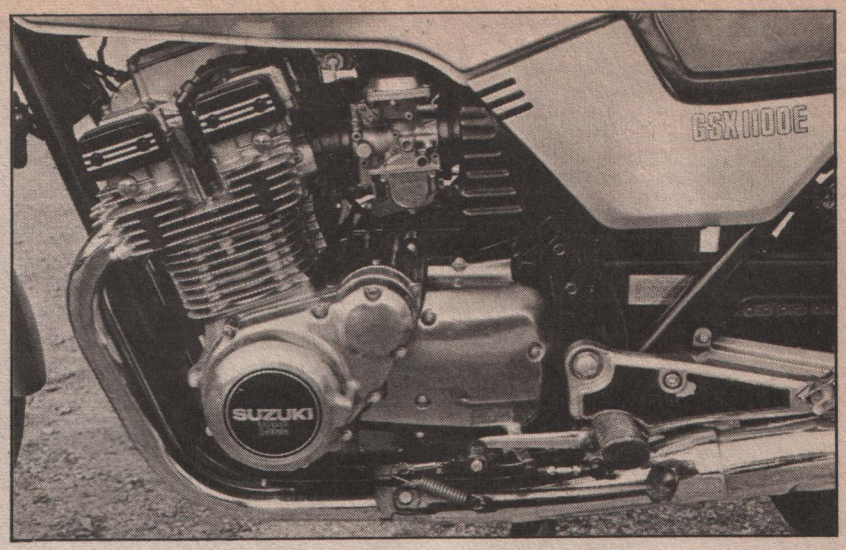
There was also nowhere for any straps to be attached; you may not want to go grand touring but this bike even makes it difficult to take a packed lunch.

Around town the Suzuki was not the easiest bike that I have ever ridden. It felt large and









Left: ***Peter Hughes found the powerful front discs a great help when a wasp took refuge inside his helmet! They also made riding on tight roads enjoyable and safe. Anti-drive braking is a useful feature on a machine of this weight and performance.***

Above: ***The motor is identical to that of the Katana with plenty of power for most folks' needs. Top speed was a respectable 139 mph.***

lumpy and, try as I might, I could not make low-speed gearchanges smoothly. This may have been associated with the clutch which was always a bit fierce and, when the motor was hot, tended to drag a bit, just enough to make neutral hard to find.

Out of traffic the bike was superb, the 1100 engine making an absolute nonsense out of speed limits. As soon as the engine was buzzing the gears changed smoothly and clearly. The most enjoyable conditions were the French N-roads where the power available gave easy, safe overtaking at any opportunity. The handling, through fast sweeping main-road curves backed up the performance with enough grip to make me forget the thousand-mile seat problem. With about an hour of mountain roads, the final leg of the journey got better still. The braking, handling and engine combined to make the twisting sections of road enjoyable rather than frightening, even when the odd surprise hairpin had a rutted, disintegrating surface.

The double disc at the front could drag the bike down from high speeds both quickly and safely. This was illustrated nicely on the occasion that a wasp took refuge inside my helmet when we were motoring along quite rapidly. This was probably the only time that the brakes were used in earnest and they really worked well. The back brake is also a disc, with a nice firm feel to the pedal and, for some reason, is the only brake which is connected to the stop lamp.

Coming out of a corner, grabbing a big handful of throttle and feeling a huge hand push you back down the seat was an experience not to be missed — my one regret is that we didn't have the chance to track test these bikes on a handling circuit. The mountain roads were the next best and it seems that the Suzuki was built for this kind of riding. Considering the amount of power available, the bike was surprisingly forgiving.

We did take the three bikes to MIRA for straight-line performance testing and while the mountain hairpins hadn't brought any complaints about the tyres, they let go surprisingly easily in the standing start acceleration tests. The first attempt — a fairly cautious, exploratory run — was the fastest, at 11.68 seconds for the quarter mile (as fast as the Katana, so it wasn't doing so badly). After that the back tyre lit up more and more easily, and the times got slower.

Top speed, at 139.6 mph was a fraction down on the Katana. The engine, with a claimed 111 bhp is the same as the Katana's, so any differences are due to the Katana's shape and small screen. More to the point, the naturally tucked-in riding position let the Suzuki run up to 129 mph with the rider normally seated. This, in fairly neutral conditions, is a better measure of the Suzuki's performance and gives some idea of the effortless, open-road cruising abilities — and the ease with which it could keep up with the others in all road conditions.

The fuel consumption shows how hard the Suzuki had to work. In identical conditions it was usually 10 mpg better than the R80RT, dipping once to 46.8 mpg but usually running just above 50. Over the whole trip it averaged 51.8 mpg — by coincidence, this was the *best* mileage that the BMW ever saw.

If the Suzuki was (relatively) good on fuel, it was significantly harder on its tyres. These were IRC items, rarely seen on big bikes and the rear tyre was wearing at least 20 per cent faster than the other two bikes. I say "at least" because it was not wearing evenly — either the wheel was out of balance or the tyre was out of round. Over most of the circumference the tyre lost 1.2mm in 1484 miles, in one sector it lost 2.0 mm — which was exactly twice the wear recorded on the other bikes.

Still, handling hadn't aroused any hostile comments and straight-line stability was good, right up to the enormous speeds which the 1100 is so easily capable of. There was, on the return journey as the tyres wore down, a slight weave at 80 to 85 mph, otherwise it was absolutely steady and for the first time ever the periphérique held no terror for me.

The general finish of the bike was good, but the black bars and levers were already scratched by the cable clips and the key fob, making the thing look very secondhand after only 3000 miles total use.

Everything else seemed about average for a big performance bike — the chain did the whole trip on one adjustment, it used a drop of oil on one of the faster sections and the tank gave around 160 miles before getting on to reserve.

The performance as a big roadburner is impressive and other than the inability to carry a passenger or luggage with any security, it is very hard to find fault with the 1100.

Peter Hughes

YAMAHA XJ650 TURBO

YAMAHA'S much vaunted XJ650 Turbo was billed as something a bit special, so we arranged a special test for it.

We were looking for three bikes to take us to the Bol D'Or 24 hour race at Paul Ricard and, more importantly, to bring us back.

Suzuki's GSX1100EZ and BMW's new R80RT were already booked and we thought the Yamaha turbo would complete an interesting trio. The Yam' seemed an ideal proposition for such a run. It was reputed to have the performance of a one-litre bike, good fuel economy and, most important, good aerodynamics.

We were expecting to clock up just under 2,000 miles in less than a week so we thought it a test worthy of a turbo.

I must admit, however, that I did view the idea of taking the Yamaha with more than little trepidation. Our test bike had blown a vital seal at the end of the previous road test, repairs to which meant we could only collect the bike a day before we were due to catch the hovercraft across to Calais — hardly enough time to give the bike the once-over before leaving.

Time was to suddenly become all the more precious when I realised that the Yam would need a couple of new tyres if I was to be sure of getting there and back without a change en route.

Master plan number one meant riding down to Dover the morning of the crossing but this soon became Master plan number two when I decided at the last minute to whiz down to Dover the night before to give me a couple of hours to sort the bike before leaving Britain.

Actually, whistle down would be more descriptive judging by the note of the turbo spinning at 180,000rpm. At low revs it sounds like a Harrier coming in to land.

I was in two minds whether to start the trip ▶

◄ at all when the Yam's clutch began to slip, but since it only complained when the plates were very hot and the throttle was opened savagely, I decided to take a chance and carry on.

Riding on boring French motorways for hundreds of miles at a stretch can be a bit of a pain at the best of times and this type of riding usually tells you very little about a bike's character. What it did soon give me, however, were indications of what to expect in terms of fuel economy and rider comfort.

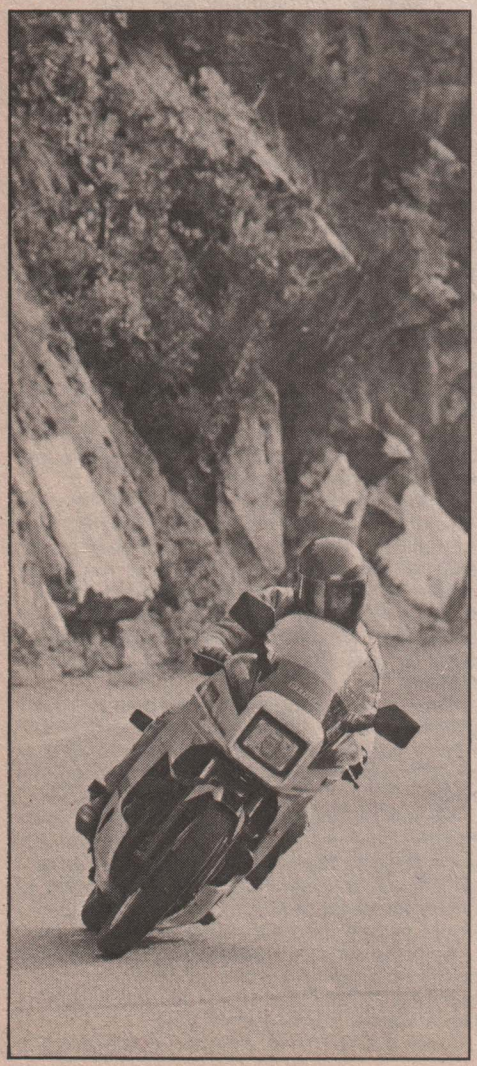
We reckoned that an average speed of 80-90mph would result in the best compromise between distance covered and time between fuel stops, and so it proved, especially for the turbo.

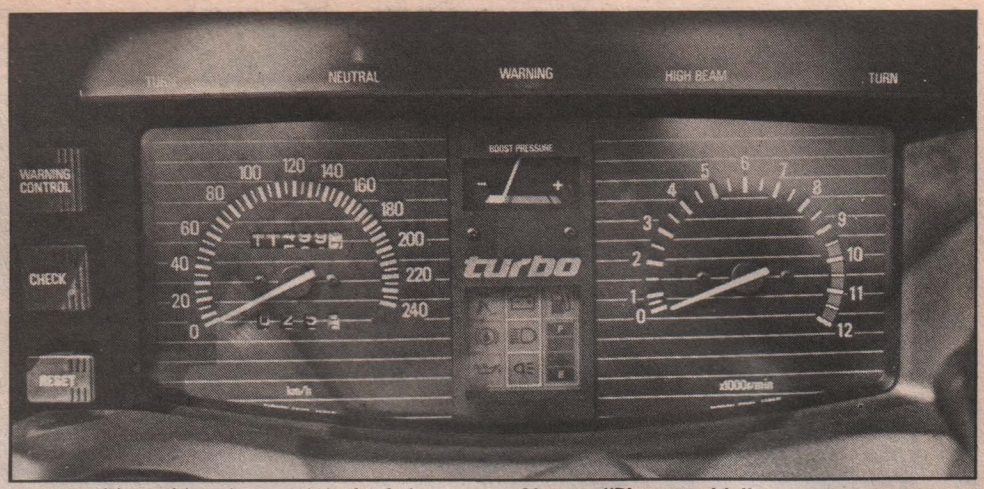
During the first two riding stints, the Yamaha achieved 51.6 and 54.4mpg. The 1100 Suzuki was almost as good but the 800 BeeEm was surprisingly worse, in the low forties in fact. Still, we all expected the BMW's large tank to give it the best range but approaching the next fuel stop we were proved wrong. Both the Suzi and the BMW went onto reserve but the Yamaha had not. The Yamaha's low-fuel warning indicator was flashing furiously trying to catch my attention but there was still a gallon left in the tank.

From then on, we refuelled at 160-mile intervals, or thereabouts, and the Yamaha averaged 52mpg, making it an emminently suitable tourer in this respect.

Yamaha's wind-tunnel tested fairing worked well at 80-90mph cruising speeds. The gush of air over the front screen just clips the top of your helmet but there's no buffeting.

At the start of the run, just south of Calais, we ran into a heavy mist which clouded the outside of our visors. Intead of repeatedly wiping mine, I was able to ride with it in the





open position with only a cool draft of air over my eyes.

The shape of the fairing tends to push down the front of the bike the faster you go. This makes steering corrections heavy but it gives you a feeling of stability.

Handling was very good, firm but far from light and twitchy. The front and rear shockers coped well with the bike's weight (496lb) although I had to run the rear units set at their hardest damping and spring pre-load position all of the time. I also still look forward to the day when anti-dive front forks are commonplace. The Yam does dive a lot.

It would be mean of me to criticise rider comfort because one day I clocked up 600-plus miles on the turbo without any body crippling effect. It's just that it is not quite as comfortable as the BMW we took on the trip. The Yamaha's seat isn't any harder but it probably isn't as well shaped nor is the riding position quite so upright.

So, as far as fuel economy and comfort are concerned the Yamaha is a touring winner, but what about performance?

Perhaps I was expecting too much of the Yam's performance before actually riding it, but the first time I whacked open the throttle and kept it there with the bike in top gear I was mildly disappointed.

It surged through the 100mph barrier with ease, and surprised more than a few frogs (the car transported species) by the speed with which it could accelerate from around 80mph. The speedo' needle continued to dash round to 190kmh (118mph) and then the rate of increase would slow up as it crept past the 200kmh (124mph) mark.

With only 8,500rpm showing on the rev counter, 1,000rpm below the red, it makes you think that the Yam is seriously underpowered, overgeared or both. Later, at the end of our Bol D'Or run, the Yamaha achieved 124.30mph at MIRA, but by then the clutch slip had got a little worse. Without slip I'm sure it would have gone a couple of mph quicker. I had seen 210kmh-plus on the speedo earlier in the test.

Standing-start quarter-mile times were also ruined by clutch slip. As soon as the engine peaked in first gear it maintained those revs regardless of the gear chosen. Its best run was 13.4s.

The standard unblown bike a few years earlier ripped through the timing lights in a staggering 12.8s, but there are rumours of a hurricane wind that day. You can understand my disapointment at the turbo, though... can't you?

It would be fairer I suppose to compare figures with a faired, standard XJ650 and we tested such a machine in December last year. That bike had a top speed of 116.6mph compared with 129.9mph for the unfaired model. The best quarter mile time it achieved was 13.3s. Granted, it wasn't equipped with yer

Above: *"Pictographic" type alarm system sits neatly below the boost pressure gauge — note the absence of psi figures.* Below: *The Yamaha is still comparatively slim despite being equipped with a very good fairing. The right hand silencer only comes into play when the turbo reaches maximum boost pressure.*

average computer designed jet nose cone of the turbo but it's a guide.

Incidentally, the turbo' managed 116mph with the rider sitting up.

So just what is the difference between the blown and unblown XJ650. Judging by the figures not much but then that damn clutch slip had clouded the picture somewhat.

The standard XJ engine is a cammy unit which has to have its testicles screwed off to get the best out of it. At low revs, its gutless and at 5,000rpm, there's a power trough in the true sense of the word. At these revs it's knocking out 27.2bhp, building up to 40.9bhp at 6,500rpm and a peak of 58.5bhp at 9,500rpm.

The big difference with the blown variety is that at 5,000rpm, when the turbo' is giving nearly maximum boost of 7-8psi, the engine is already churning out 45bhp and goes on to hit 64bhp at 7,500rpm and maintain it to the ►

9,500rpm redline when it begins to tail off.

To sum up, there's only a small increase in peak power but a staggering difference in mid-range wallop.

Even on the turbo though, at engine speeds below 5,000rpm, performance on the road is on the weak side of docile, when you want to pass quickly at speeds around 70mph, you need to drop one, maybe two gears, then it explodes into action.

At 6,000rpm, the power delivery is surprising in its ferocity and calls for some long-term planning, so soon do you overhaul your distance of view.

Compared with the Honda CX500 turbo which runs on a maximum boost pressure of 18psi, the turbo Yamaha could be said to be mildly tuned. Like Honda, however, Yamaha have felt it necessary to lower the compression of the standard bike (9.2 to 8.2:1) to avoid detonation.

The blown Yam engine also has sensors to detect knocking — no, not that kind of knocking. These sensors transmit a message to the transistorised ignition system which retards the timing.

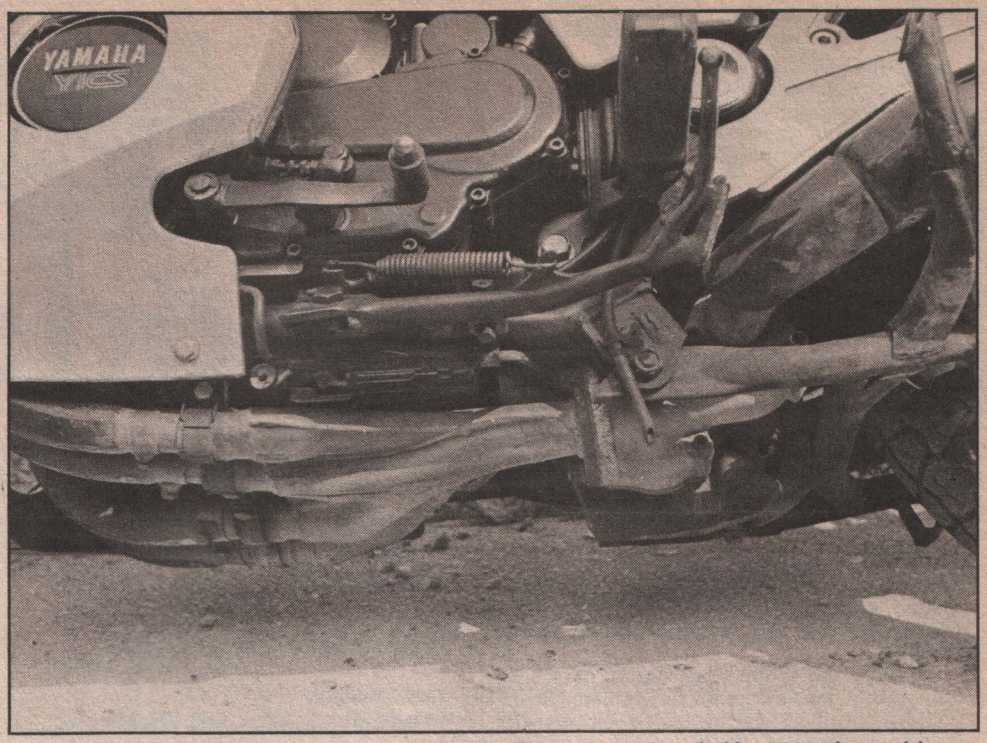
I suppose the fact that turbo boost pressure only peaks at 7-8psi (or 380mmHg if you want to be truly accurate) is the reason why there are no figures printed on the boost pressure gauge in the instrument panel. There are just different shades of colour to tell you whether you're getting boost or not.

Someone dissatisfied with the Yamaha's performance might decide, if the gauge were calibrated, that 8psi was a bit low and be tempted to bump it up a couple of psi. As it is, the red danger zone stands alone as if to infer "keep off".

There are two safety devices to stop the engine turbo-charging itself to bursting point as has been known on drag bikes. As well as a common turbocharger pop-off pressure safety valve in the exhaust system there is a valve in the surge tank on the inlet side which can depressurise the system if the exhaust waste gate fails to open.

I wonder who'll be the first person to "modify" the spring rate in the waste gate to try and extract more boost pressure? The secondary valve in the surge tank does not open until it "sees" a few psi higher than the waste gate so there's plenty of scope to try and blow your engine. One tip though, wait until the warranty expires. That way you won't feel too bad when Yamaha refuse to supply you with a new replacement engine.

At first sight, there is nothing externally to suggest that the Yamaha is anything but normally aspirated (apart from the giveaway TURBO logo on the fairing that is). The business end of the turbo set-up, the Mitsubishi turbo-compressor, is well hidden below and behind the crankcase where, say Yamaha, heat can be dissipated without bothering engine or rider.



Exhaust gases are led into one pipe to drive the turbine fan which is connected to the compressor fan in a separate sealed chamber on the right side. Siting the turbo beneath and behind the crankcase helps heat dissipation but some heat must be lost over the length of the extended exhaust pipes. Note how the heat has already begun to corrode the pipes.

In the South of France, the engine didn't suffer any overheating problems but I can't say the same for the rider. A hot day, a hot engine, coupled with slow moving town traffic were a bit too much even for the well ventilated Yamaha fairing. Wafts of hot air circulate around your legs and make life uncomfortable. Above walking pace, the fairing begins to do its job and the ride becomes enjoyable again.

One of the problems inherent in turbocharging is slow throttle response or TTL (Terrible Turbo Lag). This happens when the throttle is snapped open from low revs and the exhaust gases do not have enough velocity or volume to get the turbine spinning fast enough to be of any use.

Yamaha have used this theory, or excuse if you like, to fit a one-way reed valve in the surge tank on the inlet side which reacts to the negative pressure caused by the wide throttle openings. It opens up to allow the engine to breath directly through a conventional air filter at low and medium speed revs rather than sucking through the turbo.

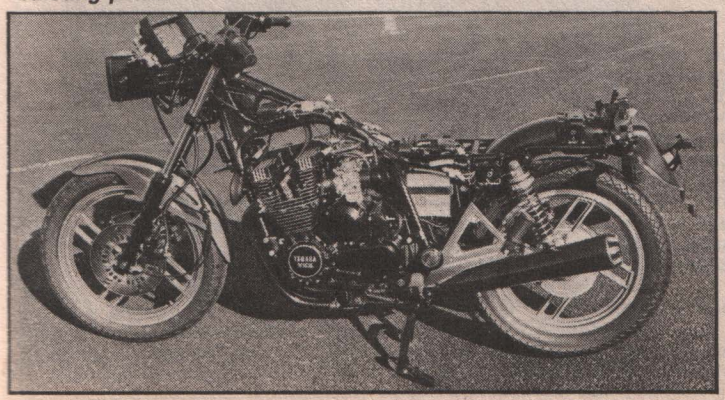
When the turbo blades speed up, the reed valve closes and you get full turbo boost. The system operates with four pressure-sealed 30mm Mikuni carbs and the overall result on the road is pretty good.

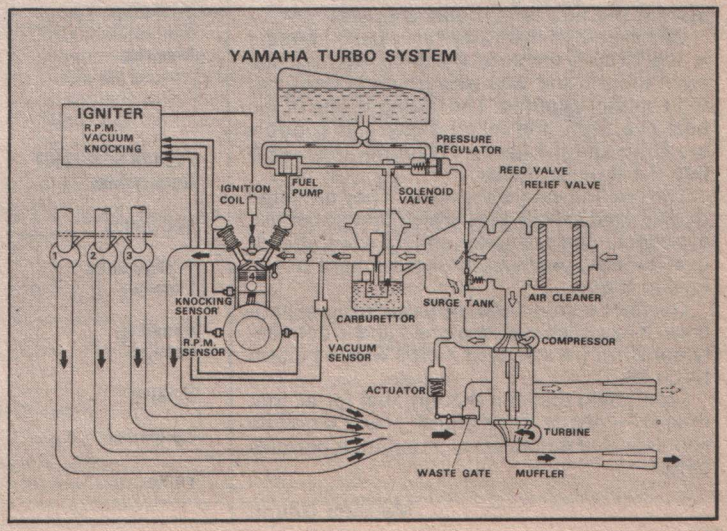
Using carburettors is a damn sight cheaper than the computer controlled fuel injection system of the Honda CX500 turbo, but from my blurred recollections of riding the Honda, it had better throttle response at low revs.

One thing the Yamaha doesn't like doing is travelling extremely slowly when hot. It stalled a couple of times when being turned round in the road and only a quick dab with a hefty left boot saved the fairing from a tarmac initiation ceremony.

Talking of fairings, which I wasn't, I happened to notice in the massive owner's manual for the turbo' that the fairing is made from 17 separate pieces of moulding. We tried to find out the cost of a new replacement but no one this side of Japan will yet own up to knowing how much it is. Neither could we find out the cost of a new turbo. The exhaust ▶

Below: ***Even with its tank, seat and fairing removed the Yamaha still almost manages to conceal the fact that it is turbocharged.*** **Right:** ***Schematic of the turbo system. There are two safety blow-off systems to prevent the turbocharger from pressurising the engine to bursting point.***





system, however, will set you back nearly £200.

For all its bulk, 285 pages in all, the handbook does not include one wiring diagram. Someone cynically suggested that perhaps Yamaha haven't got enough different colours to draw the complicated drawings for the electronics.

Back to the engine though, which has been well strengthened to take account of the extra stresses of the turbo. Cylinder heads have been redesigned with larger fins and bigger joint areas. The cylinders themselves are stronger, so too are the pistons and the oil feed has been modified for better cooling and lubrication. The exhaust pipes and mufflers are double-skinned with stainless steel inner tubes to withstand the extra heat. The engine has different camshafts to the standard XJ650 but the same inlet and exhaust valves.

Judging by the sheer number of modifications, there is not much chance of turbocharging your standard XJ650 engine using Yamaha spares.

It's a pity that the clutch has not been similarly beefed up. We weren't the only magazine to have problems of slip. *Australian Motorycle News* also hinted of trouble at the test strip.

From looking at the specification details of the turbo, it uses the same clutch plates as its unblown brother but the clutch springs are fractionally larger.

In 2,000 miles of testing the turbo's clutch didn't get much worse so at least an owner should get plenty of warning of impending failure.

Gear changing on the Yamaha is a clunky business at high speeds. On most bikes you need slightly greater pressure on the gear lever as the revs rise but the Yamaha is particularly bad in this respect.

It's like there is a coil spring behind the gear lever preventing you from selecting a gear. As the revs climb, the spring coils up more and more and increases the presssure on the lever. I often had to make a concerted effort to change up at high revs and I, for one, would prefer gearchanging to be less stiff. I don't think you can blame the shaft drive but this probably doesn't help. There was very little else to fault on the Yamaha, however.

My initial fears of reliability proved unfounded. The only unusual bit of running maintenance I had to do in France was to top up the battery twice with distilled water. Perhaps the heat of the engine causes the fluid to evaporate (the battery wasn't leaking).

I was also kidded into putting half a litre of oil into the engine. Why kidded? — Well, the oil level sight glass suggested that the level was low so I topped it up. A bit later it showed it to be overfull. I can only assume that some of the oil was trying to hide somewhere in the system the first time it was checked.

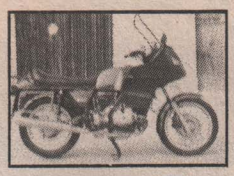
One aspect of the Yamaha I must commend is the overall finish of the bike, not just the paint job but the way everything is designed to fit snugly together. The fairing is one of the best I've seen, the instruments and controls are good and the general layout of the bike is tidy if a little compact.

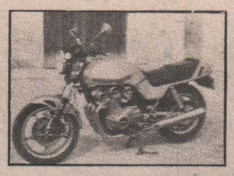
The rear indicators are novel. They are fitted to extended rubber legs which flop about like a demented pair of space antlers when you go over bumps, much to the amusement of following traffic.

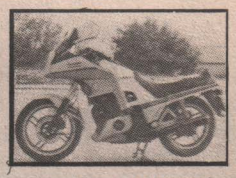
Overall I enjoyed the Yamaha turbo experience. It has been well designed and is definitely not simply a standard XJ650 with a bolt-on turbo kit.

I can't help thinking though, that for all that money — nearly three grand — and for all its sophisticated engineering, it ought to perform better.

Malcolm Gough







	BMW R80RT	SUZUKI GSX1100EZ	YAMAHA XJ650T
PERFORMANCE			
Maximum speed			
prone	104.2mph	139.6mph	124.30mph*
sitting up	90.8mph	129.2mph	115.60mph*
Standing-start ¼ mile	14.3s/91.9mph	11.68s/118.1mph	13.45s/103.65mph*
Fuel consumption			
average	41.1mpg	51.8mpg	52.3mpg
worst	35.0mpg	35.0mpg	43mpg
			(* figures achieved with slight clutch slip)
ENGINE			
Type	OHV flat twin	DOHC, 4cyl	DOHC, in-line 4cyl 4-stroke, turbocharged
Bore x stroke	84.8 x 70.6mm	72 x 66mm	63 x 52.4mm
Displacement	797.5cc	1074cc	653cc
Compression ratio	8.2:1	9.5:1	8.2:1
Fuel system	2 CV Bing 32mm V64	4 Mikuni BS34SS	4 Mikuni BS30 carbs & Mitsubishi turbocompressor
Ignition system	electronic breakerless	transistorised	transistorised
TRANSMISSION			
Gear ratios	4.40, 2.86, 2.00 1.67, 1.50	2.5, 1.77, 1.38, 1.125, 0.961	2.187, 1.500, 1.153, 0.933, 0.812
Primary drive	direct	helical gear	gear
Final drive	shaft/bevel gear	630 chain	shaft
Clutch	dry, single plate, diaphragm spring	wet, multiplate	wet, multiplate
Final reduction	3.36	2.8	2.909
ELECTRICS			
Generator	12V, a.c. generator 280W	12V, 245W a.c. generator	12V, a.c. generator 266W
Battery	12V, 28Ah	12V, 14Ah	12V, 12Ah
Headlamp	12V, 55/60W H4	12V, 60/55W	60/55W
CHASSIS			
Front tyre	3.25S x 19	50V x 19	3.25V x 19
Rear tyre	4.00S x 18	4.50V x 17	120/90V x 18
Front brake	twin disc	twin disc	twin disc
Rear brake	sls drum	single disc	drum
Front suspension	telescopic fork, 7.9 inch travel	telescopic fork with hydraulic anti-dive, fork travel 160mm (6.3 inch)	telescopic fork with air adjustment
Rear suspension	swing arm, 3 pre-load springs, travel 4.9 inch	swing arm, travel 108mm (4.25 inch)	swing arm, two spring dampers
Trail	3.7 inch	116mm (4.6 inch)	116mm (4.6 inch)
Castor	n/a	62 degrees	62 degrees
DIMENSIONS			
Wheelbase	1465mm (57.7 inch)	1510mm (59.4 inch)	1440mm (56.7 inch)
Overall length	2220mm (87.4 inch)	2225mm (87.6 inch)	2200mm (86.6 inch)
Overall width	930mm (36.6 inch)	770mm (30.3 inch)	730mm (28.7 inch)
Dry weight	214kg (472lb)	237kg (521lb)	225kg (496lb)
Fuel capacity	24 litre (5.3 gal)	22 litre (4.8 gal)	19 litres (4.18 gal)
PRICE	£2899	£2850	£2998
Warranty	12 months unlimited mileage	12 months unlimited mileage	12 months unlimited mileage
Importer	BMW (GB) Ltd, Ellesfield Avenue, Bracknell, Berks.	Heron Suzuki (GB) Ltd, 46 Gatwick Road, Crawley, W. Sussex.	Mitsui Machinery Sales, Oakcroft Road, Chessington, Surrey.
TESTER'S VERDICT			
Good points	comfort, practicality, weather protection	all-round performance	economy, styling
Bad points	fuel consumption, both stands	no grab rail or strap hooks	transmission, clutch slip
Performance	acceptable	very adequate	okay above 5500rpm
Economy	good compared to a TZ Yamaha	can be very good	very good
Handling	very safe and sure	fun	firm but heavy
Comfort	particularly good in UK climate	okay	good
Braking	heavy but effective	powerful	1 point below exceptional
Equipment	above average	average plus lots of instruments	sophisticated
Value	not cheap but has a lot to offer	at £26 per bhp it's cheaper than a 125!	best value for money turbo on the market!