

**T**HEY'RE both 500s but the similarity ends with the name on the tank. From the XT500's big, thumping enduro motor to the sedately humming XS500 twin, Yamaha's four-strokes have as much in common as the Lake District and the North Circular. Tough and rugged, the big single turns on power like a traction engine, heaving itself up 1 in 1 slopes

from a tickover with no apparent effort.

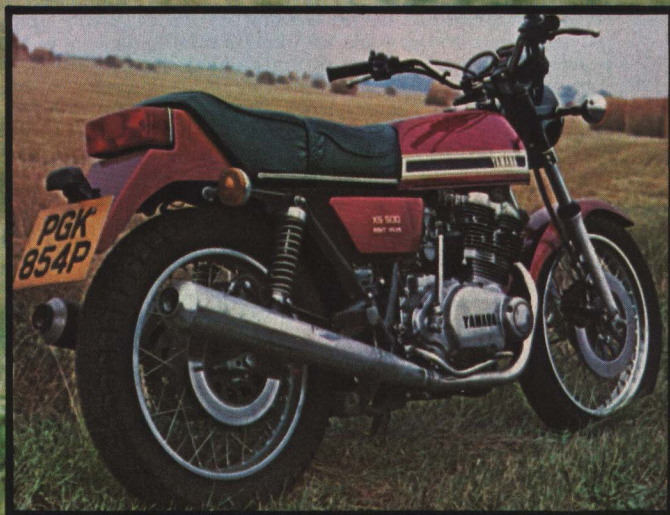
The silent twin is a smooth tarmac machine, feeling and behaving more like a lightweight two-stroke as the motor buzzes up through the gears and zips through traffic. Which-ever way you look at the two, it's hard to believe they both come from the same factory.

*continued on page 28*

**ROAD  
TEST**

By John Robinson

# ROUGH WITH THE SMOOTH





# ROAD TEST

## ROUGH WITH THE SMOOTH

### YAMAHA XS500

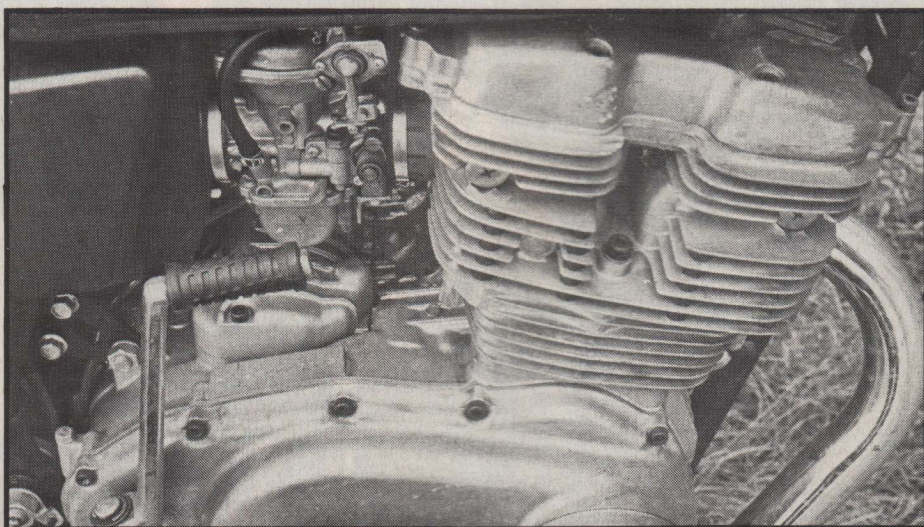
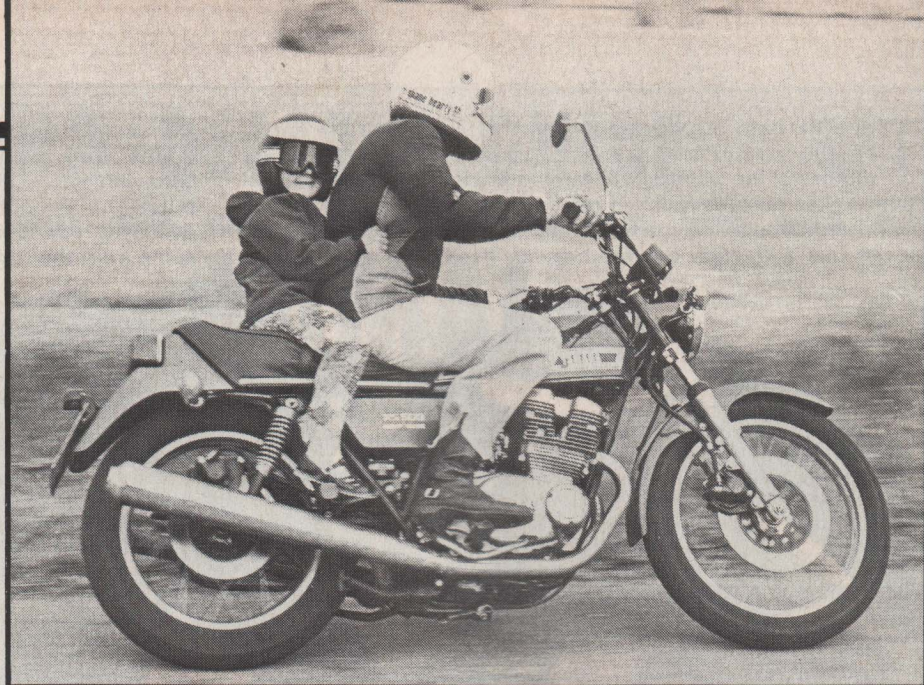
**T**HE sleek, neatly styled lines of Yamaha's 500 sum up its smooth character before you even sit astride it. It rolls on and off its stand as easily as a lightweight and the rows of Allen screws studding the engine casings give a hint to the quality which Yamaha have aimed at.

The eight-valve twin usually took a little while to start and warm up, needing the choke even in hot weather and when the fuel taps were turned on I often noticed a slight weep of petrol from the left hand tap. There was a light, very free feel to the controls, which with the very revvy engine responding to the slightest touch of throttle made the 500 feel more like a smaller, two-stroke multi. In fact, on the road the XS felt like it owed a lot to Yamaha's experience in two-stroke design.

As well as feeling light with a direct steering response through the handlebars, the motor behaved like a two-stroke, thriving on revs and needing them for instant acceleration. Keeping the speed down and dropping the Yamaha into a high gear gave rather woolly throttle response but kept the well silenced motor in the noise zone normally restricted to large limousines. In fact the machine was too well silenced, letting the rider hear all the worrying rustles and rattles from the valve gear.

Used normally, the motor was very smooth. Apart from one patch of vibration half way through the rev range and a tendency to snatch violently below 2000 rpm. The only evidence of the buzzing twin was slightly blurred mirror images.

The riding position is very upright but the tall handlebars and controls fall into a natural position to make the most of the Yamaha's light handling. Around town and for legal-speed cruising on country lanes, the riding position is superb. Above 60 mph the wind strain starts to tell both on the rider and the motor which has to struggle against the added drag. I found that the tank, which is designed so that it tapers up towards the top, looks good but is too narrow, leaving knees to jut out into the wind with nothing to grip on. The broad flat seat is amply big enough to carry a passenger and although it has a convenient hump to support a pillion rider, there is nothing else to hold on to. After an hour's solo riding I began to get uncomfortable and cramped. Carrying a passenger or some lug-



The eight-valve twin uses CV carbs. Note the abundant use of Allen screws

gage strapped to the seat improved the Yamaha's comfort enormously by taking some of the strain off the arms.

The motor never feels cammy, the power curve goes smoothly and progressively up to its 8000 peak, but between 5000 and 6000 the torque steps sharply up to its peak. On the road the effect was a howl from the exhausts, reminiscent of early Honda twins and an immediate response to the throttle as the motor got into the top half of its rev range.

With a modest power output, which relies on engine rpm rather than abundant torque the 500 is ideally suited to modest touring speeds. It will plough on at 60 to 70 all day long with the throttle backed right off. Sitting upright in a full riding suit restricts top end performance, 90 mph being a practical maximum with the same speed on tap in fourth gear. When we tried some flat on the tank runs, wearing leathers, top speed jumped up to a level 100 mph — into a 15 mph headwind — while the gearing allows a theoretical 110 plus mph at 9000 in top, 100 mph coincides with its peak power at 8000 rpm.

Someone who was looking for top end performance in this capacity class would be better off with the more lively Yamaha RD400 or the Honda CB550, as both concentrate their

power into being useful at the top end. Despite the sporty associations of the eight-valve, overhead cam layout, the XT500 spreads its power over a wide range of easy docility instead of letting it all come to a sharp point at the top.

With such a character, fuel consumption might be expected to be a big selling point; but using most of the motor's rev range and burning up fuel in hard acceleration, we got figures ranging from 44 to 51 mpg — much less than we'd anticipated from the general level of performance. On one occasion the consumption shot up to 70 mpg but as we were unable to duplicate this, it seems possible that a mistake was made in the mileage figures. It would be interesting to hear what fuel consumption XS500 owners reckon to get.

The handling and brakes — in particular — more than cope with the 500's pace and weight. It is one of those machines which steer on the handlebars, feeling light, easy to throw around and also as if it's getting close to twitching and weaving. But until the tyres wore down to their last 2 or 3 mm, the Yamaha never actually misbehaved. The tyres reached their wear limit quite suddenly. One day it was handling fine, a couple of hundred miles later it was skipping and twitching on



white lines and ridges. This and a trace of wallowing from the rear suspension were the only faults in an otherwise stable and predictable machine.

I still have doubts about the wisdom of using rear disc brakes until their wet-weather performance can be guaranteed, but I didn't get a chance to ride the Yamaha through any pouring rain, so I don't know how well the disc arrangement works. In the dry the brakes are powerful, and very controllable, needing only a touch but never coming on fiercely. Several times I rode the machine on wet roads where powerful brakes are often an embarrassment but the Yamaha could be braked quite hard with enough feel from the

controls to prevent overdoing it.

Overall the XS500 is a nicely developed, friendly sort of machine which is smooth and easy to ride, light to handle, great in traffic and powerful enough for touring. Long runs with a passenger seemed, if anything, easier than riding solo. It is not a roadburner and anyone who wants sports performance is likely to be disappointed. Maybe with some attention to the riding position, plus a fairing, the top end potential is there but the original package is aimed at a totally different kind of riding. It is lacking in two departments — fuel consumption is no better than you get from bikes with more performance and, at £839 the twin is not cheap. The Honda CB500T and

Suzuki GT500 are considerably cheaper, as are the RD400 and the Honda CB400F. The CB550F is only marginally more expensive.

The twin isn't ultra-powerful but its torque comes in early and stays pretty constant through the rev range to give a smooth, classic power curve peaking well within the motor's safe 9000 rpm limit. The flexibility which lets the motor pull full throttle from 2000 rpm means that it is producing more torque over a wider band than the XT500!

With lights and controls well up to its touring performance, a kerb weight of 440 lb and a range of some 140 miles, not counting reserve, the XS500 is well-placed in the highly competitive middleweight bracket.

**R**OUGH, tough, rugged are the kind of descriptions Yamaha's big single inspires. And after sampling the sweet-running docility of the twin, the other 500's rough edges are even more noticeable. Matching the clatter of the big single, the wholly functional approach is quite satisfying in its own way.

But let's get the bad news over with first. The XT500 could often be painfully obstinate about starting and it vibrated like only a big single can. Apart from this there was very little I didn't like about the bike and a lot that I found attractive. Possibly that's because this kind of bike has a very definite character and because it is so fundamentally different from anything else on the market that it is quite a novelty. But even after I'd got over the "new toy" stage it remained a bike I felt at home on and one which I thoroughly enjoyed riding — to the extent that if I had more than ten minutes' spare time I would grab a helmet and some boots and pray that the Yamaha would fire up before I ran out of time.

Big, high compression singles always had a reputation for poor starting and anyone who's ever turned over a Gold Star or a Velocette will remember the ritual of pushing it up to compression, easing it over and giving a long almighty swing on the starter. Whether it then fired and ran, or fired and broke your ankle depended on getting exactly the right settings of throttle, choke, fuel level, ignition retard and so on. People said you had to "know" how to start a big single and would probably say the same about the XT500. I've always been a bit sceptical about such traditions and certainly the Yamaha didn't need a knack in starting technique. It was hard to start because the kickstart is badly designed. The handlebars are tall and wide, there's no centre stand, the kick start is high, and to balance at the height necessary to achieve a full-blooded swing was quite perilous. Sometimes it fired up in the first few kicks, sometimes it didn't. We also used our XT500 for the carburation tests we ran last month and the dyo is equipped with a 12-volt starter motor: by the simple expedient of putting 24 volts across this trusty device we started the Yam easily, first time every time on all manner of carb settings, including over-rich and over weak, with the throttle in any position!

The nice four-stroke noises as the throttle is blipped quickly made up for the bad temper provoked by its hesitant starting but the next thing I noticed was the vibration. This was the first Japanese bike I've seen which flaps its front forks about while the engine is ticking over. The vibration caused lots of rattles and

## YAMAHA XT500



regularly loosened off the exhaust guard plate, losing the screws one by one until I finally removed it altogether. By the end of the test the rear number plate was also cracking up around its mounting screws.

The low-geared, low-revving motor produces lots of torque from the very start and would pull away as rapidly if you dumped the clutch at tickover or fed it in at high revs. All the gears feel low, although bottom will take it up to 30 mph — perhaps it's because the torque comes in early and doesn't change much plus the fact that the motor peaks at 6000. It gets up to about 80 mph quite rapidly and just hangs on to peak rpm in top — indicating that the gearing is just right — but it always felt like there was another gear to go.

General rideability and the motor's hard, flat torque band more than make up for the Yamaha's faults. The dynamometer test showed almost text-book power curves, implying that somebody at Yamaha got their sums right. The torque spread from 3000 to 6500 is flat, ranging between 20 and 25 lb ft to give peak horsepower at 6200 rpm with peak torque at 5300. From second gear onwards, changing up at peak power drops the motor right on to peak torque, which is exactly what an enduro racer wants. Bottom gear is lower but while it isn't low enough for trials' type trickling there is enough thump from the motor to pull a full load right from zero rpm. 26 horse-power at the back wheel may not be a lot but it's enough to nudge the speed just over 80 mph and the low-revving motor combined with the characteristics of the single cylinder give this with the maximum of traction — there's no point in having more power from a buzzy motor if all you get is wheelspin.

These things were pretty well predicted by the dynamometer but I'd already confirmed the Yamaha's capabilities — unintentionally — on an off-road circuit. I was experimenting with the Yamaha on the lesser slopes along the edges of a short but sharp bank which was nearly vertical for a few feet and went up at a rate of 1 in 1 on average. As I turned the 500 in a tight circle at the bottom, an unseen rock shoved the front end over, pointing the bike at the steep bit. I was still up on the footrests as the bike rolled up the slope, fully expecting it to stall as soon as gravity loaded it up. While working out which way to turn the bike and get off I gave it full throttle, the motor turned on like a steam engine and from tickover just heaved itself up the slope. That little exercise summed up what the XT500 is all about; it's easy to handle, produces power right where you need it and always manages to keep on going.

Perhaps a serious enduro racer would be able to find lots of things wrong with the Yamaha. But for someone who doesn't mind about not winning prizes, who still wants to be able to compete and who needs a bike for day-to-day transport it comes very close to providing the best in each of its roles. When you think that an enduro competitor isn't likely to get in more than eight or ten races a year the Yamaha also offers a lot of alternatives as a trail bike, commuter, even a modest tourer which will cruise at 70 mph without stretching itself.

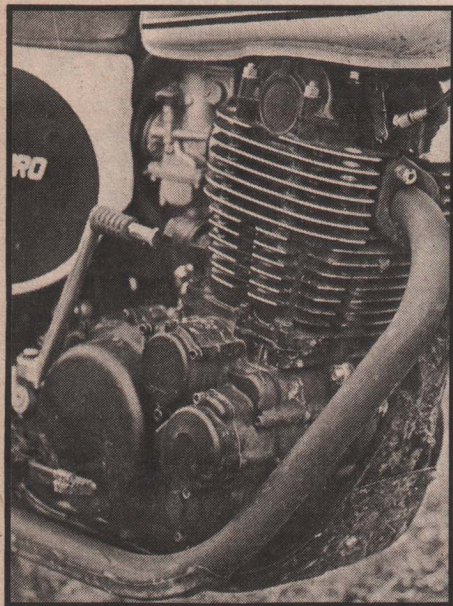
And the bike is economical, too. At normal road speeds but using the gears and acceler-



## ROUGH WITH THE SMOOTH

ating hard, it was still easy to get 59 mpg. Even on a tight off-road course where it was buzzing in first and second most of the time, it only dropped to 43 mpg.

On the road the handling is not unimpressive, on trials tyres the road holding and braking were up to roadster standards — and with a small single-leading shoe brake at that. The riding position and seat are comfortable, the lighting is good by trail bike standards and



Big single power is ideal for off-road traction but the 500 isn't as quick as the enduro two-strokes.

just about contains the bike's performance although dipped beam leaves a lot of dark spaces. With steering obviously set up for off-road performance the Yamaha reaches its limits at 70 mph on tarmac when the least disturbance would set up a violent wobble which had the handlebars flapping at a considerable rate. It didn't seem to affect the bike's progress, though, and could be stopped easily by either sitting further forward or by using a firmer grip on the bars.

There were several annoying details about the bike which could have been ironed out at the factory. Like having nowhere to clip an elastic strap to hold oversuits, etc. And indicators mounted via a rubber grommet on thin plate brackets. The first time the Yam fell over one of the brackets got bent. They look like they may be fairly easy to strip off but in the context of such a machine anything less than

30 seconds isn't really QD. The quick action throttle is a nice thing to have but the rubber grip was binding on the throttle drum giving an on-off action at low speeds which made the machine more difficult to control. Despite all this I found the bike so appealing that I could happily overlook its faults, resigning myself to the fact that I needed to wear a big pair of boots every time I rode it. A friend developed a technique for bump starting it, using the clutch and the decompressor in timed co-ordination but I couldn't contort my fingers into the necessary shape.

### LIGHT HANDLING

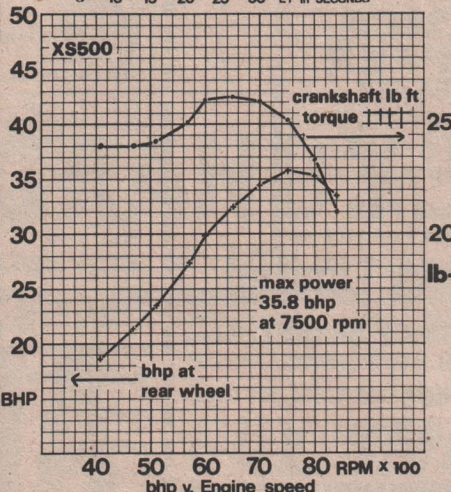
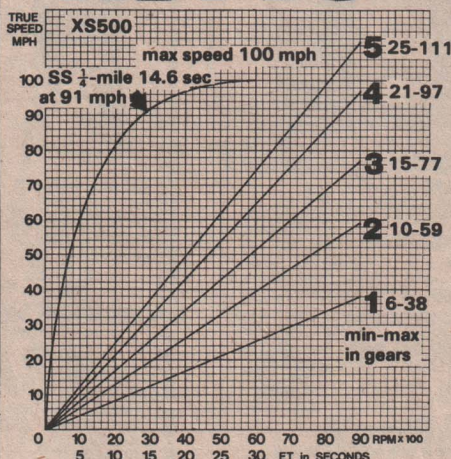
Off-road the 320-lb bike is light to handle and easy to manage, at least I found I could drag it out of the holes I got into without busting anything. It's geared for enduro/road use and isn't really suitable for tight, trials' sections so I thought it would be interesting to mark out a sort of moto-cross circuit and time the bike over it to see what sort of averages I could keep up. (In enduros the unseen route has to be covered at an average speed of 20 or 30 mph). We set up a course with a couple of sharp hairpins and an obstacle or two that were on the limit of what I would tackle without getting off and walking through it first. After riding round once, very slowly, to

measure the length of the circuit, I tried the Yamaha against the stopwatch. Although I had the advantage of knowing where the route went, this was offset speed-wise by only having two or three hundred yards of straight, the rest wriggling and climbing around an overgrown quarry.

On the first attempt the Yamaha managed 22 mph average, which I was quite pleased about because it was my first attempt at running an off-road bike against any time schedule. Also the straights which we'd included to let the bike pick up some speed and give me a rest, were proving as hard as the naggery bits. It had rained earlier and the drought-dried land was holding the surface water, stopping the Yam taking full power. To accelerate along the straights meant feeding it in to the point of wheelspin and trying to hold it on this limit with the back end bucking and slithering along.

After a couple more circuits I was finding that I could chuck the 500 about confidently and had got the average speed up to over 30 mph before I realised that the tyres were still running at full road pressure! Having witnessed the immense amounts of grip that moto-cross tyres can give, I would say that the Yamaha was doing very well under the circumstances. As far as I was concerned, knobbly tyres would have been worth quite a

## XS500



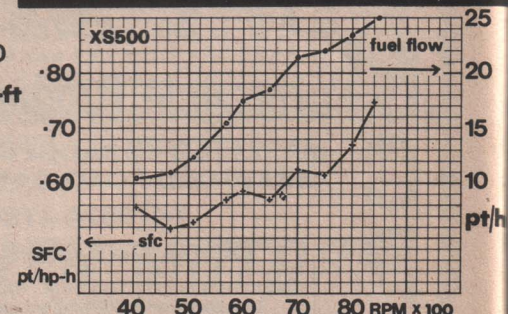
## PERFORMANCE AND TEST CONDITIONS:

XT 500: wet, ambient temp. 52 deg F, no wind.  
XS 500: dry, ambient temp. 56 deg F, 15 mph headwind.

| PERFORMANCE XT 500                      | XS 500                 |
|---|------------------------|
| Max speed..... 83 mph                   | 100 mph                |
| braking from 30 mph..... 27.5 ft        | 27.5 feet              |
| standing quarter..... 16.4s/79 mph      | 14.6s/91 mph           |
| fuel consumption:                       |                        |
| best..... 59 mpg                        | 70 (51) mpg (see text) |
| worst..... 43 mpg                       | 44 mpg                 |
| average over test..... 56 mpg           | 47 mpg                 |
| speedo error at 70 mph 1 mph fast       | 3 mph fast             |
| tacho error at 6000..... 300 fast       | 300 fast               |
| power to weight ratio.... 0.0823 bhp/lb | 0.0814                 |

### ENGINE

|                        |                  |                     |
|------------------------|------------------|---------------------|
| Type.....              | SOHC single      | DOHC twin           |
| displacement.....      | 499 ccm          | 498 ccm             |
| bore x stroke.....     | 87 x 84 mm       | 73 x 59.6 mm        |
| compression ratio..... | 9:1              | 8.5:1               |
| carburation.....       | one 34 mm Mikuni | two 38 mm Mikuni CV |
| ignition.....          | magneto          | cb and coil         |
| lighting.....          | 6V AC            | 12V DC              |
| lubrication.....       | dry sump         | wet sump            |





few mph plus a much easier ride, but to get an average speed of 30 when the available maximum was only about 45 mph — and briefly at that — was quite encouraging.

While the Yamaha gives a pretty comfortable ride — the seat is good and the riding position made a nice compromise between road comfort and being able to move around off-road.

## "BOUNCY" REAR

I found that it took some time to get used to the suspension. My first impression was that it was too stiff, letting road bumps get past the springs. Later I found that the long travel dampers presumably have quite strong springs to cope with the extra leverage and this gives the suspension more of a "bouncy" nature, particularly off-road. This was pretty good when I was able to use bumps and the springs to help navigate the bike but when I read the track wrong or things started happening too quickly the suspension took control and bounced the bike right where I didn't want to go. The rear suspension units have about four inches of travel and being steeply inclined need strong springs. The damper units contain pressurised nitrogen and give rigidly controlled rebound damping — the effect of a big bump is absorbed easily, followed by a very determined kick back from

the springs, at which point the dampers take over preventing any further bounce. Knowing this, if you drive the bike at a bump and make the front suspension work too, the springs will lift the bike and take it smoothly over, losing traction for the minimum amount of time. Get it wrong and the bump will have the back wheel kicking high in the air.

The front forks are simply clamped into the yokes, as the stanchions are parallel there is a mark scored on them to line up with the yoke in the "correct" position. This is all that is mentioned in the shop manual and all that Mitsui have been told, but the arrangement certainly looks like the forks can be adjusted over a length of three or four inches to effectively alter the head angle and trail.

Increasing suspension movement always causes transmission problems and the chain on the Yamaha drooped sadly when it was unladen (they've fitted a nylon roller on the swing-arm pivot to prevent it getting chewed up). But as soon as someone got on the bike and rode off, the weight transfer even under gentle acceleration was enough to tighten the chain up. I was lubricating the chain every 200 miles, but before the test was over the sprocket was showing more wear than you'd expect from its 3000-mile life.

It seemed to get through a fair amount of engine oil too. In less than 900 miles we'd

added two pints to the tank — contained in the spine and down-tube of the frame. It wasn't leaking and didn't appear to be burning oil — in the conventional sense of letting it get past the piston rings. We assumed that either the enormous compression ratio was squeezing it all into a smaller volume or that the crankcase breather was quietly passing it through the carburettor while nobody was looking!

The torque which is summoned instantly by a twitch of the throttle tempts a mention of the wide power range. In fact, although its muscle does make itself felt from 1000 rpm up to about 6000 this is a narrower range than most big roadsters which deliver from 2000 to 8 or 9000! In top gear the 500 would snatch like mad a needle's width below 30 mph, so it's not that flexible. But what counts is traction where it seems that one big bang every so often gives better results than lots of little ones closer together. Bishops and actresses please note.

For an enduro machine, especially one developed from the American TT500 racer, we were surprised to find that the rear wheel isn't QD. The chain has to come off — a lengthy operation with Yamaha chains as the split link is an interference fit in the fish-plate and on our model the spindle had to be drifted out. The bike's toolkit certainly wasn't up to the job.

The tiny single-leading shoe drum brakes worked surprisingly well on and off-road. From 30 mph we got stopping distances of 27 feet on the first few runs, gradually increasing to 31 or 32 feet as the front drum got hot. Our acceleration tests didn't show the Yamaha in its best light as the track was wet — normally a handful of throttle in bottom gear would have the front wheel climbing up into the air but the combination of water and the reduced rubber put down by the trials tyres simply resulted in wheelspin and the bike wouldn't take full power until it was well under way in second gear.

As a competitive enduro machine the 500 would need some tidying up. I'd guess it could lose maybe 30 lb of superfluous trimmings, scrambles tyres would improve it no end and there are many details which would need some tailoring. There are plenty of two-strokes which deliver more power but very few which are as easy to use — the Yamaha scores with its instant response, instant traction and the fact that it never appears to be stretching itself. And for the less serious competitor it is a much better all-rounder with all the qualities of a superb trail bike and a good enough roadster for commuting or touring.

Frank Melling, our off-road racer and tester, was a lot more critical about the machine looking at it from a serious enduro rider's point of view. As well as being too heavy and too big it is not, he reckons, fast enough, even on standard gearing. Worse still, the gearing is too high. Other details which Frank criticised include the push-pull throttle (two cables to break!), the low-slung exhaust, the mudguards which don't, and the poor riding position for hard fast riding.

Then there is the price — at £750, plus whatever it takes to make it competitive (Frank reckons £100), it is in the same bracket as Bultaco, KTM or Suzuki PE. And it is certainly a lot more expensive than a tweaked trail bike such as the 175 Yamaha or Kawasaki models.

# SPECIFICATION

## TRANSMISSION

|                |            |            |
|----------------|------------|------------|
| Primary drive  | 2.56 gear  | 3.04 gear  |
| final drive    | 2.75 chain | 2.53 chain |
| gearbox ratios |            |            |
| first          | 2.36       | 2.33       |
| second         | 1.56       | 1.55       |
| third          | 1.19       | 1.19       |
| fourth         | .92        | .97        |
| fifth          | .78        | .81        |

## CHASSIS

|                   |               |               |
|-------------------|---------------|---------------|
| Front tyre        | 3.00 x 21     | 3.25 x 19     |
| rear tyre         | 4.00 x 18     | 4.00 x 18     |
| wheelbase         | 56 in         | 55 in         |
| caster            | 59 deg 36 min | 62 deg 30 min |
| trail             | 5.3 in        | 4.6 in        |
| ground clearance  | 8.4 in        | 6.1 in        |
| dry weight        | 304 lb        | 425 lb        |
| test weight       | 322 lb        | 440 lb        |
| front/rear ratio, |               |               |
| per cent          | 42.8/57.2     | 45.4/54.6     |
| fuel tank         | 1.9 gal       | 3.3 gal       |
| oil tank          | 3.9 pint      | 5.3 pints     |

## PARTS PRICES inc VAT

|   |        |        |
|---|--------|--------|
| Front mudguard                                      | 16.75  | 7.28   |
| handlebars  | 6.34   | 5.80   |
| speedo cable  | 2.21   | 2.81   |
| exhaust system                                      | 79.98  | 68.84  |
| set of pistons/rings                                | 23.60  | 16.34  |
| set cb points                                       | 5.15   | 4.49   |
| list price  | 839.00 | 750.00 |
| warranty: 6 months or 4000 miles, parts and labour. |        |        |

# XT500

