

**T**HE introduction, three years ago, of the Yamaha XJ750 gave the world something it had lacked — a sporty 750, capable of holding its own against the hotties in the bracket, but also offering the benefits of shaft drive. It proved to be a great allrounder, with no particular facet of its design (except perhaps oddball styling and an overdose of electrogimmicks) detracting from the effect.

However, the hotties got hotter, and the XJ was left a little high and dry. And instead of bringing in a replacement straight away, Yamaha chose to counter with a neat Euro-styled 900 (actual capacity only 853 cm<sup>3</sup>), able to match the 750 screamers at their own game, and weighing no more. Call it the big-bore version of the new XJ750.

For 1984 comes the standard-bore version, the XJ750RL, identical in many respects with the 900. The areas of difference are centred on the omission of some of the 900's upmarket inclusions. It was a move aimed at keeping the bike price-competitive, but has resulted in a less capable motorcycle and will tend to limit the 750's share of the market.

The effect of the omissions is most critical at the front end, where Yamaha has deleted the 900's antive system and air preload. This leaves the 750 with a vastly undersprung and underdamped front end that simply can't cope with the braking and cornering ability of the bike.

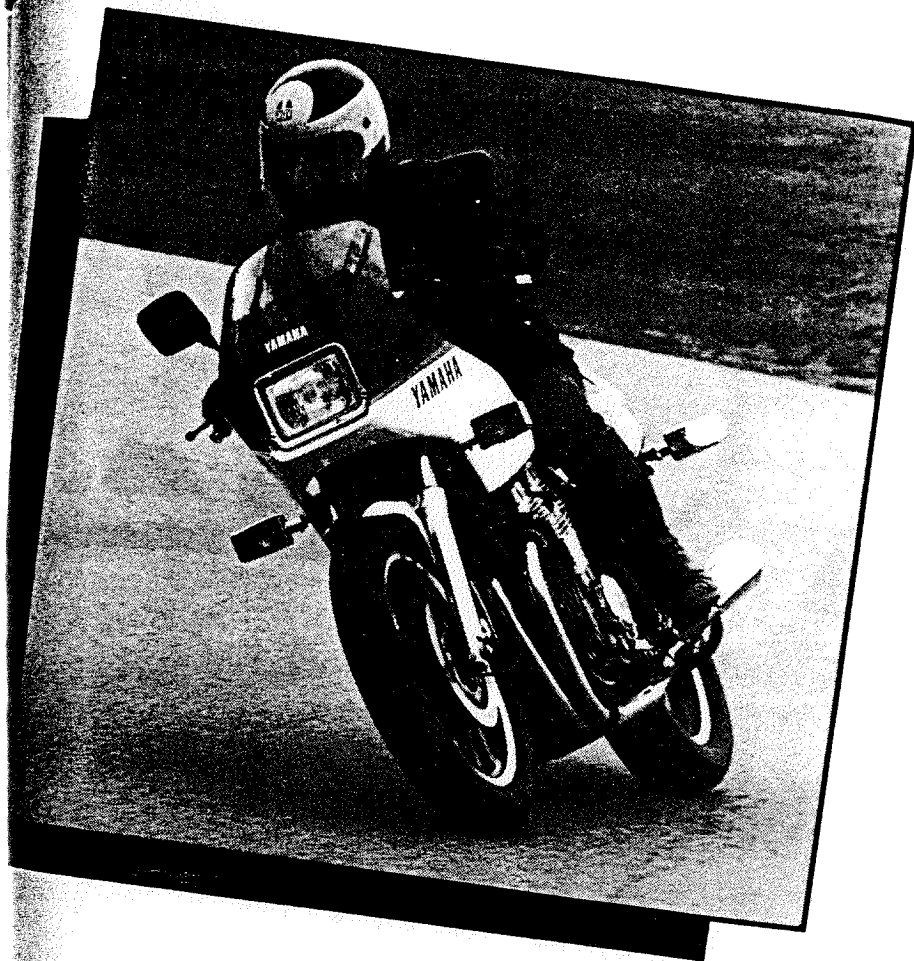
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The rear suspension is unchanged from the 900 and looks good in specification but its ability to soak up bumps or handle the forces placed upon it by the shaft drive is suspect.

Styling too has been taken from the 900, as has that bike's bodywork and frame. The front wheel is now an 18-inch unit, replacing the XJ750RH's 19-inch version not only with a smaller diameter but also a usefully wider rim. The rear wheel is also an 18-incher, with a 2.75 rim. Tri-spoke styling replaces the ten-spoke alloy wheels of the earlier XJs.

Yamaha has taken Suzuki's lead and fitted the 750 with V-rated Michelin tyres, a 100/90 A48 at the front, and a 120/90 M48 at the rear.

In the power department the Yamaha is now far closer to its opposition, with numerous internal changes having boosted the top end particularly. Yet the motor remains a neat and comparatively simple alternative to the four valves per cylinder, V configurations and water-cooling of some of its competitors.

With its two valves per cylinder operated by the double overhead camshafts through inverted bucket followers and shim adjusters, its one-piece plain-bearing crank, and the chain-driven alternator mounted behind the barrels, the unit is XJ through and through.

Bore diameter remains the same as previous models at 65 mm, but stroke has

been increased by a minute 0.1 mm to give a total of 56.5 mm and a capacity of 749 cm<sup>3</sup>. But the most substantial changes have taken place in the cylinder head with both inlet and exhaust valves gaining 1 mm in diameter and camshaft modifications giving 0.5 mm more lift and more duration. Induction is now taken care of by a bank of 33 mm Hitachi CV carburettors (up from 32 mm) equipped with YICS and the mixture is compressed at a ratio of 9.8:1 compared with 9.2:1 of the XJ750RK.

### Hello, power!

These changes have resulted in a boost to the top end. Yamaha claims a peak output of 64.9 kW at 9000 rpm, an increase of 4.5 kW over its predecessor. On the road this difference is negligible until around 6000 rpm. From then on, better power is available through to the redline at 9500 rpm.

This relatively strong top end, however, accentuates one of the more disappointing aspects of the engine — its midrange. With a strong bottom and top end bracketing it, the mid range feels comparatively weak and gives the XJ a power delivery pattern more akin to a bike of lesser capacity. While performance in midrange is not unreasonable, a down change or two helps the acceleration so much it becomes instinctive to do so for overtaking or quick progress through tight sections of road.

Responsiveness remains a strong point of the XJ engine, with instantaneous reaction to throttle movement being its forte. Although appreciated, this response can be excessive and smooth use of the throttle is required in traffic and exiting corners, when a sudden surge of revs is matched by an equally sudden change in suspension attitude as the drive shaft winds up. It can be disconcerting.

Fuel economy on test proved to be a mixed bag with the high-speed work giving a reasonable 15.1 km/l and normal urban riding seeing 17.1 km/l. Touring figures on the other hand showed a greater variation, ranging from a fairly disappointing 16.3 km/l to an incredible 24.0 km/l for one ride aimed specifically at obtaining the best possible economy. This involved an extremely sedate (read boring) expressway run with a constant throttle opening to maintain 120-130 km/h. While this figure was easily obtained it is unlikely many owners would see it unless expressways, an aching wrist and acute boredom were their thing.

Starting the engine hot or cold proved no problem — but keeping it running until warm did! The bike would not start cold without use of the handlebar-mounted choke control but would then race with the choke left on or stall with it off unless a slight throttle was maintained. Once underway it often stalled when backing off for the first corner unless the clutch was pulled in early and the throttle blipped. In its defence, however, once warmed the motor ran smoothly and quietly with no discernible vibration other than a slight buzz at around 4500 rpm and again towards the redline. In this respect the 750 was much better than the XJ900 we tested late last year.

### Step aside, GT

The XJ750RL takes the crown off the GT750 as the quickest 750 shafter we've tested, blasting through the standing 400 metre run in a consistent 12.2 seconds, 0.2 secs ahead of the GT and 0.45 secs ahead of the XJ750RH we tested in Oct '81.

Against the other sports-orientated 750s the Yamaha also held its own, beating the Suzuki GSX by 0.1 secs and only lagging 0.05 and 0.2 secs behind the Kawasaki GPz and Honda VF respectively. More importantly, the XJ proved exceptionally easy to get moving quickly, and backed up happily for several acceleration runs without protest from the clutch or gearchange.

Dyno testing confirmed that this is one powerful shafter. Strapped down, the XJ put out 47.5 kW at 9000 rpm and 51 Nm of torque at 8000 rpm. That puts it fourth in the 750 cm<sup>3</sup> rear wheel power figures behind the GPz, VF and new CBX and second in the torque figures, just shaded by the CBX.

Compared with the original XJ750, the increases look even better than those claimed by Yamaha, with the RL gaining 14 percent in power at the same revs and making 5.5 Nm more torque at 500 rpm less.

Apart from the increases, the dyno showed graphically what our ride impressions had suggested. The torque curve started well, increasing to around 40 Nm at 4500 rpm, but then actually dropped slightly until 6200 rpm before increasing steadily to its maximum at 8000 rpm.

The strong bottom end translates to excellent top-gear pull around town but the flat mid range makes frequent gear changes a necessity to extract the best out of the bike on the open road. If you accept that necessity the bike's open-road performance is excellent.

The XJ750 has reaped the benefits of having a bigger brother by scoring the XJ900's beefed-up gearbox internals. This also translates to mean significantly longer legs than the XJ750RK, a reasonably high 22.9 km/h per 1000 rpm in top gear compared with 21 km/h per 1000 rpm.

### Driveline blues again

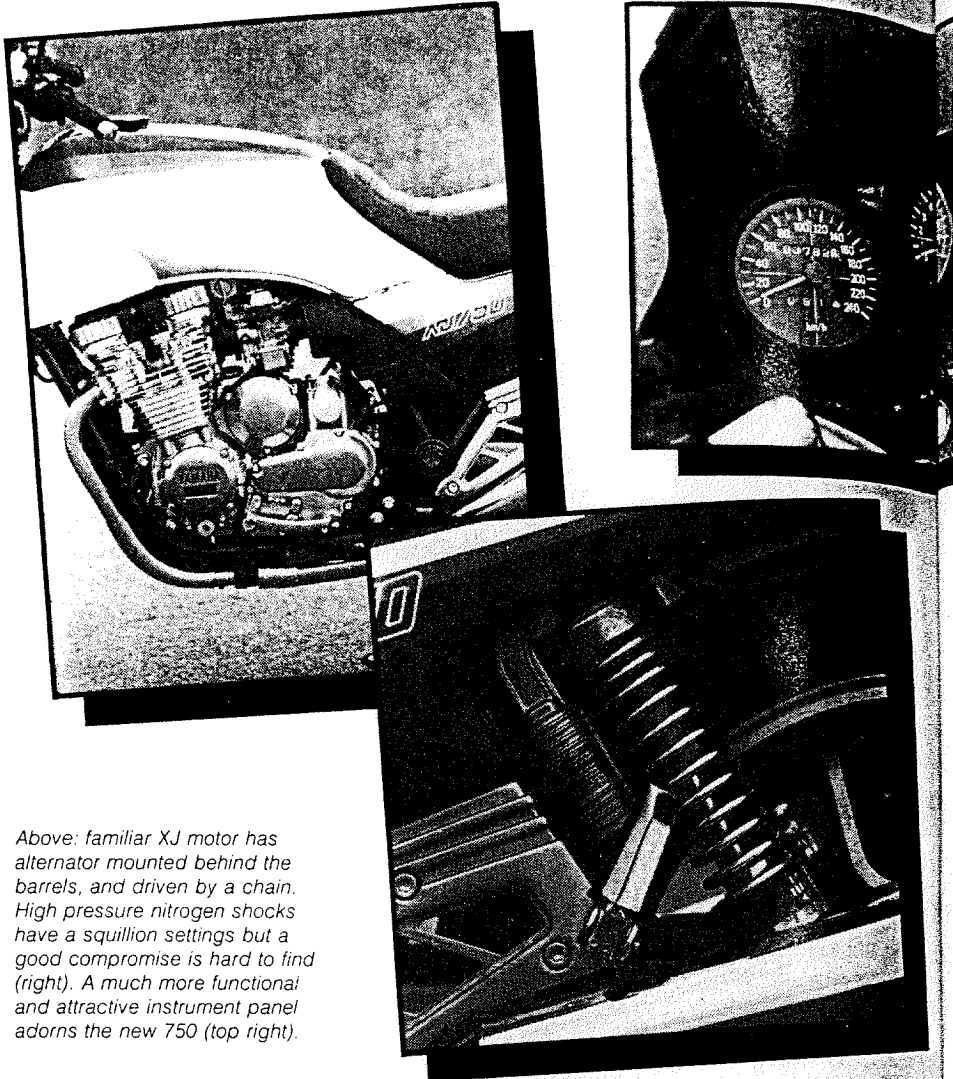
The 750 suffers from a fair amount of torque reaction from its power transmission. In this respect it is better than the 900, but still has excessive driveline freeplay and rises and falls badly at the rear end with throttle changes. A further problem is the presence of rear wheel patter under hard acceleration, behaviour which is particularly prevalent under power over rough or broken surfaces.

We found the clutch had a moderately heavy lever feel, yet was progressive and smooth. The gearchange action was a little heavy with a longer travel than typical, but all in all the gearbox behaved faultlessly throughout the test. Overall the transmission is a fine unit with a ratio spread which suits the engine's power characteristics well.

The XJ750RL receives the larger full double cradle frame of the 900 and while this unit is rigid and beyond criticism, the bike's overall handling suffers from other deficiencies — notably the suspension.

The forks lack the 900's air preload and antitive equipment but haven't seen a boost in spring or damping rates to compensate for their omission. This leaves the 750 with a vastly undersprung and underdamped front end that bottoms out far too easily over large potholes and under brakes. These events see the stability of the bike reduced markedly due to the resultant loss in trail and suspension travel.

The rear suspension units too are not without fault, although in specification they



*Above: familiar XJ motor has alternator mounted behind the barrels, and driven by a chain. High pressure nitrogen shocks have a squillion settings but a good compromise is hard to find (right). A much more functional and attractive instrument panel adorns the new 750 (top right).*

look good. The shocks are high pressure nitrogen gas items with five preload and twelve damping settings. Adjustment of these settings is made by rotating two knurled rings at the base of the shock: one adjusts the preload and damping simultaneously, while the other takes care of damping fine tuning.

Ideally, this system should give a broad range of suspension settings for various loads and road conditions but the spring rate is too heavy and the damping range not as wide as you would expect from a set-up with twelve available settings. This leaves the shocks with a poor ability to soak up small bumps. We found the softest spring setting and a high damping setting the best compromise.

Set up this way the bike gave a more comfortable ride and all but eliminated the high speed float that the rear end demonstrated over rises. Lower damping settings exaggerated this problem and more often than not the rider's bum was left in the air over rough surfaces.

### Not a good match

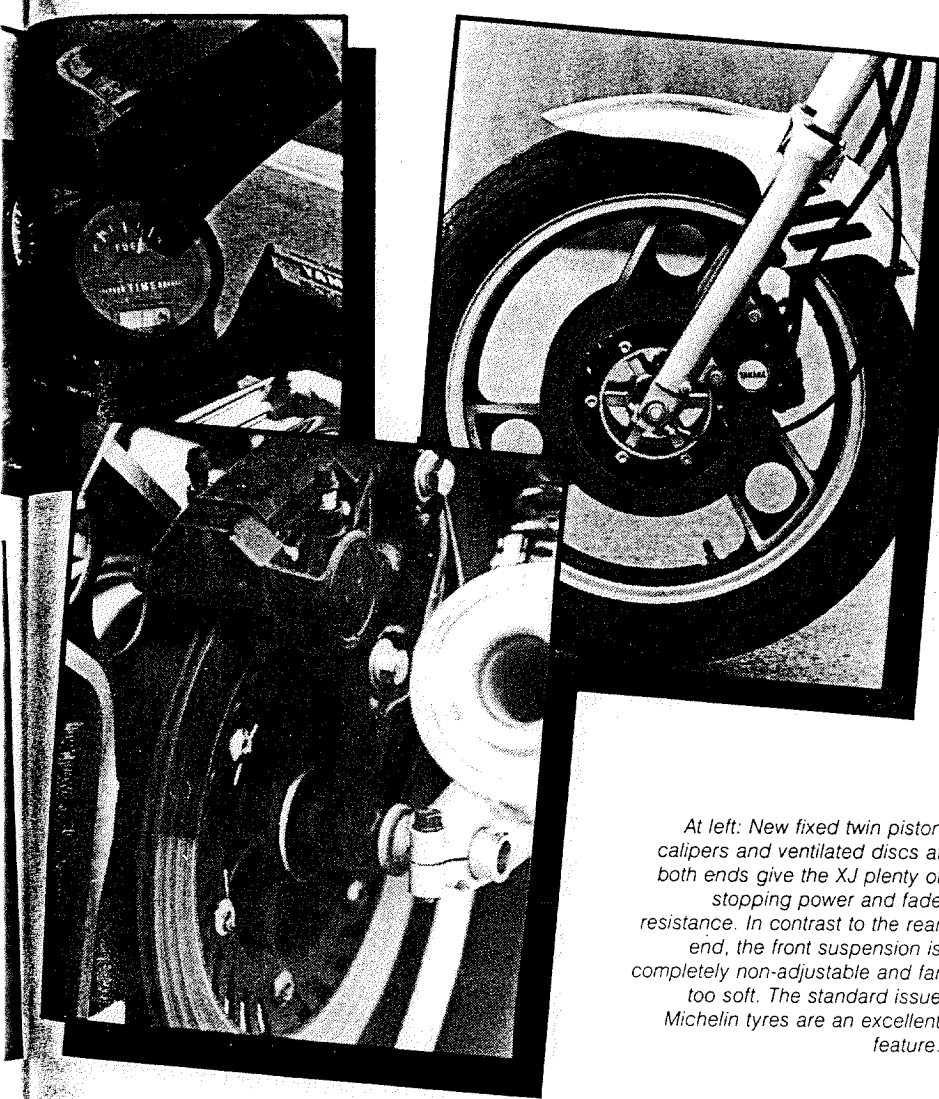
Overall suspension match left a lot to be desired with bumpy bends and braking

in corners exposing the poor co-ordination between front and rear. These conditions in their extreme had the front end plowing under and simultaneously the rear end hopping about — not a combination which enhances line recovery.

Around town the story improves. In this environment the bike feels lighter than its 218 kg dry weight. Quick changes of line and side-to-side swerving are strong points. Such manoeuvres are aided by the front wheel which provides quick steering without having a tendency to drop into slow corners. The only criticism in this area is the presence of some self steering at very low speeds (parking or U-turns) which some riders may find disconcerting.

In overall terms, the bike handles well, with the light precise steering, a strong frame and good cornering clearance. The Michelin tyres aid exploration of this clearance although their relatively flat profile leaves a fine line between a controlled slide and sliding behind the bike. The pegs were the only items we scraped and grounding anything else is unlikely while contact with the seat is maintained.

Yamaha's braking system design is one



*At left: New fixed twin piston calipers and ventilated discs at both ends give the XJ plenty of stopping power and fade resistance. In contrast to the rear end, the front suspension is completely non-adjustable and far too soft. The standard issue Michelin tyres are an excellent feature.*

of the areas in which racing technology has been applied to the road, resulting in fixed twin-piston calipers being fitted to the discs on the XJ900, and now the 750. These provide greater power and feel than the old floating piston calipers and when coupled to the XJ's ventilated discs front and rear give a system with excellent fade resistance and fine wet-weather performance.

Lined up against the competition the front brakes have more feel than the Suzuki items but lack a little of both power and feel compared with the Honda CBX750 and Kawasaki GPz 750 units, currently the best Japanese brakes in the 750 class.

In their resistance to fading and locking the XJ brakes are equal to the best — fade is impossible to induce and both the front and rear units offer heaps of retardation without locking (the rear is particularly good in this respect).

Unfortunately the edge is taken off the ultimate braking performance by the front end, and while the absence of the antidive improves the feel at the lever, the forks dive so heavily that the full stopping potential cannot be used unless surface

conditions are ideal.

Braking ability in corners and on rough surfaces is another weak point of the bike. We found under these conditions that more rear brake than usual was required to stabilise the machine and stop the front end washing out.

### Back from the Space Age

With the transition from RK to RL the XJ750 loses the Buck Rogers flight panel and gains neater and more functional instruments. Idiot lights are kept to a minimum with oil level, high beam and neutral lights beneath the main instrument binnacle in the console which also holds buttons for setting the LCD clock.

The well-designed three-quarter fairing is rigidly mounted and holds the 60 55W QH headlamp which provides a good spread of light although the low beam cut-off is a little sharp. Other lights are good with large indicators mounted on flexible stalks and a bright, twin bulb, stop tail light giving ample warning of your intentions to the tin-top brigade.

The tank, side covers, seat and tailpiece are the same units used on the XJ900 although clever paintwork has

changed their appearance. The fuel tank is a large 22 litre unit which has a lockable cap and plenty of flat surface area on which to strap a tankbag. The 22 litres includes a useful five litres of reserve which was generally not needed until after 300 km, so 400 km should be within the bike's touring range. The seat proved to be a bit of a disappointment in its ability to absorb transmitted road shock although it was generally comfortable for both rider and pillion passenger.

The riding position is a compromise, with the lower part of the body adopting an upright position, while the rider is forced to lean forward to the bars. This involves bending the back which becomes uncomfortable after long stints on the bike — a problem which would be alleviated by the inclusion of the 900's multiadjustable bars.

The switchgear is generally good with choke, indicators, horn, passing and high beam controls located on the left block and the starter, headlight and kill switch on the right. Our only complaint in this area is the collar type choke control which is easily knocked to the on position when giving some errant motorist a blast of the dual horns.

Mirrors unfortunately are not as good as the other ancillaries with their unusual parallelogram shape cutting vision in important areas. As extreme outside vision was cut the best idea is to turn them through 90 degrees — looks odd but works well. Additionally the mirrors vibrate at low revs and are knocked out of adjustment by the corners of the fairing which they hit on full lock. This problem could not be resolved by adjustment without limiting the field of view.

Finish of the bike is good with neat touches including a storage compartment in the tailpiece, an alloy pillion grabrail plus a smaller grabrail at the side to aid lifting the bike onto the well balanced centrestand. In addition a comprehensive toolkit resides under the right side cover from where it can be obtained without the need to remove luggage strapped to the seat.

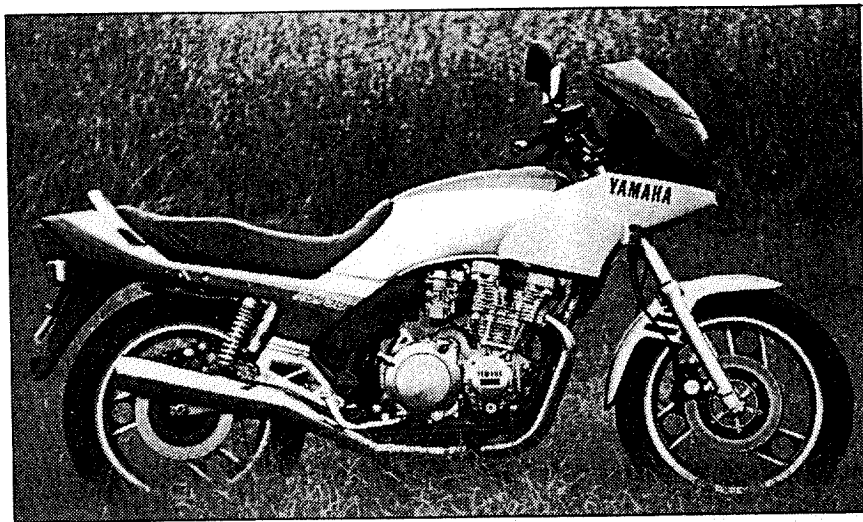
At \$4199 the XJ750RL falls into the lower end of the 750 price range and at this figure represents pretty good value for money for those looking for a sporting 750 shaft drive with all-road potential.

As an overall package the bike is let down by the performance of its suspension which has an adverse effect on nearly every facet of its otherwise excellent performance and function. With improved front suspension the Yamaha's sporting potential would be more close to being realised, while the shaft drive would still give an advantage in the touring biased role.

In other words, with a few deficiencies removed the XJ750RL could be an outstanding allrounder.

— S.M.





# YAMAHA XJ750

## ENGINE

Air-cooled transverse four-cylinder four-stroke. Chain-driven double overhead camshafts, two valves per cylinder, clearance adjustment by shims. Forged one-piece crankshaft, plain main and big-end bearings. Wet sump lubrication.

Claimed maximum power	64.0 kW at 9000 rpm
Claimed maximum torque	70 Nm at 7000 rpm
Bore x stroke	65.0 x 56.5 mm
Displacement	749 cm <sup>3</sup>
Compression ratio	9.8:1
Maximum engine speed	9500 rpm
Carburation	4 x 33 mm Hitachi CV
Air filtration	Pleated paper
Starter system	Electric only
Ignition	Transistored battery/coil

## TRANSMISSION

Gear primary drive through wet, multiple clutch to five-speed, constant-mesh gearbox. Left foot shift, one-down, four-up pattern. Shaft final drive.

Ratios (overall:1)

(km/h per 1000 rpm in brackets)

First	14.55 (8.5)
Second	9.98 (12.4)
Third	7.67 (16.1)
Fourth	6.21 (19.9)
Fifth	5.40 (22.9)
Primary reduction:	1.672:1 (102/61)
Secondary reduction:	1.297:1 (48/37)
Final reduction:	3.069:1 (89/29)

## FRAME AND BRAKES

Welded tubular steel double cradle frame. Telescopic forks. Rear suspension by twin gas/oil spring/damper units with remote fluid reservoirs. Five spring preload positions, 12-way adjustable damping. Twin disc brakes front, single rear, twin piston fixed hydraulic calipers.

Front suspension travel	120 mm
Rear suspension travel	65 mm
Fork rake	27 degrees
Fork trail	114 mm
Front brake diameter	270 mm
Rear brake diameter	270 mm
Front tyre	100/90 V18 Michelin
Rear tyre	120/90 V18 Michelin

## DIMENSIONS

Dry weight	218 kg
Seat height	790 mm
Wheelbase	1480 mm
Ground clearance	150 mm
Fuel capacity (incl. reserve)	22 litres
Fuel reserve	5 litres
Engine oil capacity	3.6 litres

## CALCULATED DATA

Weight to power ratio (90 kg load)	6.48 kg/kW
Specific power output	63.4 kW/litre
Mean piston speed at redline revs	17.9 m/sec

## PERFORMANCE

<b>Acceleration</b>	
Standing 400 m	12.2 secs at 174 km/h
Zero to 100 km/h	4.5 secs
Maximum speed	208 km/h
<b>Braking</b>	
From 100 km/h to zero	35.9 metres
From 60 km/h to zero	12.3 metres
<b>Fuel consumption</b>	
Touring	19.1 km/litre
City	17.3 km/litre
Hard riding	15.1 km/litre
Average on test	17.6 km/litre

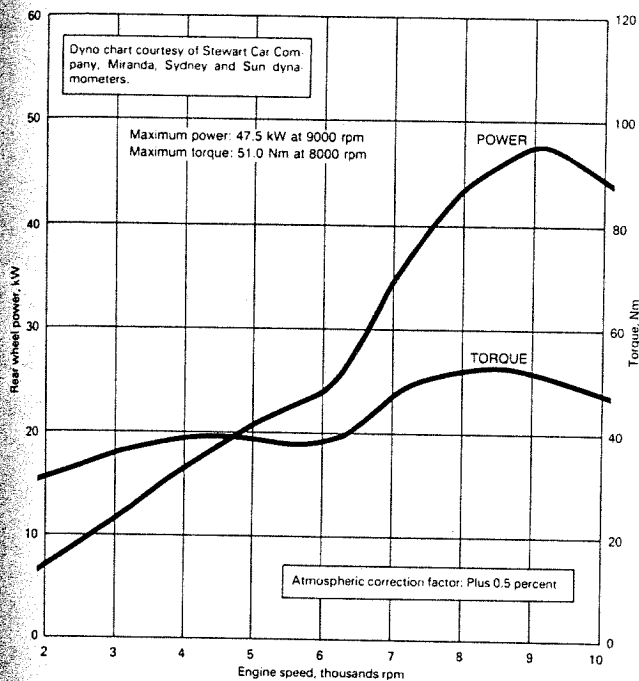
## TEST MACHINE

Manufacturer	Yamaha Motor Company, Iwata, Japan
Test machine	Yamaha Motor Australia, Silverwater, NSW
Price	\$4199

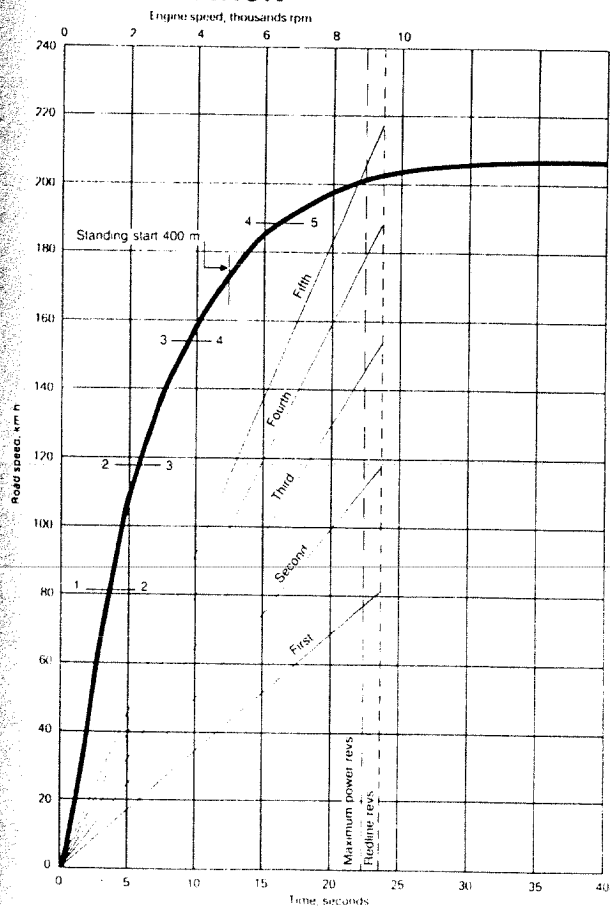
**Best points:** Excellent bottom and top-end power. Well laid-out, functional instruments. Nimble feel in traffic. Good lights, loud horn, strong brakes. Well-finished quarter fairing.

**Worst points:** Front suspension too soft and readily bottoms out. Rear suspension too harsh, affecting long-distance comfort. Braking stability under poor road conditions is not good. Midrange power very disappointing. Mirrors need a more thoughtful design.

## CHASSIS DYNAMOMETER



## ACCELERATION



## SUMMARY

	Poor	Below Average	Average	Above Average	Outstanding
<b>RATINGS</b>					
<b>ENGINE</b>					
Responsiveness			●		
Smoothness			●		
Bottom end power				●	
Mid range power		●			
Top end power					●
Fuel economy			●		
Starting		●			
Ease of maintenance			●		
Quietness			●		
Engine braking				●	
<b>TRANSMISSION</b>					
Clutch operation				●	
Gearbox operation				●	
Ratio suitability			●		
Drivetrain freeplay		●			
<b>HANDLING</b>					
Steering			●		
Cornering clearance			●		
Ability to forgive rider error			●		
High speed cornering			●		
Medium speed cornering				●	
Bumpy bends				●	
Tossing side to side			●		
Changing line in corners				●	
Braking in corners				●	
Manoeuvring		●			
Top speed stability			●		
<b>SUSPENSION</b>					
Front		●			
Rear		●			
Front/rear match		●			
<b>BRAKES</b>					
Resistance to fading				●	
Stopping power			●		
Braking stability		●			
Feel at controls		●			
<b>CONTROLS</b>					
Location of major controls			●		
Switches				●	
Instruments				●	
<b>TWO-UP SUITABILITY</b>					
Passenger comfort			●		
Stability with pillion			●		
Cornering clearance two-up			●		
<b>GENERAL</b>					
Quality of finish			●		
Engine appearance			●		
Overall styling			●		
Seat comfort		●			
Riding position		●			
Touring range			●		
Headlight			●		
Other lights			●		
Stands			●		
Rearview mirrors	●				
Horn		●			
Toolkit		●			
<b>VALUE FOR MONEY</b>					
			●		