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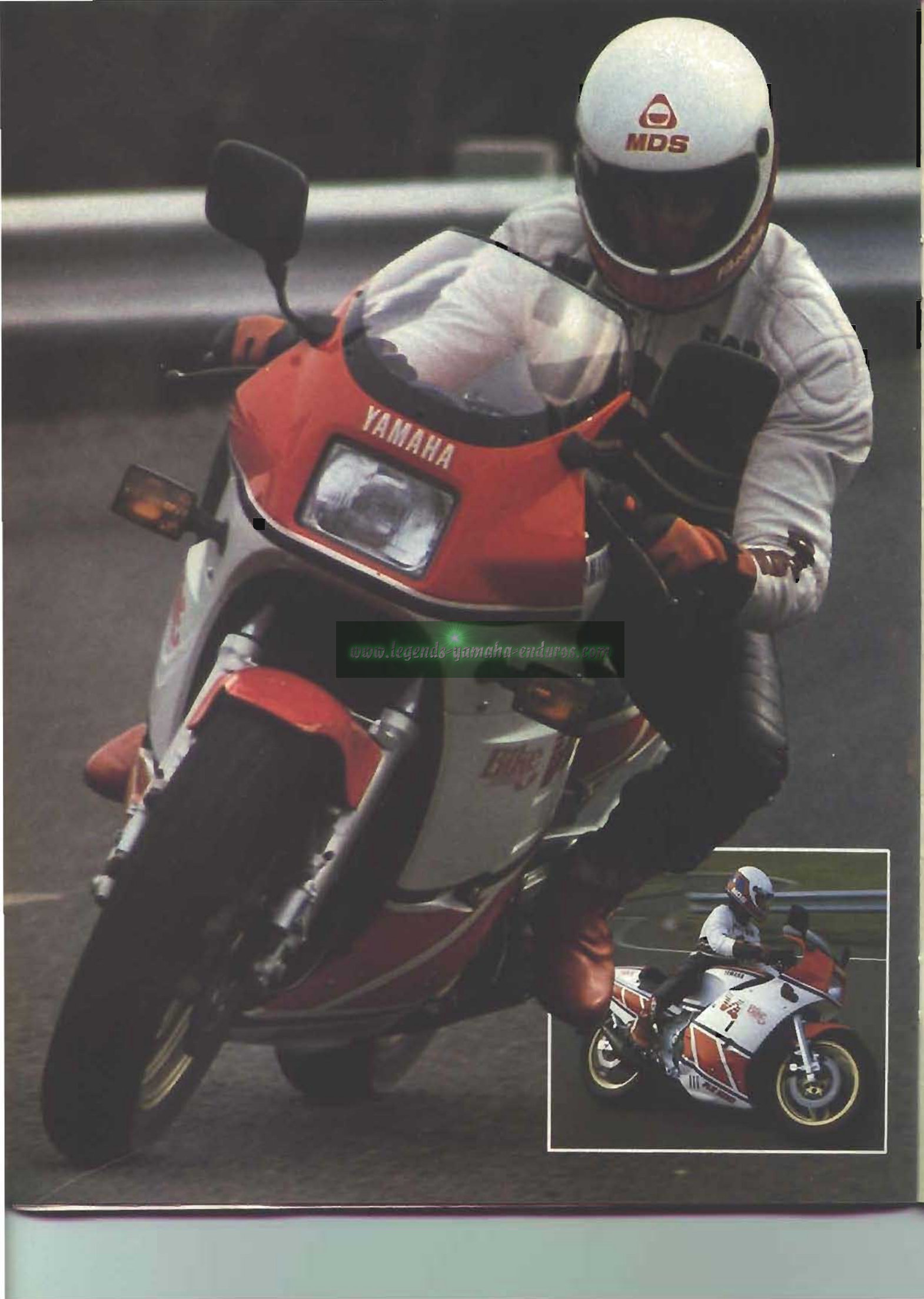


YAMAHA RZ500L

BIKE TEST

Bob gets his TZ back

Bob Rosenthal's eyes went misty when he first saw one — so he ordered it, and now here he is testing it! That might seem the wrong way around to you, but it made perfect sense to him!

To say that the world waited with bated breath when Yamaha let loose rumours of the RZ500 would be an understatement. Not since the Ducati Mike Hailwood replica has a factory put so much on the line and produced a model so close to actual world championship bikes. There have been various Honda "R" models, but these have been modeled on superbikes and production racers, not GP bikes.

I first saw the RZ at the 1984 Melbourne Motor Show and made immediate plans to acquire one. Like, man, I just had'ta have one! It was duly ordered and I ended up with the first privately registered RZ500 in Victoria. To say that I am impressed is also an understatement. It is so close to the race bikes that Milledge Yamaha used to give me it's not true. One of the real regrets I have since retiring from active competition is that I did not buy my last TZ750E and just put it away. Mount it up in my rumpus room and sit and dream of days gone. I have films, photos, great memories, but, not one of my bikes.

Well, all that has changed. I now have something that feels like one, looks like one, almost goes like one and yet is "streetable" and legal. As a promotional exercise the RZ has to be the success of the year. Even though most people cannot buy one (only 300 for Oceania) everybody knows about them. Those lucky enough to race them have an enormous advantage over their four stroke competitors. Given that the GPz900R Kawasaki is faster in a straight line, the RZ is less thirsty, more ridable and better braked. It's almost as though the engineers purposely built a production racer.

They didn't, really. It just ended up a better compromise than the opposition. At the time of writing the RZ has won the first two long distance races of the year, the Hub 300 and the 750 race at Oran Park. Both in the hands of a man not really dialled into production racing; Mike Dowson.

So, what's the bike like? Well, the main impression is one of no frills, no nonsense, purposeful simplicity. The instruments are fairing mounted and consist of a central tacho flanked by a 250 km/h speedo and a coolant temperature gauge. A small square pod above the temp gauge houses four warning lights for oil level, neutral, turn and high beam. That's it. No stand lights, no excess gauges.

The handlebars are real clip-ons and clamp to the forks where they protrude above the top triple clamp. Switchgear is the usual Yamaha offering and fits humans well. The fuel tank is steel and shaped like the current GP bike's. It is hinged at the rear to give access to the top spark plugs and air filter. One strange thing is that the filler cap is a normal removable type. Why not a flip cap like the real TZ range, particularly as they already have them in house? The fuel tap is not actually part of the tank either. It is mounted on a bracket between the fairing and the frame and faces back at the rider. Nice and easy to get at when needed. It is also one of the automatic vacuum operated type. The seat is well shaped for a single rider and has a removable back section to make it look like a racing single seat. It's nice and low too at 780 mm and makes people of average stature able to place both feet on the ground when stopped.

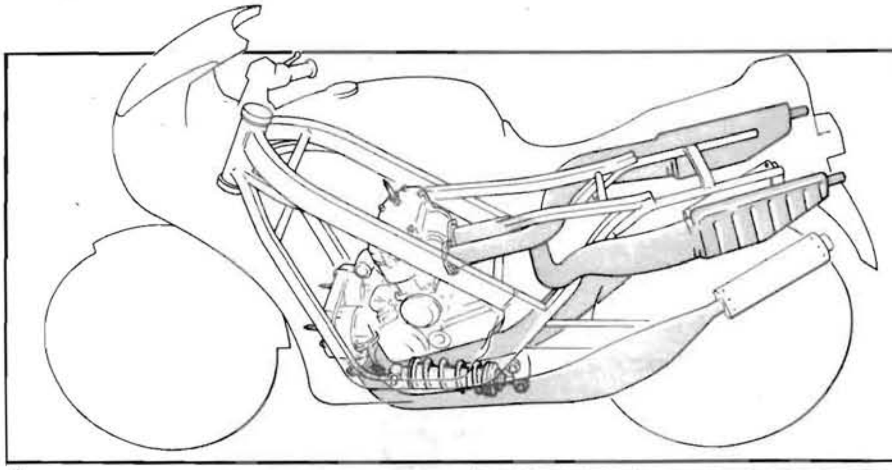
The frame is a steel rectangular tube type and has a removable section on the right hand side. The main section is 20 x 40 mm and runs from the swingarm pivot plates to the steering head. The steering head is braced by seven tubes and is about as stiff as you will get. The actual section that holds the seat is a round tube removable section and is bolted to the main frame. It takes no stress at all, so that is okay.

To keep the wheelbase short, the rear suspension unit is under the motor. A rocker arm links the swingarm (alloy rectangular tube) with the unit and gives the required rising rate.

Front suspension uses 37 mm tele forks and the only adjustment is for the anti dive. No air, no spring preload, no damper settings. In this day and age that seems like a backward step until you ride the bike. At the back end, the spring preload can be varied and there are seven rebound damping settings.

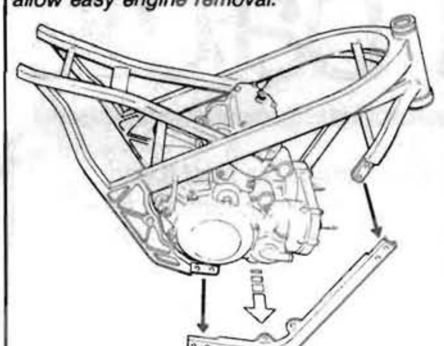
The brakes are vented discs and use twin opposed calipers with semi metallic pads. The fairing on the RZ is used to house various containers for water and oil; there simply is nowehere else to put them. Space is so crowded that the battery is on top of the swingarm pivot along with the YPVS servo motor.

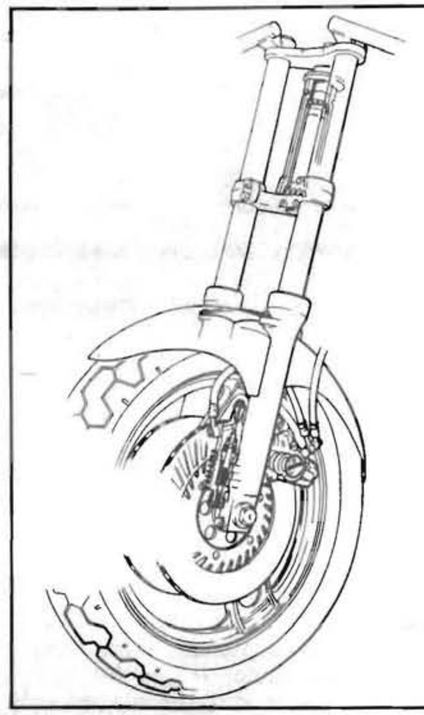
The exhaust pipes for the front cylinders sweep under the bike in normal manner, but the rear cylinders' pipes follow a real obstacle course. They cross over themselves and exit on opposite sides to their corresponding cylinders. They are not the expansion chambers that the front ones are, either. Nor are they as light. To give the RZ that real "works racer" look the rear pipes are covered by side panels. These have lots of heat shielding to insulate the rider and stop the plastic from melting. The rear mudguard also has flutes molded in it to pick up air swirled off the rear wheel and push it into the underseat area to cool it.



↑ *The RZ frame is rigid and strong. The exhaust system is just as complicated as it looks!*

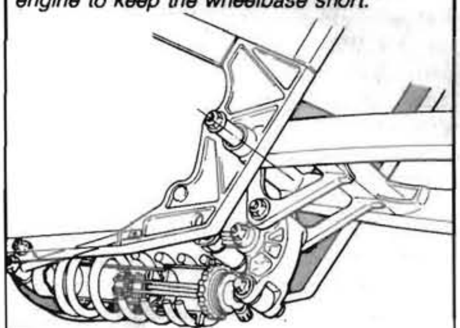
Part of the frame downtube detaches to allow easy engine removal.

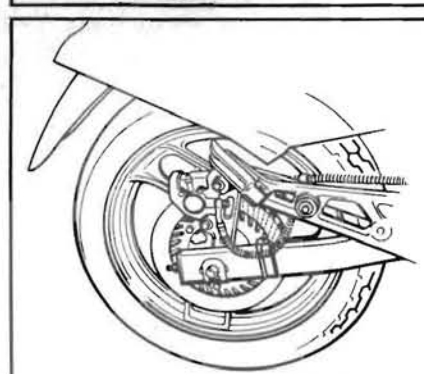




In the best Yamaha traditions, the front suspension isn't adjustable. As usual, though, it works well. →

3. The rear single shock sits under the engine to keep the wheelbase short.





Brakes both front and back are beyond reproach. Racing really does improve the breed! →

There are four exhaust outlets. The sound they make is pure music to an old two stroke racer. Below six grand it is just a smooth purr. At six it starts to crackle and at eight it really rips. Red line is ten grand and in the first four gears it gets there really easily. It will run out to red line in top, too. That is 230+ km/h. A UK journo managed to squeeze 238 out of an RZ. Remember that it is *only* a five hundered, folks!

One poor area of performance is fuel consumption. Boy does it consume! It averaged out at about 12.8 km/l (36 mpg, 7.95 l/100 km) with my worst at 11.77 km/l (33 mpg, 8.5 l/100 km). Obviously it doesn't change as much with speed as the big four strokes; the RZ goes further on a race track.

Handling and brakes

For braking performance the RZ would be hard to beat. With 177 kg dry weight (199 kg wet) there is not a lot of work for the brakes to do. The front brakes are twin discs with venting slots and are of 267 mm diameter. They are 7.5 mm thick and constructed from three sections to give the cooling slots area. The calipers hold twin opposed pistons, very similar to TZ racing units. The main difference here is that these are of die cast alloy and the TZ's were magnesium. The pads have a fair amount of metallic content and work very well, wet or dry.

The rear brake uses a similar caliper, but has a 214 mm x 8.5 mm disc. It is also vented. The brakes are superb. Control is good and feel is just perfect. I really punished them during our photo session and could not detect any fade at all. The rear disc being smaller, it has less mechanical leverage on the wheel and there is no tendency to lock a wheel. What a change. At last someone is putting hard learnt lessons from racing back into production models.

There is a variable anti dive system on the RZ, but it has minimal effect. I think it's just there because people these days expect it. Yamaha does not like the dive control concept and the GP bikes that Eddie Lawson rides this year do not appear to have any at all.

The dive control works via a valve which is closed by hydraulic brake line pressure and increases the amount of compression damping. The adjustment does not change the amount of anti dive, only how much brake line pressure is needed to activate it. In my opinion a little more compression damping change would be of benefit; Yamaha does not agree. Oh well.

The suspension at the front is not adjustable at all, but I felt that the spring and damper rates were very well chosen. In fact, other than the amount of anti dive, I can think of no changes in this area that I would make. More on this later. At the rear, the single spring/damper is of the de Carbon type. It has seven positions of damper adjustments and an infinitely variable spring. I settled on full soft and damper 2. At times I felt the rear end bottom out, but never hard enough to worry about and it still had more than adequate ground clearance. No matter how hard I tried, I couldn't scrape anything.

The RZ has 130 mm fork movement and 120 mm rear suspension travel. At the front 34 mm are used to support its own weight. That leaves 96 mm to handle bumps and 34 mm to let the wheel fall into holes. In my opinion, perfect.

At the rear there is 20 mm of sag, rider

Specs

Make ..... Yamaha
Model RZ500L
Price (plus on road charges) $4800

Engine
Type ..... "V4" two stroke
Bore x stroke ..... 56 x 50 mm
Displacement ..... 492 cm³
Compression ratio 6.4:1
Carburetion ..... 4 x Mikuni VM26SS
Ignition ..... Solid state
Redline ..... 10,000 rpm
Starting ..... Kick
Claimed power ..... 67.89 kW at 9500 rpm
Claimed torque ..... 67.4 Nm at 8500 rpm

Transmission
Number of gears 6
Clutch ..... Wet multiplate
Primary drive ..... Gear
Final drive ..... Chain

Suspension
Front ..... Tele forks with adjustable antidive
Travel ..... 140 mm
Rear ..... Single shock
Travel ..... 120 mm

Brakes
Front ..... Dual 267 mm discs
Rear ..... Single 214 mm disc

General
Electrical output ..... 224 W at 9000 rpm
Headlight ..... 55/60W QH
Air filter ..... Oiled foam
Lubrication ..... Autolube

Dimensions
Weight ..... 177 kg
Wheelbase ..... 1375 mm
Ground clearance ..... 145 mm
Seat height ..... 780 mm
Fuel capacity ..... 22 litres
Oil capacity ..... 2 litres
Rake/trail ..... 26°/95 mm

Performance
Top speed ..... 238 km/h
Standing 400 m ..... 12.24 sec
Fastest run ..... 12.04 sec

Speed in gears

1	2	3	4	5	6
92	131	162	189	211	230

Top gear acceleration
60-80 km/h ..... 8.5 sec
80-100 km/h ..... 5.2 sec
100-120 km/h ..... 3.9 sec

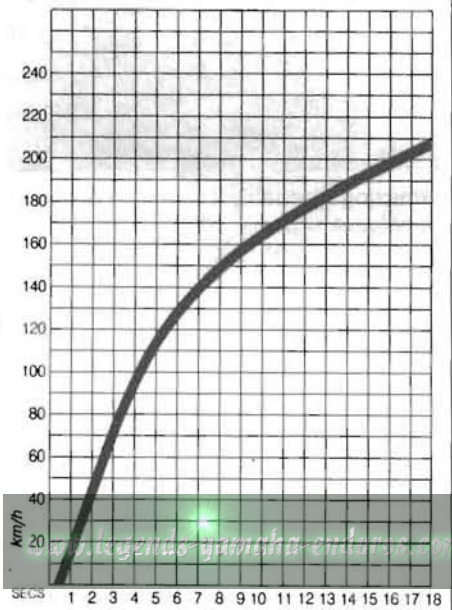
Fuel consumption
Kilometres per litre 12.8
Litres per 100 km 7.95
Range per tank ..... 281 km

Plus: Fantastic handling, brakes, engine response, gear ratios, tyres, looks.
Minus: Tendency to tank slap at medium speeds, poor economy, availability.

Replacement
Oil filter: N/A
Air filter: $2.84
Brake pads/linings: $122.22
Globes: $28
One blinker lens: $1.55

Crash
Petrol tank: $239.30
Headlight assembly: $88.30
Blinker assembly: $15.50
Brake master cylinder: $87.24
Brake lever: $9.42
Mirror: $28.58
Handlebars: $25.98
Muffler: $147.01
Engine cover: $98.38
Footrest assembly: $33.34
Fairing: $398

Test bike supplied by: BIKE Australia and Yamaha Australia



Summing up	Terrible	Poor	Average	Good	Brilliant
Cornering					■
Cornering clearance					■
Steering				■	
High speed stability				■	
Front Forks				■	
Rear Shocks					■
Engine responsiveness				■	
Smoothness				■	
Bottom end power		■			
Medium range power				■	
Top end power					■
Fuel economy	■				
Clutch operation				■	
Gearbox operation				■	
Brake effectiveness					■
Fade resistance					■
Quality of finish				■	
Riding position				■	
Seat comfort				■	
Pillion comfort			■		
Touring range		■			
Headlight				■	
Value for money				■	

unmounted, and about 40 mm with a 65 kg rider on board. Again this is a good compromise and leaves 80-100 mm of bump absorption and 20-40 mm of extension to allow the wheel to drop into holes. Roughly half movement *should* be used to support the rider and bike.

All is not perfect though. One thing I did keep from my last TZ750 was the handbook. Reading through the frame specs and comparing that bike to the RZ frame is very interesting. The TZ had a rake and trail of 26°/97 mm; the RZ has 26°/95 mm. 2 mm less trail. The TZ had a wheelbase of 1390 mm; the RZ has 1375 mm. 15 mm less. The TZ hd an 18″ front wheel of 2.15″ width; the RZ has 16″ diameter and 2.75″ width.

You wanna know what the TZ did? It tank slapped really badly. The only thing that kept it at bay was a hydraulic steering damper. Now what do you think a bike with less trail, the same rake and 15 mm less wheelbase is going to want to do? Give up? Well, I'll tell you. The bloody thing has a tendency to tank slap! And what do you think Yamaha has not put on? Give up again? A bloody hydraulic damper.

Actually, there was one other thing I kept from that last TZ ... Yep. The steering damper. Quite by accident, you understand. I really am utterly honest and reliable. It just got left behind when Murray Sayle bought the bike. Sorry Muzza. And can you guess where it's being put? Gee you're a mob of smarties. Yes, on my RZ.

It's got so I don't know up from down. I mean here I am just tootling along and all of a sudden the front end goes berserk. Seriously, it is quite an oversight. I repeat, for the benefit of any Yamaha engineers. How the bloody hell can it do anything but slap? To make it any easier to do so would require help from the rider!

So, having just made enemies of all Yamaha folk, (sorry about that) let me say that the RZ is easier to go fast on than all but a couple of its peers. It has frame precision that until now could only be dreamt of on pukka racers. The bike can be steered through the eye of a needle it's so precise. I found that I could drive it hard into corners and make a late apex, brake, flick and gas it up with real confidence. Once leaned over the tank slapping I mentioned did not appear at all.

I played around with the spring and damper settings on the back of the RZ

The antidive under brakes isn't very noticeable, but the bike sure as hell stops!

and it was obvious that soft spring was best for me on the road. Any more than three on damping was too strong and made the back stay compressed too long after a large bump. Otherwise it is one of the best rear ends since the Suzuki Full Floater. Even pressed really hard I couldn't detect any frame or fork flex. The forks are held together with a solid brace, with the axle and two triple clamps doing their part as well.

With that short wheelbase the steering is very quick indeed. Changes in direction are easy and made with a minimum rider input. The 16" front wheel complements the frame and these two things make the RZ a natural race handler. Once the damper is fitted to the front it will be pretty well perfect. I have heard that some people are fitting the forks with heavier oil. Don't. It will only make it worse. Remember that for racing the forks have to do a lot more work, and work of a different kind. For the road the standard oil is perfectly adequate. The heavier oil will only make the compression damping too harsh. Kind of like increasing spring rate. Compliance is very good as is. The only thing I would look into is possibly the anti dive, but even that is really adequate. Just look at how well the RZ brakes compare.

As a day to day bike I find the RZ to be not as good as say an FJ1100 or an 1100 Honda or Suzuki. You have to preplan most of your movements. In top gear at about four thousand revs, response is sluggish (what do you expect from a high performance two stroke?). I found that quite often I had to change back 3 or 4 times to really make the RZ jump! It's a good thing that the gear shift is a good one. Once up around 6000 revs the response is simply amazing. Probably the reason is engine tune and slippery shape. The RZ has one of the best drag co-efficients of all bikes, .35. That's getting down to good car figures and beats the previous best of .4 (Yamaha Turbo).

Motor

The RZ500 uses what must be the most complicated two stroke engine currently in production. It is a Vee Four, with fifty degrees between banks. Induction is by 26 mm slide Mikuni carbs and reed valves. There is a balance shaft between the banks to help smooth out the vibes and it works well. The engine actually fires two cylinders together so that in effect it is a split twin. It has a 180° firing sequence and is set so that the cylinders that fire are diagonally opposite. The barrels are separate and each pair has a common head.

Actually what we have here is two separate engines sharing a common crankcase. The upper crankshaft has only one gear on its end, the lower crank has three. There is one for the primary drive, just like the upper crank, one for the balancer shaft and one to drive the water pump. The crank primary drive gears are split so that in effect there are two side by side. Of these one has 31 teeth and is keyed to the crankshaft and the other has 32 teeth and is a friction fit. This cuts down on primary gear noise. The gears are all straight out.

The exhaust has the Yamaha Power Valve System to vary exhaust port timing. At revs below 6000 the port height is reduced to increase mid range power. From 6 to 8000 it progressively opens until at 8000 it is fully open. Kind of get your cake and eat it too. It is controlled by a micro computer linked to the ignition system. The valves themselves are opened and closed by a servo motor mounted just above the swingarm pivot. From there, long cables go off to the valve actuating rods. The reed valves feeding the engine are different from one another too. The upper crank is fed via induction track reeds and the lower is via direct crankcase induction reeds. The upper pistons therefore have windows cut into the inlet skirts.

The ignition is solid state, of course, mounted on the left side and driven from the lower crankshaft. The cover for this is magnesium too. There are no idle mixture screws on the carbies. Instead there is a fixed jet that does not breathe to the bellmouth, but to a plastic hose that vents to atmosphere. The air going into this tube, and hence the pilot air jet, is unfiltered. Don't ride around on dirt roads! One other difference is that the slides are plastic.

To lube the cranks and pistons there is a new type of Mikuni oil injection pump. Instead of simply being controlled by revs and throttle opening this one is also controlled by the YPVS servo motor. It means that when revs are high and throttle closed, such as on overrun going into a corner at anything above 6000 rpm, more oil output occurs. There are four outlets to the various inlet tracks and these lead to the inlets just ahead of the inlet reed blocks.

Oil consumption is very low for street use. After 1680 km I have used about 1400 ml. The total capacity is 2 litres. The warning light comes on at 600 ml left.

Whenever the ignition system is turned on the power valve goes into a cleaning mode. It opens, closes and opens again ready for start up. Once the engine starts it closes and stays closed until the computer sees the correct revs.

Cooling is by liquid, of course. The water pump is driven via a gear from the lower crankshaft and sucks water from a frame mounted radiator. This passes into the heads and barrels of upper and lower cylinders and through a common thermostat housing. From there it passes back to the radiator. There is a cooling system expansion tank mounted in the fairing. Total capacity is 2.3 litres. The motor warms up very quickly and idles reliably within about one kilometre.

Gearbox/clutch

The clutch is a 14 plate wet unit. The clutch basket has six cushion springs to dampen drive shocks. The primary drive secondary gear has straight cut gears and is also used to couple the two crankshafts together. The gearbox is a six speeder with all indirect ratios. At 100 km/h it is spinning over at 4200 rpm.

It would be better, in my opinion, to gear it back just a touch. I have heard that a 40 tooth rear sprocket is available; I will be getting one. Top speed will be

Rosenthal tells the Bear that if he wants a ride, he'll have to buy his own RZ!

Lean, mean, and as close to a GP bike as you can street register.

reduced to 219 km/h and the bike will be much better around town. There would be less clutch slipping getting under way and better response, when needed, to pass traffic.

Another interesting thing with the RZ is that there is an oil pump in the gearbox. Again, just like the TZ750. It is a trochoidal pump and pressure feeds the upper primary drive gear, both gearbox shafts and the autolube pump gears. In this way the gears are kept cooler and less oil can be run in the gearbox; 100 ml less than the RZ350. The gearshift is of the same type as the TZ series and felt the same to me. A few missed shifts, just like the old days. Generally it is a good cog swapper.

To date I have enjoyed the RZ a great deal. I love just poddling around on it just as much as giving it a good squirt. The only reservation is the omission of that steering damper; the rest of the package is very good. Even the original equipment tyres are good. They are Yokohama F101 120/80 x 16 front and R101 130/80 x 18 rear. The tread is very open and compound very soft and sticky. They are real gum balls. To be honest, I have not used better tyres on the road on any bike thus far.

It is interesting to read various articles around at the moment as to why this bike and that bike wobble and slap. Some of the reasons given are so far off beam it's really unbelievable. Proponents of long travel suspension for road bikes don't seem to realize the drawbacks.

With long travel there is a great attitude change when braking and accelerating. With a bike like the RZ this could lead to wheelstanding at both ends. It also would mean greater ride height and higher centre of gravity; both undesirable in a sports bike. As with the FJ1100, I believe that the travel as it is is quite a good compromise.

Yamaha has chosen a great compromise in frame dimensions; now all they need to do is temper them a little and all will be perfect. If the rake and trail were too short the RZ would tend to fall into corners and the rider would be constantly correcting the steering to hold it from turning in. The effect is similar to what happens in deep sand. The RZ does not display any of these tendencies and so I think the ratio of rake/trail to wheelbase is a good one.

As it is, this has to be one of the most fun bikes to ride that come my way; so I bought one.