

**TESTS: Yamaha RZ350 and YZ490,
Honda 1000 Interceptor and CR250
Riding Roberts' 200-mph Daytona Winner**

CYCLE WORLD

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THRILLER!

YAMAHA'S RZ350 FUN MACHINE



 **CYCLE WORLD TEST: YAMAHA RZ350**



**REBORN
POCKET-ROCKET**



Specification sheets display lots of useful numbers, but those numbers don't always tell the whole story. Sometimes, a spec sheet needs yet another number, one that indicates how much fun a bike is to ride. And on a fun scale of one to 10, Yamaha's RZ350 rates a perfect 10.

Some of those other numbers on the spec sheet, however, do help to explain *why* the RZ is so much fun. A look at the weight figures shows that, at 371 lb. with its 5.2-gal. gas tank half-full, the bike is light. Another number is 52. That's the claimed peak horsepower, reached at 8750 rpm. By comparison, Yamaha's 700cc Virago V-Twin, despite having a four-stroke engine twice as big as the RZ350's two-stroke, puts out only 55 claimed horsepower. So when you combine the RZ's high power with its low weight, you get another set of numbers: the quarter-mile time. The RZ350 clipped through the lights in 13.19 sec. at 99.22 mph. That's quick, especially for a 350cc motorcycle.

Some other numbers aren't so impressive. Fuel mileage was 43 mpg on our official loop, but often dipped to around 30 mpg when ridden hard; so even with the big gas tank, the bike can go on reserve around 120 mi. And the stunning performance of the highly tuned engine comes at the expense of good low- and mid-range performance; so the top-gear roll-on figures are unimpressive to say the least.

Numbers aside, there is something wonderfully *right* about the RZ350, which isn't surprising, since Yamaha has a heritage of sporting two-stroke Twins. The speedy two-strokes created Yamaha's performance image, and bikes developed from the same genetic strain as the RZ still rule lightweight road races around the world. And in most places around that world, Yamaha never stopped selling two-strokes for the street. Air-cooled Twins became liquid-cooled Twins, but not in America, where emissions laws and infatuation with big-bore four-strokes made the sale of two-stroke street bikes a losing proposition. So in the U.S., at least, Yamaha began losing its performance image. Yamaha, formerly the company specializing in roadracers, became more renowned for things like shaft drive, V-Twins and beginner bikes.

That's all changed now. The RZ350L might be the smallest 1984 Yamaha street bike sold in the U.S. but it's no beginner's bike. Riding the RZ well requires considerable skill, largely because it comes on the pipe like no other street-licensable motorcycle. Below 6000 rpm it runs smoothly and easily, but it just doesn't make enough power to pull the skin off a bowl of rice pudding. Wait an instant more, let the tach needle slip past the 6000-rpm mark and away you go on a latter-day version of the original pocket rocket. At full throttle in first gear, the front wheel has to be held on the ground by slipping the clutch. Then it's a matter of holding on while this screaming little bumble-bee of a bike tears down the highway. You can rev the engine and speed-shift all day without worrying

about a bent valve, or broken cam chain or any of that business found on four-strokes.

What makes the RZ so much fun, then, is the engine. Two-stroke Twins have always been good sporting motors, but the RZ's is better than most. With a bore of 64mm and stroke of 54mm, displacement works out to 347cc. Corrected compression ratio, calculated from the point at which the exhaust port closes is listed as 6.0:1, though it's not an absolute figure on the Yamaha engine, as we shall see. A pair of 26mm slide-valve Mikuni carburetors feeds large reed valves

violation of federal emissions standards, so the Yamaha is equipped with a two-stage catalytic converter in each muffler to clean up the exhaust. (Good as the converters are, they aren't enough to clean up the Yamaha to California standards, so the RZ350 isn't available at California Yamaha dealers.) To help the catalytic converters work more efficiently, there's an air-induction system in the exhaust, comprised of a small air filter, a reed valve and inlet tubes mounted just downstream of the exhaust ports, hidden by the lower engine cowling.



mounted on the liquid-cooled cylinders. A small metal balance-pipe links the two intake tracts between the carburetors and the reed valves.

Each carburetor also has a small rubber pipe plumbed into its front end, and that connection marks the business end of the RZ's Autolube oil-injection system. A small, crankshaft-driven pump under the righthand engine cover draws oil from the storage tank under the seat and, according to how far the throttle is opened, meters just the right amount of lubricant into the throttle bore of each carb via those little rubber hoses. That mixes the oil with the fuel so it can lubricate the vital engine internals before being burned and routed out through the RZ's exhaust system along with the spent fuel mixture.

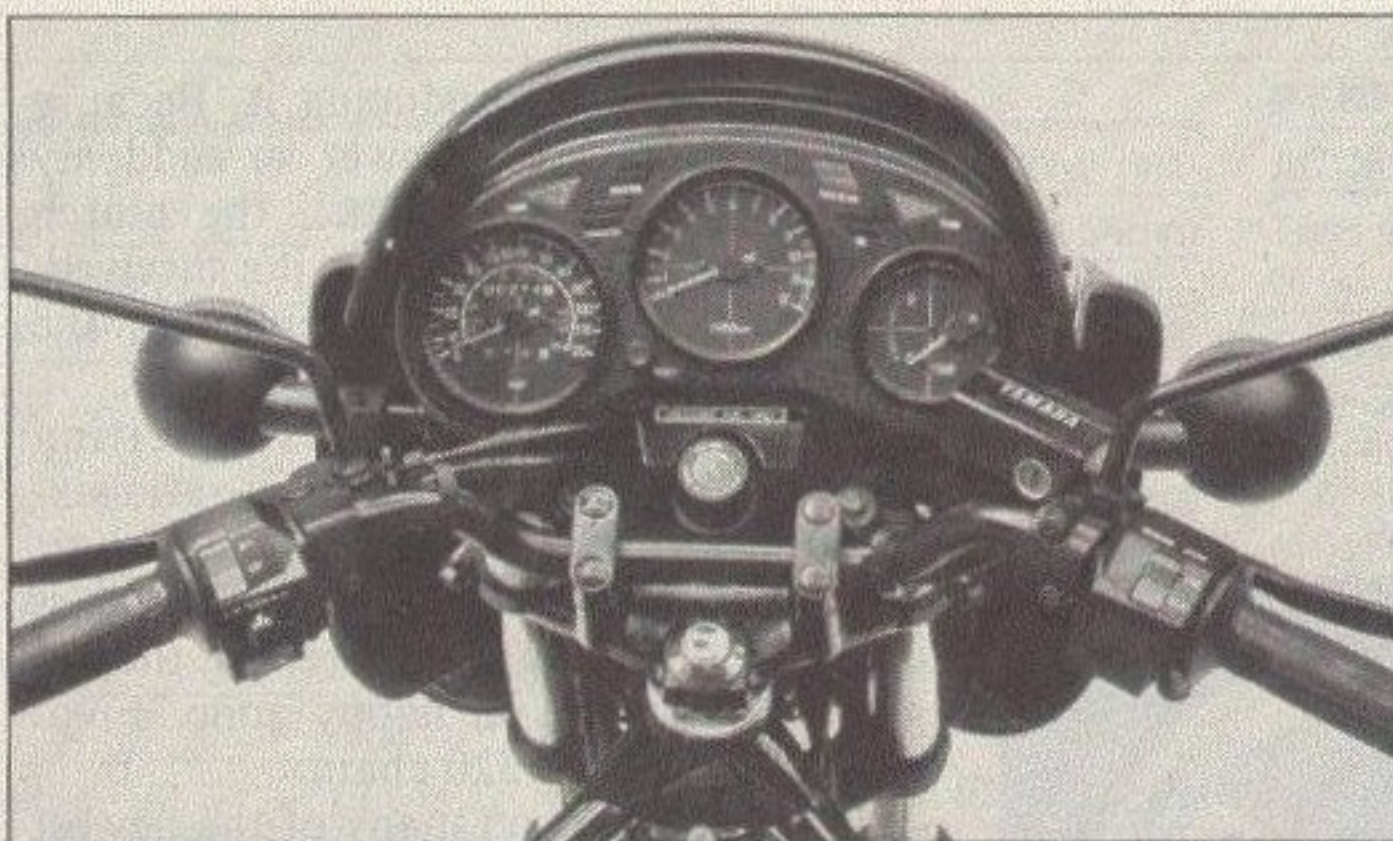
That exhaust system is critical to the Yamaha in several ways. A typical two-stroke cloud of blue smoke would be in

Because catalytic converters can't tolerate leaded fuel, however, the gas tank has a restrictor in the filler neck so only unleaded fuel can be installed.

There also are shields around the exhaust pipes to protect the rider from the extreme heat coming off of the catalytic converters. A light and beeper connected to the exhaust warns when converter temperature reaches 1650°. But when it comes to riding the motorcycle, under all conditions, in all places, none of this emissions-related paraphernalia is apparent to the rider. The only time the RZ smokes is just after it's started. Once the crankcase gets clear of choke-richened fuel and the converters heat up to operating temperatures, the smoke goes away.

Just as unusual is the rest of the exhaust. On a two-stroke engine, the height of the ports, especially the exhaust ports, determines the engine's basic state of tune. Raise the ports and the engine is

tuned for more power at high rpm, at the expense of low-rpm power. Lower the tops of the ports and the opposite occurs. What Yamaha has devised for the RZ350 is the Yamaha Power Valve System (YPVS), which is an electronically controlled, variable-height exhaust port in each cylinder. As engine rpm increases, a servo motor under the gas tank rotates an eccentric drum at the top of the exhaust ports thereby raising the top of the port. A pair of cables link the servo motor to the left end of the interconnected power valves. Yamaha motocrossers have used a mechanically



Instruments are housed behind this small fairing. Because the restrictor in the gas tank filler gets in the way of checking fuel level, this is one motorcycle where a gas gauge would be useful.

DETAIL PHOTOS BY KIRK WILLIS

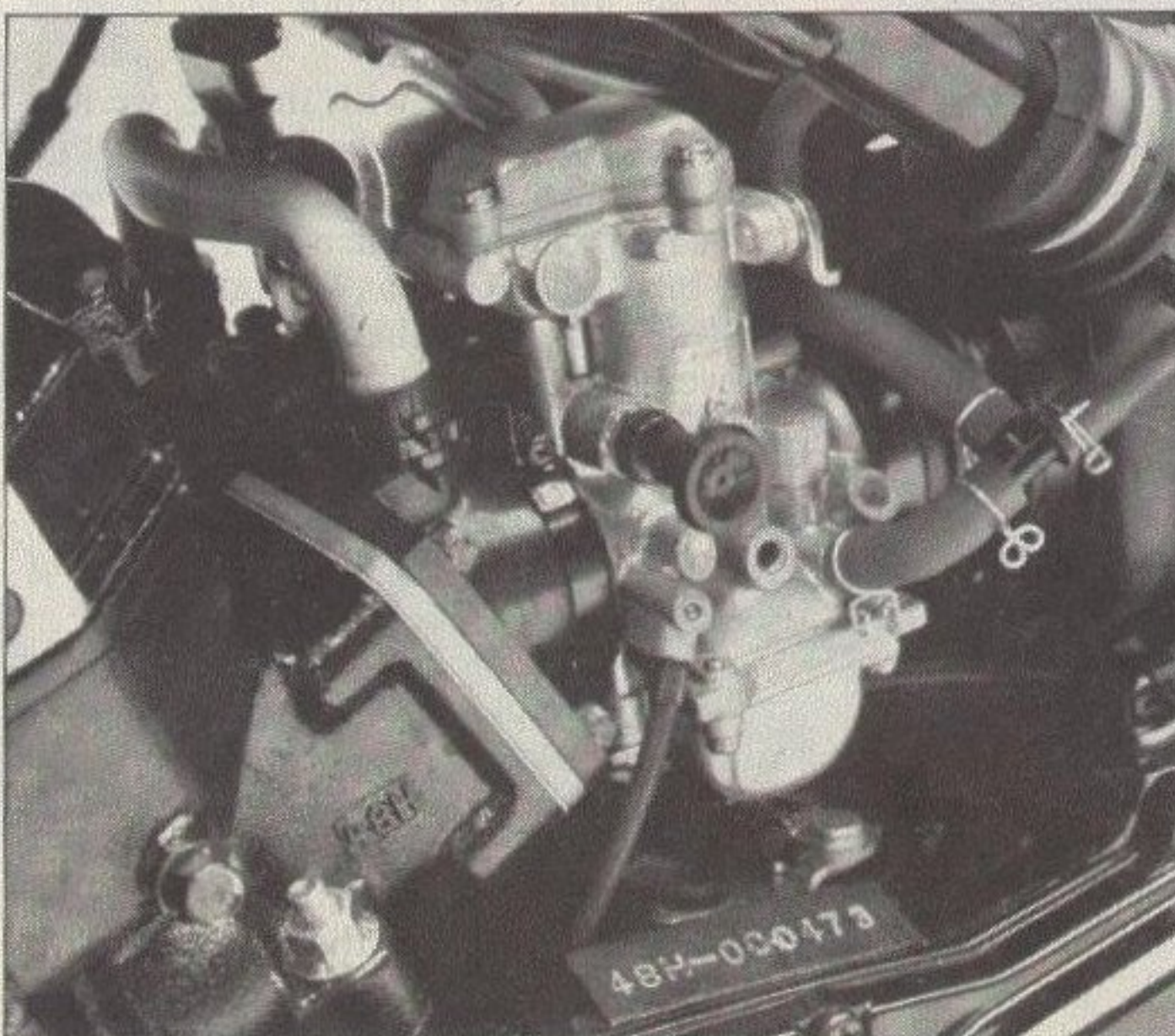


controlled version of the YPVS, while the roadracers have used an electronically controlled version similar to the RZ's system.

Variable-height exhaust port or not, there's a peculiar flat spot in the RZ's powerband. Accelerate from a low engine speed, anything below 4000 rpm, for example, and when the engine hits about 4500 rpm it just doesn't want to run. It quickly goes through this flat spot and then runs cleanly to the 9500-rpm red-line, but that one stumble can be annoying.

When the RZ is in its powerband, there isn't anything annoying about it. And it was a continual amazement to us how smooth the bike is. The rubber engine-mounting system is more effective on the RZ than it is on most other bikes.

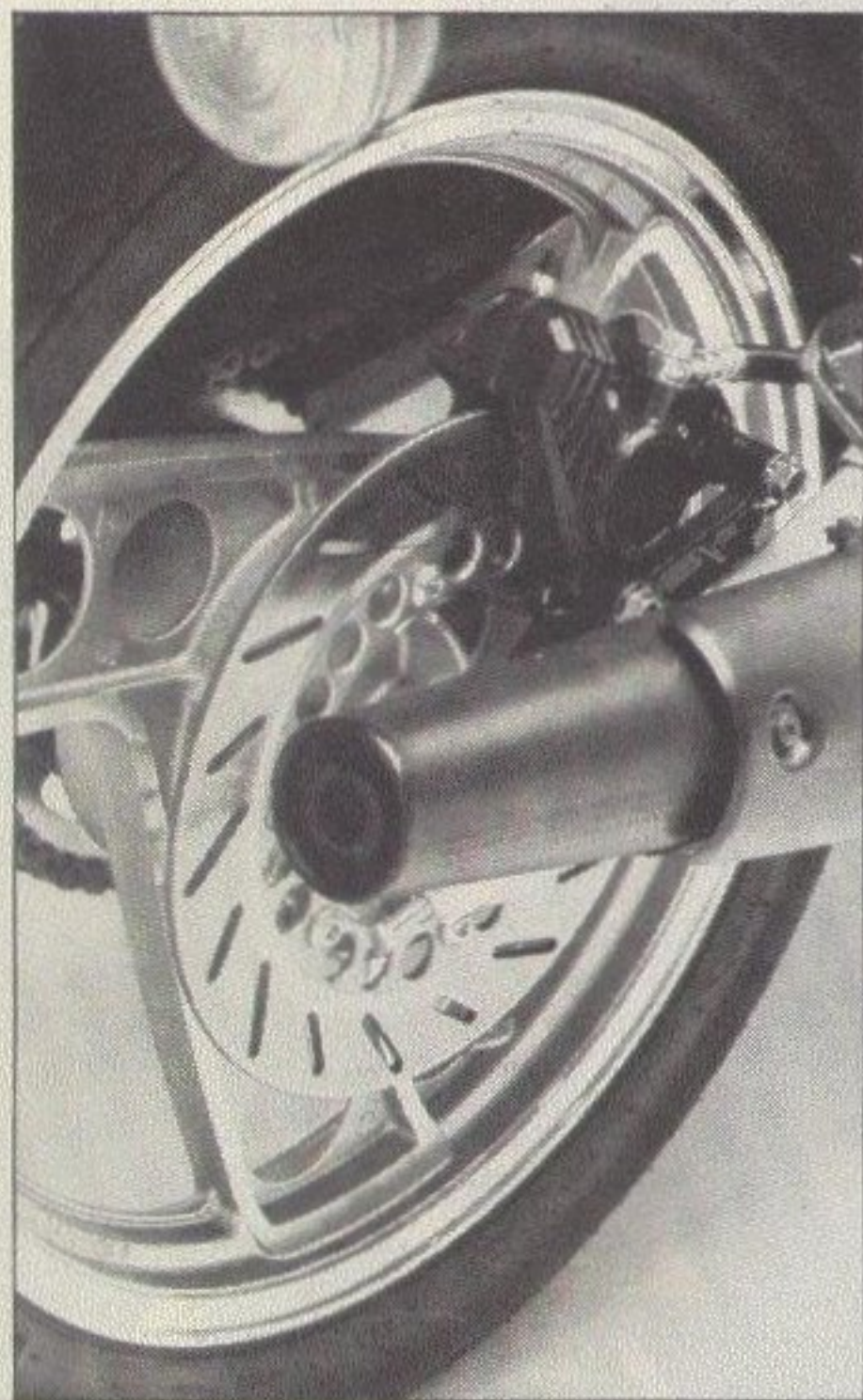
All the wizardry wouldn't mean much without a capable clutch and gearbox. The Yamaha is just as capable of trans-



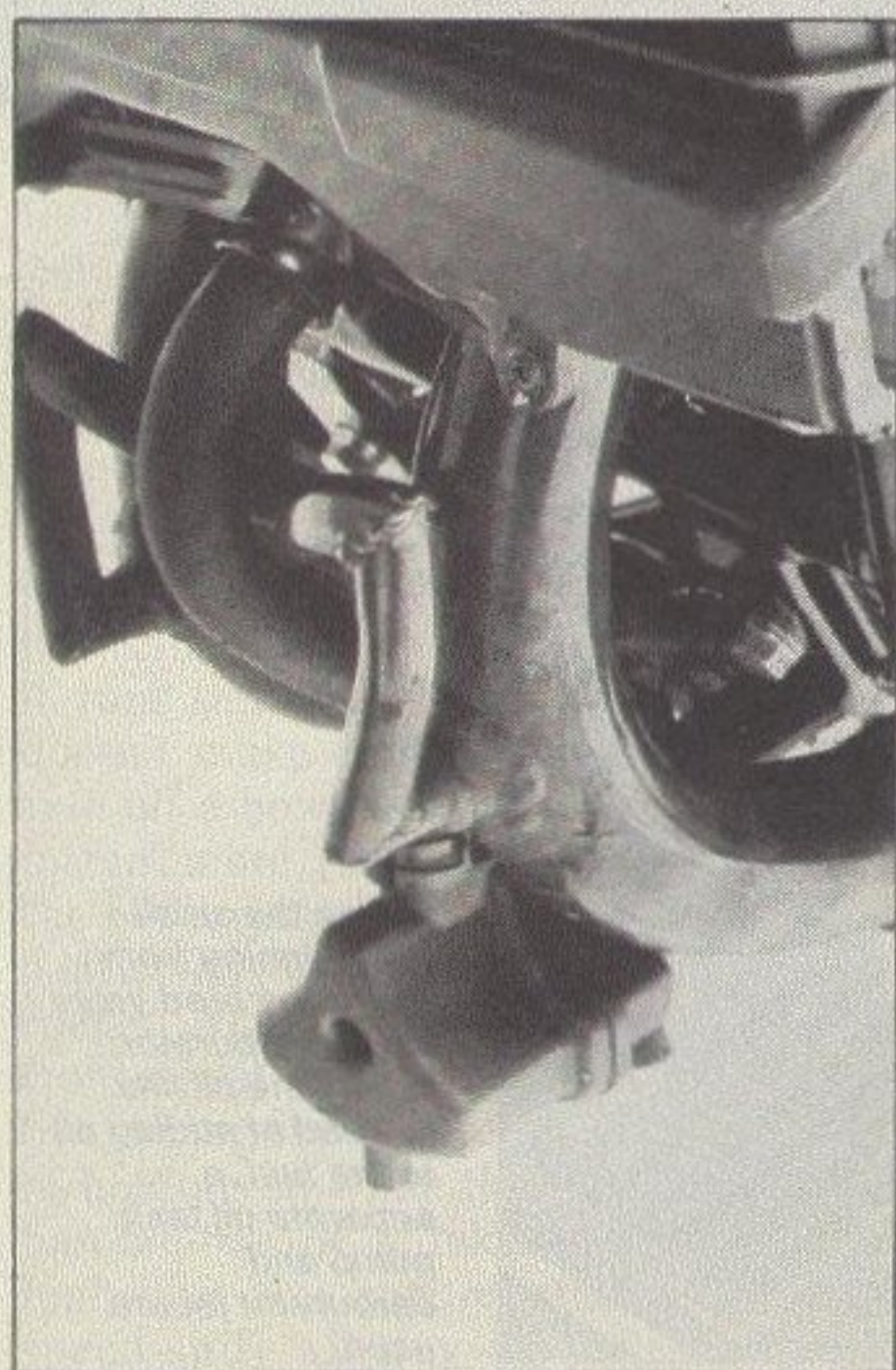
PHOTOS BY RICH CHENET

Notice the small tube running from under the reed valve to the carburetor. That's the oil line. Instead of adding oil to the fuel, a separate oil tank, pump and carburetor jet are used.

Most of the time, there's no visible smoke from the exhaust. Two-stage catalytic converters are mounted in the mufflers, behind multiple shields. Only when the engine is cold is any smoke visible.



Catalytic converters require an air source to complete combustion. For that, the RZ350 has this small air filter, reed valve and tubes allowing air to be sucked into the exhaust.



mitting power as producing it. Because the engine develops power so suddenly and has so little flywheel, the clutch takes terrible abuse. So far, it's survived, though the amount of freeplay at the lever varies with clutch temperature.

To make use of its exciting powerband, the RZ has a close-ratio six-speed transmission. The throws are short and wonderfully light, while the gears are spaced just right for keeping the engine spinning in its happy zone. Final drive is through a 520 chain.

On the RZ, as on many of the newest sport bikes, chassis design is part of the styling. A sporting motorcycle is supposed to look like a racebike, and a racebike looks like, well, like the RZ350. Notice that the gas tank looks as though it fits flat on the top frame tubes. Those top frame tubes don't fit inside the gas tank, but bend outwards from the steering head and wrap around the swing arm pivot, curving in a graceful arc under the engine to become the engine cradle. Look at the frame from the side and the top frame tubes look straight until they loop around the engine and aim back toward the steering head. This same general shape is used on the Yamaha FJ1100 and the Honda Interceptors. And on the RZ, at least, there's nothing wrong with this frame shape. It does a good job of holding all the parts in precise alignment, without being heavy or getting in the way of the rider.

Nevertheless, one of the most important things the frame does is add to the race-ready appearance of the RZ. The bike may have a license plate, lights and street tires, but its overall appearance is as close to that of a racebike as any street-legal motorcycle ever made. The paint scheme, for one, is either red and white or—right off of Kenny Roberts' roadracer—yellow and black and visible a mile away. It even has Roberts' signature on the tiny fairing, just in case there's any confusion.

During our time with the RZ we had occasion to park it beside a Yamaha FJ1100 and a Honda 1000 Interceptor at a local lunch spot. When we returned to the bikes the RZ was surrounded by a crowd, while the other two bikes might as well have been invisible. In fact, it became an everyday occurrence to be swarmed by curious people whenever we parked the RZ. If good looks could kill, the RZ would be the atomic bomb of motorcycles.

Don't want to be looked at wherever you go? Simple. There are showrooms filled with motorcycles people don't look at. And they come cheap, too. But that brings us to price, another thing the RZ can brag about. List price is \$2399, about half the cost of the big road-burners. Yes, the RZ350 is less powerful than the bikes three times as big, but it is no

less thrilling to ride, since it accelerates, corners and stops better than any bike its size.

A lot of new technology has found its way onto the RZ, but some currently fashionable features aren't on the bike, and aren't missed. The forks are simple 35mm telescopic units. There are no damping adjustments, no anti-dives. Air caps are fitted as the only means of adjustment. The linkage-operated, single-shock rear suspension is just as simple. No air fitting or damping knobs are installed; instead, there's only a remote preload adjustment under the righthand sidecover, with a toothed rubber belt from the remote adjuster to the shock-spring. But the suspension is simple and effective anyway. There's enough travel to keep the wheels on the pavement and the rider in the saddle, and there's no weave or wobble. The frame geometry and light weight combine to make a quick-steering bike, but one that's not twitchy. This is a compact motorcycle, too, with all the parts well tucked up. It's easy to lean way over but not easy to scrape things.

Braking performance is just as admirable. Opposed-piston calipers are used on all three disc brakes. There's no annoying sponginess at the adjustable handlebar lever, just strong braking. If anything, the brakes sometimes feel stronger than normal because the engine provides virtually no braking of its own. You often come into a corner faster than you expect, clamp on the brakes and feel some kind of shock waves running through the bike as it shudders down to a slower speed.

All of this, of course, fits in perfectly with the RZ's purpose in life: to straighten out curvy roads in an almost effortless manner. Indeed, an RZ rider isn't expected to install saddlebags, tow a trailer or hook up a sidecar. There's no provision for a sound system or chromed engine guards. And many RZs are likely to log considerable time on a racetrack. They could even become the dominant club-racing bike that the old RD350 once was, a position occupied in recent years by Kawasaki's GPz550.

All of this adds up to a motorcycle with an unusually narrow focus, a lightweight, repli-racer sport machine. And within that narrow scope, the RZ350 is so good, so *right*. You know what the bike was built to do the instant you lay eyes on it. And so does everyone else, a fact that is perhaps best exemplified by what happened the first time one of our editors took the RZ home: His three-year-old ran to the back door, saw the Yamaha and asked, "What kind of bike is that?"

"A Yamaha"

"Were you racing?"

"No, just having fun."



SPECIFICATIONS

GENERAL

List Price	\$2399
Importer	Yamaha Motor Corp. USA 6555 Katella Ave. Cypress, CA 90630
Customer service phone	(714) 761-7439
Warranty	12 mo./unlimited mi.

CHASSIS

Test weight (w/half-tank fuel)	371 lb.
Weight distribution front/rear, percent	45/55
Fuel capacity	5.3 gal.
Wheelbase	54.5 in.
Rake/trail	26°/3.8 in.
Handlebar width	28 in.
Seat height	31.1 in.
Seat width	9.2 in.
Footpeg height	13.5 in.
Ground clearance	7.0 in.
Headlight	60/55w
GVWR	825 lb.
Load capacity	454 lb.

SUSPENSION/ BRAKES/TIRES

Suspension:	
Front	telescopic fork
travel	5.5 in.
Rear	single-shock swing arm
travel	3.9 in.
Wheels:	
Front	2.15 x 18 in. cast alloy
Rear	2.5 x 18 in. cast alloy
Tires:	
Front	90/90-18 Dunlop F14
Rear	110/80-18 Dunlop K130
Rear tire revs. per mi.	818
Brakes:	
Front	dual 10.5 in. disc
Rear	10.5 in. disc
Brake swept area	245 sq. in.
Brake loading (160 lb. rider)	2.17 lb./sq. in.

ENGINE/GEARBOX

Engine	two-stroke Twin
Bore x stroke	64 x 54mm
Displacement	347cc
Compression ratio	6.0:1
Carburetion	(2) 26mm Mikuni
Air filter	oiled foam
Ignition	CDI
Claimed power	52 bhp @ 8750 rpm
Claimed torque	30.4 lb.-ft. @ 7500 rpm
Lubrication	oil injection
Oil capacity	1.7 qt.
Electrical power	12v alternator
Starter	primary kick
Battery	12v, 5.5a-h
Primary drive	gear
Clutch	wet multi-plate
Final drive	520 O-ring chain
Gear ratios, overall:1	
6th	6.00
5th	6.49
4th	7.31
3rd	8.90
2nd	12.00
1st	17.36

PERFORMANCE

ACCELERATION

Time to distance:	
1/4 mi. 13.19 sec. @	99.22
Time to speed, sec.	
0-30 mph	1.6
0-40 mph	2.4
0-50 mph	3.5
0-60 mph	4.7
0-70 mph	6.7
0-80 mph	8.2
0-90 mph	10.2
0-100 mph	13.4
Top gear time to speed, sec.	
40-60 mph	6.5
60-80 mph	7.8

SPEED IN GEARS

Measured top speed in 1/2 mi.	111 mph
Calculated at 9500 rpm redline:	
1st gear	40 mph
2nd	58 mph
3rd	78 mph
4th	95 mph
5th	107 mph
6th	116 mph
Engine speed at 60 mph	4905 rpm

FUEL CONSUMPTION

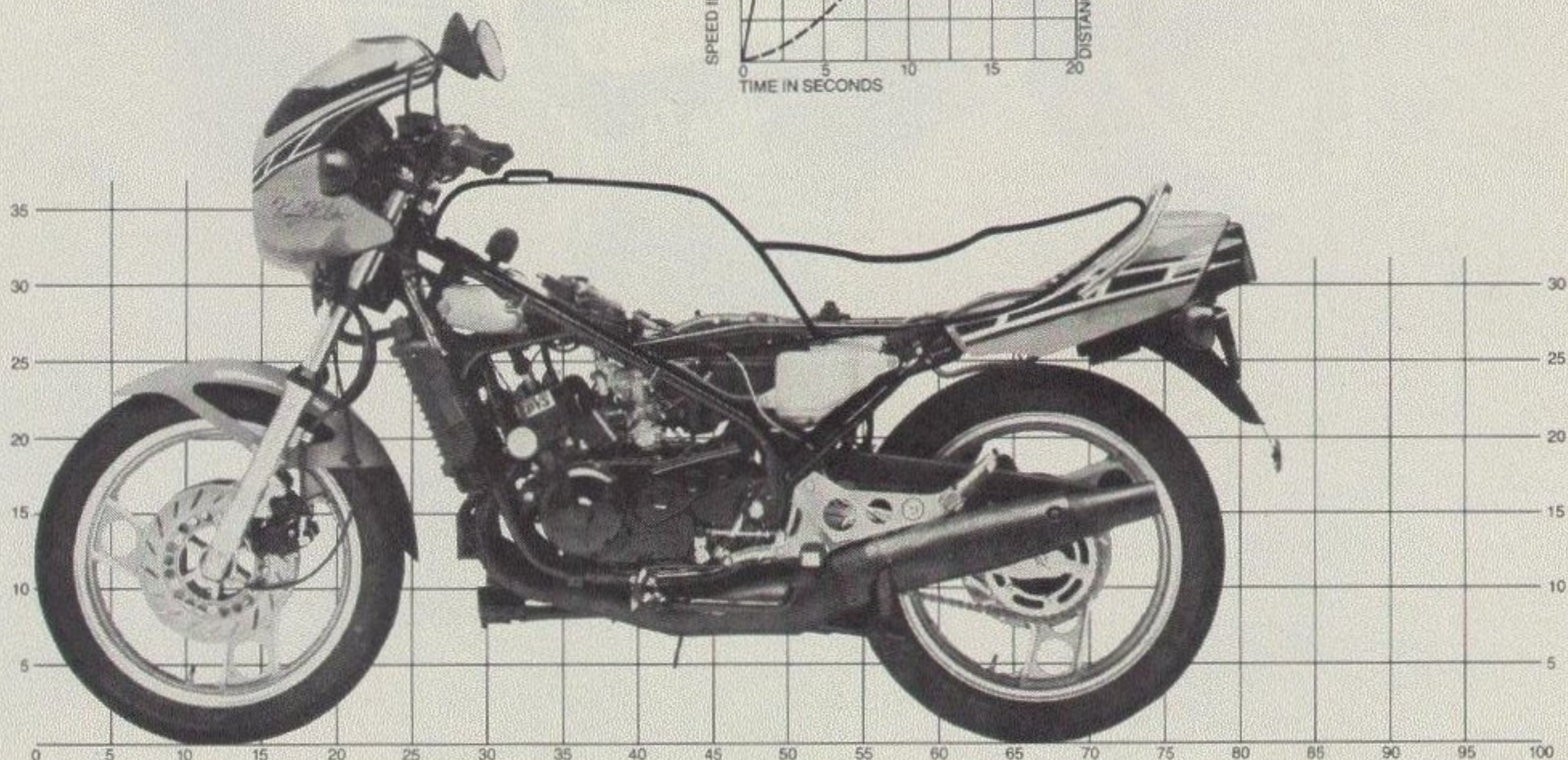
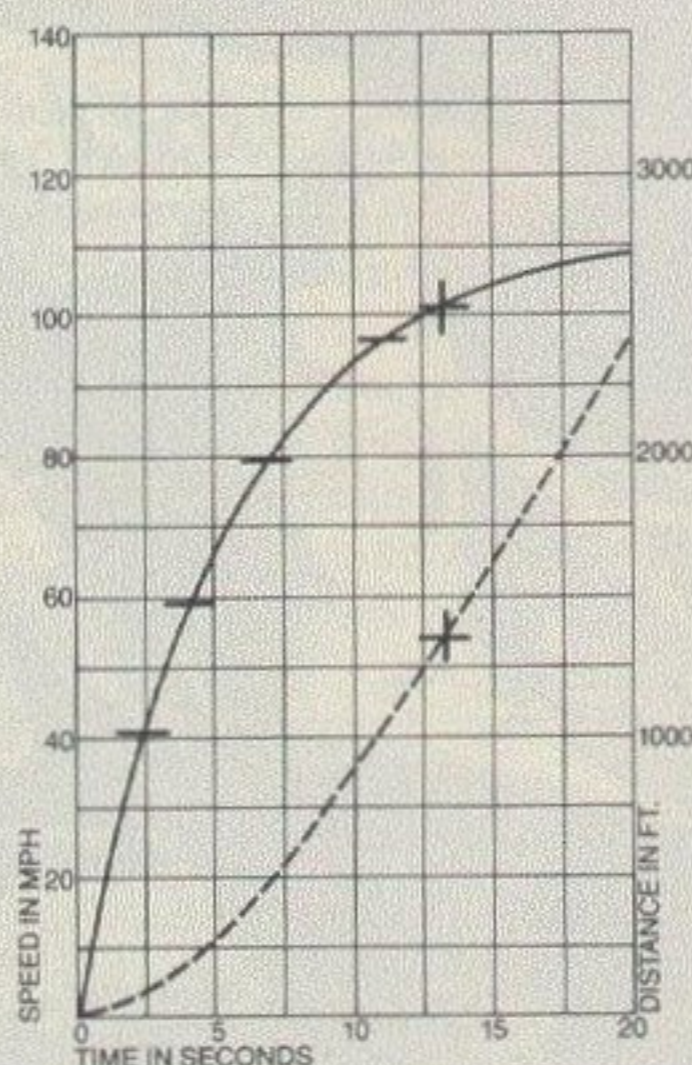
Test loop	43 mpg
Range (to reserve)	206 mi.

BRAKING DISTANCE

from 30 mph	36 ft.
from 60 mph	125 ft.

SPEEDOMETER ERROR

30 mph indicated	30 mph
60 mph indicated	59 mph



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TEST:
YAMAHA
RZ350L**