YAMAHA XJ900RK SECA

For years Yamaha has built bikes with shaft drive: nice, but without impressive handling. Now the 900 Seca eye-popper: This time Yamaha really got it right.

How good can a shaft-drive sporting motorcycle be? Judging by Yamaha's new XJ900 Seca, very good indeed. You sporting purists might take one look at the drive shaft and immediately dismiss the Seca from consideration. A big mistake: this Seca is a great sidearm for Captain Canyon Courageous. The 900 Yamaha has a sporty riding position, a strong, wide power spread, responsive steering, abundant ground clearance and well-balanced suspension components. Yet the basic motorcycle is flexible enough for wide-range, all-round duty, thanks to a tractable engine and hassle-free suspension tunability.

The 900 resembles other Yamaha four-cylinder machines; the engine configuration and cases are identical to the company's 650, 650 Turbo, and 750 powerplants. As with the smaller XJs, Yamaha engineers have located the 900's alternator and starter behind the crankshaft. Consequently, the engine can be narrower than traditional transverse-four designs, which hang the alternator on one end of the crank. The 900 also uses many drivetrain pieces and deep engine components common with the smaller XJs, a strategy further reducing design, development and production costs.

The 900 shares most of its drivetrain pieces


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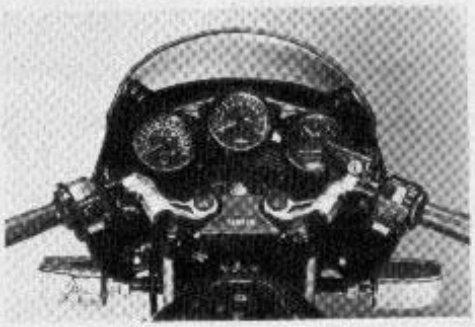
with the Turbo 650, standard strengthened components upgraded for turbo use. The big bike's transmission is identical to the Turbo unit, except for the secondary reduction pairing: the Seca 900's is slightly taller (49/36) than the 650/750's (48/37). As a result, the 900 turns 4222 rpm at 60 mph, about 300 rpm slower than the smaller-displacement XJs. The 900's transmission shafts stagger in the vertical plane for shortened engine length, and its clutch is identical to the Turbo's strengthened unit. Final drive ratios are also identical, even though a new final-drive housing alters the big XJ's appearance. Furthermore, the 900 has a magnesium oil pan, lighter and slightly larger than the aluminum pans on the 650/750 XJs.

From the base gasket up, the 900 is new. Yamaha's new low-pressure casting technique for the cylinder block minimizes the number of air pockets and improves quality control and heat transfer. The Seca's bore and stroke of 67.0 x 60.5mm give an actual displacement of 853cc. (The 750 measures 65.0 x 56.6mm for a displacement of 748cc, and the 650, 63.0 x 52.4mm for 653cc). The longer stroke puts crankcase space at a premium; the 900's rod bolts go in upside down to conserve crankshaft-to-case clearance.



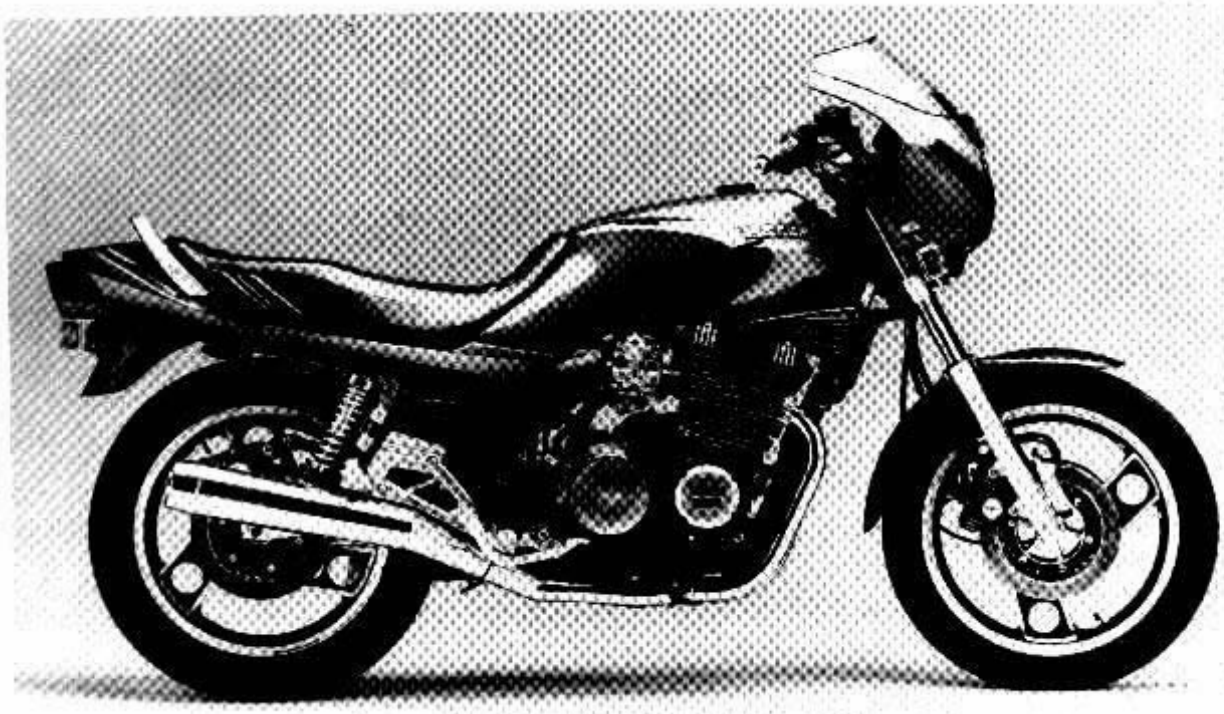
In the cylinder head a single roller chain drives the double overhead camshafts. The combustion chambers have two valves each: 36mm intakes and 30mm exhausts. (The 650/750 inhales through 33mm poppets and exhales through 28mm pieces.) The 900's camshafts spin directly in the aluminum head and ride in four journals (not three as per 650/750 practice).

The 900 head also incorporates the Yamaha Induction Control System (YICS). The YICS head uses a series of interconnected sub-intake ports to swirl the incoming air/fuel mixture within the combustion chamber, thereby promoting fuel economy through improved burning efficiency.

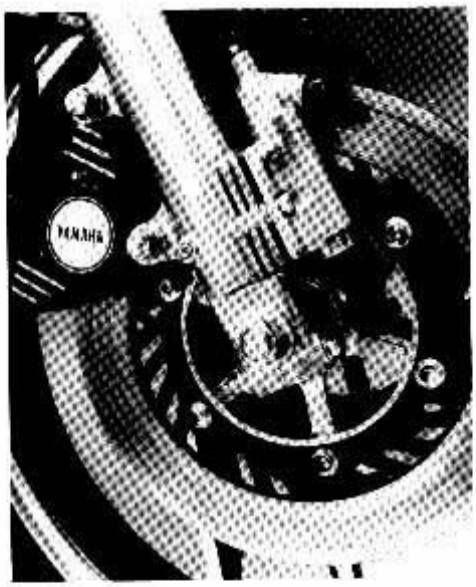
Like the 650 Turbo, the 900 has four Mikuni constant-vacuum carburetors. These 35mm Mikunis work exceptionally well; cold-starting is instantaneous, the

Seca runs willingly when only half-warm, and once up to full operating temperatures the XJ meters fuel without a hitch. A tiny, almost undetectable bit of CV lag shows itself at very small throttle openings.

Yamaha arranged the XJ's powerband ideally for a 900-class bike. The Seca, though lacking the lightning punch



Yamaha outfitted the XJ with a set of new-generation disc brakes that feature ventilated rotors and dual piston calipers. The 900's dual-disc front brake is excellent, on par with the best street-bike brakes available today. The Seca's anti-dive system, however, needs some refinement.



of an 1100cc sport bike, feels much stronger mid-range than 750-class machines. Informal roll-on comparisons with a Honda Interceptor, an exceptionally torquey 750, revealed a Yamaha superiority at low engine speeds. In mid-range roll-on contests, the bikes run dead even, but when the Interceptor finally gets into the upper portion of its powerband, it leaves the Seca behind.

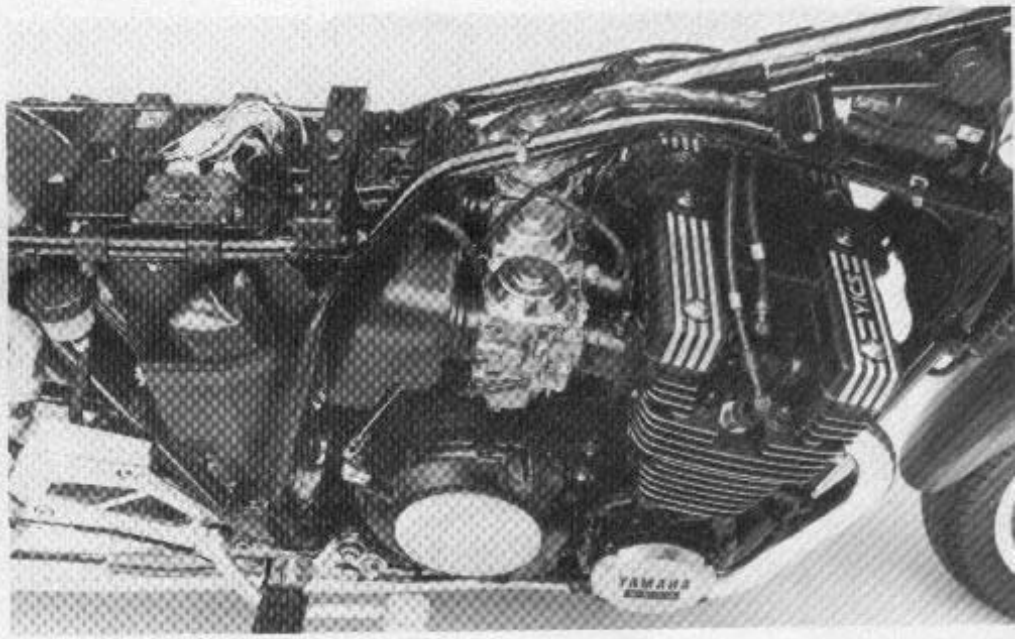
The 900's drag strip performance mirrors these findings. With a best run of 11.82 seconds at 113.78 mph, the Yamaha is strong without being breathtaking, roughly in league with this year's premium 750 sport bikes. Though the 900 buzzes a bit as the engine nears redline speeds, for the most part the Seca runs smoothly. The five-speed gearbox matches well the Yamaha's broad power, and shift and clutch action are good. More important, the Seca has precious little driveline lash, and the nearly dead-nuts-perfect carburetion conceals most of that. The power train engineers did something equally impressive with the old up-and-down torque-reaction bop-and-bob of shaft-drive motorcycles: they got a perfect compromise.

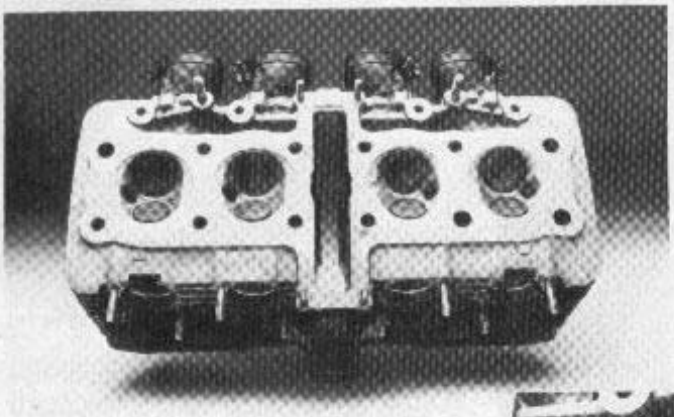
When designing shaft-equipped motorcycles, manufacturers face a difficult choice: Either make the rear suspension stiff to control the inherent shaft-induced rise and fall, or sacrifice rear-end control for comfort's sake. Most engineering departments compromise, but where others have aimed and missed, Yamaha hit dead-on.

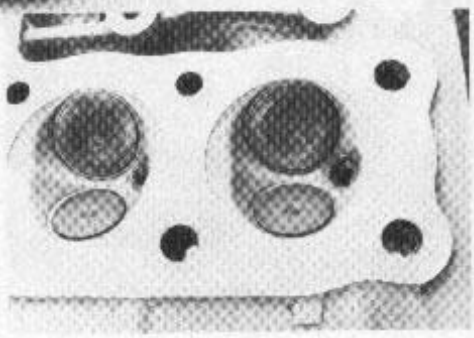
The all-new suspension components at both ends were designed specifically for the 900. The twin-shock rear suspension system features five-position spring preload adjusters and 12-way-adjustable rebound damping. True, Yamaha's off-road machines have long had multiple damping settings, but the Seca's impressive range of damping adjustability raises the standard for street bikes. Even a wide range of adjustability can offer useless suspension options if the settings are grouped on the borders of the ideal window. With the Yamaha's shock springs set on the softest preload position and the dampers turned to the soft side of the standard sixth position, the XJ900 has a comfortable, responsive ride. Compared to the interstate-only touring rigs, the Seca is a bit firm, but all our testers agree—the Seca is fine for day-long or even week-long journeys. Up front, a crossover tube connects the two legs of the air-adjustable fork. Yamaha recommends a range from zero to 17.1 psi, with 5.7 psi as the standard setting.

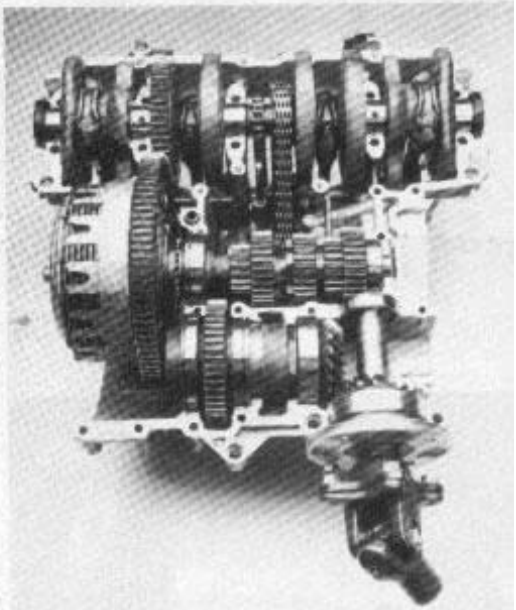
For fast sport riding we set the fork to maximum pressure, jacked the shock springs to the fourth-highest setting, and turned the damping adjuster three clicks stiffer than standard. This setup produces a stiff ride, but faultless suspension action; the Seca never wallows, wobbles or pogos through fast sweeping corners or bumpy, nasty hairpins. The stiff rear suspension settings control

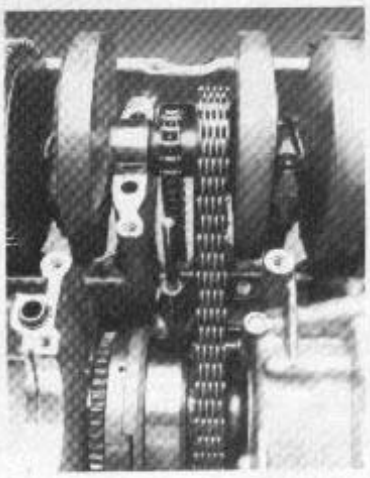
The Yamaha XJ's engine configuration and cases are identical to those of the 650, 650 Turbo and 750 powerplants, which make the 900 a strong-running yet remarkably compact package.











Clockwise from above: The Seca 900 powerplant is based on the 650/750 engine. Most of the 900's drive train is common to the 650 Turbo, including the strengthened clutch (right). The Seca employs a roller chain to drive the dual overhead cams, and a Hy-Vo-type chain spins the alternator, located behind the crank (bottom right). A new head features larger intake and exhaust valves (below and left).

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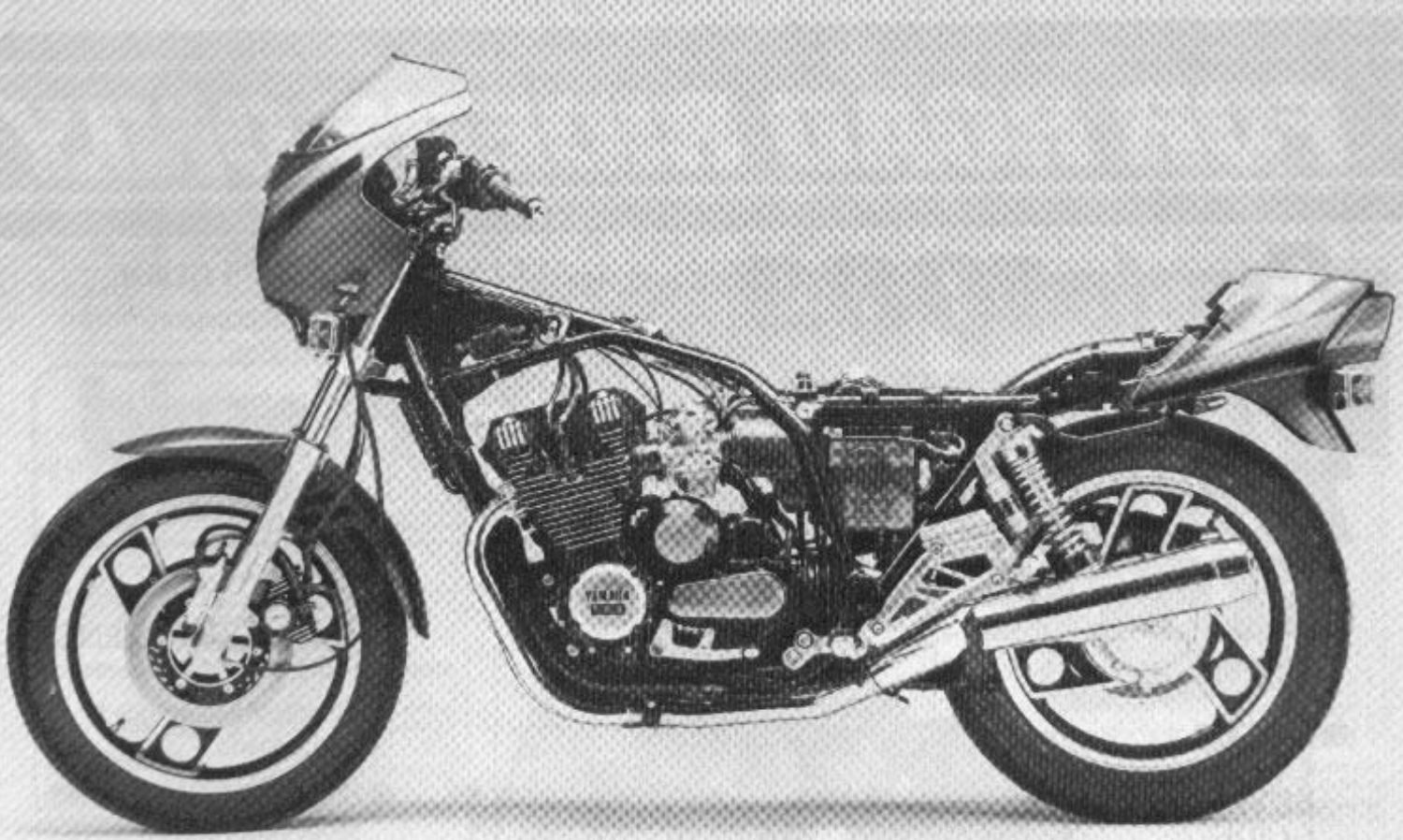
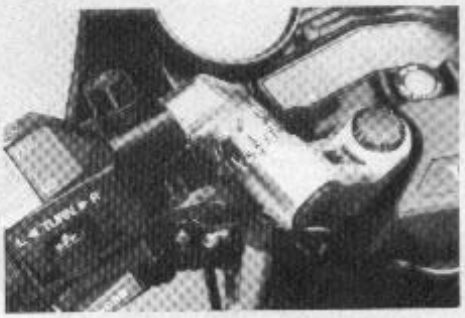
the shaft's torque reaction well. The XJ900's rear end kicks up mildly during slam-bang upshifts, and the bike never loses significant ground clearance unless the rider slams the throttle shut halfway through a corner. Since the Seca has such generous ground clearance, anyone who scrapes the undercarriage would presumably be skilled enough to compensate for this mild drive-shaft handicap.

The Seca's pegs touch down before anything else grinds, and expert riders eventually touch the centerstand and sidestand tangs on the left of the bike. The rear Bridgestone tire provides plenty of traction; as you press the front toward the outer limits of traction, however, it squirms and wanders a bit, diminishing cornering confidence. The Mag Mopus-L303 has long been a standard front tire on Japanese bikes, but as OEM rubber improves, the 303 grows more dated.

Like the new suspension components, the Seca's steering geometry and wheelbase dimensions are unique to the 900; at 58.3 inches the 900 measures 1.3 inches longer than the 650 Turbo and 750. This increase, as well as a wider front rim and tire, would make the big Seca steer more slowly were it not for altered steering geometry. The 900 has 27.0 degrees of rake with 4.5 inches of trail (the 650T and 750 measure 28 degrees and 4.5 inches). Consequently, the 900 feels like a nimble 750 rather than a big one-liter. The 900 weighs a modest 534 pounds fully gassed, and in physical dimensions could easily pass for a 750. By seat-of-the-pants feel, the big XJ, with its fairly quick and light steering, falls between the quick-responding Honda Interceptor and the slower-steering Kawasaki GPz750.

The Seca 900 also rates highly in the brake department. Yamaha outfitted the XJ with three new-generation disc brakes—ventilated rotors and dual-piston calipers. The rear brake has progressive action with good feel; it's not overly sensitive. The front dual-disc setup is simply excellent, ranking with the best street bike brakes available today. The brakes feel firm and positive through the lever, provide strong and linear stopping power, yet require only modest lever pressure. Though linked to the front brakes, the hydraulic anti-dive doesn't hurt brake performance in the least. Wink-adjustable, this system lacks sufficient resistance for our testers even on





its full-resist position. More range, please. Get those rear suspension guys working on anti-dive!

All riders should applaud the Seca's excellent seating position. The 900 places the pilot in a light forward crouch; the flattish bars sweep backward a bit, and the pegs sit directly beneath the rider's torso, exactly where we think they should. This seating position works splendidly under all conditions; the rider sits poised, ready for active riding, yet he is well-balanced against the oncoming windblast. Our range of testers, from five-eight to six-one, judged the 900's seating position as nearly perfect as anyone is likely to build into a mass-produced motorcycle. Our shortest testers would have liked the bars better moved back a touch; our tallest rider would have preferred to move the bars forward just a pinch. In both cases, the riders were picking nits. Incidentally, the two-way adjustable handlebars have very coarse adjusting splines that permit only gross changes in bar position. Finer splines would expand the adjustment range, further improving ergonomics.

The small quarter-fairing deflects windblast well, completely protecting the rider's torso. Shorter riders may find the windscreen ducting air at their chins and directing some turbulence into their helmets. Our smaller staffers moved back on the seat or sat more upright for temporary relief. Here's more reason for a finely adjustable bar.

The 900 holds a healthy 5.8 gallons of fuel, giving the XJ a long-legged range of 255 miles at our average fuel consumption rate of 44.0 mpg. One mild-man

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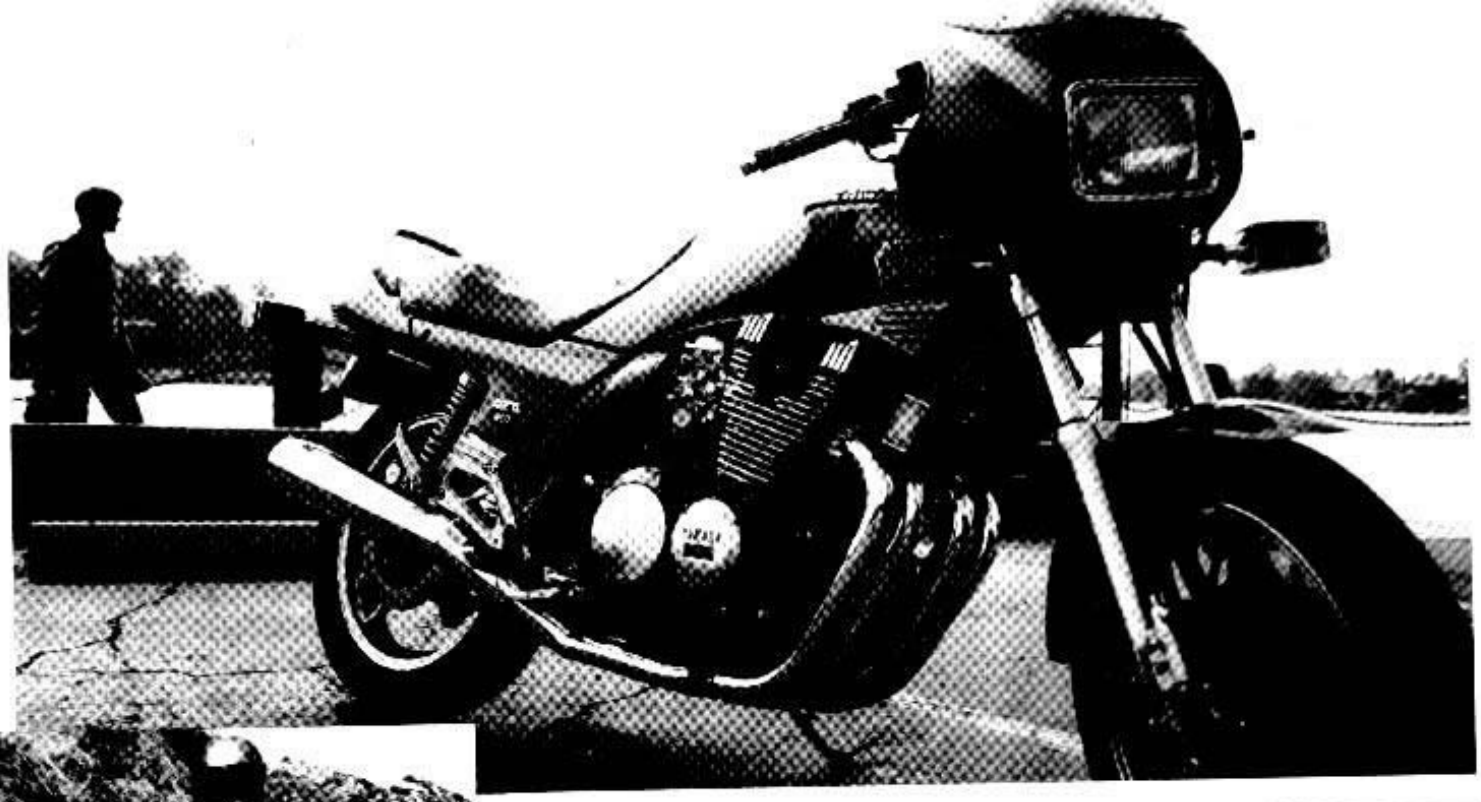

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nered freeway cruise netted 56.7 mpg; restrained riders will cover 300 miles with a full tank.

Long-term, steady-state cruising reveals a light buzz in the bars, becoming mildly irritating after a couple of hours. The mirrors, with very short stalks, force the rider to work for a view rearward, and after a while, most people tire of seeing their arms. Day-trippers will like the storage area found in the tail section, the digital clock, and the best self-cancelling turn signals in the business. Most important is the go-forth-and-forget it shaft drive.

And that's the heart of the matter — the Seca 900's real attraction is its never-think-about-it nature. Plenty of high performance sport bikes just glut the market: shaft equipped Specials, standards and touring rigs abound, too. But precious few shaft drive bikes earn genuine sport bike status. With the Yamaha XJ900 Seca, you get the sport and the shaft, and will be delighted with both. ■

TEST SPECIFICATIONS

Make and model	Yamaha XJ900RK Seca
Price, suggested retail (as of 5/25/83)	$3699

Performance

Standing start ¼ mile	11.82 sec. @ 113.78 mph
Engine rpm @ 60 mph, top gear	4222
Average fuel consumption rate	44.0 mpg (18.7 km/l)
Cruising range (main/reserve)	198/57 mi. (319/92 km)
Load capacity (GVWR less curb weight)	428 lbs. (193 kg)
Maximum speed in gears @ engine redline	(1) 60 (2) 73 (3) 95 (4) 118 (5) 135

Engine

Type	Four-stroke, transverse four; air-cooled with two chain-driven overhead camshafts; two valves per cylinder
Bore and stroke	67.0 x 60.5mm (2.64 x 2.38 in.)
Piston displacement	853cc (52.1 cu. in.)
Compression ratio	9.6:1
Carburetion	(4) Mikuni 35mm constant vacuum
Exhaust system	Four into-two
Ignition	Battery powered, inductive, magnetically triggered
Air filtration	Paper element, disposable
Oil filtration	Paper element, disposable
Oil capacity	3.8 qts. (3.6 l)

Transmission

Type	Five speed, constant-mesh, wet clutch
Primary drive	Spur gear; 97/58, 1.67
Final drive	Shaft, with spur and hi-ca bevel gears; 49/37 x 19/18 x 32/11, 3.38
Gear ratios (transmission)	(1) 35/16, 2.19 (2) 30/20, 1.50 (3) 30/26, 1.15 (4) 29/30, 0.93 (5) 26/32, 0.81
Gear ratios (overall)	(1) 14.67 (2) 10.05 (3) 7.71 (4) 6.22 (5) 5.43

Chassis

Type	Double-downtube, full-cradle frame; tube/box-section steel swing arm
Suspension, front	Center-axle, air-adjustable fork with 37mm tubes, anti-dive valving, and 5.9 in. (150mm) of travel
rear	(2) gas charged, piggyback-reservoir shock absorbers, adjustable for spring preload and rebound damping, producing 4.0 in. (102mm) of rear-wheel travel
Wheelbase	58.3 in. (1480mm)
Rake/trail	27.0°/4.5 in. (114mm)
Brake, front	Hydraulic, dual-disc with dual piston calipers
rear	Hydraulic, single-disc with dual-piston caliper
Wheel, front	Cast, 2.15 x 18
rear	Cast, 2.75 x 18
Tire, front	100/90 V 18 Bridgestone Mag Mopus-L303
rear	120/90 V 18 Bridgestone Mag Mopus-G516
Seat height	31.2 in. (792mm)
Ground clearance	6.8 in. (173mm)
Fuel capacity	4.5/1.3 gal. (17.0/5.0 l)
Curb weight, full tank	534.0 lbs. (242.2 kg)
Test weight	694.0 lbs. (314.8 kg)

Electrical

Power source	Three-phase AC generator, 250 watts
Charge control	Solid-state voltage regulator
Headlight beams, high/low	60/55 watts
Tail/stoplights	(2) 8/27 watts
Battery	12V 14AH

Instruments

Includes	Speedometer, odometer, tripmeter, tachometer with 9500-rpm redline, fuel gauge, clock; indicators for low oil level, high beam, turn signals, neutral
Speedometer error, 30 mph indicated, actual	28.00 mph
60 mph indicated, actual	53.92 mph

Customer Service Contact

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