

# **YAMAHA**

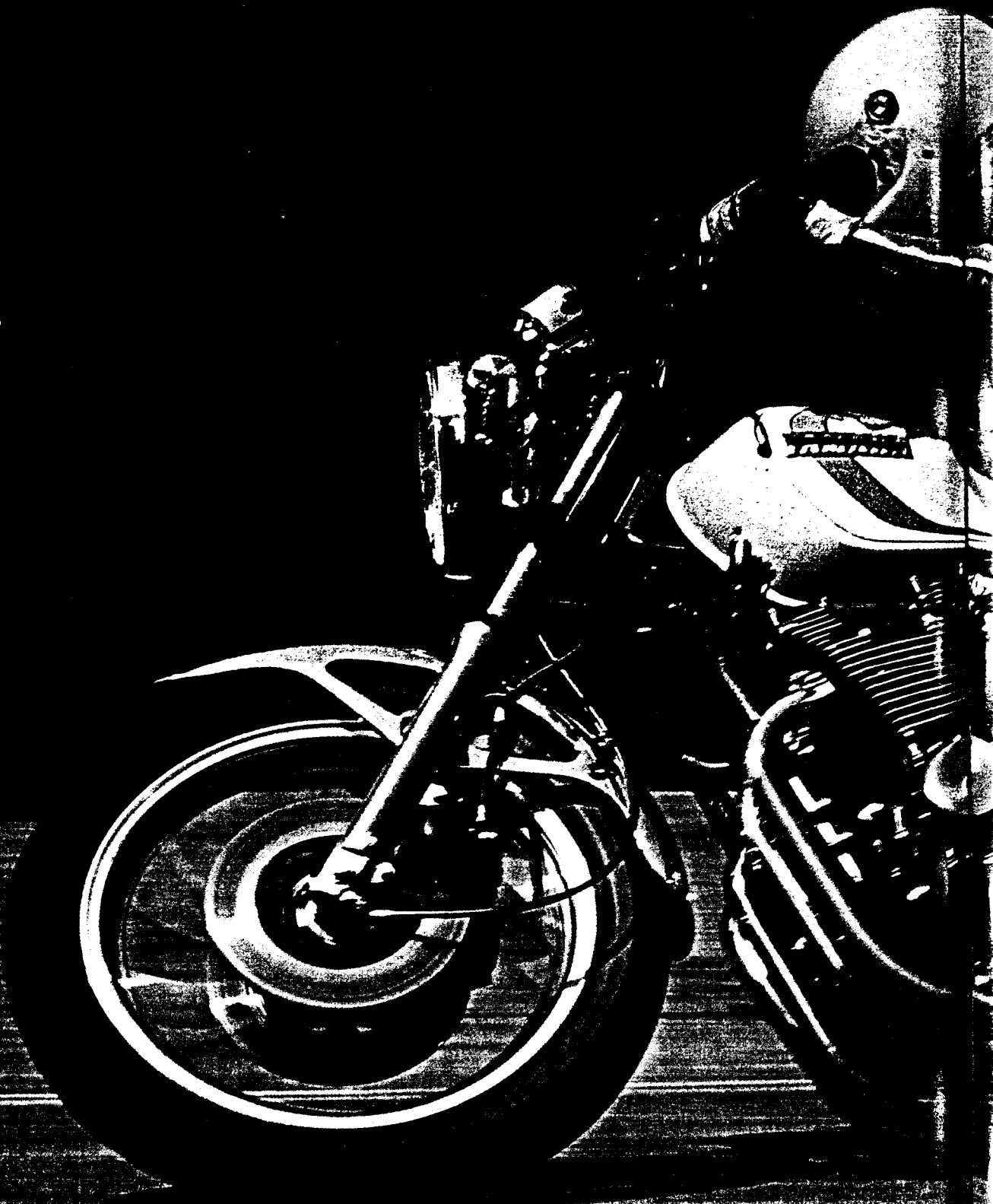
---

# **XJ650RJ SECA**

Last year, Europeans were treated to a sporting 650 while Yamaha delivered us the Maxim.

We cried for justice and got it.

Meet the Americanized 650 Seca, featuring a torquey engine, superb riding position and suspension tuned for the open road.



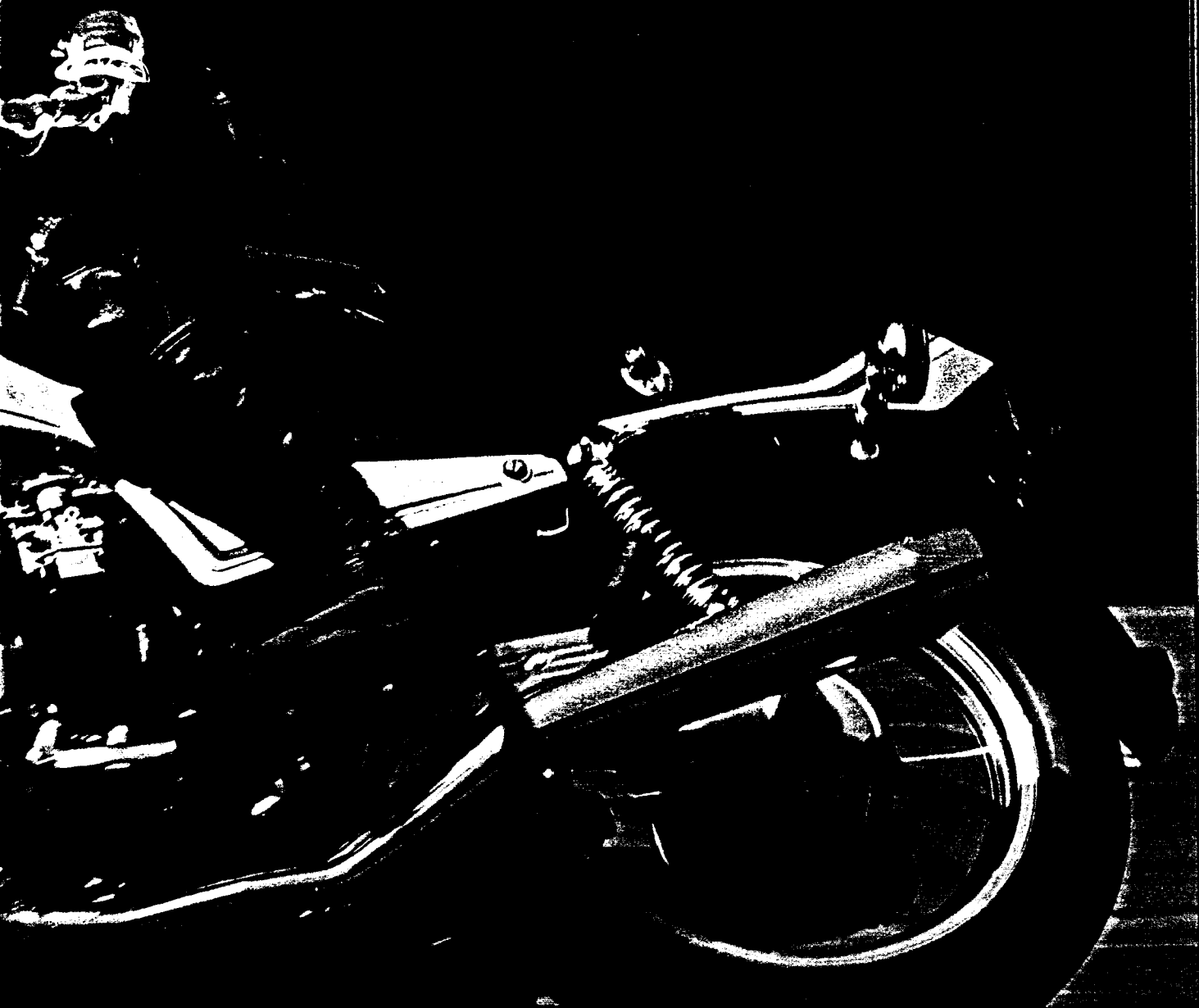
● SEEING MAY BE BELIEVING, BUT SEEING can also be deceiving. Case in point is Yamaha's new Seca 650, a Europe-first model which has landed on American shores for 1982. The Seca 650 must have presented Yamaha with an interesting problem in the United States: the new bike must live in a marketing space bounded below by the Yamaha Seca 550, above by the Seca 750, and at the elbows by the very successful 650

Maxim. In the Seca 750, Yamaha already had a sports/tourer, with the accent on sport, living 100cc above the Seca 650. Downstairs 100cc, the Seca 550 is about as pure a sports device as you're likely to find these days. It makes sense, then, that the Seca 650 should be a sports/touring motorcycle, but with its emphasis on *touring*.

But not touring in the American idiom. That concept increasingly features all the

built-ins: fairing, bags, etc. Rather, Yamaha's Seca 650 comes to touring with a distinctly transatlantic flavor. Touring, according to the European understanding of the word, involves fitting the human body on the machine to maximize comfort and control. Therefore the Seca has a relatively low bar, rearward pegs and cushy saddle—and the space relationships between those points make for serious, high-speed, long-distance cruising. The

PHOTOGRAPHY: DAVE HAWKINS





## YAMAHA XJ650R SEC A

Seca's strong engine and tall gearing make the bike feel long-legged in the European tradition: the engine burbles along at 4480 rpm at 60 mph. The most American thing about this sports/tourer is its compliant, pillow-perfect suspension which makes straight roads a pleasure and makes twisty roads not such a delight.

The American Seca is identical to its European counterpart with a few minor exceptions: a small change in carburetion brings it within EPA specifications; lighting changes and a sidestand safety-switch satisfy DOT requirements; Yamaha fits NGK rather than Nippondenso spark plugs in the U.S. model and drops the European oil cooler from the Seca made-for-55-mph-America.

The engine contains no surprises. With the exception of their intake camshafts, all of Yamaha's 650cc four-cylinder motorcycles—Seca and Maxim, U.S. and European—share the same powerplant. European Seca intake cams have four degrees more overlap and 0.30mm more lift than the cams on the U.S. model. Yamaha's engineers held the 650's width to a minimum. At 17.5 inches, the Seca engine measures 3.0 inches narrower than its shaft-drive competitor, Suzuki's GS650G. The alternator is located high behind the crankshaft and the starter motor sits behind the alter-

nator, spinning the crankshaft by gear-driving the alternator. The main bearings are of the plain variety, as are the connecting rods' big-end bearings.

The eight-valve cylinder head has two overhead camshafts operating bucket-and-shim followers. The Seca has slipper-type pistons with shallow domes and the usual two-compression/single-oil-control rings. A chain-driven trochoidal pump supplies lubrication to the engine and gearbox. Yamaha's design follows conventional practice though it is both distinguished and complicated by the remote location of the alternator—a feature that keeps the engine narrow.

The Seca's exhaust system differs from the Maxim's, resulting in a small but significant increase—about four percent according to Yamaha spokesmen—in peak torque output. The improved mid-range power gives rise to impressive quarter-mile performance despite the longer rolling circumference of the 18-inch wheel compared to the Maxim's 16-inch. Since the overall gearing is the same on both bikes, the Seca has "taller" or "longer" gearing; that is, fewer revs per 1000 rpm. The Seca's elapsed time barks at the rear wheels of 1981-model 750s and its 105.38-mph terminal speed betters the speed we were able to coax from last year's 104.89-mph Seca 750.

The Seca has a straightedge power-

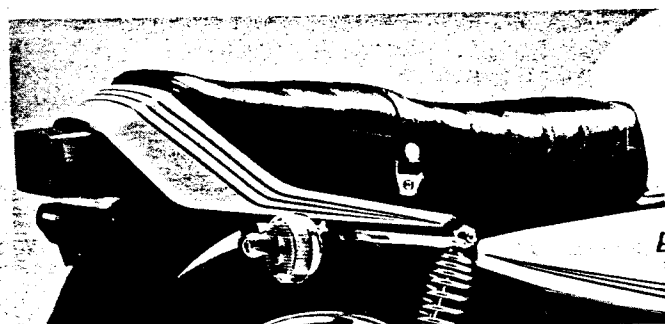
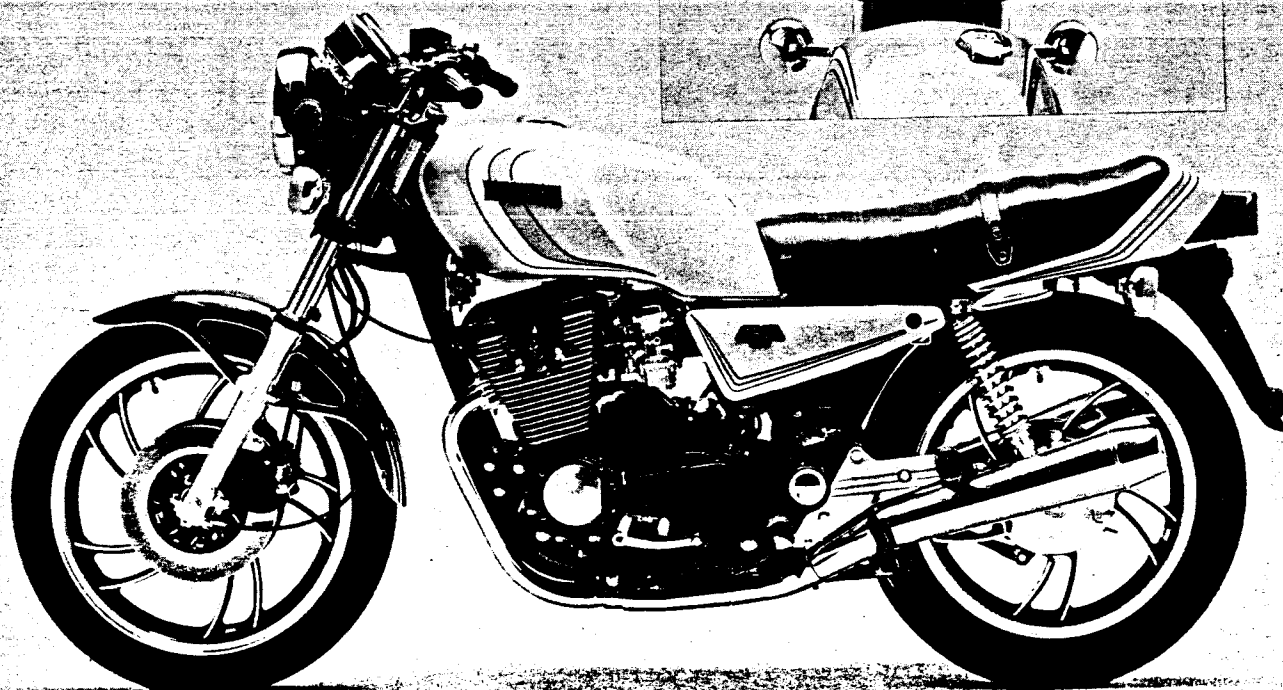
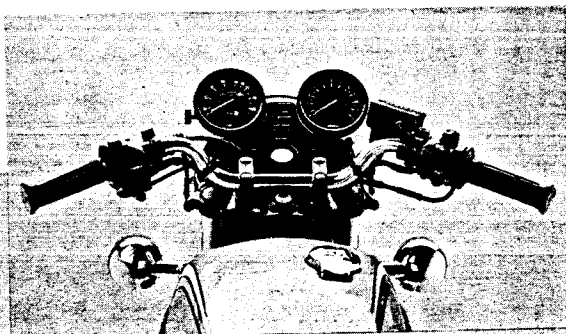
band rather than a hump—or so it feels. At no point in its rev range does the engine show the rider a power surge, and there are no flat spots in carburetion. Take that, EPA. The Seca is clearly the quickest 40-inch shaft-driven bike and it matches almost exactly the performance of the class champion—Suzuki's chain-driven 12.73-second, 102.73-mph GS650EX. Dramatic differences in vibration levels exist between the Seca and Maxim, a situation that's downright puzzling. Our 1981 Maxim remained sedate at virtually every engine speed; our test Seca reached a frantic level of vibration at 5000 rpm and beyond this point vibrations came and went in various magnitudes all the way to redline. While it was most pronounced in the handlebar, the tingling was also felt through footrests, gas tank and seat.

Some testers found themselves unconsciously compensating for this by short-shifting. One staffer who took a high-speed run through the mountains discovered he was changing gears at 7000 rpm when he felt, judging by vibration levels, that the engine was running over its 9500-rpm redline. The buzzing makes the engine feel as if it's a reluctant revver, though in fact, the Seca engine is quite willing. Here's another consolation: in high gear, the vibes set in at an already-illegal 68 mph.

Why the Seca should vibrate this

CYCLE

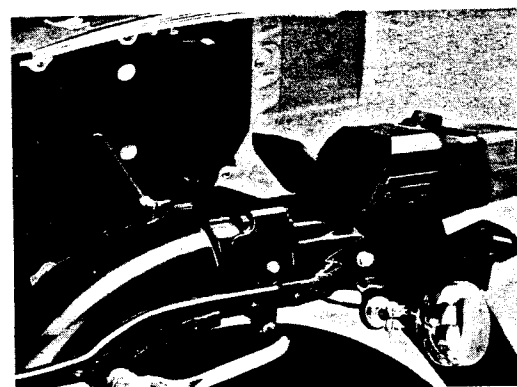
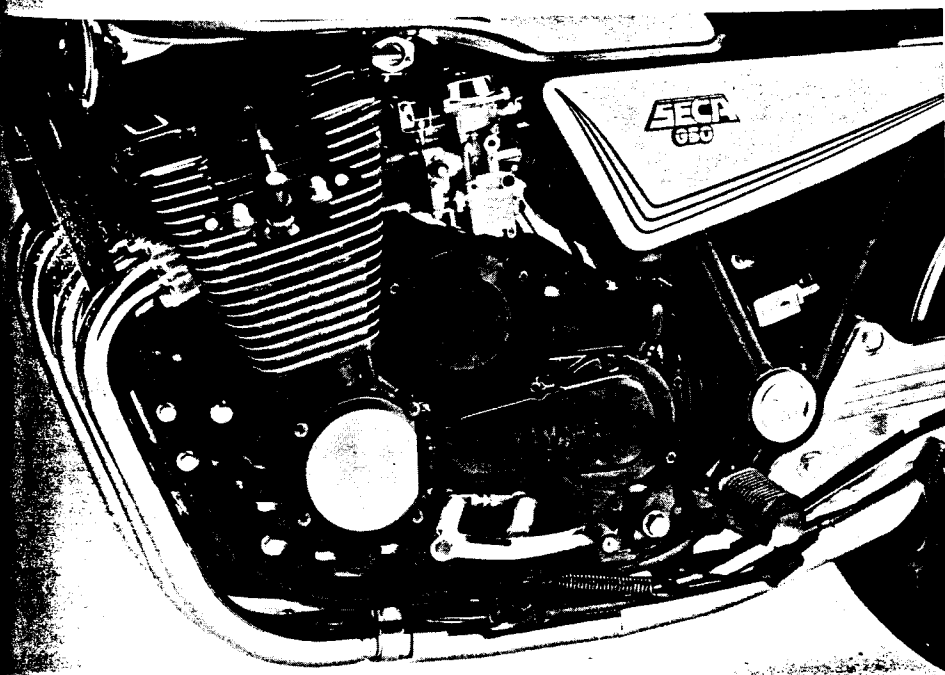
Though the Seca's seating position beckons you to set out on a sporting jaunt, its suspension is tuned to provide soft, supple action, and that compromises the 650's high-speed cornering ability.



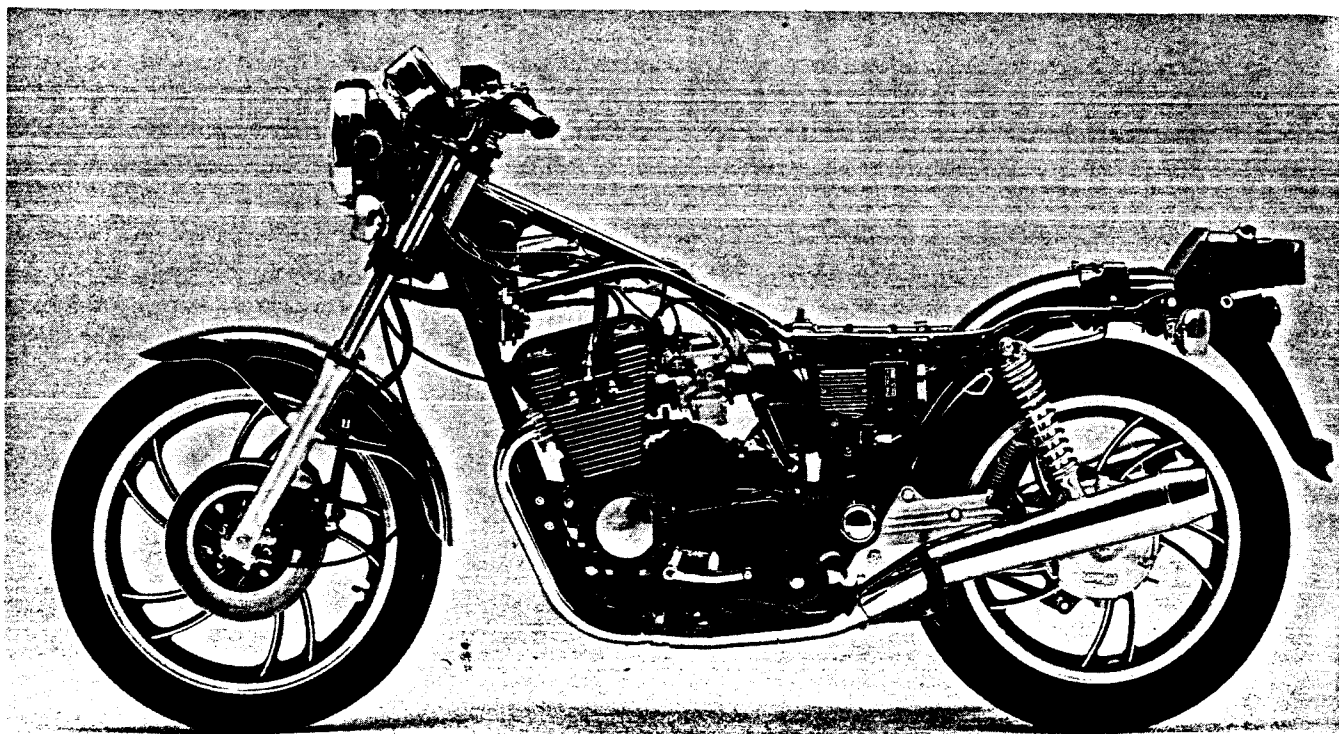
One of the most comfortable seats in motorcycling makes long rides fun and offers plenty of fore/aft space.



Seca's standard equipment includes a 2.6-foot chain and lock which stores in its own compartment.



A small rod holds the hinged seat open for access to the tool kit and a box suitable for small items.



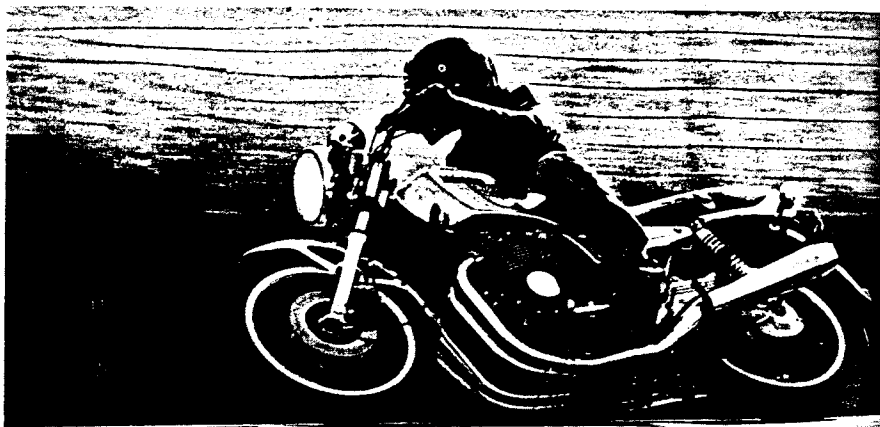
## YAMAHA XJ650RJ SECA

way—and the Maxim not—remains a puzzle. The same engine in different frames will display its vibration differently because every frame design will damp and/or amplify vibration differently. Nevertheless, the Seca 650's frame is quite similar to the Maxim's frame-tube layout and gusseting. Steering geometry is changed—rake has been steepened by 1.25 degrees and trail has been shortened nine millimeters—giving the Seca lighter, more responsive, and Gibraltar-steady steering. The XJ steering seems downright lazy, however, compared to the whippet-like 550 Seca.

Compared to tiller-types the flat-type handlebar allows the rider to place more body weight against the bar. Every staffer judged the handlebar-seat-footrest relationship excellent. The seat has enough fore/aft space to accommodate a wide range of body sizes. Although the seat appears high, its depth of padding and softness sinks the rider closer to the ground, and cushion quality is among the best in motorcycling.

This broad and lengthy saddle allows the rider to angle his torso to balance with speed. At low speeds he can slip forward when wind pressures are light. At higher speeds when the wind pushes with gale force, he can slide aft, leaning into the wind. This takes nearly all pressure off body, shoulders, arms and wrists so that the rider can sail on the wind without undue strain or fatigue, making the Seca an ideal all-day mount even without a fairing.

The riding position says made-for-Europe, and the supple suspension would be right at home on the autostrada for a



quick day's burst from the Adriatic to the Mediterranean. Suspension components enhance this day-long livability. The Seca has enough fork rigidity (36mm tubes) to resist front-end deflection. Stiction simply doesn't exist and highway ride is excellent. The fork isolates road irregularities from the rider except for occasional bottoming. The rear shock absorber travel amounts to 2.85 inches, which is relatively short these days; the soft springing produces an almost-Detroit ride, and it's Comfort City as long as you stay away from big bumps.

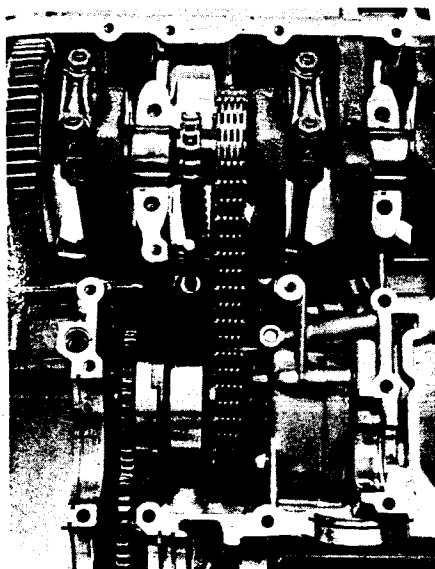
The same softness that produces the best 40-inch ride also brings you to the bottom limits of travel. The fork tubes have no air assist to bolster limp springing, and merely braking hard for a stop completely soaks up the fork's 5.4 inches of travel. At the rear hard bumps eat up all the distance in the short-stroke dampers. Flaccid damping further compounds rear suspension problems. Fast sweepers or hard bumps cause a gentle

wallow which, while never threatening, is obvious and present.

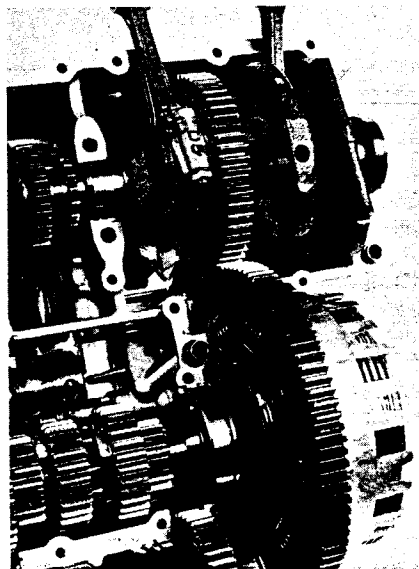
European Seca specifications call for 15-weight fork oil, while American versions are supplied with 10w. We changed the fork oil to 15w to determine if that would eliminate, or at least reduce, the amount of fork bottoming present in our test machine. Although the change did firm things up a small amount, the difference was not significant enough to appreciably improve front-end springing.

Suddenly you understand that you've left Europe and Continental-style touring, and you're right back in America. Ground clearance is good, but aggressive cornering requires the stiffest shock-spring preload to help resist thrashing the undersides. Even at this setting, the springs settle down to their limits, allowing the sidestand on the left and the exhaust header on the right to drop. Driveline lash and torque reaction become the Bobbsey Twins of caution. Hard on/off throttling in corners results in a lot of wind-up/

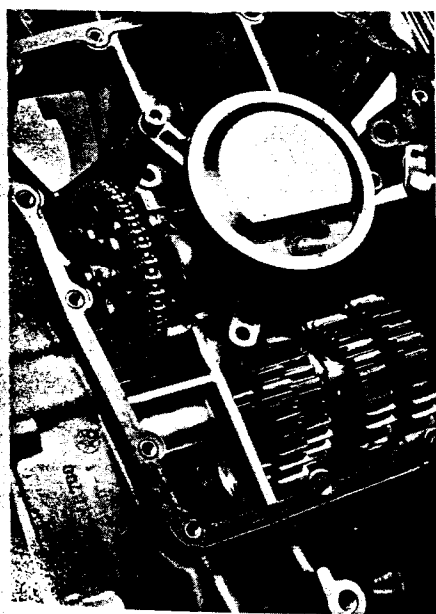
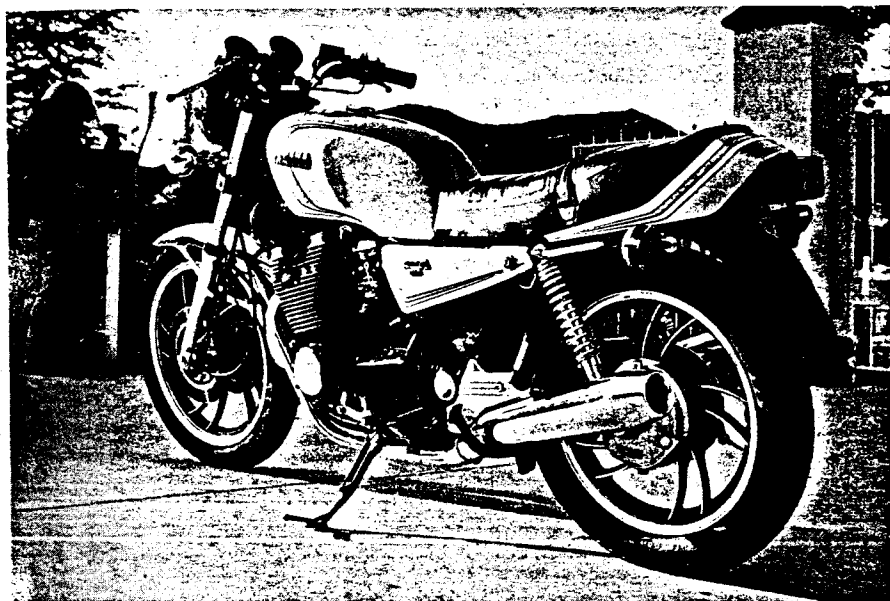




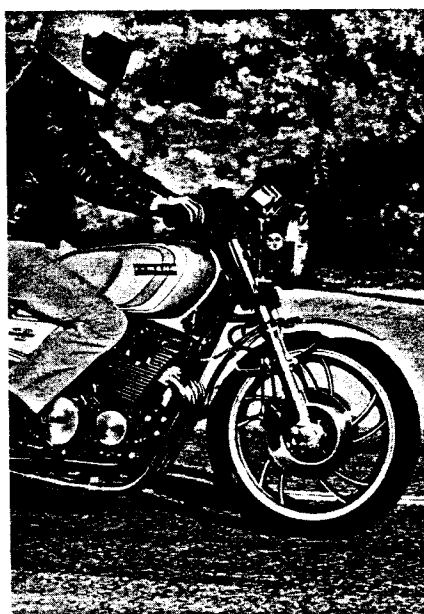
Drive for the alternator (Hy-Vo chain) and camshaft (single-row chain) originates at crankshaft's center.



Straight-cut spur gears deliver primary drive. The crank flywheels are the cut-down "pork chop" style.



The chain-driven trochoidal oil pump nestles into a baffled wet sump; screened opening faces rearward.



Fork spring rates are soft for long-range comfort; however, travel is used up under hard braking/cornering.

pull-down in the rear suspension. This activity can put the 650's nether regions scraping on the road, or can tend to pull the bike up and out of its cornering attitude. The lash is not obvious when cruising down the turnpike; however, shifting gears or changing throttle setting briskly will reveal the up-and-down bob in suspension activity.

Yamaha's powerful dual-disc brakes grace the front end, endowing the Seca with tremendous stopping force. The calipers are the single-piston type and the 268mm rotors are solid, without the fashionable holes and slots. Feedback through the front-brake lever is a tad spongy and response to input is not exactly linear, requiring increasingly hard pressures to extract shorter stopping distances. The mechanical drum rear brake has no quirks, provides adequate feel and power, and resists lockup.

Clutch-lever feel is very good with light lever pressure and a wide, smooth engagement arc. The shift pedal has a nice short throw and its action is smooth and light—the linkage doesn't affect shift action at all and it's much slicker and more positive than many bikes which have their shift levers bolted directly to the shift shaft.

The handlebar-mounted choke lever can be thumb operated without removing your hands from the handlebar. Yamaha has been positioning the choke lever this way on many of its bikes, and this trigger/thumb-lever is a splendid example of Bright-Think. It gives the rider a perfect way to modulate the choke for cold-engine running. Riding away on a dead-cold Seca engine requires precise choke adjustment to prevent engine flame-out.

Appointments aboard the Seca include Yamaha's self-canceling turn signals—a solid, non-gimmick feature that aids safe riding. The high-pitched dual-tone horns are above average. Instrumentation is rather unremarkable, providing adequate but not overwhelming information, presented without glitzy read-outs. The short grips don't allow much hand space and the short rearview mirror stalks don't put the mirrors out far enough to see around your elbows, giving only half a mirror's measure of the next lane and nothing directly behind.

As you might expect from its impressive specification, the eight-inch-diameter quartz halogen headlamp illuminates exceptionally well. While its range is about equal to most quartz units, the pattern and spread are much broader. Besides the wide main beam thrown forward, a generous swath of light splashes around the area directly to the sides in front of the bike, especially when on high beam.

The small storage compartment under the lockable seat measures about 5.5 inches wide, three inches high and four inches deep—just big enough to stash lightweight summer gloves. Also in-

# YAMAHA XJ650RJ SECA

cluded as standard equipment is a 32-inch chain, with lock, that locks into its own storage compartment.

Shim-type tappet adjustment presents the only intricate maintenance chore. The cam chain is self-adjusting and both ignition timing and advance are electronically controlled, requiring no attention. Drain plugs, filler plugs and oil filter are easily accessible; there are engine-oil and brake-fluid view windows for visual inspection. Flip up the seat and lift out the tool tray and you have access to the air filter cover; the electrical system's fuse box is mounted on the air-cleaner lid. The battery resides under the snap-off right side cover. Overall, owner-

servicing the Seca is simple and straightforward.

The gas tank filler neck, located on the right side of the tank, permits refueling while the bike rests on its sidestand. The fuel tap is prominent and easy to operate. Although the total capacity is 5.1 gallons, filling the tank to the brim results in seepage from the cap. The practical refueling limit is within a couple of tenths of a liter from the top, which leaves a usable 5.0-gallon capacity. Even so, range between fuel stops is a genuine 200 miles—perfect for cross-country jaunts. Fuel consumption averaged 47.5 miles per gallon and we received a high of 51.4 on one legal-speed trip. Our all-time low was 45.8 mpg.

The XJ's abundant range adds muscle

to its already strong features: its lush ride, obliging riding position, shaft drive and high performance. The Seca is the most comfortable riding motorcycle in its class. With more sophisticated—read tunable—suspension, the sporting side of the Seca could be strengthened enormously.

If your blood runs at 100 degrees centigrade when the road begins to twist, you've got lots of options—Yamaha 550 and 750 Secas, Kawasaki 550 and 750 roadsters, the Suzuki 650. But if your blood cools to merely lukewarm when it comes to assaulting corners and the idea of booking 500-mile days in an open cockpit makes your heart pound, then the XJ650RJ will fit your brand of sport-touring.

## Cycle TEST SPECIFICATIONS

Make and model ..... Yamaha XJ650RJ  
Price, suggested retail (as of 8/25/81) ..... \$3099

### PERFORMANCE

Standing start ¼-mile ..... 12.78 @ 105.38 mph  
Engine rpm @ 60 mph, top gear ..... 4480 rpm  
Average fuel consumption rate ..... 47.5 mpg (20.2 km/l)  
Cruising range, main/reserve ..... 185/52 mi.  
Load capacity (GVWR less curb weight) ..... 225.6 kg  
(497.5 lbs.)  
Maximum speed in gears @ 9500 rpm ..... (1) 47.3  
(2) 69.0 (3) 89.7  
(4) 110.9 (5) 127.3

### ENGINE

Type ..... Four-stroke transverse four-cylinder with dual overhead camshafts, chain-driven  
Bore and stroke ..... 63.0 x 52.4mm (2.48 x 2.06 in.)  
Piston displacement ..... 653cc (39.8 cu. in.)  
Compression ratio ..... 9.2:1  
Carburetion ..... (4) 32mm Hitachi constant-velocity slide-throttle  
Exhaust system ..... Four-into-two, interconnected  
Ignition ..... Battery-powered inductive, magnetically triggered with electronically-controlled advance  
Air filtration ..... Paper element, disposable  
Oil filtration ..... Paper element, disposable  
Oil capacity ..... 3.5 liters (3.7 qts.)

### TRANSMISSION

Type ..... Five-speed, constant-mesh, multi-plate wet clutch  
Primary drive ..... Straight-cut spur gear; 97/58; 1.672  
Final drive ..... Shaft; 49/36, 19/18, 32/11; 4.180  
Gear ratios, overall ..... (1) 15.29 (2) 10.48 (3) 8.06  
(4) 6.52 (5) 5.68

### CHASSIS

Type ..... Full-cradle tubular steel, twin downtube  
Suspension, front ..... Telescopic, coil spring, oil damped  
rear ..... Swing arm with (2) dampers adjustable for preload

Wheelbase ..... 1435mm (56.5 in.)  
Rake/trail ..... 27.75° / 115mm (4.53 in.)  
Brake, front ..... Hydraulic, twin disc, 268mm (10.55 in.)  
rotors with single-piston calipers  
rear ..... Mechanical drum, rod-actuated  
Wheel, front ..... Cast aluminum alloy 1.85 x 19  
rear ..... Cast aluminum alloy 2.15 x 18  
Tire, front ..... 3.25H x 19 Bridgestone Mag Mopus-L303  
rear ..... 120/90H x 18 Bridgestone Mag Mopus-S716  
Seat height ..... 784mm (30.86 in.)  
Ground clearance ..... 149mm (5.86 in.)  
Fuel capacity, main/reserve ..... 14.8/4.5 liters  
(3.9/1.2 gals.)  
Curb weight, full tank ..... 227.9 kg (502.5 lbs.)  
Test weight ..... 300.5 kg (662.5 lbs.)

### ELECTRICAL

Power source ..... AC generator  
Charge control ..... Solid-state voltage regulator/rectifier  
Headlight beams, high/low ..... 60/55 watts  
Tail/stop lights ..... 8/27 watts  
Battery ..... 12V 14AH

### INSTRUMENTS

Includes ..... Speedometer, odometer, tripmeter, tachometer with 9500-rpm redline; indicators for high beam, neutral, low oil level and left and right turn indicator

Speedometer error,  
30 mph indicated, actual ..... 28.70  
60 mph indicated, actual ..... 59.13

### CUSTOMER SERVICE CONTACT

Customer Relations Department  
Yamaha Motor Corporation, USA  
6555 Katella Avenue  
Cypress, CA 90630