

CYCLE ROAD TEST

Yamaha 650cc XS1Twin

The XS1 is a mount for the guy who doesn't go for 750-and-up multis or the 350 that turns 10-jillion revs on the Interstate.



• Yamaha's much rumored and much anticipated 650 twin is nothing really new. It has about the same size and feel as the BSA Lightning and Triumph Bonneville and the engine has about the same design and layout as the Honda 350 twin.

But the terms "new" and "about" don't mean much when used as above to describe Yamaha's first four-stroke. Since the machine embodies no engineering concepts that are "new," chances are that owners won't have to suffer while reliability is developed. And while the Yamaha feels "about" the same as the two English bikes, there are important differences that may be deciding factors to prospective buyers.

Following normal Japanese bike engine design practice, the crankcase's seam is horizontal: once the engine outer cases are removed, the whole bottom of the engine-gearbox can be taken off to inspect and repair the insides. The crankshaft is built up from four circular flywheel discs, the pairs for each cylinder being pressed onto a solid crankpin and the two assemblies joined with a splined shaft. Large roller bearing assemblies support the crankshaft at three points, two in the middle and one on the left end, and a ball bearing carries the right drive-end. The connecting rods look like beefed-up versions of Yamaha's 360 two-stroke rods, with caged needle rollers at both ends of each. A driving sprocket for the camshaft sits between the two center main

bearings. The cam chain goes up through the one-piece cylinder in a passage between the bore sleeves. Adjustable idler gears and rubbing nylon sliders keep standing waves from developing in the slack side of the chain. The one-piece camshaft is supported by ball bearings between the pairs of inlet and exhaust valves. A removeable housing that joins the head at the camshaft center line holds the rocker arms in place and fastens the camshaft bearings. Valve clearance is adjusted with screws at the ends of the rocker arms.

Power is transmitted from the end of the crankshaft to the clutch via a pair of straight-cut gears and passes through the six-plate wet clutch to the five-speed gearbox. The clutch turns one of the gearbox shafts and the rear drive sprocket is fastened to the other. Large double-row ball bearings are used behind the clutch and drive sprocket; needle rollers carry the less heavily loaded ends. The gear selector mechanism is the familiar Yamaha cylindrical drum, operated by a reciprocating finger with hooked ends, with sliding forks to the three moveable gearbox pinions.

Lubrication is totally contained in the engine. Three quarts of oil in the sump are pushed through the engine and gearbox by a trochoid-type single-stage pump. All of the bearings and friction pivots are pressure-fed. An outside return tube in front of the engine lets oil get from the valve cavities to the sump. A circular cover on the right side outer

cover conceals a washable mesh oil filter. With no outside oil tank, the likelihood of oil leaks is reduced and the heat is kept away from the rider's seating area. The rider's manual recommends that the oil be changed every 2000 miles.

Electrical power originates in a 100-watt alternator on the left end of the crankshaft. A points-type voltage regulator controls the generator output by using battery current to excite the alternator field when demand is high. A four diode, full-wave rectifier changes the alternator's pulses to DC for battery charging current. The exciting field is fed through two slip-rings and carbon brushes.

Sparks are supplied from a battery and coil system. The breaker points are fastened to the cylinder head and are operated by an extension from the camshaft. A rod extending through the hollow camshaft couples the centrifugal advance mechanism on the right to the points on the left. A couple of Phillips-head screws hold chrome-plated covers over each end. Setting the ignition timing is super easy. Timing marks are stamped on the alternator rotor. The only thing missing is a timing light. (We wonder who's going to be the first to put a light within vision of the points and timing marks. It sure would be cheap and easy.)

The rocker arm adjusting covers are big and easy to get off. There is plenty of room for fingers and wrenches when