

Cycle

OCTOBER 1973/30p

HONDA XL-350 BOOMER
BASICS: HANDLING AND
THE SPEED WOBBLE
BAILEY'S MX SCHOOL





PHOTOGRAPHY: BILL DELANEY

CYCLE ROAD TEST

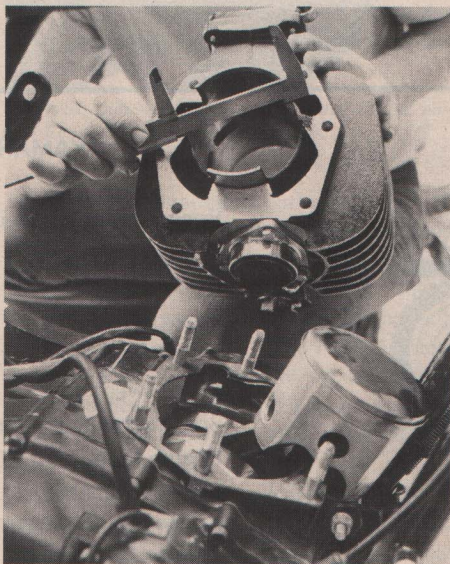
YAMAHA SC 500 MOTOCROSS

Yamaha's new 500cc (all in one cylinder) dirt bike is long on brute torque, rock-chunking, and manufacturing niceties and painfully short on handling finesse, piston-life, and general usability.

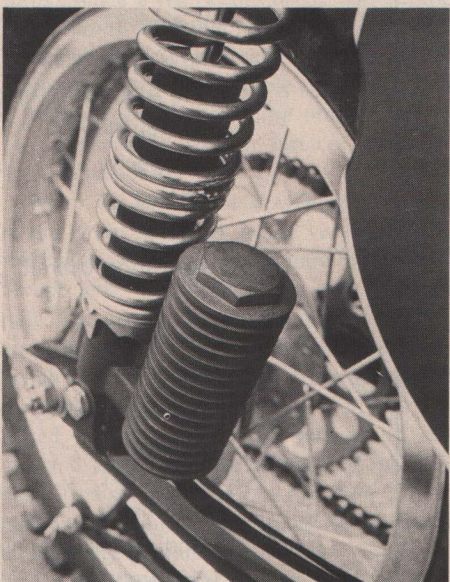
● Yamaha's new SC 500 Motocross. That doesn't really grab you, does it? No picture is painted; nothing springs to mind. How about Great Walloping Caterpillar Mother?

It was rather intimidating even as it was wheeled off the delivery truck. The massive, thick-necked cylinder is virtually ventilated by securing fasteners. A gorged black python writhes back through a jungle of steel and aluminum to belch out the sound and spent gasses. But it was the rear tire that told it the truest. Lettering on the sidewall informs us that it is a Dunlop Sports Senior and that it is a 4.60 x 18. A cursory examination by an even moderately experienced dirt rider will tell that it has to be the most outrageous, intimidating rock-chunker of all time.

We were thankful that our test bike was miscarbureted when we took it to Muntz Motorcycle Park for its first outing. After several laps around the motocross course, a poll was taken among the staff members there and it was unanimously decided that the SC 500 Motocross was drastically misnamed. Whatever it is, it is no motocrosser. The bike boils off the line in a deluge of clods and rocks and then, when the tire finds a semi-solid spot, the front wheel starts to climb and keeps on coming until the throttle is closed slightly. At approximately 5,000 rpm (there's no tach), the engine would start to four-stroke badly and lose power. The bike has such a wide power curve that it will accelerate very strongly if the next higher gear is selected just as the engine begins to four-stroke. Even with the last quarter of the power curve not usable, the SC 500 is almost impossible to ride around the course. The power comes on with an incredible rush and the bike accelerates like a rocket when the wheel can find just the right compromise between traction and wheelspin. But the norm is either the rear wheel spinning uncontrollably or the front wheel trying to come over



What a slug! Those calipers are measuring the bottom cylinder bore as 3.75 inches.



New remote shock absorber reservoir permits only oil in damper body thus deleting aeration.

backwards and mash the rider against the track like a giant flyswatter. When a corner is reached, the bike is going very quickly, bouncing from bump to bump like a pogo stick. We were familiar with the track. Upon arriving at one favorite banked switchback we levered the bars around in the prescribed manner, put all our weight on the outside footrest, and waited for the customary G-load in the gut to signal throttle application time. It never came: the big blaster proceeded right up over the lip of the bank, down the hill and out of sight. Oh, it hurt. Several alternate plans resulted in less spectacular but equally uninspired results. The suspension control is not good enough to allow repeatable planning from lap to lap and the throttle only coarsely controls the urge to the rear wheel.

No amount of rear shock spring adjustment gave our bike a hint of the missing suppleness. The understeer in tight corners could be substantially neutralized by lowering the triple clamps on their stanchion tubes.

So as we left the track that day, we had found adjustment to make the front end more pointable, but had failed to make the suspension less treacherous or the throttle response more controllable and more consistent.

During the last try-and-change period, the engine abruptly began to seize. We loaded our bikes and tools and drove off into the Southern California sunset.

In the shop we checked the quantities and amounts of the suspension fluids and made sure that there was no mechanical binding or sloppiness in the forks and swingarm. These points were okay and the wheel alignment was spot on. The rear suspension units have large external fluid reservoirs with cooling fins cast into the resulting tower. We suppose that's a good idea, but Yamaha should work on getting the bike to handle more predictably before spending time on such appliances as the external towers.

Removing components for servicing on the SC 500 is quick and easy. Loosening five fasteners and unhooking a couple of springs allows the seat, tank, and exhaust system to be removed in two minutes. Quarter-turn Dzus fasteners in each side panel allow them to be slipped off after being loosened with a coin. The right side panel also serves as the cover for the air filter housing. The filter element, removed with a single thumb screw, is made of the dual material (normal polyurethane foam covered by a furry synthetic) that seems to be universal on Japanese dirt bikes. The element is cleaned by washing in safety solvent, squeezed dry and coated with oil. A huge fiberglass box doubles as a filter housing and partial rear fender.

After removing six bolts and unplugging a few wires and cables, the engine was lifted out of the frame. A special deep socket is provided in the tool kit for removing the cylinderhead nuts and base fasteners. Though the cylinder bore sounds impressive on the

spec sheet (95mm—3.74-inch), it looks absolutely cavernous when you lift the head.

Seizure marks lined the piston skirt adjacent to the exhaust port edges. The marks were smoothed with a #2 flat file and the cylinder was honed clean to increase the clearance 0.02mm.

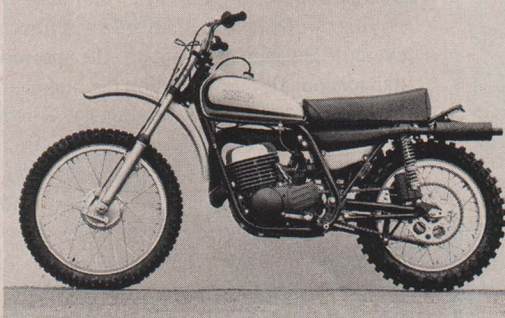
Apart from the seizure marks, the insides of the SC 500 showed the result of a vast improvement in Yamaha's casting techniques and manufacturing tooling. The walls of the crankcases are thin where there is little stress and massive where a fastener or bearing is supported. This manner of material distribution control is very difficult in high-production die casting. All machined surfaces are extremely clean and smooth.

With the engine apart, we noticed that all the necessary machining is already done for the installation of a tachometer drive. It was too late to obtain the requisite pieces, but a tach would have been extremely handy to use when the carburetion was being sorted out.

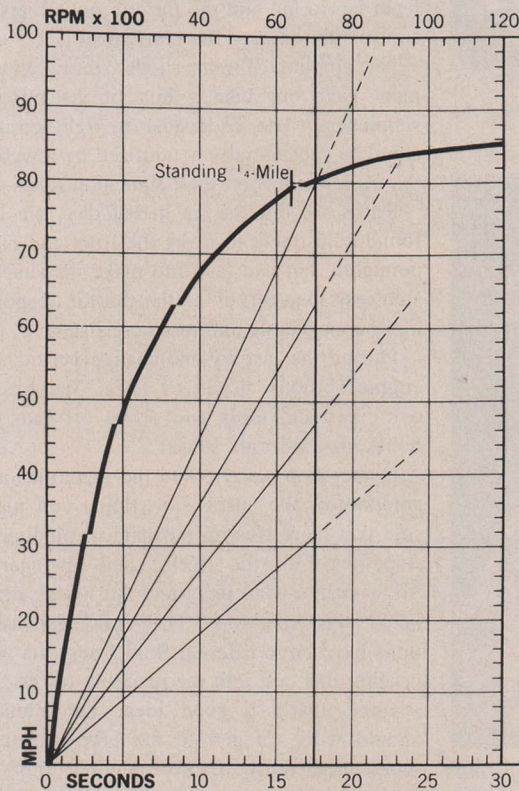
Another extremely interesting feature inside the cases is the dynamic balancer assembly. A single eccentric weight, rotating in a direction opposite to the crankshaft, is housed between a pair of ball bearings directly behind and slightly above the crankshaft. An endless duplex chain connects the balancer and crankshaft via a couple of idler sprockets and a rubber damper block. The balancer is extremely effective in smoothing engine vibration—but a couple of desert racers we talked to have disconnected it in order to gain a couple of horsepower and reduce weight. Desert racers are masochists.

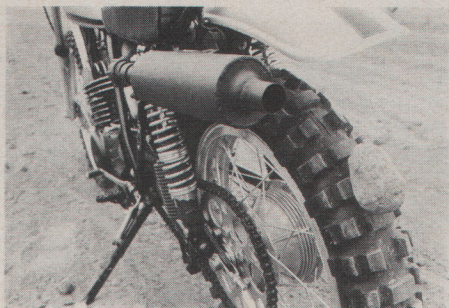
After the engine was reassembled, the bike was taken to the dragstrip in an effort to get the engine to run cleanly. As standard, the 38mm Mikuni carb has a #400 main jet, an 0-8 needle jet, a 6F16 needle, and a 3.5 slide. Our bike was detonating slightly at intermediate throttle openings and then running so rich that it would four-stroke at high revs and wide-open throttle. The needle was in the

YAMAHA SC 500 MOTOCROSS

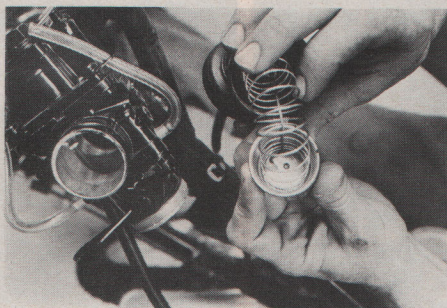


Price, suggested retail	..... West Coast, POE \$1,225
Tire, front	..... 3.00 in. x 21 in. Dunlop Sports
rear	..... 4.60 in. x 18 in. Knobby
Brake, front	..... 5.125 in. x .875 in.
rear	..... 5.969 in. x 1 in.
Brake swept area	..... 32.84 sq. in.
Specific brake loading	... 12.27 lb/sq. in., at test weight
Engine type	..... Reed valve two-stroke single
Bore and stroke	... 3.75 in. x 2.756 in., 95mm x 70mm
Piston displacement	..... 30.5 cu. in., 498cc
Compression ratio	..... N.A.
Carburetion	..... 1, 38mm; Mikuni
Air filtration	..... Dual-density oiled polyurethane foam
Ignition	..... Magnetically triggered capacitive discharge
Bhp @ rpm (claimed)	..... 38 @ 7,500 rpm
Mph/1000 rpm, top gear	..... 11.3
Fuel capacity	..... 2.4 gal.
Oil capacity	..... 0.6 qts.
Lighting	..... None
Battery	..... None
Gear ratios, overall	..... (1) 16.95 (2) 11.45 (3) 8.48 (4) 6.84
Wheelbase	..... 56.5 in.
Seat height	..... 32 in., with rider
Ground clearance	..... 9 in., with rider
Curb weight	..... 243 lbs., with full tank of gas
Test weight	..... 403 lbs., with rider
Instruments	..... None
Standing start 1/4 mile	..... 15.4 seconds 79.64 mph
Top speed	..... 80 mph with test gear

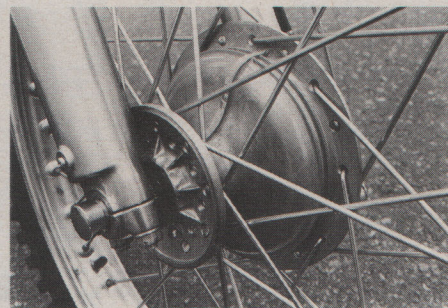




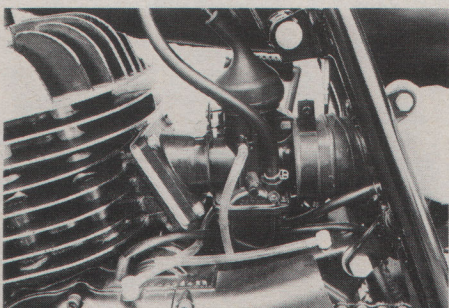
That mini-boulder is sitting unaided on a knob of Dunlop's new 4.6 x 18 skin.



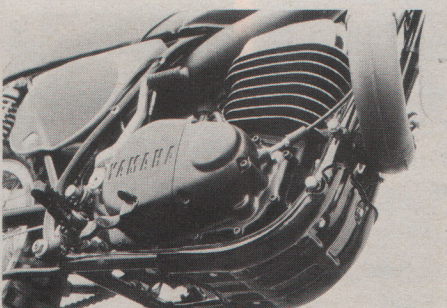
When needle position is changed, be careful not to let clip plate hang up.



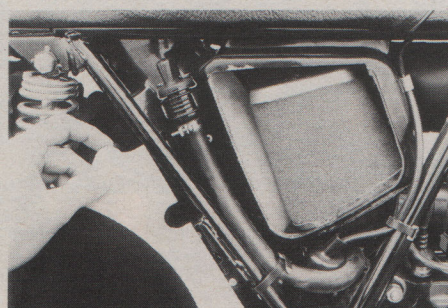
One of the nicest, lightest and strongest hubs on the market.



Rejetting the 38mm Mikuni did not clean up the carburetion entirely.



Upswept pipe and protection plate under engine keep things clean and intact.



Air filter element and oil reservoir filler tube are under right number plate.

second notch from the top, so we raised it to the fourth notch and reduced the main jet to a #380. The bike ran 16.56 seconds at 74.75 mph stock and 15.82 seconds at 77.05 mph with the first change. The part-throttle detonation had disappeared, but the full-throttle stuttering was still there. Our smallest main jet was a #370 and the engine was still stuttering somewhat in a run which produced figures of 15.39 seconds at 79.64 mph. Normally any bike's carburetion can be cleaned up by changing the settings of the standard components and replacing the main jet, but this time it looks like Yamaha has picked the wrong components—perhaps purposefully.

Our next outing with the big Yamaha was a fast trip along some 160 miles of fast fire trails in the Sierra Nevada mountain range. Many of the trails are graded decomposed granite while others are very dusty, soft dirt. In this going, the SC 500 really begins to come into its own.

One would suspect that such an engine as the SC 500 would be miserable to start. Yamaha has installed a compression release which bleeds off part of the cylinder pressure through a tap hole about midway between the top of the exhaust port and the top of the cylinder. The release is automatically actuated when the kickstart lever is depressed and is returned to normal when the lever is brought back to the resting position. The bike usually starts on the second kick, and the lever never bites back to sprain your ankle. Sound coming from the silencer is quite low and pleasant. Indeed, it is almost drowned out completely by the clattering and clanking from the huge piston. Engine noise continued to in-

crease for the duration of our test.

Despite the presence of an Autolube pump and auxiliary tank on the bike, the manual which comes under the saddle advises that a 30:1 gas/oil mixture is to be run in the tank along with the Autolube. The manual warns that the lubricating quality of pre-mixed fuel begins to deteriorate after 24 hours and that owners should mix a fresh batch before every day's ride.

Bright sun rays were just getting good and hot as we left our vans low in the foothills. On the smooth roads the Yamaha would hold long, gracefully sustained slides the whole length of the stretches of constant radius turns. When a rise would occur, just a little extra throttle opening would keep the front wheel up as far as our rider dared go before the next bend. With the triple clamps lowered 1.5 inches on the stanchion tubes, steering on the fireroads' smooth surfaces was neutral and responsive.

When we came to a slow bumpy section where it was necessary to use very low revs, the engine would often suddenly die with an abrupt jerk. It felt like the sparks simply quit. The engine has far too much compression to restart by simply releasing the clutch—unless the rider has time to depress the kickstart lever before the clutch is released. Often we would get into a turn too fast and kill the engine by locking the rear brake in a stalling slide. At such time a normal compression release fitted to the hole thoughtfully provided by Yamaha would afford more accurate braking than the touchy rear brake, and would make restarting with the clutch effortless.

Over the extremely rough sections, Yamaha's smoothly contoured tank and thickly padded seat were a blessing. Too, the strong spring-loaded footrests and forged rear brake lever absorbed worse than mortal beatings without giving up their jobs.

Our bike was fitted with an optional 16-tooth countershaft sprocket to give it an 80 mph limit. Even when geared this high the engine's incredible torque lets it pull away from a stop at almost an idle. With only four gearbox ratios the SC 500 has a practically perfect power and gearbox combination for fast riding on smooth dirt roads.

Although we never felt the engine get tight a second time, later examination in the shop brought to light new streaks on the piston and cylinder which showed that it was on the verge of a re-seizure.

From viewing the SC 500, we can see that Yamaha is showing great strides in improving the manufacturing processes and quality control used to make their bikes. We are regretful that the SC 500 was the first of the Yamaha Motocross series that we have tested. The 500 is beautifully manufactured, but it is not a racer and it is too narrow in scope to be a playbike. If you have lots of open space readily at hand and lots of time and money and patience to work the bugs out of the carburetion while you change pistons, then you may be happy with the SC 500 this year. But we'd suggest you wait until next year to see if Yamaha can make a viable racer, or an all-around playbike, or both, out of the present bellowing, rock-flinging, eye-stinging, ear-battering and trench-digging confusion.