

SUZUKI RM250B

● TECHNOLOGICAL LEADERSHIP IN MOTOCROSS changes hands faster than hot parts at a swap meet. Most everyone, at one time or another, has had their bike lauded "the best"—Husqvarna, Bultaco, Maico, Yamaha, Honda, and other names long since gone from the motocross scene. Suzuki's new B-model RM 250cc motocrosser is the latest machine to contend for the title of "the best."

Suzuki's recent development policy is a complete turnabout from the traditional Japanese business philosophies we observed during the last decade. Their products, whether street or dirt bikes, have often remained devoid of major changes for years because of the large production runs necessary to make comparatively low-cost machines highly profitable. This has been effective for long-term street bike buyers and devastating to European manufacturers. However, it has not been terribly successful with dirt bikes—especially motocrossers.

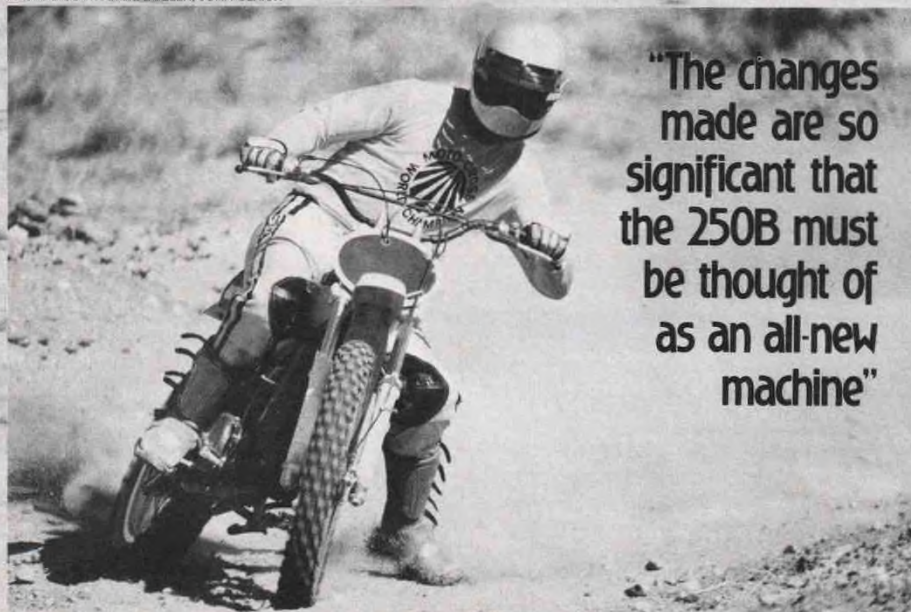
The European manufacturers have always been a half-step ahead of the Japanese in dirt bike technology. Smaller production runs by the continental firms allow for improvements and changes to be made on the line with most model series. The Europeans' ability to make the ever-so-important small improvements or correct problems on a day-to-day basis has kept them in the forefront of motocross.

It is probable that Suzuki learned much more than state-of-the-art racing secrets while campaigning for world championship titles. The profit-making motive of racing is meaningless if reasonable chunks of technology can't get to the production line quickly. Suzuki's experience with the old TM-series, which seldom changed and seldom sold, taught



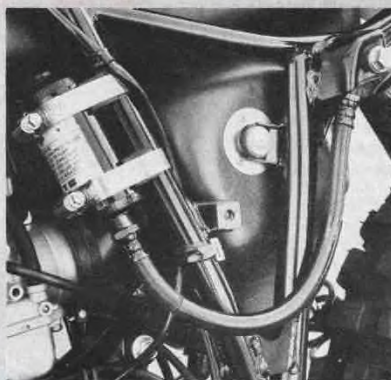


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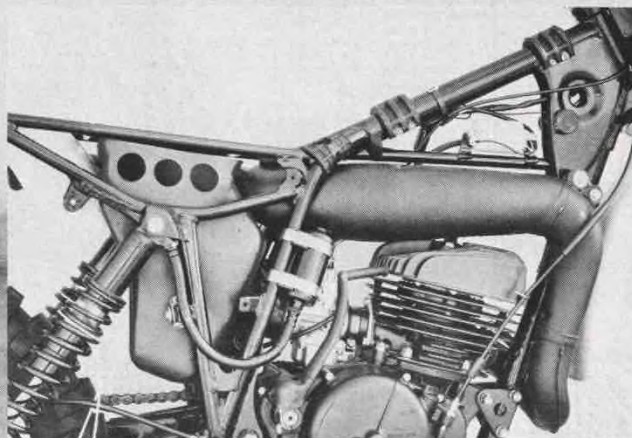


"The changes made are so significant that the 250B must be thought of as an all-new machine"

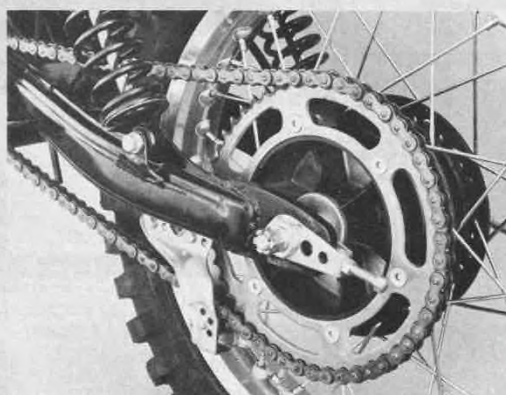
SUZUKI RM250B



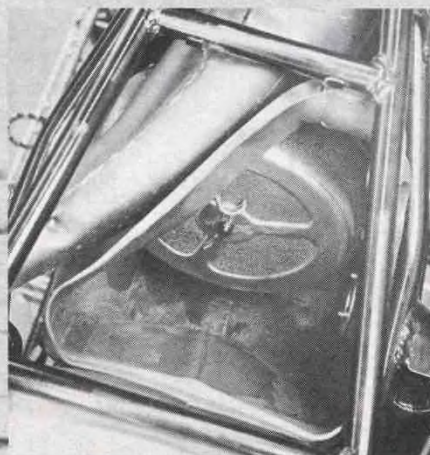
The new Kayaba shocks incorporate auxiliary reservoirs for additional gas and oil capacity.



A-Model frame and pipe designs are retained. Welds? Japanese Traditional.



Chain adjustment and rear wheel removal are straightforward tasks. Brakes work well. Tensioner is multi-positional.



Re-designed air box makes filter changes easier but still a time-consuming chore. Air filter is oiled foam.

them a hard lesson. Information on the limited, or controlled, production of the European concerns was probably returned to Suzuki's product development department along with the used Grand Prix championship bikes.

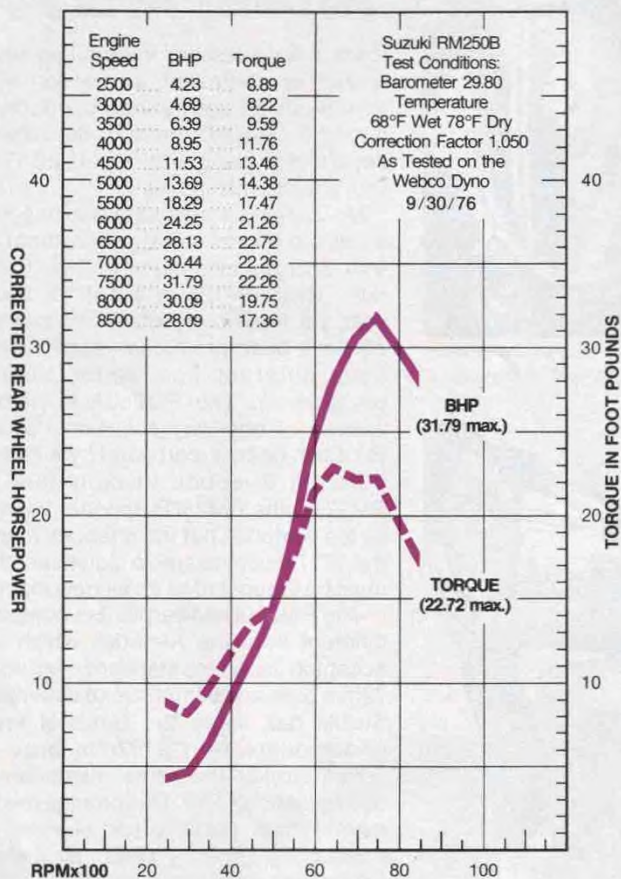
No Japanese manufacturer has made model-to-model changes comparable with Suzuki's alterations to their RM series. Their RM125 is but in its second year, yet three completely different models have been produced—each substantially different and better than its predecessor. The RM250A is hardly a veteran of one very successful season, yet it has been superseded by a radically different B-model. Visually (like the RM125s) the RM250B appears the same as the A-model, but the changes made to the 1977 machine are so significant that it must be thought of as an all-new machine.

The RM250B powerplant is completely different from the A-model, which used accepted Japanese standard over-square 70mm bore and 64mm stroke dimensions. Suzuki has made the B-model engine undersquare with a 67mm bore and 70mm stroke—the same measurements used in Maico's 250. This change involves new cylinder castings and sleeves, port positioning, pistons, rings, piston pins, connecting rods, and crankshafts.

By stroking the 250 engine there is potential for improving efficiency by reducing thermal heat build-up and increasing useable port areas. With a smaller-diameter piston there is less crown area (by around 8%) exposed directly to combustion chamber heat. With the longer stroke there is an increase of approximately 5% in the cylinder's swept area and room for a corresponding increase in port areas without increasing the port-open duration, which would tend to narrow the power band. Suzuki did use the longer stroke to get a 1.5mm taller exhaust port, at almost exactly the same timing, but actually shortened the intake and transfer periods.

The rear transfer ports of the stroker cylinder have been angled up to improve the flow pattern in the taller combustion chamber. By removing the aluminum bridge in the tunnel running from the crankcase to the side port windows, Suzuki has reduced fuel/air flow restriction to the main transfers. This single trough feeds the two side transfers, while smaller tunnels run up to the rear boost ports. The same case reed valve and 36mm carburetor are used in both old and new engines.

The B-model piston has a larger recess cast-in at the pin bosses, as well as new lightening holes. The new pistons are substantially lighter because of the B-model's smaller diameter, although both A- and B-pistons are the same height. With the B-model Suzuki has selected



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Price, suggested retail \$1445

Tire, front 3.00-21 in. Bridgestone

rear 4.60-18 in. IRG G.P.R.

Brake, front 5.12 x 1.0 in. (130 x 28mm)

rear 5.91 x 1.14 in. (150 x 29mm)

Brake swept area 38.86 sq. in. (250.65 sq. cm)

Engine type Piston port/crankcase
reed two-stroke single

Bore and stroke 67 x 70mm (2.64 x 2.76 in.)

Piston displacement 246cc (15 cu. in.)

Compression ratio 7.8:1

Carburetion 1-36mm Mikuni

Air filtration Oiled polyurethane foam

Ignition Internal Rotor, CDI

Bhp @ rpm 31.79 @ 7500

Torque @ rpm 22.96 @ 7000

Rake/Trail 30°/126mm (4.96 in.)

Fuel capacity 8.0 liters (2.1 gal.)

Transmission oil capacity 900cc (0.9 qt.)

Primary transmission Spur gear 2.727 (60/22)

Secondary transmission #520 Roller
chain 3.846 (50/13)

Gear ratios, overall (1) 21.77 (2) 18.35 (3) 14.18
(4) 11.59 (5) 9.58

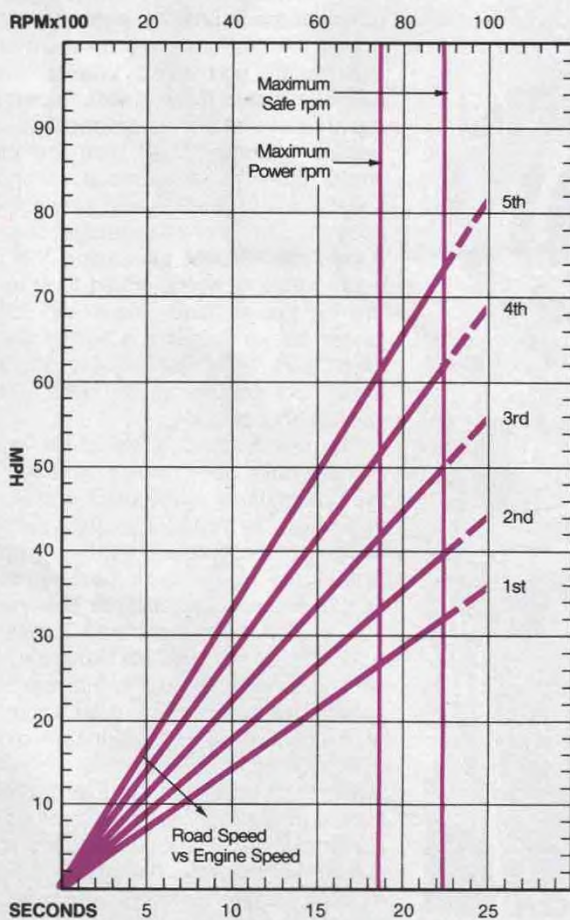
Wheelbase 56.75 in. (144cm)

Seat height 37.25 in. (94cm)

Ground clearance 11.0 in. (28cm)

Curb weight 229 lbs. (103.9kg)

Test weight 429 lbs. (194.6kg)



SUZUKI RM250B

tapered Keystone-type rings instead of the conventional-style items used last year. At the bore face the Keystones are slightly thicker (1.2 verses 1.04mm) and they are narrower (2.6 verses 3.0mm) than the old rings.

The internal-rotor capacitive discharge ignition systems of the old and new models appear the same, but aren't. The keyway slot on the crankshaft taper has a new location to match the B's more advanced timing specification. The A-model is statically set at 3.31mm BTC; the B-model fires at 3.62mm BTC. Suzuki has altered the performance curve of the latest electronic ignition. The old system advanced from approximately 12 degrees BTDC at idle to 21 degrees at peak torque rpm (approximately 5000 to 7500 rpm), then dropped off to five degrees at 10,000. The new ignition has a similar curve with a more severe drop-off beyond peak torque speeds. This in effect acts as a RPM-limiter to prevent over-revving.

The RM250B is the first stock Japanese 250cc motocrosser to produce over 30 bhp on Webco's dynamometer. The horsepower and torque curves of the B-model indicate that Suzuki has accomplished exactly what they desired—more mid-range torque over a wider rpm span. The B-model engine averages 20 or more lbs/ft torque from 6000 to almost 8000 rpm; the A-model produced about two lbs./ft. less in a 1000 rpm narrower range. The RM250B does not make power comparable with the Can-Am (MX-2 or GP) but it is only one-tenth shy of the Penton MC-5's 31.87 bhp reading. While the RM uses engine dimensions identical to the 250 Maico's, it produces considerably more power. The power curves of the B-model are strangely near-identical to the MC-5's—an engine with a radically over-square bore/stroke ratio.

Suzuki was adamant that we use Castrol R castor oil in the RM250B. With the A-model any oil was fine. Webco's dyno did indicate one possible reason for using castor: heat. Between 7000 and 8500 rpm (the B-model engine would not make useable power past 8500) the heat rise was dramatic. The spark plug thermocouple read 500° at one point. Of more concern was the engine's reluctance to cool rapidly, sometimes taking a full minute to get back under 400°. The engine was not reluctant to make power; it just got alarmingly hot at peak torque rpms. The jetting was marginally rich and the timing was set to factory specifications. We have encountered overheating and cooling problems with most of the Japanese big-bore engines. This was the first 250 which gave us this difficulty—but then again the RM250B makes markedly more power than any of its Oriental peers.

The Suzuki starts easy enough, usually a one- to three-kick affair. When cold the

lightly-sprung choke knob must be raised and twisted, then dropped a few moments after the engine fires. The knob, a slender knurled shaft, is awkward to use at best and near impossible when wet or muddy. A return to the old lever-type choke apparatus would be an improvement.

The first time the throttle is cracked full-open we found that the new, longer (by 1 1/2-inches) silencer was not designed to reduce noise. It was probably a tuning consideration for the new engine, since the same expansion chamber has been retained. Throttle response is, like the old engine, instantaneous with a minimal amount of inertia restriction from the tiny internal-rotor magneto. The engine produces markedly less vibration than the A-model. Whether by accident or intention Suzuki's new engine configuration is better balanced than last year's.

The entire A-model driveline has been retained without any changes. After a year of using and abusing an A-model we can attest to its relentless durability. Through a season of numerous races, thousands of tough miles and project testing, only the clutch plates have required replacement. A minor mid-year modification was made to some of the gear dogs and ears, which were given slightly more bevel angle to improve engagement. Of all the Japanese 250cc motocrossers, the RM Suzuki has thus far proven to have the most durable transmission and driveline.

Since the new chassis assembly has the same geometry and basic dimensions as the old, it sits just the same: tall. With over 8 1/2 inches travel front and rear the RM requires abundant ground clearance, which results in a high saddle position. While the RM has a tall stance it is hardly noticeable once aboard. The RM has a very comfortable seating position and an exceptionally nice standing position. The shape of the handlebars is ideal and accommodates virtually any rider style when adjusted forward or back. The weight difference between the old and new bikes is two pounds.

The frame is more affectionately than accurately called chrome moly. Technically the tubing may have small portions of chrome molybdenum, but any heli-arc welder will confirm that the metal is closer to water pipe than chrome moly. The swing arm material is now described as high-tensile-strength steel rather than chrome moly. The B-model swing arm is completely new and re-structured with plate-stock to avoid the bending and cracking which were prevalent with old RMs that were raced hard. The shocks are now located 1 1/8-inch farther forward on the swing arm than before, and they deliver about 1/4-inch more wheel travel.

The Kayaba rear shocks are also completely re-designed on the B-model. Auxiliary reservoirs are attached on the high-pressure Kayabas and provide more oil

(Continued on page 79)



**Fade-free suspension
and spot-on geometry
come from Grand Prix racing.**

and nitrogen capacity to the dampers to resist heat-fading. The front fork uses full-length springs, which eliminate the short coils and spacers used last year. The damping system is re-valved to give smoother performance and the 8.6 inches travel is unchanged. The air box intake opening has been enlarged to simplify removal and replacement of the filter element. While improved, it is still awkward and apt to permit dirt to enter the carburetor when the filter is removed.

The RM250B is not radically different from the A-model in performance. The B-model's improved torque output makes traction easier to come by, and the power surge seems to occur more gradually (though it's still pipey, jumping over 10 bhp in 1000 rpm increments). The fork action is more supple on the little bumps and stiffens as the travel gets above five inches. The shock springs are much as before—choppy on slow bumps, just right in whoop-de-dos. The old Kayabas were good for 15 to 20 minutes of racing. We were unable to make the new shocks fade appreciably in the same time.

Gear staging in the lower two cogs is very close. If the stock secondary ratio (11/50) is right for a particular track, second gear starts are a must. The new torquey engine delights in second gear starts, with the throttle held steadily at half-crack and the clutch released when the gate drops. By keeping most of the rider's weight posted over the gas tank, wheelies are easily prevented on non-tacky tracks. Getting from second to third usually required a blip of the clutch lever to release pressure on the lower gear's dogs and ears. Once out of the starting gate the clutch isn't really required unless the rider gets bogged down and has to use the first two gears.

Straight line acceleration over choppy or whoop-de-do ground is exceptional. The steering is precise and the back end goes straight and tracks superbly. Gear staging in the upper notches is perfectly mated to the engine's power range. If anything, the gears are a bit too close when the engine is running spot-on. However, if the gear ratios were spread apart more the rider might suffer when the engine goes a bit off-song late in a race. Heavier riders (over 185 lbs.) will find the bottom of the front suspension on rough and deep whoop-laden courses. But few riders will be able to find the spring limits of the rear.

In turns the front end of the RM slips just a little—not enough to panic you, but enough to make you twitch. The front end is a little rubbery as compared with Maico or Marzocchi forks. The RM's fork is, however, far superior to other Japanese front suspensions in action and rigidity. The tires on the RM work very well, which isn't so much attributable to the rubber as

it is to the bike's near-perfect geometry and suspension. The chassis and suspension are superbly matched for rough-course racing and excel at minimizing shock fatigue while offering excellent handling characteristics.

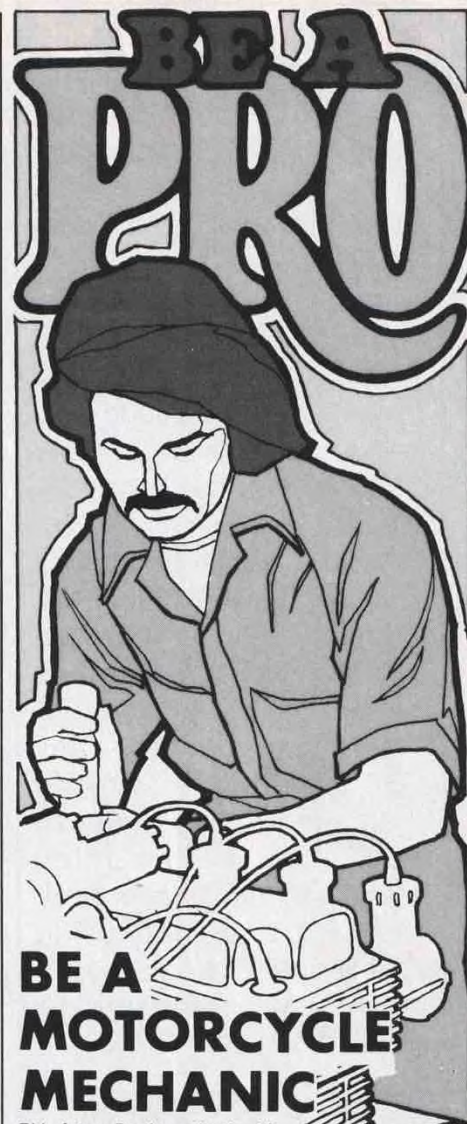
When hammered hard for extended periods (particularly on rough, fast courses) the engine heat build-up becomes noticeable. Power does not fade dramatically, but the sharp torque surge diminishes with the increase in heat. During some early-on comparison racing with a modified A-model, we found that the B-model would beat it comfortably to the first turn by a wheel to a bike length, and the B-model would grab another wheel length out of each corner. But after 15 minutes of pounding the B-model's engine lost its decisive edge. Straight-line acceleration comparisons became dead heats. The B-model handily walked away from the older bike in the rough stuff, however, due to its superior suspension.

The brakes on the RM have to get hot before their slight grabbiness disappears. Once warm they provide smooth, predictable slowing action. Gear shifting wasn't perfect; when the engine was hot we found a false neutral every other lap.

Everyone who rode the RM250B liked the bike, but usually for different reasons: comfort, power, ease of shifting or steering precision. Nobody had any real dislikes about the B-model. Small-bike riders found it easy to transfer from a pipey 125 to the torquey power of the RM. They also liked its feel. Open-class riders were usually surprised at how well the Suzuki accelerated, and were especially delighted with its nimble accuracy.

Still, the RM has its little zits. The newly-located offset gas cap is still too damn small to accommodate anything larger than an eye dropper. The Takasago rims are the same as on the A-model and they bend with discouraging ease. Suzuki has also retained the same hodgepodge fabricated rear engine mount, which likes on occasion to divide into three separate pieces. The front fender won't give riders sufficient protection on muddy courses. The brakes, especially the back, go away when thoroughly drenched. There is one, *just one*, oversize piston available for the RMs—and if yours gets hot like ours did, you might need more than one.

In function there is little to fault on the RM250B. It has power and handling comparable to any 250 MXer from Europe. For the price differences you *don't* get pure-grade chrome moly tubing, or magnesium forks, or nine or ten inches of travel, or another gear or gobs of cooling fins. What you *do* get—for three or four hundred less—is a fair measure of DeCoster/Robert/Rahier technology. And *that's* worth its weight in magnesium or chrome moly any day of the week—and especially Sunday. ©



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