



Yamaha DT-2 MX And RT-2 MX

Now do you believe Yamaha is serious about motocross?

CYCLE ROAD TEST:

Since 1968 Yamaha has been the undisputed sales leader in the off-road market. The DT-1 started it and the ensuing Enduro line strengthened Yamaha's position to the point where they now sell around 20 per cent of the entire amount of motorcycles in this country. And most of these sales are Enduros.

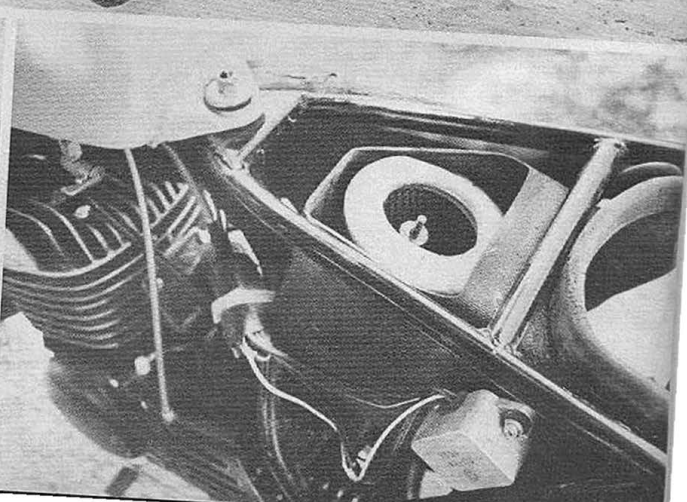
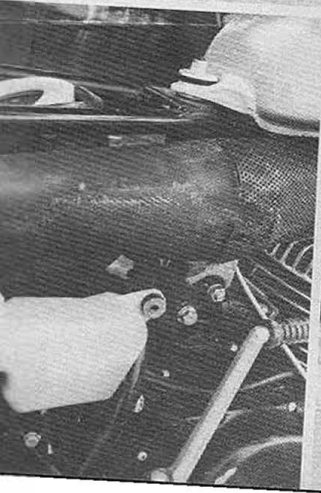
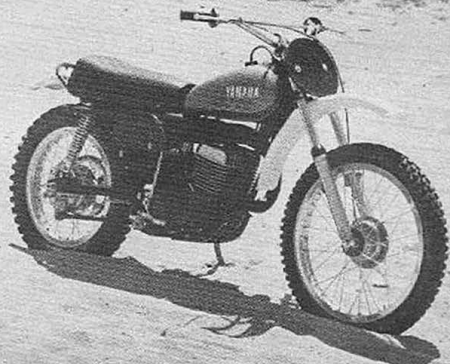
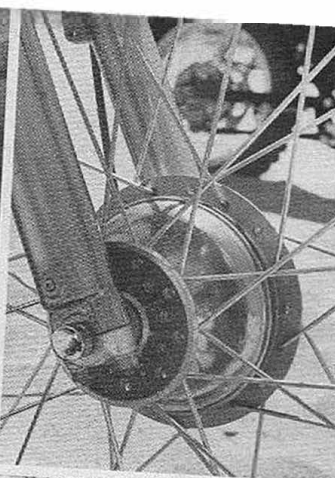
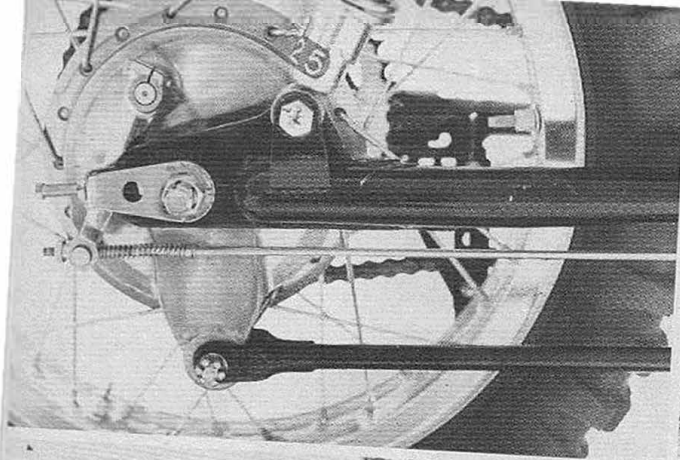
Like a sleeping giant first opening its eyes, the American public discovered trail riding and backwoods exploring on motorized two-wheelers. The market was there waiting for someone like Yamaha and Honda to come along and give them a fairly inexpensive way to enjoying their spare time.

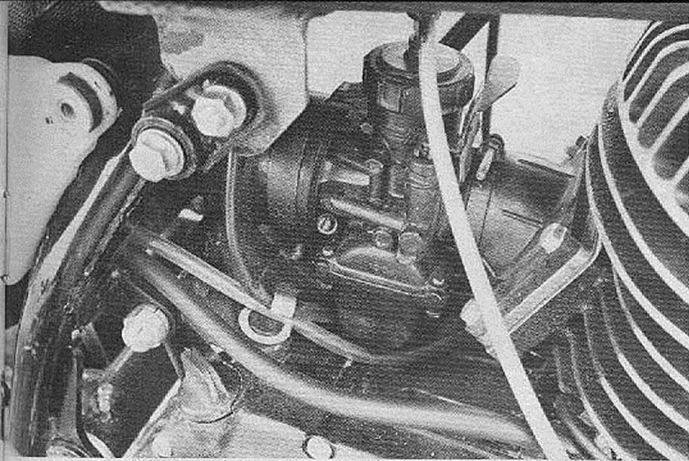
As the rider's proficiency increased, so did his desire

for a better, stronger machine to test his newly acquired skills. The Yamaha dealers flourished. The customers traded up as soon as they found a hill they couldn't climb. Yamaha kept pace by introducing the 360cc version of the DT-1.

The faithful Yamaha rider had leap-frogged his way to the top of the Enduro line. And countless thousands more followed in his footsteps, assuring the Yamaha dealers of continuing prosperity.

Then something began to happen. The once-loyal Yamaha owner began looking at the more specialized off-road and competition models offered by some of the smaller European manufacturers. Some of the dealers took on these lines to keep their Yamaha custom-





A few details for your perusal: full-floating rear brake (top left), super-light conical front hub (top center) and the roadracer-type Mikuni carb with read-valve port control. Wheelbase on both MX's is 53 inches (center left); 250 works better with a shortened swingarm. Footpegs on both bikes (center right) are of the folding variety. Oil tank (bottom far left) is tough to get at; so is air filter.

ers. Other dealers, unable or unwilling to take on additional brands, howled at the factory. Yamaha responded by introducing their Motocross 250 and 300 models: stop-gap measures to give the factory more time to develop a really competitive machine capable of dealing on even terms with any of the Europeans—not a warmed-over Enduro as in the past, but a real honest-to-goodness motocrosser.

Finally, after four years of building and changing, testing and evaluating, Yamaha has a suitable replacement for the DT-1 MX—a machine capable of winning motocross events. The new DT-2 MX and RT-2 MX, as they are designated, are like the old DT-1 in some ways and totally different in others. They will be available in quantity like the old MX model; Not a super scarce, one-to-a-dealer thing, like the factory specials, but a regular production line item with the equivalent reasonable prices of a production line machine. Unlike the old DT-1 and RT-1, they are 30 lbs. lighter and have completely new steering geometry. The center of gravity has been lowered and the suspension improved.

To arrive at this final production line ver-



sion several prototypes were tested under fire. The latest one, before the DT-2 and RT-2 started down the assembly line, was dubbed the YZ, model by the Yamaha R & D staff. The YZs have chrome-moly frames, magnesium wheel hubs and outer engine cases, overall weight of under 200 lbs., and enough power to make a roadracer green with envy. Yamaha could not economically produce the YZ series for the public, much less in any kind of quantity to satisfy their dealer network. So the things that worked on the YZs were transferred to the new DT-2 and RT-2. And instead of magnesium, aluminum is used and mild steel replaces chrome-moly. The frame dimensions remain the same except the YZs are an inch shorter.

Several of these hand-built YZ models were sent to Europe and this country for field evaluation by select riders before giving the final stamp of approval to the DT-2/RT-2 motocrossers. In Europe, the Yamaha factory branch in Holland hired the first superhero of motocross, Torsten Hallman. Four time World Motocross Champion Hallman has ridden the YZ at several meetings and plans to attend the Trans-AMA series this fall.

For "battlefield" testing in the United States, Yamaha International (the U.S. distributors) hired a pair of relatively unknown riders from California to contest the Summer-AMA International 250 motocross series. The series consisted of six races starting at Indian Dunes Motorcycle Park near Los Angeles, bounced its way through Colorado, Texas, Florida, Ohio, and ended in Unadilla, New York. The Jones boys, brothers Gary and DeWayne, did pretty well, considering they were up against some of Europe's best and the "who's who" of American talent clear across the country.

Gary did a great job for having the only

Yamaha entered in the International 250 class. He finished seventh overall and first American. DeWayne rode the 360 Yamaha in the supporting 500 class and finished in the top ten several times. Gary's best effort was at CycloSport Park in Texas where he finished sixth overall and first American. Following this, he came in tenth overall and second American at Orlando Sports Stadium in Florida and ninth overall and third American in the opener at Indian Dunes.

The only fly in the ointment is the AMA: they have Gunnar Lindstrom down as first American. Gunnar is a very fine motocross rider and deserves the credit. But he is also a Swedish citizen working in this country for Husqvarna on a temporary visa. According to Dave Welsh, the AMA's Coordinator of Professional Racing, the only requirement an alien needs to qualify him as an American is that he have one year's residency in this country and hold a current AMA professional license. Things get a little complicated when the subject of contingency money for first American comes up and a Swedish citizen comes out on top. Congratulations are in order to Bates Industries for being able to see through the bureaucratic smokescreen and award the Bates Leathers contingency money to Gary Jones: the highest-placing born and bred American to finish the Inter-AMA summer series.

By looking at the new RT-2 MX and DT-2 MX Yamahas it would be hard to tell they descended from the DT-1. Nothing on them except the swinging-arm and rear wheel bear resemblance to their predecessor. The front wheel, fork internals, frame, seat, gas tank, fenders and engine are new. The 250cc DT-2 MX is identical to the 360cc RT-2 MX except for the internal crankcase dimensions, the carb throat size, (30mm vs 34mm) and the size of the cylinder, bead, piston and ex-

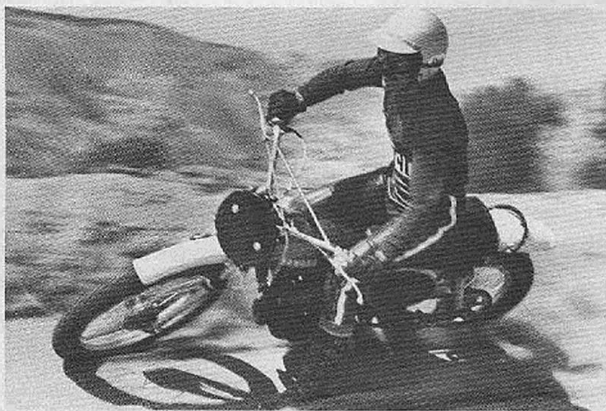
pansion chamber.

The steel gas tanks are painted bright yellow on the 250 and a metallic bronze/copper on the 360. The plastic screw-in filler cap has a rubber overflow hose coming out of the center. The petcock is new and has no reserve position. Mounting for the tank is similar to last years', except that a hold-down bolt is used in the rear instead of a rubber loop. The vinyl covered seat has a fiberglass base and two different layers of foam padding. Its shape is similar to Husky's seat and is light and comfortable.

The front and rear fenders are made of fairly soft flexible plastic. They do scratch when taking a spill, but do not break or change color from their off-white shade. The non-spring-loaded footpegs fold at a 45 degree angle towards the rear; a real asset should your foot or ankle bounce back against the peg. They have a stop to keep them from folding all the way up and becoming stuck, and always seem to flop back into place by their own weight.

The exhaust pipe curves up over the top of the engine and along the right side of the machine. It is out of the way of everything except for a small portion left unguarded where the rider's inner right thigh passes over it. The fault lies in the right-hand side cover. Actually the lack of a cover would be more accurate. All that protects the rider from the hot pipe is the oval number plate lined with an asbestos material. One shaped like the plastic item fitted to the left side would do the job nicely.

An opaque plastic oil tank for the auto-lube system is tucked out of the way behind the right-hand number plate. It is mounted in rubber grommets to small lugs on the diagonal rear frame tube. The screws that hold the number plate in place also pass through the oil tank grommets and secure the tank



YAMAHA DT-2MX 250 MOTOCROSS

Price, suggested retail	\$ N.A.
Tire, front	3.00 in. x 21 in., Dunlop
rear	4.00 in. x 18 in., Dunlop
Brake, front	.86 in. x 5.11 in.
rear	1.10 in. x 5.90 in.
Brake swept area	34.16 sq. in.
Specific brake loading	11.35 lb/sq. in., at test weight
Engine type	Two-stroke reed valve single
Bore and stroke	2.75 in. x 2.51 in., 70mm x 64mm
Piston displacement	15.01 cu. in., 246cc
Compression ratio	7.47:1 (Actual)
Carburetion	1; 30mm; Mikuni
Air filtration	Oiled poly. foam
Ignition	Hitachi capacitive discharge
Bhp @ rpm, actual	28.2 @ 8500 rpm (R. wheel)
Mph/1000 rpm, top gear	12.2
Fuel capacity	2.1 gal.
Oil capacity	1.6 pints
Gear ratios, overall	(1) 23.31 (2) 16.83 (3) 13.34 (4) 11.04 (5) 9.49
Wheelbase	56 in.
Seat height	31 in., with rider
Ground clearance	8.0 in., with rider
Curb weight	228 lbs., with 1/2-tank of gas (F.100-R.128)
Test weight	388 lbs., with rider
Instruments	None

YAMAHA RT-2M 360 MOTOCROSS

Price, suggested retail	\$ N.A.
Tire, front	3.00 in. x 21 in., Dunlop
rear	4.00 in. x 18 in., Dunlop
Brake, front	.86 in. x 5.11 in.
rear	1.10 in. x 5.90 in.
Brake swept area	34.16 sq. in.
Specific brake loading	11.50 lb/sq. in., at test weight
Engine type	Two-stroke reed valve single
Bore and stroke	3.14 in. x 2.75 in., 80mm x 70mm
Piston displacement	21.4 cu. in., 351cc
Compression ratio	7.13:1 (Actual)
Carburetion	1; 34mm; Mikuni
Air filtration	Oiled poly. foam
Ignition	Hitachi cap. discharge
Bhp @ rpm, actual	32.6 @ 7500 rpm (@ R. wheel)
Mph/1000 rpm, top gear	13.2
Fuel capacity	2.1 U.S. gal.
Oil capacity	1.6 U.S. pints
Gear ratios, overall	(1) 21.74 (2) 15.70 (3) 12.45 (4) 10.30 (5) 8.83
Wheelbase	56 in.
Seat height	31 in., with rider
Ground clearance	8.0 in., with rider
Curb weight	233 lbs., with 1/2-tank fuel (F.103-R.130)
Test weight	393 lbs., with rider
Instruments	None

and plate to the frame. The long screw for the front mount broke three times during the test, due to lack of side support, and allowed the number plate to flap in the breeze. A simple one-piece number plate/side cover that is quickly detachable for servicing the oil tank would solve the constant bolt failure and time-consuming job of removing the plate to fill the oil tank after every race.

The porous poly-foam type air cleaner element is mounted inside a fiberglass air box underneath the seat. The element is well protected from spray, but isn't easy to service due to the task of having to remove the seat. Slotting the rear lugs that the seat mount bolts pass through would shorten the time required for cleaning the element, and saving time between motos is important for the rider who has to do his own maintenance before the next event.

The mild steel tubular frame is similar in basic design as the DT-1, the big difference being in the lower engine location. Also the steering head angle has been pulled back slightly to 30 degrees. The engine sits almost two inches closer to the ground (or 14 inches from the center of the crankshaft) than last year. This dimension is very similar to that

found on the Maico, CZ and Husky. The swinging-arm pivot point rides on bronze bushings instead of the plastic type used on the earlier models. This more precise method helps eliminate the rubbery, disjointed feel between the rear section and the rest of the frame.

The forks are quite similar to the ones introduced by Yamaha on the 1971 DT and RT series. The inner damping valve arrangement has been altered and improved to a point where the new DT-2 and RT-2 motocross machines' front forks work as well as anything on the market. The top and bottom yokes are new. The distance from the steering axis to the centerline of the fork shafts has been increased, reducing the trail to four inches. This allows the fork shafts to be moved up or down in the yokes to suit the rider's preference in front end height and rake. The shorter trail gives the front wheel a better bite when rounding corners; the machine will turn the bend with less side-slip and loss of directional stability.

The rear suspension units are entirely new and a 50% improvement over the 1971 versions. They have dual springs fitted, like the new Suzuki TM400 we tested last Spring.

The lower short spring has a softer rate and absorbs the initial bump; the longer main spring is stiffer and provides the main cushion. Travel is 3.5 inches and the damping in both directions is good, but not equal to a Koni or Girling.

The wheel rims are soft aluminum alloy and are the Achilles heel of the entire machine. They dent quite easily for a motocross machine and their reluctance to stay in shape causes the spoke nipples to loosen frequently. The prototype YZ series machines were laced up with Akronts, as are all the top motocross mounts that finish races with reasonably round wheels. Possibly Yamaha will come up with an equally strong rim by the time the new MXs start arriving in this country. If not, the rims on these units will have to be changed before any real serious racing can be attempted.

The front hub is all new and is one of the lightest production units on the market: 20 pounds total with tire, tube and brake, lighter than the small AT-1 MX by a couple of pounds. Yet its conical shape is stronger and it has better braking action. The rear is the same as last year, except for the aluminum rim and sprocket, reducing unsprung

weight. A lighter, conical design on the rear wheel complement the front and reduce the unsprung workload on the rear dampers, improving the suspension action. The rear hub has a rubber crush drive built in to absorb driveline jolts, but the brake is a little oversize for the weight of the machine and causes premature lock-up during light application of the foot pedal.

The crankcases are similar to the 1971 edition, but have been strengthened by casting additional ribs around the transmission mainshaft bearing holes. The bore and stroke for both the 250 and 360 remain the same. The shifting mechanism and kickstart gear train is beefier. The real significant changes lie in the induction system, port timing and ignition.

The intake track of the new MXs, as well as the entire Yamaha Enduro line, now has reed valves installed into a cavity cast into the back of the cylinder. These thin spring steel reeds, about the shape of the end of your finger, are mounted on a tent-shaped triangular aluminum casting that fits pointed-end-first into the cavity in the cylinder. The reeds work like a one-way valve to give better control to the incoming fuel charge. This more precise method of cutting off the charge during the blow-down period of the engine's cycle gives increased low and mid-range torque. Fuel economy is also slightly better due to more efficient consumption. Standard Mikuni light alloy rubber-mounted carburetors are employed. These units are similar to the ones found on the 250 and 360 Yamaha roadracing Twins.

To facilitate the intake flow, the pistons have windows cast into each side of the rear portion of their skirt. This enables the fuel charge to get into the area under the piston more quickly and fully, and thus more of this charge will be forced up through the transfer ports into the combustion chamber. The port layout is the same as past Yamaha five-port cylinders, except for a groove cut into the cylinder wall down from the lower edge of the intake port. This channels a shot of fuel mix onto the big end of the rod for lubrication, as well as increasing the charge to the crankcase area.

An Autolube system, just like that found on the rest of the Yamaha line, is installed. But unlike the others the motocross models must also have a 40:1 mix added to the gas tank. The Autolube system can be removed if the owner doesn't like to keep filling the oil tank after each moto. If this is the case, he must mix his fuel at a 16:1 ratio.

The entire ignition system is new. A Hitachi capacitive discharge system is standard equipment on both motocross models. The generator has a small diameter rotor mounted on the end of the left crankshaft. The current is amplified inside a small metal cov-

ered box fixed to the left side of the air cleaner box. A regular ignition coil under the gas tank provides the spark to the single plug mounted angularly in the cylinder head. The system worked like a charm during our test. Starting either model was extremely easy. The timing on both machines was checked before and after the test's conclusion and found to be exactly as set.

During the period of time Yamaha allowed us to keep the new MXs, we decided to put them on C. R. Axtell's dynamometer to get some torque and horsepower figures on the new reed-valve-equipped engines. Axtell's pump is as impartial as a lump of concrete: if an engine puts out, it shows on the scale. Seat-of-the-pants impressions during the first few laps seemed to indicate the new ones were a whole lot stronger. But the human element sometimes over-reacts to the excitement of being the first to test all-new equipment.

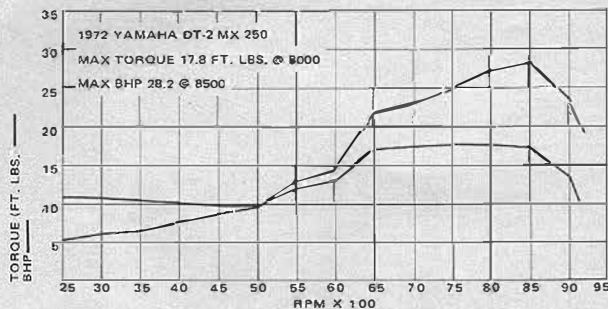
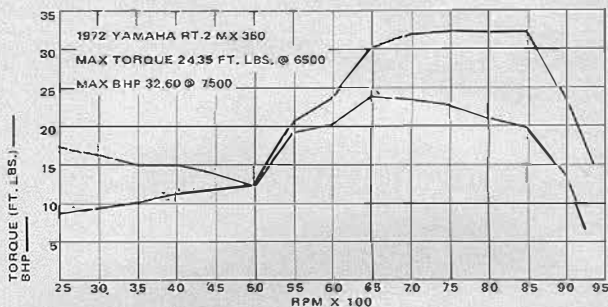
The 250's rear wheel was removed first and the chain connected from the gearbox drive sprocket to the input shaft of the dynamometer. From 2500 to 5000 the torque hovered around 10 ft. lbs. and the horsepower measured from five to nine. At 5500 they started

to climb: torque 12, and bhp 12.55. Then up to 17.05 at 6500 on the torque scale, and holding right around 17 up to 9000 where it dropped to 13.40. The 15 incher started making good horsepower at 6500 and climbed steadily up to a peak of 28.20 at 8500; then it dropped off to 22.95 at 9000. Not that bad in comparison to other top rated dirt 250's Axtell has tested.

The 360 got its turn next. Torque started fairly high for only 2500 rpm, with a 17.9 ft. lb. reading. Then it gradually dropped down to a low of 13.45 at 5000. At 5500 it jumped to 19.5, then steadily up to a high of 24.35 at 6500 before gradually tapering off to 20.1 at 8500 and finally 13.30 at 9000. The 360's horsepower curve climbed from 8.52 at 2500 up to 12.80 at 5000. Then it started up rapidly: 20.4 at 5500 and on up to a high of 32.6 at 7500. At 8500 the 360 was still holding over 32 horsepower, to give it a nice spread of around 32 ponies for a range of 2500 rpm. The RT-2 MX has a better peak than the TM400 Suzuki we tested on the same dynamometer: 31.9 for the Suzuki at 6500, with only a 1000 rpm spread. The Maico K400 was only slightly better: 34.3 at 6500, but

(Continued on page 68)

FIGURES TAKEN AT GEAR BOX SPROCKET ON C.R. AXTELL'S DYNO



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CIRCLE NO. 44 ON READER SERVICE PAGE

YAMAHA *Continued from page 59*

more torque over a wider band.

The results of the dyno charts confirmed our riding impressions. The 250 is very strong for its size, and equal to or better than any other production motocross 250 on the market. And it doesn't feel uncontrollable. The 360 needs softening up. It has plenty of power, and holds it long enough. The only big fault is that it comes on quick and hard. This could cause trouble if applied at the wrong time. Both machines have more than enough steam to keep up with the opposition. Just a little more work on the porting and pipe will round off the 360's sharpness and give it the torque to be really effective.

Along with everything else on the improvement list the new Yamahas are really shaping up in the handling department. The forks inter-act with the rear dampers to tame the notorious rear end hop. The lowered center of gravity and improved steering gives a really stable feel to cornering. Bumps, ditches and ruts arc met with anticipation instead of clenched teeth.

The controls and pedals on the Yamaha Enduro line has always been some of the best available and the newest Yamahas are no exception. The throttle housing is larger, giving less rotation to gain full stroke on the cable. This means that the machine comes on much quicker and is something to watch until familiarity sets in. One thing about the twistgrip that is annoying is that the new rubber grips chafe on the housing and bind the throttle action.

The gear ratios are close, as they have to be for the work these machines intend to do. But with the new reed valves, bogging down with a high first gear is practically eliminated. The engine just chugs along flatly, never loading up as the old model did under these conditions, until it clears itself out and perks up after the load is decreased. This is a great asset during motocross when you find yourself suddenly shutting off and getting down off the torque peak. With the reed valve system it's practically impossible to stall the engine.

The 250 has the same wheelbase (56 in.) as the 360. The big bore, with its sudden power, needs the extra length to tame it down. And it has the extra muscle to perform well with that much overhang. The 250 doesn't need the length. We changed the swinging-arm to the one from a 1970 DT-1 and shortened the overall wheelbase by one inch. The shorter DT-1 worked better. The front end seemed lighter and it handled easier in the tight stuff. No ill effects came about when going fast over the rough either. Everyone likes things a little different, but 55 in. is plenty for the DT-2.

Yamaha has come up with a pair of winners. The 360 has a few teething problems, but the basic package is there. If the rims were as tough as Akronts, look out Husky, CZ, Malco, AJS, Rickman, Bultaco, Yamaha has arrived.

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