

CYCLE GUIDE MOTOCROSS TEST

OSSA 125 PHANTOM MOTOCROSS

The littlest Phantom desperately needs a better engine to do justice to its fantastic chassis

PHOTOGRAPHY BY ART FRIEDMAN

There has never before been a production 125 OSSA motorcycle, at least not in this country. The factory built about 200 125 motocross engines a few years back which were slated to go into a Dick Mann-designed, Yankee Motors-built chassis. The 125 was to have been the first group of motorcycles ever put together on the assembly line that had been built for the Yankee 500 Z Enduro. It was to have been sort of a basic training exercise for the assembly line people. But numerous delays in deliveries from component vendors caused a shift in production schedules which would have caused a conflict in the assembly of the 125 and the 500 Z, so the 125 project was indefinitely "shelved," as it were, to make way for the Yankee.

The OSSA factory hadn't made a complete 125 for several reasons. For one thing, it's a small factory that had enough work just keeping up with the demand for 250 and 175 OSSAs. It had neither the time nor the budget to start from the

ground up with an all-new 125, so the only way it could have built one was to have used existing pieces. But the frames used then were heavy, even for a 250, and *certainly* not suited for a 125. The only potentially usable existing major component was the engine. It had been originally designed as a 125, and first sold here as a 160 before being bored and stroked to 175, 230, and 250. So with a de-bore and de-stroke, the engine could easily be returned to 125cc—which is exactly what the factory did.

Unfortunately, the 125's power characteristics were not very spectacular. The factory had decided to use the 250 crank wheels and magneto flywheel, and all that crankshaft inertia was just too much for a one-two-five. It revved up slowly, like a peaky trials bike, and it lacked good throttle response. And within its narrowish powerband it didn't generate enough horsepower to be competitive. The engines obviously needed some more devel-

opment. But it was all academic anyway, since the engines had no frames to live in. So Yankee sold them off to their dealers, who experimented with them on their own.

Then along came the Phantom 250 motocrosser in mid-1974. Besides its superb handling and steering characteristics, it was light—just 197 pounds dry. It sparked some new interest in the 125 concept, so the factory did some more development on the engine, dropped it in a 250 Phantom chassis, and came up with a 191-pound 125 motocrosser.

The engine refinements consisted mainly of some porting changes, a better expansion chamber, and the use of less flywheel inertia.

Being a staff of full-sized, fairly long-legged testers, we appreciated the idea of a 125 that would not feel like a little motorcycle. The other bikes in the 125 range are continually growing larger anyhow, and the 125 Phantom is a real hon-



est-to-Gawd people-sized motorcycle. We were anxious to find out if it was a good one.

THE BIKE: The 125 Phantom uses the same basic engine as the 250, with only a few changes. The bore was decreased from 72mm to 54mm, and the stroke shortened from 60mm to 54mm. The 125 uses a 175 connecting rod, which is shorter than the 250 rod, but the crankshaft flywheels are peculiar to the 125. Their diameter is much smaller to provide less inertia; however since the crankcases are essentially the same as the larger-flywheeled 175, there's a machined aluminum "stuffer" surrounding the crankshaft to lower the crankcase volume to the proper amount.

The main bearings are the same as in the 250, as are the double-row primary drive chain, six-plate wet clutch, and five-speed close-ratio gearbox. Since the primary ratio and gearbox ratios are identical to the 250, the factory arrived at the lower overall gearing needed for a 125 by using a 9/56 final ratio instead of a 12/53. That's right—a nine-tooth transmission sprocket, and with a 5/8-inch chain pitch! Chain manufacturers don't recommend using fewer than 15 teeth with a 5/8-inch-pitch chain and frown heavily on the 13- and 14-tooth sprockets used by some motorcycles. OSSA has used 11-, 12-, and 13-tooth sprockets for years with reasonable success, but nine teeth is stretching the whole issue a bit too far. The factory even had to design a special nut to secure the sprocket on the shaft.

The 125 is fitted with a Motoplat magneto CDI, but it too uses a smaller diameter flywheel than the other OSSA models. A 30mm Spanish Amal concentric carburetor

is rubber-mounted to the cylinder, and it breathes in through a paper filter element in the big fiberglass airbox under the seat. Our bike was a pre-production unit, and the expansion chamber had no silencer built into or onto it. The first production bikes were also built this way, but Yankee assured us that anyone who bought an unsilenced 125 would be given either a production pipe with a welded-on silencer, or a slip-on silencer, depending upon which one the factory finally decided to use.

The rest of the motorcycle is absolutely identical to the 250 with the exception of the rear tire. A 4.00 x 18 Pirelli knob was selected instead of the 4.50 that comes on the 250.

The Phantom frame uses thinwall chromoly tubing throughout and an aluminum alloy swingarm. The steering head angle is 31 degrees from vertical, and the front wheel has 4.5 inches of trail. The 55-inch average wheelbase makes the 125 about the longest in its class, and the 34-inch seat height makes it the highest.

The front suspension is by Betor, with OSSA-made aluminum triple clamps mounted in caged tapered roller bearings on the steering shaft. The rear shocks are also Betor, with a five-way preload adjustment on each shock. OSSA has not yet gotten around to forward-mount rear shocks, so the rear wheel travel is 4 inches. The forks permit just over 6-1/2 inches of front wheel travel.

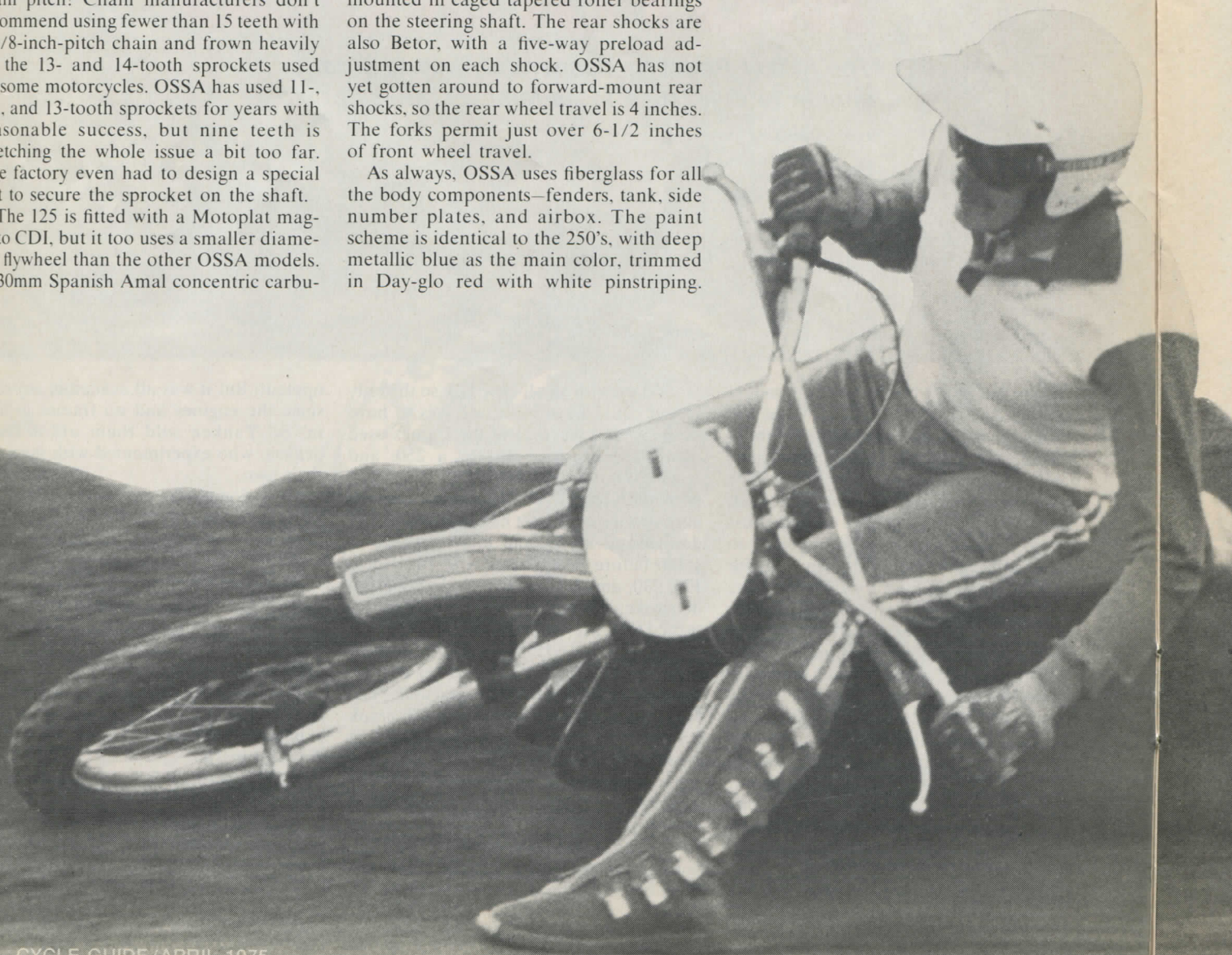
As always, OSSA uses fiberglass for all the body components—fenders, tank, side number plates, and airbox. The paint scheme is identical to the 250's, with deep metallic blue as the main color, trimmed in Day-glo red with white pinstriping.

With the satin-finish black engine cases the 125 looks lean and purposeful, but still quite attractive.

ENGINE AND GEARBOX: The 125 engine is peaky, high-revving, and has a relatively narrow powerband. It doesn't pull very well at all until you near 7500 or 8000 rpm, depending upon which gear it's in or the steepness of the upgrade. From that point up to 10,000 rpm, the OSSA moves out respectably; but it's no neck-snapper. Below 7500 the throttle response is poor and the power output weak. And the lower in the rpm range you go, the more exaggerated the sluggishness becomes.

The 125 Phantom's lack of low end becomes immediately apparent the first time you ride it away. You have to slip and feather the clutch while keeping the revs up in order to pull out cleanly. When you consider that the 125 has an overall first gear ratio of 36.5 to 1, which is comparable to that of an OSSA trials bike, you know there can't be very much low-end torque available.

Out on the racetrack, riding the little



Phantom becomes an exercise in gear shifting. The extremely low overall gearing makes the usable speed range in each gear very narrow, so you must upshift a lot when accelerating. And cornering can require one, two, or three downshifts, depending upon the course.

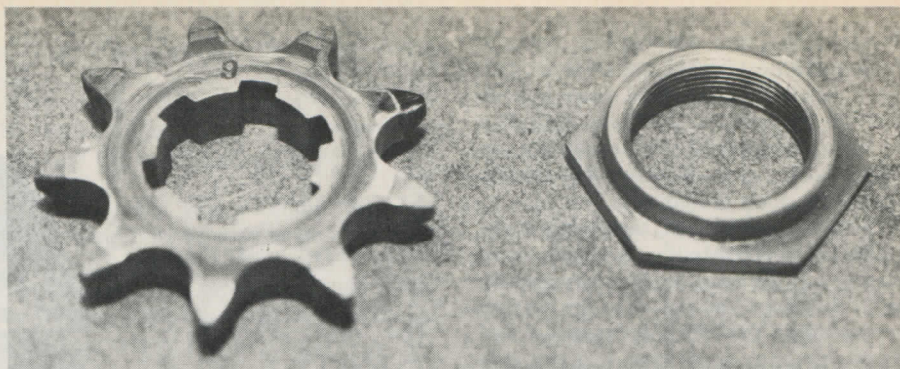
The general engine characteristics make it difficult to consistently cut competitive lap times. *If* the track has no steep uphill, and *if* the shape and radius of the corners are just right, the 125 is competitive and reasonably consistent—that is, *if* you ride superhard and absolutely flat out. But most motocross tracks have a minimum of one or two steep uphills and unless you own the track yourself, there's no way to be sure that all the corners will be to the Phantom's liking.

The problem is mainly one of too little power, spread over too narrow a range of rpm, through very low gearing. In its powerband the OSSA 125 is not too bad. A stock 125 Honda Elsinore or Kawasaki KX125 is a little faster, but the OSSA is almost in the ballpark between 8000 and 10,000 rpm. But outside of that range the engine is dead. If you shift gears and the rpm is at, say, 6000 or 7000, the engine either accelerates very, very slowly or bogs out altogether. If you're going up a steep hill, you must rev the engine as high as it will possibly go before shifting in order to be above 7500 or 8000 after shifting. Sometimes, depending upon the circumstances, the speed of the bike drops enough to put the engine rpm below the critical point after the shift. In other words, you're in bog city.

The problem in corners is similar. On all the race tracks we used, there were any number of corners in which the OSSA



needed either a wider powerband or another gear between two existing gears. If we used the higher of the two gears, the bike would accelerate out of the corner very slowly until it got into the powerband. If we used the lower of the two gears, the engine would be at the top end of the powerband. The bike would accelerate briefly until it reached maximum rpm, and then we'd have to shift. That meant shifting in the middle of a corner, which is often difficult. Besides, the speed we would have gained in those few screeching rpm before shifting would not



The nine-tooth 5/8-inch-pitch transmission sprocket is unprecedented. It is so small that they had to make a special nut to hold it on. The sharp bend it puts in the chain makes frequent chain adjustments necessary.

us ever fell because of them. And since the 125 has less power than the 250, you aren't going as fast at any particular point on the track, and the predicaments you do get into aren't as hairy.

The Phantom goes straight when you want it to go straight, it turns when and where and how you want it to turn, and it never wiggles, wobbles, or twitches. You can't ask for much more than that in a chassis.

The straight-line stability is excellent, be it on loose or bumpy or rutted terrain. And you don't need a vise-like grip to hang onto the bars because they never try to escape your grasp.

Because of the engine, our favorite method of cornering the 125 was to slam it off a berm. Since a berm is on the outside of a corner, we could usually keep the engine rpm up much easier by using the berm, which gave us the longest radius available in each turn. The Phantom's broadsliding ability was second to none, but the engine didn't have enough power to maintain long slides. If we used a lower gear, the engine would run out of rpm in the middle of a long slide. If we used a higher gear, the rear wheel would get traction and bog the engine, which would try to highside the bike. If the engine can't keep the rear wheel spinning all the while, there's no way any bike can slide properly.

The Betor forks did their usual excellent job of keeping the front wheel on the ground as much as possible. Betors are found on a number of bikes nowadays, and they are a benefit to every machine that uses them. The rear shocks were a trifle too stiff, perhaps only in springing, not dampening. They're the same shocks used on the 250 Phantom, and we thought them to be too stiff when we tested one in September of 1974. We must have had an exceptionally stiff set back then, because neither the 125 Phantom nor the 250 Desert Phantom (Mar. '75 CG) felt quite as stiff in the rear. The only time

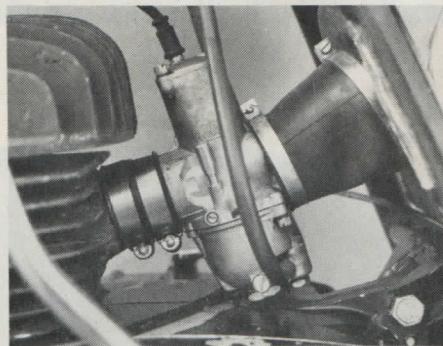


The double-downtube chromoly frame and aluminum swingarm keep the Phantom chassis light, and excellent Betor forks and well-engineered steering geometry make it one of the finest handling motocrossers available.

be enough to get us out of the corner competitively.

The only track we visited where the OSSA was really competitive was the Shadow Glen course at Indian Dunes. It is flat, not too rough, and doesn't have any real long straightaways. By keeping the throttle wide open, shifting a lot, and bouncing the bike from corner to corner by using the berms, we could keep up with almost any 125 and a few 250s. But the credit goes to the bike's handling, not the engine. If the factory ever expects to have a truly competitive 125, they'll have to do something with the engine.

HANDLING: We were very impressed with the 250 Phantom's handling and steering so it is only natural that we would like the handling of the same motorcycle equipped with an engine making only about half as much power. Actually, as dismal as the engine performance was,



The stock clamps on the rubber intake manifold wouldn't cinch down tightly, so the engine seized because of an intake air leak. Yankee replaced the stock clamps with these worm gear hose clamps.

that's how much a bright spot the handling was.

More than one rider commented that "you just can't seem to fall off" the 125. We're sure that's an exaggeration, but it very often appeared to be true. Because of the wide-open way the engine forced us to ride, we frequently got into incredibly out-of-shape situations, but none of



the 125 shocks were objectionable was when we hit a sharp bump with the throttle off. That would cause the rear of the bike to kick up in the air. If we were sitting, the weight on the seat would keep the back end from becoming highly airborne. But if we were standing, the seat would often come up and whack us in the fanny, even with the spring preload set on the softest position.

COMFORT AND RIDE: The OSSA factory struck gold when they developed the Phantom chassis; the 125 is one of the least-tiring motocrossers we've ridden. It's light, so you don't have to wrestle with it; it handles precisely, so you don't have to make continual steering corrections; the front end geometry eliminates the need for a death grip on the bars; and the seat, seating position, and standing position are

all easy on the rider.

The seat is one of our favorites, albeit some 34 inches off the ground. Aside from some bikes with forward-mount shocks, that's about as high as they get. But the seat's height doesn't impress us; its shape and padding do. The padding insulates the rider's rear end from most of the abrupt bumps and jolts that produce saddle sores. And the contour of the seat

supports you where you need it.

The seating position is equally nice. You don't have to crank your legs or body into any uncomfortable positions just to reach the controls, and you can stand up for long periods without tiring quickly. We also liked the soft natural rubber handgrips. Grips are largely a matter of taste, but a large percentage of motocross riders swap their stock grips for the natural rubber type. It's a nice touch to provide them as standard equipment.

Our bike never had a silencer, so we don't know how much noise the production exhaust system will make. Our unmuffled system pumped out 104.2 decibels of raspy, ring-ding two-stroke noise, enough to get us a few frowns of disapproval from track officials and fellow riders. There have been silencer requirements in this country for quite a few years now, and there is no excuse for selling an open-chambered bike nowadays.

The 125 doesn't vibrate excessively, and with the rpm the engine turns, it's a good thing. A few tingles are occasionally felt through the footpegs and handlebars, but they don't amount to anything worth worrying about.

BRAKING: The 125 Phantom's brakes are powerful, predictable, and consistent. They require just the right amount of lever or pedal pressure for positive control while braking. You can lock either wheel at will, but it very seldom happens accidentally.

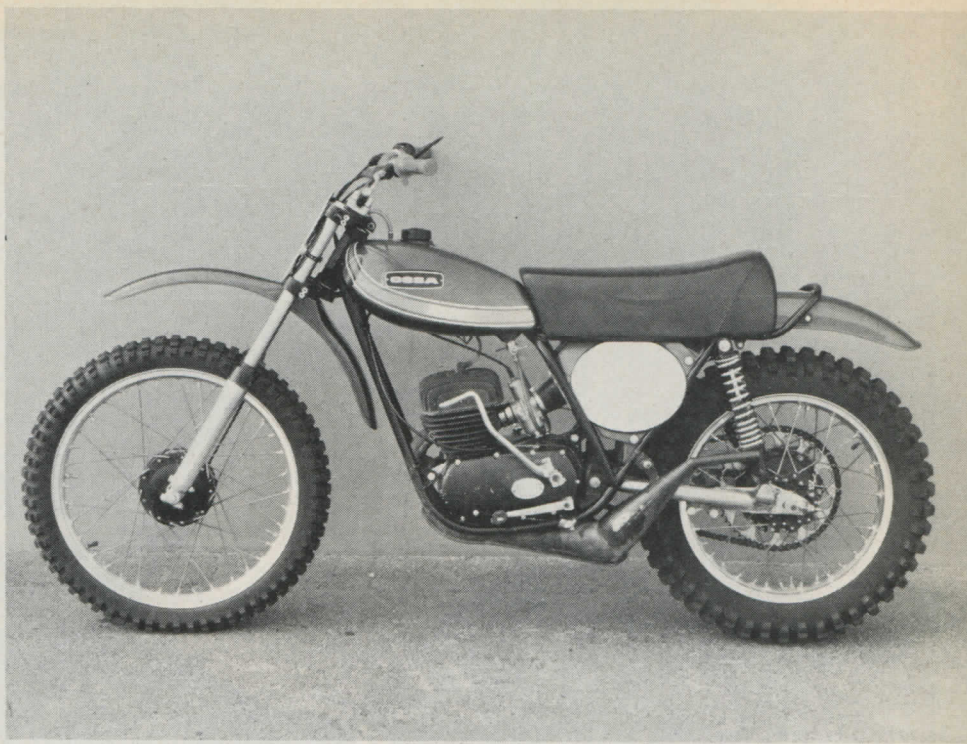
The single-leading shoe front brake is in a hub originally designed for OSSA trials machines. The first ones had some structural breakage problems, but the factory stuck with it and ended up with a sturdy, powerful, yet lightweight brake assembly.

The rear brake had a nice progressive feel, but the rear wheel would occasionally chatter during hard braking when the rider was standing. The 250 Phantom we tested didn't do this, but the 250 Desert Phantom did. The problem could possibly be with the brake rod, which has a wide, U-shaped bend to get around the right rear shock. The bend causes the rod to flex somewhat as the brake is applied, and in our opinion, this flexing, combined with a non-floating rear brake anchor, could be the cause of the wheel hop.

The brakes require considerably more lever or pedal pressure when they get wet, but it is still possible to lock the wheels. After a short period of use the linings dry out and the full braking power returns.

RELIABILITY DURING TEST: On our second day of motocross testing, the 125 Phantom seized three times. The first two were gradual enough that we were able to shut the engine off before any permanent damage occurred. The third time, the piston seized at high rpm without warning, causing the piston rings to stick in their grooves. There was no compression, so we had to return the bike to Yankee Motors for repair.

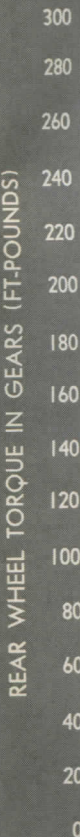
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SPECIFICATIONS

Engine type	two-stroke
Cylinder arrangement	vertical single
Port arrangement	one piston-controlled intake, two transfers, one exhaust
Bore and stroke	54mm x 54mm
Displacement	123.7cc
Compression ratio (uncorrected)	12.5:1
Ignition	Motoplat magneto CDI
Charging system	none
Carburetion	one 30mm Spanish Amal slide/needle
Air filter	disposable paper element
Lubrication	pre-mixed fuel and oil
Primary drive	double-row chain, 2.26:1 ratio
Clutch	wet, 6 drive plates, 6 driven plates
Starting system	kick, in neutral only
Transmission	5-speed, left foot shift
Overall drive ratios	(1) 36.55; (2) 26.99; (3) 20.10; (4) 16.45; (5) 14.06
Transmission sprocket	9-tooth
Rear wheel sprocket	56-tooth
Drive chain	5/8-in. pitch, 1/4-in. width (#520)
Front forks	Betor, 6.6 in. (167mm) travel
Rear shocks	Betor, 5-way adjustable, 4.0 in. (101mm) rear wheel travel
Front brake	drum, single-leading shoe
Rear brake	drum, single-leading shoe, rod-operated
Front tire	3.00 x 21 Pirelli motocross
Rear tire	4.00 x 18 Pirelli motocross
Frame	tubular chromoly steel, double downtube
Steering head angle	31 degrees from vertical
Front wheel trail	4.5 in. (114.3mm)
Wheelbase	54.5 to 55.5 in. (138 to 141cm)
Length	81.5 in. (207cm)
Weight	191 lb. (86.8kg)
Weight distribution	44% front, 56% rear
Ground clearance	8.8 in. (223mm), at expansion chamber
Seat height	34 in. (864mm), unladen
Handlebar width	34.2 in. (869mm)
Handlebar grip height	42.6 in. (108cm)
Footpeg height	13 in. (330mm)
Instrumentation	none
Sound level as per SAE XJ 331a	104.2 db(A)
Suggested retail price	\$1450 East and West Coasts

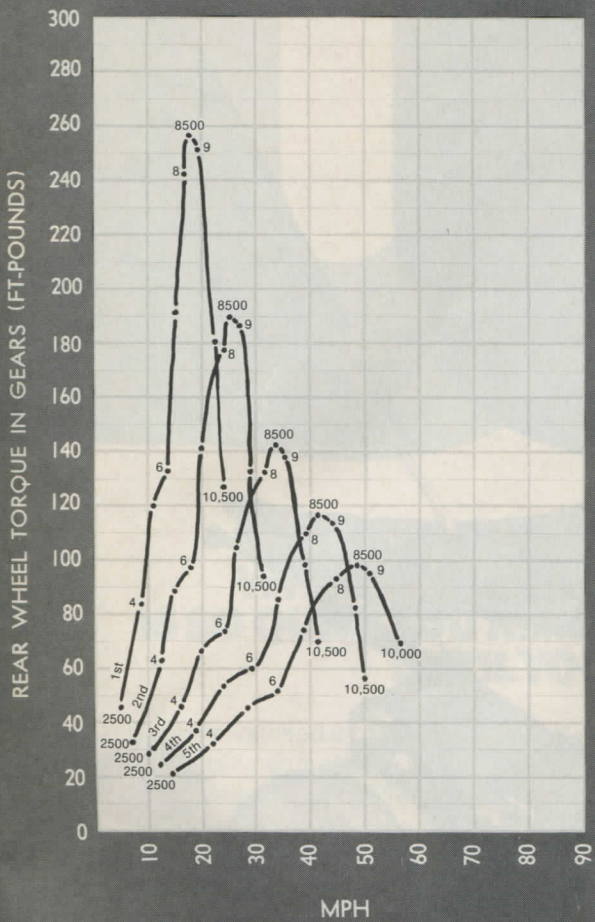
REAR WHEEL TORQUE IN GEARS (FT.-POUNDS)



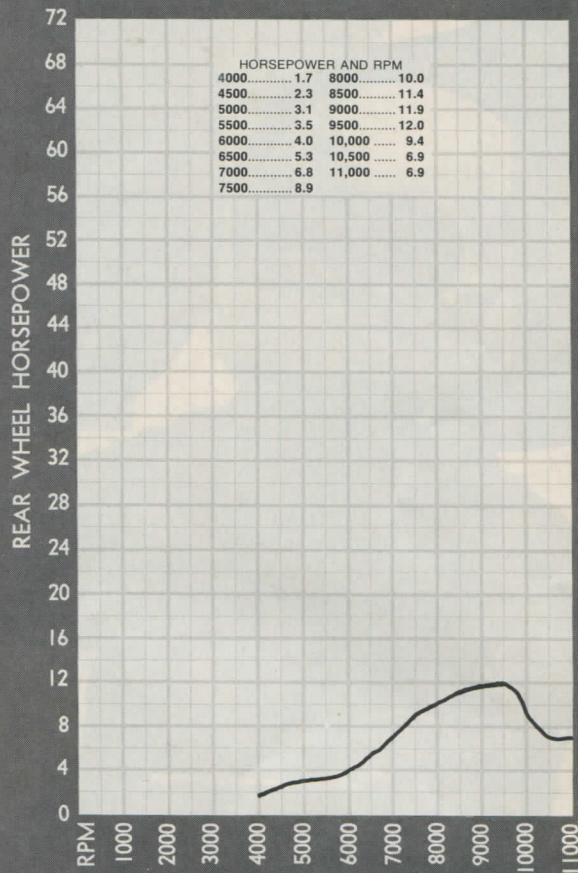
This graph shows gear. Maximum torque lines intersect

1
2
3
4
5

OSSA 125 PHANTOM MOTOCROSS

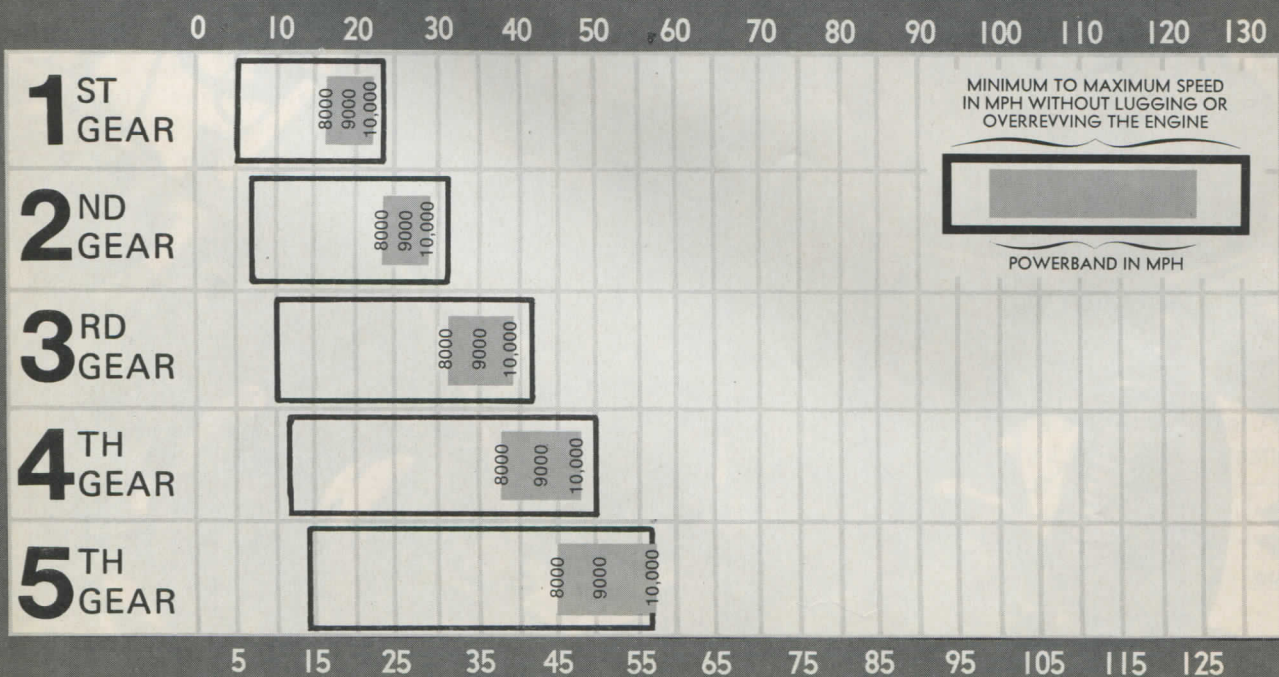


This graph shows the amount of rear wheel torque available at any speed, at any rpm, and in any gear. Maximum acceleration will be obtained by shifting gears at the points where the consecutive lines intersect.



This graph shows the amount of horsepower delivered to the ground as measured by a Patraco MK111 rear wheel dynamometer. These figures may vary from the manufacturer's claims, or from those obtained on a different dynamometer.

MILES PER HOUR



OSSA 125 PHANTOM

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The culprit in this malfunction was part of the clamping mechanism that secures the carburetor into the rubber intake manifold. The factory now uses a metal band under the regular full-circle screw-type clamp which is supposed to insure even tightening of the manifold and eliminate a possible pinched area in the rubber. But the band had been cut too long, and its mating ends would butt together before the clamp was tight. As a result, the manifold would leak air and cause a

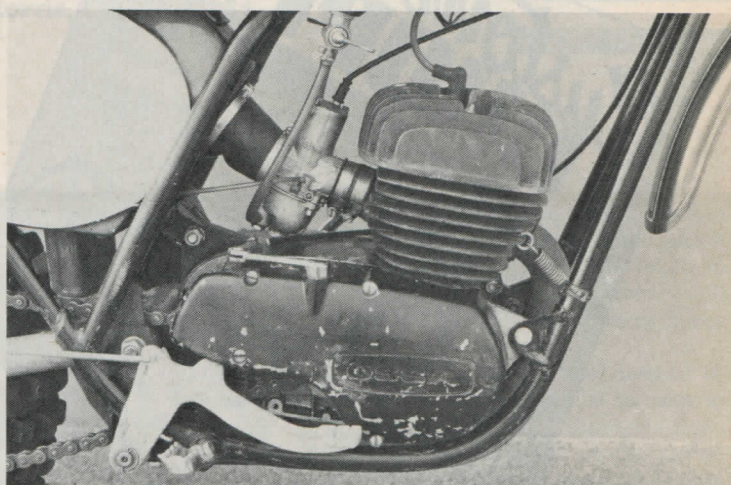
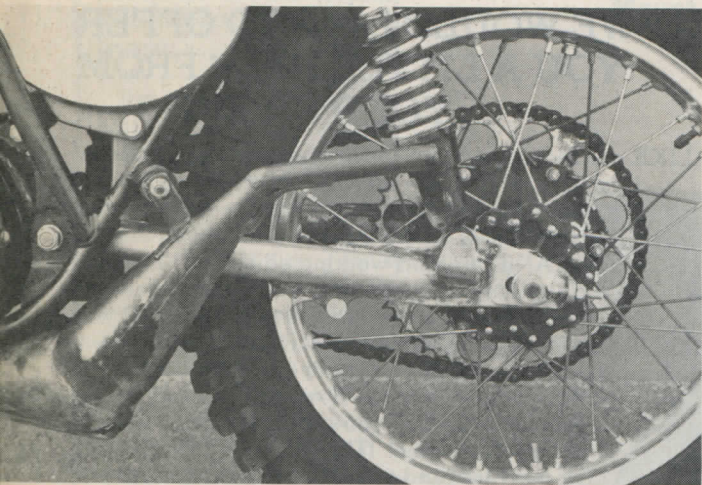
We really abused the clutch and gearbox during the test due to the amount of clutch slippage and gear changing that was necessary. Throughout it all, the clutch and gearbox never uttered the slightest protest and continued to function without the need for any attention whatsoever.

Despite the bogging and loading up that frequently occurred, the 125 never fouled one single plug. The Motoplant ignition generally brought the engine to life in two or three kicks. We occasionally bogged the engine on purpose until it stalled, but it always fired up without a plug change.

SUMMARY AND CONCLUSION: The 125 Phantom motocrosser is a de-bored and de-stroked 250 Phantom motocrosser. The engine has a narrow, high-rpm powerband, and produces barely

its place. Many loyal OSSA racers took to other bikes, and fewer and fewer Stiletos were seen in motocross races. Then after years of speculation the Phantom became available. It received rave reviews in all the publications, but Yankee Motor Company, the U.S. distributor, knew that the long road back to acceptability among motocross people would not be an easy one. They had to get the OSSA name back into the limelight—they had to make people believe the Phantom was a bike they could win on.

With the 250, they have an excellent bike with which to do that job. But with the 125, that long, hard road could become longer and harder. Yes, it handles beautifully, but when you're wide open in the right gear on an uphill straight and a



Our test bike was a pre-production model and had no silencer. A silenced pipe will soon be available, and one will be given free to anyone who bought an unsilenced 125 Phantom.

seizure regardless of how much we tightened the clamp. Yankee replaced the stock clamps with worm-gear-type hose clamps, and the problem went away.

The carburetion on our test bike was very erratic and unpredictable. The engine would load up easily if we let the rpm drop too low and every once in a while the engine would starve out for about a second after landing off a jump, even when it was turning at high rpm at large throttle openings. And the engine would frequently stall when we were trying to pull out from a dead stop. Once the rpm would start faltering, we'd try everything possible to prevent the stall, but to no avail. We'd have to let the bike sit for a few seconds, then depress the float tickler button before kicking.

The nine-tooth transmission sprocket caused the chain to stretch quickly, so we had to adjust it quite frequently. The other OSSAs we tested never did this, so we must assume that the sharp bend put into the chain by the sprocket is at fault.

enough power to be competitive. The peakiness of the engine makes it difficult to stay within the optimum rpm range, especially when climbing hills or cornering.

The motorcycle handles and steers exceptionally well and is very stable on all kinds of terrain. The front suspension is superb, and the rear shocks are good, but a bit too stiff.

The 125 is very comfortable and non-fatiguing, partially due to the well-designed seat and partially due to the excellent layout of the controls, footpegs, and handlebars. The bike doesn't feel like most other 125s because it is a full-sized motorcycle with a small-displacement engine.

The brakes are generally very good, with the only complaint being an occasional rear wheel hop during hard braking. We experienced a few reliability problems, ranging from excessive chain stretch to a piston seizure induced by a leak in the intake system.

For a period of two to three years during which the Phantom was under development, the OSSA name virtually dropped out of the motocross picture. The Stiletto chassis was no longer competitive, and there was no better OSSA available to take

The engine was de-bored and de-stroked from 244cc to 123cc. It just doesn't have enough power to compete with the current crop of 125s.

half-dozen competitors blow past you, all the handling in the world won't hold them back. No matter how hard you can stuff it into a corner, if a usable gear or some usable power isn't available to pull you out of the turn, it was all for naught. A motocross bike is an equal balance of power and handling, and on that count, the super-doooper chassis is carrying the load alone.

The OSSA factory needs to refine the engine much further. Perhaps the nine-tooth transmission sprocket typifies the problem: They were obviously still looking for the most economical way to build and sell a 125. But at \$1450, that same feeling for economy was not passed on to the customer. For that amount of money, a person should be able to roll a 125 up to the starting gate and race it competitively as is, without any heavy modifications. Handling or no handling, that won't happen with the 125 Phantom. Not against today's competition. No way.

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