



Cycle-Test

OSSA 250 PHANTOM MX



• After resting too many years on the laurels of their old Stiletto scrambler, Ossa has finally come through with a new group of motocrossers. Called Phantoms (though of no kin to the Benellis having the same name), these racers come in three versions: 125, 175, and 250cc.

Hard-core motocross racers ask only two questions when word comes of a new model: how much does it weigh, and how much power does the engine make? Any other factor can be tailored, or conned, into shape. The Phantom is incredibly light and it makes a lot of horsepower: 211 pounds brimming with gas and oil, 27.85 bhp with a blown base gasket. That makes it the lightest 250 we've tested. And one of the more powerful.

Ossa's tardiness in introducing the Phantoms was a direct result of their small factory's direction of interest. While Bultaco was busy developing competitive equipment for Jim Pomeroy's incredible GP challenge, and Montesa was gaining hard knowledge from building Kalevi Vehkonen's racers for Europe's only sus-

tained counterthrust to the Japanese giants, Ossa was playing catch-up to the previously established Bultaco-Montesa lead in the observed trials field. Ossa's management had great fun chasing around the world with Mick Andrews, who won the European Trials Championship. But popular interest in trials did not follow as many had hoped, and Ossa was compelled to play quick catch-up in the proven motocross market. And catch up they did.

The first step in a major weight reduction program must be to make the frame lighter without sacrificing reliability or rigidity. The accepted material for such a frame is thin-wall chrome moly tubing. Ossa uses this material to good advantage in the Phantom's new frame. Twin engine cradle tubes join a 1.175 inch (45 mm) backbone above the carburetor and at the steering head. For the rear frame section, which supports the seat, fender, and air cleaner and feeds the top shock absorber mount loads into the backbone, the outside diameter is reduced from the



OSSA 250cc PHANTOM MOTOCROSSER

Price, suggested retail..... \$1380 (Average U.S. plus freight & dealer prep.)

Tire, front 3.00 x 21 Pirelli MT 07 Motocross Knob rear 4.50 x 18 Pirelli MT 16 Motocross Knob

Brake, front..... 4.8 in. x 1.175 in. (122mm x 30mm) rear 5.9 in. x 1.175 in. (150mm x 30mm)

Brake drum swept area 39.5 sq. in. (254.9 sq. cm) Specific brake loading..... 6.86 lb./in.² (0.48 kg/cm²) at test weight

Engine type Piston-port two-stroke single

Bore and stroke...2.83 in. x 2.36 in. (72mm x 60mm)

Piston displacement.....14.84 cu. in. (244.29cc)

Compression ratio 13.2 nominal, 7.6 corrected to exhaust opening.

Carburetion..... One 36mm Spanish Bing

Air filtration..... Dry micronic paper

Ignition Magnetically triggered Motoplat CDI

Bhp @ rpm (actual maximum).....27.85 @ 9000

Torque @ rpm 17.7 lb. ft. @ 7500 (2.45 kg M @ 7500)

Rake/Trail...31 degrees/4.5 in. (31 degrees/11.43cm)

Mph/1000 rpm, top gear...8.04 with standard gearing

Fuel capacity2.37 gal. (9 liter)

Oil capacity.....Mixed in fuel

Transmission oil capacity 1.06 qt. (1 liter)

Gear ratios, overall (1) 25.95 (2) 19.16 (3) 14.27 (4) 11.68 (5) 9.98

Primary transmission Duplex chain; 2.26:1 ratio with 34/13 sprockets

Secondary transmission # 520 roller chain (5/8 in. x 1/4 in.)

Wheelbase 55 in. (139.7cm)

Seat height 33 in. (83.8cm)

Ground clearance 7.5 in. (19.05cm)

Curb weight 211 lb. (95.69kg) with full tank fuel

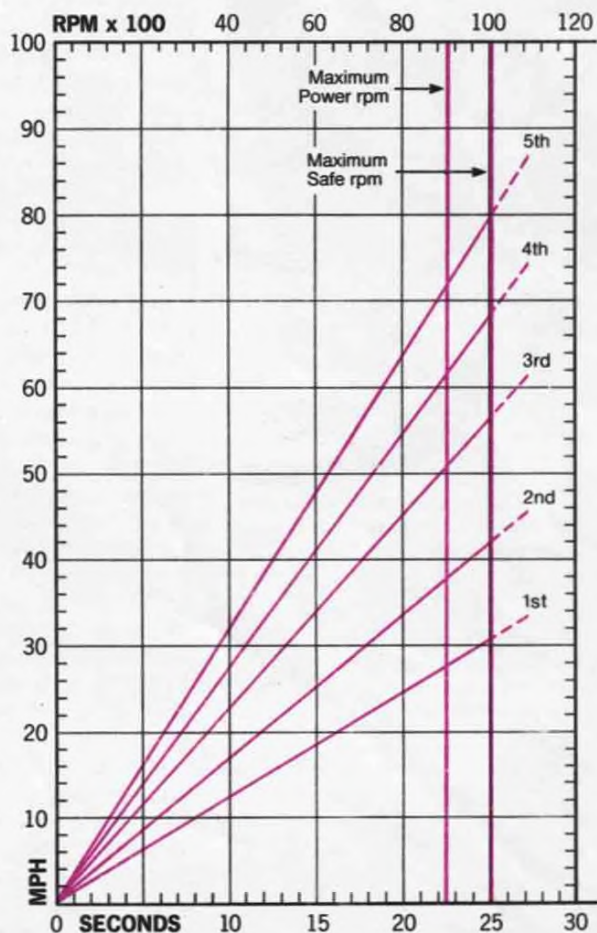
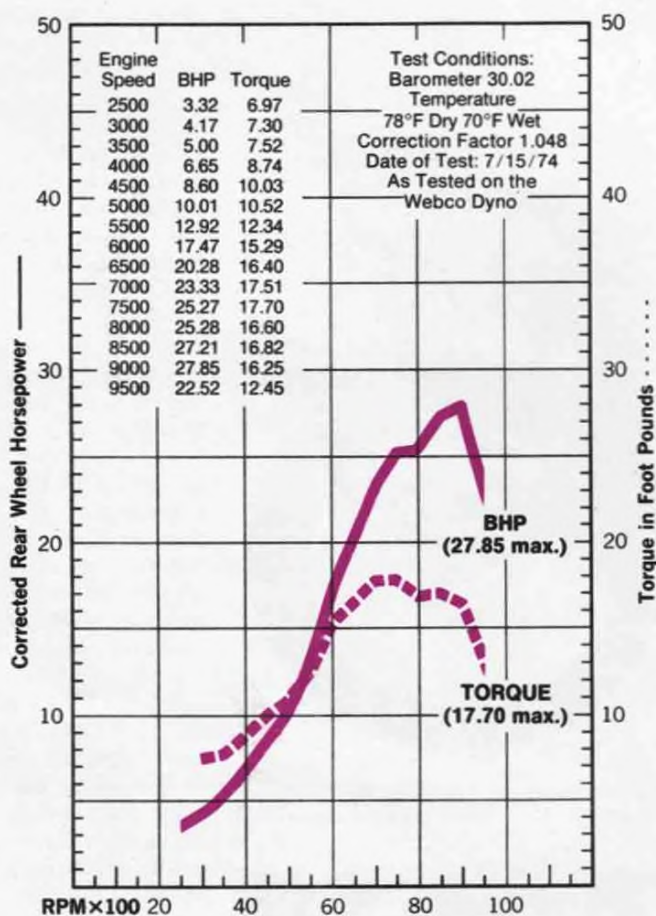
Test weight 371 lb. (168.25kg) with rider

Instruments..... none

Sound level (AMA Standard) 75-78 dB(A)

Standing start 1/4-mile 16.69 sec @ 71.2 mi./hr. (16.69 sec. @ 114.6 km/hr)

Top speed..... 72.37 mi./hr. (116.4 km/hr) @ max power rpm with std. gearing



cleaner box are all made of fiberglass. Any of these articles is susceptible to being fractured in a crash. We fell off the Phantom twice and got the front fender both times. The other pieces mentioned are fairly well protected by the bike's hardware, but they will go the way of all fiberglass eventually.

The combination air cleaner box and number plates completely fills the cavity under the seat. A portion of the rear fender forms the backside of the box. Cracks between the fender and cleaner can easily be fixed with normal race preparation's liberal dousing of silicon seal. The treated paper element does not stop microscopic dirt very well, and a small amount of water soon clogs its pores. OSSA spokesmen recommend slipping a dry Filtron sock (#K-203) over the paper element for security, and a spare sock should be ready for substitution between motos. The air cleaner is accessible after removing the seat's two retaining bolts and lifting the seat aside. A 10 mm wrench removes the single nut securing the fiberglass and cover on the filter element.

A firmly resilient slab of foam rubber 5.5 inches thick cushions the rider from much of motocross's awful beating. While the cushioning properties of the seat are among the best on the market, the vinyl covering may as well be coated with grease at the mere thought of getting wet.

Tank shape is pleasing and safe: all the corners are nicely rounded and the seat/tank junction is perfectly integrated. A vent hose comes from its tube in front of the filler cap and tucks neatly into the steering axle. The filler cap is molded of black bakelite, has coarse threads for easy engagement, and covers a filler neck with a full 2 inches (50 mm) inside diameter to permit entry of big fuel can spouts. Both fuel valves leaked fast enough to make puddles on the shop floor until we filed the tank nipples flat. They were tight after that, but their new position caused the on-off lever to hit the frame when the tank was being removed. A cork gasket in the filler cap will probably have to be changed often or replaced with a fat neoprene o-ring. The tank holds a generous 2.3 gallons (9 liters) without being bulky and intrusive to the knees and crotch during a race.

The Phantom's engine is a further development of the tried-and-true OSSA mill that last powered the Stiletto scrambler. As refined for hard MX usage in the Phantom, the power curve has been altered drastically, the crankshaft has been made much stiffer, and the gearbox ratios have been changed to suit the new power and weight.

Basic cylinder and head castings are as before. The alteration in power characteristics starts with new port timings and shapes. Compression ratio is now 13.2 : 1 (7.6 : 1 when calculated from exhaust closing). Compared to the Montesa, which produced the highest power reading of any 250 crosser we've tested (see May '74) and



Phantom handles and tracks predictably in most situations if quick throttle is very carefully adjusted.

had a nominal ratio of 12 : 1, the OSSA C.R. is pretty high.

Feeding new cylinder timing is one of the new 36 mm Spanish Bing center-float carburetors. Two rubber adapters fit the carb to the cylinder and air cleaner in a vibration-damping and temperature-insulating live mount. Simple, Italian-type hose clamps keep the carb securely vertical. Loosening the clamp screws permits the carb body to be rotated to a horizontal position for metering adjustments and cleaning. Some careful attention must be given to returning the top cap in its correct position after adjustment. The two screws which secure the cap can be installed with the cap rotated 180 degrees. It happens that the throttle cable is offset in the cap and the slide will not open fully when the cable is nearer the rear of the carb body. There are two identical pairs of bosses on the carb body and

top cap, which are of no value in getting the cap on right. Phantom owners would do well to file off one set of bosses or mark the cap and body with aligning indicators to prevent mis-fitting in the heat of battle. With an engine as highly tuned as the Phantom's, mixture control at full throttle is extremely critical and the needle hanging down in its jet that little bit could definitely cause trouble. Inspecting the float chamber contents showed that the float needle will drop out into the dirt after the bowl is removed. OSSA people say that some do and some don't, so be warned. The float needle is the Holley-type with a ball and spring detent to prevent fuel flow surging. The needle jet is held in place by a ball union with the emulsifier tube. If the needle jet is removed, it should be replaced and the emulsion tube tightened against it, with the slide and needle in place to center the

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needle jet properly. Otherwise the jet could cock and cause the needle to bind. The emulsifier tube is tightened with a 10 mm wrench and the main jet screws into it. The slide is cast in zinc alloy (which has a much lower expansion rate than the aluminum carb body), so the slide will not stick if some dirt should get into the carb when it is at racing temperature. The float flooding plunger is shrouded to keep water out and gas in. An overflow hose carries excess fuel away from the carb when it is flooded for starting. The carb functioned perfectly throughout our test.

The final part of breathing control is exercised by the exhaust system. Two very stiff springs hold the pipe into a spigot mount in the center of the cylinder between the twin frame down tubes. As the expansion chamber swells directly under the engine, it is secured by a Lord-type rubber live mount before the piping curls up alongside the bike from the frame-swinging arm juncture. More rubber mounts hold the pipe to the side of the frame. These kinds of mounts were designed to cushion loads in compression: with something pushing their threaded ends toward each other. When operated with the rubber filler in tension, or worse yet, a combination of tension and shear, they will quickly fail in the presence of severe vibration, and the slightest crash will easily rip the mounts asunder. Perhaps this latter is what the OSSA people had in mind and it is a point which will be more thoroughly discussed later.

The Phantom sits high. Our six-foot rider could just firmly plant both boot soles when standing astraddle. Sitting compressed the seat and shocks enough to keep both feet against the hard California soil. It's a good, long, straight-armed reach to the bars and the Magura-type levers feel natural to outstretched fingers. At 211 pounds, the bike feels like a 125 of three years ago. With both fuel valves on and the float bowl flooded, the rider is obliged to stand to the left of the machine and jab at the long, folded-out kick-start pedal with his right boot. A quick and hard jab brings the engine snarling quickly to life without a lot of cold-engine stutters. Tweaking the grip gingerly produces an explosive burst of revs. An easy pull on the clutch and nudging down on the left foot pedal engages low and the Phantom carburates cleanly away as the throttle and clutch coincide. First gear is extremely low with the standard 12 tooth sprocket (25.95, as compared to 20.95 for the Montesa, and 22.7 for a Honda CR250). Low produces hardly any acceleration at all, any throttle opening being entirely spent in wheelspin. Engaging second gear in the pit area gave the right feel for starting out. A slight amount of body movement fore or aft allows the rider to choose the best compromise between the front wheel predictably climb-

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ing and the rear wheel beginning to snake from side to side. On loose or hard dirt, shifting early in the rpm band gives an unbelievable rush of acceleration.

After the engine got good and hot we headed out onto the parched, pebble- and powder-covered monument to self-abuse that is Valley Cycle Park's short course. The engine was still smelly-new so we rode easily around the track, getting warmed up and only gassing it a little when in the vicinity of the photographer. Both brakes work with predictable sureness. On the second lap in the last powdery climb to the peak, the engine stalled from a little too much pressure on the brakes. Lack of a primary kickstart is a real bummer when you are on a hill, trying to find neutral and hold onto the front wheel brake while climbing off the bike to start it from the left. After a while we began to get on the throttle a little harder and noticed a lot of pinging and rattling from the engine on uphill climbs. Inspection showed that the carb needle was in the lowest of its three positions, so we raised it to the middle notch. Happier sounds came from the engine but the Champion N-2G plug still showed lean with a #165 main jet (the largest in the bike's standard equipment selection) installed. After taking it easy for the remainder of the first tank of gas, the engine began to tighten on the third lap of the second tank. Slowing down to a lope again restored the engine's crisp feel. On the next hard-charging lap, we were exiting the first turn and getting a good hard drive toward a small jump that has some ripples at its base. With the throttle open enough to sustain a wheel lift, the rear wheel hit the small ripples and began to slam violently from side-to-side. The next sound was a sort of twin splat as our rider and the Phantom struck the ground.

The pipe was flattened somewhat, the bars were seriously kinked, the front fender was shattered and the rider was seriously wondering if his breath was ever going to return. Back at the shop, we wondered if we hadn't just over-boogied a hair and gassed it too hard on those ripples. Band-sawing the pipe into pieces, straightening the kinks, and welding the thing back into an assembly gave us plenty of time to think it all over before calling Yankee Motor Co. for the other pieces and bigger jets.

Inspection during reassembly showed that there were faint seizure marks on the piston. These were carefully dressed off with a fine jeweler's file and corresponding touches in the cylinder were cleaned off with green-grade 3M scouring pads. The Phantom's piston rings are the very thin (1 mm) clip-type with chromed edges that, as far as we know, were developed by the Wiseco Co.

After all the pieces, new and repaired, were reassembled many more break-in miles were logged on the bike, during which the main jet was raised to a #170. Another check on the engine settings was made and the machine was taken to Webco for the dynamometer test. The engine ran faultlessly on the pump but its cylinder head temperature climbed so fast that it was necessary to let the engine cool for a period between the power readings at each rpm step. Almost as an afterthought, we decided to run a few checks with the silencer removed. The maximum readings were almost identical along the scale but the cylinder head temperature was much lower with the open expansion chamber. Exhaust gas has to make two 180 degree turns in the silencer and the resulting restriction to flow doesn't let the heat escape at high revs. This would explain why the engine regained its sharpness at the track after we allowed it to loaf for a couple of laps when the engine was new and the mixture was too lean. Anyone attempting to race a Phantom in the desert would do well to replace OSSA's silencer with one of the straight-through fiberglass-packed variety.

Toward the end of the dyno runs oil began to saturate the engine cases and drop steadily on the floor. We thought at the time that a gasket or oil seal had ruptured but a check back at our shop showed that the cylinder base gasket had blown out at the transfer port bulges and the oil we had seen had all come from the escaping fuel mixture. Wow, we thought. Almost 28 bhp with a blown base gasket. A replacement gasket was quickly cut out of gasket material that was 0.3 mm thick and we raced to Webco the following morning to satisfy our curiosity and conscience. But the engine tightened and seized on the first hard run.

Back at the *Cycle* shop we observed that the homemade gasket had compressed more than the stock one, and the piston was actually rising above the top of the cylinder liner slightly at top dead center. Three gaskets were necessary to keep the piston top flush after the head was torqued and the engine run a few times. After we were satisfied that the engine was as ready and carefully tuned as we could manage, the rest was gone over equally carefully.

Back at Valley Cycle Park for a final check on our opinions, the engine ran better than ever before. Because of the Phantom's high compression ratio and previous tendency to detonate, several brands of high-test gas were tried (all being mixed in a 20:1 ratio with Castrol R30). The engine was decidedly happier with Union 76 than it was with Shell, Mobil, or Gulf.

The Phantom handled extremely well everywhere on the circuit except that one fast turn where we crashed on the first outing. It is the one place on the circuit

where we can accelerate hard enough to keep the front wheel up over a fast and ripply surface while making a turn. The bike will do that wild snake-dance every time under the same conditions, though we did not approach the situation with enough abandon to provoke another spectacular get-off.

On slower turns, where the brakes must be used heavily, the Phantom will make the abrupt change in direction very quickly and easily. It will accelerate as hard as traction and rider ability will allow. On turns where there is a banked berm, the rider's weight must be forced as far forward as possible to keep the front wheel from climbing over the edge as the throttle is opened. The track was so hard in places that our rider could hear the front tire howling as it skidded into the desired direction. Unlike the Yamaha YZ, the OSSA's front wheel can be made to bite on hard, slick turns.

During that session the throttle grip began to migrate on the bars and we missed a power shift several times. A small strip of emery cloth clamped under the twist grip, with the rough side toward the bar, anchored the grip for further use. The shift lever was hitting against the thick-headed screw which holds down the front of an inspection cover over the clutch. We bent the lever out a little bit and the shifting returned to normal.

In a final session for photos we were fairly exhausted and got into one of the hard, slick turns a little too hot. In what would have been a very easy, almost slow-motion slide-out, the Phantom's exhaust system was totally wiped out: kinked, smashed, and completely torn loose from the bike. Perhaps those rubber mounts were made to let the pipe get loose in a fall, but they did nothing to prevent its total demise in our case. We went home to think it all out.

We like the OSSA a lot. It, the Montesa VR, and the Honda CR250 are the only ones of the production motocrossers we've tested so far that we could learn to cope with and enjoy racing on a week-to-week basis. But still, \$1400 is a lot of coin to borrow with the prospect of having to replace hoards of fiberglass parts in the near future. And that last little spill we took so light-heartedly would have cost the average weekend warrior at least \$100. We still don't have a good feeling about whether the shocks or swinging arm caused the awful snake-dance that tossed us down so hard. If you've got the money to keep up with normal repairs and buy the better second-year pieces that will replace many of the present ones, the OSSA Phantom will be a serious mount for a developing racer. If you've got to watch your pennies, better look at something more durable and developed. Second-year hindsight, after all, is a good point of view when buying any kind of a racer. ©