CYCLE DIRT TEST

KAWASAKI KX250-A4

Kawasaki returns to 250cc motocross with a vengence. At 219 pounds the KX250-A4 is the lightest 250 motocrosser available. Armed with 27.6 horsepower, the bike is fast—and it's a quick, responsive handler. At last, the Green turns mean again.

PHOTOGRAPHY: DAVE HAWKINS

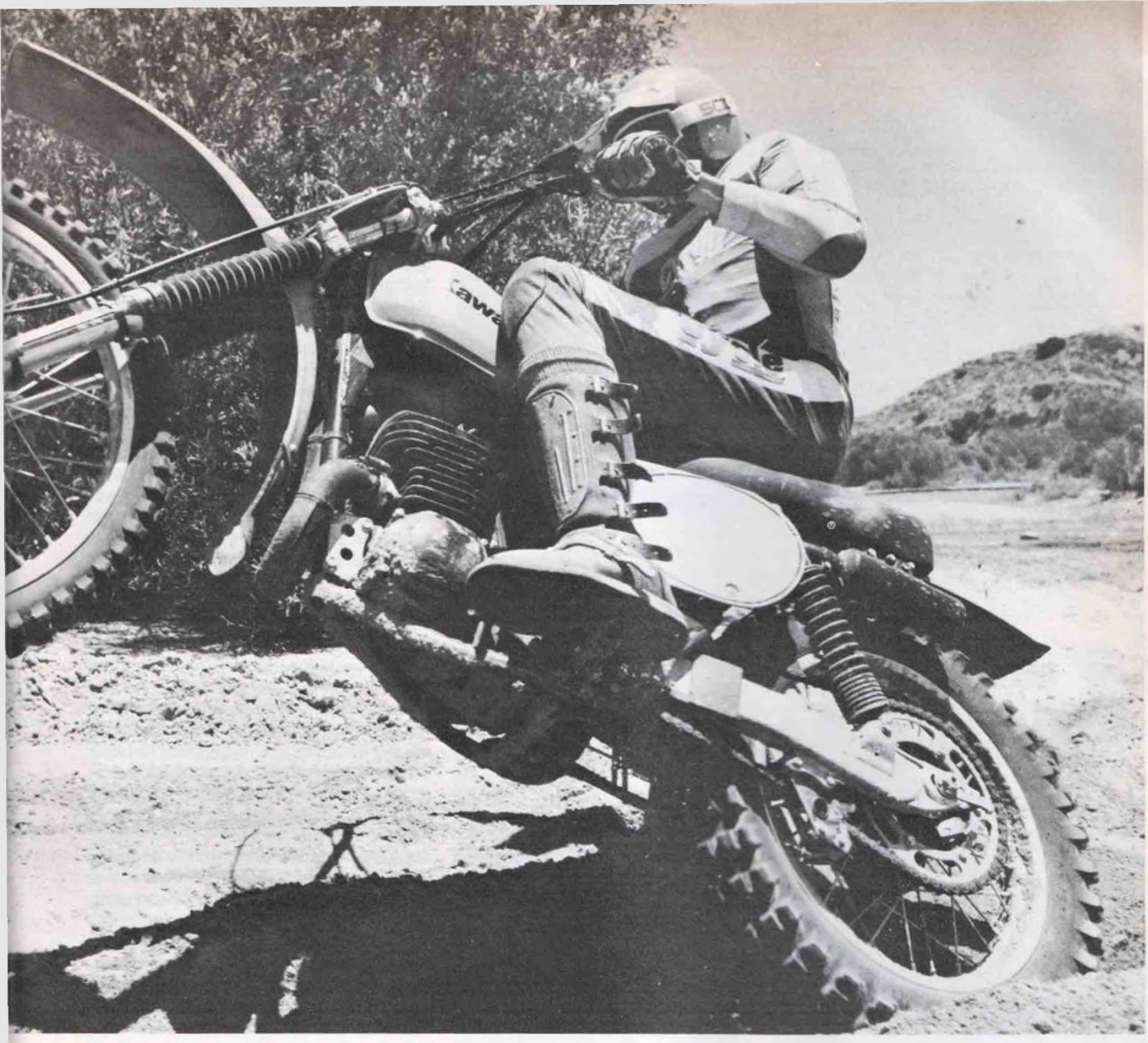
● THE COLOR OF MOTOCROSS IS SLOWLY changing. Once upon a time, the biggest challenge in racing was outfitting yourself with unique and noticeable riding gear that went with your yellow bike. In part, Honda upset the color scheme of motocross with the introduction of the bright red CR250R. And now Kawasaki has returned with a new green machine for 250 motocross. And what a dazzler the KX250-A4 is: gold-anodized aluminum swing arm and matching rims, lightweight plastic fenders and number plates, hollow axles front and rear, drilled and anodized aluminum motor mounts, and aircraft lock-nuts everywhere.

The KX250-A4 looks exactly like the bike it is—a limited-production motocrosser for expert-level riders. Usually a bike is delivered to our offices and then returned to the manufacturer after the riding evaluations, internal inspections and dyno runs have been completed. But Kawasaki handles things a bit differently. To insure that this uncompromised motocrosser would be maintained like an all-out race machine, a representative from Kawasaki met us with our freshly prepared KX and stayed with the bike every day of the testing. He carefully attended to spokes, drive chain and tire pressures. When one day's testing was completed, the bike would be returned to Kawasaki's racing department for inspection and preparation for the next day's testing. Given this careful shepherding, the bike performed flawlessly.

Like the smaller 125, the KX250 is the lightest bike in its class we have tested. Tanked-up, the bike weighs 219 pounds. That is 10 pounds lighter than the Yamaha YZ250E and eight pounds under the CR250R Honda. The lightness of the machine is apparent everywhere on the track. Off the starting line, the front tire just skims the terrain, and in turns the KX is nimble and agile. With some heavier machines, you must force a bike over on its side in a turn, but the Kawasaki makes squaring corners a snap and berm-shots easy. The bike responds quickly to weight shifts by the rider and to all steering inputs. In rough whoop-de-doo sections, a slight twist of the throttle and a small weight transfer rearward will loft the front tire and bypass the mounds.

The feathery weight of the KX250 results in a bike that demands concentration when exiting turns. A sloppy rider who isn't properly seated forward near the green tank may soon see the other team color, sky blue. A good rider, of course, won't have this problem, and all riders will benefit from the KX250's lightness, especially in long motos. In these circumstances, even a donk rider can race longer and harder if he doesn't have to haul around a lot of excess baggage.

The lightweight single-downtube frame is tubular alloy steel. Diameters vary according to stress loads; the frame tapers from 35mm at the downtube to 22mm for the rear seat mount. The steering stem area is heavily gusseted to the main backbone tube, and there's more heavy-duty gusseting at the rear section of the engine cradle near the swing-arm pivot. To damp



vibrations and form an additional engine mount, a head stay runs from the rear of the cylinder head to the junction of the frame's main backbone and airbox area. Stays are common to larger-displacement motocross machines and a few of the larger-bore single-cylinder street bikes. The KX stay reduces vibrations by securing the engine more firmly within the frame's cradle. With the KX's frame (not chrome-moly), the increased rigidity produced by the stay reduces the stress on the other engine mounts.

The frame has its share of tapered roller and needle bearings. The steering stem load is supported by tapered roller bearings, while the swing arm pivots on four needle bearings. There's even a bearing support for the brake torque arm. Tapered rollers in the steering head give much more bearing area to support the triple clamps and front end than loose, uncaged ball bearings, which will soon brinell under constant pounding.

The front suspension is a KYB-manufactured air-charged, oil-damped fork. The air volume couples with the three internal springs to give a progressively sprung ride and 9.25 inches of travel. The longest of the three springs (14 pound-inch rated) couples with a shorter (5.5 inches) spring to give a dual rate. The shortest spring in the fork is only one inch long, and its sole function is to prevent the fork from clanking when it tops out over jumps. Five cooling fins are cast into the bottom of each slider; they serve to increase the cooling area for the 270cc of oil in each fork leg. The ideal fork pressure for our riding proved to be 12.5 pounds of air in each leg. At lower levels, the fork bottomed out over larger whoops and was too soft on the braking bumps before a turn. With higher pressures, the fork was quite stiff and transmitted the smallest shocks from tiny bumps directly to the rider's arms.

KYB also makes the remote-reservoir shocks on the Kawasaki. The bike's rear suspension offers 8.5 inches of travel. The shock itself has a travel of 5.9 inches with the 20mm rubber stops compressed 50 per cent. Although the shocks worked well, the under nine inches of travel is a bit short-legged compared to the other leading 250s. Kawasaki's factory team riders mount their shocks at an extreme laid-down position relative to the stock KX. The standard KX uses a 55-93 pound-inch dual-rate spring on the rear and this spring rate matches up with the rest of the bike nicely.

The reservoirs are connected to the top of the shock bodies by an oil line that leads forward to the rear of the engine cradle where the reservoir is mounted. Separate reservoirs can be large enough to increase the oil capacity significantly and help the dampers resist fading. The shocks are tucked in and do not cause an annoying bulge in the number plates.

The A4's aluminum swing arm is massive. The square-section main body of the arm is heli-arced to a rear I-beam section. The lower shock mount intersects the

KAWASAKI KX250-A4

junction of the square-section arm and the I-beam axle-mount section. With all the heli-arc junctions, the shock location appears to be strong enough to support an open class bike easily. The arm has a conventional chain guide near the rear sprocket and a roller support near the swing-arm pivot mounted on the frame. A replaceable chain skid pad is wrapped around the arm to prevent scuffing of the arm by a loose chain.

The KX250-A4's engine has one unique feature: Kawasaki's patented wire-explosion coating on the cylinder wall. Each unfinished cylinder has its ports plugged, and it's then fitted on a machine that feeds 15 separate wires through the center of the cylinder. A 16,000-volt current is applied to the wire, and the wire's center is vaporized by the voltage surge. A millisecond later the wire explodes and coats the cylinder wall with particles of the wire.

This new system has apparently solved many problems presented by the use of iron sleeves or chrome-plated bores. If an iron sleeve is inserted into an aluminum cylinder casting, hot spots develop at any place that the liner and the cylinder have not formed a perfect fit. Inevitably there are slight misalignments between the liner windows and the cylinder ports. Chrome-plating the cylinder eliminates problems of fit but presents a number of maintenance problems.

Fifteen separate explosions effectively "spray" coat the cylinder with combinations of pure molybdenum wire and high-carbon steel wire. Each explosion coats the cylinder with .0005-millimeter particles. The first three molybdenum-wire blasts form a strong bond between the cylinder and the subsequent wire coatings. The next six applications alternate between the moly wire and the carbon wire. These coatings actually impregnate each other to form an evenly distributed mix. Tests were conducted with alloy (carbon and moly) wire, but though this shortened production time, the coating was not

Hollow axle, full-length leg protectors and cast-in cooling fins highlight the 9.25-inch travel front fork.

as homogeneous as the alternating wire method.

The entire cylinder coating is only 70 microns thick after the last three blasts of carbon wire are honed away. One micron is .001-millimeter, or .000039-inch. The thin wall coating permits rapid heat dissipation, and the ports are perfectly aligned.

The coating provides a porous (moly wire) yet hard (carbon wire) surface. According to Kawasaki's wear indicator tests, the KX cylinder will resist seizures under extreme test conditions. One test included feeding silt into the cylinder; even then the KX cylinder survived the silt-torture test with half the wear of a conventional iron-sleeved engine.

The charge is fed to the cylinder through a still air box and a 38mm Mikuni. A foam pad is glued to the back of the right-side number plate that covers the opening to the air box. By simply removing two number-plate screws, the air cleaner is readily accessible. An easily serviced air cleaner will undoubtedly be cleaned more often than one that is hard to reach, so Kawasaki has helped insure maximum cylinder life by putting the air cleaner in quick reach.

Commonly, most test motocrossers *Cycle* receives are jetted rich and have the ignition timing advanced. The KX was no exception. The bike blubbered throughout the mid-range powerband. After rejetting the carb, the KX was running very strong in a few laps. As a guide, we ran the bike at an elevation of about 250 feet and in temperatures ranging from 65 to 85 degrees F. The main jet was changed to a 162.5, the pilot jet a 50.

Before entering the cylinder, the charge passes through a six-petal reed block. The reeds appear to be fiberglass, but Kawasaki technicians assured us that they are a special plastic composition. During our test period, the reeds did not fret at all and gave clean carburetion throughout the power range. The flapping of the reeds is cushioned by a rubber dip coating on the reed's V-shaped block. The main intake port is a large single-opening port that opens into the crankcase. The KX also has two smaller "boost" ports that tunnel from the reed block area directly into the crankcase. The cylinder uses four transfer ports and dual, bridged exhaust ports.

The chamber wraps around the single down tube of the frame and up along the right side of the engine. The pipe is gradually tapered throughout the belly section of the chamber; an irregular dual taper is used to clear the frame near the seat/tank junction where the pipe crosses through the frame. The dual tapered cone will disrupt, to a small extent, smooth exhaust gas flow, and there may be a slight loss in power for this reason.

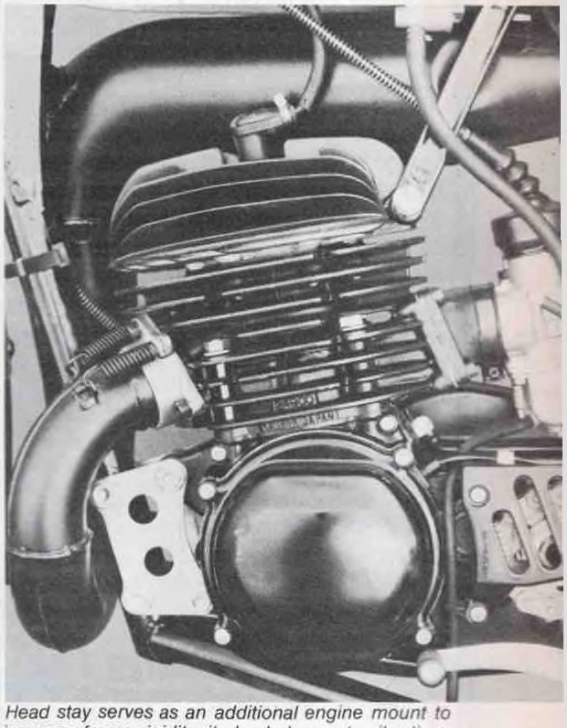
KX250s require some modification to their pistons, and Kawasaki dealers have been sent technical bulletins regarding this situation. The stock piston is a two-ring Dykes model. Some early KXs seized pistons in the exhaust bridge area, and so follow-up bulletins have advised filing a .020-inch relief on the piston where it contacts the exhaust bridge. Also, the two oil holes in the piston on the exhaust side must be chamfered.

We had a chance to inspect a seized (unmodified) piston and cylinder; although the piston was badly scored, the cylinder wall was still operational. On our bike, with the modifications, the bike ran strong throughout our testing and also survived our dyno runs without incident.

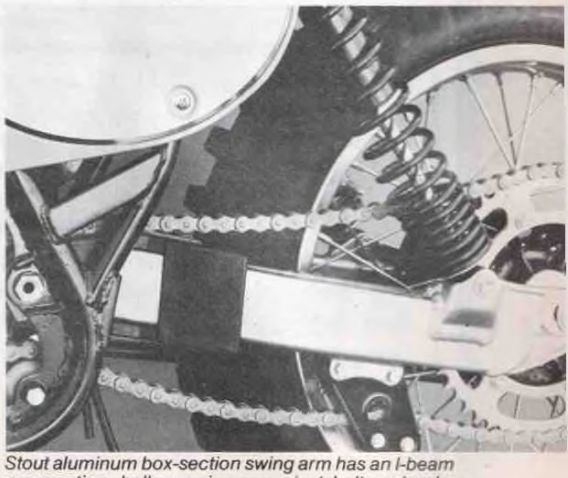
The KX has a five-speed constant-mesh transmission. The gears are straight-cut, and shifts go through neatly once you become accustomed to the throw. The gear box does not operate as smoothly as the one on a CR250 Honda, but the Kawasaki's is much better than, for example, a CZ's. The ratios of the gears are ideal for motocross.

On the track the bike feels much quicker than the dyno figures indicate. The machine's low weight does not show up on horsepower numbers, but power-to-weight ratio certainly counts on the track. The KX250 produced 27.56 horsepower at 7500 rpm. While the figures aren't overwhelming, they are respectable. At a local motocross race our stock A4 exited the first turn in third and first places in the two motos.

The Kawasaki's peak power at 7500 rpm is the exact rpm that both the Yamaha YZ250E and the Honda CR250R reached their maximum outputs. However, the KX is more than two horsepower down on the Honda but one horsepower up on the Yamaha YZ250E *Cycle* first tested in April 1978. Given three bikes that close in power, the rider who shuts off last going into the first turn will have the



Head stay serves as an additional engine mount to increase frame rigidity; it also helps mute vibrations.



Stout aluminum box-section swing arm has an I-beam rear section, hollow swing-arm pivot bolt and axle.

advantage and the holeshot.

The gold-anodized DID alloy rims are both strong and light. The front 1.60 x 21-inch and rear 2.15 x 18-inch rims complement the bike's bright green. The conical front hub has a magnesium backing plate; the rear hub is also conical and it, as well as the backing plate, is magnesium.

The stock Dunlop tires are also light. The rear tire, a four-ply 5.00 x 18-inch Sports K-88, is about a half-pound lighter than a Metzeler and is far less expensive, two important considerations for mass-produced machines. The tire performed nicely on hard-packed as well as sand courses. The front tire is also lighter than a comparable Metzeler—and that's the only good thing we can say of the front rubber. The tire pushed or plowed, depending on track surface. The KX's rake of 30 degrees felt more like 40, because the front tire just refused to grip any kind of dirt we rode on. The front tire (and the handgrips) should be replaced *before* you leave the shop.

The KX uses a two-ring piston that will require hand-relieving in the contact area with the exhaust bridge.

The KX's cast aluminum head has a concentric shaped combustion dome with a wider-than-usual squish band.

Despite the front tire, the front brake worked extremely well. The strong, progressive front brake not only tolerated but encouraged deep dives into corners. The front shoes are only six inches in diameter, but their small size belies the stopping strength. The rear brake is a full-floating unit. The torque arm secures the backing plate to the frame so that braking loads are fed into the frame rather than into the swing arm where the shocks would compress in braking.

On its reentry into motocross, Kawasaki has played its best hand. The 250-A4 is a solid racing package. Changing rear shock absorbers, tires and handgrips will propel the KX from the middle of the thundering pack to a front runner. As a limited production motorcycle the A4 bike has been a way for Kawasaki to "test the (motocross) water." With the 250-A4, Kawasaki has discovered that the water is just fine. The yellow stranglehold on 250 starting lines across America has already been broken by the bright green KX-A4. ◉

Make and model ..... Kawasaki KX250-A4
Price, suggested retail ..... NA

ENGINE
Type: ..... Two-stroke, air-cooled single cylinder
Bore and stroke ..... 70 x 64.9mm (2.76 x 2.56 in.)
Piston displacement ..... 249cc (15.91 cu. in.)
Compression ratio 7.6:1
Carburetion ..... 1; VM38SS Mikuni
Exhaust system ..... Expansion chamber with silencer
Ignition ..... Magnetically triggered, magneto-energized electronic CDI
Air filtration ..... Oiled foam
Oil filtration ..... None required
Bhp @ rpm ..... 27.56 @ 7500
Torque @ rpm ..... 20.46 @ 6500

TRANSMISSION
Type: ..... Constant-mesh, five-speed
Primary drive ..... Straight-cut gears; 2.68 (59/22)
Final drive ..... ⅝ x ¼ in. chain
Gear ratios, overall ..... (1) 2.33 (2) 1.73 (3) 1.41 (4) 1.16 (5) 1.00
Oil capacity ..... 1.0 liter (1.1 qt.)

CHASSIS
Type: ..... Tubular steel, single downtube, semi-cradle
Wheelbase ..... 1415mm (55.7 in.)
Rake/Trail ..... 30°/130mm (5.1 in.)
Brake and hub, front ..... Drum, conical, double shoe
rear ..... Drum, conical, double shoe
Wheel, front ..... DID Shoulderless, 1.60 x 21
rear ..... DID Shoulderless, 2.15 x 18
Tire, front ..... 3.00 x 21 Dunlop Sports Senior, 4pr
rear ..... 5.00 x 18 Dunlop Sports K-88, 4pr
Seat height ..... 914mm (36 in.)
Ground clearance ..... 300mm (11.8 in.)
Fuel capacity ..... 8 liters (2.1 gal.)
Curb weight, full tank ..... 99.32 kg (219 pounds)

Suspension, front ..... Telescopic, forward-axle fork
rear ..... Remote-reservoir KYB shocks

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