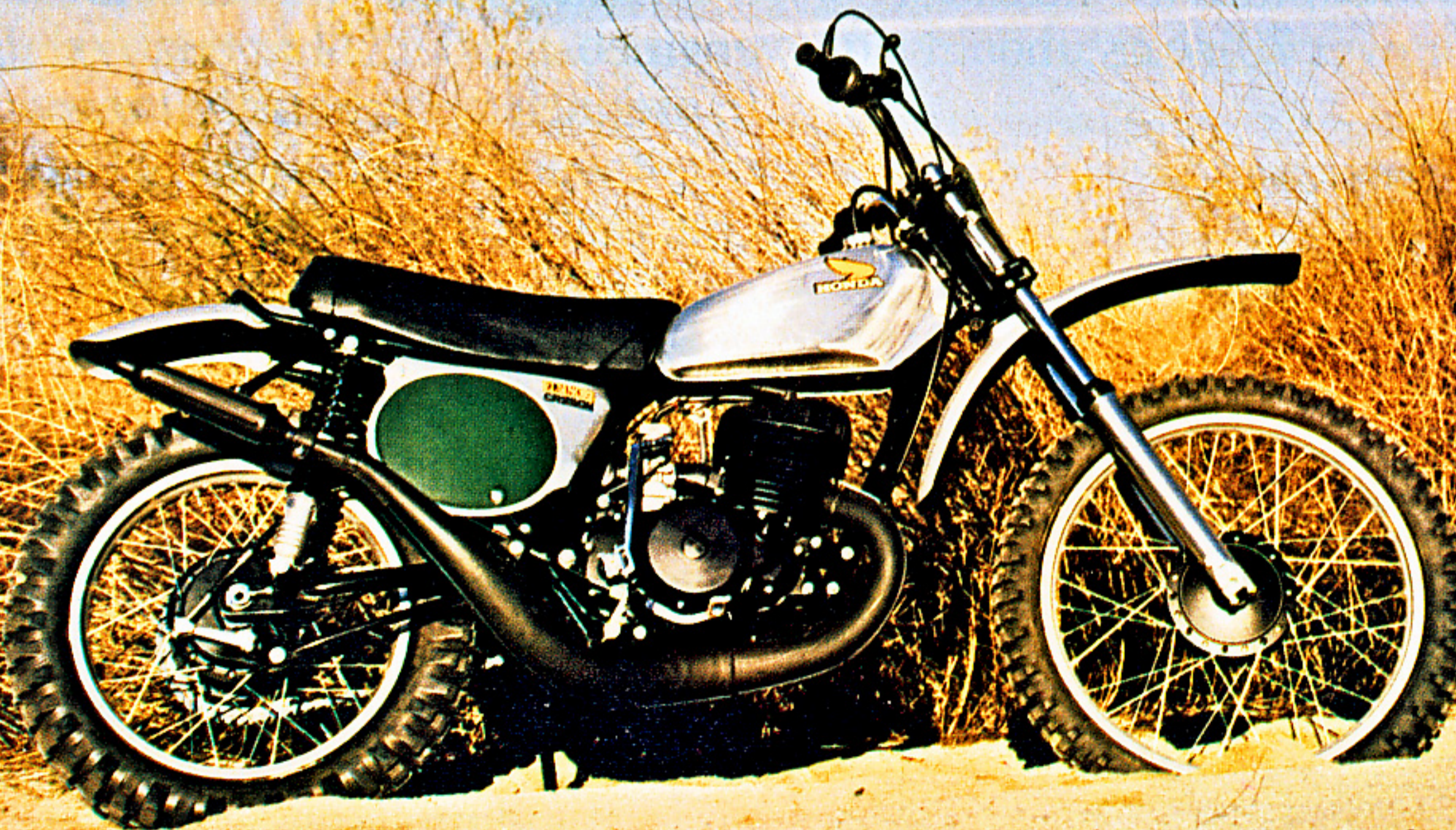


HONDA CR250M ELSINORE MOTOCROSSER

This time Honda really cared—and it shows.



Don't let the "Elsinore" part of the name fool you; it's the "CR" that counts. In the past Honda has used the CR designation only very sparingly, to label the factory racers that Honda's works-riders ran in world-championship Grand Prix events. Those machines were built super-light, with engines tuned to deliver the maximum in horsepower. The bikes had such viciously-narrow powerbands and developed so much more power than contemporary frames could handle that only a handful of riders could pilot them with any degree of safety. The average skilled racer could have made better lap times around a circuit with a modified production bike. But now Honda has developed a production motocross machine to be offered for sale to the general public, and they have called it a CR model. How come?

After exercising the first production-line example of the CR250M available in this country, we conclude that Honda was fully justified in slapping on the CR label. In its own way, the Elsinore is every bit as much a thoroughbred racing machine as its Grand Prix predecessors. Honda probably spent more time and money and loving care developing the CR250M than any three of their works machines. But the most impressive thing about the bike is that it represents a far more sophisticated set of design goals than racing-bike manufacturers have ever set for themselves in the past.

Rather than design a motorcycle that would go fast, and expect the rider to adapt himself to its eccentricities, Honda set about developing a bike that would go fast; handle; be very easy to ride; and also be comfortable. With the Elsinore, Honda has gone right to the heart of a matter that most motorcycle manufacturers have studiously ignored until now: a tired rider makes mistakes and loses; a relaxed rider stands a far better chance of winning.

Probably the four most important questions that can be asked about any racing bike are: does it go fast? Does it go where you point it? Is it easy to ride? Will it stay together?

Tackling the last question first, we had the Elsinore for three days. The three of us rode it on the motocross tracks, and Sam rode it in a desert race. Under those circumstances, some motorcycles would probably have gotten sick, and the Elsinore didn't. But that in no way duplicates a season's worth of racing, so we don't know how reliable the machine will be. From the way it is built, the motorcycle *looks* as if it will be as re-

liable as anything on the racetrack, and more reliable than most.

Honda took a lot of pains to build the Elsinore as light as possible—214 pounds, dry. But they didn't go overboard in lightening the engine components. The engine, even though it has magnesium clutch and magneto covers, weighs 64 pounds, which is about par for a 250 two-stroke single. They get a lot of mileage out of those 64 pounds.

The vital statistics: the engine is mildly oversquare, with a bore of 70 mm and a stroke of 64.4 mm. The compression ratio is 7.2:1. The engine gets into the powerband between 3500 and 4000 rpm, hits peak horsepower at about 7500 (a shade over 29 hp at the rear wheel), and redlines at 8000.

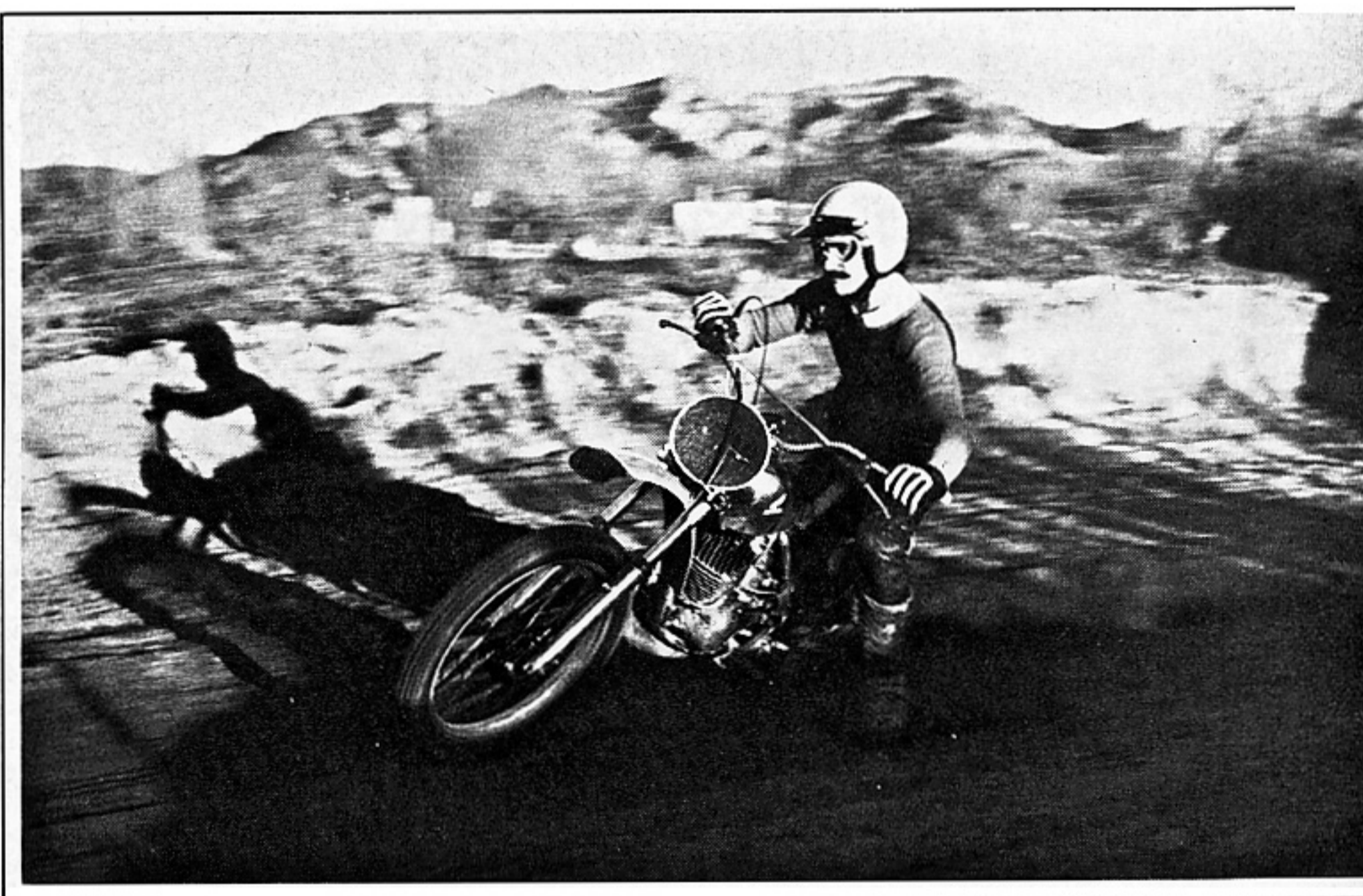
The engine cases (which split vertically) were near-perfect injection-

air leaks that result either from poor-quality castings or from leaks at the crankshaft seals.

The crank assembly consists of two fly-wheels with driveshafts, pressed on a particularly stout-looking crankpin, with a large-diameter caged-roller big-end bearing inside the 120 mm (center-to-center) connecting rod.

The wristpin rides on a caged-needle bearing, and each of the wristpin bosses in the piston has two elongated lubrication passages. The bearing surface of the piston has been etched via a special process to retain an oil film. The two piston-rings are teflon coated to avoid scuffing the cylinder while they seat.

The head and the cylinder (with ferrous liner) are cast from a high-density aluminum alloy with a normalized grain pattern to enable them



molded castings with healthy webbing and careful machining. The cases have cast-in steel bosses for the main bearings, to eliminate the possibility of hogging out due to steel (bearing race)-to-aluminum (boss) contact.

The main bearings themselves are huge #7306s, with an OD of 72 mm. The crankshaft seals are double-lipped and look to be as troublefree as Honda seals generally are. The main bearing on the right side lives outside its crankshaft seal, and gets its lubrication from oil slung by the clutch. On the other side, the stator covers an aluminum disc which presses against the left crankshaft seal.

Honda took pains to eliminate one of the big bugaboos of two-stroke engines: seizures caused by crankcase

to grow uniformly as they get hot. The cylinder and the head mount to the cases on four through-studs. There are four more studs to clamp the head to the cylinder. The head is positioned precisely on the cylinder by means of two hollow dowels, and there is a half-mm solid copper head gasket. Nothing unorthodox—just a whole lot of attention to expensive details to prevent the second bugaboo of two-stroke engines: seizure due to cylinder/head distortion.

The geared clutch is huge—about what you'd expect to find in a street bike, where there's plenty of room to make everything big; the Elsinore clutch is far more massive than those of most 250 motocrossers. There are seven sets of plates, and six cush-drive rubbers.

The gearshift selector mechanism

is of the same type used in the XL-250. The right side of the shifter drum is ball-bearing mounted, to make it easier to rotate. The camming grooves in the drum, that slide the shifter forks from side to side, have been machined out very carefully, and evidently the mechanical advantages were calculated precisely. The gearbox shifted so easily that we thought the shifter forks might have cam-follower bearings, but such was not the case. Just a careful design, well-executed.

The Elsinore has a five-speed gearbox. On the transmission shafts, the splined shifting-gears have oversize dogs, double-dovetailed to fit into—and stay locked into—the oversize slots in the freespinning gears, whether accelerating or decelerating.

Those are the reasons why we believe the Elsinore will prove to be a reliable motorcycle.

Where Honda went wild was in the engine breathing. For openers, the left window of the bridged intake port extends 4 mm higher up the cylinder wall than the right one. The two transfer ports (this is a six-port engine) are also purging ports—to assist in cooling the cylinder and in getting rid of the exhaust gases. The two exhaust ports are positioned unusually high in relation to the intake ports, and the top edges of the exhaust ports widen out radically, for better scavenging.

S-t-r-a-n-g-e. It is highly unlikely that Honda arrived at porting of this type just by accident. More likely this porting reflects thousands of man-hours of gas-flow study in elaborate facilities, machining in the model shop, dyno-room studies, and test riding. We suspect that the Honda R&D people could write a two-stroke engine-design textbook that would startle *everybody*.

Honda worked very closely with Keihin to develop a motocross carburetor for this particular engine: the 34 mm Keihin model PW34 with centerfloat. It is a slide/needle carb, with a partially-masked venturi in the bottom of the bore to smooth the awkward transition from the idle-rpm metering to the slide-cutaway metering.

The body of the carburetor is aluminum alloy, but the slide is chrome-plated brass, to eliminate aluminum-to-aluminum contact and lessen the chances of a sticking slide caused by grit. The needle is held in position by a drilled flat disc, mounted in the bottom of the slide by a big spring. That eliminates the notoriously-fragile needle clip.

The float is solid plastic foam. The jets are partially enclosed within the

bowl by baffle cups, to prevent surging when you're riding washboard or whoop-de-dooos. There is a built-in overflow tube to prevent flooding.

The bottom of the float bowl has a threaded brass plug with an O-ring seal. To change jets, you just loosen the front and rear hose clamps, rotate the carburetor 90 degrees, unscrew the bottom plug with a 17 mm wrench, and there's the main jet right in front of your eyes.

The engine uses ET (energy transfer) ignition, with contact-breaker points. Probably to work within the peculiarities of the porting, the igni-

The common design-practice is to bolt a stator to the side of the engine case, and outside that hang a magneto flywheel on the end of the crankshaft. If you want to retune the ignition on such an engine, you have to use special tools to pry off the flywheel so that you can get to the stator. But the Elsinore has a small rotor spinning inside a large stator. There are timing marks on the rotor and the stator. To retune the ignition, all you do is loosen the three stator-mounting screws, rotate the stator, and tighten the screws again.

The Elsinore engine bolts into the



tion occurs unusually late, when the piston is only 1.5 mm Before Top Dead Center. That's at least a millimeter of piston travel later than most other competition two-strokes fire.

When resetting the timing, you don't have to be nearly as concerned about the points-gap in the Elsinore as you do with other bikes. Most engines call for a gap between .014"-.016". The Elsinore engine makes satisfactory sparks with the gap set anywhere between .011" and .019".

The ignition is very easy to retune.

frame at four mounts: left and right up front; and top and bottom in the rear. The frame has a single front downtube, which spreads to cradle rails at the bottom. The tubing is a special seamless alloy steel similar to 4130 chrome-molybdenum in tensile strength, but with better welding characteristics. The front downtube has an OD of 38.5 mm; the cradle tubes, 22.75 mm. The frame is MIG (wire-feed) welded, and the welds look strong and professional. The frame weighs only 19 pounds; the swingarm, 7.4 pounds. The frame is painted black, and the welds don't

look as pretty as those coming out of the best custom-frame shops, but in terms of what's available today, the rider is getting what amounts to a high-quality custom frame.

The front forks have 7.1 inches of total travel (compression and extension). The fork tubes look sturdy; they have an OD of 35 mm. But the Japanese don't believe in using over-size reservoirs of damping fluid up front; the leg capacity is 165 cc, which is about par.

The forks are mounted in forged-aluminum-alloy triple clamps; the top yoke has one pinchbolt per fork tube;

that came standard on the bike and replace them with Konis, or the equivalent. The Elsinore's shocks, which have a full four inches of travel, also have a new design. Their damping tubes are almost half an inch in diameter. They have extra-large damping-oil reservoirs, which are finned to help dissipate the tremendous amounts of heat generated inside heavily-used shocks. And the engineers spent a lot of time working on spring rates and damper valving.

Every once in awhile some motorcycle manufacturer comes along with a particular combination of frame,

makes for what might normally be a slightly heavy front wheel. With dimensions like that, you'd think maybe you were looking at a motorcycle set up for cruising at 100 mph on smooth dirt roads with gentle bends, instead of a motocrosser geared to run 65-70 mph and built to turn square corners on tight, rough tracks. That's why studying the specifications is fascinating, but only part of the story. Motorcycle chassis design is still very much an art, and not by any stretch of the imagination a science.

The handlebars are low motocross bars with just enough rearward rake so the rider doesn't have to stretch his wrist tendons to hold on. The throttle makes less than a quarter turn from closed to wide open. The grips are a slightly softer copy of the Dougherty grip.

The gas tank is hand-welded aluminum, artificially aged for strength. It holds 1.8 gallons of pre-mixed fuel; there is no oil injection system on the Elsinore. The Honda engineers insisted that we run Castrol R mixed 20:1.

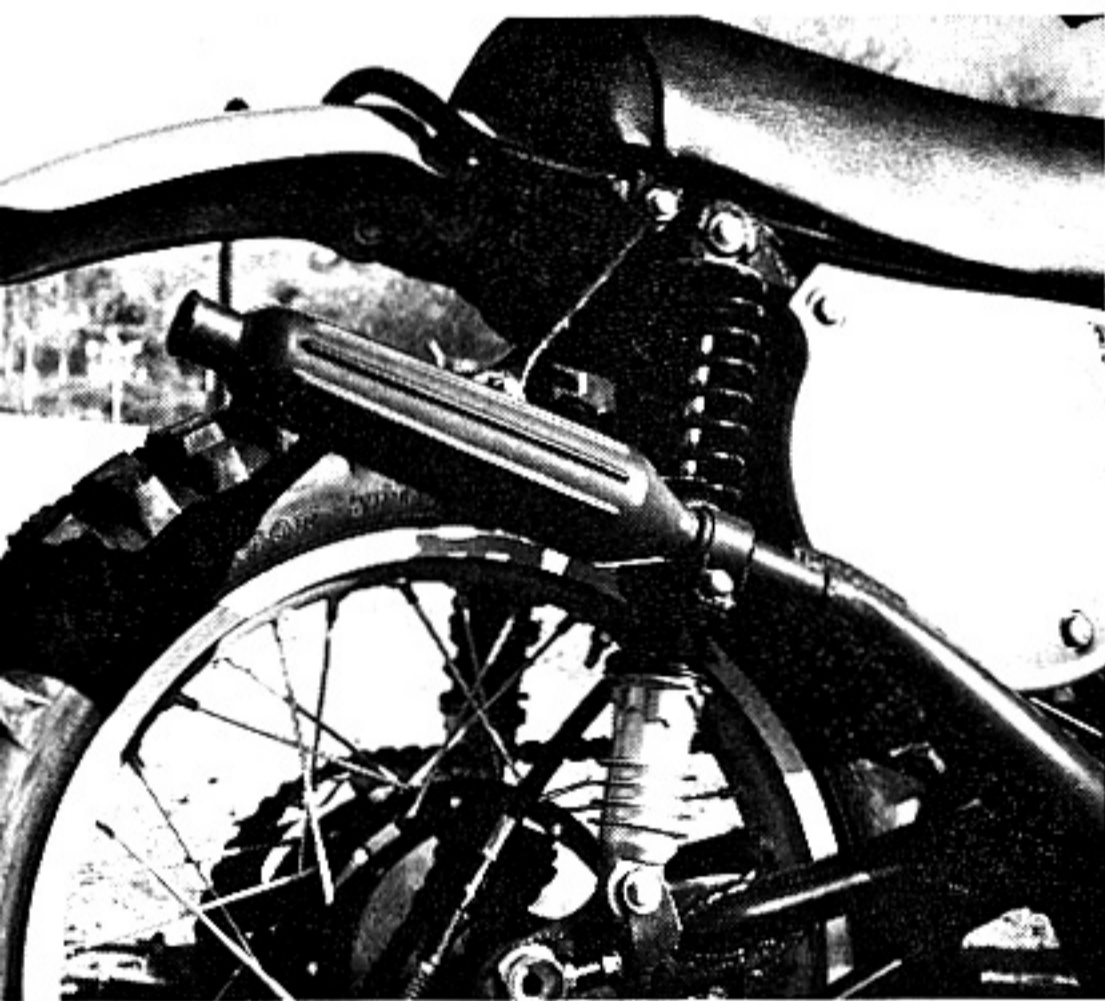
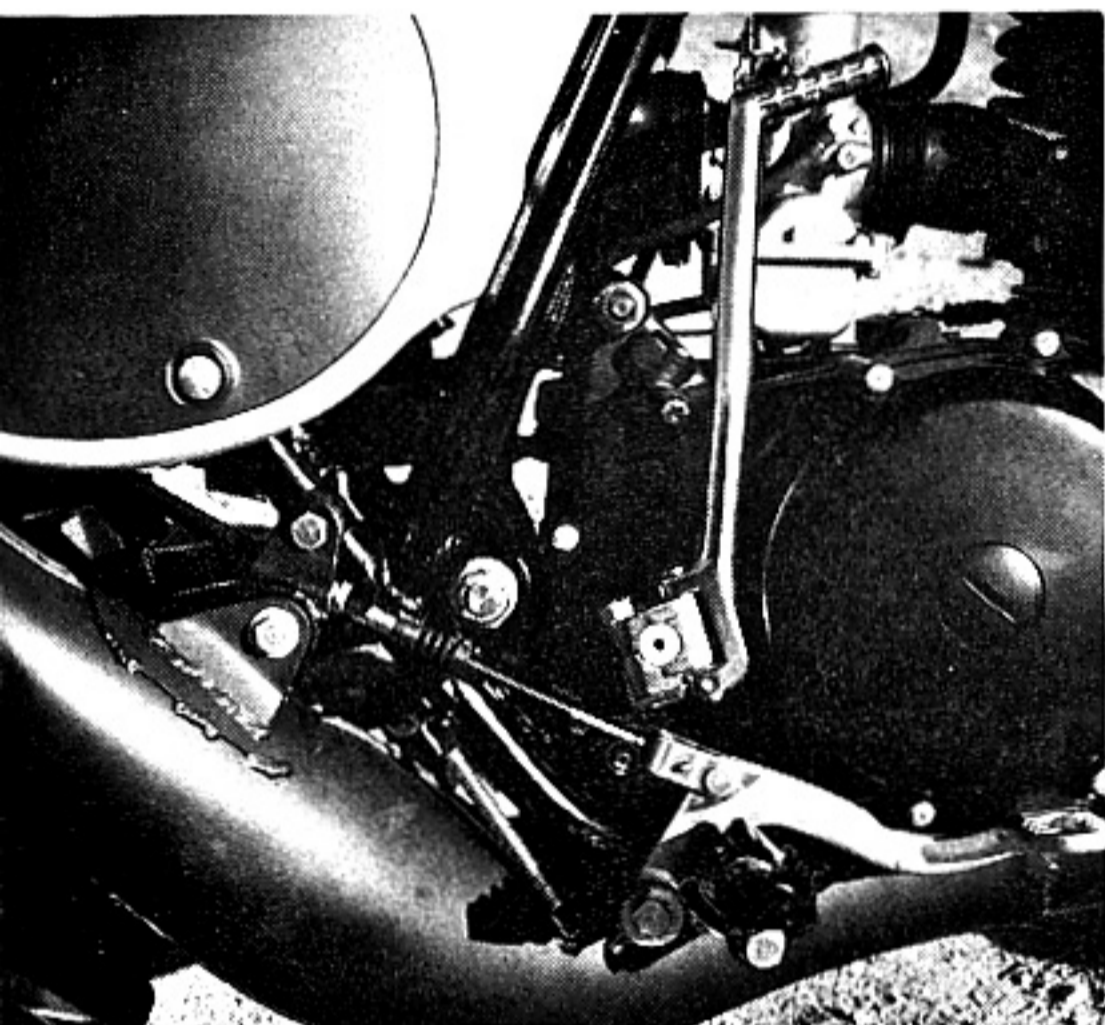
The saddle is long and narrow. Honda wanted to make it as light as possible, but they didn't want to use fiberglass for the base. So they laminated a sheet of plastic between two thin sheets of aluminum: still light, but lots stronger.

The furry polyurethane air-cleaner element hides away in a well-protected compartment beneath the saddle.

The Elsinore runs on Japanese Dunlop knobbies—a 3.00 x 21 up front, and a 4.00 x 18 in the rear. The fenders are high-impact plastic. There are lots of neat little touches all over the bike—like the forged-alloy control levers that until now have appeared only on machines like the BMW. But all those neat little touches add up to weight savings, and that's why the machine we tested weighed 214 pounds dry.

The Elsinore has a sidestand which doesn't seem to get in the way when the wheels are rolling. To get the wheels rolling, you climb aboard the saddle, which stands 32½" off the ground; even a fairly short rider can touch bottom with his feet without stretching.

You turn on the single fuel petcock, and you push down the carburetor enricher. You fold out the kickstarter lever, and check to see that the handlebar-mounted three-way kill switch is in the middle position. Then you kick hard with your right foot. Usually the test bike would start on the first kick; occasionally we had to prod it a second or third time.



the bottom yoke has two. The yokes were obviously designed for maximum tensile-strength at minimum weight. And the yokes are bored so that the fork tubes can be repositioned up or down to change the steering speed. The top part of each tube has five reference grooves machined into it so that you don't have to measure the tubes at the track to position them equally.

For a long time, Japanese rear shocks have been outstandingly bad, and the serious rider would automatically go to the added expense of throwing away the brand-new shocks

swingarm, and suspension dimensions that really handles well, and that combination gets adopted by the other manufacturers as the standard—until some other factory gets even better handling out of an entirely-different set of dimensions. The Elsinore has gone to a super-long wheel-base of 57", fully three inches longer than some comparable machines. Whereas the fork rake usually lives between 27 and 30 degrees, the Elsinore's forks are hung way out there at 32 degrees. The trail is a huge 5.7 inches. The weight distribution—45% front, 55% rear—

That easy starting was nice; there's nothing like wearing yourself down into a little melted heap just before the start of an event, trying to kick-start an engine that doesn't want to play.

As soon as it has caught, you rev hell out of it for a few moments to let it know you are serious, and then you sit there and blip it until it will keep running when you pull up the carb-enricher lever.

After *that* the bloody thing will just sit there and tick over so smoothly that people might mistake it for a trials machine.

To get moving, you pull the easy clutch, and with your left foot flick the shift lever down into low gear. The throw is very short, and as smooth as skin. The gearbox goes "klik," just to let you know that something has happened. You let out the clutch, which engages gently, and you're underway. With 22.8:1 overall gearing in low, you don't have to do anything complicated to get the bike moving from a dead stop.

You putt around the parking area for a little while, getting used to the machine. Even an inexperienced rider can snatch it up into controllable wheelies. Standing on the pegs, the bike feels as narrow as it does when you're sitting down. Even a small person like me (5'8", 135 pounds) can lean way up over the handlebars, or back over the rear wheel without getting hung up on the seat or the tank or the exhaust. This was one of the few bikes on which I never bumped into the kick-starter lever; when it is folded away, it is *out of the way*. Incredible.

After learning that the Elsinore would run along nicely at low speeds like an enduro bike with good manners, and that it would go where I aimed it without hesitating awhile to make up its mind, I headed for the motocross track. Most new motorcycles feel strange to me for awhile, and take a lot of getting used to, but this one didn't. It inspired confidence right from the beginning. I leaned forward in a slight crouch to grasp the handlebar grips. The rake in the bars allowed me to use some twist in my wrist to control the throttle, which is far less tiring than just bending your wrist up and down on straight bars.

The pegs were just high enough, and located just far enough aft to put the right amount of bend in my knees for greatest leverage in controlling the bike. My small feet (size 8) fit the stub footpegs perfectly, and I had no trouble using the foot controls.

George Etheridge, American Honda's dirt-racing specialist, had said that the bike was scaled to the 5'10", 160-pound rider, but the machine felt as if it had been built just for me. Even the saddle was comfortable.

I brought the Elsinore in for Sam and Paul to try. Sam is built to the approved specifications: 5'10", at 160. He made some laps and said that the machine was set up just right for him, except for the shift lever. Then came the acid test. Paul is 6'1", wears a 34" sleeve, and at present weighs 230 pounds (Dick Mann once told him, "Paul, you never will find out how good a racer

In making a series of test runs, Paul found that there was a slight hesitation—a dead spot—in the carburetion of our test bike just off idle. We noticed a barely-detectable ping—detonation—between half and three-quarters throttle. George Etheridge didn't think the detonation was serious enough to cause us any trouble, and it didn't.

We began taking turns running up through the gears on the motocross track. The acceleration was wild; I was glad that the gearbox worked so well, because I had to shift quick to keep up with the engine. The bike was so stable that I felt as if I were moving



The MIG-welded alloy-steel frame weighs 19 pounds. The new Keihin carburetor has baffles around the jets to prevent surging on rough ground. The crank rides on monstrous main bearings. Aren't those wild intake ports?

you *could* be.") Paul climbed on, kicked the starter as if he were squashing ants, and went out on the course. Much later he came back wearing a smile. "I wouldn't change a thing, except maybe the shift lever and the brake pedal; my feet are too big for them." It is safe to say that the Elsinore will fit a wide range of riders.

Paul was curious to find out how much torque this bike had, so he took it into a clearing, stopped, pulled the clutch, and put the gearbox in fifth gear. Then he revved the engine and slipped the clutch. The bike took off smoothly while the rest of us stood around with our mouths hanging open.

a lot slower than I was. In fact, it gives the illusion that if you really had to change directions in a hurry, it wouldn't get the message in time. But that wasn't true. Each of us found that—with our widely-differing riding styles—the machine would respond instantly. None of us had the desire to raise the fork tubes so as to speed up the steering.

I could get the front wheel off the ground for the jumps easily enough with the throttle, but the wheel also tracked well the rest of the time. It did not want to wash out; the rider has his choice of going through a rough, loose corner while standing, sitting, or footing. Even better, I could do strange things in the corners, like get

into them and then change my mind about how fast I wanted to go or what line I wanted to take, and the machine would take it all in stride. If I turned on way too much power too soon in a bad corner and the back end started to slide out, I could correct with one quick dab and a change in throttle setting, and the bike would straighten right out. It was one of the most forgiving machines I've ever ridden.

With the shocks in their middle settings, the suspension was still sensitive enough to absorb medium-size bumps. The rebound damping was good; the bike would track straight through the whoop-de-dooos. I

Over lunch, George Etheridge told us that we'd been riding the bike wrong. "You're shifting way too late. To get good lap times on this bike, what you want to do is ride the torque curve rather than wait for peak horsepower in each gear. The Elsinore engine was designed so that the torque builds up *right away*, then it flattens out until you're between half and two-thirds throttle, and then it dies long before you get to maximum horsepower. If you're in a place where you can't upshift, but you want to keep on accelerating, then you just let it wind out. Otherwise, shift up between half and two-thirds throttle."

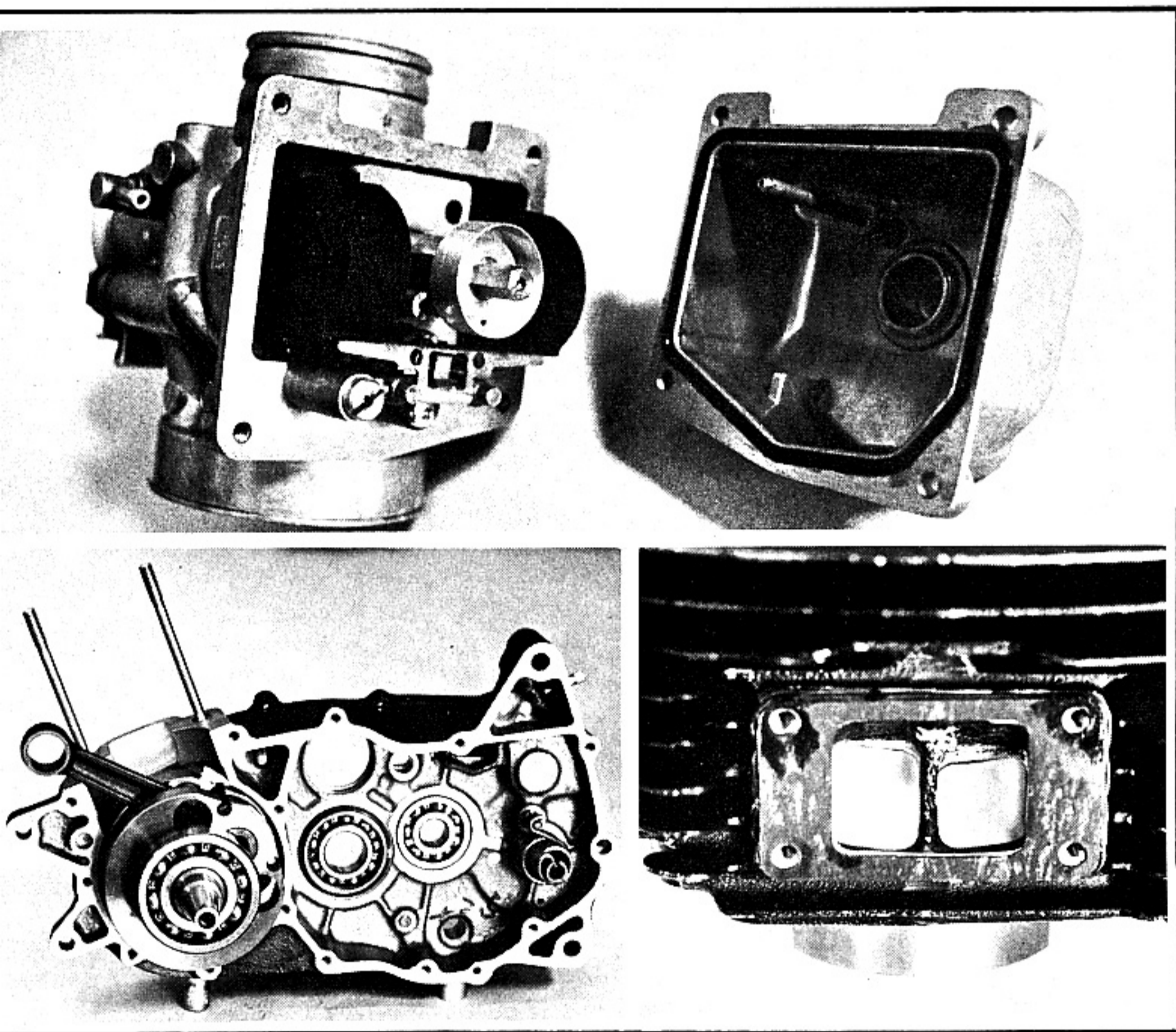
us twice or three times longer to get tired on the Elsinore than on any other motocrossers we had ridden previously. I didn't have to horse the bike around in the corners, and it took me a long time to sort out the reason. True, the bike was light—very light for an out-of-the-crate Everyman's motocrosser. True, Honda appeared to have gotten the steering geometry just about right. But still . . . gradually it came through: the unusual combination of rapid throttle-response and smooth, progressive acceleration was the answer. The engine was not at all pipey; it just started gathering a head of steam when you turned on the throttle, and it kept going. I was doing about half of my steering with body lean, and the other half with the twistgrip. And it was all so easy and predictable that I wasn't getting tired. Sam and Paul got the same reaction.

Toward the end of the day, Don Draz—an eighteen-year-old motocrosser from Sepulveda (one of the L.A. environs)—came over to look at the bike. We'd been watching him practice all day long, and he'd been motoring around the track at some respectable speeds. George asked him if he'd like to try out the Elsinore. "Sure." Within a few laps, Don was completely at home on the bike. He'd tear into a corner, grab the binders, haul it down almost to a complete stop, flick the machine around to face out of the corner with one fluid motion, and then rip out of the corner into the next straightaway.

He came back, and George asked him what he thought of it. "It's freaky—here's Honda building a *two-stroke*, and it's really a good bike. I've never seen anything without a reed valve that pulls so clean off the bottom. Just turn it on, and it's there."

A couple of days later, Sam entered the Elsinore in a really-nasty desert race at Lucerne Valley. Sam had mixed feelings about going, since he had just gotten out of bed with a case of the flu, but curiosity won.

Later he described the race. "It was a tough event, because the fire roads and lake beds were few and far between, so you couldn't rest. There was lots of sand, though; there was one downhill dune I've never seen anything like outside of *Lawrence of Arabia*. But the bike made it down okay. I was freaking out lots of other guys in the deep, loose sand washes; they were having to downshift for torque, and I was *upshifting!* The bike handles well in sand.



watched Sam and Paul charging through those sections, and the shocks didn't seem to be loading much. I only bottomed the forks once, when I came off a fairly-fast jump completely wrong and landed front-wheel first. The bike gave one tiny little twitch of disapproval and kept going where I hoped it would.

The front brake was a marvel. It was so easy to use, yet it had so much feel, that you could grab the lever with two fingers and haul your speed right down without getting that puckery feeling. The rear brake was something else. None of us seemed to be able to get used to it; the thing was either off, or it was on-and-locked. Finally we gave up on it and used the front brake.

He said something else that was equally interesting. "You can get through the corners a lot faster with this bike than you can with another bike that has the same gearing, if you'll stay one or two gears higher than you normally would. You'll hit the apex way down on the powerband, but that's okay. The engine will still give you enough torque to get you through the corner, and at those lower revs you won't get all the wild wheelspin that you normally do. You'll have lots better traction, and the back wheel won't be going sideways."

We rode. What George had said turned out to be true.

Each of us found that it was taking

"There were lots of rocks, too—great big rocks. Some of it was like riding an observed-trials section. In a few of the worst places, I had to put my feet down and slip the clutch. By the way, that's a good clutch. There was one uphill grade where 20 or 30 riders were stuck in the only path you could take. You had to stop, get off, and walk the bike around the stuck machines, slipping the clutch as you went. A lot of guys burned out their clutches before they got to the top of the hill, but the Elsinore's clutch didn't even smell warm.

"There was a lot of different kinds of terrain. I kept the shocks set on their softest position, and I bottomed the suspension a total of twelve or fifteen times all the way through. But that never made me lose control of the bike. If you were measuring how true the back wheel tracks, without sidehop, and your scale ran from zero for the worst to 100 for perfection, I'd rate this bike at 90. The desert-racing standard is a Husky or CZ with Konis, and I'd say this bike tracks as well.

"I found two faults with it. The handlebars are fine for motocross, but for me they were too low for desert racing, and the grips were too hard. The other problem was that sometimes, when I was braking hard, I'd accidentally downshift.

"I was tired when I finished the race, but that was because I'm just now getting over the flu. If I'd been riding anything else, I don't know if I would have made it."

We have praised the Elsinore strongly in this roadtest, because we think that Honda has done its homework thoroughly, setting a mature set of design goals, and following through down to small details. I asked George if I could borrow the test bike for another three or four weeks to play with.

"Nope. It's the only rideable one we have right now, and we need to get lots more roadtests out of it."

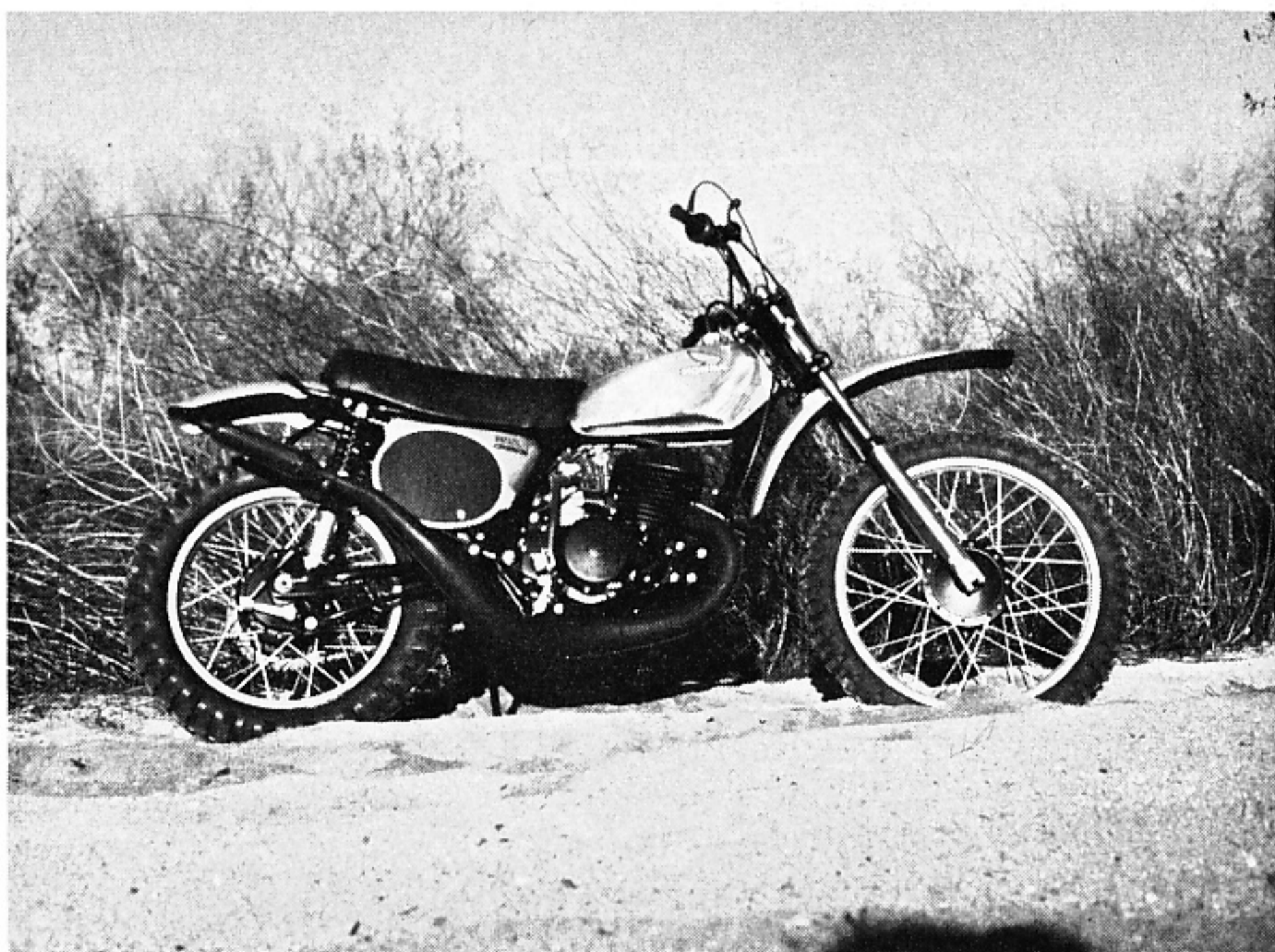
Then I tried the Magazine Staffer's Last Resort: "Well, gee, how soon do you reckon I could buy one?"

"It'll probably be a little while before they start showing up, and there won't be a whole lot of them the first year. There's a lot of special machining and welding that goes into these bikes. They're not hand-built works machines, but they're a long way from being production-line stamp-outs, too."

"Oh." I was really sorry to hear that.

"But I'll have something new for you to play with pretty soon."

"Oh, yeah?" I think I know what it will be. *Frank Conner.*



HONDA CR250M

Engine type	single cylinder, two-stroke, six-port
Bore & stroke	70 x 64.4mm
Displacement	247.84cc
Compression ratio	7.2:1
Ignition	flywheel magneto
Carburetion	34mm Keihin
Lubrication	pre-mix
Length	84.3 inches
Wheelbase	57.1 inches
Ground clearance	7.5 inches
Dry weight	214 pounds
Front tire	3.00 x 21 Japanese Dunlop
Front brake	internal expanding, 15.5 sq in.
Rear tire	4.00 x 18 Japanese Dunlop
Rear brake	internal expanding, 15.5 sq in.
Transmission	constant mesh, five-speed
Clutch	wet, multi-plate
Overall drive ratios	(1) 22.765, (2) 17.403, (3) 13.847, (4) 11.487, (5) 9.549
Final ratio	3.357
Countershaft sprocket	14 tooth
Rear wheel sprocket	47 tooth
Air filter	oiled polyurethane foam
Fuel tank	aluminum, 1.8 gal.
Front suspension	telescopic forks, 7.1 in. travel
Rear suspension	adjustable hydraulic, 4.1 in. travel
Frame	semi double cradle
Color	green and silver
Price	n.a.

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