HONDA CR450R

Honda's 450 thrills you to the threshold of terror but never lets you step beyond. Enjoy: that's what big-bore motocrossers are all about.

HONDA CR450R

● WHAT A WAY TO INTRODUCE A NEW model. Before Honda began marketing their first-ever open-class motocrosser, the company sent its big guns aboard prototypes and captured the 500 Motocross World Championship and the AMA 500 National Championship. André Malherbe and Chuck Sun brought home the honors, while Roger DeCoster lurked in the background race-developing the RC machines. This approach is significant: it shows how far motocross has come. It's not enough for a manufacturer of race bikes simply to market a basically sound product and then begin a long process of development and refinement. Manufacturers must introduce bikes which are ready to win.

Honda engineers have taken their time to develop the Pro-Link CR-R Elsinores, and these new models are worth the wait. The water-cooled CR250R, which we tested last month, is a state-of-the-art machine: fast, tractable and well suspended. The CR450R shares many components with its little brother, most notably its frame, air-charged KYB fork with 41mm tubes and single remote-reservoir Showa shock. Though the 450's engine cases strongly resemble the 250's and the two engines have some major parts in common (such as clutches), so many differences separate the powerplants that it's fair to say the 450 has its own engine.

Of principal concern to Honda's R&D people was the development of the Pro-Link system. During 1980, the year Honda did most of its development of Pro-Link, DeCoster and company worked right up to production deadlines figuring out which linkage setup produced the most suitable degree of progressive springing. That attribute—mechanically progressive springing—makes the Elsinores unique as production machines and easily competitive with the best bikes available in terms of rear-suspension performance. As pointed out last month, we haven't yet had a chance to test any other '81 motocrossers. However, the CR250R and the 450R both handle better than any other 1980 motocrossers in their classes.

The linkage system Honda's R&D department finally settled on results in a significant rising-rate effect; that is, the links, which connect the bottom of the shock to the frame, pivot in such a way that the rear wheel must travel progressively less to compress the shock a given distance. Consequently, to the rider's advantage, the rear wheel moves easily in the initial inches of travel (over small bumps or at low speed) and only when much force is exerted in the final inches of travel (over large bumps or at high speed).

By its nature, the system also produces in effect progressive damping. In the first inches of travel the damping is light because the wheel is compressing the shock relatively little, thus moving a relatively small amount of oil through the orifices. As the rear wheel nears bottoming it is compressing the shock relatively farther and so is moving more oil, effectively increasing the damping.

As you'd expect, the CR450R handles very nearly the same as the 250R. Honda has made only one modification to the 450's chassis, lengthening its wheelbase to 59.4 inches by using a swing arm 15 millimeters longer than the 250's. The added length enhances high-speed stability and is necessary to slow the big CR's steering in slides, where its extra horsepower might otherwise make things happen too quickly. If you have to take the inside line or square off a corner with the rather slow-steering 450, it helps to use some of the CR's low-end power to pivot and turn all in one move.

When we had the chance, we found it best to run the 450 along the outside; it's a natural feet-up slider. Dial the 450 on through a second- or third-gear corner—sandy or hard-pack, smooth or mildly potted, it doesn't matter which—and it slides easily, gradually and predictably.

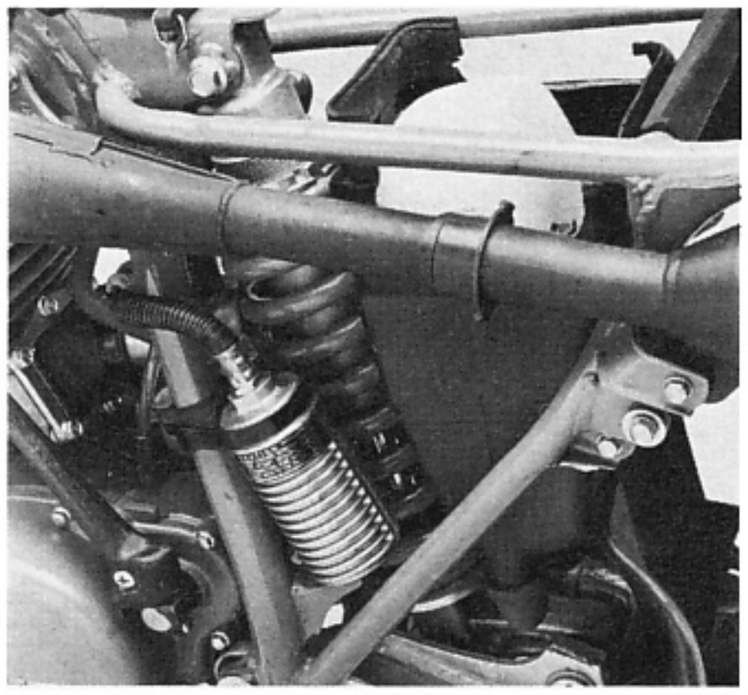
Perhaps an unexpected side effect of the longer wheelbase is the CR's tendency to wag its front end a little more than the 250 in trailing-throttle conditions. Evidently, lengthening the wheelbase has altered the weight bias slightly toward the front. When you have to shut off the throttle over stutter bumps or in deep sand, the handlebar oscillates hard and fast—not enough to have you bouncing off the guy next to you, but definitely enough to encourage you to practice the old desert rider's trick of using the rear brake while simultaneously keeping some power (about a quarter-throttle) going to the rear wheel.

After you've set up the CR's suspension for your weight and riding ability, it will function as well as any stock bike we've ever ridden. The fork has plenty of travel—12.0 inches—and it's air-charged (which means progressive springing) so it will rarely bottom. *Cycle*'s heavier intermediates (160–180 pound) and lighter experts (140–160 pound) found that the fork provided a sufficiently cushy ride at low speed with five to six psi air pressure, and the fork bottomed very infrequently with that pressure.

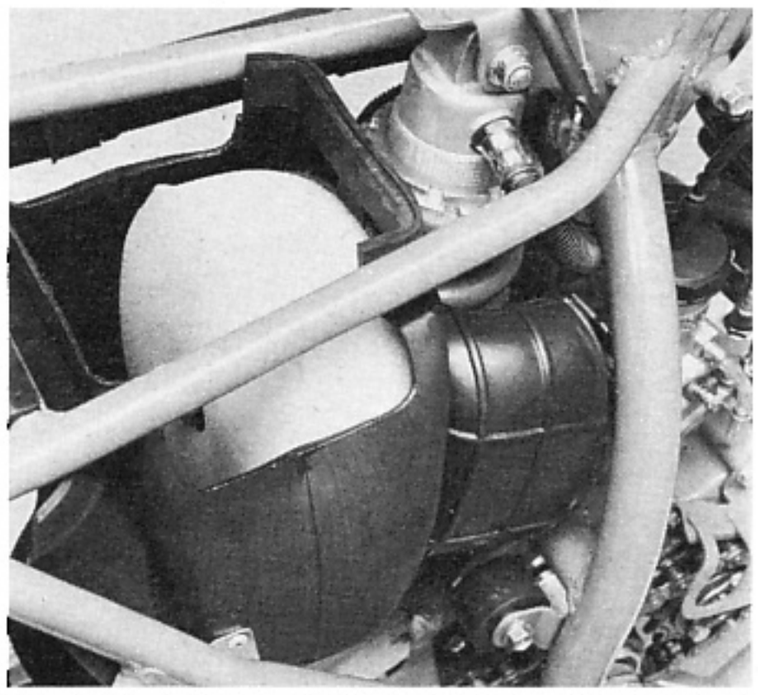
Thanks to its longer swing arm, the 450 has slightly more rear-wheel travel than the 250, 11.8 compared to 11.5 inches (the 450's axle travels in a longer arc). Though neither the shock's nitrogen pressure nor the linkage is adjustable, the rear suspension's rate of progressivity satisfied all of *Cycle*'s test riders. With the spring pre-load adjusted very light (with only one-quarter inch of threads showing) and the damping on the number "2" setting, the 450 handled every course situation with grace. The rear suspension, like the fork, soaks up little ripples and rarely bottoms, even while landing off large high-speed jumps.

The 450R weighs 253 pounds, only five more than the 250R, and part of the additional weight lies in the 450's greater fuel capacity. Consequently, whereas the 250 is a relatively heavy "lightweight" motocrosser, the open-class CR is mid-pack for its displacement. The 1980 Yamaha YZ465 weighed 244 pounds and last year's Kawasaki KX420 weighed 261. On the track the CR's weight is never bothersome. The 450R bounces obligingly into berms and doesn't tend to stand upright when you're trying to be flashy and drag a bar; it maintains its forward tracking over whoops and doesn't sidehop (the latter being a common ailment of heavy bikes); and you can easily adjust the bike's attitude in mid-air.

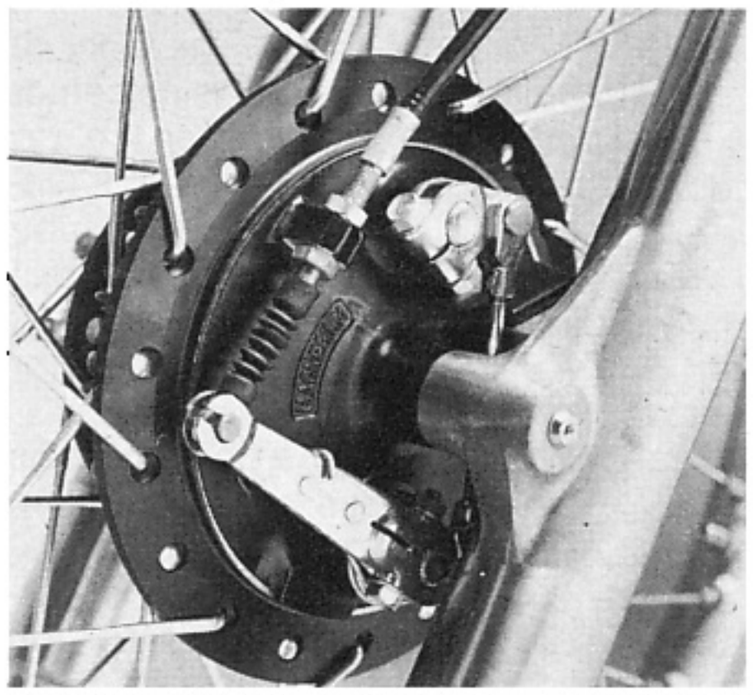
More manufacturers are realizing the necessity of having first-rate brakes for motocross. Consequently, Honda's 450, like its 250, uses a double-leading-shoe front drum brake, and a full-floating, leading-trailing rear. Work the two to-



Shock location requires the air box passage to skirt the right while the reservoir mounts on the left side.

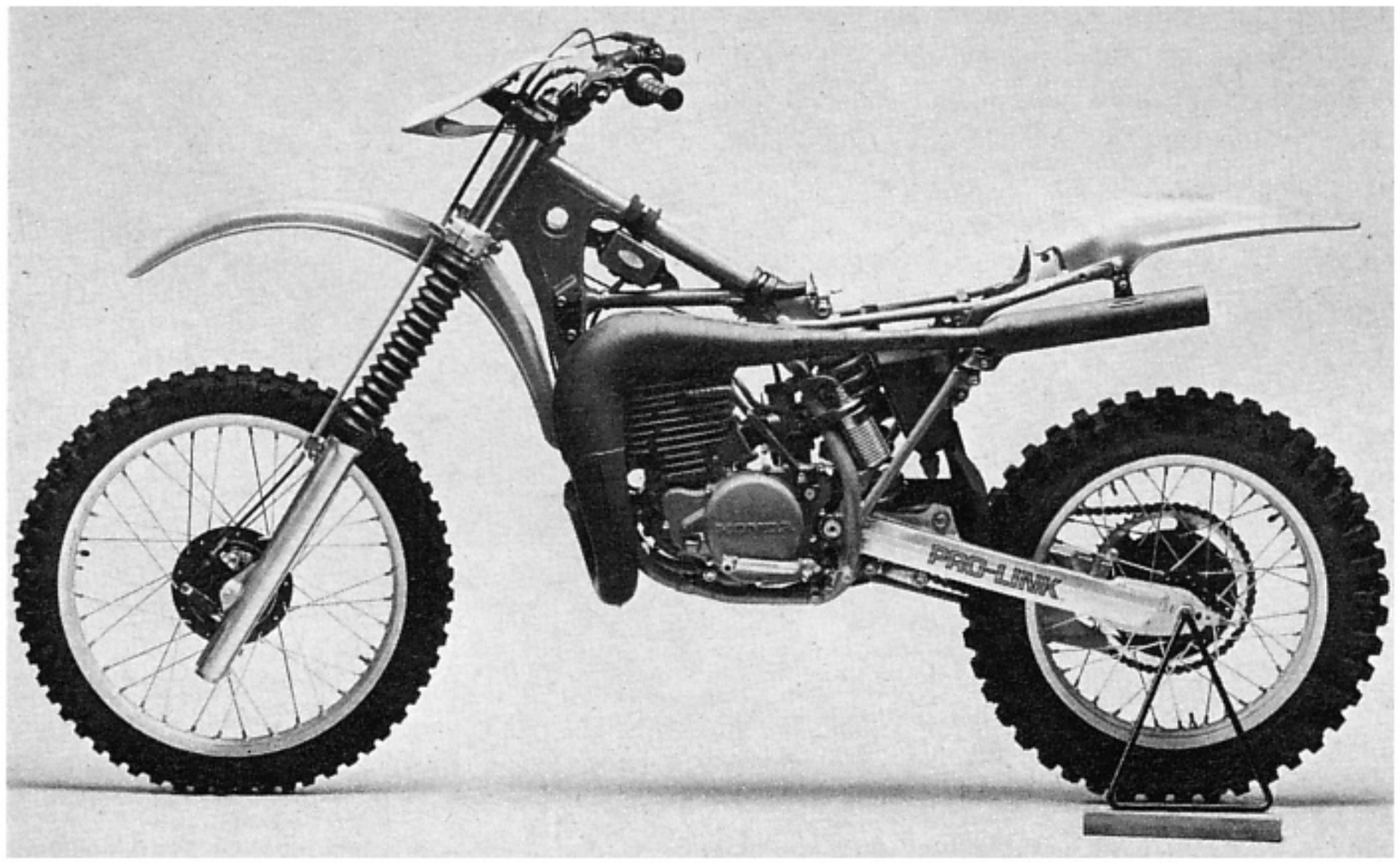


With little practice you can easily slip the filter out of the box. Unscrewing nuts adjusts shock preload.



The double-leading-shoe front brake has a progressive feel at the lever and provides super stopping power.

With its long wheelbase and flat torque curve, the CR slides easily and predictably—anytime, anywhere.



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gether and you can pull down the 450 quickly and easily. The front brake operates progressively and without binding, and the rear chatters very little over stutter bumps or down hills, two situations where non-floating brakes often lock.

Regardless of how well the CR handles, it wouldn't be a sensational entry on the scene without its extraordinary engine. There's little doubt that most people buy open-class motocrossers to enjoy their powerplants. There probably aren't 10 riders in the country who could turn a few laps on the CR either full on the throttle or full on the brakes. But that doesn't matter: for the rest the power is there to give instant satisfaction to those in search of an adrenaline high.

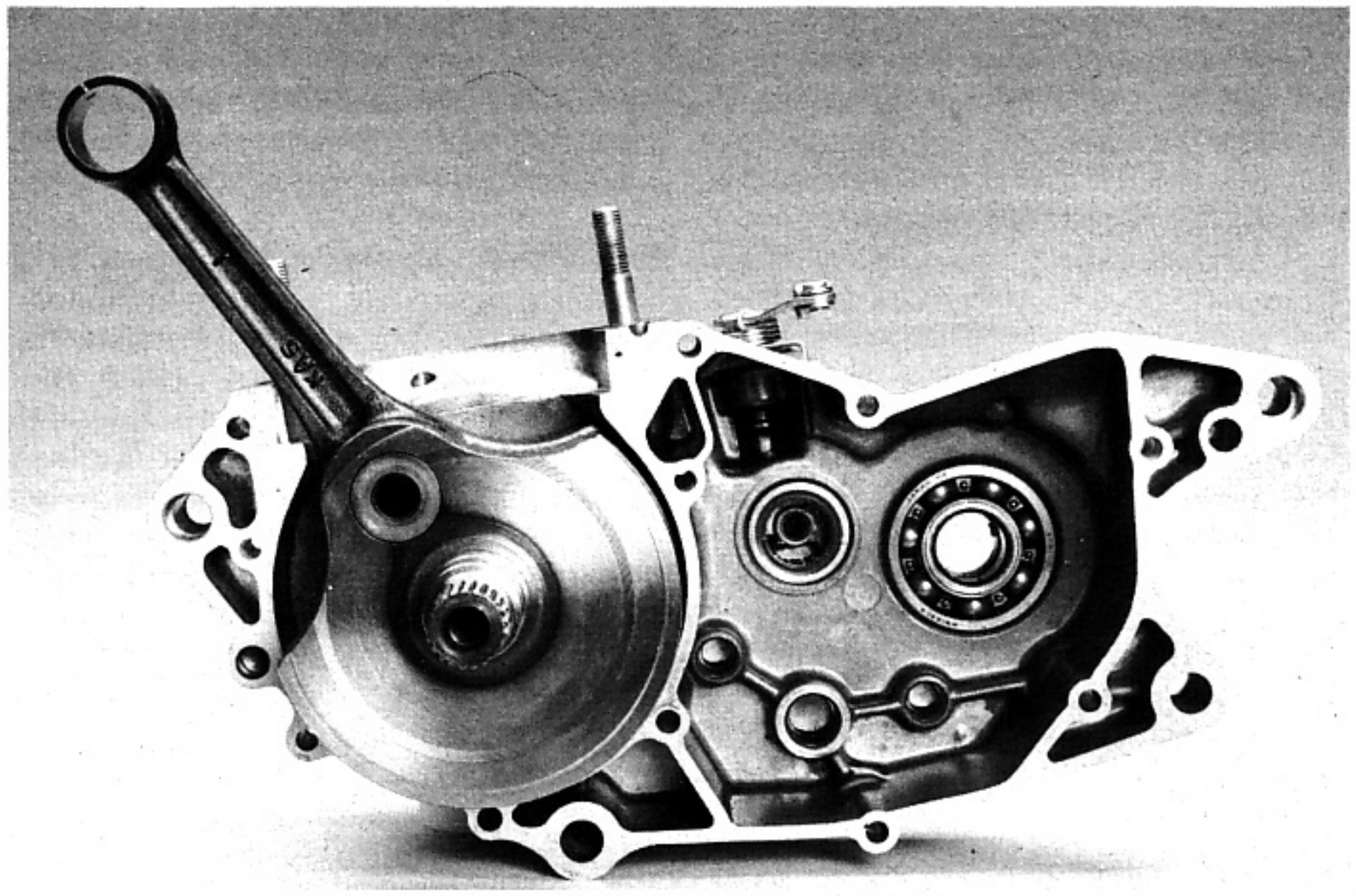
The CR450R cranks out 42.86 horsepower at 6000 rpm, making it the strongest production dirt bike we've ever dyno tested. Until now, last year's 41.92-horsepower YZ465 held the honor of being the overall strongest throughout the powerband. The CR makes most of its contenders look like strong 250s at best: in any rpm range it cranks out anywhere from one-half to five horsepower more than any other open-class bike we've tested.

Honda hasn't resorted to trick technology to build their behemoth. The fanciest design about the powerplant is its center exhaust port, which necessitates the use of the frame's split-cradle front downtube. (Actually, the front downtube merely ends and two engine-cradle tubes meet it directly in front of the exhaust port, allowing an uncomplicated route for the exhaust pipe.)

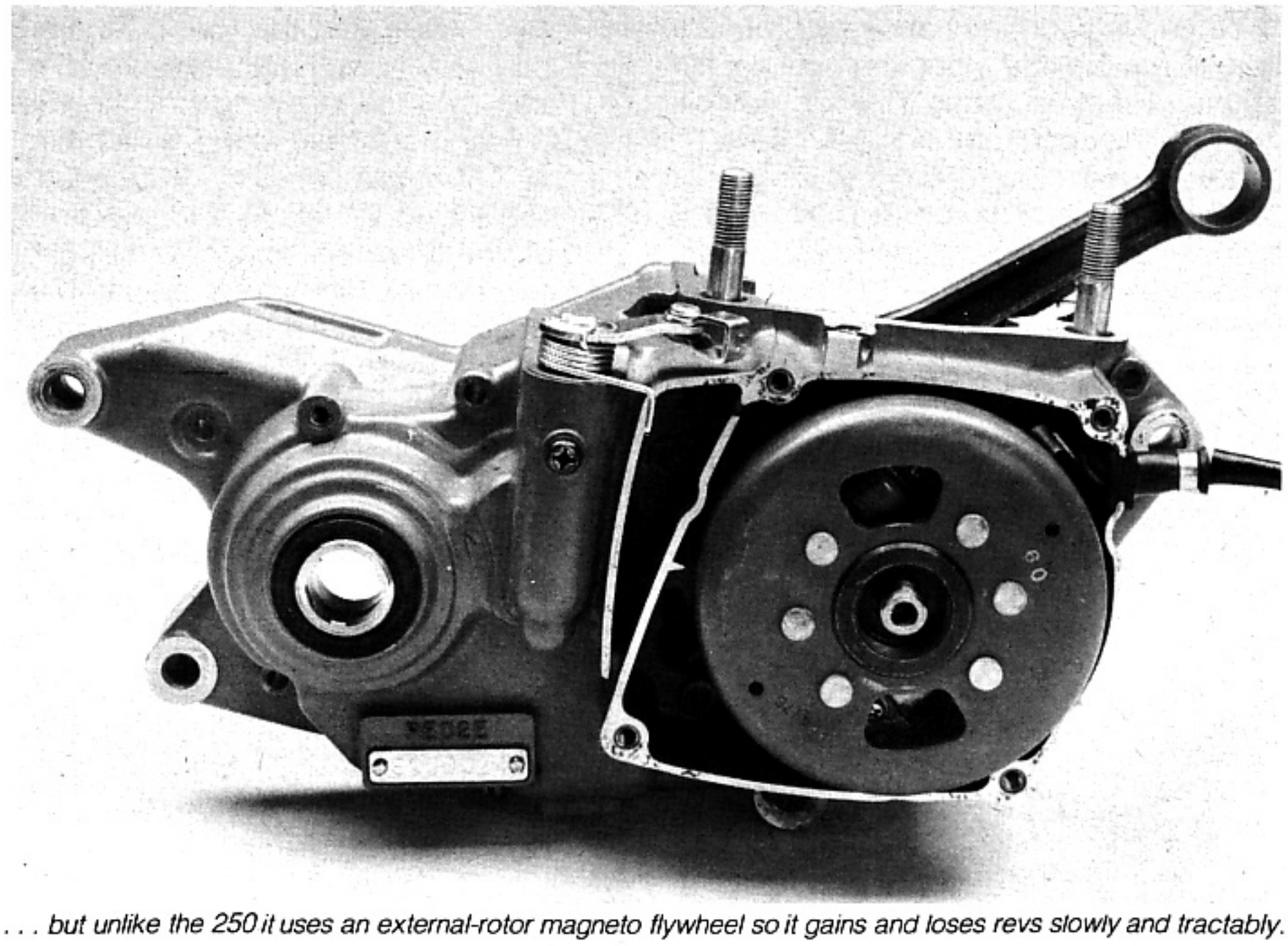
In all other respects the powerplant is straightforward. It uses an 85 x 76mm bore and stroke to produce its actual displacement of 431cc. A 38mm Keihin carburetor passes air and fuel to the crankcase via a six-petal reed-valve assembly. The downstroking piston forces the charge to the top-end through five transfer ports. The 450's essentials display standard two-stroke technology; Honda has made the powerplant special simply with solid engineering.

Racers who have to make a bike last more than one season are likely to appreciate the fact that Honda has, if anything, over-engineered the powerplant and transmission to handle the high horsepower output. For instance, the piston pin is 20 millimeters in diameter—huge for a two-stroke dirt bike. Taking advantage of the 450's wide powerband and enormous torque output, Honda had the opportunity to use a four-speed gearbox. That allowed the 450 to use physically wider, stronger gears than the 250.

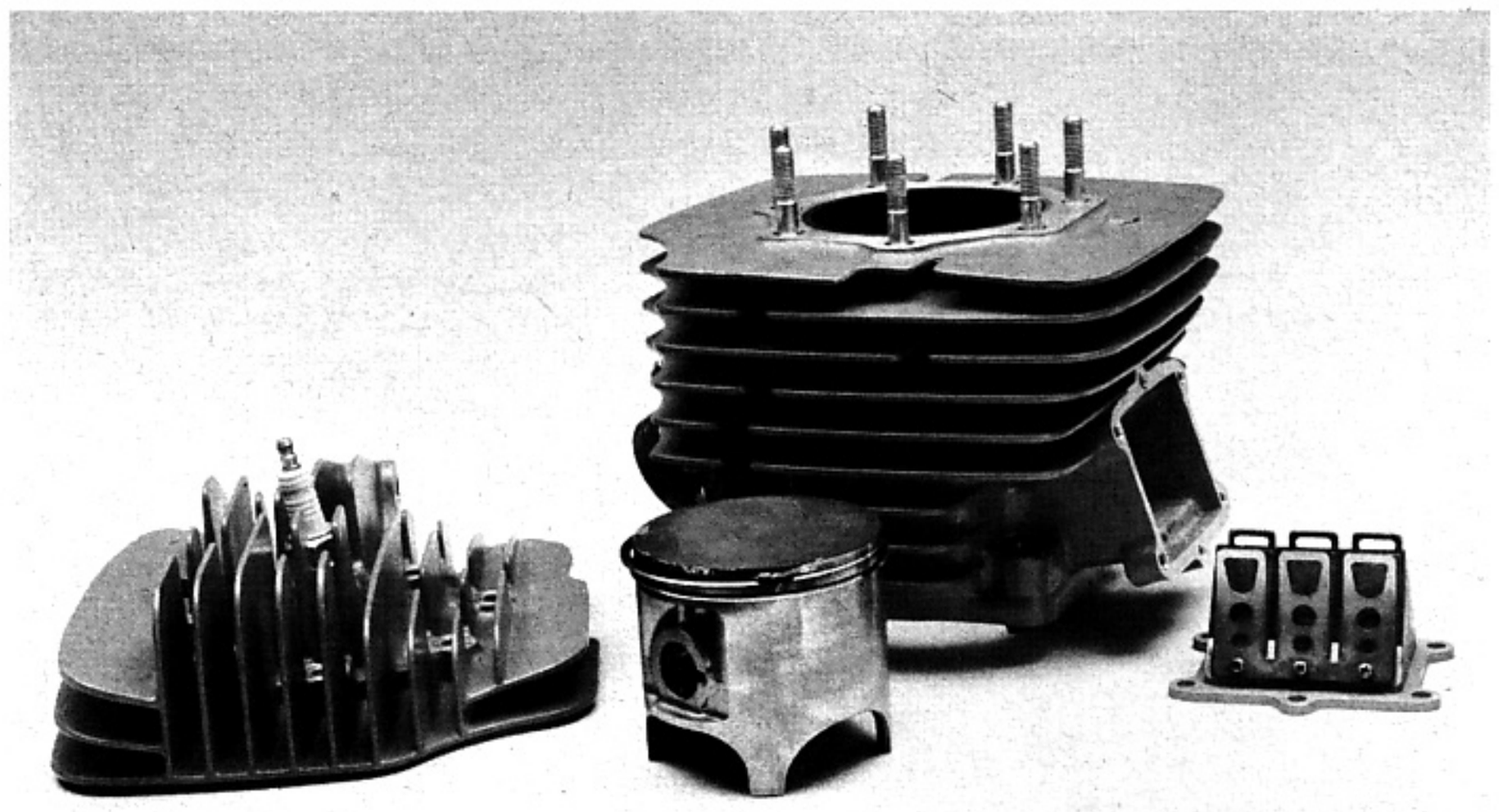
Theory and numbers aside, the CR dishes out everything you could hope for from a big-bore motocrosser. Start in second gear and the rear wheel digs fur-



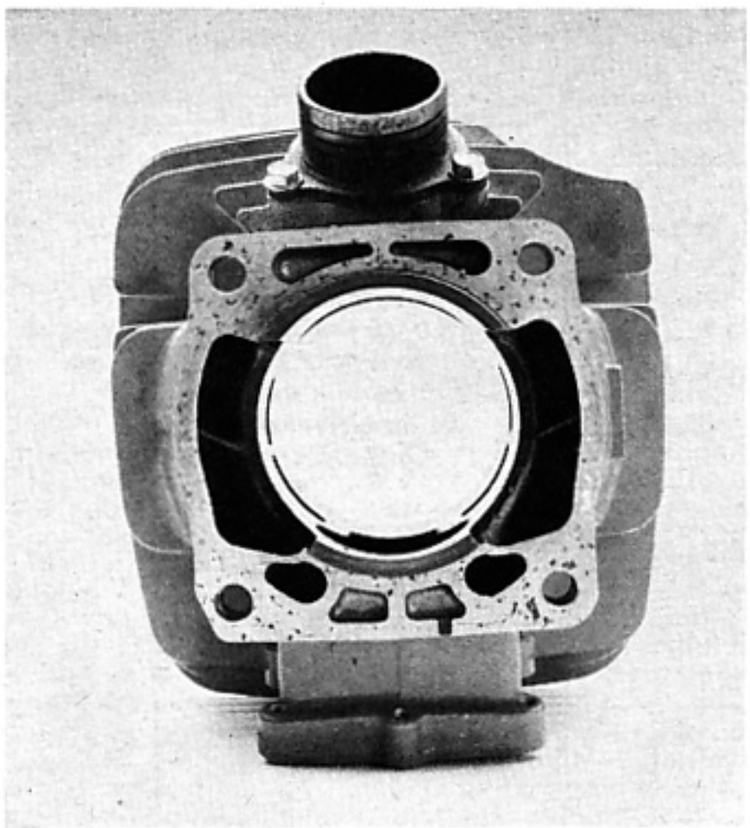
Honda has attended to regulating the 450's power output. Like the 250, the 450 uses cutaway crank flywheels . . .



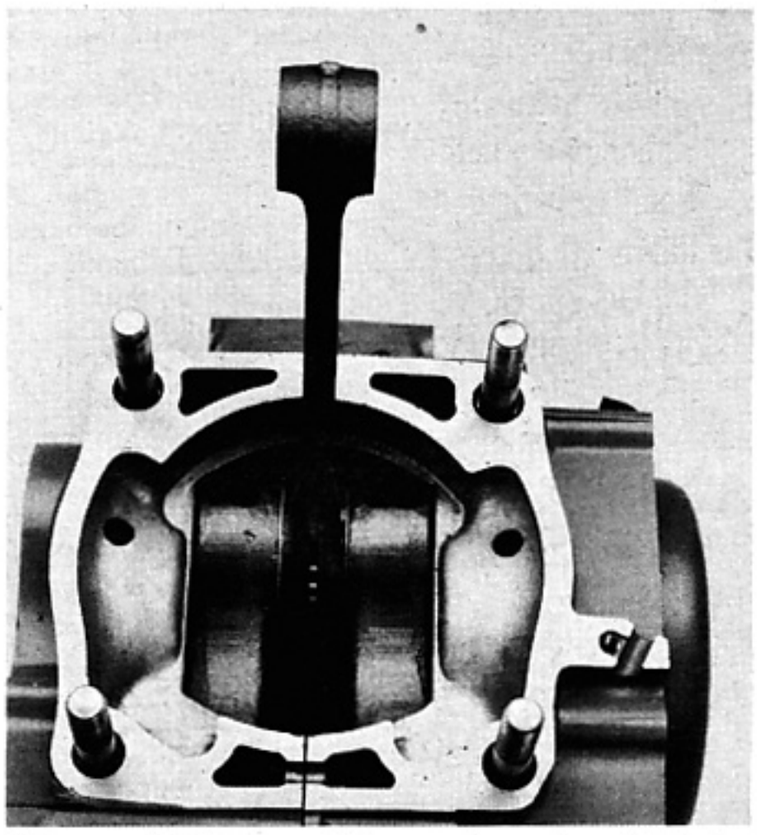
. . . but unlike the 250 it uses an external-rotor magneto flywheel so it gains and loses revs slowly and tractably.



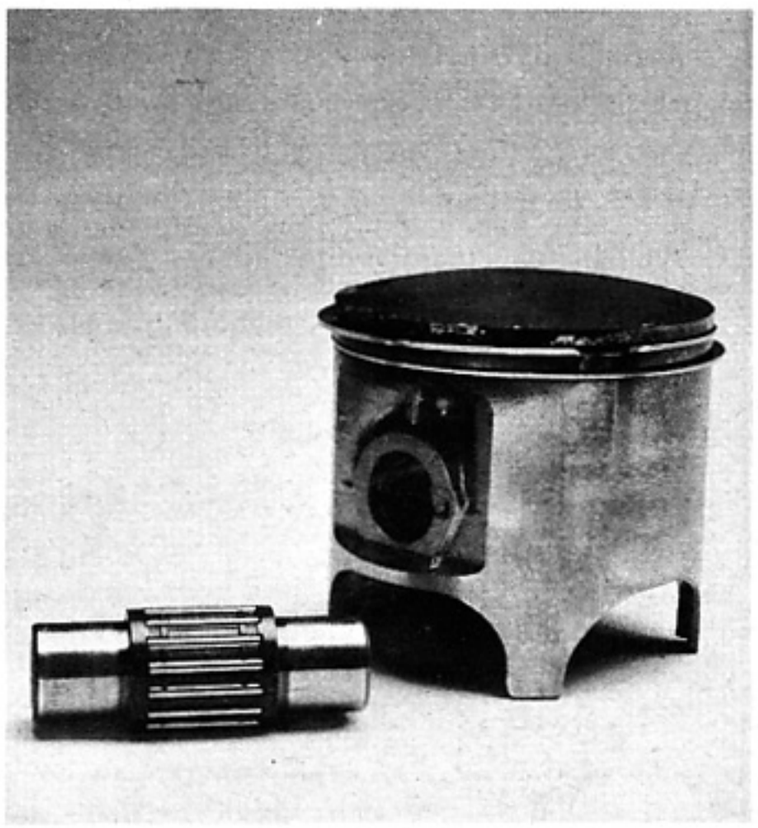
Solid designs need not be flashy: a standard six-petal reed feeds the cylinder; piston uses two keystone rings.



Crankcase charge flows through four primary transfers and two boost ports, which converge above the inlet.



Passages (at the rear of the crankcase) ventilate the gearbox and eliminate the need for a vent tube.



A huge 20mm piston pin is an example of Honda's effort to maintain reliability in the high-horsepower 450.

rows to the first turn. On a typical start area you can get by with one up-shift, which gains you a wheel or two on the competition while they shift to fourth. That's an advantage you may not need, though, in view of the CR's peak output.

If you feel like lazin' it around the course you can get by using only second and third. Though it's definitely geared tall, the 450 pulls strongly out of slow corners in second from just off idle; only in especially rough corners do you need to jab for first. Similarly, unless your local track has a road-racing straight, you don't find yourself looking for the top cog.

Because the CR chugs out over 20 pounds-feet of torque from 2500 rpm up (and peaks at 37.50 lbs-ft at 6000 rpm), you can wheelie or slide the Honda virtually anytime in any gear. Setting up for an early apex of a corner is a breeze: just slide forward, jerk the handlebar the opposite direction of the turn and crack the throttle—the 450 makes its own line. Though the CR is far from wheelie-prone (a primary benefit of the longer swing arm), long, controllable wheelies are a snap with just a tug on the handlebar.

The 450 uses essentially the same cutaway crankshaft flywheels as the 250 does. Had Honda not added extra flywheel weight, the 450 undoubtedly would have been a quick-revving monster. Wisely, Honda opted to use an external-rotor magneto flywheel, adding more inertia and slowing power delivery. Consequently, the 450 builds and loses revs smoothly and tractably.

Because the production CR Elsinore sprang from the RC factory machines, the 450R includes many high-quality and some innovative detail features. It uses Honda's new side-pull throttle assembly, which routes the cable cleanly along the handlebar. It may take you a few tries to

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re-assemble the intricate mechanism after you've torn it apart for maintenance, but on balance the new wave of side-pull throttles and particularly the Honda's represent solid progress. There's no need for and indeed good reason not to have a kickstand mounted on a race bike; Honda has done away with this superfluous item but also recognized the need for a stand. They include a neat triangular prop which plugs into either side of the tubular rear axle. Knowing that metal springs often clog with mud when located in a vulnerable area, the designers switched to a rubberband spring for the gear-shift-lever tip. The band runs within the dished lever and is virtually foolproof. The use of tapered roller bearings in the steering head and needle bearings in the swing arm is further evidence of the factory's effort to make the CR a genuine race bike.

Fine tuning and normal maintenance of the Elsinore provide few surprises. Access to the Pro-Link's preload requires removal of the seat and right side cover, but that's a two-minute chore. You need to remove nothing to adjust the damping and you do that by hand, but it *is* difficult to read the numbers on the knob to know which setting you're at; it would be nice if the numerals were marked on the perimeter rather than on the face of the knob.

If you adhere to the manual's instructions, you'll have no problem with the CR's foam air filter. If not, you'll be sorry. The manual asks that you wash the filter with soap and water and not with gas-

(Continued on page 127)

Cycle Test Specifications

HONDA CR450R

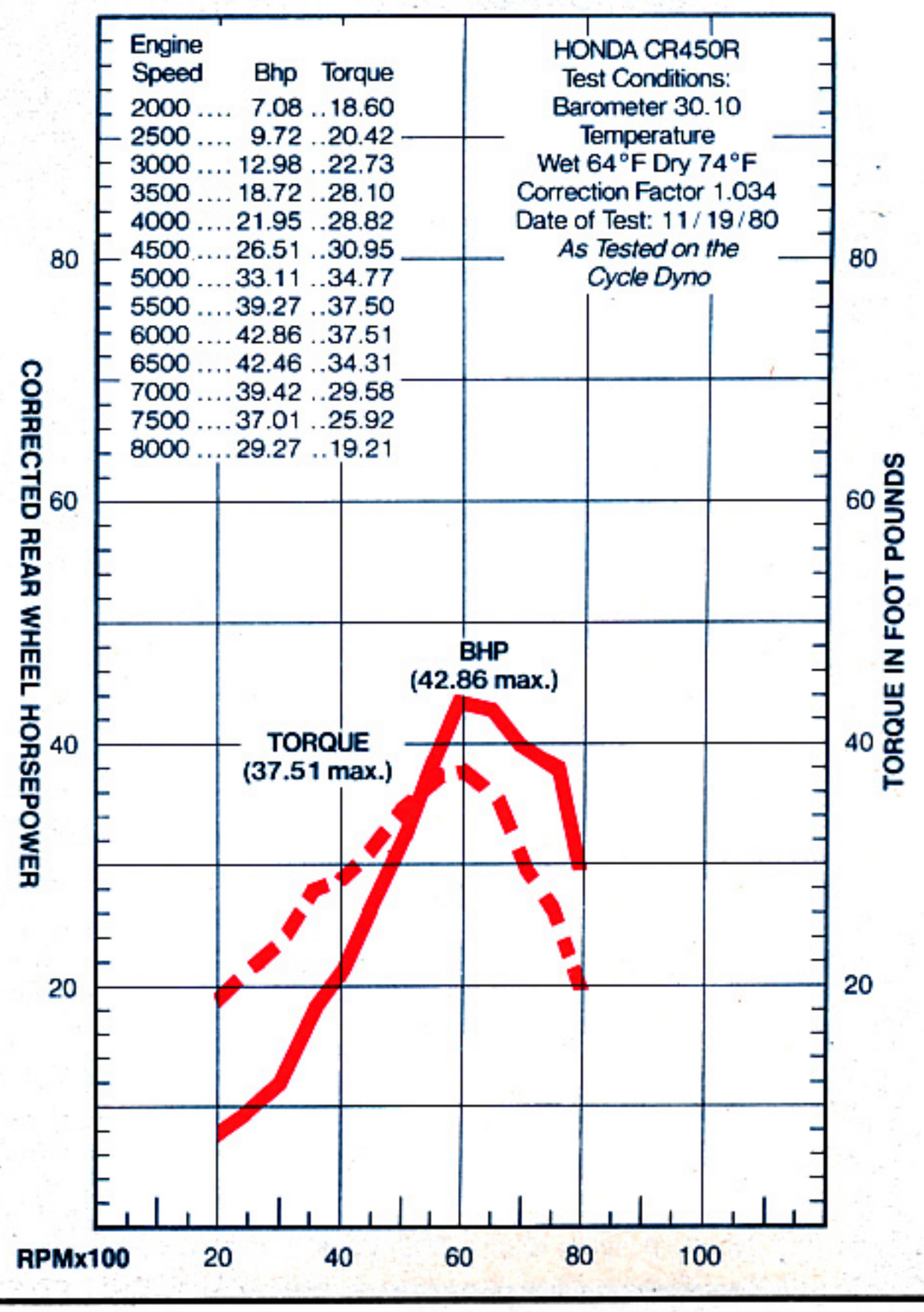
Make and model ..... Honda CR450R
Price, suggested retail (as of 12/5/80) ..... N/A

ENGINE
Type ..... Two-stroke, air-cooled, reed-inducted single cylinder
Bore and stroke ..... 85 x 76mm (3.34 x 2.99 in.)
Piston displacement ..... 431cc (26.3 cu. in.)
Compression ratio ..... 7.1:1 (trapped)
Carburetion ..... (1) 38mm Keihin
Exhaust system ..... Upswept expansion chamber with silencer
Ignition ..... Capacitor-discharge; external-rotor magneto
Air filtration ..... Dual-density foam; oiled; washable
Oil capacity ..... 0.8 liters (0.8 qts.)
Bhp @ rpm ..... 42.86 @ 6000
Torque @ rpm ..... 37.51 @ 6000

TRANSMISSION
Type ..... Four-speed with wet clutch
Primary drive ..... Straight-cut gear; 2.500:1
Final drive ..... 520 DID chain; 14/54 sprockets; 3.857:1
Gear ratios (at transmission) ..... (1) 1.625:1, (2) 1.211:1, (3) 0.952:1, (4) 0.792:1

CHASSIS
Type ..... Single-downtube, split-cradle, chrome-moly frame; aluminum, box-section swing arm
Suspension, front ..... Air-charged, oil-damped fork with 41mm tubes and 305mm (12.0 in.) of travel
rear .. Single shock with remote reservoir and adjustable damping and preload producing 300mm (11.8 in.) of rear-wheel travel
Wheelbase ..... 1510mm (59.4 in.)
Rake/trail ..... 29.5°/123mm (4.8 in.)
Brake, front ..... Drum; double-leading; cable activated
rear ..... Drum; leading-trailing; rod-activated; full-floating
Wheel, front ..... DID 1.60 x 21 rim; half-conical hub
rear ..... DID 2.15 x 18 rim; conical hub
Tire, front ..... Bridgestone 3.00 x 21 Motocross M21
rear ..... Bridgestone 5.10 x 18 Motocross M22
Seat height ..... 914mm (36.0 in.)
Ground clearance ..... 297mm (11.7 in.)
Footpeg ground clearance ..... 356mm (14.0 in.)
Fuel capacity ..... 9.0 liters (2.4 gal.)
Curb weight, full tank ..... 115 kg (253 lbs.)
Test weight ..... 187 kg (413 lbs.)

CUSTOMER SERVICE CONTACT
Customer Relations Department
American Honda Motor Co. Inc.
100 W. Alondra Blvd.
Gardena, CA 90247



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oline. Some people have found out the hard way that gas can cause the glue which holds the dual-density filter together to separate. Should that happen and you don't catch it in time, prepare to kiss much of your engine goodbye.

Finally, if you own the standard assortment of ⅜-inch drive, 10-22mm sockets for working on your bike, you'll have to run out and pick up an eight-millimeter socket to dig very far into the lower end; eight-millimeter hex-heads secure the clutch cover. No sweat here, except that as far as we know most eight-millimeter sockets are ¼-inch drive. Persevere: you can always find a ⅜-to-¼-inch conversion piece.

Honda's CR450R is one more indication that 1981 is going to be the best year for dirt bike riders in many seasons. In a time when bankers balk at lending money to racers to finance trophy collections, and when land closures still persist, it's nice to see Honda reaffirming the view that dirt bikes are a vital part of the motorcycle scene.

It's even nicer to see Honda make a stand with an absolutely first-rate piece of equipment like the open-class Elsinore. It develops a staggering amount of horsepower. More important, it puts that power to the ground so serenely you'll swear you can do no wrong. Of course, Honda has chosen its designs carefully and made the appropriate trade-offs: they could have made the CR steer more quickly to cut through tight turns more precisely; but if they had they would have bartered away some of its reassuring straightline stability. With this bike, which so obligingly takes you up to Pro speeds, Honda made the most of the compromise, blessing the CR with rock-steady high-speed handling and very decent low-speed agility. But that's the only compromise apparent in the CR. In every other way it's as good as open-class motocrossers are likely to be anytime soon. ◉