

HONDA XR500R

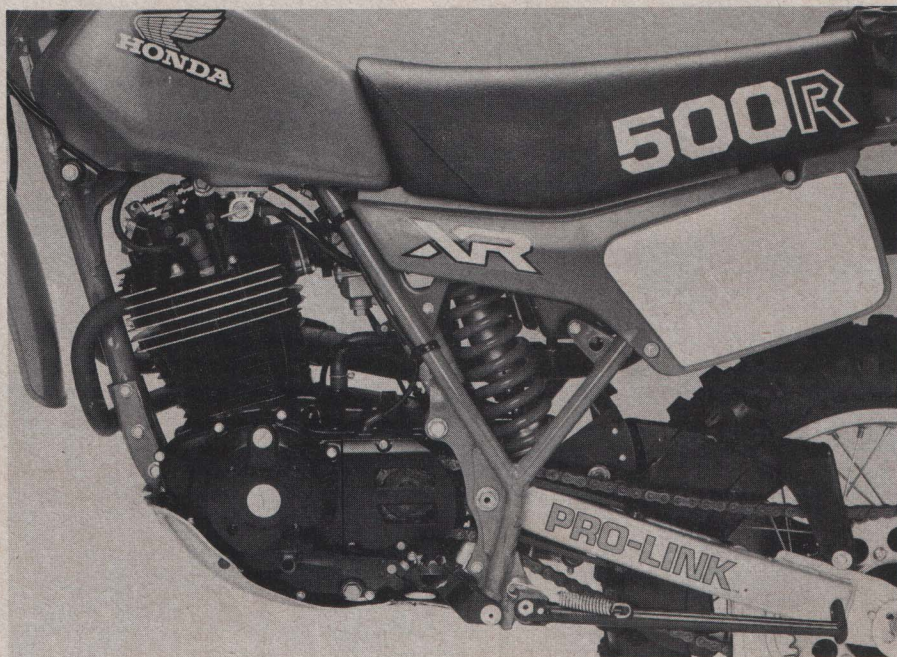
Progress never passes by the Honda XR500. That forces everyone to work harder in the big off-road thumper class. Here's 1982's little technogem: an intake-tract reed valve.



PHOTOGRAPHY: DAVE HAWKINS, STEVE BROADBUSH

● SINCE ITS INTRODUCTION IN 1979, HONDA'S XR500 has stood at the head of its class. Both Yamaha and Suzuki have offered 500 four-stroke thumpers, but year-to-year Honda's competitors have yet to match the performance of the XR. Now the old Yamaha 500 single is scheduled for retirement—its replacement will be an all-new bike with a four-valve engine; Suzuki has been refining and shaping its thumper playbike and the 1982 version might show greater progress than in the past; and, after a year's delay, Can-Am will plunge into '82 with its four-stroke challenger. The Honda XR500 is the target for other manufacturers; but it's a difficult shot because the Honda XR is a moving target.

Honda has made it a point to update the XR periodically to maintain the bike's leadership. In two years' time, Honda engineers rendered both the original 1979 and the improved 1980 XR500s obsolete with the 1981 XR/R series. These bikes had completely new frames and suspen-



HONDA XR500R

sions, featuring Honda's rising-rate Pro-Link rear suspension.

Honda's 1982 XR500R is an improved version of last year's Pro-Link bike. Subtle changes bring the '82 bike closer to two-stroke enduros, against which the Honda competes for the serious enduro rider. Make no mistake: the Honda is closer than before, closer than any four-stroke thumper we've tested. Still, the Honda XR500R hasn't reached performance parity with genuinely good two-stroke enduro bikes; for the guy who takes his enduro riding seriously and wants the most help and least resistance from the bike, the choice is clear. For all other enduro-types and playbike riders, the Honda XR's beauty lies in its wide, wide powerband, which is the reason people buy thumpers in the first place.

Honda has modified the 498cc single in only three ways in its fourth year of pro-

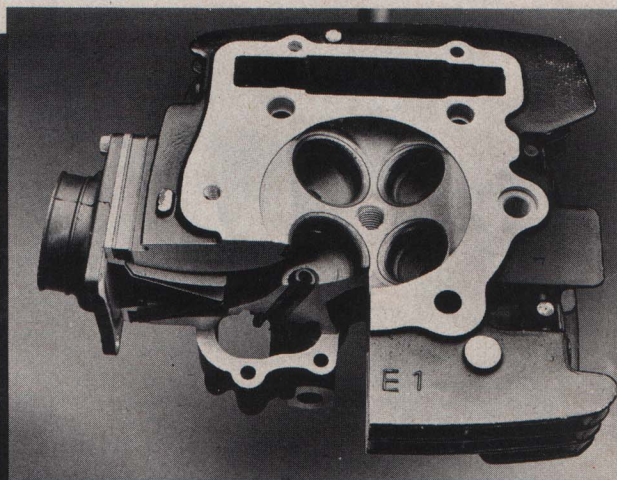
duction. The first two changes make no difference in performance; the third modification affects the XR's ridability and power curve.

Change number one likely rates as an engineering touch by the styling department. That is, there's a theoretical advantage in the highly visual change. The factory applied a matte black finish to the XR's engine, and this process is reputed to increase the heat dissipation from the engine. Heat buildup is always a problem with big-displacement air-cooled single-cylinder engines that make good power, and anything that helps transfer heat from the engine to the atmosphere is desirable. In actual practice, however, the engine runs under a covering of dirt and mud, which hurts heat dissipation.

Change two makes the 500 single easier to start. In addition to the automatic kickstarter-controlled compression release, the 500 now features a manual-lever release. The small lever mounts on the left handlebar just below

the clutch lever. This welcome addition makes it possible to be sure the piston is past TDC on compression and to bump-start the big XR without resorting to any gear higher than third. Just head down a hill and select a gear. With the compression lever pulled in, release the clutch lever, then the compression release and, presto, a running engine without the coast-and-bump routine that seldom works. The compression-release start is especially valuable in tight situations where a locked-up rear wheel and resulting slide would put the rider off his intended—and often only—path.

The third and unique engine innovation is motorcycling's first four-stroke production bike with a six-petal reed valve in the intake tract, mounted just as it would be on a two-stroke. The reed valve overcomes a problem in all '79 and '80 XR500s: the "Spit-Back, Cough, Stall at the Top of the Hill, Roll Back on Top of the Rider" syndrome, well known by early XR owners. Here's an example. You are



This cutaway cylinder head shows the six-petal reed valve in the intake tract, which bifurcates downstream from the reed assembly.



riding in an unfamiliar area. Good judgment—and the desire to live a long life—causes you to approach the top of a blind hill at a slow, safe speed. Usually you drop into first or second gear. As you reach the top, you close the throttle. Just as you see all's clear, you roll the throttle on to make it over the top. Gasp! Choke! Fzzzz . . . goes the spark that would have produced the next thump to propel you over the crest. The bike stalls; if you're not ready, you lose your balance and topple over, most likely on the path of least resistance—down the hill.

To prevent the cough-fzzzz, Honda engineers adopted the reed valve to cut off the errant backward puff from the combustion chamber, which in turn disrupts the next intake charge. The reed valve performs wonderfully; spit-back never once stalled the engine at low revs.

It would seem that introducing a restrictive six-petal reed valve into the intake tract of an engine that relies heavily on good breathing would severely cut

power, provided all other things remained the same. The reed-valve-XR actually shows a maximum power increase over the reedless XR of 1.40 horsepower at 2500 rpm. There are losses, as expected, at higher revs. At 6500 rpm, the reedless XR shows a maximum advantage of 3.94 horsepower over the reed version. Torque curves bend much the same way: a maximum gain of 3.28 pounds-feet at 3000 rpm (for the reed) to a maximum loss of 3.67 pounds-feet at 6500 rpm.

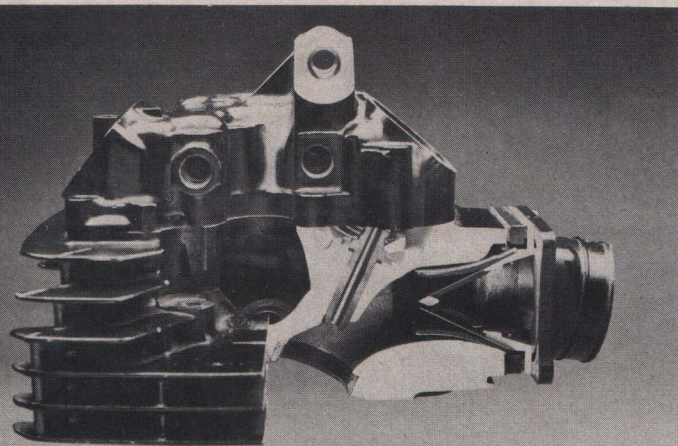
Power losses at the higher rpm levels are quite noticeable, especially at altitudes of 3500 feet and higher. In time, the rider senses the flatness of the power above 4500 rpm, and learns to short-shift the bike in most situations to really make time. While top-end power *is* stifled, the XR/R shows greater low-end power with much better throttle response, especially at low engine revs. On balance, we think most XR/R riders will like the changes.

The XR500R's running chassis is much

the same as the XR250R's, but the 500's spring and damping rates have been increased to cope with the 500's additional 12 pounds. The 500 shares the 250's chassis dimensions with a rake and trail of 28 degrees and 112mm. The geometry and moderate 55.9-inch wheelbase allow a good compromise between tight trail agility and high-speed stability in fire-road riding.

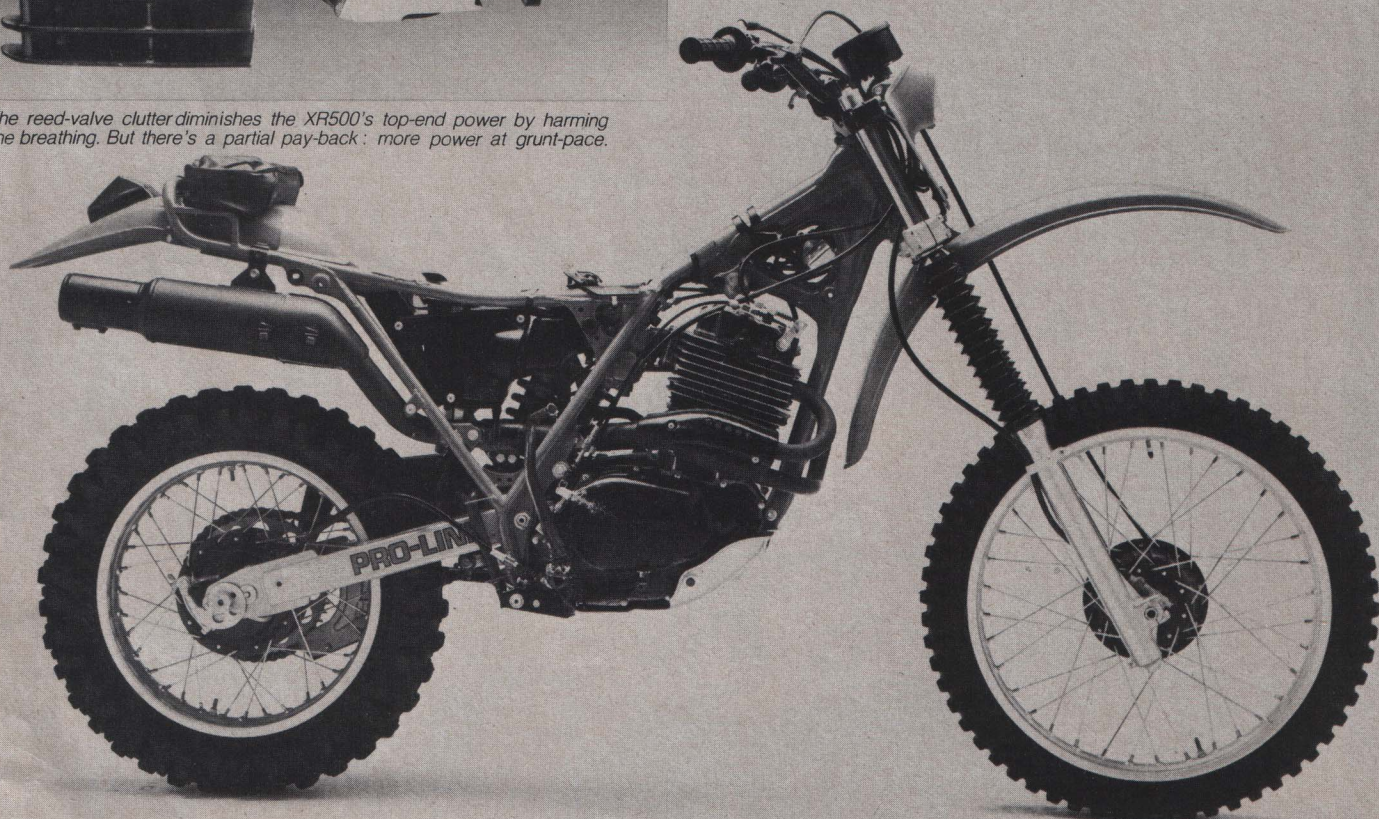
The 500's 37mm fork carries higher-rate fork springs than that of the 250. While the 250's fork performs its best with five psi of air in each leg, the 500 works optimally with none. The fork caps have Schraeder valves, so heavier riders (over 150 pounds) or experts covering extremely rough terrain at high speeds can add air. Overall fork operation is excellent, with just a hint of flex when the front is heavily loaded, near or at full compression.

The rear shock on our 500 has higher damping rates than that on our 1982 XR250R. While the 250 required the high-



The reed-valve clutter diminishes the XR500's top-end power by harming the breathing. But there's a partial pay-back: more power at grunt-pace.

Why would anyone put a reed-valve on a four-stroke single? To eliminate a very low-speed spit-back that kills the fire in awkward places and leaves the rider struggling.



HONDA XR500R

est of the four available rebound damping settings at all times, the 500 was acceptable at number three for the first 100 miles of testing; later, number four was needed. In part the change may have resulted from the "running in" of the parts and from a partial breakdown of the shock oil's viscosity.

The '82 shock does work better than the 1981, and we attribute the improvement to the redesign of the damper assembly. Flexible disc valves, mounted rigidly on the shock-shaft, control damping by deflecting and passing limited amounts of oil as the shock compresses and extends. This design is not dissimilar to the one employed by Ohlins, generally acknowledged as the best damper units available in the world. But unlike the Ohlins, which offer a variety of disc valves allowing the rider to radically alter the damping curves, the Honda has no provision for changing nitrogen pressure, oil, damping curves or rates. Despite being nonadjustable, the Honda's new shock is an enormous improvement over the earlier VHD type, something that

becomes apparent on the first ride.

Sitting astride the XR500 the rider feels perfectly comfortable. Once motoring, however, he finds that the riding ergonomics aren't quite right; the faster a rider goes and the more body English he applies, the faster things that were fine become less so. The handlebar has a couple of problems. First, the bend of the bar at the grip leaves the grips pointing up at an angle that strains the wrist unnecessarily. Rotate the bar to flatten the rise, and it's too low and close to the rider for comfortable control.

Second, the bar is a few inches too long. Riding the XR on narrow trails in a wooded area exposes fingers and

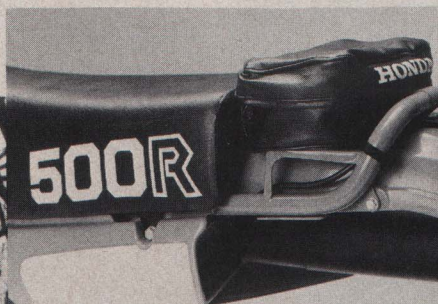
knuckles to the painful swatting of branches. Fortunately, the construction of the bar makes it possible to remove one and a half inches from each bar end. Bear in mind that handlebar choice is highly personal; nonetheless, we were surprised at our staff's unanimity on the bar bend and length.

The XR's seat provides an excellent base for all sitting and riding conditions. Fairly firm foam delays the inevitable low spot that forms at the rider's favorite seat spot. The seat, though long, doesn't hamper the rider from quickly shifting his weight to the rear.

The easy-to-reach shifter doesn't cramp the rider's boot-covered foot, and the spring-loaded pedal should keep the lever from breaking. Spring-loaded, too, is the brake pedal/lever, which tucks close to the engine case and is thus prevented from snagging rocks and low branches, though it still reaps all the weeds in its path.

The footpegs give excellent boot traction—wet, muddy, dry—but they're a tad close to the ground. When the suspension bottoms after a hard landing or the rider turns the bike in rough terrain, the pegs allow the rider's boots to drag.

Riders who take enduro work very seriously may stick with bikes of the two-stroke persuasion. Fun-time riders and playbike enthusiasts will revel on 500 off-road thumpers.



HONDA XR500R

The handling characteristics of the XR/R suit most types of enduro riding and *all* play riding. Steering is light, responding quickly to rider input; high-speed stability makes the Honda great on fireroads (only its mediocre mid-range and top-end power—a hindrance on long straights—keep it from being excellent); and excellent throttle response makes long, controlled slides pure joy.

Threading through tight trails, however, makes evident the Honda's considerable weight. Although the 500 scales in just 13 pounds over the XR250R, the up-

stairs weight makes the 500 a little top-heavy, which is one cause of front-wheel push. When the trail gets into knotty first- and second-gear sections, the rider must compensate for the 500's bulk by modifying his riding style. Instead of using lots of front wheel to get through tight rights and lefts, the rider can better navigate by slipping the clutch and applying the rear brake to bring the back around and head the bike in the right direction. Then drop the clutch, and squirt to the next turn with generous throttle.

This riding technique isn't recommended for everyone. If the rider applies the rear brake too hard, locking up the rear wheel and killing the engine, the big

thumper isn't likely to restart by itself. This kind of stall-out can result in a low-speed high-side.

To date, the Honda XR500R is the most enjoyable and complete off-road four-stroke available. It has pounds and pounds of low-end torque, state-of-the-art suspension, excellent reliability, great handling and weight comparable to anything else in its class. It also comes with a supply of entertainment that will last the lifetime of the motorcycle.

Other manufacturers with new or revised big thumpers might have the XR500R in their marketing cross-hair sights, but everyone should know the Honda XR/R is a fast-moving target. ●

Cycle TEST SPECIFICATIONS

Make and model Honda XR500R
Price, suggested retail as of 10/8/81 \$2148

ENGINE

Type Four-stroke, single-cylinder with chain-driven overhead camshaft and four-valve head
Bore and stroke 89.0 x 80.0mm (3.50 x 3.14 in.)
Piston displacement 498cc (30.3 cu. in.)
Compression ratio 8.6:1
Carburetion (1) 34mm Keihin
Exhaust system Upswept pipe with dual headers and spark arrester
Ignition Capacitor discharge; magneto
Air filtration Oiled, two-stage washable foam
Oil filtration Wire strainer
Oil capacity 2.0 liters (2.1 qts.)
Bhp @ rpm 29.50 @ 6500
Torque @ rpm 28.10 @ 3000

TRANSMISSION

Type ... Five-speed, constant-mesh, multi-plate wet clutch
Primary drive Straight-cut gears; 2.379:1
Final drive DID #520 chain, 14.48 sprockets, 4.0:1
Gear ratios (at transmission) (1) 2.462:1 (2) 1.647:1
..... (3) 1.250:1 (4) 1.000:1
..... (5) 0.840:1

CHASSIS

Type Semi-full-cradle, mild-steel frame
Suspension, front Coil/air-spring leading-axle fork with 37mm tubes and 254mm (10.0 in.) travel
..... rear One shock absorber with adjustable damping and preload producing 254mm (10.0 in.) travel
Wheelbase 1420mm (55.9 in.)
Rake/trail 28°/112mm (4.4 in.)
Brake, front Double-leading-shoe drum brake
..... rear Single-leading-shoe drum brake, cable-actuated
Wheel, front Semi-conical hub; DID 1.60 x 21
..... rear Conical hub; DID 2.15 x 17
Tire, front IRC 3.00 x 21 Volcanduro VE-31

rear IRC 5.10 x 17 Volcanduro VE-31
Seat height 945mm (37.2 in.)
Ground clearance 320mm (12.6 in.)
Fuel capacity 9 liters (2.4 gals.)
Curb weight, full tank 140.4 kg (303.0 lbs.)
Test weight 205.5 kg (453.0 lbs.)

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