

CYCLE DIRT TEST

# YAMAHA IT175F





**The Bad News:** For no good reason, there's a shortage of high-quality 175 dirt bikes.

**The Good News:** The few that are available are really good.

**The Bottom Line:** With progress in the form of an upgraded suspension system, a chrome-moly frame and a new yard-long power curve, the Yamaha IT175F falls into the category of Really Good.

● **WHEN YOU'RE TUGGING ON THE HANDLEBAR** over a long section of whoops, or through a rock patch, or on a tight forested trail, maybe you'll realize the little 237-pound machine beneath you is not fatiguing. You'll feel good because you're not tired. And as you're tucking in up a long sandwash, or on an arrow-straight fireroad, you'll realize the 171cc engine is still pulling strongly though the speedometer registers 65 mph. Then it will dawn on you that a good 175 has the potential for a near-perfect combination of light weight and horsepower.

In each model year since the IT175's introduction in 1977, Yamaha has acted toward fulfilling that potential. From the beginning the International Trials bike has had a well-engineered powerplant and a sound, functional suspension system. Two years ago, it competed with Can-Am, Husqvarna, Hercules and KTM. Though the IT was a very good bike, the other machines had a slight edge in performance. But because the IT (at \$998 in 1977) was priced \$500 to \$900 under the others, the Yamaha gained popularity immediately. Circumstances have changed considerably since then. Hercules motorcycles, at least temporarily, are not available; KTM and Husqvarna no longer produce 175s; Can-Am, after a lapse in production of 175 ISDT bikes, has resumed sale of the Qualifier; SWM GS175s are available but very scarce; and Suzuki has joined the fray with the PE175.

Where does the Yamaha stand in relation to these machines? Quite simply, it's a front-liner. Though *Cycle* has not undertaken full-scale tests of the SWM, we know it's \$738 more expensive than the Yamaha; the Italian bike would have to be a *lot* better to justify the price difference. Surprisingly, the Can-Am has gone down in price since 1977. The Canadian machine is currently \$1339 (only \$82 more than the IT), and the Can-Am and the Yamaha are the class leaders.

There have been no sweeping refinements of the 175 since its introduction. Yamaha began with functionally sound engine and chassis designs, and they've found it necessary to update the machine by increments each year. Most of the changes for 1979 involve chassis modifications. As is common with race-bike improvements, many of the 175's updates have been track-tested on the larger ITs

and on the bike's cousins, the YZs.

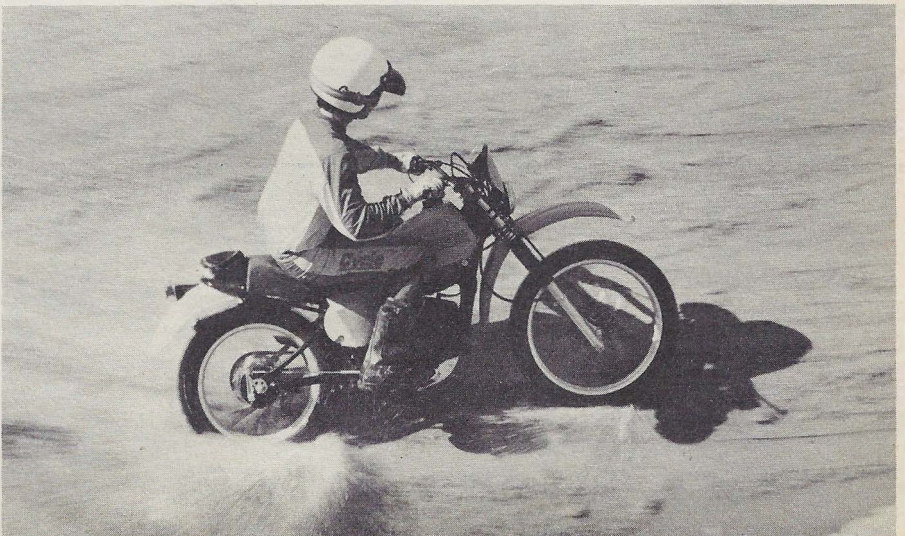
The single most important chassis update is the rather drastic reduction of the IT's steering-head angle from 32 degrees to 29.5 degrees. Using the same fork, the inevitable result of this change is 17mm less trail. Consequently, the IT's new geometry produces quicker, more precise steering. The rider finds himself willing and able to maneuver the 175 with the handlebar rather than with a more fatiguing and less effective combination of body

English and throttle. The effect of the change is that the rider needn't use any extra effort making the IT dart around trees.

Typically, a significantly steeper head angle will impact high-speed straight-line stability. The IT-F loses some stability, but not much. At speeds over 50 mph in deep sand or on a soft fireroad the front end wobbles just slightly. However, over high-speed whoops—which most often bring out the worst in bikes with steep head angles—the IT tracks straight without any



PHOTOGRAPHY: DON PHILLIPSON, JOHN STEIN





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side-hopping. The new 175 doesn't handle the whoops any better than previous ITs, but it's no worse either.

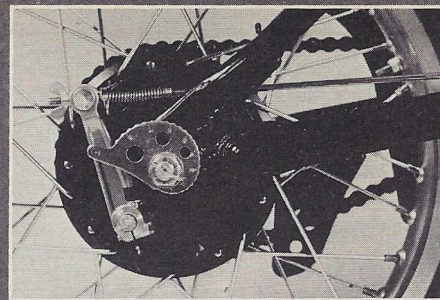
Other changes may have combined with the new geometry to maintain the IT's excellent handling characteristics. For example, a chrome-moly frame replaces the mild-steel unit used on previous 175s; the larger ITs also benefit from this change. Yamaha YZs have been blessed with chrome-moly frames for a couple of years, and it seems the factory has now come to the realization that enduro riders are just as serious about their machinery as motocrossers. In any case, the IT's frame rigidity and geometry result in a superb, predictable handler. Off jumps, through slides or over the roughest terrain the rider wants to tackle, the IT stays straight and true.

Yamaha has increased the IT's suspension travel only slightly: the F-mono-shock's stroke is 12.5mm longer than the E's, up to 120mm, which results in 26mm more wheel travel, raising total rear-wheel travel to 211mm (8.31 inches). But there have been many other significant suspension updates. Last year's two springs have been replaced by a single spring which is 19mm longer and has a slightly lighter spring rate. Two optional springs, one lighter and one heavier, are available. Yamaha now recommends nitrogen pressure down from 18 kg/cm<sup>2</sup> to 15 kg/cm<sup>2</sup>. The DeCarbon valving setup is used on the IT. This device controls damping through the use of a small thermostatic valve. As the oil viscosity changes (thinner as it gets hotter), the higher temperature begins to close the valve, which keeps the damping characteristics consistent. As with other ITs and YZs, the 175's mono has manually adjustable damping and preload. The absorber must be removed from the motorcycle to adjust the spring preload, but the damping is easily adjustable through a hole in the frame backbone (which can be reached by removing the seat and gas tank).

The leading-axle oil-spring fork with its 36mm tubes produces, as did the E-model, 195mm (7.68 inches) of travel. New, shorter springs, however, are installed. Each spring has been reduced from 566mm (22.3 inches) to 468mm (18.4 inches), and the winding diameter has also been reduced. A 129mm (5.1-inch) spacer in each leg takes up the slack left by the downsized springs. At first glance this move appears to be simply an effort to save money, but this isn't necessarily so. The quality of any spring depends upon its ability to resist collapsing under a specified load. Mild-steel springs have a yield point of about 30,000 psi (yield point being the limit of pressure at which the steel actually bends). Inexpensive spring steel has a yield point of about 60,000 psi, and good alloy steel springs or chrome-moly springs (such as valve springs) have



Tools need more secure mounting inside pouch. USFS spark arrestor and silencer are effective.



Quick-maintenance items: snail adjusters, and spring-loaded brake rod that releases from arm in an instant.







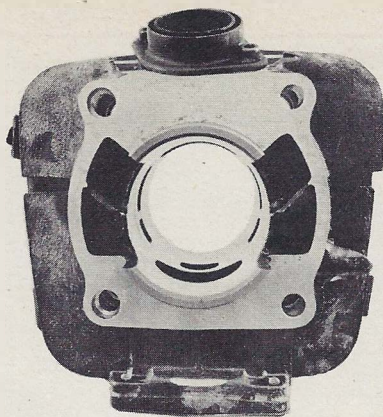


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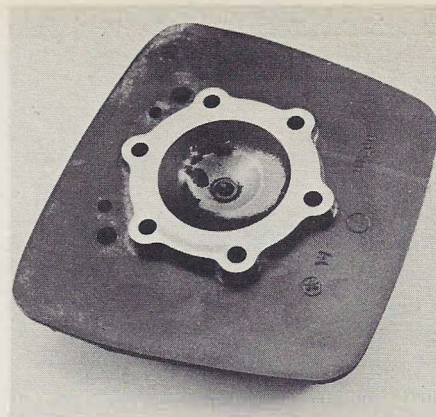
a yield point of anywhere from 100,000 to 230,000 psi. If more pressure is exerted on a fork spring than it can stand, then the spring sags or collapses. Yamaha traditionally has used one of the many grades of inexpensive spring steel; this year, they've upgraded the metal in their fork springs to help avoid collapsing and gone to shorter springs to maintain approximately the same spring rate.

Though the 175's suspension travel figures are only about average, it's important to note that they're about the same as the IT 250/400 figures. The little enduro bike has an inch less fork travel and identical monoshock and rear wheel travel. Even though the larger ITs plainly need more wheel movement, the 175—about 30 pounds lighter than the 250 or 400—gets by quite nicely on stock suspension. Fork damping action, both compression and rebound, is smooth and progressive without a trace of hydraulic locking. The spring rate is well matched to a 170-pound rider. The fork uses nearly all of its travel on large bumps but only bottoms occasionally. The mono, with the damping adjustment in the middle position, responds precisely to any and all terrain variations.

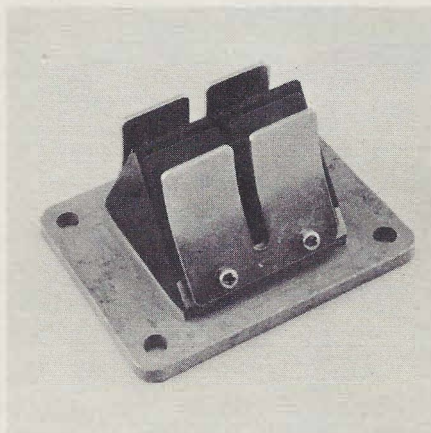
As controllable over high-speed ground as the 175 is, it is also comfortable to ride while just putzing along. Though the longer monoshock has raised the seat



All port passages are smooth and fairly well finished; intake and exhaust ports are lower than E-model's.



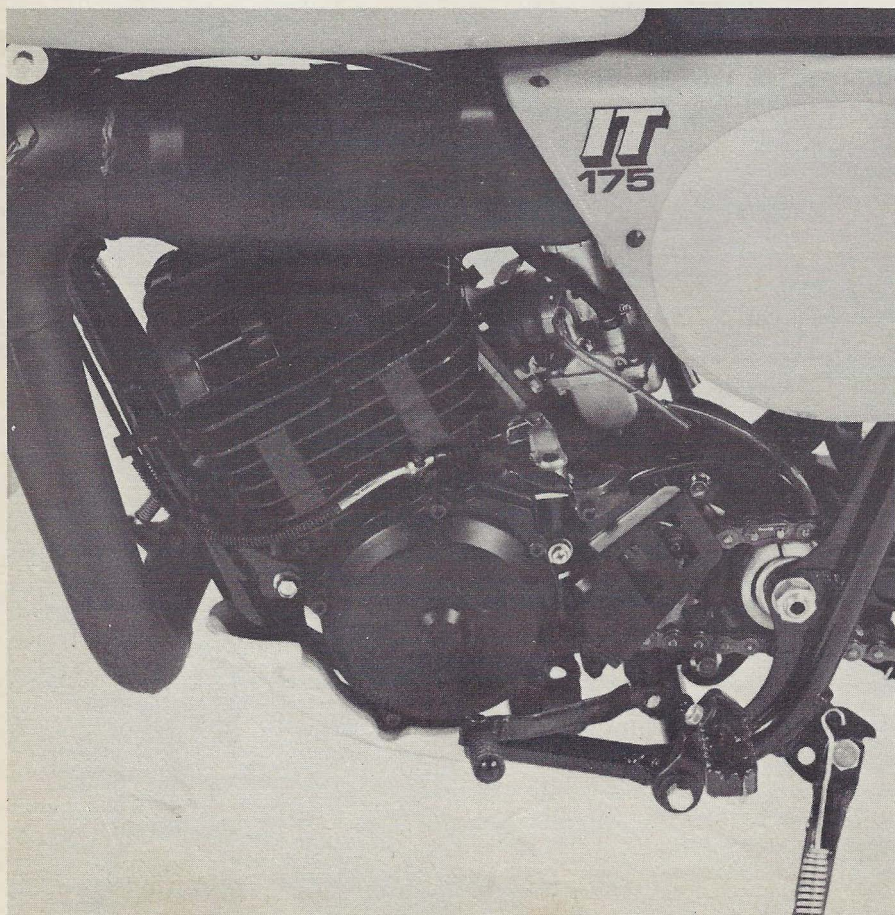
The head has centrally-located combustion chamber; compression ratio is raised slightly this year.



Four-petal reed valve and 34mm Mikuni carburetor provide crisp throttle response at almost any rpm.



Piston crown showed only moderate carbon build-up. Two keystone rings and needle bearing are standard.



Though the cylinder and head have only a moderate amount of fin area, the engine runs cool.



height one-half inch (to 34.5 inches), the ride height practically makes the IT a low rider. This permits the rider to throw the little bike around trees and make it dance over rocks. Its low center of gravity also makes the bike feel lighter than it really is, and lets the rider banzai through rough stretches without getting overly tired. The major drawback to its low height is that its footpegs are just 13 inches above the toe-smashing nasties. There's an ideal compromise available in seat height, footpeg height and suspension travel. We believe an extra inch of suspension would make a





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good system better, would add some much-needed footpeg ground clearance and wouldn't make the seat height unbearable for shorter riders.

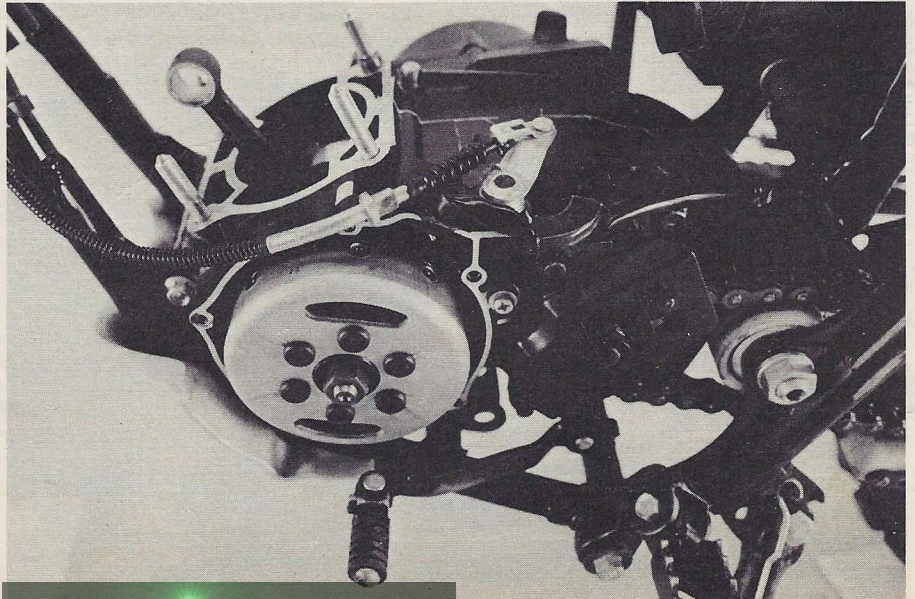
Both wheel assemblies are well constructed and functional. IRC tires, a motocross front and a Volcanduro rear, wrap around DID rims. The 4.10 x 18 rear tire has the rim saver feature, which is an

extended portion of tire protecting the rim from rocks. Slightly larger diameter spokes than on the E-model are used in the front wheel for added strength. Though the rod-actuated rear brake is non-floating, it doesn't chatter much under hard use—even when activated over stutter bumps or downhills. The excellent front brake, typical of Yamaha units, is progressive and powerful. Both front and rear brake backing plates are magnesium.

All the miscellaneous detail chassis features reflect careful construction and design. The brake pedal and rear shift lever both have folding tips to prevent them from snapping off when the rider either tosses the bike down the trail or just clips a log. The rear axle snail cams, in use on the IT175 since its introduction, speed chain adjustment. The block-type chain tensioner keeps the DID 520 chain taut at all times. Chain-tensioning fluctuations,



Aluminum sidecover removed exposes external-rotor flywheel. CD ignition is standard on dirt Yamahas.











an accessory center stand, which would be convenient for quick wheel removal.

Its engine was the primary feature which made the original IT175C so attractive. In 1977, the 21.5-horsepower Yamaha was just a little down from the 23-horsepower KTM and the 21.7-horsepower Can-Am; both of these bikes were several pounds heavier than the IT. Yamaha R & D men haven't lopped any significant weight off the IT in two years, but they have made steady progress and coaxed some more torque and horsepower out of the midrange.

The IT175F produces its peak horsepower 1000 rpm lower than did the original C-model. The 1979 machine develops 20.60 horsepower at 8500 rpm, compared to the older IT's 21.55 at 9500. The change is a result of some port modifications. Both the intake and exhaust ports have been lowered one millimeter. As a rule, shorter exhaust timing produces a less radical engine; the IT's lowered exhaust port produces that shorter timing and results in more mid-range power.

A lower exhaust port also produces a slight increase in the trapped compression ratio—up from 7.4 to 7.5:1. It does so because of the way compression ratio is calculated. Actual compression ratio (or trapped) is the ratio of the volume of fuel mixture in the cylinder when the piston closes the exhaust port compared to the volume of fuel mixture in the cylinder when the piston reaches top dead center. This "actual" measurement is opposed to the common European practice of computing the ratio between the cylinder's volume at bottom dead center and top dead center, which ratio is called the full-stroke compression ratio.

Both the cylinder and head are un-

changed in any other way. The head still uses a centrally located combustion chamber with a mild squish band and a copper head gasket. The aluminum cylinder has four studs securing it to the cases. The piston's relatively large bore and short stroke (66 x 50mm) is unchanged, but the piston now uses two keystone rings rather than last year's combination, which had one keystone and one normal ring. The connecting rod mounts on a needle bearing at the big end, and the piston pin rides on needles.

After 600 miles of running, the piston showed virtually no blowby, and the rings were not even a bit sticky. On the underside of the piston crown there was very little discoloration, which indicates the engine was running cool. Throughout the dirt test the IT ran on Yamalube mixed 20:1, and the bike clicked off 25 to 30 miles per gallon.

In the field the IT is a dynamo. It revs cleanly and strongly right from idle. There are no spectacular leaps in the powerband, just a good solid climb. The IT produces its best power from 7000 to 8500 rpm. After peaking with 20.60 horsepower at 8500, the IT goes on to produce 20.46 at 9000 and 20.02 at 9500. This ability to rev past the peak power point is important in a 175, where the rider inevitably runs the machine to its limit. The Yamaha doesn't penalize overrevving.

Compared to a Suzuki PE175C, the Yamaha produces just a shade more power off idle, then from 4000 rpm to 5500 pumps out anywhere from one-half to 1.7 more horsepower. At 6000 and 6500 the PE takes a sizeable jump in power production and reverses the situation: in that narrow spread it makes one-half to 1.5 horsepower more than the Yamaha does.

From 7000 rpm upward, the Yamaha pulls strongly ahead and outpowers the PE by .70 to 3.6 horsepower. Some fireroad drag races last year between an IT175E and a PE175C bore out the dyno figures. The IT pulled the PE by anywhere from three to five bike-lengths by the time both reached sixth gear, and the results were the same after the riders swapped bikes.

Other particulars of the powerplant remain unchanged. A 34mm Mikuni carburetor, a four-petal reed valve and an oiled foam air cleaner form the induction system. At 2000 to 4000 foot elevations, the stock jetting (#70 pilot jet, 6F21 needle and #360 main jet) carburets cleanly.

By and large there's been no need to fiddle with the IT's lower end. Helical-cut primary gears—71/22 for a ratio of 3.227:1—transfer power to the gearbox via an 11-plate clutch. Its six-speed gearbox has a couple of notable features. First, it shifts cleanly and requires a fairly short throw of the shift lever. Full-throttle shifts require a quick jab at the clutch lever, and backing half way off the throttle allows easy clutchless up or downshifts. All the gear ratios are ideally spaced. First is good for more than just getting underway; in the bottom gear the rider can slog through difficult muddy sections or through particularly tight trails up to about 15 mph. The bike never drops out of its powerband when run hard from second through sixth gear; this results from carefully matching gear ratios and power characteristics. Fifth, with a drive-to-driven gear ratio of 1.0:1, is good for 60 mph and sixth, the only overdrive (0.840:1), carries the IT to its top speed of about 75 mph. Both gears are obviously good enough for making up time in any enduro.

Only one minor change has been made to the electrical system. At low rpm (1000 rpm, which is the approximate crank speed when the rider kick starts the engine) the timing has been slightly advanced for easier starting. No IT has ever been hard to start, but the F-model fires before your foot makes a full arc.

Several manufacturers are missing out on the 175 class. It's a popular class in competition: most Hare Scrambles and Enduros have either a 175 or 200cc category. For serious trail riders, a good 175 performs nearly as well as a 250 and costs \$300 to 500 less. As a bonus, 175s are 20 to 30 pounds lighter than the average 250. Despite these facts, there are, practically speaking, only three competition-worthy 175s readily available at a local dealer. They are the Can-Am, the Suzuki and the Yamaha. We haven't yet run a Can-Am head to head with the IT; we know the Yamaha is a notch above the Suzuki by virtue of its more powerful engine and better suspension. For novices, amateurs and experts alike, the Yamaha IT175F is a reliable, versatile machine for competition or play riding.

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