Cycle Test

HERCULES 250 ENDURO

Germany's 7-speed shot is aimed at the carriage trade of trail riders--- those who demand and will pay for ISDT performance. After the factory clears up a few problems, it will hit KTM and Husky between the eyes.

● Late last summer *Cycle* published the first American road test on a 175 seven-speed Hercules, and stated flatly that it could be the best enduro bike in production with certain refinements. Here is another exclusive Hercules test, this time a 250, and the same basic conclusion remains. The need for refinements, however, is significantly more evident with this bike than the 175.

Such is the case for several reasons: In the first test, the bike was different and new, and we were caught up in the discovery of a genuine ISDT machine for serious enduro riders. Preoccupied with the mystique of its seven-speed gearbox and near-perfect steering, we dispatched a missed shift here and a little vibration there with a sentence or two; probably just a quirk of the test bike. In this test, however, greater familarity generated greater objectivity. Confronted with the same problems on the 250 that occurred with the 175, we can only conclude that they weren't idiosyncracies of our particular 175, but inherent difficulties for the whole Hercules line.

This situation is unfortunate, and somewhat serious. There are four major problems—vibration, missed shifts, rear-brake hop and excessive fuel consumption. The factory is presently at work on cures, and solutions should reach production models by the time 250s are readily available in America. Indeed, several improvements appeared on the 250 in the three months separating our two Hercules tests, so it's clear the factory has the capability to correct defects with haste. But *Cycle* doesn't road test future models. The machine we had will have to take its knocks. In the end, however, it delivered superior overall performance, which overshadows most of the problems and lavishly enhances its future potential.

But first the bad news.

Vibration: On the powerband the Sachs engine shook enough to (1) intrude upon the rider's concentration, (2) fracture two motor mounts, (3) crack a horn bracket, (4) render the taillight bulb inactive and (5) jeopardize the life expectancy and accuracy of enduro clocks mounted on the handlebar. The bike vibrates as much as any open-class motocrosser, which is a lot for a 250 and something that Sachs must resolve.

Missed shifts: It happens most often between first and second gear when you're on the power and shifting hard—just when you need a crisp shift the most. Many times it took two tries to climb a hill because the first charge ended in a hopeless loss of momentum and an over-revved engine when neutral was snagged instead of second. Most gears are missed when upshifting, and the frequency is several times an hour on an average trail ride.

Rear brake hop: All off-road motorcycles suffer some degree of clatter-bang-hop while braking hard on rough terrain—especially on rocky downhills. This prob-


It slides like
a half miler
on fire roads
and darts
through the forest
like a fox.
Another 250
probably won't
catch it.

lem is aggravated to an especially noticeable level on the Hercules by (1) a rod-activated brake instead of a cable, (2) too-stiff shock springs, (3) a non-floating backing plate and (4) a high friction coefficient between the brake shoe and brake drum. Hercules' new motocrossers already have a fully-floating brake, and it would be wise for them to incorporate it on the enduro immediately.

Fuel consumption: Mileage is an abysmally low 15–22 mpg, depending on how hard you ride. Range from the 2.6-gallon tank is an unacceptable 35 miles when riding hard and 40–42 miles at leisurely speeds. We ran out of gas on a 48-mile enduro loop and lost any chance of placing the Hercules high in the results. Ironically, our 175 test bike got excellent mileage and had a bigger tank, but the factory recontoured the 250's tank for less knee-crowding and reduced its capacity by a quart, thus compounding the range problem. Hercules will have to improve mileage considerably or offer a larger tank before anyone could expect to finish an enduro or take extended rides with his friends.

In spite of these problems this motorcycle dices with Penton/KTM and Husky for top enduro honors in the 250 class. It gives way to neither in power, and after fork and shock springs are exchanged for something less harsh, it matches both in handling. No Japanese street/trail bike or pure enduro can approach its overall performance.

The cylinder catches everybody's eye because of its huge size and truly different appearance. Enormous fins extend past magnesium sidecovers on both sides and wrap across the head in a flattened sunburst pattern which leaves plenty of room for changing the plug. Vertical noise-control and strengthening ribs cast between the regular fins shield a direct view of the barrel, so everybody bends at odd angles to study the cylinder. "Why is it so big?" people ask. Dyno testing reveals the answer: even at peak power, head temperature refuses to surpass 410 degrees, an exceptionally safe operating level that indicates even a wide-open blast up a sandwash on a hot day won't seize the engine. Rapid heat dissipation keeps horsepower consistent at times when scantily-finned engines lose power.

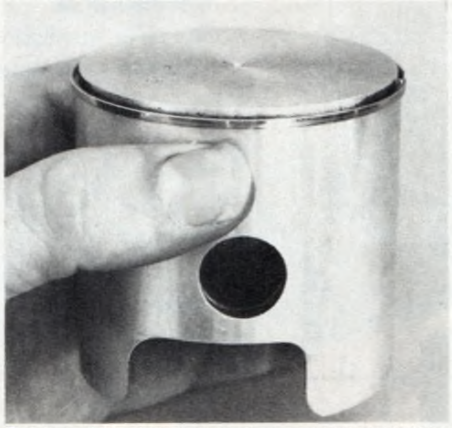
People next notice the unmistakable similarity to a Penton, especially in the identical method of variable shock mounting. This enables the No. 3 Marzocchi shocks (with old-style 10mm shafts) to be positioned five different ways, depending on rider preference. Rear wheel travel varies from 5.9 inches in the laydown shock position to 7.25 inches all the way forward. With stock 120-pound springs, which were too stiff for even our 200-pounders, it was difficult to get a clear read on shock performance. Because of heavy springs on both ends the bike reached its handling zenith at high speed in extremely rough terrain. Huge rolling whoop-dee-doos deep enough to conceal a Toyota wouldn't bottom the shocks or pitch the rear end from side to side. The harder you hit bumps the more the stiff suspension came into its own, but very few riders could stand such high speeds for very long, so softer springs are definitely necessary—especially for enduro work and trail riding. With them the rear end would be close to perfect by delivering more comfort, greater travel and reducing the brake hop problem. The rebuildable Marzocchi gas shocks are highly adjustable and easily serviced. Their action for enduro usage is entirely satisfactory.

The particular Ceriani fork on the 250 had a much smoother action than the one on our 175. Both required flushing with solvent and proper mounting to begin working right, but once set up, the 250's fork was superb. It had new dual springs separated by an aluminum spacer, but again, the heavier one was too stiff, allowing full travel on only the most horrendous bumps. A bike should bottom its suspension three or four times an hour in a tough enduro to demonstrate that nearly full travel is being utilized the rest of the time. A lighter second spring would make the Ceriani's entire 8.25 inches of travel as supple and cushy as the first four inches, which are controlled by the softer of the two springs. The fork is the latest leading-axle design with a magnesium slider and seals which don't leak. For oil we used 200cc of Torco MTF Fluid, a 10-weight primary case oil which many racers are using successfully in forks.

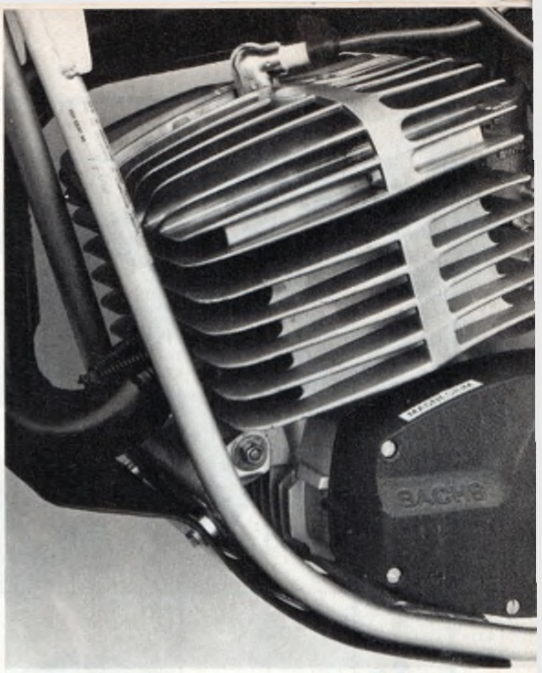
The next question observers ask is the relationship between Sachs, the name stamped on the engine and hubs, to Hercules, the name on the tank. Sachs is a giant German industrial conglomerate which builds engines, clutches, shock absorbers, hubs, automatic transmissions, washing machine parts, etc. One of their subsidiaries is Hercules, builder of the largest selling line of motorcycles in Germany. Sachs makes the engine and hubs, and Hercules does the rest. The

(Specifications page 56, story continued on page 69)

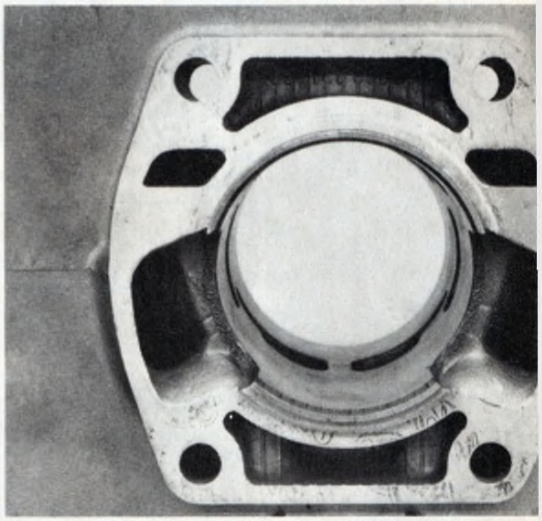
PHOTOGRAPHY: DALE BOLLER



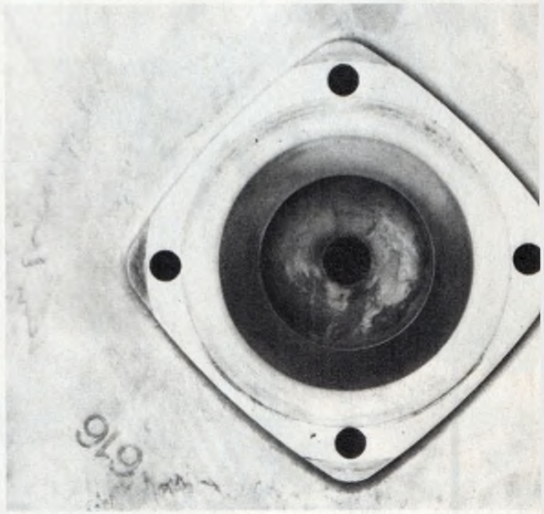
Flat top piston has less surface area to get hot as compared to a domed piston so the engine runs cooler.



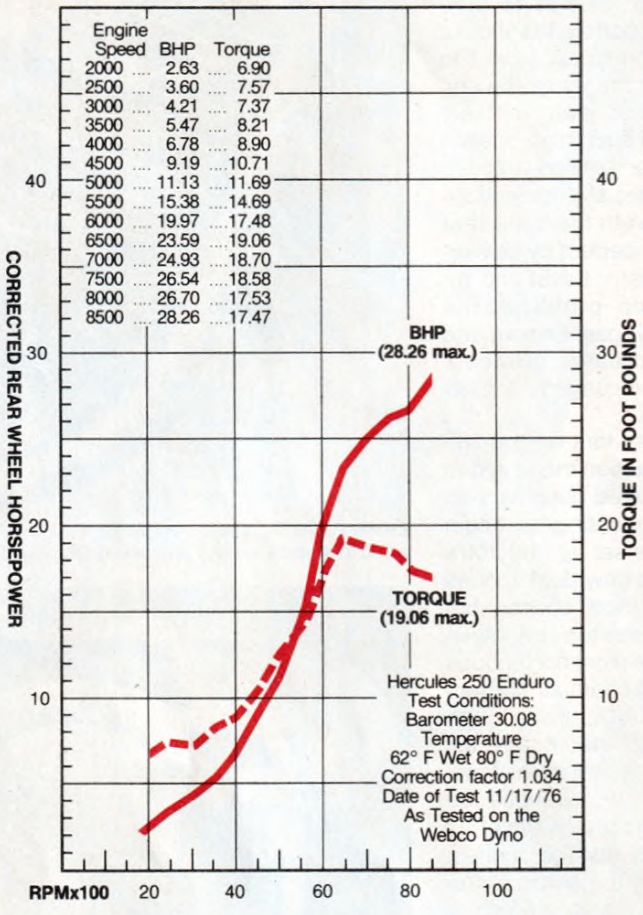
Enormous finning makes most people think the bike is a 400. Cylinder and head are intricate alloy castings.

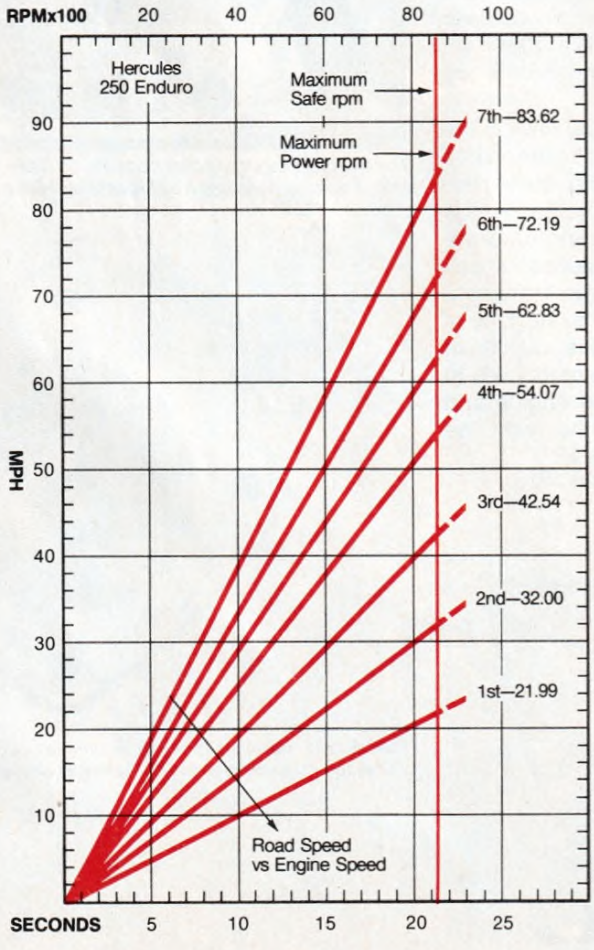


The main transfers and boost ports are on either side. Hollow areas at noon and 6 o'clock merely save metal.



The 250's combustion chamber is symmetrical, not a D-shape as found on the 175. Gasket is aluminum.





HERCULES 250 ENDURO

Price, suggested retail	$1698
Tire, front	3.00-21 Metzeler MX-Enduro
rear	4.50-18 Metzeler MX-Enduro
Brake, front	.95 x 5.5 in. (24 x 140mm)
rear	.95 x 5.5 in. (24 x 140mm)
Brake swept area	32.8 sq. in. (211 sq. cm.)
Specific brake loading	13.14 lbs./sq. in.
Engine type	Two-stroke piston-port single
Bore and stroke	71.5 x 61mm
Piston displacement	245cc
Compression ratio	11.5:1
Carburetion	1; 36mm; Bing
Air filtration	Twin Air wet foam
Ignition	Motoplat CDI
Bhp @ rpm	28.26 @ 8500
Torque @ rpm	19.06 @ 6500
Rake/Trail	28.5°/4.9 in. (124mm)
Mph/1000 rpm, top gear	9.84 mph
Fuel capacity	2.65 gal. (10 liters)
Lubrication	Premix
Transmission oil capacity	1.48 qt. (700cc)
Electrical power	6V, 35W lighting coil
Primary transmission	Helical gear 2.60:1
Secondary transmission	⅝ x ⅜ Jwis chain 14/51 3.64:1
Gear ratios, overall	(1) 30.00 (2) 20.62 (3) 15.51 (4) 12.20 (5) 10.50 (6) 9.14 (7) 7.89
Wheelbase	57 in. (1448mm)
Seat height	35.5 in. (91cm)
Ground clearance	10.2 in. (26cm)
Curb weight	271 lbs. (123 kg)
Test weight	431 lbs. (196 kg)
Instruments	VDO speedometer with odometer resettable both ways by tenths.
Average fuel consumption	15–22 mpg

HERCULES 250 ENDURO

bikes are distributed in America by Rotary Cycles of U.S.A., a Cleveland-based firm with 140 dealers in the east and plans for a West Coast distributorship in the near future. Rotary sponsored several riders in ISDT Qualifiers and sent a three-man Manufacturer's Team to the Six Day in Austria where Billy Uhl on a 250 and Mike Rosso and Drew Smith on 175s all won Gold Medals. Rosso was the top American in the 175 class in the final day's motocross test, and Uhl was the seventh American overall in the Trial.

"A seven-speed transmission?" people query. There are conflicting stories as to why Sachs fitted so many ratios, especially since the engine is certainly strong enough to provide outstanding performance with only five speeds. Perhaps there are seven as a marketing gimmick, but it's more likely that real advantages were anticipated in advance. There are several: (1) First gear can be extremely low. Without touching the clutch the Hercules can easily cope with large rocks, natty uphills, logs across the trail—anything that would normally require careful clutch slipping. (2) Seventh gear can be an overdrive that results in a 90-mph-plus top speed for pavement sections of the ISDT, Baja dry lakes or just so you can stick it to your buddies in a speed contest. (3) The gears are close-ratio, so upshifting rarely bogs the engine. (4) Engine braking on downhills is more precise and flexible. (5) Since the transmission shifts beautifully 95 percent of the time, a rider can dial-in almost any kind of power with a flick of his boot. This is true because maximum torque—the gritty, dig-in kind of power—occurs at 6500 revs; and maximum horsepower—the neck-snapping wheelspin type—occurs at 8500 revs. Just shift up for the former and down for the latter. This tremendous flexibility is what makes the Hercules so versatile without being hard to ride.

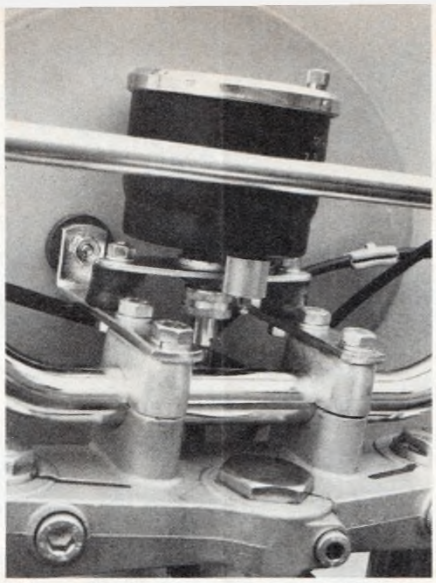
"Do the lights and speedo come with it?" Yes, and herein lies a major advantage over a Penton or Husky, which require $100 in parts and a day's installation to make enduro-ready. The Hercules' speedometer is a first-rate gear-driven VDO beautifully rubber-mounted on the triple clamp. The taillight includes a brake light, and the headlight has two beams. A horn is also standard, another contributor to the "enduro-legal" status of the Hercules, but Iowa corn grows louder than the horn honks.

The inevitable question: "How much does it cost?" Suggested Retail Price is $1698, over $100 less than a Penton, fairly close to the repriced Huskys and $250 more than a PE 250 Suzuki—but the Suzuki has about five less horsepower. Considering that the Hercules comes with lights and instruments, its price is substantially lower than its real competition.

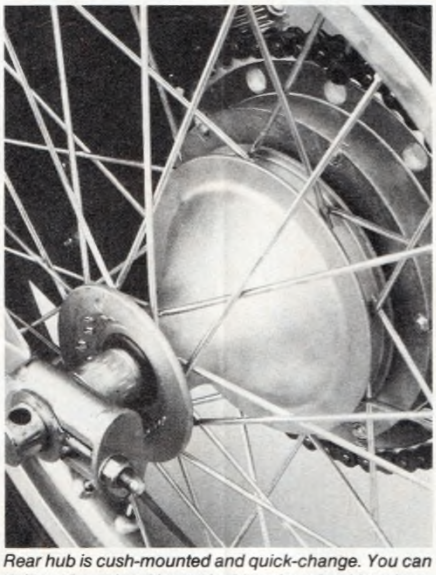
On Webco's dynamometer the engine easily spun off 28.26 horsepower at 8500 revs, the most of any true enduro *Cycle* has ever tested. The Hercules pulled Can-Am's latest ISDT 250 by 10 feet in a race to 90 mph, and it stayed with a CR 250 Husky in a violent dice up a high-speed fire road. The engine doesn't have the low-down gutsy enduro power of a Yamaha DT enduro or MR Honda, but it's not pipey like a motocrosser either. Below 5000 revs the motor holds its own and won't bog if the trail begins to rise, but there's no ready power for acceleration below the midrange. Beginning at 6500 revs, there is 23 hp or more for the next 2000 rpm, and this represents an extremely wide range of tremendous power. A good rider can work magic with the engine and an average rider will thrill to it. The Hercules climbed every hill we tried and beat or matched every 250 we raced.

There are no mystery ports in the 250's cylinder, as there were in the 175. A large main transfer is joined on both sides by a small boost port. The exhaust is bridged and features ears on the top half to in-

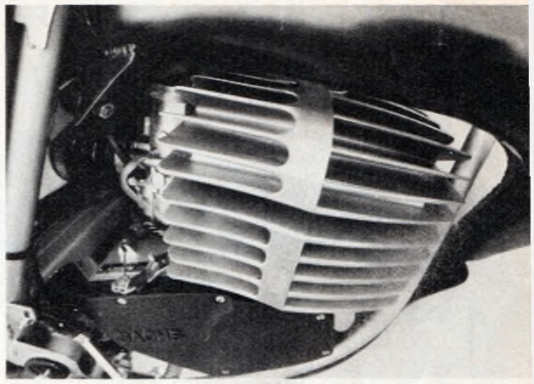
(Continued on page 117)



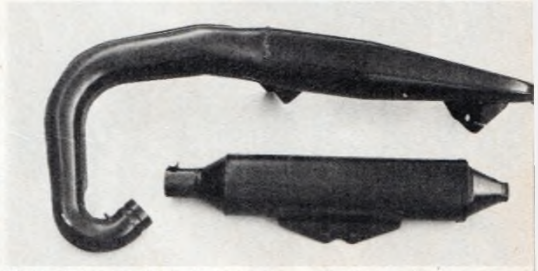
VDO speedometer is nicely rubber mounted. Four handle-bar bolts thread directly into the alloy triple clamp.



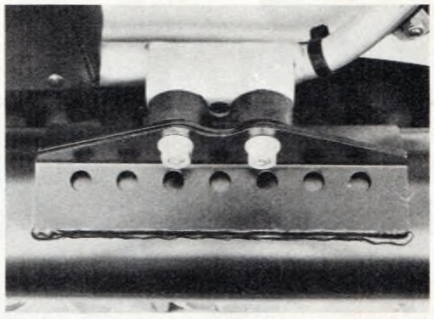
Rear hub is cush-mounted and quick-change. You can tighten the axle without pinching the wheel bearings.



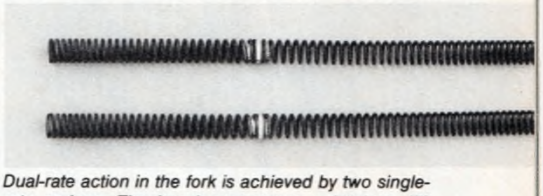
The incredible cylinder is dominant in every view. Rubber-mounted pipe is tricky to take on and off.



Huge silencer looks bulky but only weighs 2 pounds. Overall noise level of the 250 is still quite loud.

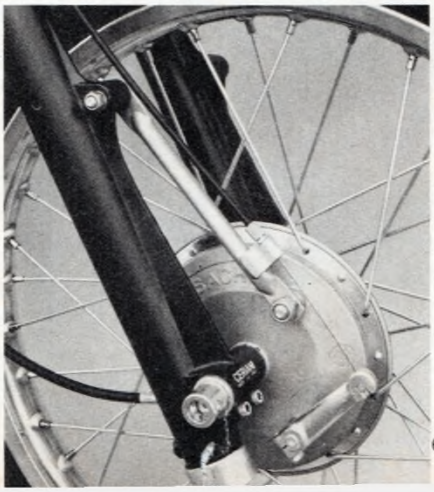


Double Lord mounts hold the silencer to the frame with 13mm nuts in an impressive mounting system.



Dual-rate action in the fork is achieved by two single-rate springs. The heavier ones are a bit too stiff.

Conical alloy hub has a steel-reinforced spoke flange and contains one of the best front brakes anywhere.



CAMBER ..... *Continued from page 101*

Like other good touring fairings, the Camber unit increases the utility of a motorcycle, if utility means greater use through greater convenience. Out on a short haul? You don't have to be dressed to battle the wind-chill factor. A motorcycle is more convenient when you can grab your helmet, ignore a bulky jacket, leave your dress trousers on, pull a pair of gloves out of a fairing compartment, hit the electric starter and depart for the newsstand. Many other times during the spring and fall a fairing eliminates or minimizes the normal motorcycle ritual of getting-ready and coming back. You can be a lot less sensitive to what you're wearing, even on a grey-cloudy day.

Contrary to the pop-music myth, sometimes it does rain in Southern California, and rain-riding is not our idea of fun. A sudden shower blew up out on Interstate Five, and in seconds the windscreen went opaque with raindrops. Soon thereafter you could see the Seventy-sixer knocking a hole in the weather and blowing the rain around the dead-air pocket. Happily the rain sputtered out instead of expanding into a genuine douser, so the Camber fairing held the inconvenience to nothing more than a damp jacket.

Riding inside the dead-air envelope of the Camber '76 suggests why touring buffs develop a never-ending emphasis on comfort and convenience. Sheltered from the air blast, your attention turns to other matters. Should the seat be uncomfortable then you'll notice it, and fast, because you don't have the wind slapping you around. Are the grips uncomfortable? You can't miss it. How are the legs? Could you use floorboards? One accessory leads to the next.

The Camber fairing is a stylish touring unit, well conceived and well executed. It provided comfort and protection without giving our 550 Honda a weight problem (18 pounds complete) or sacrificing its straightline stability or mucking up its handling. With few exceptions touring riders will like Camber's handiwork. And what about those hot-blooded sporting types who clench motorcycles with knees and elbows? They will have little use for the Seventy-sixer. No big problem. Camber can put the Harry Hotlaps behind a Yamaha TZ750 fairing—where there's little comfort and no place to hide. ◉

HERCULES 250 .... *Continued from page 69*

fed by a huge 36mm Bing carburetor which must be mounted at an angle for its cables to clear the upswept pipe. Carburetion was beautiful throughout 700 miles of testing, so function is not apparently effected by the tilt. Nevertheless Hercules is rerouting the pipe and reangling the cable retainers on top of the carburetor. They should also consider rubber-mounting the carb as they did on the 175, because the 250's solid mounting requires a socket and extention to loosen, thereby complicating trail-side jet changes. Without rubber to insulate the carburetor from vibration, metering can also be effected and slide wear excessive.

While racing the Husky on a Death Valley fire road, we were running the Hercules at wide-open throttle with only 94 miles on the odometer and the piston seized. That was our fault—we simply let out all the stops before proper break-in had occurred. Rotary Cycles air-freighted another barrel which turned out to be shaped just like that—a barrel. Piston clearance ranged from .004 on top to .008 in the middle and back to .004 on the bottom. It was a used cylinder—the iron liner had merely been honed. Since a subsequent new cylinder was round, we can only assume that the liner may not be thick enough to resist distorting.

After a new cylinder was installed and break-in extended to 200 miles, the engine survived a fast-paced 86-mile District 37 enduro and several torturous dyno runs without so much as a ping. Starting usually requires one or two kicks and can be achieved in any gear, another advantage over a Penton or Husky.

The drive-train is an impressive design with several exclusive features. Most important is the relationship between the swing-arm pivot point and the countershaft sprocket—very close—so in spite of long-travel suspension, not much chain slack is necessary. This eliminates elaborate tensioners and guides, which rarely control great amounts of chain slack with total success. The Hercules chain can be adjusted with only one inch of play. It is manufactured in Germany by Jwis and features extra-thick link plates.

Both the rear hub and clutch contain rubber cushes to insulate the transmission from shock loadings. The quick-change hub can be removed without disturbing the sprocket, brake-rod or chain. Tires aren't as easy to work with because the Akront alloy rims don't employ spikes to keep them from slipping. You'll have to wrestle with rim locks when fitting new knobs. The spokes require very little maintenance, mostly because they are straight-pull on the sprocket side.

An exclusive design in the clutch—L-shaped tangs on the plates—protect the basket from the usual notching. Satin clutch action and a wide friction point top off one of the finest drivelines in motorcycling.

Another bulletproof design is the use of tapered roller bearings at the swing-arm pivot. These sealed units are superior to bushings or needles and should never need replacement. Both the swing arm and frame are chrome moly steel. The bike's wet weight of 271 pounds is indicative of heavy-gauge steel, and lots of it. The resultant durability is why 23 of 25 Hercules entries finished the ISDT.

"Can I sit on it?" the onlookers ask. They squeeze the levers and pump the forks and prove whether they're street riders by how smoothly they lift it onto the centerstand. The stand is an option weighing less than two pounds and worth every cent of its $24 pricetag because of simpler wheel removal, chain lubrication, etc. The Hercules also comes with a sidestand.

Everybody likes the bike's feel. It sits right, it's not too tall and the Magura-equipped handlebar has a natural feeling. Both foot levers are shaped and positioned perfectly, but the pegs need sharper serrations for a better grip on boots. A thick saddle with soft but resilient foam doesn't keep inching the rider forward and doesn't sag in the middle.

Experiencing the Hercules at speed is what still leaves us enthusiastic in spite of the Big Four Problems and numerous niggles. The motorcycle steers beautifully. It will either slide or track through a turn, whichever you prefer. Metzeler tires, neutral geometry and excellent suspension damping make handling difficult to criticize. Stiff springs pummel the rider at slower speeds, but they add 6 or 7 mph to his potential speed on really rough trails. When the MR Hondas are strung out in fifth and gnashing at their suspension stops, the Hercules can catch another gear and start using full travel. A superb front brake keeps speed in check without losing its progression or feel when hot.

Power or its delivery cannot be faulted. The engine contributes greatly to the bike's steering abilities because it lifts the front end to clear obstacles and drifts the back end to set up tighter lines, all with a crack of the throttle or a poke at the shift lever—assuming you catch a gear instead of a neutral.

And that brings us to the only possible conclusion—a strong endorsement of the bike's potential and 95 percent of its actual performance, punctuated by a discouraging reminder of reality—missed shifts, vibration, brake hop and gas-guzzling. God, how we wish they weren't there. ◉

Cycle®

FEBRUARY 1977 • 75 CENTS

Hercules Seven-Speed 250 Enduro

Yamaha XS360-2D Econo-Bike

How Helmets Work

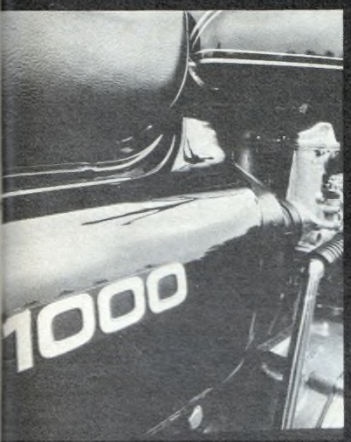
1977 KAWASAKI KZ1000

A Gentler King is a Better King

Cycle®

February 1977 Volume XXVIII No. 2

p.81



p.28

p.52

This Month's Cover: Alone on a deserted California highway, the new, big-bore Kawasaki KZ1000 represents a great technical accomplishment. It's quiet, smooth—and even faster than it was before. Photography by Michael Going.

Road Tests

Features

Technical

Departments