Hercules GS250

POWERFUL ENOUGH TO BLOW PENTONS AND HUSKYS IN THE WEEDS-BUT LACKING THE BOTTOM-END ENGINE FLEXIBILITY TO KEEP THEM THERE...

While accumulating enduro machines for last month's comparison test, the Hercules GS250 seven-speed, a relative newcomer to enduro competition, was scheduled to be included—in fact it was in our sweaty little palms—but an unfortunate foul-up during the Hercules pre-test preparation caused it to miss the party altogether. The rear axle nut was not tightened and within the first several miles of riding the hub assembly separated, shredding all five rubber donuts in the cushion drive.

It's too bad, since we had anticipated a strong showing from this unique and exotic machine, perhaps even enough to blow away Husqvarna's Malcolm Smith Replica which ended up the overall winner by recording fast time in the hillclimb, drag race and special test events. Throughout the comparison we kept wondering if the Hercules would be formidable competition for the Huskys and Pentons, so naturally, after acquiring new cushion rubbers, we immediately returned to the 3.7-mile special-test course to confirm any speculation that the Hercules might have aroused. One month earlier the MS Replica had blitzed the course in seven minutes flat and convinced the test riders there could be no faster way around—that is until the business-like Hercules pounded the winning time to oblivion. With the identical test rider aboard, the fire-engine-red Hercules turned a one-lap time of 6:52, absolutely blowing the Husky's time into the weeds by eight seconds. It was a startling display of horsepower and speed, and with such a hair-raising performance we couldn't help but bring the Hercules back for a personal encore.

The GS line (GS stands for enduro in Europe) consists of a 125, 175 and 250, which are just starting to flourish in the U.S. after three years of identity problems. They're still a bit unfamiliar, although the "Hercules" decal on the tank and the name "Sachs" cast into the outer magnesium engine cases should ring a familiar bell; in the past both have been responsible for the lightweight DKW and Sachs bullets that prowled the deserts, winning the Baja 1000 three times before being over-priced and dropped by distributors. This Hercules engine is made by the same West German industrial firm of Fichtel & Sachs (known as Sachs) who began motorcycle engine production in 1930, although it was originally founded in 1895 to manufacture engines, clutches and assorted industrial components. You'll also see "Sachs" cast into the alloy hubs.

Hercules, on the other hand, takes credit for chassis and running gear. The firm broke into the bicycle and motorcycle business in 1882 concentrating solely on chassis design, assembly and marketing; it was never involved in engine building. In the mid-Sixties, Sachs, then an industrial conglomerate, bought Hercules out and now operates it as a wholly-owned subsidiary. So, although the Hercules GS looks like it has been magnetized and sent sailing through a parts bin, it has evolved from one large family.

Sachs Motors of U.S.A. near Cleveland is the main distributor for Hercules machines, supplying 260 East Coast dealers with approximately 800 of the 250s this year; they're rather scarce on the West Coast, although a Southern California distributorship has been established recently. In an effort to acquaint the U.S. public with Hercules, Sachs has been involved in ISDT competition the last two years. A three-man manufacturer's team—Billy Uhl on a 250, Mike Rosso and Drew Smith aboard 175s—went to Six Days in Austria and all three won Gold Medals. Rosso was the top American in the 175 class in the final day's MX test, and Uhl was seventh American overall in the trial. In '77 Sachs mounted Ron Bohn and Drew Smith on 250s and Mike Rosso on a 175. Their performances were impressive considering the severeness of the Trials; Bohn went out on the rain-drenched 5th day; Smith was 30 miles from the finish on Day Six when the shifting rod was torn out; and Rosso finished with a Silver.

Aside from engine bore and stroke, all three sizes of machines use almost identical running gear—and it's an impressive list of trick components at that. Each boasts the same seven-speed transmission, a heavily gusseted dual-cradle chrome-moly frame, German-made Falk fenders like those used on Maicos, the latest magnesium-legged Ceriani forks sporting 8.86 inches of fork travel, No. 3 medium-damped Marzocchi gas shocks, lipless Akront rims, VDO speedo with trip meter, Magura Power Levers and quick-turn throttle, Magura throttle housing with quick-change throttle cable, 2.9-gallon steel tank and traditionally dependable Metzeler tires.

The Hercules surpasses other competition enduros by coming equipped with full lights and instrumentation from the factory instead of hitting the customer with an extra $100 charge for a lighting kit which he then must install himself. It's as street-legal as an "enduro" bike can be, sporting a dual-beam headlight that's typically just bright enough to illuminate the front fender, a taillight and stoplight assembly which miraculously stays on and a squeaky-sounding horn mounted to the frame downtubes.

At first glance you'll swear it's a repainted Penton. The most obvious similarity is the rear suspension which has multiple shock mounting positions available to the rider. You can dial-in anywhere from 5¾ inches of wheel travel (in the lay-down position) to 7¼ inches with the shocks moved all the way forward. The Six Day riders preferred the forward mounting in conjunction with slightly longer shocks. We found this arrangement caters to faster, more aggressive riders, since it's somewhat harsh over smaller bumps but able to handle really nasty terrain more effectively at high speeds. Laying the shocks down makes them less resistant to initial movement and therefore not as harsh at lower speeds and over smaller bumps. However, the shocks work twice as hard in this position, heat up quickly and tend to fade and bottom more frequently at high speeds. At no time did we feel the rear suspension to be totally inadequate. Placement of the shocks should be determined by how hard you ride and type of ride desired.

The brute-looking leading-axle Ceriani forks are coupled to magnesium triple clamps and give excellent fork action, although they're traditionally stiff when new. The dual fork springs were reluctant to provide full travel at first, pounding our test riders severely, but loosened up quite nicely after about 150 miles. We recommend you thoroughly flush both legs and replace the factory fluid with 5-weight

PHOTOGRAPHY: RICH COX, DALE BOLLER AND DAVE HOLEMAN

fork oil for best results. With steering geometry nearly identical to a Penton, we weren't surprised to find the Hercules steers precisely and handles superbly through tight wooded areas, the Metzeler tire always carving a path and never sliding or pushing. It has a field day on slick fire roads because the front end feels like it's glued in a groove, while the rear dances from side to side.

In the weight category the GS is a bit heavy at 268 pounds wet, however it splits two formidable competitors down the middle: The Husky MS Replica weighs 249 pounds, while the IT Yamaha is a real fatty at 274 pounds. But one reason it bested the Husky's special test time was the fact it felt comfortable to the rider. Everything is positioned correctly and the few extra pounds soon become of no concern to the rider. The seat is narrow and nicely rounded, the tank has been slimmed down slightly in the rear this year and allows ample leg movement. The plastic side covers and outer engine cases are unobstructing to ankles or feet, the conservatively-bent handlebars are comfortable, and you'll find all levers and pedals placed correctly—in fact you can feel at home on this baby even before the factory chain lube has worn off. We would, however, pop for softer grips than the stock Maguras, and definitely take a file to the pegs as the serrated stock jobs just aren't sharp enough to effectively keep a boot from sliding.

Hercules has tried to build reliability as well as performance into the GS, evident in the rigidly built chrome-moly swing arm that swings in caged tapered roller bearings instead of the usual plain brass bushings that continually deteriorate, or needle bearings that eat themselves alive if penetrated by water and dirt. Rubber caps prevent the rollers from being contaminated and you can manually adjust lateral side play—there's absolutely no better way to mount a swing arm. Hercules has also moved the countershaft sprocket extremely close to the swing-arm pivot which enables the rear wheel to go through its full range of travel with very little chain slack. In fact the chain can be adjusted with just one inch of slack, thereby ruling out any

DIRT TEST

Hercules GS250

need for a chain tensioner—you won't find one on the Hercules. We've noticed that several of the Japanese companies are going to this technique on their '78 motocrossers to eliminate hassles of chain tensioners and thrown chains.

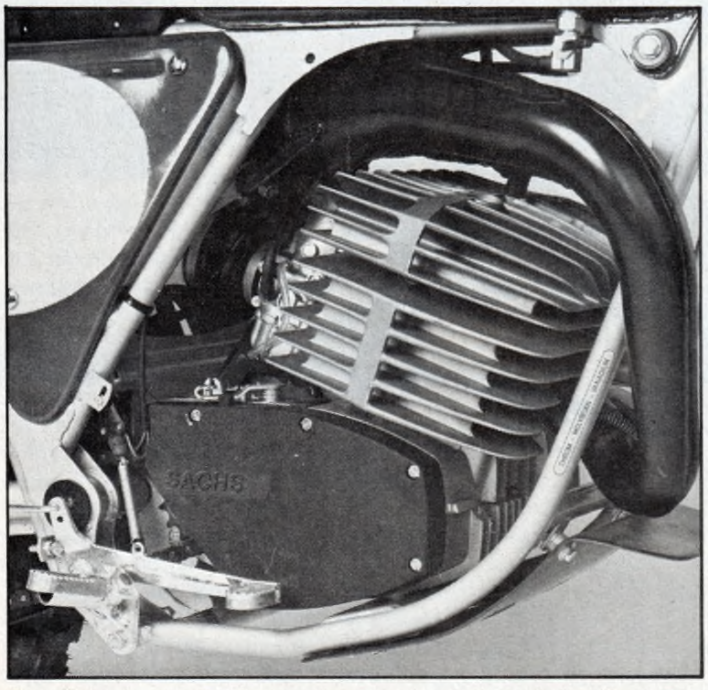
In an attempt to suppress harsh engine impulses and increase drivetrain life, Hercules incorporates a double-cushion drive system: one located in a clutch hub that has eight built-in rubber donuts; the other in the five-donut rear hub assembly. The rear system looks complicated, especially come tire-changing time, but it isn't. The drive side, consisting of sprocket, chain and backing plate, simply acts as a carrier with its own axle and stays intact when the wheel is removed. You needn't remove the chain, brake cable, brake torque rod or backing plate—it definitely facilitates quick and easy tire changes.

One area that has haunted Hercules in the past has been the rear brake system that produces an annoying amount of wheel hop under severe braking. Not only is the bounce and loss of traction unnerving, but the bouncing is transmitted down the chain and into the gearbox producing loud clanking noises from within, which are bothersome to hear and represent a considerable strain on the driveline. We got into the habit of totally ignoring the rear brake altogether and relying solely on the front—fortunately it's beefy enough to handle it. Special test times could have been even quicker if it weren't for several overshot corners due to an ineffective rear brake. Hopefully next year we will see a full-floating system that could cure this annoyance—it's a crime to have such a poor brake on a machine that's capable of hitting over 80 mph.

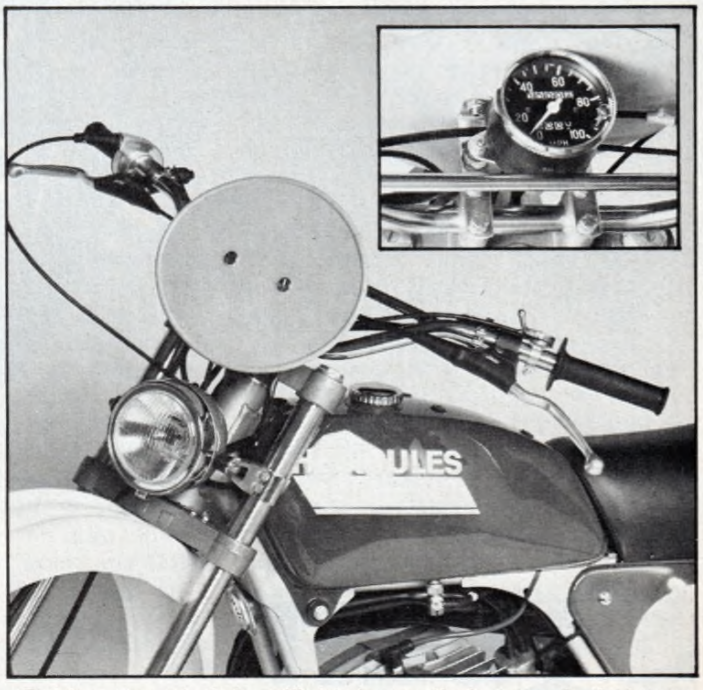
The heart of any competition enduro bike and the component that determines its success is its engine, and the Hercules powerplant is quite controversial in appearance and function. It's second to none in being absolutely gassy-looking with black magnesium outer engine cases, a massively finned cylinder and radial head that makes the Sachs engine look both exotic and horrendous in size. Cylinder head temperature never exceeded the 400-degree mark while running on the Webco dyno; most two-strokes heat up to around 420 degrees, with the 440 mark being on the verge of melting the cylinder and piston into one unit. This means the Hercules can charge down long, deep sandwashes on the most humid and hottest days without the fear of seizing; this cooler head temperature also increases engine life and helps retain peak horsepower when the going gets rough.

The alloy cases split horizontally for ease of maintenance and once inside the Sachs engine you'll find it's

With its clothes removed, the Hercules looks like a Penton protege. Exhaust has a winding, tight-fitting pipe featuring a quiet silencer, but no spark arrester. Engine noise sometimes exceeds exhaust tone. Tranny vents through upper outer case bolt (by kickstarter) and leaks all over engine.



Sexy black magnesium outer cases and massive finning characterize slim Sachs engine. Plastic skid plate guards alloy center cases. Gas mileage figured out a dismal 50 miles per 2.9-gallon tank, not good enough.



Rubber-mounted headlight is nestled snuggly between magnesium triple clamps. Magura controls and levers are flawless—note nifty leather covers and extra choke lever. Tank feeds fuel through dual four-way petcocks.

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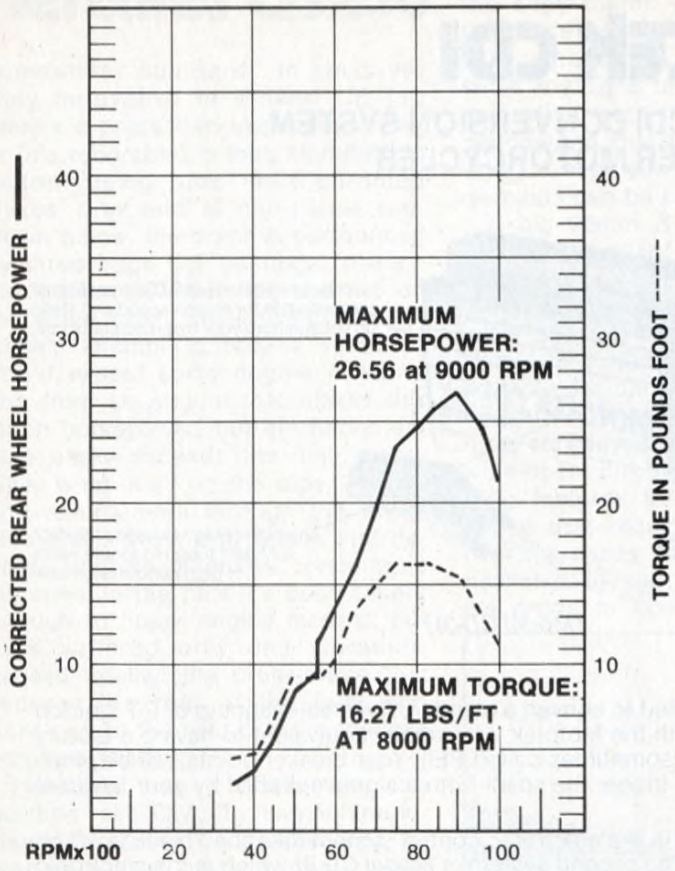

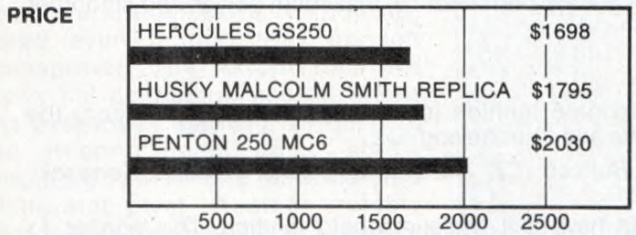

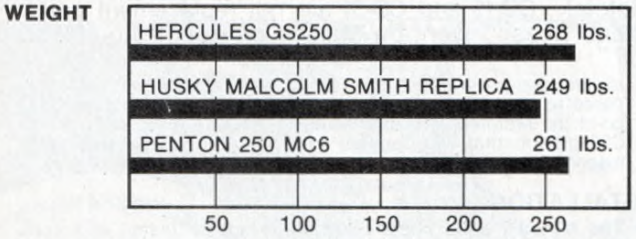

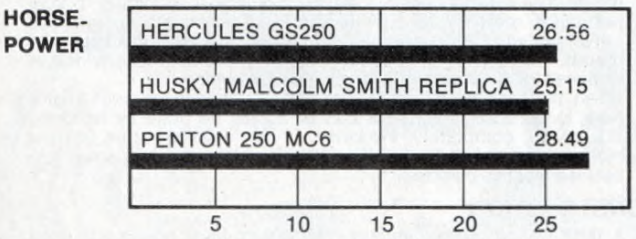

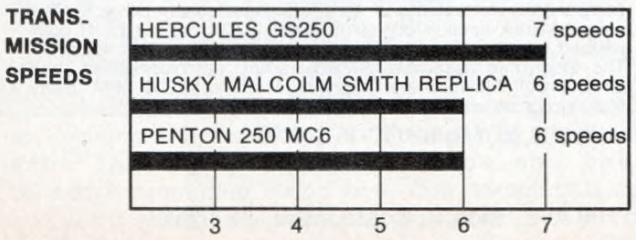

TEST BIKE: HERCULES GS250
Price, sugg. retail.....$1698

ENGINE
Type.....Piston-port two-stroke single
Bore/stroke.....71 x 61 mm (2.79 x 2.40 in.)
Piston displacement.....245 cc (14.95 cu. in.)
Compression ratio.....11.5:1 (uncorrected)
Carburetion.....Bing 54/36/1101
Air filtration.....Oiled foam
Ignition.....Breakerless electronic
BHP @ rpm.....26.56 @ 9000
Torque @ rpm.....16.27 @ 8000
Lubrication.....Oil in fuel
Electrical power.....6V generator
Battery.....None

DRIVETRAIN
Primary transmission.....Spur gear, 3.04 ratio
Clutch.....Multi-plate, wet
Secondary transmission.....⅝ x ⅜ in. (530) chain, 3.64 ratio
Gear ratios, overall :1....1st 35.19; 2nd 24.20; 3rd 18.21; 4th 14.32; 5th 12.32; 6th 10.72; 7th 9.26

CHASSIS & SUSPENSION
Suspension, front.....Telescopic fork, 225 mm (8.86 in.) travel
Suspension, rear.....Swing arm, 105 mm (4.13 spring travel)
Tire, front.....3.00 x 21
Tire, rear.....4.50 x 18
Brake, front.....Drum, 160 x 25 mm (6.3 x .98 in)
Brake, rear.....Drum, 160 x 25 mm (6.3 x .98 in.)
Brake swept area.....98.x cm./sq. (38.8 in./sq.)
Rake/trail.....n.a.
Wheelbase.....1425 mm (56.1 in.)
Seat height.....902 mm (35.5 in.)
Handlebar width.....832 mm (33.0 in.)
Ground clearance.....267 mm (10.5 in.)
Instruments.....Speedometer, trip reset
Stands.....Side
Tire retention device(s).....Security bolts; 1 front, 1 rear

WEIGHTS & CAPACITIES
Fuel capacity.....11 lit. (2.9 U.S. gal.)
Oil capacity.....700 cc
Weight, wet, unladen.....121.6 kg. (268 lb.)

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somewhat "standard" in ways yet truly innovative in others. Up top there's a pressed-in iron cylinder liner (it's reborable), a long skirt-flat-top piston using one hard-chromed Dykes ring and a one-piece rod. Down below, the crank is surrounded by three huge ball bearings (one on the ignition flywheel side and two on the drive side) while full-circle flywheels attempt to reduce vibration. You'd expect some degree of vibration from an engine that makes this much horsepower, but the Sachs engine easily exceeds the limit, especially when it's "on the pipe." Vibration reverberates through the entire bike and it's the only factor that detracts from an otherwise comfortable machine. In the past it's been severe enough to break engine mounts, but ours suffered only one vibration-caused fatality: the cross-brace that secures the rear of the tank and front part of the seat broke under the constant shaking.

Hercules has concentrated on building reliability *into* its machine instead of adding it on later. For instance helical primary gears have been installed in place of straight-cut spur gears, their extra strength favored even though they do rob horsepower. The Akront rims are heavy but ding-proof, and the frame has excessive gusseting surrounding the steering head, upper shock mounting point and around the swing-arm pivot. Another notable item is that the clutch has L-shaped tangs on the six driving plates to keep them from gouging notches in the alloy clutch basket as straight tangs generally do. The clutch is silky smooth in action and didn't show any signs of slipping or require any adjustment throughout the test period—and that's surprising considering the power the Sachs engine develops can be brutal to clutches.

A big 36mm Bing carb feeds the fuel into standard piston-port intakes without the help of any reed-valve assembly. It's a dual-slide Bing, the extra slide acting as a choke controlled by a handlebar-mounted lever so the rider can richen the fuel mixture and prevent seizures when running steadily down paved roads at wide-open throttle. For starting, the Bing features the standard "tickle" choke that requires running fuel all over the cases, but the engine never hesitated to start easily when cold; it's prone to flooding when hot, so we got into the habit of closing the fuel petcocks each time the engine was shut off. It's a difficult carb to work on because it is mounted rigidly to the cylinder and stuffed underneath the exhaust; it's actually cocked at an angle so the cables will clear the pipe. Ours needed work too—it never carbureted cleanly on the bottom-end, even after we dropped the needle to its lowest position. It even committed the worst of two-stroke sins by fouling two plugs while we were riding leisurely—this isn't a natural characteristic of the Sachs engine, so we hold the not-quite spot-on Bing jetting primarily responsible. One night's worth of carb fiddling will do wonders for low-speed running.

The over-enthusiastic Bing was no doubt partially the villain in the Hercules giving terrible gas mileage; it

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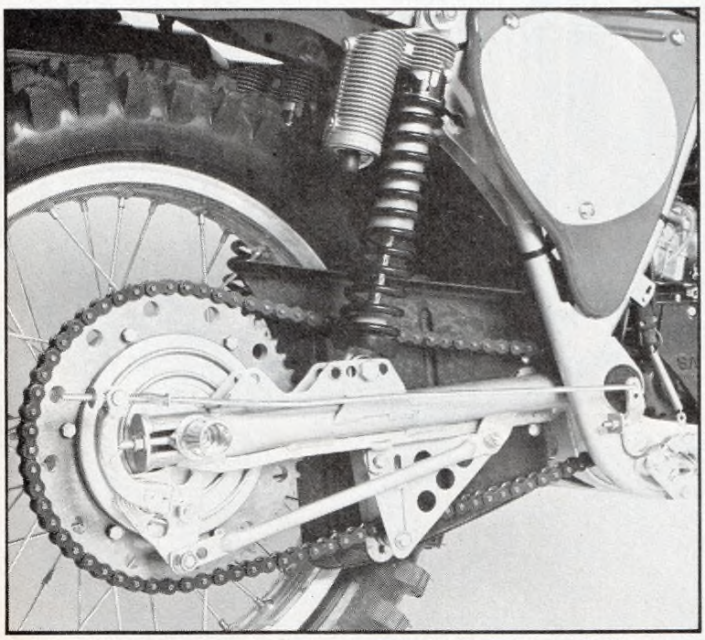
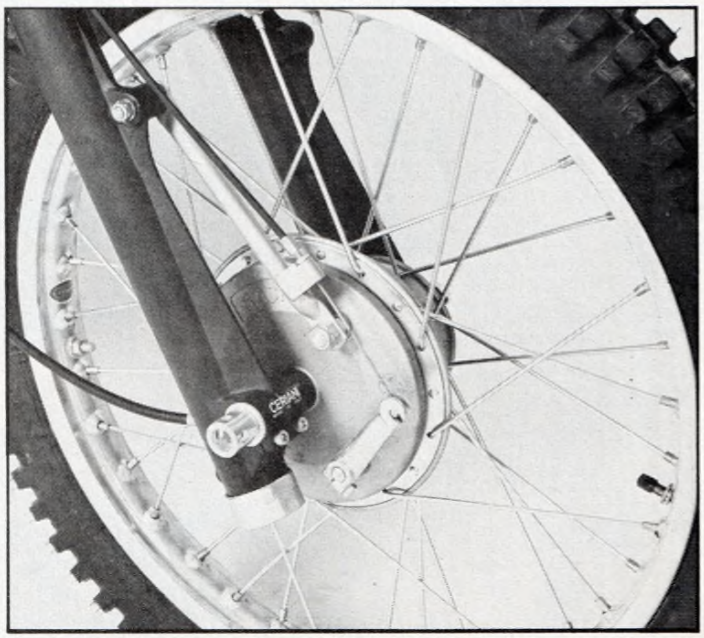


Busy-looking rear end has multiple shock positions, plastic chain guard, a chain guide and beefy roller-bearing-mounted swing arm. Gas Marzocchis can be mounted either right-side-up or inverted.



Magnesium-legged Cerianis are super beefy with seals that don't leak. Like the rear, it's a quick-change front end. Conical hub features steel ring around spoke holes for added strength. Spokes were beautiful, needing only one initial tightening.

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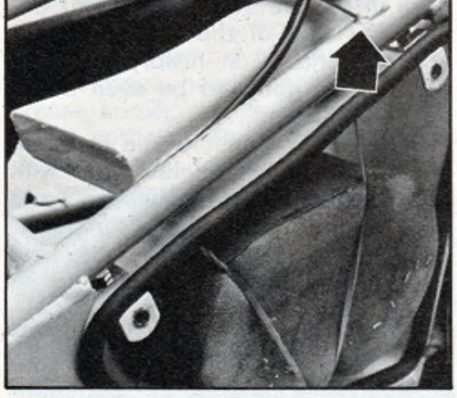
averaged only 50 miles on a full tank of fuel which means it will never make it to the finish of most enduro loops, and it won't let you stray far from the campfire. Leaning the carb should improve this somewhat, but Sachs and Hercules are going to have to get together and either make the engine thriftier or increase the tank capacity even though it's already a plump 2.9 gallons in size.

The Hercules is outrageously powerful at the higher revs and once "up on the pipe" will constantly supply the type of neck-jerking acceleration to inspire even the purest motocross racer. It'll constantly break the tire loose with every upshift and the gearbox ratios are so close that it will rarely bog once it has built up a head of steam. Le' the revs drop a bit too low and a quick jab at the gear lever or slip of the clutch brings it right back to hard-charging. With seven speeds forward the Hercules can crawl along at sub-walking speeds and yet blitz fire roads at over an eye-watering 70 mph—and it has the reserve power to pull strongly in the upper gears. With the gear ratios so closely spaced you can expect to do a lot of shifting, but it's this arrangement that allows the engine to stay in its power band.

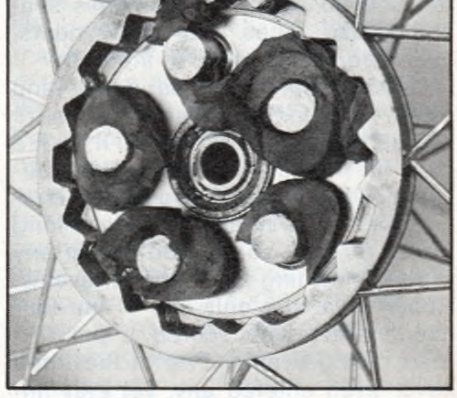
Though once plagued with shifting problems, our Hercules test bike shifted cleanly with a solid stroke of the boot. We missed a couple gears while goofing off, but in general the shifts are clean and crisp. You can expect the rubber pad on the shift lever to wear out in about 100 miles—ours did.

Unfortunately whether it's the characteristic of the engine, a carburetor in need of tune or both, the Sachs engine was simply too pipey for anything other than wide open "put the throttle to the stop" racing. It pulls rather sluggishly up to 5500 rpm as evidenced by the dyno curves, and then literally explodes. Stock carburetor jetting won't let the engine pull in the lower range for casual sight-seeing—do it and you'll be looking at the end of the plug more than the scenery. It's fun to ride fast, but it becomes a handful when tackling slow, steep, winding hills because it wants to load up. We've heard that a Lectron carb will help clean up its act considerably. We hope so, because the way ours carbureted just isn't acceptable for the variety of terrain the bike is expected to traverse. It will smoke them in wide open desert-type events, but it'll suffer in wooded areas where slow, tight going is the name of the game. Previous experience with properly jetted GS250s left us with a favorable impression of the bike's overall tractability, but this particular test machine required an expert's touch and fast terrain to run clean.

By besting the Husky's time over our "special test" course the Hercules proved it has the speed and handling to challenge and even overcome some of its stiffest competitors, but only over a specified course and under a controlled set of circumstances. To be really competitive out in open uncontrolled territory with bikes such as the Penton, Husky and IT Yamaha, its engine personality needs to be tailored from a hyped-up difficult-to-control animal, to a more conservative engine that pulls strongly through the entire power band. As of now it's only as effective as the quality of rider aboard it. M



Plastic air box breathes from under seat through a long scoop. Plastic side cover seals off air box and also helps secure foam filter. Vibration broke welds (arrow) securing rear tank mounting crossbar.



Here's what happens to the rubber donuts in the rear cushion drive when you leave the axle nut loose—they get shredded! Even with proper care they need to be replaced about every six months.

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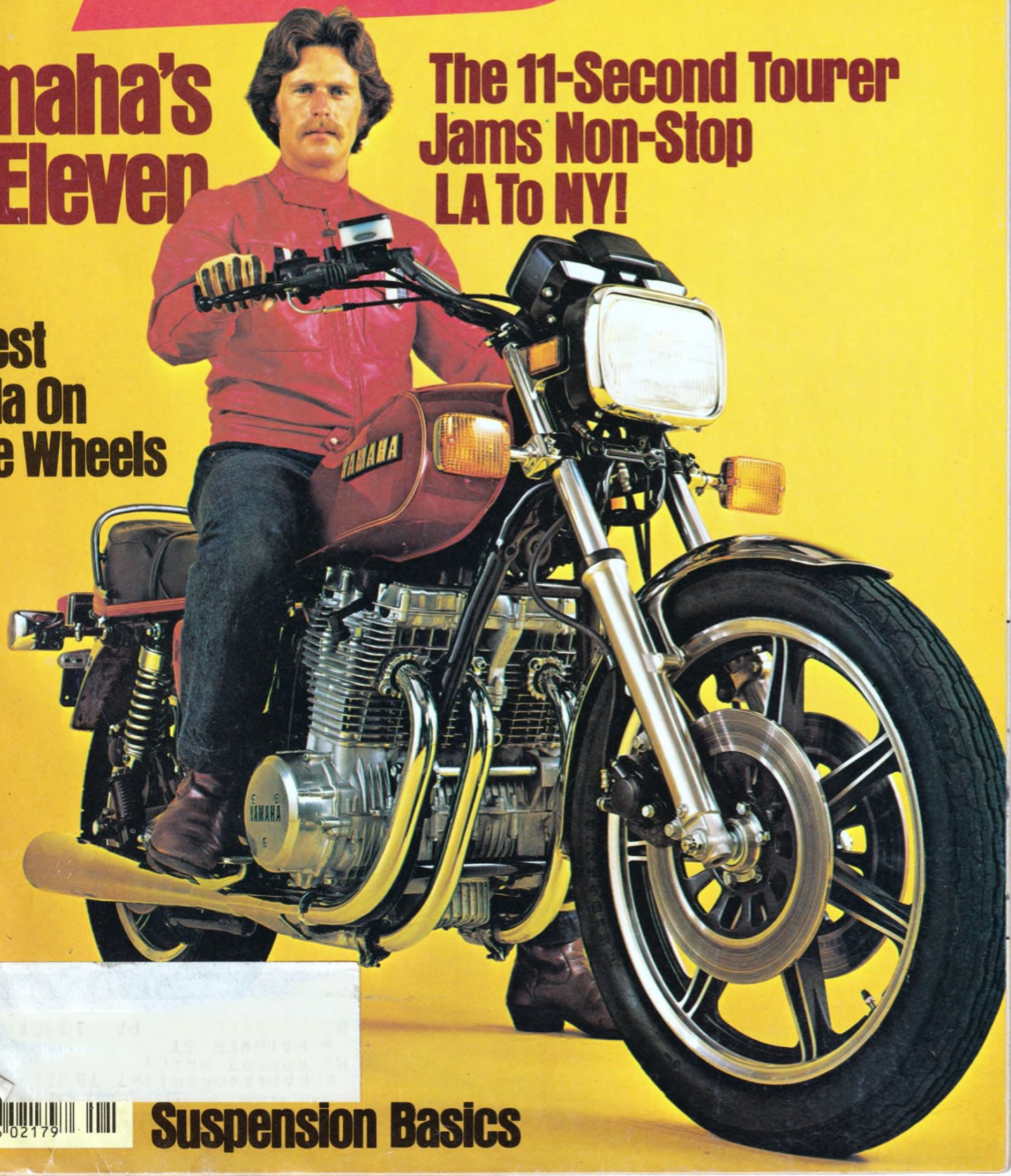

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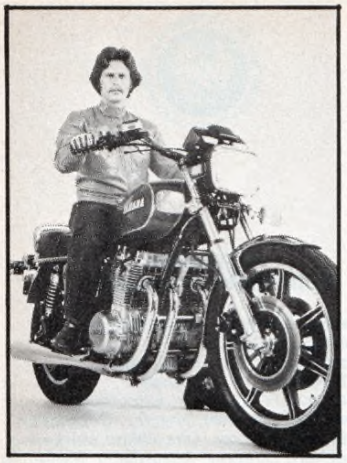
Suspension Basics



Motorcyclist Magazine

PUBLISHED
MONTHLY
NUMBER 967

JANUARY 1978

COVER

Yamaha's startling new XS1100 shifted into light drive in Los Angeles and landed in New York 59½ hours later. One of the riders was Rich Cox, warming up on the cover for his 811-mile 14-hour stint in the saddle. His impressions are on page 20. Photo by Mike Levasheff.

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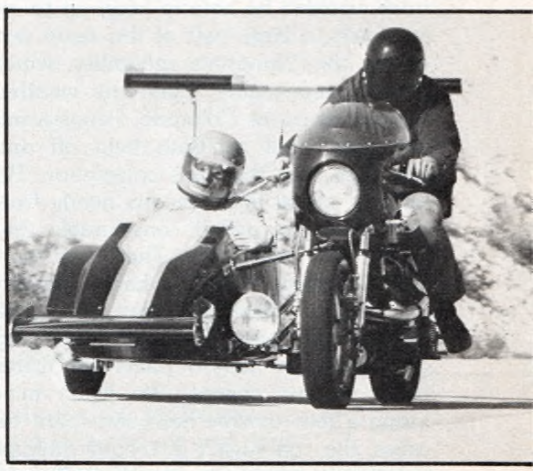

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